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December 12, 2019

Mr. Joshua Adams
Ohio EPA - NEDO, DMWM
2110 Aurora Rd.
Twinsburg, Ohio 44087

RE: Royalton Road Sanitary Landfill, Cuyahoga County
Corrective Measures Plan –December 2019 Revision

Dear Mr. Adams:

On behalf of Norton Construction Company, DBA Norton Environmental, Eagon & Associates, Inc. is submitting the enclosed revision to the Corrective Measures Plan (CMP) for the Significant Zone of Saturation for Royalton Road Sanitary Landfill in accordance with Rule OAC 3745-27-10(F)(2). This December 2019 revision is submitted to add additional language for monitoring of natural attenuation (MNA) parameters for Alternative 1 in the CMP. This revision replaces the previous revision of the CMP submitted in November 2019. The revisions have been made to the CMP and to the Corrective Measures Groundwater Quality Monitoring Plan (CMGWQMP) which is included as Appendix A of the CMP in accordance with OAC 3745-27-10(F)(2)(e).

The following pages have been revised in the CMP submitted herewith to Ohio EPA: the cover page, affirmation pages; text page 5-1 through 5-5 and 6-1; and the following pages of Appendix A (CMGWQMP): the cover page, affirmation pages, text pages ii, iv, 3-12 through 3-15, 4-1, and 6-14 through 6-16; and Tables 2 through 4. This CMP submittal replaces all previous versions. For those persons receiving a hard copy cc, only those pages that have been revised are enclosed and, therefore, should replace the corresponding page in the November 2019 version.

Please call Richard Heier (330) 224-4079 or me if you have further questions or comments.

Sincerely,
Kelly E. Birkas
Kelly E. Birkas
Hydrogeologist

KEB/kj
encl.
cc: Richard Heier, Norton Environmental, w/encl.
Matt Johnson, Program Manager, Solid Waste, Cuyahoga Co. Board of Health, w/encl.

SOLID WASTE
APPROVED
OHIO ENVIRONMENTAL PROTECTION AGENCY
02/03/2020
AS EVIDENCED BY COPY OF
LETTER OF APPROVAL
ATTACHED HERETO

CORRECTIVE MEASURES PLAN FOR THE SIGNIFICANT ZONE OF SATURATION ROYALTON ROAD SANITARY LANDFILL

Cuyahoga County, Ohio

Prepared for:

NORTON ENVIRONMENTAL

Prepared by:

EAGON & ASSOCIATES, INC.
Worthington, Ohio

October 2007
Revised February 2011
Revised September 2018
Revised May 2019
Revised November 2019
Revised December 2019

EAGON & ASSOCIATES, INC.
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AFFIRMATION

I, Rich Heier, a representative of the Owner/Operator for Royalton Road Sanitary Landfill, Cuyahoga County, Ohio, certify that to the best of my knowledge the contents of the submitted December 2019 Revision to the *"Corrective Measures Plan for the Significant Zone of Saturation, Royalton Road Sanitary Landfill"* are true and complete and comply with the requirements of Chapter 3734 of the Revised Code and the rules adopted thereunder. I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete.

Rich Heier
Landfill Manager

Subscribed and affirmed to before me this 11th day of December 2019 by Richard Heier.

STATE OF OHIO
COUNTY OF Summit

Cheryl Heier
Notary Public

CHERYL HEIER
Notary Public, State of Ohio
My Comm. Expires 12-09-2021

AFFIRMATION

I, Kelly E. Birkas, a qualified Groundwater Scientist of Eagon & Associates, Inc., 100 Old Wilson Bridge Road, Suite 115, Worthington, Ohio 43085, certify that to the best of my knowledge the contents of the submitted December 2019 revision to the *"Corrective Measures Plan For the Significant Zone of Saturation, Royalton Road Sanitary Landfill"* are true and complete and comply with the requirements of Chapter 3734 of the Revised Code and the rules adopted thereunder.

Kelly E. Birkas

Kelly E. Birkas
Hydrogeologist

Subscribed and affirmed to before me this 12th day of December 2019, by Kelly E. Birkas.

STATE OF OHIO
COUNTY OF FRANKLIN

Melissa A Stonerook
Notary Public
In and for the State of Ohio
My Commission Expires
April 24, 2023

Melissa A. Stonerook

Melissa A. Stonerook
Notary Public

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1.0 INTRODUCTION

1.1 Purpose and Scope

This Corrective Measures Plan (CMP) is provided in accordance with OAC 3745-27-10(F) to address the presence of waste-derived constituents in the groundwater in the significant saturated zone (significant zone of saturation (SZS)) at Royalton Road Sanitary Landfill in Cuyahoga County, Ohio. Presented herein is an evaluation of the corrective measures alternatives as required by OAC 3745-27-10(F)(3). Performance standards and technical criteria are evaluated and compared for each corrective measures alternative. The report also includes a recommended alternative. Data evaluation methods are provided that will be used to monitor the effectiveness of the selected remedial measure. The Corrective Measures Groundwater Quality Monitoring Plan is provided, in accordance with OAC 3745-27-10(F)(2)(e), as a stand-alone document and is presented as Appendix A.

1.2 Background

Royalton Road Sanitary Landfill is located in south central Cuyahoga County, Brecksville Township, within the limits of Broadview Heights, Ohio. The Site is northwest of the intersection of I-77 and Royalton Road (SR 82) (Figure 1). The Site property is bounded by Chippewa Creek to the north, an unnamed tributary valley to Chippewa Creek to the west, and Royalton Road and commercial and development business development to the south and east.

The property was owned by Emil E. Kocor from 1939 to 1963 and operated as a waste disposal site serving the Villages of Broadview Heights and Seven Hills. In 1963, G & H Enterprises, Inc. acquired the property and large scale landfill development on the site was initiated for solid-waste disposal. Tri-Square Corporation took over ownership of the property in 1969 and is the current property owner. The Norton Construction Company has operated the facility for the Tri-Square Corporation since 1969. The Site is currently closed and was operated under permit PTI # 02-9306 which was issued by the Ohio Environmental Protection Agency

(OEPA) in 1998. Closure certification for the Site was received from the OEPA in a letter dated February 1, 2011 (Bowman and Sowers, Ohio EPA to Balog, Norton Environmental). A copy of the closure certification letter is located in Appendix B.

The groundwater assessment monitoring network consists of 19 wells, 17 wells completed in the Cuyahoga Group Shale and two wells completed in the unconsolidated deposits which directly overlay the Shale. These strata are defined as the SZS at the Site. During the hydrogeologic investigation conducted by Bowser-Morner in 1999 it was concluded that monitoring wells in the SZS had elevated concentrations of certain indicator parameters (i.e., chloride). In 2002 five additional monitoring wells were installed by Eagon & Associates, Inc. for a supplemental site investigation and these wells were placed into the assessment program due to degraded water quality. Although no statistics were performed and statistically significant increases were not declared, constituent concentrations of the SZS wells appeared to be elevated above normal background levels, therefore, all SZS wells were placed into the assessment monitoring network. The initial assessment plan was submitted by Eagon & Associates, Inc. October 3, 2002. Figure 2 displays the locations of the assessment and detection groundwater monitoring wells. Table 1 is a well construction summary of all wells in the assessment and detection programs.

A brief summary of the findings of the groundwater quality assessment report that defined the rate and extent of groundwater impact and the constituents of concern are also presented herein. Please refer to the document, "Ground-Water Quality Assessment Report, Significant Saturated Zone, Royalton Road Sanitary Landfill, Cuyahoga County, Ohio" (April 2007, Revised February 2011 and April 2012) and subsequent Semiannual Groundwater Assessment Activities Reports with Determination of Rate, Extent, and Concentration for a description of the rate and extent of groundwater impacts at the Site.

The Berea Sandstone is designated as the uppermost aquifer system (UAS) at the Site and the groundwater monitoring system for the UAS is comprised of three monitoring wells. All wells in the UAS are monitored under the "Site Specific Groundwater (Detection) Monitoring

Plan" for the Site. Groundwater quality within the UAS has not been degraded by landfill activities and is therefore not discussed in this CMP, except for the discussion of hydrogeologic conditions at the Site.

2.0 HYDROGEOLOGIC CONDITIONS

The Site is situated along the southern valley wall of Chippewa Creek, extending south over an upland till plain. Ground surface elevations vary from about 920 feet above mean sea level (MSL) near Chippewa Creek to 1,180 feet, MSL along the southern property line. Historical topographic information indicates that a north-south trending ravine dissected the property. Site drainage is northward towards Chippewa Creek. Chippewa Creek flows to the east and discharges into the Cuyahoga River. Ultimately, surface water discharges to Lake Erie approximately 13 miles to the north.

The facility is located in the glaciated section of the Appalachian Plateau Physiographic Province. In the vicinity of the site the plateau is deeply dissected by streams. Current landforms primarily owe their origin to Pleistocene glaciation. The Site lies on a till plain that has experienced significant dissection by streams since the end of the Wisconsinan glacial period. The proximity of the Site to the Cuyahoga River (which lies about 3 ½ miles east) has intensified the degree of stream dissection. Chippewa Creek and its larger tributaries are incised into the underlying bedrock. The high degree of stream dissection and resulting high erosion rates have largely removed unconsolidated glacial deposits at the site.

Remaining glacial deposits at the Site are encountered primarily to the south, generally in the upland areas. At the southern property boundary, unconsolidated deposits are as thick as 105 feet. Near Chippewa Creek and along the tributary valley near the western site boundary, unconsolidated deposits are absent or very thin due to surficial erosion. The glacial deposits are primarily till, an unsorted mixture of clay, silt, sand, gravel, and cobbles.

Bedrock that immediately underlies the unconsolidated deposits at the Site is identified as the Meadville Shale Formation of the Mississippian age Cuyahoga Group. The Meadville Formation consists predominantly of shale with thin sandstone interbeds. The base of the Meadville Formation is not readily determined from the existing site data, but based on regional data should be near the base level of the Chippewa Creek. Underlying the Meadville Shale are two similar units of the Cuyahoga Group, the Sharpsville Sandstone, and the Orangeville Shale. The Sharpsville Sandstone consists of interbedded shale and sandstone while the Orangeville Shale is primarily shale. Thickness of individual units is difficult to discern but in general the thickness of the Cuyahoga Group Shale at the site ranges from 288 feet (MW-11D) to 119 feet (MW-7).

The Cuyahoga Group is underlain by the Mississippian age Berea Sandstone which is designated as the uppermost aquifer system at the site. The Berea is described as a fine to coarse-grained sandstone with calcareous cement. The top of the Berea Sandstone is encountered in the range of 835 to 820 feet MSL at the site. The maximum thickness of the Berea Sandstone observed at the site is 57 feet at well MW-7/BH-2.

Regional aquifers identified within the area surrounding the site are limited to the Berea Sandstone. The Berea Sandstone has regional extent and generally is capable of yielding sufficient groundwater for domestic supplies. In the southern vicinity of the site the Berea is encountered at depths in excess of 200 feet. Previous searches of Ohio Department of Natural Resources (ODNR), Division of Water files by Bowser-Morner (2000b) identified only five residential wells completed in the Berea Sandstone within one mile of the site.

The unconsolidated deposits and Cuyahoga Group strata also are a potential groundwater source in the site vicinity. However, groundwater production from the unconsolidated deposits and Cuyahoga Group is dependent on localized water-producing zones and the unit is not considered an aquifer. Typically, the degree of surficial weathering and the presence of localized sandstone beds, or zones of increased permeability, control well yield. Groundwater production within the Cuyahoga Group strata typically is confined to the weathered surficial part of the unit. Deep drilling within the unit rarely increases well yield. Groundwater flow within the Cuyahoga Group probably is not uniform but rather characterized by discrete local flow zones. Perched groundwater flows along the interface of the Cuyahoga Shale with overlying till/waste resulting in a flow pattern that converges toward the center of the site, concentrating flow northward, toward the mouth of the buried valley. Similarly, it is likely that groundwater in the western and eastern parts of the site have components of flow influenced by ravines that bound the site on the west and the north. In general, flow probably follows the existing local and historical topography with a dominant northern flow direction toward Chippewa Creek. Recharge occurs in upland areas and local ravines are the discharge points.

As stated, the unconsolidated deposits and the underlying Cuyahoga Group Shale is designated as the SZS at the site. Due to the discontinuous nature of the zone a potentiometric surface map cannot be constructed. However, Figure 3 is a groundwater elevation map of the SZS with inferred flow lines using both past and present topography.

A previous search of ODNR well records within a one mile radius of the site identified 11 wells developed within the Cuyahoga Group strata. Several of the well logs indicated that no water-producing zones were encountered and the borehole was dry. Wells with water producing zones having yields as high as 10 gpm were recorded and the average yield is 4.3 gpm. The City of Cleveland provides municipal water service to the area surrounding the site. There are no known groundwater users proximal to the site. Properties identified with wells during prior regional investigations have been identified as having service accounts with the City of Cleveland.

3.0 RATE AND EXTENT OF GROUNDWATER IMPACTS

The extent of groundwater contamination is limited to the significant zone of saturation at the site. The uppermost aquifer wells do not exhibit water-quality indicative of waste-derived contamination. This CMP presents the parameters that have been determined to be above upgradient (background) conditions. A detailed discussion of methods used to determine parameters above background is presented in the document, "Groundwater Quality Assessment Report, Significant Saturated Zone, Royalton Road Sanitary Landfill, Cuyahoga County, Ohio" submitted April 2007 (Revised February 2011 and April 2012) and in the reports documenting the semiannual determination of rate, extent, and concentration submitted in accordance with OAC 3745-27-10(E)(9), most recently in August 2018.

All the groundwater quality results used to identify parameters above background have been submitted previously in semiannual reports. The SZS monitoring wells and parameters that were determined to be above background conditions are listed on Table 2. Only those downgradient SZS wells that have water-quality that has been impacted are listed on Table 2. Downgradient SZS wells that do not display impacted water-quality (WMW-2 and WMW-3) are not included on Table 2. Water-quality summary tables and time-series plots of all SZS wells for those parameters determined to be above background are located in Appendix C and Appendix D, respectively.

The Appendix II semivolatile organic compound (SVOC) n-nitrosodibutylamine was detected at well MW-10S during the 2014 first semiannual event. Subsequently, that parameter was added to the semiannual assessment sampling parameter list. That SVOC has not been detected in well MW-10S for any subsequent sampling event or at any other assessment well. The anomalous SVOC detection at MW-10S is not believed to be related to a waste-derived impact from the facility. Therefore, that parameter is not included on Table 2. The OAC 3745-27-10 Appendix II parameter sulfide was detected at well MW-11S at a concentration of 0.2 mg/L during the 2018 first semiannual assessment sampling event. The result was just above the PQL of 0.1 mg/L. Sporadic detections of sulfide have been observed historically at other

SZS wells. Based on the sporadic, non-routine detections at other SZS wells, the result observed at well MW-11S is likely an outlier and sulfide is not anticipated to be continually detected at this or any other SZS well. However, because this parameter was not verified at the time of this submittal, to be conservative, sulfide was added to Table 2 and is indicated to be above background at well MW-11S. No other Appendix II parameters (that are not also listed in Appendix I) are listed on Table 2.

Historical results of the parameters selenium and zinc indicated that concentrations were above background at a few SZS wells. Recent data (since 2012) indicates that concentrations of these parameters are no longer above background at any SZS well. Therefore, the parameters selenium and zinc are not included on Table 2. Time-series plots for selenium and zinc are enclosed at the end of Appendix D.

Figure 4 is a map illustrating the maximum extent of the facility's influence on groundwater quality based on the data provided in the 2007 Assessment Report (revised April 2012) and semiannual determinations. The extent of groundwater impacts presented on Figure 4 remains unchanged from the previous determinations presented in prior semiannual reports and the Assessment Report.

4.0 CORRECTIVE MEASURES STUDY APPROACH AND OBJECTIVES

4.1 Objectives of Corrective Measures Plan

The objectives of the Corrective Measures Plan are to identify the appropriate level of action to address the concerns at the Site, identify a range of remedial procedures appropriate to address those concerns, evaluate the potential remedial procedures in accordance with the criteria specified in OAC 3745-27-10(F), and recommend a corrective action appropriate to the Site conditions and concerns.

4.2 Performance Standards

OAC 3745-27-10(F) specifies that a corrective measures study should evaluate the practicable remediation procedures that are available to address the Site conditions identified in the groundwater assessment. This evaluation should, at a minimum, evaluate the potential remediation procedures with respect to four primary performance standards.

(1) The procedure should be protective of human health and the environment (OAC 3745-27-10(F)(2)(a)). Measures to address protectiveness are described elsewhere in OAC 3745-27-10(F) such as the discussion of the technical criteria for evaluating remedial procedures. Protectiveness must be considered in conjunction with the assessment of potential risk posed by the presence of waste-derived constituents.

(2) The procedure should attain the groundwater concentration levels established in accordance with OAC 3745-27-10(F)(2)(b).

(3) The procedure should control the source of releases to reduce or eliminate, to the maximum extent practicable, the potential for further releases of waste-derived constituents into the environment (OAC 3745-27-10(F)(2)(c)).

(4) The procedure should comply with appropriate standards for the management of wastes (OAC 3745-27-10(F)(2)(d)). Paragraph (F)(13) specifies that wastes should be managed in a manner that protects human health and the environment and complies with applicable laws and regulations.

4.3 Technical Criteria

OAC 3745-27-10(F)(3) identifies 11 specific technical criteria against which the various remediation procedures should be evaluated to determine their effectiveness and practicability to implement. These criteria include:

1. Short-term and long-term effectiveness with emphasis on degree of reduction of existing risks, magnitude of residual risks after the procedure is implemented, potential for risks during implementation, and reliability of the measure (OAC 3745-27-10(F)(3)(a)). This criterion is divided into eight factors ((a)(i) through (a)(viii)).

2. Effectiveness of the remediation procedure in controlling the source to reduce further releases by considering the use of containment and treatment (OAC 3745-27-10(F)(3)(b)). This criterion is divided into two factors ((b)(i) and (b)(ii)).

3. The need to coordinate with and obtain necessary approvals and permits from regulatory bodies to implement the procedure (OAC 3745-27-10(F)(3)(c)).

4. The available capacity and location of needed treatment, storage, and disposal services (OAC 3745-27-10(F)(3)(d)).

5. The ease or difficulty of implementing potential remedies based on consideration of the degree of difficulty associated with constructing the technology, the expected operational reliability, and the availability of necessary equipment and specialists (OAC 3745-27-10(F)(3)(e)). This criterion is divided into three factors ((e)(i) through (e)(iii)).

6. The degree to which community concerns are addressed by a potential corrective measure (OAC 3745-27-10(F)(3)(f)).

7. The performance, reliability, ease of implementation, and potential impacts of the potential remediation procedures (OAC 3745-27-10(F)(3)(g)).

8. The schedule to initiate and complete the remedial procedure considering the capability of the technology to achieve the groundwater concentration levels (OAC 3745-27-10(F)(3)(h)). This criterion is divided into seven factors ((h)(i) through (h)(vii)).

9. The resource value of the aquifer including among other factors the current and future uses of the aquifer, proximity and withdrawal rates of users, hydrogeologic characteristics of the site, and groundwater treatment and removal costs (OAC 3745-27-10(F)(3)(i)). This criterion is divided into seven factors ((i)(i) through (i)(vii)).

10. Practical capability of the owner or operator (OAC 3745-27-10(F)(3)(j)).

11. Other relevant factors (OAC 3745-27-10(F)(3)(k)).

5.0 CORRECTIVE MEASURES ALTERNATIVES

5.1 General Concept

In selecting corrective measures alternatives to be evaluated, consideration was given to the geologic setting at the facility, chemical properties of the parameters of concern, concentration and distribution of parameters above background in the groundwater, practicability and technical feasibility of the methods, and potential risk to any viable receptors. The goal of implementing a remedial technology is to restore the impacted zone in an efficient and cost-effective manner.

Four corrective measures alternatives are discussed in the following sections and evaluated for their practicability and effectiveness.

5.2 Alternatives Evaluated

Corrective measures alternatives selected for consideration were evaluated based on performance standards and technical criteria specified in OAC 3745-27-10(F)(7)(2) and (3). A comparison of the alternatives evaluated with the performance standards and technical criteria is presented in Table 3. The following is a brief description and summary of key factors for each alternative evaluated:

> Alternative 1. Continued Monitoring with Natural Attenuation: This alternative involves continuation of semiannual monitoring of the groundwater monitoring wells and surface water locations at the Site. No further active corrective measures would be implemented, but natural attenuation parameters would be monitored. The natural attenuation parameters (MNA parameters) include the major ions, total iron, ferrous iron, dissolved oxygen, oxygen reduction potential, total organic carbon, nitrate-nitrite, ammonia, routine field parameters (pH, temperature, turbidity, specific conductance), and select VOCs. The MNA parameters will be monitored and evaluated semiannually to determine the

effectiveness of natural attenuation. This alternative is easily implemented and would provide monitoring the rate of migration and extent of groundwater impacts.

Alternative 2. Capping and Leachate Management System: Capping of the entire facility has been completed and has received approval from OEPA. This alternative involves installation of a leachate collection system and capping constructed of approved material. A leachate system has already been implemented at the Site and liquids are being removed from gas extraction wells. The capping will reduce infiltration of water and leachate generation at the Site. Appendix E contains a figure from URS that displays the capped areas and the date of closure for each segment of the cap.

Alternative 3. Extend Leachate Management System (LMS): This extension intercepts degraded groundwater as it flows north towards Chippewa creek. An LMS extension was previously completed and a certification was submitted to the Ohio EPA by URS on January 2, 2007. The URS Certification of LMS is enclosed as Appendix F. The LMS consisted of installation of an additional sump and additional leachate line between waste placement boundaries and impacted downgradient monitoring wells MW-17S and MW-14D and piezometer MW-14S. Since installation of the sump and the LMS, reduced saturation of the SZS in this area as a result of the extended leachate line is evident based on lower groundwater levels and partial or no sample collections at adjacent monitoring wells because of an insufficient amount of available water. This indicates that the sump is collecting degraded water prior to leaving the Site. Groundwater continues to be pumped from the sump. Details of the sump installation and evacuated volumes of groundwater are located in Appendix F. As shown on Figure 1 of Appendix F, the underground pipe for the LMS has been extended to intercept groundwater from the area near the northern-most wells to the existing Chippewa Creek pumping station.

Alternative 4. Phytoremediation: This alternative involves the use of plants for bioremediation to remove, degrade, or stabilize contaminants in groundwater. The use of plants could be implemented but based on the depth of the wells and the discontinuous nature of the SZS water producing zones within the unit, phytoremediation may not be very effective, especially in the weathered shale unit of the SZS.

5.3 Recommended Alternative

Alternatives 2 and 3 have been completed; therefore, Alternative 1 is recommended for the following reasons:

1. The leachate management system with the extension and capping of the entire facility are completed.

2. Corrective measures monitoring will allow for monitoring for any future changes in groundwater quality at the site.

3. There is currently no risk to human health or the environment outside of the property since the extent of the impacted area is within the property boundaries.

4. Alternative 1 does not have any of the short-term risk exposure (i.e., handling of impacted groundwater and soils).

5.4 Proposed Groundwater Remediation Standards

Rule OAC 3745-27-10(F)(7) provides criteria for setting groundwater remediation standards (GWRS) for parameters found to be above background concentrations. It is noted that the initial CMP submittal (and February 2011 revision) referred to the GWRS as concentration level goals (CLGs); however, the CLG terminology has been replaced in this text with GWRS.

The collection of additional groundwater quality data during the routine semiannual assessment sampling events has been ongoing since submittal of the original (and subsequent revision) of the CMP. The parameters determined to be above background and derivation of the proposed GWRS for those parameters incorporate historical and more recent data and are presented herein. Parameters above background are located on Table 2 and the proposed GWRS for those parameters are presented on Table 4.

The proposed GWRS presented on Table 4 were determined by evaluating each constituent above background individually. The GWRS for the constituents identified above background have been set equal to the MCL established for the constituent unless the constituent does not have a MCL. Those parameters that do not have a MCL, the GWRS has been established using a Secondary MCL (SMCL), U.S. EPA Action Level (AL), or U.S, EPA Health Advisory. However, if background (upgradient well) concentrations for a parameter with an associated MCLs, SMCLs or other regulatory limit exceeds that limit (i.e., natural background is greater than a MCL, SMCL, etc.), two times the highest concentration in background was established as the GWRS. This is the case for the parameters arsenic, manganese, iron, and total dissolved solids. Additionally, if a constituent does not have an established regulatory limit, two times the highest concentration in background is the proposed GWRS. The practical quantitation limit (PQL) is set as the GWRS for a constituent if no regulatory limit is established and all the upgradient well data for that constituent is nondetect.

The upgradient SZS monitoring wells at the Site are MW-2R, MW-3, MW-12, and MW-13. Water-quality data from wells MW-2R, MW-3, and MW-12 were pooled and evaluated to determine the highest result to be used for calculating the GWRS for a specific parameter when a regulatory limit was not utilized (or not applicable) as the GWRS. Data sets were analyzed, by well, by parameter using the ChemStat statistical program to identify any outliers. Any identified outliers were excluded from the highest result determination. A summary of the upgradient well data used to determine the applicable GWRS are presented on Table 5.

Groundwater quality results from upgradient well MW-13 were not included in the pooled data based on previous Ohio EPA comments and the inferred poor waste quality at the well. Well MW-13 is located near the landfill property boundary, in proximity to an equipment and vehicle storage area, a maintenance shed, commercial office buildings, and paved driveways (i.e., vehicle traffic). The proximity to several potential sources of groundwater impact not directly related to solid waste placement may have yielded groundwater quality that is not entirely representative of upgradient natural groundwater conditions. Groundwater quality data for all of the SZS wells (including all upgradient wells) for parameters above background are located in Appendix C.

6.0 SAMPLING AND ANALYSIS PLAN

A Corrective Measures Groundwater Quality Monitoring Plan (CMGWQMP) has been prepared in accordance with rule OAC 3745-27-10(F)(2)(e) and is presented in Appendix A. The CMGWQMP provides detailed descriptions of the methods and procedures used for groundwater sampling, data evaluation, and statistical analysis of the water-quality results for the corrective measures. The statistical analysis of the groundwater quality data for the proposed corrective measures will consist of two parts, one for the parameters below background and the other for parameters above background. The CMGWQMP also includes provisions for surface water sampling of Chippewa Creek and evaluation of MNA parameters. Figure 2 presents the locations of the groundwater monitoring wells and the creek sampling locations.

Once a corrective measure is selected by the Director (or authorized representative) the CMGWQMP is intended to be a living, standalone document. As such, the document will require periodic revisions to update background or to include modifications in sampling practices and/or equipment. Changes of this nature will follow applicable Rules and may be implemented with the submitted Plan revision. If Ohio EPA does not concur with any such revisions, it is understood that the facility will receive correspondence from Ohio EPA requesting “more information needed” to discuss the revision in question. Non-routine changes such as a background update for a statistically significant increase above background or a change in the monitoring system (i.e., installation or abandonment of a well) will require Director’s (or an authorized representative’s) approval or approval at the Ohio EPA Northeast District level, depending on the proposed revision, prior to implementation at the Site. The procedure outlined above for revisions to the CMGWQMP creates a more efficient, usable document while still maintaining rule compliance as well as the integrity of the corrective measures monitoring program at the Site.

7.0 SCHEDULE

The recommended corrective measure of continued groundwater monitoring with natural attenuation is currently ongoing under the assessment program. With approval of the recommended corrective measure by the Director, the monitoring will continue with evaluation of the data for constituents below background and for those constituents determined to be above background as described in the CMGWQMP presented in Appendix A of this Plan.

8.0 REFERENCES

Bowser-Morner Associates, Inc., 1999, Revised 2000b. Revised Hydrogeological Site Investigation, Ohio Administrative Code 3745-27-06(C)(2), Royalton Road Sanitary Landfill, Broadview Heights, Ohio: Volumes 1 and 2.

Eagon & Associates, Inc., Semiannual Groundwater Assessment Activities Report with Determination of Rate, Extent, and Concentration, Royalton Road Sanitary Landfill, Cuyahoga County, Ohio, September 2007 through August 2018.

Eagon & Associates, Inc. June 2017, Revision 5. Groundwater Quality Assessment Plan For the Significant Saturated Zone, Royalton Road Sanitary Landfill, Cuyahoga County, Ohio.

Eagon & Associates, Inc. April 2007, Revised April 2012. Groundwater Quality Assessment Report For the Significant Saturated Zone, Royalton Road Sanitary Landfill, Cuyahoga County, Ohio.

United States Environmental Protection Agency (USEPA), March 2018, *2018 Edition of the Drinking Water Standards and Health Advisories Tables.*

URS. January 2007. Certification of Leachate Management System Installation (letter), Royalton Road Sanitary Landfill, Cuyahoga County, Ohio.

URS. Royalton Road Sanitary Landfill, Application For A Permit To Install (Revised April 16, 1998), Cuyahoga County, Ohio.

FIGURES

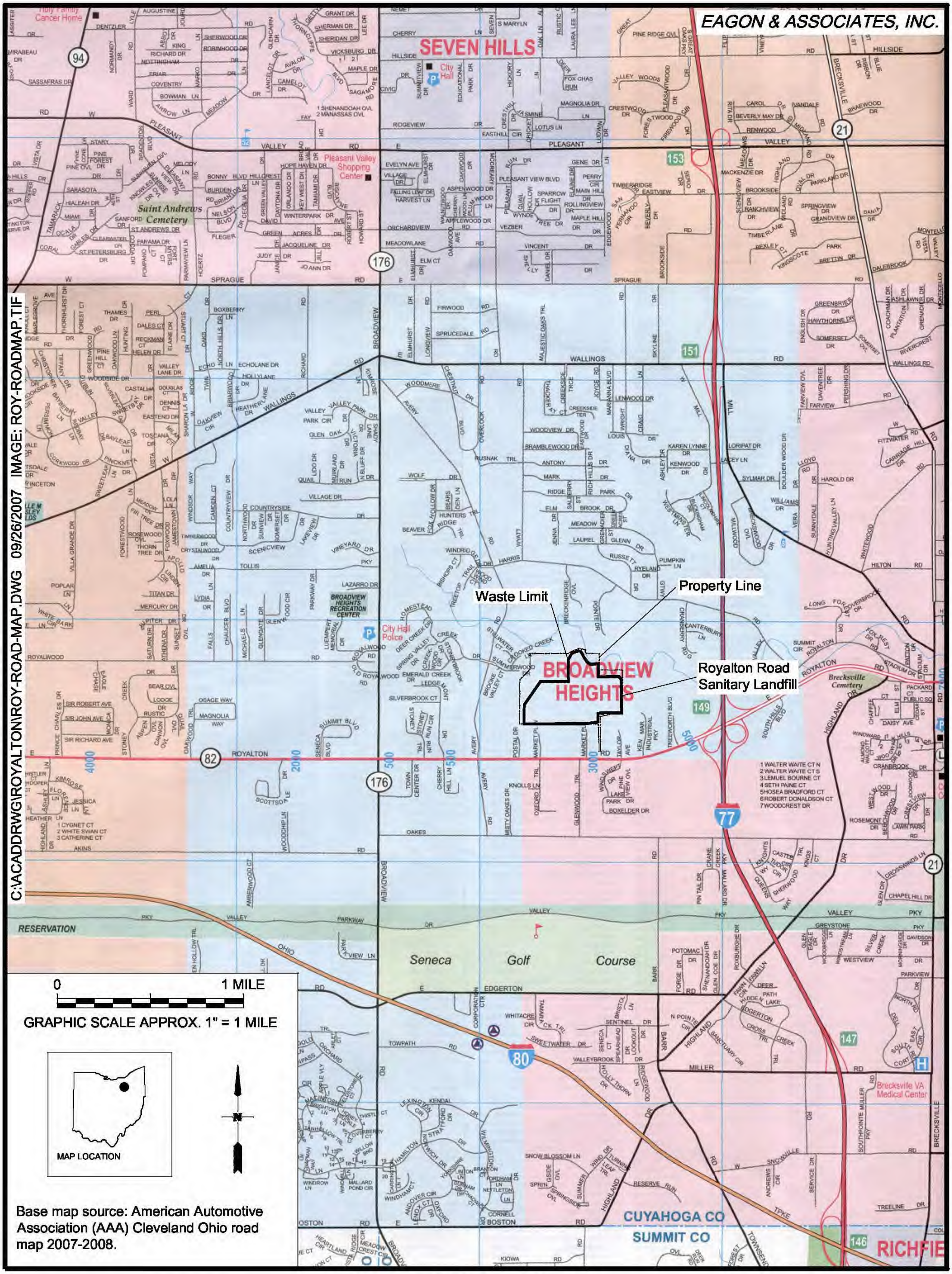
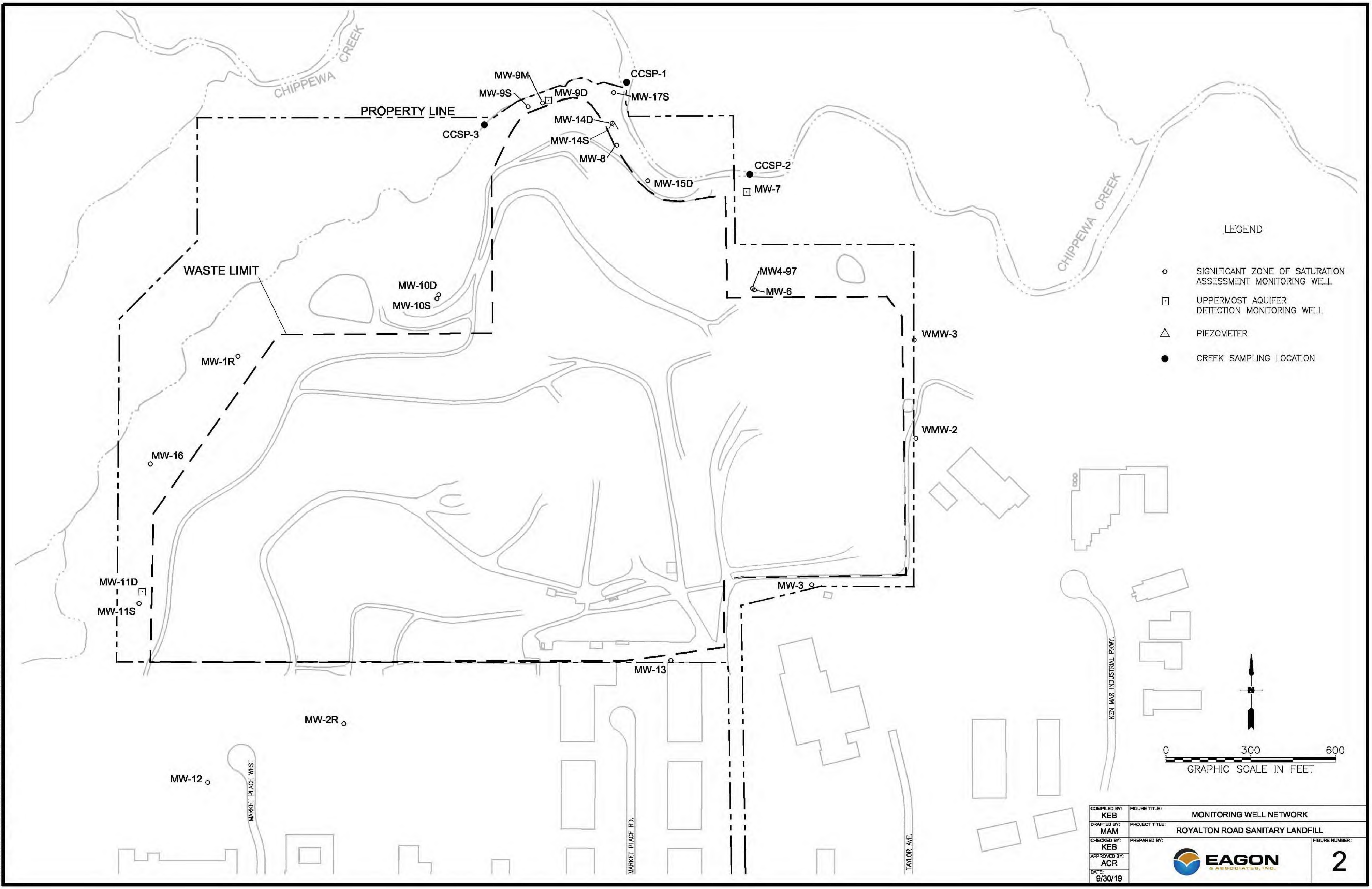


FIGURE 1. SITE LOCATION MAP



COMPILED BY: KEB	FIGURE TITLE: MONITORING WELL NETWORK
DRAFTED BY: MAM	PROJECT TITLE: ROYALTON ROAD SANITARY LANDFILL
CHECKED BY: KEB	PREPARED BY: EAGON & ASSOCIATES, INC.
APPROVED BY: ACR	FIGURE NUMBER: 2
DATE: 9/30/19	

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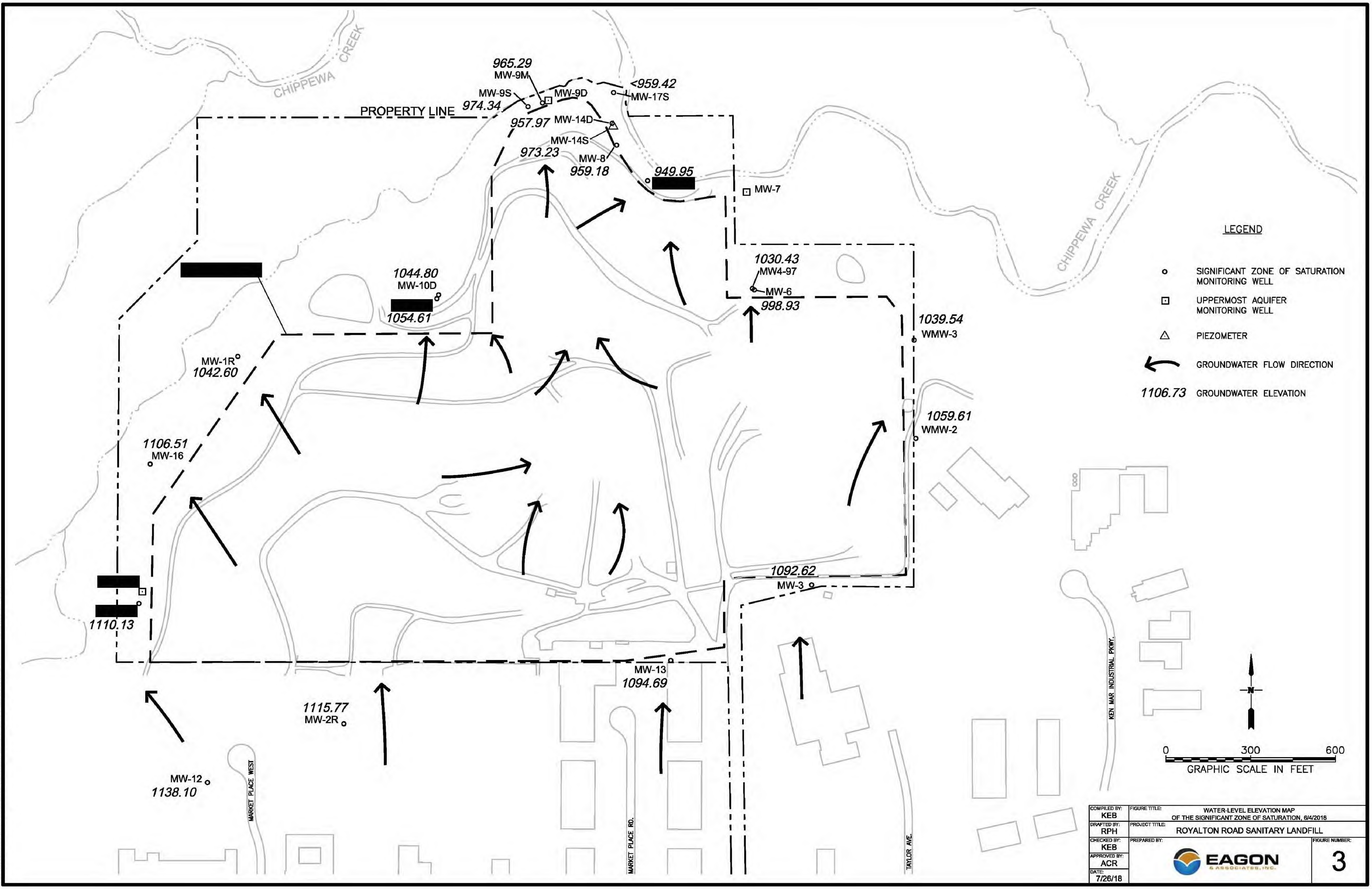

COMPILED BY: KEB	FIGURE TITLE: WATER-LEVEL ELEVATION MAP OF THE SIGNIFICANT ZONE OF SATURATION, 6/4/2018	
DRAFTED BY: RPH	PROJECT TITLE: ROYALTON ROAD SANITARY LANDFILL	
CHECKED BY: KEB	PREPARED BY: EAGON & ASSOCIATES, INC.	FIGURE NUMBER: 3
APPROVED BY: ACR		
DATE: 7/26/18		

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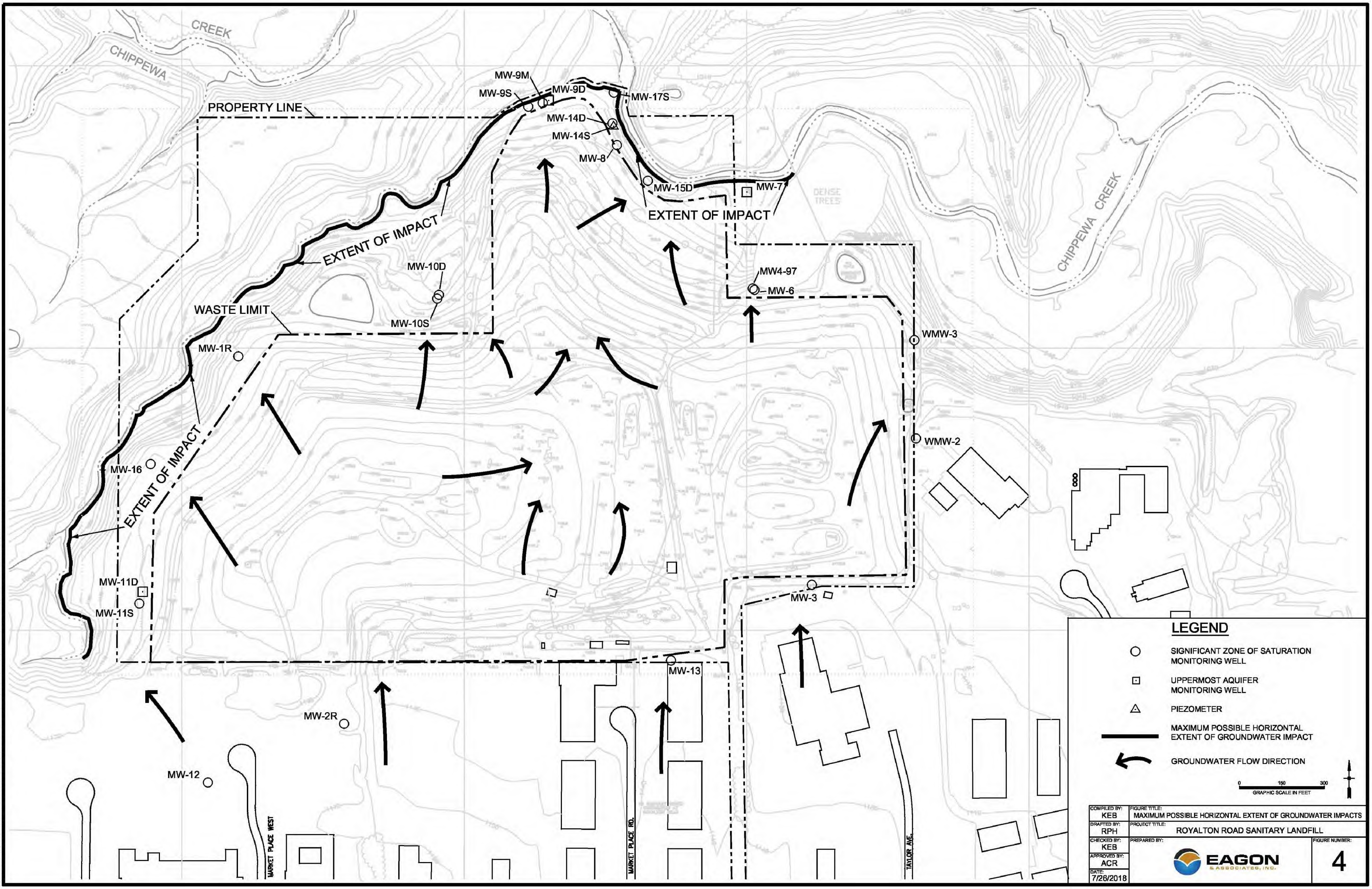

COMPILED BY: KEB
DRAFTED BY: RPH
CHECKED BY: KEB
APPROVED BY: ACR
DATE: 7/26/2018

FIGURE TITLE: MAXIMUM POSSIBLE HORIZONTAL EXTENT OF GROUNDWATER IMPACTS

PROJECT TITLE: ROYALTON ROAD SANITARY LANDFILL

PREPARED BY: EAGON & ASSOCIATES, INC.

FIGURE NUMBER: 4

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TABLES

TABLE 1. MONITORING WELL CONSTRUCTION SUMMARY
ROYALTON ROAD SANITARY LANDFILL

Well ID	Boring Log ID	Date Installed	Ground Surface Elevation (ft, MSL)	Measuring Point Elevation (ft, MSL-TOC)	Boring Depth (ft, BGL)	Screen Interval (ft, BGL)	Well Casing Diam. (in)	Casing Stickup (ft)	Total Well Depth[1] (ft, TOC)	Sampling Equipment	Pump Model[2]	Pump Tubing ID[2] (inch.)	Pump Intake Depth (ft, TOC)	Monitoring Status	Gradient Position
Uppermost Aquifer System - Berea Sandstone Monitoring Wells															
MW-7	BH-2	6/10/99	950.8	952.43	189.0	117 - 127	2	1.6	129.15	Pump	P1101M	0.25	127.0	D	Down
MW-9D	BH-1D	11/9/99	983.9	985.99	182.0	167 - 182	2	2.1	184.37	Pump	P1101M	0.25	177.0	D	Down
MW-11D	BH-3D	11/8/99	1151.6	1154.48	343.0	323 - 343	3	2.9	345.90	Pump	P1101M	0.25	333.0	D	Up
Significant Zone of Saturation - Cuyahoga Group Shale Monitoring Wells															
MW-1R	MW-1R	6/4/99	1107.4	1109.60	105.0	90 - 105	2	2.1	108.62	Pump	P1101M	0.25	107.0	A	Down
MW-2R	MW-2R	12/19/96	1170.5	1172.02[3]	125.0	103 - 123	2	--[3]	126.69[3]	Pump	P1101M	0.25	125.0	A	Up
WMW-2	WMW-2	8/7/87	1072.3	1072.79	26.0	15 - 25	2	0.5	20.37	Pump	P1150	0.17	20.0	A	Down
MW-3	MW-3	5/22/85	1123.5	1124.30	73.0	68 - 73	2	1	67.89	Pump	P1101M	0.25	63.0	A	Up
WMW-3	WMW-3	8/5/87	1057.1	1057.84[4]	28.0	17.5 - 27.5	2	0.32	20.38	Bailer	--	--	--	A	Down
MW4-97	MW4-97	1/2/97	1054.4	1056.97	27.0	15 - 25	2	2.5	27.95	Bailer	--	--	--	A	Down
MW-6	BH-3	6/11/99	1054.4	1056.30	115.0	55 - 65	2	2	67.60	Pump	P1150	0.17	67.0	A	Down
MW-8	BH-6A	10/6/99	988.2	990.29	65.0	55 - 65	2	2.1	67.24	Pump	P1101M	0.25	62.0	A	Down
MW-9S	BH-1S	10/3/99	982.5	984.83	22.0	12 - 22	2	2.3	24.26	Pump	P1101M	0.25	19.0	A	Down
MW-9M	BH-1M	11/4/99	983.6	985.83	50.0	40 - 50	2	2.2	52.85	Pump	P1101M	0.25	48.0	A	Down
MW-10S	BH-2S	10/7/99	1075.8	1078.16	30.0	20 - 30	2	2.2	30.69	Pump	P1150	0.17	29.5	A	Down
MW-10D	BH-2D	10/8/99	1075.3	1077.80	70.0	55 - 70	2	2.5	72.42	Pump	P1101M	0.25	67.0	A	Down
MW-11S	BH-3S	10/21/99	1149.8	1151.95	66.0	56 - 66	2	2.2	68.61	Pump	P1101M	0.25	66.5	A	Down
MW-12	BH-4	10/11/99	1173.3	1175.78	78.0	58 - 78	2	2.5	79.19	Pump	P1101M	0.25	74.0	A	Up
MW-13	BH-5	10/13/99	1138.7	1141.14	75.0	65 - 75	2	2.5	76.70	Pump	P1101M	0.25	72.0	A	Up
MW-14D	MW-14D	5/1/02	985.50	987.50	50.5	40.3 - 49.8	2	2.3	52.43	Pump	P1101M	0.25	48.0	A	Down
MW-15D	MW-15D	4/30/02	986.30	988.42	50.25	40.0 - 49.4	2	2.6	52.48	Pump	P1101M	0.25	48.0	A	Down
MW-16	MW-16	4/25/02	1131.50	1133.67	33.0	25.5 - 29.8	2	2.2	32.31	Pump	P1150	0.17	32.0	A	Down
Significant Zone of Saturation - Unconsolidated Material Monitoring Well															
MW-17S	MW-17S	4/26/02	982.60	984.74	25.3	20.7 - 25.2	2	2.4	27.63	Pump	P1150	0.17	27.0	A	Down
Significant Zone of Saturation - Unconsolidated Material Piezometer															
MW-14S	MW-14S	4/24/02	985.80	987.74	18.0	10.3 - 15.1	2	2.3	17.30	--	--	--	--	P	Down

D - Detection Monitoring Well

A - Assessment Well

P - Piezometer

[1] *- Total depth for wells equipped with bailers taken during May 10, 2004 sampling event. Well MW-2R depth taken during the December 6, 2004 event.*

[2] *- Volume of QED dedicated model pump P1101M is 395ml & P1150 is 130ml; Volume of tubing is 10 ml/ft for 0.25-inch I.D. & 4.5ml/ft for 0.17-inch I.D.*

[3] *- Measuring point elevation and total well depth for well MW-2R were adjusted due to conversion to a flush mount well. The inner well casing is below the new surface grade and therefore does not have a stick-up.*

[4] *- Measuring point elevation changed after first semiannual 2005 sampling completed. Old elevation was 1057.52 ft, MSL-TOC.*

TABLE 2.
PARAMETERS ABOVE BACKGROUND
ROYALTON ROAD SANITARY LANDFILL

Parameter	Downgradient												
	MW-1R	MW4-97	MW-6	MW-8	MW-9M	MW-9S	MW-10S	MW-10D	MW-11S	MW-14D	MW-15D	MW-16	MW-17S
Arsenic (Total)											✓	✓	
Barium (Total)	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Chromium (Total)													✓
Cobalt (Total)		✓		✓			✓			✓	✓	✓	✓
Copper (Total)									✓				
Lead (Total)									✓				
Nickel (Total)	✓	✓		✓			✓		✓	✓	✓	✓	✓
Vanadium (Total)													✓
Ammonia	✓	✓		✓		✓	✓	✓	✓	✓	✓		✓
Chloride	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓
Sodium (Total)	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓
Potassium (Total)		✓		✓		✓	✓		✓	✓	✓		✓
Total Dissolved Solids		✓		✓			✓				✓		✓
Total Alkalinity	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓
Iron (Total)						✓					✓		✓
Manganese (Total)		✓		✓		✓	✓			✓	✓	✓	✓
Sulfide									✓				
VOCs													
Acetone									✓				
Benzene				✓			✓			✓	✓	✓	✓
Chlorobenzene											✓		✓
Chloroethane				✓			✓			✓	✓		
1,4-Dichlorobenzene									✓				✓
1,1-Dichloroethane												✓	
Cis-1,2-Dichloroethene												✓	

✓ = Parameter determined to be above background.

TABLE 3.
SUMMARY OF CORRECTIVE MEASURES EVALUATIONS
ROYALTON ROAD SANITARY LANDFILL

Rule Requirement	**Alternative 1. Continued Monitoring with Natural Attenuation**	**Alternative 2. Capping and Leachate Management System**	**Alternative 3. Extend Leachate Management System**	**Alternative 4. Phytoremediation**
Performance Criteria				
(F) (2) (a) Protectiveness of Human Healt and the Environment	Would be protective by monitoring future migration	Would be protective by controlling future migration and decreasing infiltration volume.	Would be protective by controlling future migration.	Would be protective by capturing or making inert, contaminants in groundwater.
(F) (2) (b) Attaining Proposed Concentration Levels	Would provide some benefit in attaining proposed concentration levels.	Infiltration and runoff will be decreased lowering volume of leachate generation. Cutoff migration pathways	Concentration goals could be achieved. Migration pathways would be effectively cutoff and/or intercepted.	Would provide some benefit in attaining proposed concentration levels.
(F) (2) (c) Control Source of Releases	Does not provide source control.	Will reduce potential for future release by controlling future migration and water infiltration.	Will reduce potential for future releases by controlling future migration	Does not provide source control.
(F) (2) (d) Complies with Waste Management Standards	Complies.	Complies.	Complies.	Complies.
(F) (3) (a) Short/Long-Term Effectiveness	Would be effective short-term. Long-term effectiveness will be determined by monitoring.	Provides both short and long term effectiveness with continued operation.	Provides both short and long term effectiveness with continued operation.	Provides both short and long term effectiveness with continued operation.
(F) (3) (a) (i) Magnitude of Reduction of Existing Risks	Current risks are low. This alternative will not further reduce risk.	Current risks are low. This alternative will further reduce risk.	Current risks are low. This alternative will further reduce risk.	Current risks are low. This alternative will further reduce risk.
(F) (3) (a) (ii) Magnitude of Residual Risks	No residual risks.	No residual risks.	No residual risks.	Low due to exposure and handling of soils during planting.
(F) (3) (a) (iii) Type and Degree of Long-Term Management	Continued monitoring of designated wells on a semiannual basis.	Low to Moderate O&M required.	Low to Moderate O&M required.	Low to Moderate O & M required until established.
(F) (3) (a) (iv) Short-Term Risks	No short-term risks.	Low. Workers may be exposed to impacted ground water and soils during installation of extraction wells.	Low. Workers may be exposed to leachate and contaminated soils during installation.	Low. Workers may be exposed to impacted groundwater and soils during installation.
(F) (3) (a) (v) Potential for Human Exposure	No potential for exposure.	Low. Workers may be exposed to impacted groundwater and soils during installation of extraction wells.	Low. Workers may be exposed to impacted groundwater and soils during installation of extraction wells.	Low. Workers may be exposed to impacted groundwater and soils during installation of extraction wells.
(F) (3) (a) (vi) Long-Term Reliability	Good.	Good.	Good.	Good.
(F) (3) (a) (vii) Potential Need for Replacement	One time installation. Some well maintenance will be required.	One time installation. Some maintenance will be required.	One time installation. Some maintenance will be required.	One time installation. Some maintenance or replanting will be required.
(F) (3) (a) (viii) Time Until Full Protection is Achieved	Monitoring required to determine.	Monitoring required to determine.	Monitoring required to determine.	Monitoring required to determine.

Note: Alternative #2 and Alternative #3 are completed.

TABLE 3.
SUMMARY OF CORRECTIVE MEASURES EVALUATIONS
ROYALTON ROAD SANITARY LANDFILL

Rule Requirement	Alternative 1. Continued Monitoring with Natural Attenuation	Alternative 2. Capping and Leachate Management System	Alternative 3. Extend Leachate Management System	Alternative 4. Phytoremediation
Technical Criteria				
(F) (3) (b) (i) Use of Containment to Control Releases	Will supplement other source controls.	Provides containment and collection as source control.	Provides containment and collection as source control.	Provides collection as source control.
(F) (3) (b) (ii) Use of Treatment to Control Releases	No treatment necessary.	Extracted ground water will be pumped to collection tank/pump station.	Extracted ground water will be pumped to collection tank/pump station.	No treatment necessary.
(F) (3) (c) Approval/Permit Requirements	Corrective Measures Plan approval.	Corrective Measures Plan approval.	Corrective Measures Plan approval.	Corrective Measures Plan approval.
(F) (3) (d) Availability of Treatment Storage and Disposal (TSD)	None required.	Capacity of existing system is adequate	Capacity of existing system is adequate	None required.
(F) (3) (e) (i), (ii), (iii) Degree of Difficulty in Implementation	Already implemented	Already implemented	Already implemented	Implementation would be moderate.
(F) (3) (f) Degree to Which Community Concerns are Addressed	May not address all community concerns.	May not address all community concerns.	Should address all community concerns.	May not address all community concerns.
(F) (3) (g) Performance, Reliability, and Implementability	Implementation does not cause adverse impact.	Reliable and easily implemented.	Reliable and easily implemented.	Reliable and easily implemented after installation complete.
(F) (3) (h) Schedule to Implement:	Can be implemented immediately.	Already implemented	Already implemented	Not scheduled to be implemented.
(F) (3) (h) (i) Extent and Nature of Any Contamination	No health-based risk currently exists.	No health-based risk currently exists.	No health-based risk currently exists.	No health-based risk currently exists.
(F) (3) (h) (ii) Practical Capability to Achieve Proposed Concentration Levels	Low capability to achieve compliance.	Moderate capability to achieve compliance.	Moderate capability to achieve compliance.	Low capability to achieve compliance.
(F) (3) (h) (iii) Availability of Treatment or Disposal Capacity	None required.	Available on site.	Available on site.	None required.

Note: Alternative #2 and Alternative #3 are completed.

TABLE 3.
SUMMARY OF CORRECTIVE MEASURES EVALUATIONS
ROYALTON ROAD SANITARY LANDFILL

Rule Requirement	Alternative 1. Continued Monitoring with Natural Attenuation	Alternative 2. Capping and Leachate Management System	Alternative 3. Extend Leachate Management System	Alternative 4. Phytoremediation
Technical Criteria (cont.)				
(F) (3) (h) (iv) Alternate Technologies	Conventional technology is sufficient.	Conventional technology is sufficient.	Conventional technology is sufficient.	Conventional technology is sufficient.
(F) (3) (h) (v) Potential Risks Prior to Completion	None.	None.	None.	None.
(F) (3) (h) (vi) Practical Capability of Owner/Operator	Within owner/operator capability.	Within owner/operator capability.	Within owner/operator capability.	Within owner/operator capability.
(F) (3) (h) (vii) Other Relevant Factors	None.	None.	None.	None.
(F) (3) (i) Resource Value of Aquifer:	Moderate. Aquifer has not been impacted by site. Would require installation of a deep well.	Moderate. Aquifer has not been impacted by site. Would require installation of a deep well.	Moderate. Aquifer has not been impacted by site. Would require installation of a deep well.	Moderate. Aquifer has not been impacted by site. Would require installation of a deep well.
(F) (3) (i) (i) Current and Future Uses	None expected.	None expected.	None expected.	None expected.
(F) (3) (i) (ii) Proximity and Withdrawal Rate of Users	No known utilized residential users. City of Cleveland provides water service.	No known utilized residential users. City of Cleveland provides water service.	No known utilized residential users. City of Cleveland provides water service.	No known utilized residential users. City of Cleveland provides water service.
(F) (3) (i) (iii) Groundwater Quantity and Quality	Significant saturated zone: Quantity minimal, quality poor.	Significant saturated zone: Quantity minimal, quality poor.	Significant saturated zone: Quantity minimal, quality poor.	Significant saturated zone: Quantity minimal, quality poor.
(F) (3) (i) (iv) Potential Damage by Exposure to Waste Constituents	No damage likely.	No damage likely.	No damage likely.	No damage likely.
(F) (3) (i) (v) Hydrogeologic Characteristics of Facility and Surrounding Area	See text of this report.	See text of this report.	See text of this report.	See text of this report.
(F) (3) (i) (vi) Groundwater Removal and Treatment Costs	No water removed from aquifer system.	Low Costs.	Low Costs.	No water removed from aquifer system.
(F) (3) (i) (vii) Alternative Water Supplies	None needed.	None needed.	None needed.	None needed.
(F) (3) (j) Practical Capability of Owner/Operator	Within owner/operator capability.	Within owner/operator capability.	Within owner/operator capability.	Within owner/operator capability.
(F) (3) (k) Other Relevant Factors	None.	None.	None.	None.

Note: Alternative #2 and Alternative #3 are completed.

TABLE 4.
GROUNDWATER REMEDIATION STANDARDS FOR PARAMETERS ABOVE BACKGROUND ROYALTON ROAD SANITARY LANDFILL

Parameter	GWRS (mg/L)	Type
Inorganic Parameters		
Arsenic	0.0648	2x highest concentration in upgradient wells[1,2]
Barium	2	MCL
Chromium	0.1	MCL
Cobalt	0.005	PQL
Copper	1.3	Action Limit
Lead	0.015	Action Limit
Nickel	0.100	Health Advisory Limit
Vanadium	0.005	PQL
Ammonia	30	Health Advisory Limit
Chloride	250	SMCL
Sodium	262	2x highest concentration in upgradient wells[1]
Potassium	25.8	2x highest concentration in upgradient wells[1]
Total Dissolved Solids	6720	2x highest concentration in upgradient wells[1,2]
Alkalinity	1042	2x highest concentration in upgradient wells[1]
Iron	17.6	2x highest concentration in upgradient wells[1,2]
Manganese	0.962	2x highest concentration in upgradient wells[1,2]
Sulfide	0.1	PQL
Volatile Organic Compounds (VOCs)		
Acetone	0.010	PQL
Benzene	0.005	MCL
Chlorobenzene	0.100	MCL
Chloroethane	0.001	PQL
1,4-Dichlorobenzene	0.075	MCL
1,1-Dichloroethane	0.001	PQL
Cis-1,2-Dichloroethene	0.070	MCL

[1] - See Table 5 for upgradient well water-qualtiy summary.

[2] - Upgradient (background well) parameter concentrations exceed the regulatory limit.

TABLE 5.
SUMMARY OF UPGRADIENT WELL WATER-QUALITY RESULTS FOR DETERMINATION OF GWRS
ROYALTON ROAD SANITARY LANDFILL

	Arsenic (ug/L)			Sodium (mg/L)			Potassium (mg/L)			TDS (mg/L)			Alkalinity (mg/L)			Iron (mg/L)			Manganese (mg/L)		
Date	MW-2R	MW-3	MW-12	MW-2R	MW-3	MW-12	MW-2R	MW-3	MW-12	MW-2R	MW-3	MW-12	MW-2R	MW-3	MW-12	MW-2R	MW-3	MW-12	MW-2R	MW-3	MW-12
10/14/2002	<9*	<9*	17	48	79.8	50.6	6.9	7.2	10	1260	1190	2550	339	464	449	1.59	1.87	6.35	0.2	0.19	0.09
4/14/2003	<9*	<9*	10	56.3	81.7	49	5.3	7.3	10	1290	1210	2840	334	469	463	2.12	1.82	5.46	0.18	0.12	0.09
11/3/2003	<9*	<9*	16	57.5	89.9	52	5.5	7.9	10	1280	1190	2830	335	468	467	2.33	1.91	5.49	0.2	0.13	0.09
5/10/2004	<2	<2	12.7	64.4	96.1	54.9	5.9	8.5	10.7	1260	1190	2620	333	481	452	2.2	1.93	5.72	0.194	0.165	0.088
12/6/2004	<2	<2	15.7	61.8	97.8	54.3	5.9	8.6	10.5	1270	1220	2750	333	490	457	3.27	1.87	6.27	0.21	0.16	0.1
5/23/2005	3.7*	<1	14.9	64.8	101	56.3	6.8	8.8	11	1260	1220	2700	344	424	354*	11.3*	1.84	5.96	0.317	0.2	0.091
11/14/2005	<1	1	13	71.3	109	60	6.3	8.4	11.1	1290	1240	2760	343	507	451	2.33	1.84	6.03	0.188	0.237	0.094
5/22/2006	<1	1.2	10.8	63.1	113	56.6	5.7	9.4	10.8	1300	1270	2850	335	507	458	2.77	1.43	6.45	0.205	0.481	0.101
11/13/2006	<1	<1	<5	64.4	98.9	56.7	5.7	8.6	10.7	1230	1270	2730	334	506	449	1.55	2.04	6.09	0.192	0.168	0.096
6/25/2007	<1	1.9	15.4	63.2	105	56.6	6.1	9.4	11.5	1260	1270	2830	337	521	454	1.71	2.55	5.92	0.184	0.272	0.098
12/17/2007	<1	<1	15.1	68	118	59.9	5.6	9.2	10.4	1250	1430	2820	329	524	459	1.37	1.96	5.83	0.167	0.246	0.096
6/16/2008	<1	2.8	14.9	62.5	105	57.6	5.8	9	11.6	1270	1310	2840	304*	487	465	1.47	3.26	5.82	0.172	0.787*	0.093
12/2/2008	<1	<1	12.5	65.1	111	61.1	5.8	9.4	11.7	1210	1350	2810	338	503	463	1.07	2	5.45	0.159	0.21	0.089
6/1/2009	<1	4.5*	14.5	78.9	105	56.6	5.8	9	10.8	1320	1360	2900	342	487	466	2.06	4.68*	6.38	0.199	0.867*	0.094
12/2/2009	<1	<1	24.9	57.6	111	62.2	4.7	8.4	11.5	1030*	1280	3110	279*	483	493	1.05	1.89	8.46	0.164	0.243	0.132
6/21/2010	1.1	<1	24.1	62.6	112	61.8	5.8	8.5	11.9	1340	1170	3110	339	449	490	1.93	0.91	7.09	0.242	0.152	0.112
12/6/2010	<1	<1	25	74.3	124	63.3	6.9	6.3	12	1300	1020	3160	348	432	484	1.69	0.8	7.89	0.272	0.132	0.129
6/21/2011	<2	<2	26.3	61.1	131	68.8	6.5	9.8	12.9	1390	1250	3160	345	469	493	3.14	1.49	8.66	0.365	0.162	0.147
12/13/2011	2.2	<1	24.1	57.4	115	68.3	5.8	9.1	12.2	1450	1330	3360	282*	479	488	2.72	1.98	8.82	0.327	0.173	0.15
6/4/2012	<1	<1	15.5	65.5	122	66.5	5.8	9.4	12.1	1260	1270	3070	350	469	469	1.38	1.99	7.08	0.205	0.236	0.1
12/11/2012	1.9	<1	20.6	61	124	65.9	5.8	8.8	11.8	1310	1180	3100	342	443	480	2	2.4	6.98	0.261	0.372	0.135
6/3/2013	<1	<1	16.5	63.8	116	64.9	5.8	9.2	12.3	1250	1250	3140	325	427	479	1.58	1.68	7.41	0.213	0.174	0.126
12/3/2013	1.2	<1	19.8	63.7	120	67.7	5.9	9.2	12	1350	1320	3150	338	443	484	1.95	1.44	7.54	0.268	0.104	0.126
6/2/2014	<1	<1	20	66.2	121	65.4	6.1	8.1	12	1280	994	2960	338	410	473	1.56	1.12	7.31	0.221	0.145	0.119
12/2/2014	1.4	<1	17.9	62	122	68	5.2	8.4	11.3	1320	1210	3040	345	437	476	1.81	1.81	6.6	0.243	0.347	0.11
6/1/2015	1.9	<1	19.2	125*	111	61.7	5.8	6.8	10.9	1540*	968	2970	338	393	461	2.83	1.42	7.31	0.304	0.429	0.106
12/7/2015	1	1.8	24.2	78.6	108	68.2	6	8	11.9	1390	1070	3100	342	406	466	1.75	2.27	8.18	0.263	0.695*	0.111
6/6/2016	<1	<1	22.1	82.3	118	66.6	6.4	7.9	11.6	1310	978	2990	337	396	464	1.53	1.51	7.41	0.214	0.449	0.119
12/5/2016	2.2	<1	32.4	66.5	117	72.3	5.8	7.4	12.1	1300	1000	3110	343	396	461	2.08	0.79	8.35	0.313	0.298	0.159
6/20/2017	1.4	<1	21.2	68.7	115	65.3	5.7	7.8	11.6	1380	1060	3180	337	396	459	1.95	0.76	7.75	0.305	0.173	0.127
12/4/2017	2.3	<1	29.7	61.7	112	69.1	5.8	7.1	11.4	1350	994	3120	344	392	481	2.12	0.71	7.74	0.311	0.259	0.133
6/4/2018	2	<1	19.4	82.7	123	69.7	5	8.3	11.4	1380	1070	3100	340	396	478	2.34	0.85	8.2	0.275	0.203	0.131
Highest in Background	2.3	2.8	32.4	82.7	131	69.7	6.9	9.8	12.9	1450	1430	3360	350	521	493	3.27	3.26	8.82	0.365	0.481	0.15

Notes:

Highest result in background excludes identified outliers.

* = identified outlier

APPENDIX A.

CORRECTIVE MEASURES GROUNDWATER QUALITY MONITORING PLAN

CORRECTIVE MEASURES GROUNDWATER QUALITY MONITORING PLAN FOR THE SIGNIFICANT ZONE OF SATURATION ROYALTON ROAD SANITARY LANDFILL

Cuyahoga County, Ohio

Prepared for:

NORTON ENVIRONMENTAL

Prepared by:

EAGON & ASSOCIATES, INC.
Worthington, Ohio

Revision 5; December 2019

EAGON & ASSOCIATES, INC.
100 Old Wilson Bridge Road, Suite 115
Worthington, Ohio 43085
(614)888-5760

AFFIRMATION

I, Rich Heier, a representative of the Owner/Operator for Royalton Road Sanitary Landfill, Cuyahoga County, Ohio, certify that to the best of my knowledge the contents of the submitted Revision 5 of the *"Corrective Measures Groundwater Quality Monitoring Plan for the Significant Zone of Saturation, Royalton Road Sanitary Landfill"* are true and complete and comply with the requirements of Chapter 3734 of the Revised Code and the rules adopted thereunder. I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete.

Rich Heier
Landfill Manager

Subscribed and affirmed to before me this 11th day of December 2019 by Richard Heier.

STATE OF OHIO
COUNTY OF Summit

Cheryl Heier
Notary Public

CHERYL HEIER
Notary Public, State of Ohio
My Comm. Expires 12-09-2021

AFFIRMATION

I, Kelly E. Birkas, a qualified Groundwater Scientist of Eagon & Associates, Inc., 100 Old Wilson Bridge Road, Suite 115, Worthington, Ohio 43085, certify that to the best of my knowledge the contents of the submitted December 2019, Revision 5 to the "Corrective Measures Groundwater Quality Monitoring Plan for the Significant Zone of Saturation, Royalton Road Sanitary Landfill" are true and complete and comply with the requirements of Chapter 3734 of the Revised Code and the rules adopted thereunder.

Kelly E. Birkas

Kelly E. Birkas
Hydrogeologist

Subscribed and affirmed to before me this 12th day of December 2019 by Kelly E. Birkas.

STATE OF OHIO
COUNTY OF FRANKLIN

Melissa A Stonerook
Notary Public
In and for the State of Ohio
My Commission Expires
April 24, 2023

Melissa A. Stonerook

Melissa Stonerook
Notary Public

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CORRECTIVE MEASURES GROUNDWATER QUALITY MONITORING PLAN FOR THE SIGNIFICANT ZONE OF SATURATION
ROYALTON ROAD SANITARY LANDFILL

Date of Revision	Number	Revision Inserted By
October 4, 2007	Original	*Eagon & Associates, Inc.*
February 2011	1	*Eagon & Associates, Inc.*
Entire Text; Table 1		
September 2018	2	*Eagon & Associates, Inc.*
Entire Report		
May 2019	3	*Eagon & Associates, Inc.*
Text pages ii, iv, 2-1, 3-15, 4-1, 6-14, 6-15, and 7-1; Figure 2; and Table 4		
November 2019	4	*Eagon & Associates, Inc.*
Text pages i, iv, Section 2.0, 3-15, 6-2 through 6-4, 6-15, 7-1; Figure 2; Table 5		
December 2019	5	*Eagon & Associates, Inc.*
Text pages ii, iv, 3-12 through 3-15, 4-1, and 6-14 through 6-16; Tables 2 through 4		

CORRECTIVE MEASURES GROUNDWATER QUALITY MONITORING PLAN FOR THE SIGNIFICANT ZONE OF SATURATION ROYALTON ROAD SANITARY LANDFILL CUYAHOGA COUNTY, OHIO

1.0 INTRODUCTION

1.1 Purpose

The purpose of this document is to present the corrective measures groundwater quality monitoring program for the significant zone of saturation (SZS) at the Royalton Road Sanitary Landfill, Cuyahoga County, referred to herein as the site. The goal of this program is to monitor groundwater quality within the significant zones of saturation determined to be impacted by the facility to monitor the effectiveness of the corrective measures. This Corrective Measures Groundwater Quality Monitoring Plan (CMGWQMP) has been developed in accordance with the requirements of OAC 3745-27-10(F) and applicable agreements and permits.

Periodic revisions to the document may occur with changing regulations, company policies, or other applicable updates. Any future changes will be identified on the "Revisions" page of this document and all changes will be submitted to the Ohio EPA and the Cuyahoga County District Board of Health. The site description, hydrogeologic setting, and local water use are presented in the remainder of this section. The groundwater monitoring system is summarized in Section 2.0. Sections 3.0 through 5.0 present the sampling and analysis methodologies. The statistical program for the corrective measures is presented in Section 6.0 and a summary is provided in Section 7.0.

1.2 Location

Royalton Road Sanitary Landfill is located in south central Cuyahoga County, within Broadview Heights, Ohio (Figure 1). The site is located northwest of the intersection of I-77 and Royalton Road (SR 82). The site property is bound by Chippewa Creek on the north, an unnamed tributary valley to Chippewa Creek on the west, Royalton Road and business development on the south, and a construction and demolition landfill on the east.

1.3 Operational History

In 1963, G & H Enterprises, Inc. acquired the property and continued developing the land for solid-waste disposal. Tri-Square Corporation took over ownership of the property in 1969 and is the current property owner. The Norton Construction Company operated the facility for the Tri-Square Corporation from 1969 under permit PTI # 02-9306 which was issued by the Ohio Environmental Protection Agency (OEPA) in 1998. The facility is now closed (closure certification received from the Ohio EPA in a letter dated February 1, 2011) and has ceased accepting solid waste. The 30 year post-closure period for the landfill commenced on October 22, 2010.

1.4 Status of Monitoring Programs

The CMGWQMP and the Site Specific Groundwater (Detection) Monitoring Plan are independent stand-alone documents. This CMGWQMP is written as part of the corrective measures program. The corrective measures program is established in accordance with submittal of the Assessment Report (determination of rate and extent) (Eagon, April 2007; revised February 2011 and April 2012). All monitoring wells which were sampled under the Assessment Monitoring Plan (Revision 10, November 2017) will move into corrective measures monitoring and will be sampled and analyzed following procedures outlined in this CMGWQMP upon selection of a corrective measure by the Director of the Ohio EPA as discussed in the September 2018 revision of the Corrective Measures Plan (CMP) for Royalton Road Sanitary Landfill. Typically, the routine semiannual detection and corrective measures sampling events will be performed concurrently but will follow their respective plans.

1.5 Geologic Setting

1.5.1 Regional Geology

The facility is located in the glaciated section of the Appalachian Plateau Physiographic Province. In the vicinity of the site the plateau is deeply dissected by streams. Topography is steep, varying from 1,180 feet (MSL) along the southern part of the site to 920 feet (MSL) to the north along Chippewa Creek. Surface water at the site is controlled by Chippewa Creek which is a tributary to the Cuyahoga River. Ultimately, surface water discharges to Lake Erie approximately 13 miles to the north.

Current landforms primarily owe their origin to Pleistocene glaciation. The site is situated within a till plain area that has experienced significant dissection by streams since the end of the Wisconsinan glacial period. The proximity of the site to the Cuyahoga River (3 ½ miles east) has intensified the degree of stream dissection. Chippewa Creek and its larger tributaries are incised into the underlying bedrock. The high degree of stream dissection and resulting high erosion rates has largely removed unconsolidated glacial deposits at the site. Glacial deposits are primarily located at high elevations along the southern side of the site. The bedrock of interest in the site vicinity is the Mississippian age, Cuyahoga Group and Berea Sandstone. The dominant rock type is shale.

1.5.2 Site Geology

Glacial deposits at the site are primarily confined to the south, generally within the upland areas. At the southern property boundary, unconsolidated deposits as thick as 105 feet have been documented. Near Chippewa Creek and the tributary valley along the western site boundary, unconsolidated deposits are absent or very thin due to surficial erosion. The composition of the glacial deposits is primarily till, and unsorted mixture of clay, silt, sand, gravel, and cobbles. Silt and/or clay deposits, that probably represent lacustrine environments, are reported at a few locations. Generally, the lacustrine deposits are encountered beneath till deposits directly overlying the bedrock. Sand and/or gravel deposits within the till or lacustrine deposits are rare, and where encountered are generally very thin. Recent alluvial deposits associated with Chippewa Creek are thin (one to three feet) and are located proximal to the current stream valley.

Bedrock encountered under the unconsolidated deposits at the site is identified as Mississippian age, Cuyahoga Group, Meadville Shale Formation. The Meadville consists predominantly of shale with thin interbedded sandstone beds. The base of the Meadville formation is not readily discerned using existing site data, but should be near the base level of the Chippewa Creek based on regional data. Underlying the Meadville Shale within the Cuyahoga Group are two similar units, the Sharpsville Sandstone, and the Orangeville Shale. The Sharpsville Sandstone consists of interbedded shale and sandstones and the Orangeville Shale is primarily shale. Based on regional data, the combined thickness of the Sharpsville Sandstone and the Orangeville Shale is about 145 feet. Existing site data is largely limited to rotary drill cutting interpretations which do not provide the detail to differentiate between Cuyahoga Group strata. As a whole, the Meadville Shale, Sharpsville Sandstone, and Orangeville Shale have very similar geologic characteristics, and are appropriately referred to as one unit (Cuyahoga Group). Thickness of the individual units is difficult to discern but in general the thickness of the Cuyahoga Group Shale at the site ranges from 288 feet (MW-11D) to 119 feet (MW-7).

The Cuyahoga Group is underlain by the Mississippian age Berea Sandstone which is the deepest stratigraphic unit of interest underlying the site. The unit is described as a fine to coarse-grained sandstone with calcareous cement. The top of the unit is encountered between 835 and 820 feet MSL at the site. The complete thickness of the Berea Sandstone at the site is defined at 57 feet (MW-7/BH-2).

1.6 Hydrogeologic Setting

1.6.1 Regional Hydrogeology

Regional aquifers identified within the area surrounding the site are limited to the Berea Sandstone. The Berea Sandstone has regional extent and is generally capable of yielding sufficient ground water for domestic supplies. In the southern site vicinity the unit is encountered at depths in excess of 200 feet. Only five residential wells completed in the Berea Sandstone were identified within one mile of the site through a search of Ohio Department of Natural Resources (ODNR), Division of Water files (Bowser-Morner 2000b). Reported well yields varied from one gallon per minute (gpm) to 10 (gpm) and averaged four (gpm). The groundwater flow direction is expected to be north-northwest towards the outcrop/subcrop of the unit. Recharge to the unit occurs across large upland areas by slow infiltration through overlying units. Discharge from the unit primarily occurs near the units outcrop, north and east of the site.

The Cuyahoga Group strata is also a potential groundwater source in the site vicinity. However, groundwater production from the Cuyahoga Group is dependent on localized water-producing zones and the unit is not considered a regional aquifer. Typically, the degree of surficial weathering and the presence of localized sandstone beds, or zones of increased permeability, control well yield. Groundwater production within the Cuyahoga Group strata is typically confined to the weathered surficial part of the unit. Deep drilling within the unit rarely increases well yield. A search of ODNR well records, for prior investigations, for a one mile radius of the site identified 11 wells developed within the Cuyahoga Group strata. Several of the well logs indicated that no water-producing zones were encountered and the borehole was dry. Well yields as high as 10 gpm were recorded and the average yield is 4.3 gpm. Groundwater flow within the unit is probably not uniform and is composed of discrete local flow zones. In general, flow probably follows the local topography. Recharge occurs in upland areas and local ravines are discharge points.

1.6.2 Site Hydrogeology

The Berea Sandstone is the uppermost aquifer system (UAS) at the site and the groundwater monitoring system is comprised of three monitoring wells. The unit is the first laterally extensive zone of saturation underlying the site. Cuyahoga Group strata overlying the Berea Sandstone has been characterized as a SZS. Saturated zones within the Cuyahoga Group have been defined as discontinuous. Groundwater production from the Cuyahoga Group is primarily limited to the surficially exposed, weathered strata. Unweathered strata within the Cuyahoga Group unit typically acts as an aquitard. At the site, this aquitard isolates the Berea

Sandstone from surficial water producing zones. Within the northern part of the site near Chippewa Creek, soil fill and thin alluvial deposits associated with Chippewa Creek have also been defined as a significant saturated zone.

Characterization of the Berea Sandstone at the site was accomplished with three borings and their associated wells. Field permeability testing indicates values within the 10^{-5} to 10^{-6} cm/sec range. Groundwater elevation data indicate flow within the unit is to the northeast which correlated with the expected regional flow.

Existing permeability values for the Cuyahoga Group strata vary from 4.5×10^{-3} to 5.9×10^{-9} cm/sec. Generally, the unit has a very low permeability which is supported by the difficulty in obtaining groundwater samples from many of the site monitoring wells. Precise groundwater flow determinations are not possible due to the discontinuous nature of the unit. The pre-filled buried valley in the center of the site likely has influence on the ground water flow at the interface of the Cuyahoga Shale and overlying deposits resulting in a convergent flow pattern toward the center of the site ultimately concentrating flow to the north near the mouth of the original valley. Furthermore, it is likely that ground water in the western part of the site has a component of flow toward the ravine that bounds the site on the west, and to the north on the eastern side of the facility. The groundwater flow direction within the unit is toward adjacent stream valleys with a dominant northern flow direction toward Chippewa Creek.

1.7 Local Water Use

The City of Cleveland provides municipal water service to the area surrounding the site. There are no known groundwater users proximal to the site. Properties identified with wells during prior regional investigations have been identified as having service accounts with the City of Cleveland.

2.0 GROUNDWATER MONITORING SYSTEM

2.1 Groundwater Monitoring Well Network

The groundwater monitoring system for the Royalton Road Sanitary Landfill consists of 22 monitoring wells and one piezometer (Figure 2). Three of the site monitoring wells are completed within the UAS (Berea Sandstone) and 19 monitoring wells and one piezometer are completed in a SZS (Cuyahoga Group strata, soil fill, and alluvial deposits associated with Chippewa Creek). The three UAS wells are in the detection program and the 19 SZS monitoring wells are sampled as part of a groundwater quality corrective measures program.

As discussed in Section 1.6.2, groundwater flow in the SZS is influenced by the pre-filled buried valley resulting in flow patterns that converge toward the center of the site and flow north toward Chippewa Creek. The presence of discreet zones of saturation within the SZS create the potential for a component of flow that discharges to an unnamed tributary of Chippewa Creek located on the western side of the site and also ultimately to Chippewa Creek. Therefore, presented on Figure 2 are surface water sampling locations at Chippewa Creek and the unnamed tributary sampled as part of the corrective measures program. There are a total of three surface water sampling locations; one located along Chippewa Creek, just slightly upstream of the property boundary; one downstream in Chippewa Creek as the stream exits the property boundary; and one along the unnamed tributary above the confluence with Chippewa Creek. It is noted that creek sampling locations presented on Figure 2 are the anticipated sampling locations; however, if field observation determines that one or more locations are inaccessible or are a safety concern, the location may be altered. Any revised location will have the same intent (i.e., Chippewa Creek upstream, tributary prior to the confluence with Chippewa Creek, etc.) and will be noted on the field form.

A potentiometric surface map of the Berea Sandstone is presented on Figure 3. Figure 4 shows groundwater elevations and illustrates the general groundwater flow direction for the SZS. The maps show the upgradient/downgradient relationships of the UAS and SZS with respect to the limits of solid-waste placement. The construction details for all of the wells in the groundwater monitoring system are summarized on Table 1. Boring logs and well construction diagrams for each corrective measures well are included in Appendix A.

2.2 Well Placement

Twenty-two monitoring wells are placed at locations surrounding the existing limits of solid-waste placement (Figure 2). Five wells are located hydraulically upgradient of the site and 17 wells are located sidegradient or downgradient of the existing limits of solid-waste placement. The hydraulic gradient position of each monitoring well relative to the limits of solid waste is presented on Table 1. The current groundwater monitoring network is of sufficient number and spacing to define groundwater quality as it passes under the site. The adequacy of the network will be evaluated on an annual basis.

2.3 Well Construction

2.3.1 Well Numbering

Wells are labeled with either a "MW" or "WMW" prefix followed by a numerical number. At well pair locations, a suffix generally distinguishes between wells. A D-suffix indicates a deep well, a S-suffix indicates a shallow well, and a M-suffix indicates an intermediate well. A R-suffix indicates a replacement well.

2.3.2 Drilling and Soil Sampling

Installation of the groundwater monitoring system at the Royalton Road Sanitary Landfill was initiated in 1985. Prior to 2002, drilling operations were performed by either Bowser-Morner or Duncan Brothers. Drilling operations performed in 2002 were completed by Frontz Drilling. Documentation and rationale for drilling methods and soil sampling procedures is variable but follow current industry practices. The following provides a general description of the drilling and soil sampling procedures utilized. Detailed drilling and soil sampling practices are outlined on the boring logs (See Appendix A).

Drilling was accomplished using auger, rotary, and sonic drilling methods. Typically, boreholes drilled with auger drill rigs were advanced through unconsolidated deposits and weathered bedrock using four 3-inch inside diameter (ID) hollow stem augers (HSA). Soil characterization was accomplished by collecting split-spoon samples or by cuttings. Generally, the augers were advanced into the weathered bedrock to the desired depth or until auger refusal. Auger boreholes advanced below the weathered bedrock were advanced using air or water rotary drilling methods. Bedrock boreholes advanced with rotary drill rigs typically required the installation of surficial casing through unconsolidated deposits and weathered bedrock. Bedrock was characterized with continuous core or by cuttings. Sonic boreholes were generally advanced while collecting continuous core. The core barrel and an outer casing was advanced as sonic boreholes were drilled.

2.3.3 Well Installation

Monitoring well construction summaries are presented in Appendix A following their associated boring log. Well construction details are summarized on Table 1.

All of the monitoring wells and the piezometer at the site have similar construction and are appropriate for the defined hydrogeology. Two-inch diameter, schedule 40 PVC riser and screen was utilized in all of the monitoring wells except upgradient UAS well MW-11D which is three inches in diameter. The excessive depth of MW-11D (343 feet) necessitated using heavier gauge schedule 80 PVC. Screen sections vary from five to 20 feet. Screen lengths greater than 10 feet generally are not used, but are acceptable within the site's hydrogeologic setting. Often, the identification of water-producing zones within the Cuyahoga Group strata is difficult in the field and the greater screen lengths increase the likelihood of connecting the water-bearing strata to the well. Cross-connection of water-producing zones does not occur in any site well. Sand filter packs generally extend from 1.5 to 5.0 feet above the screen slots. The annular space between the well casing and borehole wall above the sand pack is sealed with one or a combination of the following: bentonite pellets, bentonite chips, cement grout, and/or bentonite grout.

Some of the monitoring wells were installed with an inner and outer casing. Generally, deep rotary boreholes that penetrated unstable surficial deposits required the installation of outer casing to facilitate cutting circulation. In some instances outer casing was installed across shallow water producing zones to prevent mixing of shallow groundwater with deeper zones during the drilling process. All of the wells have concrete surface seals and locking protective covers.

2.3.4 Well Abandonment Procedures

Any monitoring well or piezometer that is removed from the groundwater monitoring network will be properly abandoned in accordance with the State of Ohio Technical Guidance Manual – Chapter 9: Sealing Abandoned Monitoring Wells and Boreholes (September 2016). The Ohio EPA will be notified prior to the installation or decommissioning of any well in the groundwater monitoring network at the site. All work will be documented and entered into the operating record maintained at the facility.

2.4 Groundwater Monitoring Well Integrity Program

The purpose of the Well Integrity Program is to ensure that the physical integrity of all monitoring wells is maintained, and thus, representative groundwater quality samples are obtained from the wells. As part of each scheduled sampling event, the monitoring wells are inspected for construction integrity by the Monitoring Team. These inspections are recorded on the Monitoring Well Integrity Report form (Figure 5) which is designed to supplement the Field Information Form (FIF) (Figure 6).

The conditions near the casing are crucial in maintaining the integrity of the well. For example, the surface seal acts as a seal to prevent surface water from traveling along the casing to ground water. Any damage to the seal, including cracks, should be noted and subsequently corrected.

Any problems observed with the external protective casing are to be noted and recorded by the Monitoring Team on the Monitoring Well Integrity Report Form. The external protective casing serves to protect the internal well casing. Drain holes must be drilled, if not present, as they allow water to drain from the annular space. Water in the annular space may freeze in the winter months applying a crushing force upon the casing. This may cause damage to the casing which might prevent the lowering or removal of sampling equipment. If the external protective casing is loose, it should be stabilized.

The Monitoring Team shall perform a visual survey of the well casing and note any problems. As part of the sampling procedures, the Monitoring Team is responsible for inspecting the exposed part of the dedicated sampling systems. Any exposed sample collection tubing or piping associated with the system is to be inspected for cracks, leaks, kinks, or other problems which may affect the performance of the system or the integrity of a sample withdrawn from the well by the system.

After each routine sampling event the Monitoring Well Integrity Report form (Figure 5) will be reviewed to determine if any maintenance is needed for any well. Any changes or alterations will be completed as soon as possible either before or during the following routine sampling event. However, this may not always be possible due to scheduling and/or attainability of needed materials; therefore, when dealing with extenuating circumstances maintenance issues will be corrected within a reasonable time frame.

3.0 SAMPLING PLAN

The objective of the Royalton Road Sanitary Landfill Corrective Measures Groundwater Quality Monitoring Plan is to collect representative groundwater quality data in order to monitor the effectiveness of the corrective measure implemented at the site. The performance of the sampling team will be an integral part of the monitoring program. Formalized training of the sampling personnel and periodic audit of sampling procedures will be performed in order to maintain sampling consistency and integrity.

The analytical laboratory used for analysis of groundwater samples will be Geochemical Testing (GT) in Somerset, Pennsylvania. GT is responsible for performing or coordinating all organic and inorganic analyses.

3.1 Sampling Event Preparation

Before the initiation of any sampling event at the facility, the sampling team will review plans relevant to the sampling event and procure sample containers and sampling equipment necessary for completing the event. Prior to field work, the sampling team will identify well locations and characteristics, verify the sampling schedule, and determine sampling point order. The sampling team also will be responsible for coordinating timely bottle set delivery from the laboratory, inspecting bottle set shipments, and assembling necessary field records and sampling equipment and supplies for completing the sampling event. Equipment should be checked to ensure it is operating properly prior to use in the field.

3.2 Sampling Procedure Summary

The plan for sampling ground water at the Royalton Road Sanitary Landfill includes the following procedures and techniques:

(1) Procedures prior to sampling;
(2) Sample Collection;

(3) Preservation and shipment; and
(4) Chain-of-Custody control.

Sampling activities and an instructional step-by-step description of the above procedures are described in the following sections. These procedures will be revised periodically to reflect advances in groundwater sampling technology and regulatory policies.

The following subsections describe procedures and techniques for measurement of water levels, purging of wells, field measurements of pH, specific conductance, temperature, and turbidity, sample collection (bottles, preservation and shipping), and Chain-of-Custody control.

3.2.1 Procedures Prior to Sampling

A general set of procedures will be followed prior to sample collection at each corrective measures monitoring well. The condition of the well and its surrounding area will be recorded on the Monitoring Well Integrity Report form (Figure 5). Sample appearance, weather conditions, and specific comments will be recorded in the "Field Comments" section of the Field Information Form (FIF) presented on Figure 6.

3.2.1.1 Well Integrity

During each routine sampling event the sampling team will fill out a Monitoring Well Integrity Form (Figure 5) which is a checklist of maintenance issues that may be encountered at a well. Any maintenance problems discovered with conditions of the well or surrounding area during review will be noted on the well integrity form. Additional details regarding the well integrity program are discussed in Section 2.4 of this plan.

3.2.1.2 Measurement of Groundwater Elevations

Static water-level measurements will be completed prior to purging at any of the wells and will be measured within a 24-hour period. Each static water-level measurement and the date and time the water level was measured will be recorded on the Water-Level Record (Figure 7). Water-level measurements will be collected with a portable electric tape and will be recorded to the nearest 0.01 foot. The tip of the water-level indicator will be washed with a non-phosphate detergent (e.g. Liquinox) and thoroughly rinsed with distilled water before and after use at each well. At least semiannually water levels for the entire monitoring system including the UAS and SZS will be measured. Water levels will also be collected for the monitoring network if a sampling event is conducted in which more than half of the wells in that monitored zone are sampled. All measurements will be recorded on the Water-Level Record.

The mark on the top of the sampling pump cap inside the guard pipe will always be used as the reference measuring point when a dedicated pump is installed. If a dedicated pump is not installed, then the mark on the top of the PVC well casing will be used as the measuring point. All measuring point elevations have been determined by a licensed surveyor. Using the measuring point elevations, the depth to water will be converted to water-level elevations.

3.2.1.3 Well Depth Measurements

Well depths will not be measured in wells with dedicated sampling pumps on a routine basis at the facility. In order to determine total well depths in wells with dedicated pumps, the pumps would have to be removed from each well. Removal and installation of sampling equipment agitates the water column, increases sample turbidity, and increases the potential for accidental contamination. Therefore, pumps will be removed only to perform needed maintenance or to check the well for siltation if an increasing trend in turbidity is identified. Whenever a pump is removed for repair or replacement, a total well depth will be measured. Total depth in wells which do not have dedicated pumps will be measured annually. Measurements will be taken prior to any purging and/or sampling at the well. Total well depths will be measured using a water-level tape calibrated to the nearest 0.01 foot. Whenever a total depth is measured, the tape to be used will be washed with a non-phosphate detergent (e.g., Liquinox) and will be rinsed with distilled or deionized water. Total depth measurements will be recorded on the Water-Level Record.

3.2.1.4 Detection of Immiscible Layers

Purge water from all wells will be discharged into a bucket of known volume and the water in the container will be visually inspected for immiscible layers. For wells equipped with dedicated bailers, the first bailer of water removed at the beginning of purging will be carefully removed from the well and visually inspected for immiscible layers. Clear bailers or interface probes cannot be used in wells with dedicated bladder pumps; therefore, water is purged directly from the dedicated pump tubing into a bucket of known volume and then visually inspected for immiscible layers. If any immiscible layers are observed in the purge water, it will be noted on the FIF. In addition, the water level probe will be visually inspected for film indicative of floating layers.

3.2.2 Well Purging Methods

3.2.2.1 Purging and Sampling Equipment

All purging and sampling equipment will be dedicated to the well or disposable (i.e., disposable bailer), thus preventing any potential cross-contamination between wells. Samples will be extracted using either dedicated or disposable bailers or dedicated Well Wizard-brand bladder pumps. Bailers and pump systems are composed of "inert" materials (PVC, Teflon) which are compatible with the well-construction materials (PVC). When using bailers, care will be taken not to allow the bailer or string used to lower the bailer in the well to touch the ground.

Samples will be collected based on decreasing sensitivity of the parameters and according to the Ohio EPA TEGD. That is, the order of filling sample bottles for corrective measures wells will be: volatile organic compounds (VOCs), total metals, sulfide, sulfate, chloride, alkalinity, TDS, ammonia, and nitrate-nitrite. The order for collecting samples and minimum volumes required for each analysis at Royalton Road Sanitary Landfill is listed on Table 2.

Note: A low-yield well request was submitted October 27, 2003 for three wells in the monitoring network. The request to Ohio EPA to obtain approval for designating three *significant saturated zone wells (WMW-3, MW4-97, and MW-16) as low yielding and the use of an alternate parameter list was approved in a Final Findings and Orders dated March 27, 2007. The alternate parameter collection order remains the same but reflects the parameter list that is established in this plan for corrective measures monitoring.*

For low-yield wells, the water volume and sampling order have been changed to reflect production capabilities of the wells as stated in the low-yield well request. Table 3 is a revised sampling order for the corrective measures monitoring parameters. Also included is the minimum sample volume needed to perform the analysis. It should be understood that minimum volumes do not include "extra" water. Therefore, if a minimum volume sample is collected and that container is accidentally broken or re-analysis is needed it will not be possible. Table 3 contains all corrective measures monitoring parameters and is not an alternate list with deletions, but a revised list to use when collecting samples. For example, during a given sampling event, multiple analyses may be collected using the minimum volumes (from Table 3) depending on the amount of recovery of the well. However, the next sampling event may not yield as much water and therefore only a partial sample, if any, may be collected in accordance with sampling order displayed on Table 3. This infers that there cannot be a set parameter list due to the nature of the wells and the variable water production of each. Hence, Table 3 is a parameter sampling priority list that is dependent on the yield from each well during each event.

3.2.2.2 Pump Settings

Whenever a pump is installed in a well, the pump intake will be located near the mid-point of the screen unless the static water level is routinely within the screen interval. Pump intakes in this case will be located near the bottom of the well screen. Pump intake depth for the wells are located on Table 1.

3.2.2.3 Well Purging Criteria

The following purging and sampling techniques are meant to produce groundwater samples of the highest quality possible using the sampling equipment currently installed in the corrective measures groundwater monitoring system at the site. In general, wells with dedicated sampling pumps will be purged using low-flow or minimum purge sampling procedures and wells equipped with bailers will be purged using traditional (i.e., 3-5 well volume) methods. Each procedure is outlined in the following sections. The U.S. EPA paper "Low Flow (minimal drawdown) Ground Water Sampling Procedures" written by Puls and Barcelous (April 1996) and Ohio EPA's Technical Guidance Manual for Hydrogeologic Investigations and Ground Water Monitoring (February 1995) were used for guidance in developing the procedures for sampling groundwater at the Royalton Road Sanitary Landfill.

3.2.2.4 Low-Flow Method

Low-flow (minimal drawdown) groundwater sampling procedures will purge wells at very low rates in order to produce minimal drawdown in the well during purging and sampling. Purging will be considered complete when both the water level and field measurements of specific conductance, pH, and temperature have stabilized. The U.S. EPA paper on low-flow procedures referenced above states, “Temperature and pH...are actually quite insensitive in distinguishing between formation water and stagnant casing water; nevertheless, these are important parameters for data interpretation purposes and should also be measured.” However, based on comments from Ohio EPA, pH and temperature, in addition to specific conductance will be used to determine purging completion. Sample collection will be initiated immediately after purging at each well.

During purging, wells will be pumped at a rate that allows water levels to stabilize. Purging rates in the range of 0.1 - 0.5 L/min (100-500 ml/min) will be used and no well will be purged in excess of 1 L/min (1000 ml/min). Drawdown in the well will be monitored periodically during purging and the pumping rate will be adjusted accordingly to achieve stabilization in the water column. If stabilization of the water level cannot be maintained at a pumping rate of 0.1 L/min (100 ml/min), the well will be sampled using the “minimum purge” procedure described below.

Wells will be purged using the minimum purge method if stabilization in the water column cannot be achieved at a pumping rate of at least 0.1 L/min (100 ml/min). In wells that have been shown during previous sampling events that cannot stabilize at described above, the equivalent of the volume of water in two pump and discharge tubing volumes will be evacuated prior to sample collection. This volume will be determined by calculating the pump system volume (adding the volume of water in the dedicated pump installed in the well (395 ml for Model # P1101M pumps and 130 ml for Model # 1150 pumps) to the volume of water in the discharge tubing), and multiplying the pump system volume result by two. The discharge tubing volume will be calculated by multiplying the length of tubing in the well (using the pump intake depth from Table 1) by a conversion factor (10 ml/ft. for 0.25-inch and 4.5 ml/ft for 0.17-inch inner diameter (ID) tubing). The pump model, tubing ID, and pump intake depth for each well in which a pump is installed is presented on Table 1. Field parameters pH, specific conductance, temperature, and turbidity will be measured at sample time. The field parameter values collected will be recorded in the "Field Data" section of the FIF. Sampling will begin after the required volume has been evacuated.

For those wells sampled using the low-flow method, field water-quality parameter measurements of pH, specific conductance, and temperature will be measured during purging at each well. Prior to collecting the initial set of field parameters, the water in the sampling pump and discharge tubing (pump system volume) remaining from the previous sampling event will be removed. The amount of water in the pump system will be determined as described previously. The depth to water and field parameters will be measured during purging in each well, typically every 3-5 minutes (or less frequently in wells that require sizable evacuation volumes prior to parameter stabilization). Stabilization will be considered achieved and purging will be considered complete when three consecutive water-level measurements vary by 0.3 feet or less, three consecutive measurements of specific conductance vary by three percent or less, three consecutive pH measurements vary by 0.2 S.U. or less, and three consecutive temperature measurements vary by 0.5 degrees Celsius or less. Samples will not be collected from any well unless all four criteria are met. All field measurements will be recorded in the "Stabilization Data" section of the FIF. The final set of field measurements recorded in the "Stabilization Data" section, including the date and time of sample collection, also will be recorded in the "Field Data" section of the form.

A gasoline-powered air compressor or compressed gas cylinder will be used to run the purge control unit for the pumps. When a gasoline-powered compressor is used, precautions will be taken to prevent contamination of equipment and samples. The air compressor and gasoline container will be segregated from other equipment during transport. Engine exhaust will be directed away and downwind from the well. Work gloves or nitrile gloves will be worn when fueling or adjusting the engine. The sampler will re-glove with nitrile gloves before handling sampling equipment and containers.

Pressure hoses will be connected in-line from the well head air-inlet nipple on the Well Wizard cap to the control box, then to the oil-less air compressor or compressed gas cylinder. The maximum purge rate will be approximately 1.0 L/min (1000 ml/min) after adjusting controls for pump pressurization and vent cycles. A graduated container will be used to measure the volumes purged. Actual purged volumes and times will be recorded on the FIF.

Any deviations from normal operating conditions (e.g., equipment malfunction) will be noted on the Field Information Form.

3.2.2.5 Traditional (Three to Five Well Volume) Method

Low-flow procedures are not appropriate for purging and sampling wells equipped with bailers. Instead, monitoring wells equipped with dedicated bailers will be purged a minimum of the equivalent of three standing water volumes, measured from the depth to water to the base of the well, prior to sampling. The required purge volume will be calculated by multiplying the height of the water column (i.e. total well depth minus depth to water) by a conversion factor for well casing size (0.163 for 2.0-inch I.D. wells). This value will be one well volume, in gallons, which will be multiplied by three to calculate the minimum required purge volume. All well and purge volume calculations for each well will be recorded in the "Field Comments" section of the FIF. At least three well volumes will be purged from each well equipped with a bailer unless the well runs dry before three well volumes can be evacuated. If the well is purged dry, then purging is complete before sampling. In those wells that do not purge dry, field parameters pH, temperature, and specific conductance will be measured after each well volume is evacuated. Purging will be considered complete when a minimum of three well volumes is evacuated and two consecutive measurements of specific conductance vary by three percent or less. Purging will continue until stabilization is achieved or until five well volumes have been evacuated, whichever is sooner. The values for field parameters will be recorded in the “Stabilization Data” section of the FIF and the final values will be recorded in both the "Stabilization Data" and "Field Data" sections of the form. A field turbidity measurement will be collected at sample time and the result will be recorded in the "Field Data" section of the field form.

If a monitoring well is purged dry before three well volumes are removed, purging will be considered complete and the well will be sampled when enough water has collected for sampling but no longer than 24 hours after purging. The only wells at the site equipped with bailers are wells WMW-3 and MW4-97 (see Table 1). These wells are routinely purged dry and both are designated as low-yield wells (request approved by Ohio EPA in a March 2007 Findings and Orders). If a well does not recharge enough for a complete sample within 24 hours as expected for these low-yield wells, samplers will collected whatever water is available at that time in the order presented on the applicable table (Table 3 for low-yield wells or Table 2 for all other wells). If there is adequate recharge, field parameters pH, specific conductance, and temperature will be measured in wells that are purged dry immediately after a complete sample has been collected and the results will be recorded on the field information form.

Wells with dedicated or disposable bailers will be purged by lowering and retrieving the bailer on disposable nylon string attached to a plastic cord reel or similar device. Disposable nitrile gloves will be worn by the sampler when handling any purging equipment (i.e. bailer, string, cord reel) to decrease the chance of introducing contaminants to the well. The bailer will be slowly lowered into the water column to avoid agitation of the water that may cause an increase in turbidity or aerate the water column. Purge water will be poured directly from the bailer into a bucket of known volume. Care will be taken to keep the bailer and string from touching the ground. Nylon string will be disposed after each use and new string will be used at each well. In addition, the cord reel or similar device will be washed with a non-phosphate detergent, rinsed with distilled or deionized water, and wiped down with a paper towel soaked with distilled or deionized water prior to use at each well.

Collected purge water from detection monitoring wells will be disposed by dumping downslope and away from the monitoring well. Purge water from downgradient monitoring wells in the corrective measures program will be contained in five gallon buckets with lids or similar containers and disposed in the leachate collection area.

3.2.3 Sample Collection

3.2.3.1 Sample Withdrawal

After purging is complete, the sampler will re-glove with new disposable nitrile gloves before handling sample containers. Samples will be withdrawn from the wells with the same equipment used for purging. Sample bottles will be filled directly from the bladder pump discharge tube or bailer with minimal air contact and without allowing the sampling equipment or fingers to contact the inside of the bottles.

The VOC bottles will be filled so that they are headspace free. The Teflon-lined caps should be replaced gently to eliminate air bubbles in the sample. The bottles should be checked for bubbles by inverting them and tapping them sharply with a finger. Due to the presence of hydrochloric acid preservative in the VOC vials, if a bubble is present the bottle should not be emptied and refilled. For that reason, multiple VOC bottles are collected. The analytical laboratory will evaluate the preservation of each sample and check for the presence of air bubbles. If the laboratory determines that there is an unacceptable volume of air (according to USEPA SW-846 Chapter 4) in any of the sample vials provided, they will be discarded. If there are not a sufficient number of acceptable VOC vials to complete the analysis, the well will be resampled. The bottle for alkalinity should also be completely filled.

3.2.3.2 Sample Preservation and Containers

Sample water will be discharged directly into appropriate containers containing the appropriate preservatives. Only sample bottles that have been pre-cleaned by the manufacturer and prepared at the laboratory with the appropriate preservative will be used to collect samples from each well. If high turbidity is consistently a problem at a particular well, then attempts will be made to reduce the turbidity by redeveloping the well or reducing the purging and sampling pumping rate. Field filtering of routine groundwater samples will not be conducted.

Since multiple analyses will be required, different types of containers and preservatives may be necessary. Labels for containers will be supplied by the laboratory for each sampling point. Sample containers will be supplied by the laboratory with the required preservative already added. The minimum sample volume requirements, containers, preservatives, and holding times to be used for each sample analysis are listed on Table 2. An example of a label affixed to the sample bottles to be used during sampling is presented on Figure 8.

Immediately after collection, bottles will be placed in insulated shuttles or coolers with a sufficient number of "wet" ice packs to maintain the groundwater samples at a temperature as close to 4 degree Celsius as possible. However, it cannot be guaranteed that a shuttle full of groundwater at about 13 degrees Celsius can be cooled to and maintained at exactly 4 degrees Celsius. As long as ice is present in the coolers and noted by the laboratory upon receipt, the temperature preservation will be considered acceptable. Once the sample bottles are packed into the coolers, the coolers will be sealed and sent to the analytical laboratory. A signed Field Chain-of-Custody Record (Figure 9) and copies of the Field Information Forms will be placed inside the sample shipping containers. Custody seals will be placed on the shipping containers if a third party courier is used (i.e. FedEx, UPS).

3.2.4 Field Analysis

Specific conductance, pH, and groundwater temperature measurements will be taken at 3-5 minute (or less frequent) intervals during purging for wells with pumps using the low-flow method or at each well volume for wells that use the three to five well volume method. Turbidity, pH, temperature, and specific conductance will be measured at sample time. In wells which purge dry, field parameters will be taken after a complete sample set has been collected if there is available volume. Procedures provided with the instruments will be used for calibration and testing. All calibration results will be recorded on the Field Meter Calibration Record (Figure 10).

Field meter(s) capable of determining temperature/pH/specific conductance and other monitoring natural attenuation (MNA) parameters will be used for all field analyses. Prior to use in the field each day, the meter(s) will be calibrated using procedures furnished by the manufacturer. Sampling personnel will ensure that they are in proper working order and capable of providing accurate and reliable data.

The field pH meter will be calibrated with pH 4.0 and 7.0 (or similar) buffers and then checked with a standard buffer solution. Calibration should be within 0.1 standard unit (S.U.). During sampling, the meter will be checked at least once during the day, or more frequently if anomalous readings occur, using a standard buffer solution. If a meter does not read the standard buffer solution to within 0.1 unit, the meter will be recalibrated. All calibration results and checks will be recorded on the Field Meter Calibration Record (Figure 10).

The field conductivity meter will be calibrated with 1413 umhos/cm (or similar) standard (or checked against a standard if the meter is calibrated by the manufacturer) prior to use each day. The meter should read the known standard to within 5 percent. During sampling, the meter will be checked at least once per day, or more frequently if anomalous readings occur, using a standard solution and the results will be noted on the Field Meter Calibration Record.

The field turbidity meter does not require frequent calibration. Instead, the meter will be checked each day using a known standard provided by the manufacturer. If the meter reads a known standard within plus or minus two NTUs of the calibrated value of the standard, it will be considered acceptable. Meters will be kept away from extreme temperatures and weather conditions as much as possible. Any meter that cannot maintain calibration will be repaired or replaced prior to use.

Field measurements for temperature, pH, specific conductance, turbidity, and other MNA parameters will be made at each monitoring well. All results will be recorded on the Field Information Form. Typically, a flow through cell will be used to collect field measurements. When not able to be used, sample water will be placed directly into the sample container from the bladder pump discharge tube or bailer. The sample container will be rinsed with sample water before readings are taken. Temperature will be measured first and then adjustments will be made to the pH and conductivity meters to reflect sample temperature (if required by the manufacturer). Temperature will be measured in degrees Celsius, pH will be measured in standard units (S.U.), specific conductance will be measured in umhos/cm, and turbidity will be measured in Nephelometric Turbidity Units (NTUs).

3.2.5 Decontamination of Field Devices

Dedicated or disposable (i.e., disposable bailers) down-hole sampling equipment will be used at all wells to preclude cross-contamination of samples. The electric water-level measuring tape and bailing cord reels (if applicable) will be the only non-dedicated sampling equipment. The tip of the electric tape and bailing cord reels will be thoroughly washed with a non-phosphate detergent and rinsed with commercially distilled or deionized water before and after use at each well. Bailing cord will be disposed of after use at each well. Although pH, conductivity, and temperature probes do not come into contact with water to be analyzed, the probes will also be washed with distilled or deionized water rinses between wells. If dedicated pumps fail or malfunction, they will be repaired or replaced with new dedicated equipment.

3.2.6 Chain-of-Custody

A completed Chain-of-Custody Record (Figure 9) will be included with each sample shipment. Upon transfer of sample possession to subsequent custodians, the Field Chain-of-Custody Record will be signed by the person taking custody of the sample container. Upon receipt of samples at the laboratory, the shipping container will be opened and the condition of samples, including temperature and presence of ice, will be recorded by the receiver. The field records will be included in the analytical report prepared by the laboratory, and will be considered an integral part of that report.

As part of the chain-of-custody procedure, each sample container will be labeled with the sample number and the parameter(s) to be sampled. All sampling measurements and observations will be recorded on the FIF. The following information will be documented on the

Chain-of-Custody Record:

1. Facility site name, sample point identification number, and other pertinent identifiers.
2. Requested Analyses
3. Sample Date and Time
4. Number of Sample Containers
5. Date and Time Sample Container is Sealed or Custody is Transferred
6. Sampler's Signature.

Upon receipt of the samples at the laboratory, the date and time of arrival will be noted on the Chain-of-Custody Records. The laboratory receiver also will make note of sample bottle condition on the forms if any unusual problems are present (e.g., broken bottles). These forms will be retained by the laboratory and returned with the results of the analysis.

3.2.7 Field Quality Assurance/Quality Control

3.2.7.1 Duplicates

During each routine sampling event at least one field duplicate sample will be collected. Every 20 samples collected will trigger another duplicate sample. After the initial duplicate is collected, a second duplicate sample will not be collected until 21 samples have been collected. The number of duplicates will also be dependent on the total number of days in a sampling event. One duplicate will be collected per three consecutive days of sampling. For each routine sampling event, the greater number of duplicates, as defined by one of the two procedures described above, will be collected. Each duplicate sample should be collected by alternating between the regular sample bottles and the duplicate sample bottles, proceeding in the designated parameter sampling order (i.e., VOCs first, etc.). The well at which the duplicate is collected will be identified on the FIF for the duplicate sample. Once a duplicate is collected, it is handled and shipped in the same manner as the rest of the samples.

3.2.7.2 Trip Blanks / Field Blanks / Equipment Blanks

All purging and sampling equipment at the site is dedicated or disposable except the electric water-level measuring tape and bailing cord reels, which are washed between wells; therefore, field blanks and equipment blanks are not needed. A field blank sample may be collected if a detection at a monitoring well appears to be related to the sampling environment. In this case, if a resampling event is performed, a field blank may be collected for the resample event. Trip blanks for volatile organics will accompany each cooler containing VOC sample vials and will not be opened. One trip blank will be analyzed for each sampling event. The detection monitoring and corrective measures monitoring events are conducted concurrently; therefore, one trip blank will be analyzed for the combined detection/corrective measures event.

3.2.8 Creek Sampling Procedures

Sampling of Chippewa Creek and its tributary will be performed using a new disposable polypropylene syringe or similar device to extract the sample water at each collection point. Sample bottles will be filled directly from the sampling device and without allowing the sampling equipment to contact the inside of the bottles. The field parameters pH, specific conductance, temperature, and turbidity will be measured each time a sample is collected. The creek samples will be handled, shipped, and stored in the same manner as the groundwater samples. Creek samples will be collected concurrently with the routine groundwater sampling events (i.e., two semiannual events).

If unsafe conditions are encountered, such as flooding, sampling of the surface water location will be postponed until locations can be safely accessed and surface water flows are more representative of normal base flow conditions. The subsequent attempt may be made during a resampling event, if necessary, or within an approximately 30 day time frame. If a surface water sample cannot be sampled within that timeframe and no resampling event is conducted, the facility will note the circumstances regarding why the surface water sample(s) was not collected.

4.0 SAMPLE PARAMETERS AND SCHEDULE

The groundwater monitoring system for Royalton Road Sanitary Landfill has been established to meet the requirements of OAC 3745-27-10. Table 4 presents the semiannual parameter list for corrective measures monitoring wells. The SZS groundwater monitoring wells at the facility are in the corrective measures program and will be analyzed semiannually for the parameters listed in Appendix I to OAC 3745-27-10, with the exception of the VOCs 1,2-dibromoethane (EDB) and 1,2-dibromo-3-chloropropane (DBCP). The summary tables located in Appendix B demonstrate that there has never been a detection of EDB or DBCP in the groundwater wells at the facility. A parameter deletion request was approved for the assessment monitoring program at the site under rule OAC 3745-27-10(E)(4) in an Ohio EPA letter dated June 15, 2017; therefore, the removal of EDB and DBCP from the corrective measures groundwater monitoring for Royalton Road Landfill is appropriate. The parameter sulfide was determined to be above background at one SZS well; therefore, this parameter also will be sampled and analyzed semiannually at all corrective measures wells. If Alternative 1 is selected as the corrective measures for the Royalton Road Landfill, semiannual monitoring of the SZS groundwater monitoring wells will include additional parameters for monitoring and evaluation of the natural attenuation processes ongoing at the site. The MNA monitoring parameters are footnoted with a superscript "1" on Table 4. Water-quality samples collected at Chippewa Creek as part of the corrective measures program will be sampled and analyzed for OAC 3745-27-10 Appendix I parameters (minus EDB and DBCP) and the parameter sulfide. Water-quality summary tables for all Appendix I parameters and sulfide for the corrective measures wells are located in Appendix B. Time-series graphs for Appendix I inorganic parameters and sulfide are located in Appendix C.

5.0 ANALYSIS PLAN

5.1 Laboratory Quality Control Procedures

The quality assurance program for the analytical laboratory is described in their quality assurance plan, which is available upon request. The laboratory is responsible for the implementation of and adherence to the quality assurance and quality control requirements outlined in their quality assurance plan.

Data Quality Reviews (DQR), or equivalent, are requests submitted to the laboratory to formally review results that differ from historical results, or that exceed certain permit requirements or quality control criteria. The laboratory prepares a formal written response to each DQR explaining the discrepancy. The DQR is the first line of investigation following any anomalous result.

5.2 Practical Quantitation Limits

Practical quantitation limits (PQLs) utilized for each parameter are identified on the analytical reports provided by the laboratory, as are the method detection limits (MDLs). The PQLs used will be below respective MCLs. Although not anticipated, there may be rare occurrences where PQLs equal to or above MCLs will be reported and considered acceptable due to matrix interference in the sample water that require the laboratory to report level above quantification limits (e.g., dilution).

5.3 Analytical Methodologies

The analytical reports provided by the laboratory will identify the methodologies used by the laboratory for each parameter (or group of parameters). All methods are EPA approved. The analysis of groundwater samples will be conducted in accordance with U.S. EPA SW-846 analytical procedures.

5.4 Data Reporting and Record Keeping

5.4.1 Submission of Results

All final reports for the Royalton Road Sanitary Landfill, which includes all field forms, field water-level record, field meter calibration records, Chain-of-Custody (COC) forms with preservation methods, sample receipt forms, data summary tables, data evaluation (including statistical analysis results), groundwater maps, quality assurance (QA/QC), and analytical results will be submitted to the Ohio EPA Northeast District and the Cuyahoga County Board of Health. The laboratory report will include a description of the analytical methods used including MDLs and PQLs for the constituents analyzed. This document, as well as the analytical results for each sampling event, are kept with the site operating record. Per OAC 3745-27-10(C)10, all semiannual and annual sampling event reports will be submitted within 75 days of the sampling event.

5.5 Laboratory Contacts

The current contact person at the Laboratory is:

Mr. Timothy Bergstresser
Geochemical Testing
2005 N. Center Avenue
Somerset, Pennsylvania 15501
(814) 443-1671

6.0 DATA EVALUATION AND STATISTICAL PROGRAM

6.1 Evaluation of Groundwater Elevations

Typically, corrective measures monitoring and detection monitoring sampling events will be conducted concurrently. Groundwater elevations will be determined for each combined sampling event. Groundwater elevations from each sampling event will be used to construct water-level maps for each zone that will be submitted with the semiannual reports. The direction of groundwater flow will be determined from up-and downgradient relationships as depicted on the water level map for each zone and reported pursuant to OAC 3745-27-10.

6.2 Statistical Program General Conditions

The following summarizes the statistical methodology to be used for the corrective measures monitoring program. The purpose of the statistical analysis program is to monitor the effectiveness of the corrective measures. Statistical methodology is provided below for the statistical analysis of parameters below background concentrations and, also for those found to be above background concentrations. The ChemStat statistical software developed by Starpoint Software will be used for conducting statistical analyses.

6.3 Statistical Methods for Parameters Below Background

Interwell statistical analyses will be performed for the downgradient corrective measures wells for parameters 1 through 66 from Appendix I determined to be below background by well/by parameter. Parametric and nonparametric prediction limits will be generated using the data from upgradient wells MW-2R, MW-3, and MW-12. These wells were used to determine the parameters above background during the assessment investigation and are therefore appropriate to use for calculation of the interwell limits. The selected statistical methods described herein are consistent with those contained in the USEPA Unified Guidance document (Statistical Analysis of Groundwater Monitoring of RCRA Facilities, Unified Guidance, March 2009) and ASTM statistical guidance. The software manual for the ChemStat program is included in Appendix D and presents the analytical formulas used to conduct the statistical analyses. The current background periods and statistical procedures for each parameter determined to be below background are summarized on Table 5.

6.3.1 Statistical Methods for Inorganic Parameters

Interwell parametric and nonparametric prediction limits will be used to statistically analyze the compliance data for downgradient corrective measures wells for those parameters below background. Water-quality data from upgradient wells MW-2R, MW-3, and MW-12 will be used to calculate the interwell prediction limits. Parametric prediction limits will be used for parameters comprised of less than or equal to 50% nondetect data that are normally distributed or meet an assumption normally. Nonparametric prediction limits will be used for parameters comprised of greater than 50% nondetect data or for parameters comprised of less than or equal to 50% nondetect data where data sets are found to be non-normal to statistically analyze groundwater quality data.

6.3.1.1 Parametric Prediction Limits

In order to use a parametric prediction limit for statistical analysis, the background data for a particular parameter, in addition to being comprised of less than or equal to 50% nondetect data, must be normally distributed, or meet an assumption of normality, at an alpha = 0.01. Distributional testing will be performed using the Shapiro-Wilk test for datasets comprised of less than or equal to 50 observations and the Shapiro-Francia test will be used for datasets comprised of greater than 50 observations. In order to test for normality, any data set must have three quantified results.

The following rules apply to distributional testing in this program:

1. Distributional testing is conducted in ChemStat using both raw (i.e., original) and ln-transformed datasets. The distribution that is normally distributed (i.e., the Shapiro-Wilk or Shapiro-Francia W Statistic is equal to or greater than the critical value) will be used to calculate the background summary statistics. If both distributions are normally distributed, the distribution with the higher of the two Shapiro-Wilk or Shapiro-Francia W statistics will be used to calculate the background summary statistics.

2. When neither distribution is normal, then a nonparametric prediction limit will be used to statistically analyze the compliance data.

3. In the event that the software produces an unacceptably high lognormal statistical limit which can sometimes occur using the lognormal distribution, the original distribution will be used to calculate the background summary statistics, assuming the original distribution is normally distributed. If the original distribution is not normal, then a nonparametric prediction limit will be used to statistically analyze the compliance data.

Appendix E contains the distributional testing results. A minimum of eight observations will be used as background when calculating the parametric prediction limits for all applicable parameters at the site.

The prediction limits will be calculated at the 99 percent significance level and with k = 1. Any non-detect results within the background data set will be transformed to ½ the detection limit for calculation of the prediction limits. The compliance data from the downgradient corrective measures wells from each semiannual sampling event will be compared to the prediction limits to determine if the results are statistically significant. A semiannual result that exceeds a parametric prediction limit will be considered an initial statistical exceedance and may be verified by resampling. Table 5 summarizes the statistical method and results of distributional testing for each inorganic parameter.

6.3.1.2 Nonparametric Prediction Limits

Nonparametric prediction limits will be used for parameters comprised of greater than 50% nondetect data or for parameters comprised of less than or equal to 50% nondetect data where the assumption of normality cannot be met. A nonparametric prediction limit is determined as the largest observation (excluding outliers) recorded within the background period of the pooled upgradient well data. Table 5 summarizes the statistical method for each inorganic parameter.

For parameters comprised of 100 percent nondetect data, the most recent PQL will be set as the nonparametric prediction limit. It is noted that if there is a new lower PQL utilized by the laboratory in the future, the statistical limit will be maintained at the previous higher PQL until there are eight observations reported using the new lower PQL. The statistical limit will be re-evaluated once eight results at the lower PQL are available.

Semiannual sampling results from downgradient corrective measures wells will be compared to the nonparametric prediction limits to determine if results are statistically significant. For parameters for which background is comprised of 100% nondetect data, any compliance result identified at or above the nonparametric prediction limit will be considered an initial statistical exceedance and may be verified by resampling. For parameters where background is not comprised of 100% nondetect data, any compliance result that is greater than the nonparametric prediction limit will be considered statistically significant, pending the results of verification resampling.

6.3.2 Statistical Method for Volatile Organic Chemicals

A monitoring measurement at or above the laboratory specific practical quantitation limit (PQL) for a volatile organic compound (VOC) will be considered a statistically significant result and may require verification either by resampling or laboratory reanalysis. Confirmatory resampling may be conducted at the discretion of the program manager in the event of a PQL exceedance for a VOC. Only one verification sample may be collected for VOCs in the event of a detection at or above a PQL. When collected, if the resample or reanalysis does not confirm a statistically significant result, the well will continue in corrective measures monitoring. If a resample is not collected or reanalysis is not conducted, a statistically significant increase above background (SSI) will be declared on the initial result.

6.3.3 Outlier Testing

Outlier testing for the background data sets will be conducted by well, by parameter for inorganic parameters using either Dixon's or Rosner's outlier test. Dixon's test is used for data sets comprised of less than 75% nondetect data and having less than or equal to 25 samples and Rosner's test is used for data sets having more than 25 sample results. For any data set comprised of equal to or greater than 75% nondetect data, Dixon's or Rosner's outlier tests will not be performed. In this instance, the rare detect outlier procedure listed below for data sets comprised of equal to or greater than 75% nondetect data will be followed. Outlier testing will be conducted using the outlier identification process developed by the Ohio EPA Statistics Workgroup (Division of Drinking and Groundwaters) as documented in an April 7, 2006 letter from the Ohio EPA (Crowell to Cobel, April 7, 2006). The procedures contained in the April 2006 letter are consistent with Ohio EPA documents IP0406;100 dated February 23, 2007, and guidance document 0715 (DSIWM) dated September 12, 2012. The following procedure developed by Ohio EPA will be used to conduct outlier testing for this facility.

6.3.3.1 Dixon's/Rosner's Outlier Test

1. The facility will provide a listing of identified outliers based on the results of Dixon's/Rosner's test (for data sets by well/by parameter comprised of less than 75% nondetect data) within the statistical plan document for the facility, which will be submitted each time background is updated or a new well is added to the program.

2. Based on the results of the Dixon's/Rosner's outlier tests, any outlier identified will either be excluded from background or documentation will be presented within the statistical program with justification for retaining the result.

6.3.3.2 Rare-Detect Outlier Test

1. The facility will provide a listing of identified outliers based on the results of the Rare-Detect outlier test (for data sets comprised of greater than or equal to 75% nondetect data), which will be submitted each time background is updated or a new well is added to the program.

2. Based on the results of the Rare-Detect outlier tests, any outlier identified will either be excluded from background or documentation will be presented within the statistical program with justification for retaining the result.

3. For parameters comprised of greater than or equal to 75% nondetect data, the following Rare-Detect procedure developed by Ohio EPA will be used:

   a. When censored data are ≥ 75%:
      i. If there is only a single detection ≥ the PQL;

    a. And detections ≥ the MDL are ≥ 50%, then any result ≥ 2 times the median/current PQL will be identified as a potential outlier.
    b. And detections ≥ the MDL are < 50%, then any result ≥ highest/median/current PQL will be identified as a potential outlier.

- ii. If there are at least 2 detections ≥ the PQL:
    a. And detections ≥ the MDL are ≥ 50%, then any result ≥ 3 times the median/current PQL will be identified as a potential outlier.
    b. And detections ≥ the MDL are less than 50%, then any result ≥ 2 times the median/current PQL will be identified as a potential outlier.

6.3.3.3 Additional Justification

The following additional information will be considered when providing justification for retaining a result identified as a potential outlier using either Dixon's test or the Rare-Detect outlier test:

a. consideration of available censored data;
b. discussion of relevant literature;
c. analysis of background data from other detection wells both up and downgradient;
d. use of additional outlier testing procedures; and
e. any other appropriate information that may provide justification for retaining a result identified as an outlier.

If a reviewer at Ohio EPA reviews the statistical plan, semiannual report, or other appropriate report and identifies a result that he/she feels is unrepresentative of background, it is understood that the facility will receive correspondence from Ohio EPA requesting "more information needed" to determine the representativeness of the data in question. At that point, the facility will provide additional information as soon as reasonably possible upon receipt of the request to support the original demonstration made in the statistical program. During future updates to background, previous and existing results designated as outliers will be re-examined in the context of the new data set being proposed for use as the statistical background period.

6.3.4 Verification Sampling for Parameters Below Background

If there is a SSI , the Ohio EPA will be notified within 75 days of the initial sampling of the wells. When resampling is performed, a "1 of m" sampling protocol will be used to verify initial statistical exceedances. Specifically, a "1 of 2" sampling protocol will be followed to verify initial statistical exceedances. A “1 of 2” sampling plan is defined as the collection of an initial sample and one confirmatory resample. Therefore, in the event of an initial exceedance, verification resampling will consist of collecting one confirmatory resample. If the resample does not confirm the initial exceedance, the well will continue corrective measures monitoring. If the resample result verifies the initial statistical exceedance, the result will be evaluated to determine if it is laboratory, sampling, or other sources that are the result of the statistical exceedance. An alternate source demonstration (described below) may be submitted to continue statistical analysis for the parameter(s) below background. The facility may chose not to perform resampling in some circumstances, in which case an evaluation of the data will be made based on the initial sample result.

6.3.5 Alternate Source Demonstration

If a SSI is identified, an investigation may be conducted to determine if the SSI resulted from a source other than the landfill, or error in the sampling, analysis, or statistical evaluation, or from natural variation in groundwater quality. As part of a demonstration, additional groundwater quality samples may be collected as necessary from the well displaying a verified statistically significant increase to support the alternate source demonstration. A self-implementing, alternate source demonstration will be submitted, if appropriate, by a qualified groundwater scientist.

If it is determined an alternate source demonstration is not appropriate or if notification is received by the Director that the submitted report does not successfully demonstrate that the SSI is not due to the landfill, the procedures described in Section 6.3.6 will be followed.

6.3.6 Evaluation of Existing Corrective Measures for Parameters Below Background

In the instance that statistical analysis of the parameters below background at a well has a SSI and an alternate source demonstration was not submitted or notification has been received from the Director that a submitted demonstration is not successful, a determination of rate, extent, and concentration will be performed for the new parameter(s) at the particular well.

Once rate, extent, and concentration have been established for the new parameter(s) at a well, the effectiveness of the existing corrective measures will be evaluated. The evaluation will consist of a comparison of the chemical, physical, and chemical degradation characteristics of the released parameter to the characteristics of the corrective measures being employed to determine if the existing corrective measures will address the remediation of the additional parameter(s). If the existing remedial method is appropriate for the additional parameter(s), a Groundwater Remediation Standard (GWRS) will be established for the new elevated parameter consistent with OAC 3745-27-10(F)(7) if not already established, prior to the next semiannual sampling event. If the initial evaluation indicates that the existing corrective measures will not address the elevated parameter concentration, the owner/operator shall comply with the provisions of paragraph (E) of this rule.

6.3.7 Updating Background Observations / Trend Analysis

As with other statistical methods, the parametric and nonparametric prediction limits must be updated periodically. Trends in water-quality data due to laboratory variance, sampling variance, seasonal fluctuation, and other sources of variation are incorporated into each data set with the collection of additional samples. Therefore, the background data sets require periodic updating to ensure that all potential sources of variation are incorporated in the background data sets. Background data sets will be updated in blocks consisting of a minimum of four samples. Trend analyses will be performed for each well and parameter prior to updating the background period. Trend analyses are performed using the Sen's Slope test for each well and parameter, after outliers are removed. A significant trend is one in which the 99% lower confidence bound is greater than zero. Summary statistics will be updated for each well and parameter as appropriate following the incorporation of new results into the background observation periods. The background observation periods are displayed on Table 5.

The trend analyses are conducted on the entire set of data, i.e. the existing background data and the data to be moved to background. However, it is emphasized that OAC 3745-27-10(C)(7)(g) does not require that a trend test be performed when updating background. If an upward trend is identified, it will be discussed to evaluate whether it is a natural trend in background concentrations. If Ohio EPA does not concur with such an explanation, it is understood that the facility will receive correspondence from Ohio EPA requesting "more information needed" to determine the representativeness of the data in question. At that point, the facility will provide additional information to support the original demonstration made in the statistical plan.

6.3.8 Background Period Update for Wells/Parameters Below Background

The background periods are displayed on Table 5 for parameters where at least one downgradient corrective measures well is below background.

6.3.8.1 Outlier Testing

The background period observations were evaluated by well/by parameter for the presence of outlying observations. For data sets comprised of less than 75% nondetect data, Dixon’s (for less than or equal to 25 samples) or Rosner's (for data sets having more than 25 sample results) test at the 0.01 level significance. For any data set comprised of equal to or greater than 75% nondetect data, Dixon's or Rosner's outlier tests will not be performed. In this instance, results detected above the PQL were evaluated in accordance with the Ohio EPA outlier evaluation criteria as preciously referenced.

Table 6 is a summary of the outlier evaluation that provides the results of Rosner's or Dixon's tests and an evaluation of detected results above the current PQL for data sets comprised of greater than or equal to 75% nondetect data. Appendix F contains the outlier evaluation results for Dixon's/Rosner's tests. Any result within a background data set equal to or greater than 75 nondetect data for a well/parameter combination is listed on Table 6 and was evaluated based on the rare detect procedure to determine if it should be identified as an outlier. The results to be excluded as outliers are labeled with a "Y" on Table 6 and any that will not be excluded are labeled with a "N" or "N[1]". Results labeled with a "N[1]" will be retained as permitted in accordance with the Ohio EPA rare-detect outlier evaluation procedure. There are no identified outliers labeled with a "N" on Table 6; therefore, no discussion is needed. All results identified as an outliers will be excluded; therefore, all identified outliers are labeled with a "Y" on Table 6.

6.3.8.2 Trend Analysis

Trend analysis has been performed on the new background data sets. It is emphasized that OAC 3745-27-10(C)(7)(g) does not require that a trend test be performed when updating background. The existence of an upward trend will not preclude an update of background. However, any upward trend identified will be evaluated. Only data that are representative of naturally occurring conditions are used to update background. Trend analyses have been conducted using Sen's test within the ChemStat software program. Appendix G contains the results of trend testing for each background well and parameter. A statistically significant upward trend was identified for chloride at well MW-12. Well MW-12 is upgradient of the solid waste-placement; therefore, the chloride data represents upgradient concentrations. Additionally, the chloride concentrations at well MW-12 are within range of other upgradient monitoring wells. No other statistically significant upward trends were identified.

6.3.8.3 Statistical Exceedances

Rule OAC 3745-27-10(C)(7)(g) prohibits the inclusion of current groundwater quality results that are statistically different from background water-quality results. Eagon & Associates, Inc. has previously discussed the specific requirements of OAC 3745-27-10(C)(7)(g) with the Ohio EPA Statistics Workgroup to clarify what is required relative to updating background. Based on meetings and discussions with Ohio EPA Central Office, the background period can be updated with any result in the compliance period that has not been previously identified as statistically significant. Ohio EPA has defined statistically significant as any result that has failed statistically whether an initial or verified statistical exceedance. Director's (or an authorized representative's) approval is required only for specific statistically significant results that are proposed for inclusion in the background. Removal of statistical exceedances from the compliance data set is acceptable prior to moving compliance data to background. In this instance, as long as any previously declared exceedance is removed from compliance before updating background, no Director's approval is required to update background for wells with previously declared statistical exceedances. No results within the new background windows were previously declared statistical exceedances.

6.4 Statistical Methods for Parameters Above Background

The statistical methods for the corrective measures monitoring for the well/parameter combinations above background at Royalton Road Landfill are described below. Corrective measures monitoring is conducted throughout the active period of corrective action to determine the progress of remediation.

Evaluating corrective measures parameters that have been determined to be above background is accomplished semiannually by two methods. The first method is by comparison of an upper confidence limit (UCL) to the groundwater remediation standards (GWRS) presented in the Corrective Measures Plan for the Site (also presented on Table 7 herein), along with a trend evaluation of the data. The second method is evaluating recent data for those parameters above background which have constituent concentrations below the GWRS to determine if a re-evaluation of the corrective measure is needed.

6.4.1 UCL/GWRS Comparison

For well/parameter combinations determined to be above background, the four most recent analytical results will be used to calculate the UCL for comparison to the GWRS. Corrective action continues until there is a high degree of confidence that the true concentration mean is below the GWRS. Therefore, corrective measures monitoring is conducted throughout the active period of corrective action to determine the progress of remediation and to identify statistically significant trends in groundwater concentrations for the constituent of concern. Once the 95% UCL is below the proposed concentration level for the GWRS for the elevated parameter and remains below the GWRS for three years, or until the end of post-closure care, whichever is longer, corrective measures can be terminated, subject to the approval of the Director of Ohio EPA.

The statistical evaluation for the corrective measures parameter will include comparison of the 95% upper confidence limit to the applicable concentration levels (GWRS). The UCL is a statistical estimate of the upper boundary of the true mean concentration (or a percentile of the concentration distribution) with a specified level of confidence (e.g., 95%) based on a given number of samples. The 95% UCL for the mean of m measurements is computed as follows:

$$95\%\ \mathrm{UCL} = x + t_{[m-1,\ 0.95]}\ (S/m^{1/2})$$

Where:

t = the 95th upper percentage point of Students' T-distribution on m-1 degrees of freedom;

S = the sample-based standard deviation of a constituent based on m measurements;

m = the number of measurements for the well and constituent; and

x = the sample-based mean of a constituent for the well.

A minimum of four independent samples from corrective measures wells are required to calculate the relevant 95% UCL for each parameter. Once this value is calculated, it will be compared to its respective GWRS to determine the progress of the remedial action. It is noted the confidence limit time interval for the calculation of the individual UCLs for parameters above background will be updated continuously using a two year moving window in accordance with the procedures described in ASTM D7048-04.

6.4.2 Data Evaluation for Existing Corrective Measures

6.4.2 Data Evaluation for Existing Corrective Measures

Evaluation of the recent groundwater quality data are used to track the effectiveness of the corrective measure and provide the mechanism to initiate a review of the corrective measure, if appropriate.

Water-quality results for those parameters above background with concentrations below the GWRS, by well/by parameter, will be evaluated using the methods presented on the flow chart located on Figure 11 to determine if a re-evaluation of the corrective measures is necessary. As shown on Figure 11, first trend testing will be performed using Sen's nonparametric estimate of trend (at a 99% confidence level). The most recent eight results will be used for the trend analysis. Based on the trend testing results, further data evaluation and/or sampling may be conducted. This includes comparison of the most recent sampling result to an upper confidence band (at a 99% confidence level). The upper confidence band is calculated from the eight parameter results prior to the result that is being evaluated. Multiple consecutive exceedances of the upper confidence band will result in an evaluation of the data and a possible re-evaluation of the corrective measures.

Data evaluation for those parameters with concentrations above the GWRS is performed as described in Section 6.4.1 for the purpose of completion of the corrective measures. In addition, trend analyses will be conducted and those results will be discussed in the groundwater submittals.

The evaluation of MNA monitoring also will be used to evaluate the corrective measure. Several transport and attenuation processes control the movement of VOCs and metals in the subsurface. These include advection, dispersion, sorption, dilution, volatilization, and biodegradation. Lines of evidence used to demonstrate natural attenuation is groundwater include:

1. Historical trends in contaminant data showing plume stabilization and/or loss of contaminant mass over time.

2. Analytical data showing that geochemical conditions are suitable for biodegradation and that active biodegradation has occurred as indicated by the consumption of electron acceptors and/or the production of metabolic byproducts. This chemical and analytical data can include evidence of:

    - depletion of electron acceptors and donors
    - increasing metabolic byproduct concentrations
    - decreasing parent compound concentrations
    - increasing daughter compound concentrations.

Measurements of dissolved oxygen (DO) and oxidation reduction potential (ORP) will be used to identify areas of aerobic versus anaerobic conditions and oxidative versus reducing conditions. The strength of reducing conditions and the potential for anaerobic biodegradation will be assessed by evaluation of DO and ORP results and up to down gradient concentrations of potential electron donors, i.e., DO, nitrate, iron, and sulfate. The presence of metabolic by-products such as ferrous iron, as well as parent and daughter products will be examined for evidence of reductive dechlorination and biodegradation of organic contaminants.

Water-quality data will be submitted semiannually and will include summary tables of the water-quality data and trend plots for key constituents. The MNA evaluation will include discussions of the volatile organic compounds (VOCs) and metal results. Once adequate MNA parameter data is available, which will take multiple events, concentrations will be compared to the recent historical results using trend plots to assess whether concentrations are declining, remaining consistent with historical results, or increasing.

6.4.3 Verification Sampling for Parameters Above Background

Verification resampling for the evaluation of the existing corrective measures may be conducted following the flow chart located on Figure 11 for parameters with concentrations below the GWRS. For parameters above background with concentrations above the GWRS, verification resampling may be conducted based on the results of trend evaluation.

6.5 Evaluation of Surface Water Data

Water-quality data from the Chippewa Creek and its tributary sampling locations will be evaluated semiannually. A comparison of upstream to downstream results will be performed and a discussion of these comparisons will be submitted as described in Section 6.6. If further evaluation of creek data is warranted, other methods for data evaluation may include comparison to the GWRS, review of summarized data, parameter concentration plots, or review of applicable water quality standards for Chippewa Creek under Ohio Administrative Code (OAC) 3745-1.

6.6 Submission of Results

A report providing the results of the field, laboratory, and statistical analyses will be submitted to the Ohio EPA and placed in the operating record no later than 75 days after initiation of the sampling event. The groundwater submittals for each semiannual sampling event will include the following components:

- Text presenting groundwater and surface water sampling results;
- Groundwater elevation contour map(s);
- Analytical data summary table for semiannual event;
- Analytical data summary table for resampling event(s), if conducted;
- Appendix including laboratory and resample (if conducted) analyses with methods, method detection and practical quantitation limits, field forms, and chain-of-custody forms, and field and laboratory QA/QC data; and
- Results of data comparisons and statistical analyses (e.g., tables, statistical print-outs).

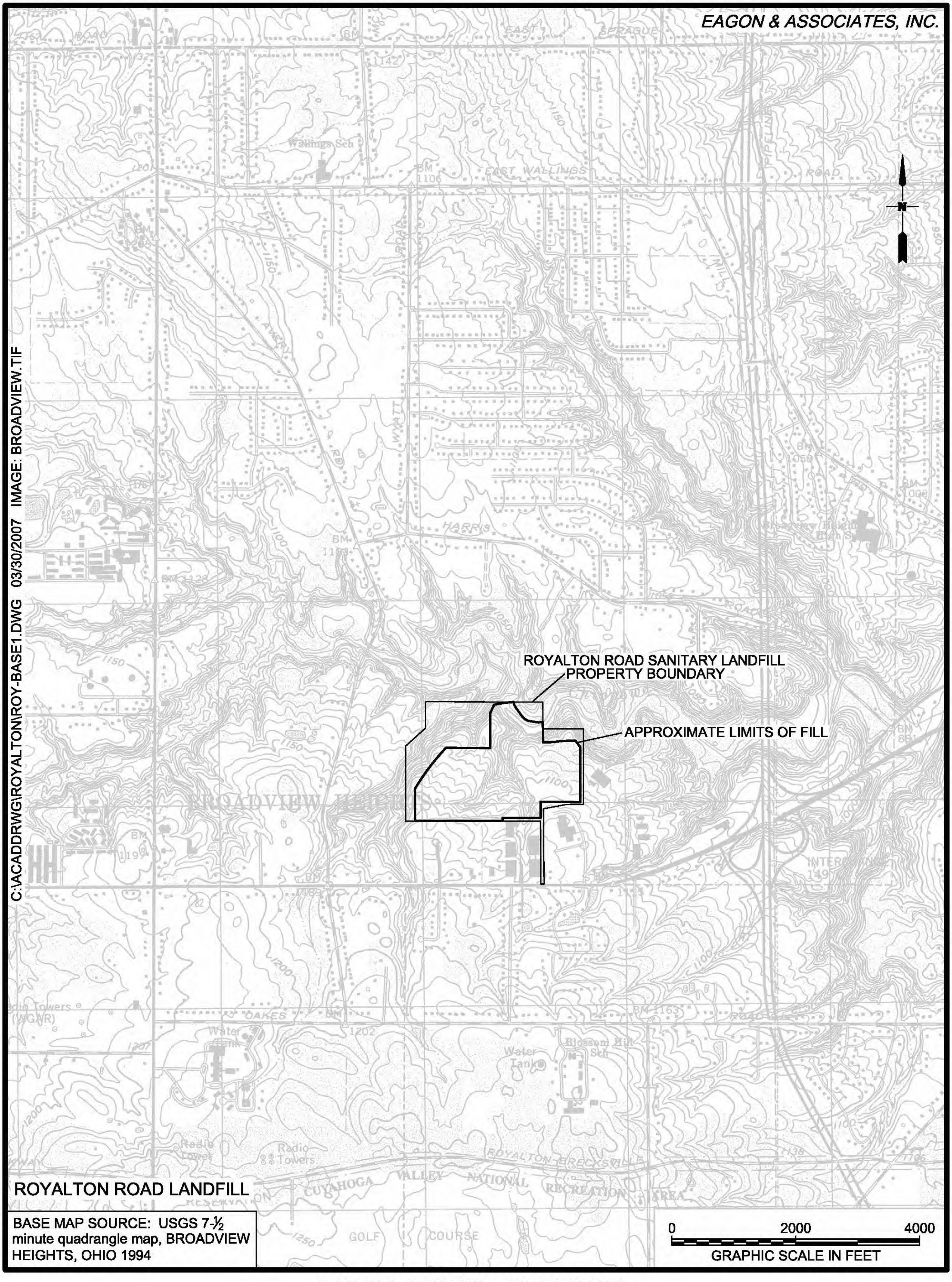
7.0 SUMMARY

This corrective measures groundwater quality monitoring plan is submitted in accordance with OAC 3745-27-10(F)(2)(e) and will be implemented with Director's approval of the proposed corrective measure as presented in the Corrective Measures Plan (November 2019). Once a corrective measure is selected by the Director (or authorized representative) the CMGWQMP is intended to be a living, standalone document. As such, the document will require periodic revisions to update background or to include modifications in sampling practices and/or equipment. Changes of this nature will follow applicable Rules and may be implemented with the submitted Plan revision. If Ohio EPA does not concur with any such revisions, it is understood that the facility will receive correspondence from Ohio EPA requesting "more information needed" to discuss the revision in question. Non-routine changes such as a background update for an SSI or a change in the monitoring system (i.e., installation or abandonment of a well) will require Director's (or an authorized representative's) approval or approval at the Ohio EPA Northeast District level, depending on the proposed revision, prior to implementation at the Site. The procedure outlined above for revisions to the CMGWQMP creates a more efficient, usable document while still maintaining rule compliance as well as the integrity of the corrective measures monitoring program at the Site.

FIGURES

C:\ACADDRWG\ROYALTON\ROY-BASE1.DWG 03/30/2007 IMAGE: BROADVIEW.TIF

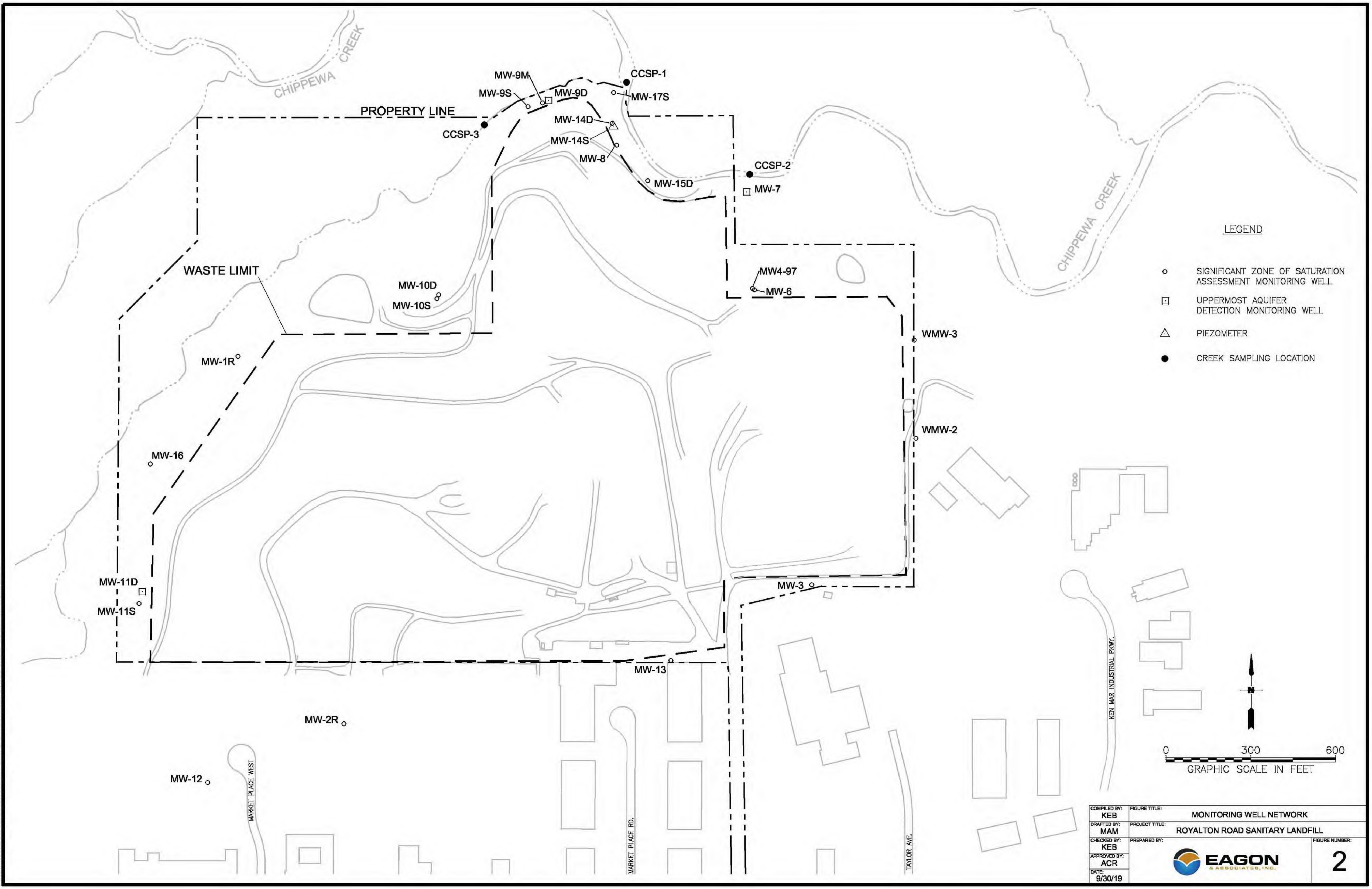
EAGON & ASSOCIATES, INC.



ROYALTON ROAD LANDFILL

BASE MAP SOURCE: USGS 7-½ minute quadrangle map, BROADVIEW HEIGHTS, OHIO 1994

FIGURE 1. GENERAL LOCATION MAP



COMPILED BY: KEB
DRAFTED BY: MAM
CHECKED BY: KEB
APPROVED BY: ACR
DATE: 9/30/19

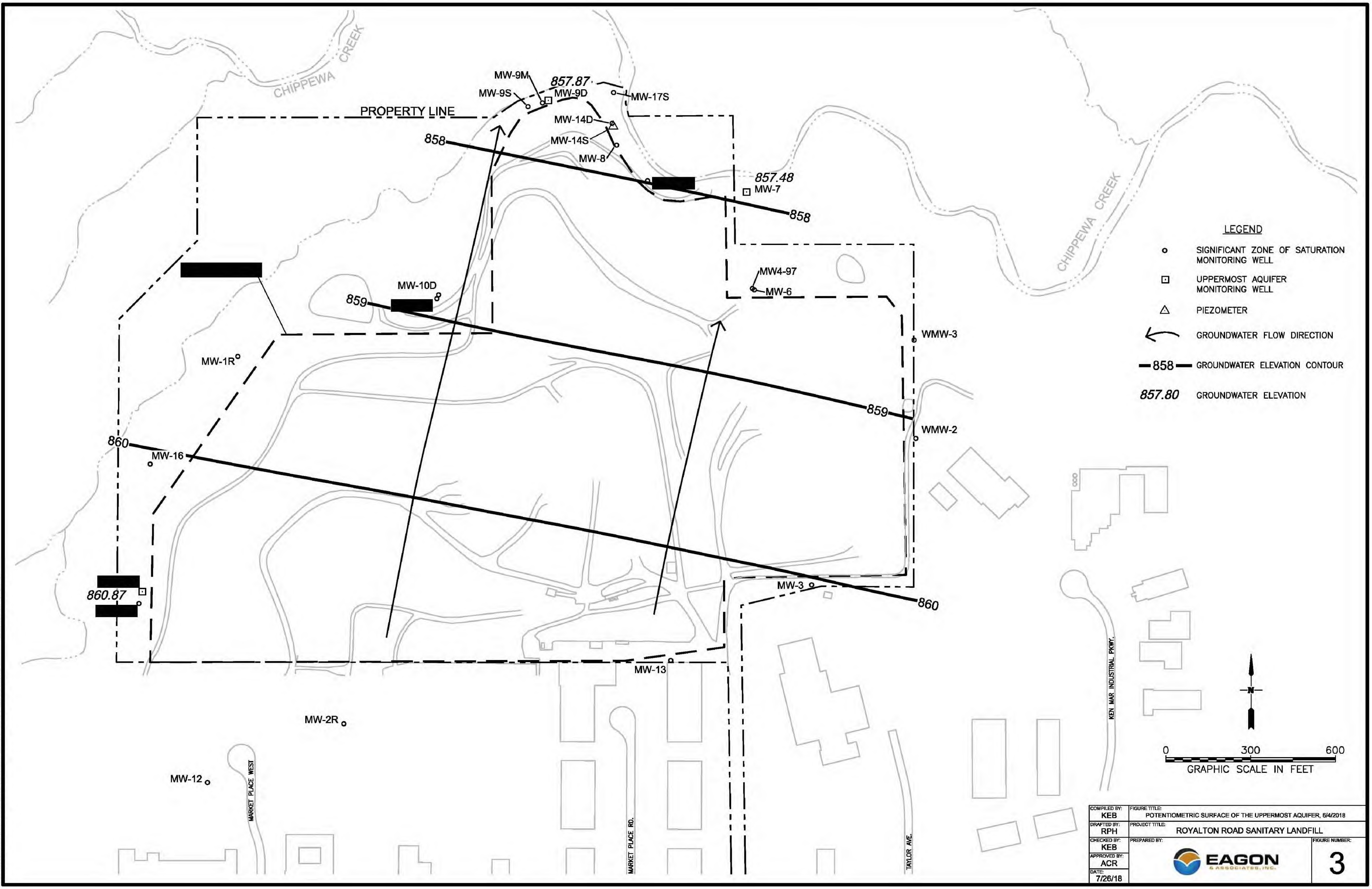
FIGURE TITLE: MONITORING WELL NETWORK

PROJECT TITLE: ROYALTON ROAD SANITARY LANDFILL

PREPARED BY: EAGON & ASSOCIATES, INC.

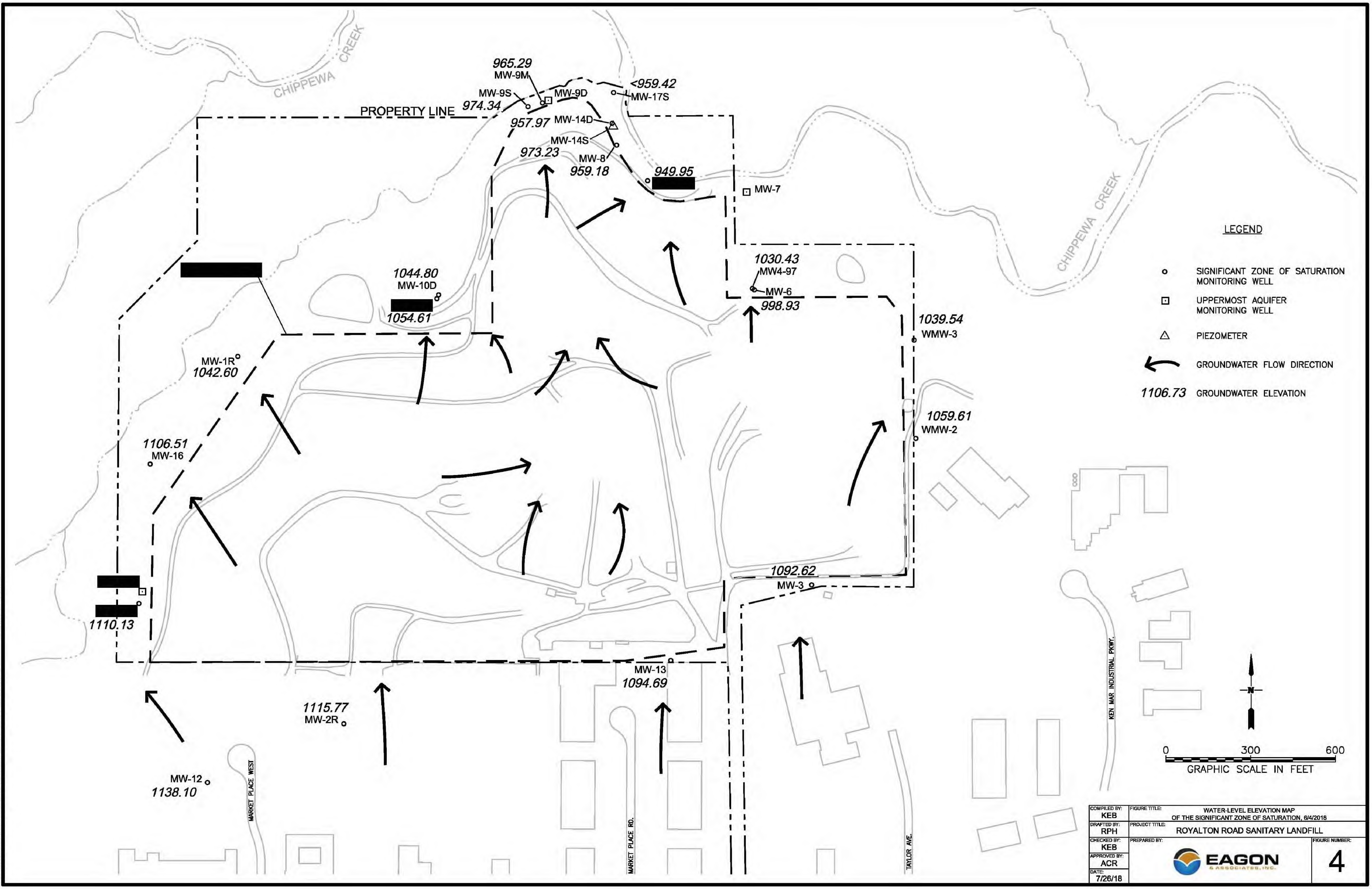
FIGURE NUMBER: 2

F:\AUTOCAD\ROYALTON\CREEK SAMPLING LOCATIONS.DWG 10/21/2019 4:01 PM



COMPILED BY: KEB	FIGURE TITLE: POTENTIOMETRIC SURFACE OF THE UPPERMOST AQUIFER, 6/4/2018	
DRAFTED BY: RPH	PROJECT TITLE: ROYALTON ROAD SANITARY LANDFILL	
CHECKED BY: KEB	PREPARED BY: EAGON & ASSOCIATES, INC.	FIGURE NUMBER: 3
APPROVED BY: ACR		
DATE: 7/26/18		

F:\AUTOCAD\ROYALTON\ROYAL-PSURF-06-04-2018.DWG 7/26/2018 9:15 AM



COMPILED BY: KEB
DRAFTED BY: RPH
CHECKED BY: KEB
APPROVED BY: ACR
DATE: 7/26/18

FIGURE TITLE: WATER-LEVEL ELEVATION MAP
OF THE SIGNIFICANT ZONE OF SATURATION, 6/4/2018

PROJECT TITLE: ROYALTON ROAD SANITARY LANDFILL

PREPARED BY: EAGON & ASSOCIATES, INC.

FIGURE NUMBER: 4

MONITORING WELL INTEGRITY REPORT

(✓) YES
(X) NO
(NA) NOT APPLICABLE

Date: ____________________

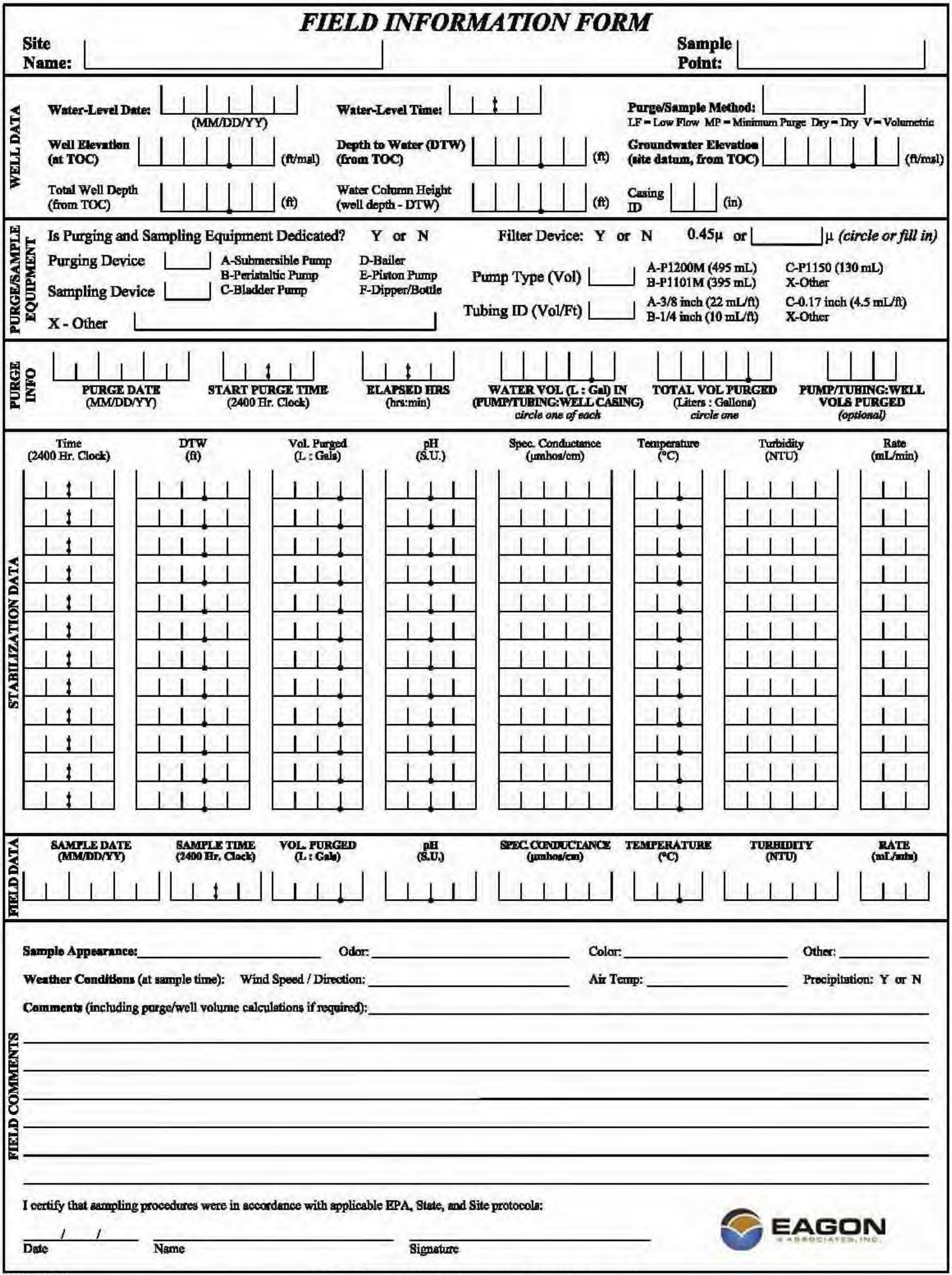
Facility Name: Royalton Road Sanitary Landfill

Inspected by: ____________________

	Monitoring Well									
A. Location / Identification										
1. Is well adequately flagged if hard to find?										
2. Is well labeled outside?										
3. Is well labeled inside?										
4. Is well situated away from a low point or point or ponded water?										
5. Is wellhead area clean and free of waste, stored chemicals, etc.?										
6. If in vulnerable traffic area, is well surrounded by protective posts?										
7. Is the well location appropriately shown on facility map?										
8. Is well elevation information on the well correct?										
B. Surface Seal										
1. Is there a concrete surface seal in good conditions (i.e., no cracks)?										
2. Is the seal free from erosion around and under the base?										
3. Is the seal sloped away from well head?										
C. External Casing										
1. Is external casing locked?										
2. Is lock in good condition (i.e., no severe rust)?										
3. Does cap and lock effectively prevent tampering?										
4. Is casing/annulus in good condition and free of water/live animals/debris?										
5. Do above-ground wells have weep holes at the base of protective casing?										
D. Internal Casing										
1. Is there a survey mark on the casing/pump assembly cap?										
2. Is cap vented?										
3. Is casing tight horizontally/vertically/rotationally?										
4. Is the cap snugly fitting/in good condition/made of suitable materials?										
5. Is sampling equipment in good condition (tubing, etc.)?										
6. Is casing free of live animals/debris/kinks or bends?										

Comments:

FIGURE 5.



FIELD INFORMATION FORM

Site Name:

Sample Point:

WELL DATA

Water-Level Date: (MM/DD/YY)

Water-Level Time:

Purge/Sample Method:
LF = Low Flow MP = Minimum Purge Dry = Dry V = Volumetric

Well Elevation (at TOC) (ft/msl)

Depth to Water (DTW) (from TOC) (ft)

Groundwater Elevation (site datum, from TOC) (ft/msl)

Total Well Depth (from TOC) (ft)

Water Column Height (well depth - DTW) (ft)

Casing ID (in)

PURGE/SAMPLE EQUIPMENT

Is Purging and Sampling Equipment Dedicated? Y or N

Filter Device: Y or N 0.45μ or μ *(circle or fill in)*

Purging Device

Sampling Device

A-Submersible Pump
B-Peristaltic Pump
C-Bladder Pump
D-Bailer
E-Piston Pump
F-Dipper/Bottle

X - Other

Pump Type (Vol)
A-P1200M (495 mL)
B-P1101M (395 mL)
C-P1150 (130 mL)
X-Other

Tubing ID (Vol/Ft)
A-3/8 inch (22 mL/ft)
B-1/4 inch (10 mL/ft)
C-0.17 inch (4.5 mL/ft)
X-Other

PURGE INFO

PURGE DATE (MM/DD/YY)	START PURGE TIME (2400 Hr. Clock)	ELAPSED HRS (hrs:min)	WATER VOL (L : Gal) IN (PUMP/TUBING:WELL CASING) *circle one of each*	TOTAL VOL PURGED (Liters : Gallons) *circle one*	PUMP/TUBING:WELL VOLS PURGED *(optional)*

STABILIZATION DATA

Time (2400 Hr. Clock)	DTW (ft)	Vol. Purged (L : Gals)	pH (S.U.)	Spec. Conductance (μmhos/cm)	Temperature (°C)	Turbidity (NTU)	Rate (mL/min)

FIELD DATA

SAMPLE DATE (MM/DD/YY)	SAMPLE TIME (2400 Hr. Clock)	VOL. PURGED (L : Gals)	pH (S.U.)	SPEC. CONDUCTANCE (μmhos/cm)	TEMPERATURE (°C)	TURBIDITY (NTU)	RATE (mL/min)

FIELD COMMENTS

Sample Appearance: ______ Odor: ______ Color: ______ Other: ______

Weather Conditions (at sample time): Wind Speed / Direction: ______ Air Temp: ______ Precipitation: Y or N

Comments (including purge/well volume calculations if required): ______

I certify that sampling procedures were in accordance with applicable EPA, State, and Site protocols:

/ /
Date Name Signature

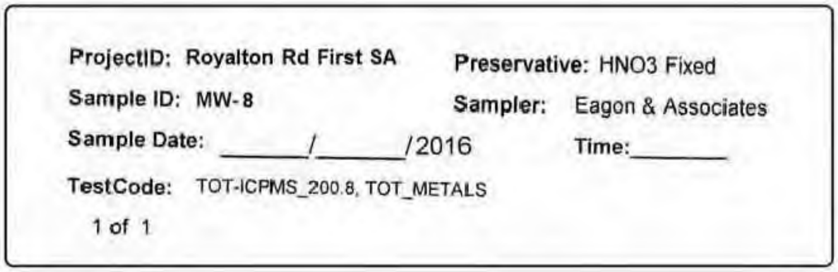
EAGON & ASSOCIATES, INC.

FIGURE 6. FIELD INFORMATION FORM

FIGURE 7.
WATER-LEVEL RECORD
ROYALTON ROAD SANITARY LANDFILL

Date: ____________________ Recorded By: ____________________

Well I.D.	Measuring Point Elevation (ft., MSL)	Time (24:00 Hour)	Depth to Water (feet)	Water Level Elevation (ft., MSL)	Total Well Depth (feet, TOC)	Comments
Uppermost Aquifer Monitoring Wells						
MW-7	952.43					
MW-9D	985.99					
MW-11D	1154.48					
Significant Saturated Zone Monitoring Wells						
MW-1R	1109.60					
MW-2R	1172.02					
WMW-2	1072.79					
MW-3	1124.30					
WMW-3	1057.84					
MW4-97	1056.97					
MW-6	1056.30					
MW-8	990.29					
MW-9S	984.83					
MW-9M	985.83					
MW-10S	1078.16					
MW-10D	1077.80					
MW-11S	1151.95					
MW-12	1175.78					
MW-13	1141.14					
MW-14D	987.50					
MW-15D	988.42					
MW-16	1133.67					
MW-17S	984.74					
Significant Saturated Zone Piezometer						
MW-14S	987.74					



ProjectID: Royalton Rd First SA

Preservative: HNO3 Fixed

Sample ID: MW-8

Sampler: Eagon & Associates

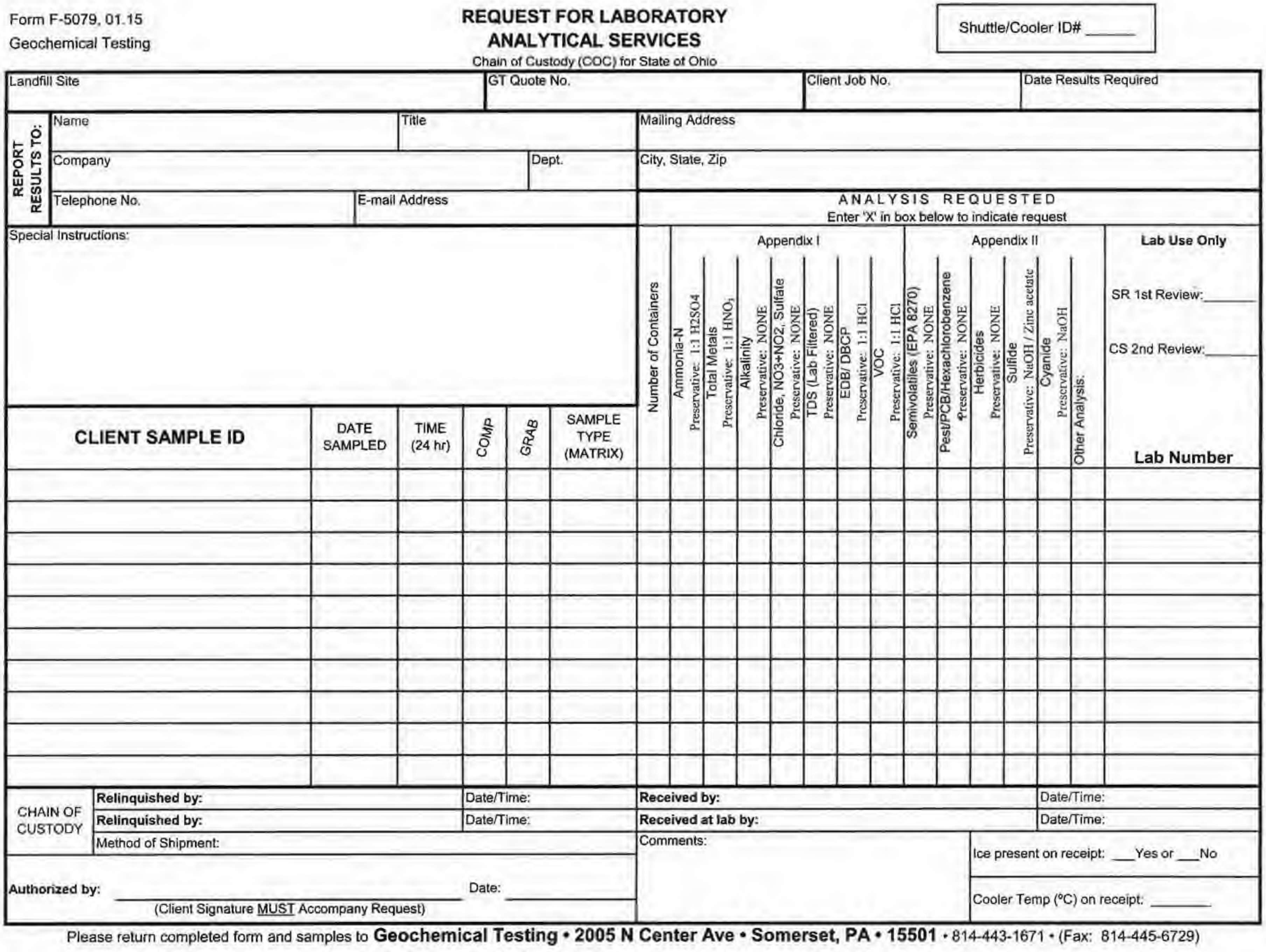
Sample Date: ______/______/2016

Time:________

TestCode: TOT-ICPMS_200.8, TOT_METALS

1 of 1

FIGURE 8. EXAMPLE SAMPLE BOTTLE LABEL



Form F-5079, 01.15
Geochemical Testing

REQUEST FOR LABORATORY ANALYTICAL SERVICES

Chain of Custody (COC) for State of Ohio

Shuttle/Cooler ID# _____

Landfill Site	GT Quote No.	Client Job No.	Date Results Required

REPORT RESULTS TO:

Name
Title
Mailing Address
Company
Dept.
City, State, Zip
Telephone No.
E-mail Address

Special Instructions:

ANALYSIS REQUESTED
Enter 'X' in box below to indicate request

							Appendix I						Appendix II						Lab Use Only SR 1st Review:_____ CS 2nd Review:_____
CLIENT SAMPLE ID	DATE SAMPLED	TIME (24 hr)	COMP	GRAB	SAMPLE TYPE (MATRIX)	Number of Containers	Ammonia-N Preservative: 1:1 H2SO4	Total Metals Preservative: 1:1 HNO_3	Alkalinity Preservative: NONE	Chloride, NO3+NO2, Sulfate Preservative: NONE	TDS (Lab Filtered) Preservative: NONE	EDB/ DBCP Preservative: 1:1 HCl	VOC Preservative: 1:1 HCl	Semivolatiles (EPA 8270) Preservative: NONE	Pest/PCB/Hexachlorobenzene Preservative: NONE	Herbicides Preservative: NONE	Sulfide Preservative: NaOH / Zinc acetate	Cyanide Preservative: NaOH	Other Analysis:	Lab Number

CHAIN OF CUSTODY

Relinquished by: Date/Time:
Received by: Date/Time:
Relinquished by: Date/Time:
Received at lab by: Date/Time:
Method of Shipment:
Comments:
Ice present on receipt: ___Yes or ___No
Cooler Temp (°C) on receipt: ________

Authorized by: ________________ Date: ________
(Client Signature MUST Accompany Request)

Please return completed form and samples to **Geochemical Testing • 2005 N Center Ave • Somerset, PA • 15501** • 814-443-1671 • (Fax: 814-445-6729)

FIGURE 9. CHAIN-OF-CUSTODY RECORD

FIELD METER CALIBRATION RECORD

Project Name: Royalton Road Sanitary Landfill Sampler(s): ____________________

pH Meter(s): Make/Model/Serial No: ____________________

Buffer Brand/Expiration: pH 4 __________; pH 7 __________; pH 10 __________

Date	Time	Calibrate/Check	pH 4 Buffer Result (S.U.)	pH 7 Buffer Result (S.U.)	pH 10 Buffer Result (S.U.)	Temp. of Cal. Soln' (^{o}C)

Conductivity/Temp. Meter(s): Make/Model/Serial No: ____________________

Cond. Solution Brand/Expiration: ____________________ Cond. Solution Value (@ 25 ^{o}C): __________

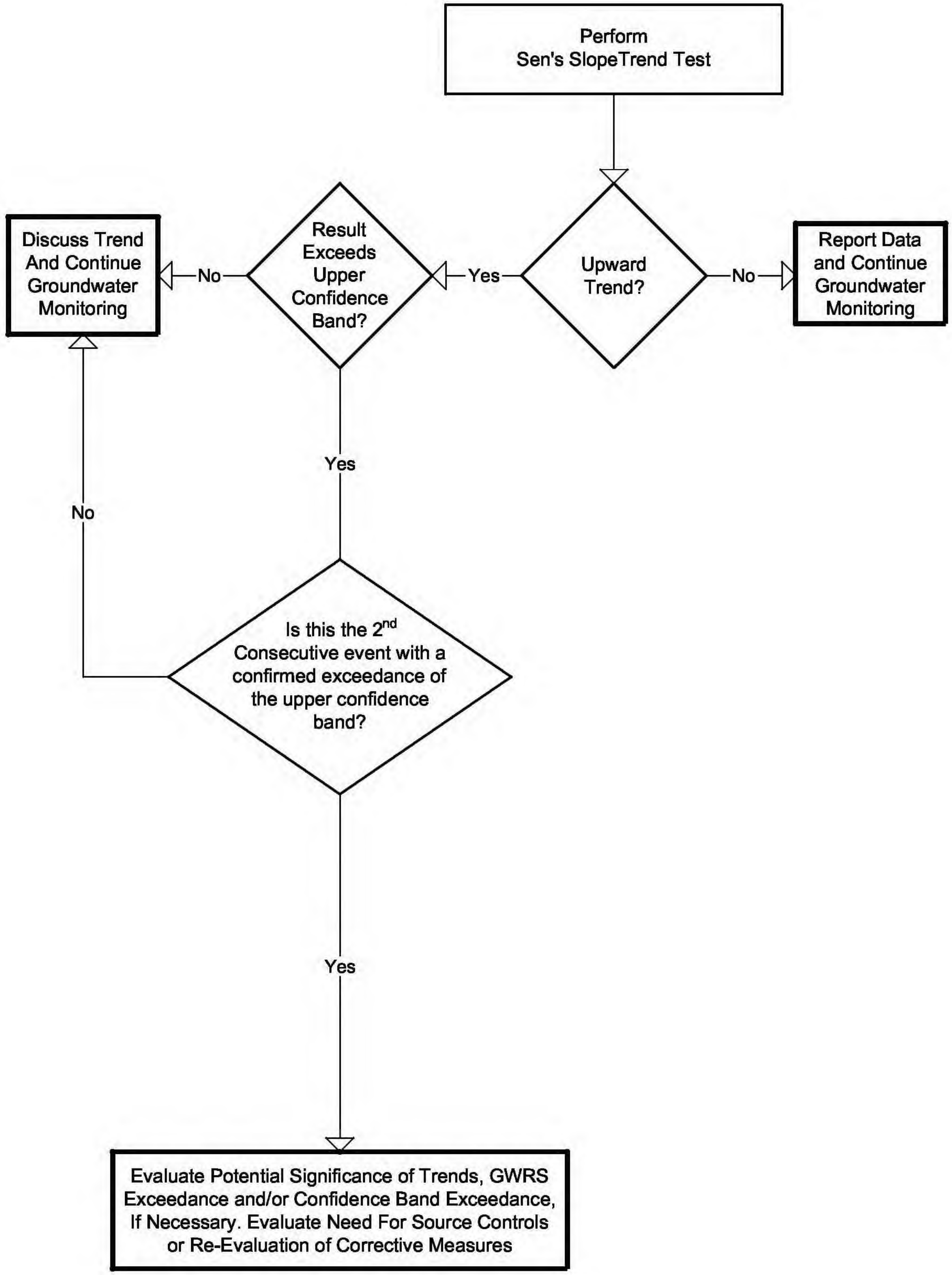
Date	Time	Calibrate/Check	Cond. Standard Result (µmhos/cm)	Temp. of Cond. Soln' (^{o}C)	Notes:

Turbidity Meter(s): Make/Model/Serial No.: ____________________

Date	Time	Calibrate/Check	Gel Value (NTU)	Reading (NTU)	Notes:

Sampler (Name): ____________________ Sampler (Signature): ____________________

FIGURE 10.



F:\AUTOCAD\ROYALTON\FLOWCHART2017.DWG 9/21/2018

ROYALTON ROAD SANITARY LANDFILL - CUYAHOGA COUNTY, OHIO

FIGURE 11. FLOWCHART FOR EVALUATION OF PARAMETERS ABOVE BACKGROUND WITH CONCENTRATIONS BELOW GWRS

TABLES

TABLE 1. MONITORING WELL CONSTRUCTION SUMMARY
ROYALTON ROAD SANITARY LANDFILL

Well ID	Boring Log ID	Date Installed	Ground Surface Elevation (ft, MSL)	Measuring Point Elevation (ft, MSL-TOC)	Boring Depth (ft, BGL)	Screen Interval (ft, BGL)	Well Casing Diam. (in)	Casing Stickup (ft)	Total Well Depth^1 (ft, TOC)	Sampling Equipment	Pump Model^2	Pump Tubing ID^2 (inch.)	Pump Intake Depth (ft, TOC)	Monitoring Status	Gradient Position
Uppermost Aquifer System - Berea Sandstone Monitoring Wells															
MW-7	BH-2	6/10/99	950.8	952.43	189.0	117 - 127	2	1.6	129.15	Pump	P1101M	0.25	127.0	D	Down
MW-9D	BH-1D	11/9/99	983.9	985.99	182.0	167 - 182	2	2.1	184.37	Pump	P1101M	0.25	177.0	D	Down
MW-11D	BH-3D	11/8/99	1151.6	1154.48	343.0	323 - 343	3	2.9	345.90	Pump	P1101M	0.25	333.0	D	Up
Significant Zone of Saturation - Cuyahoga Group Shale Monitoring Wells															
MW-1R	MW-1R	6/4/99	1107.4	1109.60	105.0	90 - 105	2	2.1	108.62	Pump	P1101M	0.25	107.0	C	Down
MW-2R	MW-2R	12/19/96	1170.5	1172.02^3	125.0	103 - 123	2	--^{3}	126.69^3	Pump	P1101M	0.25	125.0	C	Up
WMW-2	WMW-2	8/7/87	1072.3	1072.79	26.0	15 - 25	2	0.5	20.37	Pump	P1150	0.17	20.0	C	Down
MW-3	MW-3	5/22/85	1123.5	1124.30	73.0	68 - 73	2	1	67.89	Pump	P1101M	0.25	63.0	C	Up
WMW-3	WMW-3	8/5/87	1057.1	1057.84^4	28.0	17.5 - 27.5	2	0.32	20.38	Bailer	--	--	--	C	Down
MW4-97	MW4-97	1/2/97	1054.4	1056.97	27.0	15 - 25	2	2.5	27.95	Bailer	--	--	--	C	Down
MW-6	BH-3	6/11/99	1054.4	1056.30	115.0	55 - 65	2	2	67.60	Pump	P1150	0.17	67.0	C	Down
MW-8	BH-6A	10/6/99	988.2	990.29	65.0	55 - 65	2	2.1	67.24	Pump	P1101M	0.25	62.0	C	Down
MW-9S	BH-1S	10/3/99	982.5	984.83	22.0	12 - 22	2	2.3	24.26	Pump	P1101M	0.25	19.0	C	Down
MW-9M	BH-1M	11/4/99	983.6	985.83	50.0	40 - 50	2	2.2	52.85	Pump	P1101M	0.25	48.0	C	Down
MW-10S	BH-2S	10/7/99	1075.8	1078.16	30.0	20 - 30	2	2.2	30.69	Pump	P1150	0.17	29.5	C	Down
MW-10D	BH-2D	10/8/99	1075.3	1077.80	70.0	55 - 70	2	2.5	72.42	Pump	P1101M	0.25	67.0	C	Down
MW-11S	BH-3S	10/21/99	1149.8	1151.95	66.0	56 - 66	2	2.2	68.61	Pump	P1101M	0.25	66.5	C	Down
MW-12	BH-4	10/11/99	1173.3	1175.78	78.0	58 - 78	2	2.5	79.19	Pump	P1101M	0.25	74.0	C	Up
MW-13	BH-5	10/13/99	1138.7	1141.14	75.0	65 - 75	2	2.5	76.70	Pump	P1101M	0.25	72.0	C	Up
MW-14D	MW-14D	5/1/02	985.50	987.50	50.5	40.3 - 49.8	2	2.3	52.43	Pump	P1101M	0.25	48.0	C	Down
MW-15D	MW-15D	4/30/02	986.30	988.42	50.25	40.0 - 49.4	2	2.6	52.48	Pump	P1101M	0.25	48.0	C	Down
MW-16	MW-16	4/25/02	1131.50	1133.67	33.0	25.5 - 29.8	2	2.2	32.31	Pump	P1150	0.17	32.0	C	Down
Significant Zone of Saturation - Unconsolidated Material Monitoring Well															
MW-17S	MW-17S	4/26/02	982.60	984.74	25.3	20.7 - 25.2	2	2.4	27.63	Pump	P1150	0.17	27.0	C	Down
Significant Zone of Saturation - Unconsolidated Material Piezometer															
MW-14S	MW-14S	4/24/02	985.80	987.74	18.0	10.3 - 15.1	2	2.3	17.30	--	--	--	--	P	Down

D - Detection Monitoring Well
C - Corrective Measures Monitoring Well
P - Piezometer

[1] *- Total depth for wells equipped with bailers taken during May 10, 2004 sampling event. Well MW-2R depth taken during the December 6, 2004 event.*

[2] *- Volume of QED dedicated model pump P1101M is 395ml & P1150 is 130ml; Volume of tubing is 10 ml/ft for 0.25-inch I.D. & 4.5ml/ft for 0.17-inch I.D.*

[3] *- Measuring point elevation and total well depth for well MW-2R were adjusted due to conversion to a flush mount well. The inner well casing is below the new surface grade and therefore does not have a stick-up.*

[4] *- Measuring point elevation changed after first semiannual 2005 sampling completed. Old elevation was 1057.52 ft, MSL-TOC.*

TABLE 2. SAMPLE COLLECTION, PRESERVATION, AND HOLDING TIMES
ROYALTON ROAD SANITARY LANDFILL

Sample Order	Parameter	Minimum Sample Volume	Container Type	Sample Preservation	Recommended Holding Time
1	VOCs	2-40 ml	Glass	HCL, pH<2; Cool, 3-10°C	14 days
2	Total Organic Carbon	1-40 mgl	Amber Glass	H_2SO_4, pH<2; Cool, 3-10°C	28 days
3	Metals Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc	100 ml	Plastic	HNO_3, pH<2; Cool, 3-10°C	6 months
4	Sulfide	50 ml	Plastic	NaOH/ZnAcetate; pH>9; Cool, 3-10°C	7 days
5	Sulfate	80 ml	Plastic	Cool, 3-10°C	28 days
	Chloride	80 ml	Plastic	Cool, 3-10°C	28 days
	Total Alkalinity	100 ml	Plastic	Cool, 3-10°C, No Headspace	14 days
	TDS	100 ml	Plastic	Cool, 3-10°C	7 days
6	Ammonia	25 ml	Plastic	H_2SO_4, pH<2; Cool, 3-10°C	28 days
	Nitrate-Nitrite (353.2)	50 ml	Plastic	H_2SO_4, pH<2; Cool, 3-10°C	28 days
	Nitrate-Nitrite (300.0)	50 ml	Plastic	Cool, 3-10°C	48 hours
7	Turbidity	In situ	--	None	Field Determination
	pH	In situ	--	None	Field Determination
	Specific Conductance	In situ	--	None	Field Determination
	Temperature	In situ	--	None	Field Determination
	Dissolved Oxygen	In situ	--	None	Field Determination
	Oxidation Reduction Potential	In situ	--	None	Field Determination
	Iron, Ferrous	In situ	--	None	Field Determination

TABLE 3.
LOW-YIELD WELLS
SAMPLE ORDER AND MINIMUM SAMPLE VOLUMES
ROYALTON ROAD SANITARY LANDFILL

Sample Order	Parameter	Minimum Sample Volume
1	VOCs	2 - 40 ml (80 ml)
2	Total Organic Carbon	1 - 40 ml
3	Ammonia	25 ml
4	Sulfate Chloride Nitrate-Nitrite (353.2) Nitrate-Nitrite (300.0)	80 ml 80 ml 50 ml 50 ml
5	Metals Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc	100 ml
6	Iron, Ferrous	In situ - 50 ml
7	Dissolved Oxygen Oxidation Reduction Potential pH Specific Conductance Temperature	In situ - 150 ml
8	Turbidity	In situ - 30 ml
9	Total Alkalinity	100 ml
10	TDS	100 ml
11	Sulfide	50 ml

TABLE 4. SEMIANNUAL CORRECTIVE MEASURES SAMPLING PARAMETER LIST
ROYALTON ROAD SANITARY LANDFILL

	Compound	MCL
1.	Antimony (Total)	6 ug/L
2.	Arsenic (Total)[1]	10 ug/L
3.	Barium (Total)	2000 ug/L
4.	Beryllium (Total)	4 ug/L
5.	Cadmium (Total)	5 ug/L
6.	Chromium (Total)	100 ug/L
7.	Cobalt (Total)	--
8.	Copper (Total)	--
9.	Lead (Total)	--
10.	Nickel (Total)	--
11.	Selenium (Total)	50 ug/L
12.	Silver (Total)	--
13.	Thallium (Total)	2 ug/L
14.	Vanadium (Total)	--
15.	Zinc (Total)	--
16.	Acetone	--
17.	Acrylonitrile	--
18.	Benzene	5 ug/L
19.	Bromochloromethane	--
20.	Bromodichloromethane	--
21.	Bromoform; Tribromomethane	--
22.	Carbon Disulfide	--
23.	Carbon Tetrachloride	5 ug/L
24.	Chlorobenzene[1]	100 ug/L
25.	Chloroethane; Ethyl Chloride[1]	--
26.	Chloroform; Trichloromethane	--
27.	Dibromochloromethane; Chlorodibromomethane	--
28.	1,2-dibromo-3-chloropropane; DBCP[2]	0.2 ug/L
29.	1,2-Dibromoethane; Ethylene Dibromide; EDB[2]	0.05 ug/L
30.	1,2-Dichlorobenzene; o-Dichlorobenzene	600 ug/L
31.	1,4-Dichlorobenzene; p-Dichlorobenzene	75 ug/L
32.	trans-1,4-Dichloro-2-Butene	--
33.	1,1-Dichloroethane; Ethylidene Chloride[1]	--
34.	1,2-Dichloroethane; Ethylidene Dichloride	5 ug/L
35.	1,1-Dichloroethylene; 1,1-Dichloroethene	7 ug/L
36.	cis-1,2-Dichloroethene[1]	70 ug/L
37.	trans-1,2-Dichloroethene[1]	100 ug/L
38.	1,2-Dichloropropane; Propylene Dichloride	5 ug/L
39.	cis-1,3-Dichloropropene	--
40.	trans-1,3-Dichloropropene	--
41.	Ethylbenzene	700 ug/L
42.	2-Hexanone; Methyl Butyl Ketone	--
43.	Methyl Bromide; Bromomethane	--
44.	Methyl Chloride; Chloromethane	--
45.	Methylene Bromide; Dibromomethane	--

[1] - MNA Parameter

[2] - Parameter removed from the corrective measures groundwater program.

TABLE 4. SEMIANNUAL CORRECTIVE MEASURES SAMPLING PARAMETER LIST
ROYALTON ROAD SANITARY LANDFILL

	Compound	MCL
46.	Methylene Chloride; Dichloromethane	5 ug/L
47.	Methyl Ethyl Ketone; MEK; 2-Butanone	--
48.	Methyl Iodine; Iodomethane	--
49.	4-Methyl-2-Pentanone; MIK	1,000 ug/L
50.	Styrene	100 ug/L
51.	1,1,1,2-tetrachloroethane	--
52.	1,1,2,2-Tetrachloroethane	--
53.	Tetrachloroethene; Perchloroethylene[1]	5 ug/L
54.	Toluene	1,000 ug/L
55.	1,1,1-Trichloroethane; Methyl Chloroform[1]	200 ug/L
56.	1,1,2-Trichloroethane	5 ug/L
57.	Trichloroethene; Trichloroethylene[1]	5 ug/L
58.	Trichlorofluoromethane; CFC-11	--
59.	1,2,3-Trichloropropane	--
60.	Vinyl Acetate	--
61.	Vinyl Chloride[1]	2 ug/L
62.	Xylenes	10,000 ug/L
63.	Ammonia[1]	--
64.	Chloride[1]	--
65.	Sodium (Total)[1]	--
66.	Potassium (Total)[1]	
67.	Temperature[1]	--
68.	pH[1]	--
69.	Specific Conductance[1]	--
70.	Total Dissolved Solids	--
71.	Total Alkalinity[1]	--
72.	Nitrate-Nitrite[1]	10 mg/L
73.	Sulfate[1]	--
74.	Magnesium (Total)[1]	--
75.	Calcium (Total)[1]	--
76.	Turbidity[1]	--
77.	Iron (Total)[1]	--
78.	Manganese (Total)	--
	Dissolved Oxygen[1, 3]	--
	Iron, Ferrous[1, 3]	--
	Oxidation Reduction Potential[1, 3]	--
	Total Organic Carbon[1, 3]	--
	APPENDIX II PARAMETER	
	Sulfide	--

[1] - MNA Parameter

[2] - Parameter removed from the corrective measures groundwater program.

[3] - Collected only at groundwater monitoring wells.

TABLE 5. SUMMARY OF BACKGROUND PERIODS AND STATISTICAL PROCEDURES CORRECTIVE MEASURES MONITORING PARAMETERS BELOW BACKGROUND ROYALTON ROAD SANITARY LANDFILL

Parameter	Background Period	No. of Background Dates	No. of Background Observations	Background Percent Nondetect[1]	Distribution Test log/orig	Distribution 1% Critical Value	Distribution Used log/orig	Statistical Method[2]	Interwell Prediction Limit
Antimony	12/1/11 - 8/1/18	14	42	100	--	--	--	NPPL	1.0 ug/L
Arsenic	12/1/09 - 8/1/18	18	53	44	0.789/0.720	0.938	--	NPPL	32.4 ug/L
Barium	12/1/09 - 8/1/18	18	54	31	0.891/0.836	0.940	--	NPPL	61 ug/L
Beryllium	12/1/11 - 8/1/18	14	42	100	--	--	--	NPPL	1.0 ug/L
Cadmium	12/1/09 - 8/1/18	18	54	89	--	--	--	NPPL	5.0 ug/L
Chromium	12/1/11 - 8/1/18	14	42	100	--	--	--	NPPL	10 ug/L
Cobalt	12/1/11 - 8/1/18	14	42	100	--	--	--	NPPL	5.0 ug/L
Copper	12/1/11 - 8/1/18	14	42	100	--	--	--	NPPL	10 ug/L
Lead	12/1/11 - 8/1/18	14	42	100	--	--	--	NPPL	1.0 ug/L
Nickel	12/1/11 - 8/1/18	14	42	100	--	--	--	NPPL	10 ug/L
Selenium	12/1/11 - 8/1/18	14	42	100	--	--	--	NPPL	1.0 ug/L
Silver	12/1/11 - 8/1/18	14	42	100	--	--	--	NPPL	5.0 ug/L
Thallium	12/1/11 - 8/1/18	14	42	100	--	--	--	NPPL	0.2 ug/L
Vanadium	12/1/11 - 8/1/18	14	42	100	--	--	--	NPPL	5.0 ug/L
Zinc	6/1/14 - 8/1/18	9	26	63	--	--	--	NPPL	0.186 mg/L
Ammonia	12/1/09 - 8/1/18	18	51	0	0.923/0.916	0.935	--	NPPL	2.36 mg/L
Chloride	10/1/02 - 8/1/18	32	87	0	0.918/0.876	0.961	--	NPPL	211 mg/L
Sodium	12/1/09 - 8/1/18	18	53	0	0.819/0.796	0.938	--	NPPL	131 mg/L
Potassium	12/1/09 - 8/1/18	18	54	0	0.924/0.913	0.940	--	NPPL	12.9 mg/L
VOCs	NA	NA	NA	100	--	--	--	NPPL	PQL

Notes:

See Table 6 for outlier identification

-- = Not Applicable

[1] *- Percent nondetect of pooled background data from wells MW-2R, MW-3, and MW-12.*

[2] *NPPL = Nonparametric Prediction Limit; PPL = Parametric Prediction Limit*

Data from upgradient wells MW-2R, MW-3, and MW-12 were used to calculate the Interwell Prediction Limits.

TABLE 6.
OUTLIER EVALUATION SUMMARY
CORRECTIVE MEASURES GROUNDWATER QUALITY MONITORING PLAN
ROYALTON ROAD SANITARY LANDFILL

Well No.	Parameter	By Well Background Percent Nondetect	Outliers Identified by Dixons/Rosners Test	Results Identified Above the PQL for ≥75% ND data sets	Date	Result to be Excluded Y / N
MW-2R	Chloride	0	3.0 mg/L	--	5/10/2004	Y
			3.0 mg/L	--	12/6/2004	Y
			23 mg/L	--	6/1/2009	Y
			22 mg/L	--	12/2/2009	Y
			3.0 mg/L	--	6/3/2013	Y
			136 mg/L	--	6/1/2015	Y
			37 mg/L	--	12/7/2015	Y
			23 mg/L	--	6/6/2016	Y
			23 mg/L	--	6/4/2018	Y
	Sodium	0	125 mg/L	--	6/1/2015	Y
	Zinc	89	--	12 ug/L	6/1/2015	Y
MW-3	Arsenic	94	--	1.8 ug/L	12/7/2015	Y
MW-12	Ammonia	0	0.82 mg/L	--	6/21/2010	Y
			0.58 mg/L	--	12/6/2010	Y
			0.90 mg/L	--	6/2/2014	Y
	Barium	94	--	10 ug/L	6/6/2016	N[1]

[1] - Not and outlier following the Rare-Detect procedure developed by Ohio EPA.

TABLE 7.
GROUNDWATER REMEDIATION STANDARDS FOR PARAMETERS ABOVE BACKGROUND ROYALTON ROAD SANITARY LANDFILL

Parameter	GWRS (mg/L)	Type
Inorganic Parameters		
Arsenic	0.0648	2x highest concentration in upgradient wells[1,2]
Barium	2	MCL
Chromium	0.1	MCL
Cobalt	0.005	PQL
Copper	1.3	Action Limit
Lead	0.015	Action Limit
Nickel	0.100	Health Advisory Limit
Vanadium	0.005	PQL
Ammonia	30	Health Advisory Limit
Chloride	250	SMCL
Sodium	262	2x highest concentration in upgradient wells[1]
Potassium	25.8	2x highest concentration in upgradient wells[1]
Total Dissolved Solids	6720	2x highest concentration in upgradient wells[1,2]
Alkalinity	1042	2x highest concentration in upgradient wells[1]
Iron	17.6	2x highest concentration in upgradient wells[1,2]
Manganese	0.962	2x highest concentration in upgradient wells[1,2]
Sulfide	0.1	PQL
Volatile Organic Compounds (VOCs)		
Acetone	0.010	PQL
Benzene	0.005	MCL
Chlorobenzene	0.100	MCL
Chloroethane	0.001	PQL
1,4-Dichlorobenzene	0.075	MCL
1,1-Dichloroethane	0.001	PQL
Cis-1,2-Dichloroethene	0.070	MCL

[1] - See Corrective Measures Plan (September 2018) for notes regarding concentration used for GWRS.

[2] - Upgradient (background well) parameter concentrations exceed the regulatory limit.

APPENDIX A.

BORING LOGS AND WELL CONSTRUCTION DETAILS

NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION

113494

BORING STARTED 6/3/99	BORING COMPLETED 6/3/99	**MW-1R** Boring No.
DRILLER AW, MT	METHOD 5 5/8" Roller Bit	
TYPED BY hgw		Sheet 1 of 5

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION 1107.39'
BORING LOCATION
Next to MW-1

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

N VALUE, blows/ft.
10 20 30 40 50 60 70 80 90

DEPTH	SAMPLE NO.	SAMPLER TYPE	RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	REMARKS
				▨	Brown sandy CLAY with silt and gravel, cobbles, and builders, very stiff		
1.0				▨			▽
2.0				▨			
3.0				▨	(Well installed as replacement for MW-1 installed in 1985 by Herron Consultants. Lithological description taken from MW-1 log.)		
4.0				▨			
5.0				▨			
6.0				▨			
7.0				▨			
8.0				▨			
9.0				▨			
10.0				▨			
11.0				▨			
12.0				⁙	Brown SANDSTONE, hard - moist		
13.0				⁙			
14.0				⁙			
15.0				⁙			
16.0					Gray weathered SHALE with layers of gray siltstone, hard - moist		
17.0							
18.0							
19.0							
20.0					(6" casing set to 20.0')		
21.0					Gray weathered SHALE with layers of gray siltstone, hard - moist		
22.0							

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH		DATE
INITIAL	NONE	▽	6/3/99
AT COMPLETION	1.0	▽	6/3/99
OTHER	49.7	▽	12hrs.

■	A—SPLIT SPOON
◨	B—ROCK CORE
☒	C—SHELBY TUBE
▩	D—SONIC
◧	E—AUGER CUTTINGS
▨	F—

BOWSER MORNER

NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION

113494

BORING STARTED 6/3/99	BORING COMPLETED 6/3/99	**MW-1R** Boring No.	
DRILLER AW, MT	METHOD 5 5/8" Roller Bit		
TYPED BY hgw		Sheet 2 of 5	

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION 1107.39'
BORING LOCATION
Next to MW-1
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

N VALUE, blows/ft.

DEPTH	SAMPLE NO.	SAMPLER TYPE	RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE 10 20 30 40 50 60 70 80 90	REMARKS
23.0								
24.0								
25.0								
26.0								
27.0								
28.0								
29.0								
30.0								
31.0								
32.0								
33.0								
34.0								
35.0								
36.0								
37.0								
38.0								
39.0								
40.0								
41.0								
42.0								
43.0								
44.0								
45.0								
46.0					Gray-weathered SHALE with layers of gray siltstone, hard - moist			
47.0								
48.0								

Continued Next Page

NORTON ENVIRONMENTAL

PROJECT
**ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION**

113494

BORING STARTED 6/3/99
BORING COMPLETED 6/3/99
DRILLER AW, MT
METHOD 5 5/8" Roller Bit
TYPED BY bgw

MW-1R
Boring No.
Sheet 3 of 5

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION 1107.39'
BORING LOCATION
Next to MW-1

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

N VALUE, blows/ft.
10 20 30 40 50 60 70 80 90

DEPTH	SAMPLE NO.	SAMPLER TYPE RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	REMARKS
49.0						
50.0						▼
51.0						
52.0						
53.0						
54.0						
55.0						
56.0						
57.0						
58.0						
59.0						
60.0						
61.0						
62.0						
63.0						
64.0						
65.0						
66.0						
67.0						
68.0						
69.0						
70.0				Gray weathered SHALE with layers of gray siltstone, hard - moist		
71.0						
72.0						
73.0						

Continued Next Page

NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION

113494	
BORING STARTED 6/3/99	BORING COMPLETED 6/3/99
DRILLER AW, MT	METHOD 5 5/8" Roller Bit
TYPED BY hgw	

MW-1R
Boring No.
Sheet 4 of 5

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION 1107.39'
BORING LOCATION
Next to MW-1
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

N VALUE, blows/ft.
10 20 30 40 50 60 70 80 90

DEPTH	SAMPLE NO.	SAMPLER TYPE RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft.	REMARKS
75.0							
76.0							
77.0							
78.0							
79.0							
80.0							
81.0							
82.0							
83.0							
84.0							
85.0							
86.0							
87.0							
88.0							
89.0							
90.0							
91.0							
92.0							
93.0							
94.0				Gray weathered SHALE with layers of gray siltstone, hard - moist			
95.0							
96.0							
97.0							
98.0							
99.0							

Continued Next Page

NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION

113494

BORING STARTED 6/3/99
BORING COMPLETED 6/3/99
DRILLER AW, MT
METHOD 5 5/8" Roller Bit
TYPED BY bgw

MW-1R
Boring No.
Sheet 5 of 5

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION 1107.39'
BORING LOCATION
Next to MW-1
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

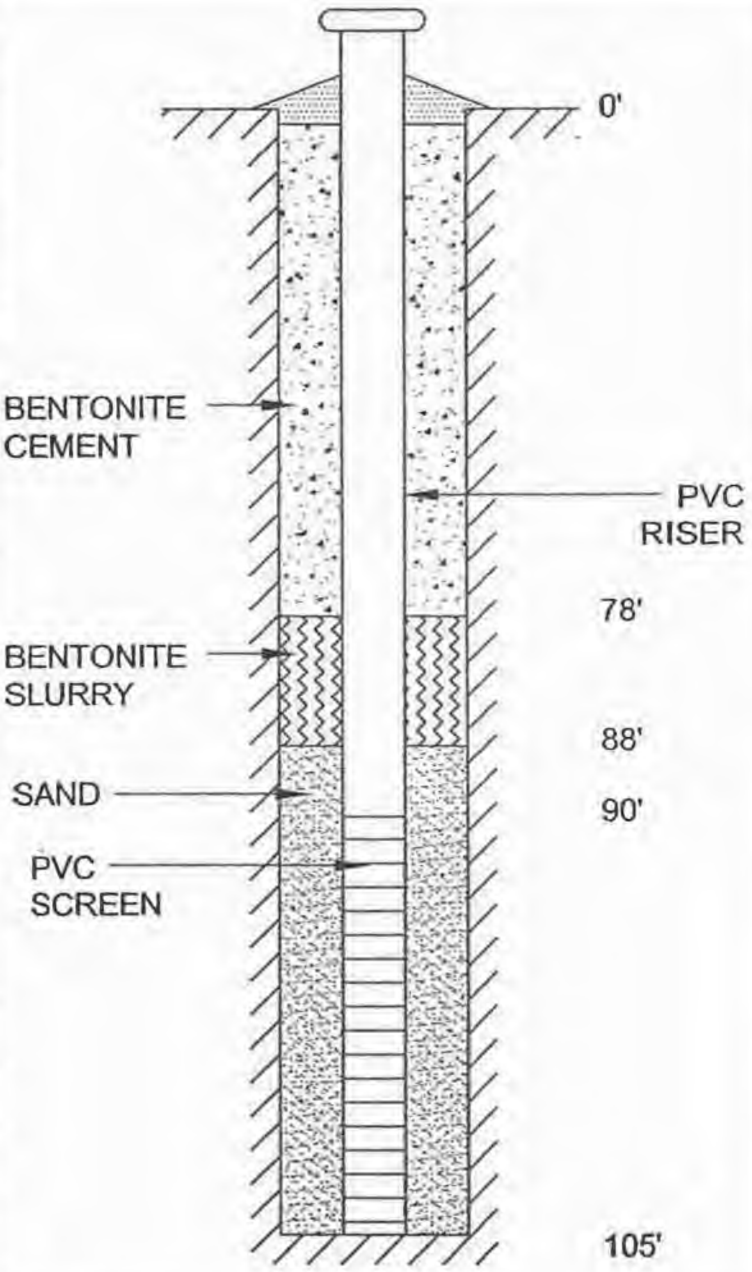
COMMENTS

DEPTH	SAMPLE NO.	SAMPLER TYPE RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft. 10 20 30 40 50 60 70 80 90	REMARKS
100.0							
101.0							
102.0							
103.0							
104.0							
105.0				Bottom of Boring at 105.0'			
106.0							
107.0							
108.0							
109.0							
110.0							
111.0							
112.0							
113.0							
114.0							
115.0							
116.0							
117.0							
118.0							
119.0							
120.0							
121.0							
122.0							
123.0							
124.0							
125.0							

LOG OF WELL NO. MW-1R

NORTON ENVIRONMENTAL
113494/hgw

6/4/99	Date Installed
1109.60'	Top of Casing (PVC)
1107.40'	Surface Elevation
PVC	Riser Pipe Material
PVC	Screen Material
2"	Screen Diameter
.010"	Screen Slot Size
105'	Bottom of Boring
105'	Bottom of Screen
90'	Top of Screen
88'	Top of Sand
78'	Top of Bentonite Slurry
-	Top of Bentonite Pellet
-	Top of Soil Backfill
-	Top of Well Riser Pipe
-	Initial Water Depth
-	Completion of Water Depth
49.7'	24 Hour Water Depth
-	48 Hour Water Depth
77.39'	12-7-99 Hour Water Depth



Remarks:

CLIENT
NORTON ENVIRONMENTAL

PROJECT
**ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION**

JOB NO. **113494**
BORING STARTED **12/17/96**
BORING COMPLETED **12/17/96**
DRILLER **AW**
METHOD **4 1/4" HSA**
TYPED BY **sjr**

MW-2R
Boring No.
Sheet 1 of 6

SURFACE ELEVATION **1170.5'**

PROJECT LOCATION
LAT. LONG.

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

DEPTH	SAMPLE NO.	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft.	REMARKS
0.0		Brown sandy SILT - moist			
4.0–5.5	1A		8 23 25	48	
5.0		Brown clayey TILL (some silt, trace pebbles) - damp			
9.0–10.5	2A		17 49 18	67	
9.5		Gray TILL			
14.0–15.5	3A		9 10 14	24	
19.0–20.5	4A		20 31 53	84	
20.1		Gray-brown TILL, clayey silt (trace gravel) - damp			

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH		DATE
INITIAL	110.0	∇	12/17/96
AT COMPLETION	NONE	▼	12/17/96
OTHER	59.9	▼	??hrs.

▨ A—SPLIT SPOON
◫ B—ROCK CORE
☒ C—SHELBY TUBE
░ D—SONIC
◧ E—AUGER CUTTINGS
▩ F—

BOWSER MORNER

113494.GPJ 8/17/99

CLIENT
NORTON ENVIRONMENTAL

PROJECT
**ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION**

JOB NO. 113494
BORING STARTED 12/17/96
BORING COMPLETED 12/17/96
DRILLER AW
METHOD 4 1/4" HSA
TYPED BY sjr

MW-2R
Boring No.
Sheet 2 of 6

SURFACE ELEVATION 1170.5'
PROJECT LOCATION
LAT. LONG.
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

DEPTH	SAMPLE NO.	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft.	REMARKS
		Gray-brown TILL, clayey silt (trace gravel) - damp			
22.0					
23.0					
24.0			10		
25.0	5A		18 22	40	
26.0					
27.0					
28.0					
29.0			10		
30.0	6A		22 25	47	
31.0					
32.0					
33.0					
34.0			12		
35.0	7A	Gray TILL, clayey silt (some fine gravel, trace sand) - damp	14 14	28	
36.0					
37.0					
38.0					
39.0			9		
40.0	8A		15 24	39	
41.0					
42.0					
43.0					
44.0		Gray-brown clayey SILT (some gravel trace sand) - moist	21		
45.0	9A		33		

Continued Next Page

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION

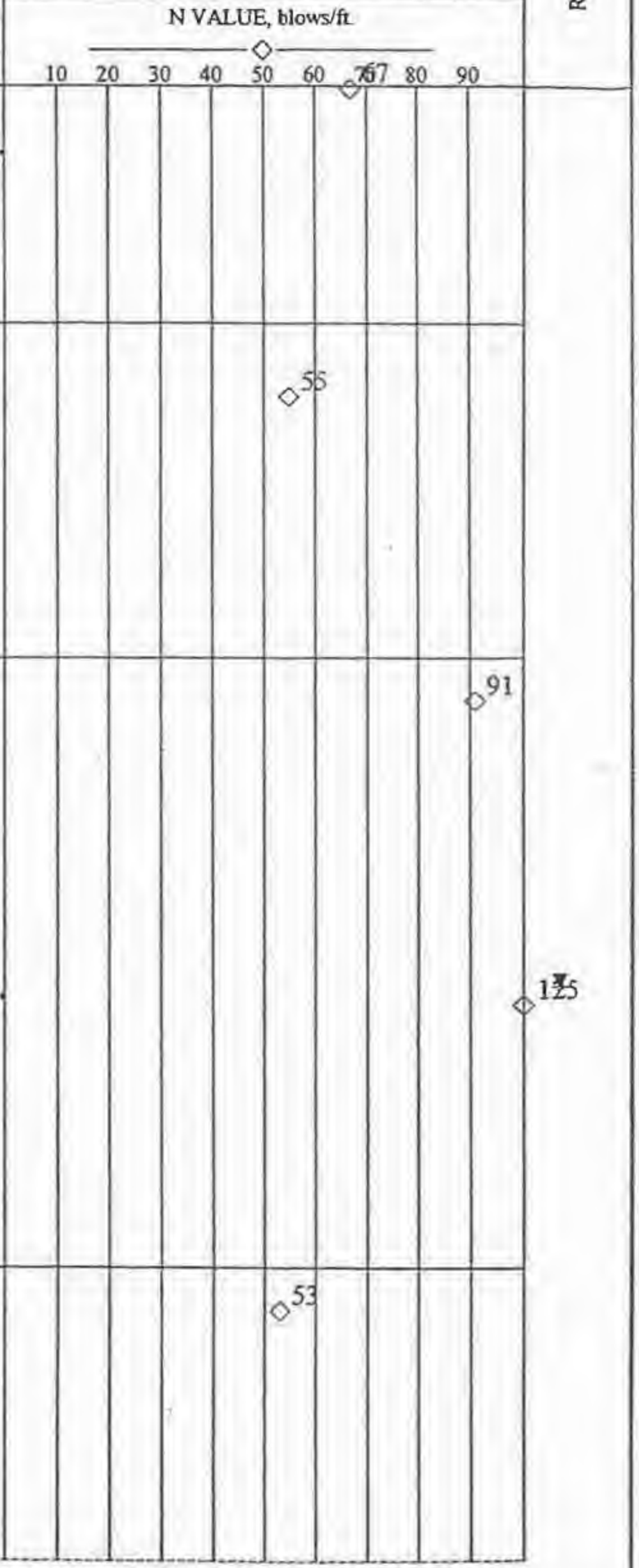
JOB NO. **113494**
BORING STARTED **12/17/96**
BORING COMPLETED **12/17/96**
DRILLER **AW**
METHOD **4 1/4" HSA**
TYPED BY **sjr**

MW-2R
Boring No.
Sheet 3 of 6

SURFACE ELEVATION **1170.5'**
PROJECT LOCATION
LAT. LONG.
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

DEPTH	SAMPLE NO.	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft	REMARKS
		(Silt and clay and gravel seam at 44.0--44.2')	34/3"	67	
49.0	10A	Gray sandy CLAY (some silt, trace gravel) - wet	17 21 34	55	
54.0	11A	Gray clayey SILT (some gravel, trace sand) - damp	31 39 52	91	
59.0	12A		75 78 50/3"	125	
64.0	13A	Brown clayey SILT (some fine gravel, trace sand) - damp	12 21 32	53	



DEPTH: 46.0, 47.0, 48.0, 49.0, 50.0, 51.0, 52.0, 53.0, 54.0, 55.0, 56.0, 57.0, 58.0, 59.0, 60.0, 61.0, 62.0, 63.0, 64.0, 65.0, 66.0, 67.0, 68.0, 69.0

Continued Next Page

CLIENT **NORTON ENVIRONMENTAL**	JOB NO. 113494		
PROJECT **ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION**	BORING STARTED 12/17/96	BORING COMPLETED 12/17/96	**MW-2R** Boring No.
	DRILLER AW	METHOD 4 1/4" HSA	
	TYPED BY sjr		**Sheet 4 of 6**

SURFACE ELEVATION 1170.5'

PROJECT LOCATION

LAT. LONG.

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

DEPTH	SAMPLE NO.	SAMPLER TYPE / RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft. ◇ (10 20 30 40 50 60 70 80 90)	REMARKS
70.0	14A	▨		Brown clayey SILT (some fine gravel, trace sand) - damp	21 31 42	◇73	
71.0							
72.0							
73.0							
74.0							
75.0							
76.0							
77.0							
78.0							
79.0							
80.0	15A	▨			31 28 50/4"		
81.0							
82.0							
83.0							
84.0							
85.0							
86.0							
87.0							
88.0							
89.0							
90.0	16A	▨			32 43 50/4"	◇93	
91.0							
92.0							
93.0							

Continued Next Page

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION

JOB NO. **113494**

BORING STARTED **12/17/96**

BORING COMPLETED **12/17/96**

DRILLER **AW**

METHOD **4 1/4" HSA**

TYPED BY **sjr**

MW-2R
Boring No.

Sheet 5 of 6

SURFACE ELEVATION **1170.5'**

PROJECT LOCATION
LAT. LONG.

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

N VALUE, blows/ft.
10 20 30 40 50 60 70 80 90

DEPTH	SAMPLE NO.	SAMPLER TYPE RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	REMARKS
94.0				Brown clayey SILT (some fine gravel, trace sand) - damp		
95.0						
96.0						
97.0						
98.0						
99.0						
100.0						
101.0						
102.0						
103.0						
104.0						
105.0				ROCK, gray shale		
106.0						
107.0						
108.0						
109.0						
110.0						
111.0						
112.0						
113.0						
114.0						
115.0						
116.0						
117.0						

Continued Next Page

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION

JOB NO. **113494**

BORING STARTED **12/17/96**

BORING COMPLETED **12/17/96**

DRILLER **AW**

METHOD **4 1/4" HSA**

TYPED BY **sjr**

MW-2R
Boring No.

Sheet 6 of 6

SURFACE ELEVATION **1170.5'**

PROJECT LOCATION
LAT. LONG.

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

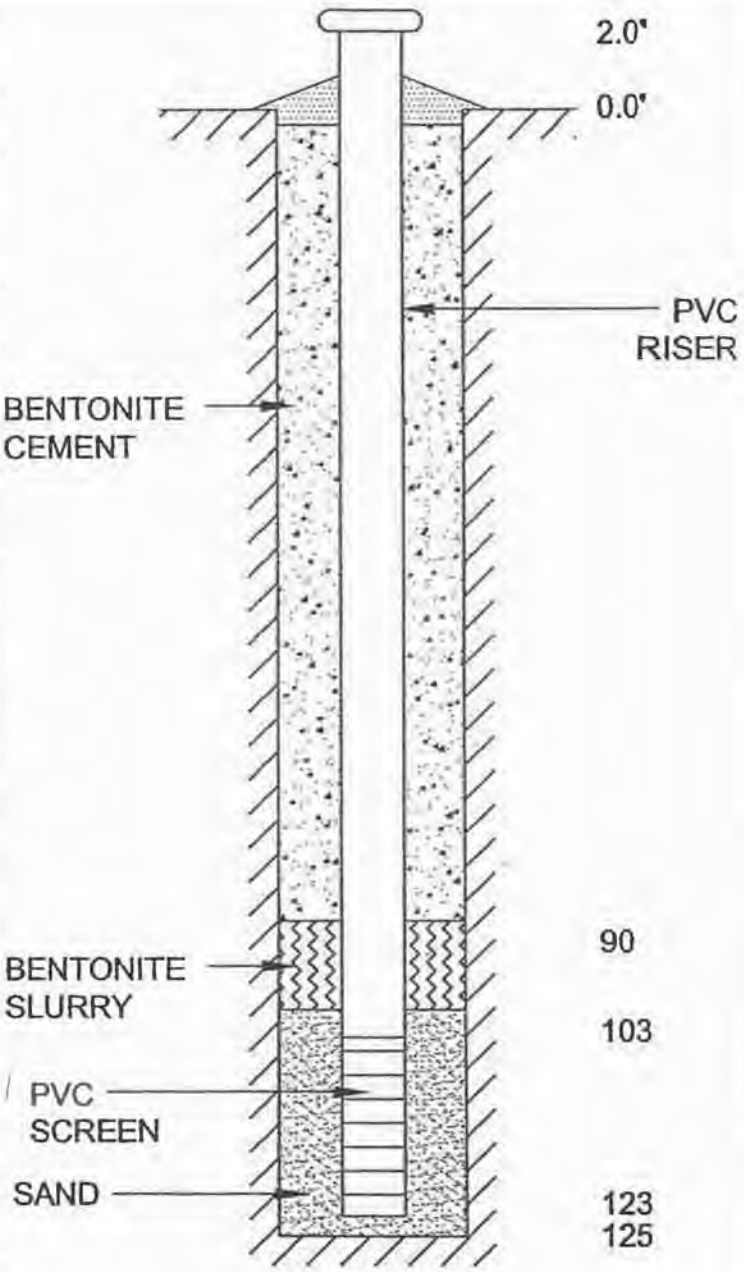
N VALUE, blows/ft. ◇ 10 20 30 40 50 60 70 80 90

DEPTH	SAMPLE NO.	SAMPLER TYPE	RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft.	REMARKS
118.0				▤	ROCK, gray shale			
119.0				▤				
120.0				▤				
121.0				▤				
122.0				▤				
123.0				▤				
124.0				▤				
125.0				▤				
126.0				▤				
127.0				▤				
128.0				▤				
129.0				▤				
130.0				▤				
131.0				▤				
132.0				▤				
133.0					Bottom of Boring at 133.0'			
134.0								
135.0								
136.0								
137.0								
138.0								
139.0								
140.0								
141.0								

LOG OF WELL NO. MW-2R

NORTON ENVIRONMENTAL
113494/sr

12/19/96	Date Installed
1173.04'	Top of Casing (PVC)
1170.5'	Surface Elevation
PVC	Riser Pipe Material
PVC	Screen Material
2"	Screen Diameter
0.010"	Screen Slot Size
125'	Bottom of Boring
123'	Bottom of Screen
103.0'	Top of Screen
101.0'	Top of Sand
90.0	Top of Bentonite Slurry
-	Top of Bentonite Pellet
-	Top of Soil Backfill
2'	Top of Well Riser Pipe
30.0	Initial Water Depth
62.0	Completion of Water Depth
-	16 Day Water Depth
-	48 Hour Water Depth
62.80'	12-7-99 Hour Water Depth



Remarks:

CLIENT **NORTON ENVIRONMENTAL**	JOB NO. **113494**	
PROJECT **ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION**	BORING STARTED **8/6/87** BORING COMPLETED **8/6/87** DRILLER **BK, JRF** METHOD **HSA** TYPED BY **sjr**	**WMW-2** Boring No. **Sheet 1 of 2**

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION **1072.7'**
BORING LOCATION
As shown on Boring Location Plan.
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

DEPTH	SAMPLE NO.	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft.	REMARKS
0.0		TOPSOIL			
1.0–6.0	1A	Stiff brown and gray CLAY, some silt, some sand, some gravel - moist	2 6 8	14	
	1C				
6.0–9.0	2A	Hard brown and gray SILT, some clay, some sand contains shale fragments - moist	10 21 19	40	
9.0–14.0	3A	Hard brown weathered SHALE	9 22 23	45	▼ (11.6)
14.0–	4A	Hard gray weathered SHALE	100/5"	100	▼ (14.1)
19.0–20.0	5A		60 40/1"	100	
21.0–22.0		Hard gray weathered SHALE			

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	NONE	▽ 08/06/1987
AT COMPLETION	14.1	▼ 08/06/1987
OTHER	11.6	▼ 13.5hrs.

- ▨ A—SPLIT SPOON
- ▮ B—ROCK CORE
- ☒ C—SHELBY TUBE
- ░ D—SONIC
- ▙ E—AUGER CUTTINGS
- ▒ F—

BOWSER MORNER®

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION

JOB NO. **113494**

BORING STARTED **8/6/87**

BORING COMPLETED **8/6/87**

DRILLER **BK, JRF**

METHOD **HSA**

TYPED BY **sjr**

WMW-2
Boring No.

Sheet 2 of 2

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION **1072.7'**
BORING LOCATION
As shown on Boring Location Plan.
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

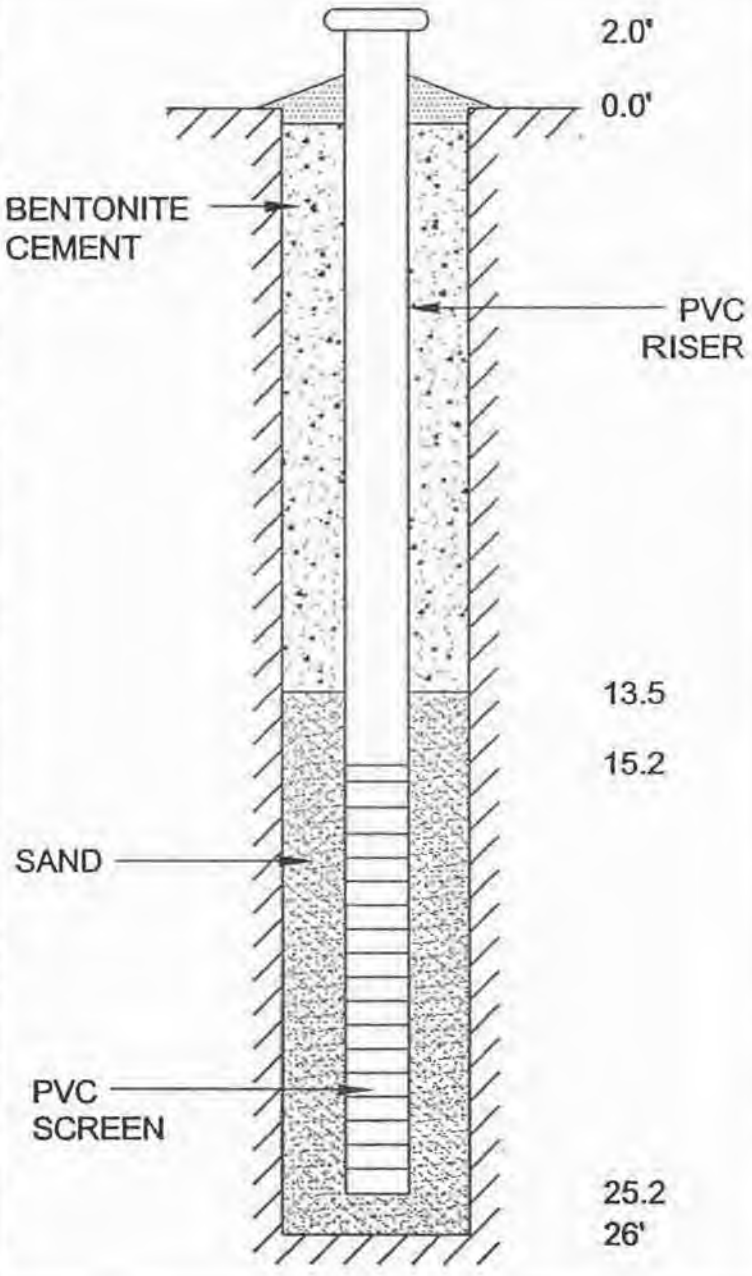
COMMENTS

DEPTH	SAMPLE NO.	SAMPLER TYPE	RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft. (10 20 30 40 50 60 70 80 90)	REMARKS
23.0				▤				
24.0	6A	▩		▤		100/5"	◇100	
25.0				▤				
26.0					(Auger refusal at 26.0') Bottom of Boring at 26.0'			
27.0								
28.0								
29.0								
30.0								
31.0								
32.0								
33.0								
34.0								
35.0								
36.0								
37.0								
38.0								
39.0								
40.0								
41.0								
42.0								
43.0								
44.0								
45.0								
46.0								
47.0								
48.0								

LOG OF WELL NO. WMW-2

NORTON ENVIRONMENTAL
113494/sr

8/5/87	Date Installed
1072.79'	Top of Casing (PVC)
1072.3'	Surface Elevation
PVC	Riser Pipe Material
PVC	Screen Material
2"	Screen Diameter
0.010"	Screen Slot Size
26'	Bottom of Boring
25.2'	Bottom of Screen
15.2'	Top of Screen
13.5'	Top of Sand
-	Top of Bentonite Slurry
-	Top of Bentonite Pellet
-	Top of Soil Backfill
2.7	Top of Well Riser Pipe
10.5/20.0	Initial Water Depth
14.1	Completion of Water Depth
-	16 Day Water Depth
17.5	24 Hour Water Depth
17.5	48 Hour Water Depth
13.58'	12-7-99 Hour Water Depth



Remarks:

CLIENT **NORTON ENVIRONMENTAL**	JOB NO. **113494**		
PROJECT **ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION**	BORING STARTED **5/22/85**	BORING COMPLETED **5/22/85**	**MW-3** Boring No.
	DRILLER **J. Tosatto**	METHOD	
	TYPED BY **sjr**		**Sheet 1 of 4**

SURFACE ELEVATION **1123.3'**

PROJECT LOCATION

LAT. LONG.

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

DEPTH	SAMPLE NO.	SAMPLER TYPE	RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft. ◇ 10 20 30 40 50 60 70 80 90	REMARKS
				▨	Stiff brown silty CLAY, trace sand - moist			
1.0				▨				
2.0				▨				
3.0				▨				
4.0				▨				
5.0				▨				
6.0				▨				
7.0				▨				
8.0				▨				
9.0				▨				
10.0				▨				
11.0				▨				
12.0				▨				
13.0				▨				
14.0				▤	Brown to gray weathered SHALE, inconsistent in hardness, soft seams - moist			
15.0				▤				
16.0				▤				
17.0				▤				
18.0				▤				
19.0				▤				
20.0				▤				
21.0								

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH		DATE
INITIAL	24.5	∇	5/22/85
AT COMPLETION	NONE	▼	5/22/85
OTHER	N/A	▼	N/A

▩	A—SPLIT SPOON
◧	B—ROCK CORE
☒	C—SHELBY TUBE
⬚	D—SONIC
◨	E—AUGER CUTTINGS
▒	F—

BOWSER MORNER®

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION

JOB NO. 113494

BORING STARTED 5/22/85

BORING COMPLETED 5/22/85

DRILLER J. Tosatto

METHOD

TYPED BY sjr

MW-3
Boring No.

Sheet 2 of 4

SURFACE ELEVATION 1123.3'

PROJECT LOCATION
LAT. LONG.

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

N VALUE, blows/ft.
10 20 30 40 50 60 70 80 90

DEPTH	SAMPLE NO.	SAMPLER TYPE RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	REMARKS
				Brown to gray weathered SHALE, inconsistent in hardness, soft seams - moist		
22.0						
23.0						
24.0						
25.0						∇
26.0						
27.0						
28.0						
29.0						
30.0						Start Roller Bitting at 30.0'
31.0						
32.0						
33.0						
34.0						
35.0						
36.0						
37.0						
38.0				Gray soft SHALE, inconsistent in hardness - moist		
39.0						
40.0						
41.0						
42.0						
43.0						
44.0						
45.0						

Continued Next Page

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION

JOB NO. **113494**

BORING STARTED **5/22/85**

BORING COMPLETED **5/22/85**

DRILLER **J. Tosatto**

METHOD

TYPED BY **sjr**

MW-3
Boring No.

Sheet 3 of 4

SURFACE ELEVATION **1123.3'**

PROJECT LOCATION
LAT. LONG.

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

N VALUE, blows/ft.
10 20 30 40 50 60 70 80 90

DEPTH	SAMPLE NO.	SAMPLER TYPE RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	REMARKS
				Gray soft SHALE, inconsistent in hardness - moist		
46.0						
47.0						
48.0						
49.0						
50.0						
51.0						
52.0						
53.0						
54.0						
55.0						
56.0						
57.0						
58.0						
59.0						
60.0						
61.0						
62.0						
63.0						
64.0						
65.0						
66.0						
67.0						
68.0						
69.0						

Continued Next Page

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION

JOB NO. **113494**

BORING STARTED **5/22/85**

BORING COMPLETED **5/22/85**

DRILLER **J. Tosatto**

METHOD

TYPED BY **sjr**

MW-3
Boring No.

Sheet 4 of 4

SURFACE ELEVATION **1123.3'**

PROJECT LOCATION

LAT. LONG.

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

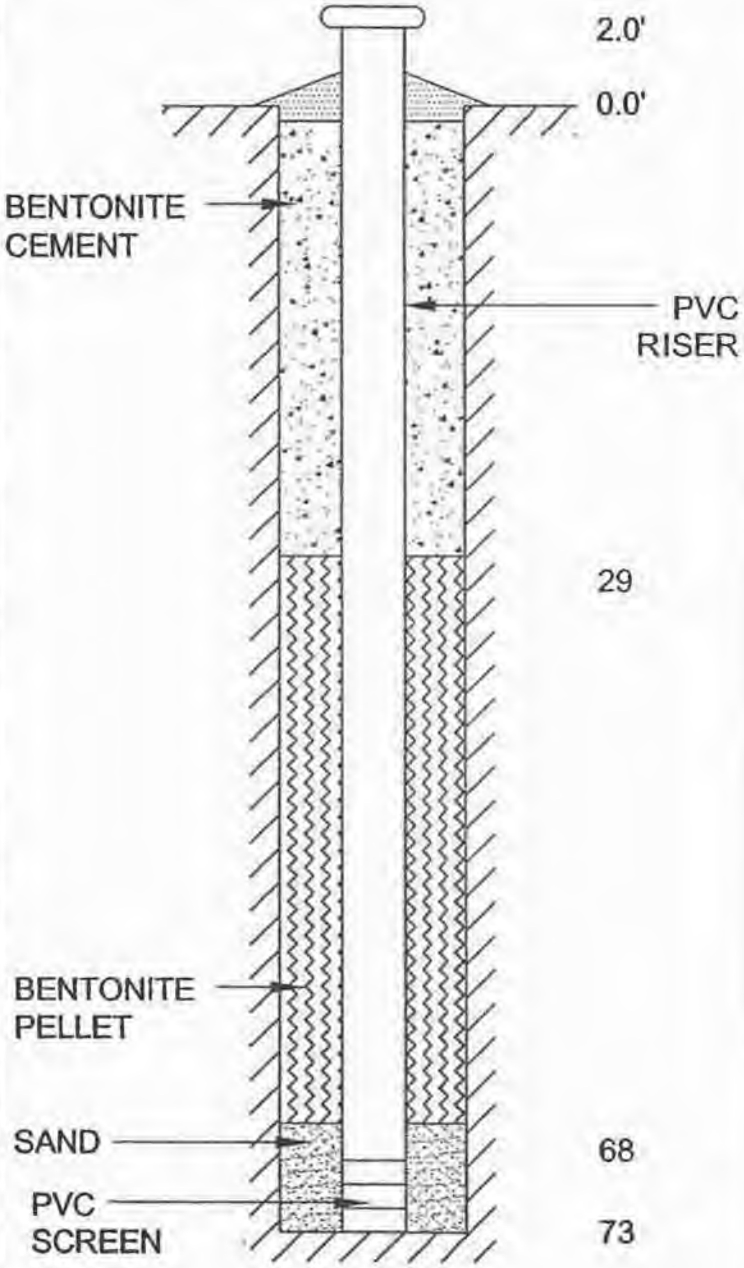
N VALUE, blows/ft.

DEPTH	SAMPLE NO.	SAMPLER TYPE	RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	10	20	30	40	50	60	70	80	90	REMARKS
70.0				▤	Gray soft SHALE, inconsistent in hardness - moist											
71.0				▤												
72.0				▤												
73.0				▤	(Monitoring well set to 73.0' 5'-2" screen 70'-2" riser pipe 3 bags silica sand 1-5 gallon bucket bentonite pellets Sand and pellets to 29.0' Backfilled with dirt to top of hole) Bottom of Boring at 73.0'											
74.0																
75.0																
76.0																
77.0																
78.0																
79.0																
80.0																
81.0																
82.0																
83.0																
84.0																
85.0																
86.0																
87.0																
88.0																
89.0																
90.0																
91.0																
92.0																
93.0																

LOG OF WELL NO. MW-3

NORTON ENVIRONMENTAL
113494/sr

5/22/85	Date Installed
1124.30'	Top of Casing (PVC)
1123.5'	Surface Elevation
PVC	Riser Pipe Material
PVC	Screen Material
2"	Screen Diameter
0.010"	Screen Slot Size
73	Bottom of Boring
73	Bottom of Screen
68	Top of Screen
66	Top of Sand
-	Top of Bentonite Slurry
29	Top of Bentonite Pellet
-	Top of Soil Backfill
2	Top of Well Riser Pipe
-	Initial Water Depth
-	Completion of Water Depth
-	16 Day Water Depth
-	24 Hour Water Depth
-	48 Hour Water Depth
37.26'	12-7-99 Hour Water Depth



Remarks:

NORTON ENVIRONMENTAL

JOB NO.	113494
BORING STARTED	8/5/87
BORING COMPLETED	8/5/87
DRILLER	BK, JRF
METHOD	HSA
TYPED BY	sjr

PROJECT
ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION

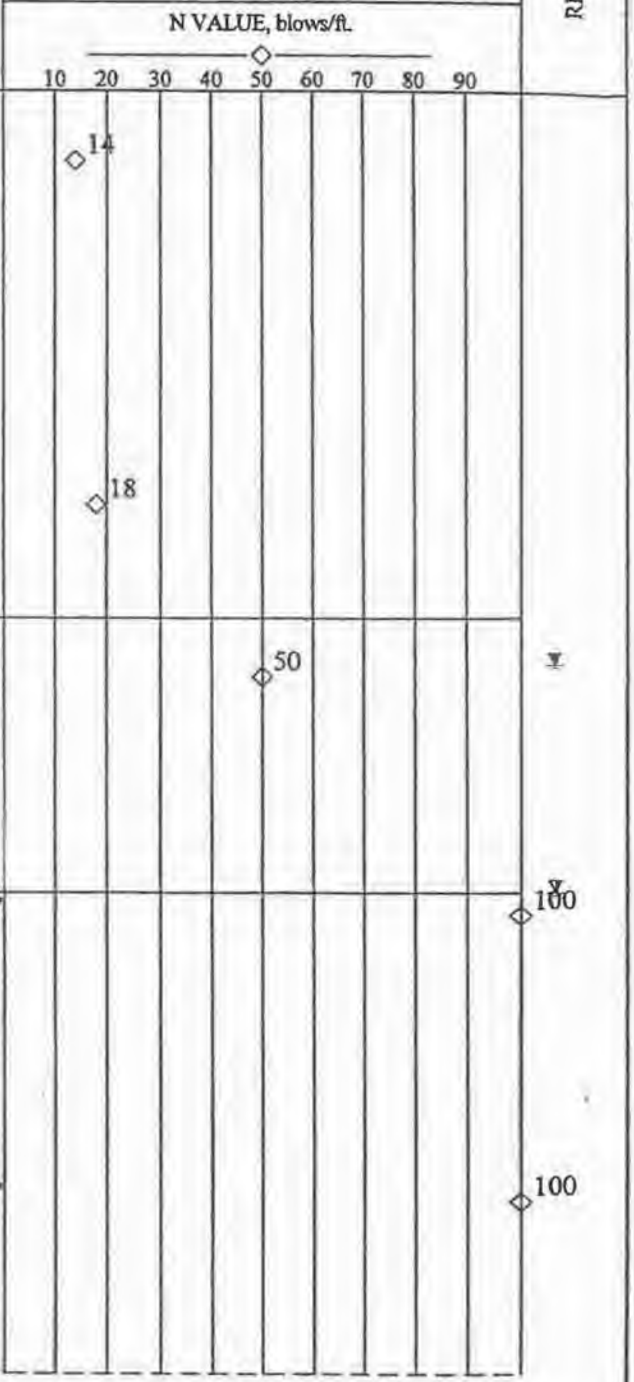
WMW-3
Boring No.
Sheet 1 of 2

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION 1057.1'*

BORING LOCATION
As shown on Boring Location Plan.
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS
***Approximately 6" of topsoil was stripped off by dozer making a clearing for drill rig.**

DEPTH	SAMPLE NO.	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft.	REMARKS
0.0–1.5	1A	Stiff brown and gray SILT, some clay, some sand, some gravel - moist	2 6 8	14	
4.0–5.6	1C				
6.0–7.5	2A	(Contains shale fragments beginning at 6.0')	8 10 8	18	
9.0–10.5	3A	Hard brown and gray SHALE	6 18 32	50	▼
14.0–14.5	4A	Hard gray weathered SHALE	100/5"	100	▼
19.0–19.5	5A		100/5"	100	
21.5		Hard gray weathered SHALE			



Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	14.0	▽ 08/05/1987
AT COMPLETION	14.0	▼ 08/05/1987
OTHER	10.0	▼ 13.25hrs.

- ▨ A—SPLIT SPOON
- ◧ B—ROCK CORE
- ☒ C—SHELBY TUBE
- ░ D—SONIC
- ◧ E—AUGER CUTTINGS
- ▨ F—

BOWSER MORNER

NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION

JOB NO. 113494
BORING STARTED 8/5/87
BORING COMPLETED 8/5/87
DRILLER BK, JRF
METHOD HSA
TYPED BY sjr

WMW-3
Boring No.
Sheet 2 of 2

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION 1057.1'*
BORING LOCATION
As shown on Boring Location Plan.
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS
***Approximately 6" of topsoil was stripped off by dozer making a clearing for drill rig.**

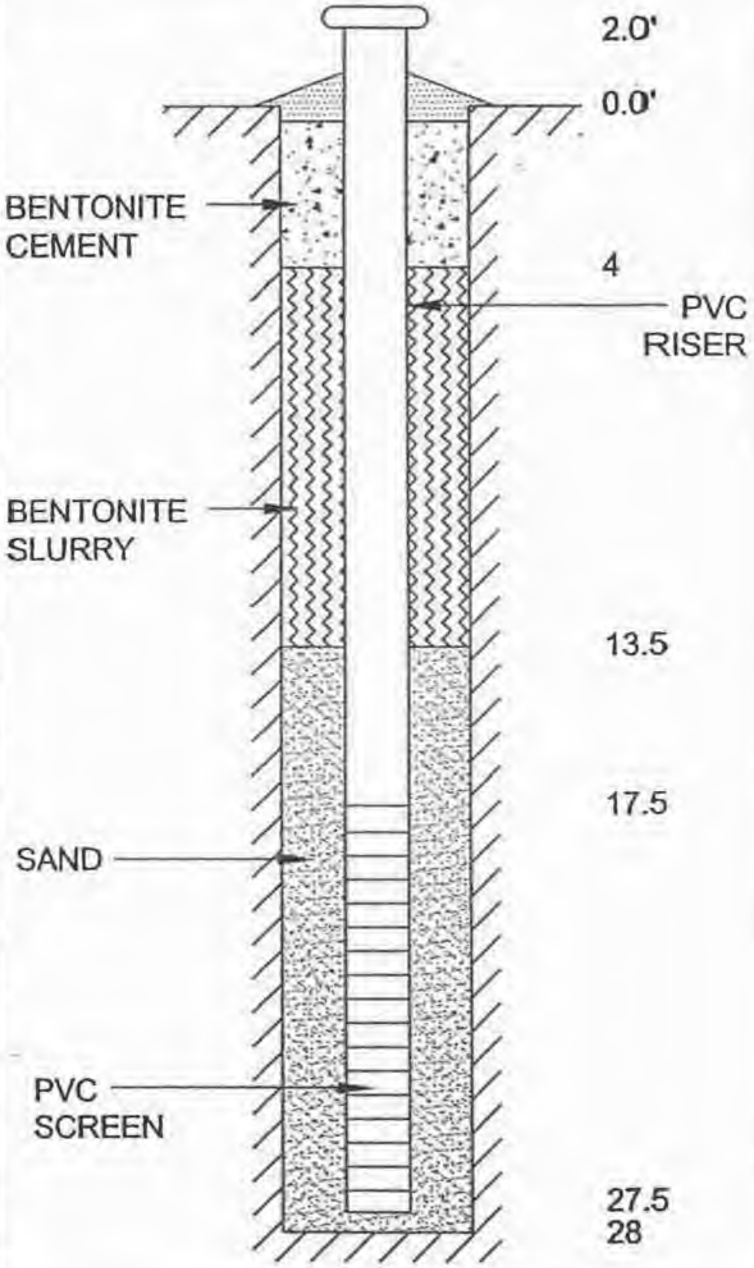
N VALUE, blows/ft. ◇ (10 20 30 40 50 60 70 80 90)

DEPTH	SAMPLE NO.	SAMPLER TYPE RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft.	REMARKS
23.0			▤				
24.0	6A	▨	▤		100/5"	◇ 100	
25.0			▤				
26.0			▤				
27.0			▤				
28.0				(Auger refusal at 28.0' Bottom of Boring at 28.0'			
29.0							
30.0							
31.0							
32.0							
33.0							
34.0							
35.0							
36.0							
37.0							
38.0							
39.0							
40.0							
41.0							
42.0							
43.0							
44.0							
45.0							
46.0							
47.0							
48.0							

LOG OF WELL NO. WMW-3

NORTON ENVIRONMENTAL
113494/sr

8/5/87	Date Installed
1057.52	Top of Casing (PVC)
1057.07	Surface Elevation
PVC	Riser Pipe Material
PVC	Screen Material
2"	Screen Diameter
0.010"	Screen Slot Size
28'	Bottom of Boring
27.5	Bottom of Screen
17.5	Top of Screen
13.5	Top of Sand
4.0	Top of Bentonite Slurry
-	Top of Bentonite Pellet
-	Top of Soil Backfill
2.6	Top of Well Riser Pipe
14.0	Initial Water Depth
14.0	Completion of Water Depth
-	16 Day Water Depth
10.6	24 Hour Water Depth
14.65	48 Hour Water Depth
10.0	13.25 Hour Water Depth
14.6	72 Hour Water Depth



Remarks:

NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION

JOB NO.	113494
BORING STARTED	1/2/97
BORING COMPLETED	1/2/97
DRILLER	AW
METHOD	4 1/4" HSA
TYPED BY	sjr

MW4-97
Boring No.
Sheet 1 of 2

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION **1054.9'**
BORING LOCATION
South/Down Gradient

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

N VALUE, blows/ft.

DEPTH	SAMPLE NO.	SAMPLER TYPE RECOVERY	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft.	REMARKS
0.0			(ORIGINAL) Brown clayey SILT (trace sand, trace gravel fragments)			
4.0–5.5	1a	A		6 8 11	19	
5.5			Brown-gray clay SILT - damp			
9.5			Brown-gray weatherd SHALE			
12.0			Gray weathered SHALE			
15.0						▽
20.0						▼
21.5			Gray weathered SHALE			

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	15.0	▽ 01/02/1997
AT COMPLETION	NONE	▼ 01/02/1997
OTHER	20.0	▼ ??hrs.

- ▦ A—SPLIT SPOON
- ▮ B—ROCK CORE
- ☒ C—SHELBY TUBE
- ▒ D—SONIC
- ▙ E—AUGER CUTTINGS
- ▩ F—

BOWSER MORNER

NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION

JOB NO. 113494
BORING STARTED 1/2/97
BORING COMPLETED 1/2/97
DRILLER AW
METHOD 4 1/4" HSA
TYPED BY sjr

MW4-97
Boring No.
Sheet 2 of

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION **1054.9'**
BORING LOCATION
South/Down Gradient

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

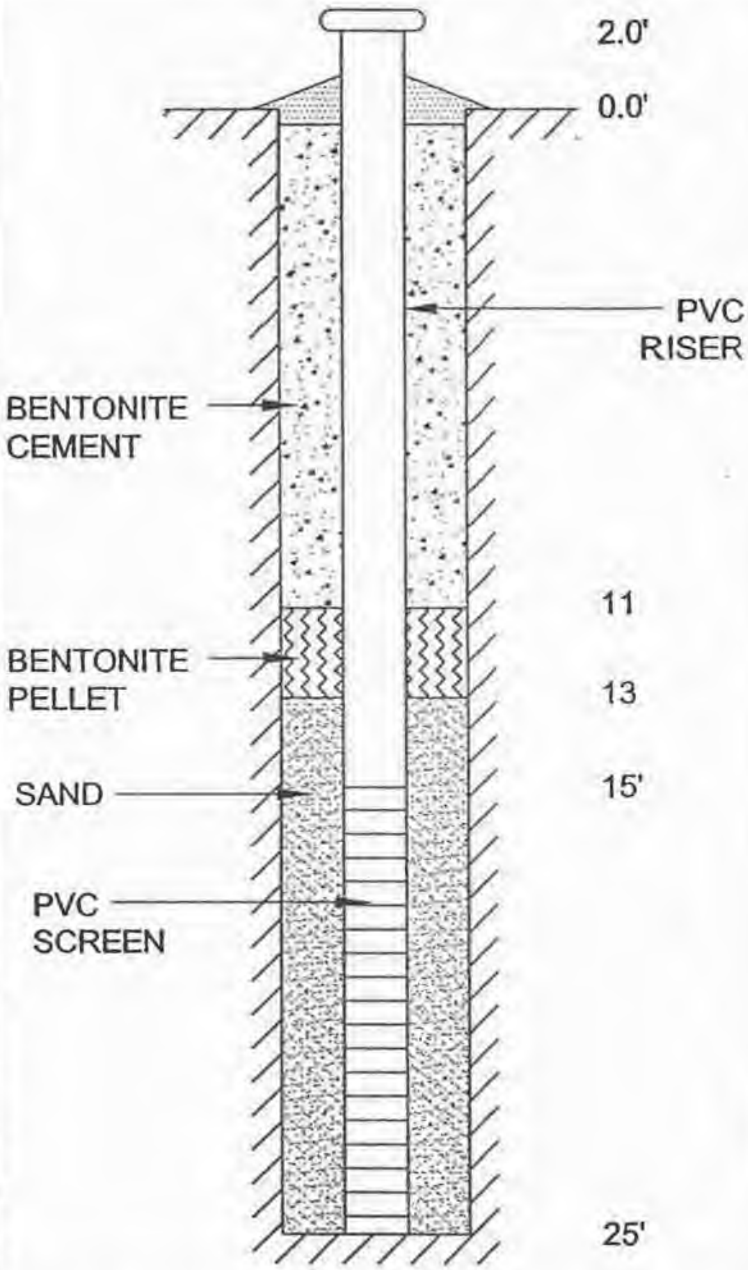
N VALUE, blows/ft.

DEPTH	SAMPLE NO.	SAMPLER TYPE	RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft. 10 20 30 40 50 60 70 80 90	REMARKS
				▤	(Cored to 22.0')			
23.0				▤				
24.0				▤				
25.0				▤				
26.0				▤				
27.0					Bottom of Boring at 27.0'			
28.0								
29.0								
30.0								
31.0								
32.0								
33.0								
34.0								
35.0								
36.0								
37.0								
38.0								
39.0								
40.0								
41.0								
42.0								
43.0								
44.0								
45.0								
46.0								
47.0								
48.0								

LOG OF WELL NO. MW4-97

NORTON ENVIRONMENTAL
113494/sr

1/2/97	Date Installed
1056.97'	Top of Casing (PVC)
1054.4'	Surface Elevation
PVC	Riser Pipe Material
PVC	Screen Material
2"	Screen Diameter
0.010"	Screen Slot Size
25'	Bottom of Boring
25'	Bottom of Screen
15.0'	Top of Screen
13.0'	Top of Sand
-	Top of Bentonite Slurry
11.0	Top of Bentonite Pellet
-	Top of Soil Backfill
2'	Top of Well Riser Pipe
15.0	Initial Water Depth
19.0	Completion of Water Depth
-	16 Day Water Depth
-	48 Hour Water Depth
27.64'	12-7-99 Hour Water Depth



Remarks:

NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL, HYDROGEOLOGICAL INVESTIGATION

113494

BORING STARTED 6/1/99	BORING COMPLETED 6/1/99
DRILLER AW, MT	METHOD 5 5/8" Roller Bit
TYPED BY hgw	

BH-3
Boring No.
Sheet 1 of 5

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION 1054.8'
BORING LOCATION
East of MW4-97

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH | SAMPLE NO. | SAMPLER TYPE | RECOVERY | GRAPHIC LOG | VISUAL CLASSIFICATION OF THE MATERIAL | BLOW COUNTS | COMMENTS | N VALUE, blows/ft. | REMARKS

N VALUE scale: 10 20 30 40 50 60 70 80 90

DEPTH	VISUAL CLASSIFICATION OF THE MATERIAL
	AUGER to 11.0'
1.0	(Brown sandy silt)
2.0	
3.0	
4.0	
5.0	
6.0	
7.0	
8.0	
9.0	
10.0	
11.0	Gray SHALE
12.0	
13.0	
14.0	
15.0	
16.0	
17.0	
18.0	
19.0	
20.0	
21.0	Gray SHALE
22.0	

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH		DATE
INITIAL	50.0	∇	6/1/99
AT COMPLETION	NONE	▼	6/1/99
OTHER	57.1	▼	13hrs.

■ A—SPLIT SPOON
◨ B—ROCK CORE
☒ C—SHELBY TUBE
▨ D—SONIC
◧ E—AUGER CUTTINGS
▩ F—

BOWSER MORNER.

NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION

113494

BORING STARTED 6/1/99	BORING COMPLETED 6/1/99	**BH-3** Boring No.	
DRILLER AW, MT	METHOD 5 5/8" Roller Bit		
TYPED BY hgw		Sheet 2 of 5	

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION 1054.8'
BORING LOCATION
East of MW4-97

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

N VALUE, blows/ft.
10 20 30 40 50 60 70 80 90

DEPTH	SAMPLE NO.	SAMPLER TYPE RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	REMARKS
23.0						
24.0						
25.0						
26.0						
27.0						
28.0						
29.0						
30.0				(Set 6" casing to 30.0') Blue-gray SHALE, fissile and crumbly - dry		
31.0						
32.0						
33.0						
34.0	1F					
35.0						
36.0						
37.0						
38.0						
39.0						
40.0						
41.0						
42.0						
43.0	2F					
44.0						
45.0				(Vertical fracture from 45'-46')		
46.0						
47.0						
48.0						

Continued Next Page

PROJECT
ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION

113494

BORING STARTED 6/1/99	BORING COMPLETED 6/1/99	**BH-3** Boring No.	
DRILLER AW, MT	METHOD 5 5/8" Roller Bit		
TYPED BY hgw		**Sheet 3 of 5**	

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION 1054.8'
BORING LOCATION
East of MW4-97
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

DEPTH	SAMPLE NO.	SAMPLER TYPE	RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft. 10 20 30 40 50 60 70 80 90	REMARKS
49.0								
50.0								▽
51.0								
52.0								
53.0	3F							
54.0								
55.0								
56.0								
57.0								▼
58.0					Blue-gray SANDSTONE - dry in core but probable water-bearing zone			
59.0					Blue-gray SHALE - dry			
60.0								
61.0								
62.0								
63.0	4F							
64.0								
65.0					Sandy SHALE - dry			
66.0								
67.0								
68.0								
69.0								
70.0								
71.0								
72.0					Gray sandy SHALE - dry			
73.0	5F							

Continued Next Page

NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION

113494

BORING STARTED 6/1/99	BORING COMPLETED 6/1/99	**BH-3** Boring No.
DRILLER AW, MT	METHOD 5 5/8" Roller Bit	
TYPED BY hgw		Sheet 4 of 5

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION 1054.8'
BORING LOCATION
East of MW4-97
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

N VALUE, blows/ft.
10 20 30 40 50 60 70 80 90

DEPTH	SAMPLE NO.	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	REMARKS
75.0				
76.0				
77.0				
78.0				
79.0		Gray SHALE - dry, fissile and crumbly (Fossils at 78.5') (Moist from 79.1' - 79.2')		
80.0				
81.0				
82.0				
83.0	6F			
84.0		Gray SANDSTONE - dry		
85.0				
86.0		(Shale parting at 85', 86.2', 86.3', 87.8')		
87.0				
88.0		(Vertical fracture at 88'-88.5') (Pyrite crystals at 88.5')		
89.0		Gray SHALE - fissile - crumbly (Possibly moist at 89.5') (Sandy shale at 89.7' - 90.4')		
90.0				
91.0				
92.0				
93.0	7F			
94.0		Gray SHALE - fissile - crumbly		
95.0				
96.0				
97.0				
98.0		Gray SHALE weathered-fissile - dry		
99.0		Gray sandy SHALE - dry		

Continued Next Page

CLIENT
NORTON ENVIRONMENTAL

PROJECT
**ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION**

113494

BORING STARTED 6/1/99
BORING COMPLETED 6/1/99
DRILLER AW, MT
METHOD 5 5/8" Roller Bit
TYPED BY hgw

BH-3
Boring No.
Sheet 5 of 5

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION 1054.8'
BORING LOCATION
East of MW4-97

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

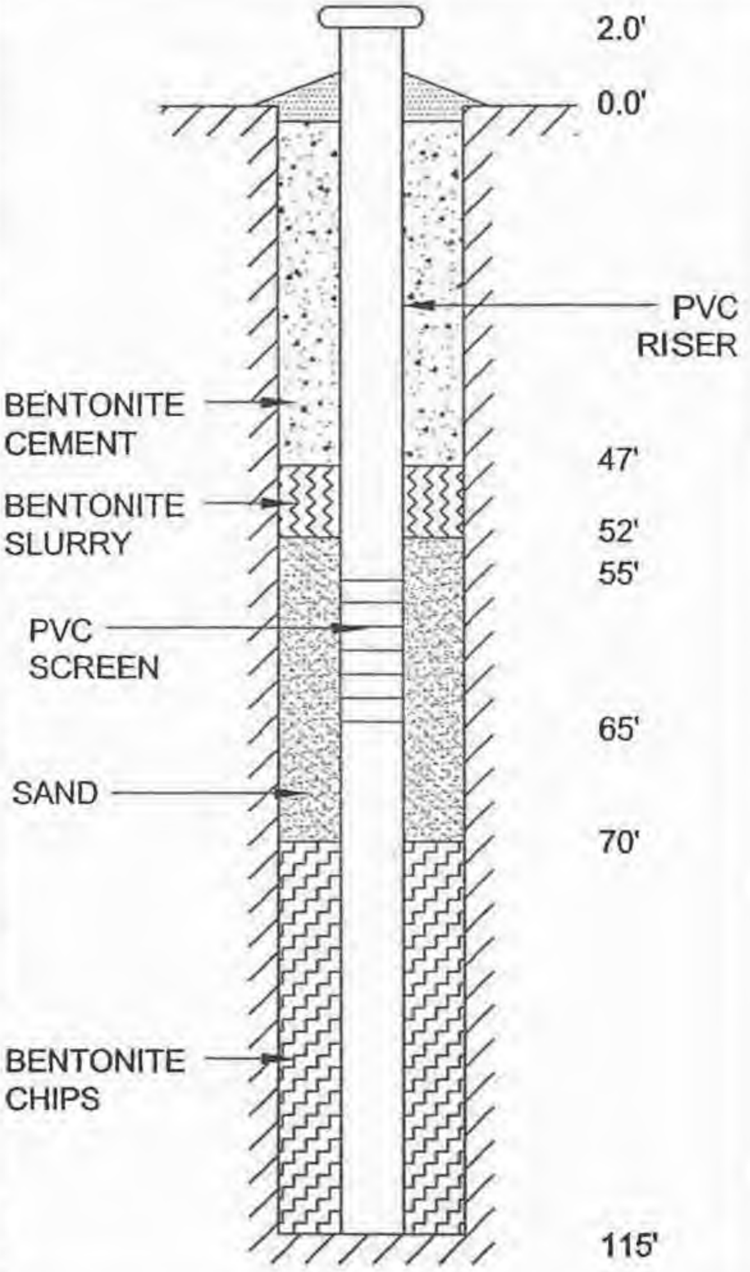
N VALUE, blows/ft.: 10 20 30 40 50 60 70 80 90

DEPTH	SAMPLE NO.	SAMPLER TYPE RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft.	REMARKS
100.0				Gray SHALE - dry - fissile, fractured throughout			
101.0				(Possible water zone at 101.0')			
102.0							
103.0							
104.0							
105.0							
106.0							
107.0							
108.0				Gray sandy SHALE (Possible water at 108.5')			
109.0				Gray weathered SHALE			
110.0							
111.0							
112.0				(Possible water zone at 112.0')			
113.0							
114.0							
115.0				Bottom of Boring at 115.0'			
116.0							
117.0							
118.0							
119.0							
120.0							
121.0							
122.0							
123.0							
124.0							
125.0							

LOG OF WELL NO. MW-6

NORTON ENVIRONMENTAL
113494/hgw

6/11/99	Date Installed
1056.33'	Top of Casing (PVC)
1054.40'	Surface Elevation
PVC	Riser Pipe Material
PVC	Screen Material
2"	Screen Diameter
0.010"	Screen Slot Size
115'	Bottom of Boring
65'	Bottom of Screen
55'	Top of Screen
52'	Top of Sand
-	Top of Bentonite Slurry
47'	Top of Bentonite Pellet
-	Top of Soil Backfill
2'	Top of Well Riser Pipe
-	Initial Water Depth
-	Completion of Water Depth
56.5'	10 Day Water Depth
-	48 Hour Water Depth
59.26'	12-7-99 Hour Water Depth



Remarks:

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION

JOB NO. **113494**

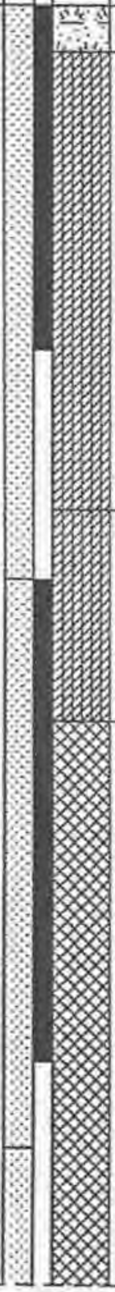
BORING STARTED **10/6/99**
BORING COMPLETED **10/7/99**
DRILLER **JF, JK, DN**
METHOD **SONIC**
TYPED BY **hgw**

BH-6A
Boring No.
Sheet 1 of 3

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION **988.2'**
BORING LOCATION
As shown on Boring Location Plan.
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS
Completed as MW-8

N VALUE, blows/ft.
10 20 30 40 50 60 70 80 90



DEPTH	SAMPLE NO.	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	REMARKS
		TOPSOIL		
1.0		Brown silty CLAY (trace sand, trace gravel) - damp		
2.0				
3.0				
4.0				
5.0	1D			
6.0				
7.0				
8.0				
9.0		Blue-gray clayey SILT (trace gravel) - damp		
10.0				
11.0				
12.0				
13.0		LANDFILL material - wood, glass, metal		
14.0				
15.0				
16.0				
17.0		(Becomes moist at 17.0')		
18.0				
19.0				
20.0	2D			
21.0				
22.0				▼

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH		DATE
INITIAL	53.0	▽	10/6/99
AT COMPLETION	21.8	▼	10/7/99
OTHER	24.3	▼	24hrs.

- ▨ A—SPLIT SPOON
- ■ B—ROCK CORE
- ☒ C—SHELBY TUBE
- ░ D—SONIC
- ■ E—AUGER CUTTINGS
- ▨ F.—

BOWSER MORNER

CLIENT **NORTON ENVIRONMENTAL**	JOB NO. **113494**		**BH-6A** Boring No.
PROJECT **ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION**	BORING STARTED **10/6/99**	BORING COMPLETED **10/7/99**	
	DRILLER **JF, JK, DN**	METHOD **SONIC**	
	TYPED BY **hgw**		**Sheet 2 of 3**

PROJECT LOCATION

LAT. LONG.

SURFACE ELEVATION **988.2'**

BORING LOCATION

As shown on Boring Location Plan.

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

Completed as MW-8

N VALUE, blows/ft. ◇ 10 20 30 40 50 60 70 80 90

DEPTH	SAMPLE NO.	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	REMARKS
		(Becomes wet at 22.0')		
23.0				
24.0	3D			▼
25.0		Brown silty CLAY (trace sand, trace gravel) - damp (Set 6" steel to 25.0')		
26.0				
27.0		Gray sandy SHALE, weathered		
28.0				
29.0				
30.0		(Pulled back to 30.0')		
31.0				
32.0				
33.0				
34.0				
35.0		Gray black SHALE - poorly fissile - dry (5' of bentonite, reset and sealed casing to 35.0')		
36.0				
37.0	4D			
38.0				
39.0				
40.0				
41.0				
42.0				
43.0		(Fractures at 42.4', 43.5', 47.0', 48.0',49.5')		
44.0				
45.0	5D			
46.0				
47.0				
48.0				

Continued Next Page

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION

JOB NO. **113494**

BORING STARTED **10/6/99**
BORING COMPLETED **10/7/99**
DRILLER **JF, JK, DN**
METHOD **SONIC**
TYPED BY **hgw**

BH-6A
Boring No.
Sheet 3 of 3

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION **988.2'**
BORING LOCATION
As shown on Boring Location Plan.
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

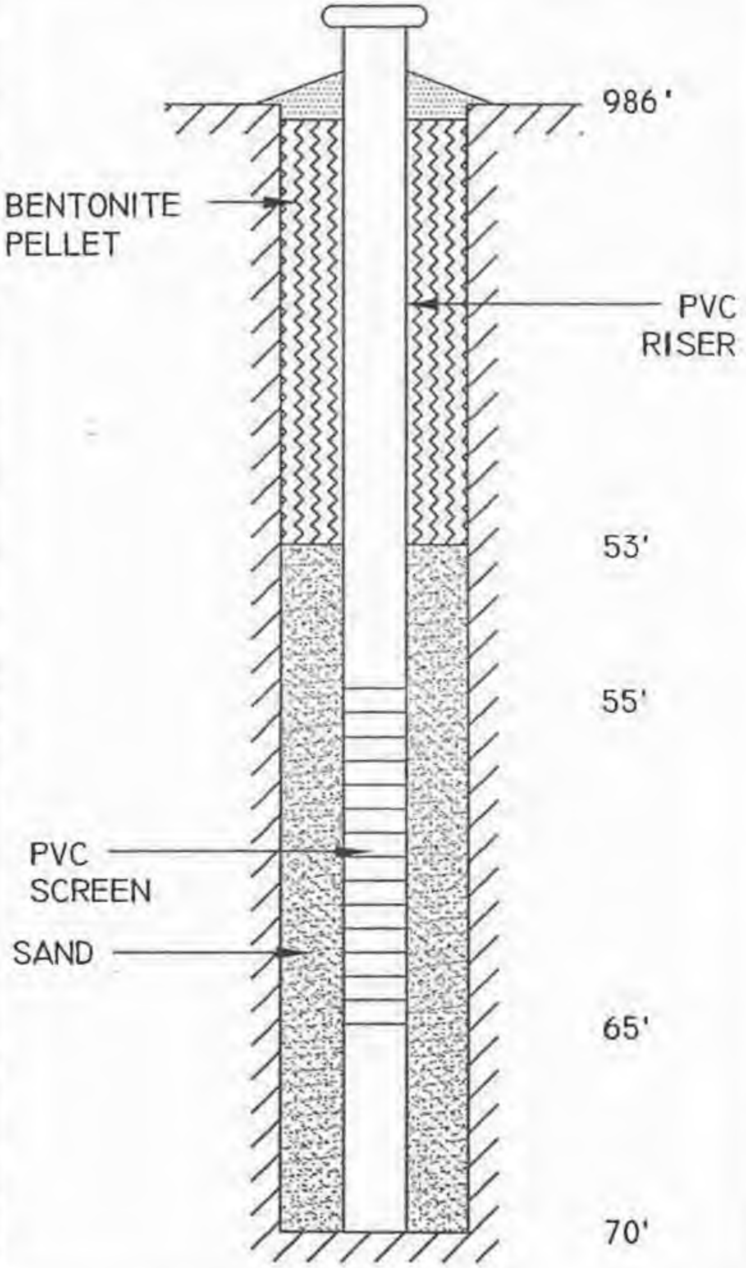
COMMENTS
Completed as MW-8

DEPTH	SAMPLE NO.	SAMPLER TYPE	RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft. 10 20 30 40 50 60 70 80 90	REMARKS
49.0								
50.0					(Weathered at 50.0' to 55.0')			
51.0								
52.0								
53.0					(Fractures at 53.0', 53.5', 53.7', 54.0', 54.2', 55.2', 55.8', 56.5', 57.0', 57.2')			∇
54.0								
55.0	6D							
56.0								
57.0								
58.0								
59.0								
60.0					(Damp to moist at 60.0'-65.0')			
61.0					(Fractures at 61.0', 62.0', 65.2', 65.3', 66.0', 67.0', 67.5', 68.0')			
62.0								
63.0								
64.0								
65.0	7D				(Dry at 65.0'-70.0')			
66.0								
67.0								
68.0								
69.0								
70.0					Bottom of Boring at 70.0'			
71.0								
72.0								
73.0								

LOG OF WELL NO. MW-8 (BH-6A)

NORTON ENVIRONMENTAL
113494/HGW

10/6/99	DATE INSTALLED
990.29'	TOP OF CASING (PVC)
988.20'	SURFACE ELEVATION
PVC	RISER PIPE MATERIAL
PVC	SCREEN MATERIAL
2"	SCREEN DIAMETER
0.010"	SCREEN SLOT SIZE
70'	BOTTOM OF BORING
65'	BOTTOM OF SCREEN
55'	TOP OF SCREEN
53'	TOP OF SAND
-	TOP OF BENTONITE SLURRY
0	TOP OF BENTONITE PELLET
-	TOP OF SOIL BACKFILL
-	TOP OF WELL RISER PIPE
56'	INITIAL WATER DEPTH
-	COMPLETION OF WATER DEPTH
-	16 DAY WATER DEPTH
-	24 HOUR WATER DEPTH
-	48 HOUR WATER DEPTH
29.34'	12-7-99 HOUR WATER DEPTH



REMARKS:

UPPER WATER AT 22' IN WASTE MATERIAL

CLIENT **NORTON ENVIRONMENTAL**	JOB NO. **113494**	
PROJECT **ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION**	BORING STARTED **10/3/99** DRILLER **JF, JK, DN** TYPED BY **hgw**	BORING COMPLETED **10/3/99** METHOD **SONIC**
		BH-1S Boring No. **Sheet 1 of 4**

PROJECT LOCATION

LAT. LONG.

SURFACE ELEVATION **982.5'**

BORING LOCATION

As shown on Boring Location Plan.

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

Completed as MW-9S

DEPTH	SAMPLE NO.	SAMPLER TYPE	RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft. 10 20 30 40 50 60 70 80 90	REMARKS
0.0					TOPSOIL, brown clayey silt (trace gravel) - damp			
5.0					Gray CLAY, - damp			
8.0					Blue-gray sandy SHALE			
11.0								▼
15.0					Gray SHALE - dry (6" casing set to 15.0') (With bentonite seal) (Fractures at 16'-22' poor fissility)			
22.0								

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH		DATE
INITIAL	35.0	∇	10/3/99
AT COMPLETION	10.8	▼	10/3/99
OTHER	10.7	▼	24hrs.

- ▨ A — SPLIT SPOON
- ■ B — ROCK CORE
- ☒ C — SHELBY TUBE
- ▨ D — SONIC
- ■ E — AUGER CUTTINGS
- ▨ F —

BOWSER MORNER

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION

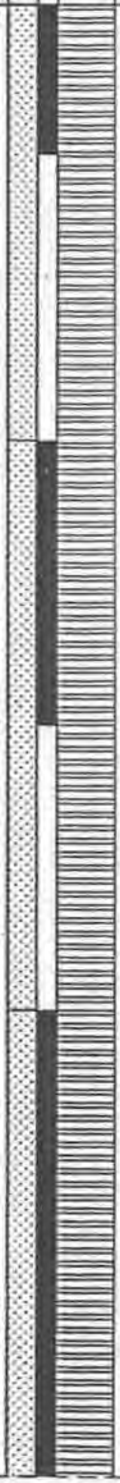
JOB NO. **113494**
BORING STARTED **10/3/99**
BORING COMPLETED **10/3/99**
DRILLER **JF, JK, DN**
METHOD **SONIC**
TYPED BY **hgw**

BH-1S
Boring No.
Sheet 2 of 4

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION 982.5'
BORING LOCATION
As shown on Boring Location Plan.
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS
Completed as MW-9S

N VALUE, blows/ft.
◇
10 20 30 40 50 60 70 80 90



DEPTH	SAMPLE NO.	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	REMARKS
	1D	(Becomes crumbly between 22.0' and 30.0')		
23.0				
24.0				
25.0				
26.0				
27.0				
28.0				
29.0				
30.0				
31.0				
32.0				
33.0				
34.0				
35.0	2D			∇
36.0				
37.0				
38.0				
39.0				
40.0				
41.0				
42.0				
43.0				
44.0				
45.0	3D	(Fractures at 45.0' to 50.0' every 0.3')		
46.0		(Becomes more competent with depth)		
47.0				
48.0				

Continued Next Page

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION

JOB NO. **113494**
BORING STARTED **10/3/99**
BORING COMPLETED **10/3/99**
DRILLER **JF, JK, DN**
METHOD **SONIC**
TYPED BY **hgw**

BH-1S
Boring No.
Sheet 3 of 4

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION **982.5'**
BORING LOCATION
As shown on Boring Location Plan.
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS
Completed as MW-9S

DEPTH	SAMPLE NO.	SAMPLER TYPE RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft. ◇ 10 20 30 40 50 60 70 80 90	REMARKS
49.0							
50.0							
51.0							
52.0							
53.0							
54.0							
55.0	4D						
56.0							
57.0							
58.0							
59.0							
60.0							
61.0							
62.0							
63.0							
64.0							
65.0	5D						
66.0							
67.0							
68.0							
69.0							
70.0							
71.0							
72.0							
73.0							

Continued Next Page

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION

JOB NO. **113494**

BORING STARTED **10/3/99**

BORING COMPLETED **10/3/99**

DRILLER **JF, JK, DN**

METHOD **SONIC**

TYPED BY **hgw**

BH-1S
Boring No.

Sheet 4 of 4

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION **982.5'**

BORING LOCATION
As shown on Boring Location Plan.

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

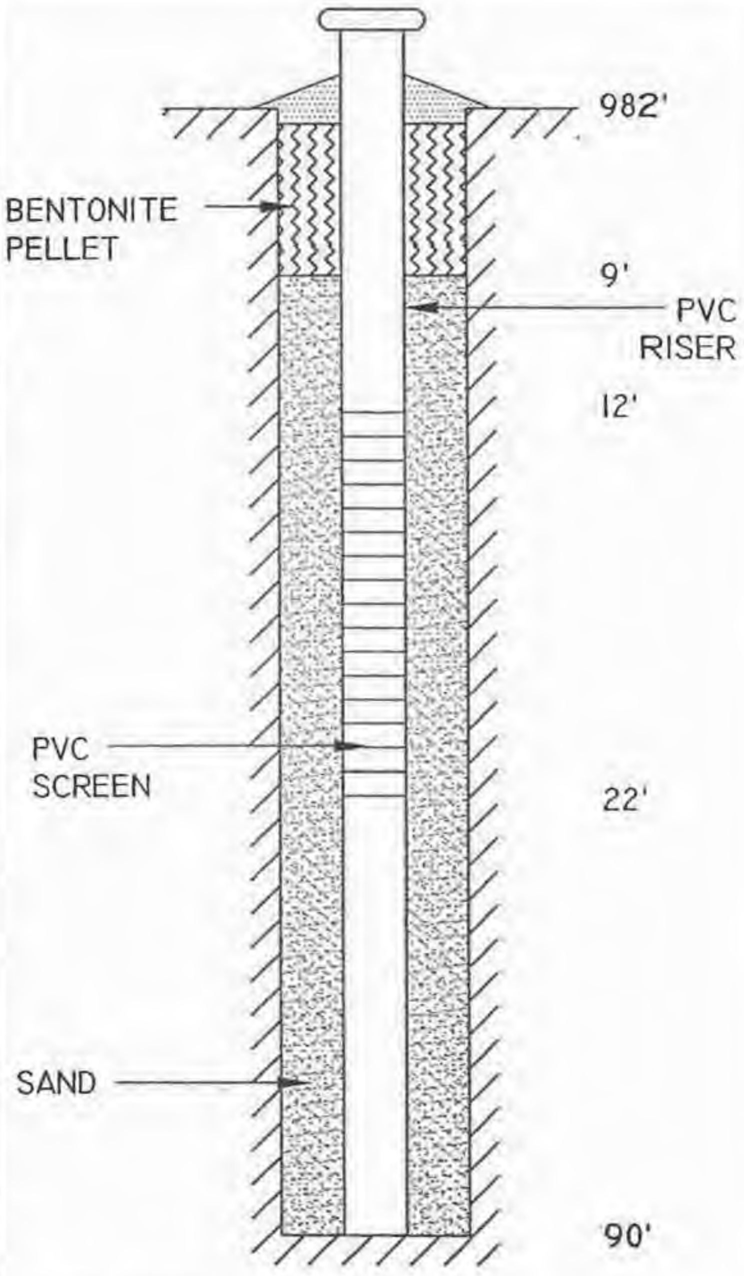
COMMENTS
Completed as MW-9S

DEPTH	SAMPLE NO.	SAMPLER TYPE RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft. 10 20 30 40 50 60 70 80 90	REMARKS
75.0	6D						
76.0							
77.0							
78.0							
79.0							
80.0							
81.0							
82.0							
83.0							
84.0							
85.0				Weathered SHALE - wet (Poorly sealed temp. casing allowed water infiltration) (Backfill with bentonite to 26' and sand to 22' to set shallow well)			
86.0							
87.0							
88.0							
89.0							
90.0				Bottom of Boring at 90.0'			
91.0							
92.0							
93.0							
94.0							
95.0							
96.0							
97.0							
98.0							
99.0							

LOG OF WELL NO. MW-9S (BH-IS)

NORTON ENVIRONMENTAL
113494/HGW

10/3/99	DATE INSTALLED
984.83'	TOP OF CASING (PVC)
982.5'	SURFACE ELEVATION
PVC	RISER PIPE MATERIAL
PVC	SCREEN MATERIAL
2"	SCREEN DIAMETER
0.010"	SCREEN SLOT SIZE
90'	BOTTOM OF BORING
22'	BOTTOM OF SCREEN
12'	TOP OF SCREEN
9'	TOP OF SAND
-	TOP OF BENTONITE SLURRY
0	TOP OF BENTONITE PELLET
-	TOP OF SOIL BACKFILL
-	TOP OF WELL RISER PIPE
12'	INITIAL WATER DEPTH
-	COMPLETION OF WATER DEPTH
-	16 DAY WATER DEPTH
-	24 HOUR WATER DEPTH
-	48 HOUR WATER DEPTH
10.66'	12-7-99 HOUR WATER DEPTH



REMARKS:

BACKFILL BENTONITE TO 26', SAND TO 9'

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION

JOB NO. **113494**

BORING STARTED **11/4/99**

BORING COMPLETED **11/8/99**

DRILLER **Duncan Bros.**

METHOD **Air Rotary**

TYPED BY **hgw**

BH-1M
Boring No.

Sheet 1 of 3

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION 983.9'
BORING LOCATION
East of 1A

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS
Completed as MW-9M

N VALUE, blows/ft.
10 20 30 40 50 60 70 80 90

DEPTH	SAMPLE NO.	SAMPLER TYPE RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	REMARKS
				8-3/4" Air rotary to 35.0'		
1.0						
2.0						
3.0						
4.0						
5.0				(Set 6-1/4" ID - 6-5/8" OD perm. casing to 35.0')		
6.0						
7.0						
8.0						
9.0						
10.0				(Allowed casing to setup)		
11.0						
12.0						
13.0						
14.0						
15.0				(Blew hole dry for 1/2 hr. prior to roller bit advancement)		
16.0						
17.0						
18.0						
19.0						▼
20.0				(See BH-15 for lithology description)		
21.0						
22.0						

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH		DATE
INITIAL	43.0	∇	11/4/99
AT COMPLETION	NONE	▼	11/8/99
OTHER	19.0	▼	12hrs.

▨ A—SPLIT SPOON
■ B—ROCK CORE
☒ C—SHELBY TUBE
▨ D—SONIC
■ E—AUGER CUTTINGS
▨ F—

BOWSER MORNER®

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION

JOB NO.	**113494**
BORING STARTED **11/4/99**	BORING COMPLETED **11/8/99**
DRILLER **Duncan Bros.**	METHOD **Air Rotary**
TYPED BY **hgw**	

BH-1M
Boring No.
Sheet 2 of 3

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION **983.9'**
BORING LOCATION
East of 1A

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS
Completed as MW-9M

N VALUE, blows/ft.
10 20 30 40 50 60 70 80 90

DEPTH	SAMPLE NO.	SAMPLER TYPE RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft.	REMARKS
23.0							
24.0							
25.0							
26.0							
27.0							
28.0							
29.0							
30.0							
31.0							
32.0							
33.0							
34.0							
35.0				Gray SHALE			
36.0							
37.0							
38.0							
39.0							
40.0							
41.0							
42.0	1E						
43.0							∇
44.0							
45.0							
46.0							
47.0							
48.0							

Continued Next Page

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION

JOB NO. **113494**

BORING STARTED **11/4/99**

BORING COMPLETED **11/8/99**

DRILLER **Duncan Bros.**

METHOD **Air Rotary**

TYPED BY **hgw**

BH-1M
Boring No.

Sheet 3 of 3

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION **983.9'**
BORING LOCATION
East of 1A

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

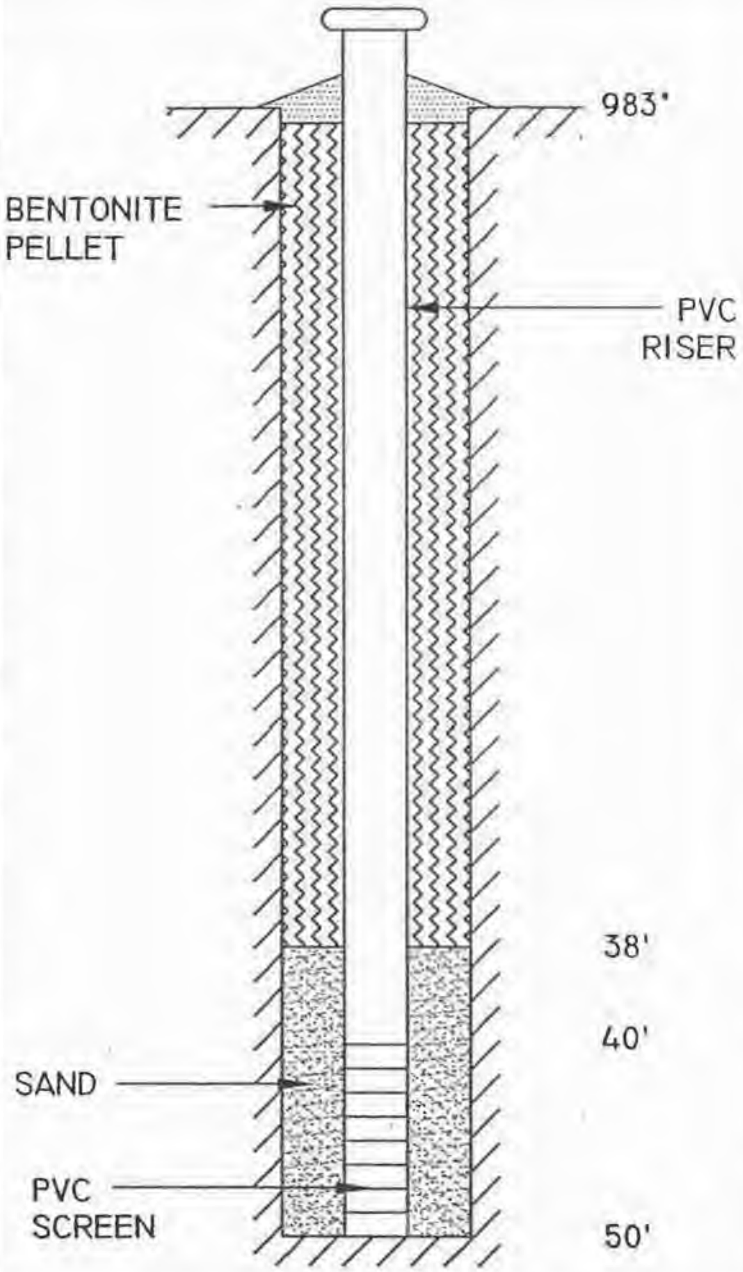
COMMENTS
Completed as MW-9M

DEPTH	SAMPLE NO.	SAMPLER TYPE RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft. 10 20 30 40 50 60 70 80 90	REMARKS
49.0							
50.0				Bottom of Boring at 50.0'			
51.0							
52.0							
53.0							
54.0							
55.0							
56.0							
57.0							
58.0							
59.0							
60.0							
61.0							
62.0							
63.0							
64.0							
65.0							
66.0							
67.0							
68.0							
69.0							
70.0							
71.0							
72.0							
73.0							

LOG OF WELL NO. MW-9M (BH-IM)

NORTON ENVIRONMENTAL
113494/HGW

11/4/99	DATE INSTALLED
985.83'	TOP OF CASING (PVC)
983.6'	SURFACE ELEVATION
PVC	RISER PIPE MATERIAL
PVC	SCREEN MATERIAL
2"	SCREEN DIAMETER
0.010"	SCREEN SLOT SIZE
50'	BOTTOM OF BORING
50'	BOTTOM OF SCREEN
40'	TOP OF SCREEN
38'	TOP OF SAND
-	TOP OF BENTONITE SLURRY
0	TOP OF BENTONITE PELLET
-	TOP OF SOIL BACKFILL
-	TOP OF WELL RISER PIPE
43'	INITIAL WATER DEPTH
-	COMPLETION OF WATER DEPTH
-	16 DAY WATER DEPTH
-	24 HOUR WATER DEPTH
-	48 HOUR WATER DEPTH
15.28'	12-7-99 HOUR WATER DEPTH



REMARKS:

NORTON ENVIRONMENTAL

JOB NO. 113494			**BH-2S** Boring No.
BORING STARTED 10/7/99	BORING COMPLETED 10/8/99		
DRILLER JF, JK, DN	METHOD SONIC		
TYPED BY hgw			Sheet 1 of 2

PROJECT
ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION 1075.8'
BORING LOCATION
As shown on Boring Location Plan.
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS
Completed as MW-10S

N VALUE, blows/ft.
10 20 30 40 50 60 70 80 90

DEPTH	SAMPLE NO.	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	REMARKS
		TOPSOIL		
1.0		Brown silty CLAY, (trace sand, trace gravel) - damp		
2.0				
3.0				
4.0				
5.0	1D			
6.0				
7.0		Olive clayey SILT - damp		
8.0				
9.0				
10.0		Weathered gray SHALE - dry		
11.0				
12.0	2D			
13.0				
14.0				
15.0		(Set casing to 15.0')		
16.0				
17.0	3D			
18.0				
19.0				
20.0				
21.0				
22.0				▼

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH		DATE
INITIAL	22.0	▽	10/7/99
AT COMPLETION	22.0	▼	10/8/99
OTHER	N/A	▼	N/A

- ▨ A—SPLIT SPOON
- ◧ B—ROCK CORE
- ☒ C—SHELBY TUBE
- ⬚ D—SONIC
- ◨ E—AUGER CUTTINGS
- ▩ F—

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113494.GPJ 10/99

NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION

JOB NO. 113494

BORING STARTED 10/7/99

BORING COMPLETED 10/8/99

DRILLER JF, JK, DN

METHOD SONIC

TYPED BY hgw

BH-2S
Boring No.
Sheet 2 of 2

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION 1075.8'
BORING LOCATION
As shown on Boring Location Plan.
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

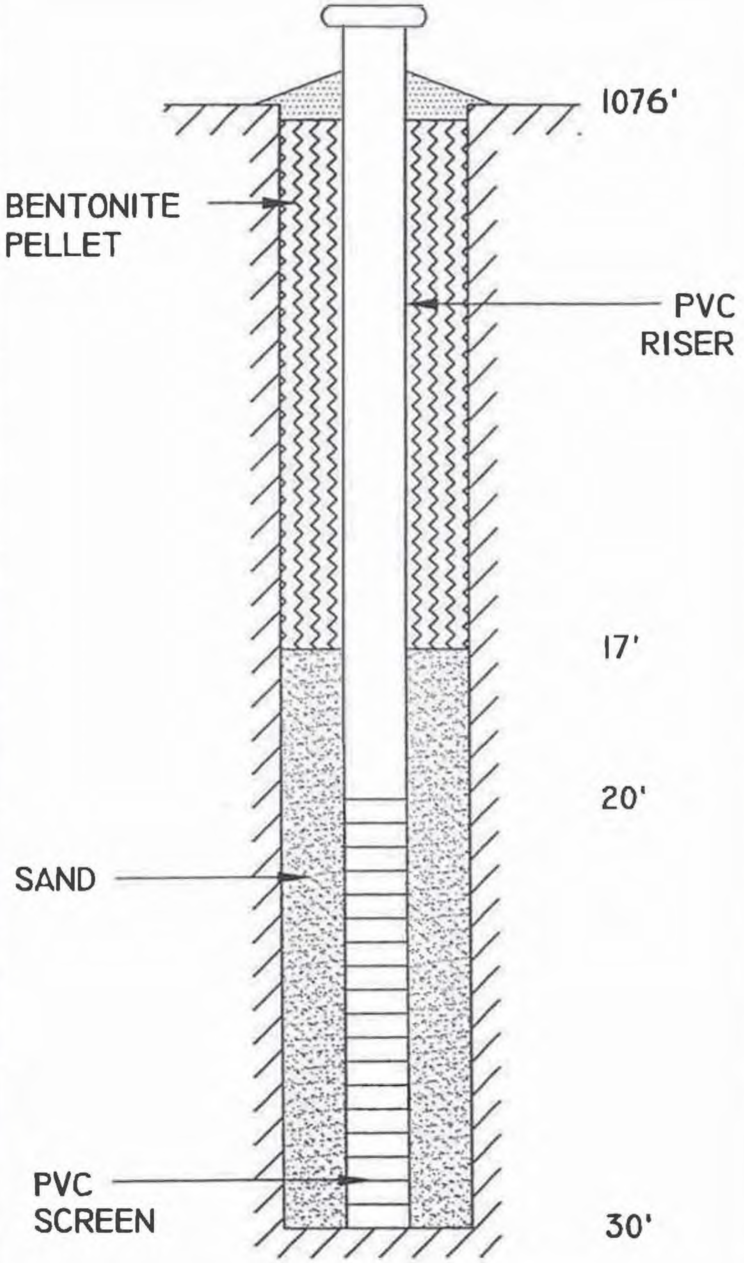
COMMENTS
Completed as MW-10S

DEPTH	SAMPLE NO.	SAMPLER TYPE	RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft. 10 20 30 40 50 60 70 80 90	REMARKS
					(Wet at 22.0')			
23.0								
24.0								
25.0	4D							
26.0								
27.0								
28.0								
29.0								
30.0					Bottom of Boring at 30.0'			
31.0								
32.0								
33.0								
34.0								
35.0								
36.0								
37.0								
38.0								
39.0								
40.0								
41.0								
42.0								
43.0								
44.0								
45.0								
46.0								
47.0								
48.0								

LOG OF WELL NO. MW-10S (BH-2S)

NORTON ENVIRONMENTAL
113494/HGW

10/7/99	DATE INSTALLED
1078.16'	TOP OF CASING (PVC)
1075.8'	SURFACE ELEVATION
PVC	RISER PIPE MATERIAL
PVC	SCREEN MATERIAL
2"	SCREEN DIAMETER
0.010"	SCREEN SLOT SIZE
30'	BOTTOM OF BORING
30'	BOTTOM OF SCREEN
20'	TOP OF SCREEN
17'	TOP OF SAND
-	TOP OF BENTONITE SLURRY
0	TOP OF BENTONITE PELLET
-	TOP OF SOIL BACKFILL
-	TOP OF WELL RISER PIPE
22'	INITIAL WATER DEPTH
-	COMPLETION OF WATER DEPTH
-	16 DAY WATER DEPTH
-	24 HOUR WATER DEPTH
-	48 HOUR WATER DEPTH
28.96'	12-7-99 HOUR WATER DEPTH



REMARKS:

CLIENT
NORTON ENVIRONMENTAL

PROJECT
**ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION**

JOB NO. **113494**

BORING STARTED **10/8/99**

BORING COMPLETED **10/11/99**

DRILLER **JF, DN, C**

METHOD **SONIC**

TYPED BY **hgw**

BH-2D
Boring No.
Sheet 1 of 4

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION **1075.3'**
BORING LOCATION
15' North of 2S

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS
Completed as MW-10D

DEPTH	SAMPLE NO.	SAMPLER TYPE	RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft. 10 20 30 40 50 60 70 80 90	REMARKS
0.0–1.0					TOPSOIL			
1.0–7.0					Brown silty CLAY, (trace sand, trace gravel) - damp			
7.0–10.0					Olive clayey SILT - damp			
10.0–22.0					Weathered gray SHALE - dry			

1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
19.0
20.0
21.0
22.0

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH		DATE
INITIAL	54.0	∇	10/08/1999
AT COMPLETION	59.0	▼	10/11/1999
OTHER	N/A	▼	N/A

- ▨ A—SPLIT SPOON
- ◧ B—ROCK CORE
- ☒ C—SHELBY TUBE
- ░ D—SONIC
- ◨ E—AUGER CUTTINGS
- ▒ F—

BOWSER MORNER

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION

JOB NO. **113494**

BORING STARTED **10/8/99**

BORING COMPLETED **10/11/99**

DRILLER **JF, DN, C**

METHOD **SONIC**

TYPED BY **hgw**

BH-2D
Boring No.

Sheet 2 of 4

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION **1075.3'**
BORING LOCATION
15' North of 2S

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS
Completed as MW-10D

DEPTH	SAMPLE NO.	SAMPLER TYPE	RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft. 10 20 30 40 50 60 70 80 90	REMARKS
23.0								
24.0								
25.0								
26.0								
27.0								
28.0								
29.0								
30.0								
31.0								
32.0								
33.0								
34.0								
35.0					(Set 6" temp. steel casing to 35' with 5' bentonite seal)			
36.0								
37.0								
38.0								
39.0								
40.0								
41.0								
42.0	1B							
43.0								
44.0								
45.0					Weathered gray SHALE - damp, crumbly			
46.0								
47.0								
48.0								

Continued Next Page

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION

JOB NO. **113494**

BORING STARTED **10/8/99**
BORING COMPLETED **10/11/99**
DRILLER **JF, DN, C**
METHOD **SONIC**
TYPED BY **hgw**

BH-2D
Boring No.

Sheet 3 of 4

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION **1075.3'**
BORING LOCATION
15' North of 2S
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS
Completed as MW-10D

N VALUE, blows/ft.
10 20 30 40 50 60 70 80 90

DEPTH	SAMPLE NO.	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	REMARKS
49.0				
50.0				
51.0				
52.0				
53.0				
54.0		(Becomes moist-wet at 54.0')		∇
55.0	2B			
56.0				
57.0				
58.0				
59.0				▼
60.0				
61.0				
62.0				
63.0				
64.0		(Becomes dry at 64.0')		
65.0	3B			
66.0				
67.0				
68.0				
69.0				
70.0				
71.0				
72.0				
73.0				

Continued Next Page

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION

JOB NO. **113494**
BORING STARTED **10/8/99**
BORING COMPLETED **10/11/99**
DRILLER **JF, DN, C**
METHOD **SONIC**
TYPED BY **hgw**

BH-2D
Boring No.
Sheet 4 of 4

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION **1075.3'**
BORING LOCATION
15' North of 2S

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

VISUAL CLASSIFICATION OF THE MATERIAL

COMMENTS
Completed as MW-10D

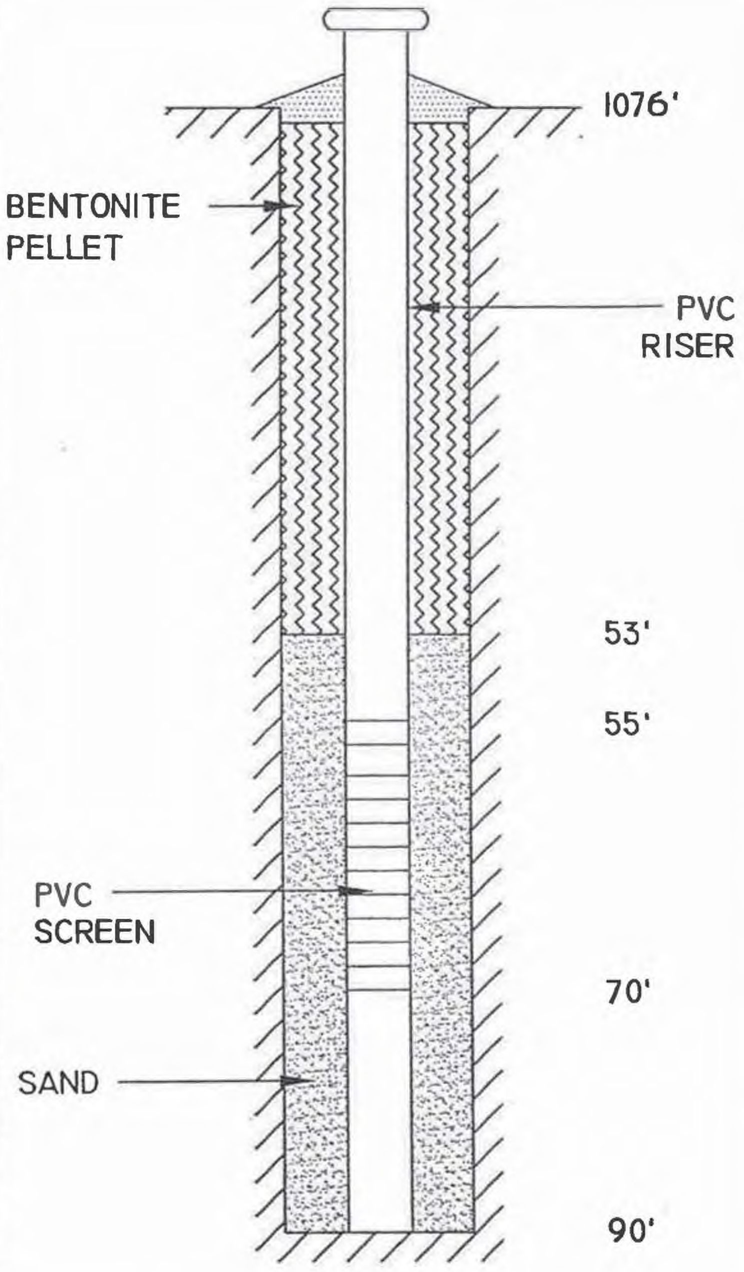
DEPTH | SAMPLE NO. | SAMPLER TYPE | RECOVERY | GRAPHIC LOG | BLOW COUNTS | N VALUE, blows/ft. 10 20 30 40 50 60 70 80 90 | REMARKS

DEPTH	SAMPLE NO.	VISUAL CLASSIFICATION OF THE MATERIAL
75.0	4B	
76.0		
77.0		
78.0		
79.0		
80.0		
81.0		
82.0		(Becomes moist to wet at 82' to 84')
83.0		
84.0		
85.0	5B	(Seal breached from temp. casing allowed water infiltration - backfill with bentonite to 72' to set well)
86.0		
87.0		
88.0		
89.0		
90.0		Bottom of Boring at 90.0'
91.0		
92.0		
93.0		
94.0		
95.0		
96.0		
97.0		
98.0		
99.0		

LOG OF WELL NO. MW-10D (BH-2D)

NORTON ENVIRONMENTAL
113494/HGW

10/8/99	DATE INSTALLED
1077.80'	TOP OF CASING (PVC)
1075.3'	SURFACE ELEVATION
PVC	RISER PIPE MATERIAL
PVC	SCREEN MATERIAL
2"	SCREEN DIAMETER
0.010"	SCREEN SLOT SIZE
90'	BOTTOM OF BORING
70'	BOTTOM OF SCREEN
55'	TOP OF SCREEN
53'	TOP OF SAND
-	TOP OF BENTONITE SLURRY
0	TOP OF BENTONITE PELLET
-	TOP OF SOIL BACKFILL
-	TOP OF WELL RISER PIPE
59'	INITIAL WATER DEPTH
-	COMPLETION OF WATER DEPTH
-	16 DAY WATER DEPTH
-	24 HOUR WATER DEPTH
-	48 HOUR WATER DEPTH
39.54'	12-7-99 HOUR WATER DEPTH



REMARKS:

BACKFILL BENTONITE TO 73', SAND TO 53'

NORTON ENVIRONMENTAL

JOB NO. **113494**

PROJECT
ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION

BORING STARTED	10/21/99	BORING COMPLETED	10/21/99
DRILLER	BMI	METHOD	SONIC
TYPED BY	hgw		

BH-3S
Boring No.
Sheet 1 of 3

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION 1149.8'
BORING LOCATION
~40' south of BH-3D

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS
Completed as MW-11S

N VALUE, blows/ft.
10 20 30 40 50 60 70 80 90

DEPTH	SAMPLE NO.	SAMPLER TYPE / RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	REMARKS
				Brown clayey SILT (trace sand) - damp		
1.0						
2.0						
3.0						
4.0						
5.0	1D					
6.0						
7.0						
8.0				(Cobbles at 8' and 12')		
9.0						
10.0						
11.0						
12.0						
13.0						
14.0						
15.0	2D					
16.0						
17.0						
18.0						
19.0						
20.0						
21.0						
22.0						

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH		DATE
INITIAL	58.0	⊻	10/21/99
AT COMPLETION	46.0	⊻	10/21/99
OTHER	N/A	⊻	N/A

▩ A — SPLIT SPOON
◻ B — ROCK CORE
☒ C — SHELBY TUBE
▨ D — SONIC
◻ E — AUGER CUTTINGS
▩ F —

BOWSER MORNER

NORTON ENVIRONMENTAL

JOB NO. **113494**

BORING STARTED **10/21/99** BORING COMPLETED **10/21/99**

DRILLER **BMI** METHOD **SONIC**

TYPED BY **hgw**

BH-3S
Boring No.
Sheet 2 of 3

PROJECT
ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION **1149.8'**
BORING LOCATION
~40' south of BH-3D
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS
Completed as MW-11S

DEPTH	SAMPLE NO.	SAMPLER TYPE RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft. 10 20 30 40 50 60 70 80 90	REMARKS
23.0							
24.0				(Silty sand and gravel zone at 24-24.5 - dry)			
25.0	3D			Brown gravelly clayey SILT			
26.0							
27.0							
28.0							
29.0							
30.0				LIMESTONE, gray, crystalline Gray sandy SHALE-somewhat fissile and fractured throughout			
31.0							
32.0							
33.0							
34.0							
35.0							
36.0							
37.0							
38.0							
39.0							
40.0							
41.0							
42.0	4D						
43.0							
44.0				Interbedded SHALE and sandstone - gray			
45.0				Gray weathered SHALE			
46.0							∇
47.0							
48.0							

Continued Next Page

NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION

JOB NO. 113494			**BH-3S** Boring No.
BORING STARTED 10/21/99	BORING COMPLETED 10/21/99		
DRILLER BMI	METHOD SONIC		
TYPED BY hgw			Sheet 3 of 3

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION 1149.8'
BORING LOCATION
~40' south of BH-3D
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS
Completed as MW-11S

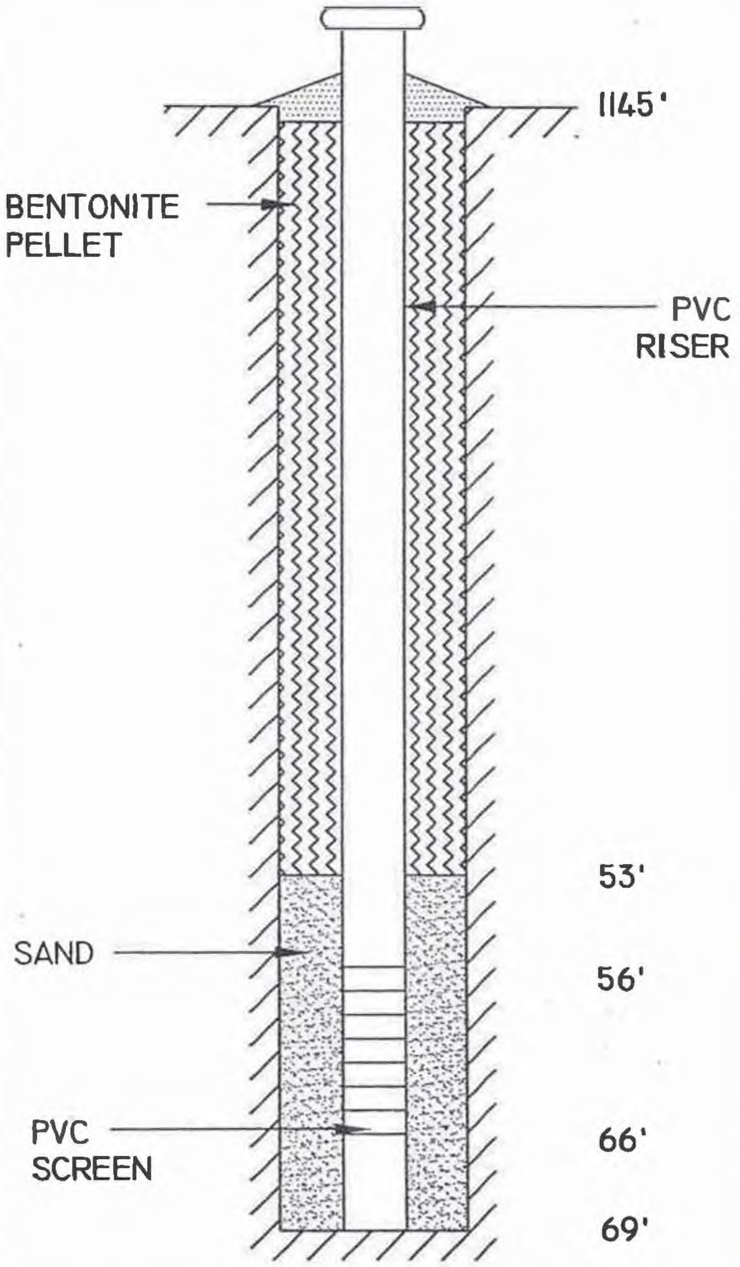
N VALUE, blows/ft.
10 20 30 40 50 60 70 80 90

DEPTH	SAMPLE NO.	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	REMARKS
49.0				
50.0				
51.0				
52.0	5D			
53.0				
54.0				
55.0				
56.0				
57.0		Gray weathered SHALE		
58.0				∇
59.0				
60.0				
61.0				
62.0				
63.0	6D			
64.0				
65.0				
66.0				
67.0				
68.0				
69.0		Bottom of Boring at 69.0'		
70.0				
71.0				
72.0				
73.0				

LOG OF WELL NO. MW-11S (BH-3S)

NORTON ENVIRONMENTAL
113494/HGW

10/21/99	DATE INSTALLED
1151.95'	TOP OF CASING (PVC)
1149.8'	SURFACE ELEVATION
PVC	RISER PIPE MATERIAL
PVC	SCREEN MATERIAL
2"	SCREEN DIAMETER
0.010"	SCREEN SLOT SIZE
69'	BOTTOM OF BORING
66'	BOTTOM OF SCREEN
56'	TOP OF SCREEN
53'	TOP OF SAND
-	TOP OF BENTONITE SLURRY
0	TOP OF BENTONITE PELLET
-	TOP OF SOIL BACKFILL
-	TOP OF WELL RISER PIPE
57'	INITIAL WATER DEPTH
-	COMPLETION OF WATER DEPTH
-	16 DAY WATER DEPTH
-	24 HOUR WATER DEPTH
-	48 HOUR WATER DEPTH
51.97'	12-7-99 HOUR WATER DEPTH



REMARKS:

CLIENT **NORTON ENVIRONMENTAL**	JOB NO. **113494**	
PROJECT **ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION**	BORING STARTED **10/11/99** BORING COMPLETED **10/12/99** DRILLER **JF, DN, C** METHOD **SONIC** TYPED BY **hgw**	**BH-4** Boring No. **Sheet 1 of 4**

PROJECT LOCATION

LAT. LONG.

SURFACE ELEVATION 1173.3'

BORING LOCATION

Southwest along fence

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS

Completed as MW-12

N VALUE, blows/ft.

10 20 30 40 50 60 70 80 90

DEPTH	SAMPLE NO.	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	REMARKS
		Brown clayey SILT (trace gravel) - damp		
1.0				
2.0				
3.0				
4.0				
5.0	1B			
6.0				
7.0				
8.0				
9.0				
10.0				
11.0				
12.0				
13.0				
14.0				
15.0	2B			
		(Cobble at 15.5')		
16.0				
17.0				
18.0				
		Brown silty SAND - damp (till)		
19.0		Mottled brown-gray clayey SILT (trace gravel) - damp (till)		
20.0				
21.0				
22.0				

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH		DATE
INITIAL	55.0	▽	10/11/1999
AT COMPLETION	38.7	▼	10/12/1999
OTHER	N/A	▼	N/A

▩ A—SPLIT SPOON
◧ B—ROCK CORE
☒ C—SHELBY TUBE
▒ D—SONIC
◨ E—AUGER CUTTINGS
▩ F—

BOWSER MORNER®

113494.GPJ 2/4/00

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION

JOB NO. **113494**

BORING STARTED **10/11/99**
BORING COMPLETED **10/12/99**
DRILLER **JF, DN, C**
METHOD **SONIC**
TYPED BY **hgw**

BH-4
Boring No.
Sheet 2 of 4

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION **1173.3'**
BORING LOCATION
Southwest along fence

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS
Completed as MW-12

N VALUE, blows/ft.
10 20 30 40 50 60 70 80 90

DEPTH	SAMPLE NO.	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	REMARKS
23.0				
24.0				
25.0	3B			
26.0				
27.0				
28.0				
29.0				
30.0		(Increase in gravel at 30' to 32').		
31.0		(Cobble at 31.0')		
32.0				
33.0				
34.0				
35.0	4B			
36.0				
37.0				
38.0				▽
39.0		Gray brown sandy clayey SILT (trace gravel) - damp		
40.0				
41.0				
42.0		Brown clayey SILT (trace gravel) - damp		
43.0				
44.0				
45.0	5B			
46.0				
47.0				
48.0				

Continued Next Page

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION

JOB NO. 113494

BORING STARTED 10/11/99
BORING COMPLETED 10/12/99
DRILLER JF, DN, C
METHOD SONIC
TYPED BY hgw

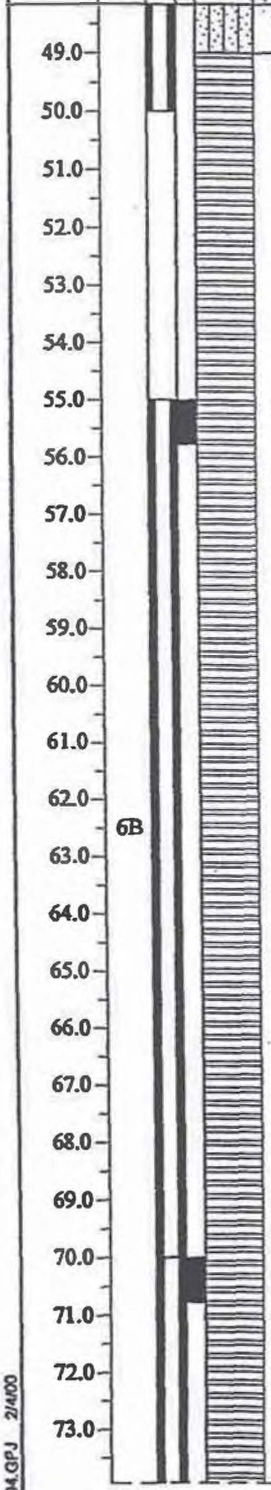
BH-4
Boring No.
Sheet 3 of 4

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION 1173.3'
BORING LOCATION
Southwest along fence

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS
Completed as MW-12

DEPTH	SAMPLE NO.	SAMPLER TYPE / RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft. 10 20 30 40 50 60 70 80 90	REMARKS



Gray sandy SILT (trace gravel) - damp

Gray SHALE - weathered

(6" casing set to 55.0')

(Water rose in well in 55'-70' run to 52' indicating water in that span)

▽

Continued Next Page

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION

JOB NO. **113494**

BORING STARTED **10/11/99**
BORING COMPLETED **10/12/99**
DRILLER **JF, DN, C**
METHOD **SONIC**
TYPED BY **hgw**

BH-4
Boring No.
Sheet 4 of 4

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION 1173.3'
BORING LOCATION
Southwest along fence
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS
Completed as MW-12

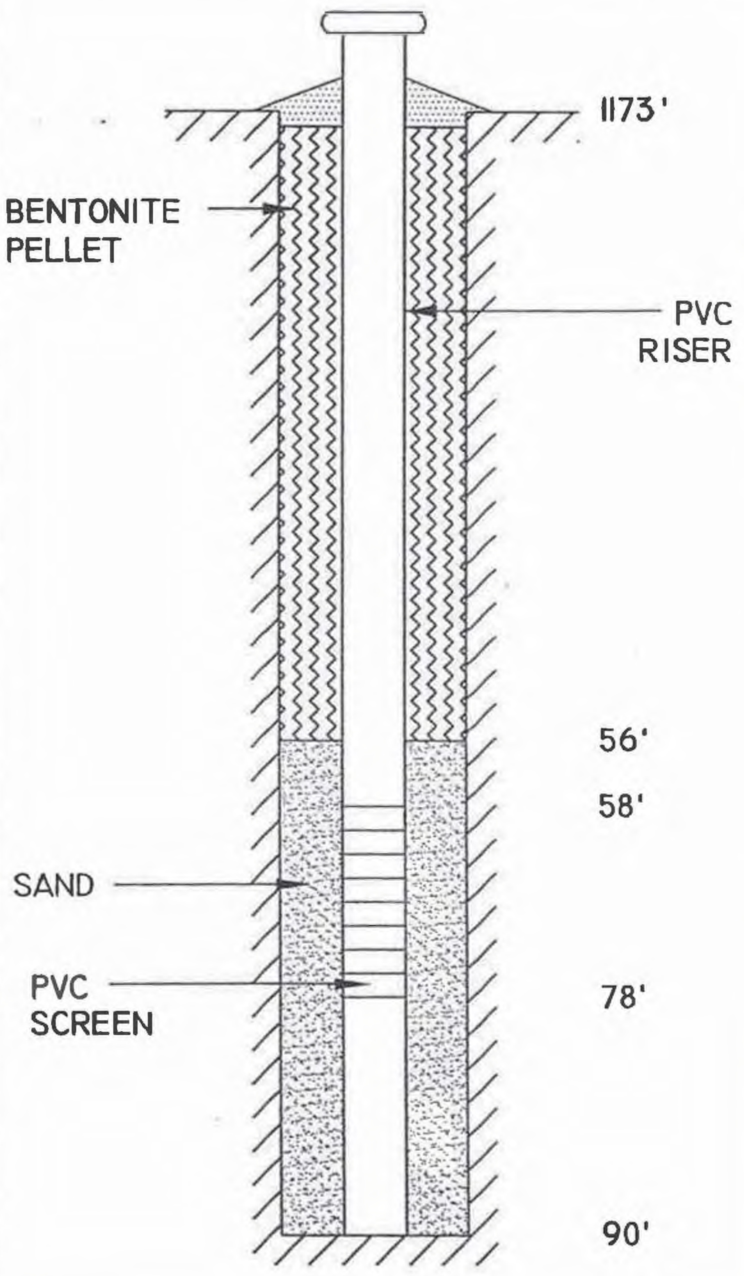
N VALUE, blows/ft.
10 20 30 40 50 60 70 80 90

DEPTH	SAMPLE NO.	SAMPLER TYPE RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft.	REMARKS
75.0	7B						
76.0							
77.0							
78.0							
79.0							
80.0							
81.0							
82.0							
83.0							
84.0							
85.0	8B						
86.0							
87.0							
88.0							
89.0							
90.0				Bottom of Boring at 90.0'			
91.0							
92.0							
93.0							
94.0							
95.0							
96.0							
97.0							
98.0							
99.0							

LOG OF WELL NO. MW-12 (BH-4)

NORTON ENVIRONMENTAL
113494/HGW

10/11/99	DATE INSTALLED
1175.78'	TOP OF CASING (PVC)
1173.3'	SURFACE ELEVATION
PVC	RISER PIPE MATERIAL
PVC	SCREEN MATERIAL
2"	SCREEN DIAMETER
0.010"	SCREEN SLOT SIZE
90'	BOTTOM OF BORING
78'	BOTTOM OF SCREEN
58'	TOP OF SCREEN
56'	TOP OF SAND
-	TOP OF BENTONITE SLURRY
0	TOP OF BENTONITE PELLET
-	TOP OF SOIL BACKFILL
-	TOP OF WELL RISER PIPE
62'	INITIAL WATER DEPTH
-	COMPLETION OF WATER DEPTH
-	16 DAY WATER DEPTH
-	24 HOUR WATER DEPTH
-	48 HOUR WATER DEPTH
48.76'	12-7-99 HOUR WATER DEPTH



REMARKS:

LEAKY SEAL ACCOUNTS FOR SCREEN LENGTH

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION

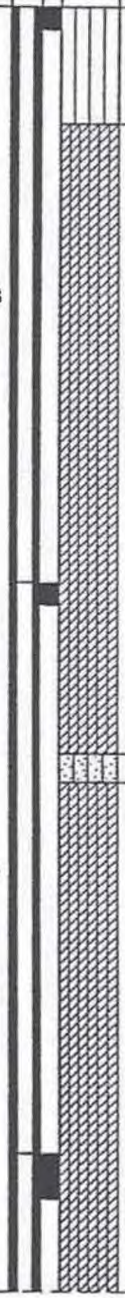
JOB NO. **113494**
BORING STARTED **10/13/99**
BORING COMPLETED **10/13/99**
DRILLER **JF, DN, C**
METHOD **SONIC**
TYPED BY **hgw**

BH-5
Boring No.
Sheet 1 of 4

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION **1138.7'**
BORING LOCATION
BH-5 next to building
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS
Completed as MW-13

N VALUE, blows/ft. ◇ 10 20 30 40 50 60 70 80 90



DEPTH	SAMPLE NO.	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	REMARKS
		Brown SILT and gravel base material		
1.0				
2.0		Gray silty CLAY - damp		
3.0				
4.0				
5.0	1B			
6.0				
7.0				
8.0				
9.0				
10.0				
11.0				
12.0				
13.0		Brown SAND and silt - damp		
		Gray silty CLAY - damp		
14.0				
15.0	2B			
16.0				
17.0				
18.0				
19.0				
20.0				
21.0				
22.0				

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH		DATE
INITIAL	70.0	∇	10/13/1999
AT COMPLETION	NONE	∇	10/13/1999
OTHER	48.6	▼	12hrs.

▨ A—SPLIT SPOON
◨ B—ROCK CORE
☒ C—SHELBY TUBE
▨ D—SONIC
◨ E—AUGER CUTTINGS
▨ F—

BOWSER MORNER

CLIENT
NORTON ENVIRONMENTAL

PROJECT
ROYALTON ROAD SANITARY LANDFILL
HYDROGEOLOGICAL INVESTIGATION

JOB NO. **113494**

BORING STARTED **10/13/99**
BORING COMPLETED **10/13/99**
DRILLER **JF, DN, C**
METHOD **SONIC**
TYPED BY **hgw**

BH-5
Boring No.
Sheet 2 of 4

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION **1138.7'**
BORING LOCATION
BH-5 next to building

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS
Completed as MW-13

N VALUE, blows/ft.
10 20 30 40 50 60 70 80 90

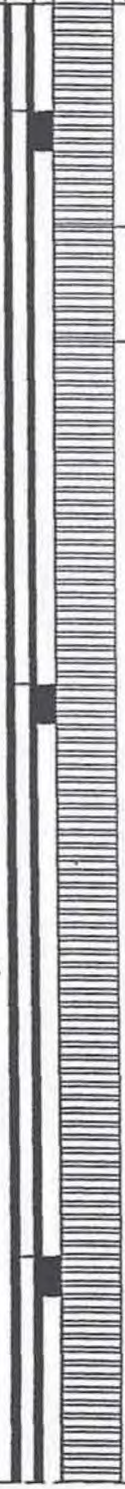
DEPTH	SAMPLE NO.	SAMPLER TYPE RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	REMARKS
23.0						
24.0						
25.0	3B					
26.0						
27.0						
28.0						
29.0						
30.0						
31.0				SHALE, weathered - dry		
32.0						
33.0						
34.0						
35.0	4B			(6" steel casing set to 35')		
36.0						
37.0						
38.0						
39.0						
40.0						
41.0						
42.0						
43.0						
44.0						
45.0	5B					
46.0				Gray weathered SHALE - dry		
47.0						
48.0						

Continued Next Page

CLIENT **NORTON ENVIRONMENTAL**	JOB NO. 113494	
PROJECT **ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION**	BORING STARTED 10/13/99 BORING COMPLETED 10/13/99 DRILLER JF, DN, C METHOD SONIC TYPED BY hgw	**BH-5** Boring No. **Sheet 3 of 4**

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION 1138.7'
BORING LOCATION
BH-5 next to building
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

COMMENTS
Completed as MW-13



DEPTH	SAMPLE NO.	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	N VALUE, blows/ft. (10 20 30 40 50 60 70 80 90)	REMARKS
					▼
49.0					
50.0					
51.0					
52.0		Gray sandy SHALE, weathered - dry			
53.0					
54.0		Gray weathered SHALE - dry			
55.0	6B				
56.0					
57.0					
58.0					
59.0					
60.0					
61.0					
62.0		(Possible water zone at 62')			
63.0					
64.0					
65.0	7B				
66.0					
67.0					
68.0					
69.0					
70.0					▽
71.0					
72.0					
73.0					

Continued Next Page

CLIENT
NORTON ENVIRONMENTAL

JOB NO. 113494

BORING STARTED 10/13/99
BORING COMPLETED 10/13/99

PROJECT
ROYALTON ROAD SANITARY LANDFILL HYDROGEOLOGICAL INVESTIGATION

DRILLER JF, DN, C
METHOD SONIC
TYPED BY hgw

BH-5
Boring No.
Sheet 4 of 4

PROJECT LOCATION
LAT. LONG.
SURFACE ELEVATION 1138.7'
BORING LOCATION
BH-5 next to building
It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata sho ld not be taken as absolute.

COMMENTS
Completed as MW-13

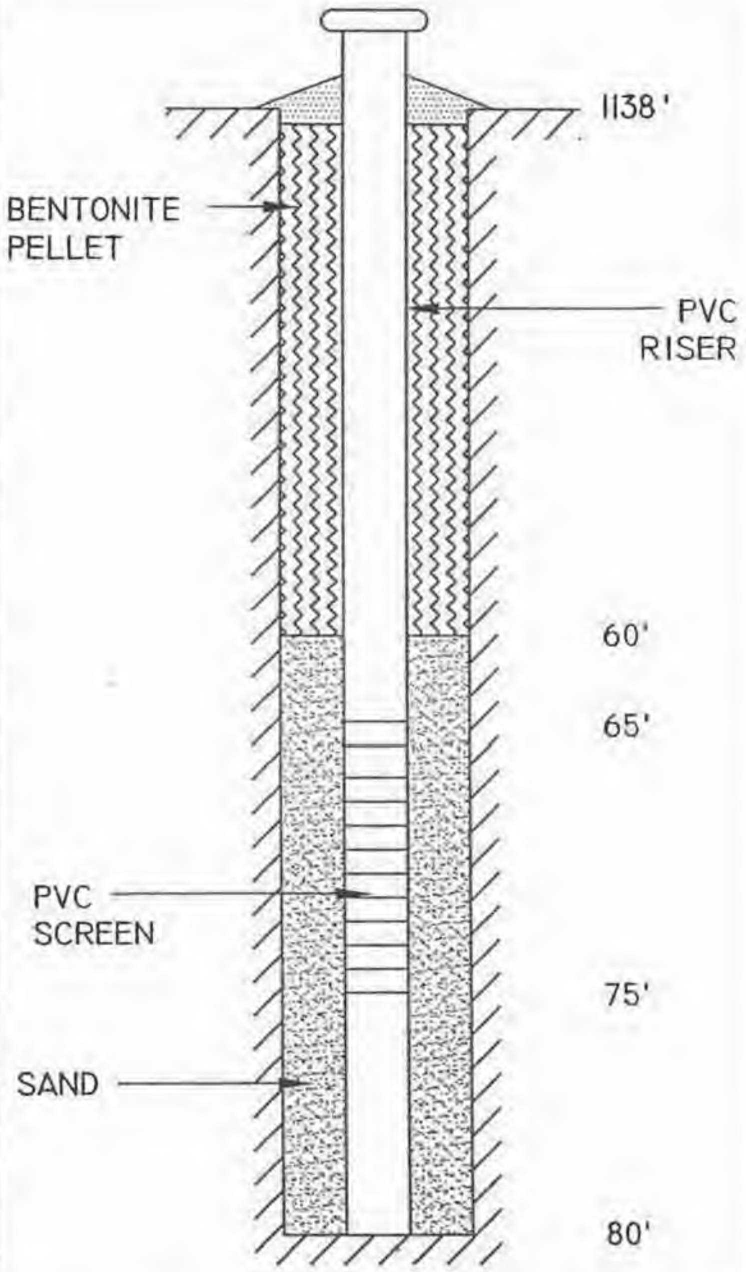
N VALUE, blows/ft.
10 20 30 40 50 60 70 80 90

DEPTH	SAMPLE NO.	SAMPLER TYPE	RECOVERY	GRAPHIC LOG	VISUAL CLASSIFICATION OF THE MATERIAL	BLOW COUNTS	REMARKS
					(Wet to 74.0')		
75.0	8B				(Dry gray weathered shale at 74')		
76.0							
77.0							
78.0							
79.0							
80.0					Bottom of Boring at 80.0'		
81.0							
82.0							
83.0							
84.0							
85.0							
86.0							
87.0							
88.0							
89.0							
90.0							
91.0							
92.0							
93.0							
94.0							
95.0							
96.0							
97.0							
98.0							
99.0							

LOG OF WELL NO. MW-13 (BH-5)

NORTON ENVIRONMENTAL
113494/HGW

10/13/99	DATE INSTALLED
1141.14'	TOP OF CASING (PVC)
1138.7'	SURFACE ELEVATION
PVC	RISER PIPE MATERIAL
PVC	SCREEN MATERIAL
2"	SCREEN DIAMETER
0.010"	SCREEN SLOT SIZE
80'	BOTTOM OF BORING
75'	BOTTOM OF SCREEN
65'	TOP OF SCREEN
60'	TOP OF SAND
–	TOP OF BENTONITE SLURRY
0	TOP OF BENTONITE PELLET
–	TOP OF SOIL BACKFILL
–	TOP OF WELL RISER PIPE
70'	INITIAL WATER DEPTH
–	COMPLETION OF WATER DEPTH
–	16 DAY WATER DEPTH
–	24 HOUR WATER DEPTH
–	48 HOUR WATER DEPTH
52.56'	12-7-99 HOUR WATER DEPTH



REMARKS:

Eagon & Associates, Inc.

BOREHOLE LOG

Site Name and Location: Royalton Road Landfill Broadview Heights, OH	Drilling Methods: 4 1/4" ID HSA				Boring Number MW-14S
Drilling Firm: *Frontz Drilling*	DATE	TIME	DEPTH DRILLED (ft)	WATER LEVEL (ft)	
Driller / Rig: *Rob Hamilton/CME-750*					Page 1 of 1
Logged by: *David J. Sugar*					
Coordinates: *14139.40N 29764.40E*	Sampling Methods: ST = Shelby Tube WS = Waxed Sample		SS = Split Spoon CS = Continuous Sampler C = Coring		Start: Time 1248, Date 4/24/02 Finish: Time 1330, Date 4/24/02
Surface Elevation: *985.40 ft/MSL*					

Surface Conditions / Weather: *Firm, grass covered area adjacent to access road./55° Sunny.*

Remarks: Adjacent to MW-14D.

Depth (feet)	Sample Method	Sample Recovery (feet)	Blows/6 in or RQD	SAMPLE DESCRIPTION	Graphic Log	Remarks	USCS
1 2 3 4 5 6 7 8 9	NS			Straight drilled to 10.0' without sampling. See Borehole log for MW-14D for soils description. SOIL FILL	▨	4 1/4" ID HSA (9" Borehole)	CL
10 11	SS-1	0.2	4 8 7 10	10.0' - 12.0' sample interval, wood blocked recovery. Trace clayey silt, wood chips, grass, and plastic. Soft. Wet.	▨	No water on rods when pulling center plug at 10.0'. Wet below 10.0'.	
12 13	SS-2	1.2	6 8 7 9	Below 12.0' gray and light brown CLAYEY SILT. Trace wood fragments and brick. Soft to medium stiff. Moist to wet. SOIL FILL.	▨		
14 15	SS-3	1.1	4 6 8 10	Bottom of Auger Borehole = 15.3'.	▨	Monitoring Well MW-14S installed in borehole. Split spoon hole from 15.0'-18.0' filled with cuttings while augering to 15.0'. Flushed borehole with approximately 50 gallons water. Most returned to surface.	
16 17	SS-4	0.4	3 7 9 7	Note: SS-4 split spoon driven through SS-3 split spoon hole.	▨		
18 19				Bottom of Split Spoon Hole = 18.0'			

Eagon & Associates, Inc.

Well Number
MW-14S

Monitoring Well Installation Report

Site Name and Location: *Royalton Road Landfill, Broadview Heights, OH*	Completion Date: *4/24/02*
Coordinates: *14139.40N 29764.40E*	Borehole Depth (ft): *18.0*
Elevation Top of Casing (ft/MSL): *987.74*	Borehole Diameter (in): *8"*
Elevation Ground Surface (ft/MSL): *985.40*	Drilling Methods: *4 1/4" ID HSA*
Installed By: *R. Hamilton/Frontz Drilling*	Completed Drilling: *4/24/02*
Supervised By: *David J. Sugar/Eagon & Associates, Inc.*	Drilling Water Used (gals): *50*

Well Design

Component	Materials	Depth (LSD)	Elevation
Well Protector	5" x 5' Steel	-2.8 - 2.2	988.2 - 983.2
Riser	2" Schedule 40 PVC	-2.3 - 10.3	987.7 - 975.1
Surface Seal	2' x 2' Concrete	-0.5 - 2.0	985.9 - 983.4
Bentonite Seal	3/8" Bentonite Chips	2.0 - 8.0	983.4 - 977.4
Sand Pack	No. 5 Sand	8.0 - 15.3	977.4 - 970.1
Screen	2" Schedule 40 PVC 20-slot	10.3 - 15.1	975.1 - 970.3
Well Point Blank	2" Schedule 40 PVC	15.1 - 15.3	970.3 - 970.1
Natural Fill	Soil Cuttings	15.3 - 18.0	970.1 - 967.4

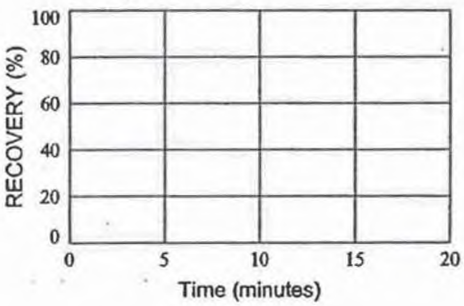
Well Development

Well Depth (ft,TOC):	Depth to Water (ft,TOC):	Well Volume (gals):	Volume Purged (gals):
17.34	*8.61*	*1.5*	*355.0*

Development Method:
Bailing & Pumping with a centrifical pump. Pumped at 3 gpm with <1 foot of drawdown.

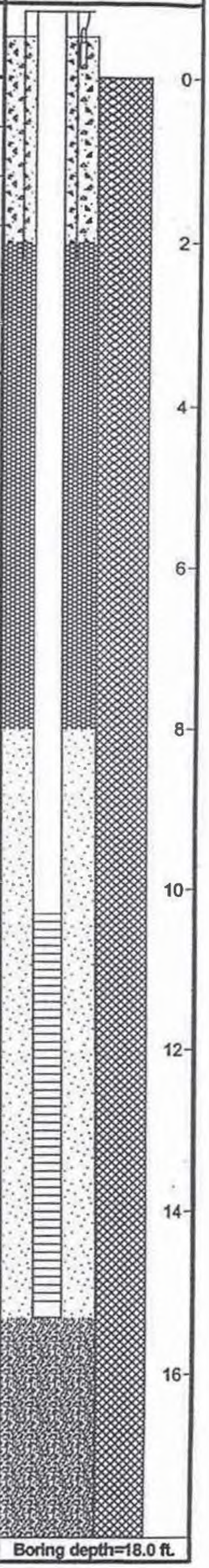
Date	Time	Cumulative Volume Removed (gals)	Temp (°C)	Specific Conductivity (µmhos/cm)	pH (S.U.)	Turbidity (NTU)
4/29/02	1726	5	10.5	7970	7.13	
4/30/02	0907	20	14.1	8690	6.99	
4/30/02	0925	70	14.6	8660	7.02	
4/30/02	0939	110	14.6	8690	6.98	
4/30/02	1057	170	15.4	8510	7.07	
4/30/02	1140	355	15.4	8270	7.11	

Recovery Data



Sampling Equipment:

Comments:



Boring depth=18.0 ft.

Eagon & Associates, Inc.

BOREHOLE LOG

Site Name and Location: Royalton Road Landfill Broadview Heights, OH	**Drilling Methods:** 6 1/4" ID HSA & Air Rotary				**Boring Number** MW-14D
Drilling Firm: *Frontz Drilling*	**DATE**	**TIME**	**DEPTH DRILLED (ft)**	**WATER LEVEL (ft)**	
Driller / Rig: *Rob Hamilton/CME-750*	4/23/02	1130	24.5	~10.0'	*Page 1 of 3*
Logged by: *H. Downer/D. Sugar*					
Coordinates: *14150.20N 29760.30E*	**Sampling Methods:** ST = Shelby Tube WS = Waxed Sample	SS = Split Spoon CS = Continuous Sampler C = Coring			**Start** Time 0930 / **Finish** Time 1250
Surface Elevation: *985.20 ft/MSL*					
Surface Conditions / Weather: *Firm, grass covered area adjacent to access road./40° Overcast.*					Date 4/23/02 / Date 5/1/02

Remarks: Initial borehole was plugged due to poor surface casing seal. Moved approximately 5' from original location.

Depth (feet)	Sample Method	Sample Recovery (feet)	Blows/6 in or RQD	SAMPLE DESCRIPTION	Graphic Log	Remarks	USCS
1	SS-1	1.2	1 3 3 6	Light brownish gray to pale brown SANDY CLAYEY SILT. Trace sandstone and shale fragments. Trace roots. Soft. Medium plasticity. No dilatancy. Medium to high toughness. Moist. No odor. No reaction to HCl. SOIL FILL.	▨	6 1/4" ID HSA, continuous 2" OD, 2' Drive Split spoons. Driven with 140 lb hammer. 0.0-31.5' Logged by D. Sugar.	CL
2 3	SS-2	1.1	2 3 4 3		▨		
4 5	SS-3	0.9	1 1 1 1	Unsorted, jumbled fabric. Color is variable (layered to mottled). Yellowish brown to greenish gray. Below 4.0' becomes very soft. Moist. Trace organic material, plant fibers, twigs.	▨		
6 7	SS-4	1.9	2 1 3 1	Below 6.5' higher percentage of shale fragments. Higher clay content. Possibly silty clay classification. Trace wood fragments.	▨	No reaction to HCl.	
8 9	SS-5	0.4	6 2 1 3		▨		
10 11	SS-6	1.1	1 3 4 2	Below 10.0' primarily gray shale fragments. Trace wood fragments at bottom of recovery.	▨	Wet below 11.0'. Appears to be entering borehole from a relatively small interval between 11.0' and 13.0'.	
12 13	SS-7	1.5	3 5 4 6	Trace wood fragments (may be from 10-12' interval).	▨		
14 15	SS-8	0.6	5 7 9 6	Trace wood fragments at 14.0'-14.2' (probably carried down from 10-12' interval).	▨	No reaction to HCl.	
16 17	SS-9	0.9	2 8 5 7		▨		
18 19	SS-10	0.7	4 5 6 12	Below 18.0' primarily shale fragments.	▨	18.0'-20.0' angular shale fragment wedged in sampler tip.	

Royalton Road Landfill Broadview Heights, OH	BOREHOLE LOG	Boring Number MW-14D

Remarks: Initial borehole was plugged due to poor surface casing seal. Moved approximately 5' from original location.

Depth (feet)	Sample Method	Sample Recovery (feet)	Blows/6 in or RQD	SAMPLE DESCRIPTION	Graphic Log	Remarks	USCS
21	SS-11	0.7	5 7 11 19	Brownish gray to pale brown SOIL FILL. (cont'd). Primarily shale fragments with clayey silt/silty clay matrix. Moist.			CL
22 23	SS-12	1.1	9 17 13 38	Change at 22.6'. Gray, grayish brown and yellowish brown CLAYEY SAND and GRAVEL. Very dense. Poorly sorted. Weathered. Damp. Slightly cohesive. Change at 24.0'.		Does not appear to be wet. Original stream-bed.?	GC
24	SS-13	0.7	23 50/4	Medium gray SHALE. Thinly bedded. Fissile. Light brown to yellowish orange oxidation along bedding planes and subvertical fractures. Soft. Damp to dry.		1132-1134 Flushed borehole with 50 gal. water. Set 4" PVC casing, grouted with "Pure Gold" grout. Finished setting casing at 1520. 4/26/02 Tried to advance borehole in rock using air rotary. Casing seal did not hold. No reaction to HCl. Numerous subvertical and horizontal fractures. Weathered.	
25 26 27 28 29 30	NS					Plugged borehole with bentonite grout. 4/29/02 Moved 5.0' from original borehole and straight drilled to 30.5' with 6 1/4" ID HSA. Set 4" steel casing grouted in place with cement bentonite grout. Used 12 bags cement. 15 lbs bentonite. ~150 gal. grout Below 30.5' Logged by Hugh Downer. 5/1/02 Prepare to core below 31.5'. Started coring at 0900, air circulation, borehole is dry at 31.5'.	
31 32 33 34 35	C-1	0	0%	Core barrel blocked by piece of very hard, fine-grained, calcareous siltstone. Moderate brown to moderate yellowish brown. Low reaction to HCl. Probably hit horizon early in run and cut through softer shale with siltstone wedged in core barrel. Very hard. Unfossiliferous.			
36 37	C-2	0.3	0%	SHALE. Dark gray, very fine-grained. Soft, thinly laminated. Dry. Possibly weathered. Very little recovery. Very little mica <1%.			
38 39 40	C-3	3.0	83%	Below 37.5' color varies between dark gray to dark greenish gray. Very low fissility, dry. Unweathered below 38.1'. No evidence of fractures. All breaks drilling induced. Little clay.		37.5'-38.1' Very broken. 38.1'-40.5' Competent.	
41 42 43 44	C-4	4.1	8%	Broken zone from 43.0-43.6'. Wet. No signs of oxidation. Low to moderately fissile. Moderately competent above and below zone.		W.L. = ~27.0' in drill rods after C-4 run. 43.0'-43.6' zone appears to be producing water.	

Royalton Road Landfill
Broadview Heights, OH

BOREHOLE LOG

Boring Number **MW-14D**

Remarks: Initial borehole was plugged due to poor surface casing seal. Moved approximately 5' from original location.

Depth (feet)	Sample Method	Sample Recovery (feet)	Blows/6 In or RQD	SAMPLE DESCRIPTION	Graphic Log	Remarks	USCS
				Dark greenish gray to dark gray SHALE (cont'd).			
46							
47							
48	C-5	5.15	76%				
49							
50							
51				Bottom of Corehole = 50.5'. Bottom of Borehole = 50.3'.		1220-1250 Reamed with 3 7/8" Tri-Cone bit using air to 50.3'.	
52							
53				Well MW-14D installed in borehole.		Developed borehole with air for approximately 15 minutes after reaming corehole.	
54							
55							
56							
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69							

Eagon & Associates, Inc.

Well Number
MW-14D

Monitoring Well Installation Report

Site Name and Location: *Royalton Road Landfill, Broadview Heights, OH*	Completion Date: *5/1/02*
Coordinates: *14150.20N 29760.30E*	Borehole Depth (ft): *50.5*
Elevation Top of Casing (ft/MSL): *987.50*	Borehole Diameter (in): *0-30.5' 11 1/4"; 30.5'-50.25'=4"*
Elevation Ground Surface (ft/MSL): *985.20*	Drilling Methods: *6 1/4" ID HSA & Air Rotary*
Installed By: *R. Hamilton/Frontz Drilling*	Completed Drilling: *5/1/02*
Supervised By: *Hugh Downer/Eagon & Associates, Inc.*	Drilling Water Used (gals): *None*

Well Design

Component	Materials	Depth (LSD)	Elevation
Well Protector	5" diameter x 5' Steel with locking cap	-2.8 - 2.2	988.0 - 983.0
Riser	2" Schedule 40 PVC	-2.3 - 40.3	987.5 - 944.9
Secondary Casing	4" Steel	-0.7 - 30.5	985.9 - 954.7
Surface Seal	2'x 2' Concrete	-0.5 - 1.0	985.7 - 984.2
Grout Seal	"Pure Gold" Grout	1.0 - 30.5	984.2 - 954.7
Grout Seal	Cement-Bentonite Grout	1.1 - 30.5	984.1 - 954.7
Grout Seal	"Pure Gold" Grout	30.5 - 34.0	954.7 - 951.2
Bentonite Seal	3/8" Bentonite Chips	34.0 - 38.0	951.2 - 947.2
Sand Pack	No. 5 Sand	38.0 - 50.3	947.2 - 934.9
Screen	2" Schedule 40 PVC 20-slot	40.3 - 49.8	944.9 - 935.4
Well Point Blank	2" Schedule 40 PVC End Cap	49.8 - 50.3	935.4 - 934.9

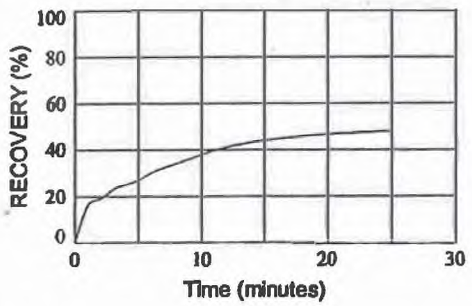
Well Development

Well Depth (ft,TOC):	Depth to Water (ft,TOC):	Well Volume (gals):	Volume Purged (gals):
52.52	*27.04*	*4.3*	*300.0*

Development Method:
Submersible pump (Grundfos Rediflow 2). Pumped between 1 to 4.5 gpm.

Date	Time	Cumulative Volume Removed (gals)	Temp (°C)	Specific Conductivity (µmhos/cm)	pH (S.U.)	Turbidity (NTU)
5/2/02	0859	30	15.7	5990	7.05	
5/2/02	1525	70	14.5	5260	7.36	
5/2/02	1550	140	14.5	5000	7.42	
5/2/02	1625	170	14.1	5240	7.53	
5/2/02	1657	280	14.3	4710	7.64	
5/2/02	1705	300	14.4	4720	7.54	

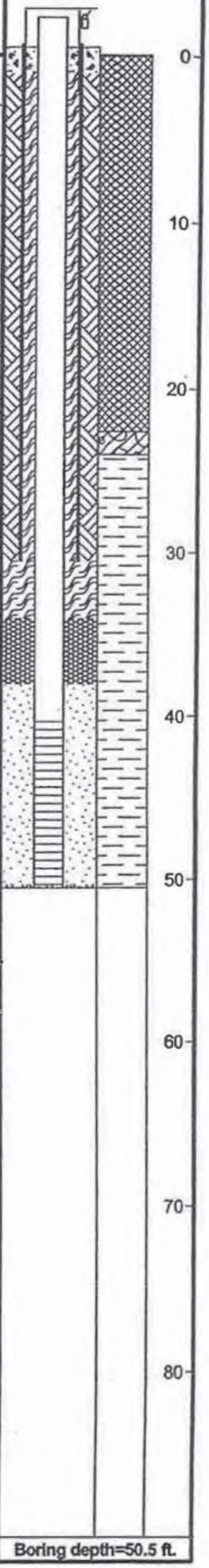
Recovery Data



ampling Equipment:

Comments:

50.3' - 50.5' Shale Cuttings.



Eagon & Associates, Inc.

BOREHOLE LOG

Site Name and Location: Royalton Road Landfill Broadview Heights, OH	**Drilling Methods:** 6 1/4" ID HSA / Air Rotary				**Boring Number** **MW-15D**
Drilling Firm: *Frontz Drilling*	**DATE**	**TIME**	**DEPTH DRILLED (ft)**	**WATER LEVEL (ft)**	
Driller / Rig: *Rob Hamilton/CME-750*	4/24/02	0735	30.0	Dry	*Page 1 of 3*
Logged by: *David J. Sugar*	4/29/02	1300	35.8	Dry	

Coordinates: *13948.00N 29888.10E*	Sampling Methods: ST = Shelby Tube WS = Waxed Sample	SS = Split Spoon CS = Continuous Sampler C = Coring	**Start** Time 1525 / **Finish** Time 1405
Surface Elevation: *985.80 ft/MSL*			
Surface Conditions / Weather: *Adjacent to access road./50° Partly cloudy*			Date 4/23/02 / Date 4/30/02

Remarks: Initial HSA borehole was plugged due to poor surface casing seal. Moved approximately 5' from original location.

Depth (feet)	Sample Method	Sample Recovery (feet)	Blows/6 in or RQD	SAMPLE DESCRIPTION	Graphic Log	Remarks	USCS
1	SS-1	1.2	4 7 3 5	Medium gray road bed gravel. Moist. SOIL FILL.	▨	Advanced borehole with 6 1/4" ID HSA.	CL
2 3	SS-2	0.3	5 4 2 3	Below 2.0' primarily shale fragments. Gray. Unsorted jumbled fabric. Moist. Silty clay matrix.	▨	Note: Original borehole for surface seal was plugged with bentonite grout, could not maintain a positive seal with the surface casing when air was applied to core. Re-drilled borehole (5'SE) and installed steel surface casing sealed with cement-bentonite grout.	
4 5	SS-3	1.5	4 3 3 6		▨		
6 7	SS-4	1.0	5 3 5 4	6.0'-8.0' Trace water. Trace grayish brown and brown colors, become mottled. Change at 8.0'.	▨	Auger cuttings are dry.	
8 9	SS-5	0.8	4 6 7 15	Light brown SANDY CLAYEY SILT. SOIL FILL. Trace gravel, very weathered sandstone and shale primarily, trace chert, quartz, and igneous clasts (sub-rounded). Medium stiff. Medium plasticity. No dilatancy. Medium toughness. Moist to damp. No reaction to HCl. Unsorted jumbled fabric.	▨		CL
10 11	SS-6	1.1	7 4 5 7		▨	10.9'-11.0' Laminated clay seam.	
12 13	SS-7	1.5	9 7 11 9	Below 12.9' gray laminated clay to silt. Damp. Change at 14.0'.	▨	Borehole is dry.	
14 15	SS-8	0.2	11 5 5 8	Gray shale fragments. Silty clay matrix. Medium stiff. Damp to moist. Unsorted jumbled fabric. SOIL FILL.	▨	Borehole is dry.	CL
16 17	SS-9	1.6	5 7 9 15	Below 16.0' becomes mottled grayish brown, brown and gray.	▨		
18 19	SS-10	1.6	5 6 5 10	Below 18.0' primarily clayey silt with shale fragments.	▨		

Royalton Road Landfill Broadview Heights, OH	BOREHOLE LOG	Boring Number MW-15D

Remarks: Initial HSA borehole was plugged due to poor surface casing seal. Moved approximately 5' from original location.

Depth (feet)	Sample Method	Sample Recovery (feet)	Blows/6 in or RQD	SAMPLE DESCRIPTION	Graphic Log	Remarks	USCS
21	SS-11	0.8	5 11 13 9	Grayish brown to gray shale fragmentsL. Primarily shale fragments with a clayey silt matrix. Unsorted jumbled fabric. Stiff/medium stiff. No reaction to HCl. SOIL FILL.	▩	No indication of water. Damp to moist.	CL
22 23	SS-12	1.6	10 13 11 15		▩		
24 25	SS-13	1.9	4 3 5 8	At 24.7' tree branch fragment.	▩		
26 27	SS-14	1.0	11 15 11 17	Change at 28.3'.	▩		
28 29	SS-15	1.4	4 6 7 5	Light brown fine SILTY SAND to SAND. Trace to no gravel. Trace black organic material. Moderate to well sorted. Loose. Moist.	░	Original material possibly GM in part.	SM
30 31	SS-16	1.0	6 12 13 17	Change at 30.9'. Medium gray SHALE. Thinly bedded. Soft. No indication of weathering.	░ ▤	Stop for day 1730 4/23/02. Begin 4/24/02 0740. 0810 finish augering to 33.7' (refusal). Install 4" PVC casing, grout in place with "Pure Gold" grout.	
32	SS-17	0.4	50/5		▤		
33 34	NS				▤	4/26/02 Clean out 4" casing. Will advance borehole with NX core. Grout seal did not hold. Did not core	
35 36 37	C-1	2.15	17%	Dark greenish gray to dark gray SHALE. Thinly bedded. Soft. Unweathered. Sample is broken along bedding planes but appears to be drilling induced. No fracturing is evident. Does appear to have relatively high clay content but would not describe as argillaceous.	▤	4/29/02 Move 5' SE, auger to 35.3' with 6 1/4" ID HSA. Set 4" Steel casing, grout in place with Portland cement. Used 165 gal. grout/12 bags cement. 4/30/02 0950, prepare to core at 35.3', 1010 start coring, air circulation.	
38 39	C-2	1.9	50%		▤	After C-1 run Borehole is dry.	
40 41 42 43 44	C-3	4.0	8%	41.25'-41.40' Near vertical fracture. May be drilling induced. No sign of weathering or precipitate on face. 41.25'-41.85' Broken, soft zone.	▤	After C-2 run Borehole is dry. Water on rods after C-3 run. Could not get a reading with WL tape. Water level near 40.5'. Sample appeared to be wet also.	

Royalton Road Landfill Broadview Heights, OH	BOREHOLE LOG	Boring Number MW-15D

Remarks: Initial HSA borehole was plugged due to poor surface casing seal. Moved approximately 5' from original location.

Depth (feet)	Sample Method	Sample Recovery (feet)	Blows/6 in or RQD	SAMPLE DESCRIPTION	Graphic Log	Remarks	USCS
46 47 48 49 50	C-4	4.4	71%	Dark greenish gray to dark gray SHALE (cont'd). 49.65'-49.85' Near 80° fracture, may be drilling induced. No indication of weathering.		C-4 run initially removed a few gallons of water out of borehole and the remainder of the run returns were dust.	
51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69				Bottom of Corehole = 50.25'. Reamed corehole to 4" diameter to a depth of 50.0'. Well MW-15D installed in borehole.		1354 start reaming borehole to 4". 1405 finish reaming to 50.0'. Borehole making at least a couple gpm. Water returns are foamy with a relatively strong odor. Developed borehole with air for approximately 15 minutes after reaming corehole. Original borehole with PVC caisng was plugged on 5/2/02. 4" PVC casing was removed and the borehole was filled with bentonite grout.	

Eagon & Associates, Inc.

Well Number
MW-15D

Monitoring Well Installation Report

Site Name and Location: *Royalton Road Landfill, Broadview Heights, OH*	Completion Date: *4/30/02*
Coordinates: *13948.00N 29888.10E*	Borehole Depth (ft): *50.3*
Elevation Top of Casing (ft/MSL): *988.42*	Borehole Diameter (in): *0-35.3'=11 1/4" 35.3'-50.0'=4"*
Elevation Ground Surface (ft/MSL): *985.80*	Drilling Methods: *6 1/4" ID HSA / Air Rotary*
Installed By: *R. Hamilton/Frontz Drilling*	Completed Drilling: *4/30/02*
Supervised By: *David J. Sugar/Eagon & Associates, Inc.*	Drilling Water Used (gals): *None*

Well Design

Component	Materials	Depth (LSD)	Elevation
Well Protector	5" diameter x 5' Steel with locking cap	-3.0 - 2.0	988.8 - 983.8
Riser	2" Schedule 40 PVC	-2.6 - 50.0	988.4 - 935.8
Secondary Casing	4" Steel	-0.7 - 35.3	986.5 - 950.5
Surface Seal	2' x 2' Concrete	-0.5 - 1.0	986.3 - 984.8
Grout Seal	"Pure Gold" Grout	1.0 - 34.0	984.8 - 951.8
Grout Seal	Cement Bentonite Grout	1.1 - 35.3	984.7 - 950.5
Bentonite Seal	3/8" Bentonite Chips	34.0 - 35.3	951.8 - 950.5
Bentonite Seal	3/8" Bentonite Chips	35.3 - 38.0	950.5 - 947.8
Sand Pack	No. 5 Sand	38.0 - 50.0	947.8 - 935.8
Screen	2" Schedule 40 PVC 20-slot	40.0 - 49.4	945.8 - 936.4
Well Point Blank	2" Schedule 40 PVC End Cap	49.4 - 50.0	936.4 - 935.8

Well Development

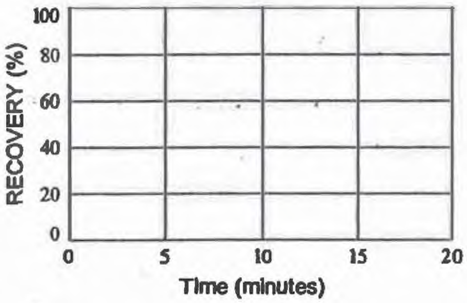
Well Depth (ft,TOC):	Depth to Water (ft,TOC):	Well Volume (gals):	Volume Purged (gals):
52.61	*33.73*	*3.2*	*250.0*

Development Method:

Submersible pump (Grundfos Rediflow 2). Pumped well at 2 gpm.

Date	Time	Cumulative Volume Removed (gals)	Temp (°C)	Specific Conductivity (μmhos/cm)	pH (S.U.)	Turbidity (NTU
5/1/02	0802	10	14.2	9180	7.14	
5/1/02	0919	36	15.2	9580	7.11	
5/1/02	1115	95	15.2	9070	7.03	
5/1/02	1254	145	14.9	8910	7.07	
5/1/02	1526	175	17.0	9200	7.19	
5/1/02	1720	245	17.9	9010	7.17	

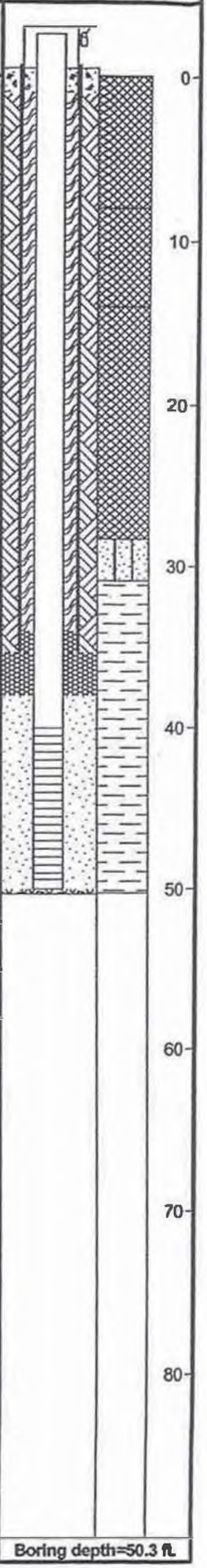
Recovery Data



Sampling Equipment:

Comments:

50.0' - 50.3' Shale Cuttings.



Boring depth=50.3 ft.

Eagon & Associates, Inc.

BOREHOLE LOG

Site Name and Location: Royalton Road Landfill Broadview Heights, OH	**Drilling Methods:** 4 1/4" ID HSA				**Boring Number** MW-16
Drilling Firm: *Frontz Drilling*	**DATE**	**TIME**	**DEPTH DRILLED (ft)**	**WATER LEVEL (ft)**	
Driller / Rig: *Rob Hamilton/CME-750*					*Page 1 of 2*
Logged by: *David J. Sugar*					

Coordinates: *12927.10N 28137.70E*

Surface Elevation: *1,131.50 ft/MSL*

Sampling Methods:
ST = Shelby Tube
WS = Waxed Sample
SS = Split Spoon
CS = Continuous Sampler
C = Coring

Start	Finish
Time 1618	Time 1330
Date 4/24/02	Date 4/25/02

Surface Conditions / Weather: *Flat dirt pad in wooded area. Soft and moist./*

Remarks:

Depth (feet)	Sample Method	Sample Recovery (feet)	Blows/6 in or RQD	SAMPLE DESCRIPTION	Graphic Log	Remarks	USCS
1 2	SS-1	1.9	3 7 5 7	Grayish borwn SILT. Trace clay. Little sand. Trace gravel and roots. Soft. Massive appearance. Low plasticity and dry strength. SOIL. Change at 0.6'. Light brown CLAYEY SILT/SILT CLAY. Little sand. Trace gravel, subrounded, less than .5" diameter. Medium stiff. High plasticity. Dry strength and toughness. No diltancy. No odor. No reaction to HCl. Massive to slight layered structure. Weathered TILL.		Trace gray reduction zones along root trace, may be following desiccation fractures.	ML CL
3 4	SS-2	1.6	7 5 18 15	2.7'-2.9' small sandstone cobble. Below 2.0' color changes to brown/grayish brown. Higher percentage of clasts. (Predominately sandstone and shale). Very stiff. Damp.		Below 2.0' slight reaction to HCl.	
5 6	SS-3	2.0	11 16 17 19			Below 5.0 moderate to strong reaction to HCl.	
7	SS-4	0.6	19 33 50/3	Underlying contact is approximate. May be as high as 6.5'. Change at 7.0'. Pale olive, olive gray, and light olive brown LIMESTONE. Trace to some sand. Fossiliferous, crynoid stems. Medium hard. Highly bedded. Near horizontal. Some darker banding. Upper 0.6' of recovery is very broken and fractured. Trace solutioning. No indication of water.		4 1/4" ID HSA borehole is 9" diameter. 1700 stop drilling at 8.0' will switch to Nx Core tomorrow. 0800 4/25/02 set 4" sch 40 PVC casing to 8.0', grouted with Benseal, gravity placed and hydrated with water (100 lbs Benseal). Switched over to Nx core. Air circulation. Start coring at 1022.	
8	NS						
9 10	C-1	1.0	18%				
11 12 13 14 15	C-2	5.1	21%	Change at 10.9'. Moderate olive brown to light olive brown SHALE to SANDY SHALE. Thinly bedded. Trace Mica. Soft. Trace marine fossils (primarily crynoid stems). Numerous bedding plane breaks. No significant vertical fracturing. No reaction to HCl. 11.8'-12.2' Olive gray limestone seam. Fossiliferous. Medium hard. Strong reaction to HCl.		Cuttings are dust. Numerous bedding plane breaks (at 0.05' to 0.2' intervals). Faces are yellowish orange to black, manganese and iron precipitate. Generally moist along bedding planes. Still blowing heavy dust. No sign of water.	
16 17 18 19	C-3	5.0	0%	Some olive gray color below 15.0'. 17.2'-17.8' greenish gray to medium bluish gray, fine SANDSTONE. Thinly bedded. Micaceous. Weathered along some bedding planes. Very slight to no reaction to HCl.		C-3 run heavy dust. No sign of water.	

Eagon & Associates, Inc.

Royalton Road Landfill Broadview Heights, OH	**BOREHOLE LOG**	Boring Number MW-16

Remarks:

Depth (feet)	Sample Method	Sample Recovery (feet)	Blows/6 in or RQD	SAMPLE DESCRIPTION	Graphic Log	Remarks	USCS
21 22 23 24	C-4	4.6	0%	Moderate olive brown to olive gray SHALE to SANDY SHALE (cont.'d) Trace bluish gray color generally near center of core pieces. Has somewhat of a layered color appearence. 23.2'-23.3' bluish gray fine sandstone seam. Thinly bedded. Micaceous.		Numerous bedding plane breaks typically at 0.1' to 0.3' intervals. Generally faces are oxidized with iron oxide or manganese oxide. C-4 run, heavy dust, no indication of water. 0.5' of water on core barrel after C-4 run. Measured water level at 23.0'.	
25 26 27	C-5	2.9	12%	25.5'-26.0' bluish gray fine sandstone seam thinly bedded. Micaceous.		Remaining runs made a trace of water when air was started but returns quickly turned to dust when coring started.	
28 29	C-6	1.8	0%			Having trouble with sample feeding into barrel. Running short runs.	
30 31	C-7	1.8	0%	Below 30.0' color changes to dark olive brown/olive gray.		1413 finished coring at 31.8'. Will ream borehole (4" diameter) to 33.0' and set well. 1446 start reaming. 1330 finish reaming to 33.0'.	
32	NS						
33 34 35 36 37 38 39 40 41 42 43 44				Bottom of borehole = 33.0' Monitoring well MW-16 set in borehole.			

Eagon & Associates, Inc.

Monitoring Well Installation Report

Well Number
MW-16

Site Name and Location: *Royalton Road Landfill, Broadview Heights, OH*

Completion Date: *4/25/02*

Coordinates: *12927.10N 28137.70E*

Borehole Depth (ft): *33.0*

Elevation Top of Casing (ft/MSL): *1,133.67*

Borehole Diameter (in): *0.0-8.0=9" 8.0-33.0=4"*

Elevation Ground Surface (ft/MSL): *1,131.50*

Drilling Methods: *4 1/4" ID HSA*

Installed By: *R. Hamilton/Frontz Drilling*

Completed Drilling: *4/25/02*

Supervised By: *David J. Sugar/Eagon & Associates, Inc.*

Drilling Water Used (gals): *None*

Well Design

Component	Materials	Depth (LSD)	Elevation
Well Protector	5"x 5' steel protector w/ locking cap	-2.7 - 2.3	1134.2 - 1129.2
Riser	2" Sch. 40 PVC	-2.2 - 25.5	1133.7 - 1106.0
Surface Seal	2' Sq. x 2' Concrete	-0.5 - 2.0	1132.0 - 1129.5
Grout Seal	"Pure Gold"	2.0 - 20.0	1129.5 - 1111.5
Bentonite Seal	3/8" Bentonite Chips	20.0 - 23.0	1111.5 - 1108.5
Sand Pack	No. 5 Sand	23.0 - 30.0	1108.5 - 1101.5
Screen	2", Schedule 40 PVC 20-slot	25.5 - 29.8	1106.0 - 1101.7
Well Point Blank	2"Schedule 40 PVC end cap	29.8 - 30.0	1101.7 - 1101.5
Bentonite Seal	3/8" Bentonite Chips	30.0 - 33.0	1101.5 - 1098.5

Well Development

Well Depth (ft,TOC): *32.25*

Depth to Water (ft,TOC): *26.70*

Well Volume (gals): *0.9*

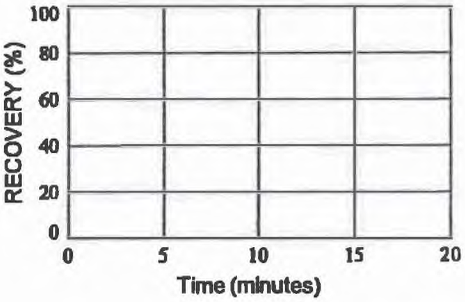
Volume Purged (gals): *55.0*

Development Method:

Bailing and pumping with submersible (Grundfos Rediflow2). Well pumped at 0.25 gpm.

Date	Time	Cumulative Volume Removed (gals)	Temp (°C)	Specific Conductivity (µmhos/cm)	pH (S.U.)	Turbidity (NTU)
4/29/02	1610	5	12.7	1231	6.55	
4/30/02	1433	15	15.6	745	6.46	
4/30/02	1459	20	16	1465	6.56	
4/30/02	1516	25	16	1499	6.51	
4/30/02	1715	55	15.9	1472	6.57	

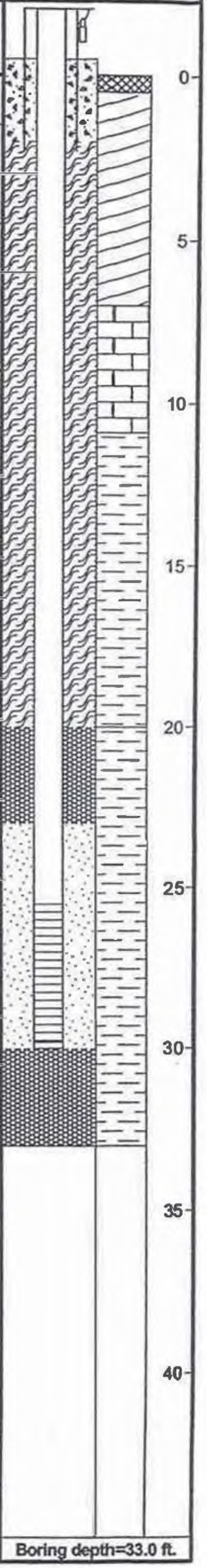
Recovery Data



ampling Equipment:

Comments:

After reaming to 33.0' borehole was maintining about one foot of water and cascading water was observed. Plugged back borehole with holeplug to 30.0' to seal below perching zone prior to setting well.



Boring depth=33.0 ft.

Eagon & Associates, Inc.

BOREHOLE LOG

Site Name and Location: Royalton Road Landfill Broadview Heights, OH	Drilling Methods: 4 1/4" ID HSA				Boring Number MW-17S
Drilling Firm: *Frontz Drilling*	DATE	TIME	DEPTH DRILLED (ft)	WATER LEVEL (ft)	
Driller / Rig: *Rob Hamilton/CME-750*	4/26/02	1525	25.3	23.7	Page 1 of 2
Logged by: *David J. Sugar*	4/29/02	0825	25.3	22.1	

Coordinates: *14259.10N 29764.00E*	Sampling Methods: ST = Shelby Tube WS = Waxed Sample	SS = Split Spoon CS = Continuous Sampler C = Coring	Start	Finish
Surface Elevation: *982.30 ft/MSL*			Time 1430	Time 1520
Surface Conditions / Weather: *Grass area on berm area adjacent to stream./50° Sunny*			Date 4/26/02	Date 4/26/02

Remarks:

Depth (feet)	Sample Method	Sample Recovery (feet)	Blows/6 in or RQD	SAMPLE DESCRIPTION	Graphic Log	Remarks	USCS
1 2	SS-1	1.1	4 3 5 3	Greenish gray to yellowish brown CLAYEY SILT. Possibly silty clay in part. Trace shale and sandstone clasts. Unsorted, disturbed structure. Soft. High plasticity, dry strength, and toughness. No dilatancy. No reaction to HCl. Moist. SOIL FILL	▨	4 1/4" ID HSA (9" Borehole)	CL
3 4	SS-2	0.7	4 6 3 6		▨		
5 6	SS-3	1.8	5 5 7 9	4.3'-4.4' Plastic cup piece. Sampled through the side of one plastic cup. Damp.	▨		
7 8	SS-4	0.9	5 10 8 10	Piece of wire at 6.0'.	▨		
9 10	SS-5	1.2	5 8 8 5		▨		
11 12	SS-6	0.65	4 4 6 8		▨		
13 14	SS-7	1.2	6 4 4 9		▨		
15 16	SS-8	1.2	3 5 3 4		▨		
17 18	SS-9	1.4	7 5 13 11	Wood fragment at 16.5'.	▨		
19	SS-10	1.0	9 3 3 4	Higher percentage of shale and sandstone fragments with depth.	▨		

Royalton Road Landfill Broadview Heights, OH	BOREHOLE LOG	Boring Number MW-17S

Remarks:

Depth (feet)	Sample Method	Sample Recovery (feet)	Blows/6 in or RQD	SAMPLE DESCRIPTION	Graphic Log	Remarks	USCS
21	SS-11	1.2	3 3 4 5	Greenish gray to yellowish brown CLAYEY SILT. SOIL FILL (cont'd).	▨		CL
22	SS-12	1.2	7 5 6 7		▨	No indication of water until 23.0'.	
23				Below 23.0' becomes wet. Underlying contact may be as high as 23.2'. Change at 24.0'.	▨		
24	SS-13	0.8	13 50/3	Greenish gray SAND with GRAVEL. Trace to little silt. Trace organic material, leaf/twig fragments. Poorly sorted. Medium dense. Wet. Change at 24.7'.	°	Original material. Possibly GP in part.	GM
25	NS			Medium gray SHALE.	⚋		
26				Bottom of Borehole = 25.3'. Well MW-17S installed in borehole.			
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BOREHOLE LOG TON.GPJ ELIVER.GPJ 8/8/02

Eagon & Associates, Inc.

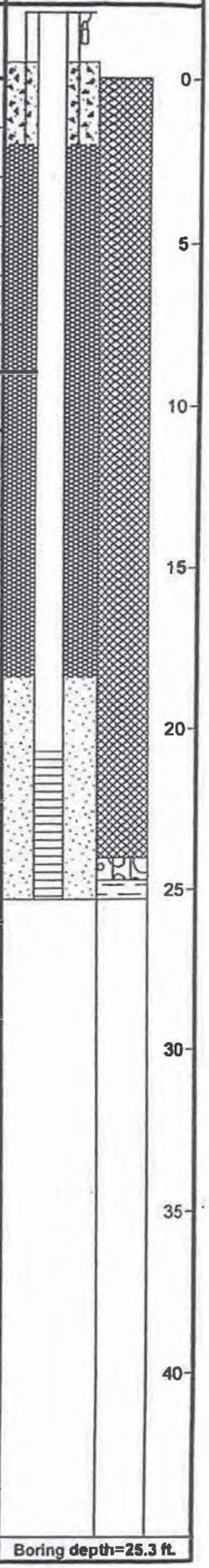
Well Number
MW-17S

Monitoring Well Installation Report

Site Name and Location: *Royalton Road Landfill, Broadview Heights, OH*	Completion Date: *4/29/02*
Coordinates: *14259.10N 29764.00E*	Borehole Depth (ft): *25.3*
Elevation Top of Casing (ft/MSL): *984.74*	Borehole Diameter (in): *9"*
Elevation Ground Surface (ft/MSL): *982.30*	Drilling Methods: *4 1/4" ID HSA*
Installed By: *R. Hamilton/Frontz Drilling*	Completed Drilling: *4/26/02*
Supervised By: *David J. Sugar/Eagon & Associates, Inc.*	Drilling Water Used (gals): *None*

Well Design

Component	Materials	Depth (LSD)	Elevation
Well Protector	5" diameter x 5' Steel	-2.9 - 2.1	985.2 - 980.2
Riser	2" Schedule 40 PVC	-2.4 - 20.7	984.7 - 961.6
Surface Seal	2' x 2' Concrete	-0.5 - 2.0	982.8 - 980.3
Bentonite Seal	3/8" Bentonite Chips	2.0 - 18.4	980.3 - 963.9
Sand Pack	No. 5 Sand	18.4 - 25.3	963.9 - 957.0
Screen	2" Schedule 40 PVC 20-slot	20.7 - 25.2	961.6 - 957.1
Well Point Blank	2" Schedule 40 PVC End Cap	25.2 - 25.3	957.1 - 957.0



Boring depth=25.3 ft.

Well Development

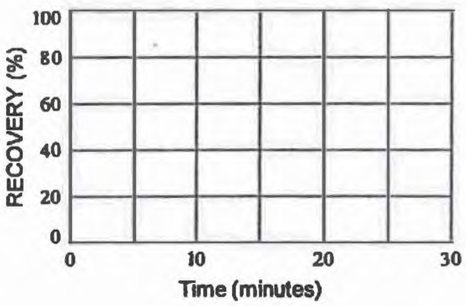
Well Depth (ft,TOC):	Depth to Water (ft,TOC):	Well Volume (gals):	Volume Purged (gals):
27.67	*24.53*	*0.5*	*100.0*

Development Method:

Bailing, Surge Block, & Pumping (Grundfos Rediflow 2). Pumped well at 1 gpm.

Date	Time	Cumulative Volume Removed (gals)	Temp (°C)	Specific Conductivity (µmhos/cm)	pH (S.U.)	Turbidity (NTU)
4/29/02	1510	5	13.1	5540	6.81	
4/30/02	1940	30	14	7460	6.76	
5/1/02	1709	45	15.5	7660	7.23	
5/2/02	1847	55	13.3	7200	7.11	
5/3/02	0835	70	13.7	7780	6.92	
5/3/02	0909	100	14.9	7870	6.94	

Recovery Data



ampling Equipment:

Comments:

APPENDIX B.

WATER-QUALITY SUMMARY TABLES ON CD

Data Summary Table, Well MW-1R

Name: Royalton Road

Location ID: MW-1R
Number of Sampling Dates: 32

Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Antimony, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	2.1	3
Arsenic, total	ug/L	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	3.4	12.9	3.4	9	2.3
Barium, total	mg/l	0.11	0.11	0.1	0.103	0.1	0.0921	0.171	0.197
Beryllium, total	mg/l	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.004	<0.004	<0.004	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	4.9	4.9
Nickel, total	mg/l	0.028	0.021	0.022	0.023	0.026	0.017	0.02	0.018
Selenium, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	11.7	<0.02 mg/l	<0.02 mg/L	<0.02 mg/L	<0.02 mg/L
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.0015 mg/l	<0.001 mg/l	<0.001 mg/l	<1	<1	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.005	0.011	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<100	<100	<100	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Benzene	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Bromoform	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.04	<0.1	<0.1
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.045	<0.045	<0.045	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<5	<5	<5	<1	<10	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<5	<5	<5	<1	<10	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<5	<5	<5	<1	<1	<2	<2	<2
1,1-Dichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<5	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Bromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1

Location ID: MW-1R
Number of Sampling Dates: 32

Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Chloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<4	<4	<4	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<1	<5	<1	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Styrene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<5	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<5	<5	<5	<3	<3	<3	<3	<3
Ammonia Nitrogen	mg/l	13.4	13.8	18.9	12.4	13.8	12.2	5.59	3.43
Chloride	mg/l	855	668	614	762	578	640	678	602
Sodium	mg/l	496	470	463	459	485	503	892	840
Potassium, total	mg/l	28	26	24	25.2	24.7	24.4	15.3	12
Temperature, Field	deg C	14	17	14	19.9	15.2	16.2	12	15.1
pH, Field	S.U.	7.1 SU	6.83 SU	6.81 SU	6.7 SU	7.28 SU	7.18 SU	7.3 SU	7.26 SU
Specific Conductivity, Field	umhos/cm	3750	3720	1850	3620	2720	5519	4380	3780
Total Dissolved Solids	mg/l	2350	2330	2250	2070	2130	2110	2330	2150
Alkalinity (calcium carbonate)	mg/L	1020	979	901	905	791	881	930	905
Nitrate,Nitrite	mg/l	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	169	156	197	192	153	161	230	244
Magnesium, total	mg/L	127	104	116	109	103	101	35.4	24.6
Calcium, total	mg/L	241	227	219	228	226	222	75.8	51.6
Turbidity, Field	NTU	--	8.1	8.9	19.1	11.4	8.53	83	7.15
Iron, total	mg/L	1.35	1.34	0.85	0.67	0.56	0.81	0.17	0.08
Manganese, total	mg/L	0.18	0.14	0.14	0.134	0.13	0.121	0.042	0.029
Sulfide	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05

Location ID: MW-1R
Number of Sampling Dates: 32

Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Antimony, total	ug/L	1.1	<1	<1	1.1	<1	<1	<5	<1
Arsenic, total	ug/L	<5	1.3	3.3	2	2.6	<1	<5	1.2
Barium, total	mg/l	0.116	0.0786	0.134	0.203	0.144	0.127	0.072	0.062
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Location ID: MW-1R

Number of Sampling Dates: 32

Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.024	<0.01	<0.01
Lead, total	ug/L	9.9	8.6	7.4	5	8.1	10.2	<5	<1
Nickel, total	mg/l	0.018	0.018	0.025	0.025	0.028	0.032	0.029	0.025
Selenium, total	ug/L	<0.02 mg/L	2.1	6.7	4.5	7.4	<1	6.2	3
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	0.019	<0.01	<0.01	<0.01	0.016	0.03	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<3	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	5.8	4.81	5.75	5.75	9.58	8.27	8.33	7.7
Chloride	mg/l	543	597	696	711	700	706	640	666
Sodium	mg/l	677	574	862	691	721	642	742	767
Potassium, total	mg/l	14.4	20.8	18.4	18	19.5	17.9	15.1	16.4
Temperature, Field	deg C	15.2	17.1	10.5	16.2	11.8	17.1	18.1	17.5
pH, Field	S.U.	7.5 SU	6.91	6.84	7.01	6.44	7.3	6.85	7.07
Specific Conductivity, Field	umhos/cm	4240	3720	3740	3460	3210	3010	3480	4940
Total Dissolved Solids	mg/l	2070	2160	2240	2180	2280	2370	2240	2240
Alkalinity (calcium carbonate)	mg/L	871	893	944	923	985	954	925	937
Nitrate,Nitrite	mg/l	0.54	1.12	0.59	<0.05	0.69	1	0.43	<0.05
Sulfate	mg/L	209	189	152	163	163	149	186	156
Magnesium, total	mg/L	38.8	69	62.2	54	62.2	70.8	49.8	52
Calcium, total	mg/L	82.6	153	121	113	132	147	104	102
Turbidity, Field	NTU	5.43	2.88	12.6	3.77	1.26	9.83	8.3	3.86
Iron, total	mg/L	0.99	0.13	0.31	0.12	0.19	2.65	0.87	0.13
Manganese, total	mg/L	0.064	0.092	0.082	0.064	0.081	0.112	0.083	0.082
Sulfide	mg/l	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Antimony, total	ug/L	<1	<1	<1	<1	<1	<2	<1	<1
Arsenic, total	ug/L	4.1	2.9	9.4	1.2	1.3	<2	<1	<1
Barium, total	mg/l	0.098	0.171	0.167	0.0666	0.065	0.07	0.05	0.063
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<2	<1	<1
Nickel, total	mg/l	0.032	0.034	0.031	0.034	0.022	0.021	0.02	0.02
Selenium, total	ug/L	9.4	<1	5.3	8.6	2.8	<3	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	16.4

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Parameter Name	**Units**	**12/6/2010**	**6/21/2011**	**12/13/2011**	**6/4/2012**	**12/11/2012**	**6/3/2013**	**12/3/2013**	**6/2/2014**
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	6.21	3.23	2.68	6.83	5.68	6.6	5.57	6.33

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Chloride	mg/l	648	761	712	626	604	607	542	586
Sodium	mg/l	930	1160	1170	820	830	842	781	785
Potassium, total	mg/l	14.4	9.7	8.3	16.1	12.8	13.5	12	14.1
Temperature, Field	deg C	9.8	15.9	12.1	14.5	13	14.3	14.8	16.2
pH, Field	S.U.	7.24	7.1	7.35 SU	6.99 SU	6.85	7.47 SU	6.84	7.59
Specific Conductivity, Field	umhos/cm	3300	3610	3450	3890	3870	3900	4400	6270
Total Dissolved Solids	mg/l	2350	2510	2170	2460	2220	2280	2230	2130
Alkalinity (calcium carbonate)	mg/L	995	1090	1030	908	909	916	886	890
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	186	169	150	156	154	150	163	168
Magnesium, total	mg/L	38.8	11	9.42	46.8	37	36.7	31.9	31.6
Calcium, total	mg/L	79.6	23.9	20.4	92.6	71.9	72.4	62.5	62
Turbidity, Field	NTU	6.26	4.12	7.76	4.31	7.04	0.86	1.04	1.51
Iron, total	mg/L	0.85	1.26	1.22	0.19	0.6	0.57	0.5	0.43
Manganese, total	mg/L	0.08	0.059	0.054	0.073	0.064	0.064	0.057	0.057
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	1.2	<1	<1	<1	<1	<1	<1	<1
Barium, total	mg/l	0.119	0.048	0.134	0.045	0.068	0.055	0.154	0.08
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	0.018	0.019	0.018	0.018	0.014	0.015	0.014	0.013
Selenium, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	4.5	5.77	3.94	4.08	2.09	4.41	1.95	4.11
Chloride	mg/l	594	581	544	548	575	478	594	512
Sodium	mg/l	926	774	908	734	773	737	906	810
Potassium, total	mg/l	6.8	11.2	8.7	13	9.1	11.6	5.6	7.4
Temperature, Field	deg C	11.2	14.1	11.9	14.2	12.3	14.3	13.3	14.8
pH, Field	S.U.	7.69	6.98	7.14	7.35	7.15	7.5	7.42	7.42
Specific Conductivity, Field	umhos/cm	4120	4220	4440	3990	4239	4270	4460	3650
Total Dissolved Solids	mg/l	2250	1720	2230	1990	2200	2040	2130	2000
Alkalinity (calcium carbonate)	mg/L	937	876	873	846	896	807	1230	838
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	175	172	162	196	167	194	200	204

Location ID: MW-1R
Number of Sampling Dates: 32

Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Magnesium, total	mg/L	12	25.4	16.2	26.1	17	23.7	5.32	12
Calcium, total	mg/L	23.9	49.5	29.1	51.5	33.9	47.1	13.1	24.1
Turbidity, Field	NTU	1.53	1.44	1.05	4.8	129	2.2	1.74	2.07
Iron, total	mg/L	0.62	0.41	0.48	0.21	0.38	0.31	0.36	0.42
Manganese, total	mg/L	0.042	0.049	0.04	0.052	0.049	0.056	0.034	0.043
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Data Summary Table, Well MW-2R

Name: Royalton Road

Location ID: MW-2R
Number of Sampling Dates: 32

Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Antimony, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	<2	<2	3.7	<1	<1
Barium, total	mg/l	0.0124	<0.02	0.01328	0.013	0.02	0.0422	0.013	0.0162
Beryllium, total	mg/l	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.004	<0.004	<0.004	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	1.3	4.9	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.011	<0.01	<0.01
Selenium, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<0.02 mg/l	<0.02 mg/L	<0.02 mg/L	<0.02 mg/L
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.0015 mg/l	<0.001 mg/l	<0.001 mg/l	<1	<1	0.4	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	0.009	<0.005	<0.005
Zinc, total	mg/L	0.011	<0.005	<0.005	0.015	0.012	0.025	<0.01	<0.01
Acetone	ug/l	<100	<100	<100	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Benzene	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Bromoform	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<5	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.04	<0.1	<0.1
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.045	<0.045	<0.045	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<5	<5	<5	<1	<1	<2	<2	<2
1,1-Dichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<5	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Bromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1

Location ID: MW-2R
Number of Sampling Dates: 32

Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Chloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<4	<4	<4	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<1	<5	<1	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Styrene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<5	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<5	<5	<5	<3	<3	<3	<3	<3
Ammonia Nitrogen	mg/l	1.11	1.23	1.35	1.2	1.29	1.27	1.12	1.14
Chloride	mg/l	5	5	5	3	3	5	4.7	4.77
Sodium	mg/l	48	56.3	57.5	64.4	61.8	64.8	71.3	63.1
Potassium, total	mg/l	6.9	5.3	5.5	5.9	5.9	6.8	6.3	5.7
Temperature, Field	deg C	12	13.6	12	13.7	11	13.3	10	13.3
pH, Field	S.U.	7.4 SU	7.3 SU	7.17 SU	7.28 SU	7.37 SU	7.32 SU	7.44 SU	7.28 SU
Specific Conductivity, Field	umhos/cm	1500	1575	1200	1391	1380	1593	1459	1350
Total Dissolved Solids	mg/l	1260	1290	1280	1260	1270	1260	1290	1300
Alkalinity (calcium carbonate)	mg/L	339	334	335	333	333	344	343	335
Nitrate,Nitrite	mg/l	0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	706	725	609	748	557	639	749	692
Magnesium, total	mg/L	89.7	88.7	92.3	88	87.1	88	83.6	88.6
Calcium, total	mg/L	200	224	207	212	215	221	208	227
Turbidity, Field	NTU	25	28.6	27	25.4	78	288	37.4	64.8
Iron, total	mg/L	1.59	2.12	2.33	2.2	3.27	11.3	2.33	2.77
Manganese, total	mg/L	0.2	0.18	0.2	0.194	0.21	0.317	0.188	0.205
Sulfide	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05

Location ID: MW-2R
Number of Sampling Dates: 32

Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<1	<1	<1	<1	<1	<1	<1	1.1
Barium, total	mg/l	0.012	0.012	<0.01	0.011	0.01	0.014	0.015	0.01
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Location ID: MW-2R
Number of Sampling Dates: 32

Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	2.3	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<0.02 mg/L	1.6	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	0.015	<0.01	<0.01	<0.01	<0.01	0.037	0.019	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1

Location ID: MW-2R
Number of Sampling Dates: 32

Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<3	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	1.09	1.04	1.22	1.25	1.4	1.21	1.08	1.26
Chloride	mg/l	4	6.1	5	4.8	5	23	22	9
Sodium	mg/l	64.4	63.2	68	62.5	65.1	78.9	57.6	62.6
Potassium, total	mg/l	5.7	6.1	5.6	5.8	5.8	5.8	4.7	5.8
Temperature, Field	deg C	10.7	15.2	11.4	12.2	10.5	13.1	10.8	11.7
pH, Field	S.U.	7.33 SU	6.95	7.21	7.29	7.29	7.41	7.07	6.97
Specific Conductivity, Field	umhos/cm	1293	1170	1465	1424	1623	1338	1248	1310
Total Dissolved Solids	mg/l	1230	1260	1250	1270	1210	1320	1030	1340
Alkalinity (calcium carbonate)	mg/L	334	337	329	304	338	342	279	339
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	0.66	0.49	<0.05
Sulfate	mg/L	642	653	659	662	620	628	535	647
Magnesium, total	mg/L	87.6	82.7	78.2	81	76.4	84.4	67.1	85.8
Calcium, total	mg/L	217	211	204	205	192	213	186	217
Turbidity, Field	NTU	7.59	28.1	9.59	8.94	6.24	16.4	9.75	6.79
Iron, total	mg/L	1.55	1.71	1.37	1.47	1.07	2.06	1.05	1.93
Manganese, total	mg/L	0.192	0.184	0.167	0.172	0.159	0.199	0.164	0.242
Sulfide	mg/l	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Location ID: MW-2R
Number of Sampling Dates: 32

Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<1	<2	2.2	<1	1.9	<1	1.2	<1
Barium, total	mg/l	0.015	0.017	0.013	0.0129	0.011	0.011	0.011	0.011
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<1	<2	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10

Location ID: MW-2R
Number of Sampling Dates: 32

Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	1.08	0.94	1.01	1.19	1.25	1.25	1.2	1.46

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Chloride	mg/l	6	4	7	4	11	3	6	5
Sodium	mg/l	74.3	61.1	57.4	65.5	61	63.8	63.7	66.2
Potassium, total	mg/l	6.9	6.5	5.8	5.8	5.8	5.8	5.9	6.1
Temperature, Field	deg C	9.3	13.6	11.1	13	11	13	12.7	12
pH, Field	S.U.	6.77	6.7	6.77 SU	6.96 SU	6.73	6.65 SU	6.62	7.24
Specific Conductivity, Field	umhos/cm	1512	1752	1710	1719	1540	1802	1570	1590
Total Dissolved Solids	mg/l	1300	1390	1450	1260	1310	1250	1350	1280
Alkalinity (calcium carbonate)	mg/L	348	345	282	350	342	325	338	338
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	609	805	723	635	617	637	603	575
Magnesium, total	mg/L	96.3	111	102	89.8	92.2	89.9	97.2	96.8
Calcium, total	mg/L	244	271	255	223	224	224	227	241
Turbidity, Field	NTU	7.61	9.24	6.77	8.32	3.68	3.42	7.49	2.59
Iron, total	mg/L	1.69	3.14	2.72	1.38	2	1.58	1.95	1.56
Manganese, total	mg/L	0.272	0.365	0.327	0.205	0.261	0.213	0.268	0.221
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	1.4	1.9	1	<1	2.2	1.4	2.3	2
Barium, total	mg/l	0.012	0.02	0.014	0.013	0.014	0.015	0.013	0.013
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	0.012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	1.31	1.4	1.32	1.3	1.09	1.12	1.04	1.13
Chloride	mg/l	5	136	37	23	11	11	6	23
Sodium	mg/l	62	125	78.6	82.3	66.5	68.7	61.7	82.7
Potassium, total	mg/l	5.2	5.8	6	6.4	5.8	5.7	5.8	5
Temperature, Field	deg C	12	13.4	12.1	12.2	11.6	14	12.8	13.8
pH, Field	S.U.	7	6.94	7.27	7.03	7.12	7.48	7.27	7.14
Specific Conductivity, Field	umhos/cm	1380	1885	1684	1578	1805	1682	1881	1561
Total Dissolved Solids	mg/l	1320	1540	1390	1310	1300	1380	1350	1380
Alkalinity (calcium carbonate)	mg/L	345	338	342	337	343	337	344	340
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	661	648	604	640	638	584	677	593

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Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Magnesium, total	mg/L	89	89.4	92	87.8	93.9	95.8	101	94
Calcium, total	mg/L	202	220	254	223	242	235	245	217
Turbidity, Field	NTU	1.74	8.74	2.57	7.59	2	3.76	2.99	9.09
Iron, total	mg/L	1.81	2.83	1.75	1.53	2.08	1.95	2.12	2.34
Manganese, total	mg/L	0.243	0.304	0.263	0.214	0.313	0.305	0.311	0.275
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Data Summary Table, Well WMW-2

Name: Royalton Road

Location ID: WMW-2
Number of Sampling Dates: 32

Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Antimony, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	<2	<2	2	3	1.8
Barium, total	mg/l	0.019	0.03	0.02	0.032	0.03	0.0387	0.0338	0.0309
Beryllium, total	mg/l	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.004	<0.004	<0.004	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	2.7	<0.02 mg/l	<0.02 mg/L	<0.02 mg/L	<0.02 mg/L
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.0015 mg/l	<0.001 mg/l	<0.001 mg/l	<1	<1	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<100	<100	<100	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Benzene	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Bromoform	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.04	<0.1	<0.1
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.045	<0.045	<0.045	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<5	<5	<5	<1	<10	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<5	<5	<5	<1	<10	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<5	<5	<5	<1	<1	<2	<2	<2
1,1-Dichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<5	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Bromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1

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Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Chloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<4	<4	<4	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<1	<5	<1	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Styrene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<5	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<5	<5	<5	<3	<3	<3	<3	<3
Ammonia Nitrogen	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chloride	mg/l	67	140	62	222	84	309	185	189
Sodium	mg/l	32.4	39.3	39.4	50.8	40.3	66	67.4	78.2
Potassium, total	mg/l	1.6	1.7	1.7	2.1	2	2.4	2.3	2.4
Temperature, Field	deg C	12	13	13	14.1	14.3	11.1	14.1	11.9
pH, Field	S.U.	7.2 SU	6.7 SU	6.93 SU	6.74 SU	7.29 SU	6.47 SU	6.49 SU	6.34 SU
Specific Conductivity, Field	umhos/cm	636	1020	677	1019	719	2880	1974	1082
Total Dissolved Solids	mg/l	396	592	446	756	442	962	622	788
Alkalinity (calcium carbonate)	mg/L	154	178	196	184	192	199	227	221
Nitrate,Nitrite	mg/l	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	79	78	82	66	45	58.1	52.4	51
Magnesium, total	mg/L	18.9	26.6	23.9	34.5	24.5	46.9	36.5	44.1
Calcium, total	mg/L	69.3	93.9	86.9	125	92	173	141	166
Turbidity, Field	NTU	10	4.2	11	12	12.2	5.59	4.62	0.78
Iron, total	mg/L	0.04	0.09	0.06	0.17	0.23	0.08	0.08	<0.05
Manganese, total	mg/L	0.43	1.4	0.69	1.2	1.23	1.78	1.7	0.385
Sulfide	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	1.5	<1	<1	<1	<1	<1	<1	3
Barium, total	mg/l	0.031	0.0483	0.031	0.048	0.05	0.059	0.051	0.147
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Cobalt, total	mg/l	<0.005	<0.005	0.006	0.013	0.012	0.013	0.008	0.024
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	0.015	0.014	0.022	0.02	0.021	0.03	0.043
Selenium, total	ug/L	<0.02 mg/L	<1	1.1	2	2.1	<1	<2	17.1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	1.2	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<3	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chloride	mg/l	231	277	334	347	460	423	780	487
Sodium	mg/l	93.2	124	126	129	166	167	232	328
Potassium, total	mg/l	2.8	2.8	2.7	3	3.5	3	3.8	4.9
Temperature, Field	deg C	13.8	14.8	12.5	11.3	12.1	12.1	12	13
pH, Field	S.U.	6.44 SU	6.22	6.78	6.13	6.45	6.73	6.84	6.83
Specific Conductivity, Field	umhos/cm	1261	1172	1291	1606	1892	1719	1538	1411
Total Dissolved Solids	mg/l	754	1060	928	1040	1250	1620	1890	3260
Alkalinity (calcium carbonate)	mg/L	247	243	267	237	310	277	267	226
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	1.2	0.05
Sulfate	mg/L	77	68.1	93	73	87	87	97	3
Magnesium, total	mg/L	39.8	54.6	38.3	48	52.8	53	67.1	118
Calcium, total	mg/L	151	202	153	181	198	201	270	471
Turbidity, Field	NTU	2.85	6.75	5.85	13	5.56	12.3	4.31	2.76
Iron, total	mg/L	<0.05	<0.05	0.14	0.36	0.14	0.19	<0.05	0.08
Manganese, total	mg/L	0.486	2.36	2.54	5.69	3.61	4.16	5.44	13.2
Sulfide	mg/l	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	10.3	3.8	<1	<1	<1	<1	<1	<1
Barium, total	mg/l	0.309	0.062	0.02	0.0449	0.027	0.032	0.025	0.018
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	0.039	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	0.069	0.015	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<2	14.7	<1	6.6	<1	<3	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Chloride	mg/l	2540	623	82	551	137	288	58	45
Sodium	mg/l	645	183	39	165	72.5	102	48.6	42.2
Potassium, total	mg/l	7.9	3.2	2.2	3	2.2	2.5	2	1.8
Temperature, Field	deg C	11.9	12.3	13.2	11.8	13.8	12.2	13.3	10.7
pH, Field	S.U.	6.04	6.51	6.29 SU	6.52 SU	6.59	6.01 SU	6.59	6.73
Specific Conductivity, Field	umhos/cm	1600	1563	1059	2340	1037	1857	1144	1088
Total Dissolved Solids	mg/l	4780	1790	716	1580	824	1130	886	746
Alkalinity (calcium carbonate)	mg/L	243	287	346	449	324	289	410	327
Nitrate,Nitrite	mg/l	0.75	0.19	0.12	0.06	0.07	0.06	0.11	<0.05
Sulfate	mg/L	92	129	151	107	197	184	239	210
Magnesium, total	mg/L	214	64.8	45.5	66.4	52.5	51.6	50.1	47.1
Calcium, total	mg/L	936	262	151	254	183	200	175	176
Turbidity, Field	NTU	3.42	2.63	3.51	2.86	1.75	1.45	3.85	1.89
Iron, total	mg/L	0.11	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Manganese, total	mg/L	23.9	1.72	0.045	0.039	0.022	0.022	0.014	0.051
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Location ID: WMW-2
Number of Sampling Dates: 32

Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Barium, total	mg/l	0.019	0.018	0.022	0.026	0.026	0.021	0.024	0.02
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

Location ID: WMW-2
Number of Sampling Dates: 32

Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chloride	mg/l	42	40	103	30	38	24	31	25
Sodium	mg/l	42.6	39.1	55.9	42.2	42.9	41.2	42.4	42.2
Potassium, total	mg/l	2.1	1.6	2.5	1.9	2.1	1.6	2	1.6
Temperature, Field	deg C	12.1	9.2	12.8	10.7	13.4	12.9	14	10.8
pH, Field	S.U.	6.99	6.4	6.7	6.58	6.52	6.68	6.73	6.53
Specific Conductivity, Field	umhos/cm	1062	1069	1268	1059	1182	1042	1217	964
Total Dissolved Solids	mg/l	794	730	896	688	760	734	760	674
Alkalinity (calcium carbonate)	mg/L	402	324	362	335	368	343	366	332
Nitrate,Nitrite	mg/l	0.08	<0.05	0.11	0.17	0.16	0.11	0.18	0.1
Sulfate	mg/L	215	215	186	213	211	184	250	221

Location ID: WMW-2
Number of Sampling Dates: 32

Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Magnesium, total	mg/L	43.8	42.6	48.6	41.3	41.6	41	42.6	39.9
Calcium, total	mg/L	152	147	199	157	171	151	165	145
Turbidity, Field	NTU	3.22	1.97	0.74	3.95	1.65	3.28	0.85	2.68
Iron, total	mg/L	<0.05	<0.05	<0.05	0.08	<0.05	<0.05	<0.05	<0.05
Manganese, total	mg/L	0.014	0.026	0.015	0.452	0.045	0.016	0.041	<0.01
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Data Summary Table, Well MW-3

Name: Royalton Road

Location ID: MW-3
Number of Sampling Dates: 32

Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Antimony, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	1	<1	<1	<1	<1
Arsenic, total	ug/L	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	<2	<2	<1	1	1.2
Barium, total	mg/l	0.02	0.01846	0.0183	0.023	0.03	0.0283	0.0268	0.0433
Beryllium, total	mg/l	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.004	<0.004	<0.004	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<0.02 mg/l	<0.02 mg/L	<0.02 mg/L	<0.02 mg/L
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.0015 mg/l	<0.001 mg/l	<0.001 mg/l	<1	<1	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	0.026	0.008	0.01	0.016	0.014	<0.01	<0.01	0.025
Acetone	ug/l	<100	<100	<100	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Benzene	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Bromoform	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.04	<0.1	<0.1
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.045	<0.045	<0.045	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<5	<5	<5	<1	<1	<2	<2	<2
1,1-Dichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<5	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Bromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1

Location ID: MW-3
Number of Sampling Dates: 32

Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Chloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<4	<4	<4	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<1	<5	<1	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Styrene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<5	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<5	<5	<5	<3	<3	<3	<3	<3
Ammonia Nitrogen	mg/l	1.59	1.75	1.92	1.9	2.08	1.91	1.72	1.63
Chloride	mg/l	68	53	66	83	88	117	145	162
Sodium	mg/l	79.8	81.7	89.9	96.1	97.8	101	109	113
Potassium, total	mg/l	7.2	7.3	7.9	8.5	8.6	8.8	8.4	9.4
Temperature, Field	deg C	12	14	15	14.9	14	13.8	14	12.2
pH, Field	S.U.	7.3 SU	6.99 SU	7.08 SU	6.98 SU	7.25 SU	6.87 SU	6.86 SU	6.93 SU
Specific Conductivity, Field	umhos/cm	1380	1610	1280	1426	1000	1864	2080	1760
Total Dissolved Solids	mg/l	1190	1210	1190	1190	1220	1220	1240	1270
Alkalinity (calcium carbonate)	mg/L	464	469	468	481	490	424	507	507
Nitrate,Nitrite	mg/l	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	466	410	499	475	341	356	371	388
Magnesium, total	mg/L	84.3	78.3	91.1	91	93.2	90.6	92.6	96.7
Calcium, total	mg/L	168	159	180	191	201	199	204	208
Turbidity, Field	NTU	4.1	1.5	4.4	4.25	2.93	1.08	0.9	0.39
Iron, total	mg/L	1.87	1.82	1.91	1.93	1.87	1.84	1.84	1.43
Manganese, total	mg/L	0.19	0.12	0.13	0.165	0.16	0.2	0.237	0.481
Sulfide	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05

Location ID: MW-3
Number of Sampling Dates: 32

Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<1	1.9	<1	2.8	<1	4.5	<1	<1
Barium, total	mg/l	0.026	0.0477	0.037	0.053	0.03	0.051	0.043	0.047
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Location ID: MW-3
Number of Sampling Dates: 32

Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<0.02 mg/L	2.7	<1	1.1	<1	1.1	1.2	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	0.025	0.045	0.037	0.042	0.03	0.049	0.062	0.076
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<3	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	1.64	1.55	1.82	2.05	2.17	1.96	2.22	1.77
Chloride	mg/l	147	187	211	208	190	139	130	90
Sodium	mg/l	98.9	105	118	105	111	105	111	112
Potassium, total	mg/l	8.6	9.4	9.2	9	9.4	9	8.4	8.5
Temperature, Field	deg C	14.3	15.2	13.1	13.6	12.8	14.8	11.5	13.3
pH, Field	S.U.	7.09 SU	6.77	7.04	6.92	6.96	6.94	7.4	7.49
Specific Conductivity, Field	umhos/cm	1751	1347	1881	2110	1878	1509	918	1197
Total Dissolved Solids	mg/l	1270	1270	1430	1310	1350	1360	1280	1170
Alkalinity (calcium carbonate)	mg/L	506	521	524	487	503	487	483	449
Nitrate,Nitrite	mg/l	<0.05	<0.05	0.28	<0.05	<0.05	<0.05	0.72	<0.05
Sulfate	mg/L	361	341	340	363	410	405	437	319
Magnesium, total	mg/L	87.7	92	91.8	90.8	97.5	94.6	84.9	84.1
Calcium, total	mg/L	194	204	209	201	212	206	196	185
Turbidity, Field	NTU	8.55	4.49	6.87	7.89	11.3	16.8	6.33	5.48
Iron, total	mg/L	2.04	2.55	1.96	3.26	2	4.68	1.89	0.91
Manganese, total	mg/L	0.168	0.272	0.246	0.787	0.21	0.867	0.243	0.152
Sulfide	mg/l	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<1	<2	<1	<1	<1	<1	<1	<1
Barium, total	mg/l	0.034	0.037	0.031	0.0379	0.043	0.036	0.03	0.035
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<1	<2	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	0.106	0.039	0.074	0.102	0.077	0.045	0.186
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	1.66	2.07	2.12	2.11	2.09	2.18	2.36	2.27

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Chloride	mg/l	95	104	121	112	93	72	73	79
Sodium	mg/l	124	131	115	122	124	116	120	121
Potassium, total	mg/l	6.3	9.8	9.1	9.4	8.8	9.2	9.2	8.1
Temperature, Field	deg C	12	15	13.8	13.6	13.5	14.8	14.2	15.6
pH, Field	S.U.	7.36	7.42	6.85 SU	7.08 SU	6.65	6.47 SU	6.98	6.65
Specific Conductivity, Field	umhos/cm	1291	1102	1855	996	838	890	1601	838
Total Dissolved Solids	mg/l	1020	1250	1330	1270	1180	1250	1320	994
Alkalinity (calcium carbonate)	mg/L	432	469	479	469	443	427	443	410
Nitrate,Nitrite	mg/l	<0.05	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	409	471	443	391	393	458	473	301
Magnesium, total	mg/L	56.6	88.6	89.8	89.3	78.5	77.5	89	64.7
Calcium, total	mg/L	151	201	203	198	177	176	181	150
Turbidity, Field	NTU	3.91	2.23	4.97	5.07	2.42	2.37	1.7	1.41
Iron, total	mg/L	0.8	1.49	1.98	1.99	2.4	1.68	1.44	1.12
Manganese, total	mg/L	0.132	0.162	0.173	0.236	0.372	0.174	0.104	0.145
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<1	<1	1.8	<1	<1	<1	<1	<1
Barium, total	mg/l	0.048	0.047	0.061	0.049	0.045	0.036	0.049	0.044
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	0.004	0.005	0.005	0.005	0.003	0.003	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	0.093	0.145	0.107	0.098	0.109	0.095	0.111	0.08
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	2.2	1.85	1.98	2.02	1.69	1.94	1.67	1.93
Chloride	mg/l	83	76	73	83	83	89	114	119
Sodium	mg/l	122	111	108	118	117	115	112	123
Potassium, total	mg/l	8.4	6.8	8	7.9	7.4	7.8	7.1	8.3
Temperature, Field	deg C	12.8	14.5	13.7	14.2	13.2	14.8	14.3	14.8
pH, Field	S.U.	7.22	6.62	6.71	6.8	6.75	6.87	6.92	6.66
Specific Conductivity, Field	umhos/cm	1264	745	817	886	917	966	1107	1052
Total Dissolved Solids	mg/l	1210	968	1070	978	1000	1060	994	1070
Alkalinity (calcium carbonate)	mg/L	437	393	406	396	396	396	392	396
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	466	331	336	315	303	293	335	342

Location ID: MW-3
Number of Sampling Dates: 32

Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Magnesium, total	mg/L	79.7	56.7	64.7	62.1	55.8	61.7	56.4	66.1
Calcium, total	mg/L	164	135	165	139	142	150	142	153
Turbidity, Field	NTU	4.09	2.22	5.22	7.1	2.08	1.73	2.19	1.92
Iron, total	mg/L	1.81	1.42	2.27	1.51	0.79	0.76	0.71	0.85
Manganese, total	mg/L	0.347	0.429	0.695	0.449	0.298	0.173	0.259	0.203
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Data Summary Table, Well WMW-3

Name: Royalton Road

Location ID: WMW-3
Number of Sampling Dates: 10

Parameter Name	Units	4/14/2003	5/10/2004	5/23/2005	5/22/2006	12/17/2007	6/16/2008	12/13/2011	12/5/2016
Antimony, total	ug/L	<0.005 mg/l	<1	<1	<1	--	--	--	<1
Arsenic, total	ug/L	<0.009 mg/l	13.7	<1	3.2	--	--	--	<1
Barium, total	mg/l	0.37	0.11	0.0236	0.0514	--	--	--	0.024
Beryllium, total	mg/l	<0.003	<0.001	<0.001	<0.001	--	--	--	<0.001
Cadmium, total	mg/l	<0.004	<0.002	<0.002	<0.002	--	--	--	<0.002
Chromium, total	mg/l	0.02	0.023	<0.01	0.018	--	--	--	<0.01
Cobalt, total	mg/l	<0.01	0.018	<0.005	0.005	--	--	--	<0.005
Copper, total	mg/l	0.02	0.023	<0.01	<0.01	--	--	--	<0.01
Lead, total	ug/L	0.142 mg/l	60	1.1	11.9	--	--	--	1.3
Nickel, total	mg/l	0.02657	0.05	<0.01	0.024	--	--	--	<0.01
Selenium, total	ug/L	<0.005 mg/l	2.2	<0.02 mg/L	<0.02 mg/L	--	--	--	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	--	--	--	<0.005
Thallium, total	ug/L	<0.001 mg/l	<1	<0.2	<0.2	--	--	--	<0.2
Vanadium, total	mg/L	0.02155	0.025	<0.005	0.011	--	--	--	<0.005
Zinc, total	mg/L	0.294	0.222	<0.01	0.025	--	--	--	0.044
Acetone	ug/l	<100	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<1	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<4	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<4	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.1	<0.04	<0.1	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.045	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<5	<1	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<4	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<5	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<5	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<4	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<5	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<5	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<1	<5	<5	<5	<5	<5	<5

Location ID: WMW-3
Number of Sampling Dates: 10

Parameter Name	Units	4/14/2003	5/10/2004	5/23/2005	5/22/2006	12/17/2007	6/16/2008	12/13/2011	12/5/2016
Bromomethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<4	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<4	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<4	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<4	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<5	<3	<3	<3	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	--	--	<0.1	<0.1	--	--	<0.1	<0.1
Chloride	mg/l	--	--	19	15	--	--	89	39
Sodium	mg/l	26.5	28.4	25	26.8	--	--	--	24.1
Potassium, total	mg/l	9	9.6	4.5	4.8	--	--	--	5.9
Temperature, Field	deg C	--	--	--	18.3	--	--	--	9.9
pH, Field	S.U.	--	--	--	6.88 SU	--	--	--	7.13
Specific Conductivity, Field	umhos/cm	--	--	--	1066	--	--	--	2133
Total Dissolved Solids	mg/l	--	--	1280	826	--	--	--	1300
Alkalinity (calcium carbonate)	mg/L	--	--	452	433	--	--	--	540
Nitrate,Nitrite	mg/l	--	--	<0.05	<0.05	--	--	0.18	0.22
Sulfate	mg/L	--	--	327	257	--	--	446	450
Magnesium, total	mg/L	70.7	79.1	60	49.6	--	--	--	96.1
Calcium, total	mg/L	179	204	204	191	--	--	--	284
Turbidity, Field	NTU	--	--	--	189	--	--	--	241
Iron, total	mg/L	14.2	30.2	0.84	9.84	--	--	--	1.64
Manganese, total	mg/L	0.38	0.688	0.361	0.167	--	--	--	0.043
Sulfide	mg/l	--	--	--	<0.05	--	--	--	<0.1

Location ID: WMW-3
Number of Sampling Dates: 10

Parameter Name	Units	12/4/2017	6/4/2018
Antimony, total	ug/L	--	--
Arsenic, total	ug/L	--	--
Barium, total	mg/l	--	--
Beryllium, total	mg/l	--	--

Location ID: WMW-3
Number of Sampling Dates: 10

Parameter Name	Units	12/4/2017	6/4/2018
Cadmium, total	mg/l	--	--
Chromium, total	mg/l	--	--
Cobalt, total	mg/l	--	--
Copper, total	mg/l	--	--
Lead, total	ug/L	--	--
Nickel, total	mg/l	--	--
Selenium, total	ug/L	--	--
Silver, total	mg/l	--	--
Thallium, total	ug/L	--	--
Vanadium, total	mg/L	--	--
Zinc, total	mg/L	--	--
Acetone	ug/l	<10	<10
Acrylonitrile	ug/l	<5	<5
Benzene	ug/l	<1	<1
Bromochloromethane	ug/l	<1	<1
Dichlorobromomethane	ug/l	<1	<1
Bromoform	ug/l	<1	<1
Carbon Disulfide	ug/l	<1	<1
Carbon tetrachloride	ug/l	<1	<1
Chlorobenzene	ug/l	<1	<1
Chloroethane	ug/l	<1	<1
Trichloromethane	ug/l	<1	<1
Chlorodibromomethane	ug/l	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	--	--
1,2-Dibromoethane; Ethylene dibromide	ug/l	--	--
1,2-Dichlorobenzene	ug/l	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2
1,1-Dichloroethane	ug/l	<1	<1
1,2-Dichloroethane	ug/l	<1	<1
1,1-Dichloroethene	ug/L	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1
1,2-Dichloropropane	ug/l	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1
Ethylbenzene	ug/l	<1	<1
2-Hexanone	ug/l	<5	<5
Bromomethane	ug/l	<1	<1
Chloromethane	ug/l	<1	<1
Dibromomethane	ug/l	<1	<1
Methylene Chloride	ug/L	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5
Iodomethane	ug/l	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1

Location ID: WMW-3
Number of Sampling Dates: 10

Parameter Name	Units	12/4/2017	6/4/2018						
Styrene	ug/l	<1	<1						
1,1,1,2-Tetrachloroethane	ug/l	<1	<1						
1,1,2,2-Tetrachloroethane	ug/l	<1	<1						
Tetrachloroethene	ug/L	<1	<1						
Toluene	ug/l	<1	<1						
1,1,1-Trichloroethane	ug/l	<1	<1						
1,1,2-Trichloroethane	ug/l	<1	<1						
Trichloroethene	ug/L	<1	<1						
Trichlorofluoromethane	ug/l	<1	<1						
1,2,3-Trichloropropane	ug/l	<1	<1						
Vinyl acetate	ug/l	<1	<1						
Vinyl chloride	ug/l	<1	<1						
Xylenes, Total	ug/L	<2	<2						
Ammonia Nitrogen	mg/l	<0.1	<0.1						
Chloride	mg/l	33	27						
Sodium	mg/l	--	--						
Potassium, total	mg/l	--	--						
Temperature, Field	deg C	--	10.8						
pH, Field	S.U.	--	6.99						
Specific Conductivity, Field	umhos/cm	--	1440						
Total Dissolved Solids	mg/l	--	--						
Alkalinity (calcium carbonate)	mg/L	--	--						
Nitrate,Nitrite	mg/l	0.3	0.38						
Sulfate	mg/L	338	427						
Magnesium, total	mg/L	--	--						
Calcium, total	mg/L	--	--						
Turbidity, Field	NTU	--	37.5						
Iron, total	mg/L	--	--						
Manganese, total	mg/L	--	--						
Sulfide	mg/l	--	--						

Data Summary Table, Well MW4-97

Name: Royalton Road

Location ID: MW4-97

Number of Sampling Dates: 20

Parameter Name	Units	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006	11/13/2006	6/25/2007
Antimony, total	ug/L	<0.005 mg/l	<1	<1	<1	<1	<1	<1	--
Arsenic, total	ug/L	<0.009 mg/l	7.3	8	5	8	6.1	13.1	--
Barium, total	mg/l	0.63	0.475	0.8	0.672	1.08	0.89	1.25	--
Beryllium, total	mg/l	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	--
Cadmium, total	mg/l	<0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	--
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
Cobalt, total	mg/l	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	--
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
Lead, total	ug/L	<0.005 mg/l	2	<1	<1	1.2	1.2	1.5	--
Nickel, total	mg/l	0.02034	0.02	0.025	0.021	0.028	0.024	0.032	--
Selenium, total	ug/L	<0.005 mg/l	6.1	<0.02 mg/l	<0.02 mg/L	<0.02 mg/L	<0.02 mg/L	<0.02 mg/L	--
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	--
Thallium, total	ug/L	<0.001 mg/l	<1	<1	<0.2	<0.2	<0.2	<0.2	--
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	--
Zinc, total	mg/L	0.058	0.016	0.026	<0.01	<0.01	<0.01	<0.01	--
Acetone	ug/l	<100	<10	<10	<10	<10	<10	<10	11.4
Acrylonitrile	ug/l	<5	<1	<1	<5	<5	<5	<5	<5
Benzene	ug/l	2	1.17	2.1	1.8	1.7	1.3	1.7	<1
Bromochloromethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<5	<1	1.1	1	<1	<1	<1	<1
Trichloromethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.1	<0.1	<0.04	<0.1	<0.1	<0.04	<0.1
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.045	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<5	<1	<1	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<5	1.25	1.4	1	1.1	<1	1.1	1.1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<5	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<5	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<5	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<1	<1	<5	<5	<5	<5	<5
Bromomethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1

Location ID: MW4-97
Number of Sampling Dates: 20

Parameter Name	Units	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006	11/13/2006	6/25/2007
Chloromethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<4	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<1	<5	8.6	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<5	<3	<3	<3	<3	<3	<3	<2
Ammonia Nitrogen	mg/l	9.24	--	16	18.9	18	10.4	21.6	--
Chloride	mg/l	330	--	269	358	466	395	416	--
Sodium	mg/l	214	218	217	255	306	243	291	--
Potassium, total	mg/l	24	24.3	24.9	28.1	34.6	27.5	33.5	--
Temperature, Field	deg C	--	--	--	--	14.1	16.6	11.5	--
pH, Field	S.U.	--	--	--	--	7.03 SU	6.13 SU	6.62 SU	--
Specific Conductivity, Field	umhos/cm	--	--	--	--	1380	3120	3260	--
Total Dissolved Solids	mg/l	1430	--	--	1600	1790	1590	1620	--
Alkalinity (calcium carbonate)	mg/L	1029	--	--	1080	1090	1060	1070	--
Nitrate,Nitrite	mg/l	<0.05	--	<0.05	<0.05	0.49	<0.05	<0.05	--
Sulfate	mg/L	23	--	14	10	<10	10	7	--
Magnesium, total	mg/L	111	105	103	106	109	107	115	--
Calcium, total	mg/L	204	209	212	224	232	235	249	--
Turbidity, Field	NTU	--	--	15.3	--	14.7	24.3	10.69	--
Iron, total	mg/L	5.1	5.32	4.49	3.34	5.87	5.84	6.94	--
Manganese, total	mg/L	0.49	0.622	0.6	0.58	0.581	0.682	0.726	--
Sulfide	mg/l	--	--	--	--	<0.05	<0.05	<0.05	--

Location ID: MW4-97
Number of Sampling Dates: 20

Parameter Name	Units	12/17/2007	6/16/2008	12/2/2008	12/2/2009	6/21/2010	12/6/2010	6/21/2011	12/13/2011
Antimony, total	ug/L	<1	<2	<2	--	--	<1	--	--
Arsenic, total	ug/L	7.1	6	10.5	--	--	23.2	--	--
Barium, total	mg/l	1.33	1.33	1.19	--	--	0.436	--	--
Beryllium, total	mg/l	<0.001	<0.001	<0.001	--	--	<0.001	--	--
Cadmium, total	mg/l	<0.002	<0.002	<0.002	--	--	<0.002	--	--
Chromium, total	mg/l	<0.01	<0.01	<0.01	--	--	<0.01	--	--

Location ID: MW4-97
Number of Sampling Dates: 20

Parameter Name	Units	12/17/2007	6/16/2008	12/2/2008	12/2/2009	6/21/2010	12/6/2010	6/21/2011	12/13/2011
Cobalt, total	mg/l	<0.005	0.009	<0.005	--	--	0.025	--	--
Copper, total	mg/l	<0.01	<0.01	<0.01	--	--	<0.01	--	--
Lead, total	ug/L	<1	2.8	<2	--	--	7	--	--
Nickel, total	mg/l	0.034	0.04	0.05	--	--	0.033	--	--
Selenium, total	ug/L	2.3	<2	4.7	--	--	3.4	--	--
Silver, total	mg/l	<0.005	<0.005	<0.005	--	--	<0.005	--	--
Thallium, total	ug/L	<0.2	<0.4	<0.4	--	--	<0.2	--	--
Vanadium, total	mg/L	<0.005	<0.005	<0.005	--	--	0.007	--	--
Zinc, total	mg/L	<0.01	0.05	0.16	--	--	1.15	--	--
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	1.3	<1	2.7	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	1.1	<1	1.1	1.3	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

Location ID: MW4-97
Number of Sampling Dates: 20

Parameter Name	Units	12/17/2007	6/16/2008	12/2/2008	12/2/2009	6/21/2010	12/6/2010	6/21/2011	12/13/2011
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	1.1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	17.8	28.3	26.4	--	--	<0.1	--	--
Chloride	mg/l	482	516	680	--	--	346	--	--
Sodium	mg/l	292	307	336	--	--	232	--	--
Potassium, total	mg/l	30.9	35.5	38.6	--	--	31.2	--	--
Temperature, Field	deg C	--	--	10.1	--	--	--	--	--
pH, Field	S.U.	--	--	6.27	--	--	--	--	--
Specific Conductivity, Field	umhos/cm	--	--	3060	--	--	--	--	--
Total Dissolved Solids	mg/l	1750	1760	2360	--	--	--	--	--
Alkalinity (calcium carbonate)	mg/L	1090	1100	1150	--	--	--	--	--
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	--	--	<0.05	--	--
Sulfate	mg/L	5	8	88	--	--	164	--	--
Magnesium, total	mg/L	110	114	145	--	--	109	--	--
Calcium, total	mg/L	245	250	314	--	--	237	--	--
Turbidity, Field	NTU	--	--	12.1	--	--	--	--	--
Iron, total	mg/L	6.72	2.7	8.16	--	--	15.2	--	--
Manganese, total	mg/L	0.869	0.569	1.18	--	--	1.19	--	--
Sulfide	mg/l	--	--	<0.1	--	--	--	--	--

Location ID: MW4-97
Number of Sampling Dates: 20

Parameter Name	Units	12/7/2015	12/5/2016	12/4/2017	6/4/2018
Antimony, total	ug/L	<1	<1	<1	<1
Arsenic, total	ug/L	6.2	7.2	7.1	4.2
Barium, total	mg/l	0.481	0.398	0.333	0.197
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	0.009	0.01	0.007	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1
Nickel, total	mg/l	0.077	0.062	0.05	0.03
Selenium, total	ug/L	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	0.036	<0.01	<0.01

Location ID: MW4-97
Number of Sampling Dates: 20

Parameter Name	Units	12/7/2015	12/5/2016	12/4/2017	6/4/2018
Acetone	ug/l	21.3	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	--	--
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	--	--
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1

Location ID: MW4-97
Number of Sampling Dates: 20

Parameter Name	Units	12/7/2015	12/5/2016	12/4/2017	6/4/2018				
Xylenes, Total	ug/L	<2	<2	<2	<2				
Ammonia Nitrogen	mg/l	52.5	39.7	40	27.5				
Chloride	mg/l	1360	934	830	447				
Sodium	mg/l	651	588	486	357				
Potassium, total	mg/l	59.9	55.1	48	32.7				
Temperature, Field	deg C	--	10.1	--	--				
pH, Field	S.U.	--	6.91	--	--				
Specific Conductivity, Field	umhos/cm	--	5681	--	--				
Total Dissolved Solids	mg/l	3410	2900	--	1820				
Alkalinity (calcium carbonate)	mg/L	1150	1100	--	765				
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05				
Sulfate	mg/L	77	122	107	99				
Magnesium, total	mg/L	164	144	130	84.1				
Calcium, total	mg/L	378	325	283	185				
Turbidity, Field	NTU	--	120	--	--				
Iron, total	mg/L	4.31	3.32	2.98	1.89				
Manganese, total	mg/L	1.27	1.34	1.01	1.01				
Sulfide	mg/l	<0.1	<0.1	--	--				

Data Summary Table, Well MW-6

Name: Royalton Road

Location ID: MW-6
Number of Sampling Dates: 32

Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Antimony, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	<2	2.2	2.2	5	1.4
Barium, total	mg/l	0.08	0.1	0.07	0.123	0.08	0.0824	0.118	0.0995
Beryllium, total	mg/l	<0.003	<0.003	<0.003	0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.004	<0.004	<0.004	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	2	<1	<1	1.8	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	4.3	<0.02 mg/l	<0.02 mg/L	<0.02 mg/L	<0.02 mg/L
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.0015 mg/l	<0.001 mg/l	<0.001 mg/l	<1	<1	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	0.009	0.011	0.033	0.014	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<100	<100	<100	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Benzene	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Bromoform	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.04	<0.1	<0.1
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.045	<0.045	<0.045	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<5	<5	<5	<1	<10	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<5	<5	<5	<1	<10	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<5	<5	<5	<1	<1	<2	<2	<2
1,1-Dichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<5	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Bromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1

Location ID: MW-6
Number of Sampling Dates: 32

Parameter Name	**Units**	**10/14/2002**	**4/14/2003**	**11/3/2003**	**5/10/2004**	**12/6/2004**	**5/23/2005**	**11/14/2005**	**5/22/2006**
Chloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<4	<4	<4	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<1	<5	<1	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Styrene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<5	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<5	<5	<5	<3	<3	<3	<3	<3
Ammonia Nitrogen	mg/l	1.64	3.08	2.01	2.09	1.86	1.59	1.95	1.19
Chloride	mg/l	446	348	349	435	304	324	334	319
Sodium	mg/l	663	581	624	581	742	699	706	634
Potassium, total	mg/l	4.5	5.8	6	5.8	3.3	4.1	4.7	5
Temperature, Field	deg C	11	14	12	15.3	13.4	13.6	14.2	14.1
pH, Field	S.U.	8 SU	8.05 SU	8.34 SU	8.02 SU	8.17 SU	7.8 SU	8.01 SU	8 SU
Specific Conductivity, Field	umhos/cm	2540	2700	2310	2690	1936	3450	2640	2750
Total Dissolved Solids	mg/l	1490	1500	1530	1460	1440	1450	1510	1420
Alkalinity (calcium carbonate)	mg/L	761	688	635	665	759	646	648	587
Nitrate,Nitrite	mg/l	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	53	196	135	51	96	75.5	153	176
Magnesium, total	mg/L	1.9	2.4	2.4	2.7	1.5	1.93	2.46	2.54
Calcium, total	mg/L	4.8	5.8	6	6.3	4.5	5.09	5.81	5.93
Turbidity, Field	NTU	29	26	54	64.7	7.4	19.51	122	16.7
Iron, total	mg/L	0.92	1.08	1.8	2.11	0.09	0.52	1.56	0.46
Manganese, total	mg/L	0.03	0.03	0.03	0.032	0.01	0.011	0.033	0.019
Sulfide	mg/l	0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05

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Parameter Name	**Units**	**11/13/2006**	**6/25/2007**	**12/17/2007**	**6/16/2008**	**12/2/2008**	**6/1/2009**	**12/2/2009**	**6/21/2010**
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<5	<1	<1	<1	<1	<1	<1	<1
Barium, total	mg/l	0.098	0.0946	0.069	0.065	0.089	0.109	0.095	0.09
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	1.1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<0.02 mg/L	<1	1.7	1	2	<1	4	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	1.2	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<3	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	2.33	1.91	1.09	1.35	1.81	2.69	2.92	2.44
Chloride	mg/l	299	320	348	338	370	311	330	320
Sodium	mg/l	624	604	709	620	626	588	588	636
Potassium, total	mg/l	4.9	4.9	3.3	3.5	5.9	5.6	5.4	5.4
Temperature, Field	deg C	11.6	13.4	10.9	13.2	11	12.4	12.6	14.3
pH, Field	S.U.	8.03 SU	7.96	8.75	8.16	8.2	8.18	8.06	7.98
Specific Conductivity, Field	umhos/cm	2800	2800	1912	2280	2300	2550	2500	2810
Total Dissolved Solids	mg/l	1410	1530	1430	1420	1390	1410	1360	1370
Alkalinity (calcium carbonate)	mg/L	652	755	692	776	650	637	621	708
Nitrate,Nitrite	mg/l	0.19	0.11	0.45	<0.05	<0.05	0.07	<0.05	<0.05
Sulfate	mg/L	147	139	81	114	55	110	149	88
Magnesium, total	mg/L	2.31	2.26	1.37	1.37	2.17	2.5	3.2	2.55
Calcium, total	mg/L	5.73	5.77	4.16	3.96	5.38	6.35	7.47	6.37
Turbidity, Field	NTU	22.6	35.2	19.22	3.96	3.92	35	8.12	2.77
Iron, total	mg/L	0.66	0.94	0.21	0.1	0.37	1.3	0.38	0.15
Manganese, total	mg/L	0.019	0.022	<0.01	<0.01	0.017	0.028	0.05	0.028
Sulfide	mg/l	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	1.2	1.8	1.9	<1	1.1	<1	<1	<1
Barium, total	mg/l	0.093	0.064	0.069	0.075	0.064	0.071	0.062	0.063
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	2	3.7	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	13	<10	<10	<10	<10	<10	<10	<10

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	2.37	1.36	1.58	1.92	1.52	1.75	1.66	1.49

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Chloride	mg/l	320	360	339	336	317	338	329	341
Sodium	mg/l	624	644	614	659	604	652	608	655
Potassium, total	mg/l	6	3.4	4	3.9	3.2	3.9	3.2	3.6
Temperature, Field	deg C	8.5	14	11	12.5	11.3	12.2	13	12.9
pH, Field	S.U.	7.83	7.82	7.45 SU	8.22 SU	8.4	8.47 SU	7.72	8.76
Specific Conductivity, Field	umhos/cm	1580	1910	1880	2590	1828	2720	2770	4050
Total Dissolved Solids	mg/l	1360	1440	1480	1430	1390	1450	1400	1370
Alkalinity (calcium carbonate)	mg/L	617	789	760	694	759	738	754	745
Nitrate,Nitrite	mg/l	<0.05	0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	148	18	44	77	38	54	35	31
Magnesium, total	mg/L	2.87	1.32	1.78	1.84	1.5	1.78	1.44	1.32
Calcium, total	mg/L	6.73	4.02	4.9	4.93	4.13	4.67	3.87	3.81
Turbidity, Field	NTU	5.32	9.89	6.72	3.15	2.9	3.93	5.36	4.64
Iron, total	mg/L	0.21	0.11	0.17	0.11	0.09	0.06	<0.05	<0.05
Manganese, total	mg/L	0.043	0.02	0.047	0.024	0.017	0.011	<0.01	<0.01
Sulfide	mg/l	<0.1	<0.1	<0.1	0.2	0.2	0.2	0.2	<0.1

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Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Barium, total	mg/l	0.056	0.056	0.065	0.06	0.057	0.062	0.054	0.055
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

Location ID: MW-6
Number of Sampling Dates: 32

Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	1.44	1.47	1.58	1.32	1.12	1.33	1.13	1.45
Chloride	mg/l	337	323	384	331	319	335	366	370
Sodium	mg/l	583	582	629	597	598	589	615	607
Potassium, total	mg/l	3.3	3.4	3.4	3.4	3.3	3.5	3.2	3
Temperature, Field	deg C	10.9	11.4	12.2	13.1	11.5	13.7	12.6	13.5
pH, Field	S.U.	8.68	8.53	8.63	8.22	8.4	8.51	8.51	8.58
Specific Conductivity, Field	umhos/cm	2460	2570	2450	2580	2544	2510	2658	2470
Total Dissolved Solids	mg/l	1400	1370	1410	1340	1300	1300	1380	1380
Alkalinity (calcium carbonate)	mg/L	776	743	739	746	762	719	758	723
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	26	20	43	27	13	27	9	28

Location ID: MW-6
Number of Sampling Dates: 32

Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Magnesium, total	mg/L	1.25	1.17	1.41	1.28	1.15	1.23	1.11	1.17
Calcium, total	mg/L	3.59	3.42	3.96	3.82	3.66	3.83	3.34	3.36
Turbidity, Field	NTU	1.67	4.76	2.26	3.2	4.68	2.82	3.12	2.91
Iron, total	mg/L	0.07	0.07	0.07	0.06	<0.05	<0.05	<0.05	<0.05
Manganese, total	mg/L	<0.01	<0.01	<0.01	<0.01	0.015	<0.01	<0.01	<0.01
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Data Summary Table, Well MW-8

Name: Royalton Road

Location ID: MW-8
Number of Sampling Dates: 32

Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Antimony, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<5
Arsenic, total	ug/L	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	16.1	23.3	<1	12	<5
Barium, total	mg/l	2.41	2.7	2.9	2.74	2.76	2.72	2.63	2.65
Beryllium, total	mg/l	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.004	<0.004	<0.004	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	0.01	0.01	0.01	0.015	0.015	0.011	0.013	0.012
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	1	<1	<1	<1	<5
Nickel, total	mg/l	0.06	0.05	0.06	0.06	0.058	0.048	0.051	0.045
Selenium, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	46.6	<0.02 mg/l	<0.02 mg/L	<0.02 mg/L	<0.02 mg/L
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.0015 mg/l	<0.001 mg/l	<0.001 mg/l	<1	<1	0.2	<0.2	<1
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	0.176	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<100	<100	<100	17.8	11.2	17.6	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Benzene	ug/l	3	<4	3	3.24	2.9	3.4	3.2	2.9
Bromochloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Bromoform	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	9	8	6	8.38	4.9	5.4	4.8	4.6
Trichloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.04	<0.1	<0.1
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.045	<0.045	<0.045	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<5	<5	<5	<1	<10	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<5	<5	<5	<1	<10	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<5	<5	<5	<1	<1	<2	<2	<2
1,1-Dichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<5	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Bromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1

Location ID: MW-8
Number of Sampling Dates: 32

Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Chloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<4	<4	<4	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<1	<5	<1	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Styrene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<5	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<5	<5	<5	<3	<3	<3	<3	<3
Ammonia Nitrogen	mg/l	113	128	125	121	122	146	106	124
Chloride	mg/l	1780	1850	1620	1820	1670	1720	2020	1900
Sodium	mg/l	1310	1160	1290	1530	1360	1480	1340	1430
Potassium, total	mg/l	124	136	136	132	135	134	136	141
Temperature, Field	deg C	15	17	14	17.6	16.1	15.5	12.8	15.6
pH, Field	S.U.	7 SU	6.9 SU	7.07 SU	7.02 SU	7.19 SU	7.17 SU	7.07 SU	7.03 SU
Specific Conductivity, Field	umhos/cm	6990	7930	4590	6060	4450	2580	9080	7620
Total Dissolved Solids	mg/l	4310	5050	4610	4660	4300	4350	4420	4240
Alkalinity (calcium carbonate)	mg/L	1820	1833	1715	1750	1680	1720	1720	1730
Nitrate,Nitrite	mg/l	0.24	<0.1	<0.05	<0.05	0.07	<0.05	<0.05	<0.05
Sulfate	mg/L	<10	<10	20	<5	<10	4	<10	<10
Magnesium, total	mg/L	105	105	86.3	110	103	102	99.1	93.4
Calcium, total	mg/L	157	159	158	173	172	176	162	153
Turbidity, Field	NTU	114	24	27	100	14.6	43.2	54.3	88.5
Iron, total	mg/L	9.96	9.53	9.65	9.79	11.8	12.2	11.1	10.6
Manganese, total	mg/L	1.92	1.92	1.93	2.01	1.98	1.92	1.85	1.71
Sulfide	mg/l	0.1	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05

Location ID: MW-8
Number of Sampling Dates: 32

Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Antimony, total	ug/L	<5	<2	<2	<3	<2	<2	<5	<2
Arsenic, total	ug/L	<5	2.2	5.4	5	3	<2	<5	2.9
Barium, total	mg/l	2.51	2.47	2.44	2.58	2.57	2.28	1.86	2
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Location ID: MW-8
Number of Sampling Dates: 32

Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Cobalt, total	mg/l	0.011	0.01	0.01	0.011	0.011	0.01	0.009	0.01
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<5	<2	<2	<3	<1	<2	<5	<2
Nickel, total	mg/l	0.051	0.047	0.048	0.051	0.05	0.047	0.047	0.046
Selenium, total	ug/L	<0.02 mg/L	4.6	14.7	13.3	15.1	<2	<5	10.3
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<1	<0.4	<0.4	<1	<0.2	<0.4	<1	<0.4
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	0.012	0.017	<0.01	<0.01
Acetone	ug/l	11.1	13.5	15.7	15	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	2.6	3	2.9	3.4	2.8	2.8	2.5	1.2
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	4.1	3.1	4	2.4	2	2.9	2.6	1.7
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<3	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	134	121	110	122	134	113	79.7	82.4
Chloride	mg/l	1760	1780	1750	1660	2000	1610	<250	1510
Sodium	mg/l	1190	1290	1520	1270	1340	1190	1400	1510
Potassium, total	mg/l	133	130	126	126	121	111	79.7	88.7
Temperature, Field	deg C	13.6	16.1	13.1	15.7	11.5	15	12.5	13.7
pH, Field	S.U.	6.94 SU	6.82	7.36	6.82	6.93	6.86	7.18	7.32
Specific Conductivity, Field	umhos/cm	7040	5910	5560	5420	6320	7740	2650	7620
Total Dissolved Solids	mg/l	4070	4230	4040	3730	4270	3950	4000	3980
Alkalinity (calcium carbonate)	mg/L	1730	1690	1670	1670	1710	1720	1700	1670
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	<2	<2	<2	3	<5	<2	<5	<2
Magnesium, total	mg/L	95.8	87	85	89.9	82.7	78.4	65	66.8
Calcium, total	mg/L	157	153	145	151	139	134	122	121
Turbidity, Field	NTU	91.9	88.5	7.34	68.6	52.7	55.6	9.31	2.92
Iron, total	mg/L	9.18	7.68	6.67	8.78	8.49	4.85	6.36	6.14
Manganese, total	mg/L	1.77	1.62	1.54	1.64	1.48	1.4	1.05	1.11
Sulfide	mg/l	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Antimony, total	ug/L	<1	<1	<2	<2	<2	<2	<1	<1
Arsenic, total	ug/L	10	5.4	<5	2.1	7.5	2.7	11.1	1.1
Barium, total	mg/l	1.65	1.9	1.55	1.49	1.61	1.89	1.41	1.09
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	0.01	0.009	0.009	0.01	0.011	0.011	0.007	0.008
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<2	<2	<2	<2	<1	<1
Nickel, total	mg/l	0.046	0.05	0.043	0.041	0.047	0.042	0.036	0.032
Selenium, total	ug/L	<2	9.1	11.5	8.8	24.4	5	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.4	<0.4	<0.4	<0.4	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	10.2	<10	<10

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	2	2.1	1.8	1.5	<1	1.9	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	2.1	1.9	1.6	1.4	1.2	3	1.2	2.3
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	59	76.5	61.1	44.7	65.2	77.6	70.2	62.8

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Chloride	mg/l	1560	1600	1710	1440	1450	1390	1280	1240
Sodium	mg/l	1520	1510	1560	1650	1530	1360	1250	1150
Potassium, total	mg/l	73.7	86.2	61.5	57.9	72.5	92.8	66	47.6
Temperature, Field	deg C	12.1	13.9	12.9	13.8	12.7	14.8	13.3	15.4
pH, Field	S.U.	7.19	7.45	7.41 SU	7.11 SU	7.19	6.66 SU	7.42	6.84
Specific Conductivity, Field	umhos/cm	7680	7380	7210	7380	5210	7810	6200	6940
Total Dissolved Solids	mg/l	4070	4010	3920	4230	4000	3880	3690	3480
Alkalinity (calcium carbonate)	mg/L	1650	1610	1550	1570	1560	1470	1450	1450
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	<5	<2	<5	<2	6	<2	<2	<2
Magnesium, total	mg/L	53.3	64.4	48.5	49.6	52.3	65.8	51	36.2
Calcium, total	mg/L	102	118	95.5	95.3	98.7	114	92	70.2
Turbidity, Field	NTU	4.06	3.56	3.01	2.9	3.41	2.13	2.96	4.21
Iron, total	mg/L	6.34	6.34	6.33	4.49	5.34	5.43	4.86	3.21
Manganese, total	mg/L	0.818	1	0.74	0.757	0.737	1.02	0.75	0.553
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	1	1	1.4	1.7	1.8	1.2	1.2	1.5
Barium, total	mg/l	1.08	1.29	1.39	1.62	1.64	1.54	1.38	1.56
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	0.007	0.007	0.007	0.01	0.007	0.007	0.008	0.009
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	0.03	0.033	0.034	0.038	0.039	0.035	0.032	0.035
Selenium, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	1.3	<1	1.4	1.2	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	2	3.9	3.3	2.1	3.2	2.3	1.5	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	49.3	66.1	65.1	73.6	73.7	71.9	60.7	67.5
Chloride	mg/l	1230	1300	1320	1340	1220	1120	1140	1220
Sodium	mg/l	1320	1270	1170	1250	1240	1280	1260	1290
Potassium, total	mg/l	42.5	60.4	64.8	81.8	79	70	59.6	67.9
Temperature, Field	deg C	13.1	13.6	13.1	12.8	11.9	14.2	13.1	14.1
pH, Field	S.U.	6.87	6.95	7.3	7.16	7.23	7.48	7.17	7.47
Specific Conductivity, Field	umhos/cm	5790	7440	6490	7570	6040	5730	5330	5560
Total Dissolved Solids	mg/l	3360	3460	3650	3540	3960	3840	3200	3310
Alkalinity (calcium carbonate)	mg/L	1520	1490	1520	1580	1590	1500	1520	1480
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	<2	<2	<2	<2	<2	<2	<2	<2

Location ID: MW-8
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Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Magnesium, total	mg/L	34.4	43.8	46	53.7	58.7	53.9	47.4	50.4
Calcium, total	mg/L	63	83.3	89.5	101	106	99.9	88.3	93.2
Turbidity, Field	NTU	1.88	3.81	3.7	2.03	1.91	1.4	1.81	2.06
Iron, total	mg/L	3.09	3.63	3.81	4.52	4.28	4.17	3.66	3.8
Manganese, total	mg/L	0.461	0.618	0.676	0.787	0.877	0.784	0.667	0.777
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Data Summary Table, Well MW-9M

Name: Royalton Road

Location ID: MW-9M
Number of Sampling Dates: 32

Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Antimony, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	3.5	15.9	5.2	10	3.5
Barium, total	mg/l	0.33	0.08	0.1	0.096	0.1	0.0978	0.0988	0.141
Beryllium, total	mg/l	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.004	<0.004	<0.004	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.033
Selenium, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<0.01 mg/L	<0.02 mg/l	<0.02 mg/L	<0.02 mg/L	<0.02 mg/L
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.0015 mg/l	<0.001 mg/l	<0.001 mg/l	<1	<1	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	0.174	0.008	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<100	<100	<100	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Benzene	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Bromoform	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.04	<0.1	<0.1
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.045	<0.045	<0.045	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<5	<5	<5	<1	<1	<2	<2	<2
1,1-Dichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<5	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Bromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Chloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1

Location ID: MW-9M
Number of Sampling Dates: 32

Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Dibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<4	<4	<4	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<1	<5	<1	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Styrene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<5	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<5	<5	<5	<3	<3	<3	<3	<3
Ammonia Nitrogen	mg/l	0.22	2.38	2.37	2.27	2.12	2.53	1.83	2.2
Chloride	mg/l	1360	1390	1270	1450	1260	1680	1790	1980
Sodium	mg/l	1180	1140	1110	1110	1310	1410	1520	1610
Potassium, total	mg/l	6.2	6.2	5.9	6.1	6.2	6.1	6.2	7.7
Temperature, Field	deg C	14	16	15	13.9	14.2	13.4	10.5	14.2
pH, Field	S.U.	7.9 SU	8.09 SU	8.18 SU	8.14 SU	8.44 SU	8.27 SU	7.97 SU	7.82 SU
Specific Conductivity, Field	umhos/cm	5330	5520	3320	4860	3420	2250	4560	5260
Total Dissolved Solids	mg/l	3070	3100	3040	2940	2930	3070	3140	3580
Alkalinity (calcium carbonate)	mg/L	772	746	720	711	703	696	685	660
Nitrate,Nitrite	mg/l	1.84	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	<10	<10	<10	<5	<10	<2	<10	<10
Magnesium, total	mg/L	4.9	4.6	4.1	5.2	4.8	5.14	5.08	6.82
Calcium, total	mg/L	14.2	13.1	13.3	14.2	13.8	15.6	14.8	17.9
Turbidity, Field	NTU	11	9.7	7.8	3.91	11.9	6.63	5.63	8.85
Iron, total	mg/L	0.3	0.26	0.22	0.32	0.27	0.27	0.24	0.61
Manganese, total	mg/L	0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.01
Sulfide	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Antimony, total	ug/L	<1	<1	<1	<2	<2	<1	<1	<1
Arsenic, total	ug/L	8.3	<1	<2	<2	<2	1.7	<1	<1
Barium, total	mg/l	0.129	0.0979	0.107	0.109	0.084	0.092	0.184	0.176
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Lead, total	ug/L	<1	<1	<1	<2	<2	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<0.02 mg/L	1.5	4.8	3.4	<2	3	<1	2.7
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.4	<0.4	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<3	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	2.07	1.77	2	2.53	2.45	2.16	2.61	<0.1
Chloride	mg/l	1860	1690	1740	1610	1500	1390	1600	1790
Sodium	mg/l	1480	1420	1600	1420	1270	1260	1450	1750
Potassium, total	mg/l	8.8	7.4	7.1	8.1	6.7	6.3	7	8.4
Temperature, Field	deg C	12.3	14.2	11.5	14.5	11.9	12.5	11.4	13.3
pH, Field	S.U.	7.93 SU	7.9	8.17	7.82	7.9	8.03	7.95	7.93
Specific Conductivity, Field	umhos/cm	7020	5930	6000	4750	4280	5630	2120	5970
Total Dissolved Solids	mg/l	3470	3230	3300	3240	2960	2940	3550	3430
Alkalinity (calcium carbonate)	mg/L	660	668	659	663	680	666	669	655
Nitrate,Nitrite	mg/l	1.97	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	<2	<2	<2	2	<5	<2	<5	<2
Magnesium, total	mg/L	6.89	5.41	5.49	6.07	4.57	4.61	7.04	7.08
Calcium, total	mg/L	19.8	16	17.4	17.5	12.9	14	19.3	20.5
Turbidity, Field	NTU	5.29	3.26	5.58	5.1	4.16	7.73	4.91	2.01
Iron, total	mg/L	0.33	0.23	0.23	0.22	0.21	0.22	0.55	0.36
Manganese, total	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.013	0.01
Sulfide	mg/l	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Number of Sampling Dates: 32

Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	3.1	<1	<5	<2	2.4	<1	1	<1
Barium, total	mg/l	0.179	0.223	0.206	0.216	0.176	0.071	0.074	0.061
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<1	<1	<5	<2	10.6	<3	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

Location ID: MW-9M

Number of Sampling Dates: 32

Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	2.45	3.06	2.44	2.77	2.94	2.17	1.88	2.12
Chloride	mg/l	1840	2170	2200	1950	1940	1220	1300	1260
Sodium	mg/l	1560	1720	1830	1610	1640	1240	1140	1150
Potassium, total	mg/l	9.1	10	10.8	8.4	12.4	6.3	5.7	5.2

Location ID: MW-9M

Number of Sampling Dates: 32

Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Temperature, Field	deg C	11.1	12.4	12	11.7	11.8	13	12.1	13.5
pH, Field	S.U.	7.92	8.23	8.27 SU	8.05 SU	7.87	7.39 SU	8.04	7.65
Specific Conductivity, Field	umhos/cm	7290	8470	7300	7720	5580	5700	4760	5370
Total Dissolved Solids	mg/l	3590	4010	3910	4060	3760	2740	2710	2560
Alkalinity (calcium carbonate)	mg/L	647	631	637	625	628	644	658	655
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	<5	<2	8	<2	<2	2	<2	<2
Magnesium, total	mg/L	7.02	8.31	8.71	8.1	8.42	4.35	3.97	3.62
Calcium, total	mg/L	19.5	25.9	25.7	24.5	25.4	12.8	11.7	11.1
Turbidity, Field	NTU	2.73	4.8	2.4	2.48	3.29	1.65	3.63	1.18
Iron, total	mg/L	0.82	0.4	0.41	0.43	0.48	0.26	0.27	0.16
Manganese, total	mg/L	0.018	0.013	0.014	0.016	0.012	<0.01	<0.01	<0.01
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Number of Sampling Dates: 32

Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Barium, total	mg/l	0.071	0.087	0.081	0.061	0.084	0.053	0.1	0.075
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

Location ID: MW-9M
Number of Sampling Dates: 32

Parameter Name	**Units**	**12/2/2014**	**6/1/2015**	**12/7/2015**	**6/6/2016**	**12/5/2016**	**6/20/2017**	**12/4/2017**	**6/4/2018**
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	1.88	2.15	2.01	1.96	2.03	1.75	2.04	1.97
Chloride	mg/l	1150	1200	1350	1230	1130	981	1290	1180
Sodium	mg/l	1020	1000	1060	1040	1040	976	1100	1060
Potassium, total	mg/l	4.6	6	6.1	6.6	6.2	5.2	5.9	5.3
Temperature, Field	deg C	12.3	12.3	12	11.5	11.7	12.8	12.3	12.7
pH, Field	S.U.	7.63	7.72	8.17	8.11	8.15	8.02	7.96	8.22
Specific Conductivity, Field	umhos/cm	4510	5600	5070	5560	4760	4200	5190	4720
Total Dissolved Solids	mg/l	2460	2520	2710	2610	2650	2420	2690	2570
Alkalinity (calcium carbonate)	mg/L	658	638	655	642	641	646	639	645
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	<2	<2	<2	<2	<2	<2	<2	<2
Magnesium, total	mg/L	3.3	3.98	3.85	3.24	3.43	2.99	3.7	3.57
Calcium, total	mg/L	9.6	11.7	11.1	10.9	10.8	9.02	11.1	9.91
Turbidity, Field	NTU	0.43	2.54	1.49	0.79	3.15	6.15	2.88	3.83
Iron, total	mg/L	0.32	0.23	0.25	0.18	0.25	0.37	0.24	0.22

Location ID: MW-9M

Number of Sampling Dates: 32

Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Manganese, total	mg/L	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Data Summary Table, Well MW-9S

Name: Royalton Road

Location ID: MW-9S
Number of Sampling Dates: 32

Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Antimony, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<0.009 mg/l	<0.009 mg/l	0.011 mg/l	3.1	2.5	2.6	3	1.8
Barium, total	mg/l	0.5	0.18	0.47	0.29	0.25	0.185	0.212	0.219
Beryllium, total	mg/l	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.004	<0.004	<0.004	<0.002	0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<0.005 mg/l	<0.005 mg/l	0.017 mg/l	<1	1.2	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	0.02186	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	2.9	<0.02 mg/l	<0.02 mg/L	<0.02 mg/L	<0.02 mg/L
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.0015 mg/l	<0.001 mg/l	<0.001 mg/l	<1	<1	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	0.0117	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	0.166	0.017	0.052	0.013	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<100	<100	<100	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Benzene	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Bromoform	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.04	<0.1	<0.1
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.045	<0.045	<0.045	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<5	<5	<5	<1	<1	<2	<2	<2
1,1-Dichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<5	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Bromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1

Location ID: MW-9S
Number of Sampling Dates: 32

Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Chloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<4	<4	<4	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<1	<5	<1	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Styrene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<5	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<5	<5	<5	<3	<3	<3	<3	<3
Ammonia Nitrogen	mg/l	4.94	6.56	7.59	6.68	8.71	6.46	5.36	4.57
Chloride	mg/l	150	182	202	129	104	76	151	173
Sodium	mg/l	97.4	78.9	108	96	82.6	52.7	74.1	110
Potassium, total	mg/l	15	15	18	16.8	14.9	15.2	18	12.8
Temperature, Field	deg C	15	13	16	9.8	14.5	9.1	12.5	10.9
pH, Field	S.U.	6.8 SU	6.82 SU	6.57 SU	6.88 SU	7.21 SU	6.82 SU	6.84 SU	6.27 SU
Specific Conductivity, Field	umhos/cm	1280	1390	1290	1020	878	819	1491	1073
Total Dissolved Solids	mg/l	724	762	714	630	596	652	612	614
Alkalinity (calcium carbonate)	mg/L	280	370	362	441	321	406	379	255
Nitrate,Nitrite	mg/l	0.38	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	90	54	90	18	59	8.7	63.7	72
Magnesium, total	mg/L	34.4	33.7	35.1	43.1	36.5	42.2	36.3	28.3
Calcium, total	mg/L	86	74.4	84.1	97.7	90.9	86.5	83.3	64.9
Turbidity, Field	NTU	42	36	32	26.8	101	29.8	10.1	17.82
Iron, total	mg/L	23.3	49.1	39.8	52.2	39.4	73.3	49.5	27.9
Manganese, total	mg/L	0.74	1.35	0.89	1.45	1.05	1.36	1.09	0.687
Sulfide	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Antimony, total	ug/L	<1	<1	<1	<2	<1	<1	<1	<1
Arsenic, total	ug/L	2.2	2.5	2.2	2.9	3.5	1.9	<1	<1
Barium, total	mg/l	0.201	0.173	0.213	0.154	0.163	0.368	0.262	0.285
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<2	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<0.02 mg/L	1.2	1.7	<2	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	0.013	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<3	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	3.65	3.96	4.34	5.47	7.08	5.56	3.66	6.85
Chloride	mg/l	133	244	126	146	140	178	1500	265
Sodium	mg/l	98.3	87.4	101	50.8	55.3	119	136	170
Potassium, total	mg/l	13.7	14.3	14.1	14.2	16.7	14.4	12	13.1
Temperature, Field	deg C	12.8	12.3	11.1	12.5	10.1	9.5	11.5	11.8
pH, Field	S.U.	6.78 SU	6.55	7.81	6.41	6.57	6.74	6.98	6.98
Specific Conductivity, Field	umhos/cm	1068	1539	979	1246	1057	1434	1171	1528
Total Dissolved Solids	mg/l	602	786	620	720	568	746	752	876
Alkalinity (calcium carbonate)	mg/L	276	259	293	326	301	371	235	247
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	84	84.4	77	67	33	42	137	98
Magnesium, total	mg/L	32.6	36.5	35.1	37.2	37	34.8	33.5	31.4
Calcium, total	mg/L	80.4	81.2	80.4	75.5	68	88.2	90.9	85.5
Turbidity, Field	NTU	2.16	22	20.2	6.16	19.4	34.5	2.95	1.04
Iron, total	mg/L	28	52.1	33.3	52.8	60.2	26.9	18.5	15.9
Manganese, total	mg/L	0.726	1.04	0.877	1.14	1.02	0.76	0.686	0.587
Sulfide	mg/l	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<1	<1	1.1	<1	1	<1	1.3	1.2
Barium, total	mg/l	0.233	0.218	0.167	0.182	0.161	0.184	0.152	0.208
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	3.71	3.09	2.35	2.58	2.47	3.06	2.95	3.73

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Chloride	mg/l	201	299	129	207	148	198	169	353
Sodium	mg/l	139	157	102	147	106	150	121	182
Potassium, total	mg/l	12.9	11.4	9.9	9.8	9.9	10.8	10.4	12.5
Temperature, Field	deg C	11.3	10.5	12.2	9.8	12.1	10	12.9	10.2
pH, Field	S.U.	6.7	6.97	7.05 SU	6.69 SU	6.95	6.36 SU	6.8	6.54
Specific Conductivity, Field	umhos/cm	1335	1235	1087	1471	1007	1314	1158	1758
Total Dissolved Solids	mg/l	710	780	574	792	598	746	694	924
Alkalinity (calcium carbonate)	mg/L	249	192	245	230	233	256	234	263
Nitrate,Nitrite	mg/l	0.68	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	114	121	80	100	93	94	90	71
Magnesium, total	mg/L	33.2	28.5	29.1	29	31.5	31.8	32.9	37.9
Calcium, total	mg/L	89.1	79.7	79.8	82.8	82.4	81.6	81.4	97.1
Turbidity, Field	NTU	5.05	3.95	1.89	2.71	1.51	2.93	2.48	6.52
Iron, total	mg/L	19.7	14.8	15.5	12.2	20.4	21.5	23.4	29.4
Manganese, total	mg/L	0.71	0.535	0.497	0.421	0.511	0.577	0.567	0.708
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	1.5	1.1	1.5	1.4	1.3	<1	<1	<1
Barium, total	mg/l	0.206	0.257	0.219	0.245	0.216	0.287	0.205	0.291
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

Location ID: MW-9S
Number of Sampling Dates: 32

Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	4.29	4.37	4.08	4.62	3.77	5.7	3.7	5.09
Chloride	mg/l	223	329	269	257	192	188	175	291
Sodium	mg/l	157	206	171	170	148	131	134	196
Potassium, total	mg/l	11.4	12.9	12.1	14.1	12	17.3	9.9	13.9
Temperature, Field	deg C	13	9.3	13	9.2	12.9	11.6	13.4	10
pH, Field	S.U.	6.52	6.65	6.77	6.8	6.79	6.6	6.9	6.96
Specific Conductivity, Field	umhos/cm	1256	1645	1479	1596	1298	1488	1153	1644
Total Dissolved Solids	mg/l	776	936	812	832	710	860	730	890
Alkalinity (calcium carbonate)	mg/L	270	237	277	315	264	388	225	350
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	76	78	84	65	73	33	109	37

Location ID: MW-9S
Number of Sampling Dates: 32

Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Magnesium, total	mg/L	31.9	36.9	32.4	36.6	29.4	42.5	25.6	35.2
Calcium, total	mg/L	74.5	95.7	86.1	93.9	79.2	102	70.1	93.5
Turbidity, Field	NTU	1.53	7.12	2.58	3.41	1.28	4.13	3.07	5.52
Iron, total	mg/L	24.1	25.4	25.5	30.8	20.9	41.3	11.7	19.4
Manganese, total	mg/L	0.583	0.656	0.629	0.727	0.554	0.936	0.347	0.567
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Data Summary Table, Well MW-10D

Name: Royalton Road

Location ID: MW-10D
Number of Sampling Dates: 32

Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Antimony, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	<2	<2	<1	<1	<1
Barium, total	mg/l	0.24	0.02	0.0199	0.021	0.02	0.016	0.0168	0.0181
Beryllium, total	mg/l	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.004	<0.004	<0.004	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<0.02 mg/l	<0.02 mg/L	<0.02 mg/L	<0.02 mg/L
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.0015 mg/l	<0.001 mg/l	<0.001 mg/l	<1	<1	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	0.177	0.006	0.009	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<100	<100	<100	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Benzene	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Bromoform	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.04	<0.1	<0.1
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.045	<0.045	<0.045	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<5	<5	<5	<1	<10	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<5	<5	<5	<1	<10	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<5	<5	<5	<1	<1	<2	<2	<2
1,1-Dichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<5	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Bromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1

Location ID: MW-10D
Number of Sampling Dates: 32

Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Chloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<4	<4	<4	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<1	<5	<1	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Styrene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<5	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<5	<5	<5	<3	<3	<3	<3	<3
Ammonia Nitrogen	mg/l	2.72	2.85	3.01	2.49	3.72	3.06	2.51	2.67
Chloride	mg/l	6	4	3	3	5	4	4	8.12
Sodium	mg/l	68.1	63.4	73.1	83.7	79.3	81.4	83.5	82.4
Potassium, total	mg/l	9	8.2	8.9	9.8	9.7	9.6	8.9	9.6
Temperature, Field	deg C	13	16	13	15.2	15.2	12.8	11.9	15.7
pH, Field	S.U.	7.4 SU	7.38 SU	7.45 SU	7.39 SU	7.63 SU	7.64 SU	7.53 SU	7.17 SU
Specific Conductivity, Field	umhos/cm	1080	1210	1060	836	957	761	1520	1150
Total Dissolved Solids	mg/l	814	856	848	806	850	930	824	818
Alkalinity (calcium carbonate)	mg/L	388	389	387	388	376	392	394	392
Nitrate,Nitrite	mg/l	0.07	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	345	355	353	370	275	305	315	336
Magnesium, total	mg/L	55.1	53	57.3	56.6	56.9	53.9	54.3	55.3
Calcium, total	mg/L	124	124	129	134	141	136	136	139
Turbidity, Field	NTU	46	12	28	13.3	12.7	7.46	11.7	10.56
Iron, total	mg/L	3.75	1.17	1.71	1.77	1.57	1.21	1.05	1.17
Manganese, total	mg/L	0.03	0.02	0.03	0.023	0.03	0.016	0.018	0.018
Sulfide	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05

Location ID: MW-10D
Number of Sampling Dates: 32

Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Barium, total	mg/l	0.018	0.0186	0.017	0.018	0.02	0.016	0.017	0.018
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Location ID: MW-10D
Number of Sampling Dates: 32

Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<0.02 mg/L	<1	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5 ugL
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1

Location ID: MW-10D
Number of Sampling Dates: 32

Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<3	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	2.44	2.33	2.57	2.72	1.9	3.22	2.71	<0.1
Chloride	mg/l	5	5.8	7	5.5	7	7	10	10
Sodium	mg/l	82.7	82.5	79.2	69.2	84.3	78.1	70.4	68.1
Potassium, total	mg/l	9.7	9.8	8.8	9.2	9.8	9.2	8.8	9.4
Temperature, Field	deg C	13.9	15.3	11.8	14.1	10.5	14	14.2	16.3
pH, Field	S.U.	7.38 SU	6.86	7.45	7.14	7.15	7.43	7.17	7.19
Specific Conductivity, Field	umhos/cm	1064	1260	1100	1289	1300	1266	1057	1252
Total Dissolved Solids	mg/l	822	834	850	836	848	832	834	832
Alkalinity (calcium carbonate)	mg/L	392	392	389	391	394	399	390	384
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.33	0.19
Sulfate	mg/L	308	326	318	317	321	322	324	297
Magnesium, total	mg/L	55.4	56.2	52	51.7	57.3	52	53.7	53.2
Calcium, total	mg/L	133	132	128	128	137	124	134	131
Turbidity, Field	NTU	6.92	16.56	11.52	11.2	12.3	10.2	7.22	3.22
Iron, total	mg/L	1.12	1.94	1.44	1.89	2.51	0.84	1.01	0.7
Manganese, total	mg/L	0.02	0.018	0.022	0.02	0.02	0.016	0.017	0.012
Sulfide	mg/l	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Location ID: MW-10D
Number of Sampling Dates: 32

Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Barium, total	mg/l	0.016	0.018	0.025	0.02	0.017	0.018	0.018	0.018
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10

Location ID: MW-10D

Number of Sampling Dates: 32

Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	2.44	2.9	2.48	2.46	2.64	2.65	2.62	2.88

Location ID: MW-10D
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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Chloride	mg/l	9	8	14	10	15	10	13	23
Sodium	mg/l	84.4	110	84.7	82.2	72.1	76.3	77.2	69.4
Potassium, total	mg/l	9.7	10.1	10	9.7	9.4	9.5	9.8	9.5
Temperature, Field	deg C	10.8	14.2	11.2	13.6	11.7	15.2	14.7	15.2
pH, Field	S.U.	6.97	6.97	7.16 SU	7.29 SU	7.6	6.79 SU	6.92	6.95
Specific Conductivity, Field	umhos/cm	1150	1226	1196	1061	946	1187	1145	1188
Total Dissolved Solids	mg/l	856	878	842	876	832	860	878	794
Alkalinity (calcium carbonate)	mg/L	404	409	402	384	388	392	392	387
Nitrate,Nitrite	mg/l	<0.05	0.09	0.21	0.13	<0.05	<0.05	0.21	0.05
Sulfate	mg/L	314	387	298	300	279	285	255	290
Magnesium, total	mg/L	55.7	56.8	57.7	55.6	52.7	54	55.4	52.4
Calcium, total	mg/L	134	137	144	138	127	126	126	128
Turbidity, Field	NTU	9.79	2.48	7.09	4.23	2.78	1.73	2.72	1.7
Iron, total	mg/L	0.74	0.51	1.36	0.73	0.57	0.66	0.62	0.56
Manganese, total	mg/L	0.019	0.021	0.036	0.025	0.038	0.024	0.026	0.021
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Number of Sampling Dates: 32

Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Barium, total	mg/l	0.019	0.017	0.018	0.019	0.019	0.017	0.02	0.021
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

Location ID: MW-10D
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Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	2.36	2.31	2.71	2.3	2.43	2.45	2.51	2.72
Chloride	mg/l	16	12	13	15	16	16	21	22
Sodium	mg/l	73	61.9	64.6	68.7	73.7	75.2	53.9	67.3
Potassium, total	mg/l	8.8	8.7	9.4	9.7	9.4	9.3	9.6	9.5
Temperature, Field	deg C	14.2	14.2	13.7	13.5	13.5	14.7	13.6	15.3
pH, Field	S.U.	6.87	6.87	7.27	7.3	7.25	7.22	7.3	7.36
Specific Conductivity, Field	umhos/cm	1054	1118	1146	1160	1147	1175	1315	1196
Total Dissolved Solids	mg/l	834	796	844	770	850	844	812	830
Alkalinity (calcium carbonate)	mg/L	388	374	385	385	384	380	386	390
Nitrate,Nitrite	mg/l	0.35	0.49	0.25	0.4	0.34	0.33	0.08	0.06
Sulfate	mg/L	296	262	278	272	269	271	296	296

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Number of Sampling Dates: 32

Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Magnesium, total	mg/L	52.3	51.1	57.1	53.7	52.9	55.6	60.3	57.5
Calcium, total	mg/L	117	122	151	135	135	134	151	139
Turbidity, Field	NTU	2.8	2.14	8.19	3.63	3.2	3.12	7.11	6.95
Iron, total	mg/L	0.66	0.82	1.08	0.46	0.66	0.63	0.97	1.37
Manganese, total	mg/L	0.019	0.018	0.015	0.016	0.019	0.015	0.027	0.035
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Data Summary Table, Well MW-10S

Name: Royalton Road

Location ID: MW-10S
Number of Sampling Dates: 32

Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Antimony, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<5	<1	<1	<5
Arsenic, total	ug/L	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	13.4	20.5	5.3	4	<5
Barium, total	mg/l	4.15	3.61	4.76	4.61	5.49	4.05	4.54	3.97
Beryllium, total	mg/l	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.004	<0.004	<0.004	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	0.011	<0.01	<0.01	<0.01
Cobalt, total	mg/l	0.03	0.03	<0.01	0.024	0.019	0.022	0.023	0.023
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01
Lead, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	5.4	3	1.5	<5
Nickel, total	mg/l	0.12	0.13	0.1	0.14	0.14	0.139	0.161	0.142
Selenium, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<0.01 mg/L	<0.02 mg/l	<0.02 mg/L	<0.02 mg/L	<0.02 mg/L
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.0015 mg/l	<0.001 mg/l	<0.001 mg/l	<1	<1	<0.2	<0.2	1
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	<0.005
Zinc, total	mg/L	0.16	0.007	0.051	<0.01	0.456	0.016	0.011	<0.01
Acetone	ug/l	<100	<100	<100	11.5	<10	13.1	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Benzene	ug/l	2	<4	2	2.12	1.1	2.2	2.1	1.7
Bromochloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Bromoform	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.04	<0.1	<0.1
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.045	<0.045	<0.045	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<5	<5	<5	<1	<1	<2	<2	<2
1,1-Dichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<0.5
1,2-Dichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<5	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	6	<5	<5	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Bromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Chloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1

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Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Dibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<4	<4	<4	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<1	<5	<1	27.6	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Styrene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Toluene	ug/l	1	<5	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	2	1	2	1.38	<1	<1	<1	<1
Xylenes, Total	ug/L	6	<5	<5	<3	<3	<3	<3	<3
Ammonia Nitrogen	mg/l	14.5	18.7	12.4	13.3	17.8	20.8	18.5	27.2
Chloride	mg/l	3590	3020	2790	2970	2440	2490	3490	3060
Sodium	mg/l	1140	1140	1080	1190	1270	1250	1640	1490
Potassium, total	mg/l	36	35	26	29.8	33.7	35	44	44
Temperature, Field	deg C	13	16	13	17.8	15.8	13.7	15.1	16.4
pH, Field	S.U.	6.6 SU	6.45 SU	6.47 SU	6.38 SU	6.62 SU	6.36 SU	4.16 SU	6.2 SU
Specific Conductivity, Field	umhos/cm	6980	8590	5590	8210	4940	2730	8080	7410
Total Dissolved Solids	mg/l	6130	6110	6210	6570	5860	7140	6410	6310
Alkalinity (calcium carbonate)	mg/L	1580	1519	1442	1420	1140	1540	1580	1510
Nitrate,Nitrite	mg/l	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	<10	<10	<10	<5	<10	2	<10	<10
Magnesium, total	mg/L	233	293	307	325	354	291	290	260
Calcium, total	mg/L	678	566	711	645	776	652	637	543
Turbidity, Field	NTU	298	30	41	46.8	156	120	39.5	15.82
Iron, total	mg/L	13.1	17	14.1	19.8	18.1	16.6	15.1	14.9
Manganese, total	mg/L	2.46	3.75	1.23	2.82	1.56	2.33	2.02	2.74
Sulfide	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Antimony, total	ug/L	<5	<1	<2	<2	<2	<1	<5	<1
Arsenic, total	ug/L	<5	10	<5	4.6	5.5	4.1	<5	4.3
Barium, total	mg/l	4.09	4.46	4.19	3.91	4.65	4.07	4.44	4.04
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	0.014	0.012	0.023	0.01	0.018	0.011	0.011	0.009
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Lead, total	ug/L	<5	<1	<2	<2	<2	1.1	<5	<1
Nickel, total	mg/l	0.133	0.147	0.17	0.13	0.18	0.133	0.153	0.133
Selenium, total	ug/L	<0.02 mg/L	23.5	8.2	16.9	20.2	12.2	<5	14.8
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<1	<0.2	<0.4	<0.4	<0.4	<0.2	<1	<0.2
Vanadium, total	mg/L	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	0.012	<0.01	0.01	0.018	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	10.9	<10	11	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	1.3	1.5	1.6	1.6	1.1	1.6	1.7	1.6
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	1.1	<1	1.4
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<3	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	27.9	29.3	40.8	38.3	24.1	40.2	47.4	40.8
Chloride	mg/l	2560	2480	2700	2600	3000	2200	2500	2380
Sodium	mg/l	1150	1400	1590	1170	1620	1250	1280	1360
Potassium, total	mg/l	53.8	60.7	61	51.8	72.7	49.3	65.5	53.2
Temperature, Field	deg C	14.1	14.7	12.2	14	10.6	13.2	14.2	15.4
pH, Field	S.U.	6.48 SU	6.28	6.27	6.41	6.51	6.54	6.69	6.38
Specific Conductivity, Field	umhos/cm	7550	6390	6790	9310	9440	9630	8910	9920
Total Dissolved Solids	mg/l	5580	6280	5910	5740	6090	5500	5670	5830
Alkalinity (calcium carbonate)	mg/L	1500	1580	1550	1390	1650	1580	1610	1560
Nitrate,Nitrite	mg/l	<0.05	2.76	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	<2	7.9	3	4	<5	<2	<5	2
Magnesium, total	mg/L	260	288	277	275	280	290	266	308
Calcium, total	mg/L	536	491	545	473	489	412	469	448
Turbidity, Field	NTU	27.1	22.7	13.14	7.39	11.4	28.7	5.02	1.7
Iron, total	mg/L	12.3	10.9	13.8	9.27	13	10.2	10.7	9.32
Manganese, total	mg/L	1.56	1.34	2.3	1.24	1.69	1	1.14	0.959
Sulfide	mg/l	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Antimony, total	ug/L	<1	<1	<2	<2	<2	<2	<1	<1
Arsenic, total	ug/L	6.7	<2	5.9	4.7	5.3	3.7	1.7	1.5
Barium, total	mg/l	4.05	4.32	4.2	3.94	4.16	4.62	4.34	4.6
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	0.012	0.01	0.01	0.008	0.011	0.009	0.008	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<2	<2	<2	<2	<1	<1
Nickel, total	mg/l	0.146	0.132	0.131	0.107	0.125	0.119	0.111	0.136
Selenium, total	ug/L	<2	<2	18.7	20.6	21.5	6	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.4	<0.4	<0.4	<0.4	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	0.016	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	12.3	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	1.6	1.6	1.4	1.5	<1	1.4	1.2	1.1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	1.4	1.4	1.1	1.4	<1	1.8	<1	2
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	36.4	35.1	31.8	25	43.3	28.2	39.2	41.1
Chloride	mg/l	2400	2210	2580	1950	2140	2090	2020	2000
Sodium	mg/l	1380	1280	1230	1150	1440	1270	1260	1260
Potassium, total	mg/l	62.4	51.4	51.2	40.7	65.1	55.9	56.6	56.2

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Temperature, Field	deg C	10.7	14	11.1	13.1	13.2	14.4	14.5	15
pH, Field	S.U.	6.64	6.35	6.32 SU	6.39 SU	6.7	6.04 SU	6.3	6.35
Specific Conductivity, Field	umhos/cm	6040	7010	6600	5540	4730	9610	9540	10070
Total Dissolved Solids	mg/l	5430	5320	5440	5410	5820	5530	5320	5490
Alkalinity (calcium carbonate)	mg/L	1530	1630	1510	1490	1690	1540	1600	1630
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	<5	6	<5	<4	6	7	8	4
Magnesium, total	mg/L	292	294	282	300	277	295	265	246
Calcium, total	mg/L	472	523	476	428	418	478	393	475
Turbidity, Field	NTU	3.6	7.44	6.21	2.82	7.92	1.84	5.88	1.07
Iron, total	mg/L	9.37	8.93	8.61	6.8	8.41	7.53	6.91	7.86
Manganese, total	mg/L	1.05	0.998	0.85	0.655	0.866	0.66	0.59	0.613
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Number of Sampling Dates: 32

Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	2	3	2.2	2.1	2.5	1.9	1.8	1.5
Barium, total	mg/l	4.36	4.71	4.48	4.35	4.38	4.36	4.25	4.23
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	0.01	0.021	0.01	0.012	0.013	0.008	0.009	0.01
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	0.119	0.172	0.131	0.131	0.134	0.126	0.121	0.127
Selenium, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	13	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	1.4	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	1.2	1.2	1.3	<1	1.2	<1	<1	1.5
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

Location ID: MW-10S
Number of Sampling Dates: 32

Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	43.7	98.1	52.4	39.7	49.2	41.1	46.1	42.3
Chloride	mg/l	2090	2900	2000	2200	2190	1960	1960	1930
Sodium	mg/l	1260	1860	1310	1210	1290	1260	1260	1280
Potassium, total	mg/l	52.4	93.5	66.8	60.9	68	53	57.5	54
Temperature, Field	deg C	13.3	13.2	13.3	12.7	13.1	14	13.5	13.6
pH, Field	S.U.	6.29	6.34	6.57	6.54	6.56	6.7	6.7	6.68
Specific Conductivity, Field	umhos/cm	7510	13200	9240	9760	8760	8360	9541	8250
Total Dissolved Solids	mg/l	5240	6530	5600	5330	5040	5230	6990	4750
Alkalinity (calcium carbonate)	mg/L	1590	1910	1660	1640	1620	1560	1610	1470
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	5	<10	3	<4	<2	3	2	<2
Magnesium, total	mg/L	228	229	239	221	220	232	223	207
Calcium, total	mg/L	369	353	445	388	384	392	366	338
Turbidity, Field	NTU	0.81	1.94	2.87	4.11	2.24	1.46	1.29	6.54
Iron, total	mg/L	6.62	9.19	6.74	6.35	6.57	5.87	5.83	6.27

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Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Manganese, total	mg/L	0.602	0.977	0.564	0.54	0.557	0.477	0.429	0.446
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Data Summary Table, Well MW-11S

Name: Royalton Road

Location ID: MW-11S
Number of Sampling Dates: 32

Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Antimony, total	ug/L	0.009 mg/l	<0.005 mg/l	0.007 mg/l	5.2	3.2	1.6	1.5	<5
Arsenic, total	ug/L	0.031 mg/l	0.017 mg/l	0.027 mg/l	23.7	22.4	20.9	16	<5
Barium, total	mg/l	0.49	0.43	0.75	0.779	0.76	0.757	1.02	0.591
Beryllium, total	mg/l	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.004	<0.004	<0.004	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	0.015	0.015	<0.01	0.013	<0.01
Cobalt, total	mg/l	<0.01	<0.01	<0.01	<0.01	0.01	0.006	0.009	0.005
Copper, total	mg/l	0.04	<0.01	<0.01	0.035	0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	2.4	1.6	<1	1.1	<5
Nickel, total	mg/l	0.04	0.06	0.08	0.08	0.084	0.072	0.083	0.059
Selenium, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	15.3	<0.02 mg/l	<0.02 mg/L	<0.02 mg/L	<0.02 mg/L
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.0015 mg/l	<0.001 mg/l	<0.001 mg/l	<1	<1	<0.2	<0.2	<1
Vanadium, total	mg/L	0.0151	0.00656	0.00679	0.01	0.01	0.005	0.008	<0.005
Zinc, total	mg/L	0.217	0.009	0.009	<0.01	0.018	<0.01	0.01	<0.01
Acetone	ug/l	<100	<100	<100	10.8	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Benzene	ug/l	7	6	6	5.02	7	6.2	4.9	4.7
Bromochloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Bromoform	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.04	<0.1	<0.1
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.045	<0.045	<0.045	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<5	<5	<5	<1	<10	<1	<1	<1
1,4-Dichlorobenzene	ug/l	11	11	10	7.68	<10	11.2	8.1	6.9
trans-1,4-Dichloro-2-Butene	ug/l	<5	<5	<5	<1	<1	<2	<2	<2
1,1-Dichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<5	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Bromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1

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Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Chloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<4	<4	<4	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<1	<5	<1	<5	15.3	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Styrene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Toluene	ug/l	1	<5	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	7	<5	<5	<3	3.7	3.3	<3	<3
Ammonia Nitrogen	mg/l	39.4	94.2	106	136	63.1	115	121	76.9
Chloride	mg/l	311	535	549	748	558	600	758	757
Sodium	mg/l	203	388	408	424	394	446	389	360
Potassium, total	mg/l	55	101	104	101	116	116	119	97.9
Temperature, Field	deg C	19	22	20	22.5	19.4	20.5	18.5	20.7
pH, Field	S.U.	6.8 SU	6.79 SU	6.91 SU	6.86 SU	7.07 SU	6.86 SU	6.74 SU	6.92 SU
Specific Conductivity, Field	umhos/cm	4010	4760	2860	3950	1646	1615	5110	3950
Total Dissolved Solids	mg/l	2800	3260	3140	3250	3160	3420	3240	3030
Alkalinity (calcium carbonate)	mg/L	1516	1772	1749	1760	1760	1790	1930	1890
Nitrate,Nitrite	mg/l	0.76	0.85	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	569	548	487	553	397	394	371	437
Magnesium, total	mg/L	263	249	262	267	285	239	256	242
Calcium, total	mg/L	408	357	381	354	341	340	315	331
Turbidity, Field	NTU	42	31	25	89.8	27.8	33.2	20.3	38
Iron, total	mg/L	10.6	3.54	3.56	6.87	6.36	3.15	4.5	3
Manganese, total	mg/L	0.16	0.09	0.09	0.14	0.1	0.1	0.084	0.112
Sulfide	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Antimony, total	ug/L	<1	3.2	3.4	<3	1.4	1	<1	<1
Arsenic, total	ug/L	12.3	10.9	11.9	14.6	8.7	9.6	5.9	5.7
Barium, total	mg/l	0.382	0.226	0.22	0.461	0.368	0.321	0.239	0.257
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	2.3	<2	<3	<1	<1	<1	<1
Nickel, total	mg/l	0.056	0.057	0.05	0.063	0.048	0.049	0.049	0.043
Selenium, total	ug/L	<0.02 mg/L	2.7	3.5	5.2	8.3	7.7	<2	5
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.4	<1	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	0.006	0.006	0.01	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	0.01	0.018	0.014	<0.01	0.011	<0.01	<0.01	0.035
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	4.2	3.1	3	5.2	4.8	4.7	4.9	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	1.2	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	6.2	4.7	4.3	7.6	7.5	5.9	2.7	5.7
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<3	<2	<2	2.1	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	74.9	47.4	37.8	57	41.2	36.4	38.8	35.2
Chloride	mg/l	612	487	498	645	670	565	560	559
Sodium	mg/l	312	265	296	352	289	274	272	261
Potassium, total	mg/l	89	65.3	66	75.1	55.1	50.8	52.2	48.4
Temperature, Field	deg C	18.2	20.9	14.4	21.2	14.9	21.4	16.1	20
pH, Field	S.U.	6.73 SU	6.81	6.83	6.86	6.46	6.79	6.67	6.61
Specific Conductivity, Field	umhos/cm	4620	3680	3990	3890	3310	3120	4050	4600
Total Dissolved Solids	mg/l	2710	2710	2620	2870	2530	2480	480	2650
Alkalinity (calcium carbonate)	mg/L	1460	1410	1430	1600	1510	1400	1440	1380
Nitrate,Nitrite	mg/l	0.81	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	520	515	442	328	336	294	236	224
Magnesium, total	mg/L	240	256	237	237	263	255	235	236
Calcium, total	mg/L	356	337	335	323	314	338	367	333
Turbidity, Field	NTU	14.63	36.5	38.4	9.77	18.2	8.53	7.04	4.27
Iron, total	mg/L	3.67	5.45	2.8	2.15	1.67	1.38	0.23	0.1
Manganese, total	mg/L	0.14	0.142	0.166	0.098	0.122	0.121	0.143	0.131
Sulfide	mg/l	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Antimony, total	ug/L	<1	<1	<1	<1	<1	<2	<1	<1
Arsenic, total	ug/L	4.1	8.6	6.7	5.7	6.9	4.6	5.7	3.8
Barium, total	mg/l	0.209	0.315	0.392	0.354	0.385	0.493	0.499	0.43
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	0.047	0.063	0.033	0.094	0.017	0.018	0.014
Lead, total	ug/L	<1	<1	<1	<1	2.3	<2	<1	<1
Nickel, total	mg/l	0.038	0.043	0.039	0.033	0.031	0.032	0.029	0.028
Selenium, total	ug/L	6.3	15.8	5.7	7.5	6.6	<3	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	0.094	0.142	0.176	0.1	0.11	0.049	0.059	0.021
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	1.2	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	6.1	4.9	4.2	3.8	2.5	3.1	3	3
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	24.3	40.6	41.6	32.8	25.7	33.9	34.2	34.4

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Chloride	mg/l	523	588	583	535	518	495	471	533
Sodium	mg/l	234	303	300	256	236	277	253	240
Potassium, total	mg/l	47.7	58.6	57	45.8	41.2	53	49.2	46.4
Temperature, Field	deg C	12.1	20.7	14.2	17.4	13.7	17.8	16.6	18.3
pH, Field	S.U.	6.71	6.76	7.03 SU	6.84 SU	6.92	6.86 SU	6.5	6.97
Specific Conductivity, Field	umhos/cm	2640	3260	3090	3320	3750	3300	4130	5470
Total Dissolved Solids	mg/l	474	2410	1920	2390	2300	2380	2290	2190
Alkalinity (calcium carbonate)	mg/L	1330	1440	1420	1300	1380	1360	1340	1170
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	290	226	152	128	112	89	101	102
Magnesium, total	mg/L	243	225	230	240	211	213	215	216
Calcium, total	mg/L	354	354	330	310	287	285	291	291
Turbidity, Field	NTU	7.28	6.61	5.6	4.14	3.91	2.69	3.06	1.3
Iron, total	mg/L	0.08	0.08	0.09	0.08	0.07	0.08	<0.05	0.05
Manganese, total	mg/L	0.143	0.101	0.102	0.081	0.076	0.084	0.076	0.076
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	3.7	4	4	4	3	4.4	4.1	3.7
Barium, total	mg/l	0.571	0.703	0.761	0.778	0.606	1.02	1.12	1.26
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	0.012	0.012	0.023	<0.01	0.022	0.011	0.045	0.012
Lead, total	ug/L	<1	<1	1.2	<1	<1	<1	1.8	<1
Nickel, total	mg/l	0.028	0.027	0.029	0.035	0.026	0.029	0.027	0.029
Selenium, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	0.033	0.017	0.056	0.014	0.015	0.01	0.042	0.016
Acetone	ug/l	<10	<10	<10	<10	<10	17.7	10.5	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	2.5	2.5	2.4	2.5	2.6	1.6	1.8	2.1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	35.1	39.7	37.6	37.2	30	39.4	36.6	39.2
Chloride	mg/l	518	519	469	483	427	446	496	521
Sodium	mg/l	246	246	234	254	232	268	263	267
Potassium, total	mg/l	45.4	46.3	51.3	54.1	46.9	48.9	49.8	51.4
Temperature, Field	deg C	12.3	14.3	13.4	15.6	12.8	15.9	15.3	16.4
pH, Field	S.U.	7.06	6.75	6.53	6.78	6.67	6.82	7.02	6.82
Specific Conductivity, Field	umhos/cm	3630	4070	3670	3510	3800	3820	2090	3720
Total Dissolved Solids	mg/l	2050	1810	2330	2270	2100	2250	1840	2010
Alkalinity (calcium carbonate)	mg/L	1330	1320	1260	1230	1280	1300	1230	1190
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	0.25	<0.05	<0.05
Sulfate	mg/L	79	57	76	76	92	34	66	38

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Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Magnesium, total	mg/L	186	196	194	177	186	191	184	174
Calcium, total	mg/L	245	245	322	278	290	279	287	260
Turbidity, Field	NTU	2.26	2.98	3.21	2.8	3.7	3.29	8.26	4.14
Iron, total	mg/L	0.15	0.24	0.16	0.09	0.14	0.65	0.39	0.26
Manganese, total	mg/L	0.078	0.079	0.084	0.08	0.113	0.12	0.105	0.094
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2

Data Summary Table, Well MW-12

Name: Royalton Road

Location ID: MW-12
Number of Sampling Dates: 32

Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Antimony, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<1
Arsenic, total	ug/L	0.017 mg/l	0.01 mg/l	0.016 mg/l	12.7	15.7	14.9	13	10.8
Barium, total	mg/l	0.23	0.01032	<0.01	0.01	0.01	<0.01	<0.01	<0.01
Beryllium, total	mg/l	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.004	<0.004	<0.004	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<0.02 mg/l	<0.02 mg/L	<0.02 mg/L	<0.02 mg/L
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.0015 mg/l	<0.001 mg/l	<0.001 mg/l	<1	<1	0.3	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	0.195	0.024	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<100	<100	<100	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Benzene	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Bromoform	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.04	<0.1	<0.1
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.045	<0.045	<0.045	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<5	<5	<5	<1	<10	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<5	<5	<5	<1	<10	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<5	<5	<5	<1	<1	<2	<2	<2
1,1-Dichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<5	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Bromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1

Location ID: MW-12
Number of Sampling Dates: 32

Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Chloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<4	<4	<4	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<1	<5	<1	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Styrene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<5	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<5	<5	<5	<3	<3	<3	<3	<3
Ammonia Nitrogen	mg/l	0.83	0.82	0.88	0.93	0.83	1.27	0.63	0.68
Chloride	mg/l	8	10	8	9	8	14	21.8	24.7
Sodium	mg/l	50.6	49	52	54.9	54.3	56.3	60	56.6
Potassium, total	mg/l	10	10	10	10.7	10.5	11	11.1	10.8
Temperature, Field	deg C	12	15	14	14.5	13.8	13.2	11	12.6
pH, Field	S.U.	7.2 SU	7.59 SU	6.9 SU	6.93 SU	7.09 SU	6.81 SU	7.06 SU	6.66 SU
Specific Conductivity, Field	umhos/cm	2790	2980	1790	1227	1206	4150	3330	2420
Total Dissolved Solids	mg/l	2550	2840	2830	2620	2750	2700	2760	2850
Alkalinity (calcium carbonate)	mg/L	449	463	467	452	457	354	451	458
Nitrate,Nitrite	mg/l	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	1520	1420	1550	1580	1310	1420	1790	1820
Magnesium, total	mg/L	220	212	218	222	265	226	258	227
Calcium, total	mg/L	453	409	440	409	528	481	426	477
Turbidity, Field	NTU	19	15	20	18.6	12.9	21.6	22.2	27.1
Iron, total	mg/L	6.35	5.46	5.49	5.72	6.27	5.96	6.03	6.45
Manganese, total	mg/L	0.09	0.09	0.09	0.088	0.1	0.091	0.094	0.101
Sulfide	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<5	15.4	15.1	14.9	12.5	14.5	24.9	24.1
Barium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<0.02 mg/L	1.2	<1	<1	<1	<1	1.1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<3	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	0.62	0.58	0.71	0.86	0.84	0.82	0.68	0.82
Chloride	mg/l	26	24.8	26	19.9	19	16	35	24
Sodium	mg/l	56.7	56.6	59.9	57.6	61.1	56.6	62.2	61.8
Potassium, total	mg/l	10.7	11.5	10.4	11.6	11.7	10.8	11.5	11.9
Temperature, Field	deg C	13.2	14.6	11.4	13.2	11	14.2	12.4	17.2
pH, Field	S.U.	6.93 SU	6.48	7.23	6.67	6.87	6.98	6.65	6.5
Specific Conductivity, Field	umhos/cm	3600	1553	1739	1763	1770	1960	3310	3650
Total Dissolved Solids	mg/l	2730	2830	2820	2840	2810	2900	3110	3110
Alkalinity (calcium carbonate)	mg/L	449	454	459	465	463	466	493	490
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	1600	1690	1730	1720	1690	1690	1880	1990
Magnesium, total	mg/L	240	238	235	234	257	233	262	262
Calcium, total	mg/L	439	444	439	448	427	448	509	439
Turbidity, Field	NTU	10.1	12	15.21	9.85	6.78	8.43	3.64	5.1
Iron, total	mg/L	6.09	5.92	5.83	5.82	5.45	6.38	8.46	7.09
Manganese, total	mg/L	0.096	0.098	0.096	0.093	0.089	0.094	0.132	0.112
Sulfide	mg/l	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Location ID: MW-12
Number of Sampling Dates: 32

Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	25	26.3	24.1	15.5	20.6	16.5	19.8	20
Barium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<1	<2	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10

Location ID: MW-12
Number of Sampling Dates: 32

Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	0.58	0.69	0.72	0.7	0.64	0.73	0.69	0.9

Location ID: MW-12
Number of Sampling Dates: 32

Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Chloride	mg/l	44	37	43	38	45	39	53	45
Sodium	mg/l	63.3	68.8	68.3	66.5	65.9	64.9	67.7	65.4
Potassium, total	mg/l	12	12.9	12.2	12.1	11.8	12.3	12	12
Temperature, Field	deg C	12.2	16.4	10.6	12.7	11.5	13.1	13.5	12.9
pH, Field	S.U.	6.71	6.48	6.69 SU	6.57 SU	6.87	6.68 SU	6.49	6.79
Specific Conductivity, Field	umhos/cm	4070	2640	2590	2690	2140	2520	3630	5070
Total Dissolved Solids	mg/l	3160	3160	3360	3070	3100	3140	3150	2960
Alkalinity (calcium carbonate)	mg/L	484	493	488	469	480	479	484	473
Nitrate,Nitrite	mg/l	0.59	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	1980	1930	1870	1690	1540	1570	1530	1670
Magnesium, total	mg/L	285	303	308	304	284	280	276	278
Calcium, total	mg/L	565	564	561	552	489	482	485	497
Turbidity, Field	NTU	6.74	10.9	6.31	9.27	8.26	2.43	3.41	2.4
Iron, total	mg/L	7.89	8.66	8.82	7.08	6.98	7.41	7.54	7.31
Manganese, total	mg/L	0.129	0.147	0.15	0.1	0.135	0.126	0.126	0.119
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Number of Sampling Dates: 32

Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	17.9	19.2	24.2	22.1	32.4	21.2	29.7	19.4
Barium, total	mg/l	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

Location ID: MW-12

Number of Sampling Dates: 32

Parameter Name	**Units**	**12/2/2014**	**6/1/2015**	**12/7/2015**	**6/6/2016**	**12/5/2016**	**6/20/2017**	**12/4/2017**	**6/4/2018**
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	0.7	0.75	0.68	0.71	0.71	0.69	0.7	0.71
Chloride	mg/l	61	61	75	65	76	73	80	76
Sodium	mg/l	68	61.7	68.2	66.6	72.3	65.3	69.1	69.7
Potassium, total	mg/l	11.3	10.9	11.9	11.6	12.1	11.6	11.4	11.4
Temperature, Field	deg C	11.8	12.2	12.4	13.4	11.9	13.8	12.9	13.1
pH, Field	S.U.	6.81	6.5	6.71	6.67	6.62	6.77	6.78	6.62
Specific Conductivity, Field	umhos/cm	3130	3510	3240	3350	3509	3460	3696	3310
Total Dissolved Solids	mg/l	3040	2970	3100	2990	3110	3180	3120	3100
Alkalinity (calcium carbonate)	mg/L	476	461	466	464	461	459	481	478
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	1640	1610	1690	1600	1580	1520	1690	1620

Location ID: MW-12
Number of Sampling Dates: 32

Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Magnesium, total	mg/L	235	235	259	242	273	269	258	248
Calcium, total	mg/L	452	464	518	480	517	518	488	476
Turbidity, Field	NTU	3.87	2.79	2.12	3.6	3.89	2.28	1.84	3.13
Iron, total	mg/L	6.6	7.31	8.18	7.41	8.35	7.75	7.74	8.2
Manganese, total	mg/L	0.11	0.106	0.111	0.119	0.159	0.127	0.133	0.131
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Data Summary Table, Well MW-13

Name: Royalton Road

Location ID: MW-13
Number of Sampling Dates: 32

Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Antimony, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	3.5	2.8	2.3	2	<1
Barium, total	mg/l	0.06	0.07	0.07	0.073	<0.01	0.0745	0.0757	0.0835
Beryllium, total	mg/l	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.004	<0.004	<0.004	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	3.4	<0.02 mg/l	<0.02 mg/L	<0.02 mg/L	<0.02 mg/L
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.0015 mg/l	<0.001 mg/l	<0.001 mg/l	<1	<1	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	0.009	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<100	<100	<100	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Benzene	ug/l	2	<4	2	1.7	1.4	<1	<1	<1
Bromochloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Bromoform	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	1.03	1.1	1.5	<1	1.4
Chloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.04	<0.1	<0.1
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.045	<0.045	<0.045	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<5	<5	<5	<1	<10	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<5	<5	<5	<1	<10	1.2	1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<5	<5	<5	<1	<1	<2	<2	<2
1,1-Dichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<5	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<5	<5	<5	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<1	<1	<5	<5	<5
Bromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1

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Parameter Name	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
Chloromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<4	<4	<4	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<1	<5	<1	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Styrene	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<5	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<4	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<4	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<5	<5	<5	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<5	<5	<5	<3	<3	<3	<3	<3
Ammonia Nitrogen	mg/l	0.15	<0.1	0.37	0.29	0.43	0.62	0.37	0.46
Chloride	mg/l	375	403	336	434	366	423	514	483
Sodium	mg/l	61.2	65.1	68.5	76.9	76.9	83.1	90	86.4
Potassium, total	mg/l	3.6	3.8	3.6	4	4.1	4.3	4.8	4.6
Temperature, Field	deg C	12	16	12	16.8	13.8	15.3	13.8	15.1
pH, Field	S.U.	6.8 SU	7.21 SU	6.7 SU	6.64 SU	6.63 SU	6.6 SU	6.82 SU	6.68 SU
Specific Conductivity, Field	umhos/cm	1840	2200	1350	1796	3320	3470	1580	1961
Total Dissolved Solids	mg/l	1410	1310	1230	1370	1270	1390	1350	1410
Alkalinity (calcium carbonate)	mg/L	609	611	592	590	588	599	595	595
Nitrate,Nitrite	mg/l	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	148	147	108	129	93	86	110	112
Magnesium, total	mg/L	125	118	124	122	124	122	118	132
Calcium, total	mg/L	224	221	231	248	262	260	255	294
Turbidity, Field	NTU	27	14	9.2	4.65	2.96	10.47	4.24	2.82
Iron, total	mg/L	2.36	2.31	2.22	1.63	1.22	1.1	0.97	0.83
Manganese, total	mg/L	5.25	5.23	5.26	5.18	5.14	5	4.74	4.8
Sulfide	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Barium, total	mg/l	0.082	0.0855	0.083	0.086	0.09	1.35	0.062	0.057
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	0.014	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	<0.01	<0.01
Selenium, total	ug/L	<0.02 mg/L	<1	1.2	1.5	1.2	<1	3	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	0.019	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	1.3	1.1	1.1	1.1	1.1	1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<3	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	0.4	0.48	0.57	0.89	0.72	0.65	1.07	1
Chloride	mg/l	435	460	454	444	500	412	410	413
Sodium	mg/l	82.8	86.9	93.2	86.6	89.2	1180	100	99
Potassium, total	mg/l	4.3	5.4	4.8	4.8	5	230	6.4	6.1
Temperature, Field	deg C	14.5	17.1	12.5	14.9	13.5	15.7	12.7	13.7
pH, Field	S.U.	6.74 SU	6.24	6.9	6.58	6.71	6.82	7.01	6.97
Specific Conductivity, Field	umhos/cm	1747	1527	2640	1736	2140	1778	1460	2140
Total Dissolved Solids	mg/l	1340	1530	1360	1420	1550	1710	1420	1430
Alkalinity (calcium carbonate)	mg/L	579	596	577	538	566	553	564	579
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	129	107	144	189	169	163	159	80
Magnesium, total	mg/L	118	126	116	121	129	111	113	110
Calcium, total	mg/L	264	276	260	260	276	67.7	254	226
Turbidity, Field	NTU	2.96	4.98	4.68	2.94	3.22	23.1	7.53	6.21
Iron, total	mg/L	0.84	0.81	0.95	0.88	0.98	18.9	0.59	0.66
Manganese, total	mg/L	4.54	4.56	3.88	4.08	4.22	0.552	2.88	3.19
Sulfide	mg/l	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<1	1.8	<2	1.7	<1	1.4	1.9	<1
Barium, total	mg/l	0.063	0.067	0.066	0.068	0.064	0.068	0.068	0.053
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	2.2	2.6	<2	<1	1.6	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10

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Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	0.81	1.33	0.74	0.82	0.79	0.83	0.81	1.18

Location ID: MW-13
Number of Sampling Dates: 32

Parameter Name	Units	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014
Chloride	mg/l	483	515	521	487	469	484	450	432
Sodium	mg/l	105	104	101	104	105	102	108	108
Potassium, total	mg/l	6.5	5.8	5.1	5.3	5.8	5.3	5.5	6.5
Temperature, Field	deg C	12.3	13.4	14	14.1	13.7	14.4	14.6	14.6
pH, Field	S.U.	6.66	6.87	6.56 SU	6.71 SU	6.54	6.6 SU	6.67	7.09
Specific Conductivity, Field	umhos/cm	1702	1681	2590	2240	1479	1280	2490	1827
Total Dissolved Solids	mg/l	1450	1660	1480	1610	1340	1610	1500	1290
Alkalinity (calcium carbonate)	mg/L	585	570	562	547	570	567	551	518
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	93	98	80	81	84	72	64	163
Magnesium, total	mg/L	121	136	126	134	133	123	131	104
Calcium, total	mg/L	265	286	271	282	272	250	255	222
Turbidity, Field	NTU	4.44	1.92	1.87	1.37	1.34	0.59	1.84	1.86
Iron, total	mg/L	0.87	1.74	1.78	1.78	1.41	1.75	1.72	0.96
Manganese, total	mg/L	3.51	4.37	4.06	4.2	3.81	3.9	3.84	2.41
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Location ID: MW-13
Number of Sampling Dates: 32

Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	1.5	<1	<1	<1	<1	2.4	<1	<1
Barium, total	mg/l	0.044	0.037	0.035	0.031	0.027	0.032	0.022	0.023
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

Location ID: MW-13

Number of Sampling Dates: 32

Parameter Name	Units	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	1.16	1.24	1.34	1.17	1.1	0.89	1.21	1.42
Chloride	mg/l	399	155	171	111	87	317	65	62
Sodium	mg/l	102	116	106	121	112	113	122	125
Potassium, total	mg/l	6.4	7.1	7.7	7.6	8.1	7.8	7.5	7.4
Temperature, Field	deg C	13.3	13.5	14.3	14.8	14	15	14.4	14.6
pH, Field	S.U.	7.21	6.69	6.92	6.85	6.82	6.91	7.04	7.06
Specific Conductivity, Field	umhos/cm	1587	1736	1729	1715	1899	1725	1981	1619
Total Dissolved Solids	mg/l	1350	1340	1490	1320	1320	1470	1310	1340
Alkalinity (calcium carbonate)	mg/L	529	452	472	433	405	492	410	414
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	0.08	<0.05	<0.05	<0.05
Sulfate	mg/L	171	417	381	463	552	220	555	560

Location ID: MW-13

Number of Sampling Dates: 32

Parameter Name	**Units**	**12/2/2014**	**6/1/2015**	**12/7/2015**	**6/6/2016**	**12/5/2016**	**6/20/2017**	**12/4/2017**	**6/4/2018**
Magnesium, total	mg/L	95.4	85.3	93.2	87.9	82.4	112	80.9	86
Calcium, total	mg/L	208	190	235	196	192	244	197	199
Turbidity, Field	NTU	1.63	2.89	2.64	3.11	1.26	1.52	3.79	2.67
Iron, total	mg/L	1.11	0.85	0.97	0.9	0.75	1.49	0.8	0.94
Manganese, total	mg/L	2.21	1.43	1.51	1.32	1.22	2.15	1.05	1.15
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Data Summary Table, Well MW-14D

Name: Royalton Road

Location ID: MW-14D
Number of Sampling Dates: 33

Parameter Name	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005
Antimony, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1
Arsenic, total	ug/L	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	11.6	33.9	2.4	3
Barium, total	mg/l	2.76	0.33	1.95	1.64	2.31	1.41	1.83	1.19
Beryllium, total	mg/l	<0.003	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.004	<0.004	<0.004	<0.004	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	0.01	0.01	<0.01	<0.01	0.012	<0.01	0.008	0.006
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1
Nickel, total	mg/l	0.05	0.06	0.03466	0.03407	0.05	0.035	0.034	0.027
Selenium, total	ug/L	0.002 mg/l	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	34	<0.02 mg/l	<0.02 mg/L	<0.02 mg/L
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.0015 mg/l	<0.0015 mg/l	<0.001 mg/l	<0.001 mg/l	<1	<1	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	0.131	0.166	0.005	<0.005	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<100	<100	<100	<100	22.2	14.3	14.7	39.1
Acrylonitrile	ug/l	<5	<5	<5	<5	<1	<1	<5	<5
Benzene	ug/l	<4	4	<4	2	3.17	2.4	3.2	2.5
Bromochloromethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Bromoform	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Carbon Disulfide	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<4	<1	<4	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	13	17	14	8	16	7.8	10.7	7.9
Trichloromethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<5	<5	--	<5	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.04	<0.1
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.045	<0.045	<0.045	<0.045	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<5	<5	<5	<5	<1	<10	<1	<1
1,4-Dichlorobenzene	ug/l	<5	<5	<5	<5	<1	<10	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<5	<5	<5	<5	<1	<1	<2	<2
1,1-Dichloroethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<4	<1	<4	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<5	<1	<5	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<5	<5	<5	<5	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<4	<1	<4	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<5	<5	<5	<5	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<5	<5	<5	<5	<1	<1	<1	<1
Ethylbenzene	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<1	<1	<5	<5
Bromomethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Chloromethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1

Location ID: MW-14D

Number of Sampling Dates: 33

Parameter Name	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005
Dibromomethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Methylene Chloride	ug/L	<4	<4	<4	<4	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<1	<5	<1	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Styrene	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Tetrachloroethene	ug/L	<4	<1	<4	<1	<1	<1	<1	<1
Toluene	ug/l	<5	<1	<5	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<4	<1	<4	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<4	<1	<4	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Vinyl acetate	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<5	<5	<5	<5	<3	<3	<3	<3
Ammonia Nitrogen	mg/l	89.5	115	87.3	48.3	<0.1	74.6	289	69
Chloride	mg/l	2540	1810	1500	1080	1510	964	1290	1250
Sodium	mg/l	1380	1350	1130	1150	1160	1150	1340	1100
Potassium, total	mg/l	96	130	100	90	121	84.2	111	75.4
Temperature, Field	deg C	14	13	15	15	15.6	15.7	14.4	10.4
pH, Field	S.U.	6.9 SU	7 SU	7.09 SU	7.26 SU	7.14 SU	7.34 SU	7.11 SU	7.24 SU
Specific Conductivity, Field	umhos/cm	7460	6940	6710	5890	5720	3880	2330	4460
Total Dissolved Solids	mg/l	4590	4530	3610	3280	3980	2920	3530	3030
Alkalinity (calcium carbonate)	mg/L	1649	1837	1602	1417	1590	1400	1560	1370
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	16	<10	<10	<10	<5	<10	2.1	<10
Magnesium, total	mg/L	98.3	114	69.5	50.4	90.1	53.9	69.5	45.3
Calcium, total	mg/L	153	165	107	86.7	140	87.9	115	72.3
Turbidity, Field	NTU	--	58	49	54	21.3	17.2	31.1	27.8
Iron, total	mg/L	11.3	11.6	6.92	6.11	9.37	5.93	7.59	5.16
Manganese, total	mg/L	2.21	2.36	1.47	1.19	1.84	1.13	1.42	0.952
Sulfide	mg/l	--	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05

Location ID: MW-14D

Number of Sampling Dates: 33

Parameter Name	Units	5/22/2006	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009
Antimony, total	ug/L	<5	<5	<1	<1	<3	<2	<1	<1
Arsenic, total	ug/L	<5	<5	2.3	7.8	<3	<2	<1	3.9
Barium, total	mg/l	1.41	1.2	1.59	1.34	1.2	1.15	1.39	0.626
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	0.007	0.006	0.007	0.006	0.006	0.006	0.006	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

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Parameter Name	Units	5/22/2006	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009
Lead, total	ug/L	<5	<5	<1	<1	<3	<2	<1	<1
Nickel, total	mg/l	0.029	0.026	0.033	0.03	0.027	0.03	0.033	0.018
Selenium, total	ug/L	<0.02 mg/L	<0.02 mg/L	3.5	20	6	6.7	5.1	<2
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<1	<1	<0.2	<0.2	<1	<0.4	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.011	<0.01
Acetone	ug/l	<10	<10	10.9	<10	11.3	14	12	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	2.6	2.1	3.5	1.3	2.8	1.5	2.9	1.6
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	7.7	6.8	9.3	4.9	7.1	2.5	6.5	1.6
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.04	<0.1	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	5/22/2006	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<3	<3	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	66.9	63.8	86.6	62.4	136	57.6	66.7	31.2
Chloride	mg/l	1280	1100	1360	1220	1180	1400	1130	790
Sodium	mg/l	1220	1020	1180	1320	989	1100	1160	925
Potassium, total	mg/l	86.8	81.3	101	83.5	75.5	60.4	75	34.7
Temperature, Field	deg C	14.4	12.6	14.6	12.7	15.5	11	13.5	11.9
pH, Field	S.U.	7.14 SU	7.3 SU	7.06	7.94	7.04	6.88	7.15	7.45
Specific Conductivity, Field	umhos/cm	4760	5600	6620	5720	4500	5200	6390	1760
Total Dissolved Solids	mg/l	3270	2900	3290	3040	3170	3110	3150	2310
Alkalinity (calcium carbonate)	mg/L	1440	1340	1490	1390	1430	1410	1490	1180
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	<10	<2	<2	<2	3	<5	<2	<5
Magnesium, total	mg/L	53.3	46.4	60	50.4	43.3	42.5	47.7	22.4
Calcium, total	mg/L	85.9	73	94.6	75	69.5	70	78.1	40.1
Turbidity, Field	NTU	32.5	19.99	8.78	18.64	28.7	19.3	38.4	4.25
Iron, total	mg/L	6.15	5.14	6.36	5.62	4.47	4.48	5.94	2.54
Manganese, total	mg/L	1.08	0.929	1.2	0.968	0.869	0.81	0.975	0.501
Sulfide	mg/l	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Parameter Name	Units	6/21/2010	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<2	<1
Arsenic, total	ug/L	1.3	3.7	5.1	<2	<1	3.2	2.4	6.1
Barium, total	mg/l	0.716	0.574	0.879	0.632	0.676	0.808	1.71	0.876
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.008	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<2	<1
Nickel, total	mg/l	0.018	0.016	0.021	0.014	0.015	0.019	0.036	0.017
Selenium, total	ug/L	2.8	10.6	18.2	5.3	4.7	10.6	<3	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	0.011	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	1.5	1.4	2	1.4	1.7	1.4	3.3	1.9
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	6/21/2010	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	3.4	3.4	4.4	3	3.7	3.3	8.7	4.9
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	33.5	26.2	33.4	27.9	29.6	34.1	73.6	63.6
Chloride	mg/l	792	736	928	775	769	800	1360	925
Sodium	mg/l	1040	914	1030	934	1000	931	1260	1110
Potassium, total	mg/l	42.4	36.3	49.5	37.5	36.5	46.5	91.9	48.2

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Parameter Name	Units	6/21/2010	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013
Temperature, Field	deg C	13.9	11.8	13.3	12.6	13.1	12.3	13.9	12.7
pH, Field	S.U.	7.55	7.18	7.28	7.34 SU	7.1 SU	7.04	6.58 SU	7.32
Specific Conductivity, Field	umhos/cm	4990	5010	6130	4270	6170	3960	7570	5150
Total Dissolved Solids	mg/l	2480	2130	2510	2220	2330	2350	3690	2870
Alkalinity (calcium carbonate)	mg/L	1140	1030	1140	1020	1020	1050	1440	1270
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	<2	<5	<2	<5	<2	<2	<2	<2
Magnesium, total	mg/L	25.2	20.4	31.3	22	24.8	29.5	61.1	33.1
Calcium, total	mg/L	44.4	35.2	54	39.7	44	50.7	99.2	56.9
Turbidity, Field	NTU	1.16	2.64	2.55	4.66	5.52	3.59	1.17	3.01
Iron, total	mg/L	2.69	2.21	3.13	2.3	2.58	3.01	5.91	3.29
Manganese, total	mg/L	0.54	0.437	0.643	0.486	0.533	0.568	1.23	0.641
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Parameter Name	Units	6/2/2014	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	1.3	<1	<1	<1	<1	<1	<1	<1
Barium, total	mg/l	1.45	0.955	1.14	0.784	0.864	0.774	0.869	0.747
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	0.008	<0.005	0.005	<0.005	0.006	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	0.031	0.018	0.023	0.017	0.02	0.016	0.019	0.017
Selenium, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	3	1.7	2.4	1.4	1.4	1.1	1.4	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	10.2	5.2	7.7	4.6	4	3.8	4.5	2.6
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	--	--
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	--	--
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	6/2/2014	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	84.6	47.7	58.3	29.5	32.7	27.5	31	25
Chloride	mg/l	1300	1010	1120	907	881	822	866	905
Sodium	mg/l	1210	1120	1150	990	1100	1170	1150	1110
Potassium, total	mg/l	78.3	46.6	50.8	36.2	44.9	34.6	37.3	31.7
Temperature, Field	deg C	15.1	12.9	13	12.8	12.9	12	13.5	12.6
pH, Field	S.U.	6.59	6.81	6.81	7.25	7.16	7.24	7.34	7.09
Specific Conductivity, Field	umhos/cm	7040	5150	7000	5380	5650	5060	5260	4780
Total Dissolved Solids	mg/l	2970	2810	3010	2880	2910	2960	3150	2530
Alkalinity (calcium carbonate)	mg/L	1430	1360	1410	1310	1360	1370	1420	1400
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	5	2	<2	27	<2	<2	<2	<2
Magnesium, total	mg/L	51.2	34	40	25.8	28.7	26.6	29.4	24.4
Calcium, total	mg/L	93.6	56.7	71.9	48.1	54.7	49.5	57.6	49
Turbidity, Field	NTU	1.31	0.76	1.64	2.61	4.85	9.1	1.86	2.53
Iron, total	mg/L	5.74	3.27	3.9	2.66	2.82	2.42	2.81	2.33

Location ID: MW-14D
Number of Sampling Dates: 33

Parameter Name	Units	6/2/2014	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017
Manganese, total	mg/L	1.09	0.65	0.783	0.577	0.6	0.592	0.627	0.534
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Location ID: MW-14D
Number of Sampling Dates: 33

Parameter Name	Units	6/4/2018
Antimony, total	ug/L	<1
Arsenic, total	ug/L	<1
Barium, total	mg/l	0.773
Beryllium, total	mg/l	<0.001
Cadmium, total	mg/l	<0.002
Chromium, total	mg/l	<0.01
Cobalt, total	mg/l	<0.005
Copper, total	mg/l	<0.01
Lead, total	ug/L	<1
Nickel, total	mg/l	0.017
Selenium, total	ug/L	<1
Silver, total	mg/l	<0.005
Thallium, total	ug/L	<0.2
Vanadium, total	mg/L	<0.005
Zinc, total	mg/L	<0.01
Acetone	ug/l	<10
Acrylonitrile	ug/l	<5
Benzene	ug/l	1.1
Bromochloromethane	ug/l	<1
Dichlorobromomethane	ug/l	<1
Bromoform	ug/l	<1
Carbon Disulfide	ug/l	<1
Carbon tetrachloride	ug/l	<1
Chlorobenzene	ug/l	<1
Chloroethane	ug/l	6.8
Trichloromethane	ug/l	<1
Chlorodibromomethane	ug/l	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	--
1,2-Dibromoethane; Ethylene dibromide	ug/l	--
1,2-Dichlorobenzene	ug/l	<1
1,4-Dichlorobenzene	ug/l	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2
1,1-Dichloroethane	ug/l	<1
1,2-Dichloroethane	ug/l	<1
1,1-Dichloroethene	ug/L	<1
cis-1,2-Dichloroethene	ug/L	<1
trans-1,2-Dichloroethene	ug/l	<1
1,2-Dichloropropane	ug/l	<1
cis-1,3-Dichloropropene	ug/L	<1
trans-1,3-Dichloropropene	ug/L	<1
Ethylbenzene	ug/l	<1

Location ID: MW-14D
Number of Sampling Dates: 33

Parameter Name	Units	6/4/2018
2-Hexanone	ug/l	<5
Bromomethane	ug/l	<1
Chloromethane	ug/l	<1
Dibromomethane	ug/l	<1
Methylene Chloride	ug/L	<1
Methyl Ethyl Ketone	ug/L	<5
Iodomethane	ug/l	<5
4-Methyl-2-Pentanone	ug/l	<1
Styrene	ug/l	<1
1,1,1,2-Tetrachloroethane	ug/l	<1
1,1,2,2-Tetrachloroethane	ug/l	<1
Tetrachloroethene	ug/L	<1
Toluene	ug/l	<1
1,1,1-Trichloroethane	ug/l	<1
1,1,2-Trichloroethane	ug/l	<1
Trichloroethene	ug/L	<1
Trichlorofluoromethane	ug/l	<1
1,2,3-Trichloropropane	ug/l	<1
Vinyl acetate	ug/l	<1
Vinyl chloride	ug/l	<1
Xylenes, Total	ug/L	<2
Ammonia Nitrogen	mg/l	5.33
Chloride	mg/l	871
Sodium	mg/l	1210
Potassium, total	mg/l	33.1
Temperature, Field	deg C	13.1
pH, Field	S.U.	7.32
Specific Conductivity, Field	umhos/cm	5120
Total Dissolved Solids	mg/l	2910
Alkalinity (calcium carbonate)	mg/L	1440
Nitrate,Nitrite	mg/l	<0.05
Sulfate	mg/L	<2
Magnesium, total	mg/L	24.7
Calcium, total	mg/L	48.7
Turbidity, Field	NTU	2.33
Iron, total	mg/L	2.26
Manganese, total	mg/L	0.548
Sulfide	mg/l	<0.1

Data Summary Table, Well MW-15D

Name: Royalton Road

Location ID: MW-15D
Number of Sampling Dates: 33

Parameter Name	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005
Antimony, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1
Arsenic, total	ug/L	0.099 mg/l	0.051 mg/l	0.036 mg/l	0.05 mg/l	64.8	78.9	65.4	56
Barium, total	mg/l	1.86	2.02	1.85	1.99	1.83	1.72	1.63	1.72
Beryllium, total	mg/l	<0.003	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.004	<0.004	<0.004	<0.004	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	0.01	0.01	<0.01	0.01	0.013	0.014	0.011	0.012
Cobalt, total	mg/l	0.02	0.02	0.02	0.02	0.022	0.023	0.017	0.018
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	1.1
Nickel, total	mg/l	0.07	0.07	0.06	0.06	0.08	0.074	0.065	0.063
Selenium, total	ug/L	0.002 mg/l	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	55.8	<0.02 mg/l	<0.02 mg/L	<0.02 mg/L
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.0015 mg/l	<0.0015 mg/l	<0.001 mg/l	<0.001 mg/l	<1	<1	<0.2	<0.2
Vanadium, total	mg/L	0.00516	0.0055	<0.005	<0.005	0.006	0.008	<0.005	0.007
Zinc, total	mg/L	0.131	0.176	0.013	0.155	<0.01	0.011	<0.01	<0.01
Acetone	ug/l	<100	<100	<100	<100	26.7	16.8	17.5	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<1	<1	<5	<5
Benzene	ug/l	30	28	30	20	24.9	22.5	26.1	22.2
Bromochloromethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Bromoform	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Carbon Disulfide	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<4	<1	<4	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	5	5	<1	4	4.76	4.4	4.9	3.4
Chloroethane	ug/l	41	45	51	37	63.7	36.2	40.1	36.6
Trichloromethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.04	<0.1
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.045	<0.045	<0.045	<0.045	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<5	<5	<5	<5	<1	<1	<2	<2
1,1-Dichloroethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<4	1	<4	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<5	<1	<5	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<5	<5	<5	<5	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<4	<1	<4	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<5	<5	<5	<5	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<5	<5	<5	<5	<1	<1	<1	<1
Ethylbenzene	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<1	<1	<5	<5
Bromomethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Chloromethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1

Location ID: MW-15D
Number of Sampling Dates: 33

Parameter Name	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005
Dibromomethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Methylene Chloride	ug/L	<4	<4	<4	<4	1.14	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<1	<5	<1	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Styrene	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Tetrachloroethene	ug/L	<4	<1	<4	<1	<1	<1	<1	<1
Toluene	ug/l	<5	1	<5	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<4	<1	<4	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<4	<1	<4	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Vinyl acetate	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<5	<5	<5	<5	3.03	<3	<3	<3
Ammonia Nitrogen	mg/l	282	269	258	298	288	274	262	263
Chloride	mg/l	2320	2160	2110	2040	2100	1840	1970	2330
Sodium	mg/l	1220	1310	1200	1310	1650	1470	1460	1490
Potassium, total	mg/l	242	253	241	280	281	286	268	228
Temperature, Field	deg C	15	15	15	14	15.1	15.8	15.8	10.8
pH, Field	S.U.	6.9 SU	6.9 SU	6.92 SU	6.85 SU	6.97 SU	7.08 SU	6.81 SU	6.71 SU
Specific Conductivity, Field	umhos/cm	9830	8000	9500	7570	8010	5010	3580	8350
Total Dissolved Solids	mg/l	5160	4860	4750	4940	4650	4680	4820	4620
Alkalinity (calcium carbonate)	mg/L	2026	2120	2080	2054	2050	2050	2100	2100
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05
Sulfate	mg/L	<10	<10	<10	<10	<5	<10	<2	<10
Magnesium, total	mg/L	141	143	130	143	145	133	126	120
Calcium, total	mg/L	75.4	84.1	93.4	83.6	92.9	83	91.4	96.9
Turbidity, Field	NTU	--	72	64	71	57.3	43.5	55.9	69.7
Iron, total	mg/L	21.2	21.3	20.2	20.5	22	20.2	19.3	21.3
Manganese, total	mg/L	0.76	0.83	0.82	0.75	0.763	0.68	0.719	0.765
Sulfide	mg/l	--	0.03	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05

Location ID: MW-15D
Number of Sampling Dates: 33

Parameter Name	Units	5/22/2006	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009
Antimony, total	ug/L	<5	<1	<1	<2	<3	<2	<2	<5
Arsenic, total	ug/L	15.5	84.1	58.5	52.7	52.8	52.2	54.8	62.9
Barium, total	mg/l	1.55	1.54	1.4	1.39	1.4	1.43	1.42	1.31
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	0.012	0.01	0.01	<0.01
Cobalt, total	mg/l	0.015	0.015	0.014	0.014	0.014	0.013	0.014	0.012
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Location ID: MW-15D

Number of Sampling Dates: 33

Parameter Name	Units	5/22/2006	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009
Lead, total	ug/L	<5	<1	<1	<2	<3	<2	<2	<5
Nickel, total	mg/l	0.055	0.061	0.053	0.055	0.058	0.056	0.06	0.057
Selenium, total	ug/L	<0.02 mg/L	<0.02 mg/L	17.6	15.7	15.8	12	<2	20.9
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<1	<0.2	<0.2	<0.4	<1	<0.4	<0.4	<1
Vanadium, total	mg/L	0.005	0.008	0.006	0.008	0.009	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.019	<0.01
Acetone	ug/l	<10	<10	16.8	<10	10.3	<10	<50	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<25	<5
Benzene	ug/l	20.6	23.4	1.6	22.3	21.7	21	17.3	23
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Chlorobenzene	ug/l	3.6	4.5	2.8	4	4.2	4	<5	4.3
Chloroethane	ug/l	33.4	33.9	38.6	26.1	29.6	16	26.6	48
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.04	<0.1	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<10	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<5	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<5	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<5	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<5	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<25	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<5	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<25	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<25	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<5	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1

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Parameter Name	Units	5/22/2006	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<5	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Xylenes, Total	ug/L	<3	<3	2.5	2.2	<2	2	<10	<2
Ammonia Nitrogen	mg/l	273	277	280	242	265	229	234	235
Chloride	mg/l	2130	1850	1940	1890	1820	1900	1760	1900
Sodium	mg/l	1410	1300	1290	1470	1240	1410	1240	1260
Potassium, total	mg/l	237	259	197	232	219	211	232	226
Temperature, Field	deg C	15.2	13.4	15.3	12.3	16.5	11.3	13.6	12.4
pH, Field	S.U.	6.74 SU	6.89 SU	6.63	7.33	6.76	6.67	6.95	6.76
Specific Conductivity, Field	umhos/cm	7280	9040	7900	6860	6280	6240	8850	3010
Total Dissolved Solids	mg/l	4480	4350	4220	4180	4200	3870	4170	3930
Alkalinity (calcium carbonate)	mg/L	2020	1940	1930	1900	1910	1810	1920	1730
Nitrate,Nitrite	mg/l	<0.05	4.43	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	<10	<2	<2	<2	2	<5	<2	<5
Magnesium, total	mg/L	113	114	102	100	96.6	93.9	97.2	97.1
Calcium, total	mg/L	83.4	73.6	67.6	72.3	74	74.7	63.7	61.9
Turbidity, Field	NTU	105	25.2	15.53	25.9	80.3	32.8	66.6	4.36
Iron, total	mg/L	18	19.2	17	16.1	17.7	18.2	19.4	16.2
Manganese, total	mg/L	0.656	0.587	0.528	0.567	0.583	0.598	0.535	0.481
Sulfide	mg/l	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Parameter Name	Units	6/21/2010	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013
Antimony, total	ug/L	<2	<1	<1	<2	<2	<1	<2	<1
Arsenic, total	ug/L	56.6	53.6	53.8	54.8	55	54.2	44.1	57.8
Barium, total	mg/l	1.39	1.39	1.42	1.45	1.41	1.43	1.42	1.34
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	0.013	0.012	0.012	0.012	0.012	0.013	0.013	0.011
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<2	<1	<1	<2	<2	<1	<2	<1
Nickel, total	mg/l	0.052	0.053	0.05	0.047	0.044	0.048	0.046	0.045
Selenium, total	ug/L	8.7	<2	6.4	13.2	21.3	22	6.2	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.4	<0.2	<0.2	<0.4	<0.4	<0.4	<0.4	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	0.012	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	10.4	<10	<10	<10	<10	<10	14.7	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	18.8	26	21.6	18	23	15	23.3	21.4
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	6/21/2010	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	4.9	5.3	5	5	4.6	3.1	4.7	4.5
Chloroethane	ug/l	26.8	29	30.4	30	25.3	18	24.8	22.3
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	1	<1	<1	1.1	1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	2.2	2.3	2.2	2.1	<2	<2	<2
Ammonia Nitrogen	mg/l	234	230	220	216	222	203	230	217
Chloride	mg/l	1770	1880	1810	1980	1660	1590	1600	1550
Sodium	mg/l	1350	1300	1220	1220	1210	1150	1180	1090
Potassium, total	mg/l	229	240	235	226	207	209	215	203

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Parameter Name	Units	6/21/2010	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013
Temperature, Field	deg C	13.2	12.6	13.8	13.1	13.5	12.9	14.8	13.4
pH, Field	S.U.	6.79	6.61	6.85	6.82 SU	6.77 SU	6.79	6.42 SU	7.07
Specific Conductivity, Field	umhos/cm	8710	8280	8760	8070	7780	5740	8890	7250
Total Dissolved Solids	mg/l	4190	3970	3830	744	4000	3830	3940	3730
Alkalinity (calcium carbonate)	mg/L	1660	1650	1540	1490	1510	1570	1570	1620
Nitrate,Nitrite	mg/l	<0.05	0.3	<0.05	<0.05	0.22	<0.05	<0.05	<0.05
Sulfate	mg/L	<2	<5	24	<5	<4	<2	<2	<2
Magnesium, total	mg/L	103	105	110	110	106	114	106	111
Calcium, total	mg/L	68.2	72	73.7	77.3	77.7	82.9	79.4	78.6
Turbidity, Field	NTU	1.12	6.41	3.42	4.11	3.37	2.57	1.73	5.85
Iron, total	mg/L	17.4	17	18	18.2	18.4	21.6	19.6	19.7
Manganese, total	mg/L	0.528	0.541	0.581	0.587	0.583	0.625	0.641	0.618
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Parameter Name	Units	6/2/2014	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	50.7	48.8	54.5	64.9	68.3	68	67.2	64.9
Barium, total	mg/l	1.21	1.23	1.27	1.34	1.19	1.21	1.2	1.12
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	0.012	0.01	0.012	0.011	0.012	0.011	0.01	0.01
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	0.04	0.042	0.043	0.045	0.04	0.043	0.04	0.035
Selenium, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	19.9	18.4	22	20.5	22	20.3	19.8	15
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	4.4	4.2	5	5	5.6	5.4	4.4	4.4
Chloroethane	ug/l	18.7	18	18.6	20.2	13.1	18.4	19.5	14.1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	--	--
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	--	--
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	6/2/2014	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	224	210	229	211	218	223	208	202
Chloride	mg/l	1670	1490	1540	1530	1390	1460	1290	1280
Sodium	mg/l	994	1110	1120	1040	1010	1150	1020	1010
Potassium, total	mg/l	183	164	196	209	186	202	189	179
Temperature, Field	deg C	15	13.5	13.7	13.1	13.3	13.1	14.6	13.7
pH, Field	S.U.	6.58	6.58	6.64	6.95	6.83	6.93	7.05	6.78
Specific Conductivity, Field	umhos/cm	8790	7160	8700	7920	7990	6940	6880	6280
Total Dissolved Solids	mg/l	3800	3600	3630	3760	3670	3510	3680	3170
Alkalinity (calcium carbonate)	mg/L	1670	1620	1690	1720	1680	1710	1660	1640
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	9	<4	<4	<2	<2	<2	<2	<2
Magnesium, total	mg/L	96.8	91.1	97.5	97.8	93.7	87.4	92.6	91
Calcium, total	mg/L	72.7	67.9	72.4	74	67.6	61.4	68.2	62.5
Turbidity, Field	NTU	5.8	1.14	6.72	2.55	8.84	2.31	2.19	1.6
Iron, total	mg/L	17.8	16.7	17.7	18	16.3	16.2	15.9	15.5

Location ID: MW-15D
Number of Sampling Dates: 33

Parameter Name	Units	6/2/2014	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017
Manganese, total	mg/L	0.583	0.511	0.514	0.522	0.502	0.47	0.499	0.438
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Location ID: MW-15D
Number of Sampling Dates: 33

Parameter Name	Units	6/4/2018
Antimony, total	ug/L	<1
Arsenic, total	ug/L	69
Barium, total	mg/l	1.22
Beryllium, total	mg/l	<0.001
Cadmium, total	mg/l	<0.002
Chromium, total	mg/l	<0.01
Cobalt, total	mg/l	0.011
Copper, total	mg/l	<0.01
Lead, total	ug/L	<1
Nickel, total	mg/l	0.04
Selenium, total	ug/L	<1
Silver, total	mg/l	<0.005
Thallium, total	ug/L	<0.2
Vanadium, total	mg/L	<0.005
Zinc, total	mg/L	<0.01
Acetone	ug/l	<10
Acrylonitrile	ug/l	<5
Benzene	ug/l	18.8
Bromochloromethane	ug/l	<1
Dichlorobromomethane	ug/l	<1
Bromoform	ug/l	<1
Carbon Disulfide	ug/l	<1
Carbon tetrachloride	ug/l	<1
Chlorobenzene	ug/l	5
Chloroethane	ug/l	16.7
Trichloromethane	ug/l	<1
Chlorodibromomethane	ug/l	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	--
1,2-Dibromoethane; Ethylene dibromide	ug/l	--
1,2-Dichlorobenzene	ug/l	<1
1,4-Dichlorobenzene	ug/l	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2
1,1-Dichloroethane	ug/l	<1
1,2-Dichloroethane	ug/l	<1
1,1-Dichloroethene	ug/L	<1
cis-1,2-Dichloroethene	ug/L	<1
trans-1,2-Dichloroethene	ug/l	<1
1,2-Dichloropropane	ug/l	<1
cis-1,3-Dichloropropene	ug/L	<1
trans-1,3-Dichloropropene	ug/L	<1
Ethylbenzene	ug/l	<1

Location ID: MW-15D
Number of Sampling Dates: 33

Parameter Name	**Units**	**6/4/2018**
2-Hexanone	ug/l	<5
Bromomethane	ug/l	<1
Chloromethane	ug/l	<1
Dibromomethane	ug/l	<1
Methylene Chloride	ug/L	<1
Methyl Ethyl Ketone	ug/L	<5
Iodomethane	ug/l	<5
4-Methyl-2-Pentanone	ug/l	<1
Styrene	ug/l	<1
1,1,1,2-Tetrachloroethane	ug/l	<1
1,1,2,2-Tetrachloroethane	ug/l	<1
Tetrachloroethene	ug/L	<1
Toluene	ug/l	<1
1,1,1-Trichloroethane	ug/l	<1
1,1,2-Trichloroethane	ug/l	<1
Trichloroethene	ug/L	<1
Trichlorofluoromethane	ug/l	<1
1,2,3-Trichloropropane	ug/l	<1
Vinyl acetate	ug/l	<1
Vinyl chloride	ug/l	<1
Xylenes, Total	ug/L	<2
Ammonia Nitrogen	mg/l	216
Chloride	mg/l	1380
Sodium	mg/l	1110
Potassium, total	mg/l	181
Temperature, Field	deg C	14.1
pH, Field	S.U.	7.1
Specific Conductivity, Field	umhos/cm	6350
Total Dissolved Solids	mg/l	3200
Alkalinity (calcium carbonate)	mg/L	1650
Nitrate,Nitrite	mg/l	<0.05
Sulfate	mg/L	<2
Magnesium, total	mg/L	89.2
Calcium, total	mg/L	65.4
Turbidity, Field	NTU	1.9
Iron, total	mg/L	17.1
Manganese, total	mg/L	0.493
Sulfide	mg/l	<0.1

Data Summary Table, Well MW-16

Name: Royalton Road

Location ID: MW-16
Number of Sampling Dates: 31

Parameter Name	Units	5/14/2002	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006	11/13/2006
Antimony, total	ug/L	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	<0.009 mg/l	0.015 mg/l	17.8	23.2	14.4	9	14.7	19.2
Barium, total	mg/l	0.31	0.4	0.246	0.21	0.189	0.146	0.17	0.218
Beryllium, total	mg/l	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.004	<0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	0.02	0.03	0.024	0.041	0.016	0.015	0.014	0.022
Copper, total	mg/l	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<0.005 mg/l	<0.005 mg/l	<1	4.5	<1	<1	<1	1.3
Nickel, total	mg/l	0.01515	0.0126	0.01	0.032	0.0108	<0.01	0.011	0.019
Selenium, total	ug/L	0.004 mg/l	<0.005 mg/l	<1	<0.02 mg/l	<0.02 mg/L	<0.02 mg/L	<0.02 mg/L	<0.02 mg/L
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.0015 mg/l	<0.001 mg/l	<1	<1	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	0.118	<0.005	<0.01	0.044	<0.01	<0.01	<0.01	0.013
Acetone	ug/l	<100	<100	<10	35.3	<10	14.2	<10	<10
Acrylonitrile	ug/l	<5	<5	<1	<1	<5	<5	<5	<5
Benzene	ug/l	<4	3	1.64	2.1	1.5	1.6	1.4	1.2
Bromochloromethane	ug/l	<5	<5	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<5	<5	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<5	<5	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<5	<5	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<4	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<5	2	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<5	<5	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<5	<5	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<5	<5	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.1	<0.1	<0.1	<0.04	<0.1	<0.1	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.045	<0.045	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<5	<5	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<5	<5	<1	<10	<1	1.4	1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<5	<5	<1	<1	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<5	<5	2.31	1.4	1.4	1.2	1.4	1.3
1,2-Dichloroethane	ug/l	<4	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<5	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<5	<5	2.97	<1	3.1	2.1	2.6	2.6
trans-1,2-Dichloroethene	ug/l	<5	<5	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<4	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<5	<5	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<5	<5	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<5	<5	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<1	<1	<5	<5	<5	<5
Bromomethane	ug/l	<5	<5	<1	<1	<1	<1	<1	<1

Location ID: MW-16
Number of Sampling Dates: 31

Parameter Name	Units	5/14/2002	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006	11/13/2006
Chloromethane	ug/l	<5	<5	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<5	<5	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<4	<4	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<1	<5	7.2	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<5	<5	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<5	<5	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<5	<5	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<5	<5	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<4	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<5	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<5	<5	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<4	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<4	<1	<1	1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<5	<5	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<5	<5	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<5	<5	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<5	<5	<3	<3	<3	<3	<3	<3
Ammonia Nitrogen	mg/l	<0.1	<0.1	<0.1	0.13	<0.1	<0.1	<0.1	<0.1
Chloride	mg/l	21	18	58	7	31	23.2	38.8	29
Sodium	mg/l	13.8	14.3	20.6	10.3	19.7	16	22.1	19.5
Potassium, total	mg/l	4.2	4.4	5	4	4.7	4.5	4.6	5.2
Temperature, Field	deg C	15	13	14.6	14.1	15.3	10.7	15.6	12.1
pH, Field	S.U.	6.5 SU	6.73 SU	6.78 SU	6.9 SU	7.13 SU	6.8 SU	6.35 SU	6.59 SU
Specific Conductivity, Field	umhos/cm	1430	1090	1165	786	887	1173	1494	1236
Total Dissolved Solids	mg/l	916	1010	1140	614	1090	726	1000	904
Alkalinity (calcium carbonate)	mg/L	759	901	991	535	952	650	870	846
Nitrate,Nitrite	mg/l	0.07	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	83	94	85	31	64	51.5	61	40
Magnesium, total	mg/L	59.9	77.3	89.6	41.3	77.7	48.4	74.1	72.5
Calcium, total	mg/L	202	288	302	168	285	181	256	262
Turbidity, Field	NTU	--	8.1	14.5	15.3	10.1	7.71	12.21	10.14
Iron, total	mg/L	1.92	8.47	8.88	8.56	10.8	7.53	10	7.62
Manganese, total	mg/L	5.78	11.3	8.45	6.11	6.95	5.35	6.29	6.44
Sulfide	mg/l	--	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05

Location ID: MW-16
Number of Sampling Dates: 31

Parameter Name	Units	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	1.1
Arsenic, total	ug/L	11.8	25.5	14.9	10.7	8.9	3.1	3.6	45.5
Barium, total	mg/l	0.189	0.23	0.237	0.198	0.246	0.252	0.264	0.419
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Location ID: MW-16
Number of Sampling Dates: 31

Parameter Name	Units	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
Cobalt, total	mg/l	0.01	0.023	0.011	<0.005	<0.005	<0.005	<0.005	0.006
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	2	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	0.013	0.018	0.016	0.01	0.014	0.011	<0.01	0.022
Selenium, total	ug/L	2	1.5	<1	<1	<1	1.4	<1	1.6
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	0.019	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	33	<10	18	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	1.6	1.4	1.5	<1	1.8	1.2	1.5	1.4
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	1.2	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	1.5	1.3	1.3	<1	1.4	1.5	1.4	1.1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	2.5	2.6	2.5	1.3	2.8	2.2	3	1.9
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	<0.1	<0.1	<0.1	0.28	<0.1	0.28	0.32	0.2
Chloride	mg/l	48.9	33	81	61	99	71	88	105
Sodium	mg/l	28	19.9	30.2	24.4	40.1	29.5	38.1	44.5
Potassium, total	mg/l	4.9	4.7	5	4.7	5.3	4.8	5.3	6.7
Temperature, Field	deg C	17.2	9.9	16	10	15.1	13.8	15.7	10.3
pH, Field	S.U.	6.43	6.49	6.68	6.92	6.56	6.46	6.35	6.53
Specific Conductivity, Field	umhos/cm	1836	1006	1569	1690	1884	1414	1998	1618
Total Dissolved Solids	mg/l	1100	792	1040	844	1260	5000	1200	1150
Alkalinity (calcium carbonate)	mg/L	1020	701	1050	714	1080	847	1040	1020
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	0.65	<0.05	<0.05
Sulfate	mg/L	47.1	41	66	40	68	30	40	37
Magnesium, total	mg/L	89.8	62.6	87.8	59.8	101	76.2	96.4	112
Calcium, total	mg/L	275	195	268	177	299	224	276	292
Turbidity, Field	NTU	52.3	52.3	15.7	11.2	21	8.4	4.91	3.86
Iron, total	mg/L	7.05	5.51	4.83	3.22	7.28	5.69	6.3	4.1
Manganese, total	mg/L	5.72	5.17	5.67	4.72	6.31	5.2	5.69	6.06
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Location ID: MW-16
Number of Sampling Dates: 31

Parameter Name	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	51.7	6	57.7	77.7	16.7	70	15.4	65.7
Barium, total	mg/l	0.357	0.308	0.323	0.321	0.369	0.344	0.377	0.36
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	0.006	<0.005	0.009	<0.005	0.008	<0.005	0.006	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	1.1
Nickel, total	mg/l	0.018	<0.01	0.019	<0.01	0.013	<0.01	<0.01	0.012
Selenium, total	ug/L	1.6	<1	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10	<10

Location ID: MW-16
Number of Sampling Dates: 31

Parameter Name	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	1.5	1.4	1.5	1.1	1.5	1.4	1.1	1.1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	1.3	1.6	1.3	1.1	1.3	1.1	1.3	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	2.9	3.1	2.9	2.4	3	<1	3.3	2
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	1.6	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	0.4	0.14	0.22	0.17	0.2	0.46	0.39	0.19

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Parameter Name	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014
Chloride	mg/l	82	56	84	50	63	88	63	79
Sodium	mg/l	41.1	32.3	38.8	28	35	50.9	33	40.7
Potassium, total	mg/l	6	5.3	5.7	4.8	5.3	6.6	5.5	5.6
Temperature, Field	deg C	14.3	11.9	14	11.8	11.8	13.4	12.9	11.3
pH, Field	S.U.	6.48	6.4 SU	6.24 SU	6.63	6.45 SU	6.05	6.75	6.91
Specific Conductivity, Field	umhos/cm	1826	1653	1884	1559	1146	1792	1697	1738
Total Dissolved Solids	mg/l	1130	1020	1240	962	1150	774	1030	1130
Alkalinity (calcium carbonate)	mg/L	1040	940	1070	902	1020	1030	956	1030
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	29	29	27	49	25	24	21	17
Magnesium, total	mg/L	102	86.2	105	74.7	89.9	110	87	88.5
Calcium, total	mg/L	314	297	306	233	277	288	281	243
Turbidity, Field	NTU	5.62	4.94	1.73	2.71	2.61	8.58	5.16	4.34
Iron, total	mg/L	6.09	5.83	3.07	3.57	2.18	3.51	1.86	4.34
Manganese, total	mg/L	6.3	6.29	5.75	5.07	5.11	5.22	5.17	4.42
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Location ID: MW-16
Number of Sampling Dates: 31

Parameter Name	Units	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	8.7	23.9	20.2	31.5	19	49.5	16.9
Barium, total	mg/l	0.37	0.578	0.583	0.533	0.547	0.491	0.51
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01
Selenium, total	ug/L	<1	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	<0.01	<0.01	<0.01	0.014	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	1.1	1.5	1	<1	<1	<1	<1
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1

Location ID: MW-16

Number of Sampling Dates: 31

Parameter Name	Units	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	--	--	--
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	2.3	2.1	2.4	1.6	2.3	1.5	2.1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	0.2	0.22	0.2	0.14	0.2	0.16	0.25
Chloride	mg/l	40	122	49	53	46	70	39
Sodium	mg/l	25.2	55	31.9	32.3	30	36.4	25.5
Potassium, total	mg/l	4.6	6.3	5.6	5.4	5.4	5.5	4.6
Temperature, Field	deg C	11.2	11.8	12.2	12.3	13.4	13	12.9
pH, Field	S.U.	6.44	6.73	6.68	6.36	6.69	6.78	6.81
Specific Conductivity, Field	umhos/cm	1486	1908	1586	1614	1692	1482	1333
Total Dissolved Solids	mg/l	872	1240	1010	880	1010	914	948
Alkalinity (calcium carbonate)	mg/L	793	1120	949	891	914	830	894
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	11	12	6	15	4	11	4

Location ID: MW-16
Number of Sampling Dates: 31

Parameter Name	**Units**	**6/1/2015**	**12/7/2015**	**6/6/2016**	**12/5/2016**	**6/20/2017**	**12/4/2017**	**6/4/2018**
Magnesium, total	mg/L	66.4	111	81.4	74.5	82.3	83.1	73.5
Calcium, total	mg/L	209	312	271	232	276	247	234
Turbidity, Field	NTU	6.01	1.26	3.24	5.42	2.55	9.72	2.7
Iron, total	mg/L	3.49	1.17	1.73	1.49	2.27	3.06	1.95
Manganese, total	mg/L	4.22	5.04	4.7	3.94	4.88	4.12	4.39
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Data Summary Table, Well MW-17S

Name: Royalton Road

Location ID: MW-17S
Number of Sampling Dates: 33

Parameter Name	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005
Antimony, total	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1
Arsenic, total	ug/L	0.017 mg/l	0.017 mg/l	<0.009 mg/l	0.013 mg/l	7	32.7	14.3	10
Barium, total	mg/l	1.11	1.06	1.11	1.37	0.352	1.1	0.389	0.688
Beryllium, total	mg/l	<0.003	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.004	<0.004	<0.004	<0.004	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	0.01	0.02	0.01	0.01	<0.01	0.011	<0.01	<0.01
Cobalt, total	mg/l	0.02	0.02	0.02	0.01	0.019	0.021	0.018	0.017
Copper, total	mg/l	<0.01	0.01	<0.01	0.02	<0.01	0.02	<0.01	<0.01
Lead, total	ug/L	<0.005 mg/l	0.01 mg/l	<0.005 mg/l	0.016 mg/l	<1	6.4	2.1	5.6
Nickel, total	mg/l	0.05	0.05	0.03633	0.02908	<0.01	0.032	0.014	0.028
Selenium, total	ug/L	0.002 mg/l	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<0.01 mg/L	<0.02 mg/l	<0.02 mg/L	<0.02 mg/L
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.0015 mg/l	<0.0015 mg/l	<0.001 mg/l	<0.001 mg/l	<1	<1	<0.2	<0.2
Vanadium, total	mg/L	0.00726	0.0201	0.00766	0.01153	<0.005	0.008	<0.005	<0.005
Zinc, total	mg/L	0.149	0.209	0.215	0.068	<0.01	0.507	<0.01	0.025
Acetone	ug/l	<100	<100	<100	<100	<10	<10	<10	26.7
Acrylonitrile	ug/l	<5	<5	<5	<5	<1	<1	<5	<5
Benzene	ug/l	15	12	9	11	3.75	1	<1	4.3
Bromochloromethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Bromoform	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Carbon Disulfide	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<4	<1	<4	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	7	5	<1	6	1.77	<1	<1	2.2
Chloroethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Trichloromethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.04	<0.1
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.045	<0.045	<0.045	<0.045	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<5	<5	<5	<5	<1	<10	<1	<1
1,4-Dichlorobenzene	ug/l	<5	<5	<5	<5	<1	<10	<1	<1
trans-1,4-Dichloro-2-Butene	ug/l	<5	<5	<5	<5	<1	<1	<2	<2
1,1-Dichloroethane	ug/l	<5	<5	<5	<5	1.28	<1	1.4	<1
1,2-Dichloroethane	ug/l	<4	2	<4	2	<1	2.1	2.8	1.6
1,1-Dichloroethene	ug/L	<5	<1	<5	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<5	<5	<5	<5	1.73	1.8	2.5	1.4
trans-1,2-Dichloroethene	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<4	<1	<4	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<5	<5	<5	<5	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<5	<5	<5	<5	<1	<1	<1	<1
Ethylbenzene	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<1	<1	<5	<5
Bromomethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Chloromethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1

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Parameter Name	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005
Dibromomethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Methylene Chloride	ug/L	<4	<4	<4	<4	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<1	<5	<1	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Styrene	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Tetrachloroethene	ug/L	<4	<1	<4	<1	<1	<1	<1	<1
Toluene	ug/l	<5	<1	<5	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<4	<1	<4	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<4	<1	<4	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Vinyl acetate	ug/l	<5	<5	<5	<5	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<5	<5	<5	<5	<3	<3	<3	<3
Ammonia Nitrogen	mg/l	241	141	171	161	164	145	164	186
Chloride	mg/l	1410	994	1270	1080	1130	1030	1110	1330
Sodium	mg/l	801	724	636	648	129	336	165	446
Potassium, total	mg/l	223	170	156	149	21.5	77.9	33.7	103
Temperature, Field	deg C	14	15	15	17	15.5	15.4	16.6	10
pH, Field	S.U.	7 SU	6.8 SU	7.27 SU	6.55 SU	6.79 SU	7.06 SU	6.6 SU	6.79 SU
Specific Conductivity, Field	umhos/cm	7410	5560	5840	6630	6610	3940	2210	6140
Total Dissolved Solids	mg/l	3730	3380	3440	3310	3210	3120	3310	3240
Alkalinity (calcium carbonate)	mg/L	1880	1727	1883	1887	1760	1680	1700	1800
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	24	37	23	18	31	15	41.7	17.2
Magnesium, total	mg/L	112	116	113	99.9	147	137	136	128
Calcium, total	mg/L	158	232	270	255	529	516	610	401
Turbidity, Field	NTU	--	119	326	186	14.3	158	64.8	109
Iron, total	mg/L	15.9	33.7	17.1	21.1	2.31	14.9	4.93	10.3
Manganese, total	mg/L	2.76	5.7	6.17	7.58	16.8	13.6	16.3	9.6
Sulfide	mg/l	--	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05

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Parameter Name	Units	5/22/2006	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009
Antimony, total	ug/L	<5	<1	<1	<2	<3	<2	<1	<1
Arsenic, total	ug/L	<5	27.6	12.4	15.5	11.9	13.3	12.7	7.8
Barium, total	mg/l	0.823	0.893	0.88	0.895	0.974	0.956	0.825	0.121
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	0.013	0.012	<0.01	<0.01
Cobalt, total	mg/l	0.014	0.012	0.014	0.014	0.014	0.015	0.014	<0.005
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

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Parameter Name	Units	5/22/2006	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009
Lead, total	ug/L	5.8	4.5	4.5	4.6	4.7	4.4	4	11.8
Nickel, total	mg/l	0.03	0.037	0.036	0.038	0.043	0.041	0.036	0.012
Selenium, total	ug/L	<0.02 mg/L	<0.02 mg/L	5.8	7.6	6.2	8	7.3	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<1	<0.2	<0.2	<0.4	<1	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	0.011	0.023	0.013	0.018	0.018	0.02	0.021	0.031
Acetone	ug/l	11.7	10.1	22	12	40.3	<10	<50	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<25	<5
Benzene	ug/l	10.8	8.2	9.9	8.4	10.4	14	14.9	4.6
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	14.5	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Chlorobenzene	ug/l	5.5	4	4.6	4.7	6.1	8.9	7.9	5.5
Chloroethane	ug/l	<1	1.9	<1	<1	<1	<1	<5	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.1	<0.04	<0.1	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
1,4-Dichlorobenzene	ug/l	1.8	1.4	1.5	1.6	2.2	3	<5	1.9
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<10	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
1,2-Dichloroethane	ug/l	<1	1.6	1.2	1.3	<1	<1	<5	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<5	<1
cis-1,2-Dichloroethene	ug/L	<1	1.4	1.1	1	<1	<1	<5	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<5	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<5	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<25	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<5	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<25	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<25	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<5	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1

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Parameter Name	Units	5/22/2006	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<5	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<5	<1
Xylenes, Total	ug/L	<3	<3	<2	<2	<2	<2	<10	<2
Ammonia Nitrogen	mg/l	171	158	210	175	196	177	218	59.9
Chloride	mg/l	1260	1150	1290	1310	1360	1400	1250	260
Sodium	mg/l	664	686	742	1230	778	805	587	172
Potassium, total	mg/l	145	181	173	174	170	159	123	58.5
Temperature, Field	deg C	15.2	14	14.4	13.9	14.8	13.8	13.1	13
pH, Field	S.U.	6.68 SU	6.68 SU	6.81	6.78	6.77	6.71	6.59	6.75
Specific Conductivity, Field	umhos/cm	6320	7600	6290	6540	5510	4890	5840	1576
Total Dissolved Solids	mg/l	3150	3070	3200	3350	3370	3350	3230	840
Alkalinity (calcium carbonate)	mg/L	1800	1720	1770	1680	1780	1920	1700	381
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	3.01	<0.05	<0.05	<0.05	0.77
Sulfate	mg/L	13	10	17.6	22	18	18	13	114
Magnesium, total	mg/L	122	107	106	102	110	104	108	17.3
Calcium, total	mg/L	320	211	251	258	259	286	330	52.8
Turbidity, Field	NTU	55.5	6.12	38.1	19.1	27	33.6	48.4	5.69
Iron, total	mg/L	9.31	16.2	12.3	16.6	14	17.7	17.3	3.74
Manganese, total	mg/L	6.43	4.19	5.42	5.66	5.77	6.72	8.1	1.24
Sulfide	mg/l	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Parameter Name	Units	6/21/2010	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013
Antimony, total	ug/L	<1	<1	<1	<1	<2	<1	<2	<1
Arsenic, total	ug/L	8.2	10.7	9.6	9.2	10.4	12.9	11.7	12
Barium, total	mg/l	0.29	0.305	0.232	0.115	0.484	0.831	1.1	1.13
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	0.012
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	8.5	8.6	8	18.9	4.2	1.7	<2	<1
Nickel, total	mg/l	0.014	0.015	0.013	<0.01	0.015	0.02	0.04	0.041
Selenium, total	ug/L	<1	7.7	7.7	<1	7	11.6	<3	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.4	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc, total	mg/L	0.017	0.02	0.03	0.052	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	12	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	4.3	3.9	4.3	<1	4	6	16.6	11.8
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter Name	Units	6/21/2010	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	4.6	4.6	3.8	3.8	3.8	3.9	8.7	7.7
Chloroethane	ug/l	<1	1.3	1.2	<1	1.4	1.6	1.2	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	1.6	1.6	1.3	1.3	1.2	1.1	2.1	2.1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	54.4	60.6	60.2	34.5	97	131	158	203
Chloride	mg/l	535	477	408	215	492	586	1110	1150
Sodium	mg/l	373	350	313	181	408	512	806	900
Potassium, total	mg/l	69.9	78.2	72.2	46.6	99.3	155	184	209
Temperature, Field	deg C	12.8	12.5	12.6	13.3	11.8	12.1	14	12.9
pH, Field	S.U.	6.74	6.54	7.04	6.71 SU	6.76 SU	6.79	6.28 SU	6.73

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Parameter Name	Units	6/21/2010	12/6/2010	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013
Specific Conductivity, Field	umhos/cm	3130	3640	4000	1577	3710	3570	6980	6380
Total Dissolved Solids	mg/l	1460	1270	1120	736	1650	2060	3330	3750
Alkalinity (calcium carbonate)	mg/L	606	688	571	353	967	1370	1750	1900
Nitrate,Nitrite	mg/l	<0.05	0.35	<0.05	0.06	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	61	66	63	64	29	5	5	10
Magnesium, total	mg/L	38	37.6	29.1	15.9	46.8	79	109	114
Calcium, total	mg/L	71.7	90.1	66.2	39.2	88.2	102	159	196
Turbidity, Field	NTU	3.69	3.21	6.25	6.56	2.75	2.25	1.68	3.16
Iron, total	mg/L	10.6	10.1	7.13	4.43	13.3	21.6	22.5	20.4
Manganese, total	mg/L	0.724	1.39	0.854	0.457	0.594	0.939	1.72	2.7
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Location ID: MW-17S
Number of Sampling Dates: 33

Parameter Name	Units	6/2/2014	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017
Antimony, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic, total	ug/L	11.4	12.1	11.9	14.5	15.2	11.9	13.7	13.5
Barium, total	mg/l	1.07	1.01	1.01	1.14	1.2	1.05	1.14	1.13
Beryllium, total	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium, total	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium, total	mg/l	0.011	<0.01	0.011	0.013	0.015	0.012	0.014	0.012
Cobalt, total	mg/l	0.012	0.011	0.011	0.011	0.014	0.011	0.011	0.01
Copper, total	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Nickel, total	mg/l	0.037	0.03	0.034	0.039	0.049	0.034	0.04	0.034
Selenium, total	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Silver, total	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium, total	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium, total	mg/L	<0.005	<0.005	<0.005	<0.005	0.006	0.006	<0.005	0.007
Zinc, total	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acetone	ug/l	<10	<10	<10	<10	<10	<10	13.8	<10
Acrylonitrile	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	9.4	8.2	10.8	9.4	9.6	8.1	5.6	6.4
Bromochloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorobromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/l	7.3	6.5	8.3	8.4	9	7	4.8	6.6
Chloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chlorodibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	--	--
1,2-Dibromoethane; Ethylene dibromide	ug/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	--	--
1,2-Dichlorobenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	2.2	1.9	2.5	2.5	2.6	2.1	1.3	2.1
trans-1,4-Dichloro-2-Butene	ug/l	<2	<2	<2	<2	<2	<2	<2	<2

Location ID: MW-17S

Number of Sampling Dates: 33

Parameter Name	Units	6/2/2014	12/2/2014	6/1/2015	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017
1,1-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Methylene Chloride	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Ethyl Ketone	ug/L	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/l	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes, Total	ug/L	<2	<2	<2	<2	<2	<2	<2	<2
Ammonia Nitrogen	mg/l	196	186	213	204	229	203	221	214
Chloride	mg/l	1240	1130	1150	1270	1210	1100	1150	1330
Sodium	mg/l	877	779	889	864	960	779	935	904
Potassium, total	mg/l	195	178	176	211	236	184	207	196
Temperature, Field	deg C	15	13.5	13	11.9	13.7	12.5	13.8	13.8
pH, Field	S.U.	6.42	6.46	6.57	6.78	6.76	6.69	6.84	6.75
Specific Conductivity, Field	umhos/cm	7700	5830	7760	6390	7690	5650	5840	6150
Total Dissolved Solids	mg/l	3540	3330	3260	3590	3310	3300	3740	3040
Alkalinity (calcium carbonate)	mg/L	1860	1740	1820	1900	2000	1860	1880	1860
Nitrate,Nitrite	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	10	9	5	20	6	9	5	5
Magnesium, total	mg/L	93.5	91.5	82.3	94.9	89.2	95.1	91.3	98.7
Calcium, total	mg/L	199	189	136	205	169	224	180	214
Turbidity, Field	NTU	1.91	1.17	2.98	10.5	1.15	8.15	2.31	2.07
Iron, total	mg/L	19.7	17.6	18.3	20.2	20	18.3	17.8	16.9
Manganese, total	mg/L	3.37	3.75	1.86	3.19	2.41	4.01	3.02	3.57
Sulfide	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Location ID: MW-17S
Number of Sampling Dates: 33

Parameter Name	Units	6/4/2018
Antimony, total	ug/L	<1
Arsenic, total	ug/L	12.9
Barium, total	mg/l	1.13
Beryllium, total	mg/l	<0.001
Cadmium, total	mg/l	<0.002
Chromium, total	mg/l	0.015
Cobalt, total	mg/l	0.012
Copper, total	mg/l	<0.01
Lead, total	ug/L	<1
Nickel, total	mg/l	0.041
Selenium, total	ug/L	<1
Silver, total	mg/l	<0.005
Thallium, total	ug/L	<0.2
Vanadium, total	mg/L	<0.005
Zinc, total	mg/L	<0.01
Acetone	ug/l	<10
Acrylonitrile	ug/l	<5
Benzene	ug/l	6.6
Bromochloromethane	ug/l	<1
Dichlorobromomethane	ug/l	<1
Bromoform	ug/l	<1
Carbon Disulfide	ug/l	<1
Carbon tetrachloride	ug/l	<1
Chlorobenzene	ug/l	7
Chloroethane	ug/l	<1
Trichloromethane	ug/l	<1
Chlorodibromomethane	ug/l	<1
1,2-Dibromo-3-chloropropane; DBCP	ug/l	--
1,2-Dibromoethane; Ethylene dibromide	ug/l	--
1,2-Dichlorobenzene	ug/l	<1
1,4-Dichlorobenzene	ug/l	2.2
trans-1,4-Dichloro-2-Butene	ug/l	<2
1,1-Dichloroethane	ug/l	<1
1,2-Dichloroethane	ug/l	<1
1,1-Dichloroethene	ug/L	<1
cis-1,2-Dichloroethene	ug/L	<1
trans-1,2-Dichloroethene	ug/l	<1
1,2-Dichloropropane	ug/l	<1
cis-1,3-Dichloropropene	ug/L	<1
trans-1,3-Dichloropropene	ug/L	<1
Ethylbenzene	ug/l	<1
2-Hexanone	ug/l	<5
Bromomethane	ug/l	<1
Chloromethane	ug/l	<1
Dibromomethane	ug/l	<1
Methylene Chloride	ug/L	<1
Methyl Ethyl Ketone	ug/L	<5

Location ID: MW-17S

Number of Sampling Dates: 33

Parameter Name	Units	6/4/2018
Iodomethane	ug/l	<5
4-Methyl-2-Pentanone	ug/l	<1
Styrene	ug/l	<1
1,1,1,2-Tetrachloroethane	ug/l	<1
1,1,2,2-Tetrachloroethane	ug/l	<1
Tetrachloroethene	ug/L	<1
Toluene	ug/l	<1
1,1,1-Trichloroethane	ug/l	<1
1,1,2-Trichloroethane	ug/l	<1
Trichloroethene	ug/L	<1
Trichlorofluoromethane	ug/l	<1
1,2,3-Trichloropropane	ug/l	<1
Vinyl acetate	ug/l	<1
Vinyl chloride	ug/l	<1
Xylenes, Total	ug/L	<2
Ammonia Nitrogen	mg/l	221
Chloride	mg/l	1170
Sodium	mg/l	900
Potassium, total	mg/l	193
Temperature, Field	deg C	14.4
pH, Field	S.U.	6.91
Specific Conductivity, Field	umhos/cm	6500
Total Dissolved Solids	mg/l	3320
Alkalinity (calcium carbonate)	mg/L	1750
Nitrate,Nitrite	mg/l	<0.05
Sulfate	mg/L	5
Magnesium, total	mg/L	87.1
Calcium, total	mg/L	179
Turbidity, Field	NTU	18.2
Iron, total	mg/L	18.5
Manganese, total	mg/L	3.25
Sulfide	mg/l	<0.1

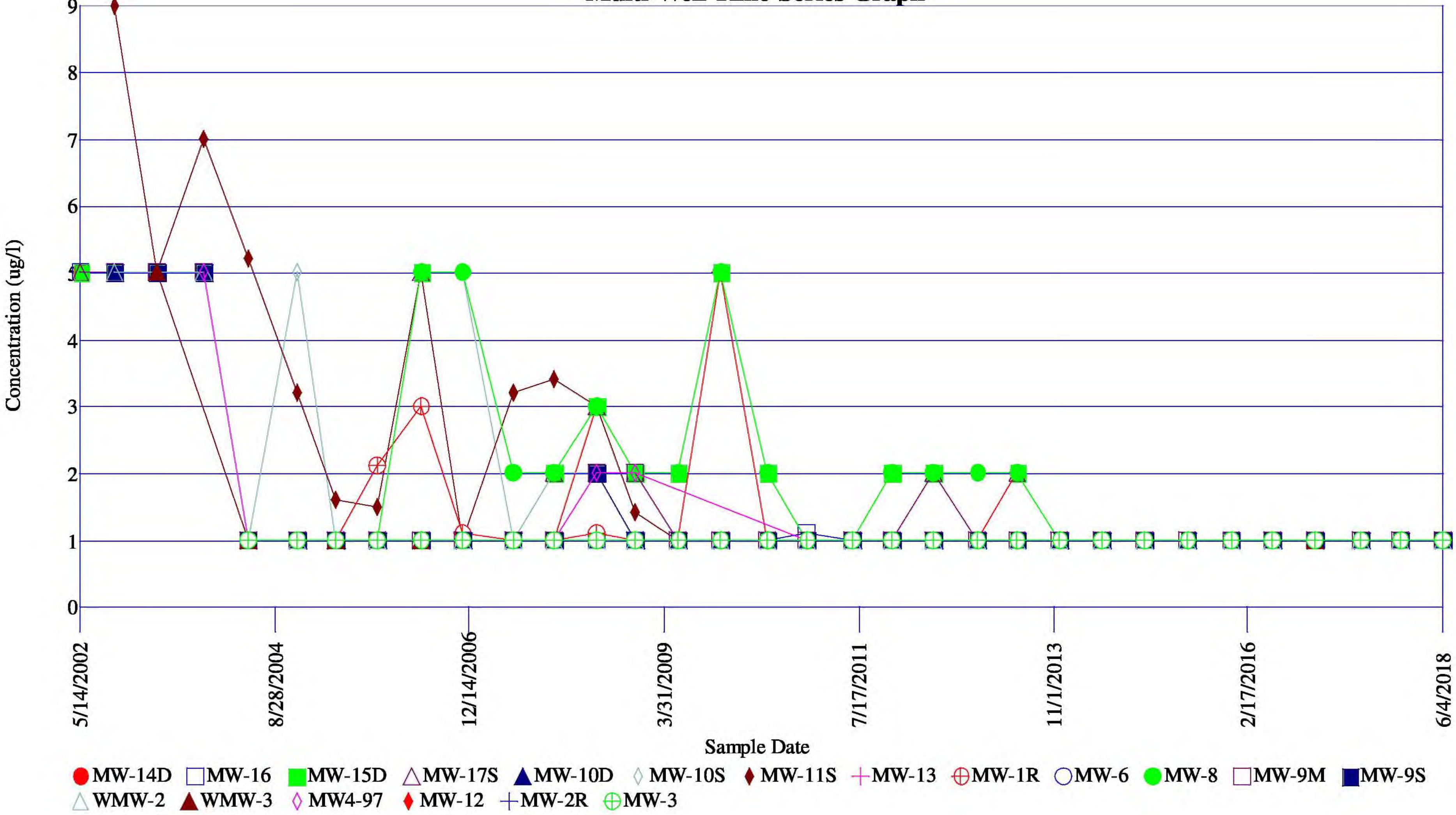
APPENDIX C.

TIME-SERIES GRAPHS ON CD

Royalton Road LF

Antimony, total

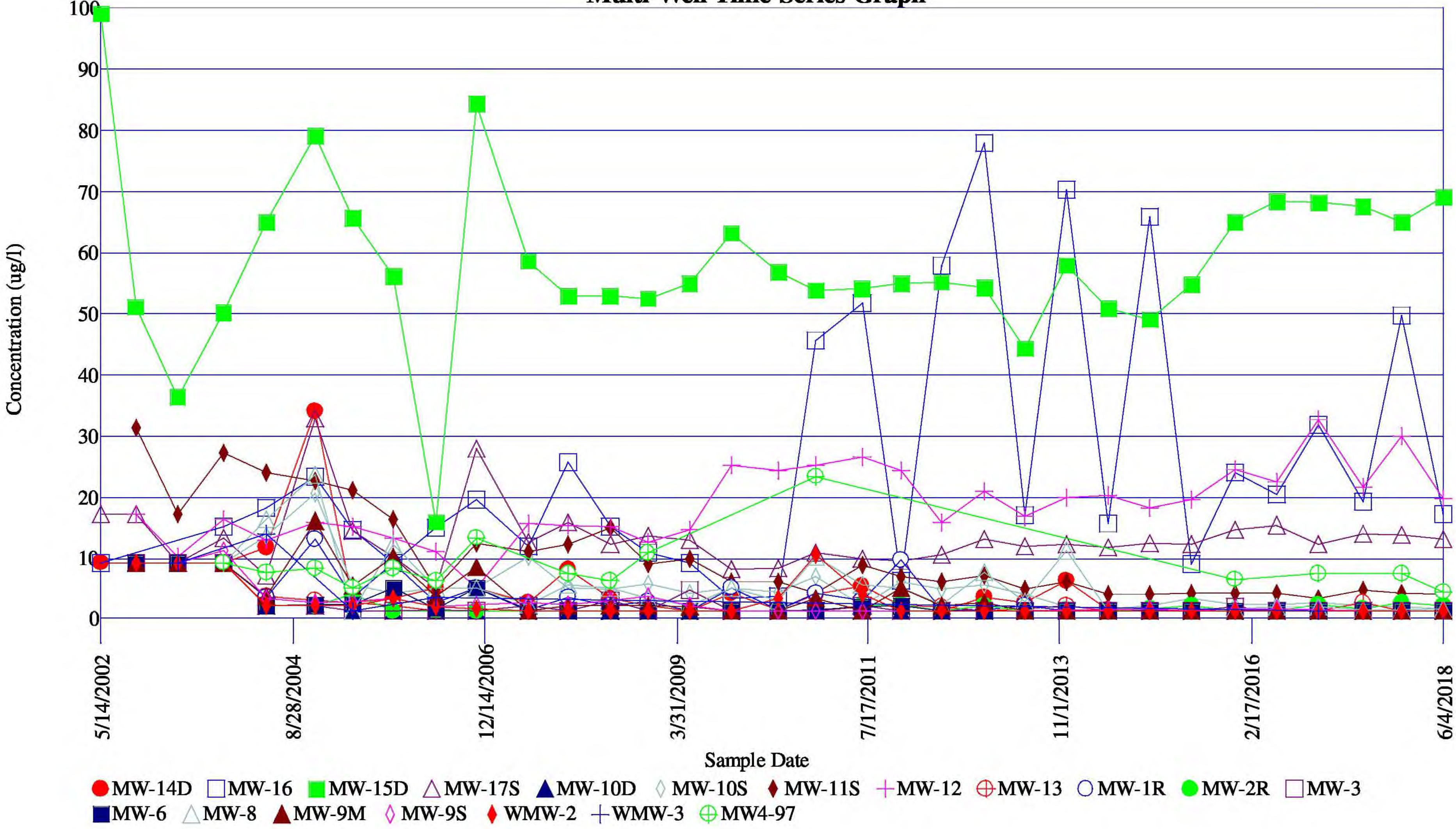
Multi-Well Time-Series Graph



Royalton Road LF

Arsenic, total

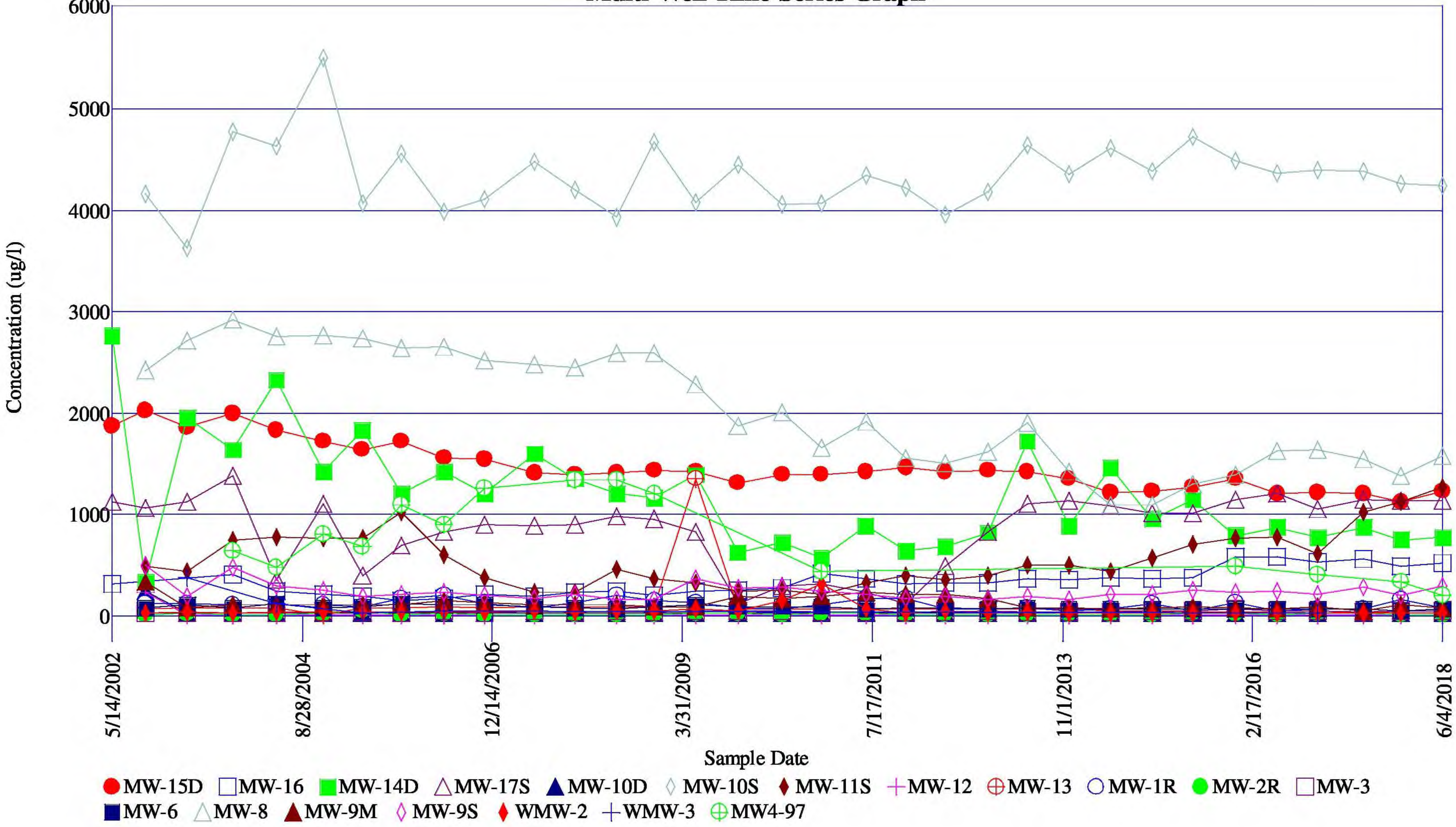
Multi-Well Time-Series Graph



Royalton Road LF

Barium, total

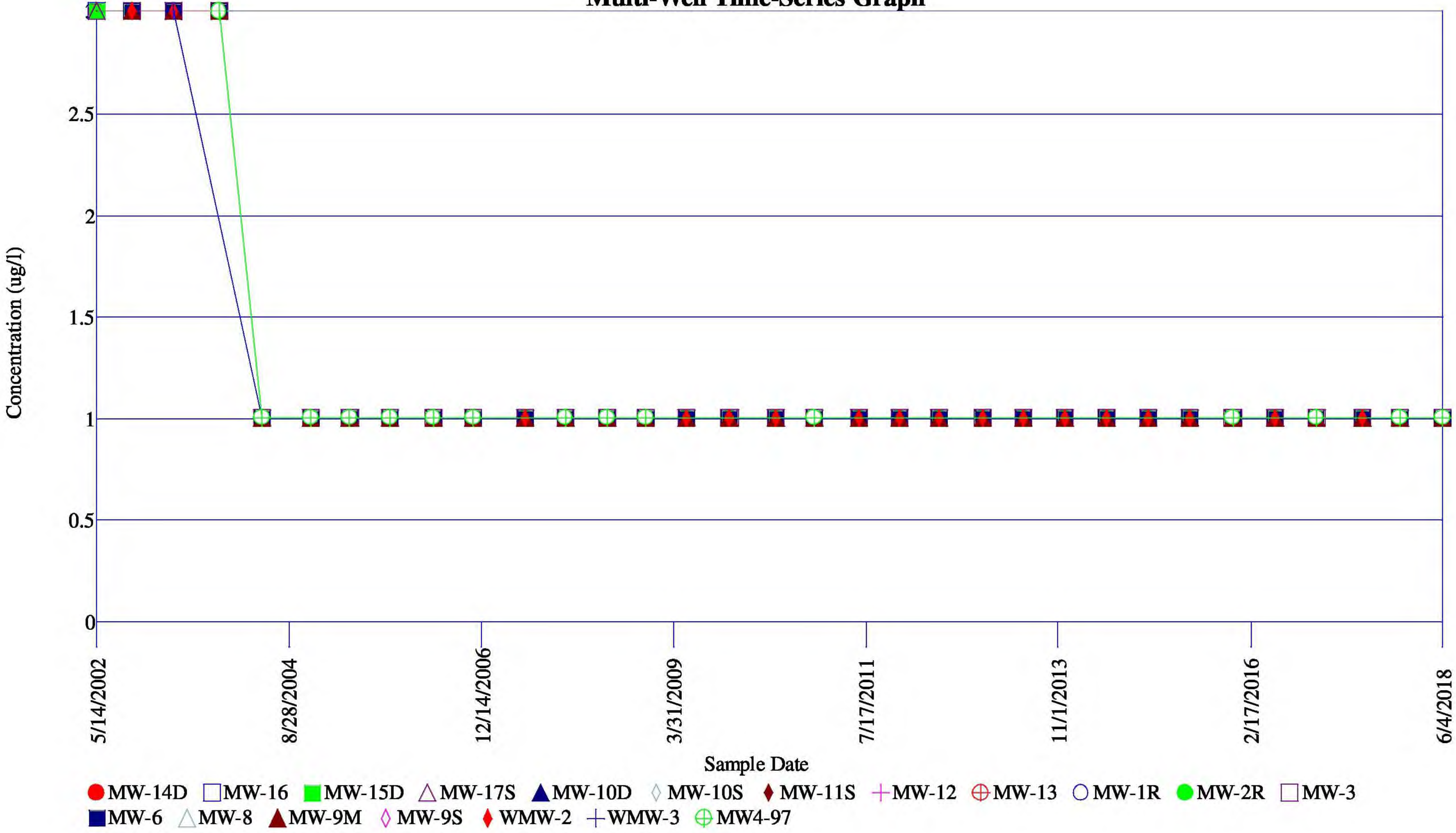
Multi-Well Time-Series Graph



Royalton Road LF

Beryllium, total

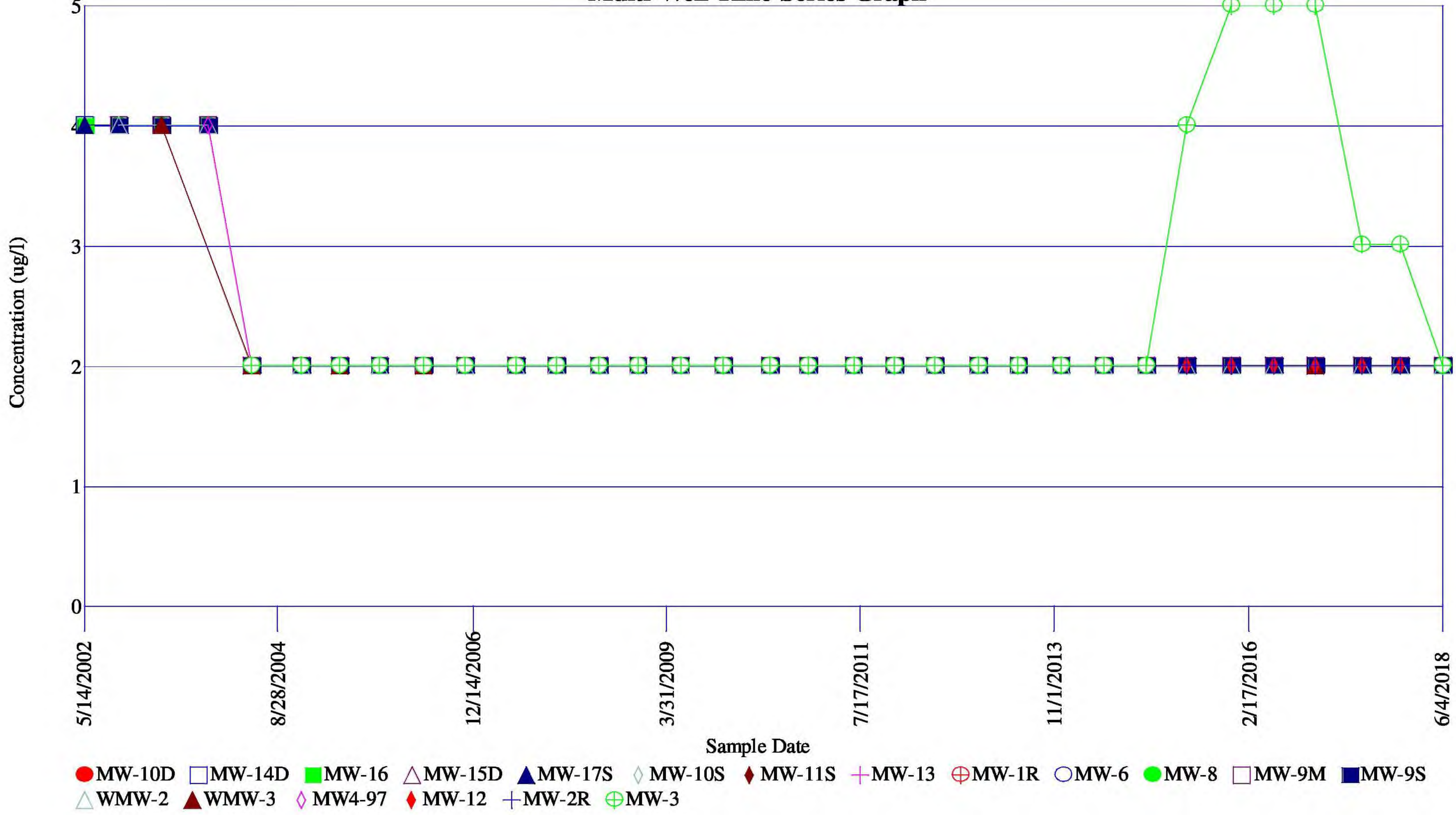
Multi-Well Time-Series Graph



Royalton Road LF

Cadmium, total

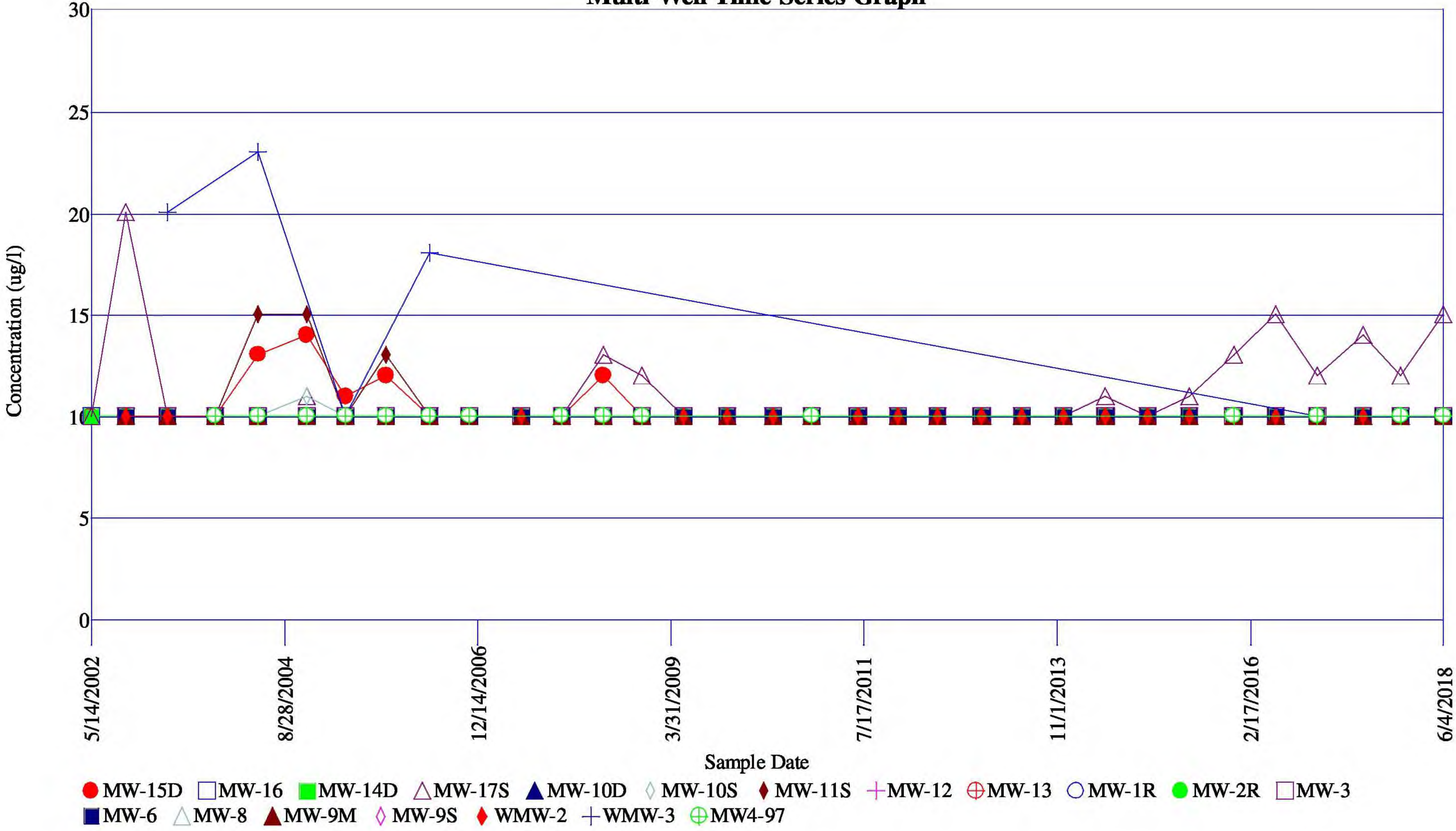
Multi-Well Time-Series Graph



Royalton Road LF

Chromium, total

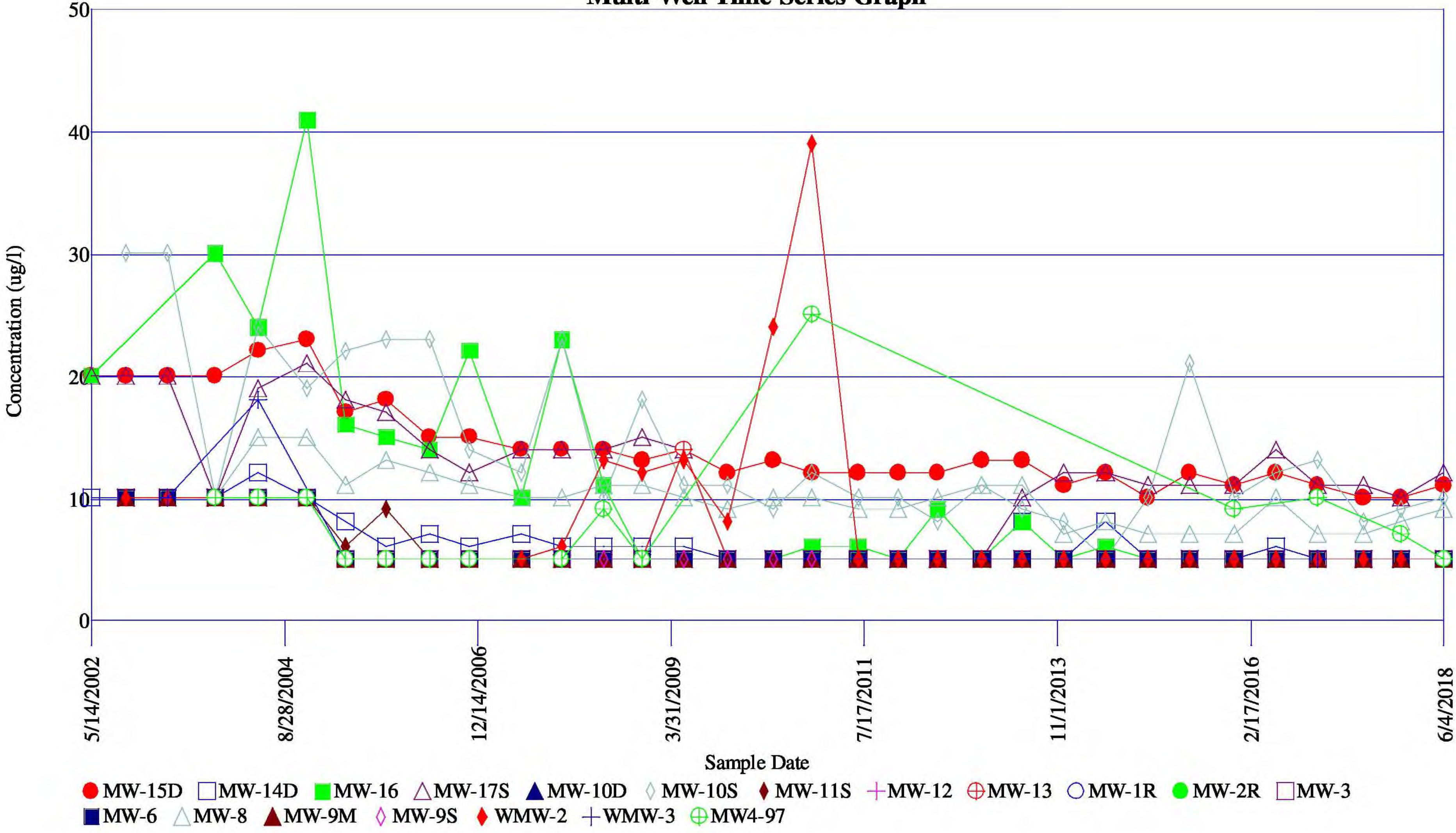
Multi-Well Time-Series Graph



Royalton Road LF

Cobalt, total

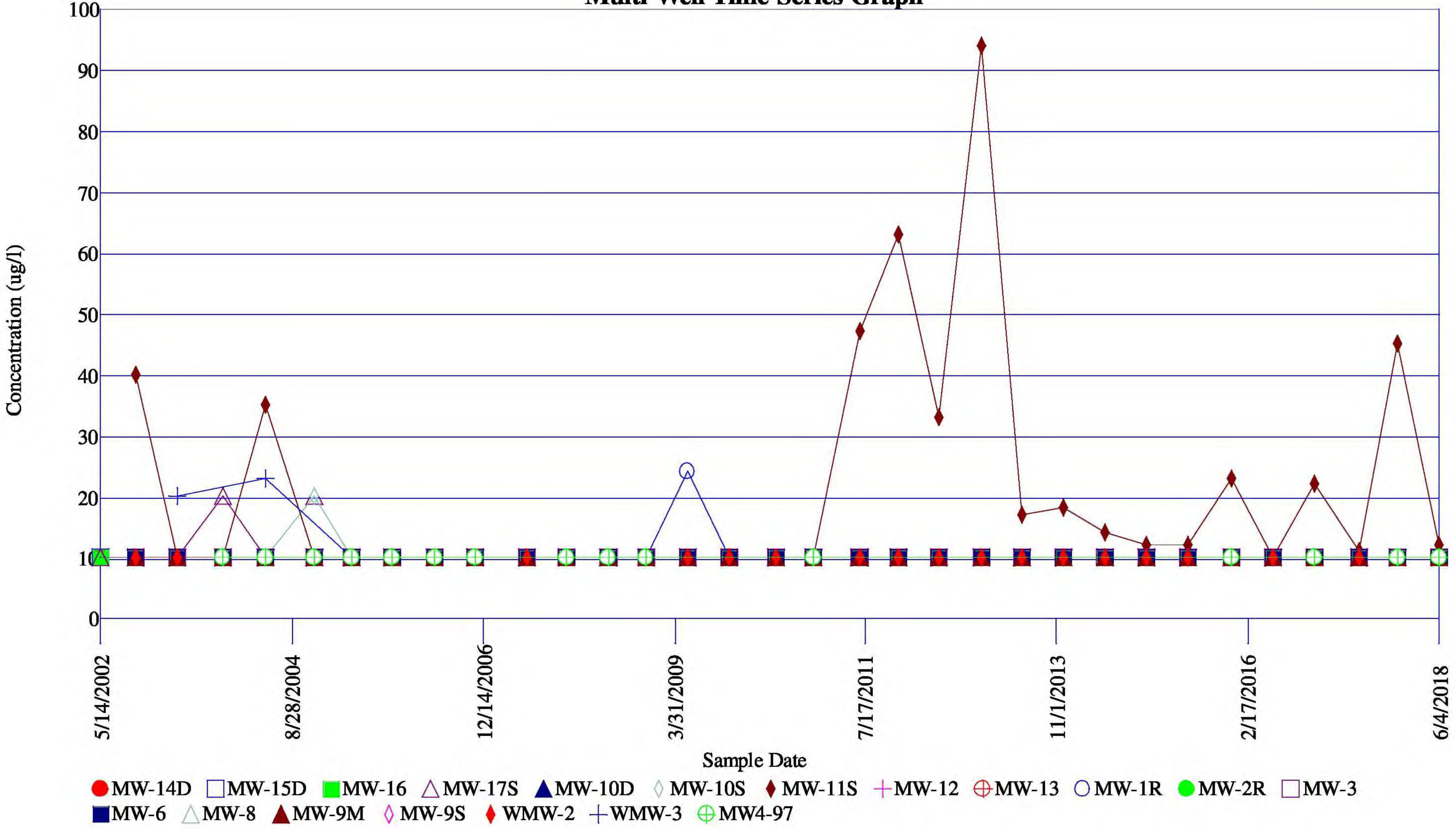
Multi-Well Time-Series Graph



Royalton Road LF

Copper, total

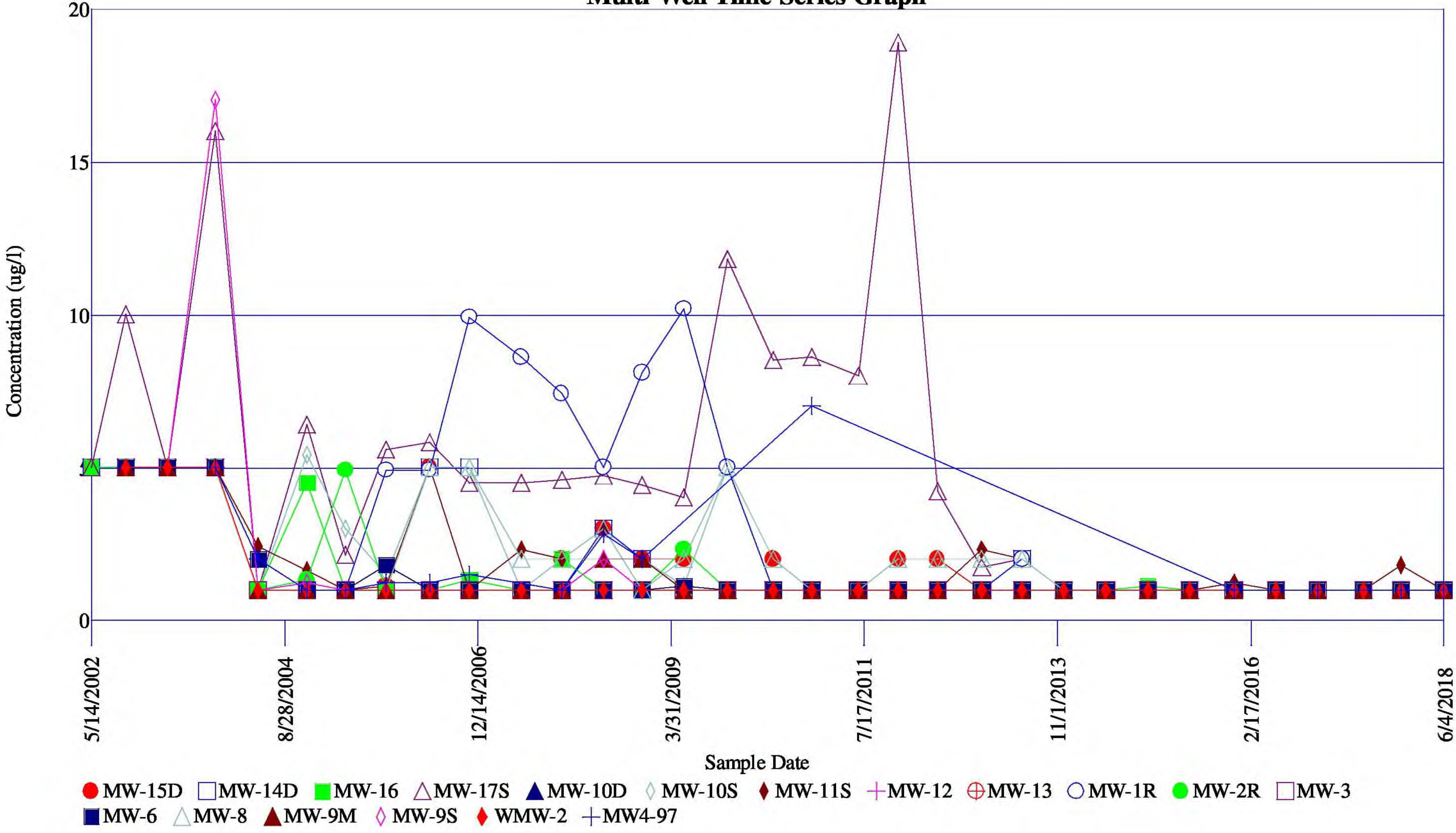
Multi-Well Time-Series Graph



Royalton Road LF

Lead, total

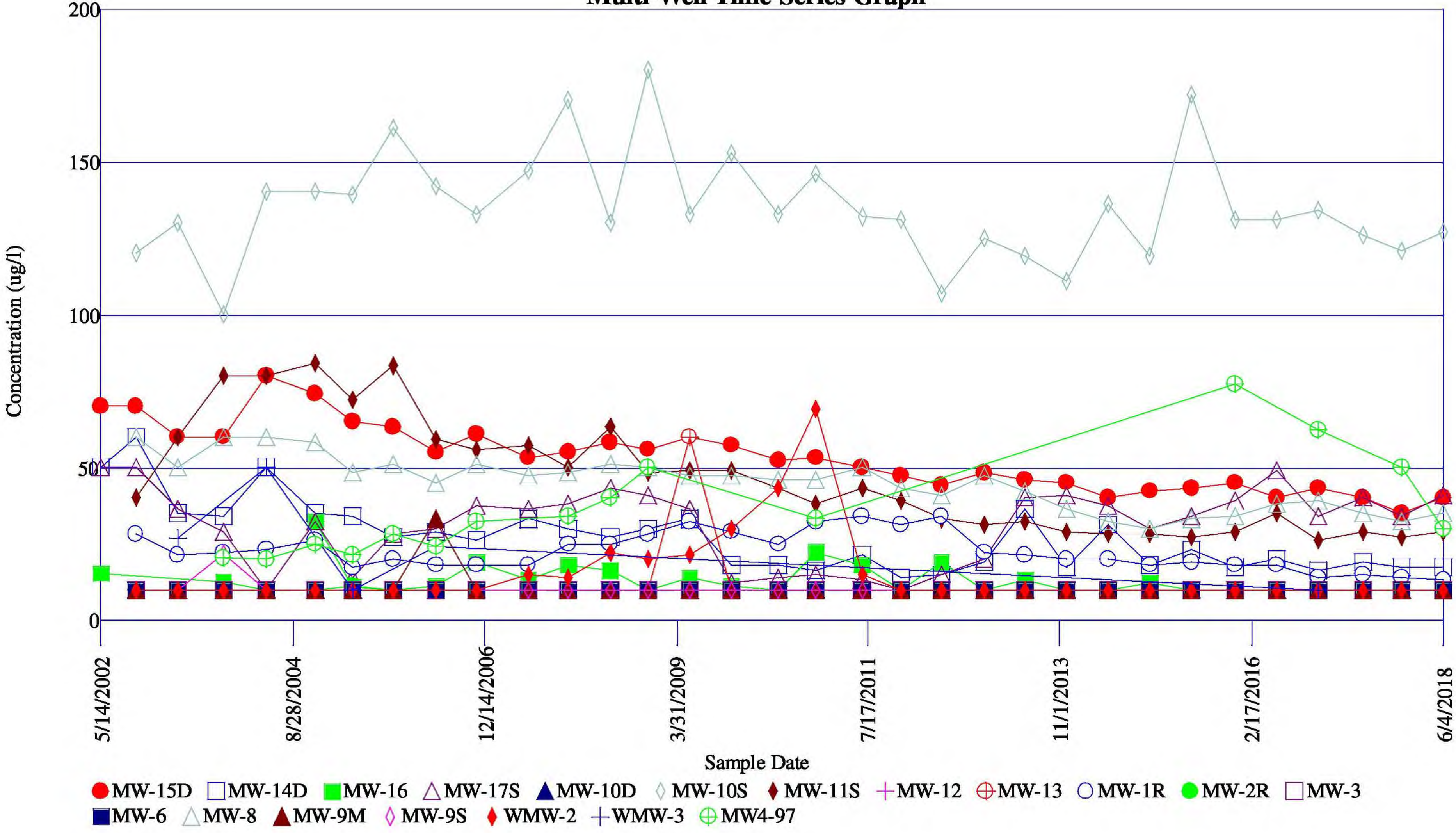
Multi-Well Time-Series Graph



Royalton Road LF

Nickel, total

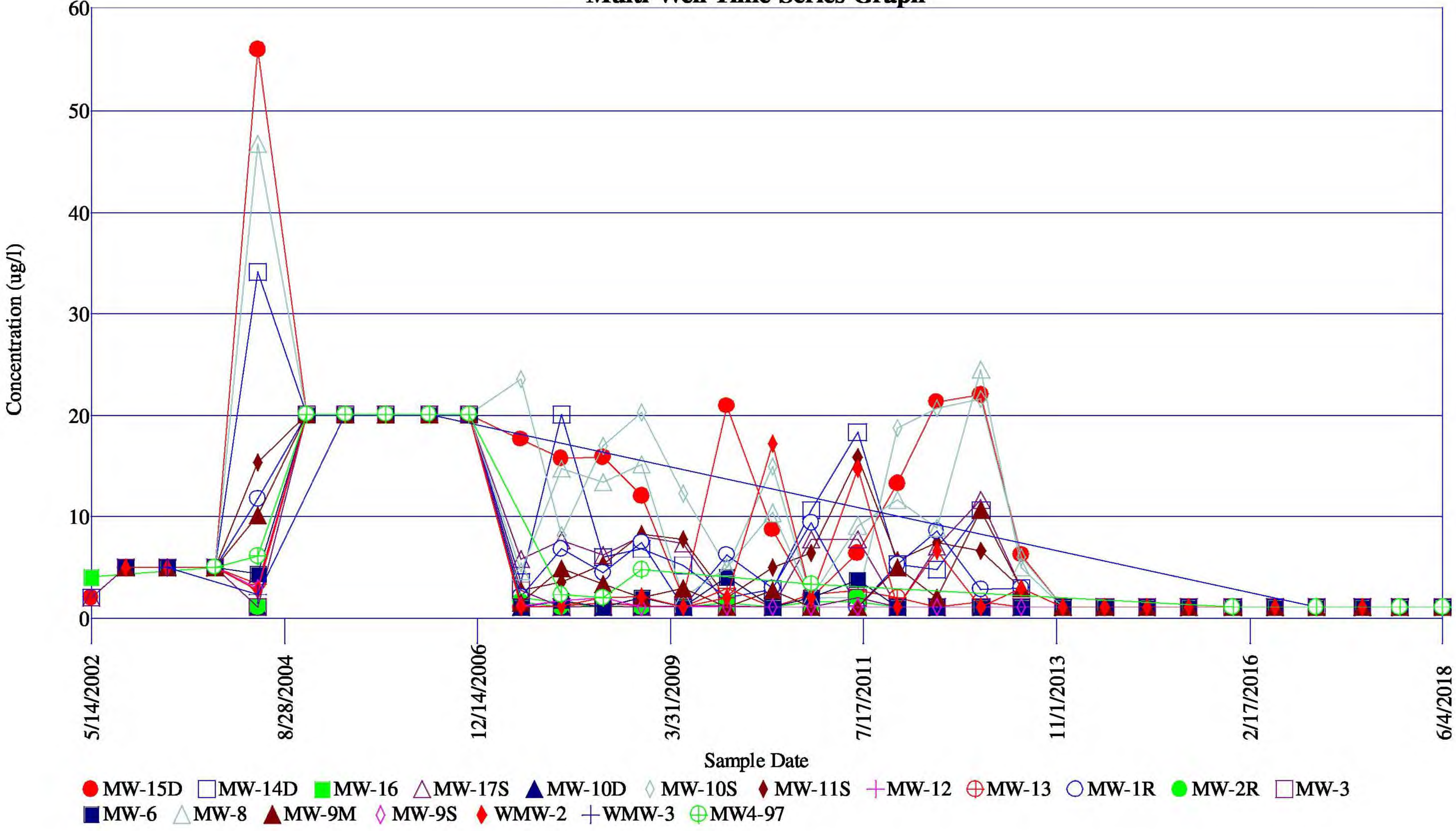
Multi-Well Time-Series Graph



Royalton Road LF

Selenium, total

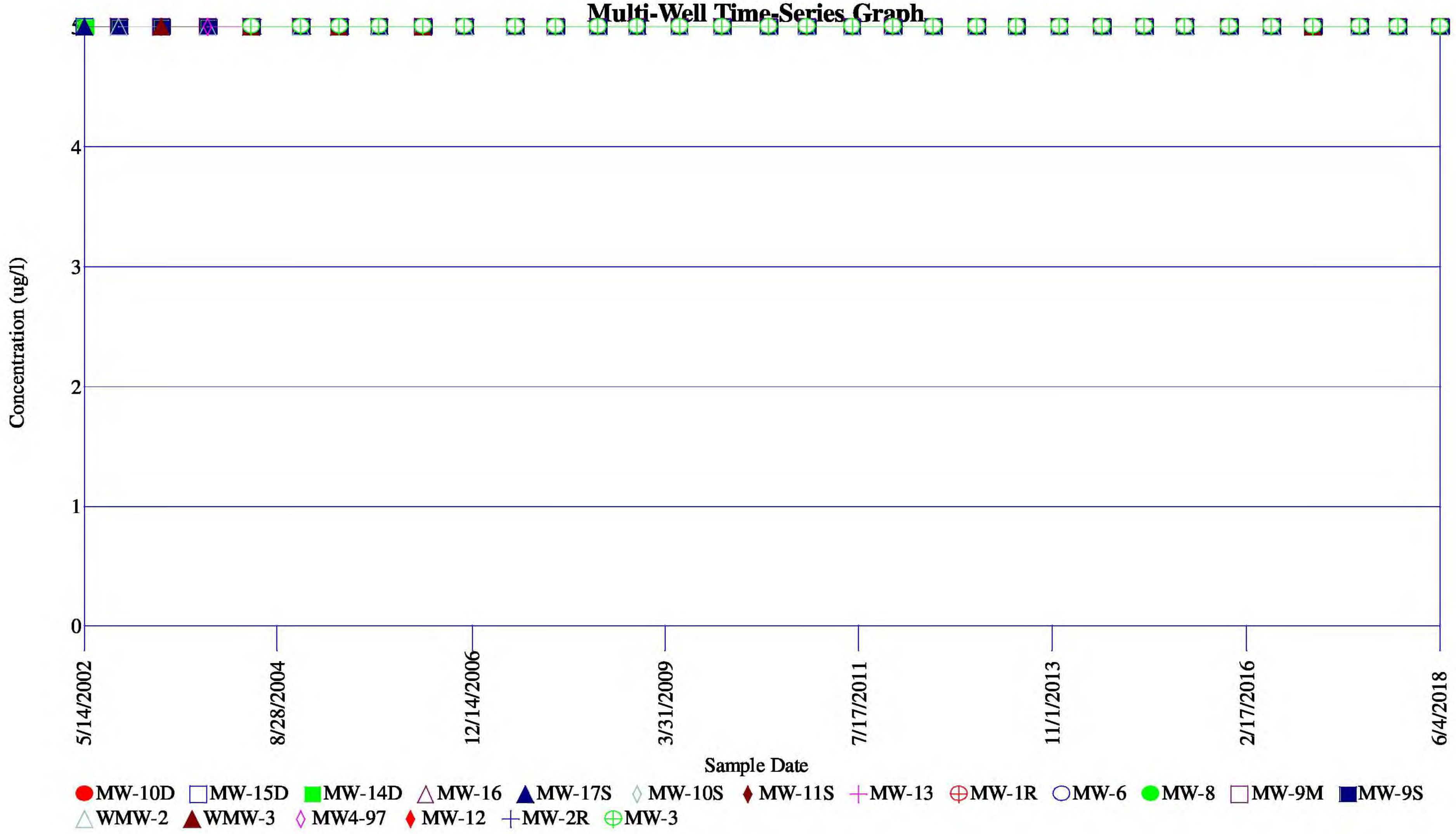
Multi-Well Time-Series Graph



Royalton Road LF

Silver, total

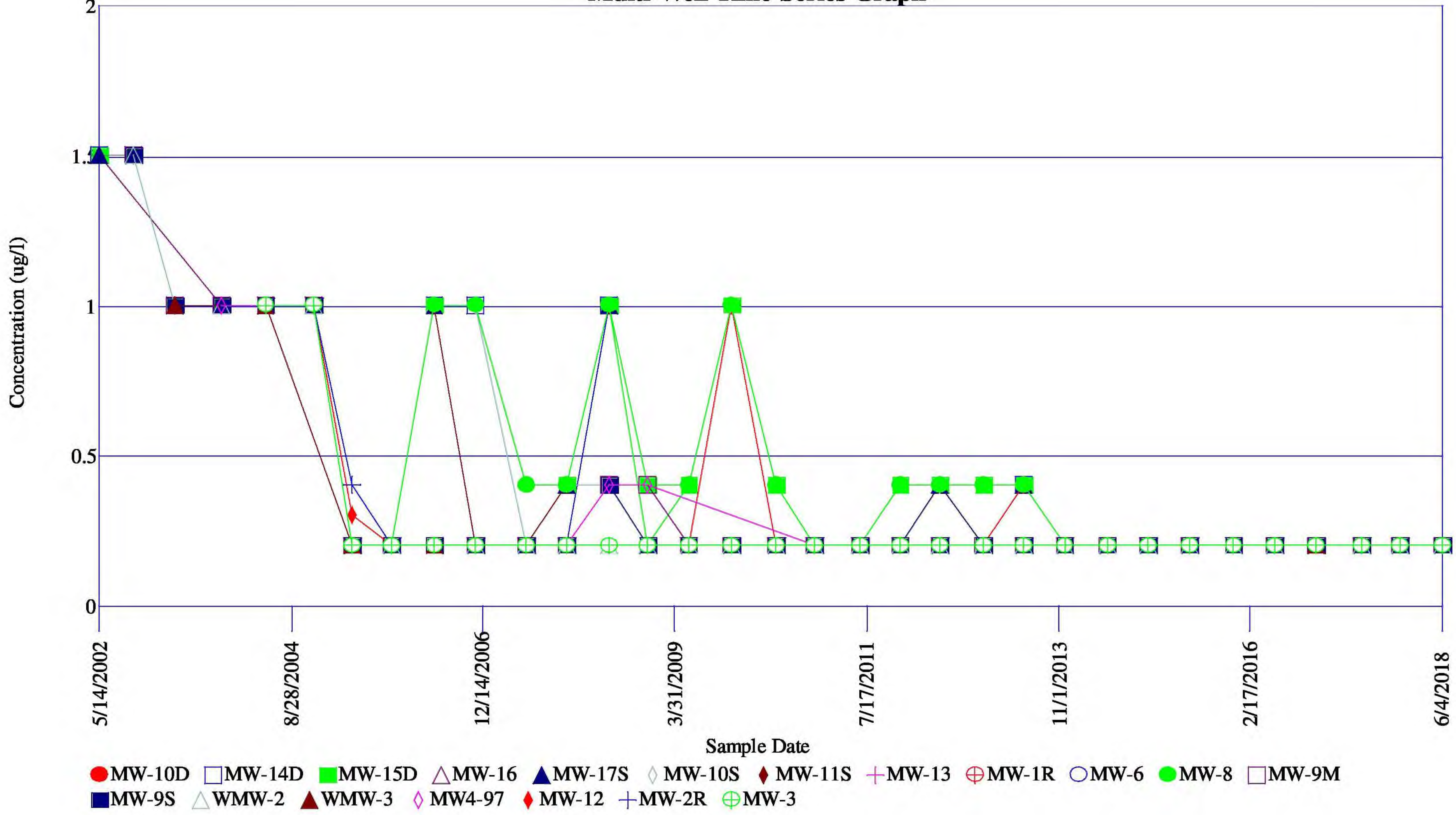
Multi-Well Time-Series Graph



Royalton Road LF

Thallium, total

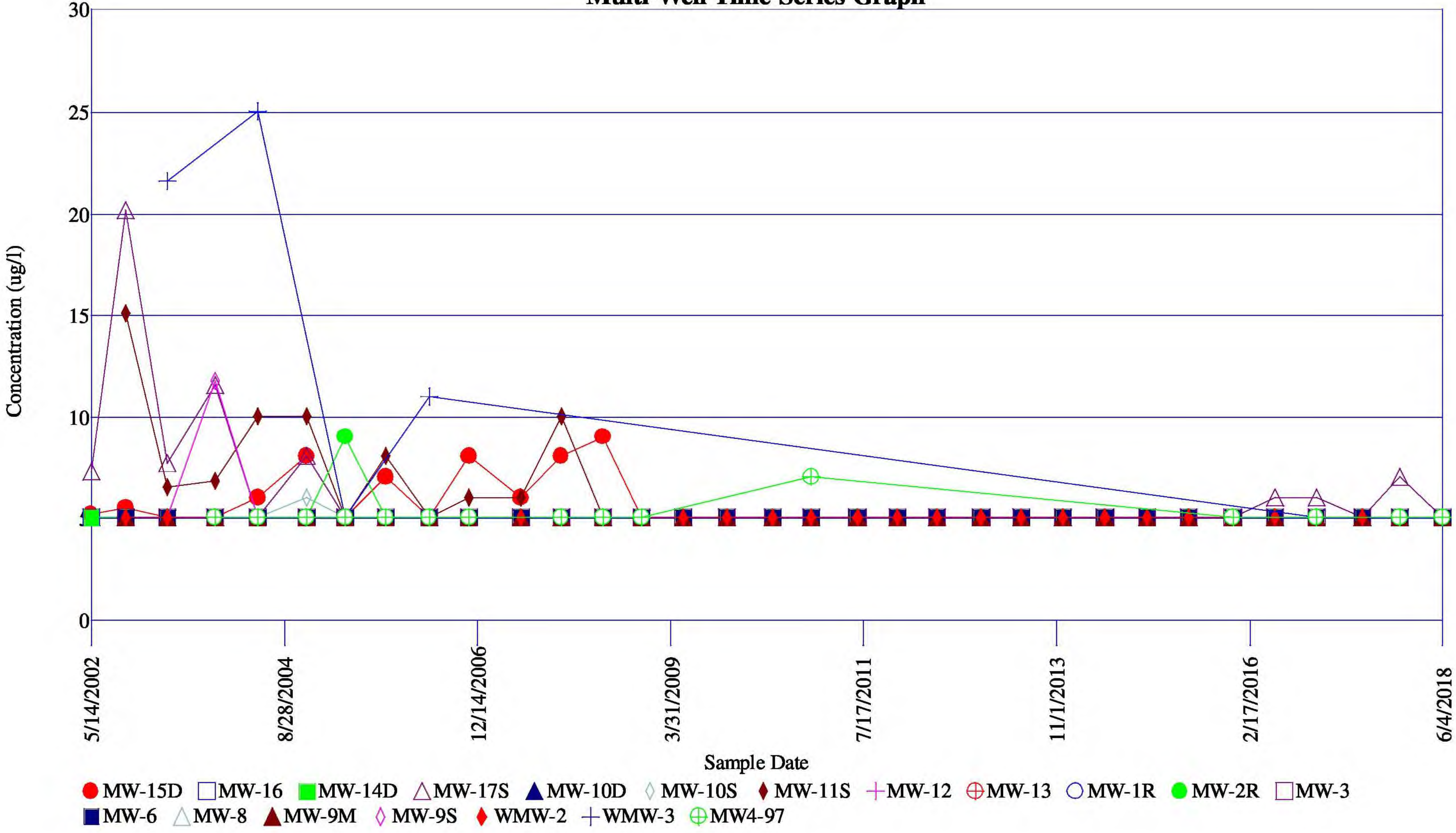
Multi-Well Time-Series Graph



Royalton Road LF

Vanadium, total

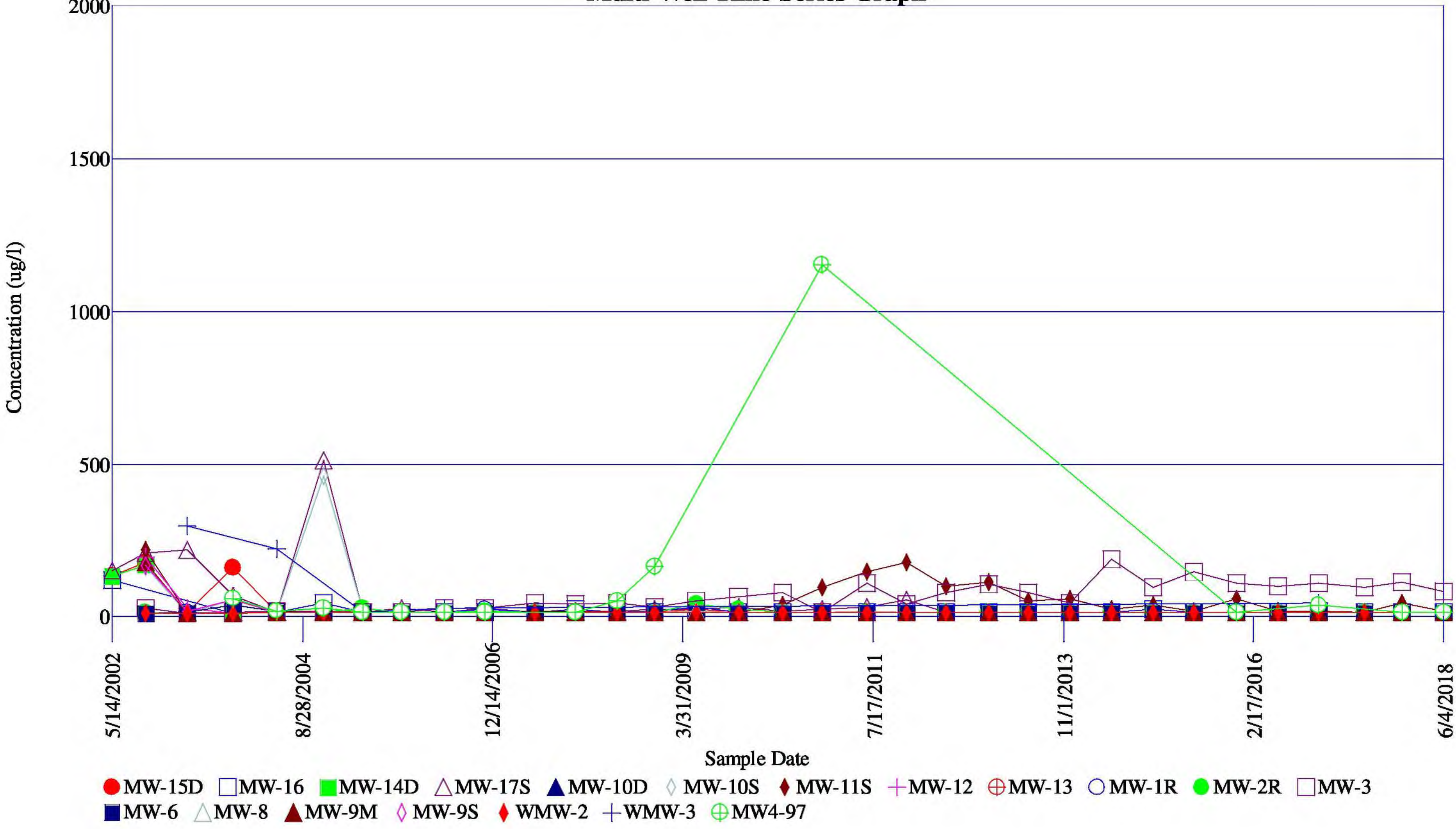
Multi-Well Time-Series Graph



Royalton Road LF

Zinc, total

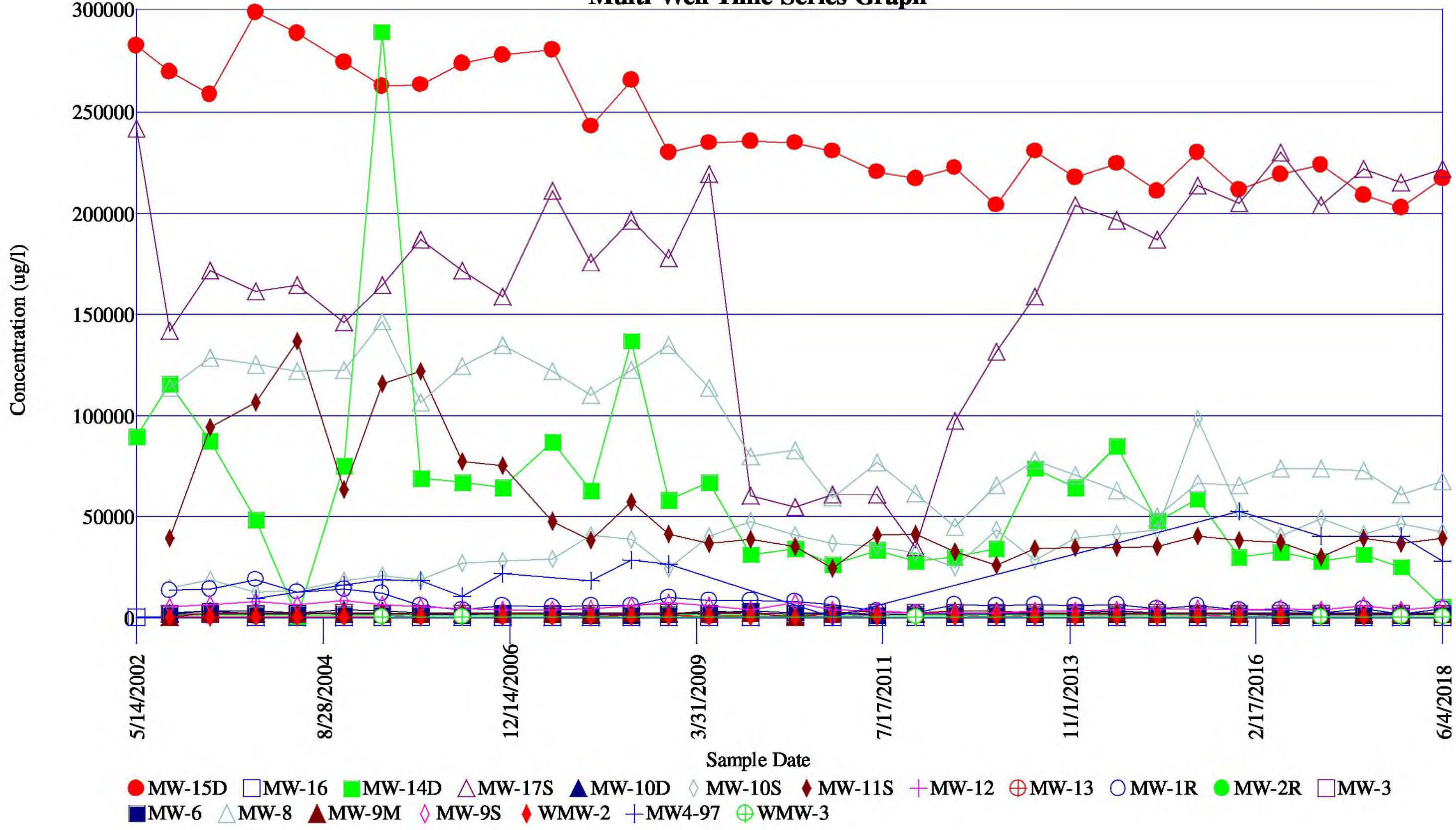
Multi-Well Time-Series Graph



Royalton Road LF

Ammonia Nitrogen

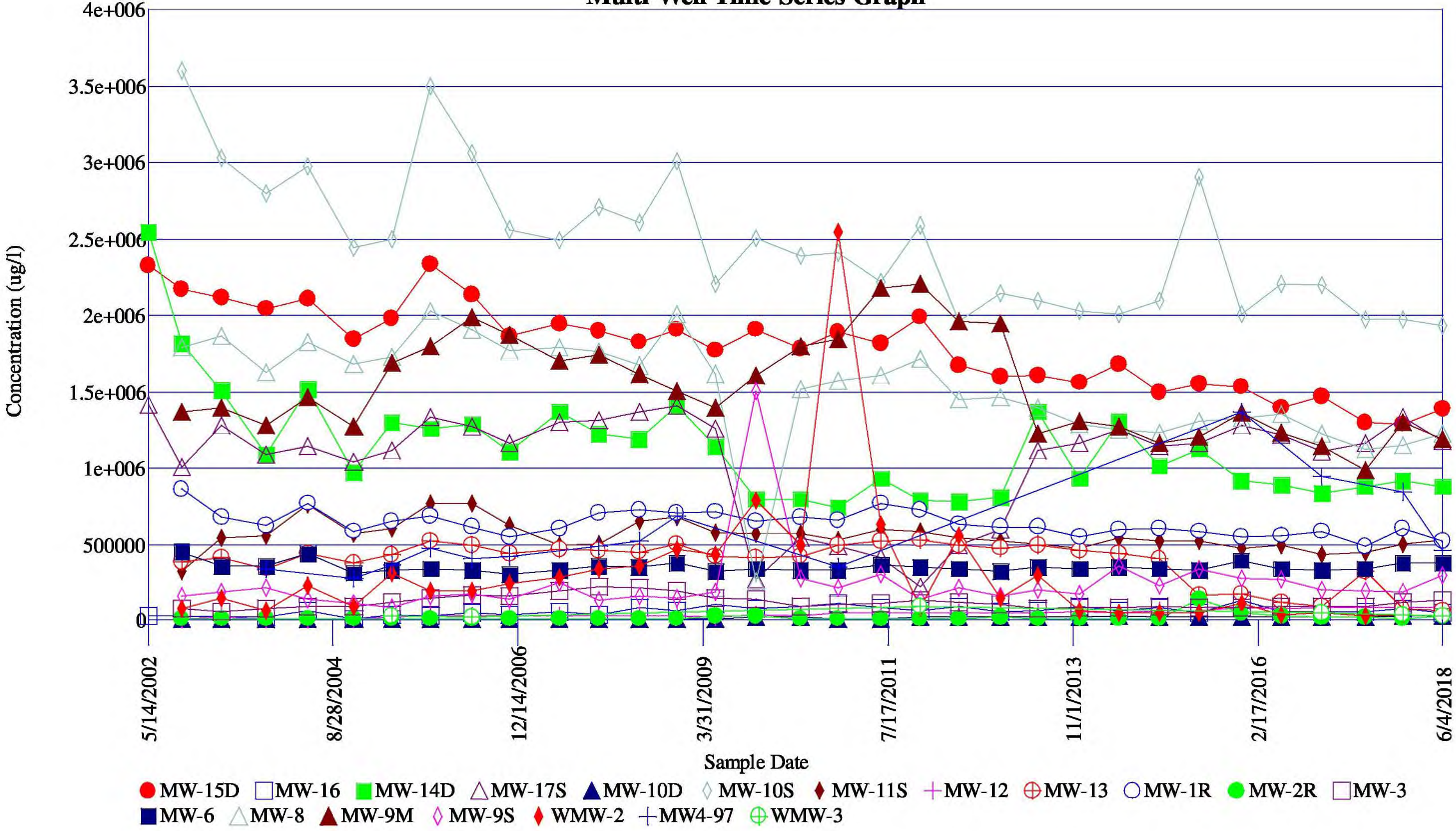
Multi-Well Time-Series Graph



Royalton Road LF

Chloride

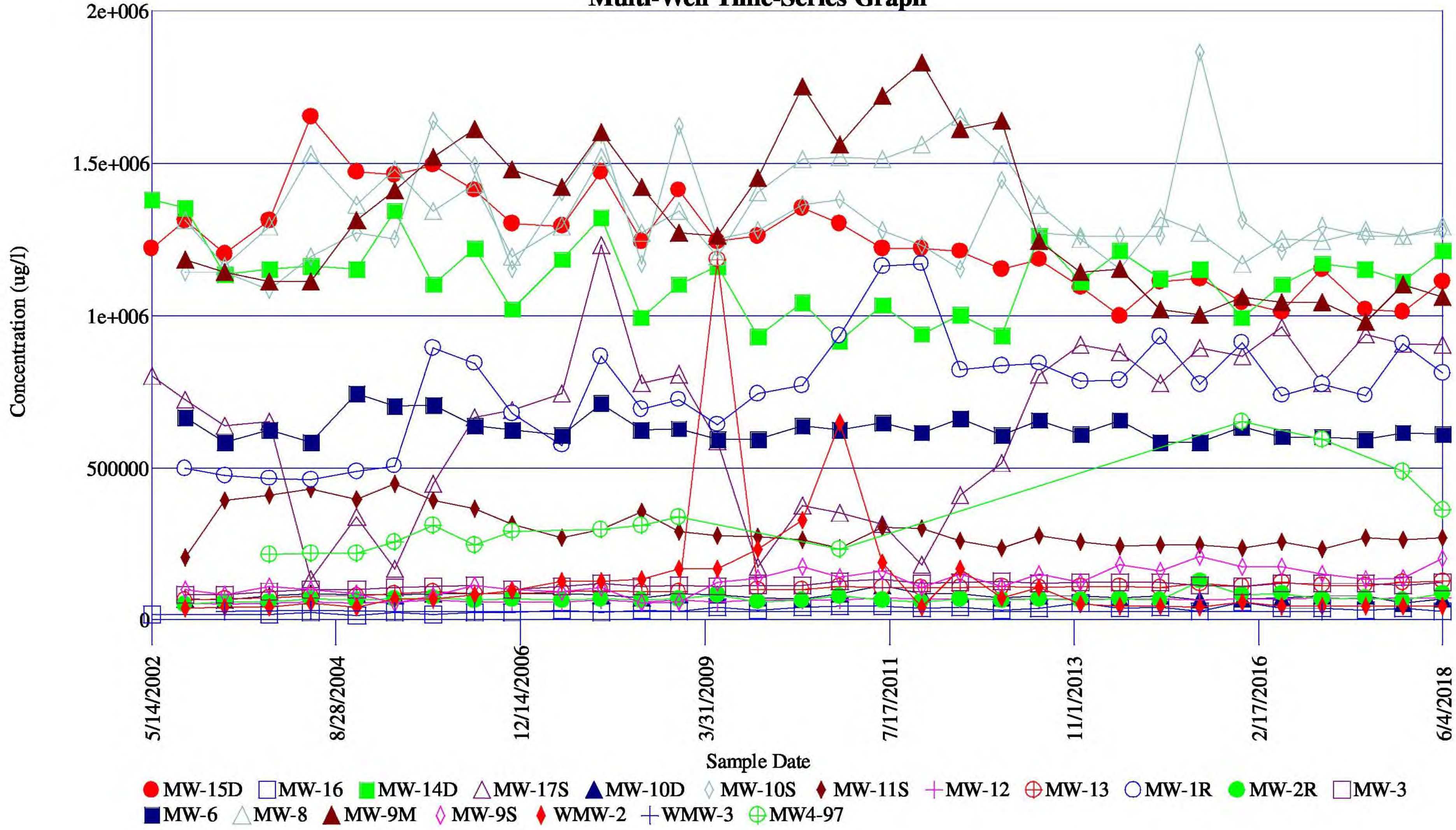
Multi-Well Time-Series Graph



Royalton Road LF

Sodium

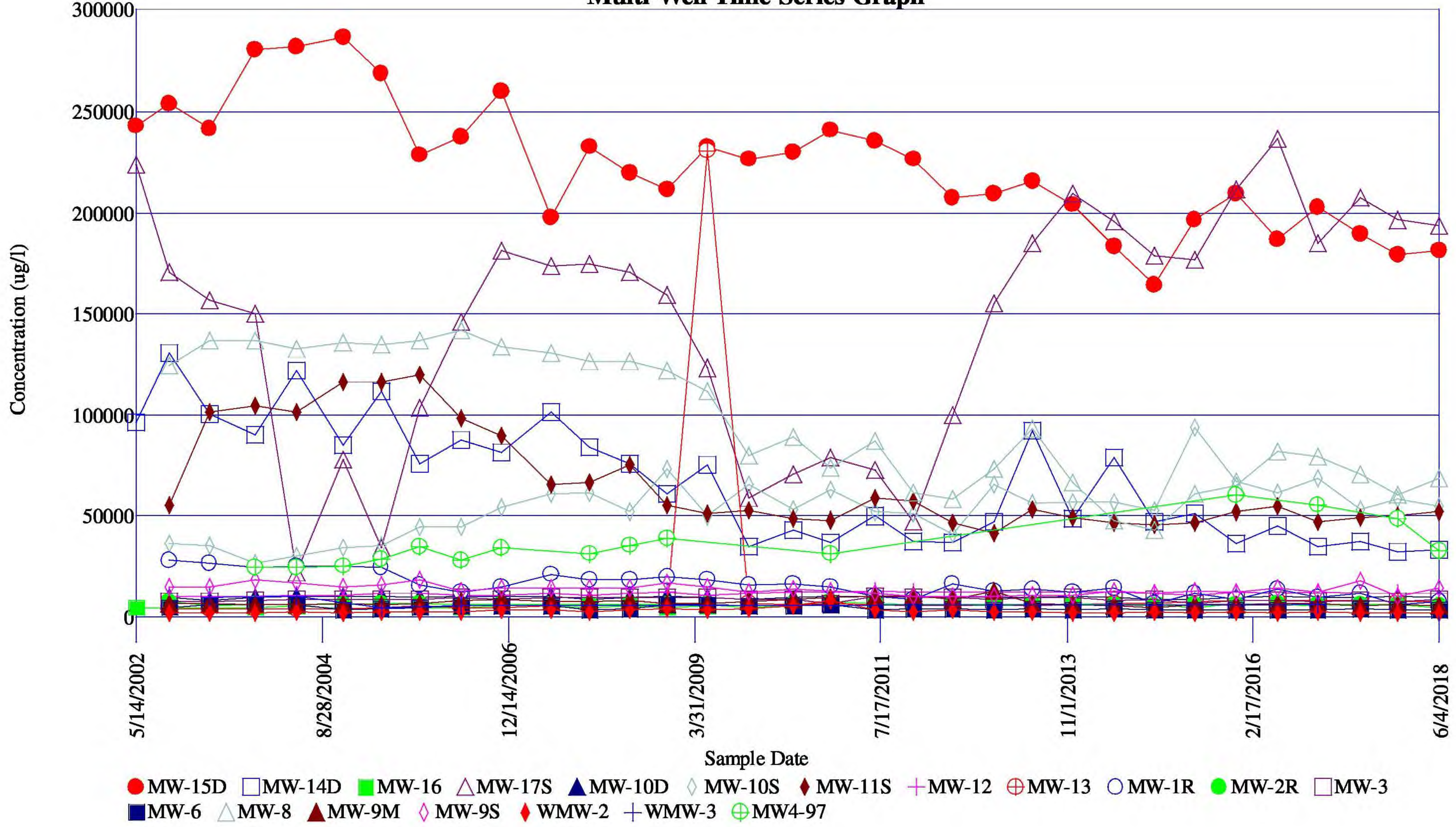
Multi-Well Time-Series Graph



Royalton Road LF

Potassium, total

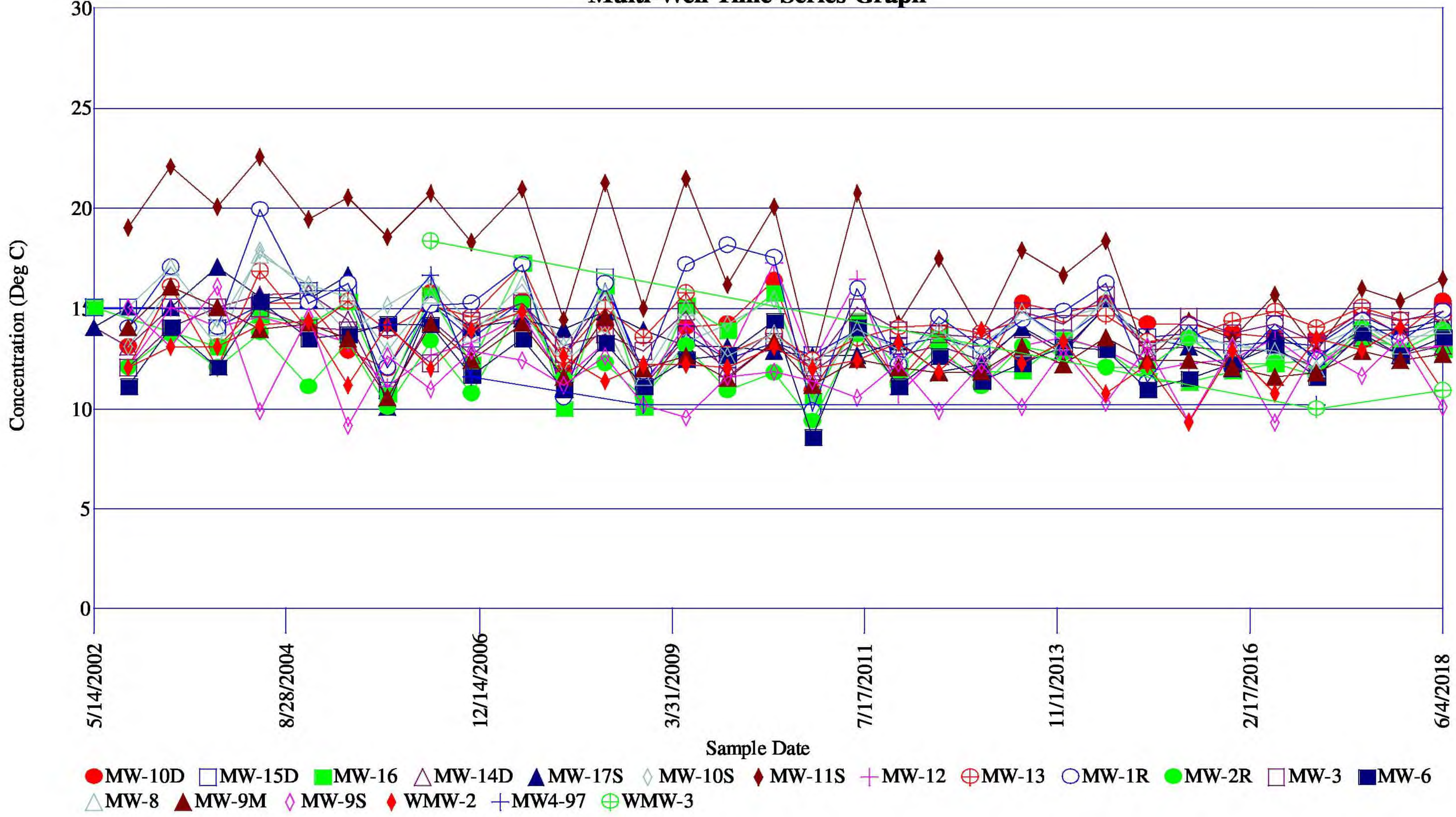
Multi-Well Time-Series Graph



Royalton Road LF

Temperature, Field

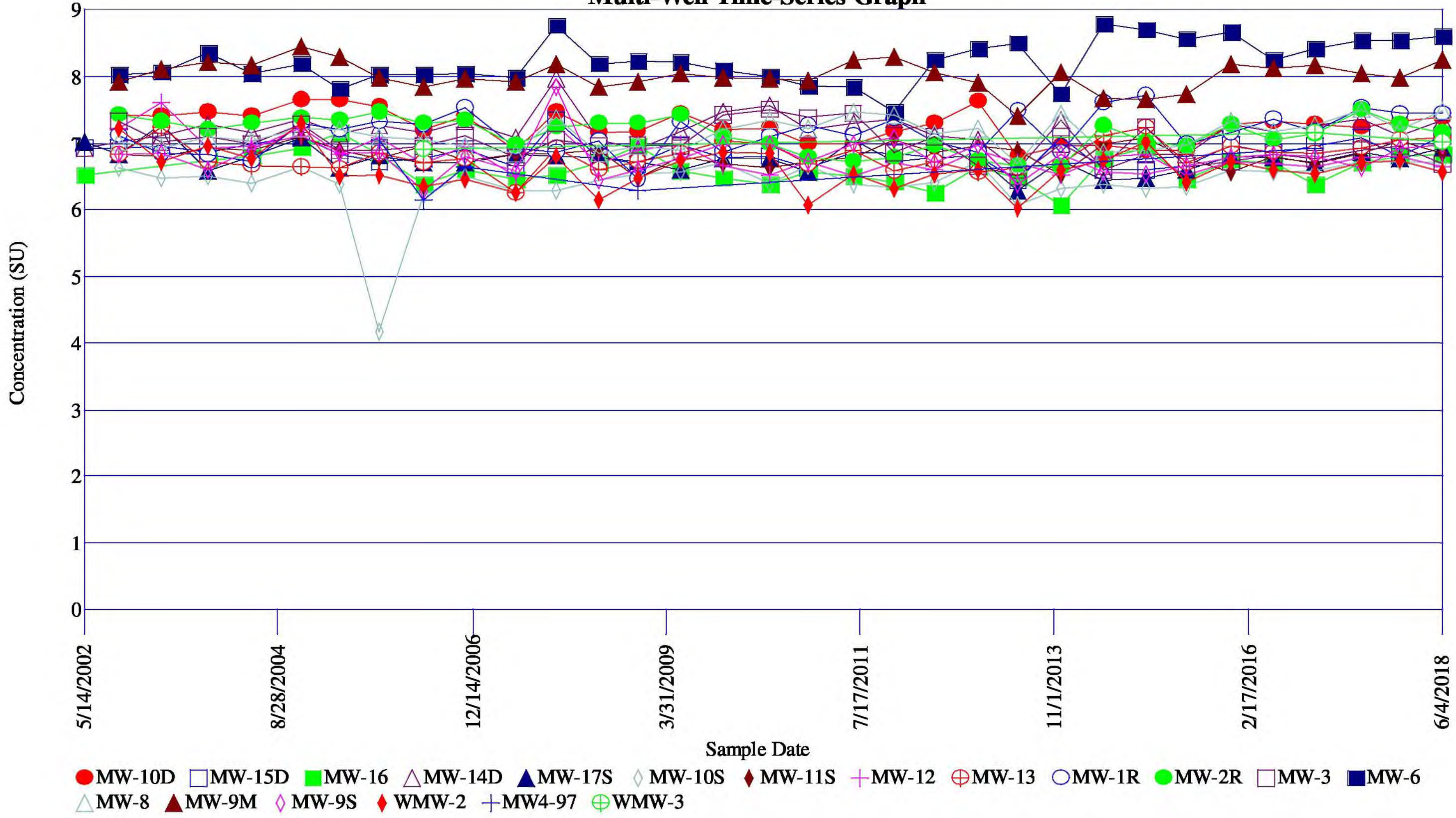
Multi-Well Time-Series Graph



Royalton Road LF

pH, Field

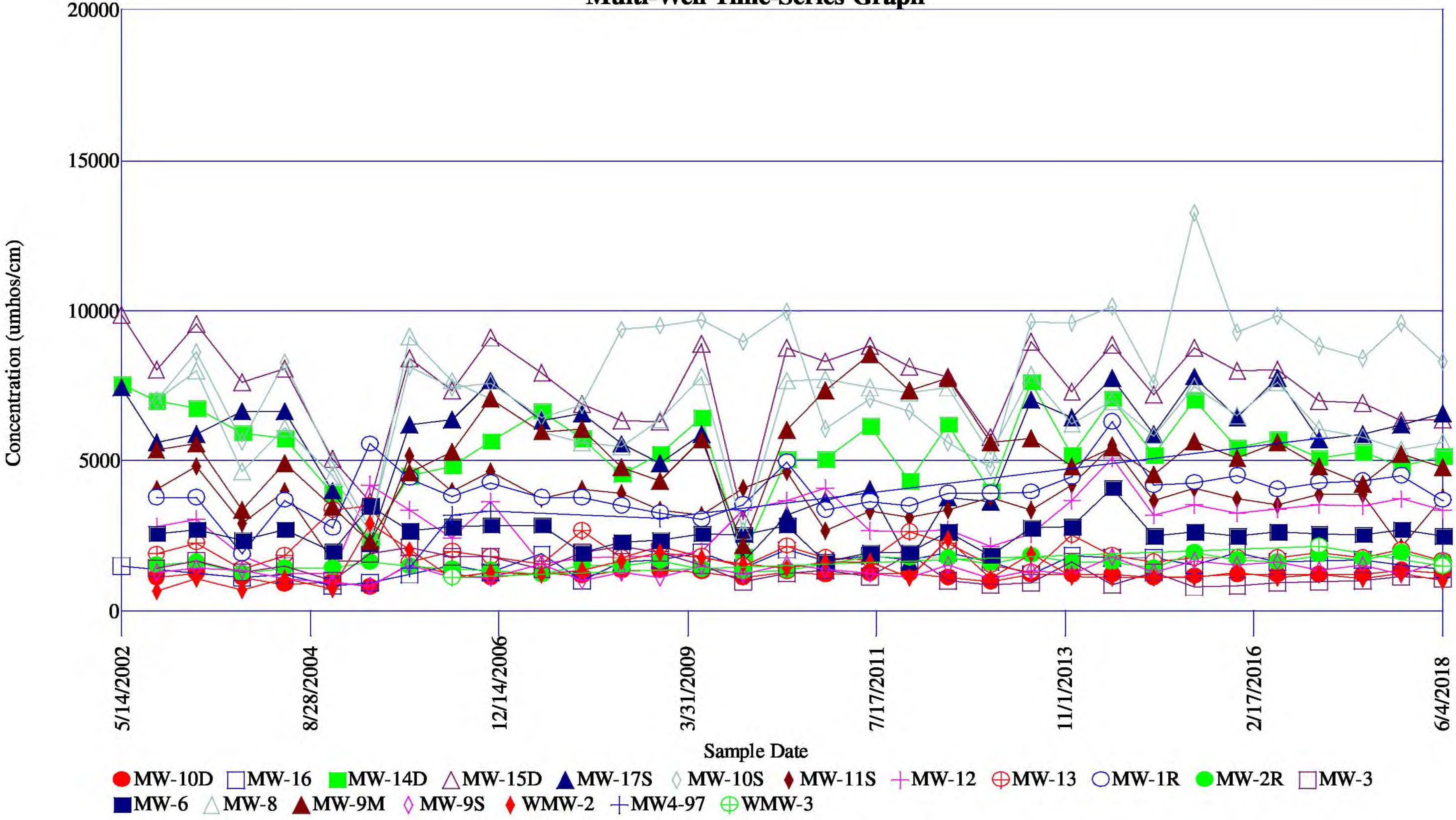
Multi-Well Time-Series Graph



Royalton Road LF

Specific Conductivity, Field

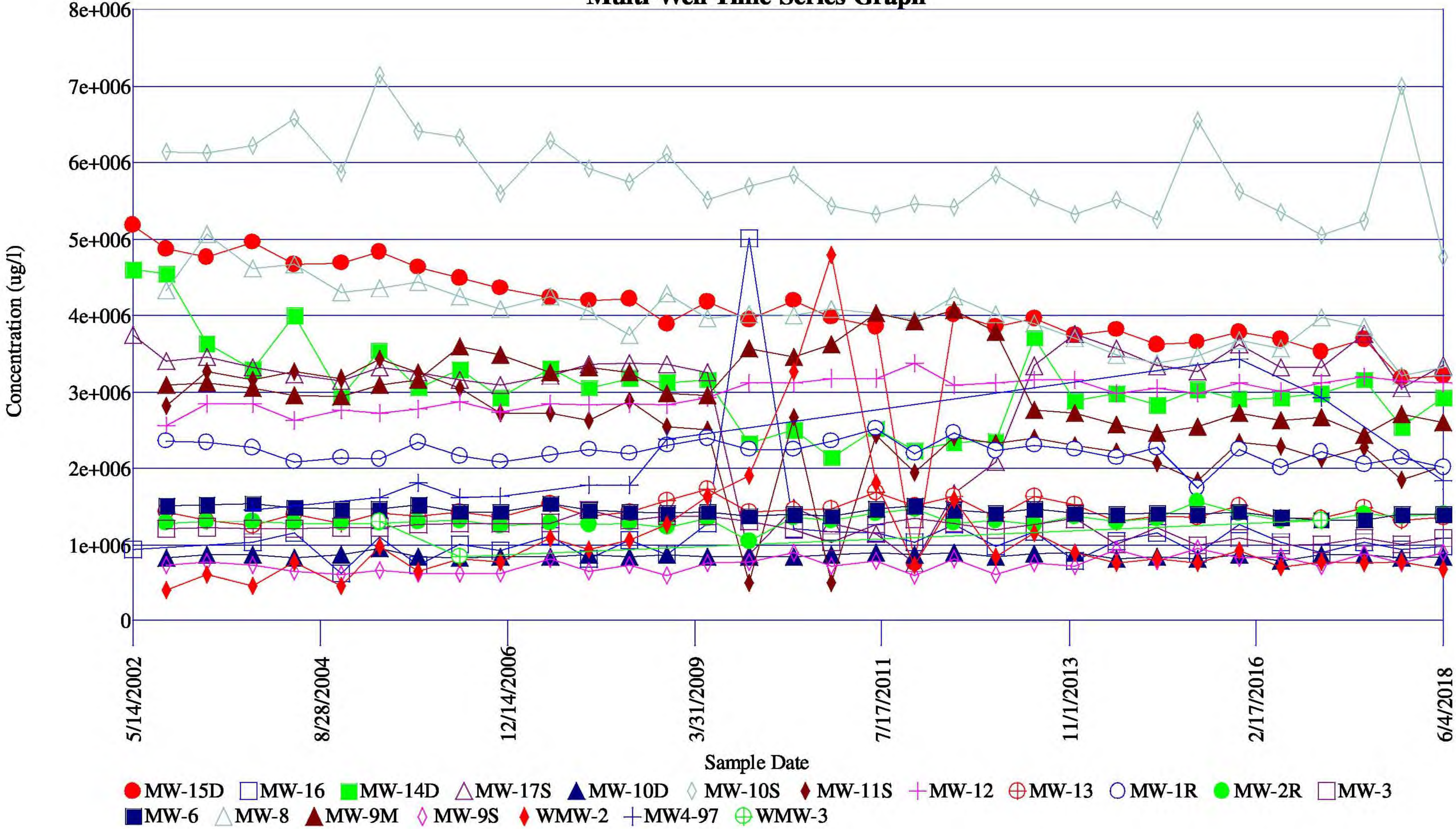
Multi-Well Time-Series Graph



Royalton Road LF

Total Dissolved Solids

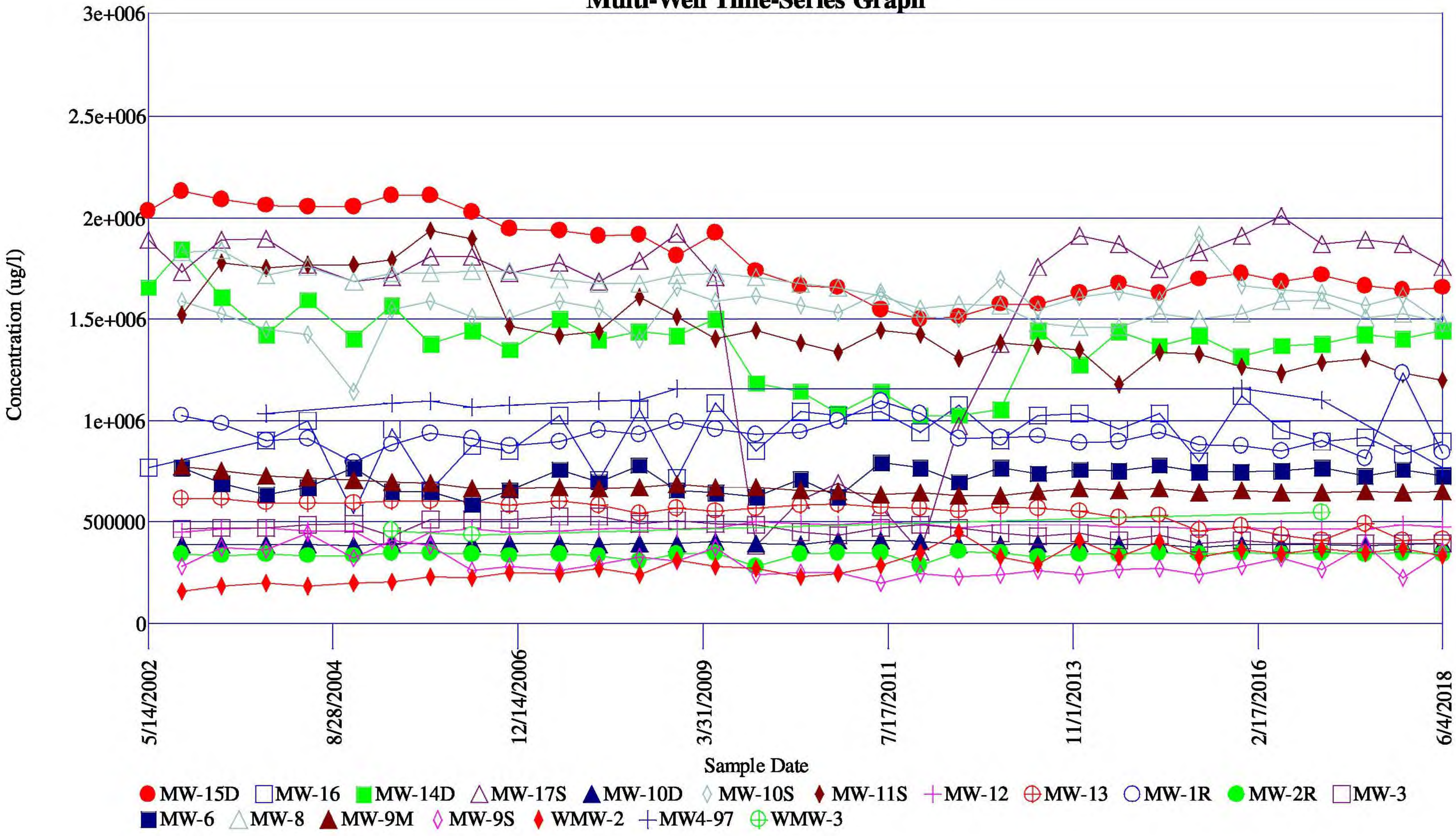
Multi-Well Time-Series Graph



Royalton Road LF

Alkalinity (calcium carbonate)

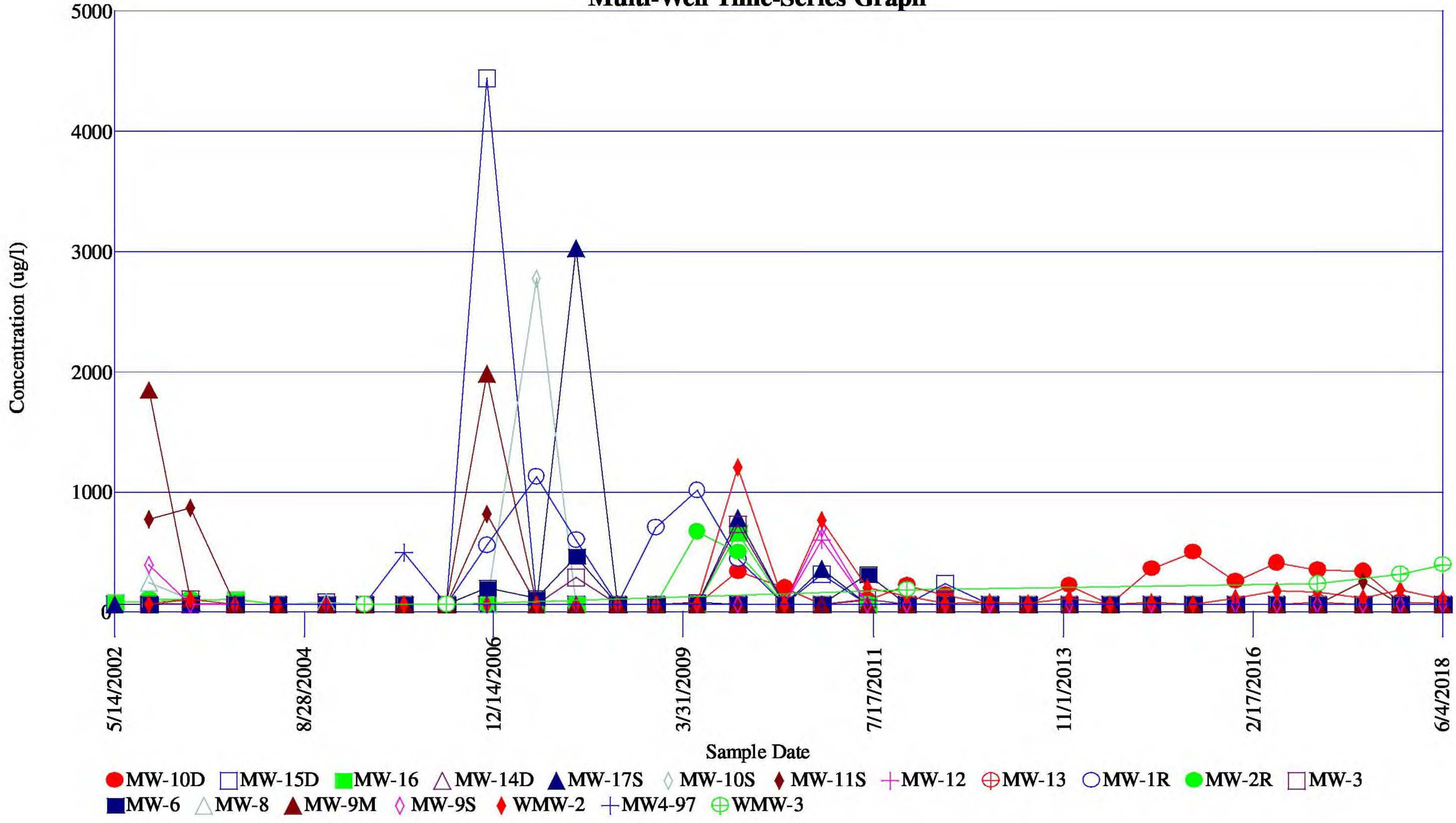
Multi-Well Time-Series Graph



Royalton Road LF

Nitrate,Nitrite

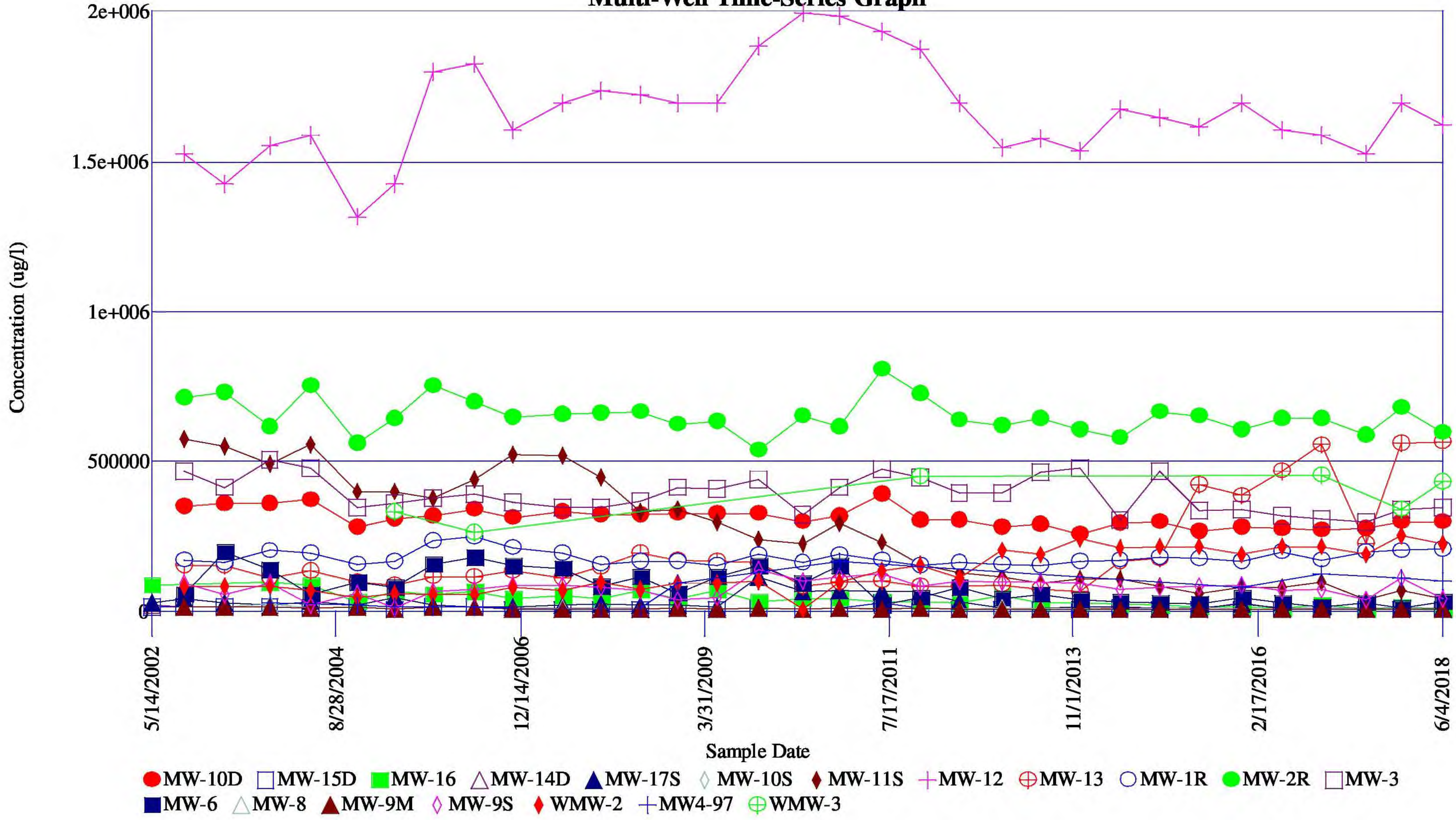
Multi-Well Time-Series Graph



Royalton Road LF

Sulfate

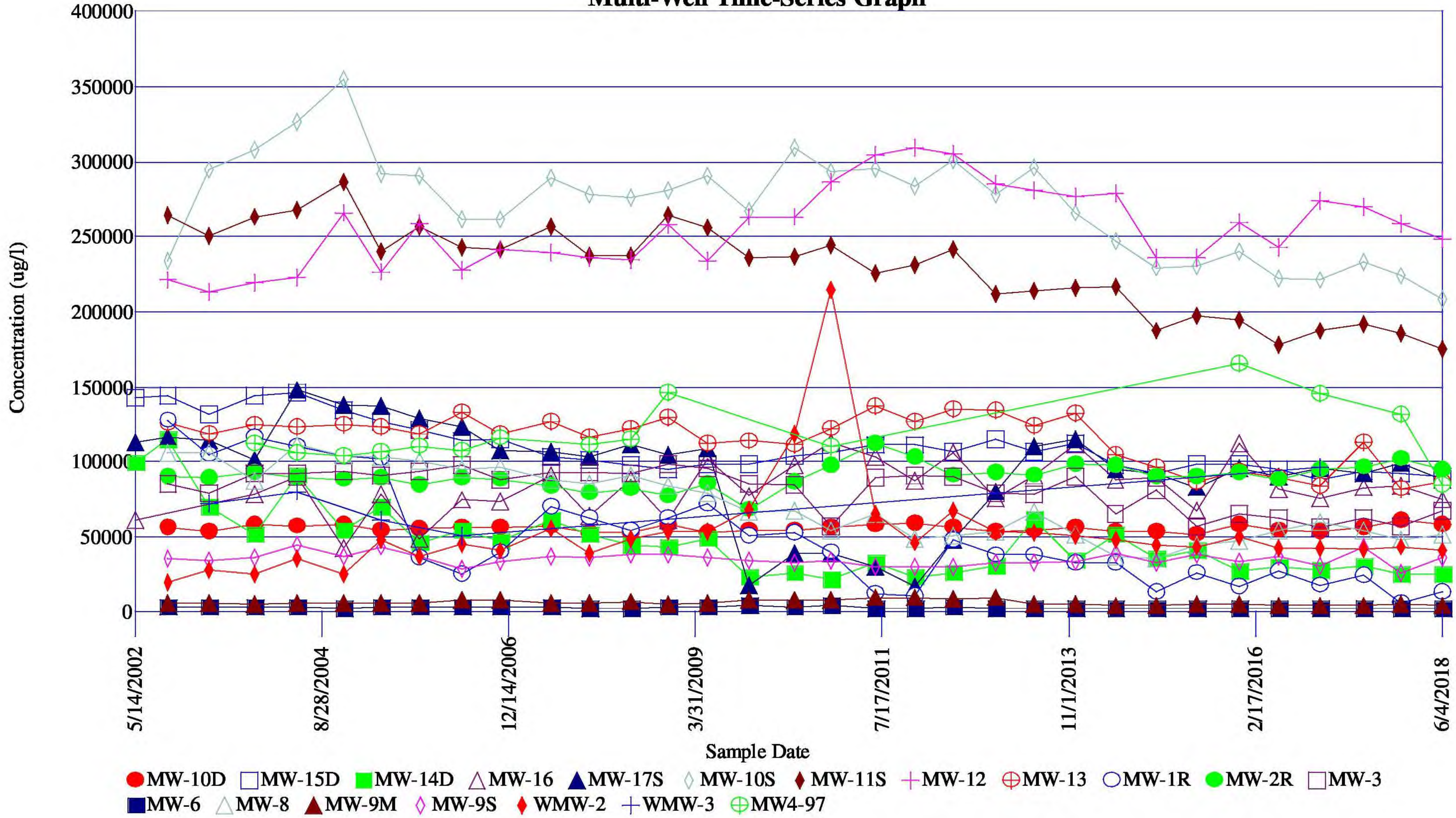
Multi-Well Time-Series Graph



Royalton Road LF

Magnesium, total

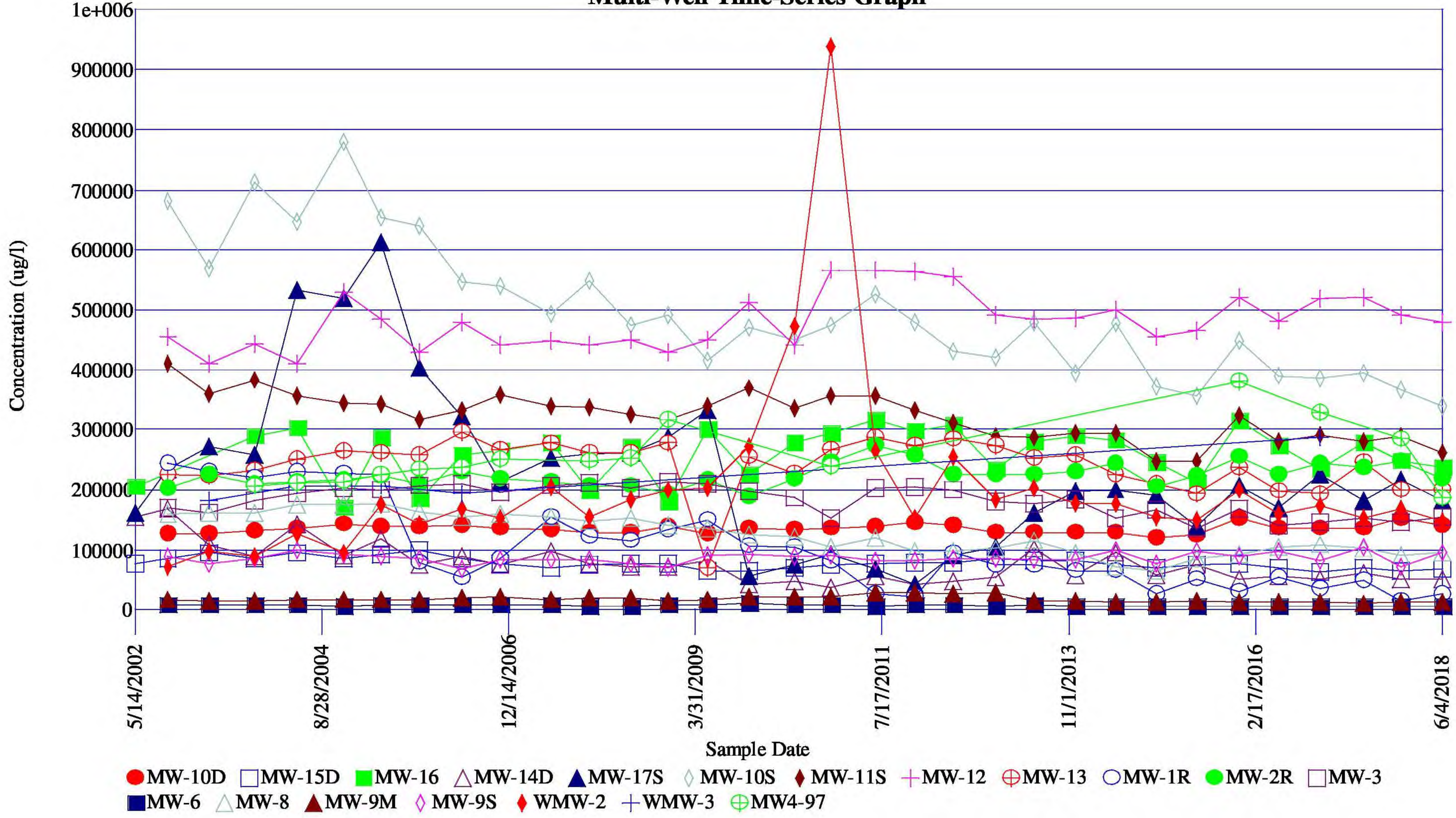
Multi-Well Time-Series Graph



Royalton Road LF

Calcium, total

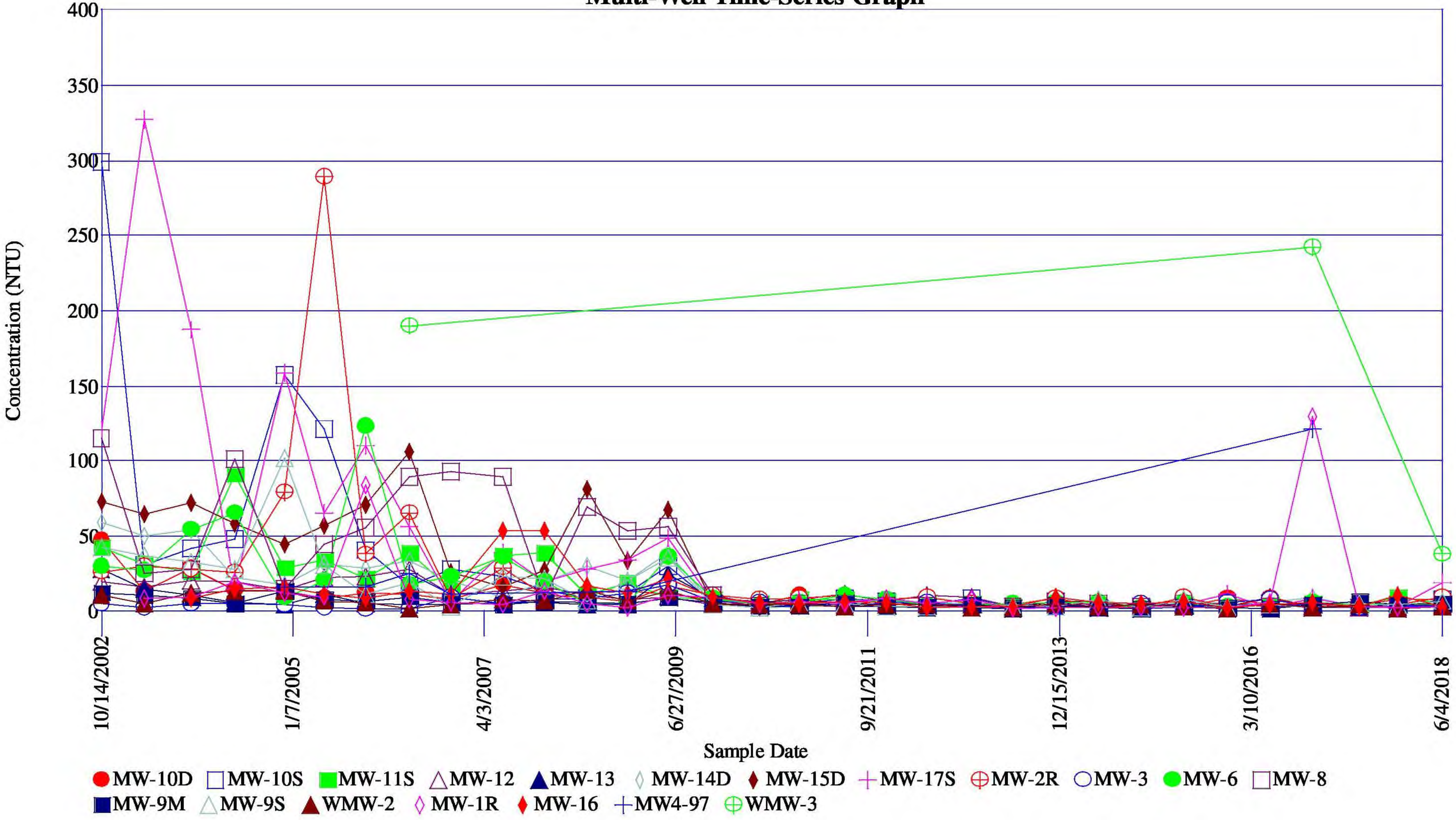
Multi-Well Time-Series Graph



Royalton Road LF

Turbidity, Field

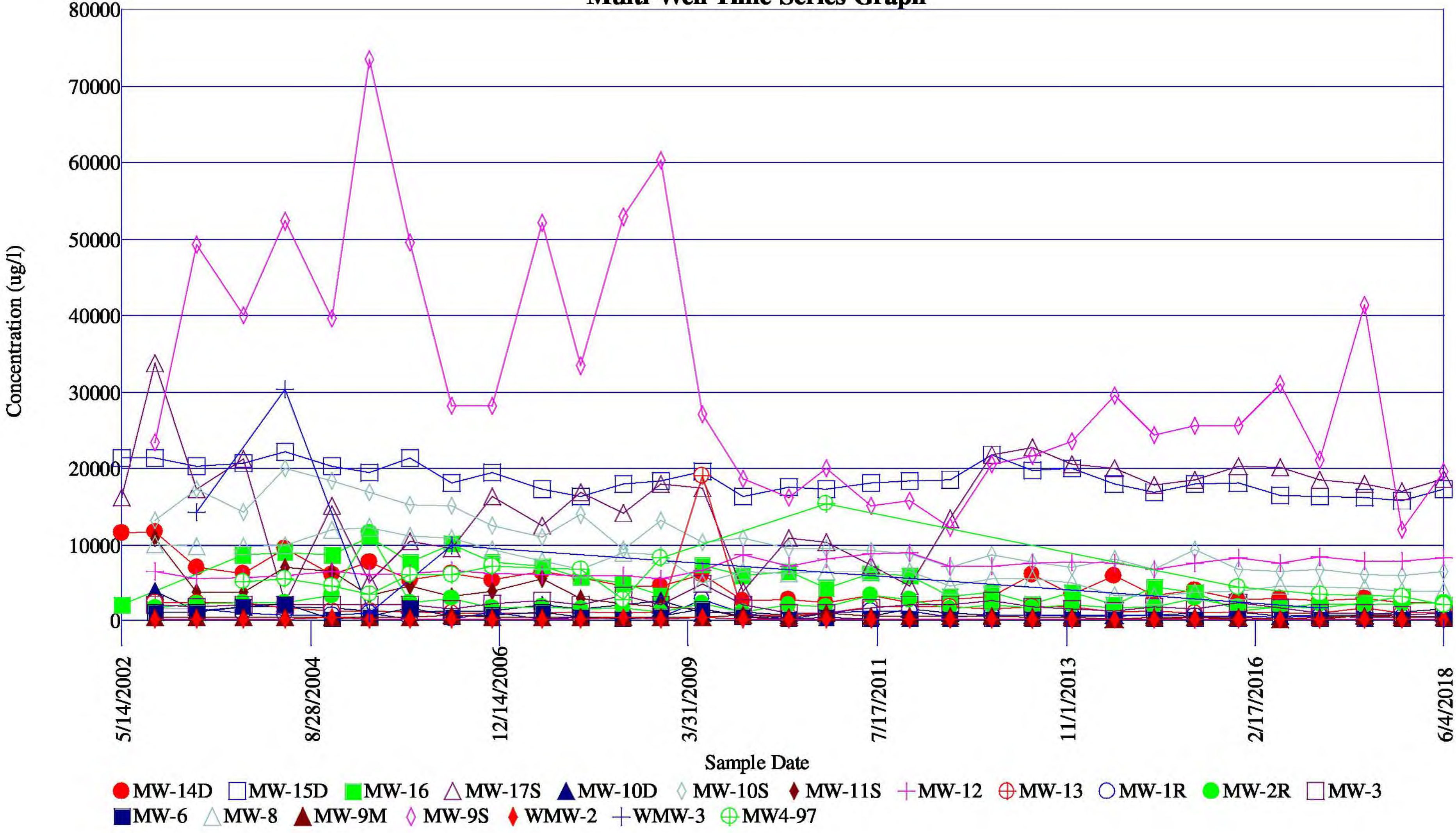
Multi-Well Time-Series Graph



Royalton Road LF

Iron, total

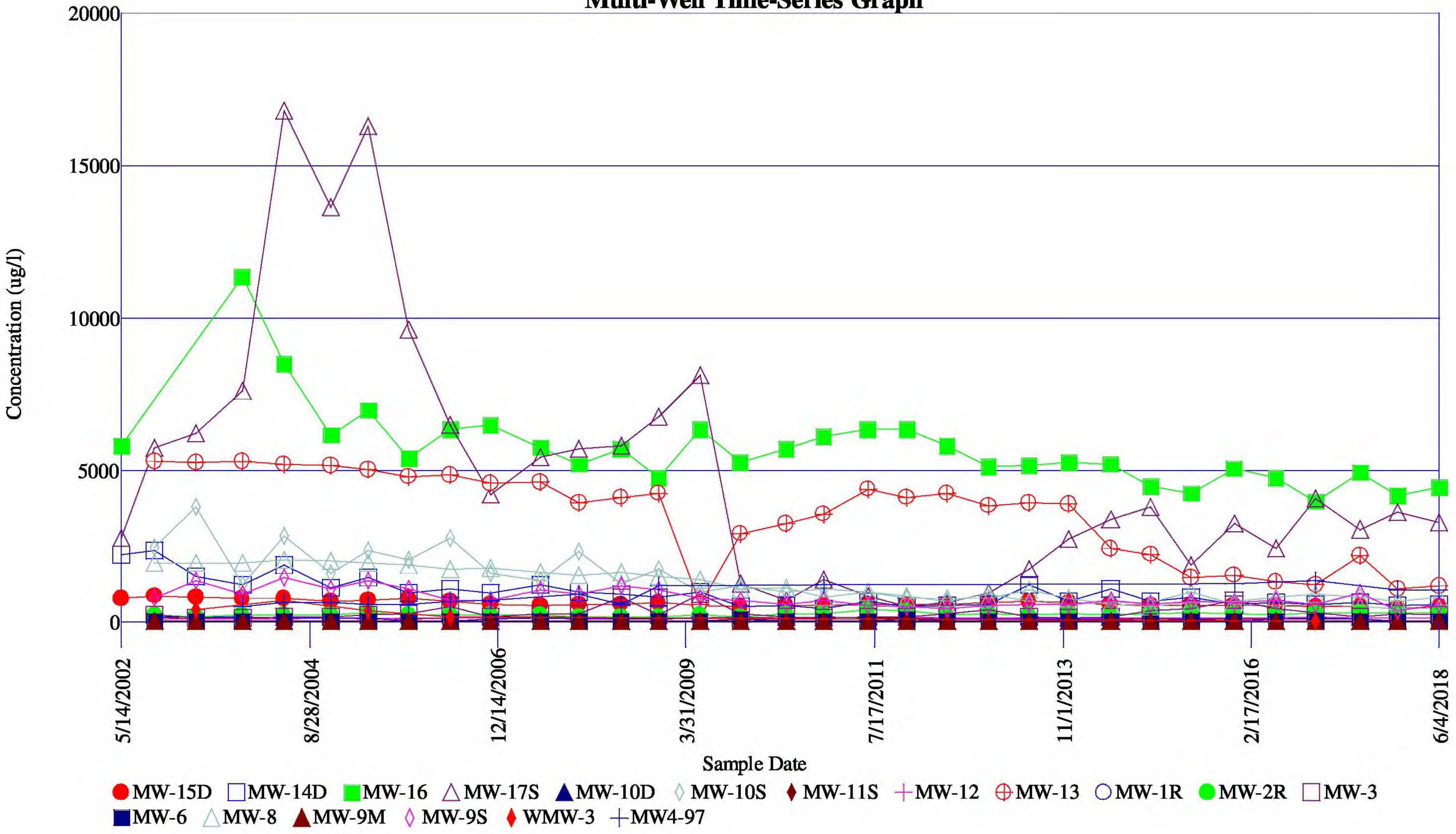
Multi-Well Time-Series Graph



Royalton Road LF

Manganese, total

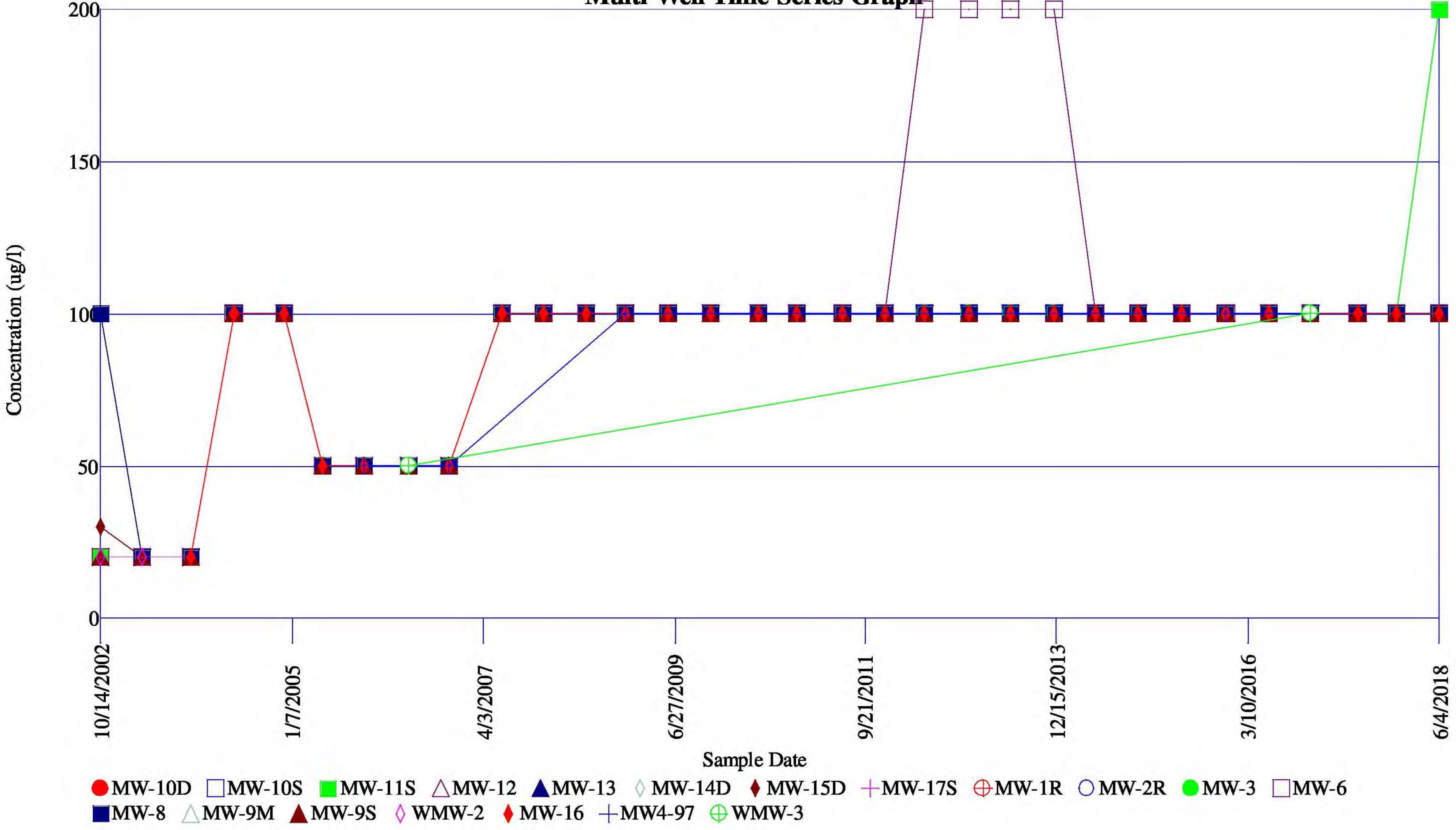
Multi-Well Time-Series Graph



Royalton Road LF

Sulfide

Multi-Well Time-Series Graph

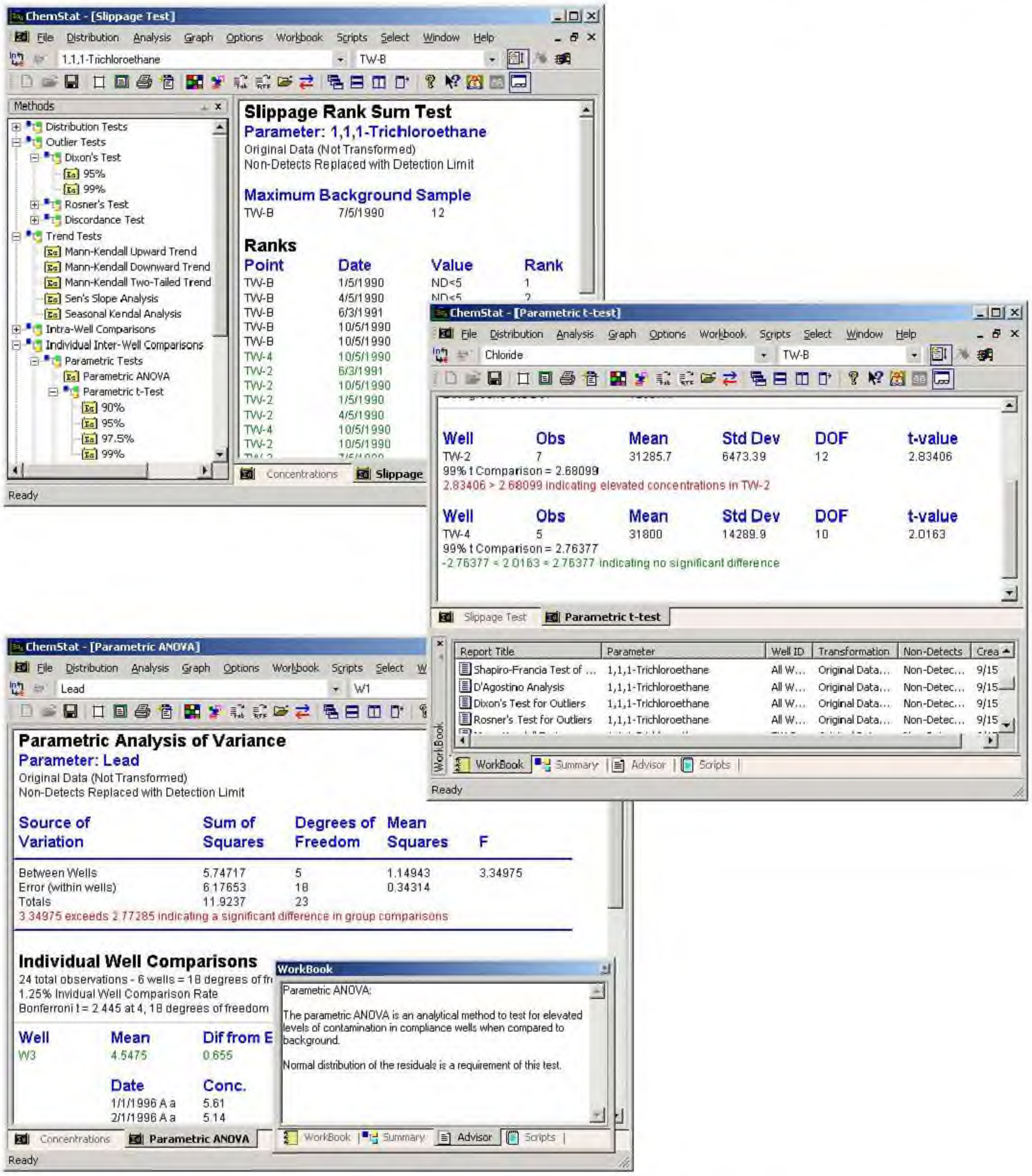


APPENDIX D.

CHEMSTAT STATISTICAL SOFTWARE DOCUMENTATION ON CD

ChemStat®

Environmental Data Statistical Analysis for Windows



```
Slippage Rank Sum Test
Parameter: 1,1,1-Trichloroethane
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Maximum Background Sample
TW-B        7/5/1990      12

Ranks
Point       Date          Value      Rank
TW-B        1/5/1990      ND<5       1
TW-B        4/5/1990      ND<5       2
TW-B        6/3/1991
TW-B        10/5/1990
TW-B        10/5/1990
TW-4        10/5/1990
TW-2        6/3/1991
TW-2        10/5/1990
TW-2        1/5/1990
TW-2        4/5/1990
TW-4        10/5/1990
TW-2        10/5/1990
```

```
Well     Obs     Mean      Std Dev    DOF     t-value
TW-2     7       31285.7   6473.39    12      2.83406
99% t Comparison = 2.68099
2.83406 > 2.68099 indicating elevated concentrations in TW-2

Well     Obs     Mean      Std Dev    DOF     t-value
TW-4     5       31800     14289.9    10      2.0163
99% t Comparison = 2.76377
-2.76377 < 2.0163 < 2.76377 indicating no significant difference
```

Report Title	Parameter	Well ID	Transformation	Non-Detects	Crea
Shapiro-Francia Test of ...	1,1,1-Trichloroethane	All W...	Original Data...	Non-Detec...	9/15
D'Agostino Analysis	1,1,1-Trichloroethane	All W...	Original Data...	Non-Detec...	9/15
Dixon's Test for Outliers	1,1,1-Trichloroethane	All W...	Original Data...	Non-Detec...	9/15
Rosner's Test for Outliers	1,1,1-Trichloroethane	All W...	Original Data...	Non-Detec...	9/15

```
Parametric Analysis of Variance
Parameter: Lead
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Source of                  Sum of      Degrees of   Mean
Variation                  Squares     Freedom      Squares     F
Between Wells              5.74717     5            1.14943     3.34975
Error (within wells)       6.17653     18           0.34314
Totals                     11.9237     23
3.34975 exceeds 2.77285 indicating a significant difference in group comparisons

Individual Well Comparisons
24 total observations - 6 wells = 18 degrees of fr
1.25% Invidual Well Comparison Rate
Bonferroni t = 2.445 at 4, 18 degrees of freedom

Well        Mean        Dif from E
W3          4.5475      0.655

            Date        Conc.
            1/1/1996 A a   5.61
            2/1/1996 A a   5.14
```

Parametric ANOVA:

The parametric ANOVA is an analytical method to test for elevated levels of contamination in compliance wells when compared to background.

Normal distribution of the residuals is a requirement of this test.

Advanced Statistical Analysis of Ground Water, Surface Water, Soil, or Air Quality Monitoring Data

Starpoint Software

Contents

1. Getting Started

1.1 Introduction to ChemStat

ChemStat is an application for the statistical analysis of ground water monitoring data at RCRA facilities. ChemStat is not a data management program. Data are imported from other data management applications such as USEPA's GRITS/STAT, or Starpoint Software's ChemPoint.

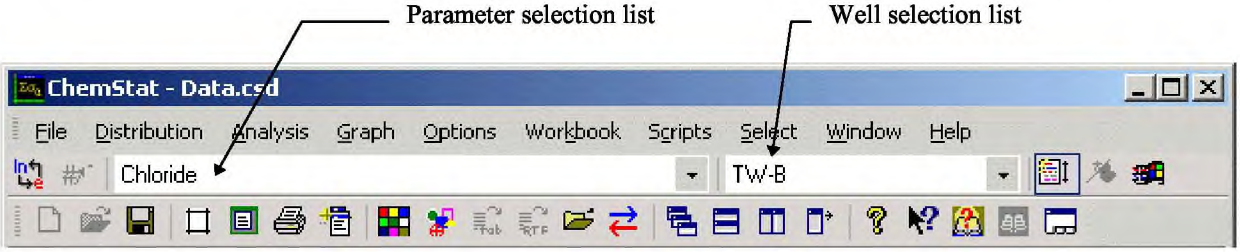
ChemStat imports data in tab-delimited ASCII text files. These can be created using any common spreadsheet application or one of the conversion utilities included with ChemPoint and ChemStat. Starpoint Software can also develop custom converters for proprietary data formats.

ChemStat operates on data for only one facility at a time. Once one project file is opened, the file must be closed before another project can be opened. Statistical methods are selected from either the *Distribution* menu, or the *Analysis* menu. Graphs are selected from the *Graphs* menu.

The *Distribution* menu includes methods to test the data for normal distribution, homogeneity of variance, skewness, trend analysis, or outlier detection. The *Analysis* menu includes statistical methods to determine if a statistically significant increase has occurred in down-gradient wells. The *Graphs* menu includes graphs for the statistical analysis of data, and time-concentration plots to view trends in data over time. The *Options* menu includes selection for program options such as fonts, colors, and customization. The *Select* menu includes functions specific to specific analyses. Context-sensitive right-click menus are available throughout the program. To access a right-click menu, click the right mouse button over the window of the current analysis. Many menu selections on the *Select* menu are available from the appropriate right-click menu. The *Workbook* menu contains commands specific to the Workbook.

Selecting a Parameter

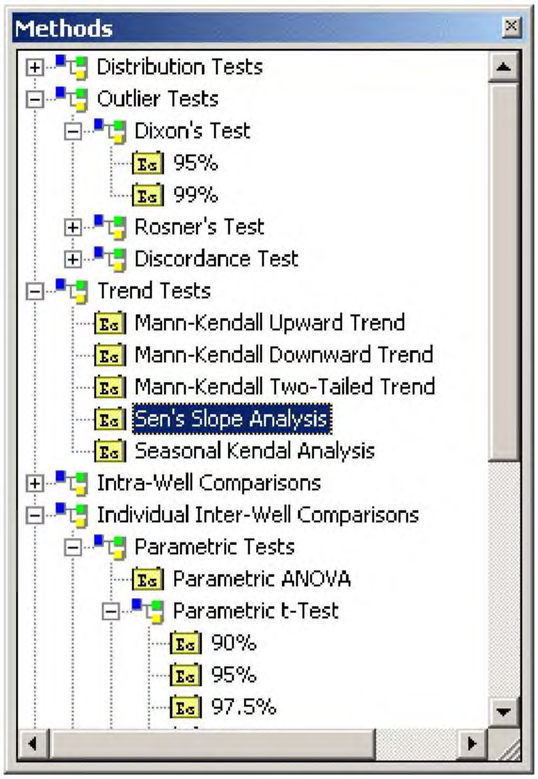
Each statistical method or graph is performed only for a single parameter (except the multi-parameter graph). The parameter is selected from the drop-down list box on the main window button bar.



Selecting a Well

Most statistical comparisons are performed for all compliance (down-gradient) wells. However some methods, such as the Wilcoxon Rank-Sum inter-well comparison method or intra-well comparisons, are performed only for a selected compliance well. For analyses that require a specific well, the well is specified from a drop-down list on the tool bar button.

Selecting an Analysis Method



Select the desired statistical report or graph from the appropriate menu. A new window will open displaying the analysis or graph for the selected parameter or well. Changing the parameter or well selection will update all displayed statistical reports and graphs with the new parameter/well combination.

Selecting From the Method Tree

You can also select statistical analysis methods from the Method Tree, shown right. The tree lists all statistical methods in a hierarchical structure, so you can find methods based on guidance documents, or data set requirements. Double click on a statistical method to perform the test.

Default Values

Some statistical reports or graphs are displayed with default values that you may want to change. For most methods, options to change default values are selected from the right-click menu. For example, graphs have a choice of connection lines; prediction intervals have a choice of recent sampling dates for the comparison; and normality tests have a choice of the well groups to test for normality.

Transforming Data

ChemStat allows for the statistical analysis of the original data, or one of many transformations. Non-detects can be represented by the detection limit, ½ of the detection limit, 1, or 0, or adjusted with Aitchison's or Cohen's methods. Select *Options* | *Transform Data* to change the detection limit. All displayed methods will be updated with the new transformation and non-detect representation.

Saving Data

Although data can only be imported into ChemStat via an ASCII text file, there are advantages to saving your data in ChemStat's binary format. Binary data files load as much as 99% faster than ASCII text files. The binary format can not be access or edited by any other program, so the data are not subject to accidental alteration. Additional information is saved with the binary file including a description of the file. You can enter this description, along with other information from *File* | *Properties*. Binary files all contain all of your Workbook information. Binary ChemStat files have a "csd" file name extension.

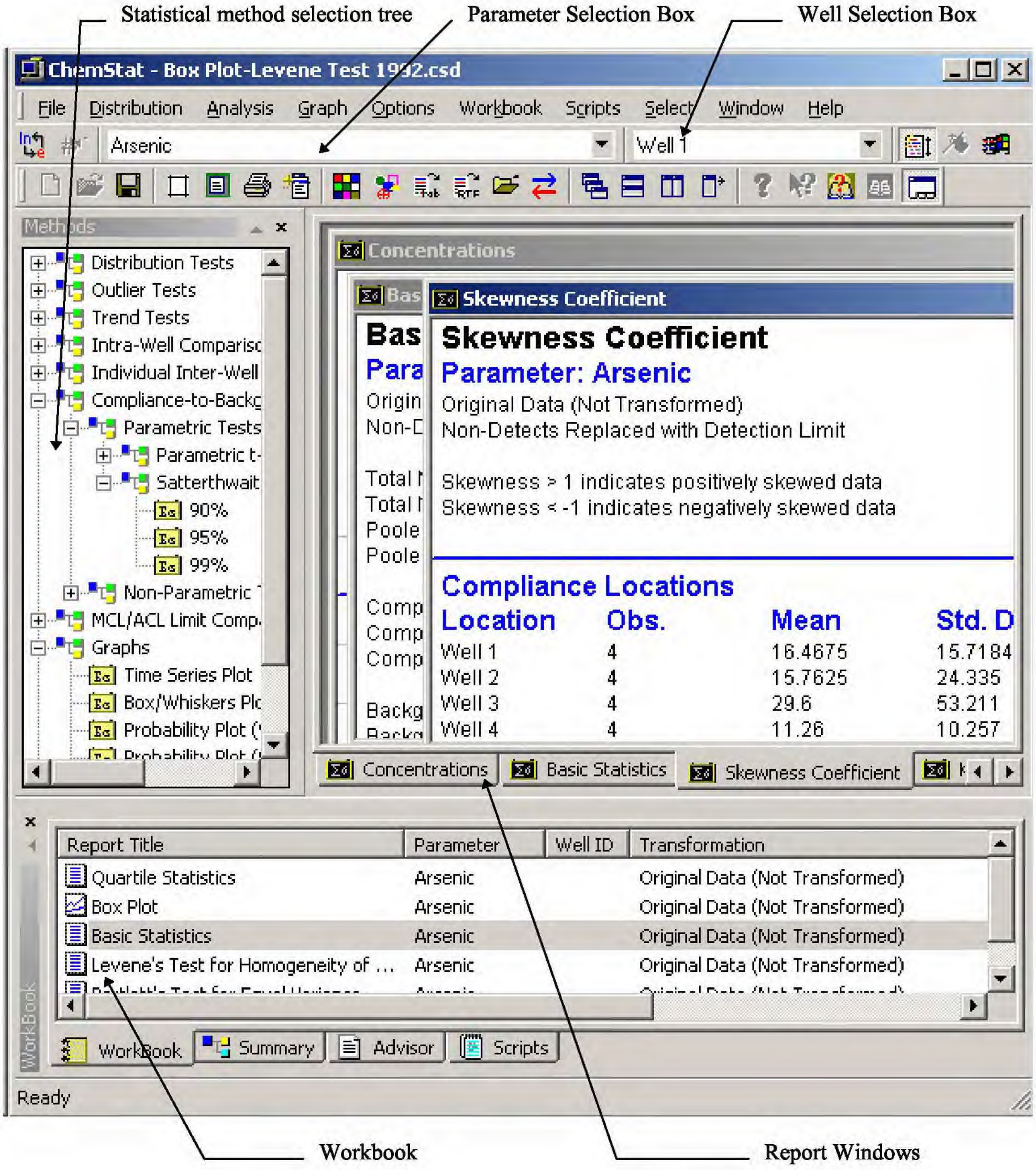
Displaying Statistical Analyses

Results for any statistical method are quickly displayed in a new window. Text results are referred to as reports. Other results appear as graphs. Reports and graphs can both be printed. From *File* | *Header/Footer*, page header and footer options can be selected. Options for headers and footers include the representation of non-detects, and the data transformation.

Reports can also be exported to tab-delimited ASCII text files, or rich-text formatted files. Tab-delimited ASCII text files can be imported into spreadsheet applications. Rich-text format can be imported into most word processors, while preserving the font and color scheme.

Report text that show a statistically significant increase in contamination can be displayed in with different colors than text not showing a statistically significant increase in contamination. From *Options* | *Colors*, set the *transient* color for the color that does not show a statistically significant increase in contamination, and set the *alert* color for the color the does show a statistically significant increase in contamination. By default, transient is green and alert is red. Because results may be printed on a black-and-white printer, the background color for alert text can be specified. By setting the alert background to gray, alert text will appear shaded when printing in black-and-white.

The ChemStat Main Window Interface



Skewness Coefficient

Parameter: Arsenic

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Skewness > 1 indicates positively skewed data
Skewness < -1 indicates negatively skewed data

Compliance Locations

Location	Obs.	Mean	Std. D
Well 1	4	16.4675	15.7184
Well 2	4	15.7625	24.335
Well 3	4	29.6	53.211
Well 4	4	11.26	10.257

Report Title	Parameter	Well ID	Transformation
Quartile Statistics	Arsenic		Original Data (Not Transformed)
Box Plot	Arsenic		Original Data (Not Transformed)
Basic Statistics	Arsenic		Original Data (Not Transformed)
Levene's Test for Homogeneity of ...	Arsenic		Original Data (Not Transformed)

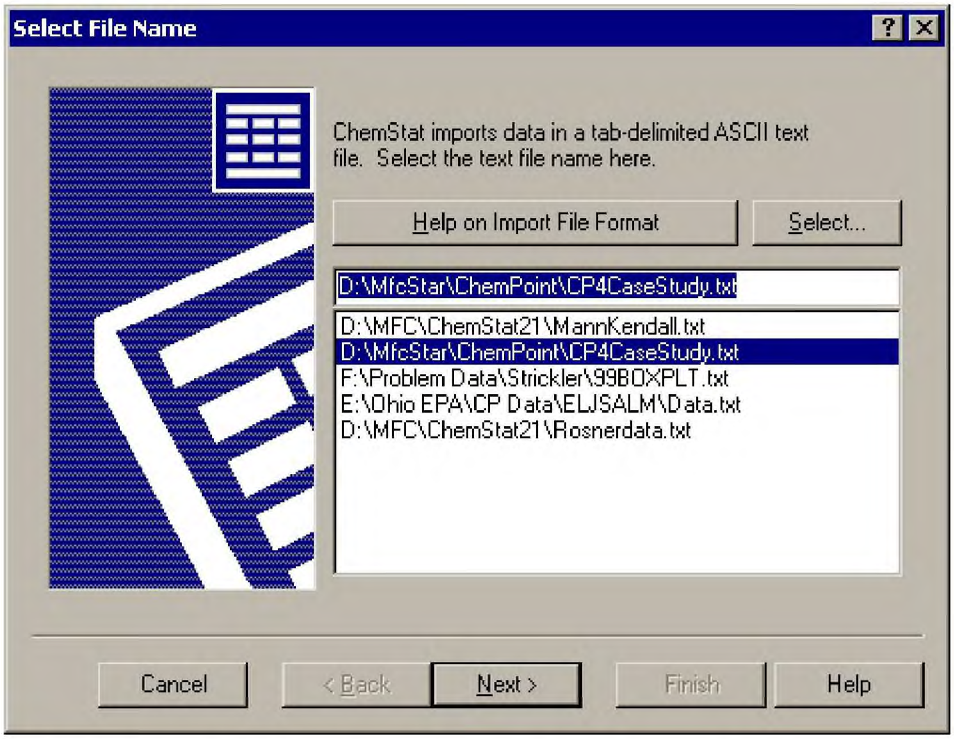
2. Importing Data

2.1 Import Options

ChemStat does not include a database. ChemStat imports data from tab-delimited text files. The text files can be created in one of the following ways:

- Exported from ChemPoint
- Import directly from DUMPStat® or Sanitas® databases.
- Converted from another environmental data management system such as GRITS, Monitor System
- Created manually in a spreadsheet application such as Microsoft Excel (this is for advanced users only).

Select *New Project* | *ChemStat Text File* from the *File* menu to import the text file. ChemStat will display the *Import Wizard* displayed below. The wizard allows you to select a file to import, specify options for importing the data, and preview the file to ensure correct processing.



ChemStat imports data in a tab-delimited ASCII text file. Select the text file name here.

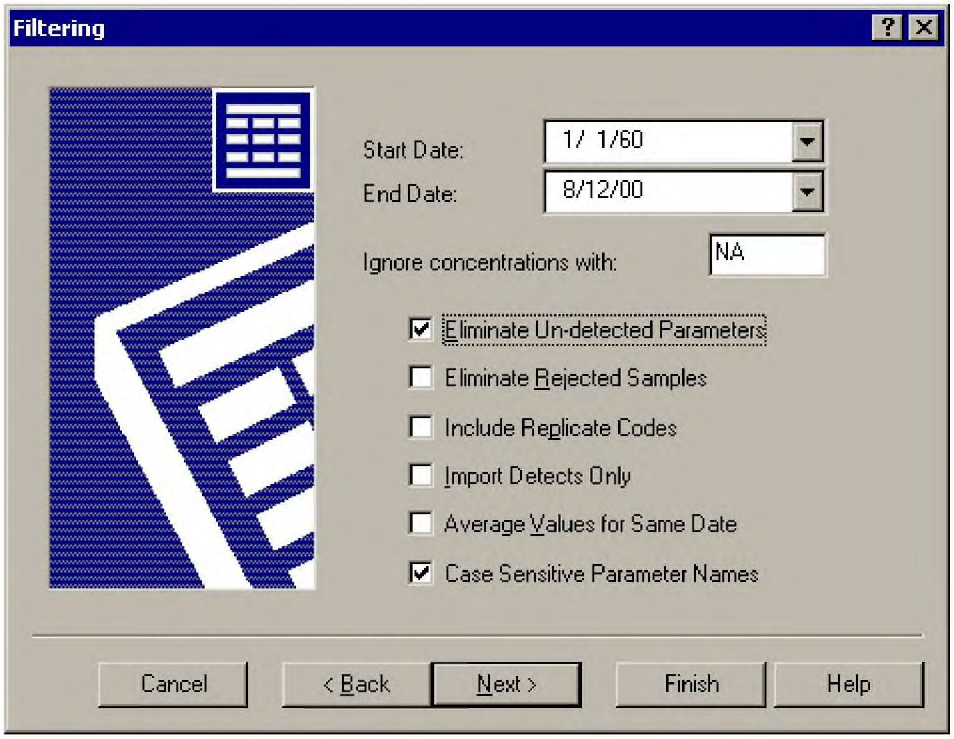
D:\MfcStar\ChemPoint\CP4CaseStudy.txt

D:\MFC\ChemStat21\MannKendall.txt
D:\MfcStar\ChemPoint\CP4CaseStudy.txt
F:\Problem Data\Strickler\99BOXPLT.txt
E:\Ohio EPA\CP Data\ELJSALM\Data.txt
D:\MFC\ChemStat21\Rosnerdata.txt

In the first page of the Import Wizard, specify the name of the text file containing your ChemStat data.

Import Filtering:

Import filtering options control which data are imported.



Start Date: 1/ 1/60

End Date: 8/12/00

Ignore concentrations with: NA

☑ Eliminate Un-detected Parameters

☐ Eliminate Rejected Samples

☐ Include Replicate Codes

☐ Import Detects Only

☐ Average Values for Same Date

☑ Case Sensitive Parameter Names

Start Date – ChemStat will ignore samples collected before this date.

End Date – ChemStat will ignore samples collected after this date. The default value is the current date.

Ignore Concentrations With – Enter a value to indicate that a concentration should be ignored. "NA" would be a typical value.

Eliminate Undetected Parameters – If this box is checked, all parameters with 100% non-detects in compliance, background, and unused wells, will be excluded.

Eliminate Rejected Samples – If this box is checked, all samples with a data qualifier code containing an "R" will be excluded.

Include Replicate Codes – If this box is checked, sample replicate codes will be included with the sample information. In reports, replicates codes will then be displayed adjacent to the sample date. If this box is not checked, replicate codes will be ignored, and reports will display the date without the replicate code. This option affects only the display in reports, and does not affect the statistical analyses or the importing of data.

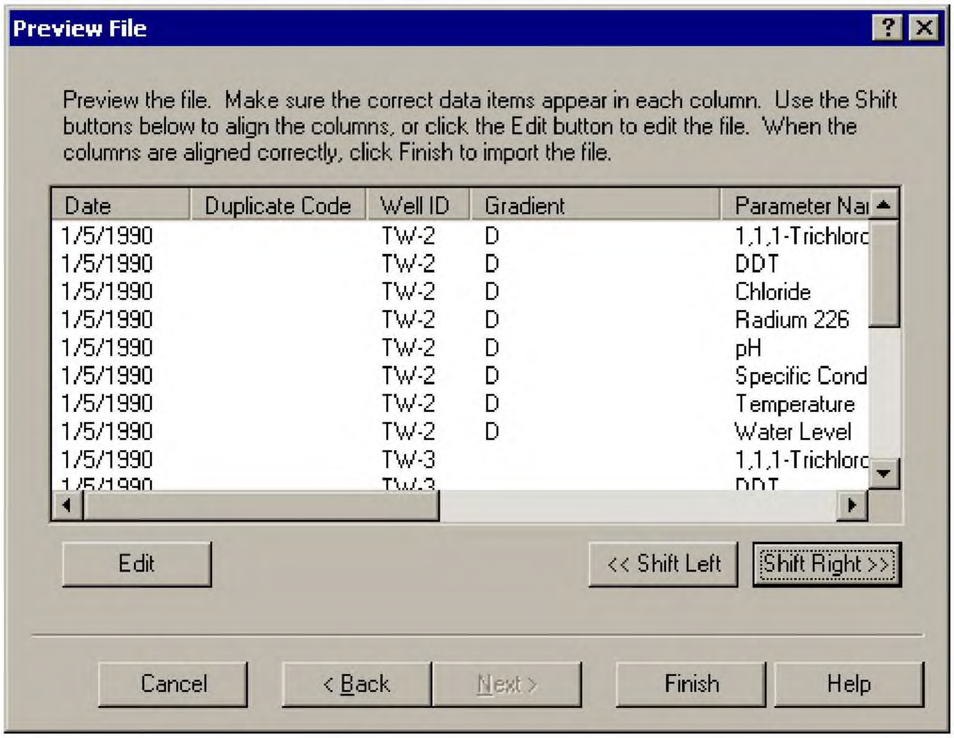
Import Detects Only – If this box is checked, only sample with detectable concentrations will be imported. Samples with concentrations below the detection limit will not be included in any statistical analyses.

Average Values for Same Date – If this box is checked, duplicate and replicate samples (multiple samples for the same date, well, and parameter) will be averaged and will be represented by one sample. Dates with averaged values are represented with a "~" for the duplicate code. If this box is not checked, duplicate and replicate samples will count as individual samples.

Case Sensitive Parameter Names – If this box is checked, parameter names will be case-sensitive. If this box is not checked, case will be ignored on parameter names.

Previewing the File:

The final step before importing data is to make sure that the file is formatted correctly. If you create the text file with one of the converters, you need not worry about correct format. However, if you create the file in Microsoft Excel, the file may be incorrectly formatted. Excel has a tendency to drop empty columns. Make sure that the data displayed is aligned with the appropriate column header. Use the *Shift Left* and *Shift Right* buttons to align the columns appropriately.



Preview the file. Make sure the correct data items appear in each column. Use the Shift buttons below to align the columns, or click the Edit button to edit the file. When the columns are aligned correctly, click Finish to import the file.

Date	Duplicate Code	Well ID	Gradient	Parameter Na
1/5/1990		TW-2	D	1,1,1-Trichlor
1/5/1990		TW-2	D	DDT
1/5/1990		TW-2	D	Chloride
1/5/1990		TW-2	D	Radium 226
1/5/1990		TW-2	D	pH
1/5/1990		TW-2	D	Specific Cond
1/5/1990		TW-2	D	Temperature
1/5/1990		TW-2	D	Water Level
1/5/1990		TW-3		1,1,1-Trichlor
1/5/1990		TW-3		DDT

If the columns can not be properly aligned with the *Shift* buttons, the file is not in the proper format for ChemStat. Use one of the converter programs to format the file.

You can click the *Edit* button to edit the source text file.

Click *Finish* to import the file.

2.2 Import File Format

ChemStat imports data in a flat, tab-delimited, ASCII text file format. The file must contain the columns described below. The first row must contain data (no blank rows or title rows). Any column can be empty, although a tab character is required as a placeholder for any empty column. There is no limit on the length of any text.

Facility ID – This is no longer used.

Date (required) – The date on which the sample was collected. It should be in a valid date format, such as mm/dd/yy. If the date can not be parsed correctly, the analysis will be ignored.

Duplicate Code – This is no longer used.

Well ID (required) – The identifier of the well, such as MW-1. Each individual well must have a unique identifier.

Gradient (optional) – The hydraulic gradient of the well with respect to the waste disposal facility. This must be either a "U" for up-gradient or background wells, or a "D" for down-gradient of compliance wells. If this is neither a "U" or a "D", the well will be categorized as unused. Wells are classified by the gradient value of the first sample for that well.

Do not worry if you do not have these values. Gradients can be specified or changed from within ChemStat.

Parameter (required) – The name of the parameter. The length is unlimited and it may contain numeric values, spaces, and commas. If the parameter name is enclosed in double quotes, as is done in some spreadsheets, the quotes will be removed.

Replicate Code (optional) – This is the code indicating a replicate sample. This is the replicate code provided by GRITS/STAT or ChemPoint. Replicates are indicated with lower case letters "a", "b", ... etc. This value is typically "a" or left blank. A replicate code is not required even if there are multiple samples for the same date. Replicates are not used by ChemStat, but can be displayed. Refer to your database system documentation for information on replicates.

Units – The units for the analysis. If no units are provided, ppb is assumed. All concentrations should be in consistent units for each parameter. The specific unit of measurement is not considered in any statistical methods.

Concentration (required) – The measured concentration of the analyte. For non-detects, this value should be the negative of the detection limit. Throughout the data, units for each parameter should be consistent for all samples.

Comparison Level (optional) – This is the value to which statistical results are compared, such as MCL or ACL. This should be in the same units as the concentration.

Specifying a comparison level in the import file is an older method. A better way to specify comparison levels is within ChemStat from *Options* | *Comparison Levels*.

Data Qualifier – This is the data quality code for the sample. If this value contains an R, and "Eliminate Rejected Parameters" is checked, the sample will be ignored. For any other value, the data qualifier is ignored.

Suite – This is no longer used.

3. Types of Comparisons

3.1 Intra-Well Comparisons

With intra-well comparisons, data from a single well are compared to historical data from the same well. Typically four to twelve samples are required from the well to establish a baseline concentration. For the analysis to be valid, the baseline samples must not be impacted by the facility. Some regulators have recommended that intra-well comparisons be made only for wells that existed prior to waste disposal at the facility.

The advantage of intra-well comparisons is that they eliminate the spatial variability of natural ground water quality. The disadvantage of intra-well comparisons is the large number of historical samples required and known not to be impacted from waste disposal activities. Sufficient samples may not be available at many facilities.

The following methods can be implemented as intra-well comparisons:

- Shewhart-CUSUM Control Charts
- Exponentially Weighted Moving Average (EWMA) Control Charts
- Wilcoxon Rank-Sum non-parametric method
- Parametric Prediction Limits
- Non-Parametric Prediction Limits
- Poisson Prediction Limits
- Mann-Kendall Trend Analysis
- Sen's Slope Estimator
- Spearman's Trend Test

3.2 Inter-Well Comparisons

With inter-well comparisons, data from the compliance well are compared to data pooled from one or more background wells. The background wells are required to be hydrogeologically up-gradient of the facility and should not be impacted by the facility or any other source of contamination.

One advantage of inter-well comparisons is that as few as four background measurements are sufficient for most tests. Unlike intra-well comparisons, inter-well comparisons can evaluate a large number of compliance wells simultaneously. In some statistical methods, all compliance wells can be evaluated with a single test, although the test may not be appropriate for all situations.

The primary disadvantage of inter-well comparisons is that they are susceptible to spatial variability of natural ground water quality conditions, which can be significant. Spatial variability can cause compliance wells to show statistical significance that is not a result of facility activities, or it can mask existing contamination. Additionally, it is not unusual to have contamination in background wells from an adjacent facility, or as a result of fluctuating hydrogeologic gradients.

3.2.1 Compliance Well to Background Statistic

With compliance well to background statistic comparisons, the total set of samples from a compliance well is compared to a statistic calculated from the pooled background wells. The analysis method can indicate if the compliance well is contaminated, but can not discern which specific samples in the wells caused the statistically significant event.

- Parametric Analysis of Variance
- Parametric t-test
- Kruskal-Wallis Non-Parametric Rank Analysis
- Wilcoxon Rank-Sum Non-Parametric Analysis
- Poisson Prediction Limits
- Quantile Test
- Welch's T-Test

3.2.2 Compliance Well Sample to Background Statistic

With compliance well sample to background statistic comparisons, each individual sample from each compliance well is compared to a statistic calculated from the pooled background wells. Such a method can determine which specific samples are statistically elevated with respect to background.

- Parametric Prediction Limits
- Non-Parametric Prediction Limits
- Parametric Tolerance Limits
- Poisson Tolerance Limits
- Non-Parametric Tolerance Limits
- Shewhart-CUSUM Control Chart
- EWMA Control Chart

3.3 Compliance to Background Group Comparisons

With compliance to background group comparisons, all compliance sampling points are compared as a group to all background sampling points. The test determines if compliance points as a group have elevated concentrations when compared to background. These tests are most appropriate for soil samples, as they can not determine which individual sampling points are elevated. These tests include:

- Parametric t-test Group Comparison
- Satterthwaite t-test Group Comparison
- Wilcoxon Rank Sum Test Group Comparison
- Gehan's Test
- Quantile Test
- Slippage Test
- Welch's T-Test

3.4 Compliance Limit Comparisons

With compliance limit comparisons, a statistical value calculated from compliance well data is compared to a specified compliance limit for the parameter, such as an MCL or action limit. For each method, the compliance limit entered specified for the most recent date for the parameter is used.

Methods supporting compliance limit comparisons include:

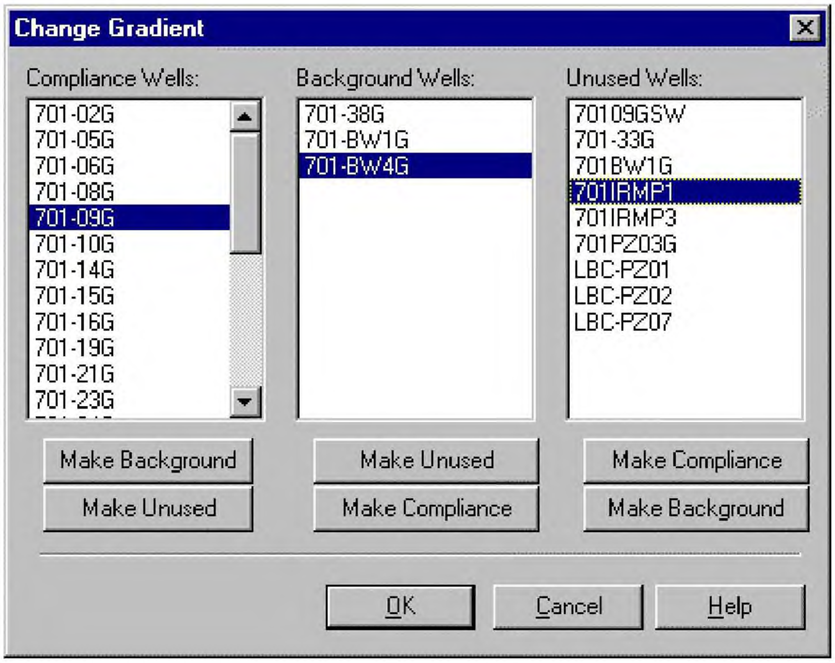
- Confidence Intervals
- Land's Formula Confidence Interval

- Parametric Tolerance Limits
- Poisson Tolerance Limits
- Two Sample Test of Proportions

From *Options | Compliance Limits*, You can specify compliance limits for any parameter.

3.5 Changing Well Gradient

ChemStat classifies all wells in one of three categories; compliance (or down-gradient) wells, background (or up-gradient) wells, and unused wells (not used in the statistical calculations). When importing data, all wells not indicated as compliance or background are grouped with the unused wells. Data from unused wells are totally excluded from statistical calculations. Unused wells are also unavailable in the well selection combo box in the main window. In addition to wells without a gradient specification, field blanks and trip blanks are typically classified as unused.



Compliance Wells:
701-02G
701-05G
701-06G
701-08G
701-09G
701-10G
701-14G
701-15G
701-16G
701-19G
701-21G
701-23G

Background Wells:
701-38G
701-BW1G
701-BW4G

Unused Wells:
70109GSW
701-33G
701BW1G
701IRMP1
701IRMP3
701PZ03G
LBC-PZ01
LBC-PZ02
LBC-PZ07

Using the dialog shown above, wells can be transferred between the compliance, background, and unused lists from *Options | Change Well Gradient*.

4. Analysis Methods

4.1 Data Representation

4.1.1 Concentrations Report

Description:

This is the default initial ChemStat report. This report displays measured concentrations for all data from all locations, and for the selected parameter. This is the only report that displays data for unused locations. The report also displays measurements that have been removed from analysis. These measurements are displayed in the *alert* text color.

Use:

This report displays all data in the current project.

4.1.2 Threshold Report

Description:

The Threshold Report displays all compliance location and background location measurements for the selected parameter that meet a threshold criterion. There are three possible criteria for thresholds

1. Report all values above the detection limit.

2. Report all values above the specified comparison level. This may be the comparison level specified in the source database, or the comparison level specified from *Options* | *Comparison Levels*.

3. A custom comparison level enter from *Select* | *Threshold Options*.

Threshold criteria are specified from *Select* | *Threshold Options*.

4.1.3 Basic Statistics

Description:

The **Basic Statistics** report shows a variety of statistical calculations for the data. Statistics for are displayed for all locations for the selected parameter. These statistical values can be used to simplify statistical calculations beyond the capabilities of ChemStat, or for verification of ChemStat's calculations.

Parameter Specific Values:

Total Measurements – The total number of measurements for the specified parameter.

Total Non-Detects – The total number of non-detects for the specified parameter.

Pooled Mean – The arithmetic mean of all measurements for the specified parameter.

Pooled Std Dev – The standard deviation of all measurements for the specified parameter.

Background Mean – The arithmetic mean of all background measurements for the specified parameter.

Background Std Dev – The standard deviation of all background measurements for the specified parameter.

Well Specific Values:

Samples – The total number of samples for the specified parameter from the specified well.

Non-Detects – The total number of non-detects for the specified parameter from the specified well.

% ND – The percentage of non-detects for the specified parameter from the specified well.

Total – The sum of all measurements for the specified parameter from the specified well.

Mean – The arithmetic mean of all measurements for the specified parameter from the specified well.

Std Dev – The standard deviation for the specified parameter from the specified well.

Dif From Bkg – The difference of the well mean and the background mean.

Std Err – The standard error of the measurements for the specified parameter from the specified well. Standard error is used for individual well comparisons in the parametric ANOVA method.

Rank Sum – The sum of the ranks for the specified parameter from the specified well. This value is used for the Kruskal-Wallis non-parametric analysis.

Rank Mean -- The arithmetic mean of the ranks for the specified parameter from the specified well. This value is used for the Kruskal-Wallis non-parametric analysis.

4.1.4 Quartiles

Description:

The quartiles reports displays maximum and minimum values, and 25th, 50th, and 75th percentiles for data for each well. Statistics for the report are displayed for all wells for the selected parameter. These statistical values can be used to simplify statistical calculations beyond the capabilities of ChemStat or for verification of ChemStat's calculations.

The Box Plot graph is a graphical display of the values in this report. The algorithm used for the Quartile report is the same as that used for the display of the Box Plot.

Remarks:

The xth percentile of a distribution is the value below which x percent of the measurements lie. In many cases, the percentiles for a box plot do not produce an integer number. For example, in a distribution with 7 measurements, the 3.5th sample is the 50th percentile. The 1989 guidance recommends averaging the upper and lower values, in the case average the 3rd and 4th values in the distribution to get the 50th percentile.

However ChemStat implements a weighted average between measurements. In testing, calculated values differed slightly than those reported in the 1992 guidance, but matched exactly with the values obtained with Microsoft Excel™. The difference between the two methods is typically so small, that it should not have any noticeable effect on the box plot.

4.2 Graphs

4.2.1 Box/Whiskers-Plot

Description:

This graph is a box-whiskers plot for the parameter indicated in the selection bar. The graph is displayed for all sampling locations.

Use:

Box plots are a graphical method used to determine if sample distributions have equal variance. Levene's test and Bartlett's test are analytical methods that also test equality of variance.

Implementation:

The box-whiskers plot is a method of visualizing the distribution of sample concentrations. The top-most and bottom-most points on the plot (the whiskers) indicate the maximum and minimum concentrations respectively. The "box" portion is made up of the 25th, 50th, and 75th percentiles of the concentration distribution.

Remarks:

The xth percentile of a distribution is the value below which x percent of the measurements lie. In many cases, the percentiles for a box plot do not produce an integer number. For example, in a distribution with 7 measurements, the 3.5th sample is the 50th percentile. The 1989 guidance recommends averaging the upper and lower values, in the case average the 3rd and 4th values in the distribution to get the 50th percentile.

ChemStat implements a weighted average between measurements. In testing, calculated values differed slightly than those reported in the 1992 guidance, but matched exactly with the values obtained with Microsoft Excel™. The difference between the two methods is typically so small, that it should not have any noticeable effect on the box plot.

4.2.2 Time Series Graph

Description:

This graph displays a plot of the concentration of one parameter for a single well over time. The concentration is plotted along the vertical axis and the sample date is plotted along the horizontal axis. The date axis is scaled such that the space between tick marks is proportional to the time between sampling events.

Use:

Use this graph to view changes in concentration over time for a parameter at a given well. The graph is suitable for any available data transformation.

Options:

A variety of options are available for the Time-Series graph. The fonts can be selected from the *Options* menu. Graph symbols can be selected from *Options* | *Symbols*. Separate symbols are available for values above the detection limit, values below the detection limit, and the comparison level. Relative size of the graph symbol can also be specified.

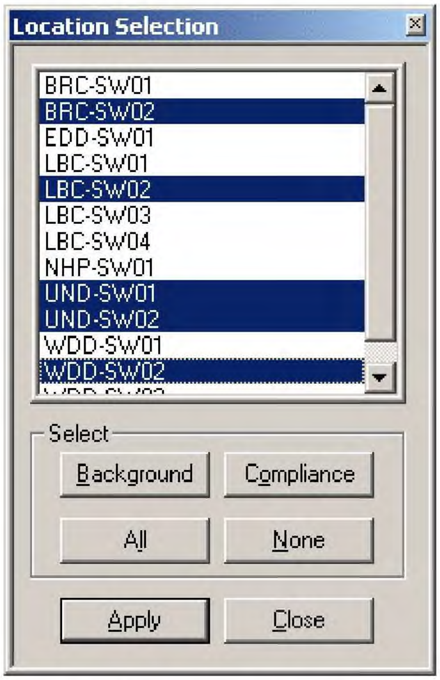
The style of line connecting the points can be selected from the right-mouse-click menu. Note that use of lines connecting sampling points may result in an irregular appearance if there are multiple measurements for a single date.

4.2.3 Time Series Graph for Multiple Wells

Description:

This graph displays a plot of the concentration of one parameter for any combination of wells over time. The concentration is plotted along the vertical axis and the sample date is plotted along the horizontal axis. The date axis is scaled such that the space between tick marks is proportional to the time between sampling events. Unlike the single well time-concentration plot, the multiple well time-concentration plot does not use separate symbols for detects and non-detects, and comparison level is not plotted.

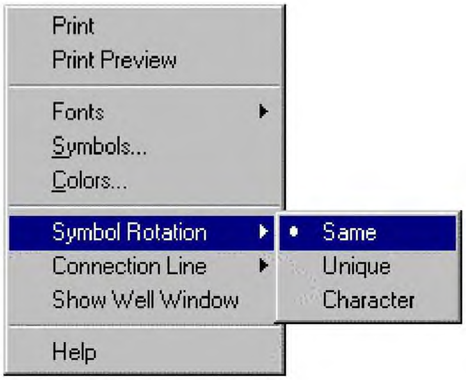
To select a well, use the *Well Selection* window show right. Press the *Background* button to select background wells only. Press the *Compliance* button to select compliance wells only. Click on individual well labels to select or de-select each individual well. If the *Well Selection* window is closed, it can be re-displayed by selecting *Show Well Window* from the right-click menu (shown below).



Use:

Use this graph to compare changes in concentration over time for a parameter between multiple wells. The graph is suitable for any available data transformation.

Options:



There are three options for symbols available from the right click menu shown right. The *Symbol Rotation* sub-menu controls which symbols are used to plot points. Each well is plotted in one of eight colors. If there are more than eight wells, the color rotation starts again at the first color. The following symbol options are available.

Same -- The same symbol will be used until the eight available colors have been used. Then the next symbol in the sequence will be used. The initial symbol is the symbol selected for detect values from *Options | Graph Symbols*. Seven different symbols are available.

Unique -- Each well is plotted with a different symbol. Seven symbols are available. The initial symbol is the symbol selected for detect values from *Options | Graph Symbols*.

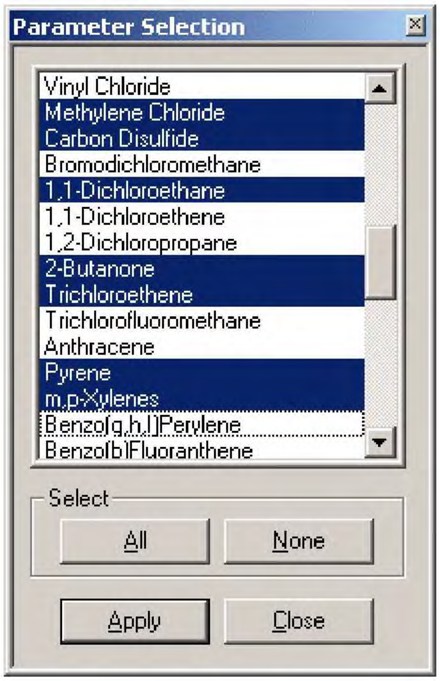
Character -- Each well is plotted with alphabetical character values starting with "A".

Background/Compliance – Background and compliance wells are displayed with unique symbols.

The style of line connecting the points can be selected from the right-mouse-click menu. Note that use of lines connecting sampling points may result in an irregular appearance if there are multiple measurements for a single date.

4.2.4 Time Series Graph for Multiple Parameters

Description:



This graph displays a plot of the Concentration vs. Time plot of any combination of parameters for one well. The concentration is plotted along the vertical axis and the sample date is plotted along the horizontal axis. The date axis is scaled such that the space between tick marks is proportional to the time between sampling events. Unlike the single well time-concentration plot, the multiple parameter time-concentration plot does not use separate symbols for detects and non-detects, and comparison level is not plotted.

To select a parameter, use the *Parameter Selection* window show right. If the *Parameter Selection* window is closed, it can be re-displayed by selecting *Show Parameter Window* from the right-click menu.

Use:

Use this graph to compare changes in concentration over time for a parameter between multiple wells. The graph is suitable for any available data transformation.

Options:

This graphs has the same options as the *Multiple Well Concentration vs. Time* graph.

4.2.5 Shewhart CUSUM Control Chart

Description:

Control charts are a graphical method to assess contamination levels for individual wells. The 1989 guidance recommends Shewhart-CUSUM control charts for intra-well comparisons. ChemStat also provides an inter-well comparison implementation of the Shewhart-CUSUM control chart.

Four values, a decision internal value (h), a reference value (k), the Shewhart Control Limit (SCL), and the fast initial response (FIR) multiplier, are entered by the user.

For intra-well comparisons, the number of baseline measurements used to establish mean and standard deviation of the constituent level must also be specified. For the measurements collected beyond the time of the baseline sample, the standardized mean (Z) and the cumulative sum (S) are plotted for each sampling date. If S > h or Z > SCL, possible contamination is indicated at the well.

For intra-well comparisons, ChemStat can plot baseline concentrations as they are calculated from the baseline mean and standard deviation.

Use:

As a graphical method for intra-well or inter-well comparisons.

Options:

Select *S-C Control Chart Options* from the *Options* menu or from the right-mouse-button context menu to enter estimates of h, k, SCL, and FIR. Also entered from this option is the number of baseline measurements. If a positive number of baseline measurements is entered, the baseline measurements are counted from the first sampling date. If a negative number is entered, the number of baseline measurements is equal to the total number of measurements for the well minus the absolute value of the number entered. Baseline measurements are not graphed, but are used only to establish baseline mean and standard deviation.

Total Measurements	Indicated Baseline Measurements	Baseline Measurements	Measurements Graphed
15	4	4	11
15	-4	11	4

The line style connecting points for the Z line and the S line can also be specified from *S-C Control Chart Options*.

There is also an option to circle data points which exceed either the k or SCL lines. Circling exceedences can make the graph easier to interpret by those unfamiliar with Shewhart-CUSUM control charts. From *Select | Control Chart Options*, check the *Circle Exceedances* check box.

Implementation:

1. From *Options* | *Control Chart Options*, select values of h, k, and SCL. The 1989 guidance recommends h = 5, k = 1, and SCL = 4.5. Also specify the number of baseline measurements.

2. Calculate the mean μ and standard deviation σ of the baseline measurements.

3. For i time periods beyond the baseline measurements, calculate the average of n measurements collected for each ith time period. If only one sample was collected for a time period, n will of course be 1.

4. Calculate the standardized mean Z_i of the i time periods.

$$Z_i = \left(\overline{X}_i - \mu\right)\sqrt{n_i}\Big/\sigma$$

where:

Z_i = the standardized mean for the ith time period

$\overline{X}_i$ = the mean of the n measurements of the ith time period

μ = the baseline sample mean

n_i = the number of measurements for the ith time period

σ = the baseline sample standard deviation

5. For each ith time period, compute the cumulative sum S_i as:

$$S_i = \max\left[0, \left(Z_i - k\right) + S_{i-1}\right]$$

where:

S_i = the cumulative sum of the ith time period.

k = the reference value selected in step 1.

S_0 = (FIR)σ where σ is the baseline standard deviation and FIR is the fast initial response multiplier entered from *Options* | *S-C Control Chart Options*. A fast initial response (FIR) condition exists when $S_0 \neq 0$. If fast initial response is to be used, FIR equal to h/2 is generally recommended.

Use of FIR is not discussed by USEPA and may increase the probability of false positives, so it should be used with caution.

6. Plot S and Z on a graph versus time. If S > h or Z > SCL, the well shows evidence of contamination.

Remarks:

Shewhart-CUSUM control charts may be very susceptible to false positives and are not robust with respect to outlier values. However, the graph is useful in providing a visual indication of changing trends in parameter concentrations.

Note that in specifying the number of baseline measurements, it is the actual number of measurements that is counted and not the number of sampling dates. However the graph plots a single point for each sampling date, regardless of the number of measurements collected on that date.

4.2.6 Exponentially Weighted Moving Average Control Chart

Description:

The exponentially weighted moving average (EWMA) control chart is an alternative to the Shewhart-CUSUM control chart. It was first introduced in the 1950's for use in statistical quality control applications. This implementation is based on information provided by Montgomery (1996).

With the EWMA control chart, the comparison value Z_i consists of a weighted average of the current datum and each previous datum. The weight for each data point decreases geometrically as i increases. Therefore, as monitoring continues, older values are given less weight than more recent values. By incorporating historical data into the calculations of the comparison value Z, the EWMA control chart may be less susceptible to false exceedances by outlier concentrations than the Shewhart-CUSUM control chart. The value λ controls the distribution of weights for datum.

Use:

The EWMA provides a graphical method that is not sensitive to normality requirements, and therefore can be used with non-normal data distributions, or moderate percentages of non-detects. As implemented in ChemStat, the EWMA Control Chart may be used for either intra-well or inter-well comparisons.

Options:

Select *MA Control Chart Options* from the *Options* menu or from the right-mouse-button context menu to enter values of L, λ (lambda), and group size(n). Also entered from this option is the number of baseline samples. If a positive number of baseline samples is entered, the baseline samples are counted from the first sampling date. If a negative number is entered, the number of baseline samples is equal to the total number of samples for the well minus the absolute value of the number entered. Baseline samples are not graphed, but are used only to establish baseline mean and standard deviation.

There is also an option to circle points that exceed the control limits. This can make the chart easier to interpret by persons unfamiliar with control charts.

Implementation:

1. The exponentially weighted moving average is defined as:

$$z_i = \lambda x_i + (1 - \lambda) z_{i-1}$$

where:

0 < λ ≤ 1 is a constant, typically between 0.05 and 0.25 for quality control use. Higher values will reduce the ability to detect increases. Lower values of λ increase the weights of historical values. This may decrease susceptibility to anomalously elevated concentrations.

X_i is the parameter concentration for the i^{th} date, or the mean of i^{th} group if group size is > 1

Z_i = the average of the n concentrations for the i^{th} date, of the group

Z_0 is the goal value. In ChemStat, this value is the mean of background concentrations (for inter-well comparisons), or the mean of the baseline concentrations for intra-well comparisons.

2. Calculate the control limits (UCL). For ground water monitoring, only the upper control limit is used.

$$\mathrm{UCL} = \mu_0 + L\sigma \sqrt{\frac{\lambda}{(2-\lambda)}\left[1 - (1-\lambda)^{2i}\right]}$$

The value L is the multiple of the standard deviation for the control limit. A value of 3 is common in quality control situations.

3. Plot the values of UCL and Z_i over time. If Z_i exceeds UCL, then an out of control situation has occurred.

Remarks:

If the group size (n) is 1, each individual concentration is compared to the control limit. A larger group size will average consecutive concentrations for the comparison, and help to control for outlier concentrations.

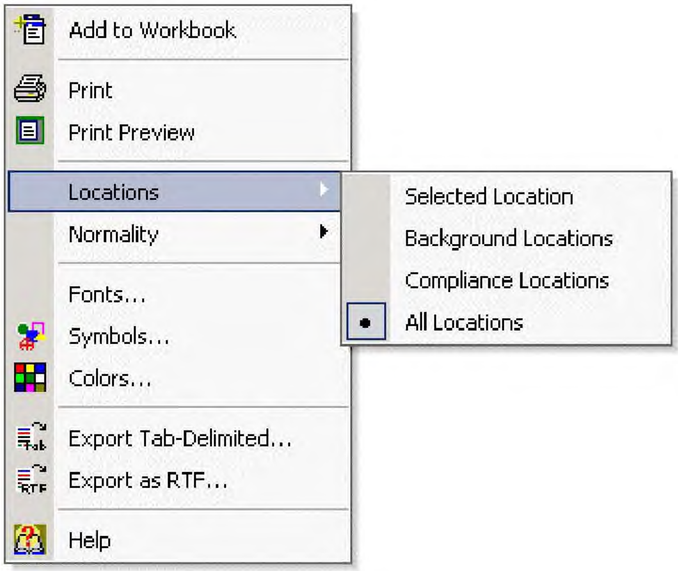
Like the Shewhart-CUSUM control chart, the EWMA control chart reacts quickly to small changes, but is not as sensitive to large changes as the Shewhart chart.

4.2.7 Probability Plot

Description:

This graph displays a plot of the concentration on the horizontal axis and normal quartiles on the vertical axis. If the data points lie in a straight line, the data are normally distributed. Wells to be graphed are selected from the right-click menu (shown right). The graph can be plotted for all wells, compliance wells, background wells, or the selected well.

The Probability Plot can also be used to test for normality of the residuals. From the normality sub-menu on the right-click menu, select *Residuals* to test the residuals. Select *Data* to test the actual parameter concentrations for normality.



Use:

The Probability Plot is a graphical method to test for normality of the data or the residuals. The graph is suitable for any available data transformation.

Implementation:

1. Order the data from lowest to highest.

2. For each ith value, calculate the normal quartile of the n total samples with the formula:

$$y_i = \Phi^{-1}\left(\frac{i}{n+1}\right)$$

where:

Φ^{-1} = the inverse of the standard normal distribution with zero mean and unit variance.

3. Plot the points with y_i on the vertical axis, and the ith concentration on the horizontal axis. Normally distributed data will lie along a straight line.

Calculating the Correlation Coefficient:

The Probability Plot Correlation Coefficient is present on page 13 of the USEPA 1992 Guidance Document as a way to numerically indicate the normality of the data distribution. The number is a measurement of the linearity of the plot.

1. Order the data from lowest to highest.

2. Calculate the correlation coefficient (r) with the following formula:

$$r = \frac{\sum_{i=1}^{n} X_i M_i - n\overline{X}\overline{M}}{C_n \cdot \sigma\sqrt{n-1}}$$

where:

$\overline{X}$ is the mean of all values of X_i, the ordered concentrations with standard deviation σ

$\overline{M}$ is the mean of all values of M_i

and

$$M_i = \Phi^{-1}(m_i)$$

$$m_i = \begin{cases} 1-(0.5)^{1/n} & \text{for } i = 1 \\ (i-0.3175)/(n+0.365) & \text{for } 1 < i < n \\ (0.5)^{1/n} & \text{for } i = n \end{cases}$$

$$C_n = \sqrt{\left(\sum_{i}^{n} M_i^2\right) - n\left(\overline{M}\right)^2}$$

Remarks:

The computer implementation has a maximum sample size of 2000 samples.

4.3 Parametric Methods

4.3.1 Parametric ANOVA

Description:

The one-way parametric Analysis of Variance (Parametric ANOVA) is useful for compliance to background (inter-well) comparisons.

The 1989 guidance recommends that for p wells (where p >= 2), there be at least 3 observations for each well and that the total sample size N is large enough that N-p >= 5. With fewer samples, the ability to detect contamination will be reduced.

The 1992 guidance recommends that there be fewer than 15% non-detects for the parametric ANOVA.

ChemStat performs the parametric ANOVA on all background and compliance well data for a parameter. Individual comparisons for each well are then performed.

Use:

For inter-well comparisons.

Implementation:

1. For each well, calculate the totals and means of all samples from the individual well.

2. For the i^{th} well and the j^{th} sample from the i^{th} well (including background wells), compute well totals and means as follows:

$x_i = \sum_{j=1}^{n_i} x_{ij}$: the total of all n_i observations at well i

$\bar{x}_i = \frac{1}{n_i} x_i$: average of all n_i observations at well i

$X = \sum_{i=1}^{p} \sum_{j=1}^{n_i} x_{ij}$: grand total of all observations for all wells

$\bar{X} = \frac{1}{N} X$: grand mean of all N observations

where:
N = the total number of samples from all wells
x_{ij} = the j^th^ sample result from the i^th^ well
p = the total number of wells

3. Compute the sum of squares of difference between well means and the grand mean:

$$SS_{wells} = \left(\sum_{i=1}^{p} \frac{1}{n_i} x_i^2 \right) - \frac{1}{N} X^2$$

with (p-1) degrees of freedom.

4. Compute the corrected total sum of squares

$$SS_{total} = \left(\sum_{i=1}^{p} \sum_{j=1}^{n_i} x_{ij}^2 \right) - \frac{X^2}{N}$$

with (N-1) degrees of freedom.

5. Compute the sum of squares of differences of observations within wells from the well means (sum of squares due to error).

$$SS_{error} = SS_{total} - SS_{wells}$$

with (N-p) degrees of freedom.

6. Calculate mean square quantities

$$MS_{wells} = SS_{wells} / (p - 1)$$

$$MS_{error} = SS_{error} / (N - p)$$

7. Set up the ANOVA table

Source of Variation	**Sums of Squares**	**Degrees of Freedom**	**Mean Squares**	**F**
Between Wells	Ss_{wells}	p-1	MS_{wells}	F = MS_{wells}/MS_{error}
Error (within wells)	SS_{error}	N-p	MS_{error}	
Total	SS_{total}	N-1		

8. Compare the computed F statistic with a tabulated F-statistic with p-1 and N-p degrees of freedom at the 5% significance level. This is included in Table 2, Appendix B of the 1989 guidance document.

If the calculated F value exceeds the tabulated value, reject the hypothesis of equal well means (the down-gradient wells indicate contamination). Otherwise conclude that there is no significant difference between the concentrations at the p wells and therefore no evidence of contamination.

Individual Well Comparisons

Up to this point, the parametric ANOVA can only show that some well shows contamination, however the specific well or wells have not been identified. The Bonferroni t-statistic test is used to determine the individual wells that show statistically elevated concentrations of the parameter.

1. Assume that of the p wells, u are background wells and m are compliance wells. Obtain the total sample size n_b of all background wells:

$$n_b = \sum_{i=1}^{u} n_i$$

2. Compute the average concentration from the u background wells.

$$\overline{X}_b = \frac{1}{n_b}\sum_{i=1}^{u} \overline{x}_i$$

3. Compute the m differences between the average concentration of each compliance well and the average concentration of the background wells.

4. For the i^{th} well, compute the standard error of each difference as:

$$SE_i = \left[MS_{error} \cdot \left(\frac{1}{n_b} + \frac{1}{n_i} \right) \right]^{1/2}$$

5. Obtain the t-statistic from Bonferroni's t-table (Table 3, Appendix B in the 1989 guidance) with (N-p) degrees of freedom. For more than 5 down-gradient wells, use the 1% significance level ($\alpha = 0.01$), otherwise use the 5% experiment-wide significance level ($\alpha = 0.05/m$ for individual well comparisons). If m > 5, use the table entry for m = 5.

6. Compute the Critical Value (D_i) for each compliance well.

$$D_i = SE_i \cdot t$$

7. For the i^th^ well, compute the difference between the well mean and the background mean.

$$\delta = \overline{X}_i - \overline{X}_b$$

8. If $\delta > D_i$ the well shows a statistically significant increase in contamination. Otherwise, contamination of the well is not indicated.

9. Compute the residual (R_{ij}) for each compliance well measurement.

$$R_{ij} = x_{ij} - \overline{x}_{ij}$$

If the residuals are not normally distributed, the parametric ANOVA is inappropriate.

Remarks:

The 1992 USEPA Statistical Guidance incorrectly states, and many authors have incorrectly stated, that data must be normally distributed and have equal well variance for the parametric ANOVA to be appropriate. The USEPA 1989 Statistical Guidance correctly states that the *residuals* must be normally distributed for the parametric ANOVA to be appropriate. Shapiro-Wilks method, Shapiro-Francia method, D'Agostino's method, and probability plots are methods included in ChemStat to test the normality of the residuals. The USEPA 1992 Statistical Guidance correctly states that normality is required for the parametric prediction limit and the parametric tolerance limit.

4.3.2 Parametric Prediction Limit (Inter-Well)

Description:

The inter-well parametric prediction limit is used to compare samples from background wells to a selected number of recent sampling dates for from compliance wells. If there are more than one sample per date, the samples for that date are averaged, and the average is compared to the prediction limit.

Verification Resampling

The default number of recent sampling dates is specified from *Options* | *Default Options* | *Comparison* or the prediction limit right-click menu. In most cases, a value of 1 is appropriate. However, you can specify different "recent date" values for each individual well. When the parametric prediction interval report is displayed, the bottom portion of the window will display a list of all compliance wells included in the statistical analysis. Select a well or wells. Click the right mouse button to display the context menu, and select the desired number of recent dates for the selected well(s).

Use:

As an inter-well comparison, the parametric prediction limit is useful for comparing background measurements to compliance wells in situations where there are multiple samples from compliance wells for a single sampling event. The method also uses only recent samples from compliance wells, and is therefore useful for compliance wells which may have been contaminated in the past and an assessment of current conditions without regard to past contaminant levels is required.

A major advantage of the parametric prediction limit is that only one sample from any compliance well is required. This enables it to be used on newly installed wells to asses contamination.

The prediction limit analysis is performed for all compliance wells for the specified parameter.

The parametric prediction limit requires that data be normally distributed.

Implementation:

ChemStat provides six algorithms for calculating the parametric prediction limit.
- USEPA 1992 Guidance 99% Confidence
- USEPA 1992 Guidance 95% Confidence
- USEPA Draft Unified Guidance (2004) 99% Confidence One-Sided
- USEPA Draft Unified Guidance (2004) 95% Confidence One-Sided
- USEPA Draft Unified Guidance (2004) 99% Confidence Two-Sided
- USEPA Draft Unified Guidance (2004) 95% Confidence Two-Sided

Select the desired calculation method from the right-click menu accessed over the prediction limit report.

1. Calculate the mean (x) and standard deviation (S) of the background well samples.

2. Specify the number of most recent sampling dates to compare to the prediction limit. Specify different values for each well if necessary. If a date includes more than one sample, the samples will be averaged and the average will count as on comparison. Normally, this value will be 1 to compare only the most recent sampling date to the prediction limit.

3. Calculate the number of “future samples” (k). This is the number of comparisons to be performed. This number will normally be the number of sampling dates per well multiplied by the number of wells.

In the USEPA 1992 Guidance implementations only, the maximum value of k is 5, to maintain the required minimum error rate of 1% per well.

<u>For USEPA Draft Unified 2004 Guidance Methods</u>

4. Calculate the prediction limit for each sampling date included in the analysis using the formula:

$\left[0, \bar{x} + S\sqrt{1 + 1/n} \cdot t_{(n-1, \alpha/k)}\right]$ for one-sided comparisons

$\left[0, \bar{x} + S\sqrt{1 + 1/n} \cdot t_{(n-1, \alpha/k/2)}\right]$ for two-sided comparisons

where:

$t_{(n-1, \alpha/k)}$ is the 100(1-α)% point of the "Student's" t-distribution with n-1 degrees of freedom.

For USEPA 1992 Guidance Methods

4. Calculate the prediction limit for each sampling date included in the analysis using the formula:

$$\left[0, \bar{x} + S\sqrt{1/m + 1/n} \cdot t_{(n-1, k, 0.95)}\right]$$

where m is the number of samples in the compliance well sampling date (usually 1, sometimes 2, rarely greater than 2), n is the total number of background measurements, and t is the 95th percentile of the Bonferroni t-statistic determined from Appendix B, Table 3 in the 1989 guidance. In the ChemStat report, the value for m is listed under the *Samples* column.

5. Compare each of the recent sampling dates for each well to the prediction limit. If the sample result exceeds the one-sided prediction limit, or is outside the range of the two sided prediction limit, there is evidence of a statistically significant increase in contamination.

Remarks:

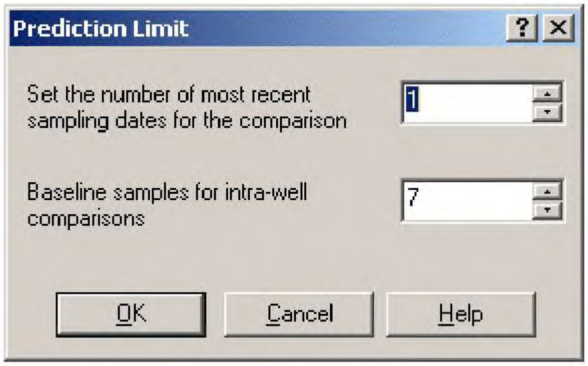
There is a considerable difference in the implementation of this method as provided in the USEPA guidance documents. Examples of the USEPA implementations of this method are provided in both the 1989 and 1992 guidance documents and in the Draft Unified Guidance document.

4.3.3 Parametric Prediction Limit (Intra-Well)

Description:

The intra-well parametric prediction limit is used to compare the samples from a selected number of recent sampling dates from a well to historical samples from that same well.

If there is more than one measurement per date, the measurements for that date are averaged. The number of recent sampling dates, and the number of baseline samples for comparison are specified from *Select | Recent Dates* or the prediction limit right-click menu. This displays the box shown right. In most cases, a value of 1 is appropriate for recent dates. At least 5 baseline samples known to not be impacted by the facility, should be available for the selected well.


Prediction Limit

Set the number of most recent sampling dates for the comparison: 1

Baseline samples for intra-well comparisons: 7

Use:

As an intra-well comparison, the parametric prediction limit can be used to test for contamination in a compliance well without the risk of false positives due to natural variability of ground water. It is important that the baseline samples used to calculate the prediction limit have not be impacted by the facility. It is preferable that baseline samples be only those samples collected before waste placement at the facility.

The prediction limit analysis maintains a minimum error rate of 5% for the well, and a minimum error rate of 1% for each comparison. The parametric prediction limit requires that data be normally distributed.

Implementation:

ChemStat provides six algorithms for calculating the parametric prediction limit.

- USEPA 1992 Guidance 99% Confidence
- USEPA 1992 Guidance 95% Confidence
- USEPA Draft Unified Guidance (2004) 99% Confidence One-Sided
- USEPA Draft Unified Guidance (2004) 95% Confidence One-Sided
- USEPA Draft Unified Guidance (2004) 99% Confidence Two-Sided
- USEPA Draft Unified Guidance (2004) 95% Confidence Two-Sided

Select the desired calculation method from the right-click menu accessed over the prediction limit report (shown right).

1. In the dialog box shown above, specify the number of recent dates and baseline samples for the analysis. In selecting recent dates, if there are multiple samples for a single date, the samples are averaged for that date, and that date will be a single comparison. If there are multiple samples for a single date for the baseline samples, the values are not averaged, but each is considered a separate sample. The mean and standard deviation of the baseline samples is used to calculate the prediction limit.

2. Calculate the number of "Future Samples" (k). This is the number of comparisons to be performed. This value will always equal the number of recent dates, unless the number of specified dates

exceeds the number of sampling dates for the well.

3. Calculate the mean (x) and standard deviation (S) of the baseline samples.

For USEPA Guidance Methods

4. Calculate the prediction limit for each sampling date included in the comparison using the formula:

$$\left[0, \overline{x} + S\sqrt{1/m + 1/n} \cdot t_{(n-1,k,0.95)}\right]$$

where m is the number of samples in the sampling date to be compared (usually 1, sometimes 2, rarely greater than 2), n is the total number of baseline samples, and t is the 95th percentile of the Bonferroni t-statistic determined from Appendix B, Table 3 in the 1989 guidance.

For USEPA Draft Unified 2004 Guidance Methods

4. Calculate the prediction limit for each sampling date included in the analysis using the formula:

$$\left[0, \overline{x} + S\sqrt{1 + 1/n} \cdot t_{(n-1,\alpha/k)}\right]$$ for one-sided comparisons

$$\left[0, \overline{x} + S\sqrt{1 + 1/n} \cdot t_{(n-1,\alpha/k/2)}\right]$$ for two-sided comparisons

where:

$t_{(n-1,\alpha/k)}$ is the 100(1-α)% point of the "Student's" t-distribution with n-1 degrees of freedom.

5. Compare each of the recent sampling date means to the prediction limit. If the mean exceeds the prediction limit for one-sided, or is outside the range of the prediction interval for two sided, there is evidence of a statistically significant increase at that well.

Remarks:

Intra-well comparisons with the prediction limit are not documented in the USEPA 1989 and 1992 statistical guidance documents.

4.3.4 Parametric Prediction Limit with Resampling (Inter-Well)

Description:

This is the Parametric Prediction Limit with verification resampling as described in the USEPA Draft Unified Guidance Document Chapter 13 (September 2004).

The method supports the following resampling scenarios:

- 1 of 2
- 1 of 3
- 1 of 4
- Modified California

The parametric prediction limit requires that data be normally distributed or can be transformed to a normal distribution.

The method is available only as a one-sided comparison. All samples collected are assumed to be independent.

Use:

The Prediction Limit with Resampling differs from most other tests in ChemStat in two ways:

1. A single run of the test applies to multiple chemical parameters
2. The background data can be limited to a specific end date.

To begin the test, select Analysis | Prediction Limit Test | Unified Guidance with Verification Resampling.

You must specify default options to run the test. Specify options from Options | Resampling Options.

Indicator Parameters – This is a list of available parameters in the data set. Check the parameters that will be included in the test.

Background Date Range – Specify the date range for background (up-gradient) well samples. Samples from within this date range will be used to calculate background mean and standard deviation.

Resampling Method – Select the verification resampling method:

- 1 of 2
- 1 of 3
- 1 of 4
- Modified California

Statistical Evaluations per Year – Enter the number of statistical evaluations per year.

Date of Last Full Sampling Event – Select the date of the last sampling event which is not a resampling event. Any dates subsequent to this event will be considered resampling events. For example, for a 1 of 3 sampling pattern, this date plus the following two dates (if available) will be evaluated for comparison to the prediction limit.

Implementation:

1. Calculate the per-evaluation, per-constituent, false positive rate.

$$\alpha = 0.1/(\mathrm{c} \cdot \mathrm{n_e})$$

where:

n_e = is the number of statistical evaluations per year
c = the number of indicator parameters to be tested

2. Compute the mean ($\overline{X}$) and standard deviation (s) of n background measurements.

3. From Appendix 13 tables in the Unified Guidance, determine the value of K for:

- the number of background measurements
- the number of wells analyzed
- the per-evaluation, per-constituent false positive rate

Note: ChemStat uses linear interpolation to determine values within a table. Chosen values of α are the closest available for the tables.

4. Calculate the prediction limit using the formula:

$$PL = \overline{x} + K \cdot s$$

5. Compare each compliance well for the specified "last full sampling event date" to the prediction limit. If the sample exceeds the prediction limit, test for the number of resamples that exceed the prediction limit as well. If the required number of resamples also exceeds the limit, then the parameter is statistically significant at that well.

Scenario	**Resamples**	**Required number of Resamples Exceeding Limit to show significance**
1 of 2	1	1
1 of 3	2	2
1 of 4	3	3
Modified California	3	2

Example:

Suppose the date of the last full sampling event is 1/1/2004. For a 1-of-3 comparison, for each parameter and well, the sample from 1/1/2004 will be compared to the prediction limit. If it does not exceed the prediction limit, no further comparisons are made for that well and parameter. If that sample exceeds the prediction limit, then the well is considered statistically significant for tat parameter if **both** of two independent resamples also exceed the limit.

Remarks:

Because all applicable parameters are tested in a single run of the test, it is not appropriate to run multiple tests with different groups of parameters. The test should be run only once for each sampling event. That run should include all applicable parameters and wells.

All samples are assumed to be independent.

4.3.5 Parametric Tolerance Limit

Description:

A tolerance limit establishes a concentration range that is constructed to contain a specified proportion of the population with a specified confidence coefficient. The parametric tolerance limit can be implemented two ways:

1. The tolerance limit can be constructed from background data and each compliance well sample compared to the tolerance limit. If the compliance well sample exceeds the tolerance limit, the sample shows statistical evidence of contamination.

2. A separate tolerance limit can be constructed from data for each compliance well, and the tolerance limit compared to a compliance limit (MCL or action limit) for that parameter. If the tolerance limit value exceeds the compliance limit, the well is shown to be contaminated.

As few as 3 measurements can be used to construct a tolerance limit. Data should have equal variance and follow a normal distribution.

Use:

To compare each individual compliance well sample to a tolerance limit constructed from background well data, or to compare compliance well data to a compliance limit.

Implementation (background comparison):

1. Calculate the mean μ and standard deviation σ of the background well data.

2. Construct the one-sided upper tolerance limit.

$$\mathrm{TL} = \mu + \mathrm{K}\sigma$$

In the USEPA 1989 guidance document, K is the one-sided normal tolerance factor from Table 5, Appendix B, in the 1989 guidance and is based on the number of background measurements used to construct the limit.

In the USEPA 1992 guidance document, K is provided by the formula:

$$\mathrm{K} = \left(t_{n-1,0.05}\right) \cdot \sqrt{1 + \frac{1}{n}}$$

where t is the Bonferroni t-statistic from Appendix B, Table 3 of the USEPA 1989 guidance document, and n is the number of background measurements used to construct the limit.

3. Compare each compliance well observation to the tolerance limit from Step 2. If the observation exceeds the tolerance limit, there is statistical evidence of contamination in that well.

Implementation (Compliance Limit Comparison):

1. Calculate the mean μ and standard deviation σ for each compliance well.

2. Construct a one-sided upper tolerance limit for each compliance well.

$$\mathrm{TL} = \mu + \mathrm{K}\sigma$$

In the USEPA 1989 guidance document, K is the one-sided normal tolerance factor from Table 5, Appendix B, in the 1989 guidance and is based on the number of compliance well samples used to construct the limit.

In the USEPA 1992 guidance document, K is provided by the formula:

$$\mathrm{K} = \left(t_{n-1,0.05}\right) \cdot \sqrt{1 + \frac{1}{n}}$$

where t is the Bonferroni t-statistic from Appendix B, Table 3 of the USEPA 1989 guidance document, and n is the number of compliance well samples used to construct the limit.

3. For each compliance well, compare the tolerance limit calculated in Step 2 to the compliance limit for the parameter (MCL or Action Limit). If the tolerance limit value exceeds the compliance limit, there is statistical evidence of contamination.

Remarks:

The USEPA 1989 and 1992 Guidance documents differ in the method of calculating the tolerance factor. Each provides slightly different results. ChemStat provides a choice of the two methods. From *Select | Parametric Tolerance Interval*, or from the *Tolerance Interval* right-click context menu, select either *1989 Calculations*, or *1992 Calculations*.

4.3.6 Parametric t-test

Description:

The parametric t-test is implement in ChemStat as either a group comparison following U.S. Navy (1999), whereby compliance well measurements are compared as a group to background measurements as a group, or as an individual well comparison as described in USEPA *Statistical Training Course for Ground Water Monitoring Data Analysis* (1992) on page 28-29. In the USEPA method, each individual compliance well is compared to background.

Because the test is parametric, the data must follow a normal distribution. Non-detects should be minimal. The test can be run at the 90%, 95%, 97.5%, or 99% confidence levels.

Use:

The parametric t-test provides a simple group comparison whereby each individual compliance location is compared to background or all compliance measurements as a group are compared to background.

Implementation:

The parametric t-test implemented here is described in the USEPA *Statistical Training Course for Ground Water Monitoring Data Analysis* (1992) on page 28-29. The method is also presented in U.S. Navy (1999). The formulas are the same, but the test is run for each compliance location.

1. Compute the mean and standard deviation (SD) for the compliance location, and for pooled background data.

2. Compute the standard error of the difference in the compliance location mean and the background mean with the formula:

$$SE_{diff} = \sqrt{\left[\frac{(n_{up}-1)SD_{up}^2 + (n_{down}-1)SD_{down}^2}{n_{up}+n_{down}-2}\right] \cdot \left(\frac{1}{n_{up}} + \frac{1}{n_{down}}\right)}$$

where n is the number of observations.

3. Compute the t-statistic.

$$t = \frac{Mean_{down} - Mean_{up}}{SE_{diff}}$$

4. Compare the calculated t-statistic to the tabulated t statistic (Appendix B, Table 6 of the 1989 USEPA Guidance Document) for the appropriate confidence level.

If the calculated t-value is greater than the tabulated t-value, then there is statistical evidence of increased concentrations in compliance locations. If the calculated t-value is less than the negative of the tabulated t-value, then the compliance location measurements are statistically lower than background.

Remarks:

ChemStat's implementation of the parametric t-test can perform individual well comparisons at either the 90%, 95%, 97.5%, or 99% confidence levels. If you are unsure of which level to use, the 99% probably preferable.

As an individual well comparison, the test is always a two-way comparison, but compliance locations are not flagged as statistically significant unless they are elevated compared to background. The exception is for pH, where compliance locations are flagged as statistically significant if they are either above or below background.

As a group comparison, the test only indicates statistical significance if the compliance group is elevated when compared to background, as per U.S. Navy (1999).

4.3.7 Satterthwaite Two Sample t-Test

Description:

The Satterthwaite Two Sample t-test is provided in the U.S. Navy 1999 Guidance Document as a test to determine if compliance location measurements are statistically elevated when compared to background. It is a parametric test, and therefore a normal distribution is required. U.S. Navy 1999 Guidance recommends replacing non-detects with the detection limit or one-half of the detection limit. In ChemStat, the test can be performed at the 99%, 95%, or 90% confidence levels.

Use:

Use the Satterthwaite test to determine if compliance observations as a group are statistically elevated when compared to background as a group. The test can not be used to determine statistically elevated levels at individual sampling points.

Implementation:

1. Let the x subscript refer to compliance measurements and the y subscript refer to background measurements.

2. Compute the Satterthwaite statistic T.

$$T = \frac{\overline{x} - \overline{y}}{\sqrt{\frac{s_x^2}{n_x} + \frac{s_y^2}{n_y}}}$$

where:

n_x is the number of compliance measurements

n_y is the number of background measurements

$\overline{x}$ is the mean of the compliance measurements.

$\overline{y}$ is the mean of the background measurements

s_x^2 is the variance of the n_x compliance measurements

s_y^2 is the variance of the n_y background measurements

3. Compute the approximate degrees of freedom f

$$f = \frac{\left(\frac{s_x^2}{n_x} + \frac{s_y^2}{n_y}\right)^2}{\frac{\left(s_x^2/n_x\right)^2}{n_x + 1} + \frac{\left(s_y^2/n_y\right)^2}{n_y + 1}}$$

4. Obtain the critical value $t_{1-\alpha,f}$ from table A.16, in the U.S. Navy 1999 guidance. In ChemStat, the value of f is rounded to the nearest integer.

5. If T > t, then statistical significance is indicated. Either compliance measurements are statistically elevated when compared to background, or background measurements are statistically elevated when compared to compliance measurements.

Remarks:

At least two background measurements and two compliance measurements are required to prevent divide by zero errors. But this is a bare minimum, and many more samples are recommended for effective use.

U.S. Navy (1999) also recommends an equal number of background and compliance measurements to simplify calculations when done by hand. However, when using ChemStat, this simplification is unimportant, so any number of background and compliance measurements are suitable.

4.3.8 Welch's Two Sample t-Test

Description:

Welch's Two Sample t-test is provided in the USEPA Draft Unified Guidance as a test to determine if compliance location measurements are statistically elevated when compared to background. It is a parametric test, and therefore a normal distribution (of residuals) is required, however equal variance is not required for this test. Welch's t-test is a modification of the student's t-test for unequal variances among the populations. In ChemStat, the test can be performed at the 99%, 97.5%, 95%, or 90% confidence levels. The test can be performed comparing all compliance well measurements as a group to the group of background data, or comparison an individual compliance well to the group of background data.

Use:

Use the Welch's t-test to determine if compliance observations as a group are statistically elevated when compared to background as a group, or if an individual well is statistically elevated when compared to background.

Implementation:

1. Calculate the t statistic using the following formula:

$$T = \left(\bar{x}_{DG} - \bar{x}_{BG}\right) \Bigg/ \sqrt{\frac{s_{BG}^2}{n_{BG}} + \frac{s_{DG}^2}{n_{DG}}}$$

Where **x** is the group mean and **s** is the group standard deviation.

2. Where the Welch's t-test differs from the Student t-test is in the calculation of the degrees of freedom. For Welch's t-test, calculate degrees of freedom using the following formula:

$$DOF = \left(\frac{s_{BG}^2}{n_{BG}} + \frac{s_{DG}^2}{n_{DG}}\right)^2 \Bigg/ \left[\frac{\left(s_{BG}^2 / n_{BG}\right)^2}{n_{BG} - 1} + \frac{\left(s_{DG}^2 / n_{DG}\right)^2}{n_{DG} - 1}\right]$$

3. Obtain the critical value $t_{1-\alpha,DOF}$ from the Student's t-test distribution for the specified confidence level and the degrees of freedom calculated in step 2.

4. If T > t, that is, the calculated T statistic exceeds the critical value t, then statistical significance is indicated.

Remarks:

At least two background measurements and two compliance measurements are required to prevent divide by zero errors. But this is a bare minimum, and many more samples are recommended for effective use.

Note that statistical significance could mean that either compliance measurements are statistically elevated when compared to background, or background measurements are statistically elevated when compared to compliance measurements.

4.4 Non-Parametric Methods

4.4.1 Kruskal-Wallis Non-Parametric Rank Method

Description:

The Kruskal-Wallis test is a non-parametric rank-based method that compares each compliance well to a group of background wells. It is recommended in the 1992 guidance document for data that do not follow a normal distribution, or have 15% to 90% non-detects.

ChemStat compares each compliance well to the background wells. Two comparisons are provided. The first comparison is performed at a minimum of 1% individual well comparison error level. The second comparison is performed at an experimentwise 5% error level, however the minimum error level may fall below the USEPA required value of 1%. The first comparison is compliant with USEPA guidance. The second comparison is less likely to produce false positives, but is more statistically accurate.

USEPA guidance recommends at least 4 observations for each well. Fewer observations will decrease the ability of the method to show statistical significance.

Use:

For comparison of compliance wells to background wells when data do not follow a normal distribution, or there are 15% to 90% non-detects.

Implementation:

1. Measurements from all background wells are pooled and the background is considered a group. Each compliance well is then also considered a group. For n measurements in each of k groups, and N total observations:

2. Rank all N measurements from least to greatest. R_{ij} is the rank of the j^{th} observation for the i^{th} group. Consider the background wells as group 1.

3. For each group, calculate the sum R_i and mean $\overline{R}_i$ of the ranks.

4. Calculate the Kruskal-Wallis statistic (H):

$$H = \left[\frac{12}{N(N+1)} \cdot \sum_{i=1}^{k} \frac{R_i^2}{n_i} \right] - 3(N+1)$$

5. Compare the calculated Kruskal-Wallis statistic to the tabulated chi-square value with (k-1) degrees of freedom (Table 1, Appendix B 1989 guidance).

If the computed value exceeds the tabulated value, there is evidence of contamination in at least one compliance well.

6. For each compliance well, compute the critical difference (C) of the well comparison to background.

$$C_i = Z_{(\alpha/(k-1))}\left[\frac{N(N+1)}{12}\right]^{1/2} \cdot \left(\frac{1}{n_1}+\frac{1}{n_i}\right)^{(1/2)}$$

where:

n_1 is the number of background measurements (group 1 is considered the background group), and

$Z_{(\alpha/(k-1))}$ is the upper $(\alpha/(k-1))$ percentile of the standard normal distribution (Table 4, Appendix B, 1989 guidance). The 1989 guidance recommends that for (k > 6), use Z(0.01), the upper 1 percentile of the standard normal distribution.

Note that the above equation is presented incorrectly on page 5-16 of the 1989 guidance. The second exponent of ½ has been omitted.

7. For each compliance well, compare the difference of the average rank and the background average rank to the critical difference computer in step 6. If the critical difference is greater, the well shows evidence of contamination.

Adjusting for Ties:

ChemStat adjusts for tied observations for non-detect values only.

Remarks:

The Kruskal-Wallis test can only determine which compliance well is elevated with respect to background, but can not determine which specific samples cause the statistical trigger.

The 1992 guidance example problem for the Kruskal-Wallis method has an error. On page 43, the rank sum and rank mean for Well 3 are given as 51 and 10 respectively. The rank sum and rank mean should be 61 and 12.2 respectively.

4.4.2 Wilcoxon Rank-Sum Inter-Well Comparison

Description:

The Wilcoxon Rank-Sum method is a non-parametric method for comparing a selected compliance well to the background well.

ChemStat performs the comparison at the 99% level of significance.

At least four samples are recommended for each well to provide adequate power.

Use:

For comparison of a single compliance well to background wells when data do not follow a normal distribution, or there are 15% to 90% non-detects.

Implementation:

1. For n compliance wells, and m background wells, with N total samples, combine the compliance and background well data and rank the ordered values from 1 to N.

2. Calculate the Wilcoxon statistic (W):

$$W = \sum_{i=1}^{n} C_i - \frac{1}{2} n(n+1)$$

where:

C_i = the i^{th} rank of the compliance well

3. Calculate a Z-score for comparison to the upper 0.01 percentile of the standard normal distribution.

$$Z \approx \frac{W - E_{(w)} - 1/2}{SD_{(w)}}$$

where:

$$E_{(w)} = \frac{mn}{2}$$

and

$$SD_{(w)} = \sqrt{\frac{1}{12} mn(N+1)}$$

If the calculated Z score exceeds the tabulated Z-score, there is evidence of contamination at the specified well.

Remarks:

The Wilcoxon Rank-Sum method can only determine that the specified well has statistically elevated levels of the parameter, but it can not determine which specific sample caused the increased elevation.

4.4.3 Wilcoxon Rank-Sum Intra-Well Comparison

Description:

The Wilcoxon Rank-Sum method is a non-parametric rank method. ChemStat provides an intra-well comparison implementation of the Wilcoxon method. The Wilcoxon method provides advantages over other intra-well comparison methods, including suitability to high percentages of non-detects, suitability for normal or non-normal data distributions, and reduced susceptibility to outlier concentrations.

ChemStat performs the comparison at both 95% and 99% levels of significance.

Use:

Use this method as a non-parametric method for intra-well comparisons.

Implementation:

Mathematically, the intra-well comparison is implemented the same as the inter-well comparison. However, the background data are replaced with the baseline samples from the selected well. Also, compliance well samples are replaced with the comparison samples from the selected well. The number of comparison samples is equal to the total number of samples from the well minus the number of baseline samples.

From *Select* | *Wilcoxon Baseline Samples* to enter the number of baseline samples.

4.4.4 Wilcoxon Rank-Sum Group Comparison

Description:

The Wilcoxon group comparison in ChemStat follows the procedures in the U.S. Navy 1999 Guidance document. The test is a non-parametric test for comparing compliance measurements to background measurements. Because the test is non-parametric, normality is not required, and the test is suitable for a moderately large number of non-detects.

ChemStat performs the group comparison at 90%, 95%, 97.5%, and 99% levels of significance.

Use:

Use this method as a non-parametric method for comparing compliance measurements to background.

Implementation:

The implementation of the group comparison follows the U.S. Navy 1999 Guidance Document procedures. This differs slightly from the USEPA guidance procedure.

1. Let m equal the number of background measurements. Let n equal the number of compliance measurements.

2. Pool the compliance and background data. Order the pooled data from smallest to largest. Replace non-detects with the detection limit.

3. Rank the data. If there are multiple measurements with the same value (tied values), then average the ranks for that value, and assign the average rank to each measurement with that value.

4. Note that if more than 50% of the measurements are ties, U.S. Navy recommends using Gehan's Test instead.

5. Sum the ranks of the n compliance measurements. Let R equal the sum of the ranks.

If there are fewer than 20 compliance measurements, and fewer than 20 background measurements, then follow these steps for the small data set size. Otherwise, skip to step 10.

6. Calculate the Wilcoxon statistic.

$$W = R - n(n+1)/2$$

7. Using Table A.15 in U.S. Navy (1999), locate the tabulated value W_α for the appropriate level of significance.

8. Compute the critical value C.

$$C = nm - w_\alpha$$

9. If C >= W, then statistical significance is indicated. If C < W, then there is insufficient data to show statistical significance.

This is the end of the analysis for the small data set.

10. For large data sets, calculate $W_{1-\alpha}$

$$w_{1-\alpha} = \frac{n(n+1)}{4} + z_{1-\alpha}\sqrt{\frac{n(n+1)(2n+1)}{24}}$$

where:

$z_{1-\alpha}$ is the 100(1-α) percentile of the standard normal distribution.

11. If $R > w_{1-\alpha}$, then statistical significance is indicated. Otherwise, there is insufficient data to show statistical significance.

Remarks:

If the test is performed at the 97.5% or 99% level of significance, then the test is performed using the procedure for large data sets regardless of the sample size. This is because there are no adequate table values for these significance levels.

4.4.5 Poisson Prediction Limit

Description:

The 1992 guidance recommends the Poisson prediction limit for greater than 90% non-detects. The sum of sample concentrations from all background well samples for the specified parameter are used to determine the Poisson prediction limit. The number of recent sampling dates to compare to the prediction limit is specified. Sample concentrations from that number of dates are summed, and the sum compared to the prediction interval. The procedure is repeated for each compliance well.

The 1992 guidance recommends replacing non-detects with ½ the detection limit to implement this method. This can be done from *Options | Transform Data*.

ChemStat calculates the Poisson prediction limit at both the 99% and 95% levels of significance as both an intra-well and inter-well comparison.

Use:

The method is recommended for situations where there are greater than 90% non-detects. ChemStat compares the prediction limit value to a recent number of recent sampling dates (selected from *Select | Recent Dates*) for each compliance well. However, the method can also be used to determine a level of triggering for samples that have not yet been collected.

Implementation:

1. The Poisson count of the background measurements (T_n) is determined. The Poisson count is the sum of the reported concentrations for each sample.

2. For k future samples, and n background measurements, the value c is determined as k/n. The value k is the number of comparisons per well and will usually be the same as the value of *Recent Dates* entered by the user (if there are a sufficient number of samples).

3. Using Gibbons (1987b) formula, calculate the upper prediction limit from:

$$T_k^* = cT_n + \frac{ct^2}{2} + ct\sqrt{T_n\left(1+\frac{1}{c}\right)+\frac{t^2}{4}}$$

where t is the upper (1-α) percentile of the students t-test distribution with (n-1) degrees of freedom.

Note: The 2004 version of the USEPA Draft Unified Guidance uses the percentile of the standard normal distribution to obtain t. ChemStat follows the 1992 guidance formula.

4. Calculate the Poisson count of the k future samples (the sum of the concentrations for the k samples) and compare it to the prediction limit. If this value exceeds the prediction limit, the samples indicate a significant level of contamination.

5. Repeat the procedure for each well.

Remarks:

Unlike parametric prediction limits, the method has the disadvantage that if the number of recent dates is greater than 1, it can not be determined which sample caused the statistically elevated result.

4.4.6 Poisson Tolerance Limit

Description:

The 1992 guidance recommends the Poisson tolerance limit for greater than 90% non-detects. This method determines the upper tolerance limit at both the 95% and 99% levels of significance. The 1992 guidance recommends replacing non-detects with ½ the detection limit. This can be done from *Options | Transform Data*.

ChemStat provides two different implementations of the Poisson tolerance interval.

1. Comparison to Background Statistic

The upper tolerance limit is determined from the background measurements. If any sample in a compliance well exceeds the tolerance limit, the sample is considered to be impacted.

2. Comparison to Compliance Limit (MCL or Action Limit)

An upper tolerance limit is calculated for each compliance well. If the tolerance limit exceeds the compliance limit, there is statistical evidence of contamination in the well. If the tolerance limit does not exceed the compliance limit, the well does not show contamination.

Use:

The method is recommended in the 1992 guidance for greater than 90% non-detects. Samples from wells indicated as background are used to determine the upper tolerance limit. The upper tolerance limit is then compared to every sample in the each compliance well for the selected parameter.

Alternatively, the compliance limit can be constructed for each compliance well and compared to a compliance limit such as MCL or action limit.

Implementation (comparison to background statistic):

1. The Poisson count of the background measurements (T_n) is determined. The Poisson count is the sum of the concentration measurements for each sample.

2. The degrees of freedom (DF) is calculated as $2^*T_n + 2$.

3. The Chi-squared statistic for the 95th and 99th percentiles is calculated for DF determined in step 2. Values for the Chi-squared distribution are given in Table 1, Appendix B of the 1989 guidance.

4. For n background measurements, the value of λ (the probable occurrence rate) is calculated from Zack's formula:

$$\lambda_{T_n} = \frac{1}{2n}\chi_\gamma^2[2T_n + 2]$$

where:

λ_{T_n} = the probable occurrence rate

n = the total number of background measurements

χ_γ^2 = is the γ percentile of the Chi-square distribution with $2^*T_n + 2$ degrees of freedom

T_n = the Poisson count (sum of n background measurements)

5. Find the smallest degree of freedom (for 95th and 99th percentiles) for the Chi-squared distribution such that:

$$\chi_{1-\beta}^2[2k + 2] \geq 2\lambda_{T_n}$$

6. The quantity $2\rho + 2$ is the smallest degree of freedom satisfying the above equation, where ρ is the upper tolerance limit.

7. Compare down-gradient samples from each compliance well to the value ρ. If the result is greater than ρ, the well is considered impacted. If the result is less than k, the result is considered not to be impacted.

Implementation (comparison to compliance limit or MCL):

1. For each compliance well, the Poisson count of the samples (T_n) is determined. The Poisson count is the sum of the concentrations for each sample for the specific well.

2. The degrees of freedom (DF) is calculated as $2^*T_n + 2$.

3. The Chi-squared statistic for the 95th and 99th percentiles is calculated for DF determined in step 2. Values for the Chi-squared distribution are given in Table 1, Appendix B of the 1989 guidance.

4. For n samples, the value of λ (the probable occurrence rate) is calculated from Zack's formula:

$$\lambda_{T_n} = \frac{1}{2n}\chi^2_\gamma[2T_n + 2]$$

where:

λ_{T_n} = the probable occurrence rate

n = the total number of samples from the compliance well

χ^2_γ = is the γ percentile of the Chi-square distribution with $2^*T_n + 2$ degrees of freedom

T_n = the Poisson count (sum of n samples from the compliance well)

5. Find the smallest degree of freedom (for 95th and 99th percentiles) for the Chi-squared distribution such that:

$$\chi^2_{1-\beta}[2k + 2] \geq 2\lambda_{T_n}$$

6. The quantity $2\rho + 2$ is the smallest degree of freedom satisfying the above equation, where ρ is the upper tolerance limit.

7. For each well, compare the Poisson tolerance limit ρ calculated for that well to the compliance limit. If the tolerance limit exceeds the compliance limit, there is statistical evidence of contamination. If the tolerance limit does not exceed the compliance limit, there is no evidence of contamination.

Remarks:

This method has several limitations:

1. The maximum Poisson count of samples is 420.

2. The maximum values for the smallest degree of freedom (from step 5 above) is 400. If a value of 401 is indicated, the Chi-squared values has exceeded the capacity of the algorithm.

4.4.7 Non-Parametric Prediction Limit

The non-parametric prediction limit can be used as an inter-well comparison, where the prediction limit is calculated from samples from background wells, or an intra-well comparison where the prediction limit is calculated from the historical samples from the selected well.

Intra-well or inter-well comparisons are selected from *Select* | *Comparison*, or from the *Prediction Limit* right-click menu (shown right).

Inter-Well Comparison:

Verification Resampling

To support verification resampling, ChemStat allows you to vary the number of samples compared to the prediction limit for each well. The default number of recent sampling dates is specified from *Options* | *Default Options* | *Comparison* or the prediction limit right-click menu. In most cases, a value of 1 is appropriate. However, you can specify different "recent date" values for each individual well. When the prediction interval report is displayed, the bottom portion of the window will display a list of all compliance wells included in the analysis. Select a well or wells. Click the right mouse button to display the context menu, and select the desired number of recent dates for the selected well(s).

Description:

The inter-well non-parametric prediction limit is recommended in the 1992 guidance for data where the assumptions of normality or transformed-normality can not be justified or when a significant portion of the samples are non-detects. A very basic test, the non-parametric prediction limit simply compares each individual down-gradient concentration for the selected dates, to the maximum concentration in background measurements. The prediction limit does not produce an actual limit, but simply a maximum value of the parameter concentration above which contamination is assumed.

The only mathematical calculation is to determine the coverage or level of significance of the test. The level of coverage is dependent on the number of background measurements and the selected number of recent dates to compare to the limit.

The inter-well non-parametric prediction limit compares samples from background wells to a selected number of recent sampling dates from compliance wells. If there are more than one sample per date, the samples for that date are averaged. The number of recent sampling dates is specified in the list of wells in the lower pane of the prediction limit menu. In most cases, a value of 1 is appropriate.

Use:

As an inter-well comparison, the non parametric prediction limit is useful for comparison of individual compliance well samples to pooled background data where data do not follow a normal or transformed-normal distribution, and/or there is an abundance of non-detects.

The test is performed on all compliance wells for the specified parameter.

Implementation:

1. Determine the maximum concentration of the background measurements.

2. Enter the number of recent samples for the analysis. This value will be 1 to evaluate only the most recent sampling event.

3. The number of "future samples" is the number of recent sample dates multiplied by the number of compliance wells. This is the actual number of comparisons to be made for the parameter. From the number of future samples, and the number of background measurements, use Table A-7 from the 1992 guidance to determine the level of coverage for the analysis.

4. Compare each sample from the compliance well to the maximum concentration from background measurements. If the sample from the compliance well exceeds the maximum background measurement, the compliance well is considered to be impacted.

5. Compute the confidence level and false positive rate for the limit. The confidence level is given by $n/(n + k)$ where n is the number of background measurements, and k is the number of comparisons. The false positive rate is given by $1 - [n/(n + k)]$.

Remarks:

This method will tend to have a high rate of false negatives unless there is a sufficient number of samples available from background wells. The method is not well described for use on actual data in the 1992 guidance. For this reason, and because of the lack of power of the method, it should be used only when other methods are not available.

Intra-Well Comparison:

Description:

Although not described in the USEPA guidance documents, non-parametric prediction limits can be used for an intra-well comparison. The intra-well non-parametric prediction limit compares a selected number of recent samples to a specified number of historical baseline samples from the same well.

The only significant calculation is to determine the coverage or level of significance of the test. The level of coverage is dependent on the number of historical samples and the selected number of recent dates.

Use:

As an intra-well comparison, the non parametric prediction limit is useful for assessing potential contamination in a well without the possibility of false positives resulting from natural variability of the ground water quality.

Implementation:

1. From *Select* | *Recent Dates*, select the number of historical baseline samples from which to calculate the limit.

2. From *Select | Recent Dates*, enter the number of recent sampling dates to compare to the limit. If there are multiple samples for each date, the samples will be averaged.

3. Calculate the number of comparisons. This will normally be the number of recent dates. This value is the value of "future samples" or k.

4. Determine the maximum concentration of the historical samples for the selected well.

5. From the number of future samples, and the number of historical samples, use Table A-7 from the 1992 guidance to determine the level of coverage for the analysis.

6. Compare each of the recent samples from the well to the prediction limit. If the sample from the exceeds the maximum historical sample, the compliance well is considered to be impacted.

7. Compute the confidence level and false positive rate for the limit. The confidence level is given by n/(n + k) where n is the number of baseline samples, and k is the number of comparisons. The false positive rate is given by 1 - [n/(n + k)].

Remarks:

Although easy to implement, as an intra-well comparison, this method requires a large number of historical samples to achieve a reasonable statistical power. To achieve a 95% confidence level, approximately 20 historical samples (known not to be impacted by the facility) are required for each future sample to be compared.

The method is not well documented for use on actual data in the 1992 guidance. For this reason, and because of the lack of power of the method, it should be used only when other methods are not available.

4.4.8 Non-Parametric Tolerance Limit

Description:

The non-parametric tolerance limit is recommended in the 1992 guidance for samples sets where the assumptions of normality or transformed-normality can not be justified or when a significant portion (> 25%) of the samples are non-detects. A very basic test, the non-parametric tolerance limit simply compares each individual down-gradient concentration to the maximum concentration in background measurements. The only mathematical calculation is to determine the coverage or level of significance of the test. Both a minimum level of coverage and an average level of coverage are provided. The greater the number of background measurements, the greater the level of coverage.

Use:

For comparison of individual compliance well samples to pooled background data when data do not follow a normal or transformed-normal distribution, and/or there is an abundance of non-detects.

The test is performed on all compliance wells for the specified parameter.

Implementation:

1. Determine the maximum concentration of the background measurements.

2. Compare each sample from the compliance well to the maximum concentration from background measurements. If the sample from the compliance well exceeds the maximum background sample, the compliance well is considered to be impacted.

3. Determine the level of coverage. The minimum level of coverage is given by Table A-6 in the 1992 guidance and depends on the number of background measurements available. The average level of coverage is given as n/(n+1) where n is the total number of background measurements.

Remarks:

This method will tend to have a high rate of false negatives unless there is a sufficient number of samples available from background wells. As stated in the 1992 guidance document, at least 19 background measurements are required for 95% coverage. Fewer background measurements will result in a lower rate of coverage and a higher incidence of false negatives.

This method will give the exact same results for both original data or log data.

4.4.9 Quantile Test

Description:

The Quantile test is provided in the U.S. Navy 1999 Guidance Document as a test to determine if compliance point measurements are statistically elevated when compared to background. It is a non-parametric test, and therefor a normal distribution is not required and the test is suitable for any number of non-detects. In ChemStat, the test can be performed at the 99% or 95% confidence levels.

Use:

In ChemStat, the Quantile test can be run in two ways:

1. It can be used to determine if compliance point observations as a group are statistically elevated when compared to background point measurements as a group, however, it can not determine which individual monitoring points are elevated. This is how the test is presented in the U.S. Navy 1999 Guidance Document.

2. It can be used as an intra-well comparison to determine if a single compliance well is elevated when compared to all background measurements, however, a large number of data points from the compliance well may be required. This implementation is more appropriate for RCRA regulated sites.

Use the right-click menu in ChemStat to select the confidence level and the well comparison type.

Implementation:

1. Let m equal the number of background measurements and n equal the number of compliance measurements[1], for a total of n + m measurements.

2. List from smallest to largest all pooled compliance and background measurements.

3. Using the values of n and m, and the specified Type I error rate of 0.01 or 0.05, refer to tables A11 or A13 in the U.S. Navy 1999 Guidance Document to determine the corresponding values for r and k.

4. Determine from the ordered list of pooled compliance and background measurements if k or more of the largest detected r measurements are compliance measurements. *Ignore any non-detects when determining the largest detected r measurements.* If so, then the test indicates statistical significance. The U.S. Navy 1999 Guidance recommends proceeding with the Wilcoxon test to confirm the analysis.

Remarks:

For use in RCRA monitoring sites when detecting a statistical significance in individual compliance wells, a large number of samples may be required to perform a suitable analysis. Pay attention to the required sample sizes on page 67 of the U.S. Navy 1999 Guidance.

ChemStat obtains r and k from Tables A11 and A13 in the U.S. Navy 1999 Guidance. Therefore, ChemStat can not calculate values of r and k for n and m that exceed the range of these tables. For intermediate values of n and m not listed in the table, ChemStat uses the next highest value of n and m for which there is a value in the table.

Also note that the Type I error rate of 0.01 or 0.05 is approximate. Tables A11 and A13 in the U.S. Navy 1999 Guidance Document provide precise Type I error rates.

4.4.10 Slippage Test

Description:

The Slippage test is provided in the U.S. Navy 1999 Guidance Document as a test to determine if compliance point measurements are statistically elevated when compared to background. It is a non-parametric test, and therefore a normal distribution is not required, and the test is suitable for any number of non-detects. In ChemStat, the test can be performed at the 99% or 95% confidence levels.

Use:

Use the Slippage test to determine if compliance measurements as a group are statistically elevated when compared to background as a group. The test can not be used to determine statistically elevated levels at individual monitoring points.

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[1] U.S. Navy 1999 Guidance uses the term "site" measurements for compliance measurements.

Implementation:

1. Let m equal the number of background measurements and n equal the number of compliance measurements[2], for a total of n + m measurements.

2. List from smallest to largest all pooled compliance and background measurements.

3. Determine the value of the largest **detected** background measurement. Ignore all non-detects in the background sample group.

4. Count the number, K, of **detected** compliance group measurements that are large than the largest background measurement. In making this determination, ignore all non-detects.

5. Using the values of n and m, and the specified Type I error rate of 0.01 or 0.05, refer to tables A9 or A10 in the U.S. Navy 1999 Guidance Document to determine the corresponding values for the critical value Kc. Note that Kc depends on m and n.

6. If K is larger than the critical value Kc, then there is evidence that the compliance group measurements are statistically elevated when compared to background.

Remarks:

The test is very simple to run, however it requires a large number of samples to provide sufficient power to be practical. Refer to the U.S. Navy 1999 Guidance Document for recommend numbers of samples.

4.4.11 Gehan's Test

Description:

Gehan's test is provided in the U.S. Navy 1999 Guidance Document as a test to determine if compliance point measurements are statistically elevated when compared to background. It is a non-parametric test, and therefore a normal distribution is not required, and the test is suitable for any number of non-detects. In ChemStat, the test can be performed at the 99% or 95% confidence levels.

Use:

Use Gehan's test to determine if compliance measurements as a group are statistically elevated when compared to background as a group. The test can not be used to determine statistically elevated levels at individual monitoring points.

Implementation:

1. Let m equal the number of background measurements and n equal the number of compliance measurements[3], for a total of n + m measurements. Let N = n + m, the total number of measurements.

2. List from smallest to largest all pooled compliance and background measurements.

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[2] U.S. Navy 1999 Guidance uses the term "site" measurements for compliance measurements.

[3] U.S. Navy 1999 Guidance uses the term "site" measurements for compliance measurements.

3. Each measurement will have a corresponding value d and e. Start the ranking procedure with d and e equal to 0. Starting with the smallest measurement, increment d by 1 if the value is detected, and increment e by 1 if the value is non-detect. Assign d and e to the corresponding value. Move to the next value and repeat. This will result in a d and e value for each measurement. Values of d and e will increase as the measurement increases. ChemStat will display the values of d and e. Refer to the U.S. Navy 1999 Guidance, page 82 for an example of this procedure.

4. Let T denote the total number of non-detects in the pooled background and compliance data sets.

5. For each of the N measurements, compute the rank R_i of the i^{th} measurement as follows:

Ri = di + (T + ei)/2 if measurement i is detected.
Ri = (T + 1 + di)/2 if measurement i is non-detect.

6. For each of the N measurements, compute the a(R) value using the formula:

$$a(R_i) = 2R_i - N - 1$$

for i = 1 to N.

7. Compute the Gehan statistic G.

$$G = \frac{\sum_{i=1}^{N}\left[h_i \cdot a(R_i)\right]}{\left\{m \cdot n \cdot \sum_{i=0}^{N} \frac{[a(R_i)]^2}{[N(N-1)]}\right\}^{1/2}}$$

8. Compare the Gehan statistic to $Z_{(1-\alpha)}$, the 100(1-α)th percentile of the standard normal distribution. If G ≥ Z, then statistical significance is indicated. Otherwise, there is insufficient evidence to determine statistical significance.

Remarks:

At least 10 measurements from compliance points and 10 measurements from background monitoring points are required to run this test.

4.4.12 Tarone-Ware Two-Sample Test for Censored Data

Description:

The Tarone-Ware Two-Sample test is a non-parametric test for comparing an individual compliance well to pooled background well data.

Use:

Use the Tarone-Ware test to compare individual compliance well data to pooled background data. The test is suitable for non-normally distributed data or data sets with a high percentage of non-detects. The test is a suitable alternative to the Wilcoxon rank-sum test. However, unlike the Wilcoxon test, this test does not use ranks and may therefore produce different outcome on log-transformed data or when non-detects are replaced with ½ of the detection limit.

Implementation:

Use the test to compare data from an individual compliance well to pooled background data for a single parameter.

1. Locate and sort the k **distinct detected** values and label these w_i through w_k. Note that w does not include non-detects. Because tied values are removed, the total k may be less than the total number of detected samples.

2. For each w, determine the following:

d_i = the number of **detected** samples equal to w_i.

n_i = the number of samples with detected measurements less than or equal to w_i plus the number of non-detects with detection limits less than or equal to w_i.

d_{i2} = the number of **detected** compliance well samples equal to w_i.

n_{i1} = the number of **background** samples with detected measurements less than or equal to w_i plus the number of **background** non-detects with detection limits less than or equal to w_i.

n_{i2} = the number of compliance well samples with detected measurements less than or equal to w_i plus the number of compliance well non-detects with detection limits less than or equal to w_i.

In other words, d represents detected measurements only and n represents all measurements. The subscript 1 represents background data and the subscript 2 represents compliance well data.

3. For I = 1 to k, compute the expected number of compliance point detections using the formula:

$$E_{i2} = \frac{d_i n_{i2}}{n_i}$$

4. Compute the variance of the number of compliance point detections using the formula:

$$V_{i2} = \frac{d_i(n_i - d_i)n_{i1}n_{i2}}{n_i^2(n_i - 1)}$$

5. Calculate the Tarone-Ware statistic (TW) using the following formula:

$$TW = \frac{\sum_{i=1}^{k} \sqrt{n_i}(d_{i2} - E_{i2})}{\sqrt{\sum_{i=1}^{k} n_i V_{i2}}}$$

6. Compare TW to the $Z_{(1-\alpha)}$, the 100(1-α)th percentile of the standard normal distribution. If TW $\geq$ Z, then statistical significance is indicated. Otherwise, there is insufficient evidence to determine statistical significance.

Remarks:

This test can be run at the 95% or 99% confidence levels. The Unified Guidance presents an example where the test is run at the 95% confidence level. However, 95% will likely results in an excessively high false positive rate. As an individual well comparison, 99% confidence is more appropriate.

4.5 Confidence Limit Tests

4.5.1 Parametric Confidence Interval MCL Test

Description:

The parametric Confidence Interval Test provides a method to compare the concentrations of parameters in a well to a comparison level such as a Maximum Contaminant Level (MCL) or Alternate Contaminant Level (ACL).

This method follows the procedures described in the USEPA 1989 document "Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities, Interim Final Guidance," page 6-3.

Use:

The Confidence interval is useful for intra-well comparisons. No background monitoring location is required. A comparison level such as an ACL/MCL must be provided for the parameter. For the parametric confidence interval, data should be normally distributed. If transformed data are used, the transformed data should follow a normal distribution, and the interval compared to the transformed comparison level. ChemStat will automatically transform the comparison level when transforming values.

Implementation:

The Confidence Interval is calculated for all monitoring locations for the parameter specified in the selection bar.

The Confidence Interval is calculated with the formula:

$$\overline{X} \pm t_{(0.99,n-1)} S/\sqrt{n}$$

ChemStat calculates the confidence interval at both the 95% and 99% levels of significance.

To determine statistical significance in the monitoring location, the lower boundary of the confidence interval is compared to the comparison level. If the lower boundary of the confidence interval exceeds the Comparison level, the monitoring location is considered to be statistically elevated when compared to the MCL/ACL.

Remarks:

The parametric confidence interval is presented in detail in the 1989 guidance, along with two example data sets, that are included with ChemStat.

The 1992 guidance indicates that confidence intervals should not be used to compare to an MCL because it is possible for samples to exceed the MCL, and yet the mean of confidence limit would still fall below the MCL, indicating no contamination, when in fact, regulatory limits had been exceeded. The 1992 guidance also points out that unlike tolerance intervals, confidence intervals do not indicate how often individual samples will exceed the MCL.

4.5.2 Non-Parametric Confidence Interval MCL Test

Description:

The non-parametric Confidence Interval Test provides a method to compare the concentrations of parameters in a well to a comparison level such as a Maximum Contaminant Level (MCL) or Alternate Contaminant Level (ACL).

This method follows the procedures described in the USEPA 1989 document "Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities, Interim Final Guidance," page 6-8.

Use:

The Non-Parametric Confidence Interval used to compare well measurements to a comparison level such as an MCL or ACL. Normality of data is not required and the test is suitable for a high percentage of non-detects.

Implementation:

ChemStat implements the non-parametric confidence interval as described in the USEPA 1989 Guidance Document beginning on page 6-8.

4.5.3 Land's Formula Confidence Interval MCL Test

Description:

The Land's Formula Confidence Interval MCL Test provides a method to compare the concentrations of parameters in a well to a comparison level such as a Maximum Contaminant Level (MCL) or Alternate Contaminant Level (ACL).

This method is presented in the USEPA document "Statistical Training Course for Ground Water Monitoring Data Analysis." The training course document is included as part of the USEPA 1992 statistical analysis guidance document.

Use:

The Confidence interval is useful for intra-well comparisons. No background monitoring location is required. A comparison level such as an ACL/MCL must be provided for the parameter. This procedure requires that data be natural log-transformed.

Implementation:

Land's formula is recommended for log-normally distributed data. The analysis should be performed on log-transformed data.

1. Calculate the mean (y) and standard deviation (s) for each monitoring location.

2. For the number of monitoring location observations (n), calculate H for the 95% lower confidence level. H is provided by Gilbert (1987) in tables A12 (for upper limit) and A13 (for lower limit). ChemStat uses linear interpolation to determine values of H(n, s). Note that Gilbert (1987) recommends cubic interpolation, so the ChemStat determination of H may be less precise than desired for some situations.

Valid ranges of s are 0.1 up to 10.0. Valid ranges for n are 3 up to and including 100. For s and n beyond these ranges, the calculations will fail.

For this analysis, ChemStat supports upper and lower confidence limits at the 95% confidence level, and two-tailed limits at the 90% confidence level.

3. Calculate the upper and lower confidence limits.

4. Calculate the natural log of the confidence limits on the mean.

$$UCL_{1-\alpha} = \overline{X} + 0.5s^2 + \left(\frac{s \cdot H_{1-\alpha}}{\sqrt{n-1}} \right)$$

$$LCL_{1-\alpha} = \overline{X} + 0.5s^2 + \left(\frac{s \cdot H_{\alpha}}{\sqrt{n-1}} \right)$$

where:
s = observation point standard deviation
n = number of measurements from the observation point
X = mean of observation point measurements

Note that for transformed data, the lower limit is also transformed. Valid ranges of s are 0.1 up to 10.0. Valid ranges for n are 3 up to and including 100. For s and n beyond these ranges, the calculations will fail.

4. Compare the limit to the comparison level (i.e. MCL). If data are transformed, the comparison will be made to the transformed comparison level.

- For a downward test, statistical significance is indicated if the LCL exceeds the comparison level.
- For an upward test, statistical significance is indicated if the UCL exceeds the comparison level.
- For a two-tailed test, statistical significance is indicated if either the UCL or LCL exceed the comparison level.

Remarks:

This method is presented in the USEPA 1992 Statistical Training Course Outline included with the 1992 guidance document. The 1992 guidance also states that confidence intervals should not be used to compare to an MCL because it is possible for samples to exceed the MCL, and yet the mean of confidence limit would still fall below the MCL, indicating no contamination, when in fact, regulatory limits had been exceeded. The 1992 guidance also points out that unlike tolerance intervals, confidence intervals do not indicate how often individual samples will exceed the MCL.

4.5.4 Land's Formula UCL Method (calculated from background)

Description:

The Land's Formula UCL Method is a lognormal test for calculation upper, lower, and two-tailed confidence limits from measured sample concentrations.

This method follows the implementation described in both:

- USEPA statistical guidance document "Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites."

- Gilbert (1987) page 170.

Use:

Use the Land's Formula UCL Method to calculate a 95% upper confidence limit from a collection of sample of environmental media collected at the site. The UCL is only calculated from sampling points listed as background. Compliance samples are not required, but if compliance samples do exists, each compliance sample concentration will be compared to the UCL. A statistically significant increase is indicated if the compliance sample concentration exceeds the UCL.

For this analysis, ChemStat supports upper and lower confidence limits at the 95% confidence level, and two-tailed limits at the 90% confidence level.

This method does not use MCLs or ACLs.

Implementation:

1. Let x_i represent the i^{th} concentration of n randomly collected samples measured at the site and characterized as background.

2. Natural log-transform the data set.

3. Compute the sample mean (of the log-transformed data).

$$\overline{X} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

4. Compute the sample standard deviation (of the log-transformed data).

$$s = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}\left(x_i - \overline{X}\right)^2}$$

5. Look up the H statistic for sample size n and the observed standard deviation of the log-transformed data. Tables are provided by Gilbert (1987) Tables A-10 and A-12.

5. Calculate the natural log of the confidence limits on the mean.

$$UCL_{1-\alpha} = \overline{X} + 0.5s^2 + \left(\frac{s \cdot H_{1-\alpha}}{\sqrt{n-1}}\right)$$

$$LCL_{1-\alpha} = \overline{X} + 0.5s^2 + \left(\frac{s \cdot H_\alpha}{\sqrt{n-1}} \right)$$

6. Statistical significance is indicated if a measured compliance concentration is greater than the UCL, or less than the LCL.

Remarks:

The method is designed for CERCLA compliant sampling programs. Unlike RCRA sampling which typically monitors the same sampling points for an extended period of time, this method is suitable for collections of samples taken at one point in time, but from many locations at the regulated site.

4.5.5 Student's t-test UCL Method

Description:

The Student's t-test UCL Method is provided in the USEPA statistical guidance document "Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites." The method is a parametric test for calculation upper confidence limits from measured sample concentrations.

Use:

Use the Student's t-test UCL method to calculate a 95% upper confidence limit from a collection of sample of environmental media collected at the site. The UCL is only calculated from sampling points listed as background. Compliance samples are not required, but if compliance samples do exists, each compliance sample concentration will be compared to the UCL. A statistically significant increase is indicated if the compliance sample concentration exceeds the UCL.

Implementation:

1. Let x_i represent the i^{th} concentration of n randomly collected samples measured at the site and characterized as background.

2. Compute the sample mean.

$$\overline{X} = \frac{1}{n} \sum_{i=1}^{n} x_i$$

3. Compute the sample standard deviation.

$$s = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}\left(x_i - \overline{X}\right)^2}$$

4. For the $\alpha = 0.05$ confidence level, and n-1 degrees of freedom, use a table to obtain the quantile of the Student's t distribution.

5. Calculate the one-sided ($1-\alpha$) upper confidence limit on the mean.

$$UCL_{1-\alpha} = \overline{X} + t_{\alpha,n-1} \cdot \left(\frac{s}{\sqrt{n}}\right)$$

Remarks:

The method is designed for CERCLA compliant sampling programs. Unlike RCRA sampling which typically monitors the same sampling points for an extended period of time, this method is suitable for collections of samples taken at one point in time, but from many locations at the regulated site.

4.5.6 Bootstrap Resampling UCL Method

Description:

The Bootstrap Resampling UCL Method is provided in the USEPA statistical guidance document "Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites." The method is a non-parametric test for calculation upper confidence limits from measured sample concentrations.

Use:

Use the Bootstrap Resampling UCL method to calculate a 95% upper confidence limit from a collection of sample of environmental media collected at the site. The UCL is only calculated from sampling points listed as background. Compliance samples are not required, but if compliance samples do exists, each compliance sample concentration will be compared to the UCL. A statistically significant increase is indicated if the compliance sample concentration exceeds the UCL.

Implementation:

1. Let x_i represent the i^{th} concentration of n randomly collected samples measured at the site and characterized as background.

2. Compute the sample mean.

$$\overline{X} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

3. Compute the sample standard deviation.

$$s = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}\left(x_i - \overline{X}\right)^2}$$

4. Compute the sample skewness.

$$k = \frac{n}{(n-1)(n-2)}\sum_{i=1}^{n}\left(\frac{x_i - \overline{X}}{s}\right)^3$$

5. For b = 1 to B (a very large number, 20000 in ChemStat), do the following:

5a. Generate a bootstrap sample data set; i.e. for i = 1 to n, let j be a random integer between 1 and n, and add observation Xj to the bootstrap sample data set.

5b. Compute the arithmetic mean, standard deviation, and skewness of the bootstrap data set b.

5c. Compute the studentized mean W.

$$W_b = \left(\overline{X}_b - \overline{X}\right)/s_b$$

5d. Compute Hall's statistic Q.

$$Q_b = W_b + \left(\frac{k_b W_b^2}{3}\right) + \left(\frac{k_b^2 W_b^2}{27}\right) + \left(\frac{k_b}{6n}\right)$$

6. Sort all of the Q values from step 5 and select the lower α^{th} quantile of these B values. It is the $(\alpha B)^{th}$ value in an ascending list of Q's. This value is from the left tail of the distribution.

7. Compute W(Q).

$$W(Q_\alpha) = \frac{3}{k}\left[\left[1 + k\left(Q_\alpha - \frac{k}{6n}\right)\right]^{1/3} - 1\right]$$

5. Calculate the one-sided (1-α) upper confidence limit on the mean.

$$\mathrm{UCL}_{1-\alpha} = \overline{\mathrm{X}} - \mathrm{W}(\mathrm{Q}_\alpha)\mathrm{s}$$

Remarks:

The method is designed for CERCLA compliant sampling programs. Unlike RCRA sampling which typically monitors the same sampling points for an extended period of time, this method is suitable for collections of samples taken at one point in time, but from many locations at the regulated site.

ChemStat runs the random sampling analysis for 20,000 iterations. Because the Bootstrap Resampling procedure depends on random sampling, the UCL may differ each time the analysis is performed.

4.5.7 Jackknife Procedure UCL Method

Description:

The Jackknife Procedure UCL Method is provided in the USEPA statistical guidance document "Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites." The method is a non-parametric test for calculation upper confidence limits from measured sample concentrations.

Use:

Use the Jackknife Procedure UCL method to calculate a 95% upper confidence limit from a collection of sample of environmental media collected at the site. The UCL is only calculated from sampling points listed as background. Compliance samples are not required, but if compliance samples do exists, each compliance sample concentration will be compared to the UCL. A statistically significant increase is indicated if the compliance sample concentration exceeds the UCL.

Implementation:

The implementation of the Jackknife procedure follows that described in the software documentation for the USEPA's ProUCL software. This documentation is included on the ChemStat CD.

1. Let x_i represent the i^{th} concentration of n randomly collected samples measured at the site and characterized as background.

2. Compute the sample mean.

$$\overline{\mathrm{X}} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

3. Calculate n mean values Θ_i by calculating the mean of the data set with the i^{th} value omitted. Then calculate $\widetilde{\Theta}$ as the mean of the n Θ_i values.

4. Calculate the n "psuedo values" J.

$$J_i = n\overline{X} - (n-1)\Theta_i$$

5. Calculate the Jackknife Estimator (JE) of Θ.

$$JE = \frac{1}{n}\sum_{i=1}^{n} J_i$$

6. Calculate the standard error of the Jackknife Estimator.

$$SE = \sqrt{\frac{1}{n(n-1)}\sum_{i=1}^{n}(J_i - JE)^2}$$

7. For the $\alpha = 0.05$ confidence level, and n-1 degrees of freedom, use a table to obtain t, the quantile of the Student's t distribution.

8. Calculate the one-sided (1-α) upper confidence limit on the mean.

$$UCL_{1-\alpha} = JE + t_{\alpha,n-1} \cdot SE$$

Remarks:

The method is designed for CERCLA compliant sampling programs. Unlike RCRA sampling which typically monitors the same sampling points for an extended period of time, this method is suitable for collections of samples taken at one point in time, but from many locations at the regulated site.

4.5.8 Central Limit Theorem UCL Method

Description:

The Central Limit Theorem UCL Method is provided in the USEPA statistical guidance document "Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites." The method is a non-parametric test for calculation upper confidence limits from measured sample concentrations.

Use:

Use the Central Limit Theorem UCL method to calculate a 95% upper confidence limit from a collection of sample of environmental media collected at the site. The UCL is only calculated from sampling points listed as background. Compliance samples are not required, but if compliance samples do exists, each compliance sample concentration will be compared to the UCL. A statistically significant increase is indicated if the compliance sample concentration exceeds the UCL.

The Central Limit Theorem is suitable for non-parametric distributions provided that there are a large number of samples.

Implementation:

1. Let x_i represent the i^{th} concentration of n randomly collected samples measured at the site and characterized as background.

2. Compute the sample mean.

$$\overline{X} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

3. Compute the sample standard deviation.

$$s = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}\left(x_i - \overline{X}\right)^2}$$

4. Compute the sample skewness.

$$\beta = \frac{n}{(n-1)(n-2)}\sum_{i=1}^{n}\left(\frac{x_i - \overline{X}}{s}\right)^3$$

5. From a table of values, obtain Zα, the $(1-\alpha)^{th}$ quantile of the standard normal distribution. For the 95% confidence level, $Z\alpha = 1.645$.

6. Calculate the one-sided $(1-\alpha)$ upper confidence limit on the mean.

$$UCL_{1-\alpha} = \overline{X} + \left(z_\alpha + \frac{\beta}{6\sqrt{n}}\left(1 + 2z_\alpha^2\right)\right) \cdot \frac{s}{\sqrt{n}}$$

Remarks:

The method is designed for CERCLA compliant sampling programs. Unlike RCRA sampling which typically monitors the same sampling points for an extended period of time, this method is suitable for collections of samples taken at one point in time, but from many locations at the regulated site.

4.5.9 Chebyshev Inequality Non-Parametric UCL Method

Description:

The Chebyshev Inequality UCL Method is provided in the USEPA statistical guidance document "Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites." The method is a non-parametric test for calculation upper confidence limits from measured sample concentrations.

Use:

Use the Chebyshev Inequality UCL method to calculate a 95% upper confidence limit from a collection of sample of environmental media collected at the site. The UCL is only calculated from sampling points listed as background. Compliance samples are not required, but if compliance samples do exists, each compliance sample concentration will be compared to the UCL. A statistically significant increase is indicated if the compliance sample concentration exceeds the UCL.

Implementation:

1. Let x_i represent the i^{th} concentration of n randomly collected samples measured at the site and characterized as background.

2. Compute the sample mean.

$$\overline{X} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

3. Compute the sample standard deviation.

$$s = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}\left(x_i - \overline{X}\right)^2}$$

4. Calculate the one-sided $(1-\alpha)$ upper confidence limit on the mean.

$$\mathrm{UCL}_{1-\alpha} = \overline{X} + \sqrt{\frac{1}{\alpha} - 1} \cdot \left(\frac{s}{\sqrt{n}} \right)$$

Remarks:

The method is designed for CERCLA compliant sampling programs. Unlike RCRA sampling which typically monitors the same sampling points for an extended period of time, this method is suitable for collections of samples taken at one point in time, but from many locations at the regulated site.

4.6 Distribution Testing

4.6.1 Levene's Test of Equal Variance

Description:

Levene's test is an analytical method recommended in the 1992 guidance to test for homogeneity of variance. The 1992 guidance states that the advantage of Levene's test is that unlike Bartlett's test, it is not sensitive to non-normality in the data.

Use:

Used to test homogeneity of variance between wells.

Implementation:

1. For each sample, compute the absolute value of the residual z.

$$z_{ij} = \left| x_{ij} - \overline{x}_i \right|$$

where:

x_{ij} = the j^th^ value from the i^th^ well

$\overline{x}_i$ = the i^th^ well mean

2. Run a standard one-way analysis of variance on the variable z. If the F-test is significant, reject the hypothesis of equal group variances.

4.6.2 Bartlett's Test for Equal Variance

Description:

Bartlett's test is a test for equal variance among the distribution from each individual well. It is assumed for Bartlett's test that data follow a normal distribution. Box Plots and Levene's test are additional methods to test for equal variance among the distribution from each individual well.

Use:

To test for equal variance between the wells.

Implementation:

1. Compute the sample variance for each of k wells. The sample variance is the square of the sample standard deviation.

$$\sigma^2 = \sum_{i=1}^{n} \left(x_i - \overline{x}\right) / \left(n - 1\right)$$

where:

x = the sample value

n = the number of samples at the well

2. Compute the test statistic.

$$\chi^2 = f \cdot \ln\left(\sigma_p^2\right) - \sum_{i=1}^{k} f_i \cdot \ln\left(\sigma_i^2\right)$$

where:

$$f = \sum_{i=1}^{k} f_i = \left(\sum_{i=1}^{k} n_i \right) - k$$

and:

$f_i = n_i - 1$ = the degrees of freedom

so that f is the total sample size minus the number of wells and:

$\sigma_p^2 = \frac{1}{f}\sum_{i=1}^{k} f_i\sigma_i^2$ is the pooled variance across all wells.

3. Using a Chi-Squared table (Table 1, Appendix B in the 1989 guidance), find the critical value for χ^2 with (k-1) degrees of freedom at the predetermined significance level of 5%.

If the calculated χ^2 is greater than the tabulated value, conclude that the wells do not have equal variance at the specified significance level.

Remarks:

Bartlett's test is presented in the 1989 guidance. The 1992 guidance recommends Levene's test and Box Plots as methods to test for equal variance that are less sensitive to non-normality in the data.

4.6.3 Shapiro-Wilks Test of Normality

Fewer than 50 Measurements

Description:

The Shapiro-Wilks method tests normal distribution of the data. The 1992 guidance document recommends this as the preferred test for normality in data sets with fewer than 50 measurements.

In ChemStat's implementation, the Shapiro-Wilks test can test the normality of data for any parameter for a selected monitoring location, for all background monitoring locations, for all compliance monitoring locations, and for all monitoring locations. Select the monitoring location group from the right-click menu. The selected group should contain fewer than 50 measurement values.

The Shapiro-Wilks test can also be used to test for normality of the residuals. From the normality sub-menu on the right-click menu, select *Residuals* to test the residuals. Select *Data* to test the actual parameter concentrations for normality.

Use:

To test for normality in data sets with fewer than 50 measurements. The test can be performed on the selected monitoring location, all compliance monitoring locations, all background monitoring locations, or all monitoring locations.

Implementation:

1. For n total measurements, create a table of the data. Order the data from smallest to largest in the first column (X_i), and in reverse order in the second column (X_{n-i+1}).

2. The third column is the value of column 2 minus column 1.

3. For n measurements, compute k as the greatest integer less than or equal to n/2.

4. In the fourth column, list the coefficients a_{n-i+1}, obtained from Table A-1 in the 1992 USEPA guidance document.

5. The fifth column contains the values in column 3 multiplied by the values in column 4, and represented as b. The value b is the sum of the first k b values.

$$b = \sum_{i=1}^{k}\left[\left(x_{n-i+1} - x_i\right)\cdot a_{n-i+1}\right] = \sum_{i=1}^{k} b_i$$

6. Compute the standard deviation σ of the data set distribution.

7. Calculate the W statistic.

$$W = \left[\frac{b}{\sigma\sqrt{n-1}}\right]^2$$

8. Compare the W statistic to the 5% critical value for sample size n in Table A-2 in the 1992 guidance. If W exceeds the critical value, the distribution is not normally distributed.

Remarks:

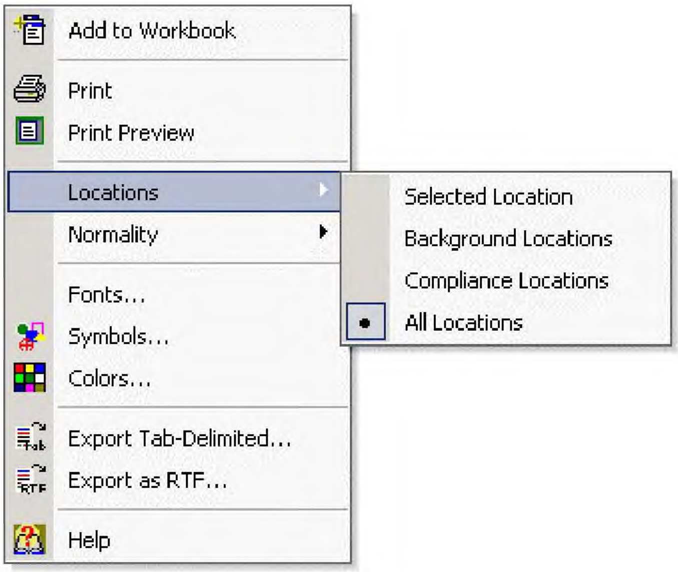
This test uses values determined from tables based on the number of measurements. Because the tables accommodate only up to 50 measurements, this test can not be used for data sets with greater than 50 measurements.

4.6.4 Shapiro-Francia Test of Normality

Description:

The Shapiro-Francia method tests for normal distribution of the data. The 1992 guidance document recommends this as the preferred test for normality in data sets with greater than 50 measurements.

In ChemStat's implementation, the Shapiro-Francia test can test the normality of data for any parameter for a selected monitoring location, for all background monitoring locations, for all compliance monitoring locations, and for all monitoring locations. Select the monitoring location group from the right-click menu. The selected group should contain at least 50 measurements. Use the right-mouse-click context menu to select the monitoring location group (shown right).



The Shapiro-Francia test can also be used to test for normality of the residuals. From the normality sub-menu on the right-click menu, select *Residuals* to test the residuals. Select *Data* to test the actual parameter concentrations for normality.

Use:

To test for normality in data sets with greater than 50 measurements. The test can be performed on the selected monitoring location, all compliance monitoring locations, all background monitoring locations, or all monitoring locations.

Implementation:

1. For n total measurements, order the data (X_i) from smallest to largest.

2. For the Shapiro-Francia analysis, calculate the W statistic with the formula:

$$W = \frac{\left[\sum_{i=1}^{n} m_i x_i |\right]^2}{(n-1)SD^2 \sum_{i=1}^{n} m_i^2}$$

where:

n = total number of measurements

x_i = the i^{th} ordered value

SD = the data set standard deviation

and m is given by the equation:

$$m_i = \Phi^{-1}\left(\frac{i}{n+1}\right)$$

where:

Φ^{-1} = the inverse of the standard normal distribution with zero mean and unit variance.

3. Compare the W statistic to the 5% and 1% critical value for data set size n in Table A-3 in the 1992 guidance. If W is too low when compared to the critical value, the distribution is not normally distributed.

Remarks:

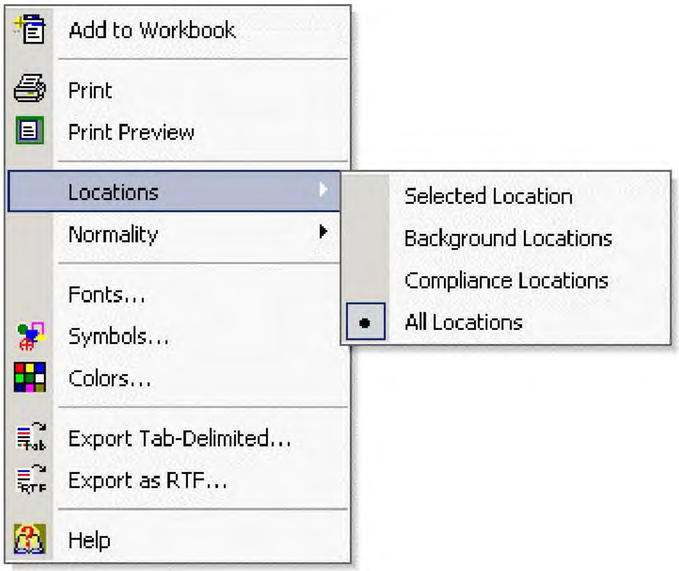
The computer implementation supports a maximum of 2000 measurements. Table A-3 in the 1992 guidance provides values only up to n = 99. The original Shapiro-Francia publication also provided tables for n up to 99. For n larger than 99, the value for n = 99 is used.

4.6.5 D'Agostino's Test of Normality

Description:

The D'Agostino test of normality is presented by various references as a suitable test for normality for 50 to 1000 measurements.

In ChemStat's implementation, the D'Agostino test can test the normality of data for any parameter for a selected monitoring location, for all background monitoring locations, for all compliance monitoring locations, and for all monitoring locations. Select the monitoring location group from the right-click menu. The selected group should contain at least 50 measurements. Use the right-mouse-click context menu to select the monitoring location group



D'Agostino's test can also be used to test for normality of the residuals. From the normality sub-menu on the right-click menu (shown right), select *Residuals* to test the residuals. Select *Data* to test the actual parameter concentrations for normality.

Use:

To test for normality in data sets with 50 to 1000 measurements. The test can be performed on the selected monitoring location, all compliance monitoring locations, all background monitoring locations, or all monitoring locations.

Implementation:

1. Rank the n measurements from lowest to highest.

2. Calculate the D'Agostino statistic (D) with the formula:

$$D = \frac{\sum_{i=1}^{n}\left[\left(i - \frac{n+1}{2}\right) \cdot x_i\right]}{n^2 s}$$

where:

x_i = the ith measurement value

s = standard deviation of the data set

3. Compute the significance statistic (Y) with the formula:

$$Y = \frac{D - 0.28209479}{0.02998598 / \sqrt{n}}$$

4. Compare the significance statistic with critical values provided by D'Agostino (1971) for both 95% and 99% levels of significance. If Y lies outside the maximum and minimum values, the assumption of normality should be rejected.

4.6.6 Coefficient of Variation Test of Normality

Description:

The coefficient of variation is an analytical method used to test the normal distribution of the data. The Coefficient of variation is the sample standard deviation divided by the sample mean. If the CV is less than 1, the distribution is considered normally distributed.

ChemStat implements the coefficient of variation for all monitoring locations for the selected parameter. The distribution for each individual monitoring location is tested for normality. Also tested is the pooled data for all monitoring locations.

Use:

Use to test for normality or transformed-normality. The Coefficient of variation in fast and easy, but may not be as reliable as other methods.

Implementation:

1. For each sample distribution (each well individually, and all wells pooled), calculate the mean and standard deviation.

$$\mu = \frac{\left(\sum_{i=1}^{n} x_i\right)}{n}$$

$$\sigma = \left[\sum_{n=1}^{n} \frac{(x_i - \bar{x})}{(n-1)}\right]^{1/2}$$

where:

μ = data set mean

σ = data set standard deviation

n = Number of measurements in the data set

x_i = the value of the ith measurement

2. Calculate the coefficient of variation (CV).

$$CV = \sigma / \mu$$

3. If CV > 1 the distribution is not normally distributed.

Remarks:

The 1992 guidance recommends the Shapiro-Wilks test and the Shapiro-Francia tests as superior alternatives to the coefficient of variation.

4.6.7 Skewness Coefficient

Description:

As described by USEPA (1992) The Skewness Coefficient indicates to what degree data are skewed or asymmetric with respect to the mean. Data from a normal distribution will have a skewness coefficient of 0, while asymmetric data will have a positive or negative skewness on whether the right- or left-hand tail of the distribution is longer or skinnier than the opposite tail.

Excessively skewed data may not be suitable for parametric analyses. ChemStat calculates the Skewness Coefficient for each monitoring location for the selected parameter.

Use:

To test for skewness of the data.

Implementation:

1. The skewness coefficient is calculated with the formula:

$$\gamma = \frac{\frac{1}{n}\sum_{i}^{n}\left(x_i - \overline{x}\right)^3}{\left(\frac{n-1}{n}\right)^{3/2}(SD)^3}$$

where:

n = the total number of measurements

SD = the data set standard deviation

$\overline{X}_i$ = the ith monitoring location mean

X_i = the value of the ith measurement

2. If the skewness coefficient is greater than 1, the data should be considered positively skewed. If the skewness coefficient is less than 1, the data should be considered negatively skewed.

4.6.8. Kurtosis Analysis

Description:

Kurtosis, or fourth moment about the mean, is used to quantify the "peakedness" of data. A positive Kurtosis value indicates a sharp peak or node in the distribution. This is also referred to as *leptokurtic*. A negative Kurtosis value indicates a flattened or plateau-like distribution. This is also referred to as *platykurtic*.

Use:

Use to determine the "peakedness" of a distribution.

Implementation:

The equation for kurtosis is:

$$\frac{n(n+1)}{(n-1)(n-2)(n-3)}\sum_{i=1}^{n}\left[\frac{\left(x_i-\overline{x}\right)^4}{\sigma^4}\right]-\frac{3(n-1)^2}{(n-2)(n-3)}$$

where:

n = number of measurements

x_i = individual measurement value

σ = standard deviation of the data set

$\overline{x}$ = mean of all measurements

Remarks:

Press et al. (1992) recommend against the use of Kurtosis measurements in statistical evaluations.

4.7 Outlier Testing

4.7.1 Dixon's Test for Outliers

Description:

Dixon's test provides a method of screening for outlier concentrations for data sets with 25 or fewer measurements. The method is iterative. In each iteration of the test, the highest or lowest outlier value is revealed. The next iteration is performed on the remaining values. Iterations continue until no data are shown to be outliers.

In each iteration, the highest and lowest critical values are calculated using a formula selected based on the number of data not yet shown to be outliers. These formulas are provided by Gibbons (1994). The critical value is then compared to tabulated comparison values based on the number of measurements now yet shown to be outliers, and the level of significance.

In ChemStat's implementation, Dixon's test can be performed on all wells, all compliance wells, all background wells, or the selected well. This option is available from the right-click menu accessed over the Dixon's test window. Remember that the total number of measurements screened can not exceed 25. Use Rosner's test for greater than 25 measurements.

ChemStat performs Dixon's test at either the 1% or 5% levels of significance. This option is selected from the right-click menu accessed over the Dixon's test window.

Use:

As a method of screening for outlier concentrations for data sets with 25 or fewer measurements.

4.7.2 Rosner's Test for Outliers

Description:

Rosner's test is a procedure for detecting up to 10 outliers in data sets with 25 or more measurements. The data (or transformed data) must follow a normal distribution. A strength of the procedure is that it detects outliers that may be masked by other outliers.

The ChemStat implementation follows the procedure described by Gilbert (1987). For the selected parameter, the test can be performed on samples from a single well, all compliance well, all background wells, or all wells. The test can be performed at either the 5% or 1% levels of significance.

Rosner's test is two-tailed meaning it will detect either suspiciously large or suspiciously small data.

Use:

For detecting up to 10 outliers in normally or lognormally distributed data sets with 25 or more measurements.

Implementation:

Rosner's test is an iterative procedure. Iterations proceed from i = 9 down to i = 0. Each iteration i is designed to detect i+1 outliers. For example, if i = 9, and outliers are detected, then there are 10 outliers and the test ends. Otherwise proceed to i = 8 to detect 9 outliers. Continue with iterations until outliers are detected or until i = 0. If i = 0 and no outliers were detected, conclude that the data contain no outliers.

1. Arrange the data by order of the magnitude of the distance of each data from the mean.
2. Begin iterations from i = 9 down to i = 0. If outliers are detected, the test stops.
3. Calculate the mean and standard deviation of the data excluding the i most extreme values.
4. Calculate Rosner's statistic:

$$R_{i+1} = \frac{\left| x^{(i)} - \overline{x}^{(i)} \right|}{s^{(i)}}$$

where:

$x^{(i)}$ = the most outlying measurements (farthest from the mean) remaining in the data after the i most extreme data have been removed.

$\overline{x}^{(i)}$ = the mean of the data after i most extreme data have been removed.

$s^{(i)}$ = the standard deviation of the data after i most extreme data have been removed.

5. Obtain the value λ_{i+1} from Table A16 in Gilbert (1987). ChemStat uses linear interpolation to obtain values not listed in the table.

6. If (R > λ) then there are i+1 outliers in the data. Otherwise, proceed to i = i - 1 and repeat the test. If i = 0 and no outliers have been detected, conclude that the data contain no outliers.

4.7.3 Discordance Outlier Test

Description:

The Discordance Outlier test is a relatively simple outlier test presented in USEPA (2000). The test can only determine if the highest value in a data set is an outlier. After removal of the outlier, data must be normally distributed (or transformed to a normal distribution) for the test to be appropriate.

Implementation:

1. Sort the n measurements from smallest to largest.
2. Compute the data set mean and standard deviation.
3. Compute the test statistic D.

$$D = \frac{x_n - \overline{x}}{s}$$

where:

x_n = the largest measurement in the data set

$\overline{x}$ = the mean of the data set

s =s the standard deviation of the data set

4. Compare D to the critical value from table A-4 in USEPA (2000). If D exceeds the critical value, then X_n is an outlier.

Remarks:

At least 3 measurements are required for this test. Lookup tables provide critical values for up to 50 measurements. For data sets with greater than 50 measurements, the critical value for 50 measurements is used as a close approximation.

ChemStat can perform this test at either the 99% or 95% confidence levels.

4.8 Other Methods

4.8.1 Two-Sample Test of Proportions

Description:

The Two-Sample Test of Proportions is a non-parametric test is provided in the U.S. Navy 1999 Guidance Document as a test to determine compliance location observations are statistically elevated when compared to background and to a compliance limit such as MCL or site-specific action limit. The test is non-parametric, so it is suitable for non-normally distributed data and for a significant number of non-detects. In ChemStat, the test can be performed at the 99%, 97.5%, 95%, or 90% confidence levels.

Use:

Use the Two-Sample Test of Proportions to determine if site contamination exceed a specified action level such as an MCL.

Implementation:

1. For the selected parameter, be sure to specify a compliance limit from *Options* | *Compliance Levels*.

2. Let m = the number of background measurements and n equal the number of compliance measurements.

3. Let Ks and Kb equal the number of compliance and background measurements respectively, that exceed the compliance limit.

4. Compute the proportions:

$p_s = \frac{k_s}{n}$ = the proportions of compliance measurements that exceed the compliance limit.

$p_b = \frac{k_b}{m}$ = the proportions of background measurements that exceed the compliance limit.

$p = \frac{k_s + k_b}{n + m}$ = the proportions of total measurements that exceed the compliance limit.

5. Compute the test statistic.

$$Z_p = \frac{(p_s - p_b)}{\sqrt{p(1-p)\left(\frac{1}{n} + \frac{1}{m}\right)}}$$

6. Use Table A.1 from U.S. Navy (1999) to obtain the critical value $Z_{1-\alpha}$, the percentile of the standard normal distribution.

7. If $Z_p \geq Z_{1-\alpha}$, then statistical significance is indicated, meaning that a true proportion of compliance measurements exceed the compliance limit. Otherwise, there is no enough data to conclude that a true proportion of compliance measurements exceed the compliance limit.

Remarks:

If any of the following values are less than 5.0, U.S. Navy recommends seeking assistance from a statistician.

np_s mp_b $n(1-p_s)$ $m(1-p_b)$

4.8.2 Mann-Kendall Trend Analysis

Description:

The Mann-Kendall trend analysis is provided by Gilbert (1987) as a non-parametric test for trends in data over time. The test is suitable for data that do not follow a normal distribution, and supports multiple observations per time period. There is no physical limit on the data set size. Only testing of individual monitoring locations for trends is supported. Testing groups of monitoring locations is not supported. The test is performed at a confidence level selected by the user.

Use:

To detect the presence of an upward, downward, or two-tailed trend in data over time.

Implementation:

The implementation of the Mann-Kendall test is based on that provided by Gilbert (1987). The Mann-Kendall analysis tests the null hypothesis of no trend against the alternative hypothesis of an upward, downward, or two-tailed trend.

Given:
n = the number of measurements for the monitoring location
x_i = is the i^{th} measurement at the monitoring location

1. List the data in the order in which they were collected over time.

2. Determine the sign of all n(n-1)/2 possible differences $(x_j - x_k)$ where j > k. These differences are $x_2 - x_1, x_3 - x_1, \ldots, x_n - x_1, x_3 - x_2, x_4 - x_2, \ldots, x_n - x_{n-2}, x_n - x_{n-1}$.

3. Let $\mathrm{sgn}(x_j - x_k)$ be an indicator function that takes on the values 1, 0, or -1, according to the sign of $x_j - x_k$.

$$\mathrm{Sgn}(x_j - x_k) \quad \begin{aligned} &= 1 \text{ if } (x_j - x_k) > 0 \\ &= 0 \text{ if } (x_j - x_k) = 0 \\ &= -1 \text{ if } (x_j - x_k) < 0 \end{aligned}$$

4. Compute the Mann-Kendall Statistic S.

$$S = \sum_{k=1}^{n-1} \sum_{j=k+1}^{n} \mathrm{sgn}(x_j - x_k)$$

which is the number of positive differences minus the number of negative differences.

5. If there are 10 or fewer observations for the selected monitoring location, **and** if there are not multiple observations per time period, then refer to Gilbert (1987) Table A-18 to obtain the probability of obtaining a value of S for n observations. If the tabled probability is greater than your specified a level, then accept the null hypothesis that there is no trend to the data. If the tabled probability is less than your specified a level, then the test shows evidence of a trend and the null hypothesis should be rejected.

6. If there are greater than 10 observations, or there are multiple observations per time period, proceed with the analysis using the normal approximation described below:

7. Group all data with tied concentrations regardless of the time period.

8. Calculate **VAR(S)** using the following formulas:

$$\mathrm{VAR}(S) = \frac{1}{18}\left[a - A - B + \frac{C \cdot D}{b} + \frac{E \cdot F}{c}\right]$$

where:

$$A = \sum_{p=1}^{g} t_p\left(t_p - 1\right)\left(2t_p + 5\right)$$

$$B = \sum_{q=1}^{h} u_q\left(u_q - 1\right)\left(2u_q + 5\right)$$

$$C = \sum_{p=1}^{q} t_p\left(t_p - 1\right)\left(t_p - 2\right)$$

$$D = \sum_{q=1}^{h} u_q\left(u_q - 1\right)\left(u_q - 2\right)$$

$$E = \sum_{p=1}^{g} t_p\left(t_p - 1\right)$$

$$F = \sum_{q=1}^{h} u_q\left(u_q - 1\right)$$

$$a = n\left(n - 1\right)\left(2n + 5\right)$$

$$b = 9n\left(n - 1\right)\left(n - 2\right)$$

$$c = 2n\left(n - 1\right)$$

and:

g = the number of tied groups. These are groups of data with equal concentrations.

t_p = the number of tied observations in the p^{th} group of tied observations.

h = the number of time periods that contain multiple observations

u_q = the number of observations in the q^{th} time period

9. Calculate the test statistic Z

$$Z = \frac{S-1}{\left[\mathrm{VAR(S)}\right]^{1/2}} \qquad \text{if } S > 0$$

$$= 0 \qquad \text{if } S = 0$$

$$= \frac{S+1}{\left[\mathrm{VAR(S)}\right]^{1/2}} \qquad \text{if } S < 0$$

10. Compare the test statistic Z to the percentile of the standard normal distribution for the selected confidence level. If Z exceeds the percentile of the standard normal distribution, then there is evidence of a trend, and the null hypothesis should be rejected. Otherwise accept the null hypothesis that there is no trend.

Remarks:

ChemStat supports this test for tied values, and multiple observations per time period. Analyzing data from multiple wells simultaneously is not supported.

4.8.3 Sen's Non-Parametric Estimator of Slope

Description:

Sen's non-parametric estimator of slope is a method of estimating the true slope (change in concentration over time) of the data. If the data show an upward slope, there is evidence of an upward trend. Because this method is non-parametric, it is suitable for a high percentage of non-detects and is not significantly affected by outliers.

Use:

To estimate the change in concentration over time to detect an upward or downward trend.

Implementation:

1. Compute the N' slope estimates Q for the monitoring location.

$$Q = \frac{x_j - x_k}{j - k}$$

where:
x_j and x_k are parameter concentrations at time j and k respectively
j > k
N' is the number of data points for which J > k

2. Calculate Sen's Estimator. Sen's Estimator is the median of the Q values calculated in step 1.

3. Using the desired confidence interval = 100(1-α)%, obtain the percentile of the standard normal distribution Z for the selected α.

4. Compute **VAR(S)** with the following formulas:

$$VAR(S) = \frac{1}{18}\left[a - A - B + \frac{C \cdot D}{b} + \frac{E \cdot F}{c}\right]$$

where:

$$A = \sum_{p=1}^{g} t_p\left(t_p - 1\right)\left(2t_p + 5\right)$$

$$B = \sum_{q=1}^{h} u_q(u_q - 1)(2u_q + 5)$$

$$C = \sum_{p=1}^{q} t_p(t_p - 1)(t_p - 2)$$

$$D = \sum_{q=1}^{h} u_q(u_q - 1)(u_q - 2)$$

$$E = \sum_{p=1}^{g} t_p(t_p - 1)$$

$$F = \sum_{q=1}^{h} u_q(u_q - 1)$$

$$a = n(n - 1)(2n + 5)$$

$$b = 9n(n - 1)(n - 2)$$

$$c = 2n(n - 1)$$

and:

g = the number of tied groups. These are groups of data with equal concentrations.

t_p = the number of tied observations in the pth group of tied observations.

h = the number of time periods that contain multiple observations

u_q = the number of observations in the qth time period

5. Compute $C\alpha$ using the formula:

$$C_{\alpha} = Z_{1-\alpha/2}\sqrt{VAR(S)}$$

6. Compute M_1 and M_2 using the following formulas:

$$M_1 = \left(N' - C_{\alpha}\right)/2$$

$$M_2 = \left(N' + C_{\alpha}\right)/2$$

The lower and upper limits of the confidence interval are the M_1th and (M_2+1)th largest of the N' ordered slope estimates, respectively.

7. Interpret the results. If the lower confidence limit is greater than 0, there is evidence of an upward trend in data. If the upper confidence limit is below 0, there is evidence of a downward trend in data.

Remarks:

ChemStat supports this test for tied values, and multiple observations per time period. Analyzing data from multiple monitoring locations in a single analysis is not supported.

4.8.4 Seasonal Kendall Test

Description:

Gilbert (1987) provides the Seasonal Kendall Test to detect seasonal trends in data. The method is a variation of the Mann-Kendall trend analysis. In ChemStat, seasons can be defined from *Options* | *Trend Analysis Options*. By default, there are four seasons per year and the first season begins on January 1.

Use:

To detect seasonal trends in data.

Implementation:

The implementation is very similar to the Mann-Kendall trend analysis. However, only the season in which the sample was take is considered, not the actual date. The implementation of the Seasonal Kendall test is based on that provided by Gilbert (1987). The Seasonal Kendall analysis tests the null hypothesis of no seasonal trend against the alternative hypothesis of a trend.

Given:
n = the number of measurements for the well in season i
x_i = is the i^{th} measurement at the well in season i
L = the total number of years of data

K = the number of seasons per year

1. For the each season, group all samples from the selected well by season and year in which they were collected. The actual date of sample collection is not considered in the calculations. Only the season and year are considered. **All samples collected in the same season of the same year are considered to be in the same time period.**

2. Determine the sign of all n(n-1)/2 possible differences ($x_j - x_k$) where j > k. These differences are $x_2 - x_1$, $x_3 - x_1$, . . ., $x_n - x_1$, $x_3 - x_2$, $x_4 - x_2$, . . . , $x_n - x_{n-2}$, $x_n - x_{n-1}$, and x is always in season i.

3. Let sgn($x_j - x_k$) be an indicator function that takes on the values 1, 0, or -1, according to the sign of $x_j - x_k$.

$$\mathrm{Sgn}(x_j - x_k) \quad \begin{aligned} &= 1 \text{ if } (x_j - x_k) > 0 \\ &= 0 \text{ if } (x_j - x_k) = 0 \\ &= -1 \text{ if } (x_j - x_k) < 0 \end{aligned}$$

where each x is for the i^{th} season.

4. Compute the Mann-Kendall Statistic S_i for season i.

$$S_i = \sum_{k=1}^{n_i-1} \sum_{j=k+1}^{n_i} \mathrm{sgn}\left(x_{ij} - x_{ik}\right)$$

which is the number of positive differences minus the number of negative differences.

5. Group all data with tied concentrations regardless of the time period.

6. Calculate **VAR(S_i)** using the following formulas:

$$\mathrm{VAR}(S_i) = \frac{1}{18}\left[a_i - A_i - B_i + \frac{C_i \cdot D_i}{b_i} + \frac{E_i \cdot F_i}{c_i}\right]$$

where:

$$A_i = \sum_{p=1}^{g_i} t_{ip}\left(t_{ip} - 1\right)\left(2t_{ip} + 5\right)$$

$$B_i = \sum_{q=1}^{h_i} u_{iq}\left(u_{iq} - 1\right)\left(2u_{iq} + 5\right)$$

$$C_i = \sum_{p=1}^{q_i} t_{ip}\left(t_{ip} - 1\right)\left(t_{ip} - 2\right)$$

$$D_i = \sum_{q=1}^{h_i} u_{iq}\left(u_{iq} - 1\right)\left(u_{iq} - 2\right)$$

$$E_i = \sum_{p=1}^{g_i} t_{ip}\left(t_{ip} - 1\right)$$

$$F_i = \sum_{q=1}^{h_i} u_{iq}\left(u_{iq} - 1\right)$$

$$a_i = n_i\left(n_i - 1\right)\left(2n_i + 5\right)$$

$$b_i = 9n_i\left(n_i - 1\right)\left(n_i - 2\right)$$

$$c_i = 2n_i\left(n_i - 1\right)$$

and:

g_i = the number of tied groups. These are groups of data with equal concentrations for the i^{th} season

t_{ip} = the number of tied observations in the p^{th} group of tied observations for the i^{th} season

h_i = the number of time periods that contain multiple observations for the i^{th} season

u_{iq} = the number of observations in the q^{th} time period for the i^{th} season

7. Repeat steps 2 through 6 for each season i = 1 to L.
8. Calculate the sum of S for each season and VAR(S) for each season.

$$S_{tot} = \sum_{i=1}^{K} S_i$$

$$VAR(S_{tot}) = \sum_{i=1}^{K} VAR(S_i)$$

9. Calculate the test statistic Z

$$Z = \frac{S_{tot} - 1}{[VAR(S_{tot})]^{1/2}} \qquad \text{if } S_{tot} > 0$$

$$= 0 \qquad \text{if } S_{tot} = 0$$

$$= \frac{S_{tot} + 1}{[VAR(S_{tot})]^{1/2}} \qquad \text{if } S_{tot} < 0$$

10. Compare the test statistic Z to the percentile of the standard normal distribution for the selected confidence level. If Z exceeds the percentile of the standard normal distribution, then there is evidence of an upward trend, and the null hypothesis should be rejected. Otherwise accept the null hypothesis that there is no upward trend.

Remarks:

Naturally, the Seasonal Kendall analysis is not of much use until several years of data have been collected.

4.8.5 Spearman's Trend Test

Description:

Spearman's Trend Test is provided in the USEPA Draft Unified Guidance (2004). The test is non-parametric, and therefore normality is not required for use.

Use:

As a non-parametric test to detect trends in data. In ChemStat's implementation, the test can be used to test for upward or downward trends, but not for two-tailed trends. The test can be performed at confidence levels up to 99.99%. To specify the confidence level, select **Trend Analysis Options** from the right-click menu over the report.

Implementation:

1. Determine the ideal rank (i) for each data point. (i) is the rank of the data point if there was a perfect trend – lowest to highest for increasing time for an upward trend, and highest to lowest for increasing time for w downward trend.

2. Determine the actual rank each data point T. Average the ranks for tied values.

3. Calculate the Spearman statistic D using the following formula for an upward trend test:

$$D = \sum_{i=1}^{n} (T_i - i)^2$$

Or this formula for a downward trend test:

$$D = \sum_{i=1}^{n} [T_i - (n+1-i)]^2$$

Where n is the number of samples.

4. Calculate the expected value E and standard deviation SD using the formulas:

$$E[D] = (n^3 - n)/6$$

$$SD[D] = \sqrt{\frac{[n^2(n+1)^2(n-1)]}{36}}$$

5. Calculate the Z statistic using the formula:

$$Z = |D - E[D]/SD[D]$$

6. Obtain the critical Z value from the percentile of the standard normal distribution for the desired confidence level. If Z is less then the Zcritical, then no trend was detect. Of Z exceeds the critical value, then a trend is indicated.

Remarks:

ChemStat uses the above formulas for all implementation of Spearman's trend test regardless of the number of samples or the number of ties. The Unified Guidance specifies slight difference formulas for the presence of ties, and for sample sizes less than 11, however the descriptions of those methods are insufficient to recreate the procedure in ChemStat.

4.8.6 Rank Von Neumann Test

Description:

The Rank Von Neumann test is a non-parametric statistical procedure to determine if a consecutive series of sample measurements is statistically independent. Statistical independence of sample measurements is a prerequisite for the use of the ANOVA statistical methods, including t-tests, parametric ANOVA, Kruskal-Wallis, and Wilcoxon.

ChemStat implements the rank von Neumann test for a single well and single parameter at the 99% confidence level.

Implementation:

1. For a single well and parameter, rank the data by concentration from lowest to highest. For tied values, assign the average rank of the group of tied values (as with Wilcoxon method).

2. Compute the von Neumann ratio using the formula:

$$v = \frac{\sum_{i=2}^{n} (r_i - r_{i-1})^2}{\left[\frac{n(n^2-1)}{12}\right]}$$

3. Compare the v statistic to the critical value v_c from Table 9-2 in the USEPA Draft Unified Guidance (2004). If v is larger than the critical value v_c, then the data are statistically independent and is suitable for analysis using ANOVA methods. Otherwise, the data are shown to be statistically dependent over time.

Remarks:

Although non-parametric, this test is suitable for both normal and non-normally distributed data. Because the test is performed on the ranks of the data, log-transformation does not change the result of the test.

5. Data Adjustments

5.1 Cohen's Adjustment

Description:

Cohen's adjust provides a technique to better accommodate non-detect (or censored) values in some statistical methods.

Use:

ChemStat uses Cohen's adjustment to calculate an adjusted mean and standard deviation. These adjusted parameters are calculated for each monitoring location individually, for all background monitoring locations as a group, and for all monitoring locations (compliance and background) as a group. Monitoring locations classified as "unused" are not included in the calculations.

Once Cohen's adjustment has been selected, the adjusted means and standard deviations will be used in all calculations that require a mean and standard deviation (i.e., methods such as Kruskal-Wallis would not be affected).

Important considerations in using this method:

- Once selected, all statistical methods that require a mean or standard deviation will use the adjusted mean and standard deviation.
- Non-detects are represented by the full detection limit when appropriate.
- It is possible, and may often be desirable, to apply Cohen's adjustment to transformed data.

Implementation:

1. Compute the mean and standard deviations for all values above the detection limit.

$\bar{x}^*$ = the mean of the detected values only.

σ^* = the standard deviation of the detected values only.

n = the total number of samples, including detects and non-detects.

m = the total number of samples above the detection limit.

d = the number of non-detects.

2. Compute the Cohen parameters.

$$h = \frac{n - m}{n} = \frac{d}{n}$$

and

$$\gamma = \frac{\left(\sigma^*\right)^2}{\left(\overline{x}^* - \mathrm{DL}\right)^2}$$

(note that this equation has a typographic error in the USEPA 1989 guidance. In the guidance, the mean is not clearly indicated as the mean of the detected values only)

where:

DL = is the detection limit. Because detection limits may not be equal across the data set, ChemStat calculates the mean detection limit.

3. From Table 7, Appendix B in the USEPA 1989 guidance document, use the parameters h and γ to obtain $\hat{\lambda}$. As in the 1989 USEPA guidance, ChemStat uses linear interpolation to obtain values between table rows and columns.

4. Calculate the corrected data set mean.

$$\hat{u} = \overline{x}^* - \hat{\lambda}\left(\overline{x}^* - \mathrm{DL}\right)$$

5. Calculate the corrected data set standard deviation.

$$\hat{\sigma} = \left[\left(\sigma^*\right)^2 + \hat{\lambda} \cdot \left(\overline{x}^* - \mathrm{DL}\right)^2\right]^{1/2}$$

$\hat{\sigma}$ = the adjusted overall standard deviation. This value is used as the standard deviation in all further calculations.

5.2 Aitchison's Adjustment

Description:

Aitchison's adjust provides a technique to better accommodate non-detect (or censored) values in some statistical methods.

Use:

ChemStat uses Aitchison's adjustment to calculate and adjusted mean and standard deviation. These adjusted parameters are calculated for each monitoring location individually, for all background monitoring locations as a group, and for all monitoring locations (compliance and background) as a group. Monitoring locations classified as "unused" are not included in the calculations.

Once Aitchison's adjustment has been selected, the adjusted means and standard deviations will be used in all calculations that require a mean and standard deviation (i.e., methods such as Kruskal-Wallis would not be affected).

Important considerations in using this method:

- Once selected, all statistical methods that require a mean or standard deviation will use the adjusted mean and standard deviation.
- It is possible, and may often be desirable, to apply Aitchison's adjustment to transformed data.

Implementation:

Calculate the adjusted overall mean

$$\hat{u} = \left(1 - \frac{d}{n}\right)\overline{x}^*$$

where:

$\hat{u}$ = the adjusted overall mean. This value is used as the mean in all further calculations.

d = the number of non-detects.

n = the total number of samples, including detects and non-detects.

$\overline{x}^*$ = the mean of the detected values only.

$$\hat{\sigma}^2 = \frac{n-(d+1)}{n-1}\left(\sigma^*\right)^2 + \frac{d}{n}\left(\frac{n-d}{n-1}\right)\left(\overline{x}^*\right)^2$$

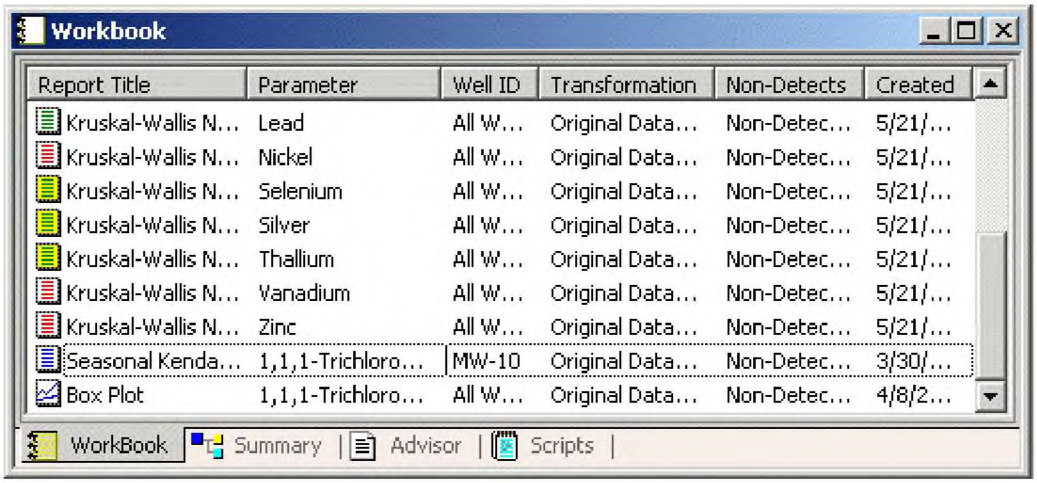
where:

σ^* = the standard deviation of the detected values only.

$\hat{\sigma}$ = the adjusted overall standard deviation. This value is used as the standard deviation in all further calculations.

6. Using the Workbook

The workbook provides a permanent repository for graphs and reports. Workbook items are saved with your data in ChemStat **csd** files. Workbook items can then be viewed or printed at any time. Reports and graphs added to the workbook are unaffected by data transformations, non-detect representation, or monitoring location gradient changes.



Report Title	Parameter	Well ID	Transformation	Non-Detects	Created
Kruskal-Wallis N...	Lead	All W...	Original Data...	Non-Detec...	5/21/...
Kruskal-Wallis N...	Nickel	All W...	Original Data...	Non-Detec...	5/21/...
Kruskal-Wallis N...	Selenium	All W...	Original Data...	Non-Detec...	5/21/...
Kruskal-Wallis N...	Silver	All W...	Original Data...	Non-Detec...	5/21/...
Kruskal-Wallis N...	Thallium	All W...	Original Data...	Non-Detec...	5/21/...
Kruskal-Wallis N...	Vanadium	All W...	Original Data...	Non-Detec...	5/21/...
Kruskal-Wallis N...	Zinc	All W...	Original Data...	Non-Detec...	5/21/...
Seasonal Kenda...	1,1,1-Trichloro...	MW-10	Original Data...	Non-Detec...	3/30/...
Box Plot	1,1,1-Trichloro...	All W...	Original Data...	Non-Detec...	4/8/2...

The Workbook window shows reports and graphs current stored in the Workbook.

6.1 Purpose of the Workbook

The Workbook acts as a permanent repository for statistical reports and graphs created from a project. Typically, as you create statistical reports and graphs, there are some you will want to keep with your project, and some that you will want to discard. Those that you want to keep can be added to the Workbook.

Saving the Workbook

Reports and graphs added to the workbook are permanent and will not change (although if fonts or colors are changed, reports will be displayed in the new font and color scheme, but graphs will always be saved as they were created). When you save your project file, the workbook items will be saved as well. Reopening your project file will allow access to all of the Workbook items for that project.

Non-Detects and Transformations in the Workbook

The representation of non-detects and your data transformation is also permanent in the Workbook. Once a report or graph is added to the workbook, information about the representation of non-detects, and the transformation of those data is also permanent. Changing these values in your data will not affect reports and graphs in the Workbook. When you print any report or graph in the workbook, they header and footer information about non-detects and transformation will reflect that report, not the current configuration of your project. You can have multiple reports and graphs in the Workbook each with different non-detect representations and transformations.

6.2 Workbook Icons

There are six types of icons to represent reports and graphs in the Workbook. Three icons represent graphs, and three represent reports.

When you add a report or graph to the Workbook, the report or graph can be flagged with one of three states. The color of the icon indicates the state.

1. Report of graph shows statistically significant contamination *(red icon).*
2. Report or graph does not show statistically significant contamination *(green icon)*.
3. Statistical significance of contamination does not apply to the report or graph. This includes time-series plots, normality tests, etc. *(blue icon)*.

This color code may be useful if you want to print or save only those reports and graphs that show contamination.

6.3 Workbook Functions

All workbook functionality is available from the *Workbook* menu. However, many items are also available from right-click context menus, particularly when right-clicking over selected items in the workbook.

Showing and Hiding the Workbook

To display or hide the Workbook, select **View Workbook** from the **Workbook** menu.

Adding to a Workbook

To add a report or graph to the Workbook:
1. Make the desired report or graph active (topmost window).
2. Select **Add Item** from the **Workbook** menu, or select **Add to Workbook** from the right-click menu accessed over the desired report or graph.

Deleting from a Workbook

To delete items from the Workbook, select the item or items to be deleted (the Workbook window must be visible). You can select and delete multiple items. Select **Delete Selected Items** from the **Workbook** menu or the right-click menu.

These items will be permanently deleted.

Viewing a Workbook

To view a Workbook report, double click on the desired report or graph. You may also highlight the desired report or graph and select **View Item** from the right-click menu.

Printing a Workbook Item

To print reports or graphs from the workbook:

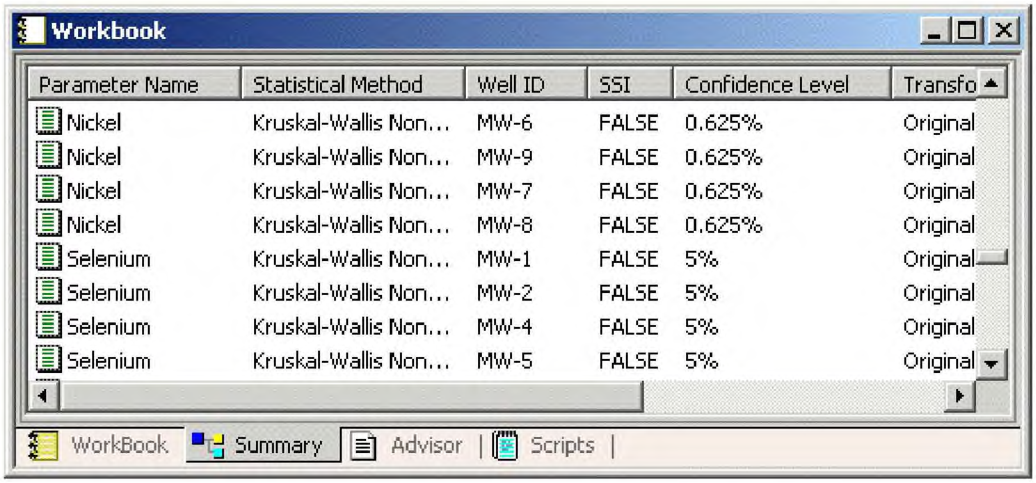
1. Highlight the reports and graphs you wish to print.
2. Select **Print Selected Items** from the right click menu or the Workbook menu.

Pages will be number consecutively from the first page. For each report or graph, headers and footers will properly reflect the representation of non-detects and data transformation for that particular item.

You can also select *Print Entire Workbook* to print all items in the Workbook, even if they are not highlighted.

6.4 The Summary List

The *Summary List* is a list of all wells that showed a statistically significant level of contamination. The summary list is linked to reports in the workbook. When a statistical report is added to the workbook, a summary entry is added for each well tested with the statistical method. If the report is deleted, the summary list items for the report are deleted from the summary list.



Parameter Name	Statistical Method	Well ID	SSI	Confidence Level	Transfo
Nickel	Kruskal-Wallis Non...	MW-6	FALSE	0.625%	Original
Nickel	Kruskal-Wallis Non...	MW-9	FALSE	0.625%	Original
Nickel	Kruskal-Wallis Non...	MW-7	FALSE	0.625%	Original
Nickel	Kruskal-Wallis Non...	MW-8	FALSE	0.625%	Original
Selenium	Kruskal-Wallis Non...	MW-1	FALSE	5%	Original
Selenium	Kruskal-Wallis Non...	MW-2	FALSE	5%	Original
Selenium	Kruskal-Wallis Non...	MW-4	FALSE	5%	Original
Selenium	Kruskal-Wallis Non...	MW-5	FALSE	5%	Original

The Workbook window shows the Summary list.

The following information is displayed for each entry in the summary list:

- Parameter Name
- Statistical Method
- Well ID
- SSI – Indicates if a statistically significant increase occurred
- Confidence Level (if applicable)
- Transformation
- Non-Detect Option
- Comment (usually indicates MCL comparison or intra-well comparison)

The Summary List has the following properties:

1. The Summary List is directly linked to the Workbook list. Items are added to the summary list only by adding reports to the Workbook.

2. Items can not be deleted specifically from the Summary List. When you delete a Workbook report, the associated summary list items will be deleted.
3. The Summary List can not be printed. You can export the summary list to a tab-delimited text file for editing in Excel. Select *Write Summary File* from the *Workbook* menu.
4. The Summary List is saved with your data in the "csd" file.
5. Only statistical methods that detect a statistically significant increase create summary list items. Statistical methods such as normality tests do not create summary list items.

7. References

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USEPA, *Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites*, OSWER 9285.6-10, December, 2002.

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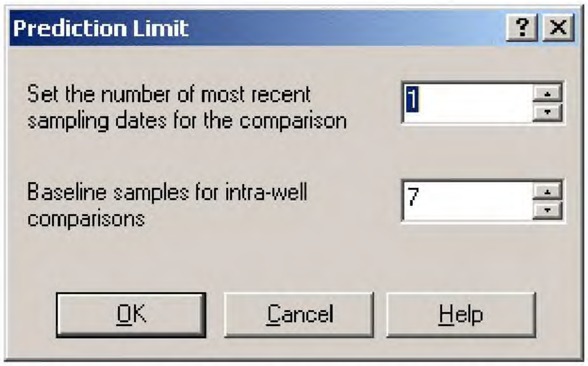
Appendix A

Prediction Limits: Recent Dates, Future Samples, and Baseline Samples

Three values that influence the results of prediction limits analysis are *Recent Dates*, *Future Samples* (k), and *Baseline Samples*.

Recent Dates – Specified in the dialog box below, the is the number of recent sampling dates to be compared to the prediction limit. If there are multiple samples for a single date, the samples for that date are averaged, and the average is compared to the prediction limit.



Set the number of most recent sampling dates for the comparison: 1

Baseline samples for intra-well comparisons: 7

Future Samples – Typically abbreviated k, the name is misleading in the application to ground water statistics. This is actually the total number of comparisons to be made to the prediction limit. This value is calculated automatically, and is not entered by the user. The maximum value for the parametric prediction limits is 5, for non-parametric prediction limits is 8, and it is unlimited for Poisson prediction limits. If the actual number of comparisons exceeds the maximum value, the maximum value will be used. The enforcement of maximum values ensure that the individual comparison error rate does not fall below 1%.

Baseline Samples – For intra-well comparisons only, this is the number of historical samples from the well used to construct the prediction limit. Samples always start with the earliest sample for the well. If there are multiple samples for a single date, the samples are not averaged, but each sample is counted individually.

Consider the following data from compliance wells:

Date	Well 1	Well 2	Well 3	Well 4	Well 5
January 1	3	5	4		
February 1	6	3, 4	6		
March 1	4	6			
April 1	5	7	7		12
May 1	8	5	8		
June 1	7	9	9, 10		
July 1	8	10	11		15
August 1	12	12, 10			
September 1	10	10		12	

For an inter-well prediction limit, with the value of *Recent Dates* set to 2, the following comparisons would be made.

Well 1 – September and August are the two most recent dates. 10 and 12 will be compared to the prediction limit. (2 comparisons)

Well 2 -- September and August are the two most recent dates. 10, and 11 (the average of 12 and 10) will be compared to the prediction limits. (2 comparisons)

Well 3 – July and June are the two most recent dates. 11, and 9.5 (the average of 9 and 10) will be compared to the prediction limits. (2 comparisons)

Well 4 – Although two recent dates are specified, there is only one sample for the well. The value 12 will be compared to the prediction limit. (1 comparison)

Well 5 – July and April are the two most recent dates. 15 and 12 will be compared to the prediction limit. (2 comparisons)

The total number of comparisons is 2 + 2 + 2 + 1 + 2 = 9, so *future samples* = 9. For a parametric prediction limit, the maximum number for future samples is 5, so 5 would be used. For a non-parametric prediction limit, the maximum number for future samples is 8, so 8 would be used. For Poisson prediction limit, there is no maximum for future samples, so 9 would be used.

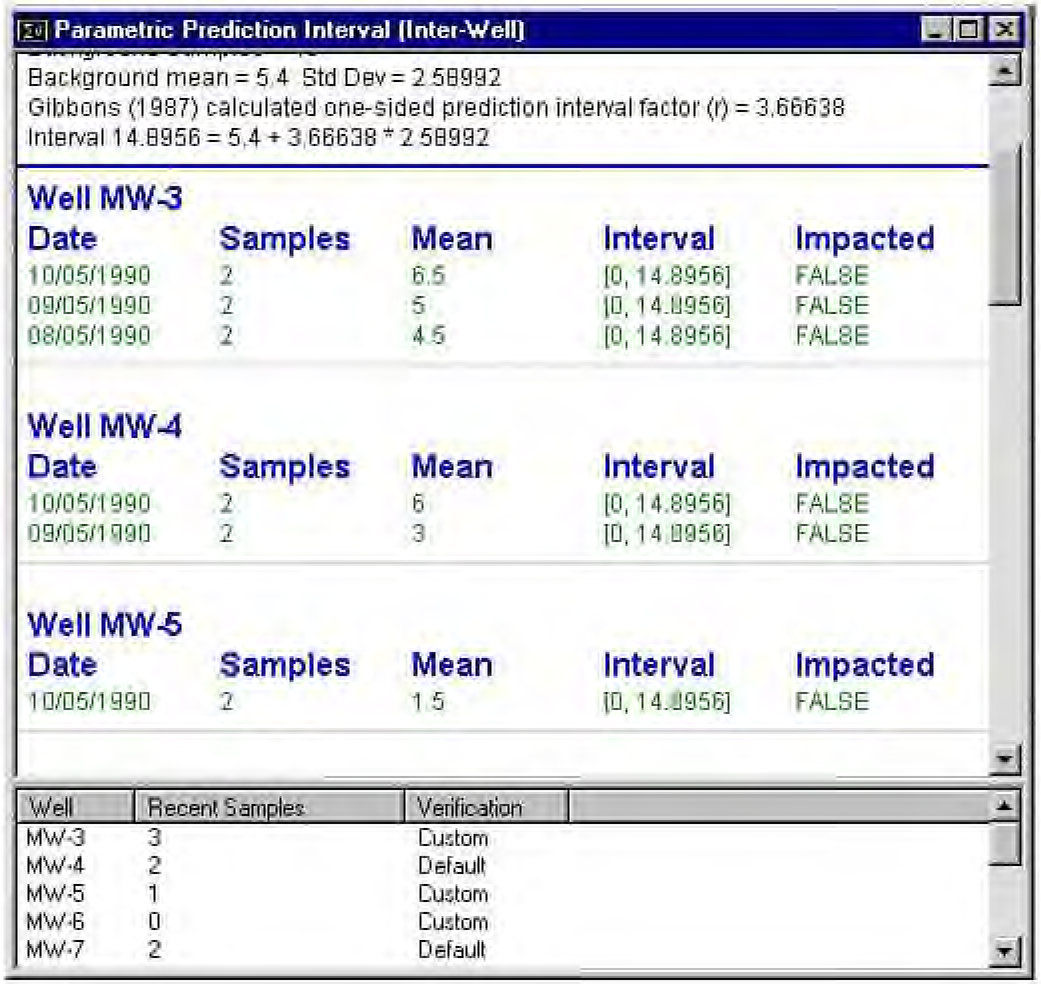
Consider the same data for intra-well comparisons, with 2 recent dates, and 6 baseline samples.

Well 1 – January through June constitute the baseline samples used to construct the prediction limit. August and September are the 2 most recent sampling dates, so 10 and 12 would be compared to the prediction limit. There are 2 comparisons, so *future samples* = 2.

Well 2 – The first six samples are January through May because February has two samples. These would be used to construct the prediction limit. September and August are the two most recent dates. 10, and 11 (the average of 12 and 10) will be compared to the prediction limits. There are 2 comparisons, so *future samples* = 2.

Well 3 – The first six samples are January through June. June has two samples, but there are none for March. These would be used to construct the prediction limit. July and June are the two most recent dates. 11, and 9.5 (the average of 9 and 10) will be compared to the prediction limits. Note that June is used to construct the prediction limit, and is also compared to the prediction limit. This is not valid. The number of recent dates should be decreased, or the number of baseline samples should be decreased. There are 2 comparisons, so *future samples* = 2.

Well 4 and 5 – There are insufficient data for an intra-well comparison.



Background mean = 5.4 Std Dev = 2.58992
Gibbons (1987) calculated one-sided prediction interval factor (r) = 3.66638
Interval 14.8956 = 5.4 + 3.66638 * 2.58992

Well MW-3

Date	Samples	Mean	Interval	Impacted
10/05/1990	2	6.5	[0, 14.8956]	FALSE
09/05/1990	2	5	[0, 14.8956]	FALSE
08/05/1990	2	4.5	[0, 14.8956]	FALSE

Well MW-4

Date	Samples	Mean	Interval	Impacted
10/05/1990	2	6	[0, 14.8956]	FALSE
09/05/1990	2	3	[0, 14.8956]	FALSE

Well MW-5

Date	Samples	Mean	Interval	Impacted
10/05/1990	2	1.5	[0, 14.8956]	FALSE

Well	Recent Samples	Verification
MW-3	3	Custom
MW-4	2	Default
MW-5	1	Custom
MW-6	0	Custom
MW-7	2	Default

APPENDIX E.

DISTRIBUTIONAL TESTING RESULTS ON CD

Royalton Road LF

Shapiro-Francia Test of Normality
Parameter: Ammonia Nitrogen
Background Locations
Normality Test of Parameter Concentrations

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
Total Number of Measurements = 51

i	x(i)	m(i)	sum(m^2)	sum(mx)
1	640	-2.07485	4.305	-1327.9
2	680	-1.77438	7.45342	-2534.48
3	680	-1.58047	9.95129	-3609.2
4	690	-1.4325	12.0034	-4597.62
5	690	-1.30469	13.7056	-5497.86
6	690	-1.20036	15.1464	-6326.11
7	700	-1.10768	16.3734	-7101.48
8	700	-1.02365	17.4212	-7818.04
9	700	-0.942375	18.3093	-8477.7
10	710	-0.87055	19.0672	-9095.79
11	710	-0.802956	19.7119	-9665.89
12	710	-0.738846	20.2578	-10190.5
13	720	-0.67449	20.7127	-10676.1
14	730	-0.615839	21.092	-11125.7
15	750	-0.559237	21.4047	-11545.1
16	940	-0.504372	21.6591	-12019.2
17	1010	-0.450985	21.8625	-12474.7
18	1040	-0.396142	22.0195	-12886.7
19	1080	-0.345126	22.1386	-13259.4
20	1080	-0.294992	22.2256	-13578
21	1090	-0.24559	22.2859	-13845.7
22	1120	-0.194225	22.3236	-14063.2
23	1130	-0.1459	22.3449	-14228.1
24	1190	-0.0979139	22.3545	-14344.6
25	1200	-0.0501541	22.357	-14404.8
26	1250	0	22.357	-14404.8
27	1250	0.0501541	22.3595	-14342.1
28	1260	0.0979139	22.3691	-14218.7
29	1300	0.1459	22.3904	-14029.1
30	1310	0.194225	22.4281	-13774.6
31	1320	0.24559	22.4884	-13450.5
32	1400	0.294992	22.5755	-13037.5
33	1460	0.345126	22.6946	-12533.6
34	1660	0.396142	22.8515	-11876
35	1670	0.450985	23.0549	-11122.8
36	1690	0.504372	23.3093	-10270.5
37	1770	0.559237	23.622	-9280.61
38	1850	0.615839	24.0013	-8141.31
39	1930	0.67449	24.4562	-6839.54
40	1940	0.738846	25.0021	-5406.18
41	1980	0.802956	25.6469	-3816.33
42	2020	0.87055	26.4047	-2057.82
43	2070	0.942375	27.2928	-107.099
44	2090	1.02365	28.3406	2032.33
45	2110	1.10768	29.5676	4369.54
46	2120	1.20036	31.0085	6914.3
47	2180	1.30469	32.7107	9758.52
48	2200	1.4325	34.7627	12910
49	2220	1.58047	37.2606	16418.7
50	2270	1.77438	40.409	20446.5

51	2360	2.07485	44.714	25343.1

Data Set Standard Deviation = 559.758
Numerator = 6.42275e+008
Denominator = 7.00511e+008
W Statistic = 0.916867 = 6.42275e+008 / 7.00511e+008

5% Critical value of 0.954 exceeds 0.916867
Evidence of non-normality at 95% level of significance

1% Critical value of 0.935 exceeds 0.916867
Evidence of non-normality at 99% level of significance

Shapiro-Francia Test of Normality

Parameter: Ammonia Nitrogen

Background Locations

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

Total Number of Measurements = 51

i	x(i)	m(i)	sum(m^2)	sum(mx)
1	6.46147	-2.07485	4.305	-13.4066
2	6.52209	-1.77438	7.45342	-24.9792
3	6.52209	-1.58047	9.95129	-35.2872
4	6.53669	-1.4325	12.0034	-44.651
5	6.53669	-1.30469	13.7056	-53.1793
6	6.53669	-1.20036	15.1464	-61.0257
7	6.55108	-1.10768	16.3734	-68.2822
8	6.55108	-1.02365	17.4212	-74.9883
9	6.55108	-0.942375	18.3093	-81.1618
10	6.56526	-0.87055	19.0672	-86.8772
11	6.56526	-0.802956	19.7119	-92.1488
12	6.56526	-0.738846	20.2578	-96.9996
13	6.57925	-0.67449	20.7127	-101.437
14	6.59304	-0.615839	21.092	-105.497
15	6.62007	-0.559237	21.4047	-109.2
16	6.84588	-0.504372	21.6591	-112.653
17	6.91771	-0.450985	21.8625	-115.772
18	6.94698	-0.396142	22.0195	-118.524
19	6.98472	-0.345126	22.1386	-120.935
20	6.98472	-0.294992	22.2256	-122.995
21	6.99393	-0.24559	22.2859	-124.713
22	7.02108	-0.194225	22.3236	-126.077
23	7.02997	-0.1459	22.3449	-127.102
24	7.08171	-0.0979139	22.3545	-127.796
25	7.09008	-0.0501541	22.357	-128.151
26	7.1309	0	22.357	-128.151
27	7.1309	0.0501541	22.3595	-127.794
28	7.13887	0.0979139	22.3691	-127.095
29	7.17012	0.1459	22.3904	-126.049
30	7.17778	0.194225	22.4281	-124.654
31	7.18539	0.24559	22.4884	-122.89
32	7.24423	0.294992	22.5755	-120.753
33	7.28619	0.345126	22.6946	-118.238
34	7.41457	0.396142	22.8515	-115.301
35	7.42058	0.450985	23.0549	-111.954
36	7.43248	0.504372	23.3093	-108.206
37	7.47873	0.559237	23.622	-104.023
38	7.52294	0.615839	24.0013	-99.3903
39	7.56528	0.67449	24.4562	-94.2876
40	7.57044	0.738846	25.0021	-88.6942
41	7.59085	0.802956	25.6469	-82.5991
42	7.61085	0.87055	26.4047	-75.9735
43	7.6353	0.942375	27.2928	-68.7781
44	7.64492	1.02365	28.3406	-60.9524
45	7.65444	1.10768	29.5676	-52.4737
46	7.65917	1.20036	31.0085	-43.28
47	7.68708	1.30469	32.7107	-33.2507
48	7.69621	1.4325	34.7627	-22.2259
49	7.70526	1.58047	37.2606	-10.048
50	7.72754	1.77438	40.409	3.6636

51	7.76642	2.07485	44.714	19.7777

Data Set Standard Deviation = 0.435342
Numerator = 391.159
Denominator = 423.716
W Statistic = 0.923162 = 391.159 / 423.716

5% Critical value of 0.954 exceeds 0.923162
Evidence of non-normality at 95% level of significance

1% Critical value of 0.935 exceeds 0.923162
Evidence of non-normality at 99% level of significance

Shapiro-Francia Test of Normality

Parameter: Arsenic, total

Background Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Total Number of Measurements = 53

i	x(i)	m(i)	sum(m^2)	sum(mx)
1	0.5	-2.09693	4.39712	-1.04847
2	0.5	-1.78661	7.5891	-1.94177
3	0.5	-1.59819	10.1433	-2.74087
4	0.5	-1.44663	12.2361	-3.46418
5	0.5	-1.32854	14.0011	-4.12845
6	0.5	-1.22123	15.4925	-4.73907
7	0.5	-1.13113	16.7719	-5.30463
8	0.5	-1.04505	17.8641	-5.82716
9	0.5	-0.970094	18.8052	-6.31221
10	0.5	-0.896473	19.6088	-6.76044
11	0.5	-0.830953	20.2993	-7.17592
12	0.5	-0.765456	20.8852	-7.55865
13	0.5	-0.706302	21.3841	-7.9118
14	0.5	-0.646431	21.802	-8.23501
15	0.5	-0.591776	22.1522	-8.5309
16	0.5	-0.53594	22.4394	-8.79887
17	0.5	-0.484544	22.6742	-9.04114
18	0.5	-0.431644	22.8605	-9.25697
19	0.5	-0.382622	23.0069	-9.44828
20	0.5	-0.331854	23.117	-9.6142
21	0.5	-0.284535	23.198	-9.75647
22	0.5	-0.235269	23.2533	-9.87411
23	1	-0.189118	23.2891	-10.0632
24	1	-0.140835	23.3089	-10.2041
25	1	-0.0953969	23.318	-10.2995
26	1.1	-0.0476439	23.3203	-10.3519
27	1.2	0	23.3203	-10.3519
28	1.4	0.0476439	23.3226	-10.2852
29	1.4	0.0953969	23.3317	-10.1516
30	1.9	0.140835	23.3515	-9.88402
31	1.9	0.189118	23.3873	-9.5247
32	2	0.235269	23.4426	-9.05416
33	2.2	0.284535	23.5236	-8.42818
34	2.2	0.331854	23.6337	-7.6981
35	2.3	0.382622	23.7801	-6.81807
36	15.5	0.431644	23.9664	-0.127589
37	16.5	0.484544	24.2012	7.86738
38	17.9	0.53594	24.4884	17.4607
39	19.2	0.591776	24.8386	28.8228
40	19.4	0.646431	25.2565	41.3636
41	19.8	0.706302	25.7554	55.3484
42	20	0.765456	26.3413	70.6575
43	20.6	0.830953	27.0318	87.7751
44	21.2	0.896473	27.8354	106.78
45	22.1	0.970094	28.7765	128.219
46	24.1	1.04505	29.8687	153.405
47	24.1	1.13113	31.1481	180.665
48	24.2	1.22123	32.6395	210.219
49	24.9	1.32854	34.4045	243.3
50	25	1.44663	36.4973	279.466

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51	26.3	1.59819	39.0515	321.498
52	29.7	1.78661	42.2435	374.56
53	32.4	2.09693	46.6406	442.501

Data Set Standard Deviation = 10.5859
Numerator = 195807
Denominator = 271782
W Statistic = 0.720457 = 195807 / 271782

5% Critical value of 0.957 exceeds 0.720457
Evidence of non-normality at 95% level of significance

1% Critical value of 0.938 exceeds 0.720457
Evidence of non-normality at 99% level of significance

Shapiro-Francia Test of Normality

Parameter: Arsenic, total

Background Locations

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

Total Number of Measurements = 53

i	x(i)	m(i)	sum(m^2)	sum(mx)
1	-0.693147	-2.09693	4.39712	1.45348
2	-0.693147	-1.78661	7.5891	2.69187
3	-0.693147	-1.59819	10.1433	3.79965
4	-0.693147	-1.44663	12.2361	4.80238
5	-0.693147	-1.32854	14.0011	5.72325
6	-0.693147	-1.22123	15.4925	6.56974
7	-0.693147	-1.13113	16.7719	7.35378
8	-0.693147	-1.04505	17.8641	8.07816
9	-0.693147	-0.970094	18.8052	8.75058
10	-0.693147	-0.896473	19.6088	9.37196
11	-0.693147	-0.830953	20.2993	9.94794
12	-0.693147	-0.765456	20.8852	10.4785
13	-0.693147	-0.706302	21.3841	10.9681
14	-0.693147	-0.646431	21.802	11.4162
15	-0.693147	-0.591776	22.1522	11.8263
16	-0.693147	-0.53594	22.4394	12.1978
17	-0.693147	-0.484544	22.6742	12.5337
18	-0.693147	-0.431644	22.8605	12.8329
19	-0.693147	-0.382622	23.0069	13.0981
20	-0.693147	-0.331854	23.117	13.3281
21	-0.693147	-0.284535	23.198	13.5253
22	-0.693147	-0.235269	23.2533	13.6884
23	0	-0.189118	23.2891	13.6884
24	0	-0.140835	23.3089	13.6884
25	0	-0.0953969	23.318	13.6884
26	0.0953102	-0.0476439	23.3203	13.6839
27	0.182322	0	23.3203	13.6839
28	0.336472	0.0476439	23.3226	13.6999
29	0.336472	0.0953969	23.3317	13.732
30	0.641854	0.140835	23.3515	13.8224
31	0.641854	0.189118	23.3873	13.9438
32	0.693147	0.235269	23.4426	14.1069
33	0.788457	0.284535	23.5236	14.3312
34	0.788457	0.331854	23.6337	14.5929
35	0.832909	0.382622	23.7801	14.9116
36	2.74084	0.431644	23.9664	16.0946
37	2.80336	0.484544	24.2012	17.453
38	2.8848	0.53594	24.4884	18.999
39	2.95491	0.591776	24.8386	20.7477
40	2.96527	0.646431	25.2565	22.6645
41	2.98568	0.706302	25.7554	24.7733
42	2.99573	0.765456	26.3413	27.0664
43	3.02529	0.830953	27.0318	29.5803
44	3.054	0.896473	27.8354	32.3181
45	3.09558	0.970094	28.7765	35.3211
46	3.18221	1.04505	29.8687	38.6467
47	3.18221	1.13113	31.1481	42.2462
48	3.18635	1.22123	32.6395	46.1375
49	3.21487	1.32854	34.4045	50.4086
50	3.21888	1.44663	36.4973	55.0651

51	3.26957	1.59819	39.0515	60.2905
52	3.39115	1.78661	42.2435	66.3491
53	3.47816	2.09693	46.6406	73.6426

Data Set Standard Deviation = 1.68251
Numerator = 5423.23
Denominator = 6865.66
W Statistic = 0.789907 = 5423.23 / 6865.66

5% Critical value of 0.957 exceeds 0.789907
Evidence of non-normality at 95% level of significance

1% Critical value of 0.938 exceeds 0.789907
Evidence of non-normality at 99% level of significance

Shapiro-Francia Test of Normality

Parameter: Barium, total

Background Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Total Number of Measurements = 54

i	x(i)	m(i)	sum(m^2)	sum(mx)
1	5	-2.09693	4.39712	-10.4847
2	5	-1.79912	7.63394	-19.4802
3	5	-1.60725	10.2172	-27.5165
4	5	-1.46106	12.3519	-34.8218
5	5	-1.34075	14.1495	-41.5255
6	5	-1.23187	15.667	-47.6849
7	5	-1.14069	16.9682	-53.3883
8	5	-1.05812	18.0878	-58.6789
9	5	-0.982202	19.0525	-63.5899
10	5	-0.911562	19.8835	-68.1477
11	5	-0.841621	20.5918	-72.3559
12	5	-0.778966	21.1986	-76.2507
13	5	-0.719228	21.7159	-79.8468
14	5	-0.661955	22.154	-83.1566
15	5	-0.606775	22.5222	-86.1905
16	5	-0.553384	22.8285	-88.9574
17	5	-0.498687	23.0771	-91.4508
18	10	-0.448213	23.278	-95.933
19	10	-0.398855	23.4371	-99.9215
20	11	-0.350451	23.5599	-103.776
21	11	-0.302855	23.6517	-107.108
22	11	-0.253347	23.7158	-109.895
23	11	-0.207012	23.7587	-112.172
24	12	-0.161119	23.7847	-114.105
25	12.9	-0.115562	23.798	-115.596
26	13	-0.0702426	23.8029	-116.509
27	13	-0.0250691	23.8036	-116.835
28	13	0.0250691	23.8042	-116.509
29	13	0.0702426	23.8091	-115.596
30	14	0.115562	23.8225	-113.978
31	14	0.161119	23.8485	-111.722
32	15	0.207012	23.8913	-108.617
33	15	0.253347	23.9555	-104.817
34	15	0.302855	24.0472	-100.274
35	17	0.350451	24.17	-94.3166
36	20	0.398855	24.3291	-86.3395
37	30	0.448213	24.53	-72.8931
38	31	0.498687	24.7787	-57.4338
39	34	0.553384	25.0849	-38.6187
40	35	0.606775	25.4531	-17.3816
41	36	0.661955	25.8913	6.44878
42	36	0.719228	26.4086	32.341
43	37	0.778966	27.0154	61.1628
44	37.9	0.841621	27.7237	93.0602
45	43	0.911562	28.5546	132.257
46	43	0.982202	29.5194	174.492
47	44	1.05812	30.639	221.049
48	45	1.14069	31.9402	272.38
49	47	1.23187	33.4576	330.278
50	47	1.34075	35.2553	393.293

51	48	1.46106	37.39	463.424
52	49	1.60725	39.9732	542.18
53	49	1.79912	43.21	630.336
54	61	2.09693	47.6072	758.249

Data Set Standard Deviation = 16.5069
Numerator = 574942
Denominator = 687513
W Statistic = 0.836263 = 574942 / 687513

5% Critical value of 0.958 exceeds 0.836263
Evidence of non-normality at 95% level of significance

1% Critical value of 0.94 exceeds 0.836263
Evidence of non-normality at 99% level of significance

Royalton Road LF

Shapiro-Francia Test of Normality

Parameter: Barium, total

Background Locations

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

Total Number of Measurements = 54

i	x(i)	m(i)	sum(m^2)	sum(mx)
1	1.60944	-2.09693	4.39712	-3.37488
2	1.60944	-1.79912	7.63394	-6.27045
3	1.60944	-1.60725	10.2172	-8.85722
4	1.60944	-1.46106	12.3519	-11.2087
5	1.60944	-1.34075	14.1495	-13.3666
6	1.60944	-1.23187	15.667	-15.3492
7	1.60944	-1.14069	16.9682	-17.185
8	1.60944	-1.05812	18.0878	-18.888
9	1.60944	-0.982202	19.0525	-20.4688
10	1.60944	-0.911562	19.8835	-21.9359
11	1.60944	-0.841621	20.5918	-23.2905
12	1.60944	-0.778966	21.1986	-24.5441
13	1.60944	-0.719228	21.7159	-25.7017
14	1.60944	-0.661955	22.154	-26.7671
15	1.60944	-0.606775	22.5222	-27.7436
16	1.60944	-0.553384	22.8285	-28.6343
17	1.60944	-0.498687	23.0771	-29.4369
18	2.30259	-0.448213	23.278	-30.4689
19	2.30259	-0.398855	23.4371	-31.3873
20	2.3979	-0.350451	23.5599	-32.2277
21	2.3979	-0.302855	23.6517	-32.9539
22	2.3979	-0.253347	23.7158	-33.5614
23	2.3979	-0.207012	23.7587	-34.0578
24	2.48491	-0.161119	23.7847	-34.4582
25	2.55723	-0.115562	23.798	-34.7537
26	2.56495	-0.0702426	23.8029	-34.9338
27	2.56495	-0.0250691	23.8036	-34.9981
28	2.56495	0.0250691	23.8042	-34.9338
29	2.56495	0.0702426	23.8091	-34.7537
30	2.63906	0.115562	23.8225	-34.4487
31	2.63906	0.161119	23.8485	-34.0235
32	2.70805	0.207012	23.8913	-33.4629
33	2.70805	0.253347	23.9555	-32.7768
34	2.70805	0.302855	24.0472	-31.9567
35	2.83321	0.350451	24.17	-30.9638
36	2.99573	0.398855	24.3291	-29.7689
37	3.4012	0.448213	24.53	-28.2444
38	3.43399	0.498687	24.7787	-26.532
39	3.52636	0.553384	25.0849	-24.5805
40	3.55535	0.606775	25.4531	-22.4232
41	3.58352	0.661955	25.8913	-20.0511
42	3.58352	0.719228	26.4086	-17.4737
43	3.61092	0.778966	27.0154	-14.6609
44	3.63495	0.841621	27.7237	-11.6017
45	3.7612	0.911562	28.5546	-8.17313
46	3.7612	0.982202	29.5194	-4.47887
47	3.78419	1.05812	30.639	-0.474739
48	3.80666	1.14069	31.9402	3.86748
49	3.85015	1.23187	33.4576	8.61034
50	3.85015	1.34075	35.2553	13.7724

51	3.8712	1.46106	37.39	19.4285
52	3.89182	1.60725	39.9732	25.6836
53	3.89182	1.79912	43.21	32.6855
54	4.11087	2.09693	47.6072	41.3057

Data Set Standard Deviation = 0.871108
Numerator = 1706.16
Denominator = 1914.66
W Statistic = 0.891101 = 1706.16 / 1914.66

5% Critical value of 0.958 exceeds 0.891101
Evidence of non-normality at 95% level of significance

1% Critical value of 0.94 exceeds 0.891101
Evidence of non-normality at 99% level of significance

Shapiro-Francia Test of Normality

Parameter: Chloride

Background Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
Total Number of Measurements = 87

i	x(i)	m(i)	sum(m^2)	sum(mx)
1	4000	-2.29036	5.24576	-9161.45
2	4000	-2.01409	9.30234	-17217.8
3	4000	-1.82501	12.633	-24517.8
4	4700	-1.6954	15.5074	-32486.2
5	4770	-1.58927	18.0331	-40067
6	4800	-1.49085	20.2558	-47223.1
7	5000	-1.41183	22.249	-54282.3
8	5000	-1.34075	24.0467	-60986.1
9	5000	-1.27024	25.6602	-67337.2
10	5000	-1.21073	27.126	-73390.9
11	5000	-1.15035	28.4493	-79142.6
12	5000	-1.09847	29.656	-84635
13	5000	-1.04939	30.7572	-89881.9
14	5000	-0.998575	31.7543	-94874.8
15	6000	-0.954165	32.6648	-100600
16	6000	-0.911562	33.4957	-106069
17	6000	-0.866894	34.2472	-111271
18	6100	-0.827417	34.9318	-116318
19	7000	-0.789191	35.5547	-121842
20	8000	-0.748762	36.1153	-127832
21	8000	-0.712751	36.6233	-133534
22	8000	-0.67449	37.0782	-138930
23	9000	-0.640266	37.4882	-144693
24	9000	-0.606775	37.8564	-150153
25	10000	-0.570999	38.1824	-155863
26	11000	-0.538836	38.4727	-161791
27	11000	-0.507221	38.73	-167370
28	11000	-0.473299	38.954	-172576
29	14000	-0.442676	39.15	-178774
30	16000	-0.412463	39.3201	-185373
31	19000	-0.379927	39.4645	-192592
32	19900	-0.350451	39.5873	-199566
33	21800	-0.318639	39.6888	-206512
34	24000	-0.28976	39.7728	-213466
35	24700	-0.26112	39.841	-219916
36	24800	-0.230118	39.8939	-225623
37	26000	-0.201894	39.9347	-230872
38	26000	-0.173829	39.9649	-235392
39	35000	-0.143367	39.9854	-240410
40	37000	-0.115562	39.9988	-244685
41	38000	-0.0878447	40.0065	-248024
42	39000	-0.0576847	40.0098	-250273
43	43000	-0.0300838	40.0107	-251567
44	44000	0	40.0107	-251567
45	45000	0.0300838	40.0117	-250213
46	45000	0.0576847	40.015	-247617
47	53000	0.0878447	40.0227	-242962
48	53000	0.115562	40.0361	-236837
49	61000	0.143367	40.0566	-228091

50	61000	0.173829	40.0868	-217488
51	65000	0.201894	40.1276	-204365
52	66000	0.230118	40.1805	-189177
53	68000	0.26112	40.2487	-171421
54	72000	0.28976	40.3327	-150558
55	73000	0.318639	40.4342	-127297
56	73000	0.350451	40.557	-101714
57	73000	0.379927	40.7014	-73979.7
58	75000	0.412463	40.8715	-43045
59	76000	0.442676	41.0675	-9401.59
60	76000	0.473299	41.2915	26569.1
61	76000	0.507221	41.5487	65117.9
62	79000	0.538836	41.8391	107686
63	80000	0.570999	42.1651	153366
64	83000	0.606775	42.5333	203728
65	83000	0.640266	42.9432	256870
66	83000	0.67449	43.3982	312853
67	83000	0.712751	43.9062	372011
68	88000	0.748762	44.4668	437902
69	89000	0.789191	45.0897	508140
70	90000	0.827417	45.7743	582608
71	93000	0.866894	46.5258	663229
72	95000	0.911562	47.3567	749827
73	104000	0.954165	48.2672	849060
74	112000	0.998575	49.2643	960901
75	114000	1.04939	50.3655	1.08053e+006
76	117000	1.09847	51.5722	1.20905e+006
77	119000	1.15035	52.8955	1.34594e+006
78	121000	1.21073	54.3613	1.49244e+006
79	130000	1.27024	55.9748	1.65757e+006
80	139000	1.34075	57.7725	1.84394e+006
81	145000	1.41183	59.7657	2.04865e+006
82	147000	1.49085	61.9884	2.26781e+006
83	162000	1.58927	64.5141	2.52527e+006
84	187000	1.6954	67.3885	2.84231e+006
85	190000	1.82501	70.7192	3.18906e+006
86	208000	2.01409	74.7757	3.60799e+006
87	211000	2.29036	80.0215	4.09126e+006

Data Set Standard Deviation = 52681.6
Numerator = 1.67384e+013
Denominator = 1.90995e+013
W Statistic = 0.876377 = 1.67384e+013 / 1.90995e+013

5% Critical value of 0.972 exceeds 0.876377
Evidence of non-normality at 95% level of significance

1% Critical value of 0.961 exceeds 0.876377
Evidence of non-normality at 99% level of significance

Shapiro-Francia Test of Normality

Parameter: Chloride

Background Locations

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

Total Number of Measurements = 87

i	x(i)	m(i)	sum(m^2)	sum(mx)
1	8.29405	-2.29036	5.24576	-18.9964
2	8.29405	-2.01409	9.30234	-35.7014
3	8.29405	-1.82501	12.633	-50.8381
4	8.45532	-1.6954	15.5074	-65.1732
5	8.4701	-1.58927	18.0331	-78.6345
6	8.47637	-1.49085	20.2558	-91.2715
7	8.51719	-1.41183	22.249	-103.296
8	8.51719	-1.34075	24.0467	-114.716
9	8.51719	-1.27024	25.6602	-125.535
10	8.51719	-1.21073	27.126	-135.847
11	8.51719	-1.15035	28.4493	-145.644
12	8.51719	-1.09847	29.656	-155
13	8.51719	-1.04939	30.7572	-163.938
14	8.51719	-0.998575	31.7543	-172.443
15	8.69951	-0.954165	32.6648	-180.744
16	8.69951	-0.911562	33.4957	-188.674
17	8.69951	-0.866894	34.2472	-196.216
18	8.71604	-0.827417	34.9318	-203.427
19	8.85367	-0.789191	35.5547	-210.415
20	8.9872	-0.748762	36.1153	-217.144
21	8.9872	-0.712751	36.6233	-223.55
22	8.9872	-0.67449	37.0782	-229.611
23	9.10498	-0.640266	37.4882	-235.441
24	9.10498	-0.606775	37.8564	-240.966
25	9.21034	-0.570999	38.1824	-246.225
26	9.30565	-0.538836	38.4727	-251.239
27	9.30565	-0.507221	38.73	-255.959
28	9.30565	-0.473299	38.954	-260.363
29	9.54681	-0.442676	39.15	-264.589
30	9.68034	-0.412463	39.3201	-268.582
31	9.85219	-0.379927	39.4645	-272.325
32	9.89848	-0.350451	39.5873	-275.794
33	9.98967	-0.318639	39.6888	-278.977
34	10.0858	-0.28976	39.7728	-281.9
35	10.1146	-0.26112	39.841	-284.541
36	10.1186	-0.230118	39.8939	-286.869
37	10.1659	-0.201894	39.9347	-288.922
38	10.1659	-0.173829	39.9649	-290.689
39	10.4631	-0.143367	39.9854	-292.189
40	10.5187	-0.115562	39.9988	-293.405
41	10.5453	-0.0878447	40.0065	-294.331
42	10.5713	-0.0576847	40.0098	-294.941
43	10.669	-0.0300838	40.0107	-295.262
44	10.6919	0	40.0107	-295.262
45	10.7144	0.0300838	40.0117	-294.939
46	10.7144	0.0576847	40.015	-294.321
47	10.878	0.0878447	40.0227	-293.366
48	10.878	0.115562	40.0361	-292.109
49	11.0186	0.143367	40.0566	-290.529

50	11.0186	0.173829	40.0868	-288.614
51	11.0821	0.201894	40.1276	-286.376
52	11.0974	0.230118	40.1805	-283.822
53	11.1273	0.26112	40.2487	-280.917
54	11.1844	0.28976	40.3327	-277.676
55	11.1982	0.318639	40.4342	-274.108
56	11.1982	0.350451	40.557	-270.183
57	11.1982	0.379927	40.7014	-265.929
58	11.2252	0.412463	40.8715	-261.299
59	11.2385	0.442676	41.0675	-256.324
60	11.2385	0.473299	41.2915	-251.005
61	11.2385	0.507221	41.5487	-245.304
62	11.2772	0.538836	41.8391	-239.228
63	11.2898	0.570999	42.1651	-232.781
64	11.3266	0.606775	42.5333	-225.909
65	11.3266	0.640266	42.9432	-218.657
66	11.3266	0.67449	43.3982	-211.017
67	11.3266	0.712751	43.9062	-202.944
68	11.3851	0.748762	44.4668	-194.419
69	11.3964	0.789191	45.0897	-185.425
70	11.4076	0.827417	45.7743	-175.987
71	11.4404	0.866894	46.5258	-166.069
72	11.4616	0.911562	47.3567	-155.621
73	11.5521	0.954165	48.2672	-144.598
74	11.6263	0.998575	49.2643	-132.989
75	11.644	1.04939	50.3655	-120.77
76	11.6699	1.09847	51.5722	-107.951
77	11.6869	1.15035	52.8955	-94.5065
78	11.7035	1.21073	54.3613	-80.3367
79	11.7753	1.27024	55.9748	-65.3793
80	11.8422	1.34075	57.7725	-49.5018
81	11.8845	1.41183	59.7657	-32.7229
82	11.8982	1.49085	61.9884	-14.9845
83	11.9954	1.58927	64.5141	4.07938
84	12.1389	1.6954	67.3885	24.6596
85	12.1548	1.82501	70.7192	46.8421
86	12.2453	2.01409	74.7757	71.5053
87	12.2596	2.29036	80.0215	99.5843

Data Set Standard Deviation = 1.25264
Numerator = 9917.02
Denominator = 10798.4
W Statistic = 0.918382 = 9917.02 / 10798.4

5% Critical value of 0.972 exceeds 0.918382
Evidence of non-normality at 95% level of significance

1% Critical value of 0.961 exceeds 0.918382
Evidence of non-normality at 99% level of significance

Shapiro-Francia Test of Normality

Parameter: Potassium, total

Background Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
Total Number of Measurements = 54

i	x(i)	m(i)	sum(m^2)	sum(mx)
1	4700	-2.09693	4.39712	-9855.58
2	5000	-1.79912	7.63394	-18851.2
3	5200	-1.60725	10.2172	-27208.9
4	5700	-1.46106	12.3519	-35536.9
5	5800	-1.34075	14.1495	-43313.3
6	5800	-1.23187	15.667	-50458.1
7	5800	-1.14069	16.9682	-57074.1
8	5800	-1.05812	18.0878	-63211.2
9	5800	-0.982202	19.0525	-68908
10	5800	-0.911562	19.8835	-74195
11	5800	-0.841621	20.5918	-79076.4
12	5800	-0.778966	21.1986	-83594.4
13	5900	-0.719228	21.7159	-87837.9
14	6000	-0.661955	22.154	-91809.6
15	6100	-0.606775	22.5222	-95510.9
16	6300	-0.553384	22.8285	-98997.2
17	6400	-0.498687	23.0771	-102189
18	6500	-0.448213	23.278	-105102
19	6800	-0.398855	23.4371	-107814
20	6900	-0.350451	23.5599	-110233
21	7100	-0.302855	23.6517	-112383
22	7400	-0.253347	23.7158	-114258
23	7800	-0.207012	23.7587	-115872
24	7900	-0.161119	23.7847	-117145
25	8000	-0.115562	23.798	-118070
26	8100	-0.0702426	23.8029	-118639
27	8300	-0.0250691	23.8036	-118847
28	8400	0.0250691	23.8042	-118636
29	8400	0.0702426	23.8091	-118046
30	8500	0.115562	23.8225	-117064
31	8800	0.161119	23.8485	-115646
32	9100	0.207012	23.8913	-113762
33	9200	0.253347	23.9555	-111431
34	9200	0.302855	24.0472	-108645
35	9400	0.350451	24.17	-105351
36	9800	0.398855	24.3291	-101442
37	10900	0.448213	24.53	-96556.5
38	11300	0.498687	24.7787	-90921.3
39	11400	0.553384	25.0849	-84612.8
40	11400	0.606775	25.4531	-77695.5
41	11500	0.661955	25.8913	-70083
42	11600	0.719228	26.4086	-61740
43	11600	0.778966	27.0154	-52704
44	11800	0.841621	27.7237	-42772.9
45	11900	0.911562	28.5546	-31925.3
46	11900	0.982202	29.5194	-20237.1
47	12000	1.05812	30.639	-7539.6
48	12000	1.14069	31.9402	6148.66
49	12000	1.23187	33.4576	20931
50	12100	1.34075	35.2553	37154.2

51	12100	1.46106	37.39	54833
52	12200	1.60725	39.9732	74441.4
53	12300	1.79912	43.21	96570.6
54	12900	2.09693	47.6072	123621

Data Set Standard Deviation = 2575.21
Numerator = 1.52821e+010
Denominator = 1.6733e+010
W Statistic = 0.913296 = 1.52821e+010 / 1.6733e+010

5% Critical value of 0.958 exceeds 0.913296
Evidence of non-normality at 95% level of significance

1% Critical value of 0.94 exceeds 0.913296
Evidence of non-normality at 99% level of significance

Shapiro-Francia Test of Normality

Parameter: Potassium, total

Background Locations

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

Total Number of Measurements = 54

i	x(i)	m(i)	sum(m^2)	sum(mx)
1	8.45532	-2.09693	4.39712	-17.7302
2	8.51719	-1.79912	7.63394	-33.0536
3	8.55641	-1.60725	10.2172	-46.8059
4	8.64822	-1.46106	12.3519	-59.4415
5	8.66561	-1.34075	14.1495	-71.0599
6	8.66561	-1.23187	15.667	-81.7348
7	8.66561	-1.14069	16.9682	-91.6196
8	8.66561	-1.05812	18.0878	-100.789
9	8.66561	-0.982202	19.0525	-109.3
10	8.66561	-0.911562	19.8835	-117.199
11	8.66561	-0.841621	20.5918	-124.493
12	8.66561	-0.778966	21.1986	-131.243
13	8.68271	-0.719228	21.7159	-137.488
14	8.69951	-0.661955	22.154	-143.246
15	8.71604	-0.606775	22.5222	-148.535
16	8.7483	-0.553384	22.8285	-153.376
17	8.76405	-0.498687	23.0771	-157.747
18	8.77956	-0.448213	23.278	-161.682
19	8.82468	-0.398855	23.4371	-165.202
20	8.83928	-0.350451	23.5599	-168.299
21	8.86785	-0.302855	23.6517	-170.985
22	8.90924	-0.253347	23.7158	-173.242
23	8.96188	-0.207012	23.7587	-175.097
24	8.97462	-0.161119	23.7847	-176.543
25	8.9872	-0.115562	23.798	-177.582
26	8.99962	-0.0702426	23.8029	-178.214
27	9.02401	-0.0250691	23.8036	-178.44
28	9.03599	0.0250691	23.8042	-178.214
29	9.03599	0.0702426	23.8091	-177.579
30	9.04782	0.115562	23.8225	-176.534
31	9.08251	0.161119	23.8485	-175.07
32	9.11603	0.207012	23.8913	-173.183
33	9.12696	0.253347	23.9555	-170.871
34	9.12696	0.302855	24.0472	-168.107
35	9.14846	0.350451	24.17	-164.901
36	9.19014	0.398855	24.3291	-161.235
37	9.29652	0.448213	24.53	-157.068
38	9.33256	0.498687	24.7787	-152.414
39	9.34137	0.553384	25.0849	-147.245
40	9.34137	0.606775	25.4531	-141.577
41	9.3501	0.661955	25.8913	-135.387
42	9.35876	0.719228	26.4086	-128.656
43	9.35876	0.778966	27.0154	-121.366
44	9.37585	0.841621	27.7237	-113.475
45	9.38429	0.911562	28.5546	-104.921
46	9.38429	0.982202	29.5194	-95.7035
47	9.39266	1.05812	30.639	-85.7649
48	9.39266	1.14069	31.9402	-75.0508
49	9.39266	1.23187	33.4576	-63.4803
50	9.40096	1.34075	35.2553	-50.876

51	9.40096	1.46106	37.39	-37.1406
52	9.40919	1.60725	39.9732	-22.0177
53	9.41735	1.79912	43.21	-5.07477
54	9.46498	2.09693	47.6072	14.7726

Data Set Standard Deviation = 0.305818
Numerator = 218.231
Denominator = 235.979
W Statistic = 0.924789 = 218.231 / 235.979

5% Critical value of 0.958 exceeds 0.924789
Evidence of non-normality at 95% level of significance

1% Critical value of 0.94 exceeds 0.924789
Evidence of non-normality at 99% level of significance

Shapiro-Francia Test of Normality
Parameter: Sodium
Background Locations
Normality Test of Parameter Concentrations

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
Total Number of Measurements = 53

i	x(i)	m(i)	sum(m^2)	sum(mx)
1	57400	-2.09693	4.39712	-120364
2	57600	-1.78661	7.5891	-223273
3	61000	-1.59819	10.1433	-320762
4	61100	-1.44663	12.2361	-409152
5	61700	-1.32854	14.0011	-491123
6	61700	-1.22123	15.4925	-566472
7	61800	-1.13113	16.7719	-636376
8	62000	-1.04505	17.8641	-701169
9	62200	-0.970094	18.8052	-761509
10	62600	-0.896473	19.6088	-817628
11	63300	-0.830953	20.2993	-870228
12	63700	-0.765456	20.8852	-918987
13	63800	-0.706302	21.3841	-964049
14	64900	-0.646431	21.802	-1.006e+006
15	65300	-0.591776	22.1522	-1.04465e+006
16	65400	-0.53594	22.4394	-1.0797e+006
17	65500	-0.484544	22.6742	-1.11143e+006
18	65900	-0.431644	22.8605	-1.13988e+006
19	66200	-0.382622	23.0069	-1.16521e+006
20	66500	-0.331854	23.117	-1.18728e+006
21	66500	-0.284535	23.198	-1.2062e+006
22	66600	-0.235269	23.2533	-1.22187e+006
23	67700	-0.189118	23.2891	-1.23467e+006
24	68000	-0.140835	23.3089	-1.24425e+006
25	68200	-0.0953969	23.318	-1.25075e+006
26	68300	-0.0476439	23.3203	-1.25401e+006
27	68700	0	23.3203	-1.25401e+006
28	68800	0.0476439	23.3226	-1.25073e+006
29	69100	0.0953969	23.3317	-1.24414e+006
30	69700	0.140835	23.3515	-1.23432e+006
31	72300	0.189118	23.3873	-1.22065e+006
32	74300	0.235269	23.4426	-1.20317e+006
33	78600	0.284535	23.5236	-1.1808e+006
34	82300	0.331854	23.6337	-1.15349e+006
35	82700	0.382622	23.7801	-1.12185e+006
36	108000	0.431644	23.9664	-1.07523e+006
37	111000	0.484544	24.2012	-1.02145e+006
38	111000	0.53594	24.4884	-961958
39	112000	0.591776	24.8386	-895679
40	112000	0.646431	25.2565	-823279
41	115000	0.706302	25.7554	-742054
42	115000	0.765456	26.3413	-654026
43	116000	0.830953	27.0318	-557636
44	117000	0.896473	27.8354	-452749
45	118000	0.970094	28.7765	-338277
46	120000	1.04505	29.8687	-212871
47	121000	1.13113	31.1481	-76004.5
48	122000	1.22123	32.6395	72985.4
49	122000	1.32854	34.4045	235067
50	123000	1.44663	36.4973	413003

51	124000	1.59819	39.0515	611179
52	124000	1.78661	42.2435	832719
53	131000	2.09693	46.6406	1.10742e+006

Data Set Standard Deviation = 25200.6
Numerator = 1.22637e+012
Denominator = 1.54025e+012
W Statistic = 0.796218 = 1.22637e+012 / 1.54025e+012

5% Critical value of 0.957 exceeds 0.796218
Evidence of non-normality at 95% level of significance

1% Critical value of 0.938 exceeds 0.796218
Evidence of non-normality at 99% level of significance

Shapiro-Francia Test of Normality

Parameter: Sodium

Background Locations

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

Total Number of Measurements = 53

i	x(i)	m(i)	sum(m^2)	sum(mx)
1	10.9578	-2.09693	4.39712	-22.9777
2	10.9613	-1.78661	7.5891	-42.5613
3	11.0186	-1.59819	10.1433	-60.1712
4	11.0203	-1.44663	12.2361	-76.1135
5	11.03	-1.32854	14.0011	-90.7673
6	11.03	-1.22123	15.4925	-104.238
7	11.0317	-1.13113	16.7719	-116.716
8	11.0349	-1.04505	17.8641	-128.248
9	11.0381	-0.970094	18.8052	-138.956
10	11.0445	-0.896473	19.6088	-148.857
11	11.0556	-0.830953	20.2993	-158.044
12	11.0619	-0.765456	20.8852	-166.511
13	11.0635	-0.706302	21.3841	-174.325
14	11.0806	-0.646431	21.802	-181.488
15	11.0867	-0.591776	22.1522	-188.049
16	11.0883	-0.53594	22.4394	-193.992
17	11.0898	-0.484544	22.6742	-199.365
18	11.0959	-0.431644	22.8605	-204.155
19	11.1004	-0.382622	23.0069	-208.402
20	11.105	-0.331854	23.117	-212.087
21	11.105	-0.284535	23.198	-215.247
22	11.1065	-0.235269	23.2533	-217.86
23	11.1228	-0.189118	23.2891	-219.963
24	11.1273	-0.140835	23.3089	-221.53
25	11.1302	-0.0953969	23.318	-222.592
26	11.1317	-0.0476439	23.3203	-223.123
27	11.1375	0	23.3203	-223.123
28	11.139	0.0476439	23.3226	-222.592
29	11.1433	0.0953969	23.3317	-221.529
30	11.152	0.140835	23.3515	-219.958
31	11.1886	0.189118	23.3873	-217.842
32	11.2159	0.235269	23.4426	-215.204
33	11.2721	0.284535	23.5236	-211.996
34	11.3181	0.331854	23.6337	-208.24
35	11.323	0.382622	23.7801	-203.908
36	11.5899	0.431644	23.9664	-198.905
37	11.6173	0.484544	24.2012	-193.276
38	11.6173	0.53594	24.4884	-187.05
39	11.6263	0.591776	24.8386	-180.17
40	11.6263	0.646431	25.2565	-172.654
41	11.6527	0.706302	25.7554	-164.424
42	11.6527	0.765456	26.3413	-155.504
43	11.6613	0.830953	27.0318	-145.814
44	11.6699	0.896473	27.8354	-135.352
45	11.6784	0.970094	28.7765	-124.023
46	11.6952	1.04505	29.8687	-111.801
47	11.7035	1.13113	31.1481	-98.5629
48	11.7118	1.22123	32.6395	-84.2601
49	11.7118	1.32854	34.4045	-68.7006
50	11.7199	1.44663	36.4973	-51.7461

51	11.728	1.59819	39.0515	-33.0025
52	11.728	1.78661	42.2435	-12.049
53	11.783	2.09693	46.6406	12.659

Data Set Standard Deviation = 0.283897
Numerator = 160.251
Denominator = 195.473
W Statistic = 0.819807 = 160.251 / 195.473

5% Critical value of 0.957 exceeds 0.819807
Evidence of non-normality at 95% level of significance

1% Critical value of 0.938 exceeds 0.819807
Evidence of non-normality at 99% level of significance

APPENDIX F.

OUTLIER TESTING RESULTS ON CD

Royalton Road LF

Dixon's Test for Outliers

Parameter: Arsenic, total

Location: MW-2R

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 18 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.0769231	0	0.561	None

Loc.	Date	Conc.	Outlier
MW-2R	12/2/2009	ND<1	FALSE
	6/21/2010	1.1	FALSE
	12/6/2010	ND<1 0.9J	FALSE
	6/21/2011	ND<2 1.8J	FALSE
	12/13/2011	2.2	FALSE
	6/4/2012	ND<1	FALSE
	12/11/2012	1.9	FALSE
	6/3/2013	ND<1	FALSE
	12/3/2013	1.2	FALSE
	6/2/2014	ND<1 0.95J	FALSE
	12/2/2014	1.4	FALSE
	6/1/2015	1.9	FALSE
	12/7/2015	1	FALSE
	6/6/2016	ND<1 0.7J	FALSE
	12/5/2016	2.2	FALSE
	6/20/2017	1.4	FALSE
	12/4/2017	2.3	FALSE
	6/4/2018	2	FALSE

Dixon's Test for Outliers

Parameter: Arsenic, total

Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 18 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.42069	0.222222	0.561	None

Loc.	Date	Conc.	Outlier
MW-12	12/2/2009	24.9	FALSE
	6/21/2010	24.1	FALSE
	12/6/2010	25	FALSE
	6/21/2011	26.3	FALSE
	12/13/2011	24.1	FALSE
	6/4/2012	15.5	FALSE
	12/11/2012	20.6	FALSE
	6/3/2013	16.5	FALSE
	12/3/2013	19.8	FALSE
	6/2/2014	20	FALSE
	12/2/2014	17.9	FALSE
	6/1/2015	19.2	FALSE
	12/7/2015	24.2	FALSE
	6/6/2016	22.1	FALSE
	12/5/2016	32.4	FALSE
	6/20/2017	21.2	FALSE
	12/4/2017	29.7	FALSE
	6/4/2018	19.4	FALSE

Royalton Road LF

Dixon's Test for Outliers

Parameter: Barium, total

Location: MW-2R

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 18 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.555556	0.2	0.561	None

Loc.	Date	Conc.	Outlier
MW-2R	12/2/2009	15	FALSE
	6/21/2010	10	FALSE
	12/6/2010	15	FALSE
	6/21/2011	17	FALSE
	12/13/2011	13	FALSE
	6/4/2012	12.9	FALSE
	12/11/2012	11	FALSE
	6/3/2013	11	FALSE
	12/3/2013	11	FALSE
	6/2/2014	11	FALSE
	12/2/2014	12	FALSE
	6/1/2015	20	FALSE
	12/7/2015	14	FALSE
	6/6/2016	13	FALSE
	12/5/2016	14	FALSE
	6/20/2017	15	FALSE
	12/4/2017	13	FALSE
	6/4/2018	13	FALSE

Dixon's Test for Outliers

Parameter: Barium, total

Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 18 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.444444	0.210526	0.561	None

Loc.	Date	Conc.	Outlier
MW-3	12/2/2009	43	FALSE
	6/21/2010	47	FALSE
	12/6/2010	34	FALSE
	6/21/2011	37	FALSE
	12/13/2011	31	FALSE
	6/4/2012	37.9	FALSE
	12/11/2012	43	FALSE
	6/3/2013	36	FALSE
	12/3/2013	30	FALSE
	6/2/2014	35	FALSE
	12/2/2014	48	FALSE
	6/1/2015	47	FALSE
	12/7/2015	61	FALSE
	6/6/2016	49	FALSE
	12/5/2016	45	FALSE
	6/20/2017	36	FALSE
	12/4/2017	49	FALSE
	6/4/2018	44	FALSE

Royalton Road LF

Dixon's Test for Outliers

Parameter: Cadmium, total

Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 18 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0	0	0.561	None

Loc.	Date	Conc.	Outlier
MW-3	12/2/2009	ND<2	FALSE
	6/21/2010	ND<2	FALSE
	12/6/2010	ND<2	FALSE
	6/21/2011	ND<2	FALSE
	12/13/2011	ND<2	FALSE
	6/4/2012	ND<2	FALSE
	12/11/2012	ND<2	FALSE
	6/3/2013	ND<2	FALSE
	12/3/2013	ND<2	FALSE
	6/2/2014	ND<2	FALSE
	12/2/2014	ND<2	FALSE
	6/1/2015	4	FALSE
	12/7/2015	5	FALSE
	6/6/2016	5	FALSE
	12/5/2016	5	FALSE
	6/20/2017	3	FALSE
	12/4/2017	3	FALSE
	6/4/2018	ND<2 0.0019J	FALSE

Royalton Road LF

Dixon's Test for Outliers

Parameter: Zinc, total

Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 9 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.44086	0.2	0.635	None

Loc.	Date	Conc.	Outlier
MW-3	6/2/2014	186	FALSE
	12/2/2014	93	FALSE
	6/1/2015	145	FALSE
	12/7/2015	107	FALSE
	6/6/2016	98	FALSE
	12/5/2016	109	FALSE
	6/20/2017	95	FALSE
	12/4/2017	111	FALSE
	6/4/2018	80	FALSE

Royalton Road LF

Dixon's Test for Outliers

Parameter: Ammonia Nitrogen

Location: MW-2R

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 18 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.333333	0.263158	0.561	None

Loc.	Date	Conc.	Outlier
MW-2R	12/2/2009	1080	FALSE
	6/21/2010	1260	FALSE
	12/6/2010	1080	FALSE
	6/21/2011	940	FALSE
	12/13/2011	1010	FALSE
	6/4/2012	1190	FALSE
	12/11/2012	1250	FALSE
	6/3/2013	1250	FALSE
	12/3/2013	1200	FALSE
	6/2/2014	1460	FALSE
	12/2/2014	1310	FALSE
	6/1/2015	1400	FALSE
	12/7/2015	1320	FALSE
	6/6/2016	1300	FALSE
	12/5/2016	1090	FALSE
	6/20/2017	1120	FALSE
	12/4/2017	1040	FALSE
	6/4/2018	1130	FALSE

Dixon's Test for Outliers
Parameter: Ammonia Nitrogen
Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 18 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.208955	0.0535714	0.561	None

Loc.	Date	Conc.	Outlier
MW-3	12/2/2009	2220	FALSE
	6/21/2010	1770	FALSE
	12/6/2010	1660	FALSE
	6/21/2011	2070	FALSE
	12/13/2011	2120	FALSE
	6/4/2012	2110	FALSE
	12/11/2012	2090	FALSE
	6/3/2013	2180	FALSE
	12/3/2013	2360	FALSE
	6/2/2014	2270	FALSE
	12/2/2014	2200	FALSE
	6/1/2015	1850	FALSE
	12/7/2015	1980	FALSE
	6/6/2016	2020	FALSE
	12/5/2016	1690	FALSE
	6/20/2017	1940	FALSE
	12/4/2017	1670	FALSE
	6/4/2018	1930	FALSE

Dixon's Test for Outliers

Parameter: Ammonia Nitrogen

Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 18 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.681818	0.588235	0.561	900
2	0.642857	0.666667	0.577	820
3	0.428571	0.714286	0.595	580
4	0.428571	0.5	0.616	None

Loc.	Date	Conc.	Outlier
MW-12	12/2/2009	680	FALSE
	6/21/2010	**820**	**TRUE**
	12/6/2010	**580**	**TRUE**
	6/21/2011	690	FALSE
	12/13/2011	720	FALSE
	6/4/2012	700	FALSE
	12/11/2012	640	FALSE
	6/3/2013	730	FALSE
	12/3/2013	690	FALSE
	6/2/2014	**900**	**TRUE**
	12/2/2014	700	FALSE
	6/1/2015	750	FALSE
	12/7/2015	680	FALSE
	6/6/2016	710	FALSE
	12/5/2016	710	FALSE
	6/20/2017	690	FALSE
	12/4/2017	700	FALSE
	6/4/2018	710	FALSE

Royalton Road LF

Rosner's Test for Outliers

Parameter: Chloride

Location: MW-2R

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Data set mean = 12886.6

10 most extreme of 32 measurements

by order of magnitude difference from the mean

1	6/1/2015	MW-2R	136000	123113
2	12/7/2015	MW-2R	37000	24113.4
3	6/4/2018	MW-2R	23000	10113.4
4	6/6/2016	MW-2R	23000	10113.4
5	6/1/2009	MW-2R	23000	10113.4
6	12/6/2004	MW-2R	3000	-9886.56
7	5/10/2004	MW-2R	3000	-9886.56
8	6/3/2013	MW-2R	3000	-9886.56
9	12/2/2009	MW-2R	22000	9113.44
10	11/13/2006	MW-2R	4000	-8886.56

Iteration i = 9

Mean of 23 measurements = 6059.57
Std Dev = 2231.71
x(i+1) = 4000 from measurement 11/13/2006 from location MW-2R
Rosner Statistic R = |4000 - 6059.57|/2231.71 = 0.922866
Lambda(32, 10, 0.01) = 3.09
0.922866 < 3.09 -- No outliers detected for i = 9

Iteration i = 8

Mean of 24 measurements = 6723.75
Std Dev = 3918.08
x(i+1) = 22000 from measurement 12/2/2009 from location MW-2R
Rosner Statistic R = |22000 - 6723.75|/3918.08 = 3.89891
Lambda(32, 9, 0.01) = 3.112
3.89891 > 3.112 -- Measurement 12/2/2009 for location MW-2R is an outlier

---

Iteration i = 7

Mean of 25 measurements = 6574.8
Std Dev = 3907.22
x(i+1) = 3000 from measurement 6/3/2013 from location MW-2R
Rosner Statistic R = |3000 - 6574.8|/3907.22 = 0.914921
Lambda(32, 8, 0.01) = 3.134
Measurement 6/3/2013 for location MW-2R is an outlier

Iteration i = 6

Mean of 26 measurements = 6437.31
Std Dev = 3891.94
x(i+1) = 3000 from measurement 5/10/2004 from location MW-2R
Rosner Statistic R = |3000 - 6437.31|/3891.94 = 0.883185
Lambda(32, 7, 0.01) = 3.156
Measurement 5/10/2004 for location MW-2R is an outlier

Iteration i = 5

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Mean of 27 measurements = 6310
Std Dev = 3873.27
x(i+1) = 3000 from measurement 12/6/2004 from location MW-2R
Rosner Statistic R = |3000 - 6310|/3873.27 = 0.854575
Lambda(32, 6, 0.01) = 3.178
Measurement 12/6/2004 for location MW-2R is an outlier

Iteration i = 4

Mean of 28 measurements = 6906.07
Std Dev = 4939.13
x(i+1) = 23000 from measurement 6/1/2009 from location MW-2R
Rosner Statistic R = |23000 - 6906.07|/4939.13 = 3.25845
Lambda(32, 5, 0.01) = 3.2
Measurement 6/1/2009 for location MW-2R is an outlier

Iteration i = 3

Mean of 29 measurements = 7461.03
Std Dev = 5696.96
x(i+1) = 23000 from measurement 6/6/2016 from location MW-2R
Rosner Statistic R = |23000 - 7461.03|/5696.96 = 2.72759
Lambda(32, 4, 0.01) = 3.22
Measurement 6/6/2016 for location MW-2R is an outlier

Iteration i = 2

Mean of 30 measurements = 7979
Std Dev = 6275.73
x(i+1) = 23000 from measurement 6/4/2018 from location MW-2R
Rosner Statistic R = |23000 - 7979|/6275.73 = 2.39351
Lambda(32, 3, 0.01) = 3.24
Measurement 6/4/2018 for location MW-2R is an outlier

Iteration i = 1

Mean of 31 measurements = 8915.16
Std Dev = 8077.15
x(i+1) = 37000 from measurement 12/7/2015 from location MW-2R
Rosner Statistic R = |37000 - 8915.16|/8077.15 = 3.47707
Lambda(32, 2, 0.01) = 3.25
Measurement 12/7/2015 for location MW-2R is an outlier

Iteration i = 0

Mean of 32 measurements = 12886.6
Std Dev = 23829.4
x(i+1) = 136000 from measurement 6/1/2015 from location MW-2R
Rosner Statistic R = |136000 - 12886.6|/23829.4 = 5.16645
Lambda(32, 1, 0.01) = 3.27
Measurement 6/1/2015 for location MW-2R is an outlier

Rosner's Test for Outliers
Parameter: Chloride
Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Data set mean = 111031

10 most extreme of 32 measurements

by order of magnitude difference from the mean

1	12/17/2007	MW-3	211000	99968.8
2	6/16/2008	MW-3	208000	96968.8
3	12/2/2008	MW-3	190000	78968.8
4	6/25/2007	MW-3	187000	75968.8
5	4/14/2003	MW-3	53000	-58031.3
6	5/22/2006	MW-3	162000	50968.8
7	11/3/2003	MW-3	66000	-45031.3
8	10/14/2002	MW-3	68000	-43031.3
9	6/3/2013	MW-3	72000	-39031.3
10	12/7/2015	MW-3	73000	-38031.3

Iteration i = 9

Mean of 23 measurements = 101565
Std Dev = 23467.2
x(i+1) = 73000 from measurement 12/7/2015 from location MW-3
Rosner Statistic R = |73000 - 101565|/23467.2 = 1.21724
Lambda(32, 10, 0.01) = 3.09
1.21724 < 3.09 -- No outliers detected for i = 9

Iteration i = 8

Mean of 24 measurements = 100333
Std Dev = 23731.6
x(i+1) = 72000 from measurement 6/3/2013 from location MW-3
Rosner Statistic R = |72000 - 100333|/23731.6 = 1.19391
Lambda(32, 9, 0.01) = 3.112
1.19391 < 3.112 -- No outliers detected for i = 8

Iteration i = 7

Mean of 25 measurements = 99040
Std Dev = 24115.1
x(i+1) = 68000 from measurement 10/14/2002 from location MW-3
Rosner Statistic R = |68000 - 99040|/24115.1 = 1.28716
Lambda(32, 8, 0.01) = 3.134
1.28716 < 3.134 -- No outliers detected for i = 7

Iteration i = 6

Mean of 26 measurements = 97769.2
Std Dev = 24500.3
x(i+1) = 66000 from measurement 11/3/2003 from location MW-3
Rosner Statistic R = |66000 - 97769.2|/24500.3 = 1.29669
Lambda(32, 7, 0.01) = 3.156
1.29669 < 3.156 -- No outliers detected for i = 6

Iteration i = 5

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Mean of 27 measurements = 100148
Std Dev = 27018.1
x(i+1) = 162000 from measurement 5/22/2006 from location MW-3
Rosner Statistic R = |162000 - 100148|/27018.1 = 2.28928
Lambda(32, 6, 0.01) = 3.178
2.28928 < 3.178 -- No outliers detected for i = 5

Iteration i = 4

Mean of 28 measurements = 98464.3
Std Dev = 27970.2
x(i+1) = 53000 from measurement 4/14/2003 from location MW-3
Rosner Statistic R = |53000 - 98464.3|/27970.2 = 1.62545
Lambda(32, 5, 0.01) = 3.2
1.62545 < 3.2 -- No outliers detected for i = 4

Iteration i = 3

Mean of 29 measurements = 101517
Std Dev = 32010.7
x(i+1) = 187000 from measurement 6/25/2007 from location MW-3
Rosner Statistic R = |187000 - 101517|/32010.7 = 2.67044
Lambda(32, 4, 0.01) = 3.22
2.67044 < 3.22 -- No outliers detected for i = 3

Iteration i = 2

Mean of 30 measurements = 104467
Std Dev = 35360
x(i+1) = 190000 from measurement 12/2/2008 from location MW-3
Rosner Statistic R = |190000 - 104467|/35360 = 2.41893
Lambda(32, 3, 0.01) = 3.24
2.41893 < 3.24 -- No outliers detected for i = 2

Iteration i = 1

Mean of 31 measurements = 107806
Std Dev = 39426.2
x(i+1) = 208000 from measurement 6/16/2008 from location MW-3
Rosner Statistic R = |208000 - 107806|/39426.2 = 2.54129
Lambda(32, 2, 0.01) = 3.25
2.54129 < 3.25 -- No outliers detected for i = 1

Iteration i = 0

Mean of 32 measurements = 111031
Std Dev = 42861
x(i+1) = 211000 from measurement 12/17/2007 from location MW-3
Rosner Statistic R = |211000 - 111031|/42861 = 2.3324
Lambda(32, 1, 0.01) = 3.27
2.3324 < 3.27 -- No outliers detected for i = 0

Royalton Road LF

Rosner's Test for Outliers

Parameter: Chloride

Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Data set mean = 37662.5

10 most extreme of 32 measurements

by order of magnitude difference from the mean

1	12/4/2017	MW-12	80000	42337.5
2	6/4/2018	MW-12	76000	38337.5
3	12/5/2016	MW-12	76000	38337.5
4	12/7/2015	MW-12	75000	37337.5
5	6/20/2017	MW-12	73000	35337.5
6	11/3/2003	MW-12	8000	-29662.5
7	12/6/2004	MW-12	8000	-29662.5
8	10/14/2002	MW-12	8000	-29662.5
9	5/10/2004	MW-12	9000	-28662.5
10	4/14/2003	MW-12	10000	-27662.5

Iteration i = 9

Mean of 23 measurements = 34443.5
Std Dev = 15841.9
x(i+1) = 10000 from measurement 4/14/2003 from location MW-12
Rosner Statistic R = |10000 - 34443.5|/15841.9 = 1.54296
Lambda(32, 10, 0.01) = 3.09
1.54296 < 3.09 -- No outliers detected for i = 9

Iteration i = 8

Mean of 24 measurements = 33383.3
Std Dev = 16341
x(i+1) = 9000 from measurement 5/10/2004 from location MW-12
Rosner Statistic R = |9000 - 33383.3|/16341 = 1.49216
Lambda(32, 9, 0.01) = 3.112
1.49216 < 3.112 -- No outliers detected for i = 8

Iteration i = 7

Mean of 25 measurements = 32368
Std Dev = 16783.2
x(i+1) = 8000 from measurement 10/14/2002 from location MW-12
Rosner Statistic R = |8000 - 32368|/16783.2 = 1.45193
Lambda(32, 8, 0.01) = 3.134
1.45193 < 3.134 -- No outliers detected for i = 7

Iteration i = 6

Mean of 26 measurements = 31430.8
Std Dev = 17124.4
x(i+1) = 8000 from measurement 12/6/2004 from location MW-12
Rosner Statistic R = |8000 - 31430.8|/17124.4 = 1.36827
Lambda(32, 7, 0.01) = 3.156
1.36827 < 3.156 -- No outliers detected for i = 6

Iteration i = 5

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Mean of 27 measurements = 30563
Std Dev = 17386.8
x(i+1) = 8000 from measurement 11/3/2003 from location MW-12
Rosner Statistic R = |8000 - 30563|/17386.8 = 1.29771
Lambda(32, 6, 0.01) = 3.178
1.29771 < 3.178 -- No outliers detected for i = 5

Iteration i = 4

Mean of 28 measurements = 32078.6
Std Dev = 18852.7
x(i+1) = 73000 from measurement 6/20/2017 from location MW-12
Rosner Statistic R = |73000 - 32078.6|/18852.7 = 2.17059
Lambda(32, 5, 0.01) = 3.2
2.17059 < 3.2 -- No outliers detected for i = 4

Iteration i = 3

Mean of 29 measurements = 33558.6
Std Dev = 20155.8
x(i+1) = 75000 from measurement 12/7/2015 from location MW-12
Rosner Statistic R = |75000 - 33558.6|/20155.8 = 2.05606
Lambda(32, 4, 0.01) = 3.22
2.05606 < 3.22 -- No outliers detected for i = 3

Iteration i = 2

Mean of 30 measurements = 34973.3
Std Dev = 21267.1
x(i+1) = 76000 from measurement 12/5/2016 from location MW-12
Rosner Statistic R = |76000 - 34973.3|/21267.1 = 1.92912
Lambda(32, 3, 0.01) = 3.24
1.92912 < 3.24 -- No outliers detected for i = 2

Iteration i = 1

Mean of 31 measurements = 36296.8
Std Dev = 22170
x(i+1) = 76000 from measurement 6/4/2018 from location MW-12
Rosner Statistic R = |76000 - 36296.8|/22170 = 1.79085
Lambda(32, 2, 0.01) = 3.25
1.79085 < 3.25 -- No outliers detected for i = 1

Iteration i = 0

Mean of 32 measurements = 37662.5
Std Dev = 23137.4
x(i+1) = 80000 from measurement 12/4/2017 from location MW-12
Rosner Statistic R = |80000 - 37662.5|/23137.4 = 1.82983
Lambda(32, 1, 0.01) = 3.27
1.82983 < 3.27 -- No outliers detected for i = 0

Dixon's Test for Outliers

Parameter: Sodium

Location: MW-2R

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 18 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.667188	0.144578	0.561	125000
2	0.18894	0.169811	0.577	None

Loc.	Date	Conc.	Outlier
MW-2R	12/2/2009	57600	FALSE
	6/21/2010	62600	FALSE
	12/6/2010	74300	FALSE
	6/21/2011	61100	FALSE
	12/13/2011	57400	FALSE
	6/4/2012	65500	FALSE
	12/11/2012	61000	FALSE
	6/3/2013	63800	FALSE
	12/3/2013	63700	FALSE
	6/2/2014	66200	FALSE
	12/2/2014	62000	FALSE
	6/1/2015	**125000**	**TRUE**
	12/7/2015	78600	FALSE
	6/6/2016	82300	FALSE
	12/5/2016	66500	FALSE
	6/20/2017	68700	FALSE
	12/4/2017	61700	FALSE
	6/4/2018	82700	FALSE

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Dixon's Test for Outliers

Parameter: Sodium

Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 18 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.35	0.1875	0.561	None

Loc.	Date	Conc.	Outlier
MW-3	12/2/2009	111000	FALSE
	6/21/2010	112000	FALSE
	12/6/2010	124000	FALSE
	6/21/2011	131000	FALSE
	12/13/2011	115000	FALSE
	6/4/2012	122000	FALSE
	12/11/2012	124000	FALSE
	6/3/2013	116000	FALSE
	12/3/2013	120000	FALSE
	6/2/2014	121000	FALSE
	12/2/2014	122000	FALSE
	6/1/2015	111000	FALSE
	12/7/2015	108000	FALSE
	6/6/2016	118000	FALSE
	12/5/2016	117000	FALSE
	6/20/2017	115000	FALSE
	12/4/2017	112000	FALSE
	6/4/2018	123000	FALSE

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Dixon's Test for Outliers

Parameter: Sodium

Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 18 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.316832	0.0675676	0.561	None

Loc.	Date	Conc.	Outlier
MW-12	12/2/2009	62200	FALSE
	6/21/2010	61800	FALSE
	12/6/2010	63300	FALSE
	6/21/2011	68800	FALSE
	12/13/2011	68300	FALSE
	6/4/2012	66500	FALSE
	12/11/2012	65900	FALSE
	6/3/2013	64900	FALSE
	12/3/2013	67700	FALSE
	6/2/2014	65400	FALSE
	12/2/2014	68000	FALSE
	6/1/2015	61700	FALSE
	12/7/2015	68200	FALSE
	6/6/2016	66600	FALSE
	12/5/2016	72300	FALSE
	6/20/2017	65300	FALSE
	12/4/2017	69100	FALSE
	6/4/2018	69700	FALSE

Royalton Road LF

Dixon's Test for Outliers

Parameter: Potassium, total

Location: MW-2R

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 18 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.294118	0.294118	0.561	None

Loc.	Date	Conc.	Outlier
MW-2R	12/2/2009	4700	FALSE
	6/21/2010	5800	FALSE
	12/6/2010	6900	FALSE
	6/21/2011	6500	FALSE
	12/13/2011	5800	FALSE
	6/4/2012	5800	FALSE
	12/11/2012	5800	FALSE
	6/3/2013	5800	FALSE
	12/3/2013	5900	FALSE
	6/2/2014	6100	FALSE
	12/2/2014	5200	FALSE
	6/1/2015	5800	FALSE
	12/7/2015	6000	FALSE
	6/6/2016	6400	FALSE
	12/5/2016	5800	FALSE
	6/20/2017	5700	FALSE
	12/4/2017	5800	FALSE
	6/4/2018	5000	FALSE

Dixon's Test for Outliers

Parameter: Potassium, total

Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 18 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.222222	0.275862	0.561	None

Loc.	Date	Conc.	Outlier
MW-3	12/2/2009	8400	FALSE
	6/21/2010	8500	FALSE
	12/6/2010	6300	FALSE
	6/21/2011	9800	FALSE
	12/13/2011	9100	FALSE
	6/4/2012	9400	FALSE
	12/11/2012	8800	FALSE
	6/3/2013	9200	FALSE
	12/3/2013	9200	FALSE
	6/2/2014	8100	FALSE
	12/2/2014	8400	FALSE
	6/1/2015	6800	FALSE
	12/7/2015	8000	FALSE
	6/6/2016	7900	FALSE
	12/5/2016	7400	FALSE
	6/20/2017	7800	FALSE
	12/4/2017	7100	FALSE
	6/4/2018	8300	FALSE

Dixon's Test for Outliers

Parameter: Potassium, total

Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 18 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.466667	0.384615	0.561	None

Loc.	Date	Conc.	Outlier
MW-12	12/2/2009	11500	FALSE
	6/21/2010	11900	FALSE
	12/6/2010	12000	FALSE
	6/21/2011	12900	FALSE
	12/13/2011	12200	FALSE
	6/4/2012	12100	FALSE
	12/11/2012	11800	FALSE
	6/3/2013	12300	FALSE
	12/3/2013	12000	FALSE
	6/2/2014	12000	FALSE
	12/2/2014	11300	FALSE
	6/1/2015	10900	FALSE
	12/7/2015	11900	FALSE
	6/6/2016	11600	FALSE
	12/5/2016	12100	FALSE
	6/20/2017	11600	FALSE
	12/4/2017	11400	FALSE
	6/4/2018	11400	FALSE

APPENDIX G.

SEN'S TREND TEST RESULTS ON CD

Royalton Road LF

Sen's Slope Analysis
Parameter: Ammonia Nitrogen
Location: MW-2R

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1260 (6/21/2010)	1080 (12/2/2009)	(1260 - 1080)/(2 - 1)	180
1080 (12/6/2010)	1080 (12/2/2009)	(1080 - 1080)/(3 - 1)	0
940 (6/21/2011)	1080 (12/2/2009)	(940 - 1080)/(4 - 1)	-46.6667
1010 (12/13/2011)	1080 (12/2/2009)	(1010 - 1080)/(5 - 1)	-17.5
1190 (6/4/2012)	1080 (12/2/2009)	(1190 - 1080)/(6 - 1)	22
1250 (12/11/2012)	1080 (12/2/2009)	(1250 - 1080)/(7 - 1)	28.3333
1250 (6/3/2013)	1080 (12/2/2009)	(1250 - 1080)/(8 - 1)	24.2857
1200 (12/3/2013)	1080 (12/2/2009)	(1200 - 1080)/(9 - 1)	15
1460 (6/2/2014)	1080 (12/2/2009)	(1460 - 1080)/(10 - 1)	42.2222
1310 (12/2/2014)	1080 (12/2/2009)	(1310 - 1080)/(11 - 1)	23
1400 (6/1/2015)	1080 (12/2/2009)	(1400 - 1080)/(12 - 1)	29.0909
1320 (12/7/2015)	1080 (12/2/2009)	(1320 - 1080)/(13 - 1)	20
1300 (6/6/2016)	1080 (12/2/2009)	(1300 - 1080)/(14 - 1)	16.9231
1090 (12/5/2016)	1080 (12/2/2009)	(1090 - 1080)/(15 - 1)	0.714286
1120 (6/20/2017)	1080 (12/2/2009)	(1120 - 1080)/(16 - 1)	2.66667
1040 (12/4/2017)	1080 (12/2/2009)	(1040 - 1080)/(17 - 1)	-2.5
1130 (6/4/2018)	1080 (12/2/2009)	(1130 - 1080)/(18 - 1)	2.94118
1080 (12/6/2010)	1260 (6/21/2010)	(1080 - 1260)/(3 - 2)	-180
940 (6/21/2011)	1260 (6/21/2010)	(940 - 1260)/(4 - 2)	-160
1010 (12/13/2011)	1260 (6/21/2010)	(1010 - 1260)/(5 - 2)	-83.3333
1190 (6/4/2012)	1260 (6/21/2010)	(1190 - 1260)/(6 - 2)	-17.5
1250 (12/11/2012)	1260 (6/21/2010)	(1250 - 1260)/(7 - 2)	-2
1250 (6/3/2013)	1260 (6/21/2010)	(1250 - 1260)/(8 - 2)	-1.66667
1200 (12/3/2013)	1260 (6/21/2010)	(1200 - 1260)/(9 - 2)	-8.57143
1460 (6/2/2014)	1260 (6/21/2010)	(1460 - 1260)/(10 - 2)	25
1310 (12/2/2014)	1260 (6/21/2010)	(1310 - 1260)/(11 - 2)	5.55556
1400 (6/1/2015)	1260 (6/21/2010)	(1400 - 1260)/(12 - 2)	14
1320 (12/7/2015)	1260 (6/21/2010)	(1320 - 1260)/(13 - 2)	5.45455
1300 (6/6/2016)	1260 (6/21/2010)	(1300 - 1260)/(14 - 2)	3.33333
1090 (12/5/2016)	1260 (6/21/2010)	(1090 - 1260)/(15 - 2)	-13.0769
1120 (6/20/2017)	1260 (6/21/2010)	(1120 - 1260)/(16 - 2)	-10
1040 (12/4/2017)	1260 (6/21/2010)	(1040 - 1260)/(17 - 2)	-14.6667
1130 (6/4/2018)	1260 (6/21/2010)	(1130 - 1260)/(18 - 2)	-8.125
940 (6/21/2011)	1080 (12/6/2010)	(940 - 1080)/(4 - 3)	-140
1010 (12/13/2011)	1080 (12/6/2010)	(1010 - 1080)/(5 - 3)	-35
1190 (6/4/2012)	1080 (12/6/2010)	(1190 - 1080)/(6 - 3)	36.6667
1250 (12/11/2012)	1080 (12/6/2010)	(1250 - 1080)/(7 - 3)	42.5
1250 (6/3/2013)	1080 (12/6/2010)	(1250 - 1080)/(8 - 3)	34
1200 (12/3/2013)	1080 (12/6/2010)	(1200 - 1080)/(9 - 3)	20
1460 (6/2/2014)	1080 (12/6/2010)	(1460 - 1080)/(10 - 3)	54.2857
1310 (12/2/2014)	1080 (12/6/2010)	(1310 - 1080)/(11 - 3)	28.75
1400 (6/1/2015)	1080 (12/6/2010)	(1400 - 1080)/(12 - 3)	35.5556
1320 (12/7/2015)	1080 (12/6/2010)	(1320 - 1080)/(13 - 3)	24
1300 (6/6/2016)	1080 (12/6/2010)	(1300 - 1080)/(14 - 3)	20
1090 (12/5/2016)	1080 (12/6/2010)	(1090 - 1080)/(15 - 3)	0.833333
1120 (6/20/2017)	1080 (12/6/2010)	(1120 - 1080)/(16 - 3)	3.07692
1040 (12/4/2017)	1080 (12/6/2010)	(1040 - 1080)/(17 - 3)	-2.85714
1130 (6/4/2018)	1080 (12/6/2010)	(1130 - 1080)/(18 - 3)	3.33333

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1010 (12/13/2011)	940 (6/21/2011)	(1010 - 940)/(5 - 4)	70
1190 (6/4/2012)	940 (6/21/2011)	(1190 - 940)/(6 - 4)	125
1250 (12/11/2012)	940 (6/21/2011)	(1250 - 940)/(7 - 4)	103.333
1250 (6/3/2013)	940 (6/21/2011)	(1250 - 940)/(8 - 4)	77.5
1200 (12/3/2013)	940 (6/21/2011)	(1200 - 940)/(9 - 4)	52
1460 (6/2/2014)	940 (6/21/2011)	(1460 - 940)/(10 - 4)	86.6667
1310 (12/2/2014)	940 (6/21/2011)	(1310 - 940)/(11 - 4)	52.8571
1400 (6/1/2015)	940 (6/21/2011)	(1400 - 940)/(12 - 4)	57.5
1320 (12/7/2015)	940 (6/21/2011)	(1320 - 940)/(13 - 4)	42.2222
1300 (6/6/2016)	940 (6/21/2011)	(1300 - 940)/(14 - 4)	36
1090 (12/5/2016)	940 (6/21/2011)	(1090 - 940)/(15 - 4)	13.6364
1120 (6/20/2017)	940 (6/21/2011)	(1120 - 940)/(16 - 4)	15
1040 (12/4/2017)	940 (6/21/2011)	(1040 - 940)/(17 - 4)	7.69231
1130 (6/4/2018)	940 (6/21/2011)	(1130 - 940)/(18 - 4)	13.5714

1190 (6/4/2012)	1010 (12/13/2011)	(1190 - 1010)/(6 - 5)	180
1250 (12/11/2012)	1010 (12/13/2011)	(1250 - 1010)/(7 - 5)	120
1250 (6/3/2013)	1010 (12/13/2011)	(1250 - 1010)/(8 - 5)	80
1200 (12/3/2013)	1010 (12/13/2011)	(1200 - 1010)/(9 - 5)	47.5
1460 (6/2/2014)	1010 (12/13/2011)	(1460 - 1010)/(10 - 5)	90
1310 (12/2/2014)	1010 (12/13/2011)	(1310 - 1010)/(11 - 5)	50
1400 (6/1/2015)	1010 (12/13/2011)	(1400 - 1010)/(12 - 5)	55.7143
1320 (12/7/2015)	1010 (12/13/2011)	(1320 - 1010)/(13 - 5)	38.75
1300 (6/6/2016)	1010 (12/13/2011)	(1300 - 1010)/(14 - 5)	32.2222
1090 (12/5/2016)	1010 (12/13/2011)	(1090 - 1010)/(15 - 5)	8
1120 (6/20/2017)	1010 (12/13/2011)	(1120 - 1010)/(16 - 5)	10
1040 (12/4/2017)	1010 (12/13/2011)	(1040 - 1010)/(17 - 5)	2.5
1130 (6/4/2018)	1010 (12/13/2011)	(1130 - 1010)/(18 - 5)	9.23077

1250 (12/11/2012)	1190 (6/4/2012)	(1250 - 1190)/(7 - 6)	60
1250 (6/3/2013)	1190 (6/4/2012)	(1250 - 1190)/(8 - 6)	30
1200 (12/3/2013)	1190 (6/4/2012)	(1200 - 1190)/(9 - 6)	3.33333
1460 (6/2/2014)	1190 (6/4/2012)	(1460 - 1190)/(10 - 6)	67.5
1310 (12/2/2014)	1190 (6/4/2012)	(1310 - 1190)/(11 - 6)	24
1400 (6/1/2015)	1190 (6/4/2012)	(1400 - 1190)/(12 - 6)	35
1320 (12/7/2015)	1190 (6/4/2012)	(1320 - 1190)/(13 - 6)	18.5714
1300 (6/6/2016)	1190 (6/4/2012)	(1300 - 1190)/(14 - 6)	13.75
1090 (12/5/2016)	1190 (6/4/2012)	(1090 - 1190)/(15 - 6)	-11.1111
1120 (6/20/2017)	1190 (6/4/2012)	(1120 - 1190)/(16 - 6)	-7
1040 (12/4/2017)	1190 (6/4/2012)	(1040 - 1190)/(17 - 6)	-13.6364
1130 (6/4/2018)	1190 (6/4/2012)	(1130 - 1190)/(18 - 6)	-5

1250 (6/3/2013)	1250 (12/11/2012)	(1250 - 1250)/(8 - 7)	0
1200 (12/3/2013)	1250 (12/11/2012)	(1200 - 1250)/(9 - 7)	-25
1460 (6/2/2014)	1250 (12/11/2012)	(1460 - 1250)/(10 - 7)	70
1310 (12/2/2014)	1250 (12/11/2012)	(1310 - 1250)/(11 - 7)	15
1400 (6/1/2015)	1250 (12/11/2012)	(1400 - 1250)/(12 - 7)	30
1320 (12/7/2015)	1250 (12/11/2012)	(1320 - 1250)/(13 - 7)	11.6667
1300 (6/6/2016)	1250 (12/11/2012)	(1300 - 1250)/(14 - 7)	7.14286
1090 (12/5/2016)	1250 (12/11/2012)	(1090 - 1250)/(15 - 7)	-20
1120 (6/20/2017)	1250 (12/11/2012)	(1120 - 1250)/(16 - 7)	-14.4444
1040 (12/4/2017)	1250 (12/11/2012)	(1040 - 1250)/(17 - 7)	-21
1130 (6/4/2018)	1250 (12/11/2012)	(1130 - 1250)/(18 - 7)	-10.9091

1200 (12/3/2013)	1250 (6/3/2013)	(1200 - 1250)/(9 - 8)	-50
1460 (6/2/2014)	1250 (6/3/2013)	(1460 - 1250)/(10 - 8)	105
1310 (12/2/2014)	1250 (6/3/2013)	(1310 - 1250)/(11 - 8)	20
1400 (6/1/2015)	1250 (6/3/2013)	(1400 - 1250)/(12 - 8)	37.5
1320 (12/7/2015)	1250 (6/3/2013)	(1320 - 1250)/(13 - 8)	14
1300 (6/6/2016)	1250 (6/3/2013)	(1300 - 1250)/(14 - 8)	8.33333
1090 (12/5/2016)	1250 (6/3/2013)	(1090 - 1250)/(15 - 8)	-22.8571
1120 (6/20/2017)	1250 (6/3/2013)	(1120 - 1250)/(16 - 8)	-16.25
1040 (12/4/2017)	1250 (6/3/2013)	(1040 - 1250)/(17 - 8)	-23.3333

1130 (6/4/2018)	1250 (6/3/2013)	(1130 - 1250)/(18 - 8)	-12
1460 (6/2/2014)	1200 (12/3/2013)	(1460 - 1200)/(10 - 9)	260
1310 (12/2/2014)	1200 (12/3/2013)	(1310 - 1200)/(11 - 9)	55
1400 (6/1/2015)	1200 (12/3/2013)	(1400 - 1200)/(12 - 9)	66.6667
1320 (12/7/2015)	1200 (12/3/2013)	(1320 - 1200)/(13 - 9)	30
1300 (6/6/2016)	1200 (12/3/2013)	(1300 - 1200)/(14 - 9)	20
1090 (12/5/2016)	1200 (12/3/2013)	(1090 - 1200)/(15 - 9)	-18.3333
1120 (6/20/2017)	1200 (12/3/2013)	(1120 - 1200)/(16 - 9)	-11.4286
1040 (12/4/2017)	1200 (12/3/2013)	(1040 - 1200)/(17 - 9)	-20
1130 (6/4/2018)	1200 (12/3/2013)	(1130 - 1200)/(18 - 9)	-7.77778
1310 (12/2/2014)	1460 (6/2/2014)	(1310 - 1460)/(11 - 10)	-150
1400 (6/1/2015)	1460 (6/2/2014)	(1400 - 1460)/(12 - 10)	-30
1320 (12/7/2015)	1460 (6/2/2014)	(1320 - 1460)/(13 - 10)	-46.6667
1300 (6/6/2016)	1460 (6/2/2014)	(1300 - 1460)/(14 - 10)	-40
1090 (12/5/2016)	1460 (6/2/2014)	(1090 - 1460)/(15 - 10)	-74
1120 (6/20/2017)	1460 (6/2/2014)	(1120 - 1460)/(16 - 10)	-56.6667
1040 (12/4/2017)	1460 (6/2/2014)	(1040 - 1460)/(17 - 10)	-60
1130 (6/4/2018)	1460 (6/2/2014)	(1130 - 1460)/(18 - 10)	-41.25
1400 (6/1/2015)	1310 (12/2/2014)	(1400 - 1310)/(12 - 11)	90
1320 (12/7/2015)	1310 (12/2/2014)	(1320 - 1310)/(13 - 11)	5
1300 (6/6/2016)	1310 (12/2/2014)	(1300 - 1310)/(14 - 11)	-3.33333
1090 (12/5/2016)	1310 (12/2/2014)	(1090 - 1310)/(15 - 11)	-55
1120 (6/20/2017)	1310 (12/2/2014)	(1120 - 1310)/(16 - 11)	-38
1040 (12/4/2017)	1310 (12/2/2014)	(1040 - 1310)/(17 - 11)	-45
1130 (6/4/2018)	1310 (12/2/2014)	(1130 - 1310)/(18 - 11)	-25.7143
1320 (12/7/2015)	1400 (6/1/2015)	(1320 - 1400)/(13 - 12)	-80
1300 (6/6/2016)	1400 (6/1/2015)	(1300 - 1400)/(14 - 12)	-50
1090 (12/5/2016)	1400 (6/1/2015)	(1090 - 1400)/(15 - 12)	-103.333
1120 (6/20/2017)	1400 (6/1/2015)	(1120 - 1400)/(16 - 12)	-70
1040 (12/4/2017)	1400 (6/1/2015)	(1040 - 1400)/(17 - 12)	-72
1130 (6/4/2018)	1400 (6/1/2015)	(1130 - 1400)/(18 - 12)	-45
1300 (6/6/2016)	1320 (12/7/2015)	(1300 - 1320)/(14 - 13)	-20
1090 (12/5/2016)	1320 (12/7/2015)	(1090 - 1320)/(15 - 13)	-115
1120 (6/20/2017)	1320 (12/7/2015)	(1120 - 1320)/(16 - 13)	-66.6667
1040 (12/4/2017)	1320 (12/7/2015)	(1040 - 1320)/(17 - 13)	-70
1130 (6/4/2018)	1320 (12/7/2015)	(1130 - 1320)/(18 - 13)	-38
1090 (12/5/2016)	1300 (6/6/2016)	(1090 - 1300)/(15 - 14)	-210
1120 (6/20/2017)	1300 (6/6/2016)	(1120 - 1300)/(16 - 14)	-90
1040 (12/4/2017)	1300 (6/6/2016)	(1040 - 1300)/(17 - 14)	-86.6667
1130 (6/4/2018)	1300 (6/6/2016)	(1130 - 1300)/(18 - 14)	-42.5
1120 (6/20/2017)	1090 (12/5/2016)	(1120 - 1090)/(16 - 15)	30
1040 (12/4/2017)	1090 (12/5/2016)	(1040 - 1090)/(17 - 15)	-25
1130 (6/4/2018)	1090 (12/5/2016)	(1130 - 1090)/(18 - 15)	13.3333
1040 (12/4/2017)	1120 (6/20/2017)	(1040 - 1120)/(17 - 16)	-80
1130 (6/4/2018)	1120 (6/20/2017)	(1130 - 1120)/(18 - 16)	5
1130 (6/4/2018)	1040 (12/4/2017)	(1130 - 1040)/(18 - 17)	90

Number of Q values = 153

Ordered Q Values

n	Q
1	-210

Royalton Road LF

2	-180
3	-160
4	-150
5	-140
6	-115
7	-103.333
8	-90
9	-86.6667
10	-83.3333
11	-80
12	-80
13	-74
14	-72
15	-70
16	-70
17	-66.6667
18	-60
19	-56.6667
20	-55
21	-50
22	-50
23	-46.6667
24	-46.6667
25	-45
26	-45
27	-42.5
28	-41.25
29	-40
30	-38
31	-38
32	-35
33	-30
34	-25.7143
35	-25
36	-25
37	-23.3333
38	-22.8571
39	-21
40	-20
41	-20
42	-20
43	-18.3333
44	-17.5
45	-17.5
46	-16.25
47	-14.6667
48	-14.4444
49	-13.6364
50	-13.0769
51	-12
52	-11.4286
53	-11.1111
54	-10.9091
55	-10
56	-8.57143
57	-8.125
58	-7.77778
59	-7
60	-5
61	-3.33333
62	-2.85714
63	-2.5
64	-2

65	-1.66667
66	0
67	0
68	0.714286
69	0.833333
70	2.5
71	2.66667
72	2.94118
73	3.07692
74	3.33333
75	3.33333
76	3.33333
77	5
78	5
79	5.45455
80	5.55556
81	7.14286
82	7.69231
83	8
84	8.33333
85	9.23077
86	10
87	11.6667
88	13.3333
89	13.5714
90	13.6364
91	13.75
92	14
93	14
94	15
95	15
96	15
97	16.9231
98	18.5714
99	20
100	20
101	20
102	20
103	20
104	22
105	23
106	24
107	24
108	24.2857
109	25
110	28.3333
111	28.75
112	29.0909
113	30
114	30
115	30
116	30
117	32.2222
118	34
119	35
120	35.5556
121	36
122	36.6667
123	37.5
124	38.75
125	42.2222
126	42.2222
127	42.5

128	47.5
129	50
130	52
131	52.8571
132	54.2857
133	55
134	55.7143
135	57.5
136	60
137	66.6667
138	67.5
139	70
140	70
141	77.5
142	80
143	86.6667
144	90
145	90
146	90
147	103.333
148	105
149	120
150	125
151	180
152	180
153	260

Sen's Estimator (Median Q) is 5

Tied Group	Value	Members
1	1080	2
2	1250	2

Time Period	Observations
12/2/2009	1
6/21/2010	1
12/6/2010	1
6/21/2011	1
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 12546
b = 44064
c = 612

Royalton Road LF

Group Variance = 695
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 67.9063
M1 = (153 - 67.9063)/2.0 = 42.5468
M2 = (153 + 67.9063)/2.0 + 1 = 111.453
Lower limit is -18.3333 = Q(43)
Upper limit is 28.75 = Q(111)
-18.3333 < 0 < 28.75 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis
Parameter: Ammonia Nitrogen
Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1770 (6/21/2010)	2220 (12/2/2009)	(1770 - 2220)/(2 - 1)	-450
1660 (12/6/2010)	2220 (12/2/2009)	(1660 - 2220)/(3 - 1)	-280
2070 (6/21/2011)	2220 (12/2/2009)	(2070 - 2220)/(4 - 1)	-50
2120 (12/13/2011)	2220 (12/2/2009)	(2120 - 2220)/(5 - 1)	-25
2110 (6/4/2012)	2220 (12/2/2009)	(2110 - 2220)/(6 - 1)	-22
2090 (12/11/2012)	2220 (12/2/2009)	(2090 - 2220)/(7 - 1)	-21.6667
2180 (6/3/2013)	2220 (12/2/2009)	(2180 - 2220)/(8 - 1)	-5.71429
2360 (12/3/2013)	2220 (12/2/2009)	(2360 - 2220)/(9 - 1)	17.5
2270 (6/2/2014)	2220 (12/2/2009)	(2270 - 2220)/(10 - 1)	5.55556
2200 (12/2/2014)	2220 (12/2/2009)	(2200 - 2220)/(11 - 1)	-2
1850 (6/1/2015)	2220 (12/2/2009)	(1850 - 2220)/(12 - 1)	-33.6364
1980 (12/7/2015)	2220 (12/2/2009)	(1980 - 2220)/(13 - 1)	-20
2020 (6/6/2016)	2220 (12/2/2009)	(2020 - 2220)/(14 - 1)	-15.3846
1690 (12/5/2016)	2220 (12/2/2009)	(1690 - 2220)/(15 - 1)	-37.8571
1940 (6/20/2017)	2220 (12/2/2009)	(1940 - 2220)/(16 - 1)	-18.6667
1670 (12/4/2017)	2220 (12/2/2009)	(1670 - 2220)/(17 - 1)	-34.375
1930 (6/4/2018)	2220 (12/2/2009)	(1930 - 2220)/(18 - 1)	-17.0588
1660 (12/6/2010)	1770 (6/21/2010)	(1660 - 1770)/(3 - 2)	-110
2070 (6/21/2011)	1770 (6/21/2010)	(2070 - 1770)/(4 - 2)	150
2120 (12/13/2011)	1770 (6/21/2010)	(2120 - 1770)/(5 - 2)	116.667
2110 (6/4/2012)	1770 (6/21/2010)	(2110 - 1770)/(6 - 2)	85
2090 (12/11/2012)	1770 (6/21/2010)	(2090 - 1770)/(7 - 2)	64
2180 (6/3/2013)	1770 (6/21/2010)	(2180 - 1770)/(8 - 2)	68.3333
2360 (12/3/2013)	1770 (6/21/2010)	(2360 - 1770)/(9 - 2)	84.2857
2270 (6/2/2014)	1770 (6/21/2010)	(2270 - 1770)/(10 - 2)	62.5
2200 (12/2/2014)	1770 (6/21/2010)	(2200 - 1770)/(11 - 2)	47.7778
1850 (6/1/2015)	1770 (6/21/2010)	(1850 - 1770)/(12 - 2)	8
1980 (12/7/2015)	1770 (6/21/2010)	(1980 - 1770)/(13 - 2)	19.0909
2020 (6/6/2016)	1770 (6/21/2010)	(2020 - 1770)/(14 - 2)	20.8333
1690 (12/5/2016)	1770 (6/21/2010)	(1690 - 1770)/(15 - 2)	-6.15385
1940 (6/20/2017)	1770 (6/21/2010)	(1940 - 1770)/(16 - 2)	12.1429
1670 (12/4/2017)	1770 (6/21/2010)	(1670 - 1770)/(17 - 2)	-6.66667
1930 (6/4/2018)	1770 (6/21/2010)	(1930 - 1770)/(18 - 2)	10
2070 (6/21/2011)	1660 (12/6/2010)	(2070 - 1660)/(4 - 3)	410
2120 (12/13/2011)	1660 (12/6/2010)	(2120 - 1660)/(5 - 3)	230
2110 (6/4/2012)	1660 (12/6/2010)	(2110 - 1660)/(6 - 3)	150
2090 (12/11/2012)	1660 (12/6/2010)	(2090 - 1660)/(7 - 3)	107.5
2180 (6/3/2013)	1660 (12/6/2010)	(2180 - 1660)/(8 - 3)	104
2360 (12/3/2013)	1660 (12/6/2010)	(2360 - 1660)/(9 - 3)	116.667
2270 (6/2/2014)	1660 (12/6/2010)	(2270 - 1660)/(10 - 3)	87.1429
2200 (12/2/2014)	1660 (12/6/2010)	(2200 - 1660)/(11 - 3)	67.5
1850 (6/1/2015)	1660 (12/6/2010)	(1850 - 1660)/(12 - 3)	21.1111
1980 (12/7/2015)	1660 (12/6/2010)	(1980 - 1660)/(13 - 3)	32
2020 (6/6/2016)	1660 (12/6/2010)	(2020 - 1660)/(14 - 3)	32.7273
1690 (12/5/2016)	1660 (12/6/2010)	(1690 - 1660)/(15 - 3)	2.5
1940 (6/20/2017)	1660 (12/6/2010)	(1940 - 1660)/(16 - 3)	21.5385
1670 (12/4/2017)	1660 (12/6/2010)	(1670 - 1660)/(17 - 3)	0.714286
1930 (6/4/2018)	1660 (12/6/2010)	(1930 - 1660)/(18 - 3)	18

Royalton Road LF

2120 (12/13/2011)	2070 (6/21/2011)	(2120 - 2070)/(5 - 4)	50
2110 (6/4/2012)	2070 (6/21/2011)	(2110 - 2070)/(6 - 4)	20
2090 (12/11/2012)	2070 (6/21/2011)	(2090 - 2070)/(7 - 4)	6.66667
2180 (6/3/2013)	2070 (6/21/2011)	(2180 - 2070)/(8 - 4)	27.5
2360 (12/3/2013)	2070 (6/21/2011)	(2360 - 2070)/(9 - 4)	58
2270 (6/2/2014)	2070 (6/21/2011)	(2270 - 2070)/(10 - 4)	33.3333
2200 (12/2/2014)	2070 (6/21/2011)	(2200 - 2070)/(11 - 4)	18.5714
1850 (6/1/2015)	2070 (6/21/2011)	(1850 - 2070)/(12 - 4)	-27.5
1980 (12/7/2015)	2070 (6/21/2011)	(1980 - 2070)/(13 - 4)	-10
2020 (6/6/2016)	2070 (6/21/2011)	(2020 - 2070)/(14 - 4)	-5
1690 (12/5/2016)	2070 (6/21/2011)	(1690 - 2070)/(15 - 4)	-34.5455
1940 (6/20/2017)	2070 (6/21/2011)	(1940 - 2070)/(16 - 4)	-10.8333
1670 (12/4/2017)	2070 (6/21/2011)	(1670 - 2070)/(17 - 4)	-30.7692
1930 (6/4/2018)	2070 (6/21/2011)	(1930 - 2070)/(18 - 4)	-10

2110 (6/4/2012)	2120 (12/13/2011)	(2110 - 2120)/(6 - 5)	-10
2090 (12/11/2012)	2120 (12/13/2011)	(2090 - 2120)/(7 - 5)	-15
2180 (6/3/2013)	2120 (12/13/2011)	(2180 - 2120)/(8 - 5)	20
2360 (12/3/2013)	2120 (12/13/2011)	(2360 - 2120)/(9 - 5)	60
2270 (6/2/2014)	2120 (12/13/2011)	(2270 - 2120)/(10 - 5)	30
2200 (12/2/2014)	2120 (12/13/2011)	(2200 - 2120)/(11 - 5)	13.3333
1850 (6/1/2015)	2120 (12/13/2011)	(1850 - 2120)/(12 - 5)	-38.5714
1980 (12/7/2015)	2120 (12/13/2011)	(1980 - 2120)/(13 - 5)	-17.5
2020 (6/6/2016)	2120 (12/13/2011)	(2020 - 2120)/(14 - 5)	-11.1111
1690 (12/5/2016)	2120 (12/13/2011)	(1690 - 2120)/(15 - 5)	-43
1940 (6/20/2017)	2120 (12/13/2011)	(1940 - 2120)/(16 - 5)	-16.3636
1670 (12/4/2017)	2120 (12/13/2011)	(1670 - 2120)/(17 - 5)	-37.5
1930 (6/4/2018)	2120 (12/13/2011)	(1930 - 2120)/(18 - 5)	-14.6154

2090 (12/11/2012)	2110 (6/4/2012)	(2090 - 2110)/(7 - 6)	-20
2180 (6/3/2013)	2110 (6/4/2012)	(2180 - 2110)/(8 - 6)	35
2360 (12/3/2013)	2110 (6/4/2012)	(2360 - 2110)/(9 - 6)	83.3333
2270 (6/2/2014)	2110 (6/4/2012)	(2270 - 2110)/(10 - 6)	40
2200 (12/2/2014)	2110 (6/4/2012)	(2200 - 2110)/(11 - 6)	18
1850 (6/1/2015)	2110 (6/4/2012)	(1850 - 2110)/(12 - 6)	-43.3333
1980 (12/7/2015)	2110 (6/4/2012)	(1980 - 2110)/(13 - 6)	-18.5714
2020 (6/6/2016)	2110 (6/4/2012)	(2020 - 2110)/(14 - 6)	-11.25
1690 (12/5/2016)	2110 (6/4/2012)	(1690 - 2110)/(15 - 6)	-46.6667
1940 (6/20/2017)	2110 (6/4/2012)	(1940 - 2110)/(16 - 6)	-17
1670 (12/4/2017)	2110 (6/4/2012)	(1670 - 2110)/(17 - 6)	-40
1930 (6/4/2018)	2110 (6/4/2012)	(1930 - 2110)/(18 - 6)	-15

2180 (6/3/2013)	2090 (12/11/2012)	(2180 - 2090)/(8 - 7)	90
2360 (12/3/2013)	2090 (12/11/2012)	(2360 - 2090)/(9 - 7)	135
2270 (6/2/2014)	2090 (12/11/2012)	(2270 - 2090)/(10 - 7)	60
2200 (12/2/2014)	2090 (12/11/2012)	(2200 - 2090)/(11 - 7)	27.5
1850 (6/1/2015)	2090 (12/11/2012)	(1850 - 2090)/(12 - 7)	-48
1980 (12/7/2015)	2090 (12/11/2012)	(1980 - 2090)/(13 - 7)	-18.3333
2020 (6/6/2016)	2090 (12/11/2012)	(2020 - 2090)/(14 - 7)	-10
1690 (12/5/2016)	2090 (12/11/2012)	(1690 - 2090)/(15 - 7)	-50
1940 (6/20/2017)	2090 (12/11/2012)	(1940 - 2090)/(16 - 7)	-16.6667
1670 (12/4/2017)	2090 (12/11/2012)	(1670 - 2090)/(17 - 7)	-42
1930 (6/4/2018)	2090 (12/11/2012)	(1930 - 2090)/(18 - 7)	-14.5455

2360 (12/3/2013)	2180 (6/3/2013)	(2360 - 2180)/(9 - 8)	180
2270 (6/2/2014)	2180 (6/3/2013)	(2270 - 2180)/(10 - 8)	45
2200 (12/2/2014)	2180 (6/3/2013)	(2200 - 2180)/(11 - 8)	6.66667
1850 (6/1/2015)	2180 (6/3/2013)	(1850 - 2180)/(12 - 8)	-82.5
1980 (12/7/2015)	2180 (6/3/2013)	(1980 - 2180)/(13 - 8)	-40
2020 (6/6/2016)	2180 (6/3/2013)	(2020 - 2180)/(14 - 8)	-26.6667
1690 (12/5/2016)	2180 (6/3/2013)	(1690 - 2180)/(15 - 8)	-70
1940 (6/20/2017)	2180 (6/3/2013)	(1940 - 2180)/(16 - 8)	-30
1670 (12/4/2017)	2180 (6/3/2013)	(1670 - 2180)/(17 - 8)	-56.6667

1930 (6/4/2018)	2180 (6/3/2013)	(1930 - 2180)/(18 - 8)	-25
2270 (6/2/2014)	2360 (12/3/2013)	(2270 - 2360)/(10 - 9)	-90
2200 (12/2/2014)	2360 (12/3/2013)	(2200 - 2360)/(11 - 9)	-80
1850 (6/1/2015)	2360 (12/3/2013)	(1850 - 2360)/(12 - 9)	-170
1980 (12/7/2015)	2360 (12/3/2013)	(1980 - 2360)/(13 - 9)	-95
2020 (6/6/2016)	2360 (12/3/2013)	(2020 - 2360)/(14 - 9)	-68
1690 (12/5/2016)	2360 (12/3/2013)	(1690 - 2360)/(15 - 9)	-111.667
1940 (6/20/2017)	2360 (12/3/2013)	(1940 - 2360)/(16 - 9)	-60
1670 (12/4/2017)	2360 (12/3/2013)	(1670 - 2360)/(17 - 9)	-86.25
1930 (6/4/2018)	2360 (12/3/2013)	(1930 - 2360)/(18 - 9)	-47.7778
2200 (12/2/2014)	2270 (6/2/2014)	(2200 - 2270)/(11 - 10)	-70
1850 (6/1/2015)	2270 (6/2/2014)	(1850 - 2270)/(12 - 10)	-210
1980 (12/7/2015)	2270 (6/2/2014)	(1980 - 2270)/(13 - 10)	-96.6667
2020 (6/6/2016)	2270 (6/2/2014)	(2020 - 2270)/(14 - 10)	-62.5
1690 (12/5/2016)	2270 (6/2/2014)	(1690 - 2270)/(15 - 10)	-116
1940 (6/20/2017)	2270 (6/2/2014)	(1940 - 2270)/(16 - 10)	-55
1670 (12/4/2017)	2270 (6/2/2014)	(1670 - 2270)/(17 - 10)	-85.7143
1930 (6/4/2018)	2270 (6/2/2014)	(1930 - 2270)/(18 - 10)	-42.5
1850 (6/1/2015)	2200 (12/2/2014)	(1850 - 2200)/(12 - 11)	-350
1980 (12/7/2015)	2200 (12/2/2014)	(1980 - 2200)/(13 - 11)	-110
2020 (6/6/2016)	2200 (12/2/2014)	(2020 - 2200)/(14 - 11)	-60
1690 (12/5/2016)	2200 (12/2/2014)	(1690 - 2200)/(15 - 11)	-127.5
1940 (6/20/2017)	2200 (12/2/2014)	(1940 - 2200)/(16 - 11)	-52
1670 (12/4/2017)	2200 (12/2/2014)	(1670 - 2200)/(17 - 11)	-88.3333
1930 (6/4/2018)	2200 (12/2/2014)	(1930 - 2200)/(18 - 11)	-38.5714
1980 (12/7/2015)	1850 (6/1/2015)	(1980 - 1850)/(13 - 12)	130
2020 (6/6/2016)	1850 (6/1/2015)	(2020 - 1850)/(14 - 12)	85
1690 (12/5/2016)	1850 (6/1/2015)	(1690 - 1850)/(15 - 12)	-53.3333
1940 (6/20/2017)	1850 (6/1/2015)	(1940 - 1850)/(16 - 12)	22.5
1670 (12/4/2017)	1850 (6/1/2015)	(1670 - 1850)/(17 - 12)	-36
1930 (6/4/2018)	1850 (6/1/2015)	(1930 - 1850)/(18 - 12)	13.3333
2020 (6/6/2016)	1980 (12/7/2015)	(2020 - 1980)/(14 - 13)	40
1690 (12/5/2016)	1980 (12/7/2015)	(1690 - 1980)/(15 - 13)	-145
1940 (6/20/2017)	1980 (12/7/2015)	(1940 - 1980)/(16 - 13)	-13.3333
1670 (12/4/2017)	1980 (12/7/2015)	(1670 - 1980)/(17 - 13)	-77.5
1930 (6/4/2018)	1980 (12/7/2015)	(1930 - 1980)/(18 - 13)	-10
1690 (12/5/2016)	2020 (6/6/2016)	(1690 - 2020)/(15 - 14)	-330
1940 (6/20/2017)	2020 (6/6/2016)	(1940 - 2020)/(16 - 14)	-40
1670 (12/4/2017)	2020 (6/6/2016)	(1670 - 2020)/(17 - 14)	-116.667
1930 (6/4/2018)	2020 (6/6/2016)	(1930 - 2020)/(18 - 14)	-22.5
1940 (6/20/2017)	1690 (12/5/2016)	(1940 - 1690)/(16 - 15)	250
1670 (12/4/2017)	1690 (12/5/2016)	(1670 - 1690)/(17 - 15)	-10
1930 (6/4/2018)	1690 (12/5/2016)	(1930 - 1690)/(18 - 15)	80
1670 (12/4/2017)	1940 (6/20/2017)	(1670 - 1940)/(17 - 16)	-270
1930 (6/4/2018)	1940 (6/20/2017)	(1930 - 1940)/(18 - 16)	-5
1930 (6/4/2018)	1670 (12/4/2017)	(1930 - 1670)/(18 - 17)	260

Number of Q values = 153

Ordered Q Values

n	Q
1	-450

Royalton Road LF

2	-350
3	-330
4	-280
5	-270
6	-210
7	-170
8	-145
9	-127.5
10	-116.667
11	-116
12	-111.667
13	-110
14	-110
15	-96.6667
16	-95
17	-90
18	-88.3333
19	-86.25
20	-85.7143
21	-82.5
22	-80
23	-77.5
24	-70
25	-70
26	-68
27	-62.5
28	-60
29	-60
30	-56.6667
31	-55
32	-53.3333
33	-52
34	-50
35	-50
36	-48
37	-47.7778
38	-46.6667
39	-43.3333
40	-43
41	-42.5
42	-42
43	-40
44	-40
45	-40
46	-38.5714
47	-38.5714
48	-37.8571
49	-37.5
50	-36
51	-34.5455
52	-34.375
53	-33.6364
54	-30.7692
55	-30
56	-27.5
57	-26.6667
58	-25
59	-25
60	-22.5
61	-22
62	-21.6667
63	-20
64	-20

65	-18.6667
66	-18.5714
67	-18.3333
68	-17.5
69	-17.0588
70	-17
71	-16.6667
72	-16.3636
73	-15.3846
74	-15
75	-15
76	-14.6154
77	-14.5455
78	-13.3333
79	-11.25
80	-11.1111
81	-10.8333
82	-10
83	-10
84	-10
85	-10
86	-10
87	-10
88	-6.66667
89	-6.15385
90	-5.71429
91	-5
92	-5
93	-2
94	0.714286
95	2.5
96	5.55556
97	6.66667
98	6.66667
99	8
100	10
101	12.1429
102	13.3333
103	13.3333
104	17.5
105	18
106	18
107	18.5714
108	19.0909
109	20
110	20
111	20.8333
112	21.1111
113	21.5385
114	22.5
115	27.5
116	27.5
117	30
118	32
119	32.7273
120	33.3333
121	35
122	40
123	40
124	45
125	47.7778
126	50
127	58

128	60
129	60
130	62.5
131	64
132	67.5
133	68.3333
134	80
135	83.3333
136	84.2857
137	85
138	85
139	87.1429
140	90
141	104
142	107.5
143	116.667
144	116.667
145	130
146	135
147	150
148	150
149	180
150	230
151	250
152	260
153	410

Sen's Estimator (Median Q) is -14.5455

Time Period	Observations
12/2/2009	1
6/21/2010	1
12/6/2010	1
6/21/2011	1
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 12546
b = 44064
c = 612
Group Variance = 697
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 68.004
M1 = (153 - 68.004)/2.0 = 42.498

M2 = (153 + 68.004)/2.0 + 1 = 111.502
Lower limit is -42 = Q(42)
Upper limit is 21.1111 = Q(112)
-42 < 0 < 21.1111 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis

Parameter: Ammonia Nitrogen

Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
690 (6/21/2011)	680 (12/2/2009)	(690 - 680)/(2 - 1)	10
720 (12/13/2011)	680 (12/2/2009)	(720 - 680)/(3 - 1)	20
700 (6/4/2012)	680 (12/2/2009)	(700 - 680)/(4 - 1)	6.66667
640 (12/11/2012)	680 (12/2/2009)	(640 - 680)/(5 - 1)	-10
730 (6/3/2013)	680 (12/2/2009)	(730 - 680)/(6 - 1)	10
690 (12/3/2013)	680 (12/2/2009)	(690 - 680)/(7 - 1)	1.66667
700 (12/2/2014)	680 (12/2/2009)	(700 - 680)/(8 - 1)	2.85714
750 (6/1/2015)	680 (12/2/2009)	(750 - 680)/(9 - 1)	8.75
680 (12/7/2015)	680 (12/2/2009)	(680 - 680)/(10 - 1)	0
710 (6/6/2016)	680 (12/2/2009)	(710 - 680)/(11 - 1)	3
710 (12/5/2016)	680 (12/2/2009)	(710 - 680)/(12 - 1)	2.72727
690 (6/20/2017)	680 (12/2/2009)	(690 - 680)/(13 - 1)	0.833333
700 (12/4/2017)	680 (12/2/2009)	(700 - 680)/(14 - 1)	1.53846
710 (6/4/2018)	680 (12/2/2009)	(710 - 680)/(15 - 1)	2.14286
720 (12/13/2011)	690 (6/21/2011)	(720 - 690)/(3 - 2)	30
700 (6/4/2012)	690 (6/21/2011)	(700 - 690)/(4 - 2)	5
640 (12/11/2012)	690 (6/21/2011)	(640 - 690)/(5 - 2)	-16.6667
730 (6/3/2013)	690 (6/21/2011)	(730 - 690)/(6 - 2)	10
690 (12/3/2013)	690 (6/21/2011)	(690 - 690)/(7 - 2)	0
700 (12/2/2014)	690 (6/21/2011)	(700 - 690)/(8 - 2)	1.66667
750 (6/1/2015)	690 (6/21/2011)	(750 - 690)/(9 - 2)	8.57143
680 (12/7/2015)	690 (6/21/2011)	(680 - 690)/(10 - 2)	-1.25
710 (6/6/2016)	690 (6/21/2011)	(710 - 690)/(11 - 2)	2.22222
710 (12/5/2016)	690 (6/21/2011)	(710 - 690)/(12 - 2)	2
690 (6/20/2017)	690 (6/21/2011)	(690 - 690)/(13 - 2)	0
700 (12/4/2017)	690 (6/21/2011)	(700 - 690)/(14 - 2)	0.833333
710 (6/4/2018)	690 (6/21/2011)	(710 - 690)/(15 - 2)	1.53846
700 (6/4/2012)	720 (12/13/2011)	(700 - 720)/(4 - 3)	-20
640 (12/11/2012)	720 (12/13/2011)	(640 - 720)/(5 - 3)	-40
730 (6/3/2013)	720 (12/13/2011)	(730 - 720)/(6 - 3)	3.33333
690 (12/3/2013)	720 (12/13/2011)	(690 - 720)/(7 - 3)	-7.5
700 (12/2/2014)	720 (12/13/2011)	(700 - 720)/(8 - 3)	-4
750 (6/1/2015)	720 (12/13/2011)	(750 - 720)/(9 - 3)	5
680 (12/7/2015)	720 (12/13/2011)	(680 - 720)/(10 - 3)	-5.71429
710 (6/6/2016)	720 (12/13/2011)	(710 - 720)/(11 - 3)	-1.25
710 (12/5/2016)	720 (12/13/2011)	(710 - 720)/(12 - 3)	-1.11111
690 (6/20/2017)	720 (12/13/2011)	(690 - 720)/(13 - 3)	-3
700 (12/4/2017)	720 (12/13/2011)	(700 - 720)/(14 - 3)	-1.81818
710 (6/4/2018)	720 (12/13/2011)	(710 - 720)/(15 - 3)	-0.833333
640 (12/11/2012)	700 (6/4/2012)	(640 - 700)/(5 - 4)	-60
730 (6/3/2013)	700 (6/4/2012)	(730 - 700)/(6 - 4)	15
690 (12/3/2013)	700 (6/4/2012)	(690 - 700)/(7 - 4)	-3.33333
700 (12/2/2014)	700 (6/4/2012)	(700 - 700)/(8 - 4)	0
750 (6/1/2015)	700 (6/4/2012)	(750 - 700)/(9 - 4)	10
680 (12/7/2015)	700 (6/4/2012)	(680 - 700)/(10 - 4)	-3.33333
710 (6/6/2016)	700 (6/4/2012)	(710 - 700)/(11 - 4)	1.42857
710 (12/5/2016)	700 (6/4/2012)	(710 - 700)/(12 - 4)	1.25
690 (6/20/2017)	700 (6/4/2012)	(690 - 700)/(13 - 4)	-1.11111

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700 (12/4/2017)	700 (6/4/2012)	(700 - 700)/(14 - 4)	0
710 (6/4/2018)	700 (6/4/2012)	(710 - 700)/(15 - 4)	0.909091

730 (6/3/2013)	640 (12/11/2012)	(730 - 640)/(6 - 5)	90
690 (12/3/2013)	640 (12/11/2012)	(690 - 640)/(7 - 5)	25
700 (12/2/2014)	640 (12/11/2012)	(700 - 640)/(8 - 5)	20
750 (6/1/2015)	640 (12/11/2012)	(750 - 640)/(9 - 5)	27.5
680 (12/7/2015)	640 (12/11/2012)	(680 - 640)/(10 - 5)	8
710 (6/6/2016)	640 (12/11/2012)	(710 - 640)/(11 - 5)	11.6667
710 (12/5/2016)	640 (12/11/2012)	(710 - 640)/(12 - 5)	10
690 (6/20/2017)	640 (12/11/2012)	(690 - 640)/(13 - 5)	6.25
700 (12/4/2017)	640 (12/11/2012)	(700 - 640)/(14 - 5)	6.66667
710 (6/4/2018)	640 (12/11/2012)	(710 - 640)/(15 - 5)	7

690 (12/3/2013)	730 (6/3/2013)	(690 - 730)/(7 - 6)	-40
700 (12/2/2014)	730 (6/3/2013)	(700 - 730)/(8 - 6)	-15
750 (6/1/2015)	730 (6/3/2013)	(750 - 730)/(9 - 6)	6.66667
680 (12/7/2015)	730 (6/3/2013)	(680 - 730)/(10 - 6)	-12.5
710 (6/6/2016)	730 (6/3/2013)	(710 - 730)/(11 - 6)	-4
710 (12/5/2016)	730 (6/3/2013)	(710 - 730)/(12 - 6)	-3.33333
690 (6/20/2017)	730 (6/3/2013)	(690 - 730)/(13 - 6)	-5.71429
700 (12/4/2017)	730 (6/3/2013)	(700 - 730)/(14 - 6)	-3.75
710 (6/4/2018)	730 (6/3/2013)	(710 - 730)/(15 - 6)	-2.22222

700 (12/2/2014)	690 (12/3/2013)	(700 - 690)/(8 - 7)	10
750 (6/1/2015)	690 (12/3/2013)	(750 - 690)/(9 - 7)	30
680 (12/7/2015)	690 (12/3/2013)	(680 - 690)/(10 - 7)	-3.33333
710 (6/6/2016)	690 (12/3/2013)	(710 - 690)/(11 - 7)	5
710 (12/5/2016)	690 (12/3/2013)	(710 - 690)/(12 - 7)	4
690 (6/20/2017)	690 (12/3/2013)	(690 - 690)/(13 - 7)	0
700 (12/4/2017)	690 (12/3/2013)	(700 - 690)/(14 - 7)	1.42857
710 (6/4/2018)	690 (12/3/2013)	(710 - 690)/(15 - 7)	2.5

750 (6/1/2015)	700 (12/2/2014)	(750 - 700)/(9 - 8)	50
680 (12/7/2015)	700 (12/2/2014)	(680 - 700)/(10 - 8)	-10
710 (6/6/2016)	700 (12/2/2014)	(710 - 700)/(11 - 8)	3.33333
710 (12/5/2016)	700 (12/2/2014)	(710 - 700)/(12 - 8)	2.5
690 (6/20/2017)	700 (12/2/2014)	(690 - 700)/(13 - 8)	-2
700 (12/4/2017)	700 (12/2/2014)	(700 - 700)/(14 - 8)	0
710 (6/4/2018)	700 (12/2/2014)	(710 - 700)/(15 - 8)	1.42857

680 (12/7/2015)	750 (6/1/2015)	(680 - 750)/(10 - 9)	-70
710 (6/6/2016)	750 (6/1/2015)	(710 - 750)/(11 - 9)	-20
710 (12/5/2016)	750 (6/1/2015)	(710 - 750)/(12 - 9)	-13.3333
690 (6/20/2017)	750 (6/1/2015)	(690 - 750)/(13 - 9)	-15
700 (12/4/2017)	750 (6/1/2015)	(700 - 750)/(14 - 9)	-10
710 (6/4/2018)	750 (6/1/2015)	(710 - 750)/(15 - 9)	-6.66667

710 (6/6/2016)	680 (12/7/2015)	(710 - 680)/(11 - 10)	30
710 (12/5/2016)	680 (12/7/2015)	(710 - 680)/(12 - 10)	15
690 (6/20/2017)	680 (12/7/2015)	(690 - 680)/(13 - 10)	3.33333
700 (12/4/2017)	680 (12/7/2015)	(700 - 680)/(14 - 10)	5
710 (6/4/2018)	680 (12/7/2015)	(710 - 680)/(15 - 10)	6

710 (12/5/2016)	710 (6/6/2016)	(710 - 710)/(12 - 11)	0
690 (6/20/2017)	710 (6/6/2016)	(690 - 710)/(13 - 11)	-10
700 (12/4/2017)	710 (6/6/2016)	(700 - 710)/(14 - 11)	-3.33333
710 (6/4/2018)	710 (6/6/2016)	(710 - 710)/(15 - 11)	0

690 (6/20/2017)	710 (12/5/2016)	(690 - 710)/(13 - 12)	-20
700 (12/4/2017)	710 (12/5/2016)	(700 - 710)/(14 - 12)	-5
710 (6/4/2018)	710 (12/5/2016)	(710 - 710)/(15 - 12)	0

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700 (12/4/2017)	690 (6/20/2017)	(700 - 690)/(14 - 13)	10
710 (6/4/2018)	690 (6/20/2017)	(710 - 690)/(15 - 13)	10
710 (6/4/2018)	700 (12/4/2017)	(710 - 700)/(15 - 14)	10

Number of Q values = 105

Ordered Q Values

n	Q
1	-70
2	-60
3	-40
4	-40
5	-20
6	-20
7	-20
8	-16.6667
9	-15
10	-15
11	-13.3333
12	-12.5
13	-10
14	-10
15	-10
16	-10
17	-7.5
18	-6.66667
19	-5.71429
20	-5.71429
21	-5
22	-4
23	-4
24	-3.75
25	-3.33333
26	-3.33333
27	-3.33333
28	-3.33333
29	-3.33333
30	-3
31	-2.22222
32	-2
33	-1.81818
34	-1.25
35	-1.25
36	-1.11111
37	-1.11111
38	-0.833333
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0.833333
50	0.833333
51	0.909091
52	1.25

53	1.42857
54	1.42857
55	1.42857
56	1.53846
57	1.53846
58	1.66667
59	1.66667
60	2
61	2.14286
62	2.22222
63	2.5
64	2.5
65	2.72727
66	2.85714
67	3
68	3.33333
69	3.33333
70	3.33333
71	4
72	5
73	5
74	5
75	5
76	6
77	6.25
78	6.66667
79	6.66667
80	6.66667
81	7
82	8
83	8.57143
84	8.75
85	10
86	10
87	10
88	10
89	10
90	10
91	10
92	10
93	10
94	11.6667
95	15
96	15
97	20
98	20
99	25
100	27.5
101	30
102	30
103	30
104	50
105	90

Sen's Estimator (Median Q) is 1.42857

Tied Group	Value	Members
1	680	2
2	690	3
3	700	3
4	710	3

Time Period	Observations

12/2/2009	1
6/21/2011	1
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 216
B = 0
C = 18
D = 0
E = 20
F = 0
a = 7350
b = 24570
c = 420
Group Variance = 396.333
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 51.28
M1 = (105 - 51.28)/2.0 = 26.86
M2 = (105 + 51.28)/2.0 + 1 = 79.14
Lower limit is -3.33333 = Q(27)
Upper limit is 6.66667 = Q(79)
-3.33333 < 0 < 6.66667 indicating no trend in data.

Sen's Slope Analysis

Parameter: Antimony, total

Location: MW-2R

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<1 (6/4/2012)	ND<1 (12/13/2011)	(1 - 1)/(2 - 1)	0
ND<1 (12/11/2012)	ND<1 (12/13/2011)	(1 - 1)/(3 - 1)	0
ND<1 (6/3/2013)	ND<1 (12/13/2011)	(1 - 1)/(4 - 1)	0
ND<1 (12/3/2013)	ND<1 (12/13/2011)	(1 - 1)/(5 - 1)	0
ND<1 (6/2/2014)	ND<1 (12/13/2011)	(1 - 1)/(6 - 1)	0
ND<1 (12/2/2014)	ND<1 (12/13/2011)	(1 - 1)/(7 - 1)	0
ND<1 (6/1/2015)	ND<1 (12/13/2011)	(1 - 1)/(8 - 1)	0
ND<1 (12/7/2015)	ND<1 (12/13/2011)	(1 - 1)/(9 - 1)	0
ND<1 (6/6/2016)	ND<1 (12/13/2011)	(1 - 1)/(10 - 1)	0
ND<1 (12/5/2016)	ND<1 (12/13/2011)	(1 - 1)/(11 - 1)	0
ND<1 (6/20/2017)	ND<1 (12/13/2011)	(1 - 1)/(12 - 1)	0
ND<1 (12/4/2017)	ND<1 (12/13/2011)	(1 - 1)/(13 - 1)	0
ND<1 (6/4/2018)	ND<1 (12/13/2011)	(1 - 1)/(14 - 1)	0
ND<1 (12/11/2012)	ND<1 (6/4/2012)	(1 - 1)/(3 - 2)	0
ND<1 (6/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(4 - 2)	0
ND<1 (12/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(5 - 2)	0
ND<1 (6/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(6 - 2)	0
ND<1 (12/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(7 - 2)	0
ND<1 (6/1/2015)	ND<1 (6/4/2012)	(1 - 1)/(8 - 2)	0
ND<1 (12/7/2015)	ND<1 (6/4/2012)	(1 - 1)/(9 - 2)	0
ND<1 (6/6/2016)	ND<1 (6/4/2012)	(1 - 1)/(10 - 2)	0
ND<1 (12/5/2016)	ND<1 (6/4/2012)	(1 - 1)/(11 - 2)	0
ND<1 (6/20/2017)	ND<1 (6/4/2012)	(1 - 1)/(12 - 2)	0
ND<1 (12/4/2017)	ND<1 (6/4/2012)	(1 - 1)/(13 - 2)	0
ND<1 (6/4/2018)	ND<1 (6/4/2012)	(1 - 1)/(14 - 2)	0
ND<1 (6/3/2013)	ND<1 (12/11/2012)	(1 - 1)/(4 - 3)	0
ND<1 (12/3/2013)	ND<1 (12/11/2012)	(1 - 1)/(5 - 3)	0
ND<1 (6/2/2014)	ND<1 (12/11/2012)	(1 - 1)/(6 - 3)	0
ND<1 (12/2/2014)	ND<1 (12/11/2012)	(1 - 1)/(7 - 3)	0
ND<1 (6/1/2015)	ND<1 (12/11/2012)	(1 - 1)/(8 - 3)	0
ND<1 (12/7/2015)	ND<1 (12/11/2012)	(1 - 1)/(9 - 3)	0
ND<1 (6/6/2016)	ND<1 (12/11/2012)	(1 - 1)/(10 - 3)	0
ND<1 (12/5/2016)	ND<1 (12/11/2012)	(1 - 1)/(11 - 3)	0
ND<1 (6/20/2017)	ND<1 (12/11/2012)	(1 - 1)/(12 - 3)	0
ND<1 (12/4/2017)	ND<1 (12/11/2012)	(1 - 1)/(13 - 3)	0
ND<1 (6/4/2018)	ND<1 (12/11/2012)	(1 - 1)/(14 - 3)	0
ND<1 (12/3/2013)	ND<1 (6/3/2013)	(1 - 1)/(5 - 4)	0
ND<1 (6/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(6 - 4)	0
ND<1 (12/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(7 - 4)	0
ND<1 (6/1/2015)	ND<1 (6/3/2013)	(1 - 1)/(8 - 4)	0
ND<1 (12/7/2015)	ND<1 (6/3/2013)	(1 - 1)/(9 - 4)	0
ND<1 (6/6/2016)	ND<1 (6/3/2013)	(1 - 1)/(10 - 4)	0
ND<1 (12/5/2016)	ND<1 (6/3/2013)	(1 - 1)/(11 - 4)	0
ND<1 (6/20/2017)	ND<1 (6/3/2013)	(1 - 1)/(12 - 4)	0
ND<1 (12/4/2017)	ND<1 (6/3/2013)	(1 - 1)/(13 - 4)	0
ND<1 (6/4/2018)	ND<1 (6/3/2013)	(1 - 1)/(14 - 4)	0
ND<1 (6/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(6 - 5)	0
ND<1 (12/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(7 - 5)	0

ND<1 (6/1/2015)	ND<1 (12/3/2013)	(1 - 1)/(8 - 5)	0
ND<1 (12/7/2015)	ND<1 (12/3/2013)	(1 - 1)/(9 - 5)	0
ND<1 (6/6/2016)	ND<1 (12/3/2013)	(1 - 1)/(10 - 5)	0
ND<1 (12/5/2016)	ND<1 (12/3/2013)	(1 - 1)/(11 - 5)	0
ND<1 (6/20/2017)	ND<1 (12/3/2013)	(1 - 1)/(12 - 5)	0
ND<1 (12/4/2017)	ND<1 (12/3/2013)	(1 - 1)/(13 - 5)	0
ND<1 (6/4/2018)	ND<1 (12/3/2013)	(1 - 1)/(14 - 5)	0
ND<1 (12/2/2014)	ND<1 (6/2/2014)	(1 - 1)/(7 - 6)	0
ND<1 (6/1/2015)	ND<1 (6/2/2014)	(1 - 1)/(8 - 6)	0
ND<1 (12/7/2015)	ND<1 (6/2/2014)	(1 - 1)/(9 - 6)	0
ND<1 (6/6/2016)	ND<1 (6/2/2014)	(1 - 1)/(10 - 6)	0
ND<1 (12/5/2016)	ND<1 (6/2/2014)	(1 - 1)/(11 - 6)	0
ND<1 (6/20/2017)	ND<1 (6/2/2014)	(1 - 1)/(12 - 6)	0
ND<1 (12/4/2017)	ND<1 (6/2/2014)	(1 - 1)/(13 - 6)	0
ND<1 (6/4/2018)	ND<1 (6/2/2014)	(1 - 1)/(14 - 6)	0
ND<1 (6/1/2015)	ND<1 (12/2/2014)	(1 - 1)/(8 - 7)	0
ND<1 (12/7/2015)	ND<1 (12/2/2014)	(1 - 1)/(9 - 7)	0
ND<1 (6/6/2016)	ND<1 (12/2/2014)	(1 - 1)/(10 - 7)	0
ND<1 (12/5/2016)	ND<1 (12/2/2014)	(1 - 1)/(11 - 7)	0
ND<1 (6/20/2017)	ND<1 (12/2/2014)	(1 - 1)/(12 - 7)	0
ND<1 (12/4/2017)	ND<1 (12/2/2014)	(1 - 1)/(13 - 7)	0
ND<1 (6/4/2018)	ND<1 (12/2/2014)	(1 - 1)/(14 - 7)	0
ND<1 (12/7/2015)	ND<1 (6/1/2015)	(1 - 1)/(9 - 8)	0
ND<1 (6/6/2016)	ND<1 (6/1/2015)	(1 - 1)/(10 - 8)	0
ND<1 (12/5/2016)	ND<1 (6/1/2015)	(1 - 1)/(11 - 8)	0
ND<1 (6/20/2017)	ND<1 (6/1/2015)	(1 - 1)/(12 - 8)	0
ND<1 (12/4/2017)	ND<1 (6/1/2015)	(1 - 1)/(13 - 8)	0
ND<1 (6/4/2018)	ND<1 (6/1/2015)	(1 - 1)/(14 - 8)	0
ND<1 (6/6/2016)	ND<1 (12/7/2015)	(1 - 1)/(10 - 9)	0
ND<1 (12/5/2016)	ND<1 (12/7/2015)	(1 - 1)/(11 - 9)	0
ND<1 (6/20/2017)	ND<1 (12/7/2015)	(1 - 1)/(12 - 9)	0
ND<1 (12/4/2017)	ND<1 (12/7/2015)	(1 - 1)/(13 - 9)	0
ND<1 (6/4/2018)	ND<1 (12/7/2015)	(1 - 1)/(14 - 9)	0
ND<1 (12/5/2016)	ND<1 (6/6/2016)	(1 - 1)/(11 - 10)	0
ND<1 (6/20/2017)	ND<1 (6/6/2016)	(1 - 1)/(12 - 10)	0
ND<1 (12/4/2017)	ND<1 (6/6/2016)	(1 - 1)/(13 - 10)	0
ND<1 (6/4/2018)	ND<1 (6/6/2016)	(1 - 1)/(14 - 10)	0
ND<1 (6/20/2017)	ND<1 (12/5/2016)	(1 - 1)/(12 - 11)	0
ND<1 (12/4/2017)	ND<1 (12/5/2016)	(1 - 1)/(13 - 11)	0
ND<1 (6/4/2018)	ND<1 (12/5/2016)	(1 - 1)/(14 - 11)	0
ND<1 (12/4/2017)	ND<1 (6/20/2017)	(1 - 1)/(13 - 12)	0
ND<1 (6/4/2018)	ND<1 (6/20/2017)	(1 - 1)/(14 - 12)	0
ND<1 (6/4/2018)	ND<1 (12/4/2017)	(1 - 1)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	1	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Sen's Slope Analysis

Parameter: Antimony, total

Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<1 (6/4/2012)	ND<1 (12/13/2011)	(1 - 1)/(2 - 1)	0
ND<1 (12/11/2012)	ND<1 (12/13/2011)	(1 - 1)/(3 - 1)	0
ND<1 (6/3/2013)	ND<1 (12/13/2011)	(1 - 1)/(4 - 1)	0
ND<1 (12/3/2013)	ND<1 (12/13/2011)	(1 - 1)/(5 - 1)	0
ND<1 (6/2/2014)	ND<1 (12/13/2011)	(1 - 1)/(6 - 1)	0
ND<1 (12/2/2014)	ND<1 (12/13/2011)	(1 - 1)/(7 - 1)	0
ND<1 (6/1/2015)	ND<1 (12/13/2011)	(1 - 1)/(8 - 1)	0
ND<1 (12/7/2015)	ND<1 (12/13/2011)	(1 - 1)/(9 - 1)	0
ND<1 (6/6/2016)	ND<1 (12/13/2011)	(1 - 1)/(10 - 1)	0
ND<1 (12/5/2016)	ND<1 (12/13/2011)	(1 - 1)/(11 - 1)	0
ND<1 (6/20/2017)	ND<1 (12/13/2011)	(1 - 1)/(12 - 1)	0
ND<1 (12/4/2017)	ND<1 (12/13/2011)	(1 - 1)/(13 - 1)	0
ND<1 (6/4/2018)	ND<1 (12/13/2011)	(1 - 1)/(14 - 1)	0
ND<1 (12/11/2012)	ND<1 (6/4/2012)	(1 - 1)/(3 - 2)	0
ND<1 (6/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(4 - 2)	0
ND<1 (12/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(5 - 2)	0
ND<1 (6/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(6 - 2)	0
ND<1 (12/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(7 - 2)	0
ND<1 (6/1/2015)	ND<1 (6/4/2012)	(1 - 1)/(8 - 2)	0
ND<1 (12/7/2015)	ND<1 (6/4/2012)	(1 - 1)/(9 - 2)	0
ND<1 (6/6/2016)	ND<1 (6/4/2012)	(1 - 1)/(10 - 2)	0
ND<1 (12/5/2016)	ND<1 (6/4/2012)	(1 - 1)/(11 - 2)	0
ND<1 (6/20/2017)	ND<1 (6/4/2012)	(1 - 1)/(12 - 2)	0
ND<1 (12/4/2017)	ND<1 (6/4/2012)	(1 - 1)/(13 - 2)	0
ND<1 (6/4/2018)	ND<1 (6/4/2012)	(1 - 1)/(14 - 2)	0
ND<1 (6/3/2013)	ND<1 (12/11/2012)	(1 - 1)/(4 - 3)	0
ND<1 (12/3/2013)	ND<1 (12/11/2012)	(1 - 1)/(5 - 3)	0
ND<1 (6/2/2014)	ND<1 (12/11/2012)	(1 - 1)/(6 - 3)	0
ND<1 (12/2/2014)	ND<1 (12/11/2012)	(1 - 1)/(7 - 3)	0
ND<1 (6/1/2015)	ND<1 (12/11/2012)	(1 - 1)/(8 - 3)	0
ND<1 (12/7/2015)	ND<1 (12/11/2012)	(1 - 1)/(9 - 3)	0
ND<1 (6/6/2016)	ND<1 (12/11/2012)	(1 - 1)/(10 - 3)	0
ND<1 (12/5/2016)	ND<1 (12/11/2012)	(1 - 1)/(11 - 3)	0
ND<1 (6/20/2017)	ND<1 (12/11/2012)	(1 - 1)/(12 - 3)	0
ND<1 (12/4/2017)	ND<1 (12/11/2012)	(1 - 1)/(13 - 3)	0
ND<1 (6/4/2018)	ND<1 (12/11/2012)	(1 - 1)/(14 - 3)	0
ND<1 (12/3/2013)	ND<1 (6/3/2013)	(1 - 1)/(5 - 4)	0
ND<1 (6/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(6 - 4)	0
ND<1 (12/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(7 - 4)	0
ND<1 (6/1/2015)	ND<1 (6/3/2013)	(1 - 1)/(8 - 4)	0
ND<1 (12/7/2015)	ND<1 (6/3/2013)	(1 - 1)/(9 - 4)	0
ND<1 (6/6/2016)	ND<1 (6/3/2013)	(1 - 1)/(10 - 4)	0
ND<1 (12/5/2016)	ND<1 (6/3/2013)	(1 - 1)/(11 - 4)	0
ND<1 (6/20/2017)	ND<1 (6/3/2013)	(1 - 1)/(12 - 4)	0
ND<1 (12/4/2017)	ND<1 (6/3/2013)	(1 - 1)/(13 - 4)	0
ND<1 (6/4/2018)	ND<1 (6/3/2013)	(1 - 1)/(14 - 4)	0
ND<1 (6/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(6 - 5)	0
ND<1 (12/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(7 - 5)	0

ND<1 (6/1/2015)	ND<1 (12/3/2013)	(1 - 1)/(8 - 5)	0
ND<1 (12/7/2015)	ND<1 (12/3/2013)	(1 - 1)/(9 - 5)	0
ND<1 (6/6/2016)	ND<1 (12/3/2013)	(1 - 1)/(10 - 5)	0
ND<1 (12/5/2016)	ND<1 (12/3/2013)	(1 - 1)/(11 - 5)	0
ND<1 (6/20/2017)	ND<1 (12/3/2013)	(1 - 1)/(12 - 5)	0
ND<1 (12/4/2017)	ND<1 (12/3/2013)	(1 - 1)/(13 - 5)	0
ND<1 (6/4/2018)	ND<1 (12/3/2013)	(1 - 1)/(14 - 5)	0
ND<1 (12/2/2014)	ND<1 (6/2/2014)	(1 - 1)/(7 - 6)	0
ND<1 (6/1/2015)	ND<1 (6/2/2014)	(1 - 1)/(8 - 6)	0
ND<1 (12/7/2015)	ND<1 (6/2/2014)	(1 - 1)/(9 - 6)	0
ND<1 (6/6/2016)	ND<1 (6/2/2014)	(1 - 1)/(10 - 6)	0
ND<1 (12/5/2016)	ND<1 (6/2/2014)	(1 - 1)/(11 - 6)	0
ND<1 (6/20/2017)	ND<1 (6/2/2014)	(1 - 1)/(12 - 6)	0
ND<1 (12/4/2017)	ND<1 (6/2/2014)	(1 - 1)/(13 - 6)	0
ND<1 (6/4/2018)	ND<1 (6/2/2014)	(1 - 1)/(14 - 6)	0
ND<1 (6/1/2015)	ND<1 (12/2/2014)	(1 - 1)/(8 - 7)	0
ND<1 (12/7/2015)	ND<1 (12/2/2014)	(1 - 1)/(9 - 7)	0
ND<1 (6/6/2016)	ND<1 (12/2/2014)	(1 - 1)/(10 - 7)	0
ND<1 (12/5/2016)	ND<1 (12/2/2014)	(1 - 1)/(11 - 7)	0
ND<1 (6/20/2017)	ND<1 (12/2/2014)	(1 - 1)/(12 - 7)	0
ND<1 (12/4/2017)	ND<1 (12/2/2014)	(1 - 1)/(13 - 7)	0
ND<1 (6/4/2018)	ND<1 (12/2/2014)	(1 - 1)/(14 - 7)	0
ND<1 (12/7/2015)	ND<1 (6/1/2015)	(1 - 1)/(9 - 8)	0
ND<1 (6/6/2016)	ND<1 (6/1/2015)	(1 - 1)/(10 - 8)	0
ND<1 (12/5/2016)	ND<1 (6/1/2015)	(1 - 1)/(11 - 8)	0
ND<1 (6/20/2017)	ND<1 (6/1/2015)	(1 - 1)/(12 - 8)	0
ND<1 (12/4/2017)	ND<1 (6/1/2015)	(1 - 1)/(13 - 8)	0
ND<1 (6/4/2018)	ND<1 (6/1/2015)	(1 - 1)/(14 - 8)	0
ND<1 (6/6/2016)	ND<1 (12/7/2015)	(1 - 1)/(10 - 9)	0
ND<1 (12/5/2016)	ND<1 (12/7/2015)	(1 - 1)/(11 - 9)	0
ND<1 (6/20/2017)	ND<1 (12/7/2015)	(1 - 1)/(12 - 9)	0
ND<1 (12/4/2017)	ND<1 (12/7/2015)	(1 - 1)/(13 - 9)	0
ND<1 (6/4/2018)	ND<1 (12/7/2015)	(1 - 1)/(14 - 9)	0
ND<1 (12/5/2016)	ND<1 (6/6/2016)	(1 - 1)/(11 - 10)	0
ND<1 (6/20/2017)	ND<1 (6/6/2016)	(1 - 1)/(12 - 10)	0
ND<1 (12/4/2017)	ND<1 (6/6/2016)	(1 - 1)/(13 - 10)	0
ND<1 (6/4/2018)	ND<1 (6/6/2016)	(1 - 1)/(14 - 10)	0
ND<1 (6/20/2017)	ND<1 (12/5/2016)	(1 - 1)/(12 - 11)	0
ND<1 (12/4/2017)	ND<1 (12/5/2016)	(1 - 1)/(13 - 11)	0
ND<1 (6/4/2018)	ND<1 (12/5/2016)	(1 - 1)/(14 - 11)	0
ND<1 (12/4/2017)	ND<1 (6/20/2017)	(1 - 1)/(13 - 12)	0
ND<1 (6/4/2018)	ND<1 (6/20/2017)	(1 - 1)/(14 - 12)	0
ND<1 (6/4/2018)	ND<1 (12/4/2017)	(1 - 1)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	1	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Sen's Slope Analysis
Parameter: Antimony, total
Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<1 (6/4/2012)	ND<1 (12/13/2011)	(1 - 1)/(2 - 1)	0
ND<1 (12/11/2012)	ND<1 (12/13/2011)	(1 - 1)/(3 - 1)	0
ND<1 (6/3/2013)	ND<1 (12/13/2011)	(1 - 1)/(4 - 1)	0
ND<1 (12/3/2013)	ND<1 (12/13/2011)	(1 - 1)/(5 - 1)	0
ND<1 (6/2/2014)	ND<1 (12/13/2011)	(1 - 1)/(6 - 1)	0
ND<1 (12/2/2014)	ND<1 (12/13/2011)	(1 - 1)/(7 - 1)	0
ND<1 (6/1/2015)	ND<1 (12/13/2011)	(1 - 1)/(8 - 1)	0
ND<1 (12/7/2015)	ND<1 (12/13/2011)	(1 - 1)/(9 - 1)	0
ND<1 (6/6/2016)	ND<1 (12/13/2011)	(1 - 1)/(10 - 1)	0
ND<1 (12/5/2016)	ND<1 (12/13/2011)	(1 - 1)/(11 - 1)	0
ND<1 (6/20/2017)	ND<1 (12/13/2011)	(1 - 1)/(12 - 1)	0
ND<1 (12/4/2017)	ND<1 (12/13/2011)	(1 - 1)/(13 - 1)	0
ND<1 (6/4/2018)	ND<1 (12/13/2011)	(1 - 1)/(14 - 1)	0
ND<1 (12/11/2012)	ND<1 (6/4/2012)	(1 - 1)/(3 - 2)	0
ND<1 (6/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(4 - 2)	0
ND<1 (12/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(5 - 2)	0
ND<1 (6/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(6 - 2)	0
ND<1 (12/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(7 - 2)	0
ND<1 (6/1/2015)	ND<1 (6/4/2012)	(1 - 1)/(8 - 2)	0
ND<1 (12/7/2015)	ND<1 (6/4/2012)	(1 - 1)/(9 - 2)	0
ND<1 (6/6/2016)	ND<1 (6/4/2012)	(1 - 1)/(10 - 2)	0
ND<1 (12/5/2016)	ND<1 (6/4/2012)	(1 - 1)/(11 - 2)	0
ND<1 (6/20/2017)	ND<1 (6/4/2012)	(1 - 1)/(12 - 2)	0
ND<1 (12/4/2017)	ND<1 (6/4/2012)	(1 - 1)/(13 - 2)	0
ND<1 (6/4/2018)	ND<1 (6/4/2012)	(1 - 1)/(14 - 2)	0
ND<1 (6/3/2013)	ND<1 (12/11/2012)	(1 - 1)/(4 - 3)	0
ND<1 (12/3/2013)	ND<1 (12/11/2012)	(1 - 1)/(5 - 3)	0
ND<1 (6/2/2014)	ND<1 (12/11/2012)	(1 - 1)/(6 - 3)	0
ND<1 (12/2/2014)	ND<1 (12/11/2012)	(1 - 1)/(7 - 3)	0
ND<1 (6/1/2015)	ND<1 (12/11/2012)	(1 - 1)/(8 - 3)	0
ND<1 (12/7/2015)	ND<1 (12/11/2012)	(1 - 1)/(9 - 3)	0
ND<1 (6/6/2016)	ND<1 (12/11/2012)	(1 - 1)/(10 - 3)	0
ND<1 (12/5/2016)	ND<1 (12/11/2012)	(1 - 1)/(11 - 3)	0
ND<1 (6/20/2017)	ND<1 (12/11/2012)	(1 - 1)/(12 - 3)	0
ND<1 (12/4/2017)	ND<1 (12/11/2012)	(1 - 1)/(13 - 3)	0
ND<1 (6/4/2018)	ND<1 (12/11/2012)	(1 - 1)/(14 - 3)	0
ND<1 (12/3/2013)	ND<1 (6/3/2013)	(1 - 1)/(5 - 4)	0
ND<1 (6/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(6 - 4)	0
ND<1 (12/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(7 - 4)	0
ND<1 (6/1/2015)	ND<1 (6/3/2013)	(1 - 1)/(8 - 4)	0
ND<1 (12/7/2015)	ND<1 (6/3/2013)	(1 - 1)/(9 - 4)	0
ND<1 (6/6/2016)	ND<1 (6/3/2013)	(1 - 1)/(10 - 4)	0
ND<1 (12/5/2016)	ND<1 (6/3/2013)	(1 - 1)/(11 - 4)	0
ND<1 (6/20/2017)	ND<1 (6/3/2013)	(1 - 1)/(12 - 4)	0
ND<1 (12/4/2017)	ND<1 (6/3/2013)	(1 - 1)/(13 - 4)	0
ND<1 (6/4/2018)	ND<1 (6/3/2013)	(1 - 1)/(14 - 4)	0
ND<1 (6/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(6 - 5)	0
ND<1 (12/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(7 - 5)	0

ND<1 (6/1/2015)	ND<1 (12/3/2013)	(1 - 1)/(8 - 5)	0
ND<1 (12/7/2015)	ND<1 (12/3/2013)	(1 - 1)/(9 - 5)	0
ND<1 (6/6/2016)	ND<1 (12/3/2013)	(1 - 1)/(10 - 5)	0
ND<1 (12/5/2016)	ND<1 (12/3/2013)	(1 - 1)/(11 - 5)	0
ND<1 (6/20/2017)	ND<1 (12/3/2013)	(1 - 1)/(12 - 5)	0
ND<1 (12/4/2017)	ND<1 (12/3/2013)	(1 - 1)/(13 - 5)	0
ND<1 (6/4/2018)	ND<1 (12/3/2013)	(1 - 1)/(14 - 5)	0
ND<1 (12/2/2014)	ND<1 (6/2/2014)	(1 - 1)/(7 - 6)	0
ND<1 (6/1/2015)	ND<1 (6/2/2014)	(1 - 1)/(8 - 6)	0
ND<1 (12/7/2015)	ND<1 (6/2/2014)	(1 - 1)/(9 - 6)	0
ND<1 (6/6/2016)	ND<1 (6/2/2014)	(1 - 1)/(10 - 6)	0
ND<1 (12/5/2016)	ND<1 (6/2/2014)	(1 - 1)/(11 - 6)	0
ND<1 (6/20/2017)	ND<1 (6/2/2014)	(1 - 1)/(12 - 6)	0
ND<1 (12/4/2017)	ND<1 (6/2/2014)	(1 - 1)/(13 - 6)	0
ND<1 (6/4/2018)	ND<1 (6/2/2014)	(1 - 1)/(14 - 6)	0
ND<1 (6/1/2015)	ND<1 (12/2/2014)	(1 - 1)/(8 - 7)	0
ND<1 (12/7/2015)	ND<1 (12/2/2014)	(1 - 1)/(9 - 7)	0
ND<1 (6/6/2016)	ND<1 (12/2/2014)	(1 - 1)/(10 - 7)	0
ND<1 (12/5/2016)	ND<1 (12/2/2014)	(1 - 1)/(11 - 7)	0
ND<1 (6/20/2017)	ND<1 (12/2/2014)	(1 - 1)/(12 - 7)	0
ND<1 (12/4/2017)	ND<1 (12/2/2014)	(1 - 1)/(13 - 7)	0
ND<1 (6/4/2018)	ND<1 (12/2/2014)	(1 - 1)/(14 - 7)	0
ND<1 (12/7/2015)	ND<1 (6/1/2015)	(1 - 1)/(9 - 8)	0
ND<1 (6/6/2016)	ND<1 (6/1/2015)	(1 - 1)/(10 - 8)	0
ND<1 (12/5/2016)	ND<1 (6/1/2015)	(1 - 1)/(11 - 8)	0
ND<1 (6/20/2017)	ND<1 (6/1/2015)	(1 - 1)/(12 - 8)	0
ND<1 (12/4/2017)	ND<1 (6/1/2015)	(1 - 1)/(13 - 8)	0
ND<1 (6/4/2018)	ND<1 (6/1/2015)	(1 - 1)/(14 - 8)	0
ND<1 (6/6/2016)	ND<1 (12/7/2015)	(1 - 1)/(10 - 9)	0
ND<1 (12/5/2016)	ND<1 (12/7/2015)	(1 - 1)/(11 - 9)	0
ND<1 (6/20/2017)	ND<1 (12/7/2015)	(1 - 1)/(12 - 9)	0
ND<1 (12/4/2017)	ND<1 (12/7/2015)	(1 - 1)/(13 - 9)	0
ND<1 (6/4/2018)	ND<1 (12/7/2015)	(1 - 1)/(14 - 9)	0
ND<1 (12/5/2016)	ND<1 (6/6/2016)	(1 - 1)/(11 - 10)	0
ND<1 (6/20/2017)	ND<1 (6/6/2016)	(1 - 1)/(12 - 10)	0
ND<1 (12/4/2017)	ND<1 (6/6/2016)	(1 - 1)/(13 - 10)	0
ND<1 (6/4/2018)	ND<1 (6/6/2016)	(1 - 1)/(14 - 10)	0
ND<1 (6/20/2017)	ND<1 (12/5/2016)	(1 - 1)/(12 - 11)	0
ND<1 (12/4/2017)	ND<1 (12/5/2016)	(1 - 1)/(13 - 11)	0
ND<1 (6/4/2018)	ND<1 (12/5/2016)	(1 - 1)/(14 - 11)	0
ND<1 (12/4/2017)	ND<1 (6/20/2017)	(1 - 1)/(13 - 12)	0
ND<1 (6/4/2018)	ND<1 (6/20/2017)	(1 - 1)/(14 - 12)	0
ND<1 (6/4/2018)	ND<1 (12/4/2017)	(1 - 1)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	1	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis

Parameter: Arsenic, total

Location: MW-2R

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1.1 (6/21/2010)	ND<1 (12/2/2009)	(1.1 - 1)/(2 - 1)	0.1
ND<1 0.9J (12/6/2010)	ND<1 (12/2/2009)	(1 - 1)/(3 - 1)	0
ND<2 1.8J (6/21/2011)	ND<1 (12/2/2009)	(2 - 1)/(4 - 1)	0.333333
2.2 (12/13/2011)	ND<1 (12/2/2009)	(2.2 - 1)/(5 - 1)	0.3
ND<1 (6/4/2012)	ND<1 (12/2/2009)	(1 - 1)/(6 - 1)	0
1.9 (12/11/2012)	ND<1 (12/2/2009)	(1.9 - 1)/(7 - 1)	0.15
ND<1 (6/3/2013)	ND<1 (12/2/2009)	(1 - 1)/(8 - 1)	0
1.2 (12/3/2013)	ND<1 (12/2/2009)	(1.2 - 1)/(9 - 1)	0.025
ND<1 0.95J (6/2/2014)	ND<1 (12/2/2009)	(1 - 1)/(10 - 1)	0
1.4 (12/2/2014)	ND<1 (12/2/2009)	(1.4 - 1)/(11 - 1)	0.04
1.9 (6/1/2015)	ND<1 (12/2/2009)	(1.9 - 1)/(12 - 1)	0.0818182
1 (12/7/2015)	ND<1 (12/2/2009)	(1 - 1)/(13 - 1)	0
ND<1 0.7J (6/6/2016)	ND<1 (12/2/2009)	(1 - 1)/(14 - 1)	0
2.2 (12/5/2016)	ND<1 (12/2/2009)	(2.2 - 1)/(15 - 1)	0.0857143
1.4 (6/20/2017)	ND<1 (12/2/2009)	(1.4 - 1)/(16 - 1)	0.0266667
2.3 (12/4/2017)	ND<1 (12/2/2009)	(2.3 - 1)/(17 - 1)	0.08125
2 (6/4/2018)	ND<1 (12/2/2009)	(2 - 1)/(18 - 1)	0.0588235
ND<1 0.9J (12/6/2010)	1.1 (6/21/2010)	(1 - 1.1)/(3 - 2)	-0.1
ND<2 1.8J (6/21/2011)	1.1 (6/21/2010)	(2 - 1.1)/(4 - 2)	0.45
2.2 (12/13/2011)	1.1 (6/21/2010)	(2.2 - 1.1)/(5 - 2)	0.366667
ND<1 (6/4/2012)	1.1 (6/21/2010)	(1 - 1.1)/(6 - 2)	-0.025
1.9 (12/11/2012)	1.1 (6/21/2010)	(1.9 - 1.1)/(7 - 2)	0.16
ND<1 (6/3/2013)	1.1 (6/21/2010)	(1 - 1.1)/(8 - 2)	-0.0166667
1.2 (12/3/2013)	1.1 (6/21/2010)	(1.2 - 1.1)/(9 - 2)	0.0142857
ND<1 0.95J (6/2/2014)	1.1 (6/21/2010)	(1 - 1.1)/(10 - 2)	-0.0125
1.4 (12/2/2014)	1.1 (6/21/2010)	(1.4 - 1.1)/(11 - 2)	0.0333333
1.9 (6/1/2015)	1.1 (6/21/2010)	(1.9 - 1.1)/(12 - 2)	0.08
1 (12/7/2015)	1.1 (6/21/2010)	(1 - 1.1)/(13 - 2)	-0.00909091
ND<1 0.7J (6/6/2016)	1.1 (6/21/2010)	(1 - 1.1)/(14 - 2)	-0.00833333
2.2 (12/5/2016)	1.1 (6/21/2010)	(2.2 - 1.1)/(15 - 2)	0.0846154
1.4 (6/20/2017)	1.1 (6/21/2010)	(1.4 - 1.1)/(16 - 2)	0.0214286
2.3 (12/4/2017)	1.1 (6/21/2010)	(2.3 - 1.1)/(17 - 2)	0.08
2 (6/4/2018)	1.1 (6/21/2010)	(2 - 1.1)/(18 - 2)	0.05625
ND<2 1.8J (6/21/2011)	ND<1 0.9J (12/6/2010)	(2 - 1)/(4 - 3)	1
2.2 (12/13/2011)	ND<1 0.9J (12/6/2010)	(2.2 - 1)/(5 - 3)	0.6
ND<1 (6/4/2012)	ND<1 0.9J (12/6/2010)	(1 - 1)/(6 - 3)	0
1.9 (12/11/2012)	ND<1 0.9J (12/6/2010)	(1.9 - 1)/(7 - 3)	0.225
ND<1 (6/3/2013)	ND<1 0.9J (12/6/2010)	(1 - 1)/(8 - 3)	0
1.2 (12/3/2013)	ND<1 0.9J (12/6/2010)	(1.2 - 1)/(9 - 3)	0.0333333
ND<1 0.95J (6/2/2014)	ND<1 0.9J (12/6/2010)	(1 - 1)/(10 - 3)	0
1.4 (12/2/2014)	ND<1 0.9J (12/6/2010)	(1.4 - 1)/(11 - 3)	0.05
1.9 (6/1/2015)	ND<1 0.9J (12/6/2010)	(1.9 - 1)/(12 - 3)	0.1
1 (12/7/2015)	ND<1 0.9J (12/6/2010)	(1 - 1)/(13 - 3)	0
ND<1 0.7J (6/6/2016)	ND<1 0.9J (12/6/2010)	(1 - 1)/(14 - 3)	0
2.2 (12/5/2016)	ND<1 0.9J (12/6/2010)	(2.2 - 1)/(15 - 3)	0.1
1.4 (6/20/2017)	ND<1 0.9J (12/6/2010)	(1.4 - 1)/(16 - 3)	0.0307692
2.3 (12/4/2017)	ND<1 0.9J (12/6/2010)	(2.3 - 1)/(17 - 3)	0.0928571
2 (6/4/2018)	ND<1 0.9J (12/6/2010)	(2 - 1)/(18 - 3)	0.0666667

2.2 (12/13/2011)	ND<2 1.8J (6/21/2011)	(2.2 - 2)/(5 - 4)	0.2
ND<1 (6/4/2012)	ND<2 1.8J (6/21/2011)	(1 - 2)/(6 - 4)	-0.5
1.9 (12/11/2012)	ND<2 1.8J (6/21/2011)	(1.9 - 2)/(7 - 4)	-0.0333333
ND<1 (6/3/2013)	ND<2 1.8J (6/21/2011)	(1 - 2)/(8 - 4)	-0.25
1.2 (12/3/2013)	ND<2 1.8J (6/21/2011)	(1.2 - 2)/(9 - 4)	-0.16
ND<1 0.95J (6/2/2014)	ND<2 1.8J (6/21/2011)	(1 - 2)/(10 - 4)	-0.166667
1.4 (12/2/2014)	ND<2 1.8J (6/21/2011)	(1.4 - 2)/(11 - 4)	-0.0857143
1.9 (6/1/2015)	ND<2 1.8J (6/21/2011)	(1.9 - 2)/(12 - 4)	-0.0125
1 (12/7/2015)	ND<2 1.8J (6/21/2011)	(1 - 2)/(13 - 4)	-0.111111
ND<1 0.7J (6/6/2016)	ND<2 1.8J (6/21/2011)	(1 - 2)/(14 - 4)	-0.1
2.2 (12/5/2016)	ND<2 1.8J (6/21/2011)	(2.2 - 2)/(15 - 4)	0.0181818
1.4 (6/20/2017)	ND<2 1.8J (6/21/2011)	(1.4 - 2)/(16 - 4)	-0.05
2.3 (12/4/2017)	ND<2 1.8J (6/21/2011)	(2.3 - 2)/(17 - 4)	0.0230769
2 (6/4/2018)	ND<2 1.8J (6/21/2011)	(2 - 2)/(18 - 4)	0

ND<1 (6/4/2012)	2.2 (12/13/2011)	(1 - 2.2)/(6 - 5)	-1.2
1.9 (12/11/2012)	2.2 (12/13/2011)	(1.9 - 2.2)/(7 - 5)	-0.15
ND<1 (6/3/2013)	2.2 (12/13/2011)	(1 - 2.2)/(8 - 5)	-0.4
1.2 (12/3/2013)	2.2 (12/13/2011)	(1.2 - 2.2)/(9 - 5)	-0.25
ND<1 0.95J (6/2/2014)	2.2 (12/13/2011)	(1 - 2.2)/(10 - 5)	-0.24
1.4 (12/2/2014)	2.2 (12/13/2011)	(1.4 - 2.2)/(11 - 5)	-0.133333
1.9 (6/1/2015)	2.2 (12/13/2011)	(1.9 - 2.2)/(12 - 5)	-0.0428571
1 (12/7/2015)	2.2 (12/13/2011)	(1 - 2.2)/(13 - 5)	-0.15
ND<1 0.7J (6/6/2016)	2.2 (12/13/2011)	(1 - 2.2)/(14 - 5)	-0.133333
2.2 (12/5/2016)	2.2 (12/13/2011)	(2.2 - 2.2)/(15 - 5)	0
1.4 (6/20/2017)	2.2 (12/13/2011)	(1.4 - 2.2)/(16 - 5)	-0.0727273
2.3 (12/4/2017)	2.2 (12/13/2011)	(2.3 - 2.2)/(17 - 5)	0.00833333
2 (6/4/2018)	2.2 (12/13/2011)	(2 - 2.2)/(18 - 5)	-0.0153846

1.9 (12/11/2012)	ND<1 (6/4/2012)	(1.9 - 1)/(7 - 6)	0.9
ND<1 (6/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(8 - 6)	0
1.2 (12/3/2013)	ND<1 (6/4/2012)	(1.2 - 1)/(9 - 6)	0.0666667
ND<1 0.95J (6/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(10 - 6)	0
1.4 (12/2/2014)	ND<1 (6/4/2012)	(1.4 - 1)/(11 - 6)	0.08
1.9 (6/1/2015)	ND<1 (6/4/2012)	(1.9 - 1)/(12 - 6)	0.15
1 (12/7/2015)	ND<1 (6/4/2012)	(1 - 1)/(13 - 6)	0
ND<1 0.7J (6/6/2016)	ND<1 (6/4/2012)	(1 - 1)/(14 - 6)	0
2.2 (12/5/2016)	ND<1 (6/4/2012)	(2.2 - 1)/(15 - 6)	0.133333
1.4 (6/20/2017)	ND<1 (6/4/2012)	(1.4 - 1)/(16 - 6)	0.04
2.3 (12/4/2017)	ND<1 (6/4/2012)	(2.3 - 1)/(17 - 6)	0.118182
2 (6/4/2018)	ND<1 (6/4/2012)	(2 - 1)/(18 - 6)	0.0833333

ND<1 (6/3/2013)	1.9 (12/11/2012)	(1 - 1.9)/(8 - 7)	-0.9
1.2 (12/3/2013)	1.9 (12/11/2012)	(1.2 - 1.9)/(9 - 7)	-0.35
ND<1 0.95J (6/2/2014)	1.9 (12/11/2012)	(1 - 1.9)/(10 - 7)	-0.3
1.4 (12/2/2014)	1.9 (12/11/2012)	(1.4 - 1.9)/(11 - 7)	-0.125
1.9 (6/1/2015)	1.9 (12/11/2012)	(1.9 - 1.9)/(12 - 7)	0
1 (12/7/2015)	1.9 (12/11/2012)	(1 - 1.9)/(13 - 7)	-0.15
ND<1 0.7J (6/6/2016)	1.9 (12/11/2012)	(1 - 1.9)/(14 - 7)	-0.128571
2.2 (12/5/2016)	1.9 (12/11/2012)	(2.2 - 1.9)/(15 - 7)	0.0375
1.4 (6/20/2017)	1.9 (12/11/2012)	(1.4 - 1.9)/(16 - 7)	-0.0555556
2.3 (12/4/2017)	1.9 (12/11/2012)	(2.3 - 1.9)/(17 - 7)	0.04
2 (6/4/2018)	1.9 (12/11/2012)	(2 - 1.9)/(18 - 7)	0.00909091

1.2 (12/3/2013)	ND<1 (6/3/2013)	(1.2 - 1)/(9 - 8)	0.2
ND<1 0.95J (6/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(10 - 8)	0
1.4 (12/2/2014)	ND<1 (6/3/2013)	(1.4 - 1)/(11 - 8)	0.133333
1.9 (6/1/2015)	ND<1 (6/3/2013)	(1.9 - 1)/(12 - 8)	0.225
1 (12/7/2015)	ND<1 (6/3/2013)	(1 - 1)/(13 - 8)	0
ND<1 0.7J (6/6/2016)	ND<1 (6/3/2013)	(1 - 1)/(14 - 8)	0
2.2 (12/5/2016)	ND<1 (6/3/2013)	(2.2 - 1)/(15 - 8)	0.171429
1.4 (6/20/2017)	ND<1 (6/3/2013)	(1.4 - 1)/(16 - 8)	0.05
2.3 (12/4/2017)	ND<1 (6/3/2013)	(2.3 - 1)/(17 - 8)	0.144444

2 (6/4/2018)	ND<1 (6/3/2013)	(2 - 1)/(18 - 8)	0.1
ND<1 0.95J (6/2/2014)	1.2 (12/3/2013)	(1 - 1.2)/(10 - 9)	-0.2
1.4 (12/2/2014)	1.2 (12/3/2013)	(1.4 - 1.2)/(11 - 9)	0.1
1.9 (6/1/2015)	1.2 (12/3/2013)	(1.9 - 1.2)/(12 - 9)	0.233333
1 (12/7/2015)	1.2 (12/3/2013)	(1 - 1.2)/(13 - 9)	-0.05
ND<1 0.7J (6/6/2016)	1.2 (12/3/2013)	(1 - 1.2)/(14 - 9)	-0.04
2.2 (12/5/2016)	1.2 (12/3/2013)	(2.2 - 1.2)/(15 - 9)	0.166667
1.4 (6/20/2017)	1.2 (12/3/2013)	(1.4 - 1.2)/(16 - 9)	0.0285714
2.3 (12/4/2017)	1.2 (12/3/2013)	(2.3 - 1.2)/(17 - 9)	0.1375
2 (6/4/2018)	1.2 (12/3/2013)	(2 - 1.2)/(18 - 9)	0.0888889
1.4 (12/2/2014)	ND<1 0.95J (6/2/2014)	(1.4 - 1)/(11 - 10)	0.4
1.9 (6/1/2015)	ND<1 0.95J (6/2/2014)	(1.9 - 1)/(12 - 10)	0.45
1 (12/7/2015)	ND<1 0.95J (6/2/2014)	(1 - 1)/(13 - 10)	0
ND<1 0.7J (6/6/2016)	ND<1 0.95J (6/2/2014)	(1 - 1)/(14 - 10)	0
2.2 (12/5/2016)	ND<1 0.95J (6/2/2014)	(2.2 - 1)/(15 - 10)	0.24
1.4 (6/20/2017)	ND<1 0.95J (6/2/2014)	(1.4 - 1)/(16 - 10)	0.0666667
2.3 (12/4/2017)	ND<1 0.95J (6/2/2014)	(2.3 - 1)/(17 - 10)	0.185714
2 (6/4/2018)	ND<1 0.95J (6/2/2014)	(2 - 1)/(18 - 10)	0.125
1.9 (6/1/2015)	1.4 (12/2/2014)	(1.9 - 1.4)/(12 - 11)	0.5
1 (12/7/2015)	1.4 (12/2/2014)	(1 - 1.4)/(13 - 11)	-0.2
ND<1 0.7J (6/6/2016)	1.4 (12/2/2014)	(1 - 1.4)/(14 - 11)	-0.133333
2.2 (12/5/2016)	1.4 (12/2/2014)	(2.2 - 1.4)/(15 - 11)	0.2
1.4 (6/20/2017)	1.4 (12/2/2014)	(1.4 - 1.4)/(16 - 11)	0
2.3 (12/4/2017)	1.4 (12/2/2014)	(2.3 - 1.4)/(17 - 11)	0.15
2 (6/4/2018)	1.4 (12/2/2014)	(2 - 1.4)/(18 - 11)	0.0857143
1 (12/7/2015)	1.9 (6/1/2015)	(1 - 1.9)/(13 - 12)	-0.9
ND<1 0.7J (6/6/2016)	1.9 (6/1/2015)	(1 - 1.9)/(14 - 12)	-0.45
2.2 (12/5/2016)	1.9 (6/1/2015)	(2.2 - 1.9)/(15 - 12)	0.1
1.4 (6/20/2017)	1.9 (6/1/2015)	(1.4 - 1.9)/(16 - 12)	-0.125
2.3 (12/4/2017)	1.9 (6/1/2015)	(2.3 - 1.9)/(17 - 12)	0.08
2 (6/4/2018)	1.9 (6/1/2015)	(2 - 1.9)/(18 - 12)	0.0166667
ND<1 0.7J (6/6/2016)	1 (12/7/2015)	(1 - 1)/(14 - 13)	0
2.2 (12/5/2016)	1 (12/7/2015)	(2.2 - 1)/(15 - 13)	0.6
1.4 (6/20/2017)	1 (12/7/2015)	(1.4 - 1)/(16 - 13)	0.133333
2.3 (12/4/2017)	1 (12/7/2015)	(2.3 - 1)/(17 - 13)	0.325
2 (6/4/2018)	1 (12/7/2015)	(2 - 1)/(18 - 13)	0.2
2.2 (12/5/2016)	ND<1 0.7J (6/6/2016)	(2.2 - 1)/(15 - 14)	1.2
1.4 (6/20/2017)	ND<1 0.7J (6/6/2016)	(1.4 - 1)/(16 - 14)	0.2
2.3 (12/4/2017)	ND<1 0.7J (6/6/2016)	(2.3 - 1)/(17 - 14)	0.433333
2 (6/4/2018)	ND<1 0.7J (6/6/2016)	(2 - 1)/(18 - 14)	0.25
1.4 (6/20/2017)	2.2 (12/5/2016)	(1.4 - 2.2)/(16 - 15)	-0.8
2.3 (12/4/2017)	2.2 (12/5/2016)	(2.3 - 2.2)/(17 - 15)	0.05
2 (6/4/2018)	2.2 (12/5/2016)	(2 - 2.2)/(18 - 15)	-0.0666667
2.3 (12/4/2017)	1.4 (6/20/2017)	(2.3 - 1.4)/(17 - 16)	0.9
2 (6/4/2018)	1.4 (6/20/2017)	(2 - 1.4)/(18 - 16)	0.3
2 (6/4/2018)	2.3 (12/4/2017)	(2 - 2.3)/(18 - 17)	-0.3

Number of Q values = 153

Ordered Q Values

n	Q
1	-1.2

2	-0.9
3	-0.9
4	-0.8
5	-0.5
6	-0.45
7	-0.4
8	-0.35
9	-0.3
10	-0.3
11	-0.25
12	-0.25
13	-0.24
14	-0.2
15	-0.2
16	-0.166667
17	-0.16
18	-0.15
19	-0.15
20	-0.15
21	-0.133333
22	-0.133333
23	-0.133333
24	-0.128571
25	-0.125
26	-0.125
27	-0.111111
28	-0.1
29	-0.1
30	-0.0857143
31	-0.0727273
32	-0.0666667
33	-0.0555556
34	-0.05
35	-0.05
36	-0.0428571
37	-0.04
38	-0.0333333
39	-0.025
40	-0.0166667
41	-0.0153846
42	-0.0125
43	-0.0125
44	-0.00909091
45	-0.00833333
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0

Royalton Road LF

65	0
66	0
67	0
68	0
69	0
70	0
71	0.00833333
72	0.00909091
73	0.0142857
74	0.0166667
75	0.0181818
76	0.0214286
77	0.0230769
78	0.025
79	0.0266667
80	0.0285714
81	0.0307692
82	0.0333333
83	0.0333333
84	0.0375
85	0.04
86	0.04
87	0.04
88	0.05
89	0.05
90	0.05
91	0.05625
92	0.0588235
93	0.0666667
94	0.0666667
95	0.0666667
96	0.08
97	0.08
98	0.08
99	0.08
100	0.08125
101	0.0818182
102	0.0833333
103	0.0846154
104	0.0857143
105	0.0857143
106	0.0888889
107	0.0928571
108	0.1
109	0.1
110	0.1
111	0.1
112	0.1
113	0.1
114	0.118182
115	0.125
116	0.133333
117	0.133333
118	0.133333
119	0.1375
120	0.144444
121	0.15
122	0.15
123	0.15
124	0.16
125	0.166667
126	0.171429
127	0.185714

128	0.2
129	0.2
130	0.2
131	0.2
132	0.2
133	0.225
134	0.225
135	0.233333
136	0.24
137	0.25
138	0.3
139	0.3
140	0.325
141	0.333333
142	0.366667
143	0.4
144	0.433333
145	0.45
146	0.45
147	0.5
148	0.6
149	0.6
150	0.9
151	0.9
152	1
153	1.2

Sen's Estimator (Median Q) is 0.0230769

Tied Group	Value	Members
1	1	7
2	2	2
3	2.2	2
4	1.9	2
5	1.4	2

Time Period	Observations
12/2/2009	1
6/21/2010	1
12/6/2010	1
6/21/2011	1
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 870
B = 0
C = 210
D = 0
E = 50
F = 0

Royalton Road LF

a = 12546
b = 44064
c = 612
Group Variance = 648.667
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 65.6038
M1 = (153 - 65.6038)/2.0 = 43.6981
M2 = (153 + 65.6038)/2.0 + 1 = 110.302
Lower limit is -0.00909091 = Q(44)
Upper limit is 0.1 = Q(110)
-0.00909091 < 0 < 0.1 indicating no trend in data.

Sen's Slope Analysis
Parameter: Arsenic, total
Location: MW-3
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<1 (6/21/2010)	ND<1 (12/2/2009)	(1 - 1)/(2 - 1)	0
ND<1 (12/6/2010)	ND<1 (12/2/2009)	(1 - 1)/(3 - 1)	0
ND<2 (6/21/2011)	ND<1 (12/2/2009)	(2 - 1)/(4 - 1)	0.333333
ND<1 0.6J (12/13/2011)	ND<1 (12/2/2009)	(1 - 1)/(5 - 1)	0
ND<1 (6/4/2012)	ND<1 (12/2/2009)	(1 - 1)/(6 - 1)	0
ND<1 0.9J (12/11/2012)	ND<1 (12/2/2009)	(1 - 1)/(7 - 1)	0
ND<1 (6/3/2013)	ND<1 (12/2/2009)	(1 - 1)/(8 - 1)	0
ND<1 (12/3/2013)	ND<1 (12/2/2009)	(1 - 1)/(9 - 1)	0
ND<1 (6/2/2014)	ND<1 (12/2/2009)	(1 - 1)/(10 - 1)	0
ND<1 0.7J (12/2/2014)	ND<1 (12/2/2009)	(1 - 1)/(11 - 1)	0
ND<1 0.8J (6/1/2015)	ND<1 (12/2/2009)	(1 - 1)/(12 - 1)	0
ND<1 0.99J (6/6/2016)	ND<1 (12/2/2009)	(1 - 1)/(13 - 1)	0
ND<1 (12/5/2016)	ND<1 (12/2/2009)	(1 - 1)/(14 - 1)	0
ND<1 (6/20/2017)	ND<1 (12/2/2009)	(1 - 1)/(15 - 1)	0
ND<1 0.6J (12/4/2017)	ND<1 (12/2/2009)	(1 - 1)/(16 - 1)	0
ND<1 (6/4/2018)	ND<1 (12/2/2009)	(1 - 1)/(17 - 1)	0
ND<1 (12/6/2010)	ND<1 (6/21/2010)	(1 - 1)/(3 - 2)	0
ND<2 (6/21/2011)	ND<1 (6/21/2010)	(2 - 1)/(4 - 2)	0.5
ND<1 0.6J (12/13/2011)	ND<1 (6/21/2010)	(1 - 1)/(5 - 2)	0
ND<1 (6/4/2012)	ND<1 (6/21/2010)	(1 - 1)/(6 - 2)	0
ND<1 0.9J (12/11/2012)	ND<1 (6/21/2010)	(1 - 1)/(7 - 2)	0
ND<1 (6/3/2013)	ND<1 (6/21/2010)	(1 - 1)/(8 - 2)	0
ND<1 (12/3/2013)	ND<1 (6/21/2010)	(1 - 1)/(9 - 2)	0
ND<1 (6/2/2014)	ND<1 (6/21/2010)	(1 - 1)/(10 - 2)	0
ND<1 0.7J (12/2/2014)	ND<1 (6/21/2010)	(1 - 1)/(11 - 2)	0
ND<1 0.8J (6/1/2015)	ND<1 (6/21/2010)	(1 - 1)/(12 - 2)	0
ND<1 0.99J (6/6/2016)	ND<1 (6/21/2010)	(1 - 1)/(13 - 2)	0
ND<1 (12/5/2016)	ND<1 (6/21/2010)	(1 - 1)/(14 - 2)	0
ND<1 (6/20/2017)	ND<1 (6/21/2010)	(1 - 1)/(15 - 2)	0
ND<1 0.6J (12/4/2017)	ND<1 (6/21/2010)	(1 - 1)/(16 - 2)	0
ND<1 (6/4/2018)	ND<1 (6/21/2010)	(1 - 1)/(17 - 2)	0
ND<2 (6/21/2011)	ND<1 (12/6/2010)	(2 - 1)/(4 - 3)	1
ND<1 0.6J (12/13/2011)	ND<1 (12/6/2010)	(1 - 1)/(5 - 3)	0
ND<1 (6/4/2012)	ND<1 (12/6/2010)	(1 - 1)/(6 - 3)	0
ND<1 0.9J (12/11/2012)	ND<1 (12/6/2010)	(1 - 1)/(7 - 3)	0
ND<1 (6/3/2013)	ND<1 (12/6/2010)	(1 - 1)/(8 - 3)	0
ND<1 (12/3/2013)	ND<1 (12/6/2010)	(1 - 1)/(9 - 3)	0
ND<1 (6/2/2014)	ND<1 (12/6/2010)	(1 - 1)/(10 - 3)	0
ND<1 0.7J (12/2/2014)	ND<1 (12/6/2010)	(1 - 1)/(11 - 3)	0
ND<1 0.8J (6/1/2015)	ND<1 (12/6/2010)	(1 - 1)/(12 - 3)	0
ND<1 0.99J (6/6/2016)	ND<1 (12/6/2010)	(1 - 1)/(13 - 3)	0
ND<1 (12/5/2016)	ND<1 (12/6/2010)	(1 - 1)/(14 - 3)	0
ND<1 (6/20/2017)	ND<1 (12/6/2010)	(1 - 1)/(15 - 3)	0
ND<1 0.6J (12/4/2017)	ND<1 (12/6/2010)	(1 - 1)/(16 - 3)	0
ND<1 (6/4/2018)	ND<1 (12/6/2010)	(1 - 1)/(17 - 3)	0
ND<1 0.6J (12/13/2011)	ND<2 (6/21/2011)	(1 - 2)/(5 - 4)	-1
ND<1 (6/4/2012)	ND<2 (6/21/2011)	(1 - 2)/(6 - 4)	-0.5
ND<1 0.9J (12/11/2012)	ND<2 (6/21/2011)	(1 - 2)/(7 - 4)	-0.333333

ND<1 (6/3/2013)	ND<2 (6/21/2011)	(1 - 2)/(8 - 4)	-0.25
ND<1 (12/3/2013)	ND<2 (6/21/2011)	(1 - 2)/(9 - 4)	-0.2
ND<1 (6/2/2014)	ND<2 (6/21/2011)	(1 - 2)/(10 - 4)	-0.166667
ND<1 0.7J (12/2/2014)	ND<2 (6/21/2011)	(1 - 2)/(11 - 4)	-0.142857
ND<1 0.8J (6/1/2015)	ND<2 (6/21/2011)	(1 - 2)/(12 - 4)	-0.125
ND<1 0.99J (6/6/2016)	ND<2 (6/21/2011)	(1 - 2)/(13 - 4)	-0.111111
ND<1 (12/5/2016)	ND<2 (6/21/2011)	(1 - 2)/(14 - 4)	-0.1
ND<1 (6/20/2017)	ND<2 (6/21/2011)	(1 - 2)/(15 - 4)	-0.0909091
ND<1 0.6J (12/4/2017)	ND<2 (6/21/2011)	(1 - 2)/(16 - 4)	-0.0833333
ND<1 (6/4/2018)	ND<2 (6/21/2011)	(1 - 2)/(17 - 4)	-0.0769231

ND<1 (6/4/2012)	ND<1 0.6J (12/13/2011)	(1 - 1)/(6 - 5)	0
ND<1 0.9J (12/11/2012)	ND<1 0.6J (12/13/2011)	(1 - 1)/(7 - 5)	0
ND<1 (6/3/2013)	ND<1 0.6J (12/13/2011)	(1 - 1)/(8 - 5)	0
ND<1 (12/3/2013)	ND<1 0.6J (12/13/2011)	(1 - 1)/(9 - 5)	0
ND<1 (6/2/2014)	ND<1 0.6J (12/13/2011)	(1 - 1)/(10 - 5)	0
ND<1 0.7J (12/2/2014)	ND<1 0.6J (12/13/2011)	(1 - 1)/(11 - 5)	0
ND<1 0.8J (6/1/2015)	ND<1 0.6J (12/13/2011)	(1 - 1)/(12 - 5)	0
ND<1 0.99J (6/6/2016)	ND<1 0.6J (12/13/2011)	(1 - 1)/(13 - 5)	0
ND<1 (12/5/2016)	ND<1 0.6J (12/13/2011)	(1 - 1)/(14 - 5)	0
ND<1 (6/20/2017)	ND<1 0.6J (12/13/2011)	(1 - 1)/(15 - 5)	0
ND<1 0.6J (12/4/2017)	ND<1 0.6J (12/13/2011)	(1 - 1)/(16 - 5)	0
ND<1 (6/4/2018)	ND<1 0.6J (12/13/2011)	(1 - 1)/(17 - 5)	0

ND<1 0.9J (12/11/2012)	ND<1 (6/4/2012)	(1 - 1)/(7 - 6)	0
ND<1 (6/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(8 - 6)	0
ND<1 (12/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(9 - 6)	0
ND<1 (6/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(10 - 6)	0
ND<1 0.7J (12/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(11 - 6)	0
ND<1 0.8J (6/1/2015)	ND<1 (6/4/2012)	(1 - 1)/(12 - 6)	0
ND<1 0.99J (6/6/2016)	ND<1 (6/4/2012)	(1 - 1)/(13 - 6)	0
ND<1 (12/5/2016)	ND<1 (6/4/2012)	(1 - 1)/(14 - 6)	0
ND<1 (6/20/2017)	ND<1 (6/4/2012)	(1 - 1)/(15 - 6)	0
ND<1 0.6J (12/4/2017)	ND<1 (6/4/2012)	(1 - 1)/(16 - 6)	0
ND<1 (6/4/2018)	ND<1 (6/4/2012)	(1 - 1)/(17 - 6)	0

ND<1 (6/3/2013)	ND<1 0.9J (12/11/2012)	(1 - 1)/(8 - 7)	0
ND<1 (12/3/2013)	ND<1 0.9J (12/11/2012)	(1 - 1)/(9 - 7)	0
ND<1 (6/2/2014)	ND<1 0.9J (12/11/2012)	(1 - 1)/(10 - 7)	0
ND<1 0.7J (12/2/2014)	ND<1 0.9J (12/11/2012)	(1 - 1)/(11 - 7)	0
ND<1 0.8J (6/1/2015)	ND<1 0.9J (12/11/2012)	(1 - 1)/(12 - 7)	0
ND<1 0.99J (6/6/2016)	ND<1 0.9J (12/11/2012)	(1 - 1)/(13 - 7)	0
ND<1 (12/5/2016)	ND<1 0.9J (12/11/2012)	(1 - 1)/(14 - 7)	0
ND<1 (6/20/2017)	ND<1 0.9J (12/11/2012)	(1 - 1)/(15 - 7)	0
ND<1 0.6J (12/4/2017)	ND<1 0.9J (12/11/2012)	(1 - 1)/(16 - 7)	0
ND<1 (6/4/2018)	ND<1 0.9J (12/11/2012)	(1 - 1)/(17 - 7)	0

ND<1 (12/3/2013)	ND<1 (6/3/2013)	(1 - 1)/(9 - 8)	0
ND<1 (6/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(10 - 8)	0
ND<1 0.7J (12/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(11 - 8)	0
ND<1 0.8J (6/1/2015)	ND<1 (6/3/2013)	(1 - 1)/(12 - 8)	0
ND<1 0.99J (6/6/2016)	ND<1 (6/3/2013)	(1 - 1)/(13 - 8)	0
ND<1 (12/5/2016)	ND<1 (6/3/2013)	(1 - 1)/(14 - 8)	0
ND<1 (6/20/2017)	ND<1 (6/3/2013)	(1 - 1)/(15 - 8)	0
ND<1 0.6J (12/4/2017)	ND<1 (6/3/2013)	(1 - 1)/(16 - 8)	0
ND<1 (6/4/2018)	ND<1 (6/3/2013)	(1 - 1)/(17 - 8)	0

ND<1 (6/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(10 - 9)	0
ND<1 0.7J (12/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(11 - 9)	0
ND<1 0.8J (6/1/2015)	ND<1 (12/3/2013)	(1 - 1)/(12 - 9)	0
ND<1 0.99J (6/6/2016)	ND<1 (12/3/2013)	(1 - 1)/(13 - 9)	0
ND<1 (12/5/2016)	ND<1 (12/3/2013)	(1 - 1)/(14 - 9)	0
ND<1 (6/20/2017)	ND<1 (12/3/2013)	(1 - 1)/(15 - 9)	0

ND<1 0.6J (12/4/2017)	ND<1 (12/3/2013)	(1 - 1)/(16 - 9)	0
ND<1 (6/4/2018)	ND<1 (12/3/2013)	(1 - 1)/(17 - 9)	0
ND<1 0.7J (12/2/2014)	ND<1 (6/2/2014)	(1 - 1)/(11 - 10)	0
ND<1 0.8J (6/1/2015)	ND<1 (6/2/2014)	(1 - 1)/(12 - 10)	0
ND<1 0.99J (6/6/2016)	ND<1 (6/2/2014)	(1 - 1)/(13 - 10)	0
ND<1 (12/5/2016)	ND<1 (6/2/2014)	(1 - 1)/(14 - 10)	0
ND<1 (6/20/2017)	ND<1 (6/2/2014)	(1 - 1)/(15 - 10)	0
ND<1 0.6J (12/4/2017)	ND<1 (6/2/2014)	(1 - 1)/(16 - 10)	0
ND<1 (6/4/2018)	ND<1 (6/2/2014)	(1 - 1)/(17 - 10)	0
ND<1 0.8J (6/1/2015)	ND<1 0.7J (12/2/2014)	(1 - 1)/(12 - 11)	0
ND<1 0.99J (6/6/2016)	ND<1 0.7J (12/2/2014)	(1 - 1)/(13 - 11)	0
ND<1 (12/5/2016)	ND<1 0.7J (12/2/2014)	(1 - 1)/(14 - 11)	0
ND<1 (6/20/2017)	ND<1 0.7J (12/2/2014)	(1 - 1)/(15 - 11)	0
ND<1 0.6J (12/4/2017)	ND<1 0.7J (12/2/2014)	(1 - 1)/(16 - 11)	0
ND<1 (6/4/2018)	ND<1 0.7J (12/2/2014)	(1 - 1)/(17 - 11)	0
ND<1 0.99J (6/6/2016)	ND<1 0.8J (6/1/2015)	(1 - 1)/(13 - 12)	0
ND<1 (12/5/2016)	ND<1 0.8J (6/1/2015)	(1 - 1)/(14 - 12)	0
ND<1 (6/20/2017)	ND<1 0.8J (6/1/2015)	(1 - 1)/(15 - 12)	0
ND<1 0.6J (12/4/2017)	ND<1 0.8J (6/1/2015)	(1 - 1)/(16 - 12)	0
ND<1 (6/4/2018)	ND<1 0.8J (6/1/2015)	(1 - 1)/(17 - 12)	0
ND<1 (12/5/2016)	ND<1 0.99J (6/6/2016)	(1 - 1)/(14 - 13)	0
ND<1 (6/20/2017)	ND<1 0.99J (6/6/2016)	(1 - 1)/(15 - 13)	0
ND<1 0.6J (12/4/2017)	ND<1 0.99J (6/6/2016)	(1 - 1)/(16 - 13)	0
ND<1 (6/4/2018)	ND<1 0.99J (6/6/2016)	(1 - 1)/(17 - 13)	0
ND<1 (6/20/2017)	ND<1 (12/5/2016)	(1 - 1)/(15 - 14)	0
ND<1 0.6J (12/4/2017)	ND<1 (12/5/2016)	(1 - 1)/(16 - 14)	0
ND<1 (6/4/2018)	ND<1 (12/5/2016)	(1 - 1)/(17 - 14)	0
ND<1 0.6J (12/4/2017)	ND<1 (6/20/2017)	(1 - 1)/(16 - 15)	0
ND<1 (6/4/2018)	ND<1 (6/20/2017)	(1 - 1)/(17 - 15)	0
ND<1 (6/4/2018)	ND<1 0.6J (12/4/2017)	(1 - 1)/(17 - 16)	0

Number of Q values = 136

Ordered Q Values

n	Q
1	-1
2	-0.5
3	-0.333333
4	-0.25
5	-0.2
6	-0.166667
7	-0.142857
8	-0.125
9	-0.111111
10	-0.1
11	-0.0909091
12	-0.0833333
13	-0.0769231
14	0
15	0
16	0
17	0
18	0
19	0

Royalton Road LF

20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0
72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0

83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0
92	0
93	0
94	0
95	0
96	0
97	0
98	0
99	0
100	0
101	0
102	0
103	0
104	0
105	0
106	0
107	0
108	0
109	0
110	0
111	0
112	0
113	0
114	0
115	0
116	0
117	0
118	0
119	0
120	0
121	0
122	0
123	0
124	0
125	0
126	0
127	0
128	0
129	0
130	0
131	0
132	0
133	0
134	0.333333
135	0.5
136	1

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	1	16

Time Period	Observations
12/2/2009	1
6/21/2010	1

Royalton Road LF

12/6/2010	1
6/21/2011	1
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 8880
B = 0
C = 3360
D = 0
E = 240
F = 0
a = 10608
b = 36720
c = 544
Group Variance = 96
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 25.2379
M1 = (136 - 25.2379)/2.0 = 55.381
M2 = (136 + 25.2379)/2.0 + 1 = 81.619
Lower limit is 0 = Q(55)
Upper limit is 0 = Q(82)
0 < 0 < 0 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis
Parameter: Arsenic, total
Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
24.1 (6/21/2010)	24.9 (12/2/2009)	(24.1 - 24.9)/(2 - 1)	-0.8
25 (12/6/2010)	24.9 (12/2/2009)	(25 - 24.9)/(3 - 1)	0.05
26.3 (6/21/2011)	24.9 (12/2/2009)	(26.3 - 24.9)/(4 - 1)	0.466667
24.1 (12/13/2011)	24.9 (12/2/2009)	(24.1 - 24.9)/(5 - 1)	-0.2
15.5 (6/4/2012)	24.9 (12/2/2009)	(15.5 - 24.9)/(6 - 1)	-1.88
20.6 (12/11/2012)	24.9 (12/2/2009)	(20.6 - 24.9)/(7 - 1)	-0.716667
16.5 (6/3/2013)	24.9 (12/2/2009)	(16.5 - 24.9)/(8 - 1)	-1.2
19.8 (12/3/2013)	24.9 (12/2/2009)	(19.8 - 24.9)/(9 - 1)	-0.6375
20 (6/2/2014)	24.9 (12/2/2009)	(20 - 24.9)/(10 - 1)	-0.544444
17.9 (12/2/2014)	24.9 (12/2/2009)	(17.9 - 24.9)/(11 - 1)	-0.7
19.2 (6/1/2015)	24.9 (12/2/2009)	(19.2 - 24.9)/(12 - 1)	-0.518182
24.2 (12/7/2015)	24.9 (12/2/2009)	(24.2 - 24.9)/(13 - 1)	-0.0583333
22.1 (6/6/2016)	24.9 (12/2/2009)	(22.1 - 24.9)/(14 - 1)	-0.215385
32.4 (12/5/2016)	24.9 (12/2/2009)	(32.4 - 24.9)/(15 - 1)	0.535714
21.2 (6/20/2017)	24.9 (12/2/2009)	(21.2 - 24.9)/(16 - 1)	-0.246667
29.7 (12/4/2017)	24.9 (12/2/2009)	(29.7 - 24.9)/(17 - 1)	0.3
19.4 (6/4/2018)	24.9 (12/2/2009)	(19.4 - 24.9)/(18 - 1)	-0.323529
25 (12/6/2010)	24.1 (6/21/2010)	(25 - 24.1)/(3 - 2)	0.9
26.3 (6/21/2011)	24.1 (6/21/2010)	(26.3 - 24.1)/(4 - 2)	1.1
24.1 (12/13/2011)	24.1 (6/21/2010)	(24.1 - 24.1)/(5 - 2)	0
15.5 (6/4/2012)	24.1 (6/21/2010)	(15.5 - 24.1)/(6 - 2)	-2.15
20.6 (12/11/2012)	24.1 (6/21/2010)	(20.6 - 24.1)/(7 - 2)	-0.7
16.5 (6/3/2013)	24.1 (6/21/2010)	(16.5 - 24.1)/(8 - 2)	-1.26667
19.8 (12/3/2013)	24.1 (6/21/2010)	(19.8 - 24.1)/(9 - 2)	-0.614286
20 (6/2/2014)	24.1 (6/21/2010)	(20 - 24.1)/(10 - 2)	-0.5125
17.9 (12/2/2014)	24.1 (6/21/2010)	(17.9 - 24.1)/(11 - 2)	-0.688889
19.2 (6/1/2015)	24.1 (6/21/2010)	(19.2 - 24.1)/(12 - 2)	-0.49
24.2 (12/7/2015)	24.1 (6/21/2010)	(24.2 - 24.1)/(13 - 2)	0.00909091
22.1 (6/6/2016)	24.1 (6/21/2010)	(22.1 - 24.1)/(14 - 2)	-0.166667
32.4 (12/5/2016)	24.1 (6/21/2010)	(32.4 - 24.1)/(15 - 2)	0.638462
21.2 (6/20/2017)	24.1 (6/21/2010)	(21.2 - 24.1)/(16 - 2)	-0.207143
29.7 (12/4/2017)	24.1 (6/21/2010)	(29.7 - 24.1)/(17 - 2)	0.373333
19.4 (6/4/2018)	24.1 (6/21/2010)	(19.4 - 24.1)/(18 - 2)	-0.29375
26.3 (6/21/2011)	25 (12/6/2010)	(26.3 - 25)/(4 - 3)	1.3
24.1 (12/13/2011)	25 (12/6/2010)	(24.1 - 25)/(5 - 3)	-0.45
15.5 (6/4/2012)	25 (12/6/2010)	(15.5 - 25)/(6 - 3)	-3.16667
20.6 (12/11/2012)	25 (12/6/2010)	(20.6 - 25)/(7 - 3)	-1.1
16.5 (6/3/2013)	25 (12/6/2010)	(16.5 - 25)/(8 - 3)	-1.7
19.8 (12/3/2013)	25 (12/6/2010)	(19.8 - 25)/(9 - 3)	-0.866667
20 (6/2/2014)	25 (12/6/2010)	(20 - 25)/(10 - 3)	-0.714286
17.9 (12/2/2014)	25 (12/6/2010)	(17.9 - 25)/(11 - 3)	-0.8875
19.2 (6/1/2015)	25 (12/6/2010)	(19.2 - 25)/(12 - 3)	-0.644444
24.2 (12/7/2015)	25 (12/6/2010)	(24.2 - 25)/(13 - 3)	-0.08
22.1 (6/6/2016)	25 (12/6/2010)	(22.1 - 25)/(14 - 3)	-0.263636
32.4 (12/5/2016)	25 (12/6/2010)	(32.4 - 25)/(15 - 3)	0.616667
21.2 (6/20/2017)	25 (12/6/2010)	(21.2 - 25)/(16 - 3)	-0.292308
29.7 (12/4/2017)	25 (12/6/2010)	(29.7 - 25)/(17 - 3)	0.335714
19.4 (6/4/2018)	25 (12/6/2010)	(19.4 - 25)/(18 - 3)	-0.373333

24.1 (12/13/2011)	26.3 (6/21/2011)	(24.1 - 26.3)/(5 - 4)	-2.2
15.5 (6/4/2012)	26.3 (6/21/2011)	(15.5 - 26.3)/(6 - 4)	-5.4
20.6 (12/11/2012)	26.3 (6/21/2011)	(20.6 - 26.3)/(7 - 4)	-1.9
16.5 (6/3/2013)	26.3 (6/21/2011)	(16.5 - 26.3)/(8 - 4)	-2.45
19.8 (12/3/2013)	26.3 (6/21/2011)	(19.8 - 26.3)/(9 - 4)	-1.3
20 (6/2/2014)	26.3 (6/21/2011)	(20 - 26.3)/(10 - 4)	-1.05
17.9 (12/2/2014)	26.3 (6/21/2011)	(17.9 - 26.3)/(11 - 4)	-1.2
19.2 (6/1/2015)	26.3 (6/21/2011)	(19.2 - 26.3)/(12 - 4)	-0.8875
24.2 (12/7/2015)	26.3 (6/21/2011)	(24.2 - 26.3)/(13 - 4)	-0.233333
22.1 (6/6/2016)	26.3 (6/21/2011)	(22.1 - 26.3)/(14 - 4)	-0.42
32.4 (12/5/2016)	26.3 (6/21/2011)	(32.4 - 26.3)/(15 - 4)	0.554545
21.2 (6/20/2017)	26.3 (6/21/2011)	(21.2 - 26.3)/(16 - 4)	-0.425
29.7 (12/4/2017)	26.3 (6/21/2011)	(29.7 - 26.3)/(17 - 4)	0.261538
19.4 (6/4/2018)	26.3 (6/21/2011)	(19.4 - 26.3)/(18 - 4)	-0.492857
15.5 (6/4/2012)	24.1 (12/13/2011)	(15.5 - 24.1)/(6 - 5)	-8.6
20.6 (12/11/2012)	24.1 (12/13/2011)	(20.6 - 24.1)/(7 - 5)	-1.75
16.5 (6/3/2013)	24.1 (12/13/2011)	(16.5 - 24.1)/(8 - 5)	-2.53333
19.8 (12/3/2013)	24.1 (12/13/2011)	(19.8 - 24.1)/(9 - 5)	-1.075
20 (6/2/2014)	24.1 (12/13/2011)	(20 - 24.1)/(10 - 5)	-0.82
17.9 (12/2/2014)	24.1 (12/13/2011)	(17.9 - 24.1)/(11 - 5)	-1.03333
19.2 (6/1/2015)	24.1 (12/13/2011)	(19.2 - 24.1)/(12 - 5)	-0.7
24.2 (12/7/2015)	24.1 (12/13/2011)	(24.2 - 24.1)/(13 - 5)	0.0125
22.1 (6/6/2016)	24.1 (12/13/2011)	(22.1 - 24.1)/(14 - 5)	-0.222222
32.4 (12/5/2016)	24.1 (12/13/2011)	(32.4 - 24.1)/(15 - 5)	0.83
21.2 (6/20/2017)	24.1 (12/13/2011)	(21.2 - 24.1)/(16 - 5)	-0.263636
29.7 (12/4/2017)	24.1 (12/13/2011)	(29.7 - 24.1)/(17 - 5)	0.466667
19.4 (6/4/2018)	24.1 (12/13/2011)	(19.4 - 24.1)/(18 - 5)	-0.361538
20.6 (12/11/2012)	15.5 (6/4/2012)	(20.6 - 15.5)/(7 - 6)	5.1
16.5 (6/3/2013)	15.5 (6/4/2012)	(16.5 - 15.5)/(8 - 6)	0.5
19.8 (12/3/2013)	15.5 (6/4/2012)	(19.8 - 15.5)/(9 - 6)	1.43333
20 (6/2/2014)	15.5 (6/4/2012)	(20 - 15.5)/(10 - 6)	1.125
17.9 (12/2/2014)	15.5 (6/4/2012)	(17.9 - 15.5)/(11 - 6)	0.48
19.2 (6/1/2015)	15.5 (6/4/2012)	(19.2 - 15.5)/(12 - 6)	0.616667
24.2 (12/7/2015)	15.5 (6/4/2012)	(24.2 - 15.5)/(13 - 6)	1.24286
22.1 (6/6/2016)	15.5 (6/4/2012)	(22.1 - 15.5)/(14 - 6)	0.825
32.4 (12/5/2016)	15.5 (6/4/2012)	(32.4 - 15.5)/(15 - 6)	1.87778
21.2 (6/20/2017)	15.5 (6/4/2012)	(21.2 - 15.5)/(16 - 6)	0.57
29.7 (12/4/2017)	15.5 (6/4/2012)	(29.7 - 15.5)/(17 - 6)	1.29091
19.4 (6/4/2018)	15.5 (6/4/2012)	(19.4 - 15.5)/(18 - 6)	0.325
16.5 (6/3/2013)	20.6 (12/11/2012)	(16.5 - 20.6)/(8 - 7)	-4.1
19.8 (12/3/2013)	20.6 (12/11/2012)	(19.8 - 20.6)/(9 - 7)	-0.4
20 (6/2/2014)	20.6 (12/11/2012)	(20 - 20.6)/(10 - 7)	-0.2
17.9 (12/2/2014)	20.6 (12/11/2012)	(17.9 - 20.6)/(11 - 7)	-0.675
19.2 (6/1/2015)	20.6 (12/11/2012)	(19.2 - 20.6)/(12 - 7)	-0.28
24.2 (12/7/2015)	20.6 (12/11/2012)	(24.2 - 20.6)/(13 - 7)	0.6
22.1 (6/6/2016)	20.6 (12/11/2012)	(22.1 - 20.6)/(14 - 7)	0.214286
32.4 (12/5/2016)	20.6 (12/11/2012)	(32.4 - 20.6)/(15 - 7)	1.475
21.2 (6/20/2017)	20.6 (12/11/2012)	(21.2 - 20.6)/(16 - 7)	0.0666667
29.7 (12/4/2017)	20.6 (12/11/2012)	(29.7 - 20.6)/(17 - 7)	0.91
19.4 (6/4/2018)	20.6 (12/11/2012)	(19.4 - 20.6)/(18 - 7)	-0.109091
19.8 (12/3/2013)	16.5 (6/3/2013)	(19.8 - 16.5)/(9 - 8)	3.3
20 (6/2/2014)	16.5 (6/3/2013)	(20 - 16.5)/(10 - 8)	1.75
17.9 (12/2/2014)	16.5 (6/3/2013)	(17.9 - 16.5)/(11 - 8)	0.466667
19.2 (6/1/2015)	16.5 (6/3/2013)	(19.2 - 16.5)/(12 - 8)	0.675
24.2 (12/7/2015)	16.5 (6/3/2013)	(24.2 - 16.5)/(13 - 8)	1.54
22.1 (6/6/2016)	16.5 (6/3/2013)	(22.1 - 16.5)/(14 - 8)	0.933333
32.4 (12/5/2016)	16.5 (6/3/2013)	(32.4 - 16.5)/(15 - 8)	2.27143
21.2 (6/20/2017)	16.5 (6/3/2013)	(21.2 - 16.5)/(16 - 8)	0.5875
29.7 (12/4/2017)	16.5 (6/3/2013)	(29.7 - 16.5)/(17 - 8)	1.46667

19.4 (6/4/2018)	16.5 (6/3/2013)	(19.4 - 16.5)/(18 - 8)	0.29
20 (6/2/2014)	19.8 (12/3/2013)	(20 - 19.8)/(10 - 9)	0.2
17.9 (12/2/2014)	19.8 (12/3/2013)	(17.9 - 19.8)/(11 - 9)	-0.95
19.2 (6/1/2015)	19.8 (12/3/2013)	(19.2 - 19.8)/(12 - 9)	-0.2
24.2 (12/7/2015)	19.8 (12/3/2013)	(24.2 - 19.8)/(13 - 9)	1.1
22.1 (6/6/2016)	19.8 (12/3/2013)	(22.1 - 19.8)/(14 - 9)	0.46
32.4 (12/5/2016)	19.8 (12/3/2013)	(32.4 - 19.8)/(15 - 9)	2.1
21.2 (6/20/2017)	19.8 (12/3/2013)	(21.2 - 19.8)/(16 - 9)	0.2
29.7 (12/4/2017)	19.8 (12/3/2013)	(29.7 - 19.8)/(17 - 9)	1.2375
19.4 (6/4/2018)	19.8 (12/3/2013)	(19.4 - 19.8)/(18 - 9)	-0.0444444
17.9 (12/2/2014)	20 (6/2/2014)	(17.9 - 20)/(11 - 10)	-2.1
19.2 (6/1/2015)	20 (6/2/2014)	(19.2 - 20)/(12 - 10)	-0.4
24.2 (12/7/2015)	20 (6/2/2014)	(24.2 - 20)/(13 - 10)	1.4
22.1 (6/6/2016)	20 (6/2/2014)	(22.1 - 20)/(14 - 10)	0.525
32.4 (12/5/2016)	20 (6/2/2014)	(32.4 - 20)/(15 - 10)	2.48
21.2 (6/20/2017)	20 (6/2/2014)	(21.2 - 20)/(16 - 10)	0.2
29.7 (12/4/2017)	20 (6/2/2014)	(29.7 - 20)/(17 - 10)	1.38571
19.4 (6/4/2018)	20 (6/2/2014)	(19.4 - 20)/(18 - 10)	-0.075
19.2 (6/1/2015)	17.9 (12/2/2014)	(19.2 - 17.9)/(12 - 11)	1.3
24.2 (12/7/2015)	17.9 (12/2/2014)	(24.2 - 17.9)/(13 - 11)	3.15
22.1 (6/6/2016)	17.9 (12/2/2014)	(22.1 - 17.9)/(14 - 11)	1.4
32.4 (12/5/2016)	17.9 (12/2/2014)	(32.4 - 17.9)/(15 - 11)	3.625
21.2 (6/20/2017)	17.9 (12/2/2014)	(21.2 - 17.9)/(16 - 11)	0.66
29.7 (12/4/2017)	17.9 (12/2/2014)	(29.7 - 17.9)/(17 - 11)	1.96667
19.4 (6/4/2018)	17.9 (12/2/2014)	(19.4 - 17.9)/(18 - 11)	0.214286
24.2 (12/7/2015)	19.2 (6/1/2015)	(24.2 - 19.2)/(13 - 12)	5
22.1 (6/6/2016)	19.2 (6/1/2015)	(22.1 - 19.2)/(14 - 12)	1.45
32.4 (12/5/2016)	19.2 (6/1/2015)	(32.4 - 19.2)/(15 - 12)	4.4
21.2 (6/20/2017)	19.2 (6/1/2015)	(21.2 - 19.2)/(16 - 12)	0.5
29.7 (12/4/2017)	19.2 (6/1/2015)	(29.7 - 19.2)/(17 - 12)	2.1
19.4 (6/4/2018)	19.2 (6/1/2015)	(19.4 - 19.2)/(18 - 12)	0.0333333
22.1 (6/6/2016)	24.2 (12/7/2015)	(22.1 - 24.2)/(14 - 13)	-2.1
32.4 (12/5/2016)	24.2 (12/7/2015)	(32.4 - 24.2)/(15 - 13)	4.1
21.2 (6/20/2017)	24.2 (12/7/2015)	(21.2 - 24.2)/(16 - 13)	-1
29.7 (12/4/2017)	24.2 (12/7/2015)	(29.7 - 24.2)/(17 - 13)	1.375
19.4 (6/4/2018)	24.2 (12/7/2015)	(19.4 - 24.2)/(18 - 13)	-0.96
32.4 (12/5/2016)	22.1 (6/6/2016)	(32.4 - 22.1)/(15 - 14)	10.3
21.2 (6/20/2017)	22.1 (6/6/2016)	(21.2 - 22.1)/(16 - 14)	-0.45
29.7 (12/4/2017)	22.1 (6/6/2016)	(29.7 - 22.1)/(17 - 14)	2.53333
19.4 (6/4/2018)	22.1 (6/6/2016)	(19.4 - 22.1)/(18 - 14)	-0.675
21.2 (6/20/2017)	32.4 (12/5/2016)	(21.2 - 32.4)/(16 - 15)	-11.2
29.7 (12/4/2017)	32.4 (12/5/2016)	(29.7 - 32.4)/(17 - 15)	-1.35
19.4 (6/4/2018)	32.4 (12/5/2016)	(19.4 - 32.4)/(18 - 15)	-4.33333
29.7 (12/4/2017)	21.2 (6/20/2017)	(29.7 - 21.2)/(17 - 16)	8.5
19.4 (6/4/2018)	21.2 (6/20/2017)	(19.4 - 21.2)/(18 - 16)	-0.9
19.4 (6/4/2018)	29.7 (12/4/2017)	(19.4 - 29.7)/(18 - 17)	-10.3

Number of Q values = 153

Ordered Q Values

n	Q
1	-11.2

Royalton Road LF

2	-10.3
3	-8.6
4	-5.4
5	-4.33333
6	-4.1
7	-3.16667
8	-2.53333
9	-2.45
10	-2.2
11	-2.15
12	-2.1
13	-2.1
14	-1.9
15	-1.88
16	-1.75
17	-1.7
18	-1.35
19	-1.3
20	-1.26667
21	-1.2
22	-1.2
23	-1.1
24	-1.075
25	-1.05
26	-1.03333
27	-1
28	-0.96
29	-0.95
30	-0.9
31	-0.8875
32	-0.8875
33	-0.866667
34	-0.82
35	-0.8
36	-0.716667
37	-0.714286
38	-0.7
39	-0.7
40	-0.7
41	-0.688889
42	-0.675
43	-0.675
44	-0.644444
45	-0.6375
46	-0.614286
47	-0.544444
48	-0.518182
49	-0.5125
50	-0.492857
51	-0.49
52	-0.45
53	-0.45
54	-0.425
55	-0.42
56	-0.4
57	-0.4
58	-0.373333
59	-0.361538
60	-0.323529
61	-0.29375
62	-0.292308
63	-0.28
64	-0.263636

65	-0.263636
66	-0.246667
67	-0.233333
68	-0.222222
69	-0.215385
70	-0.207143
71	-0.2
72	-0.2
73	-0.2
74	-0.166667
75	-0.109091
76	-0.08
77	-0.075
78	-0.0583333
79	-0.0444444
80	0
81	0.00909091
82	0.0125
83	0.0333333
84	0.05
85	0.0666667
86	0.2
87	0.2
88	0.2
89	0.214286
90	0.214286
91	0.261538
92	0.29
93	0.3
94	0.325
95	0.335714
96	0.373333
97	0.46
98	0.466667
99	0.466667
100	0.466667
101	0.48
102	0.5
103	0.5
104	0.525
105	0.535714
106	0.554545
107	0.57
108	0.5875
109	0.6
110	0.616667
111	0.616667
112	0.638462
113	0.66
114	0.675
115	0.825
116	0.83
117	0.9
118	0.91
119	0.933333
120	1.1
121	1.1
122	1.125
123	1.2375
124	1.24286
125	1.29091
126	1.3
127	1.3

128	1.375
129	1.38571
130	1.4
131	1.4
132	1.43333
133	1.45
134	1.46667
135	1.475
136	1.54
137	1.75
138	1.87778
139	1.96667
140	2.1
141	2.1
142	2.27143
143	2.48
144	2.53333
145	3.15
146	3.3
147	3.625
148	4.1
149	4.4
150	5
151	5.1
152	8.5
153	10.3

Sen's Estimator (Median Q) is -0.075

Tied Group	Value	Members
1	24.1	2

Time Period	Observations
12/2/2009	1
6/21/2010	1
12/6/2010	1
6/21/2011	1
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 12546
b = 44064
c = 612
Group Variance = 696

Royalton Road LF

For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 67.9552
M1 = (153 - 67.9552)/2.0 = 42.5224
M2 = (153 + 67.9552)/2.0 + 1 = 111.478
Lower limit is -0.675 = Q(43)
Upper limit is 0.616667 = Q(111)
-0.675 < 0 < 0.616667 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis
Parameter: Barium, total
Location: MW-2R

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
10 (6/21/2010)	15 (12/2/2009)	(10 - 15)/(2 - 1)	-5
15 (12/6/2010)	15 (12/2/2009)	(15 - 15)/(3 - 1)	0
17 (6/21/2011)	15 (12/2/2009)	(17 - 15)/(4 - 1)	0.666667
13 (12/13/2011)	15 (12/2/2009)	(13 - 15)/(5 - 1)	-0.5
12.9 (6/4/2012)	15 (12/2/2009)	(12.9 - 15)/(6 - 1)	-0.42
11 (12/11/2012)	15 (12/2/2009)	(11 - 15)/(7 - 1)	-0.666667
11 (6/3/2013)	15 (12/2/2009)	(11 - 15)/(8 - 1)	-0.571429
11 (12/3/2013)	15 (12/2/2009)	(11 - 15)/(9 - 1)	-0.5
11 (6/2/2014)	15 (12/2/2009)	(11 - 15)/(10 - 1)	-0.444444
12 (12/2/2014)	15 (12/2/2009)	(12 - 15)/(11 - 1)	-0.3
20 (6/1/2015)	15 (12/2/2009)	(20 - 15)/(12 - 1)	0.454545
14 (12/7/2015)	15 (12/2/2009)	(14 - 15)/(13 - 1)	-0.0833333
13 (6/6/2016)	15 (12/2/2009)	(13 - 15)/(14 - 1)	-0.153846
14 (12/5/2016)	15 (12/2/2009)	(14 - 15)/(15 - 1)	-0.0714286
15 (6/20/2017)	15 (12/2/2009)	(15 - 15)/(16 - 1)	0
13 (12/4/2017)	15 (12/2/2009)	(13 - 15)/(17 - 1)	-0.125
13 (6/4/2018)	15 (12/2/2009)	(13 - 15)/(18 - 1)	-0.117647
15 (12/6/2010)	10 (6/21/2010)	(15 - 10)/(3 - 2)	5
17 (6/21/2011)	10 (6/21/2010)	(17 - 10)/(4 - 2)	3.5
13 (12/13/2011)	10 (6/21/2010)	(13 - 10)/(5 - 2)	1
12.9 (6/4/2012)	10 (6/21/2010)	(12.9 - 10)/(6 - 2)	0.725
11 (12/11/2012)	10 (6/21/2010)	(11 - 10)/(7 - 2)	0.2
11 (6/3/2013)	10 (6/21/2010)	(11 - 10)/(8 - 2)	0.166667
11 (12/3/2013)	10 (6/21/2010)	(11 - 10)/(9 - 2)	0.142857
11 (6/2/2014)	10 (6/21/2010)	(11 - 10)/(10 - 2)	0.125
12 (12/2/2014)	10 (6/21/2010)	(12 - 10)/(11 - 2)	0.222222
20 (6/1/2015)	10 (6/21/2010)	(20 - 10)/(12 - 2)	1
14 (12/7/2015)	10 (6/21/2010)	(14 - 10)/(13 - 2)	0.363636
13 (6/6/2016)	10 (6/21/2010)	(13 - 10)/(14 - 2)	0.25
14 (12/5/2016)	10 (6/21/2010)	(14 - 10)/(15 - 2)	0.307692
15 (6/20/2017)	10 (6/21/2010)	(15 - 10)/(16 - 2)	0.357143
13 (12/4/2017)	10 (6/21/2010)	(13 - 10)/(17 - 2)	0.2
13 (6/4/2018)	10 (6/21/2010)	(13 - 10)/(18 - 2)	0.1875
17 (6/21/2011)	15 (12/6/2010)	(17 - 15)/(4 - 3)	2
13 (12/13/2011)	15 (12/6/2010)	(13 - 15)/(5 - 3)	-1
12.9 (6/4/2012)	15 (12/6/2010)	(12.9 - 15)/(6 - 3)	-0.7
11 (12/11/2012)	15 (12/6/2010)	(11 - 15)/(7 - 3)	-1
11 (6/3/2013)	15 (12/6/2010)	(11 - 15)/(8 - 3)	-0.8
11 (12/3/2013)	15 (12/6/2010)	(11 - 15)/(9 - 3)	-0.666667
11 (6/2/2014)	15 (12/6/2010)	(11 - 15)/(10 - 3)	-0.571429
12 (12/2/2014)	15 (12/6/2010)	(12 - 15)/(11 - 3)	-0.375
20 (6/1/2015)	15 (12/6/2010)	(20 - 15)/(12 - 3)	0.555556
14 (12/7/2015)	15 (12/6/2010)	(14 - 15)/(13 - 3)	-0.1
13 (6/6/2016)	15 (12/6/2010)	(13 - 15)/(14 - 3)	-0.181818
14 (12/5/2016)	15 (12/6/2010)	(14 - 15)/(15 - 3)	-0.0833333
15 (6/20/2017)	15 (12/6/2010)	(15 - 15)/(16 - 3)	0
13 (12/4/2017)	15 (12/6/2010)	(13 - 15)/(17 - 3)	-0.142857
13 (6/4/2018)	15 (12/6/2010)	(13 - 15)/(18 - 3)	-0.133333

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13 (12/13/2011)	17 (6/21/2011)	(13 - 17)/(5 - 4)	-4
12.9 (6/4/2012)	17 (6/21/2011)	(12.9 - 17)/(6 - 4)	-2.05
11 (12/11/2012)	17 (6/21/2011)	(11 - 17)/(7 - 4)	-2
11 (6/3/2013)	17 (6/21/2011)	(11 - 17)/(8 - 4)	-1.5
11 (12/3/2013)	17 (6/21/2011)	(11 - 17)/(9 - 4)	-1.2
11 (6/2/2014)	17 (6/21/2011)	(11 - 17)/(10 - 4)	-1
12 (12/2/2014)	17 (6/21/2011)	(12 - 17)/(11 - 4)	-0.714286
20 (6/1/2015)	17 (6/21/2011)	(20 - 17)/(12 - 4)	0.375
14 (12/7/2015)	17 (6/21/2011)	(14 - 17)/(13 - 4)	-0.333333
13 (6/6/2016)	17 (6/21/2011)	(13 - 17)/(14 - 4)	-0.4
14 (12/5/2016)	17 (6/21/2011)	(14 - 17)/(15 - 4)	-0.272727
15 (6/20/2017)	17 (6/21/2011)	(15 - 17)/(16 - 4)	-0.166667
13 (12/4/2017)	17 (6/21/2011)	(13 - 17)/(17 - 4)	-0.307692
13 (6/4/2018)	17 (6/21/2011)	(13 - 17)/(18 - 4)	-0.285714

12.9 (6/4/2012)	13 (12/13/2011)	(12.9 - 13)/(6 - 5)	-0.1
11 (12/11/2012)	13 (12/13/2011)	(11 - 13)/(7 - 5)	-1
11 (6/3/2013)	13 (12/13/2011)	(11 - 13)/(8 - 5)	-0.666667
11 (12/3/2013)	13 (12/13/2011)	(11 - 13)/(9 - 5)	-0.5
11 (6/2/2014)	13 (12/13/2011)	(11 - 13)/(10 - 5)	-0.4
12 (12/2/2014)	13 (12/13/2011)	(12 - 13)/(11 - 5)	-0.166667
20 (6/1/2015)	13 (12/13/2011)	(20 - 13)/(12 - 5)	1
14 (12/7/2015)	13 (12/13/2011)	(14 - 13)/(13 - 5)	0.125
13 (6/6/2016)	13 (12/13/2011)	(13 - 13)/(14 - 5)	0
14 (12/5/2016)	13 (12/13/2011)	(14 - 13)/(15 - 5)	0.1
15 (6/20/2017)	13 (12/13/2011)	(15 - 13)/(16 - 5)	0.181818
13 (12/4/2017)	13 (12/13/2011)	(13 - 13)/(17 - 5)	0
13 (6/4/2018)	13 (12/13/2011)	(13 - 13)/(18 - 5)	0

11 (12/11/2012)	12.9 (6/4/2012)	(11 - 12.9)/(7 - 6)	-1.9
11 (6/3/2013)	12.9 (6/4/2012)	(11 - 12.9)/(8 - 6)	-0.95
11 (12/3/2013)	12.9 (6/4/2012)	(11 - 12.9)/(9 - 6)	-0.633333
11 (6/2/2014)	12.9 (6/4/2012)	(11 - 12.9)/(10 - 6)	-0.475
12 (12/2/2014)	12.9 (6/4/2012)	(12 - 12.9)/(11 - 6)	-0.18
20 (6/1/2015)	12.9 (6/4/2012)	(20 - 12.9)/(12 - 6)	1.18333
14 (12/7/2015)	12.9 (6/4/2012)	(14 - 12.9)/(13 - 6)	0.157143
13 (6/6/2016)	12.9 (6/4/2012)	(13 - 12.9)/(14 - 6)	0.0125
14 (12/5/2016)	12.9 (6/4/2012)	(14 - 12.9)/(15 - 6)	0.122222
15 (6/20/2017)	12.9 (6/4/2012)	(15 - 12.9)/(16 - 6)	0.21
13 (12/4/2017)	12.9 (6/4/2012)	(13 - 12.9)/(17 - 6)	0.00909091
13 (6/4/2018)	12.9 (6/4/2012)	(13 - 12.9)/(18 - 6)	0.00833333

11 (6/3/2013)	11 (12/11/2012)	(11 - 11)/(8 - 7)	0
11 (12/3/2013)	11 (12/11/2012)	(11 - 11)/(9 - 7)	0
11 (6/2/2014)	11 (12/11/2012)	(11 - 11)/(10 - 7)	0
12 (12/2/2014)	11 (12/11/2012)	(12 - 11)/(11 - 7)	0.25
20 (6/1/2015)	11 (12/11/2012)	(20 - 11)/(12 - 7)	1.8
14 (12/7/2015)	11 (12/11/2012)	(14 - 11)/(13 - 7)	0.5
13 (6/6/2016)	11 (12/11/2012)	(13 - 11)/(14 - 7)	0.285714
14 (12/5/2016)	11 (12/11/2012)	(14 - 11)/(15 - 7)	0.375
15 (6/20/2017)	11 (12/11/2012)	(15 - 11)/(16 - 7)	0.444444
13 (12/4/2017)	11 (12/11/2012)	(13 - 11)/(17 - 7)	0.2
13 (6/4/2018)	11 (12/11/2012)	(13 - 11)/(18 - 7)	0.181818

11 (12/3/2013)	11 (6/3/2013)	(11 - 11)/(9 - 8)	0
11 (6/2/2014)	11 (6/3/2013)	(11 - 11)/(10 - 8)	0
12 (12/2/2014)	11 (6/3/2013)	(12 - 11)/(11 - 8)	0.333333
20 (6/1/2015)	11 (6/3/2013)	(20 - 11)/(12 - 8)	2.25
14 (12/7/2015)	11 (6/3/2013)	(14 - 11)/(13 - 8)	0.6
13 (6/6/2016)	11 (6/3/2013)	(13 - 11)/(14 - 8)	0.333333
14 (12/5/2016)	11 (6/3/2013)	(14 - 11)/(15 - 8)	0.428571
15 (6/20/2017)	11 (6/3/2013)	(15 - 11)/(16 - 8)	0.5
13 (12/4/2017)	11 (6/3/2013)	(13 - 11)/(17 - 8)	0.222222

13 (6/4/2018)	11 (6/3/2013)	(13 - 11)/(18 - 8)	0.2
11 (6/2/2014)	11 (12/3/2013)	(11 - 11)/(10 - 9)	0
12 (12/2/2014)	11 (12/3/2013)	(12 - 11)/(11 - 9)	0.5
20 (6/1/2015)	11 (12/3/2013)	(20 - 11)/(12 - 9)	3
14 (12/7/2015)	11 (12/3/2013)	(14 - 11)/(13 - 9)	0.75
13 (6/6/2016)	11 (12/3/2013)	(13 - 11)/(14 - 9)	0.4
14 (12/5/2016)	11 (12/3/2013)	(14 - 11)/(15 - 9)	0.5
15 (6/20/2017)	11 (12/3/2013)	(15 - 11)/(16 - 9)	0.571429
13 (12/4/2017)	11 (12/3/2013)	(13 - 11)/(17 - 9)	0.25
13 (6/4/2018)	11 (12/3/2013)	(13 - 11)/(18 - 9)	0.222222
12 (12/2/2014)	11 (6/2/2014)	(12 - 11)/(11 - 10)	1
20 (6/1/2015)	11 (6/2/2014)	(20 - 11)/(12 - 10)	4.5
14 (12/7/2015)	11 (6/2/2014)	(14 - 11)/(13 - 10)	1
13 (6/6/2016)	11 (6/2/2014)	(13 - 11)/(14 - 10)	0.5
14 (12/5/2016)	11 (6/2/2014)	(14 - 11)/(15 - 10)	0.6
15 (6/20/2017)	11 (6/2/2014)	(15 - 11)/(16 - 10)	0.666667
13 (12/4/2017)	11 (6/2/2014)	(13 - 11)/(17 - 10)	0.285714
13 (6/4/2018)	11 (6/2/2014)	(13 - 11)/(18 - 10)	0.25
20 (6/1/2015)	12 (12/2/2014)	(20 - 12)/(12 - 11)	8
14 (12/7/2015)	12 (12/2/2014)	(14 - 12)/(13 - 11)	1
13 (6/6/2016)	12 (12/2/2014)	(13 - 12)/(14 - 11)	0.333333
14 (12/5/2016)	12 (12/2/2014)	(14 - 12)/(15 - 11)	0.5
15 (6/20/2017)	12 (12/2/2014)	(15 - 12)/(16 - 11)	0.6
13 (12/4/2017)	12 (12/2/2014)	(13 - 12)/(17 - 11)	0.166667
13 (6/4/2018)	12 (12/2/2014)	(13 - 12)/(18 - 11)	0.142857
14 (12/7/2015)	20 (6/1/2015)	(14 - 20)/(13 - 12)	-6
13 (6/6/2016)	20 (6/1/2015)	(13 - 20)/(14 - 12)	-3.5
14 (12/5/2016)	20 (6/1/2015)	(14 - 20)/(15 - 12)	-2
15 (6/20/2017)	20 (6/1/2015)	(15 - 20)/(16 - 12)	-1.25
13 (12/4/2017)	20 (6/1/2015)	(13 - 20)/(17 - 12)	-1.4
13 (6/4/2018)	20 (6/1/2015)	(13 - 20)/(18 - 12)	-1.16667
13 (6/6/2016)	14 (12/7/2015)	(13 - 14)/(14 - 13)	-1
14 (12/5/2016)	14 (12/7/2015)	(14 - 14)/(15 - 13)	0
15 (6/20/2017)	14 (12/7/2015)	(15 - 14)/(16 - 13)	0.333333
13 (12/4/2017)	14 (12/7/2015)	(13 - 14)/(17 - 13)	-0.25
13 (6/4/2018)	14 (12/7/2015)	(13 - 14)/(18 - 13)	-0.2
14 (12/5/2016)	13 (6/6/2016)	(14 - 13)/(15 - 14)	1
15 (6/20/2017)	13 (6/6/2016)	(15 - 13)/(16 - 14)	1
13 (12/4/2017)	13 (6/6/2016)	(13 - 13)/(17 - 14)	0
13 (6/4/2018)	13 (6/6/2016)	(13 - 13)/(18 - 14)	0
15 (6/20/2017)	14 (12/5/2016)	(15 - 14)/(16 - 15)	1
13 (12/4/2017)	14 (12/5/2016)	(13 - 14)/(17 - 15)	-0.5
13 (6/4/2018)	14 (12/5/2016)	(13 - 14)/(18 - 15)	-0.333333
13 (12/4/2017)	15 (6/20/2017)	(13 - 15)/(17 - 16)	-2
13 (6/4/2018)	15 (6/20/2017)	(13 - 15)/(18 - 16)	-1
13 (6/4/2018)	13 (12/4/2017)	(13 - 13)/(18 - 17)	0

Number of Q values = 153

Ordered Q Values

n	Q
1	-6

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2	-5
3	-4
4	-3.5
5	-2.05
6	-2
7	-2
8	-2
9	-1.9
10	-1.5
11	-1.4
12	-1.25
13	-1.2
14	-1.16667
15	-1
16	-1
17	-1
18	-1
19	-1
20	-1
21	-0.95
22	-0.8
23	-0.714286
24	-0.7
25	-0.666667
26	-0.666667
27	-0.666667
28	-0.633333
29	-0.571429
30	-0.571429
31	-0.5
32	-0.5
33	-0.5
34	-0.5
35	-0.475
36	-0.444444
37	-0.42
38	-0.4
39	-0.4
40	-0.375
41	-0.333333
42	-0.333333
43	-0.307692
44	-0.3
45	-0.285714
46	-0.272727
47	-0.25
48	-0.2
49	-0.181818
50	-0.18
51	-0.166667
52	-0.166667
53	-0.153846
54	-0.142857
55	-0.133333
56	-0.125
57	-0.117647
58	-0.1
59	-0.1
60	-0.0833333
61	-0.0833333
62	-0.0714286
63	0
64	0

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65	0
66	0
67	0
68	0
69	0
70	0
71	0
72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0.00833333
80	0.00909091
81	0.0125
82	0.1
83	0.122222
84	0.125
85	0.125
86	0.142857
87	0.142857
88	0.157143
89	0.166667
90	0.166667
91	0.181818
92	0.181818
93	0.1875
94	0.2
95	0.2
96	0.2
97	0.2
98	0.21
99	0.222222
100	0.222222
101	0.222222
102	0.25
103	0.25
104	0.25
105	0.25
106	0.285714
107	0.285714
108	0.307692
109	0.333333
110	0.333333
111	0.333333
112	0.333333
113	0.357143
114	0.363636
115	0.375
116	0.375
117	0.4
118	0.428571
119	0.444444
120	0.454545
121	0.5
122	0.5
123	0.5
124	0.5
125	0.5
126	0.5
127	0.555556

128	0.571429
129	0.6
130	0.6
131	0.6
132	0.666667
133	0.666667
134	0.725
135	0.75
136	1
137	1
138	1
139	1
140	1
141	1
142	1
143	1
144	1
145	1.18333
146	1.8
147	2
148	2.25
149	3
150	3.5
151	4.5
152	5
153	8

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	15	3
2	13	4
3	11	4
4	14	2

Time Period	Observations
12/2/2009	1
6/21/2010	1
12/6/2010	1
6/21/2011	1
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 396
B = 0
C = 54
D = 0
E = 32
F = 0
a = 12546

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b = 44064
c = 612
Group Variance = 675
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 66.9221
M1 = (153 - 66.9221)/2.0 = 43.0389
M2 = (153 + 66.9221)/2.0 + 1 = 110.961
Lower limit is -0.307692 = Q(43)
Upper limit is 0.333333 = Q(111)
-0.307692 < 0 < 0.333333 indicating no trend in data.

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Sen's Slope Analysis
Parameter: Barium, total
Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
47 (6/21/2010)	43 (12/2/2009)	(47 - 43)/(2 - 1)	4
34 (12/6/2010)	43 (12/2/2009)	(34 - 43)/(3 - 1)	-4.5
37 (6/21/2011)	43 (12/2/2009)	(37 - 43)/(4 - 1)	-2
31 (12/13/2011)	43 (12/2/2009)	(31 - 43)/(5 - 1)	-3
37.9 (6/4/2012)	43 (12/2/2009)	(37.9 - 43)/(6 - 1)	-1.02
43 (12/11/2012)	43 (12/2/2009)	(43 - 43)/(7 - 1)	0
36 (6/3/2013)	43 (12/2/2009)	(36 - 43)/(8 - 1)	-1
30 (12/3/2013)	43 (12/2/2009)	(30 - 43)/(9 - 1)	-1.625
35 (6/2/2014)	43 (12/2/2009)	(35 - 43)/(10 - 1)	-0.888889
48 (12/2/2014)	43 (12/2/2009)	(48 - 43)/(11 - 1)	0.5
47 (6/1/2015)	43 (12/2/2009)	(47 - 43)/(12 - 1)	0.363636
61 (12/7/2015)	43 (12/2/2009)	(61 - 43)/(13 - 1)	1.5
49 (6/6/2016)	43 (12/2/2009)	(49 - 43)/(14 - 1)	0.461538
45 (12/5/2016)	43 (12/2/2009)	(45 - 43)/(15 - 1)	0.142857
36 (6/20/2017)	43 (12/2/2009)	(36 - 43)/(16 - 1)	-0.466667
49 (12/4/2017)	43 (12/2/2009)	(49 - 43)/(17 - 1)	0.375
44 (6/4/2018)	43 (12/2/2009)	(44 - 43)/(18 - 1)	0.0588235
34 (12/6/2010)	47 (6/21/2010)	(34 - 47)/(3 - 2)	-13
37 (6/21/2011)	47 (6/21/2010)	(37 - 47)/(4 - 2)	-5
31 (12/13/2011)	47 (6/21/2010)	(31 - 47)/(5 - 2)	-5.33333
37.9 (6/4/2012)	47 (6/21/2010)	(37.9 - 47)/(6 - 2)	-2.275
43 (12/11/2012)	47 (6/21/2010)	(43 - 47)/(7 - 2)	-0.8
36 (6/3/2013)	47 (6/21/2010)	(36 - 47)/(8 - 2)	-1.83333
30 (12/3/2013)	47 (6/21/2010)	(30 - 47)/(9 - 2)	-2.42857
35 (6/2/2014)	47 (6/21/2010)	(35 - 47)/(10 - 2)	-1.5
48 (12/2/2014)	47 (6/21/2010)	(48 - 47)/(11 - 2)	0.111111
47 (6/1/2015)	47 (6/21/2010)	(47 - 47)/(12 - 2)	0
61 (12/7/2015)	47 (6/21/2010)	(61 - 47)/(13 - 2)	1.27273
49 (6/6/2016)	47 (6/21/2010)	(49 - 47)/(14 - 2)	0.166667
45 (12/5/2016)	47 (6/21/2010)	(45 - 47)/(15 - 2)	-0.153846
36 (6/20/2017)	47 (6/21/2010)	(36 - 47)/(16 - 2)	-0.785714
49 (12/4/2017)	47 (6/21/2010)	(49 - 47)/(17 - 2)	0.133333
44 (6/4/2018)	47 (6/21/2010)	(44 - 47)/(18 - 2)	-0.1875
37 (6/21/2011)	34 (12/6/2010)	(37 - 34)/(4 - 3)	3
31 (12/13/2011)	34 (12/6/2010)	(31 - 34)/(5 - 3)	-1.5
37.9 (6/4/2012)	34 (12/6/2010)	(37.9 - 34)/(6 - 3)	1.3
43 (12/11/2012)	34 (12/6/2010)	(43 - 34)/(7 - 3)	2.25
36 (6/3/2013)	34 (12/6/2010)	(36 - 34)/(8 - 3)	0.4
30 (12/3/2013)	34 (12/6/2010)	(30 - 34)/(9 - 3)	-0.666667
35 (6/2/2014)	34 (12/6/2010)	(35 - 34)/(10 - 3)	0.142857
48 (12/2/2014)	34 (12/6/2010)	(48 - 34)/(11 - 3)	1.75
47 (6/1/2015)	34 (12/6/2010)	(47 - 34)/(12 - 3)	1.44444
61 (12/7/2015)	34 (12/6/2010)	(61 - 34)/(13 - 3)	2.7
49 (6/6/2016)	34 (12/6/2010)	(49 - 34)/(14 - 3)	1.36364
45 (12/5/2016)	34 (12/6/2010)	(45 - 34)/(15 - 3)	0.916667
36 (6/20/2017)	34 (12/6/2010)	(36 - 34)/(16 - 3)	0.153846
49 (12/4/2017)	34 (12/6/2010)	(49 - 34)/(17 - 3)	1.07143
44 (6/4/2018)	34 (12/6/2010)	(44 - 34)/(18 - 3)	0.666667

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31 (12/13/2011)	37 (6/21/2011)	(31 - 37)/(5 - 4)	-6
37.9 (6/4/2012)	37 (6/21/2011)	(37.9 - 37)/(6 - 4)	0.45
43 (12/11/2012)	37 (6/21/2011)	(43 - 37)/(7 - 4)	2
36 (6/3/2013)	37 (6/21/2011)	(36 - 37)/(8 - 4)	-0.25
30 (12/3/2013)	37 (6/21/2011)	(30 - 37)/(9 - 4)	-1.4
35 (6/2/2014)	37 (6/21/2011)	(35 - 37)/(10 - 4)	-0.333333
48 (12/2/2014)	37 (6/21/2011)	(48 - 37)/(11 - 4)	1.57143
47 (6/1/2015)	37 (6/21/2011)	(47 - 37)/(12 - 4)	1.25
61 (12/7/2015)	37 (6/21/2011)	(61 - 37)/(13 - 4)	2.66667
49 (6/6/2016)	37 (6/21/2011)	(49 - 37)/(14 - 4)	1.2
45 (12/5/2016)	37 (6/21/2011)	(45 - 37)/(15 - 4)	0.727273
36 (6/20/2017)	37 (6/21/2011)	(36 - 37)/(16 - 4)	-0.0833333
49 (12/4/2017)	37 (6/21/2011)	(49 - 37)/(17 - 4)	0.923077
44 (6/4/2018)	37 (6/21/2011)	(44 - 37)/(18 - 4)	0.5
37.9 (6/4/2012)	31 (12/13/2011)	(37.9 - 31)/(6 - 5)	6.9
43 (12/11/2012)	31 (12/13/2011)	(43 - 31)/(7 - 5)	6
36 (6/3/2013)	31 (12/13/2011)	(36 - 31)/(8 - 5)	1.66667
30 (12/3/2013)	31 (12/13/2011)	(30 - 31)/(9 - 5)	-0.25
35 (6/2/2014)	31 (12/13/2011)	(35 - 31)/(10 - 5)	0.8
48 (12/2/2014)	31 (12/13/2011)	(48 - 31)/(11 - 5)	2.83333
47 (6/1/2015)	31 (12/13/2011)	(47 - 31)/(12 - 5)	2.28571
61 (12/7/2015)	31 (12/13/2011)	(61 - 31)/(13 - 5)	3.75
49 (6/6/2016)	31 (12/13/2011)	(49 - 31)/(14 - 5)	2
45 (12/5/2016)	31 (12/13/2011)	(45 - 31)/(15 - 5)	1.4
36 (6/20/2017)	31 (12/13/2011)	(36 - 31)/(16 - 5)	0.454545
49 (12/4/2017)	31 (12/13/2011)	(49 - 31)/(17 - 5)	1.5
44 (6/4/2018)	31 (12/13/2011)	(44 - 31)/(18 - 5)	1
43 (12/11/2012)	37.9 (6/4/2012)	(43 - 37.9)/(7 - 6)	5.1
36 (6/3/2013)	37.9 (6/4/2012)	(36 - 37.9)/(8 - 6)	-0.95
30 (12/3/2013)	37.9 (6/4/2012)	(30 - 37.9)/(9 - 6)	-2.63333
35 (6/2/2014)	37.9 (6/4/2012)	(35 - 37.9)/(10 - 6)	-0.725
48 (12/2/2014)	37.9 (6/4/2012)	(48 - 37.9)/(11 - 6)	2.02
47 (6/1/2015)	37.9 (6/4/2012)	(47 - 37.9)/(12 - 6)	1.51667
61 (12/7/2015)	37.9 (6/4/2012)	(61 - 37.9)/(13 - 6)	3.3
49 (6/6/2016)	37.9 (6/4/2012)	(49 - 37.9)/(14 - 6)	1.3875
45 (12/5/2016)	37.9 (6/4/2012)	(45 - 37.9)/(15 - 6)	0.788889
36 (6/20/2017)	37.9 (6/4/2012)	(36 - 37.9)/(16 - 6)	-0.19
49 (12/4/2017)	37.9 (6/4/2012)	(49 - 37.9)/(17 - 6)	1.00909
44 (6/4/2018)	37.9 (6/4/2012)	(44 - 37.9)/(18 - 6)	0.508333
36 (6/3/2013)	43 (12/11/2012)	(36 - 43)/(8 - 7)	-7
30 (12/3/2013)	43 (12/11/2012)	(30 - 43)/(9 - 7)	-6.5
35 (6/2/2014)	43 (12/11/2012)	(35 - 43)/(10 - 7)	-2.66667
48 (12/2/2014)	43 (12/11/2012)	(48 - 43)/(11 - 7)	1.25
47 (6/1/2015)	43 (12/11/2012)	(47 - 43)/(12 - 7)	0.8
61 (12/7/2015)	43 (12/11/2012)	(61 - 43)/(13 - 7)	3
49 (6/6/2016)	43 (12/11/2012)	(49 - 43)/(14 - 7)	0.857143
45 (12/5/2016)	43 (12/11/2012)	(45 - 43)/(15 - 7)	0.25
36 (6/20/2017)	43 (12/11/2012)	(36 - 43)/(16 - 7)	-0.777778
49 (12/4/2017)	43 (12/11/2012)	(49 - 43)/(17 - 7)	0.6
44 (6/4/2018)	43 (12/11/2012)	(44 - 43)/(18 - 7)	0.0909091
30 (12/3/2013)	36 (6/3/2013)	(30 - 36)/(9 - 8)	-6
35 (6/2/2014)	36 (6/3/2013)	(35 - 36)/(10 - 8)	-0.5
48 (12/2/2014)	36 (6/3/2013)	(48 - 36)/(11 - 8)	4
47 (6/1/2015)	36 (6/3/2013)	(47 - 36)/(12 - 8)	2.75
61 (12/7/2015)	36 (6/3/2013)	(61 - 36)/(13 - 8)	5
49 (6/6/2016)	36 (6/3/2013)	(49 - 36)/(14 - 8)	2.16667
45 (12/5/2016)	36 (6/3/2013)	(45 - 36)/(15 - 8)	1.28571
36 (6/20/2017)	36 (6/3/2013)	(36 - 36)/(16 - 8)	0
49 (12/4/2017)	36 (6/3/2013)	(49 - 36)/(17 - 8)	1.44444

44 (6/4/2018)	36 (6/3/2013)	(44 - 36)/(18 - 8)	0.8
35 (6/2/2014)	30 (12/3/2013)	(35 - 30)/(10 - 9)	5
48 (12/2/2014)	30 (12/3/2013)	(48 - 30)/(11 - 9)	9
47 (6/1/2015)	30 (12/3/2013)	(47 - 30)/(12 - 9)	5.66667
61 (12/7/2015)	30 (12/3/2013)	(61 - 30)/(13 - 9)	7.75
49 (6/6/2016)	30 (12/3/2013)	(49 - 30)/(14 - 9)	3.8
45 (12/5/2016)	30 (12/3/2013)	(45 - 30)/(15 - 9)	2.5
36 (6/20/2017)	30 (12/3/2013)	(36 - 30)/(16 - 9)	0.857143
49 (12/4/2017)	30 (12/3/2013)	(49 - 30)/(17 - 9)	2.375
44 (6/4/2018)	30 (12/3/2013)	(44 - 30)/(18 - 9)	1.55556
48 (12/2/2014)	35 (6/2/2014)	(48 - 35)/(11 - 10)	13
47 (6/1/2015)	35 (6/2/2014)	(47 - 35)/(12 - 10)	6
61 (12/7/2015)	35 (6/2/2014)	(61 - 35)/(13 - 10)	8.66667
49 (6/6/2016)	35 (6/2/2014)	(49 - 35)/(14 - 10)	3.5
45 (12/5/2016)	35 (6/2/2014)	(45 - 35)/(15 - 10)	2
36 (6/20/2017)	35 (6/2/2014)	(36 - 35)/(16 - 10)	0.166667
49 (12/4/2017)	35 (6/2/2014)	(49 - 35)/(17 - 10)	2
44 (6/4/2018)	35 (6/2/2014)	(44 - 35)/(18 - 10)	1.125
47 (6/1/2015)	48 (12/2/2014)	(47 - 48)/(12 - 11)	-1
61 (12/7/2015)	48 (12/2/2014)	(61 - 48)/(13 - 11)	6.5
49 (6/6/2016)	48 (12/2/2014)	(49 - 48)/(14 - 11)	0.333333
45 (12/5/2016)	48 (12/2/2014)	(45 - 48)/(15 - 11)	-0.75
36 (6/20/2017)	48 (12/2/2014)	(36 - 48)/(16 - 11)	-2.4
49 (12/4/2017)	48 (12/2/2014)	(49 - 48)/(17 - 11)	0.166667
44 (6/4/2018)	48 (12/2/2014)	(44 - 48)/(18 - 11)	-0.571429
61 (12/7/2015)	47 (6/1/2015)	(61 - 47)/(13 - 12)	14
49 (6/6/2016)	47 (6/1/2015)	(49 - 47)/(14 - 12)	1
45 (12/5/2016)	47 (6/1/2015)	(45 - 47)/(15 - 12)	-0.666667
36 (6/20/2017)	47 (6/1/2015)	(36 - 47)/(16 - 12)	-2.75
49 (12/4/2017)	47 (6/1/2015)	(49 - 47)/(17 - 12)	0.4
44 (6/4/2018)	47 (6/1/2015)	(44 - 47)/(18 - 12)	-0.5
49 (6/6/2016)	61 (12/7/2015)	(49 - 61)/(14 - 13)	-12
45 (12/5/2016)	61 (12/7/2015)	(45 - 61)/(15 - 13)	-8
36 (6/20/2017)	61 (12/7/2015)	(36 - 61)/(16 - 13)	-8.33333
49 (12/4/2017)	61 (12/7/2015)	(49 - 61)/(17 - 13)	-3
44 (6/4/2018)	61 (12/7/2015)	(44 - 61)/(18 - 13)	-3.4
45 (12/5/2016)	49 (6/6/2016)	(45 - 49)/(15 - 14)	-4
36 (6/20/2017)	49 (6/6/2016)	(36 - 49)/(16 - 14)	-6.5
49 (12/4/2017)	49 (6/6/2016)	(49 - 49)/(17 - 14)	0
44 (6/4/2018)	49 (6/6/2016)	(44 - 49)/(18 - 14)	-1.25
36 (6/20/2017)	45 (12/5/2016)	(36 - 45)/(16 - 15)	-9
49 (12/4/2017)	45 (12/5/2016)	(49 - 45)/(17 - 15)	2
44 (6/4/2018)	45 (12/5/2016)	(44 - 45)/(18 - 15)	-0.333333
49 (12/4/2017)	36 (6/20/2017)	(49 - 36)/(17 - 16)	13
44 (6/4/2018)	36 (6/20/2017)	(44 - 36)/(18 - 16)	4
44 (6/4/2018)	49 (12/4/2017)	(44 - 49)/(18 - 17)	-5

Number of Q values = 153

Ordered Q Values

n	Q
1	-13

Royalton Road LF

2	-12
3	-9
4	-8.33333
5	-8
6	-7
7	-6.5
8	-6.5
9	-6
10	-6
11	-5.33333
12	-5
13	-5
14	-4.5
15	-4
16	-3.4
17	-3
18	-3
19	-2.75
20	-2.66667
21	-2.63333
22	-2.42857
23	-2.4
24	-2.275
25	-2
26	-1.83333
27	-1.625
28	-1.5
29	-1.5
30	-1.4
31	-1.25
32	-1.02
33	-1
34	-1
35	-0.95
36	-0.888889
37	-0.8
38	-0.785714
39	-0.777778
40	-0.75
41	-0.725
42	-0.666667
43	-0.666667
44	-0.571429
45	-0.5
46	-0.5
47	-0.466667
48	-0.333333
49	-0.333333
50	-0.25
51	-0.25
52	-0.19
53	-0.1875
54	-0.153846
55	-0.0833333
56	0
57	0
58	0
59	0
60	0.0588235
61	0.0909091
62	0.111111
63	0.133333
64	0.142857

65	0.142857
66	0.153846
67	0.166667
68	0.166667
69	0.166667
70	0.25
71	0.333333
72	0.363636
73	0.375
74	0.4
75	0.4
76	0.45
77	0.454545
78	0.461538
79	0.5
80	0.5
81	0.508333
82	0.6
83	0.666667
84	0.727273
85	0.788889
86	0.8
87	0.8
88	0.8
89	0.857143
90	0.857143
91	0.916667
92	0.923077
93	1
94	1
95	1.00909
96	1.07143
97	1.125
98	1.2
99	1.25
100	1.25
101	1.27273
102	1.28571
103	1.3
104	1.36364
105	1.3875
106	1.4
107	1.44444
108	1.44444
109	1.5
110	1.5
111	1.51667
112	1.55556
113	1.57143
114	1.66667
115	1.75
116	2
117	2
118	2
119	2
120	2
121	2.02
122	2.16667
123	2.25
124	2.28571
125	2.375
126	2.5
127	2.66667

128	2.7
129	2.75
130	2.83333
131	3
132	3
133	3.3
134	3.5
135	3.75
136	3.8
137	4
138	4
139	4
140	5
141	5
142	5.1
143	5.66667
144	6
145	6
146	6.5
147	6.9
148	7.75
149	8.66667
150	9
151	13
152	13
153	14

Sen's Estimator (Median Q) is 0.454545

Tied Group	Value	Members
1	43	2
2	47	2
3	36	2
4	49	2

Time Period	Observations
12/2/2009	1
6/21/2010	1
12/6/2010	1
6/21/2011	1
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 72
B = 0
C = 0
D = 0
E = 8
F = 0
a = 12546

Royalton Road LF

b = 44064
c = 612
Group Variance = 693
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 67.8086
M1 = (153 - 67.8086)/2.0 = 42.5957
M2 = (153 + 67.8086)/2.0 + 1 = 111.404
Lower limit is -0.666667 = Q(43)
Upper limit is 1.51667 = Q(111)
-0.666667 < 0 < 1.51667 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis

Parameter: Barium, total

Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<10 0.007J (6/21/2010)	ND<10 0.008J (12/2/2009)	(10 - 10)/(2 - 1)	0
ND<10 0.007J (12/6/2010)	ND<10 0.008J (12/2/2009)	(10 - 10)/(3 - 1)	0
ND<10 0.01J (6/21/2011)	ND<10 0.008J (12/2/2009)	(10 - 10)/(4 - 1)	0
ND<10 0.007J (12/13/2011)	ND<10 0.008J (12/2/2009)	(10 - 10)/(5 - 1)	0
ND<10 0.0097J (6/4/2012)	ND<10 0.008J (12/2/2009)	(10 - 10)/(6 - 1)	0
ND<10 0.008J (12/11/2012)	ND<10 0.008J (12/2/2009)	(10 - 10)/(7 - 1)	0
ND<10 0.008J (6/3/2013)	ND<10 0.008J (12/2/2009)	(10 - 10)/(8 - 1)	0
ND<10 0.008J (12/3/2013)	ND<10 0.008J (12/2/2009)	(10 - 10)/(9 - 1)	0
ND<10 0.008J (6/2/2014)	ND<10 0.008J (12/2/2009)	(10 - 10)/(10 - 1)	0
ND<10 0.008J (12/2/2014)	ND<10 0.008J (12/2/2009)	(10 - 10)/(11 - 1)	0
ND<10 0.007J (6/1/2015)	ND<10 0.008J (12/2/2009)	(10 - 10)/(12 - 1)	0
ND<10 0.007J (12/7/2015)	ND<10 0.008J (12/2/2009)	(10 - 10)/(13 - 1)	0
10 (6/6/2016)	ND<10 0.008J (12/2/2009)	(10 - 10)/(14 - 1)	0
ND<10 0.008J (12/5/2016)	ND<10 0.008J (12/2/2009)	(10 - 10)/(15 - 1)	0
ND<10 0.007J (6/20/2017)	ND<10 0.008J (12/2/2009)	(10 - 10)/(16 - 1)	0
ND<10 0.008J (12/4/2017)	ND<10 0.008J (12/2/2009)	(10 - 10)/(17 - 1)	0
ND<10 0.008J (6/4/2018)	ND<10 0.008J (12/2/2009)	(10 - 10)/(18 - 1)	0
ND<10 0.007J (12/6/2010)	ND<10 0.007J (6/21/2010)	(10 - 10)/(3 - 2)	0
ND<10 0.01J (6/21/2011)	ND<10 0.007J (6/21/2010)	(10 - 10)/(4 - 2)	0
ND<10 0.007J (12/13/2011)	ND<10 0.007J (6/21/2010)	(10 - 10)/(5 - 2)	0
ND<10 0.0097J (6/4/2012)	ND<10 0.007J (6/21/2010)	(10 - 10)/(6 - 2)	0
ND<10 0.008J (12/11/2012)	ND<10 0.007J (6/21/2010)	(10 - 10)/(7 - 2)	0
ND<10 0.008J (6/3/2013)	ND<10 0.007J (6/21/2010)	(10 - 10)/(8 - 2)	0
ND<10 0.008J (12/3/2013)	ND<10 0.007J (6/21/2010)	(10 - 10)/(9 - 2)	0
ND<10 0.008J (6/2/2014)	ND<10 0.007J (6/21/2010)	(10 - 10)/(10 - 2)	0
ND<10 0.008J (12/2/2014)	ND<10 0.007J (6/21/2010)	(10 - 10)/(11 - 2)	0
ND<10 0.007J (6/1/2015)	ND<10 0.007J (6/21/2010)	(10 - 10)/(12 - 2)	0
ND<10 0.007J (12/7/2015)	ND<10 0.007J (6/21/2010)	(10 - 10)/(13 - 2)	0
10 (6/6/2016)	ND<10 0.007J (6/21/2010)	(10 - 10)/(14 - 2)	0
ND<10 0.008J (12/5/2016)	ND<10 0.007J (6/21/2010)	(10 - 10)/(15 - 2)	0
ND<10 0.007J (6/20/2017)	ND<10 0.007J (6/21/2010)	(10 - 10)/(16 - 2)	0
ND<10 0.008J (12/4/2017)	ND<10 0.007J (6/21/2010)	(10 - 10)/(17 - 2)	0
ND<10 0.008J (6/4/2018)	ND<10 0.007J (6/21/2010)	(10 - 10)/(18 - 2)	0
ND<10 0.01J (6/21/2011)	ND<10 0.007J (12/6/2010)	(10 - 10)/(4 - 3)	0
ND<10 0.007J (12/13/2011)	ND<10 0.007J (12/6/2010)	(10 - 10)/(5 - 3)	0
ND<10 0.0097J (6/4/2012)	ND<10 0.007J (12/6/2010)	(10 - 10)/(6 - 3)	0
ND<10 0.008J (12/11/2012)	ND<10 0.007J (12/6/2010)	(10 - 10)/(7 - 3)	0
ND<10 0.008J (6/3/2013)	ND<10 0.007J (12/6/2010)	(10 - 10)/(8 - 3)	0
ND<10 0.008J (12/3/2013)	ND<10 0.007J (12/6/2010)	(10 - 10)/(9 - 3)	0
ND<10 0.008J (6/2/2014)	ND<10 0.007J (12/6/2010)	(10 - 10)/(10 - 3)	0
ND<10 0.008J (12/2/2014)	ND<10 0.007J (12/6/2010)	(10 - 10)/(11 - 3)	0
ND<10 0.007J (6/1/2015)	ND<10 0.007J (12/6/2010)	(10 - 10)/(12 - 3)	0
ND<10 0.007J (12/7/2015)	ND<10 0.007J (12/6/2010)	(10 - 10)/(13 - 3)	0
10 (6/6/2016)	ND<10 0.007J (12/6/2010)	(10 - 10)/(14 - 3)	0
ND<10 0.008J (12/5/2016)	ND<10 0.007J (12/6/2010)	(10 - 10)/(15 - 3)	0
ND<10 0.007J (6/20/2017)	ND<10 0.007J (12/6/2010)	(10 - 10)/(16 - 3)	0
ND<10 0.008J (12/4/2017)	ND<10 0.007J (12/6/2010)	(10 - 10)/(17 - 3)	0
ND<10 0.008J (6/4/2018)	ND<10 0.007J (12/6/2010)	(10 - 10)/(18 - 3)	0

ND<10 0.007J (12/13/2011)	ND<10 0.01J (6/21/2011)	(10 - 10)/(5 - 4)	0
ND<10 0.0097J (6/4/2012)	ND<10 0.01J (6/21/2011)	(10 - 10)/(6 - 4)	0
ND<10 0.008J (12/11/2012)	ND<10 0.01J (6/21/2011)	(10 - 10)/(7 - 4)	0
ND<10 0.008J (6/3/2013)	ND<10 0.01J (6/21/2011)	(10 - 10)/(8 - 4)	0
ND<10 0.008J (12/3/2013)	ND<10 0.01J (6/21/2011)	(10 - 10)/(9 - 4)	0
ND<10 0.008J (6/2/2014)	ND<10 0.01J (6/21/2011)	(10 - 10)/(10 - 4)	0
ND<10 0.008J (12/2/2014)	ND<10 0.01J (6/21/2011)	(10 - 10)/(11 - 4)	0
ND<10 0.007J (6/1/2015)	ND<10 0.01J (6/21/2011)	(10 - 10)/(12 - 4)	0
ND<10 0.007J (12/7/2015)	ND<10 0.01J (6/21/2011)	(10 - 10)/(13 - 4)	0
10 (6/6/2016)	ND<10 0.01J (6/21/2011)	(10 - 10)/(14 - 4)	0
ND<10 0.008J (12/5/2016)	ND<10 0.01J (6/21/2011)	(10 - 10)/(15 - 4)	0
ND<10 0.007J (6/20/2017)	ND<10 0.01J (6/21/2011)	(10 - 10)/(16 - 4)	0
ND<10 0.008J (12/4/2017)	ND<10 0.01J (6/21/2011)	(10 - 10)/(17 - 4)	0
ND<10 0.008J (6/4/2018)	ND<10 0.01J (6/21/2011)	(10 - 10)/(18 - 4)	0
ND<10 0.0097J (6/4/2012)	ND<10 0.007J (12/13/2011)	(10 - 10)/(6 - 5)	0
ND<10 0.008J (12/11/2012)	ND<10 0.007J (12/13/2011)	(10 - 10)/(7 - 5)	0
ND<10 0.008J (6/3/2013)	ND<10 0.007J (12/13/2011)	(10 - 10)/(8 - 5)	0
ND<10 0.008J (12/3/2013)	ND<10 0.007J (12/13/2011)	(10 - 10)/(9 - 5)	0
ND<10 0.008J (6/2/2014)	ND<10 0.007J (12/13/2011)	(10 - 10)/(10 - 5)	0
ND<10 0.008J (12/2/2014)	ND<10 0.007J (12/13/2011)	(10 - 10)/(11 - 5)	0
ND<10 0.007J (6/1/2015)	ND<10 0.007J (12/13/2011)	(10 - 10)/(12 - 5)	0
ND<10 0.007J (12/7/2015)	ND<10 0.007J (12/13/2011)	(10 - 10)/(13 - 5)	0
10 (6/6/2016)	ND<10 0.007J (12/13/2011)	(10 - 10)/(14 - 5)	0
ND<10 0.008J (12/5/2016)	ND<10 0.007J (12/13/2011)	(10 - 10)/(15 - 5)	0
ND<10 0.007J (6/20/2017)	ND<10 0.007J (12/13/2011)	(10 - 10)/(16 - 5)	0
ND<10 0.008J (12/4/2017)	ND<10 0.007J (12/13/2011)	(10 - 10)/(17 - 5)	0
ND<10 0.008J (6/4/2018)	ND<10 0.007J (12/13/2011)	(10 - 10)/(18 - 5)	0
ND<10 0.008J (12/11/2012)	ND<10 0.0097J (6/4/2012)	(10 - 10)/(7 - 6)	0
ND<10 0.008J (6/3/2013)	ND<10 0.0097J (6/4/2012)	(10 - 10)/(8 - 6)	0
ND<10 0.008J (12/3/2013)	ND<10 0.0097J (6/4/2012)	(10 - 10)/(9 - 6)	0
ND<10 0.008J (6/2/2014)	ND<10 0.0097J (6/4/2012)	(10 - 10)/(10 - 6)	0
ND<10 0.008J (12/2/2014)	ND<10 0.0097J (6/4/2012)	(10 - 10)/(11 - 6)	0
ND<10 0.007J (6/1/2015)	ND<10 0.0097J (6/4/2012)	(10 - 10)/(12 - 6)	0
ND<10 0.007J (12/7/2015)	ND<10 0.0097J (6/4/2012)	(10 - 10)/(13 - 6)	0
10 (6/6/2016)	ND<10 0.0097J (6/4/2012)	(10 - 10)/(14 - 6)	0
ND<10 0.008J (12/5/2016)	ND<10 0.0097J (6/4/2012)	(10 - 10)/(15 - 6)	0
ND<10 0.007J (6/20/2017)	ND<10 0.0097J (6/4/2012)	(10 - 10)/(16 - 6)	0
ND<10 0.008J (12/4/2017)	ND<10 0.0097J (6/4/2012)	(10 - 10)/(17 - 6)	0
ND<10 0.008J (6/4/2018)	ND<10 0.0097J (6/4/2012)	(10 - 10)/(18 - 6)	0
ND<10 0.008J (6/3/2013)	ND<10 0.008J (12/11/2012)	(10 - 10)/(8 - 7)	0
ND<10 0.008J (12/3/2013)	ND<10 0.008J (12/11/2012)	(10 - 10)/(9 - 7)	0
ND<10 0.008J (6/2/2014)	ND<10 0.008J (12/11/2012)	(10 - 10)/(10 - 7)	0
ND<10 0.008J (12/2/2014)	ND<10 0.008J (12/11/2012)	(10 - 10)/(11 - 7)	0
ND<10 0.007J (6/1/2015)	ND<10 0.008J (12/11/2012)	(10 - 10)/(12 - 7)	0
ND<10 0.007J (12/7/2015)	ND<10 0.008J (12/11/2012)	(10 - 10)/(13 - 7)	0
10 (6/6/2016)	ND<10 0.008J (12/11/2012)	(10 - 10)/(14 - 7)	0
ND<10 0.008J (12/5/2016)	ND<10 0.008J (12/11/2012)	(10 - 10)/(15 - 7)	0
ND<10 0.007J (6/20/2017)	ND<10 0.008J (12/11/2012)	(10 - 10)/(16 - 7)	0
ND<10 0.008J (12/4/2017)	ND<10 0.008J (12/11/2012)	(10 - 10)/(17 - 7)	0
ND<10 0.008J (6/4/2018)	ND<10 0.008J (12/11/2012)	(10 - 10)/(18 - 7)	0
ND<10 0.008J (12/3/2013)	ND<10 0.008J (6/3/2013)	(10 - 10)/(9 - 8)	0
ND<10 0.008J (6/2/2014)	ND<10 0.008J (6/3/2013)	(10 - 10)/(10 - 8)	0
ND<10 0.008J (12/2/2014)	ND<10 0.008J (6/3/2013)	(10 - 10)/(11 - 8)	0
ND<10 0.007J (6/1/2015)	ND<10 0.008J (6/3/2013)	(10 - 10)/(12 - 8)	0
ND<10 0.007J (12/7/2015)	ND<10 0.008J (6/3/2013)	(10 - 10)/(13 - 8)	0
10 (6/6/2016)	ND<10 0.008J (6/3/2013)	(10 - 10)/(14 - 8)	0
ND<10 0.008J (12/5/2016)	ND<10 0.008J (6/3/2013)	(10 - 10)/(15 - 8)	0
ND<10 0.007J (6/20/2017)	ND<10 0.008J (6/3/2013)	(10 - 10)/(16 - 8)	0
ND<10 0.008J (12/4/2017)	ND<10 0.008J (6/3/2013)	(10 - 10)/(17 - 8)	0

ND<10 0.008J (6/4/2018)	ND<10 0.008J (6/3/2013)	(10 - 10)/(18 - 8)	0
ND<10 0.008J (6/2/2014)	ND<10 0.008J (12/3/2013)	(10 - 10)/(10 - 9)	0
ND<10 0.008J (12/2/2014)	ND<10 0.008J (12/3/2013)	(10 - 10)/(11 - 9)	0
ND<10 0.007J (6/1/2015)	ND<10 0.008J (12/3/2013)	(10 - 10)/(12 - 9)	0
ND<10 0.007J (12/7/2015)	ND<10 0.008J (12/3/2013)	(10 - 10)/(13 - 9)	0
10 (6/6/2016)	ND<10 0.008J (12/3/2013)	(10 - 10)/(14 - 9)	0
ND<10 0.008J (12/5/2016)	ND<10 0.008J (12/3/2013)	(10 - 10)/(15 - 9)	0
ND<10 0.007J (6/20/2017)	ND<10 0.008J (12/3/2013)	(10 - 10)/(16 - 9)	0
ND<10 0.008J (12/4/2017)	ND<10 0.008J (12/3/2013)	(10 - 10)/(17 - 9)	0
ND<10 0.008J (6/4/2018)	ND<10 0.008J (12/3/2013)	(10 - 10)/(18 - 9)	0
ND<10 0.008J (12/2/2014)	ND<10 0.008J (6/2/2014)	(10 - 10)/(11 - 10)	0
ND<10 0.007J (6/1/2015)	ND<10 0.008J (6/2/2014)	(10 - 10)/(12 - 10)	0
ND<10 0.007J (12/7/2015)	ND<10 0.008J (6/2/2014)	(10 - 10)/(13 - 10)	0
10 (6/6/2016)	ND<10 0.008J (6/2/2014)	(10 - 10)/(14 - 10)	0
ND<10 0.008J (12/5/2016)	ND<10 0.008J (6/2/2014)	(10 - 10)/(15 - 10)	0
ND<10 0.007J (6/20/2017)	ND<10 0.008J (6/2/2014)	(10 - 10)/(16 - 10)	0
ND<10 0.008J (12/4/2017)	ND<10 0.008J (6/2/2014)	(10 - 10)/(17 - 10)	0
ND<10 0.008J (6/4/2018)	ND<10 0.008J (6/2/2014)	(10 - 10)/(18 - 10)	0
ND<10 0.007J (6/1/2015)	ND<10 0.008J (12/2/2014)	(10 - 10)/(12 - 11)	0
ND<10 0.007J (12/7/2015)	ND<10 0.008J (12/2/2014)	(10 - 10)/(13 - 11)	0
10 (6/6/2016)	ND<10 0.008J (12/2/2014)	(10 - 10)/(14 - 11)	0
ND<10 0.008J (12/5/2016)	ND<10 0.008J (12/2/2014)	(10 - 10)/(15 - 11)	0
ND<10 0.007J (6/20/2017)	ND<10 0.008J (12/2/2014)	(10 - 10)/(16 - 11)	0
ND<10 0.008J (12/4/2017)	ND<10 0.008J (12/2/2014)	(10 - 10)/(17 - 11)	0
ND<10 0.008J (6/4/2018)	ND<10 0.008J (12/2/2014)	(10 - 10)/(18 - 11)	0
ND<10 0.007J (12/7/2015)	ND<10 0.007J (6/1/2015)	(10 - 10)/(13 - 12)	0
10 (6/6/2016)	ND<10 0.007J (6/1/2015)	(10 - 10)/(14 - 12)	0
ND<10 0.008J (12/5/2016)	ND<10 0.007J (6/1/2015)	(10 - 10)/(15 - 12)	0
ND<10 0.007J (6/20/2017)	ND<10 0.007J (6/1/2015)	(10 - 10)/(16 - 12)	0
ND<10 0.008J (12/4/2017)	ND<10 0.007J (6/1/2015)	(10 - 10)/(17 - 12)	0
ND<10 0.008J (6/4/2018)	ND<10 0.007J (6/1/2015)	(10 - 10)/(18 - 12)	0
10 (6/6/2016)	ND<10 0.007J (12/7/2015)	(10 - 10)/(14 - 13)	0
ND<10 0.008J (12/5/2016)	ND<10 0.007J (12/7/2015)	(10 - 10)/(15 - 13)	0
ND<10 0.007J (6/20/2017)	ND<10 0.007J (12/7/2015)	(10 - 10)/(16 - 13)	0
ND<10 0.008J (12/4/2017)	ND<10 0.007J (12/7/2015)	(10 - 10)/(17 - 13)	0
ND<10 0.008J (6/4/2018)	ND<10 0.007J (12/7/2015)	(10 - 10)/(18 - 13)	0
ND<10 0.008J (12/5/2016)	10 (6/6/2016)	(10 - 10)/(15 - 14)	0
ND<10 0.007J (6/20/2017)	10 (6/6/2016)	(10 - 10)/(16 - 14)	0
ND<10 0.008J (12/4/2017)	10 (6/6/2016)	(10 - 10)/(17 - 14)	0
ND<10 0.008J (6/4/2018)	10 (6/6/2016)	(10 - 10)/(18 - 14)	0
ND<10 0.007J (6/20/2017)	ND<10 0.008J (12/5/2016)	(10 - 10)/(16 - 15)	0
ND<10 0.008J (12/4/2017)	ND<10 0.008J (12/5/2016)	(10 - 10)/(17 - 15)	0
ND<10 0.008J (6/4/2018)	ND<10 0.008J (12/5/2016)	(10 - 10)/(18 - 15)	0
ND<10 0.008J (12/4/2017)	ND<10 0.007J (6/20/2017)	(10 - 10)/(17 - 16)	0
ND<10 0.008J (6/4/2018)	ND<10 0.007J (6/20/2017)	(10 - 10)/(18 - 16)	0
ND<10 0.008J (6/4/2018)	ND<10 0.008J (12/4/2017)	(10 - 10)/(18 - 17)	0

Number of Q values = 153

Ordered Q Values

n	Q
1	0

Royalton Road LF

2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0

Royalton Road LF

65	0
66	0
67	0
68	0
69	0
70	0
71	0
72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0
92	0
93	0
94	0
95	0
96	0
97	0
98	0
99	0
100	0
101	0
102	0
103	0
104	0
105	0
106	0
107	0
108	0
109	0
110	0
111	0
112	0
113	0
114	0
115	0
116	0
117	0
118	0
119	0
120	0
121	0
122	0
123	0
124	0
125	0
126	0
127	0

128	0
129	0
130	0
131	0
132	0
133	0
134	0
135	0
136	0
137	0
138	0
139	0
140	0
141	0
142	0
143	0
144	0
145	0
146	0
147	0
148	0
149	0
150	0
151	0
152	0
153	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	10	18

Time Period	Observations
12/2/2009	1
6/21/2010	1
12/6/2010	1
6/21/2011	1
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 12546
B = 0
C = 4896
D = 0
E = 306
F = 0
a = 12546
b = 44064
c = 612
Group Variance = 0

For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (153 - 0)/2.0 = 76.5
M2 = (153 + 0)/2.0 + 1 = 77.5
Lower limit is 0 = Q(77)
Upper limit is 0 = Q(78)
0 < 0 < 0 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis
Parameter: Beryllium, total
Location: MW-2R

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<1 (6/4/2012)	ND<1 (12/13/2011)	(1 - 1)/(2 - 1)	0
ND<1 (12/11/2012)	ND<1 (12/13/2011)	(1 - 1)/(3 - 1)	0
ND<1 (6/3/2013)	ND<1 (12/13/2011)	(1 - 1)/(4 - 1)	0
ND<1 (12/3/2013)	ND<1 (12/13/2011)	(1 - 1)/(5 - 1)	0
ND<1 (6/2/2014)	ND<1 (12/13/2011)	(1 - 1)/(6 - 1)	0
ND<1 (12/2/2014)	ND<1 (12/13/2011)	(1 - 1)/(7 - 1)	0
ND<1 (6/1/2015)	ND<1 (12/13/2011)	(1 - 1)/(8 - 1)	0
ND<1 (12/7/2015)	ND<1 (12/13/2011)	(1 - 1)/(9 - 1)	0
ND<1 (6/6/2016)	ND<1 (12/13/2011)	(1 - 1)/(10 - 1)	0
ND<1 (12/5/2016)	ND<1 (12/13/2011)	(1 - 1)/(11 - 1)	0
ND<1 (6/20/2017)	ND<1 (12/13/2011)	(1 - 1)/(12 - 1)	0
ND<1 (12/4/2017)	ND<1 (12/13/2011)	(1 - 1)/(13 - 1)	0
ND<1 (6/4/2018)	ND<1 (12/13/2011)	(1 - 1)/(14 - 1)	0
ND<1 (12/11/2012)	ND<1 (6/4/2012)	(1 - 1)/(3 - 2)	0
ND<1 (6/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(4 - 2)	0
ND<1 (12/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(5 - 2)	0
ND<1 (6/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(6 - 2)	0
ND<1 (12/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(7 - 2)	0
ND<1 (6/1/2015)	ND<1 (6/4/2012)	(1 - 1)/(8 - 2)	0
ND<1 (12/7/2015)	ND<1 (6/4/2012)	(1 - 1)/(9 - 2)	0
ND<1 (6/6/2016)	ND<1 (6/4/2012)	(1 - 1)/(10 - 2)	0
ND<1 (12/5/2016)	ND<1 (6/4/2012)	(1 - 1)/(11 - 2)	0
ND<1 (6/20/2017)	ND<1 (6/4/2012)	(1 - 1)/(12 - 2)	0
ND<1 (12/4/2017)	ND<1 (6/4/2012)	(1 - 1)/(13 - 2)	0
ND<1 (6/4/2018)	ND<1 (6/4/2012)	(1 - 1)/(14 - 2)	0
ND<1 (6/3/2013)	ND<1 (12/11/2012)	(1 - 1)/(4 - 3)	0
ND<1 (12/3/2013)	ND<1 (12/11/2012)	(1 - 1)/(5 - 3)	0
ND<1 (6/2/2014)	ND<1 (12/11/2012)	(1 - 1)/(6 - 3)	0
ND<1 (12/2/2014)	ND<1 (12/11/2012)	(1 - 1)/(7 - 3)	0
ND<1 (6/1/2015)	ND<1 (12/11/2012)	(1 - 1)/(8 - 3)	0
ND<1 (12/7/2015)	ND<1 (12/11/2012)	(1 - 1)/(9 - 3)	0
ND<1 (6/6/2016)	ND<1 (12/11/2012)	(1 - 1)/(10 - 3)	0
ND<1 (12/5/2016)	ND<1 (12/11/2012)	(1 - 1)/(11 - 3)	0
ND<1 (6/20/2017)	ND<1 (12/11/2012)	(1 - 1)/(12 - 3)	0
ND<1 (12/4/2017)	ND<1 (12/11/2012)	(1 - 1)/(13 - 3)	0
ND<1 (6/4/2018)	ND<1 (12/11/2012)	(1 - 1)/(14 - 3)	0
ND<1 (12/3/2013)	ND<1 (6/3/2013)	(1 - 1)/(5 - 4)	0
ND<1 (6/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(6 - 4)	0
ND<1 (12/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(7 - 4)	0
ND<1 (6/1/2015)	ND<1 (6/3/2013)	(1 - 1)/(8 - 4)	0
ND<1 (12/7/2015)	ND<1 (6/3/2013)	(1 - 1)/(9 - 4)	0
ND<1 (6/6/2016)	ND<1 (6/3/2013)	(1 - 1)/(10 - 4)	0
ND<1 (12/5/2016)	ND<1 (6/3/2013)	(1 - 1)/(11 - 4)	0
ND<1 (6/20/2017)	ND<1 (6/3/2013)	(1 - 1)/(12 - 4)	0
ND<1 (12/4/2017)	ND<1 (6/3/2013)	(1 - 1)/(13 - 4)	0
ND<1 (6/4/2018)	ND<1 (6/3/2013)	(1 - 1)/(14 - 4)	0
ND<1 (6/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(6 - 5)	0
ND<1 (12/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(7 - 5)	0

ND<1 (6/1/2015)	ND<1 (12/3/2013)	(1 - 1)/(8 - 5)	0
ND<1 (12/7/2015)	ND<1 (12/3/2013)	(1 - 1)/(9 - 5)	0
ND<1 (6/6/2016)	ND<1 (12/3/2013)	(1 - 1)/(10 - 5)	0
ND<1 (12/5/2016)	ND<1 (12/3/2013)	(1 - 1)/(11 - 5)	0
ND<1 (6/20/2017)	ND<1 (12/3/2013)	(1 - 1)/(12 - 5)	0
ND<1 (12/4/2017)	ND<1 (12/3/2013)	(1 - 1)/(13 - 5)	0
ND<1 (6/4/2018)	ND<1 (12/3/2013)	(1 - 1)/(14 - 5)	0
ND<1 (12/2/2014)	ND<1 (6/2/2014)	(1 - 1)/(7 - 6)	0
ND<1 (6/1/2015)	ND<1 (6/2/2014)	(1 - 1)/(8 - 6)	0
ND<1 (12/7/2015)	ND<1 (6/2/2014)	(1 - 1)/(9 - 6)	0
ND<1 (6/6/2016)	ND<1 (6/2/2014)	(1 - 1)/(10 - 6)	0
ND<1 (12/5/2016)	ND<1 (6/2/2014)	(1 - 1)/(11 - 6)	0
ND<1 (6/20/2017)	ND<1 (6/2/2014)	(1 - 1)/(12 - 6)	0
ND<1 (12/4/2017)	ND<1 (6/2/2014)	(1 - 1)/(13 - 6)	0
ND<1 (6/4/2018)	ND<1 (6/2/2014)	(1 - 1)/(14 - 6)	0
ND<1 (6/1/2015)	ND<1 (12/2/2014)	(1 - 1)/(8 - 7)	0
ND<1 (12/7/2015)	ND<1 (12/2/2014)	(1 - 1)/(9 - 7)	0
ND<1 (6/6/2016)	ND<1 (12/2/2014)	(1 - 1)/(10 - 7)	0
ND<1 (12/5/2016)	ND<1 (12/2/2014)	(1 - 1)/(11 - 7)	0
ND<1 (6/20/2017)	ND<1 (12/2/2014)	(1 - 1)/(12 - 7)	0
ND<1 (12/4/2017)	ND<1 (12/2/2014)	(1 - 1)/(13 - 7)	0
ND<1 (6/4/2018)	ND<1 (12/2/2014)	(1 - 1)/(14 - 7)	0
ND<1 (12/7/2015)	ND<1 (6/1/2015)	(1 - 1)/(9 - 8)	0
ND<1 (6/6/2016)	ND<1 (6/1/2015)	(1 - 1)/(10 - 8)	0
ND<1 (12/5/2016)	ND<1 (6/1/2015)	(1 - 1)/(11 - 8)	0
ND<1 (6/20/2017)	ND<1 (6/1/2015)	(1 - 1)/(12 - 8)	0
ND<1 (12/4/2017)	ND<1 (6/1/2015)	(1 - 1)/(13 - 8)	0
ND<1 (6/4/2018)	ND<1 (6/1/2015)	(1 - 1)/(14 - 8)	0
ND<1 (6/6/2016)	ND<1 (12/7/2015)	(1 - 1)/(10 - 9)	0
ND<1 (12/5/2016)	ND<1 (12/7/2015)	(1 - 1)/(11 - 9)	0
ND<1 (6/20/2017)	ND<1 (12/7/2015)	(1 - 1)/(12 - 9)	0
ND<1 (12/4/2017)	ND<1 (12/7/2015)	(1 - 1)/(13 - 9)	0
ND<1 (6/4/2018)	ND<1 (12/7/2015)	(1 - 1)/(14 - 9)	0
ND<1 (12/5/2016)	ND<1 (6/6/2016)	(1 - 1)/(11 - 10)	0
ND<1 (6/20/2017)	ND<1 (6/6/2016)	(1 - 1)/(12 - 10)	0
ND<1 (12/4/2017)	ND<1 (6/6/2016)	(1 - 1)/(13 - 10)	0
ND<1 (6/4/2018)	ND<1 (6/6/2016)	(1 - 1)/(14 - 10)	0
ND<1 (6/20/2017)	ND<1 (12/5/2016)	(1 - 1)/(12 - 11)	0
ND<1 (12/4/2017)	ND<1 (12/5/2016)	(1 - 1)/(13 - 11)	0
ND<1 (6/4/2018)	ND<1 (12/5/2016)	(1 - 1)/(14 - 11)	0
ND<1 (12/4/2017)	ND<1 (6/20/2017)	(1 - 1)/(13 - 12)	0
ND<1 (6/4/2018)	ND<1 (6/20/2017)	(1 - 1)/(14 - 12)	0
ND<1 (6/4/2018)	ND<1 (12/4/2017)	(1 - 1)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	1	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis
Parameter: Beryllium, total
Location: MW-3
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<1 (6/4/2012)	ND<1 (12/13/2011)	(1 - 1)/(2 - 1)	0
ND<1 (12/11/2012)	ND<1 (12/13/2011)	(1 - 1)/(3 - 1)	0
ND<1 (6/3/2013)	ND<1 (12/13/2011)	(1 - 1)/(4 - 1)	0
ND<1 (12/3/2013)	ND<1 (12/13/2011)	(1 - 1)/(5 - 1)	0
ND<1 (6/2/2014)	ND<1 (12/13/2011)	(1 - 1)/(6 - 1)	0
ND<1 (12/2/2014)	ND<1 (12/13/2011)	(1 - 1)/(7 - 1)	0
ND<1 (6/1/2015)	ND<1 (12/13/2011)	(1 - 1)/(8 - 1)	0
ND<1 (12/7/2015)	ND<1 (12/13/2011)	(1 - 1)/(9 - 1)	0
ND<1 (6/6/2016)	ND<1 (12/13/2011)	(1 - 1)/(10 - 1)	0
ND<1 (12/5/2016)	ND<1 (12/13/2011)	(1 - 1)/(11 - 1)	0
ND<1 (6/20/2017)	ND<1 (12/13/2011)	(1 - 1)/(12 - 1)	0
ND<1 (12/4/2017)	ND<1 (12/13/2011)	(1 - 1)/(13 - 1)	0
ND<1 (6/4/2018)	ND<1 (12/13/2011)	(1 - 1)/(14 - 1)	0
ND<1 (12/11/2012)	ND<1 (6/4/2012)	(1 - 1)/(3 - 2)	0
ND<1 (6/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(4 - 2)	0
ND<1 (12/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(5 - 2)	0
ND<1 (6/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(6 - 2)	0
ND<1 (12/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(7 - 2)	0
ND<1 (6/1/2015)	ND<1 (6/4/2012)	(1 - 1)/(8 - 2)	0
ND<1 (12/7/2015)	ND<1 (6/4/2012)	(1 - 1)/(9 - 2)	0
ND<1 (6/6/2016)	ND<1 (6/4/2012)	(1 - 1)/(10 - 2)	0
ND<1 (12/5/2016)	ND<1 (6/4/2012)	(1 - 1)/(11 - 2)	0
ND<1 (6/20/2017)	ND<1 (6/4/2012)	(1 - 1)/(12 - 2)	0
ND<1 (12/4/2017)	ND<1 (6/4/2012)	(1 - 1)/(13 - 2)	0
ND<1 (6/4/2018)	ND<1 (6/4/2012)	(1 - 1)/(14 - 2)	0
ND<1 (6/3/2013)	ND<1 (12/11/2012)	(1 - 1)/(4 - 3)	0
ND<1 (12/3/2013)	ND<1 (12/11/2012)	(1 - 1)/(5 - 3)	0
ND<1 (6/2/2014)	ND<1 (12/11/2012)	(1 - 1)/(6 - 3)	0
ND<1 (12/2/2014)	ND<1 (12/11/2012)	(1 - 1)/(7 - 3)	0
ND<1 (6/1/2015)	ND<1 (12/11/2012)	(1 - 1)/(8 - 3)	0
ND<1 (12/7/2015)	ND<1 (12/11/2012)	(1 - 1)/(9 - 3)	0
ND<1 (6/6/2016)	ND<1 (12/11/2012)	(1 - 1)/(10 - 3)	0
ND<1 (12/5/2016)	ND<1 (12/11/2012)	(1 - 1)/(11 - 3)	0
ND<1 (6/20/2017)	ND<1 (12/11/2012)	(1 - 1)/(12 - 3)	0
ND<1 (12/4/2017)	ND<1 (12/11/2012)	(1 - 1)/(13 - 3)	0
ND<1 (6/4/2018)	ND<1 (12/11/2012)	(1 - 1)/(14 - 3)	0
ND<1 (12/3/2013)	ND<1 (6/3/2013)	(1 - 1)/(5 - 4)	0
ND<1 (6/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(6 - 4)	0
ND<1 (12/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(7 - 4)	0
ND<1 (6/1/2015)	ND<1 (6/3/2013)	(1 - 1)/(8 - 4)	0
ND<1 (12/7/2015)	ND<1 (6/3/2013)	(1 - 1)/(9 - 4)	0
ND<1 (6/6/2016)	ND<1 (6/3/2013)	(1 - 1)/(10 - 4)	0
ND<1 (12/5/2016)	ND<1 (6/3/2013)	(1 - 1)/(11 - 4)	0
ND<1 (6/20/2017)	ND<1 (6/3/2013)	(1 - 1)/(12 - 4)	0
ND<1 (12/4/2017)	ND<1 (6/3/2013)	(1 - 1)/(13 - 4)	0
ND<1 (6/4/2018)	ND<1 (6/3/2013)	(1 - 1)/(14 - 4)	0
ND<1 (6/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(6 - 5)	0
ND<1 (12/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(7 - 5)	0

ND<1 (6/1/2015)	ND<1 (12/3/2013)	(1 - 1)/(8 - 5)	0
ND<1 (12/7/2015)	ND<1 (12/3/2013)	(1 - 1)/(9 - 5)	0
ND<1 (6/6/2016)	ND<1 (12/3/2013)	(1 - 1)/(10 - 5)	0
ND<1 (12/5/2016)	ND<1 (12/3/2013)	(1 - 1)/(11 - 5)	0
ND<1 (6/20/2017)	ND<1 (12/3/2013)	(1 - 1)/(12 - 5)	0
ND<1 (12/4/2017)	ND<1 (12/3/2013)	(1 - 1)/(13 - 5)	0
ND<1 (6/4/2018)	ND<1 (12/3/2013)	(1 - 1)/(14 - 5)	0
ND<1 (12/2/2014)	ND<1 (6/2/2014)	(1 - 1)/(7 - 6)	0
ND<1 (6/1/2015)	ND<1 (6/2/2014)	(1 - 1)/(8 - 6)	0
ND<1 (12/7/2015)	ND<1 (6/2/2014)	(1 - 1)/(9 - 6)	0
ND<1 (6/6/2016)	ND<1 (6/2/2014)	(1 - 1)/(10 - 6)	0
ND<1 (12/5/2016)	ND<1 (6/2/2014)	(1 - 1)/(11 - 6)	0
ND<1 (6/20/2017)	ND<1 (6/2/2014)	(1 - 1)/(12 - 6)	0
ND<1 (12/4/2017)	ND<1 (6/2/2014)	(1 - 1)/(13 - 6)	0
ND<1 (6/4/2018)	ND<1 (6/2/2014)	(1 - 1)/(14 - 6)	0
ND<1 (6/1/2015)	ND<1 (12/2/2014)	(1 - 1)/(8 - 7)	0
ND<1 (12/7/2015)	ND<1 (12/2/2014)	(1 - 1)/(9 - 7)	0
ND<1 (6/6/2016)	ND<1 (12/2/2014)	(1 - 1)/(10 - 7)	0
ND<1 (12/5/2016)	ND<1 (12/2/2014)	(1 - 1)/(11 - 7)	0
ND<1 (6/20/2017)	ND<1 (12/2/2014)	(1 - 1)/(12 - 7)	0
ND<1 (12/4/2017)	ND<1 (12/2/2014)	(1 - 1)/(13 - 7)	0
ND<1 (6/4/2018)	ND<1 (12/2/2014)	(1 - 1)/(14 - 7)	0
ND<1 (12/7/2015)	ND<1 (6/1/2015)	(1 - 1)/(9 - 8)	0
ND<1 (6/6/2016)	ND<1 (6/1/2015)	(1 - 1)/(10 - 8)	0
ND<1 (12/5/2016)	ND<1 (6/1/2015)	(1 - 1)/(11 - 8)	0
ND<1 (6/20/2017)	ND<1 (6/1/2015)	(1 - 1)/(12 - 8)	0
ND<1 (12/4/2017)	ND<1 (6/1/2015)	(1 - 1)/(13 - 8)	0
ND<1 (6/4/2018)	ND<1 (6/1/2015)	(1 - 1)/(14 - 8)	0
ND<1 (6/6/2016)	ND<1 (12/7/2015)	(1 - 1)/(10 - 9)	0
ND<1 (12/5/2016)	ND<1 (12/7/2015)	(1 - 1)/(11 - 9)	0
ND<1 (6/20/2017)	ND<1 (12/7/2015)	(1 - 1)/(12 - 9)	0
ND<1 (12/4/2017)	ND<1 (12/7/2015)	(1 - 1)/(13 - 9)	0
ND<1 (6/4/2018)	ND<1 (12/7/2015)	(1 - 1)/(14 - 9)	0
ND<1 (12/5/2016)	ND<1 (6/6/2016)	(1 - 1)/(11 - 10)	0
ND<1 (6/20/2017)	ND<1 (6/6/2016)	(1 - 1)/(12 - 10)	0
ND<1 (12/4/2017)	ND<1 (6/6/2016)	(1 - 1)/(13 - 10)	0
ND<1 (6/4/2018)	ND<1 (6/6/2016)	(1 - 1)/(14 - 10)	0
ND<1 (6/20/2017)	ND<1 (12/5/2016)	(1 - 1)/(12 - 11)	0
ND<1 (12/4/2017)	ND<1 (12/5/2016)	(1 - 1)/(13 - 11)	0
ND<1 (6/4/2018)	ND<1 (12/5/2016)	(1 - 1)/(14 - 11)	0
ND<1 (12/4/2017)	ND<1 (6/20/2017)	(1 - 1)/(13 - 12)	0
ND<1 (6/4/2018)	ND<1 (6/20/2017)	(1 - 1)/(14 - 12)	0
ND<1 (6/4/2018)	ND<1 (12/4/2017)	(1 - 1)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	1	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis
Parameter: Beryllium, total
Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<1 (6/4/2012)	ND<1 (12/13/2011)	(1 - 1)/(2 - 1)	0
ND<1 (12/11/2012)	ND<1 (12/13/2011)	(1 - 1)/(3 - 1)	0
ND<1 (6/3/2013)	ND<1 (12/13/2011)	(1 - 1)/(4 - 1)	0
ND<1 (12/3/2013)	ND<1 (12/13/2011)	(1 - 1)/(5 - 1)	0
ND<1 (6/2/2014)	ND<1 (12/13/2011)	(1 - 1)/(6 - 1)	0
ND<1 (12/2/2014)	ND<1 (12/13/2011)	(1 - 1)/(7 - 1)	0
ND<1 (6/1/2015)	ND<1 (12/13/2011)	(1 - 1)/(8 - 1)	0
ND<1 (12/7/2015)	ND<1 (12/13/2011)	(1 - 1)/(9 - 1)	0
ND<1 (6/6/2016)	ND<1 (12/13/2011)	(1 - 1)/(10 - 1)	0
ND<1 (12/5/2016)	ND<1 (12/13/2011)	(1 - 1)/(11 - 1)	0
ND<1 (6/20/2017)	ND<1 (12/13/2011)	(1 - 1)/(12 - 1)	0
ND<1 (12/4/2017)	ND<1 (12/13/2011)	(1 - 1)/(13 - 1)	0
ND<1 (6/4/2018)	ND<1 (12/13/2011)	(1 - 1)/(14 - 1)	0
ND<1 (12/11/2012)	ND<1 (6/4/2012)	(1 - 1)/(3 - 2)	0
ND<1 (6/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(4 - 2)	0
ND<1 (12/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(5 - 2)	0
ND<1 (6/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(6 - 2)	0
ND<1 (12/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(7 - 2)	0
ND<1 (6/1/2015)	ND<1 (6/4/2012)	(1 - 1)/(8 - 2)	0
ND<1 (12/7/2015)	ND<1 (6/4/2012)	(1 - 1)/(9 - 2)	0
ND<1 (6/6/2016)	ND<1 (6/4/2012)	(1 - 1)/(10 - 2)	0
ND<1 (12/5/2016)	ND<1 (6/4/2012)	(1 - 1)/(11 - 2)	0
ND<1 (6/20/2017)	ND<1 (6/4/2012)	(1 - 1)/(12 - 2)	0
ND<1 (12/4/2017)	ND<1 (6/4/2012)	(1 - 1)/(13 - 2)	0
ND<1 (6/4/2018)	ND<1 (6/4/2012)	(1 - 1)/(14 - 2)	0
ND<1 (6/3/2013)	ND<1 (12/11/2012)	(1 - 1)/(4 - 3)	0
ND<1 (12/3/2013)	ND<1 (12/11/2012)	(1 - 1)/(5 - 3)	0
ND<1 (6/2/2014)	ND<1 (12/11/2012)	(1 - 1)/(6 - 3)	0
ND<1 (12/2/2014)	ND<1 (12/11/2012)	(1 - 1)/(7 - 3)	0
ND<1 (6/1/2015)	ND<1 (12/11/2012)	(1 - 1)/(8 - 3)	0
ND<1 (12/7/2015)	ND<1 (12/11/2012)	(1 - 1)/(9 - 3)	0
ND<1 (6/6/2016)	ND<1 (12/11/2012)	(1 - 1)/(10 - 3)	0
ND<1 (12/5/2016)	ND<1 (12/11/2012)	(1 - 1)/(11 - 3)	0
ND<1 (6/20/2017)	ND<1 (12/11/2012)	(1 - 1)/(12 - 3)	0
ND<1 (12/4/2017)	ND<1 (12/11/2012)	(1 - 1)/(13 - 3)	0
ND<1 (6/4/2018)	ND<1 (12/11/2012)	(1 - 1)/(14 - 3)	0
ND<1 (12/3/2013)	ND<1 (6/3/2013)	(1 - 1)/(5 - 4)	0
ND<1 (6/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(6 - 4)	0
ND<1 (12/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(7 - 4)	0
ND<1 (6/1/2015)	ND<1 (6/3/2013)	(1 - 1)/(8 - 4)	0
ND<1 (12/7/2015)	ND<1 (6/3/2013)	(1 - 1)/(9 - 4)	0
ND<1 (6/6/2016)	ND<1 (6/3/2013)	(1 - 1)/(10 - 4)	0
ND<1 (12/5/2016)	ND<1 (6/3/2013)	(1 - 1)/(11 - 4)	0
ND<1 (6/20/2017)	ND<1 (6/3/2013)	(1 - 1)/(12 - 4)	0
ND<1 (12/4/2017)	ND<1 (6/3/2013)	(1 - 1)/(13 - 4)	0
ND<1 (6/4/2018)	ND<1 (6/3/2013)	(1 - 1)/(14 - 4)	0
ND<1 (6/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(6 - 5)	0
ND<1 (12/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(7 - 5)	0

ND<1 (6/1/2015)	ND<1 (12/3/2013)	(1 - 1)/(8 - 5)	0
ND<1 (12/7/2015)	ND<1 (12/3/2013)	(1 - 1)/(9 - 5)	0
ND<1 (6/6/2016)	ND<1 (12/3/2013)	(1 - 1)/(10 - 5)	0
ND<1 (12/5/2016)	ND<1 (12/3/2013)	(1 - 1)/(11 - 5)	0
ND<1 (6/20/2017)	ND<1 (12/3/2013)	(1 - 1)/(12 - 5)	0
ND<1 (12/4/2017)	ND<1 (12/3/2013)	(1 - 1)/(13 - 5)	0
ND<1 (6/4/2018)	ND<1 (12/3/2013)	(1 - 1)/(14 - 5)	0
ND<1 (12/2/2014)	ND<1 (6/2/2014)	(1 - 1)/(7 - 6)	0
ND<1 (6/1/2015)	ND<1 (6/2/2014)	(1 - 1)/(8 - 6)	0
ND<1 (12/7/2015)	ND<1 (6/2/2014)	(1 - 1)/(9 - 6)	0
ND<1 (6/6/2016)	ND<1 (6/2/2014)	(1 - 1)/(10 - 6)	0
ND<1 (12/5/2016)	ND<1 (6/2/2014)	(1 - 1)/(11 - 6)	0
ND<1 (6/20/2017)	ND<1 (6/2/2014)	(1 - 1)/(12 - 6)	0
ND<1 (12/4/2017)	ND<1 (6/2/2014)	(1 - 1)/(13 - 6)	0
ND<1 (6/4/2018)	ND<1 (6/2/2014)	(1 - 1)/(14 - 6)	0
ND<1 (6/1/2015)	ND<1 (12/2/2014)	(1 - 1)/(8 - 7)	0
ND<1 (12/7/2015)	ND<1 (12/2/2014)	(1 - 1)/(9 - 7)	0
ND<1 (6/6/2016)	ND<1 (12/2/2014)	(1 - 1)/(10 - 7)	0
ND<1 (12/5/2016)	ND<1 (12/2/2014)	(1 - 1)/(11 - 7)	0
ND<1 (6/20/2017)	ND<1 (12/2/2014)	(1 - 1)/(12 - 7)	0
ND<1 (12/4/2017)	ND<1 (12/2/2014)	(1 - 1)/(13 - 7)	0
ND<1 (6/4/2018)	ND<1 (12/2/2014)	(1 - 1)/(14 - 7)	0
ND<1 (12/7/2015)	ND<1 (6/1/2015)	(1 - 1)/(9 - 8)	0
ND<1 (6/6/2016)	ND<1 (6/1/2015)	(1 - 1)/(10 - 8)	0
ND<1 (12/5/2016)	ND<1 (6/1/2015)	(1 - 1)/(11 - 8)	0
ND<1 (6/20/2017)	ND<1 (6/1/2015)	(1 - 1)/(12 - 8)	0
ND<1 (12/4/2017)	ND<1 (6/1/2015)	(1 - 1)/(13 - 8)	0
ND<1 (6/4/2018)	ND<1 (6/1/2015)	(1 - 1)/(14 - 8)	0
ND<1 (6/6/2016)	ND<1 (12/7/2015)	(1 - 1)/(10 - 9)	0
ND<1 (12/5/2016)	ND<1 (12/7/2015)	(1 - 1)/(11 - 9)	0
ND<1 (6/20/2017)	ND<1 (12/7/2015)	(1 - 1)/(12 - 9)	0
ND<1 (12/4/2017)	ND<1 (12/7/2015)	(1 - 1)/(13 - 9)	0
ND<1 (6/4/2018)	ND<1 (12/7/2015)	(1 - 1)/(14 - 9)	0
ND<1 (12/5/2016)	ND<1 (6/6/2016)	(1 - 1)/(11 - 10)	0
ND<1 (6/20/2017)	ND<1 (6/6/2016)	(1 - 1)/(12 - 10)	0
ND<1 (12/4/2017)	ND<1 (6/6/2016)	(1 - 1)/(13 - 10)	0
ND<1 (6/4/2018)	ND<1 (6/6/2016)	(1 - 1)/(14 - 10)	0
ND<1 (6/20/2017)	ND<1 (12/5/2016)	(1 - 1)/(12 - 11)	0
ND<1 (12/4/2017)	ND<1 (12/5/2016)	(1 - 1)/(13 - 11)	0
ND<1 (6/4/2018)	ND<1 (12/5/2016)	(1 - 1)/(14 - 11)	0
ND<1 (12/4/2017)	ND<1 (6/20/2017)	(1 - 1)/(13 - 12)	0
ND<1 (6/4/2018)	ND<1 (6/20/2017)	(1 - 1)/(14 - 12)	0
ND<1 (6/4/2018)	ND<1 (12/4/2017)	(1 - 1)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	1	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Sen's Slope Analysis
Parameter: Cadmium, total
Location: MW-2R
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<2 (6/21/2010)	ND<2 (12/2/2009)	(2 - 2)/(2 - 1)	0
ND<2 (12/6/2010)	ND<2 (12/2/2009)	(2 - 2)/(3 - 1)	0
ND<2 (6/21/2011)	ND<2 (12/2/2009)	(2 - 2)/(4 - 1)	0
ND<2 (12/13/2011)	ND<2 (12/2/2009)	(2 - 2)/(5 - 1)	0
ND<2 (6/4/2012)	ND<2 (12/2/2009)	(2 - 2)/(6 - 1)	0
ND<2 (12/11/2012)	ND<2 (12/2/2009)	(2 - 2)/(7 - 1)	0
ND<2 (6/3/2013)	ND<2 (12/2/2009)	(2 - 2)/(8 - 1)	0
ND<2 (12/3/2013)	ND<2 (12/2/2009)	(2 - 2)/(9 - 1)	0
ND<2 (6/2/2014)	ND<2 (12/2/2009)	(2 - 2)/(10 - 1)	0
ND<2 (12/2/2014)	ND<2 (12/2/2009)	(2 - 2)/(11 - 1)	0
ND<2 (6/1/2015)	ND<2 (12/2/2009)	(2 - 2)/(12 - 1)	0
ND<2 (12/7/2015)	ND<2 (12/2/2009)	(2 - 2)/(13 - 1)	0
ND<2 (6/6/2016)	ND<2 (12/2/2009)	(2 - 2)/(14 - 1)	0
ND<2 (12/5/2016)	ND<2 (12/2/2009)	(2 - 2)/(15 - 1)	0
ND<2 (6/20/2017)	ND<2 (12/2/2009)	(2 - 2)/(16 - 1)	0
ND<2 (12/4/2017)	ND<2 (12/2/2009)	(2 - 2)/(17 - 1)	0
ND<2 (6/4/2018)	ND<2 (12/2/2009)	(2 - 2)/(18 - 1)	0
ND<2 (12/6/2010)	ND<2 (6/21/2010)	(2 - 2)/(3 - 2)	0
ND<2 (6/21/2011)	ND<2 (6/21/2010)	(2 - 2)/(4 - 2)	0
ND<2 (12/13/2011)	ND<2 (6/21/2010)	(2 - 2)/(5 - 2)	0
ND<2 (6/4/2012)	ND<2 (6/21/2010)	(2 - 2)/(6 - 2)	0
ND<2 (12/11/2012)	ND<2 (6/21/2010)	(2 - 2)/(7 - 2)	0
ND<2 (6/3/2013)	ND<2 (6/21/2010)	(2 - 2)/(8 - 2)	0
ND<2 (12/3/2013)	ND<2 (6/21/2010)	(2 - 2)/(9 - 2)	0
ND<2 (6/2/2014)	ND<2 (6/21/2010)	(2 - 2)/(10 - 2)	0
ND<2 (12/2/2014)	ND<2 (6/21/2010)	(2 - 2)/(11 - 2)	0
ND<2 (6/1/2015)	ND<2 (6/21/2010)	(2 - 2)/(12 - 2)	0
ND<2 (12/7/2015)	ND<2 (6/21/2010)	(2 - 2)/(13 - 2)	0
ND<2 (6/6/2016)	ND<2 (6/21/2010)	(2 - 2)/(14 - 2)	0
ND<2 (12/5/2016)	ND<2 (6/21/2010)	(2 - 2)/(15 - 2)	0
ND<2 (6/20/2017)	ND<2 (6/21/2010)	(2 - 2)/(16 - 2)	0
ND<2 (12/4/2017)	ND<2 (6/21/2010)	(2 - 2)/(17 - 2)	0
ND<2 (6/4/2018)	ND<2 (6/21/2010)	(2 - 2)/(18 - 2)	0
ND<2 (6/21/2011)	ND<2 (12/6/2010)	(2 - 2)/(4 - 3)	0
ND<2 (12/13/2011)	ND<2 (12/6/2010)	(2 - 2)/(5 - 3)	0
ND<2 (6/4/2012)	ND<2 (12/6/2010)	(2 - 2)/(6 - 3)	0
ND<2 (12/11/2012)	ND<2 (12/6/2010)	(2 - 2)/(7 - 3)	0
ND<2 (6/3/2013)	ND<2 (12/6/2010)	(2 - 2)/(8 - 3)	0
ND<2 (12/3/2013)	ND<2 (12/6/2010)	(2 - 2)/(9 - 3)	0
ND<2 (6/2/2014)	ND<2 (12/6/2010)	(2 - 2)/(10 - 3)	0
ND<2 (12/2/2014)	ND<2 (12/6/2010)	(2 - 2)/(11 - 3)	0
ND<2 (6/1/2015)	ND<2 (12/6/2010)	(2 - 2)/(12 - 3)	0
ND<2 (12/7/2015)	ND<2 (12/6/2010)	(2 - 2)/(13 - 3)	0
ND<2 (6/6/2016)	ND<2 (12/6/2010)	(2 - 2)/(14 - 3)	0
ND<2 (12/5/2016)	ND<2 (12/6/2010)	(2 - 2)/(15 - 3)	0
ND<2 (6/20/2017)	ND<2 (12/6/2010)	(2 - 2)/(16 - 3)	0
ND<2 (12/4/2017)	ND<2 (12/6/2010)	(2 - 2)/(17 - 3)	0
ND<2 (6/4/2018)	ND<2 (12/6/2010)	(2 - 2)/(18 - 3)	0

ND<2 (12/13/2011)	ND<2 (6/21/2011)	(2 - 2)/(5 - 4)	0
ND<2 (6/4/2012)	ND<2 (6/21/2011)	(2 - 2)/(6 - 4)	0
ND<2 (12/11/2012)	ND<2 (6/21/2011)	(2 - 2)/(7 - 4)	0
ND<2 (6/3/2013)	ND<2 (6/21/2011)	(2 - 2)/(8 - 4)	0
ND<2 (12/3/2013)	ND<2 (6/21/2011)	(2 - 2)/(9 - 4)	0
ND<2 (6/2/2014)	ND<2 (6/21/2011)	(2 - 2)/(10 - 4)	0
ND<2 (12/2/2014)	ND<2 (6/21/2011)	(2 - 2)/(11 - 4)	0
ND<2 (6/1/2015)	ND<2 (6/21/2011)	(2 - 2)/(12 - 4)	0
ND<2 (12/7/2015)	ND<2 (6/21/2011)	(2 - 2)/(13 - 4)	0
ND<2 (6/6/2016)	ND<2 (6/21/2011)	(2 - 2)/(14 - 4)	0
ND<2 (12/5/2016)	ND<2 (6/21/2011)	(2 - 2)/(15 - 4)	0
ND<2 (6/20/2017)	ND<2 (6/21/2011)	(2 - 2)/(16 - 4)	0
ND<2 (12/4/2017)	ND<2 (6/21/2011)	(2 - 2)/(17 - 4)	0
ND<2 (6/4/2018)	ND<2 (6/21/2011)	(2 - 2)/(18 - 4)	0

ND<2 (6/4/2012)	ND<2 (12/13/2011)	(2 - 2)/(6 - 5)	0
ND<2 (12/11/2012)	ND<2 (12/13/2011)	(2 - 2)/(7 - 5)	0
ND<2 (6/3/2013)	ND<2 (12/13/2011)	(2 - 2)/(8 - 5)	0
ND<2 (12/3/2013)	ND<2 (12/13/2011)	(2 - 2)/(9 - 5)	0
ND<2 (6/2/2014)	ND<2 (12/13/2011)	(2 - 2)/(10 - 5)	0
ND<2 (12/2/2014)	ND<2 (12/13/2011)	(2 - 2)/(11 - 5)	0
ND<2 (6/1/2015)	ND<2 (12/13/2011)	(2 - 2)/(12 - 5)	0
ND<2 (12/7/2015)	ND<2 (12/13/2011)	(2 - 2)/(13 - 5)	0
ND<2 (6/6/2016)	ND<2 (12/13/2011)	(2 - 2)/(14 - 5)	0
ND<2 (12/5/2016)	ND<2 (12/13/2011)	(2 - 2)/(15 - 5)	0
ND<2 (6/20/2017)	ND<2 (12/13/2011)	(2 - 2)/(16 - 5)	0
ND<2 (12/4/2017)	ND<2 (12/13/2011)	(2 - 2)/(17 - 5)	0
ND<2 (6/4/2018)	ND<2 (12/13/2011)	(2 - 2)/(18 - 5)	0

ND<2 (12/11/2012)	ND<2 (6/4/2012)	(2 - 2)/(7 - 6)	0
ND<2 (6/3/2013)	ND<2 (6/4/2012)	(2 - 2)/(8 - 6)	0
ND<2 (12/3/2013)	ND<2 (6/4/2012)	(2 - 2)/(9 - 6)	0
ND<2 (6/2/2014)	ND<2 (6/4/2012)	(2 - 2)/(10 - 6)	0
ND<2 (12/2/2014)	ND<2 (6/4/2012)	(2 - 2)/(11 - 6)	0
ND<2 (6/1/2015)	ND<2 (6/4/2012)	(2 - 2)/(12 - 6)	0
ND<2 (12/7/2015)	ND<2 (6/4/2012)	(2 - 2)/(13 - 6)	0
ND<2 (6/6/2016)	ND<2 (6/4/2012)	(2 - 2)/(14 - 6)	0
ND<2 (12/5/2016)	ND<2 (6/4/2012)	(2 - 2)/(15 - 6)	0
ND<2 (6/20/2017)	ND<2 (6/4/2012)	(2 - 2)/(16 - 6)	0
ND<2 (12/4/2017)	ND<2 (6/4/2012)	(2 - 2)/(17 - 6)	0
ND<2 (6/4/2018)	ND<2 (6/4/2012)	(2 - 2)/(18 - 6)	0

ND<2 (6/3/2013)	ND<2 (12/11/2012)	(2 - 2)/(8 - 7)	0
ND<2 (12/3/2013)	ND<2 (12/11/2012)	(2 - 2)/(9 - 7)	0
ND<2 (6/2/2014)	ND<2 (12/11/2012)	(2 - 2)/(10 - 7)	0
ND<2 (12/2/2014)	ND<2 (12/11/2012)	(2 - 2)/(11 - 7)	0
ND<2 (6/1/2015)	ND<2 (12/11/2012)	(2 - 2)/(12 - 7)	0
ND<2 (12/7/2015)	ND<2 (12/11/2012)	(2 - 2)/(13 - 7)	0
ND<2 (6/6/2016)	ND<2 (12/11/2012)	(2 - 2)/(14 - 7)	0
ND<2 (12/5/2016)	ND<2 (12/11/2012)	(2 - 2)/(15 - 7)	0
ND<2 (6/20/2017)	ND<2 (12/11/2012)	(2 - 2)/(16 - 7)	0
ND<2 (12/4/2017)	ND<2 (12/11/2012)	(2 - 2)/(17 - 7)	0
ND<2 (6/4/2018)	ND<2 (12/11/2012)	(2 - 2)/(18 - 7)	0

ND<2 (12/3/2013)	ND<2 (6/3/2013)	(2 - 2)/(9 - 8)	0
ND<2 (6/2/2014)	ND<2 (6/3/2013)	(2 - 2)/(10 - 8)	0
ND<2 (12/2/2014)	ND<2 (6/3/2013)	(2 - 2)/(11 - 8)	0
ND<2 (6/1/2015)	ND<2 (6/3/2013)	(2 - 2)/(12 - 8)	0
ND<2 (12/7/2015)	ND<2 (6/3/2013)	(2 - 2)/(13 - 8)	0
ND<2 (6/6/2016)	ND<2 (6/3/2013)	(2 - 2)/(14 - 8)	0
ND<2 (12/5/2016)	ND<2 (6/3/2013)	(2 - 2)/(15 - 8)	0
ND<2 (6/20/2017)	ND<2 (6/3/2013)	(2 - 2)/(16 - 8)	0
ND<2 (12/4/2017)	ND<2 (6/3/2013)	(2 - 2)/(17 - 8)	0

ND<2 (6/4/2018)	ND<2 (6/3/2013)	(2 - 2)/(18 - 8)	0
ND<2 (6/2/2014)	ND<2 (12/3/2013)	(2 - 2)/(10 - 9)	0
ND<2 (12/2/2014)	ND<2 (12/3/2013)	(2 - 2)/(11 - 9)	0
ND<2 (6/1/2015)	ND<2 (12/3/2013)	(2 - 2)/(12 - 9)	0
ND<2 (12/7/2015)	ND<2 (12/3/2013)	(2 - 2)/(13 - 9)	0
ND<2 (6/6/2016)	ND<2 (12/3/2013)	(2 - 2)/(14 - 9)	0
ND<2 (12/5/2016)	ND<2 (12/3/2013)	(2 - 2)/(15 - 9)	0
ND<2 (6/20/2017)	ND<2 (12/3/2013)	(2 - 2)/(16 - 9)	0
ND<2 (12/4/2017)	ND<2 (12/3/2013)	(2 - 2)/(17 - 9)	0
ND<2 (6/4/2018)	ND<2 (12/3/2013)	(2 - 2)/(18 - 9)	0
ND<2 (12/2/2014)	ND<2 (6/2/2014)	(2 - 2)/(11 - 10)	0
ND<2 (6/1/2015)	ND<2 (6/2/2014)	(2 - 2)/(12 - 10)	0
ND<2 (12/7/2015)	ND<2 (6/2/2014)	(2 - 2)/(13 - 10)	0
ND<2 (6/6/2016)	ND<2 (6/2/2014)	(2 - 2)/(14 - 10)	0
ND<2 (12/5/2016)	ND<2 (6/2/2014)	(2 - 2)/(15 - 10)	0
ND<2 (6/20/2017)	ND<2 (6/2/2014)	(2 - 2)/(16 - 10)	0
ND<2 (12/4/2017)	ND<2 (6/2/2014)	(2 - 2)/(17 - 10)	0
ND<2 (6/4/2018)	ND<2 (6/2/2014)	(2 - 2)/(18 - 10)	0
ND<2 (6/1/2015)	ND<2 (12/2/2014)	(2 - 2)/(12 - 11)	0
ND<2 (12/7/2015)	ND<2 (12/2/2014)	(2 - 2)/(13 - 11)	0
ND<2 (6/6/2016)	ND<2 (12/2/2014)	(2 - 2)/(14 - 11)	0
ND<2 (12/5/2016)	ND<2 (12/2/2014)	(2 - 2)/(15 - 11)	0
ND<2 (6/20/2017)	ND<2 (12/2/2014)	(2 - 2)/(16 - 11)	0
ND<2 (12/4/2017)	ND<2 (12/2/2014)	(2 - 2)/(17 - 11)	0
ND<2 (6/4/2018)	ND<2 (12/2/2014)	(2 - 2)/(18 - 11)	0
ND<2 (12/7/2015)	ND<2 (6/1/2015)	(2 - 2)/(13 - 12)	0
ND<2 (6/6/2016)	ND<2 (6/1/2015)	(2 - 2)/(14 - 12)	0
ND<2 (12/5/2016)	ND<2 (6/1/2015)	(2 - 2)/(15 - 12)	0
ND<2 (6/20/2017)	ND<2 (6/1/2015)	(2 - 2)/(16 - 12)	0
ND<2 (12/4/2017)	ND<2 (6/1/2015)	(2 - 2)/(17 - 12)	0
ND<2 (6/4/2018)	ND<2 (6/1/2015)	(2 - 2)/(18 - 12)	0
ND<2 (6/6/2016)	ND<2 (12/7/2015)	(2 - 2)/(14 - 13)	0
ND<2 (12/5/2016)	ND<2 (12/7/2015)	(2 - 2)/(15 - 13)	0
ND<2 (6/20/2017)	ND<2 (12/7/2015)	(2 - 2)/(16 - 13)	0
ND<2 (12/4/2017)	ND<2 (12/7/2015)	(2 - 2)/(17 - 13)	0
ND<2 (6/4/2018)	ND<2 (12/7/2015)	(2 - 2)/(18 - 13)	0
ND<2 (12/5/2016)	ND<2 (6/6/2016)	(2 - 2)/(15 - 14)	0
ND<2 (6/20/2017)	ND<2 (6/6/2016)	(2 - 2)/(16 - 14)	0
ND<2 (12/4/2017)	ND<2 (6/6/2016)	(2 - 2)/(17 - 14)	0
ND<2 (6/4/2018)	ND<2 (6/6/2016)	(2 - 2)/(18 - 14)	0
ND<2 (6/20/2017)	ND<2 (12/5/2016)	(2 - 2)/(16 - 15)	0
ND<2 (12/4/2017)	ND<2 (12/5/2016)	(2 - 2)/(17 - 15)	0
ND<2 (6/4/2018)	ND<2 (12/5/2016)	(2 - 2)/(18 - 15)	0
ND<2 (12/4/2017)	ND<2 (6/20/2017)	(2 - 2)/(17 - 16)	0
ND<2 (6/4/2018)	ND<2 (6/20/2017)	(2 - 2)/(18 - 16)	0
ND<2 (6/4/2018)	ND<2 (12/4/2017)	(2 - 2)/(18 - 17)	0

Number of Q values = 153

Ordered Q Values

n	Q
1	0

Royalton Road LF

2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0

65	0
66	0
67	0
68	0
69	0
70	0
71	0
72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0
92	0
93	0
94	0
95	0
96	0
97	0
98	0
99	0
100	0
101	0
102	0
103	0
104	0
105	0
106	0
107	0
108	0
109	0
110	0
111	0
112	0
113	0
114	0
115	0
116	0
117	0
118	0
119	0
120	0
121	0
122	0
123	0
124	0
125	0
126	0
127	0

128	0
129	0
130	0
131	0
132	0
133	0
134	0
135	0
136	0
137	0
138	0
139	0
140	0
141	0
142	0
143	0
144	0
145	0
146	0
147	0
148	0
149	0
150	0
151	0
152	0
153	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	2	18

Time Period	Observations
12/2/2009	1
6/21/2010	1
12/6/2010	1
6/21/2011	1
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 12546
B = 0
C = 4896
D = 0
E = 306
F = 0
a = 12546
b = 44064
c = 612
Group Variance = 0

Royalton Road LF

For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (153 - 0)/2.0 = 76.5
M2 = (153 + 0)/2.0 + 1 = 77.5
Lower limit is 0 = Q(77)
Upper limit is 0 = Q(78)
0 < 0 < 0 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis
Parameter: Cadmium, total
Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<2 (6/21/2010)	ND<2 (12/2/2009)	(2 - 2)/(2 - 1)	0
ND<2 (12/6/2010)	ND<2 (12/2/2009)	(2 - 2)/(3 - 1)	0
ND<2 (6/21/2011)	ND<2 (12/2/2009)	(2 - 2)/(4 - 1)	0
ND<2 (12/13/2011)	ND<2 (12/2/2009)	(2 - 2)/(5 - 1)	0
ND<2 (6/4/2012)	ND<2 (12/2/2009)	(2 - 2)/(6 - 1)	0
ND<2 (12/11/2012)	ND<2 (12/2/2009)	(2 - 2)/(7 - 1)	0
ND<2 (6/3/2013)	ND<2 (12/2/2009)	(2 - 2)/(8 - 1)	0
ND<2 (12/3/2013)	ND<2 (12/2/2009)	(2 - 2)/(9 - 1)	0
ND<2 (6/2/2014)	ND<2 (12/2/2009)	(2 - 2)/(10 - 1)	0
ND<2 (12/2/2014)	ND<2 (12/2/2009)	(2 - 2)/(11 - 1)	0
4 (6/1/2015)	ND<2 (12/2/2009)	(4 - 2)/(12 - 1)	0.181818
5 (12/7/2015)	ND<2 (12/2/2009)	(5 - 2)/(13 - 1)	0.25
5 (6/6/2016)	ND<2 (12/2/2009)	(5 - 2)/(14 - 1)	0.230769
5 (12/5/2016)	ND<2 (12/2/2009)	(5 - 2)/(15 - 1)	0.214286
3 (6/20/2017)	ND<2 (12/2/2009)	(3 - 2)/(16 - 1)	0.0666667
3 (12/4/2017)	ND<2 (12/2/2009)	(3 - 2)/(17 - 1)	0.0625
ND<2 0.0019J (6/4/2018)	ND<2 (12/2/2009)	(2 - 2)/(18 - 1)	0
ND<2 (12/6/2010)	ND<2 (6/21/2010)	(2 - 2)/(3 - 2)	0
ND<2 (6/21/2011)	ND<2 (6/21/2010)	(2 - 2)/(4 - 2)	0
ND<2 (12/13/2011)	ND<2 (6/21/2010)	(2 - 2)/(5 - 2)	0
ND<2 (6/4/2012)	ND<2 (6/21/2010)	(2 - 2)/(6 - 2)	0
ND<2 (12/11/2012)	ND<2 (6/21/2010)	(2 - 2)/(7 - 2)	0
ND<2 (6/3/2013)	ND<2 (6/21/2010)	(2 - 2)/(8 - 2)	0
ND<2 (12/3/2013)	ND<2 (6/21/2010)	(2 - 2)/(9 - 2)	0
ND<2 (6/2/2014)	ND<2 (6/21/2010)	(2 - 2)/(10 - 2)	0
ND<2 (12/2/2014)	ND<2 (6/21/2010)	(2 - 2)/(11 - 2)	0
4 (6/1/2015)	ND<2 (6/21/2010)	(4 - 2)/(12 - 2)	0.2
5 (12/7/2015)	ND<2 (6/21/2010)	(5 - 2)/(13 - 2)	0.272727
5 (6/6/2016)	ND<2 (6/21/2010)	(5 - 2)/(14 - 2)	0.25
5 (12/5/2016)	ND<2 (6/21/2010)	(5 - 2)/(15 - 2)	0.230769
3 (6/20/2017)	ND<2 (6/21/2010)	(3 - 2)/(16 - 2)	0.0714286
3 (12/4/2017)	ND<2 (6/21/2010)	(3 - 2)/(17 - 2)	0.0666667
ND<2 0.0019J (6/4/2018)	ND<2 (6/21/2010)	(2 - 2)/(18 - 2)	0
ND<2 (6/21/2011)	ND<2 (12/6/2010)	(2 - 2)/(4 - 3)	0
ND<2 (12/13/2011)	ND<2 (12/6/2010)	(2 - 2)/(5 - 3)	0
ND<2 (6/4/2012)	ND<2 (12/6/2010)	(2 - 2)/(6 - 3)	0
ND<2 (12/11/2012)	ND<2 (12/6/2010)	(2 - 2)/(7 - 3)	0
ND<2 (6/3/2013)	ND<2 (12/6/2010)	(2 - 2)/(8 - 3)	0
ND<2 (12/3/2013)	ND<2 (12/6/2010)	(2 - 2)/(9 - 3)	0
ND<2 (6/2/2014)	ND<2 (12/6/2010)	(2 - 2)/(10 - 3)	0
ND<2 (12/2/2014)	ND<2 (12/6/2010)	(2 - 2)/(11 - 3)	0
4 (6/1/2015)	ND<2 (12/6/2010)	(4 - 2)/(12 - 3)	0.222222
5 (12/7/2015)	ND<2 (12/6/2010)	(5 - 2)/(13 - 3)	0.3
5 (6/6/2016)	ND<2 (12/6/2010)	(5 - 2)/(14 - 3)	0.272727
5 (12/5/2016)	ND<2 (12/6/2010)	(5 - 2)/(15 - 3)	0.25
3 (6/20/2017)	ND<2 (12/6/2010)	(3 - 2)/(16 - 3)	0.0769231
3 (12/4/2017)	ND<2 (12/6/2010)	(3 - 2)/(17 - 3)	0.0714286
ND<2 0.0019J (6/4/2018)	ND<2 (12/6/2010)	(2 - 2)/(18 - 3)	0

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ND<2 (12/13/2011)	ND<2 (6/21/2011)	(2 - 2)/(5 - 4)	0
ND<2 (6/4/2012)	ND<2 (6/21/2011)	(2 - 2)/(6 - 4)	0
ND<2 (12/11/2012)	ND<2 (6/21/2011)	(2 - 2)/(7 - 4)	0
ND<2 (6/3/2013)	ND<2 (6/21/2011)	(2 - 2)/(8 - 4)	0
ND<2 (12/3/2013)	ND<2 (6/21/2011)	(2 - 2)/(9 - 4)	0
ND<2 (6/2/2014)	ND<2 (6/21/2011)	(2 - 2)/(10 - 4)	0
ND<2 (12/2/2014)	ND<2 (6/21/2011)	(2 - 2)/(11 - 4)	0
4 (6/1/2015)	ND<2 (6/21/2011)	(4 - 2)/(12 - 4)	0.25
5 (12/7/2015)	ND<2 (6/21/2011)	(5 - 2)/(13 - 4)	0.333333
5 (6/6/2016)	ND<2 (6/21/2011)	(5 - 2)/(14 - 4)	0.3
5 (12/5/2016)	ND<2 (6/21/2011)	(5 - 2)/(15 - 4)	0.272727
3 (6/20/2017)	ND<2 (6/21/2011)	(3 - 2)/(16 - 4)	0.0833333
3 (12/4/2017)	ND<2 (6/21/2011)	(3 - 2)/(17 - 4)	0.0769231
ND<2 0.0019J (6/4/2018)	ND<2 (6/21/2011)	(2 - 2)/(18 - 4)	0

ND<2 (6/4/2012)	ND<2 (12/13/2011)	(2 - 2)/(6 - 5)	0
ND<2 (12/11/2012)	ND<2 (12/13/2011)	(2 - 2)/(7 - 5)	0
ND<2 (6/3/2013)	ND<2 (12/13/2011)	(2 - 2)/(8 - 5)	0
ND<2 (12/3/2013)	ND<2 (12/13/2011)	(2 - 2)/(9 - 5)	0
ND<2 (6/2/2014)	ND<2 (12/13/2011)	(2 - 2)/(10 - 5)	0
ND<2 (12/2/2014)	ND<2 (12/13/2011)	(2 - 2)/(11 - 5)	0
4 (6/1/2015)	ND<2 (12/13/2011)	(4 - 2)/(12 - 5)	0.285714
5 (12/7/2015)	ND<2 (12/13/2011)	(5 - 2)/(13 - 5)	0.375
5 (6/6/2016)	ND<2 (12/13/2011)	(5 - 2)/(14 - 5)	0.333333
5 (12/5/2016)	ND<2 (12/13/2011)	(5 - 2)/(15 - 5)	0.3
3 (6/20/2017)	ND<2 (12/13/2011)	(3 - 2)/(16 - 5)	0.0909091
3 (12/4/2017)	ND<2 (12/13/2011)	(3 - 2)/(17 - 5)	0.0833333
ND<2 0.0019J (6/4/2018)	ND<2 (12/13/2011)	(2 - 2)/(18 - 5)	0

ND<2 (12/11/2012)	ND<2 (6/4/2012)	(2 - 2)/(7 - 6)	0
ND<2 (6/3/2013)	ND<2 (6/4/2012)	(2 - 2)/(8 - 6)	0
ND<2 (12/3/2013)	ND<2 (6/4/2012)	(2 - 2)/(9 - 6)	0
ND<2 (6/2/2014)	ND<2 (6/4/2012)	(2 - 2)/(10 - 6)	0
ND<2 (12/2/2014)	ND<2 (6/4/2012)	(2 - 2)/(11 - 6)	0
4 (6/1/2015)	ND<2 (6/4/2012)	(4 - 2)/(12 - 6)	0.333333
5 (12/7/2015)	ND<2 (6/4/2012)	(5 - 2)/(13 - 6)	0.428571
5 (6/6/2016)	ND<2 (6/4/2012)	(5 - 2)/(14 - 6)	0.375
5 (12/5/2016)	ND<2 (6/4/2012)	(5 - 2)/(15 - 6)	0.333333
3 (6/20/2017)	ND<2 (6/4/2012)	(3 - 2)/(16 - 6)	0.1
3 (12/4/2017)	ND<2 (6/4/2012)	(3 - 2)/(17 - 6)	0.0909091
ND<2 0.0019J (6/4/2018)	ND<2 (6/4/2012)	(2 - 2)/(18 - 6)	0

ND<2 (6/3/2013)	ND<2 (12/11/2012)	(2 - 2)/(8 - 7)	0
ND<2 (12/3/2013)	ND<2 (12/11/2012)	(2 - 2)/(9 - 7)	0
ND<2 (6/2/2014)	ND<2 (12/11/2012)	(2 - 2)/(10 - 7)	0
ND<2 (12/2/2014)	ND<2 (12/11/2012)	(2 - 2)/(11 - 7)	0
4 (6/1/2015)	ND<2 (12/11/2012)	(4 - 2)/(12 - 7)	0.4
5 (12/7/2015)	ND<2 (12/11/2012)	(5 - 2)/(13 - 7)	0.5
5 (6/6/2016)	ND<2 (12/11/2012)	(5 - 2)/(14 - 7)	0.428571
5 (12/5/2016)	ND<2 (12/11/2012)	(5 - 2)/(15 - 7)	0.375
3 (6/20/2017)	ND<2 (12/11/2012)	(3 - 2)/(16 - 7)	0.111111
3 (12/4/2017)	ND<2 (12/11/2012)	(3 - 2)/(17 - 7)	0.1
ND<2 0.0019J (6/4/2018)	ND<2 (12/11/2012)	(2 - 2)/(18 - 7)	0

ND<2 (12/3/2013)	ND<2 (6/3/2013)	(2 - 2)/(9 - 8)	0
ND<2 (6/2/2014)	ND<2 (6/3/2013)	(2 - 2)/(10 - 8)	0
ND<2 (12/2/2014)	ND<2 (6/3/2013)	(2 - 2)/(11 - 8)	0
4 (6/1/2015)	ND<2 (6/3/2013)	(4 - 2)/(12 - 8)	0.5
5 (12/7/2015)	ND<2 (6/3/2013)	(5 - 2)/(13 - 8)	0.6
5 (6/6/2016)	ND<2 (6/3/2013)	(5 - 2)/(14 - 8)	0.5
5 (12/5/2016)	ND<2 (6/3/2013)	(5 - 2)/(15 - 8)	0.428571
3 (6/20/2017)	ND<2 (6/3/2013)	(3 - 2)/(16 - 8)	0.125
3 (12/4/2017)	ND<2 (6/3/2013)	(3 - 2)/(17 - 8)	0.111111

ND<2 0.0019J (6/4/2018)	ND<2 (6/3/2013)	(2 - 2)/(18 - 8)	0
ND<2 (6/2/2014)	ND<2 (12/3/2013)	(2 - 2)/(10 - 9)	0
ND<2 (12/2/2014)	ND<2 (12/3/2013)	(2 - 2)/(11 - 9)	0
4 (6/1/2015)	ND<2 (12/3/2013)	(4 - 2)/(12 - 9)	0.666667
5 (12/7/2015)	ND<2 (12/3/2013)	(5 - 2)/(13 - 9)	0.75
5 (6/6/2016)	ND<2 (12/3/2013)	(5 - 2)/(14 - 9)	0.6
5 (12/5/2016)	ND<2 (12/3/2013)	(5 - 2)/(15 - 9)	0.5
3 (6/20/2017)	ND<2 (12/3/2013)	(3 - 2)/(16 - 9)	0.142857
3 (12/4/2017)	ND<2 (12/3/2013)	(3 - 2)/(17 - 9)	0.125
ND<2 0.0019J (6/4/2018)	ND<2 (12/3/2013)	(2 - 2)/(18 - 9)	0
ND<2 (12/2/2014)	ND<2 (6/2/2014)	(2 - 2)/(11 - 10)	0
4 (6/1/2015)	ND<2 (6/2/2014)	(4 - 2)/(12 - 10)	1
5 (12/7/2015)	ND<2 (6/2/2014)	(5 - 2)/(13 - 10)	1
5 (6/6/2016)	ND<2 (6/2/2014)	(5 - 2)/(14 - 10)	0.75
5 (12/5/2016)	ND<2 (6/2/2014)	(5 - 2)/(15 - 10)	0.6
3 (6/20/2017)	ND<2 (6/2/2014)	(3 - 2)/(16 - 10)	0.166667
3 (12/4/2017)	ND<2 (6/2/2014)	(3 - 2)/(17 - 10)	0.142857
ND<2 0.0019J (6/4/2018)	ND<2 (6/2/2014)	(2 - 2)/(18 - 10)	0
4 (6/1/2015)	ND<2 (12/2/2014)	(4 - 2)/(12 - 11)	2
5 (12/7/2015)	ND<2 (12/2/2014)	(5 - 2)/(13 - 11)	1.5
5 (6/6/2016)	ND<2 (12/2/2014)	(5 - 2)/(14 - 11)	1
5 (12/5/2016)	ND<2 (12/2/2014)	(5 - 2)/(15 - 11)	0.75
3 (6/20/2017)	ND<2 (12/2/2014)	(3 - 2)/(16 - 11)	0.2
3 (12/4/2017)	ND<2 (12/2/2014)	(3 - 2)/(17 - 11)	0.166667
ND<2 0.0019J (6/4/2018)	ND<2 (12/2/2014)	(2 - 2)/(18 - 11)	0
5 (12/7/2015)	4 (6/1/2015)	(5 - 4)/(13 - 12)	1
5 (6/6/2016)	4 (6/1/2015)	(5 - 4)/(14 - 12)	0.5
5 (12/5/2016)	4 (6/1/2015)	(5 - 4)/(15 - 12)	0.333333
3 (6/20/2017)	4 (6/1/2015)	(3 - 4)/(16 - 12)	-0.25
3 (12/4/2017)	4 (6/1/2015)	(3 - 4)/(17 - 12)	-0.2
ND<2 0.0019J (6/4/2018)	4 (6/1/2015)	(2 - 4)/(18 - 12)	-0.333333
5 (6/6/2016)	5 (12/7/2015)	(5 - 5)/(14 - 13)	0
5 (12/5/2016)	5 (12/7/2015)	(5 - 5)/(15 - 13)	0
3 (6/20/2017)	5 (12/7/2015)	(3 - 5)/(16 - 13)	-0.666667
3 (12/4/2017)	5 (12/7/2015)	(3 - 5)/(17 - 13)	-0.5
ND<2 0.0019J (6/4/2018)	5 (12/7/2015)	(2 - 5)/(18 - 13)	-0.6
5 (12/5/2016)	5 (6/6/2016)	(5 - 5)/(15 - 14)	0
3 (6/20/2017)	5 (6/6/2016)	(3 - 5)/(16 - 14)	-1
3 (12/4/2017)	5 (6/6/2016)	(3 - 5)/(17 - 14)	-0.666667
ND<2 0.0019J (6/4/2018)	5 (6/6/2016)	(2 - 5)/(18 - 14)	-0.75
3 (6/20/2017)	5 (12/5/2016)	(3 - 5)/(16 - 15)	-2
3 (12/4/2017)	5 (12/5/2016)	(3 - 5)/(17 - 15)	-1
ND<2 0.0019J (6/4/2018)	5 (12/5/2016)	(2 - 5)/(18 - 15)	-1
3 (12/4/2017)	3 (6/20/2017)	(3 - 3)/(17 - 16)	0
ND<2 0.0019J (6/4/2018)	3 (6/20/2017)	(2 - 3)/(18 - 16)	-0.5
ND<2 0.0019J (6/4/2018)	3 (12/4/2017)	(2 - 3)/(18 - 17)	-1

Number of Q values = 153

Ordered Q Values

n	Q
1	-2

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2	-1
3	-1
4	-1
5	-1
6	-0.75
7	-0.666667
8	-0.666667
9	-0.6
10	-0.5
11	-0.5
12	-0.333333
13	-0.25
14	-0.2
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0

65	0
66	0
67	0
68	0
69	0
70	0
71	0
72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0.0625
86	0.0666667
87	0.0666667
88	0.0714286
89	0.0714286
90	0.0769231
91	0.0769231
92	0.0833333
93	0.0833333
94	0.0909091
95	0.0909091
96	0.1
97	0.1
98	0.111111
99	0.111111
100	0.125
101	0.125
102	0.142857
103	0.142857
104	0.166667
105	0.166667
106	0.181818
107	0.2
108	0.2
109	0.214286
110	0.222222
111	0.230769
112	0.230769
113	0.25
114	0.25
115	0.25
116	0.25
117	0.272727
118	0.272727
119	0.272727
120	0.285714
121	0.3
122	0.3
123	0.3
124	0.333333
125	0.333333
126	0.333333
127	0.333333

128	0.333333
129	0.375
130	0.375
131	0.375
132	0.4
133	0.428571
134	0.428571
135	0.428571
136	0.5
137	0.5
138	0.5
139	0.5
140	0.5
141	0.6
142	0.6
143	0.6
144	0.666667
145	0.75
146	0.75
147	0.75
148	1
149	1
150	1
151	1
152	1.5
153	2

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	2	12
2	5	3
3	3	2

Time Period	Observations
12/2/2009	1
6/21/2010	1
12/6/2010	1
6/21/2011	1
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 3912
B = 0
C = 1326
D = 0
E = 140
F = 0
a = 12546
b = 44064

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```
c = 612
Group Variance = 479.667
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 56.4141
M1 = (153 - 56.4141)/2.0 = 48.2929
M2 = (153 + 56.4141)/2.0 + 1 = 105.707
Lower limit is 0 = Q(48)
Upper limit is 0.181818 = Q(106)
0 < 0 < 0.181818 indicating no trend in data.
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Sen's Slope Analysis

Parameter: Cadmium, total

Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<2 (6/21/2010)	ND<2 (12/2/2009)	(2 - 2)/(2 - 1)	0
ND<2 (12/6/2010)	ND<2 (12/2/2009)	(2 - 2)/(3 - 1)	0
ND<2 (6/21/2011)	ND<2 (12/2/2009)	(2 - 2)/(4 - 1)	0
ND<2 (12/13/2011)	ND<2 (12/2/2009)	(2 - 2)/(5 - 1)	0
ND<2 (6/4/2012)	ND<2 (12/2/2009)	(2 - 2)/(6 - 1)	0
ND<2 (12/11/2012)	ND<2 (12/2/2009)	(2 - 2)/(7 - 1)	0
ND<2 (6/3/2013)	ND<2 (12/2/2009)	(2 - 2)/(8 - 1)	0
ND<2 (12/3/2013)	ND<2 (12/2/2009)	(2 - 2)/(9 - 1)	0
ND<2 (6/2/2014)	ND<2 (12/2/2009)	(2 - 2)/(10 - 1)	0
ND<2 (12/2/2014)	ND<2 (12/2/2009)	(2 - 2)/(11 - 1)	0
ND<2 (6/1/2015)	ND<2 (12/2/2009)	(2 - 2)/(12 - 1)	0
ND<2 (12/7/2015)	ND<2 (12/2/2009)	(2 - 2)/(13 - 1)	0
ND<2 (6/6/2016)	ND<2 (12/2/2009)	(2 - 2)/(14 - 1)	0
ND<2 (12/5/2016)	ND<2 (12/2/2009)	(2 - 2)/(15 - 1)	0
ND<2 (6/20/2017)	ND<2 (12/2/2009)	(2 - 2)/(16 - 1)	0
ND<2 (12/4/2017)	ND<2 (12/2/2009)	(2 - 2)/(17 - 1)	0
ND<2 (6/4/2018)	ND<2 (12/2/2009)	(2 - 2)/(18 - 1)	0
ND<2 (12/6/2010)	ND<2 (6/21/2010)	(2 - 2)/(3 - 2)	0
ND<2 (6/21/2011)	ND<2 (6/21/2010)	(2 - 2)/(4 - 2)	0
ND<2 (12/13/2011)	ND<2 (6/21/2010)	(2 - 2)/(5 - 2)	0
ND<2 (6/4/2012)	ND<2 (6/21/2010)	(2 - 2)/(6 - 2)	0
ND<2 (12/11/2012)	ND<2 (6/21/2010)	(2 - 2)/(7 - 2)	0
ND<2 (6/3/2013)	ND<2 (6/21/2010)	(2 - 2)/(8 - 2)	0
ND<2 (12/3/2013)	ND<2 (6/21/2010)	(2 - 2)/(9 - 2)	0
ND<2 (6/2/2014)	ND<2 (6/21/2010)	(2 - 2)/(10 - 2)	0
ND<2 (12/2/2014)	ND<2 (6/21/2010)	(2 - 2)/(11 - 2)	0
ND<2 (6/1/2015)	ND<2 (6/21/2010)	(2 - 2)/(12 - 2)	0
ND<2 (12/7/2015)	ND<2 (6/21/2010)	(2 - 2)/(13 - 2)	0
ND<2 (6/6/2016)	ND<2 (6/21/2010)	(2 - 2)/(14 - 2)	0
ND<2 (12/5/2016)	ND<2 (6/21/2010)	(2 - 2)/(15 - 2)	0
ND<2 (6/20/2017)	ND<2 (6/21/2010)	(2 - 2)/(16 - 2)	0
ND<2 (12/4/2017)	ND<2 (6/21/2010)	(2 - 2)/(17 - 2)	0
ND<2 (6/4/2018)	ND<2 (6/21/2010)	(2 - 2)/(18 - 2)	0
ND<2 (6/21/2011)	ND<2 (12/6/2010)	(2 - 2)/(4 - 3)	0
ND<2 (12/13/2011)	ND<2 (12/6/2010)	(2 - 2)/(5 - 3)	0
ND<2 (6/4/2012)	ND<2 (12/6/2010)	(2 - 2)/(6 - 3)	0
ND<2 (12/11/2012)	ND<2 (12/6/2010)	(2 - 2)/(7 - 3)	0
ND<2 (6/3/2013)	ND<2 (12/6/2010)	(2 - 2)/(8 - 3)	0
ND<2 (12/3/2013)	ND<2 (12/6/2010)	(2 - 2)/(9 - 3)	0
ND<2 (6/2/2014)	ND<2 (12/6/2010)	(2 - 2)/(10 - 3)	0
ND<2 (12/2/2014)	ND<2 (12/6/2010)	(2 - 2)/(11 - 3)	0
ND<2 (6/1/2015)	ND<2 (12/6/2010)	(2 - 2)/(12 - 3)	0
ND<2 (12/7/2015)	ND<2 (12/6/2010)	(2 - 2)/(13 - 3)	0
ND<2 (6/6/2016)	ND<2 (12/6/2010)	(2 - 2)/(14 - 3)	0
ND<2 (12/5/2016)	ND<2 (12/6/2010)	(2 - 2)/(15 - 3)	0
ND<2 (6/20/2017)	ND<2 (12/6/2010)	(2 - 2)/(16 - 3)	0
ND<2 (12/4/2017)	ND<2 (12/6/2010)	(2 - 2)/(17 - 3)	0
ND<2 (6/4/2018)	ND<2 (12/6/2010)	(2 - 2)/(18 - 3)	0

ND<2 (12/13/2011)	ND<2 (6/21/2011)	(2 - 2)/(5 - 4)	0
ND<2 (6/4/2012)	ND<2 (6/21/2011)	(2 - 2)/(6 - 4)	0
ND<2 (12/11/2012)	ND<2 (6/21/2011)	(2 - 2)/(7 - 4)	0
ND<2 (6/3/2013)	ND<2 (6/21/2011)	(2 - 2)/(8 - 4)	0
ND<2 (12/3/2013)	ND<2 (6/21/2011)	(2 - 2)/(9 - 4)	0
ND<2 (6/2/2014)	ND<2 (6/21/2011)	(2 - 2)/(10 - 4)	0
ND<2 (12/2/2014)	ND<2 (6/21/2011)	(2 - 2)/(11 - 4)	0
ND<2 (6/1/2015)	ND<2 (6/21/2011)	(2 - 2)/(12 - 4)	0
ND<2 (12/7/2015)	ND<2 (6/21/2011)	(2 - 2)/(13 - 4)	0
ND<2 (6/6/2016)	ND<2 (6/21/2011)	(2 - 2)/(14 - 4)	0
ND<2 (12/5/2016)	ND<2 (6/21/2011)	(2 - 2)/(15 - 4)	0
ND<2 (6/20/2017)	ND<2 (6/21/2011)	(2 - 2)/(16 - 4)	0
ND<2 (12/4/2017)	ND<2 (6/21/2011)	(2 - 2)/(17 - 4)	0
ND<2 (6/4/2018)	ND<2 (6/21/2011)	(2 - 2)/(18 - 4)	0

ND<2 (6/4/2012)	ND<2 (12/13/2011)	(2 - 2)/(6 - 5)	0
ND<2 (12/11/2012)	ND<2 (12/13/2011)	(2 - 2)/(7 - 5)	0
ND<2 (6/3/2013)	ND<2 (12/13/2011)	(2 - 2)/(8 - 5)	0
ND<2 (12/3/2013)	ND<2 (12/13/2011)	(2 - 2)/(9 - 5)	0
ND<2 (6/2/2014)	ND<2 (12/13/2011)	(2 - 2)/(10 - 5)	0
ND<2 (12/2/2014)	ND<2 (12/13/2011)	(2 - 2)/(11 - 5)	0
ND<2 (6/1/2015)	ND<2 (12/13/2011)	(2 - 2)/(12 - 5)	0
ND<2 (12/7/2015)	ND<2 (12/13/2011)	(2 - 2)/(13 - 5)	0
ND<2 (6/6/2016)	ND<2 (12/13/2011)	(2 - 2)/(14 - 5)	0
ND<2 (12/5/2016)	ND<2 (12/13/2011)	(2 - 2)/(15 - 5)	0
ND<2 (6/20/2017)	ND<2 (12/13/2011)	(2 - 2)/(16 - 5)	0
ND<2 (12/4/2017)	ND<2 (12/13/2011)	(2 - 2)/(17 - 5)	0
ND<2 (6/4/2018)	ND<2 (12/13/2011)	(2 - 2)/(18 - 5)	0

ND<2 (12/11/2012)	ND<2 (6/4/2012)	(2 - 2)/(7 - 6)	0
ND<2 (6/3/2013)	ND<2 (6/4/2012)	(2 - 2)/(8 - 6)	0
ND<2 (12/3/2013)	ND<2 (6/4/2012)	(2 - 2)/(9 - 6)	0
ND<2 (6/2/2014)	ND<2 (6/4/2012)	(2 - 2)/(10 - 6)	0
ND<2 (12/2/2014)	ND<2 (6/4/2012)	(2 - 2)/(11 - 6)	0
ND<2 (6/1/2015)	ND<2 (6/4/2012)	(2 - 2)/(12 - 6)	0
ND<2 (12/7/2015)	ND<2 (6/4/2012)	(2 - 2)/(13 - 6)	0
ND<2 (6/6/2016)	ND<2 (6/4/2012)	(2 - 2)/(14 - 6)	0
ND<2 (12/5/2016)	ND<2 (6/4/2012)	(2 - 2)/(15 - 6)	0
ND<2 (6/20/2017)	ND<2 (6/4/2012)	(2 - 2)/(16 - 6)	0
ND<2 (12/4/2017)	ND<2 (6/4/2012)	(2 - 2)/(17 - 6)	0
ND<2 (6/4/2018)	ND<2 (6/4/2012)	(2 - 2)/(18 - 6)	0

ND<2 (6/3/2013)	ND<2 (12/11/2012)	(2 - 2)/(8 - 7)	0
ND<2 (12/3/2013)	ND<2 (12/11/2012)	(2 - 2)/(9 - 7)	0
ND<2 (6/2/2014)	ND<2 (12/11/2012)	(2 - 2)/(10 - 7)	0
ND<2 (12/2/2014)	ND<2 (12/11/2012)	(2 - 2)/(11 - 7)	0
ND<2 (6/1/2015)	ND<2 (12/11/2012)	(2 - 2)/(12 - 7)	0
ND<2 (12/7/2015)	ND<2 (12/11/2012)	(2 - 2)/(13 - 7)	0
ND<2 (6/6/2016)	ND<2 (12/11/2012)	(2 - 2)/(14 - 7)	0
ND<2 (12/5/2016)	ND<2 (12/11/2012)	(2 - 2)/(15 - 7)	0
ND<2 (6/20/2017)	ND<2 (12/11/2012)	(2 - 2)/(16 - 7)	0
ND<2 (12/4/2017)	ND<2 (12/11/2012)	(2 - 2)/(17 - 7)	0
ND<2 (6/4/2018)	ND<2 (12/11/2012)	(2 - 2)/(18 - 7)	0

ND<2 (12/3/2013)	ND<2 (6/3/2013)	(2 - 2)/(9 - 8)	0
ND<2 (6/2/2014)	ND<2 (6/3/2013)	(2 - 2)/(10 - 8)	0
ND<2 (12/2/2014)	ND<2 (6/3/2013)	(2 - 2)/(11 - 8)	0
ND<2 (6/1/2015)	ND<2 (6/3/2013)	(2 - 2)/(12 - 8)	0
ND<2 (12/7/2015)	ND<2 (6/3/2013)	(2 - 2)/(13 - 8)	0
ND<2 (6/6/2016)	ND<2 (6/3/2013)	(2 - 2)/(14 - 8)	0
ND<2 (12/5/2016)	ND<2 (6/3/2013)	(2 - 2)/(15 - 8)	0
ND<2 (6/20/2017)	ND<2 (6/3/2013)	(2 - 2)/(16 - 8)	0
ND<2 (12/4/2017)	ND<2 (6/3/2013)	(2 - 2)/(17 - 8)	0

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ND<2 (6/4/2018)	ND<2 (6/3/2013)	(2 - 2)/(18 - 8)	0
ND<2 (6/2/2014)	ND<2 (12/3/2013)	(2 - 2)/(10 - 9)	0
ND<2 (12/2/2014)	ND<2 (12/3/2013)	(2 - 2)/(11 - 9)	0
ND<2 (6/1/2015)	ND<2 (12/3/2013)	(2 - 2)/(12 - 9)	0
ND<2 (12/7/2015)	ND<2 (12/3/2013)	(2 - 2)/(13 - 9)	0
ND<2 (6/6/2016)	ND<2 (12/3/2013)	(2 - 2)/(14 - 9)	0
ND<2 (12/5/2016)	ND<2 (12/3/2013)	(2 - 2)/(15 - 9)	0
ND<2 (6/20/2017)	ND<2 (12/3/2013)	(2 - 2)/(16 - 9)	0
ND<2 (12/4/2017)	ND<2 (12/3/2013)	(2 - 2)/(17 - 9)	0
ND<2 (6/4/2018)	ND<2 (12/3/2013)	(2 - 2)/(18 - 9)	0
ND<2 (12/2/2014)	ND<2 (6/2/2014)	(2 - 2)/(11 - 10)	0
ND<2 (6/1/2015)	ND<2 (6/2/2014)	(2 - 2)/(12 - 10)	0
ND<2 (12/7/2015)	ND<2 (6/2/2014)	(2 - 2)/(13 - 10)	0
ND<2 (6/6/2016)	ND<2 (6/2/2014)	(2 - 2)/(14 - 10)	0
ND<2 (12/5/2016)	ND<2 (6/2/2014)	(2 - 2)/(15 - 10)	0
ND<2 (6/20/2017)	ND<2 (6/2/2014)	(2 - 2)/(16 - 10)	0
ND<2 (12/4/2017)	ND<2 (6/2/2014)	(2 - 2)/(17 - 10)	0
ND<2 (6/4/2018)	ND<2 (6/2/2014)	(2 - 2)/(18 - 10)	0
ND<2 (6/1/2015)	ND<2 (12/2/2014)	(2 - 2)/(12 - 11)	0
ND<2 (12/7/2015)	ND<2 (12/2/2014)	(2 - 2)/(13 - 11)	0
ND<2 (6/6/2016)	ND<2 (12/2/2014)	(2 - 2)/(14 - 11)	0
ND<2 (12/5/2016)	ND<2 (12/2/2014)	(2 - 2)/(15 - 11)	0
ND<2 (6/20/2017)	ND<2 (12/2/2014)	(2 - 2)/(16 - 11)	0
ND<2 (12/4/2017)	ND<2 (12/2/2014)	(2 - 2)/(17 - 11)	0
ND<2 (6/4/2018)	ND<2 (12/2/2014)	(2 - 2)/(18 - 11)	0
ND<2 (12/7/2015)	ND<2 (6/1/2015)	(2 - 2)/(13 - 12)	0
ND<2 (6/6/2016)	ND<2 (6/1/2015)	(2 - 2)/(14 - 12)	0
ND<2 (12/5/2016)	ND<2 (6/1/2015)	(2 - 2)/(15 - 12)	0
ND<2 (6/20/2017)	ND<2 (6/1/2015)	(2 - 2)/(16 - 12)	0
ND<2 (12/4/2017)	ND<2 (6/1/2015)	(2 - 2)/(17 - 12)	0
ND<2 (6/4/2018)	ND<2 (6/1/2015)	(2 - 2)/(18 - 12)	0
ND<2 (6/6/2016)	ND<2 (12/7/2015)	(2 - 2)/(14 - 13)	0
ND<2 (12/5/2016)	ND<2 (12/7/2015)	(2 - 2)/(15 - 13)	0
ND<2 (6/20/2017)	ND<2 (12/7/2015)	(2 - 2)/(16 - 13)	0
ND<2 (12/4/2017)	ND<2 (12/7/2015)	(2 - 2)/(17 - 13)	0
ND<2 (6/4/2018)	ND<2 (12/7/2015)	(2 - 2)/(18 - 13)	0
ND<2 (12/5/2016)	ND<2 (6/6/2016)	(2 - 2)/(15 - 14)	0
ND<2 (6/20/2017)	ND<2 (6/6/2016)	(2 - 2)/(16 - 14)	0
ND<2 (12/4/2017)	ND<2 (6/6/2016)	(2 - 2)/(17 - 14)	0
ND<2 (6/4/2018)	ND<2 (6/6/2016)	(2 - 2)/(18 - 14)	0
ND<2 (6/20/2017)	ND<2 (12/5/2016)	(2 - 2)/(16 - 15)	0
ND<2 (12/4/2017)	ND<2 (12/5/2016)	(2 - 2)/(17 - 15)	0
ND<2 (6/4/2018)	ND<2 (12/5/2016)	(2 - 2)/(18 - 15)	0
ND<2 (12/4/2017)	ND<2 (6/20/2017)	(2 - 2)/(17 - 16)	0
ND<2 (6/4/2018)	ND<2 (6/20/2017)	(2 - 2)/(18 - 16)	0
ND<2 (6/4/2018)	ND<2 (12/4/2017)	(2 - 2)/(18 - 17)	0

Number of Q values = 153

Ordered Q Values

n	Q
1	0

Royalton Road LF

2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0

Royalton Road LF

65	0
66	0
67	0
68	0
69	0
70	0
71	0
72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0
92	0
93	0
94	0
95	0
96	0
97	0
98	0
99	0
100	0
101	0
102	0
103	0
104	0
105	0
106	0
107	0
108	0
109	0
110	0
111	0
112	0
113	0
114	0
115	0
116	0
117	0
118	0
119	0
120	0
121	0
122	0
123	0
124	0
125	0
126	0
127	0

128	0
129	0
130	0
131	0
132	0
133	0
134	0
135	0
136	0
137	0
138	0
139	0
140	0
141	0
142	0
143	0
144	0
145	0
146	0
147	0
148	0
149	0
150	0
151	0
152	0
153	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	2	18

Time Period	Observations
12/2/2009	1
6/21/2010	1
12/6/2010	1
6/21/2011	1
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 12546
B = 0
C = 4896
D = 0
E = 306
F = 0
a = 12546
b = 44064
c = 612
Group Variance = 0

For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (153 - 0)/2.0 = 76.5
M2 = (153 + 0)/2.0 + 1 = 77.5
Lower limit is 0 = Q(77)
Upper limit is 0 = Q(78)
0 < 0 < 0 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis

Parameter: Chloride

Location: MW-2R

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
5000 (4/14/2003)	5000 (10/14/2002)	(5000 - 5000)/(2 - 1)	0
5000 (11/3/2003)	5000 (10/14/2002)	(5000 - 5000)/(3 - 1)	0
5000 (5/23/2005)	5000 (10/14/2002)	(5000 - 5000)/(4 - 1)	0
4700 (11/14/2005)	5000 (10/14/2002)	(4700 - 5000)/(5 - 1)	-75
4770 (5/22/2006)	5000 (10/14/2002)	(4770 - 5000)/(6 - 1)	-46
4000 (11/13/2006)	5000 (10/14/2002)	(4000 - 5000)/(7 - 1)	-166.667
6100 (6/25/2007)	5000 (10/14/2002)	(6100 - 5000)/(8 - 1)	157.143
5000 (12/17/2007)	5000 (10/14/2002)	(5000 - 5000)/(9 - 1)	0
4800 (6/16/2008)	5000 (10/14/2002)	(4800 - 5000)/(10 - 1)	-22.2222
5000 (12/2/2008)	5000 (10/14/2002)	(5000 - 5000)/(11 - 1)	0
9000 (6/21/2010)	5000 (10/14/2002)	(9000 - 5000)/(12 - 1)	363.636
6000 (12/6/2010)	5000 (10/14/2002)	(6000 - 5000)/(13 - 1)	83.3333
4000 (6/21/2011)	5000 (10/14/2002)	(4000 - 5000)/(14 - 1)	-76.9231
7000 (12/13/2011)	5000 (10/14/2002)	(7000 - 5000)/(15 - 1)	142.857
4000 (6/4/2012)	5000 (10/14/2002)	(4000 - 5000)/(16 - 1)	-66.6667
11000 (12/11/2012)	5000 (10/14/2002)	(11000 - 5000)/(17 - 1)	375
6000 (12/3/2013)	5000 (10/14/2002)	(6000 - 5000)/(18 - 1)	58.8235
5000 (6/2/2014)	5000 (10/14/2002)	(5000 - 5000)/(19 - 1)	0
5000 (12/2/2014)	5000 (10/14/2002)	(5000 - 5000)/(20 - 1)	0
11000 (12/5/2016)	5000 (10/14/2002)	(11000 - 5000)/(21 - 1)	300
11000 (6/20/2017)	5000 (10/14/2002)	(11000 - 5000)/(22 - 1)	285.714
6000 (12/4/2017)	5000 (10/14/2002)	(6000 - 5000)/(23 - 1)	45.4545
5000 (11/3/2003)	5000 (4/14/2003)	(5000 - 5000)/(3 - 2)	0
5000 (5/23/2005)	5000 (4/14/2003)	(5000 - 5000)/(4 - 2)	0
4700 (11/14/2005)	5000 (4/14/2003)	(4700 - 5000)/(5 - 2)	-100
4770 (5/22/2006)	5000 (4/14/2003)	(4770 - 5000)/(6 - 2)	-57.5
4000 (11/13/2006)	5000 (4/14/2003)	(4000 - 5000)/(7 - 2)	-200
6100 (6/25/2007)	5000 (4/14/2003)	(6100 - 5000)/(8 - 2)	183.333
5000 (12/17/2007)	5000 (4/14/2003)	(5000 - 5000)/(9 - 2)	0
4800 (6/16/2008)	5000 (4/14/2003)	(4800 - 5000)/(10 - 2)	-25
5000 (12/2/2008)	5000 (4/14/2003)	(5000 - 5000)/(11 - 2)	0
9000 (6/21/2010)	5000 (4/14/2003)	(9000 - 5000)/(12 - 2)	400
6000 (12/6/2010)	5000 (4/14/2003)	(6000 - 5000)/(13 - 2)	90.9091
4000 (6/21/2011)	5000 (4/14/2003)	(4000 - 5000)/(14 - 2)	-83.3333
7000 (12/13/2011)	5000 (4/14/2003)	(7000 - 5000)/(15 - 2)	153.846
4000 (6/4/2012)	5000 (4/14/2003)	(4000 - 5000)/(16 - 2)	-71.4286
11000 (12/11/2012)	5000 (4/14/2003)	(11000 - 5000)/(17 - 2)	400
6000 (12/3/2013)	5000 (4/14/2003)	(6000 - 5000)/(18 - 2)	62.5
5000 (6/2/2014)	5000 (4/14/2003)	(5000 - 5000)/(19 - 2)	0
5000 (12/2/2014)	5000 (4/14/2003)	(5000 - 5000)/(20 - 2)	0
11000 (12/5/2016)	5000 (4/14/2003)	(11000 - 5000)/(21 - 2)	315.789
11000 (6/20/2017)	5000 (4/14/2003)	(11000 - 5000)/(22 - 2)	300
6000 (12/4/2017)	5000 (4/14/2003)	(6000 - 5000)/(23 - 2)	47.619
5000 (5/23/2005)	5000 (11/3/2003)	(5000 - 5000)/(4 - 3)	0
4700 (11/14/2005)	5000 (11/3/2003)	(4700 - 5000)/(5 - 3)	-150
4770 (5/22/2006)	5000 (11/3/2003)	(4770 - 5000)/(6 - 3)	-76.6667
4000 (11/13/2006)	5000 (11/3/2003)	(4000 - 5000)/(7 - 3)	-250
6100 (6/25/2007)	5000 (11/3/2003)	(6100 - 5000)/(8 - 3)	220
5000 (12/17/2007)	5000 (11/3/2003)	(5000 - 5000)/(9 - 3)	0

Royalton Road LF

4800 (6/16/2008)	5000 (11/3/2003)	(4800 - 5000)/(10 - 3)	-28.5714
5000 (12/2/2008)	5000 (11/3/2003)	(5000 - 5000)/(11 - 3)	0
9000 (6/21/2010)	5000 (11/3/2003)	(9000 - 5000)/(12 - 3)	444.444
6000 (12/6/2010)	5000 (11/3/2003)	(6000 - 5000)/(13 - 3)	100
4000 (6/21/2011)	5000 (11/3/2003)	(4000 - 5000)/(14 - 3)	-90.9091
7000 (12/13/2011)	5000 (11/3/2003)	(7000 - 5000)/(15 - 3)	166.667
4000 (6/4/2012)	5000 (11/3/2003)	(4000 - 5000)/(16 - 3)	-76.9231
11000 (12/11/2012)	5000 (11/3/2003)	(11000 - 5000)/(17 - 3)	428.571
6000 (12/3/2013)	5000 (11/3/2003)	(6000 - 5000)/(18 - 3)	66.6667
5000 (6/2/2014)	5000 (11/3/2003)	(5000 - 5000)/(19 - 3)	0
5000 (12/2/2014)	5000 (11/3/2003)	(5000 - 5000)/(20 - 3)	0
11000 (12/5/2016)	5000 (11/3/2003)	(11000 - 5000)/(21 - 3)	333.333
11000 (6/20/2017)	5000 (11/3/2003)	(11000 - 5000)/(22 - 3)	315.789
6000 (12/4/2017)	5000 (11/3/2003)	(6000 - 5000)/(23 - 3)	50
4700 (11/14/2005)	5000 (5/23/2005)	(4700 - 5000)/(5 - 4)	-300
4770 (5/22/2006)	5000 (5/23/2005)	(4770 - 5000)/(6 - 4)	-115
4000 (11/13/2006)	5000 (5/23/2005)	(4000 - 5000)/(7 - 4)	-333.333
6100 (6/25/2007)	5000 (5/23/2005)	(6100 - 5000)/(8 - 4)	275
5000 (12/17/2007)	5000 (5/23/2005)	(5000 - 5000)/(9 - 4)	0
4800 (6/16/2008)	5000 (5/23/2005)	(4800 - 5000)/(10 - 4)	-33.3333
5000 (12/2/2008)	5000 (5/23/2005)	(5000 - 5000)/(11 - 4)	0
9000 (6/21/2010)	5000 (5/23/2005)	(9000 - 5000)/(12 - 4)	500
6000 (12/6/2010)	5000 (5/23/2005)	(6000 - 5000)/(13 - 4)	111.111
4000 (6/21/2011)	5000 (5/23/2005)	(4000 - 5000)/(14 - 4)	-100
7000 (12/13/2011)	5000 (5/23/2005)	(7000 - 5000)/(15 - 4)	181.818
4000 (6/4/2012)	5000 (5/23/2005)	(4000 - 5000)/(16 - 4)	-83.3333
11000 (12/11/2012)	5000 (5/23/2005)	(11000 - 5000)/(17 - 4)	461.538
6000 (12/3/2013)	5000 (5/23/2005)	(6000 - 5000)/(18 - 4)	71.4286
5000 (6/2/2014)	5000 (5/23/2005)	(5000 - 5000)/(19 - 4)	0
5000 (12/2/2014)	5000 (5/23/2005)	(5000 - 5000)/(20 - 4)	0
11000 (12/5/2016)	5000 (5/23/2005)	(11000 - 5000)/(21 - 4)	352.941
11000 (6/20/2017)	5000 (5/23/2005)	(11000 - 5000)/(22 - 4)	333.333
6000 (12/4/2017)	5000 (5/23/2005)	(6000 - 5000)/(23 - 4)	52.6316
4770 (5/22/2006)	4700 (11/14/2005)	(4770 - 4700)/(6 - 5)	70
4000 (11/13/2006)	4700 (11/14/2005)	(4000 - 4700)/(7 - 5)	-350
6100 (6/25/2007)	4700 (11/14/2005)	(6100 - 4700)/(8 - 5)	466.667
5000 (12/17/2007)	4700 (11/14/2005)	(5000 - 4700)/(9 - 5)	75
4800 (6/16/2008)	4700 (11/14/2005)	(4800 - 4700)/(10 - 5)	20
5000 (12/2/2008)	4700 (11/14/2005)	(5000 - 4700)/(11 - 5)	50
9000 (6/21/2010)	4700 (11/14/2005)	(9000 - 4700)/(12 - 5)	614.286
6000 (12/6/2010)	4700 (11/14/2005)	(6000 - 4700)/(13 - 5)	162.5
4000 (6/21/2011)	4700 (11/14/2005)	(4000 - 4700)/(14 - 5)	-77.7778
7000 (12/13/2011)	4700 (11/14/2005)	(7000 - 4700)/(15 - 5)	230
4000 (6/4/2012)	4700 (11/14/2005)	(4000 - 4700)/(16 - 5)	-63.6364
11000 (12/11/2012)	4700 (11/14/2005)	(11000 - 4700)/(17 - 5)	525
6000 (12/3/2013)	4700 (11/14/2005)	(6000 - 4700)/(18 - 5)	100
5000 (6/2/2014)	4700 (11/14/2005)	(5000 - 4700)/(19 - 5)	21.4286
5000 (12/2/2014)	4700 (11/14/2005)	(5000 - 4700)/(20 - 5)	20
11000 (12/5/2016)	4700 (11/14/2005)	(11000 - 4700)/(21 - 5)	393.75
11000 (6/20/2017)	4700 (11/14/2005)	(11000 - 4700)/(22 - 5)	370.588
6000 (12/4/2017)	4700 (11/14/2005)	(6000 - 4700)/(23 - 5)	72.2222
4000 (11/13/2006)	4770 (5/22/2006)	(4000 - 4770)/(7 - 6)	-770
6100 (6/25/2007)	4770 (5/22/2006)	(6100 - 4770)/(8 - 6)	665
5000 (12/17/2007)	4770 (5/22/2006)	(5000 - 4770)/(9 - 6)	76.6667
4800 (6/16/2008)	4770 (5/22/2006)	(4800 - 4770)/(10 - 6)	7.5
5000 (12/2/2008)	4770 (5/22/2006)	(5000 - 4770)/(11 - 6)	46
9000 (6/21/2010)	4770 (5/22/2006)	(9000 - 4770)/(12 - 6)	705
6000 (12/6/2010)	4770 (5/22/2006)	(6000 - 4770)/(13 - 6)	175.714
4000 (6/21/2011)	4770 (5/22/2006)	(4000 - 4770)/(14 - 6)	-96.25
7000 (12/13/2011)	4770 (5/22/2006)	(7000 - 4770)/(15 - 6)	247.778

4000 (6/4/2012)	4770 (5/22/2006)	(4000 - 4770)/(16 - 6)	-77
11000 (12/11/2012)	4770 (5/22/2006)	(11000 - 4770)/(17 - 6)	566.364
6000 (12/3/2013)	4770 (5/22/2006)	(6000 - 4770)/(18 - 6)	102.5
5000 (6/2/2014)	4770 (5/22/2006)	(5000 - 4770)/(19 - 6)	17.6923
5000 (12/2/2014)	4770 (5/22/2006)	(5000 - 4770)/(20 - 6)	16.4286
11000 (12/5/2016)	4770 (5/22/2006)	(11000 - 4770)/(21 - 6)	415.333
11000 (6/20/2017)	4770 (5/22/2006)	(11000 - 4770)/(22 - 6)	389.375
6000 (12/4/2017)	4770 (5/22/2006)	(6000 - 4770)/(23 - 6)	72.3529

6100 (6/25/2007)	4000 (11/13/2006)	(6100 - 4000)/(8 - 7)	2100
5000 (12/17/2007)	4000 (11/13/2006)	(5000 - 4000)/(9 - 7)	500
4800 (6/16/2008)	4000 (11/13/2006)	(4800 - 4000)/(10 - 7)	266.667
5000 (12/2/2008)	4000 (11/13/2006)	(5000 - 4000)/(11 - 7)	250
9000 (6/21/2010)	4000 (11/13/2006)	(9000 - 4000)/(12 - 7)	1000
6000 (12/6/2010)	4000 (11/13/2006)	(6000 - 4000)/(13 - 7)	333.333
4000 (6/21/2011)	4000 (11/13/2006)	(4000 - 4000)/(14 - 7)	0
7000 (12/13/2011)	4000 (11/13/2006)	(7000 - 4000)/(15 - 7)	375
4000 (6/4/2012)	4000 (11/13/2006)	(4000 - 4000)/(16 - 7)	0
11000 (12/11/2012)	4000 (11/13/2006)	(11000 - 4000)/(17 - 7)	700
6000 (12/3/2013)	4000 (11/13/2006)	(6000 - 4000)/(18 - 7)	181.818
5000 (6/2/2014)	4000 (11/13/2006)	(5000 - 4000)/(19 - 7)	83.3333
5000 (12/2/2014)	4000 (11/13/2006)	(5000 - 4000)/(20 - 7)	76.9231
11000 (12/5/2016)	4000 (11/13/2006)	(11000 - 4000)/(21 - 7)	500
11000 (6/20/2017)	4000 (11/13/2006)	(11000 - 4000)/(22 - 7)	466.667
6000 (12/4/2017)	4000 (11/13/2006)	(6000 - 4000)/(23 - 7)	125

5000 (12/17/2007)	6100 (6/25/2007)	(5000 - 6100)/(9 - 8)	-1100
4800 (6/16/2008)	6100 (6/25/2007)	(4800 - 6100)/(10 - 8)	-650
5000 (12/2/2008)	6100 (6/25/2007)	(5000 - 6100)/(11 - 8)	-366.667
9000 (6/21/2010)	6100 (6/25/2007)	(9000 - 6100)/(12 - 8)	725
6000 (12/6/2010)	6100 (6/25/2007)	(6000 - 6100)/(13 - 8)	-20
4000 (6/21/2011)	6100 (6/25/2007)	(4000 - 6100)/(14 - 8)	-350
7000 (12/13/2011)	6100 (6/25/2007)	(7000 - 6100)/(15 - 8)	128.571
4000 (6/4/2012)	6100 (6/25/2007)	(4000 - 6100)/(16 - 8)	-262.5
11000 (12/11/2012)	6100 (6/25/2007)	(11000 - 6100)/(17 - 8)	544.444
6000 (12/3/2013)	6100 (6/25/2007)	(6000 - 6100)/(18 - 8)	-10
5000 (6/2/2014)	6100 (6/25/2007)	(5000 - 6100)/(19 - 8)	-100
5000 (12/2/2014)	6100 (6/25/2007)	(5000 - 6100)/(20 - 8)	-91.6667
11000 (12/5/2016)	6100 (6/25/2007)	(11000 - 6100)/(21 - 8)	376.923
11000 (6/20/2017)	6100 (6/25/2007)	(11000 - 6100)/(22 - 8)	350
6000 (12/4/2017)	6100 (6/25/2007)	(6000 - 6100)/(23 - 8)	-6.66667

4800 (6/16/2008)	5000 (12/17/2007)	(4800 - 5000)/(10 - 9)	-200
5000 (12/2/2008)	5000 (12/17/2007)	(5000 - 5000)/(11 - 9)	0
9000 (6/21/2010)	5000 (12/17/2007)	(9000 - 5000)/(12 - 9)	1333.33
6000 (12/6/2010)	5000 (12/17/2007)	(6000 - 5000)/(13 - 9)	250
4000 (6/21/2011)	5000 (12/17/2007)	(4000 - 5000)/(14 - 9)	-200
7000 (12/13/2011)	5000 (12/17/2007)	(7000 - 5000)/(15 - 9)	333.333
4000 (6/4/2012)	5000 (12/17/2007)	(4000 - 5000)/(16 - 9)	-142.857
11000 (12/11/2012)	5000 (12/17/2007)	(11000 - 5000)/(17 - 9)	750
6000 (12/3/2013)	5000 (12/17/2007)	(6000 - 5000)/(18 - 9)	111.111
5000 (6/2/2014)	5000 (12/17/2007)	(5000 - 5000)/(19 - 9)	0
5000 (12/2/2014)	5000 (12/17/2007)	(5000 - 5000)/(20 - 9)	0
11000 (12/5/2016)	5000 (12/17/2007)	(11000 - 5000)/(21 - 9)	500
11000 (6/20/2017)	5000 (12/17/2007)	(11000 - 5000)/(22 - 9)	461.538
6000 (12/4/2017)	5000 (12/17/2007)	(6000 - 5000)/(23 - 9)	71.4286

5000 (12/2/2008)	4800 (6/16/2008)	(5000 - 4800)/(11 - 10)	200
9000 (6/21/2010)	4800 (6/16/2008)	(9000 - 4800)/(12 - 10)	2100
6000 (12/6/2010)	4800 (6/16/2008)	(6000 - 4800)/(13 - 10)	400
4000 (6/21/2011)	4800 (6/16/2008)	(4000 - 4800)/(14 - 10)	-200
7000 (12/13/2011)	4800 (6/16/2008)	(7000 - 4800)/(15 - 10)	440
4000 (6/4/2012)	4800 (6/16/2008)	(4000 - 4800)/(16 - 10)	-133.333

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11000 (12/11/2012)	4800 (6/16/2008)	(11000 - 4800)/(17 - 10)	885.714
6000 (12/3/2013)	4800 (6/16/2008)	(6000 - 4800)/(18 - 10)	150
5000 (6/2/2014)	4800 (6/16/2008)	(5000 - 4800)/(19 - 10)	22.2222
5000 (12/2/2014)	4800 (6/16/2008)	(5000 - 4800)/(20 - 10)	20
11000 (12/5/2016)	4800 (6/16/2008)	(11000 - 4800)/(21 - 10)	563.636
11000 (6/20/2017)	4800 (6/16/2008)	(11000 - 4800)/(22 - 10)	516.667
6000 (12/4/2017)	4800 (6/16/2008)	(6000 - 4800)/(23 - 10)	92.3077
9000 (6/21/2010)	5000 (12/2/2008)	(9000 - 5000)/(12 - 11)	4000
6000 (12/6/2010)	5000 (12/2/2008)	(6000 - 5000)/(13 - 11)	500
4000 (6/21/2011)	5000 (12/2/2008)	(4000 - 5000)/(14 - 11)	-333.333
7000 (12/13/2011)	5000 (12/2/2008)	(7000 - 5000)/(15 - 11)	500
4000 (6/4/2012)	5000 (12/2/2008)	(4000 - 5000)/(16 - 11)	-200
11000 (12/11/2012)	5000 (12/2/2008)	(11000 - 5000)/(17 - 11)	1000
6000 (12/3/2013)	5000 (12/2/2008)	(6000 - 5000)/(18 - 11)	142.857
5000 (6/2/2014)	5000 (12/2/2008)	(5000 - 5000)/(19 - 11)	0
5000 (12/2/2014)	5000 (12/2/2008)	(5000 - 5000)/(20 - 11)	0
11000 (12/5/2016)	5000 (12/2/2008)	(11000 - 5000)/(21 - 11)	600
11000 (6/20/2017)	5000 (12/2/2008)	(11000 - 5000)/(22 - 11)	545.455
6000 (12/4/2017)	5000 (12/2/2008)	(6000 - 5000)/(23 - 11)	83.3333
6000 (12/6/2010)	9000 (6/21/2010)	(6000 - 9000)/(13 - 12)	-3000
4000 (6/21/2011)	9000 (6/21/2010)	(4000 - 9000)/(14 - 12)	-2500
7000 (12/13/2011)	9000 (6/21/2010)	(7000 - 9000)/(15 - 12)	-666.667
4000 (6/4/2012)	9000 (6/21/2010)	(4000 - 9000)/(16 - 12)	-1250
11000 (12/11/2012)	9000 (6/21/2010)	(11000 - 9000)/(17 - 12)	400
6000 (12/3/2013)	9000 (6/21/2010)	(6000 - 9000)/(18 - 12)	-500
5000 (6/2/2014)	9000 (6/21/2010)	(5000 - 9000)/(19 - 12)	-571.429
5000 (12/2/2014)	9000 (6/21/2010)	(5000 - 9000)/(20 - 12)	-500
11000 (12/5/2016)	9000 (6/21/2010)	(11000 - 9000)/(21 - 12)	222.222
11000 (6/20/2017)	9000 (6/21/2010)	(11000 - 9000)/(22 - 12)	200
6000 (12/4/2017)	9000 (6/21/2010)	(6000 - 9000)/(23 - 12)	-272.727
4000 (6/21/2011)	6000 (12/6/2010)	(4000 - 6000)/(14 - 13)	-2000
7000 (12/13/2011)	6000 (12/6/2010)	(7000 - 6000)/(15 - 13)	500
4000 (6/4/2012)	6000 (12/6/2010)	(4000 - 6000)/(16 - 13)	-666.667
11000 (12/11/2012)	6000 (12/6/2010)	(11000 - 6000)/(17 - 13)	1250
6000 (12/3/2013)	6000 (12/6/2010)	(6000 - 6000)/(18 - 13)	0
5000 (6/2/2014)	6000 (12/6/2010)	(5000 - 6000)/(19 - 13)	-166.667
5000 (12/2/2014)	6000 (12/6/2010)	(5000 - 6000)/(20 - 13)	-142.857
11000 (12/5/2016)	6000 (12/6/2010)	(11000 - 6000)/(21 - 13)	625
11000 (6/20/2017)	6000 (12/6/2010)	(11000 - 6000)/(22 - 13)	555.556
6000 (12/4/2017)	6000 (12/6/2010)	(6000 - 6000)/(23 - 13)	0
7000 (12/13/2011)	4000 (6/21/2011)	(7000 - 4000)/(15 - 14)	3000
4000 (6/4/2012)	4000 (6/21/2011)	(4000 - 4000)/(16 - 14)	0
11000 (12/11/2012)	4000 (6/21/2011)	(11000 - 4000)/(17 - 14)	2333.33
6000 (12/3/2013)	4000 (6/21/2011)	(6000 - 4000)/(18 - 14)	500
5000 (6/2/2014)	4000 (6/21/2011)	(5000 - 4000)/(19 - 14)	200
5000 (12/2/2014)	4000 (6/21/2011)	(5000 - 4000)/(20 - 14)	166.667
11000 (12/5/2016)	4000 (6/21/2011)	(11000 - 4000)/(21 - 14)	1000
11000 (6/20/2017)	4000 (6/21/2011)	(11000 - 4000)/(22 - 14)	875
6000 (12/4/2017)	4000 (6/21/2011)	(6000 - 4000)/(23 - 14)	222.222
4000 (6/4/2012)	7000 (12/13/2011)	(4000 - 7000)/(16 - 15)	-3000
11000 (12/11/2012)	7000 (12/13/2011)	(11000 - 7000)/(17 - 15)	2000
6000 (12/3/2013)	7000 (12/13/2011)	(6000 - 7000)/(18 - 15)	-333.333
5000 (6/2/2014)	7000 (12/13/2011)	(5000 - 7000)/(19 - 15)	-500
5000 (12/2/2014)	7000 (12/13/2011)	(5000 - 7000)/(20 - 15)	-400
11000 (12/5/2016)	7000 (12/13/2011)	(11000 - 7000)/(21 - 15)	666.667
11000 (6/20/2017)	7000 (12/13/2011)	(11000 - 7000)/(22 - 15)	571.429
6000 (12/4/2017)	7000 (12/13/2011)	(6000 - 7000)/(23 - 15)	-125

11000 (12/11/2012)	4000 (6/4/2012)	(11000 - 4000)/(17 - 16)	7000
6000 (12/3/2013)	4000 (6/4/2012)	(6000 - 4000)/(18 - 16)	1000
5000 (6/2/2014)	4000 (6/4/2012)	(5000 - 4000)/(19 - 16)	333.333
5000 (12/2/2014)	4000 (6/4/2012)	(5000 - 4000)/(20 - 16)	250
11000 (12/5/2016)	4000 (6/4/2012)	(11000 - 4000)/(21 - 16)	1400
11000 (6/20/2017)	4000 (6/4/2012)	(11000 - 4000)/(22 - 16)	1166.67
6000 (12/4/2017)	4000 (6/4/2012)	(6000 - 4000)/(23 - 16)	285.714
6000 (12/3/2013)	11000 (12/11/2012)	(6000 - 11000)/(18 - 17)	-5000
5000 (6/2/2014)	11000 (12/11/2012)	(5000 - 11000)/(19 - 17)	-3000
5000 (12/2/2014)	11000 (12/11/2012)	(5000 - 11000)/(20 - 17)	-2000
11000 (12/5/2016)	11000 (12/11/2012)	(11000 - 11000)/(21 - 17)	0
11000 (6/20/2017)	11000 (12/11/2012)	(11000 - 11000)/(22 - 17)	0
6000 (12/4/2017)	11000 (12/11/2012)	(6000 - 11000)/(23 - 17)	-833.333
5000 (6/2/2014)	6000 (12/3/2013)	(5000 - 6000)/(19 - 18)	-1000
5000 (12/2/2014)	6000 (12/3/2013)	(5000 - 6000)/(20 - 18)	-500
11000 (12/5/2016)	6000 (12/3/2013)	(11000 - 6000)/(21 - 18)	1666.67
11000 (6/20/2017)	6000 (12/3/2013)	(11000 - 6000)/(22 - 18)	1250
6000 (12/4/2017)	6000 (12/3/2013)	(6000 - 6000)/(23 - 18)	0
5000 (12/2/2014)	5000 (6/2/2014)	(5000 - 5000)/(20 - 19)	0
11000 (12/5/2016)	5000 (6/2/2014)	(11000 - 5000)/(21 - 19)	3000
11000 (6/20/2017)	5000 (6/2/2014)	(11000 - 5000)/(22 - 19)	2000
6000 (12/4/2017)	5000 (6/2/2014)	(6000 - 5000)/(23 - 19)	250
11000 (12/5/2016)	5000 (12/2/2014)	(11000 - 5000)/(21 - 20)	6000
11000 (6/20/2017)	5000 (12/2/2014)	(11000 - 5000)/(22 - 20)	3000
6000 (12/4/2017)	5000 (12/2/2014)	(6000 - 5000)/(23 - 20)	333.333
11000 (6/20/2017)	11000 (12/5/2016)	(11000 - 11000)/(22 - 21)	0
6000 (12/4/2017)	11000 (12/5/2016)	(6000 - 11000)/(23 - 21)	-2500
6000 (12/4/2017)	11000 (6/20/2017)	(6000 - 11000)/(23 - 22)	-5000

Number of Q values = 253

Ordered Q Values

n	Q
1	-5000
2	-5000
3	-3000
4	-3000
5	-3000
6	-2500
7	-2500
8	-2000
9	-2000
10	-1250
11	-1100
12	-1000
13	-833.333
14	-770
15	-666.667
16	-666.667
17	-650
18	-571.429
19	-500
20	-500
21	-500
22	-500

23	-400
24	-366.667
25	-350
26	-350
27	-333.333
28	-333.333
29	-333.333
30	-300
31	-272.727
32	-262.5
33	-250
34	-200
35	-200
36	-200
37	-200
38	-200
39	-166.667
40	-166.667
41	-150
42	-142.857
43	-142.857
44	-133.333
45	-125
46	-115
47	-100
48	-100
49	-100
50	-96.25
51	-91.6667
52	-90.9091
53	-83.3333
54	-83.3333
55	-77.7778
56	-77
57	-76.9231
58	-76.9231
59	-76.6667
60	-75
61	-71.4286
62	-66.6667
63	-63.6364
64	-57.5
65	-46
66	-33.3333
67	-28.5714
68	-25
69	-22.2222
70	-20
71	-10
72	-6.66667
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0

86	0
87	0
88	0
89	0
90	0
91	0
92	0
93	0
94	0
95	0
96	0
97	0
98	0
99	0
100	0
101	0
102	0
103	0
104	0
105	0
106	0
107	0
108	0
109	0
110	7.5
111	16.4286
112	17.6923
113	20
114	20
115	20
116	21.4286
117	22.2222
118	45.4545
119	46
120	47.619
121	50
122	50
123	52.6316
124	58.8235
125	62.5
126	66.6667
127	70
128	71.4286
129	71.4286
130	72.2222
131	72.3529
132	75
133	76.6667
134	76.9231
135	83.3333
136	83.3333
137	83.3333
138	90.9091
139	92.3077
140	100
141	100
142	102.5
143	111.111
144	111.111
145	125
146	128.571
147	142.857
148	142.857

149	150
150	153.846
151	157.143
152	162.5
153	166.667
154	166.667
155	175.714
156	181.818
157	181.818
158	183.333
159	200
160	200
161	200
162	220
163	222.222
164	222.222
165	230
166	247.778
167	250
168	250
169	250
170	250
171	266.667
172	275
173	285.714
174	285.714
175	300
176	300
177	315.789
178	315.789
179	333.333
180	333.333
181	333.333
182	333.333
183	333.333
184	333.333
185	350
186	352.941
187	363.636
188	370.588
189	375
190	375
191	376.923
192	389.375
193	393.75
194	400
195	400
196	400
197	400
198	415.333
199	428.571
200	440
201	444.444
202	461.538
203	461.538
204	466.667
205	466.667
206	500
207	500
208	500
209	500
210	500
211	500

212	500
213	500
214	516.667
215	525
216	544.444
217	545.455
218	555.556
219	563.636
220	566.364
221	571.429
222	600
223	614.286
224	625
225	665
226	666.667
227	700
228	705
229	725
230	750
231	875
232	885.714
233	1000
234	1000
235	1000
236	1000
237	1166.67
238	1250
239	1250
240	1333.33
241	1400
242	1666.67
243	2000
244	2000
245	2100
246	2100
247	2333.33
248	3000
249	3000
250	3000
251	4000
252	6000
253	7000

Sen's Estimator (Median Q) is 70

Tied Group	Value	Members
1	5000	8
2	4000	3
3	6000	3
4	11000	3

Time Period	Observations
10/14/2002	1
4/14/2003	1
11/3/2003	1
5/23/2005	1
11/14/2005	1
5/22/2006	1
11/13/2006	1
6/25/2007	1
12/17/2007	1
6/16/2008	1
12/2/2008	1

6/21/2010	1
12/6/2010	1
6/21/2011	1
12/13/2011	1
6/4/2012	1
12/11/2012	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
12/5/2016	1
6/20/2017	1
12/4/2017	1

There are 0 time periods with multiple data

A = 1374
B = 0
C = 354
D = 0
E = 74
F = 0
a = 25806
b = 95634
c = 1012
Group Variance = 1357.33
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 94.8989
M1 = (253 - 94.8989)/2.0 = 79.0505
M2 = (253 + 94.8989)/2.0 + 1 = 174.949
Lower limit is 0 = Q(79)
Upper limit is 300 = Q(175)
0 < 0 < 300 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis

Parameter: Chloride

Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
53000 (4/14/2003)	68000 (10/14/2002)	(53000 - 68000)/(2 - 1)	-15000
66000 (11/3/2003)	68000 (10/14/2002)	(66000 - 68000)/(3 - 1)	-1000
83000 (5/10/2004)	68000 (10/14/2002)	(83000 - 68000)/(4 - 1)	5000
88000 (12/6/2004)	68000 (10/14/2002)	(88000 - 68000)/(5 - 1)	5000
117000 (5/23/2005)	68000 (10/14/2002)	(117000 - 68000)/(6 - 1)	9800
145000 (11/14/2005)	68000 (10/14/2002)	(145000 - 68000)/(7 - 1)	12833.3
162000 (5/22/2006)	68000 (10/14/2002)	(162000 - 68000)/(8 - 1)	13428.6
147000 (11/13/2006)	68000 (10/14/2002)	(147000 - 68000)/(9 - 1)	9875
187000 (6/25/2007)	68000 (10/14/2002)	(187000 - 68000)/(10 - 1)	13222.2
211000 (12/17/2007)	68000 (10/14/2002)	(211000 - 68000)/(11 - 1)	14300
208000 (6/16/2008)	68000 (10/14/2002)	(208000 - 68000)/(12 - 1)	12727.3
190000 (12/2/2008)	68000 (10/14/2002)	(190000 - 68000)/(13 - 1)	10166.7
139000 (6/1/2009)	68000 (10/14/2002)	(139000 - 68000)/(14 - 1)	5461.54
130000 (12/2/2009)	68000 (10/14/2002)	(130000 - 68000)/(15 - 1)	4428.57
90000 (6/21/2010)	68000 (10/14/2002)	(90000 - 68000)/(16 - 1)	1466.67
95000 (12/6/2010)	68000 (10/14/2002)	(95000 - 68000)/(17 - 1)	1687.5
104000 (6/21/2011)	68000 (10/14/2002)	(104000 - 68000)/(18 - 1)	2117.65
121000 (12/13/2011)	68000 (10/14/2002)	(121000 - 68000)/(19 - 1)	2944.44
112000 (6/4/2012)	68000 (10/14/2002)	(112000 - 68000)/(20 - 1)	2315.79
93000 (12/11/2012)	68000 (10/14/2002)	(93000 - 68000)/(21 - 1)	1250
72000 (6/3/2013)	68000 (10/14/2002)	(72000 - 68000)/(22 - 1)	190.476
73000 (12/3/2013)	68000 (10/14/2002)	(73000 - 68000)/(23 - 1)	227.273
79000 (6/2/2014)	68000 (10/14/2002)	(79000 - 68000)/(24 - 1)	478.261
83000 (12/2/2014)	68000 (10/14/2002)	(83000 - 68000)/(25 - 1)	625
76000 (6/1/2015)	68000 (10/14/2002)	(76000 - 68000)/(26 - 1)	320
73000 (12/7/2015)	68000 (10/14/2002)	(73000 - 68000)/(27 - 1)	192.308
83000 (6/6/2016)	68000 (10/14/2002)	(83000 - 68000)/(28 - 1)	555.556
83000 (12/5/2016)	68000 (10/14/2002)	(83000 - 68000)/(29 - 1)	535.714
89000 (6/20/2017)	68000 (10/14/2002)	(89000 - 68000)/(30 - 1)	724.138
114000 (12/4/2017)	68000 (10/14/2002)	(114000 - 68000)/(31 - 1)	1533.33
119000 (6/4/2018)	68000 (10/14/2002)	(119000 - 68000)/(32 - 1)	1645.16
66000 (11/3/2003)	53000 (4/14/2003)	(66000 - 53000)/(3 - 2)	13000
83000 (5/10/2004)	53000 (4/14/2003)	(83000 - 53000)/(4 - 2)	15000
88000 (12/6/2004)	53000 (4/14/2003)	(88000 - 53000)/(5 - 2)	11666.7
117000 (5/23/2005)	53000 (4/14/2003)	(117000 - 53000)/(6 - 2)	16000
145000 (11/14/2005)	53000 (4/14/2003)	(145000 - 53000)/(7 - 2)	18400
162000 (5/22/2006)	53000 (4/14/2003)	(162000 - 53000)/(8 - 2)	18166.7
147000 (11/13/2006)	53000 (4/14/2003)	(147000 - 53000)/(9 - 2)	13428.6
187000 (6/25/2007)	53000 (4/14/2003)	(187000 - 53000)/(10 - 2)	16750
211000 (12/17/2007)	53000 (4/14/2003)	(211000 - 53000)/(11 - 2)	17555.6
208000 (6/16/2008)	53000 (4/14/2003)	(208000 - 53000)/(12 - 2)	15500
190000 (12/2/2008)	53000 (4/14/2003)	(190000 - 53000)/(13 - 2)	12454.5
139000 (6/1/2009)	53000 (4/14/2003)	(139000 - 53000)/(14 - 2)	7166.67
130000 (12/2/2009)	53000 (4/14/2003)	(130000 - 53000)/(15 - 2)	5923.08
90000 (6/21/2010)	53000 (4/14/2003)	(90000 - 53000)/(16 - 2)	2642.86
95000 (12/6/2010)	53000 (4/14/2003)	(95000 - 53000)/(17 - 2)	2800
104000 (6/21/2011)	53000 (4/14/2003)	(104000 - 53000)/(18 - 2)	3187.5
121000 (12/13/2011)	53000 (4/14/2003)	(121000 - 53000)/(19 - 2)	4000
112000 (6/4/2012)	53000 (4/14/2003)	(112000 - 53000)/(20 - 2)	3277.78
93000 (12/11/2012)	53000 (4/14/2003)	(93000 - 53000)/(21 - 2)	2105.26

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72000 (6/3/2013)	53000 (4/14/2003)	(72000 - 53000)/(22 - 2)	950
73000 (12/3/2013)	53000 (4/14/2003)	(73000 - 53000)/(23 - 2)	952.381
79000 (6/2/2014)	53000 (4/14/2003)	(79000 - 53000)/(24 - 2)	1181.82
83000 (12/2/2014)	53000 (4/14/2003)	(83000 - 53000)/(25 - 2)	1304.35
76000 (6/1/2015)	53000 (4/14/2003)	(76000 - 53000)/(26 - 2)	958.333
73000 (12/7/2015)	53000 (4/14/2003)	(73000 - 53000)/(27 - 2)	800
83000 (6/6/2016)	53000 (4/14/2003)	(83000 - 53000)/(28 - 2)	1153.85
83000 (12/5/2016)	53000 (4/14/2003)	(83000 - 53000)/(29 - 2)	1111.11
89000 (6/20/2017)	53000 (4/14/2003)	(89000 - 53000)/(30 - 2)	1285.71
114000 (12/4/2017)	53000 (4/14/2003)	(114000 - 53000)/(31 - 2)	2103.45
119000 (6/4/2018)	53000 (4/14/2003)	(119000 - 53000)/(32 - 2)	2200

83000 (5/10/2004)	66000 (11/3/2003)	(83000 - 66000)/(4 - 3)	17000
88000 (12/6/2004)	66000 (11/3/2003)	(88000 - 66000)/(5 - 3)	11000
117000 (5/23/2005)	66000 (11/3/2003)	(117000 - 66000)/(6 - 3)	17000
145000 (11/14/2005)	66000 (11/3/2003)	(145000 - 66000)/(7 - 3)	19750
162000 (5/22/2006)	66000 (11/3/2003)	(162000 - 66000)/(8 - 3)	19200
147000 (11/13/2006)	66000 (11/3/2003)	(147000 - 66000)/(9 - 3)	13500
187000 (6/25/2007)	66000 (11/3/2003)	(187000 - 66000)/(10 - 3)	17285.7
211000 (12/17/2007)	66000 (11/3/2003)	(211000 - 66000)/(11 - 3)	18125
208000 (6/16/2008)	66000 (11/3/2003)	(208000 - 66000)/(12 - 3)	15777.8
190000 (12/2/2008)	66000 (11/3/2003)	(190000 - 66000)/(13 - 3)	12400
139000 (6/1/2009)	66000 (11/3/2003)	(139000 - 66000)/(14 - 3)	6636.36
130000 (12/2/2009)	66000 (11/3/2003)	(130000 - 66000)/(15 - 3)	5333.33
90000 (6/21/2010)	66000 (11/3/2003)	(90000 - 66000)/(16 - 3)	1846.15
95000 (12/6/2010)	66000 (11/3/2003)	(95000 - 66000)/(17 - 3)	2071.43
104000 (6/21/2011)	66000 (11/3/2003)	(104000 - 66000)/(18 - 3)	2533.33
121000 (12/13/2011)	66000 (11/3/2003)	(121000 - 66000)/(19 - 3)	3437.5
112000 (6/4/2012)	66000 (11/3/2003)	(112000 - 66000)/(20 - 3)	2705.88
93000 (12/11/2012)	66000 (11/3/2003)	(93000 - 66000)/(21 - 3)	1500
72000 (6/3/2013)	66000 (11/3/2003)	(72000 - 66000)/(22 - 3)	315.789
73000 (12/3/2013)	66000 (11/3/2003)	(73000 - 66000)/(23 - 3)	350
79000 (6/2/2014)	66000 (11/3/2003)	(79000 - 66000)/(24 - 3)	619.048
83000 (12/2/2014)	66000 (11/3/2003)	(83000 - 66000)/(25 - 3)	772.727
76000 (6/1/2015)	66000 (11/3/2003)	(76000 - 66000)/(26 - 3)	434.783
73000 (12/7/2015)	66000 (11/3/2003)	(73000 - 66000)/(27 - 3)	291.667
83000 (6/6/2016)	66000 (11/3/2003)	(83000 - 66000)/(28 - 3)	680
83000 (12/5/2016)	66000 (11/3/2003)	(83000 - 66000)/(29 - 3)	653.846
89000 (6/20/2017)	66000 (11/3/2003)	(89000 - 66000)/(30 - 3)	851.852
114000 (12/4/2017)	66000 (11/3/2003)	(114000 - 66000)/(31 - 3)	1714.29
119000 (6/4/2018)	66000 (11/3/2003)	(119000 - 66000)/(32 - 3)	1827.59

88000 (12/6/2004)	83000 (5/10/2004)	(88000 - 83000)/(5 - 4)	5000
117000 (5/23/2005)	83000 (5/10/2004)	(117000 - 83000)/(6 - 4)	17000
145000 (11/14/2005)	83000 (5/10/2004)	(145000 - 83000)/(7 - 4)	20666.7
162000 (5/22/2006)	83000 (5/10/2004)	(162000 - 83000)/(8 - 4)	19750
147000 (11/13/2006)	83000 (5/10/2004)	(147000 - 83000)/(9 - 4)	12800
187000 (6/25/2007)	83000 (5/10/2004)	(187000 - 83000)/(10 - 4)	17333.3
211000 (12/17/2007)	83000 (5/10/2004)	(211000 - 83000)/(11 - 4)	18285.7
208000 (6/16/2008)	83000 (5/10/2004)	(208000 - 83000)/(12 - 4)	15625
190000 (12/2/2008)	83000 (5/10/2004)	(190000 - 83000)/(13 - 4)	11888.9
139000 (6/1/2009)	83000 (5/10/2004)	(139000 - 83000)/(14 - 4)	5600
130000 (12/2/2009)	83000 (5/10/2004)	(130000 - 83000)/(15 - 4)	4272.73
90000 (6/21/2010)	83000 (5/10/2004)	(90000 - 83000)/(16 - 4)	583.333
95000 (12/6/2010)	83000 (5/10/2004)	(95000 - 83000)/(17 - 4)	923.077
104000 (6/21/2011)	83000 (5/10/2004)	(104000 - 83000)/(18 - 4)	1500
121000 (12/13/2011)	83000 (5/10/2004)	(121000 - 83000)/(19 - 4)	2533.33
112000 (6/4/2012)	83000 (5/10/2004)	(112000 - 83000)/(20 - 4)	1812.5
93000 (12/11/2012)	83000 (5/10/2004)	(93000 - 83000)/(21 - 4)	588.235
72000 (6/3/2013)	83000 (5/10/2004)	(72000 - 83000)/(22 - 4)	-611.111
73000 (12/3/2013)	83000 (5/10/2004)	(73000 - 83000)/(23 - 4)	-526.316
79000 (6/2/2014)	83000 (5/10/2004)	(79000 - 83000)/(24 - 4)	-200
83000 (12/2/2014)	83000 (5/10/2004)	(83000 - 83000)/(25 - 4)	0

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76000 (6/1/2015)	83000 (5/10/2004)	(76000 - 83000)/(26 - 4)	-318.182
73000 (12/7/2015)	83000 (5/10/2004)	(73000 - 83000)/(27 - 4)	-434.783
83000 (6/6/2016)	83000 (5/10/2004)	(83000 - 83000)/(28 - 4)	0
83000 (12/5/2016)	83000 (5/10/2004)	(83000 - 83000)/(29 - 4)	0
89000 (6/20/2017)	83000 (5/10/2004)	(89000 - 83000)/(30 - 4)	230.769
114000 (12/4/2017)	83000 (5/10/2004)	(114000 - 83000)/(31 - 4)	1148.15
119000 (6/4/2018)	83000 (5/10/2004)	(119000 - 83000)/(32 - 4)	1285.71

117000 (5/23/2005)	88000 (12/6/2004)	(117000 - 88000)/(6 - 5)	29000
145000 (11/14/2005)	88000 (12/6/2004)	(145000 - 88000)/(7 - 5)	28500
162000 (5/22/2006)	88000 (12/6/2004)	(162000 - 88000)/(8 - 5)	24666.7
147000 (11/13/2006)	88000 (12/6/2004)	(147000 - 88000)/(9 - 5)	14750
187000 (6/25/2007)	88000 (12/6/2004)	(187000 - 88000)/(10 - 5)	19800
211000 (12/17/2007)	88000 (12/6/2004)	(211000 - 88000)/(11 - 5)	20500
208000 (6/16/2008)	88000 (12/6/2004)	(208000 - 88000)/(12 - 5)	17142.9
190000 (12/2/2008)	88000 (12/6/2004)	(190000 - 88000)/(13 - 5)	12750
139000 (6/1/2009)	88000 (12/6/2004)	(139000 - 88000)/(14 - 5)	5666.67
130000 (12/2/2009)	88000 (12/6/2004)	(130000 - 88000)/(15 - 5)	4200
90000 (6/21/2010)	88000 (12/6/2004)	(90000 - 88000)/(16 - 5)	181.818
95000 (12/6/2010)	88000 (12/6/2004)	(95000 - 88000)/(17 - 5)	583.333
104000 (6/21/2011)	88000 (12/6/2004)	(104000 - 88000)/(18 - 5)	1230.77
121000 (12/13/2011)	88000 (12/6/2004)	(121000 - 88000)/(19 - 5)	2357.14
112000 (6/4/2012)	88000 (12/6/2004)	(112000 - 88000)/(20 - 5)	1600
93000 (12/11/2012)	88000 (12/6/2004)	(93000 - 88000)/(21 - 5)	312.5
72000 (6/3/2013)	88000 (12/6/2004)	(72000 - 88000)/(22 - 5)	-941.176
73000 (12/3/2013)	88000 (12/6/2004)	(73000 - 88000)/(23 - 5)	-833.333
79000 (6/2/2014)	88000 (12/6/2004)	(79000 - 88000)/(24 - 5)	-473.684
83000 (12/2/2014)	88000 (12/6/2004)	(83000 - 88000)/(25 - 5)	-250
76000 (6/1/2015)	88000 (12/6/2004)	(76000 - 88000)/(26 - 5)	-571.429
73000 (12/7/2015)	88000 (12/6/2004)	(73000 - 88000)/(27 - 5)	-681.818
83000 (6/6/2016)	88000 (12/6/2004)	(83000 - 88000)/(28 - 5)	-217.391
83000 (12/5/2016)	88000 (12/6/2004)	(83000 - 88000)/(29 - 5)	-208.333
89000 (6/20/2017)	88000 (12/6/2004)	(89000 - 88000)/(30 - 5)	40
114000 (12/4/2017)	88000 (12/6/2004)	(114000 - 88000)/(31 - 5)	1000
119000 (6/4/2018)	88000 (12/6/2004)	(119000 - 88000)/(32 - 5)	1148.15

145000 (11/14/2005)	117000 (5/23/2005)	(145000 - 117000)/(7 - 6)	28000
162000 (5/22/2006)	117000 (5/23/2005)	(162000 - 117000)/(8 - 6)	22500
147000 (11/13/2006)	117000 (5/23/2005)	(147000 - 117000)/(9 - 6)	10000
187000 (6/25/2007)	117000 (5/23/2005)	(187000 - 117000)/(10 - 6)	17500
211000 (12/17/2007)	117000 (5/23/2005)	(211000 - 117000)/(11 - 6)	18800
208000 (6/16/2008)	117000 (5/23/2005)	(208000 - 117000)/(12 - 6)	15166.7
190000 (12/2/2008)	117000 (5/23/2005)	(190000 - 117000)/(13 - 6)	10428.6
139000 (6/1/2009)	117000 (5/23/2005)	(139000 - 117000)/(14 - 6)	2750
130000 (12/2/2009)	117000 (5/23/2005)	(130000 - 117000)/(15 - 6)	1444.44
90000 (6/21/2010)	117000 (5/23/2005)	(90000 - 117000)/(16 - 6)	-2700
95000 (12/6/2010)	117000 (5/23/2005)	(95000 - 117000)/(17 - 6)	-2000
104000 (6/21/2011)	117000 (5/23/2005)	(104000 - 117000)/(18 - 6)	-1083.33
121000 (12/13/2011)	117000 (5/23/2005)	(121000 - 117000)/(19 - 6)	307.692
112000 (6/4/2012)	117000 (5/23/2005)	(112000 - 117000)/(20 - 6)	-357.143
93000 (12/11/2012)	117000 (5/23/2005)	(93000 - 117000)/(21 - 6)	-1600
72000 (6/3/2013)	117000 (5/23/2005)	(72000 - 117000)/(22 - 6)	-2812.5
73000 (12/3/2013)	117000 (5/23/2005)	(73000 - 117000)/(23 - 6)	-2588.24
79000 (6/2/2014)	117000 (5/23/2005)	(79000 - 117000)/(24 - 6)	-2111.11
83000 (12/2/2014)	117000 (5/23/2005)	(83000 - 117000)/(25 - 6)	-1789.47
76000 (6/1/2015)	117000 (5/23/2005)	(76000 - 117000)/(26 - 6)	-2050
73000 (12/7/2015)	117000 (5/23/2005)	(73000 - 117000)/(27 - 6)	-2095.24
83000 (6/6/2016)	117000 (5/23/2005)	(83000 - 117000)/(28 - 6)	-1545.45
83000 (12/5/2016)	117000 (5/23/2005)	(83000 - 117000)/(29 - 6)	-1478.26
89000 (6/20/2017)	117000 (5/23/2005)	(89000 - 117000)/(30 - 6)	-1166.67
114000 (12/4/2017)	117000 (5/23/2005)	(114000 - 117000)/(31 - 6)	-120
119000 (6/4/2018)	117000 (5/23/2005)	(119000 - 117000)/(32 - 6)	76.9231

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162000 (5/22/2006)	145000 (11/14/2005)	(162000 - 145000)/(8 - 7)	17000
147000 (11/13/2006)	145000 (11/14/2005)	(147000 - 145000)/(9 - 7)	1000
187000 (6/25/2007)	145000 (11/14/2005)	(187000 - 145000)/(10 - 7)	14000
211000 (12/17/2007)	145000 (11/14/2005)	(211000 - 145000)/(11 - 7)	16500
208000 (6/16/2008)	145000 (11/14/2005)	(208000 - 145000)/(12 - 7)	12600
190000 (12/2/2008)	145000 (11/14/2005)	(190000 - 145000)/(13 - 7)	7500
139000 (6/1/2009)	145000 (11/14/2005)	(139000 - 145000)/(14 - 7)	-857.143
130000 (12/2/2009)	145000 (11/14/2005)	(130000 - 145000)/(15 - 7)	-1875
90000 (6/21/2010)	145000 (11/14/2005)	(90000 - 145000)/(16 - 7)	-6111.11
95000 (12/6/2010)	145000 (11/14/2005)	(95000 - 145000)/(17 - 7)	-5000
104000 (6/21/2011)	145000 (11/14/2005)	(104000 - 145000)/(18 - 7)	-3727.27
121000 (12/13/2011)	145000 (11/14/2005)	(121000 - 145000)/(19 - 7)	-2000
112000 (6/4/2012)	145000 (11/14/2005)	(112000 - 145000)/(20 - 7)	-2538.46
93000 (12/11/2012)	145000 (11/14/2005)	(93000 - 145000)/(21 - 7)	-3714.29
72000 (6/3/2013)	145000 (11/14/2005)	(72000 - 145000)/(22 - 7)	-4866.67
73000 (12/3/2013)	145000 (11/14/2005)	(73000 - 145000)/(23 - 7)	-4500
79000 (6/2/2014)	145000 (11/14/2005)	(79000 - 145000)/(24 - 7)	-3882.35
83000 (12/2/2014)	145000 (11/14/2005)	(83000 - 145000)/(25 - 7)	-3444.44
76000 (6/1/2015)	145000 (11/14/2005)	(76000 - 145000)/(26 - 7)	-3631.58
73000 (12/7/2015)	145000 (11/14/2005)	(73000 - 145000)/(27 - 7)	-3600
83000 (6/6/2016)	145000 (11/14/2005)	(83000 - 145000)/(28 - 7)	-2952.38
83000 (12/5/2016)	145000 (11/14/2005)	(83000 - 145000)/(29 - 7)	-2818.18
89000 (6/20/2017)	145000 (11/14/2005)	(89000 - 145000)/(30 - 7)	-2434.78
114000 (12/4/2017)	145000 (11/14/2005)	(114000 - 145000)/(31 - 7)	-1291.67
119000 (6/4/2018)	145000 (11/14/2005)	(119000 - 145000)/(32 - 7)	-1040

147000 (11/13/2006)	162000 (5/22/2006)	(147000 - 162000)/(9 - 8)	-15000
187000 (6/25/2007)	162000 (5/22/2006)	(187000 - 162000)/(10 - 8)	12500
211000 (12/17/2007)	162000 (5/22/2006)	(211000 - 162000)/(11 - 8)	16333.3
208000 (6/16/2008)	162000 (5/22/2006)	(208000 - 162000)/(12 - 8)	11500
190000 (12/2/2008)	162000 (5/22/2006)	(190000 - 162000)/(13 - 8)	5600
139000 (6/1/2009)	162000 (5/22/2006)	(139000 - 162000)/(14 - 8)	-3833.33
130000 (12/2/2009)	162000 (5/22/2006)	(130000 - 162000)/(15 - 8)	-4571.43
90000 (6/21/2010)	162000 (5/22/2006)	(90000 - 162000)/(16 - 8)	-9000
95000 (12/6/2010)	162000 (5/22/2006)	(95000 - 162000)/(17 - 8)	-7444.44
104000 (6/21/2011)	162000 (5/22/2006)	(104000 - 162000)/(18 - 8)	-5800
121000 (12/13/2011)	162000 (5/22/2006)	(121000 - 162000)/(19 - 8)	-3727.27
112000 (6/4/2012)	162000 (5/22/2006)	(112000 - 162000)/(20 - 8)	-4166.67
93000 (12/11/2012)	162000 (5/22/2006)	(93000 - 162000)/(21 - 8)	-5307.69
72000 (6/3/2013)	162000 (5/22/2006)	(72000 - 162000)/(22 - 8)	-6428.57
73000 (12/3/2013)	162000 (5/22/2006)	(73000 - 162000)/(23 - 8)	-5933.33
79000 (6/2/2014)	162000 (5/22/2006)	(79000 - 162000)/(24 - 8)	-5187.5
83000 (12/2/2014)	162000 (5/22/2006)	(83000 - 162000)/(25 - 8)	-4647.06
76000 (6/1/2015)	162000 (5/22/2006)	(76000 - 162000)/(26 - 8)	-4777.78
73000 (12/7/2015)	162000 (5/22/2006)	(73000 - 162000)/(27 - 8)	-4684.21
83000 (6/6/2016)	162000 (5/22/2006)	(83000 - 162000)/(28 - 8)	-3950
83000 (12/5/2016)	162000 (5/22/2006)	(83000 - 162000)/(29 - 8)	-3761.9
89000 (6/20/2017)	162000 (5/22/2006)	(89000 - 162000)/(30 - 8)	-3318.18
114000 (12/4/2017)	162000 (5/22/2006)	(114000 - 162000)/(31 - 8)	-2086.96
119000 (6/4/2018)	162000 (5/22/2006)	(119000 - 162000)/(32 - 8)	-1791.67

187000 (6/25/2007)	147000 (11/13/2006)	(187000 - 147000)/(10 - 9)	40000
211000 (12/17/2007)	147000 (11/13/2006)	(211000 - 147000)/(11 - 9)	32000
208000 (6/16/2008)	147000 (11/13/2006)	(208000 - 147000)/(12 - 9)	20333.3
190000 (12/2/2008)	147000 (11/13/2006)	(190000 - 147000)/(13 - 9)	10750
139000 (6/1/2009)	147000 (11/13/2006)	(139000 - 147000)/(14 - 9)	-1600
130000 (12/2/2009)	147000 (11/13/2006)	(130000 - 147000)/(15 - 9)	-2833.33
90000 (6/21/2010)	147000 (11/13/2006)	(90000 - 147000)/(16 - 9)	-8142.86
95000 (12/6/2010)	147000 (11/13/2006)	(95000 - 147000)/(17 - 9)	-6500
104000 (6/21/2011)	147000 (11/13/2006)	(104000 - 147000)/(18 - 9)	-4777.78
121000 (12/13/2011)	147000 (11/13/2006)	(121000 - 147000)/(19 - 9)	-2600
112000 (6/4/2012)	147000 (11/13/2006)	(112000 - 147000)/(20 - 9)	-3181.82
93000 (12/11/2012)	147000 (11/13/2006)	(93000 - 147000)/(21 - 9)	-4500

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72000 (6/3/2013)	147000 (11/13/2006)	(72000 - 147000)/(22 - 9)	-5769.23
73000 (12/3/2013)	147000 (11/13/2006)	(73000 - 147000)/(23 - 9)	-5285.71
79000 (6/2/2014)	147000 (11/13/2006)	(79000 - 147000)/(24 - 9)	-4533.33
83000 (12/2/2014)	147000 (11/13/2006)	(83000 - 147000)/(25 - 9)	-4000
76000 (6/1/2015)	147000 (11/13/2006)	(76000 - 147000)/(26 - 9)	-4176.47
73000 (12/7/2015)	147000 (11/13/2006)	(73000 - 147000)/(27 - 9)	-4111.11
83000 (6/6/2016)	147000 (11/13/2006)	(83000 - 147000)/(28 - 9)	-3368.42
83000 (12/5/2016)	147000 (11/13/2006)	(83000 - 147000)/(29 - 9)	-3200
89000 (6/20/2017)	147000 (11/13/2006)	(89000 - 147000)/(30 - 9)	-2761.9
114000 (12/4/2017)	147000 (11/13/2006)	(114000 - 147000)/(31 - 9)	-1500
119000 (6/4/2018)	147000 (11/13/2006)	(119000 - 147000)/(32 - 9)	-1217.39

211000 (12/17/2007)	187000 (6/25/2007)	(211000 - 187000)/(11 - 10)	24000
208000 (6/16/2008)	187000 (6/25/2007)	(208000 - 187000)/(12 - 10)	10500
190000 (12/2/2008)	187000 (6/25/2007)	(190000 - 187000)/(13 - 10)	1000
139000 (6/1/2009)	187000 (6/25/2007)	(139000 - 187000)/(14 - 10)	-12000
130000 (12/2/2009)	187000 (6/25/2007)	(130000 - 187000)/(15 - 10)	-11400
90000 (6/21/2010)	187000 (6/25/2007)	(90000 - 187000)/(16 - 10)	-16166.7
95000 (12/6/2010)	187000 (6/25/2007)	(95000 - 187000)/(17 - 10)	-13142.9
104000 (6/21/2011)	187000 (6/25/2007)	(104000 - 187000)/(18 - 10)	-10375
121000 (12/13/2011)	187000 (6/25/2007)	(121000 - 187000)/(19 - 10)	-7333.33
112000 (6/4/2012)	187000 (6/25/2007)	(112000 - 187000)/(20 - 10)	-7500
93000 (12/11/2012)	187000 (6/25/2007)	(93000 - 187000)/(21 - 10)	-8545.45
72000 (6/3/2013)	187000 (6/25/2007)	(72000 - 187000)/(22 - 10)	-9583.33
73000 (12/3/2013)	187000 (6/25/2007)	(73000 - 187000)/(23 - 10)	-8769.23
79000 (6/2/2014)	187000 (6/25/2007)	(79000 - 187000)/(24 - 10)	-7714.29
83000 (12/2/2014)	187000 (6/25/2007)	(83000 - 187000)/(25 - 10)	-6933.33
76000 (6/1/2015)	187000 (6/25/2007)	(76000 - 187000)/(26 - 10)	-6937.5
73000 (12/7/2015)	187000 (6/25/2007)	(73000 - 187000)/(27 - 10)	-6705.88
83000 (6/6/2016)	187000 (6/25/2007)	(83000 - 187000)/(28 - 10)	-5777.78
83000 (12/5/2016)	187000 (6/25/2007)	(83000 - 187000)/(29 - 10)	-5473.68
89000 (6/20/2017)	187000 (6/25/2007)	(89000 - 187000)/(30 - 10)	-4900
114000 (12/4/2017)	187000 (6/25/2007)	(114000 - 187000)/(31 - 10)	-3476.19
119000 (6/4/2018)	187000 (6/25/2007)	(119000 - 187000)/(32 - 10)	-3090.91

208000 (6/16/2008)	211000 (12/17/2007)	(208000 - 211000)/(12 - 11)	-3000
190000 (12/2/2008)	211000 (12/17/2007)	(190000 - 211000)/(13 - 11)	-10500
139000 (6/1/2009)	211000 (12/17/2007)	(139000 - 211000)/(14 - 11)	-24000
130000 (12/2/2009)	211000 (12/17/2007)	(130000 - 211000)/(15 - 11)	-20250
90000 (6/21/2010)	211000 (12/17/2007)	(90000 - 211000)/(16 - 11)	-24200
95000 (12/6/2010)	211000 (12/17/2007)	(95000 - 211000)/(17 - 11)	-19333.3
104000 (6/21/2011)	211000 (12/17/2007)	(104000 - 211000)/(18 - 11)	-15285.7
121000 (12/13/2011)	211000 (12/17/2007)	(121000 - 211000)/(19 - 11)	-11250
112000 (6/4/2012)	211000 (12/17/2007)	(112000 - 211000)/(20 - 11)	-11000
93000 (12/11/2012)	211000 (12/17/2007)	(93000 - 211000)/(21 - 11)	-11800
72000 (6/3/2013)	211000 (12/17/2007)	(72000 - 211000)/(22 - 11)	-12636.4
73000 (12/3/2013)	211000 (12/17/2007)	(73000 - 211000)/(23 - 11)	-11500
79000 (6/2/2014)	211000 (12/17/2007)	(79000 - 211000)/(24 - 11)	-10153.8
83000 (12/2/2014)	211000 (12/17/2007)	(83000 - 211000)/(25 - 11)	-9142.86
76000 (6/1/2015)	211000 (12/17/2007)	(76000 - 211000)/(26 - 11)	-9000
73000 (12/7/2015)	211000 (12/17/2007)	(73000 - 211000)/(27 - 11)	-8625
83000 (6/6/2016)	211000 (12/17/2007)	(83000 - 211000)/(28 - 11)	-7529.41
83000 (12/5/2016)	211000 (12/17/2007)	(83000 - 211000)/(29 - 11)	-7111.11
89000 (6/20/2017)	211000 (12/17/2007)	(89000 - 211000)/(30 - 11)	-6421.05
114000 (12/4/2017)	211000 (12/17/2007)	(114000 - 211000)/(31 - 11)	-4850
119000 (6/4/2018)	211000 (12/17/2007)	(119000 - 211000)/(32 - 11)	-4380.95

190000 (12/2/2008)	208000 (6/16/2008)	(190000 - 208000)/(13 - 12)	-18000
139000 (6/1/2009)	208000 (6/16/2008)	(139000 - 208000)/(14 - 12)	-34500
130000 (12/2/2009)	208000 (6/16/2008)	(130000 - 208000)/(15 - 12)	-26000
90000 (6/21/2010)	208000 (6/16/2008)	(90000 - 208000)/(16 - 12)	-29500
95000 (12/6/2010)	208000 (6/16/2008)	(95000 - 208000)/(17 - 12)	-22600
104000 (6/21/2011)	208000 (6/16/2008)	(104000 - 208000)/(18 - 12)	-17333.3

121000 (12/13/2011)	208000 (6/16/2008)	(121000 - 208000)/(19 - 12)	-12428.6
112000 (6/4/2012)	208000 (6/16/2008)	(112000 - 208000)/(20 - 12)	-12000
93000 (12/11/2012)	208000 (6/16/2008)	(93000 - 208000)/(21 - 12)	-12777.8
72000 (6/3/2013)	208000 (6/16/2008)	(72000 - 208000)/(22 - 12)	-13600
73000 (12/3/2013)	208000 (6/16/2008)	(73000 - 208000)/(23 - 12)	-12272.7
79000 (6/2/2014)	208000 (6/16/2008)	(79000 - 208000)/(24 - 12)	-10750
83000 (12/2/2014)	208000 (6/16/2008)	(83000 - 208000)/(25 - 12)	-9615.38
76000 (6/1/2015)	208000 (6/16/2008)	(76000 - 208000)/(26 - 12)	-9428.57
73000 (12/7/2015)	208000 (6/16/2008)	(73000 - 208000)/(27 - 12)	-9000
83000 (6/6/2016)	208000 (6/16/2008)	(83000 - 208000)/(28 - 12)	-7812.5
83000 (12/5/2016)	208000 (6/16/2008)	(83000 - 208000)/(29 - 12)	-7352.94
89000 (6/20/2017)	208000 (6/16/2008)	(89000 - 208000)/(30 - 12)	-6611.11
114000 (12/4/2017)	208000 (6/16/2008)	(114000 - 208000)/(31 - 12)	-4947.37
119000 (6/4/2018)	208000 (6/16/2008)	(119000 - 208000)/(32 - 12)	-4450

139000 (6/1/2009)	190000 (12/2/2008)	(139000 - 190000)/(14 - 13)	-51000
130000 (12/2/2009)	190000 (12/2/2008)	(130000 - 190000)/(15 - 13)	-30000
90000 (6/21/2010)	190000 (12/2/2008)	(90000 - 190000)/(16 - 13)	-33333.3
95000 (12/6/2010)	190000 (12/2/2008)	(95000 - 190000)/(17 - 13)	-23750
104000 (6/21/2011)	190000 (12/2/2008)	(104000 - 190000)/(18 - 13)	-17200
121000 (12/13/2011)	190000 (12/2/2008)	(121000 - 190000)/(19 - 13)	-11500
112000 (6/4/2012)	190000 (12/2/2008)	(112000 - 190000)/(20 - 13)	-11142.9
93000 (12/11/2012)	190000 (12/2/2008)	(93000 - 190000)/(21 - 13)	-12125
72000 (6/3/2013)	190000 (12/2/2008)	(72000 - 190000)/(22 - 13)	-13111.1
73000 (12/3/2013)	190000 (12/2/2008)	(73000 - 190000)/(23 - 13)	-11700
79000 (6/2/2014)	190000 (12/2/2008)	(79000 - 190000)/(24 - 13)	-10090.9
83000 (12/2/2014)	190000 (12/2/2008)	(83000 - 190000)/(25 - 13)	-8916.67
76000 (6/1/2015)	190000 (12/2/2008)	(76000 - 190000)/(26 - 13)	-8769.23
73000 (12/7/2015)	190000 (12/2/2008)	(73000 - 190000)/(27 - 13)	-8357.14
83000 (6/6/2016)	190000 (12/2/2008)	(83000 - 190000)/(28 - 13)	-7133.33
83000 (12/5/2016)	190000 (12/2/2008)	(83000 - 190000)/(29 - 13)	-6687.5
89000 (6/20/2017)	190000 (12/2/2008)	(89000 - 190000)/(30 - 13)	-5941.18
114000 (12/4/2017)	190000 (12/2/2008)	(114000 - 190000)/(31 - 13)	-4222.22
119000 (6/4/2018)	190000 (12/2/2008)	(119000 - 190000)/(32 - 13)	-3736.84

130000 (12/2/2009)	139000 (6/1/2009)	(130000 - 139000)/(15 - 14)	-9000
90000 (6/21/2010)	139000 (6/1/2009)	(90000 - 139000)/(16 - 14)	-24500
95000 (12/6/2010)	139000 (6/1/2009)	(95000 - 139000)/(17 - 14)	-14666.7
104000 (6/21/2011)	139000 (6/1/2009)	(104000 - 139000)/(18 - 14)	-8750
121000 (12/13/2011)	139000 (6/1/2009)	(121000 - 139000)/(19 - 14)	-3600
112000 (6/4/2012)	139000 (6/1/2009)	(112000 - 139000)/(20 - 14)	-4500
93000 (12/11/2012)	139000 (6/1/2009)	(93000 - 139000)/(21 - 14)	-6571.43
72000 (6/3/2013)	139000 (6/1/2009)	(72000 - 139000)/(22 - 14)	-8375
73000 (12/3/2013)	139000 (6/1/2009)	(73000 - 139000)/(23 - 14)	-7333.33
79000 (6/2/2014)	139000 (6/1/2009)	(79000 - 139000)/(24 - 14)	-6000
83000 (12/2/2014)	139000 (6/1/2009)	(83000 - 139000)/(25 - 14)	-5090.91
76000 (6/1/2015)	139000 (6/1/2009)	(76000 - 139000)/(26 - 14)	-5250
73000 (12/7/2015)	139000 (6/1/2009)	(73000 - 139000)/(27 - 14)	-5076.92
83000 (6/6/2016)	139000 (6/1/2009)	(83000 - 139000)/(28 - 14)	-4000
83000 (12/5/2016)	139000 (6/1/2009)	(83000 - 139000)/(29 - 14)	-3733.33
89000 (6/20/2017)	139000 (6/1/2009)	(89000 - 139000)/(30 - 14)	-3125
114000 (12/4/2017)	139000 (6/1/2009)	(114000 - 139000)/(31 - 14)	-1470.59
119000 (6/4/2018)	139000 (6/1/2009)	(119000 - 139000)/(32 - 14)	-1111.11

90000 (6/21/2010)	130000 (12/2/2009)	(90000 - 130000)/(16 - 15)	-40000
95000 (12/6/2010)	130000 (12/2/2009)	(95000 - 130000)/(17 - 15)	-17500
104000 (6/21/2011)	130000 (12/2/2009)	(104000 - 130000)/(18 - 15)	-8666.67
121000 (12/13/2011)	130000 (12/2/2009)	(121000 - 130000)/(19 - 15)	-2250
112000 (6/4/2012)	130000 (12/2/2009)	(112000 - 130000)/(20 - 15)	-3600
93000 (12/11/2012)	130000 (12/2/2009)	(93000 - 130000)/(21 - 15)	-6166.67
72000 (6/3/2013)	130000 (12/2/2009)	(72000 - 130000)/(22 - 15)	-8285.71
73000 (12/3/2013)	130000 (12/2/2009)	(73000 - 130000)/(23 - 15)	-7125
79000 (6/2/2014)	130000 (12/2/2009)	(79000 - 130000)/(24 - 15)	-5666.67

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83000 (12/2/2014)	130000 (12/2/2009)	(83000 - 130000)/(25 - 15)	-4700
76000 (6/1/2015)	130000 (12/2/2009)	(76000 - 130000)/(26 - 15)	-4909.09
73000 (12/7/2015)	130000 (12/2/2009)	(73000 - 130000)/(27 - 15)	-4750
83000 (6/6/2016)	130000 (12/2/2009)	(83000 - 130000)/(28 - 15)	-3615.38
83000 (12/5/2016)	130000 (12/2/2009)	(83000 - 130000)/(29 - 15)	-3357.14
89000 (6/20/2017)	130000 (12/2/2009)	(89000 - 130000)/(30 - 15)	-2733.33
114000 (12/4/2017)	130000 (12/2/2009)	(114000 - 130000)/(31 - 15)	-1000
119000 (6/4/2018)	130000 (12/2/2009)	(119000 - 130000)/(32 - 15)	-647.059
95000 (12/6/2010)	90000 (6/21/2010)	(95000 - 90000)/(17 - 16)	5000
104000 (6/21/2011)	90000 (6/21/2010)	(104000 - 90000)/(18 - 16)	7000
121000 (12/13/2011)	90000 (6/21/2010)	(121000 - 90000)/(19 - 16)	10333.3
112000 (6/4/2012)	90000 (6/21/2010)	(112000 - 90000)/(20 - 16)	5500
93000 (12/11/2012)	90000 (6/21/2010)	(93000 - 90000)/(21 - 16)	600
72000 (6/3/2013)	90000 (6/21/2010)	(72000 - 90000)/(22 - 16)	-3000
73000 (12/3/2013)	90000 (6/21/2010)	(73000 - 90000)/(23 - 16)	-2428.57
79000 (6/2/2014)	90000 (6/21/2010)	(79000 - 90000)/(24 - 16)	-1375
83000 (12/2/2014)	90000 (6/21/2010)	(83000 - 90000)/(25 - 16)	-777.778
76000 (6/1/2015)	90000 (6/21/2010)	(76000 - 90000)/(26 - 16)	-1400
73000 (12/7/2015)	90000 (6/21/2010)	(73000 - 90000)/(27 - 16)	-1545.45
83000 (6/6/2016)	90000 (6/21/2010)	(83000 - 90000)/(28 - 16)	-583.333
83000 (12/5/2016)	90000 (6/21/2010)	(83000 - 90000)/(29 - 16)	-538.462
89000 (6/20/2017)	90000 (6/21/2010)	(89000 - 90000)/(30 - 16)	-71.4286
114000 (12/4/2017)	90000 (6/21/2010)	(114000 - 90000)/(31 - 16)	1600
119000 (6/4/2018)	90000 (6/21/2010)	(119000 - 90000)/(32 - 16)	1812.5
104000 (6/21/2011)	95000 (12/6/2010)	(104000 - 95000)/(18 - 17)	9000
121000 (12/13/2011)	95000 (12/6/2010)	(121000 - 95000)/(19 - 17)	13000
112000 (6/4/2012)	95000 (12/6/2010)	(112000 - 95000)/(20 - 17)	5666.67
93000 (12/11/2012)	95000 (12/6/2010)	(93000 - 95000)/(21 - 17)	-500
72000 (6/3/2013)	95000 (12/6/2010)	(72000 - 95000)/(22 - 17)	-4600
73000 (12/3/2013)	95000 (12/6/2010)	(73000 - 95000)/(23 - 17)	-3666.67
79000 (6/2/2014)	95000 (12/6/2010)	(79000 - 95000)/(24 - 17)	-2285.71
83000 (12/2/2014)	95000 (12/6/2010)	(83000 - 95000)/(25 - 17)	-1500
76000 (6/1/2015)	95000 (12/6/2010)	(76000 - 95000)/(26 - 17)	-2111.11
73000 (12/7/2015)	95000 (12/6/2010)	(73000 - 95000)/(27 - 17)	-2200
83000 (6/6/2016)	95000 (12/6/2010)	(83000 - 95000)/(28 - 17)	-1090.91
83000 (12/5/2016)	95000 (12/6/2010)	(83000 - 95000)/(29 - 17)	-1000
89000 (6/20/2017)	95000 (12/6/2010)	(89000 - 95000)/(30 - 17)	-461.538
114000 (12/4/2017)	95000 (12/6/2010)	(114000 - 95000)/(31 - 17)	1357.14
119000 (6/4/2018)	95000 (12/6/2010)	(119000 - 95000)/(32 - 17)	1600
121000 (12/13/2011)	104000 (6/21/2011)	(121000 - 104000)/(19 - 18)	17000
112000 (6/4/2012)	104000 (6/21/2011)	(112000 - 104000)/(20 - 18)	4000
93000 (12/11/2012)	104000 (6/21/2011)	(93000 - 104000)/(21 - 18)	-3666.67
72000 (6/3/2013)	104000 (6/21/2011)	(72000 - 104000)/(22 - 18)	-8000
73000 (12/3/2013)	104000 (6/21/2011)	(73000 - 104000)/(23 - 18)	-6200
79000 (6/2/2014)	104000 (6/21/2011)	(79000 - 104000)/(24 - 18)	-4166.67
83000 (12/2/2014)	104000 (6/21/2011)	(83000 - 104000)/(25 - 18)	-3000
76000 (6/1/2015)	104000 (6/21/2011)	(76000 - 104000)/(26 - 18)	-3500
73000 (12/7/2015)	104000 (6/21/2011)	(73000 - 104000)/(27 - 18)	-3444.44
83000 (6/6/2016)	104000 (6/21/2011)	(83000 - 104000)/(28 - 18)	-2100
83000 (12/5/2016)	104000 (6/21/2011)	(83000 - 104000)/(29 - 18)	-1909.09
89000 (6/20/2017)	104000 (6/21/2011)	(89000 - 104000)/(30 - 18)	-1250
114000 (12/4/2017)	104000 (6/21/2011)	(114000 - 104000)/(31 - 18)	769.231
119000 (6/4/2018)	104000 (6/21/2011)	(119000 - 104000)/(32 - 18)	1071.43
112000 (6/4/2012)	121000 (12/13/2011)	(112000 - 121000)/(20 - 19)	-9000
93000 (12/11/2012)	121000 (12/13/2011)	(93000 - 121000)/(21 - 19)	-14000
72000 (6/3/2013)	121000 (12/13/2011)	(72000 - 121000)/(22 - 19)	-16333.3
73000 (12/3/2013)	121000 (12/13/2011)	(73000 - 121000)/(23 - 19)	-12000
79000 (6/2/2014)	121000 (12/13/2011)	(79000 - 121000)/(24 - 19)	-8400
83000 (12/2/2014)	121000 (12/13/2011)	(83000 - 121000)/(25 - 19)	-6333.33

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76000 (6/1/2015)	121000 (12/13/2011)	(76000 - 121000)/(26 - 19)	-6428.57
73000 (12/7/2015)	121000 (12/13/2011)	(73000 - 121000)/(27 - 19)	-6000
83000 (6/6/2016)	121000 (12/13/2011)	(83000 - 121000)/(28 - 19)	-4222.22
83000 (12/5/2016)	121000 (12/13/2011)	(83000 - 121000)/(29 - 19)	-3800
89000 (6/20/2017)	121000 (12/13/2011)	(89000 - 121000)/(30 - 19)	-2909.09
114000 (12/4/2017)	121000 (12/13/2011)	(114000 - 121000)/(31 - 19)	-583.333
119000 (6/4/2018)	121000 (12/13/2011)	(119000 - 121000)/(32 - 19)	-153.846

93000 (12/11/2012)	112000 (6/4/2012)	(93000 - 112000)/(21 - 20)	-19000
72000 (6/3/2013)	112000 (6/4/2012)	(72000 - 112000)/(22 - 20)	-20000
73000 (12/3/2013)	112000 (6/4/2012)	(73000 - 112000)/(23 - 20)	-13000
79000 (6/2/2014)	112000 (6/4/2012)	(79000 - 112000)/(24 - 20)	-8250
83000 (12/2/2014)	112000 (6/4/2012)	(83000 - 112000)/(25 - 20)	-5800
76000 (6/1/2015)	112000 (6/4/2012)	(76000 - 112000)/(26 - 20)	-6000
73000 (12/7/2015)	112000 (6/4/2012)	(73000 - 112000)/(27 - 20)	-5571.43
83000 (6/6/2016)	112000 (6/4/2012)	(83000 - 112000)/(28 - 20)	-3625
83000 (12/5/2016)	112000 (6/4/2012)	(83000 - 112000)/(29 - 20)	-3222.22
89000 (6/20/2017)	112000 (6/4/2012)	(89000 - 112000)/(30 - 20)	-2300
114000 (12/4/2017)	112000 (6/4/2012)	(114000 - 112000)/(31 - 20)	181.818
119000 (6/4/2018)	112000 (6/4/2012)	(119000 - 112000)/(32 - 20)	583.333

72000 (6/3/2013)	93000 (12/11/2012)	(72000 - 93000)/(22 - 21)	-21000
73000 (12/3/2013)	93000 (12/11/2012)	(73000 - 93000)/(23 - 21)	-10000
79000 (6/2/2014)	93000 (12/11/2012)	(79000 - 93000)/(24 - 21)	-4666.67
83000 (12/2/2014)	93000 (12/11/2012)	(83000 - 93000)/(25 - 21)	-2500
76000 (6/1/2015)	93000 (12/11/2012)	(76000 - 93000)/(26 - 21)	-3400
73000 (12/7/2015)	93000 (12/11/2012)	(73000 - 93000)/(27 - 21)	-3333.33
83000 (6/6/2016)	93000 (12/11/2012)	(83000 - 93000)/(28 - 21)	-1428.57
83000 (12/5/2016)	93000 (12/11/2012)	(83000 - 93000)/(29 - 21)	-1250
89000 (6/20/2017)	93000 (12/11/2012)	(89000 - 93000)/(30 - 21)	-444.444
114000 (12/4/2017)	93000 (12/11/2012)	(114000 - 93000)/(31 - 21)	2100
119000 (6/4/2018)	93000 (12/11/2012)	(119000 - 93000)/(32 - 21)	2363.64

73000 (12/3/2013)	72000 (6/3/2013)	(73000 - 72000)/(23 - 22)	1000
79000 (6/2/2014)	72000 (6/3/2013)	(79000 - 72000)/(24 - 22)	3500
83000 (12/2/2014)	72000 (6/3/2013)	(83000 - 72000)/(25 - 22)	3666.67
76000 (6/1/2015)	72000 (6/3/2013)	(76000 - 72000)/(26 - 22)	1000
73000 (12/7/2015)	72000 (6/3/2013)	(73000 - 72000)/(27 - 22)	200
83000 (6/6/2016)	72000 (6/3/2013)	(83000 - 72000)/(28 - 22)	1833.33
83000 (12/5/2016)	72000 (6/3/2013)	(83000 - 72000)/(29 - 22)	1571.43
89000 (6/20/2017)	72000 (6/3/2013)	(89000 - 72000)/(30 - 22)	2125
114000 (12/4/2017)	72000 (6/3/2013)	(114000 - 72000)/(31 - 22)	4666.67
119000 (6/4/2018)	72000 (6/3/2013)	(119000 - 72000)/(32 - 22)	4700

79000 (6/2/2014)	73000 (12/3/2013)	(79000 - 73000)/(24 - 23)	6000
83000 (12/2/2014)	73000 (12/3/2013)	(83000 - 73000)/(25 - 23)	5000
76000 (6/1/2015)	73000 (12/3/2013)	(76000 - 73000)/(26 - 23)	1000
73000 (12/7/2015)	73000 (12/3/2013)	(73000 - 73000)/(27 - 23)	0
83000 (6/6/2016)	73000 (12/3/2013)	(83000 - 73000)/(28 - 23)	2000
83000 (12/5/2016)	73000 (12/3/2013)	(83000 - 73000)/(29 - 23)	1666.67
89000 (6/20/2017)	73000 (12/3/2013)	(89000 - 73000)/(30 - 23)	2285.71
114000 (12/4/2017)	73000 (12/3/2013)	(114000 - 73000)/(31 - 23)	5125
119000 (6/4/2018)	73000 (12/3/2013)	(119000 - 73000)/(32 - 23)	5111.11

83000 (12/2/2014)	79000 (6/2/2014)	(83000 - 79000)/(25 - 24)	4000
76000 (6/1/2015)	79000 (6/2/2014)	(76000 - 79000)/(26 - 24)	-1500
73000 (12/7/2015)	79000 (6/2/2014)	(73000 - 79000)/(27 - 24)	-2000
83000 (6/6/2016)	79000 (6/2/2014)	(83000 - 79000)/(28 - 24)	1000
83000 (12/5/2016)	79000 (6/2/2014)	(83000 - 79000)/(29 - 24)	800
89000 (6/20/2017)	79000 (6/2/2014)	(89000 - 79000)/(30 - 24)	1666.67
114000 (12/4/2017)	79000 (6/2/2014)	(114000 - 79000)/(31 - 24)	5000
119000 (6/4/2018)	79000 (6/2/2014)	(119000 - 79000)/(32 - 24)	5000

76000 (6/1/2015)	83000 (12/2/2014)	(76000 - 83000)/(26 - 25)	-7000
73000 (12/7/2015)	83000 (12/2/2014)	(73000 - 83000)/(27 - 25)	-5000
83000 (6/6/2016)	83000 (12/2/2014)	(83000 - 83000)/(28 - 25)	0
83000 (12/5/2016)	83000 (12/2/2014)	(83000 - 83000)/(29 - 25)	0
89000 (6/20/2017)	83000 (12/2/2014)	(89000 - 83000)/(30 - 25)	1200
114000 (12/4/2017)	83000 (12/2/2014)	(114000 - 83000)/(31 - 25)	5166.67
119000 (6/4/2018)	83000 (12/2/2014)	(119000 - 83000)/(32 - 25)	5142.86
73000 (12/7/2015)	76000 (6/1/2015)	(73000 - 76000)/(27 - 26)	-3000
83000 (6/6/2016)	76000 (6/1/2015)	(83000 - 76000)/(28 - 26)	3500
83000 (12/5/2016)	76000 (6/1/2015)	(83000 - 76000)/(29 - 26)	2333.33
89000 (6/20/2017)	76000 (6/1/2015)	(89000 - 76000)/(30 - 26)	3250
114000 (12/4/2017)	76000 (6/1/2015)	(114000 - 76000)/(31 - 26)	7600
119000 (6/4/2018)	76000 (6/1/2015)	(119000 - 76000)/(32 - 26)	7166.67
83000 (6/6/2016)	73000 (12/7/2015)	(83000 - 73000)/(28 - 27)	10000
83000 (12/5/2016)	73000 (12/7/2015)	(83000 - 73000)/(29 - 27)	5000
89000 (6/20/2017)	73000 (12/7/2015)	(89000 - 73000)/(30 - 27)	5333.33
114000 (12/4/2017)	73000 (12/7/2015)	(114000 - 73000)/(31 - 27)	10250
119000 (6/4/2018)	73000 (12/7/2015)	(119000 - 73000)/(32 - 27)	9200
83000 (12/5/2016)	83000 (6/6/2016)	(83000 - 83000)/(29 - 28)	0
89000 (6/20/2017)	83000 (6/6/2016)	(89000 - 83000)/(30 - 28)	3000
114000 (12/4/2017)	83000 (6/6/2016)	(114000 - 83000)/(31 - 28)	10333.3
119000 (6/4/2018)	83000 (6/6/2016)	(119000 - 83000)/(32 - 28)	9000
89000 (6/20/2017)	83000 (12/5/2016)	(89000 - 83000)/(30 - 29)	6000
114000 (12/4/2017)	83000 (12/5/2016)	(114000 - 83000)/(31 - 29)	15500
119000 (6/4/2018)	83000 (12/5/2016)	(119000 - 83000)/(32 - 29)	12000
114000 (12/4/2017)	89000 (6/20/2017)	(114000 - 89000)/(31 - 30)	25000
119000 (6/4/2018)	89000 (6/20/2017)	(119000 - 89000)/(32 - 30)	15000
119000 (6/4/2018)	114000 (12/4/2017)	(119000 - 114000)/(32 - 31)	5000

Number of Q values = 496

Ordered Q Values

n	Q
1	-51000
2	-40000
3	-34500
4	-33333.3
5	-30000
6	-29500
7	-26000
8	-24500
9	-24200
10	-24000
11	-23750
12	-22600
13	-21000
14	-20250
15	-20000
16	-19333.3
17	-19000
18	-18000
19	-17500
20	-17333.3
21	-17200
22	-16333.3

23	-16166.7
24	-15285.7
25	-15000
26	-15000
27	-14666.7
28	-14000
29	-13600
30	-13142.9
31	-13111.1
32	-13000
33	-12777.8
34	-12636.4
35	-12428.6
36	-12272.7
37	-12125
38	-12000
39	-12000
40	-12000
41	-11800
42	-11700
43	-11500
44	-11500
45	-11400
46	-11250
47	-11142.9
48	-11000
49	-10750
50	-10500
51	-10375
52	-10153.8
53	-10090.9
54	-10000
55	-9615.38
56	-9583.33
57	-9428.57
58	-9142.86
59	-9000
60	-9000
61	-9000
62	-9000
63	-9000
64	-8916.67
65	-8769.23
66	-8769.23
67	-8750
68	-8666.67
69	-8625
70	-8545.45
71	-8400
72	-8375
73	-8357.14
74	-8285.71
75	-8250
76	-8142.86
77	-8000
78	-7812.5
79	-7714.29
80	-7529.41
81	-7500
82	-7444.44
83	-7352.94
84	-7333.33
85	-7333.33

Royalton Road LF

86	-7133.33
87	-7125
88	-7111.11
89	-7000
90	-6937.5
91	-6933.33
92	-6705.88
93	-6687.5
94	-6611.11
95	-6571.43
96	-6500
97	-6428.57
98	-6428.57
99	-6421.05
100	-6333.33
101	-6200
102	-6166.67
103	-6111.11
104	-6000
105	-6000
106	-6000
107	-5941.18
108	-5933.33
109	-5800
110	-5800
111	-5777.78
112	-5769.23
113	-5666.67
114	-5571.43
115	-5473.68
116	-5307.69
117	-5285.71
118	-5250
119	-5187.5
120	-5090.91
121	-5076.92
122	-5000
123	-5000
124	-4947.37
125	-4909.09
126	-4900
127	-4866.67
128	-4850
129	-4777.78
130	-4777.78
131	-4750
132	-4700
133	-4684.21
134	-4666.67
135	-4647.06
136	-4600
137	-4571.43
138	-4533.33
139	-4500
140	-4500
141	-4500
142	-4450
143	-4380.95
144	-4222.22
145	-4222.22
146	-4176.47
147	-4166.67
148	-4166.67

Royalton Road LF

149	-4111.11
150	-4000
151	-4000
152	-3950
153	-3882.35
154	-3833.33
155	-3800
156	-3761.9
157	-3736.84
158	-3733.33
159	-3727.27
160	-3727.27
161	-3714.29
162	-3666.67
163	-3666.67
164	-3631.58
165	-3625
166	-3615.38
167	-3600
168	-3600
169	-3600
170	-3500
171	-3476.19
172	-3444.44
173	-3444.44
174	-3400
175	-3368.42
176	-3357.14
177	-3333.33
178	-3318.18
179	-3222.22
180	-3200
181	-3181.82
182	-3125
183	-3090.91
184	-3000
185	-3000
186	-3000
187	-3000
188	-2952.38
189	-2909.09
190	-2833.33
191	-2818.18
192	-2812.5
193	-2761.9
194	-2733.33
195	-2700
196	-2600
197	-2588.24
198	-2538.46
199	-2500
200	-2434.78
201	-2428.57
202	-2300
203	-2285.71
204	-2250
205	-2200
206	-2111.11
207	-2111.11
208	-2100
209	-2095.24
210	-2086.96
211	-2050

212	-2000
213	-2000
214	-2000
215	-1909.09
216	-1875
217	-1791.67
218	-1789.47
219	-1600
220	-1600
221	-1545.45
222	-1545.45
223	-1500
224	-1500
225	-1500
226	-1478.26
227	-1470.59
228	-1428.57
229	-1400
230	-1375
231	-1291.67
232	-1250
233	-1250
234	-1217.39
235	-1166.67
236	-1111.11
237	-1090.91
238	-1083.33
239	-1040
240	-1000
241	-1000
242	-1000
243	-941.176
244	-857.143
245	-833.333
246	-777.778
247	-681.818
248	-647.059
249	-611.111
250	-583.333
251	-583.333
252	-571.429
253	-538.462
254	-526.316
255	-500
256	-473.684
257	-461.538
258	-444.444
259	-434.783
260	-357.143
261	-318.182
262	-250
263	-217.391
264	-208.333
265	-200
266	-153.846
267	-120
268	-71.4286
269	0
270	0
271	0
272	0
273	0
274	0

275	0
276	40
277	76.9231
278	181.818
279	181.818
280	190.476
281	192.308
282	200
283	227.273
284	230.769
285	291.667
286	307.692
287	312.5
288	315.789
289	320
290	350
291	434.783
292	478.261
293	535.714
294	555.556
295	583.333
296	583.333
297	583.333
298	588.235
299	600
300	619.048
301	625
302	653.846
303	680
304	724.138
305	769.231
306	772.727
307	800
308	800
309	851.852
310	923.077
311	950
312	952.381
313	958.333
314	1000
315	1000
316	1000
317	1000
318	1000
319	1000
320	1000
321	1071.43
322	1111.11
323	1148.15
324	1148.15
325	1153.85
326	1181.82
327	1200
328	1230.77
329	1250
330	1285.71
331	1285.71
332	1304.35
333	1357.14
334	1444.44
335	1466.67
336	1500
337	1500

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338	1533.33
339	1571.43
340	1600
341	1600
342	1600
343	1645.16
344	1666.67
345	1666.67
346	1687.5
347	1714.29
348	1812.5
349	1812.5
350	1827.59
351	1833.33
352	1846.15
353	2000
354	2071.43
355	2100
356	2103.45
357	2105.26
358	2117.65
359	2125
360	2200
361	2285.71
362	2315.79
363	2333.33
364	2357.14
365	2363.64
366	2533.33
367	2533.33
368	2642.86
369	2705.88
370	2750
371	2800
372	2944.44
373	3000
374	3187.5
375	3250
376	3277.78
377	3437.5
378	3500
379	3500
380	3666.67
381	4000
382	4000
383	4000
384	4200
385	4272.73
386	4428.57
387	4666.67
388	4700
389	5000
390	5000
391	5000
392	5000
393	5000
394	5000
395	5000
396	5000
397	5000
398	5111.11
399	5125
400	5142.86

Royalton Road LF

401	5166.67
402	5333.33
403	5333.33
404	5461.54
405	5500
406	5600
407	5600
408	5666.67
409	5666.67
410	5923.08
411	6000
412	6000
413	6636.36
414	7000
415	7166.67
416	7166.67
417	7500
418	7600
419	9000
420	9000
421	9200
422	9800
423	9875
424	10000
425	10000
426	10166.7
427	10250
428	10333.3
429	10333.3
430	10428.6
431	10500
432	10750
433	11000
434	11500
435	11666.7
436	11888.9
437	12000
438	12400
439	12454.5
440	12500
441	12600
442	12727.3
443	12750
444	12800
445	12833.3
446	13000
447	13000
448	13222.2
449	13428.6
450	13428.6
451	13500
452	14000
453	14300
454	14750
455	15000
456	15000
457	15166.7
458	15500
459	15500
460	15625
461	15777.8
462	16000
463	16333.3

464	16500
465	16750
466	17000
467	17000
468	17000
469	17000
470	17000
471	17142.9
472	17285.7
473	17333.3
474	17500
475	17555.6
476	18125
477	18166.7
478	18285.7
479	18400
480	18800
481	19200
482	19750
483	19750
484	19800
485	20333.3
486	20500
487	20666.7
488	22500
489	24000
490	24666.7
491	25000
492	28000
493	28500
494	29000
495	32000
496	40000

Sen's Estimator (Median Q) is -629.085

Tied Group	Value	Members
1	83000	4
2	73000	2

Time Period	Observations
10/14/2002	1
4/14/2003	1
11/3/2003	1
5/10/2004	1
12/6/2004	1
5/23/2005	1
11/14/2005	1
5/22/2006	1
11/13/2006	1
6/25/2007	1
12/17/2007	1
6/16/2008	1
12/2/2008	1
6/1/2009	1
12/2/2009	1
6/21/2010	1
12/6/2010	1
6/21/2011	1
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1

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12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 174
B = 0
C = 24
D = 0
E = 14
F = 0
a = 68448
b = 267840
c = 1984
Group Variance = 3793
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 158.639
M1 = (496 - 158.639)/2.0 = 168.681
M2 = (496 + 158.639)/2.0 + 1 = 328.319
Lower limit is -3600 = Q(169)
Upper limit is 1230.77 = Q(328)
-3600 < 0 < 1230.77 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis

Parameter: Chloride

Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
10000 (4/14/2003)	8000 (10/14/2002)	(10000 - 8000)/(2 - 1)	2000
8000 (11/3/2003)	8000 (10/14/2002)	(8000 - 8000)/(3 - 1)	0
9000 (5/10/2004)	8000 (10/14/2002)	(9000 - 8000)/(4 - 1)	333.333
8000 (12/6/2004)	8000 (10/14/2002)	(8000 - 8000)/(5 - 1)	0
14000 (5/23/2005)	8000 (10/14/2002)	(14000 - 8000)/(6 - 1)	1200
21800 (11/14/2005)	8000 (10/14/2002)	(21800 - 8000)/(7 - 1)	2300
24700 (5/22/2006)	8000 (10/14/2002)	(24700 - 8000)/(8 - 1)	2385.71
26000 (11/13/2006)	8000 (10/14/2002)	(26000 - 8000)/(9 - 1)	2250
24800 (6/25/2007)	8000 (10/14/2002)	(24800 - 8000)/(10 - 1)	1866.67
26000 (12/17/2007)	8000 (10/14/2002)	(26000 - 8000)/(11 - 1)	1800
19900 (6/16/2008)	8000 (10/14/2002)	(19900 - 8000)/(12 - 1)	1081.82
19000 (12/2/2008)	8000 (10/14/2002)	(19000 - 8000)/(13 - 1)	916.667
16000 (6/1/2009)	8000 (10/14/2002)	(16000 - 8000)/(14 - 1)	615.385
35000 (12/2/2009)	8000 (10/14/2002)	(35000 - 8000)/(15 - 1)	1928.57
24000 (6/21/2010)	8000 (10/14/2002)	(24000 - 8000)/(16 - 1)	1066.67
44000 (12/6/2010)	8000 (10/14/2002)	(44000 - 8000)/(17 - 1)	2250
37000 (6/21/2011)	8000 (10/14/2002)	(37000 - 8000)/(18 - 1)	1705.88
43000 (12/13/2011)	8000 (10/14/2002)	(43000 - 8000)/(19 - 1)	1944.44
38000 (6/4/2012)	8000 (10/14/2002)	(38000 - 8000)/(20 - 1)	1578.95
45000 (12/11/2012)	8000 (10/14/2002)	(45000 - 8000)/(21 - 1)	1850
39000 (6/3/2013)	8000 (10/14/2002)	(39000 - 8000)/(22 - 1)	1476.19
53000 (12/3/2013)	8000 (10/14/2002)	(53000 - 8000)/(23 - 1)	2045.45
45000 (6/2/2014)	8000 (10/14/2002)	(45000 - 8000)/(24 - 1)	1608.7
61000 (12/2/2014)	8000 (10/14/2002)	(61000 - 8000)/(25 - 1)	2208.33
61000 (6/1/2015)	8000 (10/14/2002)	(61000 - 8000)/(26 - 1)	2120
75000 (12/7/2015)	8000 (10/14/2002)	(75000 - 8000)/(27 - 1)	2576.92
65000 (6/6/2016)	8000 (10/14/2002)	(65000 - 8000)/(28 - 1)	2111.11
76000 (12/5/2016)	8000 (10/14/2002)	(76000 - 8000)/(29 - 1)	2428.57
73000 (6/20/2017)	8000 (10/14/2002)	(73000 - 8000)/(30 - 1)	2241.38
80000 (12/4/2017)	8000 (10/14/2002)	(80000 - 8000)/(31 - 1)	2400
76000 (6/4/2018)	8000 (10/14/2002)	(76000 - 8000)/(32 - 1)	2193.55
8000 (11/3/2003)	10000 (4/14/2003)	(8000 - 10000)/(3 - 2)	-2000
9000 (5/10/2004)	10000 (4/14/2003)	(9000 - 10000)/(4 - 2)	-500
8000 (12/6/2004)	10000 (4/14/2003)	(8000 - 10000)/(5 - 2)	-666.667
14000 (5/23/2005)	10000 (4/14/2003)	(14000 - 10000)/(6 - 2)	1000
21800 (11/14/2005)	10000 (4/14/2003)	(21800 - 10000)/(7 - 2)	2360
24700 (5/22/2006)	10000 (4/14/2003)	(24700 - 10000)/(8 - 2)	2450
26000 (11/13/2006)	10000 (4/14/2003)	(26000 - 10000)/(9 - 2)	2285.71
24800 (6/25/2007)	10000 (4/14/2003)	(24800 - 10000)/(10 - 2)	1850
26000 (12/17/2007)	10000 (4/14/2003)	(26000 - 10000)/(11 - 2)	1777.78
19900 (6/16/2008)	10000 (4/14/2003)	(19900 - 10000)/(12 - 2)	990
19000 (12/2/2008)	10000 (4/14/2003)	(19000 - 10000)/(13 - 2)	818.182
16000 (6/1/2009)	10000 (4/14/2003)	(16000 - 10000)/(14 - 2)	500
35000 (12/2/2009)	10000 (4/14/2003)	(35000 - 10000)/(15 - 2)	1923.08
24000 (6/21/2010)	10000 (4/14/2003)	(24000 - 10000)/(16 - 2)	1000
44000 (12/6/2010)	10000 (4/14/2003)	(44000 - 10000)/(17 - 2)	2266.67
37000 (6/21/2011)	10000 (4/14/2003)	(37000 - 10000)/(18 - 2)	1687.5
43000 (12/13/2011)	10000 (4/14/2003)	(43000 - 10000)/(19 - 2)	1941.18
38000 (6/4/2012)	10000 (4/14/2003)	(38000 - 10000)/(20 - 2)	1555.56
45000 (12/11/2012)	10000 (4/14/2003)	(45000 - 10000)/(21 - 2)	1842.11

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39000 (6/3/2013)	10000 (4/14/2003)	(39000 - 10000)/(22 - 2)	1450
53000 (12/3/2013)	10000 (4/14/2003)	(53000 - 10000)/(23 - 2)	2047.62
45000 (6/2/2014)	10000 (4/14/2003)	(45000 - 10000)/(24 - 2)	1590.91
61000 (12/2/2014)	10000 (4/14/2003)	(61000 - 10000)/(25 - 2)	2217.39
61000 (6/1/2015)	10000 (4/14/2003)	(61000 - 10000)/(26 - 2)	2125
75000 (12/7/2015)	10000 (4/14/2003)	(75000 - 10000)/(27 - 2)	2600
65000 (6/6/2016)	10000 (4/14/2003)	(65000 - 10000)/(28 - 2)	2115.38
76000 (12/5/2016)	10000 (4/14/2003)	(76000 - 10000)/(29 - 2)	2444.44
73000 (6/20/2017)	10000 (4/14/2003)	(73000 - 10000)/(30 - 2)	2250
80000 (12/4/2017)	10000 (4/14/2003)	(80000 - 10000)/(31 - 2)	2413.79
76000 (6/4/2018)	10000 (4/14/2003)	(76000 - 10000)/(32 - 2)	2200

9000 (5/10/2004)	8000 (11/3/2003)	(9000 - 8000)/(4 - 3)	1000
8000 (12/6/2004)	8000 (11/3/2003)	(8000 - 8000)/(5 - 3)	0
14000 (5/23/2005)	8000 (11/3/2003)	(14000 - 8000)/(6 - 3)	2000
21800 (11/14/2005)	8000 (11/3/2003)	(21800 - 8000)/(7 - 3)	3450
24700 (5/22/2006)	8000 (11/3/2003)	(24700 - 8000)/(8 - 3)	3340
26000 (11/13/2006)	8000 (11/3/2003)	(26000 - 8000)/(9 - 3)	3000
24800 (6/25/2007)	8000 (11/3/2003)	(24800 - 8000)/(10 - 3)	2400
26000 (12/17/2007)	8000 (11/3/2003)	(26000 - 8000)/(11 - 3)	2250
19900 (6/16/2008)	8000 (11/3/2003)	(19900 - 8000)/(12 - 3)	1322.22
19000 (12/2/2008)	8000 (11/3/2003)	(19000 - 8000)/(13 - 3)	1100
16000 (6/1/2009)	8000 (11/3/2003)	(16000 - 8000)/(14 - 3)	727.273
35000 (12/2/2009)	8000 (11/3/2003)	(35000 - 8000)/(15 - 3)	2250
24000 (6/21/2010)	8000 (11/3/2003)	(24000 - 8000)/(16 - 3)	1230.77
44000 (12/6/2010)	8000 (11/3/2003)	(44000 - 8000)/(17 - 3)	2571.43
37000 (6/21/2011)	8000 (11/3/2003)	(37000 - 8000)/(18 - 3)	1933.33
43000 (12/13/2011)	8000 (11/3/2003)	(43000 - 8000)/(19 - 3)	2187.5
38000 (6/4/2012)	8000 (11/3/2003)	(38000 - 8000)/(20 - 3)	1764.71
45000 (12/11/2012)	8000 (11/3/2003)	(45000 - 8000)/(21 - 3)	2055.56
39000 (6/3/2013)	8000 (11/3/2003)	(39000 - 8000)/(22 - 3)	1631.58
53000 (12/3/2013)	8000 (11/3/2003)	(53000 - 8000)/(23 - 3)	2250
45000 (6/2/2014)	8000 (11/3/2003)	(45000 - 8000)/(24 - 3)	1761.9
61000 (12/2/2014)	8000 (11/3/2003)	(61000 - 8000)/(25 - 3)	2409.09
61000 (6/1/2015)	8000 (11/3/2003)	(61000 - 8000)/(26 - 3)	2304.35
75000 (12/7/2015)	8000 (11/3/2003)	(75000 - 8000)/(27 - 3)	2791.67
65000 (6/6/2016)	8000 (11/3/2003)	(65000 - 8000)/(28 - 3)	2280
76000 (12/5/2016)	8000 (11/3/2003)	(76000 - 8000)/(29 - 3)	2615.38
73000 (6/20/2017)	8000 (11/3/2003)	(73000 - 8000)/(30 - 3)	2407.41
80000 (12/4/2017)	8000 (11/3/2003)	(80000 - 8000)/(31 - 3)	2571.43
76000 (6/4/2018)	8000 (11/3/2003)	(76000 - 8000)/(32 - 3)	2344.83

8000 (12/6/2004)	9000 (5/10/2004)	(8000 - 9000)/(5 - 4)	-1000
14000 (5/23/2005)	9000 (5/10/2004)	(14000 - 9000)/(6 - 4)	2500
21800 (11/14/2005)	9000 (5/10/2004)	(21800 - 9000)/(7 - 4)	4266.67
24700 (5/22/2006)	9000 (5/10/2004)	(24700 - 9000)/(8 - 4)	3925
26000 (11/13/2006)	9000 (5/10/2004)	(26000 - 9000)/(9 - 4)	3400
24800 (6/25/2007)	9000 (5/10/2004)	(24800 - 9000)/(10 - 4)	2633.33
26000 (12/17/2007)	9000 (5/10/2004)	(26000 - 9000)/(11 - 4)	2428.57
19900 (6/16/2008)	9000 (5/10/2004)	(19900 - 9000)/(12 - 4)	1362.5
19000 (12/2/2008)	9000 (5/10/2004)	(19000 - 9000)/(13 - 4)	1111.11
16000 (6/1/2009)	9000 (5/10/2004)	(16000 - 9000)/(14 - 4)	700
35000 (12/2/2009)	9000 (5/10/2004)	(35000 - 9000)/(15 - 4)	2363.64
24000 (6/21/2010)	9000 (5/10/2004)	(24000 - 9000)/(16 - 4)	1250
44000 (12/6/2010)	9000 (5/10/2004)	(44000 - 9000)/(17 - 4)	2692.31
37000 (6/21/2011)	9000 (5/10/2004)	(37000 - 9000)/(18 - 4)	2000
43000 (12/13/2011)	9000 (5/10/2004)	(43000 - 9000)/(19 - 4)	2266.67
38000 (6/4/2012)	9000 (5/10/2004)	(38000 - 9000)/(20 - 4)	1812.5
45000 (12/11/2012)	9000 (5/10/2004)	(45000 - 9000)/(21 - 4)	2117.65
39000 (6/3/2013)	9000 (5/10/2004)	(39000 - 9000)/(22 - 4)	1666.67
53000 (12/3/2013)	9000 (5/10/2004)	(53000 - 9000)/(23 - 4)	2315.79
45000 (6/2/2014)	9000 (5/10/2004)	(45000 - 9000)/(24 - 4)	1800
61000 (12/2/2014)	9000 (5/10/2004)	(61000 - 9000)/(25 - 4)	2476.19

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61000 (6/1/2015)	9000 (5/10/2004)	(61000 - 9000)/(26 - 4)	2363.64
75000 (12/7/2015)	9000 (5/10/2004)	(75000 - 9000)/(27 - 4)	2869.57
65000 (6/6/2016)	9000 (5/10/2004)	(65000 - 9000)/(28 - 4)	2333.33
76000 (12/5/2016)	9000 (5/10/2004)	(76000 - 9000)/(29 - 4)	2680
73000 (6/20/2017)	9000 (5/10/2004)	(73000 - 9000)/(30 - 4)	2461.54
80000 (12/4/2017)	9000 (5/10/2004)	(80000 - 9000)/(31 - 4)	2629.63
76000 (6/4/2018)	9000 (5/10/2004)	(76000 - 9000)/(32 - 4)	2392.86

14000 (5/23/2005)	8000 (12/6/2004)	(14000 - 8000)/(6 - 5)	6000
21800 (11/14/2005)	8000 (12/6/2004)	(21800 - 8000)/(7 - 5)	6900
24700 (5/22/2006)	8000 (12/6/2004)	(24700 - 8000)/(8 - 5)	5566.67
26000 (11/13/2006)	8000 (12/6/2004)	(26000 - 8000)/(9 - 5)	4500
24800 (6/25/2007)	8000 (12/6/2004)	(24800 - 8000)/(10 - 5)	3360
26000 (12/17/2007)	8000 (12/6/2004)	(26000 - 8000)/(11 - 5)	3000
19900 (6/16/2008)	8000 (12/6/2004)	(19900 - 8000)/(12 - 5)	1700
19000 (12/2/2008)	8000 (12/6/2004)	(19000 - 8000)/(13 - 5)	1375
16000 (6/1/2009)	8000 (12/6/2004)	(16000 - 8000)/(14 - 5)	888.889
35000 (12/2/2009)	8000 (12/6/2004)	(35000 - 8000)/(15 - 5)	2700
24000 (6/21/2010)	8000 (12/6/2004)	(24000 - 8000)/(16 - 5)	1454.55
44000 (12/6/2010)	8000 (12/6/2004)	(44000 - 8000)/(17 - 5)	3000
37000 (6/21/2011)	8000 (12/6/2004)	(37000 - 8000)/(18 - 5)	2230.77
43000 (12/13/2011)	8000 (12/6/2004)	(43000 - 8000)/(19 - 5)	2500
38000 (6/4/2012)	8000 (12/6/2004)	(38000 - 8000)/(20 - 5)	2000
45000 (12/11/2012)	8000 (12/6/2004)	(45000 - 8000)/(21 - 5)	2312.5
39000 (6/3/2013)	8000 (12/6/2004)	(39000 - 8000)/(22 - 5)	1823.53
53000 (12/3/2013)	8000 (12/6/2004)	(53000 - 8000)/(23 - 5)	2500
45000 (6/2/2014)	8000 (12/6/2004)	(45000 - 8000)/(24 - 5)	1947.37
61000 (12/2/2014)	8000 (12/6/2004)	(61000 - 8000)/(25 - 5)	2650
61000 (6/1/2015)	8000 (12/6/2004)	(61000 - 8000)/(26 - 5)	2523.81
75000 (12/7/2015)	8000 (12/6/2004)	(75000 - 8000)/(27 - 5)	3045.45
65000 (6/6/2016)	8000 (12/6/2004)	(65000 - 8000)/(28 - 5)	2478.26
76000 (12/5/2016)	8000 (12/6/2004)	(76000 - 8000)/(29 - 5)	2833.33
73000 (6/20/2017)	8000 (12/6/2004)	(73000 - 8000)/(30 - 5)	2600
80000 (12/4/2017)	8000 (12/6/2004)	(80000 - 8000)/(31 - 5)	2769.23
76000 (6/4/2018)	8000 (12/6/2004)	(76000 - 8000)/(32 - 5)	2518.52

21800 (11/14/2005)	14000 (5/23/2005)	(21800 - 14000)/(7 - 6)	7800
24700 (5/22/2006)	14000 (5/23/2005)	(24700 - 14000)/(8 - 6)	5350
26000 (11/13/2006)	14000 (5/23/2005)	(26000 - 14000)/(9 - 6)	4000
24800 (6/25/2007)	14000 (5/23/2005)	(24800 - 14000)/(10 - 6)	2700
26000 (12/17/2007)	14000 (5/23/2005)	(26000 - 14000)/(11 - 6)	2400
19900 (6/16/2008)	14000 (5/23/2005)	(19900 - 14000)/(12 - 6)	983.333
19000 (12/2/2008)	14000 (5/23/2005)	(19000 - 14000)/(13 - 6)	714.286
16000 (6/1/2009)	14000 (5/23/2005)	(16000 - 14000)/(14 - 6)	250
35000 (12/2/2009)	14000 (5/23/2005)	(35000 - 14000)/(15 - 6)	2333.33
24000 (6/21/2010)	14000 (5/23/2005)	(24000 - 14000)/(16 - 6)	1000
44000 (12/6/2010)	14000 (5/23/2005)	(44000 - 14000)/(17 - 6)	2727.27
37000 (6/21/2011)	14000 (5/23/2005)	(37000 - 14000)/(18 - 6)	1916.67
43000 (12/13/2011)	14000 (5/23/2005)	(43000 - 14000)/(19 - 6)	2230.77
38000 (6/4/2012)	14000 (5/23/2005)	(38000 - 14000)/(20 - 6)	1714.29
45000 (12/11/2012)	14000 (5/23/2005)	(45000 - 14000)/(21 - 6)	2066.67
39000 (6/3/2013)	14000 (5/23/2005)	(39000 - 14000)/(22 - 6)	1562.5
53000 (12/3/2013)	14000 (5/23/2005)	(53000 - 14000)/(23 - 6)	2294.12
45000 (6/2/2014)	14000 (5/23/2005)	(45000 - 14000)/(24 - 6)	1722.22
61000 (12/2/2014)	14000 (5/23/2005)	(61000 - 14000)/(25 - 6)	2473.68
61000 (6/1/2015)	14000 (5/23/2005)	(61000 - 14000)/(26 - 6)	2350
75000 (12/7/2015)	14000 (5/23/2005)	(75000 - 14000)/(27 - 6)	2904.76
65000 (6/6/2016)	14000 (5/23/2005)	(65000 - 14000)/(28 - 6)	2318.18
76000 (12/5/2016)	14000 (5/23/2005)	(76000 - 14000)/(29 - 6)	2695.65
73000 (6/20/2017)	14000 (5/23/2005)	(73000 - 14000)/(30 - 6)	2458.33
80000 (12/4/2017)	14000 (5/23/2005)	(80000 - 14000)/(31 - 6)	2640
76000 (6/4/2018)	14000 (5/23/2005)	(76000 - 14000)/(32 - 6)	2384.62

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24700 (5/22/2006)	21800 (11/14/2005)	(24700 - 21800)/(8 - 7)	2900
26000 (11/13/2006)	21800 (11/14/2005)	(26000 - 21800)/(9 - 7)	2100
24800 (6/25/2007)	21800 (11/14/2005)	(24800 - 21800)/(10 - 7)	1000
26000 (12/17/2007)	21800 (11/14/2005)	(26000 - 21800)/(11 - 7)	1050
19900 (6/16/2008)	21800 (11/14/2005)	(19900 - 21800)/(12 - 7)	-380
19000 (12/2/2008)	21800 (11/14/2005)	(19000 - 21800)/(13 - 7)	-466.667
16000 (6/1/2009)	21800 (11/14/2005)	(16000 - 21800)/(14 - 7)	-828.571
35000 (12/2/2009)	21800 (11/14/2005)	(35000 - 21800)/(15 - 7)	1650
24000 (6/21/2010)	21800 (11/14/2005)	(24000 - 21800)/(16 - 7)	244.444
44000 (12/6/2010)	21800 (11/14/2005)	(44000 - 21800)/(17 - 7)	2220
37000 (6/21/2011)	21800 (11/14/2005)	(37000 - 21800)/(18 - 7)	1381.82
43000 (12/13/2011)	21800 (11/14/2005)	(43000 - 21800)/(19 - 7)	1766.67
38000 (6/4/2012)	21800 (11/14/2005)	(38000 - 21800)/(20 - 7)	1246.15
45000 (12/11/2012)	21800 (11/14/2005)	(45000 - 21800)/(21 - 7)	1657.14
39000 (6/3/2013)	21800 (11/14/2005)	(39000 - 21800)/(22 - 7)	1146.67
53000 (12/3/2013)	21800 (11/14/2005)	(53000 - 21800)/(23 - 7)	1950
45000 (6/2/2014)	21800 (11/14/2005)	(45000 - 21800)/(24 - 7)	1364.71
61000 (12/2/2014)	21800 (11/14/2005)	(61000 - 21800)/(25 - 7)	2177.78
61000 (6/1/2015)	21800 (11/14/2005)	(61000 - 21800)/(26 - 7)	2063.16
75000 (12/7/2015)	21800 (11/14/2005)	(75000 - 21800)/(27 - 7)	2660
65000 (6/6/2016)	21800 (11/14/2005)	(65000 - 21800)/(28 - 7)	2057.14
76000 (12/5/2016)	21800 (11/14/2005)	(76000 - 21800)/(29 - 7)	2463.64
73000 (6/20/2017)	21800 (11/14/2005)	(73000 - 21800)/(30 - 7)	2226.09
80000 (12/4/2017)	21800 (11/14/2005)	(80000 - 21800)/(31 - 7)	2425
76000 (6/4/2018)	21800 (11/14/2005)	(76000 - 21800)/(32 - 7)	2168

26000 (11/13/2006)	24700 (5/22/2006)	(26000 - 24700)/(9 - 8)	1300
24800 (6/25/2007)	24700 (5/22/2006)	(24800 - 24700)/(10 - 8)	50
26000 (12/17/2007)	24700 (5/22/2006)	(26000 - 24700)/(11 - 8)	433.333
19900 (6/16/2008)	24700 (5/22/2006)	(19900 - 24700)/(12 - 8)	-1200
19000 (12/2/2008)	24700 (5/22/2006)	(19000 - 24700)/(13 - 8)	-1140
16000 (6/1/2009)	24700 (5/22/2006)	(16000 - 24700)/(14 - 8)	-1450
35000 (12/2/2009)	24700 (5/22/2006)	(35000 - 24700)/(15 - 8)	1471.43
24000 (6/21/2010)	24700 (5/22/2006)	(24000 - 24700)/(16 - 8)	-87.5
44000 (12/6/2010)	24700 (5/22/2006)	(44000 - 24700)/(17 - 8)	2144.44
37000 (6/21/2011)	24700 (5/22/2006)	(37000 - 24700)/(18 - 8)	1230
43000 (12/13/2011)	24700 (5/22/2006)	(43000 - 24700)/(19 - 8)	1663.64
38000 (6/4/2012)	24700 (5/22/2006)	(38000 - 24700)/(20 - 8)	1108.33
45000 (12/11/2012)	24700 (5/22/2006)	(45000 - 24700)/(21 - 8)	1561.54
39000 (6/3/2013)	24700 (5/22/2006)	(39000 - 24700)/(22 - 8)	1021.43
53000 (12/3/2013)	24700 (5/22/2006)	(53000 - 24700)/(23 - 8)	1886.67
45000 (6/2/2014)	24700 (5/22/2006)	(45000 - 24700)/(24 - 8)	1268.75
61000 (12/2/2014)	24700 (5/22/2006)	(61000 - 24700)/(25 - 8)	2135.29
61000 (6/1/2015)	24700 (5/22/2006)	(61000 - 24700)/(26 - 8)	2016.67
75000 (12/7/2015)	24700 (5/22/2006)	(75000 - 24700)/(27 - 8)	2647.37
65000 (6/6/2016)	24700 (5/22/2006)	(65000 - 24700)/(28 - 8)	2015
76000 (12/5/2016)	24700 (5/22/2006)	(76000 - 24700)/(29 - 8)	2442.86
73000 (6/20/2017)	24700 (5/22/2006)	(73000 - 24700)/(30 - 8)	2195.45
80000 (12/4/2017)	24700 (5/22/2006)	(80000 - 24700)/(31 - 8)	2404.35
76000 (6/4/2018)	24700 (5/22/2006)	(76000 - 24700)/(32 - 8)	2137.5

24800 (6/25/2007)	26000 (11/13/2006)	(24800 - 26000)/(10 - 9)	-1200
26000 (12/17/2007)	26000 (11/13/2006)	(26000 - 26000)/(11 - 9)	0
19900 (6/16/2008)	26000 (11/13/2006)	(19900 - 26000)/(12 - 9)	-2033.33
19000 (12/2/2008)	26000 (11/13/2006)	(19000 - 26000)/(13 - 9)	-1750
16000 (6/1/2009)	26000 (11/13/2006)	(16000 - 26000)/(14 - 9)	-2000
35000 (12/2/2009)	26000 (11/13/2006)	(35000 - 26000)/(15 - 9)	1500
24000 (6/21/2010)	26000 (11/13/2006)	(24000 - 26000)/(16 - 9)	-285.714
44000 (12/6/2010)	26000 (11/13/2006)	(44000 - 26000)/(17 - 9)	2250
37000 (6/21/2011)	26000 (11/13/2006)	(37000 - 26000)/(18 - 9)	1222.22
43000 (12/13/2011)	26000 (11/13/2006)	(43000 - 26000)/(19 - 9)	1700
38000 (6/4/2012)	26000 (11/13/2006)	(38000 - 26000)/(20 - 9)	1090.91
45000 (12/11/2012)	26000 (11/13/2006)	(45000 - 26000)/(21 - 9)	1583.33

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39000 (6/3/2013)	26000 (11/13/2006)	(39000 - 26000)/(22 - 9)	1000
53000 (12/3/2013)	26000 (11/13/2006)	(53000 - 26000)/(23 - 9)	1928.57
45000 (6/2/2014)	26000 (11/13/2006)	(45000 - 26000)/(24 - 9)	1266.67
61000 (12/2/2014)	26000 (11/13/2006)	(61000 - 26000)/(25 - 9)	2187.5
61000 (6/1/2015)	26000 (11/13/2006)	(61000 - 26000)/(26 - 9)	2058.82
75000 (12/7/2015)	26000 (11/13/2006)	(75000 - 26000)/(27 - 9)	2722.22
65000 (6/6/2016)	26000 (11/13/2006)	(65000 - 26000)/(28 - 9)	2052.63
76000 (12/5/2016)	26000 (11/13/2006)	(76000 - 26000)/(29 - 9)	2500
73000 (6/20/2017)	26000 (11/13/2006)	(73000 - 26000)/(30 - 9)	2238.1
80000 (12/4/2017)	26000 (11/13/2006)	(80000 - 26000)/(31 - 9)	2454.55
76000 (6/4/2018)	26000 (11/13/2006)	(76000 - 26000)/(32 - 9)	2173.91

26000 (12/17/2007)	24800 (6/25/2007)	(26000 - 24800)/(11 - 10)	1200
19900 (6/16/2008)	24800 (6/25/2007)	(19900 - 24800)/(12 - 10)	-2450
19000 (12/2/2008)	24800 (6/25/2007)	(19000 - 24800)/(13 - 10)	-1933.33
16000 (6/1/2009)	24800 (6/25/2007)	(16000 - 24800)/(14 - 10)	-2200
35000 (12/2/2009)	24800 (6/25/2007)	(35000 - 24800)/(15 - 10)	2040
24000 (6/21/2010)	24800 (6/25/2007)	(24000 - 24800)/(16 - 10)	-133.333
44000 (12/6/2010)	24800 (6/25/2007)	(44000 - 24800)/(17 - 10)	2742.86
37000 (6/21/2011)	24800 (6/25/2007)	(37000 - 24800)/(18 - 10)	1525
43000 (12/13/2011)	24800 (6/25/2007)	(43000 - 24800)/(19 - 10)	2022.22
38000 (6/4/2012)	24800 (6/25/2007)	(38000 - 24800)/(20 - 10)	1320
45000 (12/11/2012)	24800 (6/25/2007)	(45000 - 24800)/(21 - 10)	1836.36
39000 (6/3/2013)	24800 (6/25/2007)	(39000 - 24800)/(22 - 10)	1183.33
53000 (12/3/2013)	24800 (6/25/2007)	(53000 - 24800)/(23 - 10)	2169.23
45000 (6/2/2014)	24800 (6/25/2007)	(45000 - 24800)/(24 - 10)	1442.86
61000 (12/2/2014)	24800 (6/25/2007)	(61000 - 24800)/(25 - 10)	2413.33
61000 (6/1/2015)	24800 (6/25/2007)	(61000 - 24800)/(26 - 10)	2262.5
75000 (12/7/2015)	24800 (6/25/2007)	(75000 - 24800)/(27 - 10)	2952.94
65000 (6/6/2016)	24800 (6/25/2007)	(65000 - 24800)/(28 - 10)	2233.33
76000 (12/5/2016)	24800 (6/25/2007)	(76000 - 24800)/(29 - 10)	2694.74
73000 (6/20/2017)	24800 (6/25/2007)	(73000 - 24800)/(30 - 10)	2410
80000 (12/4/2017)	24800 (6/25/2007)	(80000 - 24800)/(31 - 10)	2628.57
76000 (6/4/2018)	24800 (6/25/2007)	(76000 - 24800)/(32 - 10)	2327.27

19900 (6/16/2008)	26000 (12/17/2007)	(19900 - 26000)/(12 - 11)	-6100
19000 (12/2/2008)	26000 (12/17/2007)	(19000 - 26000)/(13 - 11)	-3500
16000 (6/1/2009)	26000 (12/17/2007)	(16000 - 26000)/(14 - 11)	-3333.33
35000 (12/2/2009)	26000 (12/17/2007)	(35000 - 26000)/(15 - 11)	2250
24000 (6/21/2010)	26000 (12/17/2007)	(24000 - 26000)/(16 - 11)	-400
44000 (12/6/2010)	26000 (12/17/2007)	(44000 - 26000)/(17 - 11)	3000
37000 (6/21/2011)	26000 (12/17/2007)	(37000 - 26000)/(18 - 11)	1571.43
43000 (12/13/2011)	26000 (12/17/2007)	(43000 - 26000)/(19 - 11)	2125
38000 (6/4/2012)	26000 (12/17/2007)	(38000 - 26000)/(20 - 11)	1333.33
45000 (12/11/2012)	26000 (12/17/2007)	(45000 - 26000)/(21 - 11)	1900
39000 (6/3/2013)	26000 (12/17/2007)	(39000 - 26000)/(22 - 11)	1181.82
53000 (12/3/2013)	26000 (12/17/2007)	(53000 - 26000)/(23 - 11)	2250
45000 (6/2/2014)	26000 (12/17/2007)	(45000 - 26000)/(24 - 11)	1461.54
61000 (12/2/2014)	26000 (12/17/2007)	(61000 - 26000)/(25 - 11)	2500
61000 (6/1/2015)	26000 (12/17/2007)	(61000 - 26000)/(26 - 11)	2333.33
75000 (12/7/2015)	26000 (12/17/2007)	(75000 - 26000)/(27 - 11)	3062.5
65000 (6/6/2016)	26000 (12/17/2007)	(65000 - 26000)/(28 - 11)	2294.12
76000 (12/5/2016)	26000 (12/17/2007)	(76000 - 26000)/(29 - 11)	2777.78
73000 (6/20/2017)	26000 (12/17/2007)	(73000 - 26000)/(30 - 11)	2473.68
80000 (12/4/2017)	26000 (12/17/2007)	(80000 - 26000)/(31 - 11)	2700
76000 (6/4/2018)	26000 (12/17/2007)	(76000 - 26000)/(32 - 11)	2380.95

19000 (12/2/2008)	19900 (6/16/2008)	(19000 - 19900)/(13 - 12)	-900
16000 (6/1/2009)	19900 (6/16/2008)	(16000 - 19900)/(14 - 12)	-1950
35000 (12/2/2009)	19900 (6/16/2008)	(35000 - 19900)/(15 - 12)	5033.33
24000 (6/21/2010)	19900 (6/16/2008)	(24000 - 19900)/(16 - 12)	1025
44000 (12/6/2010)	19900 (6/16/2008)	(44000 - 19900)/(17 - 12)	4820
37000 (6/21/2011)	19900 (6/16/2008)	(37000 - 19900)/(18 - 12)	2850

43000 (12/13/2011)	19900 (6/16/2008)	(43000 - 19900)/(19 - 12)	3300
38000 (6/4/2012)	19900 (6/16/2008)	(38000 - 19900)/(20 - 12)	2262.5
45000 (12/11/2012)	19900 (6/16/2008)	(45000 - 19900)/(21 - 12)	2788.89
39000 (6/3/2013)	19900 (6/16/2008)	(39000 - 19900)/(22 - 12)	1910
53000 (12/3/2013)	19900 (6/16/2008)	(53000 - 19900)/(23 - 12)	3009.09
45000 (6/2/2014)	19900 (6/16/2008)	(45000 - 19900)/(24 - 12)	2091.67
61000 (12/2/2014)	19900 (6/16/2008)	(61000 - 19900)/(25 - 12)	3161.54
61000 (6/1/2015)	19900 (6/16/2008)	(61000 - 19900)/(26 - 12)	2935.71
75000 (12/7/2015)	19900 (6/16/2008)	(75000 - 19900)/(27 - 12)	3673.33
65000 (6/6/2016)	19900 (6/16/2008)	(65000 - 19900)/(28 - 12)	2818.75
76000 (12/5/2016)	19900 (6/16/2008)	(76000 - 19900)/(29 - 12)	3300
73000 (6/20/2017)	19900 (6/16/2008)	(73000 - 19900)/(30 - 12)	2950
80000 (12/4/2017)	19900 (6/16/2008)	(80000 - 19900)/(31 - 12)	3163.16
76000 (6/4/2018)	19900 (6/16/2008)	(76000 - 19900)/(32 - 12)	2805
16000 (6/1/2009)	19000 (12/2/2008)	(16000 - 19000)/(14 - 13)	-3000
35000 (12/2/2009)	19000 (12/2/2008)	(35000 - 19000)/(15 - 13)	8000
24000 (6/21/2010)	19000 (12/2/2008)	(24000 - 19000)/(16 - 13)	1666.67
44000 (12/6/2010)	19000 (12/2/2008)	(44000 - 19000)/(17 - 13)	6250
37000 (6/21/2011)	19000 (12/2/2008)	(37000 - 19000)/(18 - 13)	3600
43000 (12/13/2011)	19000 (12/2/2008)	(43000 - 19000)/(19 - 13)	4000
38000 (6/4/2012)	19000 (12/2/2008)	(38000 - 19000)/(20 - 13)	2714.29
45000 (12/11/2012)	19000 (12/2/2008)	(45000 - 19000)/(21 - 13)	3250
39000 (6/3/2013)	19000 (12/2/2008)	(39000 - 19000)/(22 - 13)	2222.22
53000 (12/3/2013)	19000 (12/2/2008)	(53000 - 19000)/(23 - 13)	3400
45000 (6/2/2014)	19000 (12/2/2008)	(45000 - 19000)/(24 - 13)	2363.64
61000 (12/2/2014)	19000 (12/2/2008)	(61000 - 19000)/(25 - 13)	3500
61000 (6/1/2015)	19000 (12/2/2008)	(61000 - 19000)/(26 - 13)	3230.77
75000 (12/7/2015)	19000 (12/2/2008)	(75000 - 19000)/(27 - 13)	4000
65000 (6/6/2016)	19000 (12/2/2008)	(65000 - 19000)/(28 - 13)	3066.67
76000 (12/5/2016)	19000 (12/2/2008)	(76000 - 19000)/(29 - 13)	3562.5
73000 (6/20/2017)	19000 (12/2/2008)	(73000 - 19000)/(30 - 13)	3176.47
80000 (12/4/2017)	19000 (12/2/2008)	(80000 - 19000)/(31 - 13)	3388.89
76000 (6/4/2018)	19000 (12/2/2008)	(76000 - 19000)/(32 - 13)	3000
35000 (12/2/2009)	16000 (6/1/2009)	(35000 - 16000)/(15 - 14)	19000
24000 (6/21/2010)	16000 (6/1/2009)	(24000 - 16000)/(16 - 14)	4000
44000 (12/6/2010)	16000 (6/1/2009)	(44000 - 16000)/(17 - 14)	9333.33
37000 (6/21/2011)	16000 (6/1/2009)	(37000 - 16000)/(18 - 14)	5250
43000 (12/13/2011)	16000 (6/1/2009)	(43000 - 16000)/(19 - 14)	5400
38000 (6/4/2012)	16000 (6/1/2009)	(38000 - 16000)/(20 - 14)	3666.67
45000 (12/11/2012)	16000 (6/1/2009)	(45000 - 16000)/(21 - 14)	4142.86
39000 (6/3/2013)	16000 (6/1/2009)	(39000 - 16000)/(22 - 14)	2875
53000 (12/3/2013)	16000 (6/1/2009)	(53000 - 16000)/(23 - 14)	4111.11
45000 (6/2/2014)	16000 (6/1/2009)	(45000 - 16000)/(24 - 14)	2900
61000 (12/2/2014)	16000 (6/1/2009)	(61000 - 16000)/(25 - 14)	4090.91
61000 (6/1/2015)	16000 (6/1/2009)	(61000 - 16000)/(26 - 14)	3750
75000 (12/7/2015)	16000 (6/1/2009)	(75000 - 16000)/(27 - 14)	4538.46
65000 (6/6/2016)	16000 (6/1/2009)	(65000 - 16000)/(28 - 14)	3500
76000 (12/5/2016)	16000 (6/1/2009)	(76000 - 16000)/(29 - 14)	4000
73000 (6/20/2017)	16000 (6/1/2009)	(73000 - 16000)/(30 - 14)	3562.5
80000 (12/4/2017)	16000 (6/1/2009)	(80000 - 16000)/(31 - 14)	3764.71
76000 (6/4/2018)	16000 (6/1/2009)	(76000 - 16000)/(32 - 14)	3333.33
24000 (6/21/2010)	35000 (12/2/2009)	(24000 - 35000)/(16 - 15)	-11000
44000 (12/6/2010)	35000 (12/2/2009)	(44000 - 35000)/(17 - 15)	4500
37000 (6/21/2011)	35000 (12/2/2009)	(37000 - 35000)/(18 - 15)	666.667
43000 (12/13/2011)	35000 (12/2/2009)	(43000 - 35000)/(19 - 15)	2000
38000 (6/4/2012)	35000 (12/2/2009)	(38000 - 35000)/(20 - 15)	600
45000 (12/11/2012)	35000 (12/2/2009)	(45000 - 35000)/(21 - 15)	1666.67
39000 (6/3/2013)	35000 (12/2/2009)	(39000 - 35000)/(22 - 15)	571.429
53000 (12/3/2013)	35000 (12/2/2009)	(53000 - 35000)/(23 - 15)	2250
45000 (6/2/2014)	35000 (12/2/2009)	(45000 - 35000)/(24 - 15)	1111.11

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61000 (12/2/2014)	35000 (12/2/2009)	(61000 - 35000)/(25 - 15)	2600
61000 (6/1/2015)	35000 (12/2/2009)	(61000 - 35000)/(26 - 15)	2363.64
75000 (12/7/2015)	35000 (12/2/2009)	(75000 - 35000)/(27 - 15)	3333.33
65000 (6/6/2016)	35000 (12/2/2009)	(65000 - 35000)/(28 - 15)	2307.69
76000 (12/5/2016)	35000 (12/2/2009)	(76000 - 35000)/(29 - 15)	2928.57
73000 (6/20/2017)	35000 (12/2/2009)	(73000 - 35000)/(30 - 15)	2533.33
80000 (12/4/2017)	35000 (12/2/2009)	(80000 - 35000)/(31 - 15)	2812.5
76000 (6/4/2018)	35000 (12/2/2009)	(76000 - 35000)/(32 - 15)	2411.76

44000 (12/6/2010)	24000 (6/21/2010)	(44000 - 24000)/(17 - 16)	20000
37000 (6/21/2011)	24000 (6/21/2010)	(37000 - 24000)/(18 - 16)	6500
43000 (12/13/2011)	24000 (6/21/2010)	(43000 - 24000)/(19 - 16)	6333.33
38000 (6/4/2012)	24000 (6/21/2010)	(38000 - 24000)/(20 - 16)	3500
45000 (12/11/2012)	24000 (6/21/2010)	(45000 - 24000)/(21 - 16)	4200
39000 (6/3/2013)	24000 (6/21/2010)	(39000 - 24000)/(22 - 16)	2500
53000 (12/3/2013)	24000 (6/21/2010)	(53000 - 24000)/(23 - 16)	4142.86
45000 (6/2/2014)	24000 (6/21/2010)	(45000 - 24000)/(24 - 16)	2625
61000 (12/2/2014)	24000 (6/21/2010)	(61000 - 24000)/(25 - 16)	4111.11
61000 (6/1/2015)	24000 (6/21/2010)	(61000 - 24000)/(26 - 16)	3700
75000 (12/7/2015)	24000 (6/21/2010)	(75000 - 24000)/(27 - 16)	4636.36
65000 (6/6/2016)	24000 (6/21/2010)	(65000 - 24000)/(28 - 16)	3416.67
76000 (12/5/2016)	24000 (6/21/2010)	(76000 - 24000)/(29 - 16)	4000
73000 (6/20/2017)	24000 (6/21/2010)	(73000 - 24000)/(30 - 16)	3500
80000 (12/4/2017)	24000 (6/21/2010)	(80000 - 24000)/(31 - 16)	3733.33
76000 (6/4/2018)	24000 (6/21/2010)	(76000 - 24000)/(32 - 16)	3250

37000 (6/21/2011)	44000 (12/6/2010)	(37000 - 44000)/(18 - 17)	-7000
43000 (12/13/2011)	44000 (12/6/2010)	(43000 - 44000)/(19 - 17)	-500
38000 (6/4/2012)	44000 (12/6/2010)	(38000 - 44000)/(20 - 17)	-2000
45000 (12/11/2012)	44000 (12/6/2010)	(45000 - 44000)/(21 - 17)	250
39000 (6/3/2013)	44000 (12/6/2010)	(39000 - 44000)/(22 - 17)	-1000
53000 (12/3/2013)	44000 (12/6/2010)	(53000 - 44000)/(23 - 17)	1500
45000 (6/2/2014)	44000 (12/6/2010)	(45000 - 44000)/(24 - 17)	142.857
61000 (12/2/2014)	44000 (12/6/2010)	(61000 - 44000)/(25 - 17)	2125
61000 (6/1/2015)	44000 (12/6/2010)	(61000 - 44000)/(26 - 17)	1888.89
75000 (12/7/2015)	44000 (12/6/2010)	(75000 - 44000)/(27 - 17)	3100
65000 (6/6/2016)	44000 (12/6/2010)	(65000 - 44000)/(28 - 17)	1909.09
76000 (12/5/2016)	44000 (12/6/2010)	(76000 - 44000)/(29 - 17)	2666.67
73000 (6/20/2017)	44000 (12/6/2010)	(73000 - 44000)/(30 - 17)	2230.77
80000 (12/4/2017)	44000 (12/6/2010)	(80000 - 44000)/(31 - 17)	2571.43
76000 (6/4/2018)	44000 (12/6/2010)	(76000 - 44000)/(32 - 17)	2133.33

43000 (12/13/2011)	37000 (6/21/2011)	(43000 - 37000)/(19 - 18)	6000
38000 (6/4/2012)	37000 (6/21/2011)	(38000 - 37000)/(20 - 18)	500
45000 (12/11/2012)	37000 (6/21/2011)	(45000 - 37000)/(21 - 18)	2666.67
39000 (6/3/2013)	37000 (6/21/2011)	(39000 - 37000)/(22 - 18)	500
53000 (12/3/2013)	37000 (6/21/2011)	(53000 - 37000)/(23 - 18)	3200
45000 (6/2/2014)	37000 (6/21/2011)	(45000 - 37000)/(24 - 18)	1333.33
61000 (12/2/2014)	37000 (6/21/2011)	(61000 - 37000)/(25 - 18)	3428.57
61000 (6/1/2015)	37000 (6/21/2011)	(61000 - 37000)/(26 - 18)	3000
75000 (12/7/2015)	37000 (6/21/2011)	(75000 - 37000)/(27 - 18)	4222.22
65000 (6/6/2016)	37000 (6/21/2011)	(65000 - 37000)/(28 - 18)	2800
76000 (12/5/2016)	37000 (6/21/2011)	(76000 - 37000)/(29 - 18)	3545.45
73000 (6/20/2017)	37000 (6/21/2011)	(73000 - 37000)/(30 - 18)	3000
80000 (12/4/2017)	37000 (6/21/2011)	(80000 - 37000)/(31 - 18)	3307.69
76000 (6/4/2018)	37000 (6/21/2011)	(76000 - 37000)/(32 - 18)	2785.71

38000 (6/4/2012)	43000 (12/13/2011)	(38000 - 43000)/(20 - 19)	-5000
45000 (12/11/2012)	43000 (12/13/2011)	(45000 - 43000)/(21 - 19)	1000
39000 (6/3/2013)	43000 (12/13/2011)	(39000 - 43000)/(22 - 19)	-1333.33
53000 (12/3/2013)	43000 (12/13/2011)	(53000 - 43000)/(23 - 19)	2500
45000 (6/2/2014)	43000 (12/13/2011)	(45000 - 43000)/(24 - 19)	400
61000 (12/2/2014)	43000 (12/13/2011)	(61000 - 43000)/(25 - 19)	3000

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61000 (6/1/2015)	43000 (12/13/2011)	(61000 - 43000)/(26 - 19)	2571.43
75000 (12/7/2015)	43000 (12/13/2011)	(75000 - 43000)/(27 - 19)	4000
65000 (6/6/2016)	43000 (12/13/2011)	(65000 - 43000)/(28 - 19)	2444.44
76000 (12/5/2016)	43000 (12/13/2011)	(76000 - 43000)/(29 - 19)	3300
73000 (6/20/2017)	43000 (12/13/2011)	(73000 - 43000)/(30 - 19)	2727.27
80000 (12/4/2017)	43000 (12/13/2011)	(80000 - 43000)/(31 - 19)	3083.33
76000 (6/4/2018)	43000 (12/13/2011)	(76000 - 43000)/(32 - 19)	2538.46
45000 (12/11/2012)	38000 (6/4/2012)	(45000 - 38000)/(21 - 20)	7000
39000 (6/3/2013)	38000 (6/4/2012)	(39000 - 38000)/(22 - 20)	500
53000 (12/3/2013)	38000 (6/4/2012)	(53000 - 38000)/(23 - 20)	5000
45000 (6/2/2014)	38000 (6/4/2012)	(45000 - 38000)/(24 - 20)	1750
61000 (12/2/2014)	38000 (6/4/2012)	(61000 - 38000)/(25 - 20)	4600
61000 (6/1/2015)	38000 (6/4/2012)	(61000 - 38000)/(26 - 20)	3833.33
75000 (12/7/2015)	38000 (6/4/2012)	(75000 - 38000)/(27 - 20)	5285.71
65000 (6/6/2016)	38000 (6/4/2012)	(65000 - 38000)/(28 - 20)	3375
76000 (12/5/2016)	38000 (6/4/2012)	(76000 - 38000)/(29 - 20)	4222.22
73000 (6/20/2017)	38000 (6/4/2012)	(73000 - 38000)/(30 - 20)	3500
80000 (12/4/2017)	38000 (6/4/2012)	(80000 - 38000)/(31 - 20)	3818.18
76000 (6/4/2018)	38000 (6/4/2012)	(76000 - 38000)/(32 - 20)	3166.67
39000 (6/3/2013)	45000 (12/11/2012)	(39000 - 45000)/(22 - 21)	-6000
53000 (12/3/2013)	45000 (12/11/2012)	(53000 - 45000)/(23 - 21)	4000
45000 (6/2/2014)	45000 (12/11/2012)	(45000 - 45000)/(24 - 21)	0
61000 (12/2/2014)	45000 (12/11/2012)	(61000 - 45000)/(25 - 21)	4000
61000 (6/1/2015)	45000 (12/11/2012)	(61000 - 45000)/(26 - 21)	3200
75000 (12/7/2015)	45000 (12/11/2012)	(75000 - 45000)/(27 - 21)	5000
65000 (6/6/2016)	45000 (12/11/2012)	(65000 - 45000)/(28 - 21)	2857.14
76000 (12/5/2016)	45000 (12/11/2012)	(76000 - 45000)/(29 - 21)	3875
73000 (6/20/2017)	45000 (12/11/2012)	(73000 - 45000)/(30 - 21)	3111.11
80000 (12/4/2017)	45000 (12/11/2012)	(80000 - 45000)/(31 - 21)	3500
76000 (6/4/2018)	45000 (12/11/2012)	(76000 - 45000)/(32 - 21)	2818.18
53000 (12/3/2013)	39000 (6/3/2013)	(53000 - 39000)/(23 - 22)	14000
45000 (6/2/2014)	39000 (6/3/2013)	(45000 - 39000)/(24 - 22)	3000
61000 (12/2/2014)	39000 (6/3/2013)	(61000 - 39000)/(25 - 22)	7333.33
61000 (6/1/2015)	39000 (6/3/2013)	(61000 - 39000)/(26 - 22)	5500
75000 (12/7/2015)	39000 (6/3/2013)	(75000 - 39000)/(27 - 22)	7200
65000 (6/6/2016)	39000 (6/3/2013)	(65000 - 39000)/(28 - 22)	4333.33
76000 (12/5/2016)	39000 (6/3/2013)	(76000 - 39000)/(29 - 22)	5285.71
73000 (6/20/2017)	39000 (6/3/2013)	(73000 - 39000)/(30 - 22)	4250
80000 (12/4/2017)	39000 (6/3/2013)	(80000 - 39000)/(31 - 22)	4555.56
76000 (6/4/2018)	39000 (6/3/2013)	(76000 - 39000)/(32 - 22)	3700
45000 (6/2/2014)	53000 (12/3/2013)	(45000 - 53000)/(24 - 23)	-8000
61000 (12/2/2014)	53000 (12/3/2013)	(61000 - 53000)/(25 - 23)	4000
61000 (6/1/2015)	53000 (12/3/2013)	(61000 - 53000)/(26 - 23)	2666.67
75000 (12/7/2015)	53000 (12/3/2013)	(75000 - 53000)/(27 - 23)	5500
65000 (6/6/2016)	53000 (12/3/2013)	(65000 - 53000)/(28 - 23)	2400
76000 (12/5/2016)	53000 (12/3/2013)	(76000 - 53000)/(29 - 23)	3833.33
73000 (6/20/2017)	53000 (12/3/2013)	(73000 - 53000)/(30 - 23)	2857.14
80000 (12/4/2017)	53000 (12/3/2013)	(80000 - 53000)/(31 - 23)	3375
76000 (6/4/2018)	53000 (12/3/2013)	(76000 - 53000)/(32 - 23)	2555.56
61000 (12/2/2014)	45000 (6/2/2014)	(61000 - 45000)/(25 - 24)	16000
61000 (6/1/2015)	45000 (6/2/2014)	(61000 - 45000)/(26 - 24)	8000
75000 (12/7/2015)	45000 (6/2/2014)	(75000 - 45000)/(27 - 24)	10000
65000 (6/6/2016)	45000 (6/2/2014)	(65000 - 45000)/(28 - 24)	5000
76000 (12/5/2016)	45000 (6/2/2014)	(76000 - 45000)/(29 - 24)	6200
73000 (6/20/2017)	45000 (6/2/2014)	(73000 - 45000)/(30 - 24)	4666.67
80000 (12/4/2017)	45000 (6/2/2014)	(80000 - 45000)/(31 - 24)	5000
76000 (6/4/2018)	45000 (6/2/2014)	(76000 - 45000)/(32 - 24)	3875

61000 (6/1/2015)	61000 (12/2/2014)	(61000 - 61000)/(26 - 25)	0
75000 (12/7/2015)	61000 (12/2/2014)	(75000 - 61000)/(27 - 25)	7000
65000 (6/6/2016)	61000 (12/2/2014)	(65000 - 61000)/(28 - 25)	1333.33
76000 (12/5/2016)	61000 (12/2/2014)	(76000 - 61000)/(29 - 25)	3750
73000 (6/20/2017)	61000 (12/2/2014)	(73000 - 61000)/(30 - 25)	2400
80000 (12/4/2017)	61000 (12/2/2014)	(80000 - 61000)/(31 - 25)	3166.67
76000 (6/4/2018)	61000 (12/2/2014)	(76000 - 61000)/(32 - 25)	2142.86
75000 (12/7/2015)	61000 (6/1/2015)	(75000 - 61000)/(27 - 26)	14000
65000 (6/6/2016)	61000 (6/1/2015)	(65000 - 61000)/(28 - 26)	2000
76000 (12/5/2016)	61000 (6/1/2015)	(76000 - 61000)/(29 - 26)	5000
73000 (6/20/2017)	61000 (6/1/2015)	(73000 - 61000)/(30 - 26)	3000
80000 (12/4/2017)	61000 (6/1/2015)	(80000 - 61000)/(31 - 26)	3800
76000 (6/4/2018)	61000 (6/1/2015)	(76000 - 61000)/(32 - 26)	2500
65000 (6/6/2016)	75000 (12/7/2015)	(65000 - 75000)/(28 - 27)	-10000
76000 (12/5/2016)	75000 (12/7/2015)	(76000 - 75000)/(29 - 27)	500
73000 (6/20/2017)	75000 (12/7/2015)	(73000 - 75000)/(30 - 27)	-666.667
80000 (12/4/2017)	75000 (12/7/2015)	(80000 - 75000)/(31 - 27)	1250
76000 (6/4/2018)	75000 (12/7/2015)	(76000 - 75000)/(32 - 27)	200
76000 (12/5/2016)	65000 (6/6/2016)	(76000 - 65000)/(29 - 28)	11000
73000 (6/20/2017)	65000 (6/6/2016)	(73000 - 65000)/(30 - 28)	4000
80000 (12/4/2017)	65000 (6/6/2016)	(80000 - 65000)/(31 - 28)	5000
76000 (6/4/2018)	65000 (6/6/2016)	(76000 - 65000)/(32 - 28)	2750
73000 (6/20/2017)	76000 (12/5/2016)	(73000 - 76000)/(30 - 29)	-3000
80000 (12/4/2017)	76000 (12/5/2016)	(80000 - 76000)/(31 - 29)	2000
76000 (6/4/2018)	76000 (12/5/2016)	(76000 - 76000)/(32 - 29)	0
80000 (12/4/2017)	73000 (6/20/2017)	(80000 - 73000)/(31 - 30)	7000
76000 (6/4/2018)	73000 (6/20/2017)	(76000 - 73000)/(32 - 30)	1500
76000 (6/4/2018)	80000 (12/4/2017)	(76000 - 80000)/(32 - 31)	-4000

Number of Q values = 496

Ordered Q Values

n	Q
1	-11000
2	-10000
3	-8000
4	-7000
5	-6100
6	-6000
7	-5000
8	-4000
9	-3500
10	-3333.33
11	-3000
12	-3000
13	-2450
14	-2200
15	-2033.33
16	-2000
17	-2000
18	-2000
19	-1950
20	-1933.33
21	-1750
22	-1450

23	-1333.33
24	-1200
25	-1200
26	-1140
27	-1000
28	-1000
29	-900
30	-828.571
31	-666.667
32	-666.667
33	-500
34	-500
35	-466.667
36	-400
37	-380
38	-285.714
39	-133.333
40	-87.5
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	50
49	142.857
50	200
51	244.444
52	250
53	250
54	333.333
55	400
56	433.333
57	500
58	500
59	500
60	500
61	500
62	571.429
63	600
64	615.385
65	666.667
66	700
67	714.286
68	727.273
69	818.182
70	888.889
71	916.667
72	983.333
73	990
74	1000
75	1000
76	1000
77	1000
78	1000
79	1000
80	1000
81	1021.43
82	1025
83	1050
84	1066.67
85	1081.82

Royalton Road LF

86	1090.91
87	1100
88	1108.33
89	1111.11
90	1111.11
91	1146.67
92	1181.82
93	1183.33
94	1200
95	1200
96	1222.22
97	1230
98	1230.77
99	1246.15
100	1250
101	1250
102	1266.67
103	1268.75
104	1300
105	1320
106	1322.22
107	1333.33
108	1333.33
109	1333.33
110	1362.5
111	1364.71
112	1375
113	1381.82
114	1442.86
115	1450
116	1454.55
117	1461.54
118	1471.43
119	1476.19
120	1500
121	1500
122	1500
123	1525
124	1555.56
125	1561.54
126	1562.5
127	1571.43
128	1578.95
129	1583.33
130	1590.91
131	1608.7
132	1631.58
133	1650
134	1657.14
135	1663.64
136	1666.67
137	1666.67
138	1666.67
139	1687.5
140	1700
141	1700
142	1705.88
143	1714.29
144	1722.22
145	1750
146	1761.9
147	1764.71
148	1766.67

Royalton Road LF

149	1777.78
150	1800
151	1800
152	1812.5
153	1823.53
154	1836.36
155	1842.11
156	1850
157	1850
158	1866.67
159	1886.67
160	1888.89
161	1900
162	1909.09
163	1910
164	1916.67
165	1923.08
166	1928.57
167	1928.57
168	1933.33
169	1941.18
170	1944.44
171	1947.37
172	1950
173	2000
174	2000
175	2000
176	2000
177	2000
178	2000
179	2000
180	2015
181	2016.67
182	2022.22
183	2040
184	2045.45
185	2047.62
186	2052.63
187	2055.56
188	2057.14
189	2058.82
190	2063.16
191	2066.67
192	2091.67
193	2100
194	2111.11
195	2115.38
196	2117.65
197	2120
198	2125
199	2125
200	2125
201	2133.33
202	2135.29
203	2137.5
204	2142.86
205	2144.44
206	2168
207	2169.23
208	2173.91
209	2177.78
210	2187.5
211	2187.5

Royalton Road LF

212	2193.55
213	2195.45
214	2200
215	2208.33
216	2217.39
217	2220
218	2222.22
219	2226.09
220	2230.77
221	2230.77
222	2230.77
223	2233.33
224	2238.1
225	2241.38
226	2250
227	2250
228	2250
229	2250
230	2250
231	2250
232	2250
233	2250
234	2250
235	2250
236	2262.5
237	2262.5
238	2266.67
239	2266.67
240	2280
241	2285.71
242	2294.12
243	2294.12
244	2300
245	2304.35
246	2307.69
247	2312.5
248	2315.79
249	2318.18
250	2327.27
251	2333.33
252	2333.33
253	2333.33
254	2344.83
255	2350
256	2360
257	2363.64
258	2363.64
259	2363.64
260	2363.64
261	2380.95
262	2384.62
263	2385.71
264	2392.86
265	2400
266	2400
267	2400
268	2400
269	2400
270	2404.35
271	2407.41
272	2409.09
273	2410
274	2411.76

275	2413.33
276	2413.79
277	2425
278	2428.57
279	2428.57
280	2442.86
281	2444.44
282	2444.44
283	2450
284	2454.55
285	2458.33
286	2461.54
287	2463.64
288	2473.68
289	2473.68
290	2476.19
291	2478.26
292	2500
293	2500
294	2500
295	2500
296	2500
297	2500
298	2500
299	2500
300	2518.52
301	2523.81
302	2533.33
303	2538.46
304	2555.56
305	2571.43
306	2571.43
307	2571.43
308	2571.43
309	2576.92
310	2600
311	2600
312	2600
313	2615.38
314	2625
315	2628.57
316	2629.63
317	2633.33
318	2640
319	2647.37
320	2650
321	2660
322	2666.67
323	2666.67
324	2666.67
325	2680
326	2692.31
327	2694.74
328	2695.65
329	2700
330	2700
331	2700
332	2714.29
333	2722.22
334	2727.27
335	2727.27
336	2742.86
337	2750

338	2769.23
339	2777.78
340	2785.71
341	2788.89
342	2791.67
343	2800
344	2805
345	2812.5
346	2818.18
347	2818.75
348	2833.33
349	2850
350	2857.14
351	2857.14
352	2869.57
353	2875
354	2900
355	2900
356	2904.76
357	2928.57
358	2935.71
359	2950
360	2952.94
361	3000
362	3000
363	3000
364	3000
365	3000
366	3000
367	3000
368	3000
369	3000
370	3000
371	3009.09
372	3045.45
373	3062.5
374	3066.67
375	3083.33
376	3100
377	3111.11
378	3161.54
379	3163.16
380	3166.67
381	3166.67
382	3176.47
383	3200
384	3200
385	3230.77
386	3250
387	3250
388	3300
389	3300
390	3300
391	3307.69
392	3333.33
393	3333.33
394	3340
395	3360
396	3375
397	3375
398	3388.89
399	3400
400	3400

Royalton Road LF

401	3416.67
402	3428.57
403	3450
404	3500
405	3500
406	3500
407	3500
408	3500
409	3500
410	3545.45
411	3562.5
412	3562.5
413	3600
414	3666.67
415	3673.33
416	3700
417	3700
418	3733.33
419	3750
420	3750
421	3764.71
422	3800
423	3818.18
424	3833.33
425	3833.33
426	3875
427	3875
428	3925
429	4000
430	4000
431	4000
432	4000
433	4000
434	4000
435	4000
436	4000
437	4000
438	4000
439	4000
440	4090.91
441	4111.11
442	4111.11
443	4142.86
444	4142.86
445	4200
446	4222.22
447	4222.22
448	4250
449	4266.67
450	4333.33
451	4500
452	4500
453	4538.46
454	4555.56
455	4600
456	4636.36
457	4666.67
458	4820
459	5000
460	5000
461	5000
462	5000
463	5000

464	5000
465	5033.33
466	5250
467	5285.71
468	5285.71
469	5350
470	5400
471	5500
472	5500
473	5566.67
474	6000
475	6000
476	6200
477	6250
478	6333.33
479	6500
480	6900
481	7000
482	7000
483	7000
484	7200
485	7333.33
486	7800
487	8000
488	8000
489	9333.33
490	10000
491	11000
492	14000
493	14000
494	16000
495	19000
496	20000

Sen's Estimator (Median Q) is 2316.99

Tied Group	Value	Members
1	8000	3
2	26000	2
3	45000	2
4	61000	2
5	76000	2

Time Period	Observations
10/14/2002	1
4/14/2003	1
11/3/2003	1
5/10/2004	1
12/6/2004	1
5/23/2005	1
11/14/2005	1
5/22/2006	1
11/13/2006	1
6/25/2007	1
12/17/2007	1
6/16/2008	1
12/2/2008	1
6/1/2009	1
12/2/2009	1
6/21/2010	1
12/6/2010	1
6/21/2011	1
12/13/2011	1

Royalton Road LF

6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 138
B = 0
C = 6
D = 0
E = 14
F = 0
a = 68448
b = 267840
c = 1984
Group Variance = 3795
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 158.681
M1 = (496 - 158.681)/2.0 = 168.66
M2 = (496 + 158.681)/2.0 + 1 = 328.34
Lower limit is 1941.18 = Q(169)
Upper limit is 2695.65 = Q(328)
1941.18 > 0 indicating an upward trend in data.

Royalton Road LF

Sen's Slope Analysis

Parameter: Chromium, total

Location: MW-2R

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<10 (6/4/2012)	ND<10 (12/13/2011)	(10 - 10)/(2 - 1)	0
ND<10 (12/11/2012)	ND<10 (12/13/2011)	(10 - 10)/(3 - 1)	0
ND<10 (6/3/2013)	ND<10 (12/13/2011)	(10 - 10)/(4 - 1)	0
ND<10 (12/3/2013)	ND<10 (12/13/2011)	(10 - 10)/(5 - 1)	0
ND<10 (6/2/2014)	ND<10 (12/13/2011)	(10 - 10)/(6 - 1)	0
ND<10 (12/2/2014)	ND<10 (12/13/2011)	(10 - 10)/(7 - 1)	0
ND<10 (6/1/2015)	ND<10 (12/13/2011)	(10 - 10)/(8 - 1)	0
ND<10 (12/7/2015)	ND<10 (12/13/2011)	(10 - 10)/(9 - 1)	0
ND<10 (6/6/2016)	ND<10 (12/13/2011)	(10 - 10)/(10 - 1)	0
ND<10 (12/5/2016)	ND<10 (12/13/2011)	(10 - 10)/(11 - 1)	0
ND<10 (6/20/2017)	ND<10 (12/13/2011)	(10 - 10)/(12 - 1)	0
ND<10 (12/4/2017)	ND<10 (12/13/2011)	(10 - 10)/(13 - 1)	0
ND<10 (6/4/2018)	ND<10 (12/13/2011)	(10 - 10)/(14 - 1)	0
ND<10 (12/11/2012)	ND<10 (6/4/2012)	(10 - 10)/(3 - 2)	0
ND<10 (6/3/2013)	ND<10 (6/4/2012)	(10 - 10)/(4 - 2)	0
ND<10 (12/3/2013)	ND<10 (6/4/2012)	(10 - 10)/(5 - 2)	0
ND<10 (6/2/2014)	ND<10 (6/4/2012)	(10 - 10)/(6 - 2)	0
ND<10 (12/2/2014)	ND<10 (6/4/2012)	(10 - 10)/(7 - 2)	0
ND<10 (6/1/2015)	ND<10 (6/4/2012)	(10 - 10)/(8 - 2)	0
ND<10 (12/7/2015)	ND<10 (6/4/2012)	(10 - 10)/(9 - 2)	0
ND<10 (6/6/2016)	ND<10 (6/4/2012)	(10 - 10)/(10 - 2)	0
ND<10 (12/5/2016)	ND<10 (6/4/2012)	(10 - 10)/(11 - 2)	0
ND<10 (6/20/2017)	ND<10 (6/4/2012)	(10 - 10)/(12 - 2)	0
ND<10 (12/4/2017)	ND<10 (6/4/2012)	(10 - 10)/(13 - 2)	0
ND<10 (6/4/2018)	ND<10 (6/4/2012)	(10 - 10)/(14 - 2)	0
ND<10 (6/3/2013)	ND<10 (12/11/2012)	(10 - 10)/(4 - 3)	0
ND<10 (12/3/2013)	ND<10 (12/11/2012)	(10 - 10)/(5 - 3)	0
ND<10 (6/2/2014)	ND<10 (12/11/2012)	(10 - 10)/(6 - 3)	0
ND<10 (12/2/2014)	ND<10 (12/11/2012)	(10 - 10)/(7 - 3)	0
ND<10 (6/1/2015)	ND<10 (12/11/2012)	(10 - 10)/(8 - 3)	0
ND<10 (12/7/2015)	ND<10 (12/11/2012)	(10 - 10)/(9 - 3)	0
ND<10 (6/6/2016)	ND<10 (12/11/2012)	(10 - 10)/(10 - 3)	0
ND<10 (12/5/2016)	ND<10 (12/11/2012)	(10 - 10)/(11 - 3)	0
ND<10 (6/20/2017)	ND<10 (12/11/2012)	(10 - 10)/(12 - 3)	0
ND<10 (12/4/2017)	ND<10 (12/11/2012)	(10 - 10)/(13 - 3)	0
ND<10 (6/4/2018)	ND<10 (12/11/2012)	(10 - 10)/(14 - 3)	0
ND<10 (12/3/2013)	ND<10 (6/3/2013)	(10 - 10)/(5 - 4)	0
ND<10 (6/2/2014)	ND<10 (6/3/2013)	(10 - 10)/(6 - 4)	0
ND<10 (12/2/2014)	ND<10 (6/3/2013)	(10 - 10)/(7 - 4)	0
ND<10 (6/1/2015)	ND<10 (6/3/2013)	(10 - 10)/(8 - 4)	0
ND<10 (12/7/2015)	ND<10 (6/3/2013)	(10 - 10)/(9 - 4)	0
ND<10 (6/6/2016)	ND<10 (6/3/2013)	(10 - 10)/(10 - 4)	0
ND<10 (12/5/2016)	ND<10 (6/3/2013)	(10 - 10)/(11 - 4)	0
ND<10 (6/20/2017)	ND<10 (6/3/2013)	(10 - 10)/(12 - 4)	0
ND<10 (12/4/2017)	ND<10 (6/3/2013)	(10 - 10)/(13 - 4)	0
ND<10 (6/4/2018)	ND<10 (6/3/2013)	(10 - 10)/(14 - 4)	0
ND<10 (6/2/2014)	ND<10 (12/3/2013)	(10 - 10)/(6 - 5)	0
ND<10 (12/2/2014)	ND<10 (12/3/2013)	(10 - 10)/(7 - 5)	0

ND<10 (6/1/2015)	ND<10 (12/3/2013)	(10 - 10)/(8 - 5)	0
ND<10 (12/7/2015)	ND<10 (12/3/2013)	(10 - 10)/(9 - 5)	0
ND<10 (6/6/2016)	ND<10 (12/3/2013)	(10 - 10)/(10 - 5)	0
ND<10 (12/5/2016)	ND<10 (12/3/2013)	(10 - 10)/(11 - 5)	0
ND<10 (6/20/2017)	ND<10 (12/3/2013)	(10 - 10)/(12 - 5)	0
ND<10 (12/4/2017)	ND<10 (12/3/2013)	(10 - 10)/(13 - 5)	0
ND<10 (6/4/2018)	ND<10 (12/3/2013)	(10 - 10)/(14 - 5)	0
ND<10 (12/2/2014)	ND<10 (6/2/2014)	(10 - 10)/(7 - 6)	0
ND<10 (6/1/2015)	ND<10 (6/2/2014)	(10 - 10)/(8 - 6)	0
ND<10 (12/7/2015)	ND<10 (6/2/2014)	(10 - 10)/(9 - 6)	0
ND<10 (6/6/2016)	ND<10 (6/2/2014)	(10 - 10)/(10 - 6)	0
ND<10 (12/5/2016)	ND<10 (6/2/2014)	(10 - 10)/(11 - 6)	0
ND<10 (6/20/2017)	ND<10 (6/2/2014)	(10 - 10)/(12 - 6)	0
ND<10 (12/4/2017)	ND<10 (6/2/2014)	(10 - 10)/(13 - 6)	0
ND<10 (6/4/2018)	ND<10 (6/2/2014)	(10 - 10)/(14 - 6)	0
ND<10 (6/1/2015)	ND<10 (12/2/2014)	(10 - 10)/(8 - 7)	0
ND<10 (12/7/2015)	ND<10 (12/2/2014)	(10 - 10)/(9 - 7)	0
ND<10 (6/6/2016)	ND<10 (12/2/2014)	(10 - 10)/(10 - 7)	0
ND<10 (12/5/2016)	ND<10 (12/2/2014)	(10 - 10)/(11 - 7)	0
ND<10 (6/20/2017)	ND<10 (12/2/2014)	(10 - 10)/(12 - 7)	0
ND<10 (12/4/2017)	ND<10 (12/2/2014)	(10 - 10)/(13 - 7)	0
ND<10 (6/4/2018)	ND<10 (12/2/2014)	(10 - 10)/(14 - 7)	0
ND<10 (12/7/2015)	ND<10 (6/1/2015)	(10 - 10)/(9 - 8)	0
ND<10 (6/6/2016)	ND<10 (6/1/2015)	(10 - 10)/(10 - 8)	0
ND<10 (12/5/2016)	ND<10 (6/1/2015)	(10 - 10)/(11 - 8)	0
ND<10 (6/20/2017)	ND<10 (6/1/2015)	(10 - 10)/(12 - 8)	0
ND<10 (12/4/2017)	ND<10 (6/1/2015)	(10 - 10)/(13 - 8)	0
ND<10 (6/4/2018)	ND<10 (6/1/2015)	(10 - 10)/(14 - 8)	0
ND<10 (6/6/2016)	ND<10 (12/7/2015)	(10 - 10)/(10 - 9)	0
ND<10 (12/5/2016)	ND<10 (12/7/2015)	(10 - 10)/(11 - 9)	0
ND<10 (6/20/2017)	ND<10 (12/7/2015)	(10 - 10)/(12 - 9)	0
ND<10 (12/4/2017)	ND<10 (12/7/2015)	(10 - 10)/(13 - 9)	0
ND<10 (6/4/2018)	ND<10 (12/7/2015)	(10 - 10)/(14 - 9)	0
ND<10 (12/5/2016)	ND<10 (6/6/2016)	(10 - 10)/(11 - 10)	0
ND<10 (6/20/2017)	ND<10 (6/6/2016)	(10 - 10)/(12 - 10)	0
ND<10 (12/4/2017)	ND<10 (6/6/2016)	(10 - 10)/(13 - 10)	0
ND<10 (6/4/2018)	ND<10 (6/6/2016)	(10 - 10)/(14 - 10)	0
ND<10 (6/20/2017)	ND<10 (12/5/2016)	(10 - 10)/(12 - 11)	0
ND<10 (12/4/2017)	ND<10 (12/5/2016)	(10 - 10)/(13 - 11)	0
ND<10 (6/4/2018)	ND<10 (12/5/2016)	(10 - 10)/(14 - 11)	0
ND<10 (12/4/2017)	ND<10 (6/20/2017)	(10 - 10)/(13 - 12)	0
ND<10 (6/4/2018)	ND<10 (6/20/2017)	(10 - 10)/(14 - 12)	0
ND<10 (6/4/2018)	ND<10 (12/4/2017)	(10 - 10)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	10	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Sen's Slope Analysis

Parameter: Chromium, total

Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<10 (6/4/2012)	ND<10 (12/13/2011)	(10 - 10)/(2 - 1)	0
ND<10 (12/11/2012)	ND<10 (12/13/2011)	(10 - 10)/(3 - 1)	0
ND<10 (6/3/2013)	ND<10 (12/13/2011)	(10 - 10)/(4 - 1)	0
ND<10 (12/3/2013)	ND<10 (12/13/2011)	(10 - 10)/(5 - 1)	0
ND<10 (6/2/2014)	ND<10 (12/13/2011)	(10 - 10)/(6 - 1)	0
ND<10 (12/2/2014)	ND<10 (12/13/2011)	(10 - 10)/(7 - 1)	0
ND<10 (6/1/2015)	ND<10 (12/13/2011)	(10 - 10)/(8 - 1)	0
ND<10 (12/7/2015)	ND<10 (12/13/2011)	(10 - 10)/(9 - 1)	0
ND<10 (6/6/2016)	ND<10 (12/13/2011)	(10 - 10)/(10 - 1)	0
ND<10 (12/5/2016)	ND<10 (12/13/2011)	(10 - 10)/(11 - 1)	0
ND<10 (6/20/2017)	ND<10 (12/13/2011)	(10 - 10)/(12 - 1)	0
ND<10 (12/4/2017)	ND<10 (12/13/2011)	(10 - 10)/(13 - 1)	0
ND<10 (6/4/2018)	ND<10 (12/13/2011)	(10 - 10)/(14 - 1)	0
ND<10 (12/11/2012)	ND<10 (6/4/2012)	(10 - 10)/(3 - 2)	0
ND<10 (6/3/2013)	ND<10 (6/4/2012)	(10 - 10)/(4 - 2)	0
ND<10 (12/3/2013)	ND<10 (6/4/2012)	(10 - 10)/(5 - 2)	0
ND<10 (6/2/2014)	ND<10 (6/4/2012)	(10 - 10)/(6 - 2)	0
ND<10 (12/2/2014)	ND<10 (6/4/2012)	(10 - 10)/(7 - 2)	0
ND<10 (6/1/2015)	ND<10 (6/4/2012)	(10 - 10)/(8 - 2)	0
ND<10 (12/7/2015)	ND<10 (6/4/2012)	(10 - 10)/(9 - 2)	0
ND<10 (6/6/2016)	ND<10 (6/4/2012)	(10 - 10)/(10 - 2)	0
ND<10 (12/5/2016)	ND<10 (6/4/2012)	(10 - 10)/(11 - 2)	0
ND<10 (6/20/2017)	ND<10 (6/4/2012)	(10 - 10)/(12 - 2)	0
ND<10 (12/4/2017)	ND<10 (6/4/2012)	(10 - 10)/(13 - 2)	0
ND<10 (6/4/2018)	ND<10 (6/4/2012)	(10 - 10)/(14 - 2)	0
ND<10 (6/3/2013)	ND<10 (12/11/2012)	(10 - 10)/(4 - 3)	0
ND<10 (12/3/2013)	ND<10 (12/11/2012)	(10 - 10)/(5 - 3)	0
ND<10 (6/2/2014)	ND<10 (12/11/2012)	(10 - 10)/(6 - 3)	0
ND<10 (12/2/2014)	ND<10 (12/11/2012)	(10 - 10)/(7 - 3)	0
ND<10 (6/1/2015)	ND<10 (12/11/2012)	(10 - 10)/(8 - 3)	0
ND<10 (12/7/2015)	ND<10 (12/11/2012)	(10 - 10)/(9 - 3)	0
ND<10 (6/6/2016)	ND<10 (12/11/2012)	(10 - 10)/(10 - 3)	0
ND<10 (12/5/2016)	ND<10 (12/11/2012)	(10 - 10)/(11 - 3)	0
ND<10 (6/20/2017)	ND<10 (12/11/2012)	(10 - 10)/(12 - 3)	0
ND<10 (12/4/2017)	ND<10 (12/11/2012)	(10 - 10)/(13 - 3)	0
ND<10 (6/4/2018)	ND<10 (12/11/2012)	(10 - 10)/(14 - 3)	0
ND<10 (12/3/2013)	ND<10 (6/3/2013)	(10 - 10)/(5 - 4)	0
ND<10 (6/2/2014)	ND<10 (6/3/2013)	(10 - 10)/(6 - 4)	0
ND<10 (12/2/2014)	ND<10 (6/3/2013)	(10 - 10)/(7 - 4)	0
ND<10 (6/1/2015)	ND<10 (6/3/2013)	(10 - 10)/(8 - 4)	0
ND<10 (12/7/2015)	ND<10 (6/3/2013)	(10 - 10)/(9 - 4)	0
ND<10 (6/6/2016)	ND<10 (6/3/2013)	(10 - 10)/(10 - 4)	0
ND<10 (12/5/2016)	ND<10 (6/3/2013)	(10 - 10)/(11 - 4)	0
ND<10 (6/20/2017)	ND<10 (6/3/2013)	(10 - 10)/(12 - 4)	0
ND<10 (12/4/2017)	ND<10 (6/3/2013)	(10 - 10)/(13 - 4)	0
ND<10 (6/4/2018)	ND<10 (6/3/2013)	(10 - 10)/(14 - 4)	0
ND<10 (6/2/2014)	ND<10 (12/3/2013)	(10 - 10)/(6 - 5)	0
ND<10 (12/2/2014)	ND<10 (12/3/2013)	(10 - 10)/(7 - 5)	0

ND<10 (6/1/2015)	ND<10 (12/3/2013)	(10 - 10)/(8 - 5)	0
ND<10 (12/7/2015)	ND<10 (12/3/2013)	(10 - 10)/(9 - 5)	0
ND<10 (6/6/2016)	ND<10 (12/3/2013)	(10 - 10)/(10 - 5)	0
ND<10 (12/5/2016)	ND<10 (12/3/2013)	(10 - 10)/(11 - 5)	0
ND<10 (6/20/2017)	ND<10 (12/3/2013)	(10 - 10)/(12 - 5)	0
ND<10 (12/4/2017)	ND<10 (12/3/2013)	(10 - 10)/(13 - 5)	0
ND<10 (6/4/2018)	ND<10 (12/3/2013)	(10 - 10)/(14 - 5)	0
ND<10 (12/2/2014)	ND<10 (6/2/2014)	(10 - 10)/(7 - 6)	0
ND<10 (6/1/2015)	ND<10 (6/2/2014)	(10 - 10)/(8 - 6)	0
ND<10 (12/7/2015)	ND<10 (6/2/2014)	(10 - 10)/(9 - 6)	0
ND<10 (6/6/2016)	ND<10 (6/2/2014)	(10 - 10)/(10 - 6)	0
ND<10 (12/5/2016)	ND<10 (6/2/2014)	(10 - 10)/(11 - 6)	0
ND<10 (6/20/2017)	ND<10 (6/2/2014)	(10 - 10)/(12 - 6)	0
ND<10 (12/4/2017)	ND<10 (6/2/2014)	(10 - 10)/(13 - 6)	0
ND<10 (6/4/2018)	ND<10 (6/2/2014)	(10 - 10)/(14 - 6)	0
ND<10 (6/1/2015)	ND<10 (12/2/2014)	(10 - 10)/(8 - 7)	0
ND<10 (12/7/2015)	ND<10 (12/2/2014)	(10 - 10)/(9 - 7)	0
ND<10 (6/6/2016)	ND<10 (12/2/2014)	(10 - 10)/(10 - 7)	0
ND<10 (12/5/2016)	ND<10 (12/2/2014)	(10 - 10)/(11 - 7)	0
ND<10 (6/20/2017)	ND<10 (12/2/2014)	(10 - 10)/(12 - 7)	0
ND<10 (12/4/2017)	ND<10 (12/2/2014)	(10 - 10)/(13 - 7)	0
ND<10 (6/4/2018)	ND<10 (12/2/2014)	(10 - 10)/(14 - 7)	0
ND<10 (12/7/2015)	ND<10 (6/1/2015)	(10 - 10)/(9 - 8)	0
ND<10 (6/6/2016)	ND<10 (6/1/2015)	(10 - 10)/(10 - 8)	0
ND<10 (12/5/2016)	ND<10 (6/1/2015)	(10 - 10)/(11 - 8)	0
ND<10 (6/20/2017)	ND<10 (6/1/2015)	(10 - 10)/(12 - 8)	0
ND<10 (12/4/2017)	ND<10 (6/1/2015)	(10 - 10)/(13 - 8)	0
ND<10 (6/4/2018)	ND<10 (6/1/2015)	(10 - 10)/(14 - 8)	0
ND<10 (6/6/2016)	ND<10 (12/7/2015)	(10 - 10)/(10 - 9)	0
ND<10 (12/5/2016)	ND<10 (12/7/2015)	(10 - 10)/(11 - 9)	0
ND<10 (6/20/2017)	ND<10 (12/7/2015)	(10 - 10)/(12 - 9)	0
ND<10 (12/4/2017)	ND<10 (12/7/2015)	(10 - 10)/(13 - 9)	0
ND<10 (6/4/2018)	ND<10 (12/7/2015)	(10 - 10)/(14 - 9)	0
ND<10 (12/5/2016)	ND<10 (6/6/2016)	(10 - 10)/(11 - 10)	0
ND<10 (6/20/2017)	ND<10 (6/6/2016)	(10 - 10)/(12 - 10)	0
ND<10 (12/4/2017)	ND<10 (6/6/2016)	(10 - 10)/(13 - 10)	0
ND<10 (6/4/2018)	ND<10 (6/6/2016)	(10 - 10)/(14 - 10)	0
ND<10 (6/20/2017)	ND<10 (12/5/2016)	(10 - 10)/(12 - 11)	0
ND<10 (12/4/2017)	ND<10 (12/5/2016)	(10 - 10)/(13 - 11)	0
ND<10 (6/4/2018)	ND<10 (12/5/2016)	(10 - 10)/(14 - 11)	0
ND<10 (12/4/2017)	ND<10 (6/20/2017)	(10 - 10)/(13 - 12)	0
ND<10 (6/4/2018)	ND<10 (6/20/2017)	(10 - 10)/(14 - 12)	0
ND<10 (6/4/2018)	ND<10 (12/4/2017)	(10 - 10)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	10	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis
Parameter: Chromium, total
Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<10 (6/4/2012)	ND<10 (12/13/2011)	(10 - 10)/(2 - 1)	0
ND<10 (12/11/2012)	ND<10 (12/13/2011)	(10 - 10)/(3 - 1)	0
ND<10 (6/3/2013)	ND<10 (12/13/2011)	(10 - 10)/(4 - 1)	0
ND<10 (12/3/2013)	ND<10 (12/13/2011)	(10 - 10)/(5 - 1)	0
ND<10 (6/2/2014)	ND<10 (12/13/2011)	(10 - 10)/(6 - 1)	0
ND<10 (12/2/2014)	ND<10 (12/13/2011)	(10 - 10)/(7 - 1)	0
ND<10 (6/1/2015)	ND<10 (12/13/2011)	(10 - 10)/(8 - 1)	0
ND<10 (12/7/2015)	ND<10 (12/13/2011)	(10 - 10)/(9 - 1)	0
ND<10 (6/6/2016)	ND<10 (12/13/2011)	(10 - 10)/(10 - 1)	0
ND<10 (12/5/2016)	ND<10 (12/13/2011)	(10 - 10)/(11 - 1)	0
ND<10 (6/20/2017)	ND<10 (12/13/2011)	(10 - 10)/(12 - 1)	0
ND<10 (12/4/2017)	ND<10 (12/13/2011)	(10 - 10)/(13 - 1)	0
ND<10 (6/4/2018)	ND<10 (12/13/2011)	(10 - 10)/(14 - 1)	0
ND<10 (12/11/2012)	ND<10 (6/4/2012)	(10 - 10)/(3 - 2)	0
ND<10 (6/3/2013)	ND<10 (6/4/2012)	(10 - 10)/(4 - 2)	0
ND<10 (12/3/2013)	ND<10 (6/4/2012)	(10 - 10)/(5 - 2)	0
ND<10 (6/2/2014)	ND<10 (6/4/2012)	(10 - 10)/(6 - 2)	0
ND<10 (12/2/2014)	ND<10 (6/4/2012)	(10 - 10)/(7 - 2)	0
ND<10 (6/1/2015)	ND<10 (6/4/2012)	(10 - 10)/(8 - 2)	0
ND<10 (12/7/2015)	ND<10 (6/4/2012)	(10 - 10)/(9 - 2)	0
ND<10 (6/6/2016)	ND<10 (6/4/2012)	(10 - 10)/(10 - 2)	0
ND<10 (12/5/2016)	ND<10 (6/4/2012)	(10 - 10)/(11 - 2)	0
ND<10 (6/20/2017)	ND<10 (6/4/2012)	(10 - 10)/(12 - 2)	0
ND<10 (12/4/2017)	ND<10 (6/4/2012)	(10 - 10)/(13 - 2)	0
ND<10 (6/4/2018)	ND<10 (6/4/2012)	(10 - 10)/(14 - 2)	0
ND<10 (6/3/2013)	ND<10 (12/11/2012)	(10 - 10)/(4 - 3)	0
ND<10 (12/3/2013)	ND<10 (12/11/2012)	(10 - 10)/(5 - 3)	0
ND<10 (6/2/2014)	ND<10 (12/11/2012)	(10 - 10)/(6 - 3)	0
ND<10 (12/2/2014)	ND<10 (12/11/2012)	(10 - 10)/(7 - 3)	0
ND<10 (6/1/2015)	ND<10 (12/11/2012)	(10 - 10)/(8 - 3)	0
ND<10 (12/7/2015)	ND<10 (12/11/2012)	(10 - 10)/(9 - 3)	0
ND<10 (6/6/2016)	ND<10 (12/11/2012)	(10 - 10)/(10 - 3)	0
ND<10 (12/5/2016)	ND<10 (12/11/2012)	(10 - 10)/(11 - 3)	0
ND<10 (6/20/2017)	ND<10 (12/11/2012)	(10 - 10)/(12 - 3)	0
ND<10 (12/4/2017)	ND<10 (12/11/2012)	(10 - 10)/(13 - 3)	0
ND<10 (6/4/2018)	ND<10 (12/11/2012)	(10 - 10)/(14 - 3)	0
ND<10 (12/3/2013)	ND<10 (6/3/2013)	(10 - 10)/(5 - 4)	0
ND<10 (6/2/2014)	ND<10 (6/3/2013)	(10 - 10)/(6 - 4)	0
ND<10 (12/2/2014)	ND<10 (6/3/2013)	(10 - 10)/(7 - 4)	0
ND<10 (6/1/2015)	ND<10 (6/3/2013)	(10 - 10)/(8 - 4)	0
ND<10 (12/7/2015)	ND<10 (6/3/2013)	(10 - 10)/(9 - 4)	0
ND<10 (6/6/2016)	ND<10 (6/3/2013)	(10 - 10)/(10 - 4)	0
ND<10 (12/5/2016)	ND<10 (6/3/2013)	(10 - 10)/(11 - 4)	0
ND<10 (6/20/2017)	ND<10 (6/3/2013)	(10 - 10)/(12 - 4)	0
ND<10 (12/4/2017)	ND<10 (6/3/2013)	(10 - 10)/(13 - 4)	0
ND<10 (6/4/2018)	ND<10 (6/3/2013)	(10 - 10)/(14 - 4)	0
ND<10 (6/2/2014)	ND<10 (12/3/2013)	(10 - 10)/(6 - 5)	0
ND<10 (12/2/2014)	ND<10 (12/3/2013)	(10 - 10)/(7 - 5)	0

ND<10 (6/1/2015)	ND<10 (12/3/2013)	(10 - 10)/(8 - 5)	0
ND<10 (12/7/2015)	ND<10 (12/3/2013)	(10 - 10)/(9 - 5)	0
ND<10 (6/6/2016)	ND<10 (12/3/2013)	(10 - 10)/(10 - 5)	0
ND<10 (12/5/2016)	ND<10 (12/3/2013)	(10 - 10)/(11 - 5)	0
ND<10 (6/20/2017)	ND<10 (12/3/2013)	(10 - 10)/(12 - 5)	0
ND<10 (12/4/2017)	ND<10 (12/3/2013)	(10 - 10)/(13 - 5)	0
ND<10 (6/4/2018)	ND<10 (12/3/2013)	(10 - 10)/(14 - 5)	0
ND<10 (12/2/2014)	ND<10 (6/2/2014)	(10 - 10)/(7 - 6)	0
ND<10 (6/1/2015)	ND<10 (6/2/2014)	(10 - 10)/(8 - 6)	0
ND<10 (12/7/2015)	ND<10 (6/2/2014)	(10 - 10)/(9 - 6)	0
ND<10 (6/6/2016)	ND<10 (6/2/2014)	(10 - 10)/(10 - 6)	0
ND<10 (12/5/2016)	ND<10 (6/2/2014)	(10 - 10)/(11 - 6)	0
ND<10 (6/20/2017)	ND<10 (6/2/2014)	(10 - 10)/(12 - 6)	0
ND<10 (12/4/2017)	ND<10 (6/2/2014)	(10 - 10)/(13 - 6)	0
ND<10 (6/4/2018)	ND<10 (6/2/2014)	(10 - 10)/(14 - 6)	0
ND<10 (6/1/2015)	ND<10 (12/2/2014)	(10 - 10)/(8 - 7)	0
ND<10 (12/7/2015)	ND<10 (12/2/2014)	(10 - 10)/(9 - 7)	0
ND<10 (6/6/2016)	ND<10 (12/2/2014)	(10 - 10)/(10 - 7)	0
ND<10 (12/5/2016)	ND<10 (12/2/2014)	(10 - 10)/(11 - 7)	0
ND<10 (6/20/2017)	ND<10 (12/2/2014)	(10 - 10)/(12 - 7)	0
ND<10 (12/4/2017)	ND<10 (12/2/2014)	(10 - 10)/(13 - 7)	0
ND<10 (6/4/2018)	ND<10 (12/2/2014)	(10 - 10)/(14 - 7)	0
ND<10 (12/7/2015)	ND<10 (6/1/2015)	(10 - 10)/(9 - 8)	0
ND<10 (6/6/2016)	ND<10 (6/1/2015)	(10 - 10)/(10 - 8)	0
ND<10 (12/5/2016)	ND<10 (6/1/2015)	(10 - 10)/(11 - 8)	0
ND<10 (6/20/2017)	ND<10 (6/1/2015)	(10 - 10)/(12 - 8)	0
ND<10 (12/4/2017)	ND<10 (6/1/2015)	(10 - 10)/(13 - 8)	0
ND<10 (6/4/2018)	ND<10 (6/1/2015)	(10 - 10)/(14 - 8)	0
ND<10 (6/6/2016)	ND<10 (12/7/2015)	(10 - 10)/(10 - 9)	0
ND<10 (12/5/2016)	ND<10 (12/7/2015)	(10 - 10)/(11 - 9)	0
ND<10 (6/20/2017)	ND<10 (12/7/2015)	(10 - 10)/(12 - 9)	0
ND<10 (12/4/2017)	ND<10 (12/7/2015)	(10 - 10)/(13 - 9)	0
ND<10 (6/4/2018)	ND<10 (12/7/2015)	(10 - 10)/(14 - 9)	0
ND<10 (12/5/2016)	ND<10 (6/6/2016)	(10 - 10)/(11 - 10)	0
ND<10 (6/20/2017)	ND<10 (6/6/2016)	(10 - 10)/(12 - 10)	0
ND<10 (12/4/2017)	ND<10 (6/6/2016)	(10 - 10)/(13 - 10)	0
ND<10 (6/4/2018)	ND<10 (6/6/2016)	(10 - 10)/(14 - 10)	0
ND<10 (6/20/2017)	ND<10 (12/5/2016)	(10 - 10)/(12 - 11)	0
ND<10 (12/4/2017)	ND<10 (12/5/2016)	(10 - 10)/(13 - 11)	0
ND<10 (6/4/2018)	ND<10 (12/5/2016)	(10 - 10)/(14 - 11)	0
ND<10 (12/4/2017)	ND<10 (6/20/2017)	(10 - 10)/(13 - 12)	0
ND<10 (6/4/2018)	ND<10 (6/20/2017)	(10 - 10)/(14 - 12)	0
ND<10 (6/4/2018)	ND<10 (12/4/2017)	(10 - 10)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	10	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Sen's Slope Analysis

Parameter: Cobalt, total

Location: MW-2R

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<5 (6/4/2012)	ND<5 (12/13/2011)	(5 - 5)/(2 - 1)	0
ND<5 (12/11/2012)	ND<5 (12/13/2011)	(5 - 5)/(3 - 1)	0
ND<5 (6/3/2013)	ND<5 (12/13/2011)	(5 - 5)/(4 - 1)	0
ND<5 (12/3/2013)	ND<5 (12/13/2011)	(5 - 5)/(5 - 1)	0
ND<5 (6/2/2014)	ND<5 (12/13/2011)	(5 - 5)/(6 - 1)	0
ND<5 (12/2/2014)	ND<5 (12/13/2011)	(5 - 5)/(7 - 1)	0
ND<5 (6/1/2015)	ND<5 (12/13/2011)	(5 - 5)/(8 - 1)	0
ND<5 (12/7/2015)	ND<5 (12/13/2011)	(5 - 5)/(9 - 1)	0
ND<5 (6/6/2016)	ND<5 (12/13/2011)	(5 - 5)/(10 - 1)	0
ND<5 (12/5/2016)	ND<5 (12/13/2011)	(5 - 5)/(11 - 1)	0
ND<5 (6/20/2017)	ND<5 (12/13/2011)	(5 - 5)/(12 - 1)	0
ND<5 (12/4/2017)	ND<5 (12/13/2011)	(5 - 5)/(13 - 1)	0
ND<5 (6/4/2018)	ND<5 (12/13/2011)	(5 - 5)/(14 - 1)	0
ND<5 (12/11/2012)	ND<5 (6/4/2012)	(5 - 5)/(3 - 2)	0
ND<5 (6/3/2013)	ND<5 (6/4/2012)	(5 - 5)/(4 - 2)	0
ND<5 (12/3/2013)	ND<5 (6/4/2012)	(5 - 5)/(5 - 2)	0
ND<5 (6/2/2014)	ND<5 (6/4/2012)	(5 - 5)/(6 - 2)	0
ND<5 (12/2/2014)	ND<5 (6/4/2012)	(5 - 5)/(7 - 2)	0
ND<5 (6/1/2015)	ND<5 (6/4/2012)	(5 - 5)/(8 - 2)	0
ND<5 (12/7/2015)	ND<5 (6/4/2012)	(5 - 5)/(9 - 2)	0
ND<5 (6/6/2016)	ND<5 (6/4/2012)	(5 - 5)/(10 - 2)	0
ND<5 (12/5/2016)	ND<5 (6/4/2012)	(5 - 5)/(11 - 2)	0
ND<5 (6/20/2017)	ND<5 (6/4/2012)	(5 - 5)/(12 - 2)	0
ND<5 (12/4/2017)	ND<5 (6/4/2012)	(5 - 5)/(13 - 2)	0
ND<5 (6/4/2018)	ND<5 (6/4/2012)	(5 - 5)/(14 - 2)	0
ND<5 (6/3/2013)	ND<5 (12/11/2012)	(5 - 5)/(4 - 3)	0
ND<5 (12/3/2013)	ND<5 (12/11/2012)	(5 - 5)/(5 - 3)	0
ND<5 (6/2/2014)	ND<5 (12/11/2012)	(5 - 5)/(6 - 3)	0
ND<5 (12/2/2014)	ND<5 (12/11/2012)	(5 - 5)/(7 - 3)	0
ND<5 (6/1/2015)	ND<5 (12/11/2012)	(5 - 5)/(8 - 3)	0
ND<5 (12/7/2015)	ND<5 (12/11/2012)	(5 - 5)/(9 - 3)	0
ND<5 (6/6/2016)	ND<5 (12/11/2012)	(5 - 5)/(10 - 3)	0
ND<5 (12/5/2016)	ND<5 (12/11/2012)	(5 - 5)/(11 - 3)	0
ND<5 (6/20/2017)	ND<5 (12/11/2012)	(5 - 5)/(12 - 3)	0
ND<5 (12/4/2017)	ND<5 (12/11/2012)	(5 - 5)/(13 - 3)	0
ND<5 (6/4/2018)	ND<5 (12/11/2012)	(5 - 5)/(14 - 3)	0
ND<5 (12/3/2013)	ND<5 (6/3/2013)	(5 - 5)/(5 - 4)	0
ND<5 (6/2/2014)	ND<5 (6/3/2013)	(5 - 5)/(6 - 4)	0
ND<5 (12/2/2014)	ND<5 (6/3/2013)	(5 - 5)/(7 - 4)	0
ND<5 (6/1/2015)	ND<5 (6/3/2013)	(5 - 5)/(8 - 4)	0
ND<5 (12/7/2015)	ND<5 (6/3/2013)	(5 - 5)/(9 - 4)	0
ND<5 (6/6/2016)	ND<5 (6/3/2013)	(5 - 5)/(10 - 4)	0
ND<5 (12/5/2016)	ND<5 (6/3/2013)	(5 - 5)/(11 - 4)	0
ND<5 (6/20/2017)	ND<5 (6/3/2013)	(5 - 5)/(12 - 4)	0
ND<5 (12/4/2017)	ND<5 (6/3/2013)	(5 - 5)/(13 - 4)	0
ND<5 (6/4/2018)	ND<5 (6/3/2013)	(5 - 5)/(14 - 4)	0
ND<5 (6/2/2014)	ND<5 (12/3/2013)	(5 - 5)/(6 - 5)	0
ND<5 (12/2/2014)	ND<5 (12/3/2013)	(5 - 5)/(7 - 5)	0

ND<5 (6/1/2015)	ND<5 (12/3/2013)	(5 - 5)/(8 - 5)	0
ND<5 (12/7/2015)	ND<5 (12/3/2013)	(5 - 5)/(9 - 5)	0
ND<5 (6/6/2016)	ND<5 (12/3/2013)	(5 - 5)/(10 - 5)	0
ND<5 (12/5/2016)	ND<5 (12/3/2013)	(5 - 5)/(11 - 5)	0
ND<5 (6/20/2017)	ND<5 (12/3/2013)	(5 - 5)/(12 - 5)	0
ND<5 (12/4/2017)	ND<5 (12/3/2013)	(5 - 5)/(13 - 5)	0
ND<5 (6/4/2018)	ND<5 (12/3/2013)	(5 - 5)/(14 - 5)	0

ND<5 (12/2/2014)	ND<5 (6/2/2014)	(5 - 5)/(7 - 6)	0
ND<5 (6/1/2015)	ND<5 (6/2/2014)	(5 - 5)/(8 - 6)	0
ND<5 (12/7/2015)	ND<5 (6/2/2014)	(5 - 5)/(9 - 6)	0
ND<5 (6/6/2016)	ND<5 (6/2/2014)	(5 - 5)/(10 - 6)	0
ND<5 (12/5/2016)	ND<5 (6/2/2014)	(5 - 5)/(11 - 6)	0
ND<5 (6/20/2017)	ND<5 (6/2/2014)	(5 - 5)/(12 - 6)	0
ND<5 (12/4/2017)	ND<5 (6/2/2014)	(5 - 5)/(13 - 6)	0
ND<5 (6/4/2018)	ND<5 (6/2/2014)	(5 - 5)/(14 - 6)	0

ND<5 (6/1/2015)	ND<5 (12/2/2014)	(5 - 5)/(8 - 7)	0
ND<5 (12/7/2015)	ND<5 (12/2/2014)	(5 - 5)/(9 - 7)	0
ND<5 (6/6/2016)	ND<5 (12/2/2014)	(5 - 5)/(10 - 7)	0
ND<5 (12/5/2016)	ND<5 (12/2/2014)	(5 - 5)/(11 - 7)	0
ND<5 (6/20/2017)	ND<5 (12/2/2014)	(5 - 5)/(12 - 7)	0
ND<5 (12/4/2017)	ND<5 (12/2/2014)	(5 - 5)/(13 - 7)	0
ND<5 (6/4/2018)	ND<5 (12/2/2014)	(5 - 5)/(14 - 7)	0

ND<5 (12/7/2015)	ND<5 (6/1/2015)	(5 - 5)/(9 - 8)	0
ND<5 (6/6/2016)	ND<5 (6/1/2015)	(5 - 5)/(10 - 8)	0
ND<5 (12/5/2016)	ND<5 (6/1/2015)	(5 - 5)/(11 - 8)	0
ND<5 (6/20/2017)	ND<5 (6/1/2015)	(5 - 5)/(12 - 8)	0
ND<5 (12/4/2017)	ND<5 (6/1/2015)	(5 - 5)/(13 - 8)	0
ND<5 (6/4/2018)	ND<5 (6/1/2015)	(5 - 5)/(14 - 8)	0

ND<5 (6/6/2016)	ND<5 (12/7/2015)	(5 - 5)/(10 - 9)	0
ND<5 (12/5/2016)	ND<5 (12/7/2015)	(5 - 5)/(11 - 9)	0
ND<5 (6/20/2017)	ND<5 (12/7/2015)	(5 - 5)/(12 - 9)	0
ND<5 (12/4/2017)	ND<5 (12/7/2015)	(5 - 5)/(13 - 9)	0
ND<5 (6/4/2018)	ND<5 (12/7/2015)	(5 - 5)/(14 - 9)	0

ND<5 (12/5/2016)	ND<5 (6/6/2016)	(5 - 5)/(11 - 10)	0
ND<5 (6/20/2017)	ND<5 (6/6/2016)	(5 - 5)/(12 - 10)	0
ND<5 (12/4/2017)	ND<5 (6/6/2016)	(5 - 5)/(13 - 10)	0
ND<5 (6/4/2018)	ND<5 (6/6/2016)	(5 - 5)/(14 - 10)	0

ND<5 (6/20/2017)	ND<5 (12/5/2016)	(5 - 5)/(12 - 11)	0
ND<5 (12/4/2017)	ND<5 (12/5/2016)	(5 - 5)/(13 - 11)	0
ND<5 (6/4/2018)	ND<5 (12/5/2016)	(5 - 5)/(14 - 11)	0

ND<5 (12/4/2017)	ND<5 (6/20/2017)	(5 - 5)/(13 - 12)	0
ND<5 (6/4/2018)	ND<5 (6/20/2017)	(5 - 5)/(14 - 12)	0

ND<5 (6/4/2018)	ND<5 (12/4/2017)	(5 - 5)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	5	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Sen's Slope Analysis
Parameter: Cobalt, total
Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<5 (6/4/2012)	ND<5 (12/13/2011)	(5 - 5)/(2 - 1)	0
ND<5 (12/11/2012)	ND<5 (12/13/2011)	(5 - 5)/(3 - 1)	0
ND<5 (6/3/2013)	ND<5 (12/13/2011)	(5 - 5)/(4 - 1)	0
ND<5 (12/3/2013)	ND<5 (12/13/2011)	(5 - 5)/(5 - 1)	0
ND<5 (6/2/2014)	ND<5 (12/13/2011)	(5 - 5)/(6 - 1)	0
ND<5 (12/2/2014)	ND<5 (12/13/2011)	(5 - 5)/(7 - 1)	0
ND<5 (6/1/2015)	ND<5 (12/13/2011)	(5 - 5)/(8 - 1)	0
ND<5 (12/7/2015)	ND<5 (12/13/2011)	(5 - 5)/(9 - 1)	0
ND<5 (6/6/2016)	ND<5 (12/13/2011)	(5 - 5)/(10 - 1)	0
ND<5 (12/5/2016)	ND<5 (12/13/2011)	(5 - 5)/(11 - 1)	0
ND<5 (6/20/2017)	ND<5 (12/13/2011)	(5 - 5)/(12 - 1)	0
ND<5 (12/4/2017)	ND<5 (12/13/2011)	(5 - 5)/(13 - 1)	0
ND<5 (6/4/2018)	ND<5 (12/13/2011)	(5 - 5)/(14 - 1)	0
ND<5 (12/11/2012)	ND<5 (6/4/2012)	(5 - 5)/(3 - 2)	0
ND<5 (6/3/2013)	ND<5 (6/4/2012)	(5 - 5)/(4 - 2)	0
ND<5 (12/3/2013)	ND<5 (6/4/2012)	(5 - 5)/(5 - 2)	0
ND<5 (6/2/2014)	ND<5 (6/4/2012)	(5 - 5)/(6 - 2)	0
ND<5 (12/2/2014)	ND<5 (6/4/2012)	(5 - 5)/(7 - 2)	0
ND<5 (6/1/2015)	ND<5 (6/4/2012)	(5 - 5)/(8 - 2)	0
ND<5 (12/7/2015)	ND<5 (6/4/2012)	(5 - 5)/(9 - 2)	0
ND<5 (6/6/2016)	ND<5 (6/4/2012)	(5 - 5)/(10 - 2)	0
ND<5 (12/5/2016)	ND<5 (6/4/2012)	(5 - 5)/(11 - 2)	0
ND<5 (6/20/2017)	ND<5 (6/4/2012)	(5 - 5)/(12 - 2)	0
ND<5 (12/4/2017)	ND<5 (6/4/2012)	(5 - 5)/(13 - 2)	0
ND<5 (6/4/2018)	ND<5 (6/4/2012)	(5 - 5)/(14 - 2)	0
ND<5 (6/3/2013)	ND<5 (12/11/2012)	(5 - 5)/(4 - 3)	0
ND<5 (12/3/2013)	ND<5 (12/11/2012)	(5 - 5)/(5 - 3)	0
ND<5 (6/2/2014)	ND<5 (12/11/2012)	(5 - 5)/(6 - 3)	0
ND<5 (12/2/2014)	ND<5 (12/11/2012)	(5 - 5)/(7 - 3)	0
ND<5 (6/1/2015)	ND<5 (12/11/2012)	(5 - 5)/(8 - 3)	0
ND<5 (12/7/2015)	ND<5 (12/11/2012)	(5 - 5)/(9 - 3)	0
ND<5 (6/6/2016)	ND<5 (12/11/2012)	(5 - 5)/(10 - 3)	0
ND<5 (12/5/2016)	ND<5 (12/11/2012)	(5 - 5)/(11 - 3)	0
ND<5 (6/20/2017)	ND<5 (12/11/2012)	(5 - 5)/(12 - 3)	0
ND<5 (12/4/2017)	ND<5 (12/11/2012)	(5 - 5)/(13 - 3)	0
ND<5 (6/4/2018)	ND<5 (12/11/2012)	(5 - 5)/(14 - 3)	0
ND<5 (12/3/2013)	ND<5 (6/3/2013)	(5 - 5)/(5 - 4)	0
ND<5 (6/2/2014)	ND<5 (6/3/2013)	(5 - 5)/(6 - 4)	0
ND<5 (12/2/2014)	ND<5 (6/3/2013)	(5 - 5)/(7 - 4)	0
ND<5 (6/1/2015)	ND<5 (6/3/2013)	(5 - 5)/(8 - 4)	0
ND<5 (12/7/2015)	ND<5 (6/3/2013)	(5 - 5)/(9 - 4)	0
ND<5 (6/6/2016)	ND<5 (6/3/2013)	(5 - 5)/(10 - 4)	0
ND<5 (12/5/2016)	ND<5 (6/3/2013)	(5 - 5)/(11 - 4)	0
ND<5 (6/20/2017)	ND<5 (6/3/2013)	(5 - 5)/(12 - 4)	0
ND<5 (12/4/2017)	ND<5 (6/3/2013)	(5 - 5)/(13 - 4)	0
ND<5 (6/4/2018)	ND<5 (6/3/2013)	(5 - 5)/(14 - 4)	0
ND<5 (6/2/2014)	ND<5 (12/3/2013)	(5 - 5)/(6 - 5)	0
ND<5 (12/2/2014)	ND<5 (12/3/2013)	(5 - 5)/(7 - 5)	0

ND<5 (6/1/2015)	ND<5 (12/3/2013)	(5 - 5)/(8 - 5)	0
ND<5 (12/7/2015)	ND<5 (12/3/2013)	(5 - 5)/(9 - 5)	0
ND<5 (6/6/2016)	ND<5 (12/3/2013)	(5 - 5)/(10 - 5)	0
ND<5 (12/5/2016)	ND<5 (12/3/2013)	(5 - 5)/(11 - 5)	0
ND<5 (6/20/2017)	ND<5 (12/3/2013)	(5 - 5)/(12 - 5)	0
ND<5 (12/4/2017)	ND<5 (12/3/2013)	(5 - 5)/(13 - 5)	0
ND<5 (6/4/2018)	ND<5 (12/3/2013)	(5 - 5)/(14 - 5)	0
ND<5 (12/2/2014)	ND<5 (6/2/2014)	(5 - 5)/(7 - 6)	0
ND<5 (6/1/2015)	ND<5 (6/2/2014)	(5 - 5)/(8 - 6)	0
ND<5 (12/7/2015)	ND<5 (6/2/2014)	(5 - 5)/(9 - 6)	0
ND<5 (6/6/2016)	ND<5 (6/2/2014)	(5 - 5)/(10 - 6)	0
ND<5 (12/5/2016)	ND<5 (6/2/2014)	(5 - 5)/(11 - 6)	0
ND<5 (6/20/2017)	ND<5 (6/2/2014)	(5 - 5)/(12 - 6)	0
ND<5 (12/4/2017)	ND<5 (6/2/2014)	(5 - 5)/(13 - 6)	0
ND<5 (6/4/2018)	ND<5 (6/2/2014)	(5 - 5)/(14 - 6)	0
ND<5 (6/1/2015)	ND<5 (12/2/2014)	(5 - 5)/(8 - 7)	0
ND<5 (12/7/2015)	ND<5 (12/2/2014)	(5 - 5)/(9 - 7)	0
ND<5 (6/6/2016)	ND<5 (12/2/2014)	(5 - 5)/(10 - 7)	0
ND<5 (12/5/2016)	ND<5 (12/2/2014)	(5 - 5)/(11 - 7)	0
ND<5 (6/20/2017)	ND<5 (12/2/2014)	(5 - 5)/(12 - 7)	0
ND<5 (12/4/2017)	ND<5 (12/2/2014)	(5 - 5)/(13 - 7)	0
ND<5 (6/4/2018)	ND<5 (12/2/2014)	(5 - 5)/(14 - 7)	0
ND<5 (12/7/2015)	ND<5 (6/1/2015)	(5 - 5)/(9 - 8)	0
ND<5 (6/6/2016)	ND<5 (6/1/2015)	(5 - 5)/(10 - 8)	0
ND<5 (12/5/2016)	ND<5 (6/1/2015)	(5 - 5)/(11 - 8)	0
ND<5 (6/20/2017)	ND<5 (6/1/2015)	(5 - 5)/(12 - 8)	0
ND<5 (12/4/2017)	ND<5 (6/1/2015)	(5 - 5)/(13 - 8)	0
ND<5 (6/4/2018)	ND<5 (6/1/2015)	(5 - 5)/(14 - 8)	0
ND<5 (6/6/2016)	ND<5 (12/7/2015)	(5 - 5)/(10 - 9)	0
ND<5 (12/5/2016)	ND<5 (12/7/2015)	(5 - 5)/(11 - 9)	0
ND<5 (6/20/2017)	ND<5 (12/7/2015)	(5 - 5)/(12 - 9)	0
ND<5 (12/4/2017)	ND<5 (12/7/2015)	(5 - 5)/(13 - 9)	0
ND<5 (6/4/2018)	ND<5 (12/7/2015)	(5 - 5)/(14 - 9)	0
ND<5 (12/5/2016)	ND<5 (6/6/2016)	(5 - 5)/(11 - 10)	0
ND<5 (6/20/2017)	ND<5 (6/6/2016)	(5 - 5)/(12 - 10)	0
ND<5 (12/4/2017)	ND<5 (6/6/2016)	(5 - 5)/(13 - 10)	0
ND<5 (6/4/2018)	ND<5 (6/6/2016)	(5 - 5)/(14 - 10)	0
ND<5 (6/20/2017)	ND<5 (12/5/2016)	(5 - 5)/(12 - 11)	0
ND<5 (12/4/2017)	ND<5 (12/5/2016)	(5 - 5)/(13 - 11)	0
ND<5 (6/4/2018)	ND<5 (12/5/2016)	(5 - 5)/(14 - 11)	0
ND<5 (12/4/2017)	ND<5 (6/20/2017)	(5 - 5)/(13 - 12)	0
ND<5 (6/4/2018)	ND<5 (6/20/2017)	(5 - 5)/(14 - 12)	0
ND<5 (6/4/2018)	ND<5 (12/4/2017)	(5 - 5)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	5	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis
Parameter: Cobalt, total
Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<5 (6/4/2012)	ND<5 (12/13/2011)	(5 - 5)/(2 - 1)	0
ND<5 (12/11/2012)	ND<5 (12/13/2011)	(5 - 5)/(3 - 1)	0
ND<5 (6/3/2013)	ND<5 (12/13/2011)	(5 - 5)/(4 - 1)	0
ND<5 (12/3/2013)	ND<5 (12/13/2011)	(5 - 5)/(5 - 1)	0
ND<5 (6/2/2014)	ND<5 (12/13/2011)	(5 - 5)/(6 - 1)	0
ND<5 (12/2/2014)	ND<5 (12/13/2011)	(5 - 5)/(7 - 1)	0
ND<5 (6/1/2015)	ND<5 (12/13/2011)	(5 - 5)/(8 - 1)	0
ND<5 (12/7/2015)	ND<5 (12/13/2011)	(5 - 5)/(9 - 1)	0
ND<5 (6/6/2016)	ND<5 (12/13/2011)	(5 - 5)/(10 - 1)	0
ND<5 (12/5/2016)	ND<5 (12/13/2011)	(5 - 5)/(11 - 1)	0
ND<5 (6/20/2017)	ND<5 (12/13/2011)	(5 - 5)/(12 - 1)	0
ND<5 (12/4/2017)	ND<5 (12/13/2011)	(5 - 5)/(13 - 1)	0
ND<5 (6/4/2018)	ND<5 (12/13/2011)	(5 - 5)/(14 - 1)	0
ND<5 (12/11/2012)	ND<5 (6/4/2012)	(5 - 5)/(3 - 2)	0
ND<5 (6/3/2013)	ND<5 (6/4/2012)	(5 - 5)/(4 - 2)	0
ND<5 (12/3/2013)	ND<5 (6/4/2012)	(5 - 5)/(5 - 2)	0
ND<5 (6/2/2014)	ND<5 (6/4/2012)	(5 - 5)/(6 - 2)	0
ND<5 (12/2/2014)	ND<5 (6/4/2012)	(5 - 5)/(7 - 2)	0
ND<5 (6/1/2015)	ND<5 (6/4/2012)	(5 - 5)/(8 - 2)	0
ND<5 (12/7/2015)	ND<5 (6/4/2012)	(5 - 5)/(9 - 2)	0
ND<5 (6/6/2016)	ND<5 (6/4/2012)	(5 - 5)/(10 - 2)	0
ND<5 (12/5/2016)	ND<5 (6/4/2012)	(5 - 5)/(11 - 2)	0
ND<5 (6/20/2017)	ND<5 (6/4/2012)	(5 - 5)/(12 - 2)	0
ND<5 (12/4/2017)	ND<5 (6/4/2012)	(5 - 5)/(13 - 2)	0
ND<5 (6/4/2018)	ND<5 (6/4/2012)	(5 - 5)/(14 - 2)	0
ND<5 (6/3/2013)	ND<5 (12/11/2012)	(5 - 5)/(4 - 3)	0
ND<5 (12/3/2013)	ND<5 (12/11/2012)	(5 - 5)/(5 - 3)	0
ND<5 (6/2/2014)	ND<5 (12/11/2012)	(5 - 5)/(6 - 3)	0
ND<5 (12/2/2014)	ND<5 (12/11/2012)	(5 - 5)/(7 - 3)	0
ND<5 (6/1/2015)	ND<5 (12/11/2012)	(5 - 5)/(8 - 3)	0
ND<5 (12/7/2015)	ND<5 (12/11/2012)	(5 - 5)/(9 - 3)	0
ND<5 (6/6/2016)	ND<5 (12/11/2012)	(5 - 5)/(10 - 3)	0
ND<5 (12/5/2016)	ND<5 (12/11/2012)	(5 - 5)/(11 - 3)	0
ND<5 (6/20/2017)	ND<5 (12/11/2012)	(5 - 5)/(12 - 3)	0
ND<5 (12/4/2017)	ND<5 (12/11/2012)	(5 - 5)/(13 - 3)	0
ND<5 (6/4/2018)	ND<5 (12/11/2012)	(5 - 5)/(14 - 3)	0
ND<5 (12/3/2013)	ND<5 (6/3/2013)	(5 - 5)/(5 - 4)	0
ND<5 (6/2/2014)	ND<5 (6/3/2013)	(5 - 5)/(6 - 4)	0
ND<5 (12/2/2014)	ND<5 (6/3/2013)	(5 - 5)/(7 - 4)	0
ND<5 (6/1/2015)	ND<5 (6/3/2013)	(5 - 5)/(8 - 4)	0
ND<5 (12/7/2015)	ND<5 (6/3/2013)	(5 - 5)/(9 - 4)	0
ND<5 (6/6/2016)	ND<5 (6/3/2013)	(5 - 5)/(10 - 4)	0
ND<5 (12/5/2016)	ND<5 (6/3/2013)	(5 - 5)/(11 - 4)	0
ND<5 (6/20/2017)	ND<5 (6/3/2013)	(5 - 5)/(12 - 4)	0
ND<5 (12/4/2017)	ND<5 (6/3/2013)	(5 - 5)/(13 - 4)	0
ND<5 (6/4/2018)	ND<5 (6/3/2013)	(5 - 5)/(14 - 4)	0
ND<5 (6/2/2014)	ND<5 (12/3/2013)	(5 - 5)/(6 - 5)	0
ND<5 (12/2/2014)	ND<5 (12/3/2013)	(5 - 5)/(7 - 5)	0

ND<5 (6/1/2015)	ND<5 (12/3/2013)	(5 - 5)/(8 - 5)	0
ND<5 (12/7/2015)	ND<5 (12/3/2013)	(5 - 5)/(9 - 5)	0
ND<5 (6/6/2016)	ND<5 (12/3/2013)	(5 - 5)/(10 - 5)	0
ND<5 (12/5/2016)	ND<5 (12/3/2013)	(5 - 5)/(11 - 5)	0
ND<5 (6/20/2017)	ND<5 (12/3/2013)	(5 - 5)/(12 - 5)	0
ND<5 (12/4/2017)	ND<5 (12/3/2013)	(5 - 5)/(13 - 5)	0
ND<5 (6/4/2018)	ND<5 (12/3/2013)	(5 - 5)/(14 - 5)	0
ND<5 (12/2/2014)	ND<5 (6/2/2014)	(5 - 5)/(7 - 6)	0
ND<5 (6/1/2015)	ND<5 (6/2/2014)	(5 - 5)/(8 - 6)	0
ND<5 (12/7/2015)	ND<5 (6/2/2014)	(5 - 5)/(9 - 6)	0
ND<5 (6/6/2016)	ND<5 (6/2/2014)	(5 - 5)/(10 - 6)	0
ND<5 (12/5/2016)	ND<5 (6/2/2014)	(5 - 5)/(11 - 6)	0
ND<5 (6/20/2017)	ND<5 (6/2/2014)	(5 - 5)/(12 - 6)	0
ND<5 (12/4/2017)	ND<5 (6/2/2014)	(5 - 5)/(13 - 6)	0
ND<5 (6/4/2018)	ND<5 (6/2/2014)	(5 - 5)/(14 - 6)	0
ND<5 (6/1/2015)	ND<5 (12/2/2014)	(5 - 5)/(8 - 7)	0
ND<5 (12/7/2015)	ND<5 (12/2/2014)	(5 - 5)/(9 - 7)	0
ND<5 (6/6/2016)	ND<5 (12/2/2014)	(5 - 5)/(10 - 7)	0
ND<5 (12/5/2016)	ND<5 (12/2/2014)	(5 - 5)/(11 - 7)	0
ND<5 (6/20/2017)	ND<5 (12/2/2014)	(5 - 5)/(12 - 7)	0
ND<5 (12/4/2017)	ND<5 (12/2/2014)	(5 - 5)/(13 - 7)	0
ND<5 (6/4/2018)	ND<5 (12/2/2014)	(5 - 5)/(14 - 7)	0
ND<5 (12/7/2015)	ND<5 (6/1/2015)	(5 - 5)/(9 - 8)	0
ND<5 (6/6/2016)	ND<5 (6/1/2015)	(5 - 5)/(10 - 8)	0
ND<5 (12/5/2016)	ND<5 (6/1/2015)	(5 - 5)/(11 - 8)	0
ND<5 (6/20/2017)	ND<5 (6/1/2015)	(5 - 5)/(12 - 8)	0
ND<5 (12/4/2017)	ND<5 (6/1/2015)	(5 - 5)/(13 - 8)	0
ND<5 (6/4/2018)	ND<5 (6/1/2015)	(5 - 5)/(14 - 8)	0
ND<5 (6/6/2016)	ND<5 (12/7/2015)	(5 - 5)/(10 - 9)	0
ND<5 (12/5/2016)	ND<5 (12/7/2015)	(5 - 5)/(11 - 9)	0
ND<5 (6/20/2017)	ND<5 (12/7/2015)	(5 - 5)/(12 - 9)	0
ND<5 (12/4/2017)	ND<5 (12/7/2015)	(5 - 5)/(13 - 9)	0
ND<5 (6/4/2018)	ND<5 (12/7/2015)	(5 - 5)/(14 - 9)	0
ND<5 (12/5/2016)	ND<5 (6/6/2016)	(5 - 5)/(11 - 10)	0
ND<5 (6/20/2017)	ND<5 (6/6/2016)	(5 - 5)/(12 - 10)	0
ND<5 (12/4/2017)	ND<5 (6/6/2016)	(5 - 5)/(13 - 10)	0
ND<5 (6/4/2018)	ND<5 (6/6/2016)	(5 - 5)/(14 - 10)	0
ND<5 (6/20/2017)	ND<5 (12/5/2016)	(5 - 5)/(12 - 11)	0
ND<5 (12/4/2017)	ND<5 (12/5/2016)	(5 - 5)/(13 - 11)	0
ND<5 (6/4/2018)	ND<5 (12/5/2016)	(5 - 5)/(14 - 11)	0
ND<5 (12/4/2017)	ND<5 (6/20/2017)	(5 - 5)/(13 - 12)	0
ND<5 (6/4/2018)	ND<5 (6/20/2017)	(5 - 5)/(14 - 12)	0
ND<5 (6/4/2018)	ND<5 (12/4/2017)	(5 - 5)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	5	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Sen's Slope Analysis
Parameter: Copper, total
Location: MW-2R

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<10 (6/4/2012)	ND<10 (12/13/2011)	(10 - 10)/(2 - 1)	0
ND<10 (12/11/2012)	ND<10 (12/13/2011)	(10 - 10)/(3 - 1)	0
ND<10 (6/3/2013)	ND<10 (12/13/2011)	(10 - 10)/(4 - 1)	0
ND<10 (12/3/2013)	ND<10 (12/13/2011)	(10 - 10)/(5 - 1)	0
ND<10 (6/2/2014)	ND<10 (12/13/2011)	(10 - 10)/(6 - 1)	0
ND<10 (12/2/2014)	ND<10 (12/13/2011)	(10 - 10)/(7 - 1)	0
ND<10 (6/1/2015)	ND<10 (12/13/2011)	(10 - 10)/(8 - 1)	0
ND<10 (12/7/2015)	ND<10 (12/13/2011)	(10 - 10)/(9 - 1)	0
ND<10 (6/6/2016)	ND<10 (12/13/2011)	(10 - 10)/(10 - 1)	0
ND<10 (12/5/2016)	ND<10 (12/13/2011)	(10 - 10)/(11 - 1)	0
ND<10 (6/20/2017)	ND<10 (12/13/2011)	(10 - 10)/(12 - 1)	0
ND<10 (12/4/2017)	ND<10 (12/13/2011)	(10 - 10)/(13 - 1)	0
ND<10 (6/4/2018)	ND<10 (12/13/2011)	(10 - 10)/(14 - 1)	0
ND<10 (12/11/2012)	ND<10 (6/4/2012)	(10 - 10)/(3 - 2)	0
ND<10 (6/3/2013)	ND<10 (6/4/2012)	(10 - 10)/(4 - 2)	0
ND<10 (12/3/2013)	ND<10 (6/4/2012)	(10 - 10)/(5 - 2)	0
ND<10 (6/2/2014)	ND<10 (6/4/2012)	(10 - 10)/(6 - 2)	0
ND<10 (12/2/2014)	ND<10 (6/4/2012)	(10 - 10)/(7 - 2)	0
ND<10 (6/1/2015)	ND<10 (6/4/2012)	(10 - 10)/(8 - 2)	0
ND<10 (12/7/2015)	ND<10 (6/4/2012)	(10 - 10)/(9 - 2)	0
ND<10 (6/6/2016)	ND<10 (6/4/2012)	(10 - 10)/(10 - 2)	0
ND<10 (12/5/2016)	ND<10 (6/4/2012)	(10 - 10)/(11 - 2)	0
ND<10 (6/20/2017)	ND<10 (6/4/2012)	(10 - 10)/(12 - 2)	0
ND<10 (12/4/2017)	ND<10 (6/4/2012)	(10 - 10)/(13 - 2)	0
ND<10 (6/4/2018)	ND<10 (6/4/2012)	(10 - 10)/(14 - 2)	0
ND<10 (6/3/2013)	ND<10 (12/11/2012)	(10 - 10)/(4 - 3)	0
ND<10 (12/3/2013)	ND<10 (12/11/2012)	(10 - 10)/(5 - 3)	0
ND<10 (6/2/2014)	ND<10 (12/11/2012)	(10 - 10)/(6 - 3)	0
ND<10 (12/2/2014)	ND<10 (12/11/2012)	(10 - 10)/(7 - 3)	0
ND<10 (6/1/2015)	ND<10 (12/11/2012)	(10 - 10)/(8 - 3)	0
ND<10 (12/7/2015)	ND<10 (12/11/2012)	(10 - 10)/(9 - 3)	0
ND<10 (6/6/2016)	ND<10 (12/11/2012)	(10 - 10)/(10 - 3)	0
ND<10 (12/5/2016)	ND<10 (12/11/2012)	(10 - 10)/(11 - 3)	0
ND<10 (6/20/2017)	ND<10 (12/11/2012)	(10 - 10)/(12 - 3)	0
ND<10 (12/4/2017)	ND<10 (12/11/2012)	(10 - 10)/(13 - 3)	0
ND<10 (6/4/2018)	ND<10 (12/11/2012)	(10 - 10)/(14 - 3)	0
ND<10 (12/3/2013)	ND<10 (6/3/2013)	(10 - 10)/(5 - 4)	0
ND<10 (6/2/2014)	ND<10 (6/3/2013)	(10 - 10)/(6 - 4)	0
ND<10 (12/2/2014)	ND<10 (6/3/2013)	(10 - 10)/(7 - 4)	0
ND<10 (6/1/2015)	ND<10 (6/3/2013)	(10 - 10)/(8 - 4)	0
ND<10 (12/7/2015)	ND<10 (6/3/2013)	(10 - 10)/(9 - 4)	0
ND<10 (6/6/2016)	ND<10 (6/3/2013)	(10 - 10)/(10 - 4)	0
ND<10 (12/5/2016)	ND<10 (6/3/2013)	(10 - 10)/(11 - 4)	0
ND<10 (6/20/2017)	ND<10 (6/3/2013)	(10 - 10)/(12 - 4)	0
ND<10 (12/4/2017)	ND<10 (6/3/2013)	(10 - 10)/(13 - 4)	0
ND<10 (6/4/2018)	ND<10 (6/3/2013)	(10 - 10)/(14 - 4)	0
ND<10 (6/2/2014)	ND<10 (12/3/2013)	(10 - 10)/(6 - 5)	0
ND<10 (12/2/2014)	ND<10 (12/3/2013)	(10 - 10)/(7 - 5)	0

ND<10 (6/1/2015)	ND<10 (12/3/2013)	(10 - 10)/(8 - 5)	0
ND<10 (12/7/2015)	ND<10 (12/3/2013)	(10 - 10)/(9 - 5)	0
ND<10 (6/6/2016)	ND<10 (12/3/2013)	(10 - 10)/(10 - 5)	0
ND<10 (12/5/2016)	ND<10 (12/3/2013)	(10 - 10)/(11 - 5)	0
ND<10 (6/20/2017)	ND<10 (12/3/2013)	(10 - 10)/(12 - 5)	0
ND<10 (12/4/2017)	ND<10 (12/3/2013)	(10 - 10)/(13 - 5)	0
ND<10 (6/4/2018)	ND<10 (12/3/2013)	(10 - 10)/(14 - 5)	0
ND<10 (12/2/2014)	ND<10 (6/2/2014)	(10 - 10)/(7 - 6)	0
ND<10 (6/1/2015)	ND<10 (6/2/2014)	(10 - 10)/(8 - 6)	0
ND<10 (12/7/2015)	ND<10 (6/2/2014)	(10 - 10)/(9 - 6)	0
ND<10 (6/6/2016)	ND<10 (6/2/2014)	(10 - 10)/(10 - 6)	0
ND<10 (12/5/2016)	ND<10 (6/2/2014)	(10 - 10)/(11 - 6)	0
ND<10 (6/20/2017)	ND<10 (6/2/2014)	(10 - 10)/(12 - 6)	0
ND<10 (12/4/2017)	ND<10 (6/2/2014)	(10 - 10)/(13 - 6)	0
ND<10 (6/4/2018)	ND<10 (6/2/2014)	(10 - 10)/(14 - 6)	0
ND<10 (6/1/2015)	ND<10 (12/2/2014)	(10 - 10)/(8 - 7)	0
ND<10 (12/7/2015)	ND<10 (12/2/2014)	(10 - 10)/(9 - 7)	0
ND<10 (6/6/2016)	ND<10 (12/2/2014)	(10 - 10)/(10 - 7)	0
ND<10 (12/5/2016)	ND<10 (12/2/2014)	(10 - 10)/(11 - 7)	0
ND<10 (6/20/2017)	ND<10 (12/2/2014)	(10 - 10)/(12 - 7)	0
ND<10 (12/4/2017)	ND<10 (12/2/2014)	(10 - 10)/(13 - 7)	0
ND<10 (6/4/2018)	ND<10 (12/2/2014)	(10 - 10)/(14 - 7)	0
ND<10 (12/7/2015)	ND<10 (6/1/2015)	(10 - 10)/(9 - 8)	0
ND<10 (6/6/2016)	ND<10 (6/1/2015)	(10 - 10)/(10 - 8)	0
ND<10 (12/5/2016)	ND<10 (6/1/2015)	(10 - 10)/(11 - 8)	0
ND<10 (6/20/2017)	ND<10 (6/1/2015)	(10 - 10)/(12 - 8)	0
ND<10 (12/4/2017)	ND<10 (6/1/2015)	(10 - 10)/(13 - 8)	0
ND<10 (6/4/2018)	ND<10 (6/1/2015)	(10 - 10)/(14 - 8)	0
ND<10 (6/6/2016)	ND<10 (12/7/2015)	(10 - 10)/(10 - 9)	0
ND<10 (12/5/2016)	ND<10 (12/7/2015)	(10 - 10)/(11 - 9)	0
ND<10 (6/20/2017)	ND<10 (12/7/2015)	(10 - 10)/(12 - 9)	0
ND<10 (12/4/2017)	ND<10 (12/7/2015)	(10 - 10)/(13 - 9)	0
ND<10 (6/4/2018)	ND<10 (12/7/2015)	(10 - 10)/(14 - 9)	0
ND<10 (12/5/2016)	ND<10 (6/6/2016)	(10 - 10)/(11 - 10)	0
ND<10 (6/20/2017)	ND<10 (6/6/2016)	(10 - 10)/(12 - 10)	0
ND<10 (12/4/2017)	ND<10 (6/6/2016)	(10 - 10)/(13 - 10)	0
ND<10 (6/4/2018)	ND<10 (6/6/2016)	(10 - 10)/(14 - 10)	0
ND<10 (6/20/2017)	ND<10 (12/5/2016)	(10 - 10)/(12 - 11)	0
ND<10 (12/4/2017)	ND<10 (12/5/2016)	(10 - 10)/(13 - 11)	0
ND<10 (6/4/2018)	ND<10 (12/5/2016)	(10 - 10)/(14 - 11)	0
ND<10 (12/4/2017)	ND<10 (6/20/2017)	(10 - 10)/(13 - 12)	0
ND<10 (6/4/2018)	ND<10 (6/20/2017)	(10 - 10)/(14 - 12)	0
ND<10 (6/4/2018)	ND<10 (12/4/2017)	(10 - 10)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	10	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis
Parameter: Copper, total
Location: MW-3
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<10 (6/4/2012)	ND<10 (12/13/2011)	(10 - 10)/(2 - 1)	0
ND<10 (12/11/2012)	ND<10 (12/13/2011)	(10 - 10)/(3 - 1)	0
ND<10 (6/3/2013)	ND<10 (12/13/2011)	(10 - 10)/(4 - 1)	0
ND<10 (12/3/2013)	ND<10 (12/13/2011)	(10 - 10)/(5 - 1)	0
ND<10 (6/2/2014)	ND<10 (12/13/2011)	(10 - 10)/(6 - 1)	0
ND<10 (12/2/2014)	ND<10 (12/13/2011)	(10 - 10)/(7 - 1)	0
ND<10 (6/1/2015)	ND<10 (12/13/2011)	(10 - 10)/(8 - 1)	0
ND<10 (12/7/2015)	ND<10 (12/13/2011)	(10 - 10)/(9 - 1)	0
ND<10 (6/6/2016)	ND<10 (12/13/2011)	(10 - 10)/(10 - 1)	0
ND<10 (12/5/2016)	ND<10 (12/13/2011)	(10 - 10)/(11 - 1)	0
ND<10 (6/20/2017)	ND<10 (12/13/2011)	(10 - 10)/(12 - 1)	0
ND<10 (12/4/2017)	ND<10 (12/13/2011)	(10 - 10)/(13 - 1)	0
ND<10 (6/4/2018)	ND<10 (12/13/2011)	(10 - 10)/(14 - 1)	0
ND<10 (12/11/2012)	ND<10 (6/4/2012)	(10 - 10)/(3 - 2)	0
ND<10 (6/3/2013)	ND<10 (6/4/2012)	(10 - 10)/(4 - 2)	0
ND<10 (12/3/2013)	ND<10 (6/4/2012)	(10 - 10)/(5 - 2)	0
ND<10 (6/2/2014)	ND<10 (6/4/2012)	(10 - 10)/(6 - 2)	0
ND<10 (12/2/2014)	ND<10 (6/4/2012)	(10 - 10)/(7 - 2)	0
ND<10 (6/1/2015)	ND<10 (6/4/2012)	(10 - 10)/(8 - 2)	0
ND<10 (12/7/2015)	ND<10 (6/4/2012)	(10 - 10)/(9 - 2)	0
ND<10 (6/6/2016)	ND<10 (6/4/2012)	(10 - 10)/(10 - 2)	0
ND<10 (12/5/2016)	ND<10 (6/4/2012)	(10 - 10)/(11 - 2)	0
ND<10 (6/20/2017)	ND<10 (6/4/2012)	(10 - 10)/(12 - 2)	0
ND<10 (12/4/2017)	ND<10 (6/4/2012)	(10 - 10)/(13 - 2)	0
ND<10 (6/4/2018)	ND<10 (6/4/2012)	(10 - 10)/(14 - 2)	0
ND<10 (6/3/2013)	ND<10 (12/11/2012)	(10 - 10)/(4 - 3)	0
ND<10 (12/3/2013)	ND<10 (12/11/2012)	(10 - 10)/(5 - 3)	0
ND<10 (6/2/2014)	ND<10 (12/11/2012)	(10 - 10)/(6 - 3)	0
ND<10 (12/2/2014)	ND<10 (12/11/2012)	(10 - 10)/(7 - 3)	0
ND<10 (6/1/2015)	ND<10 (12/11/2012)	(10 - 10)/(8 - 3)	0
ND<10 (12/7/2015)	ND<10 (12/11/2012)	(10 - 10)/(9 - 3)	0
ND<10 (6/6/2016)	ND<10 (12/11/2012)	(10 - 10)/(10 - 3)	0
ND<10 (12/5/2016)	ND<10 (12/11/2012)	(10 - 10)/(11 - 3)	0
ND<10 (6/20/2017)	ND<10 (12/11/2012)	(10 - 10)/(12 - 3)	0
ND<10 (12/4/2017)	ND<10 (12/11/2012)	(10 - 10)/(13 - 3)	0
ND<10 (6/4/2018)	ND<10 (12/11/2012)	(10 - 10)/(14 - 3)	0
ND<10 (12/3/2013)	ND<10 (6/3/2013)	(10 - 10)/(5 - 4)	0
ND<10 (6/2/2014)	ND<10 (6/3/2013)	(10 - 10)/(6 - 4)	0
ND<10 (12/2/2014)	ND<10 (6/3/2013)	(10 - 10)/(7 - 4)	0
ND<10 (6/1/2015)	ND<10 (6/3/2013)	(10 - 10)/(8 - 4)	0
ND<10 (12/7/2015)	ND<10 (6/3/2013)	(10 - 10)/(9 - 4)	0
ND<10 (6/6/2016)	ND<10 (6/3/2013)	(10 - 10)/(10 - 4)	0
ND<10 (12/5/2016)	ND<10 (6/3/2013)	(10 - 10)/(11 - 4)	0
ND<10 (6/20/2017)	ND<10 (6/3/2013)	(10 - 10)/(12 - 4)	0
ND<10 (12/4/2017)	ND<10 (6/3/2013)	(10 - 10)/(13 - 4)	0
ND<10 (6/4/2018)	ND<10 (6/3/2013)	(10 - 10)/(14 - 4)	0
ND<10 (6/2/2014)	ND<10 (12/3/2013)	(10 - 10)/(6 - 5)	0
ND<10 (12/2/2014)	ND<10 (12/3/2013)	(10 - 10)/(7 - 5)	0

ND<10 (6/1/2015)	ND<10 (12/3/2013)	(10 - 10)/(8 - 5)	0
ND<10 (12/7/2015)	ND<10 (12/3/2013)	(10 - 10)/(9 - 5)	0
ND<10 (6/6/2016)	ND<10 (12/3/2013)	(10 - 10)/(10 - 5)	0
ND<10 (12/5/2016)	ND<10 (12/3/2013)	(10 - 10)/(11 - 5)	0
ND<10 (6/20/2017)	ND<10 (12/3/2013)	(10 - 10)/(12 - 5)	0
ND<10 (12/4/2017)	ND<10 (12/3/2013)	(10 - 10)/(13 - 5)	0
ND<10 (6/4/2018)	ND<10 (12/3/2013)	(10 - 10)/(14 - 5)	0
ND<10 (12/2/2014)	ND<10 (6/2/2014)	(10 - 10)/(7 - 6)	0
ND<10 (6/1/2015)	ND<10 (6/2/2014)	(10 - 10)/(8 - 6)	0
ND<10 (12/7/2015)	ND<10 (6/2/2014)	(10 - 10)/(9 - 6)	0
ND<10 (6/6/2016)	ND<10 (6/2/2014)	(10 - 10)/(10 - 6)	0
ND<10 (12/5/2016)	ND<10 (6/2/2014)	(10 - 10)/(11 - 6)	0
ND<10 (6/20/2017)	ND<10 (6/2/2014)	(10 - 10)/(12 - 6)	0
ND<10 (12/4/2017)	ND<10 (6/2/2014)	(10 - 10)/(13 - 6)	0
ND<10 (6/4/2018)	ND<10 (6/2/2014)	(10 - 10)/(14 - 6)	0
ND<10 (6/1/2015)	ND<10 (12/2/2014)	(10 - 10)/(8 - 7)	0
ND<10 (12/7/2015)	ND<10 (12/2/2014)	(10 - 10)/(9 - 7)	0
ND<10 (6/6/2016)	ND<10 (12/2/2014)	(10 - 10)/(10 - 7)	0
ND<10 (12/5/2016)	ND<10 (12/2/2014)	(10 - 10)/(11 - 7)	0
ND<10 (6/20/2017)	ND<10 (12/2/2014)	(10 - 10)/(12 - 7)	0
ND<10 (12/4/2017)	ND<10 (12/2/2014)	(10 - 10)/(13 - 7)	0
ND<10 (6/4/2018)	ND<10 (12/2/2014)	(10 - 10)/(14 - 7)	0
ND<10 (12/7/2015)	ND<10 (6/1/2015)	(10 - 10)/(9 - 8)	0
ND<10 (6/6/2016)	ND<10 (6/1/2015)	(10 - 10)/(10 - 8)	0
ND<10 (12/5/2016)	ND<10 (6/1/2015)	(10 - 10)/(11 - 8)	0
ND<10 (6/20/2017)	ND<10 (6/1/2015)	(10 - 10)/(12 - 8)	0
ND<10 (12/4/2017)	ND<10 (6/1/2015)	(10 - 10)/(13 - 8)	0
ND<10 (6/4/2018)	ND<10 (6/1/2015)	(10 - 10)/(14 - 8)	0
ND<10 (6/6/2016)	ND<10 (12/7/2015)	(10 - 10)/(10 - 9)	0
ND<10 (12/5/2016)	ND<10 (12/7/2015)	(10 - 10)/(11 - 9)	0
ND<10 (6/20/2017)	ND<10 (12/7/2015)	(10 - 10)/(12 - 9)	0
ND<10 (12/4/2017)	ND<10 (12/7/2015)	(10 - 10)/(13 - 9)	0
ND<10 (6/4/2018)	ND<10 (12/7/2015)	(10 - 10)/(14 - 9)	0
ND<10 (12/5/2016)	ND<10 (6/6/2016)	(10 - 10)/(11 - 10)	0
ND<10 (6/20/2017)	ND<10 (6/6/2016)	(10 - 10)/(12 - 10)	0
ND<10 (12/4/2017)	ND<10 (6/6/2016)	(10 - 10)/(13 - 10)	0
ND<10 (6/4/2018)	ND<10 (6/6/2016)	(10 - 10)/(14 - 10)	0
ND<10 (6/20/2017)	ND<10 (12/5/2016)	(10 - 10)/(12 - 11)	0
ND<10 (12/4/2017)	ND<10 (12/5/2016)	(10 - 10)/(13 - 11)	0
ND<10 (6/4/2018)	ND<10 (12/5/2016)	(10 - 10)/(14 - 11)	0
ND<10 (12/4/2017)	ND<10 (6/20/2017)	(10 - 10)/(13 - 12)	0
ND<10 (6/4/2018)	ND<10 (6/20/2017)	(10 - 10)/(14 - 12)	0
ND<10 (6/4/2018)	ND<10 (12/4/2017)	(10 - 10)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	10	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Sen's Slope Analysis
Parameter: Copper, total
Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<10 (6/4/2012)	ND<10 (12/13/2011)	(10 - 10)/(2 - 1)	0
ND<10 (12/11/2012)	ND<10 (12/13/2011)	(10 - 10)/(3 - 1)	0
ND<10 (6/3/2013)	ND<10 (12/13/2011)	(10 - 10)/(4 - 1)	0
ND<10 (12/3/2013)	ND<10 (12/13/2011)	(10 - 10)/(5 - 1)	0
ND<10 (6/2/2014)	ND<10 (12/13/2011)	(10 - 10)/(6 - 1)	0
ND<10 (12/2/2014)	ND<10 (12/13/2011)	(10 - 10)/(7 - 1)	0
ND<10 (6/1/2015)	ND<10 (12/13/2011)	(10 - 10)/(8 - 1)	0
ND<10 (12/7/2015)	ND<10 (12/13/2011)	(10 - 10)/(9 - 1)	0
ND<10 (6/6/2016)	ND<10 (12/13/2011)	(10 - 10)/(10 - 1)	0
ND<10 (12/5/2016)	ND<10 (12/13/2011)	(10 - 10)/(11 - 1)	0
ND<10 (6/20/2017)	ND<10 (12/13/2011)	(10 - 10)/(12 - 1)	0
ND<10 (12/4/2017)	ND<10 (12/13/2011)	(10 - 10)/(13 - 1)	0
ND<10 (6/4/2018)	ND<10 (12/13/2011)	(10 - 10)/(14 - 1)	0
ND<10 (12/11/2012)	ND<10 (6/4/2012)	(10 - 10)/(3 - 2)	0
ND<10 (6/3/2013)	ND<10 (6/4/2012)	(10 - 10)/(4 - 2)	0
ND<10 (12/3/2013)	ND<10 (6/4/2012)	(10 - 10)/(5 - 2)	0
ND<10 (6/2/2014)	ND<10 (6/4/2012)	(10 - 10)/(6 - 2)	0
ND<10 (12/2/2014)	ND<10 (6/4/2012)	(10 - 10)/(7 - 2)	0
ND<10 (6/1/2015)	ND<10 (6/4/2012)	(10 - 10)/(8 - 2)	0
ND<10 (12/7/2015)	ND<10 (6/4/2012)	(10 - 10)/(9 - 2)	0
ND<10 (6/6/2016)	ND<10 (6/4/2012)	(10 - 10)/(10 - 2)	0
ND<10 (12/5/2016)	ND<10 (6/4/2012)	(10 - 10)/(11 - 2)	0
ND<10 (6/20/2017)	ND<10 (6/4/2012)	(10 - 10)/(12 - 2)	0
ND<10 (12/4/2017)	ND<10 (6/4/2012)	(10 - 10)/(13 - 2)	0
ND<10 (6/4/2018)	ND<10 (6/4/2012)	(10 - 10)/(14 - 2)	0
ND<10 (6/3/2013)	ND<10 (12/11/2012)	(10 - 10)/(4 - 3)	0
ND<10 (12/3/2013)	ND<10 (12/11/2012)	(10 - 10)/(5 - 3)	0
ND<10 (6/2/2014)	ND<10 (12/11/2012)	(10 - 10)/(6 - 3)	0
ND<10 (12/2/2014)	ND<10 (12/11/2012)	(10 - 10)/(7 - 3)	0
ND<10 (6/1/2015)	ND<10 (12/11/2012)	(10 - 10)/(8 - 3)	0
ND<10 (12/7/2015)	ND<10 (12/11/2012)	(10 - 10)/(9 - 3)	0
ND<10 (6/6/2016)	ND<10 (12/11/2012)	(10 - 10)/(10 - 3)	0
ND<10 (12/5/2016)	ND<10 (12/11/2012)	(10 - 10)/(11 - 3)	0
ND<10 (6/20/2017)	ND<10 (12/11/2012)	(10 - 10)/(12 - 3)	0
ND<10 (12/4/2017)	ND<10 (12/11/2012)	(10 - 10)/(13 - 3)	0
ND<10 (6/4/2018)	ND<10 (12/11/2012)	(10 - 10)/(14 - 3)	0
ND<10 (12/3/2013)	ND<10 (6/3/2013)	(10 - 10)/(5 - 4)	0
ND<10 (6/2/2014)	ND<10 (6/3/2013)	(10 - 10)/(6 - 4)	0
ND<10 (12/2/2014)	ND<10 (6/3/2013)	(10 - 10)/(7 - 4)	0
ND<10 (6/1/2015)	ND<10 (6/3/2013)	(10 - 10)/(8 - 4)	0
ND<10 (12/7/2015)	ND<10 (6/3/2013)	(10 - 10)/(9 - 4)	0
ND<10 (6/6/2016)	ND<10 (6/3/2013)	(10 - 10)/(10 - 4)	0
ND<10 (12/5/2016)	ND<10 (6/3/2013)	(10 - 10)/(11 - 4)	0
ND<10 (6/20/2017)	ND<10 (6/3/2013)	(10 - 10)/(12 - 4)	0
ND<10 (12/4/2017)	ND<10 (6/3/2013)	(10 - 10)/(13 - 4)	0
ND<10 (6/4/2018)	ND<10 (6/3/2013)	(10 - 10)/(14 - 4)	0
ND<10 (6/2/2014)	ND<10 (12/3/2013)	(10 - 10)/(6 - 5)	0
ND<10 (12/2/2014)	ND<10 (12/3/2013)	(10 - 10)/(7 - 5)	0

ND<10 (6/1/2015)	ND<10 (12/3/2013)	(10 - 10)/(8 - 5)	0
ND<10 (12/7/2015)	ND<10 (12/3/2013)	(10 - 10)/(9 - 5)	0
ND<10 (6/6/2016)	ND<10 (12/3/2013)	(10 - 10)/(10 - 5)	0
ND<10 (12/5/2016)	ND<10 (12/3/2013)	(10 - 10)/(11 - 5)	0
ND<10 (6/20/2017)	ND<10 (12/3/2013)	(10 - 10)/(12 - 5)	0
ND<10 (12/4/2017)	ND<10 (12/3/2013)	(10 - 10)/(13 - 5)	0
ND<10 (6/4/2018)	ND<10 (12/3/2013)	(10 - 10)/(14 - 5)	0
ND<10 (12/2/2014)	ND<10 (6/2/2014)	(10 - 10)/(7 - 6)	0
ND<10 (6/1/2015)	ND<10 (6/2/2014)	(10 - 10)/(8 - 6)	0
ND<10 (12/7/2015)	ND<10 (6/2/2014)	(10 - 10)/(9 - 6)	0
ND<10 (6/6/2016)	ND<10 (6/2/2014)	(10 - 10)/(10 - 6)	0
ND<10 (12/5/2016)	ND<10 (6/2/2014)	(10 - 10)/(11 - 6)	0
ND<10 (6/20/2017)	ND<10 (6/2/2014)	(10 - 10)/(12 - 6)	0
ND<10 (12/4/2017)	ND<10 (6/2/2014)	(10 - 10)/(13 - 6)	0
ND<10 (6/4/2018)	ND<10 (6/2/2014)	(10 - 10)/(14 - 6)	0
ND<10 (6/1/2015)	ND<10 (12/2/2014)	(10 - 10)/(8 - 7)	0
ND<10 (12/7/2015)	ND<10 (12/2/2014)	(10 - 10)/(9 - 7)	0
ND<10 (6/6/2016)	ND<10 (12/2/2014)	(10 - 10)/(10 - 7)	0
ND<10 (12/5/2016)	ND<10 (12/2/2014)	(10 - 10)/(11 - 7)	0
ND<10 (6/20/2017)	ND<10 (12/2/2014)	(10 - 10)/(12 - 7)	0
ND<10 (12/4/2017)	ND<10 (12/2/2014)	(10 - 10)/(13 - 7)	0
ND<10 (6/4/2018)	ND<10 (12/2/2014)	(10 - 10)/(14 - 7)	0
ND<10 (12/7/2015)	ND<10 (6/1/2015)	(10 - 10)/(9 - 8)	0
ND<10 (6/6/2016)	ND<10 (6/1/2015)	(10 - 10)/(10 - 8)	0
ND<10 (12/5/2016)	ND<10 (6/1/2015)	(10 - 10)/(11 - 8)	0
ND<10 (6/20/2017)	ND<10 (6/1/2015)	(10 - 10)/(12 - 8)	0
ND<10 (12/4/2017)	ND<10 (6/1/2015)	(10 - 10)/(13 - 8)	0
ND<10 (6/4/2018)	ND<10 (6/1/2015)	(10 - 10)/(14 - 8)	0
ND<10 (6/6/2016)	ND<10 (12/7/2015)	(10 - 10)/(10 - 9)	0
ND<10 (12/5/2016)	ND<10 (12/7/2015)	(10 - 10)/(11 - 9)	0
ND<10 (6/20/2017)	ND<10 (12/7/2015)	(10 - 10)/(12 - 9)	0
ND<10 (12/4/2017)	ND<10 (12/7/2015)	(10 - 10)/(13 - 9)	0
ND<10 (6/4/2018)	ND<10 (12/7/2015)	(10 - 10)/(14 - 9)	0
ND<10 (12/5/2016)	ND<10 (6/6/2016)	(10 - 10)/(11 - 10)	0
ND<10 (6/20/2017)	ND<10 (6/6/2016)	(10 - 10)/(12 - 10)	0
ND<10 (12/4/2017)	ND<10 (6/6/2016)	(10 - 10)/(13 - 10)	0
ND<10 (6/4/2018)	ND<10 (6/6/2016)	(10 - 10)/(14 - 10)	0
ND<10 (6/20/2017)	ND<10 (12/5/2016)	(10 - 10)/(12 - 11)	0
ND<10 (12/4/2017)	ND<10 (12/5/2016)	(10 - 10)/(13 - 11)	0
ND<10 (6/4/2018)	ND<10 (12/5/2016)	(10 - 10)/(14 - 11)	0
ND<10 (12/4/2017)	ND<10 (6/20/2017)	(10 - 10)/(13 - 12)	0
ND<10 (6/4/2018)	ND<10 (6/20/2017)	(10 - 10)/(14 - 12)	0
ND<10 (6/4/2018)	ND<10 (12/4/2017)	(10 - 10)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	10	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Sen's Slope Analysis
Parameter: Lead, total
Location: MW-2R

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<1 (6/4/2012)	ND<1 (12/13/2011)	(1 - 1)/(2 - 1)	0
ND<1 0.2J (12/11/2012)	ND<1 (12/13/2011)	(1 - 1)/(3 - 1)	0
ND<1 (6/3/2013)	ND<1 (12/13/2011)	(1 - 1)/(4 - 1)	0
ND<1 (12/3/2013)	ND<1 (12/13/2011)	(1 - 1)/(5 - 1)	0
ND<1 (6/2/2014)	ND<1 (12/13/2011)	(1 - 1)/(6 - 1)	0
ND<1 (12/2/2014)	ND<1 (12/13/2011)	(1 - 1)/(7 - 1)	0
ND<1 0.5J (6/1/2015)	ND<1 (12/13/2011)	(1 - 1)/(8 - 1)	0
ND<1 (12/7/2015)	ND<1 (12/13/2011)	(1 - 1)/(9 - 1)	0
ND<1 (6/6/2016)	ND<1 (12/13/2011)	(1 - 1)/(10 - 1)	0
ND<1 (12/5/2016)	ND<1 (12/13/2011)	(1 - 1)/(11 - 1)	0
ND<1 (6/20/2017)	ND<1 (12/13/2011)	(1 - 1)/(12 - 1)	0
ND<1 (12/4/2017)	ND<1 (12/13/2011)	(1 - 1)/(13 - 1)	0
ND<1 (6/4/2018)	ND<1 (12/13/2011)	(1 - 1)/(14 - 1)	0
ND<1 0.2J (12/11/2012)	ND<1 (6/4/2012)	(1 - 1)/(3 - 2)	0
ND<1 (6/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(4 - 2)	0
ND<1 (12/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(5 - 2)	0
ND<1 (6/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(6 - 2)	0
ND<1 (12/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(7 - 2)	0
ND<1 0.5J (6/1/2015)	ND<1 (6/4/2012)	(1 - 1)/(8 - 2)	0
ND<1 (12/7/2015)	ND<1 (6/4/2012)	(1 - 1)/(9 - 2)	0
ND<1 (6/6/2016)	ND<1 (6/4/2012)	(1 - 1)/(10 - 2)	0
ND<1 (12/5/2016)	ND<1 (6/4/2012)	(1 - 1)/(11 - 2)	0
ND<1 (6/20/2017)	ND<1 (6/4/2012)	(1 - 1)/(12 - 2)	0
ND<1 (12/4/2017)	ND<1 (6/4/2012)	(1 - 1)/(13 - 2)	0
ND<1 (6/4/2018)	ND<1 (6/4/2012)	(1 - 1)/(14 - 2)	0
ND<1 (6/3/2013)	ND<1 0.2J (12/11/2012)	(1 - 1)/(4 - 3)	0
ND<1 (12/3/2013)	ND<1 0.2J (12/11/2012)	(1 - 1)/(5 - 3)	0
ND<1 (6/2/2014)	ND<1 0.2J (12/11/2012)	(1 - 1)/(6 - 3)	0
ND<1 (12/2/2014)	ND<1 0.2J (12/11/2012)	(1 - 1)/(7 - 3)	0
ND<1 0.5J (6/1/2015)	ND<1 0.2J (12/11/2012)	(1 - 1)/(8 - 3)	0
ND<1 (12/7/2015)	ND<1 0.2J (12/11/2012)	(1 - 1)/(9 - 3)	0
ND<1 (6/6/2016)	ND<1 0.2J (12/11/2012)	(1 - 1)/(10 - 3)	0
ND<1 (12/5/2016)	ND<1 0.2J (12/11/2012)	(1 - 1)/(11 - 3)	0
ND<1 (6/20/2017)	ND<1 0.2J (12/11/2012)	(1 - 1)/(12 - 3)	0
ND<1 (12/4/2017)	ND<1 0.2J (12/11/2012)	(1 - 1)/(13 - 3)	0
ND<1 (6/4/2018)	ND<1 0.2J (12/11/2012)	(1 - 1)/(14 - 3)	0
ND<1 (12/3/2013)	ND<1 (6/3/2013)	(1 - 1)/(5 - 4)	0
ND<1 (6/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(6 - 4)	0
ND<1 (12/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(7 - 4)	0
ND<1 0.5J (6/1/2015)	ND<1 (6/3/2013)	(1 - 1)/(8 - 4)	0
ND<1 (12/7/2015)	ND<1 (6/3/2013)	(1 - 1)/(9 - 4)	0
ND<1 (6/6/2016)	ND<1 (6/3/2013)	(1 - 1)/(10 - 4)	0
ND<1 (12/5/2016)	ND<1 (6/3/2013)	(1 - 1)/(11 - 4)	0
ND<1 (6/20/2017)	ND<1 (6/3/2013)	(1 - 1)/(12 - 4)	0
ND<1 (12/4/2017)	ND<1 (6/3/2013)	(1 - 1)/(13 - 4)	0
ND<1 (6/4/2018)	ND<1 (6/3/2013)	(1 - 1)/(14 - 4)	0
ND<1 (6/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(6 - 5)	0
ND<1 (12/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(7 - 5)	0

ND<1 0.5J (6/1/2015)	ND<1 (12/3/2013)	(1 - 1)/(8 - 5)	0
ND<1 (12/7/2015)	ND<1 (12/3/2013)	(1 - 1)/(9 - 5)	0
ND<1 (6/6/2016)	ND<1 (12/3/2013)	(1 - 1)/(10 - 5)	0
ND<1 (12/5/2016)	ND<1 (12/3/2013)	(1 - 1)/(11 - 5)	0
ND<1 (6/20/2017)	ND<1 (12/3/2013)	(1 - 1)/(12 - 5)	0
ND<1 (12/4/2017)	ND<1 (12/3/2013)	(1 - 1)/(13 - 5)	0
ND<1 (6/4/2018)	ND<1 (12/3/2013)	(1 - 1)/(14 - 5)	0
ND<1 (12/2/2014)	ND<1 (6/2/2014)	(1 - 1)/(7 - 6)	0
ND<1 0.5J (6/1/2015)	ND<1 (6/2/2014)	(1 - 1)/(8 - 6)	0
ND<1 (12/7/2015)	ND<1 (6/2/2014)	(1 - 1)/(9 - 6)	0
ND<1 (6/6/2016)	ND<1 (6/2/2014)	(1 - 1)/(10 - 6)	0
ND<1 (12/5/2016)	ND<1 (6/2/2014)	(1 - 1)/(11 - 6)	0
ND<1 (6/20/2017)	ND<1 (6/2/2014)	(1 - 1)/(12 - 6)	0
ND<1 (12/4/2017)	ND<1 (6/2/2014)	(1 - 1)/(13 - 6)	0
ND<1 (6/4/2018)	ND<1 (6/2/2014)	(1 - 1)/(14 - 6)	0
ND<1 0.5J (6/1/2015)	ND<1 (12/2/2014)	(1 - 1)/(8 - 7)	0
ND<1 (12/7/2015)	ND<1 (12/2/2014)	(1 - 1)/(9 - 7)	0
ND<1 (6/6/2016)	ND<1 (12/2/2014)	(1 - 1)/(10 - 7)	0
ND<1 (12/5/2016)	ND<1 (12/2/2014)	(1 - 1)/(11 - 7)	0
ND<1 (6/20/2017)	ND<1 (12/2/2014)	(1 - 1)/(12 - 7)	0
ND<1 (12/4/2017)	ND<1 (12/2/2014)	(1 - 1)/(13 - 7)	0
ND<1 (6/4/2018)	ND<1 (12/2/2014)	(1 - 1)/(14 - 7)	0
ND<1 (12/7/2015)	ND<1 0.5J (6/1/2015)	(1 - 1)/(9 - 8)	0
ND<1 (6/6/2016)	ND<1 0.5J (6/1/2015)	(1 - 1)/(10 - 8)	0
ND<1 (12/5/2016)	ND<1 0.5J (6/1/2015)	(1 - 1)/(11 - 8)	0
ND<1 (6/20/2017)	ND<1 0.5J (6/1/2015)	(1 - 1)/(12 - 8)	0
ND<1 (12/4/2017)	ND<1 0.5J (6/1/2015)	(1 - 1)/(13 - 8)	0
ND<1 (6/4/2018)	ND<1 0.5J (6/1/2015)	(1 - 1)/(14 - 8)	0
ND<1 (6/6/2016)	ND<1 (12/7/2015)	(1 - 1)/(10 - 9)	0
ND<1 (12/5/2016)	ND<1 (12/7/2015)	(1 - 1)/(11 - 9)	0
ND<1 (6/20/2017)	ND<1 (12/7/2015)	(1 - 1)/(12 - 9)	0
ND<1 (12/4/2017)	ND<1 (12/7/2015)	(1 - 1)/(13 - 9)	0
ND<1 (6/4/2018)	ND<1 (12/7/2015)	(1 - 1)/(14 - 9)	0
ND<1 (12/5/2016)	ND<1 (6/6/2016)	(1 - 1)/(11 - 10)	0
ND<1 (6/20/2017)	ND<1 (6/6/2016)	(1 - 1)/(12 - 10)	0
ND<1 (12/4/2017)	ND<1 (6/6/2016)	(1 - 1)/(13 - 10)	0
ND<1 (6/4/2018)	ND<1 (6/6/2016)	(1 - 1)/(14 - 10)	0
ND<1 (6/20/2017)	ND<1 (12/5/2016)	(1 - 1)/(12 - 11)	0
ND<1 (12/4/2017)	ND<1 (12/5/2016)	(1 - 1)/(13 - 11)	0
ND<1 (6/4/2018)	ND<1 (12/5/2016)	(1 - 1)/(14 - 11)	0
ND<1 (12/4/2017)	ND<1 (6/20/2017)	(1 - 1)/(13 - 12)	0
ND<1 (6/4/2018)	ND<1 (6/20/2017)	(1 - 1)/(14 - 12)	0
ND<1 (6/4/2018)	ND<1 (12/4/2017)	(1 - 1)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	1	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Sen's Slope Analysis
Parameter: Lead, total
Location: MW-3
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<1 (6/4/2012)	ND<1 (12/13/2011)	(1 - 1)/(2 - 1)	0
ND<1 (12/11/2012)	ND<1 (12/13/2011)	(1 - 1)/(3 - 1)	0
ND<1 (6/3/2013)	ND<1 (12/13/2011)	(1 - 1)/(4 - 1)	0
ND<1 (12/3/2013)	ND<1 (12/13/2011)	(1 - 1)/(5 - 1)	0
ND<1 (6/2/2014)	ND<1 (12/13/2011)	(1 - 1)/(6 - 1)	0
ND<1 (12/2/2014)	ND<1 (12/13/2011)	(1 - 1)/(7 - 1)	0
ND<1 (6/1/2015)	ND<1 (12/13/2011)	(1 - 1)/(8 - 1)	0
ND<1 (12/7/2015)	ND<1 (12/13/2011)	(1 - 1)/(9 - 1)	0
ND<1 (6/6/2016)	ND<1 (12/13/2011)	(1 - 1)/(10 - 1)	0
ND<1 (12/5/2016)	ND<1 (12/13/2011)	(1 - 1)/(11 - 1)	0
ND<1 (6/20/2017)	ND<1 (12/13/2011)	(1 - 1)/(12 - 1)	0
ND<1 (12/4/2017)	ND<1 (12/13/2011)	(1 - 1)/(13 - 1)	0
ND<1 (6/4/2018)	ND<1 (12/13/2011)	(1 - 1)/(14 - 1)	0
ND<1 (12/11/2012)	ND<1 (6/4/2012)	(1 - 1)/(3 - 2)	0
ND<1 (6/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(4 - 2)	0
ND<1 (12/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(5 - 2)	0
ND<1 (6/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(6 - 2)	0
ND<1 (12/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(7 - 2)	0
ND<1 (6/1/2015)	ND<1 (6/4/2012)	(1 - 1)/(8 - 2)	0
ND<1 (12/7/2015)	ND<1 (6/4/2012)	(1 - 1)/(9 - 2)	0
ND<1 (6/6/2016)	ND<1 (6/4/2012)	(1 - 1)/(10 - 2)	0
ND<1 (12/5/2016)	ND<1 (6/4/2012)	(1 - 1)/(11 - 2)	0
ND<1 (6/20/2017)	ND<1 (6/4/2012)	(1 - 1)/(12 - 2)	0
ND<1 (12/4/2017)	ND<1 (6/4/2012)	(1 - 1)/(13 - 2)	0
ND<1 (6/4/2018)	ND<1 (6/4/2012)	(1 - 1)/(14 - 2)	0
ND<1 (6/3/2013)	ND<1 (12/11/2012)	(1 - 1)/(4 - 3)	0
ND<1 (12/3/2013)	ND<1 (12/11/2012)	(1 - 1)/(5 - 3)	0
ND<1 (6/2/2014)	ND<1 (12/11/2012)	(1 - 1)/(6 - 3)	0
ND<1 (12/2/2014)	ND<1 (12/11/2012)	(1 - 1)/(7 - 3)	0
ND<1 (6/1/2015)	ND<1 (12/11/2012)	(1 - 1)/(8 - 3)	0
ND<1 (12/7/2015)	ND<1 (12/11/2012)	(1 - 1)/(9 - 3)	0
ND<1 (6/6/2016)	ND<1 (12/11/2012)	(1 - 1)/(10 - 3)	0
ND<1 (12/5/2016)	ND<1 (12/11/2012)	(1 - 1)/(11 - 3)	0
ND<1 (6/20/2017)	ND<1 (12/11/2012)	(1 - 1)/(12 - 3)	0
ND<1 (12/4/2017)	ND<1 (12/11/2012)	(1 - 1)/(13 - 3)	0
ND<1 (6/4/2018)	ND<1 (12/11/2012)	(1 - 1)/(14 - 3)	0
ND<1 (12/3/2013)	ND<1 (6/3/2013)	(1 - 1)/(5 - 4)	0
ND<1 (6/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(6 - 4)	0
ND<1 (12/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(7 - 4)	0
ND<1 (6/1/2015)	ND<1 (6/3/2013)	(1 - 1)/(8 - 4)	0
ND<1 (12/7/2015)	ND<1 (6/3/2013)	(1 - 1)/(9 - 4)	0
ND<1 (6/6/2016)	ND<1 (6/3/2013)	(1 - 1)/(10 - 4)	0
ND<1 (12/5/2016)	ND<1 (6/3/2013)	(1 - 1)/(11 - 4)	0
ND<1 (6/20/2017)	ND<1 (6/3/2013)	(1 - 1)/(12 - 4)	0
ND<1 (12/4/2017)	ND<1 (6/3/2013)	(1 - 1)/(13 - 4)	0
ND<1 (6/4/2018)	ND<1 (6/3/2013)	(1 - 1)/(14 - 4)	0
ND<1 (6/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(6 - 5)	0
ND<1 (12/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(7 - 5)	0

ND<1 (6/1/2015)	ND<1 (12/3/2013)	(1 - 1)/(8 - 5)	0
ND<1 (12/7/2015)	ND<1 (12/3/2013)	(1 - 1)/(9 - 5)	0
ND<1 (6/6/2016)	ND<1 (12/3/2013)	(1 - 1)/(10 - 5)	0
ND<1 (12/5/2016)	ND<1 (12/3/2013)	(1 - 1)/(11 - 5)	0
ND<1 (6/20/2017)	ND<1 (12/3/2013)	(1 - 1)/(12 - 5)	0
ND<1 (12/4/2017)	ND<1 (12/3/2013)	(1 - 1)/(13 - 5)	0
ND<1 (6/4/2018)	ND<1 (12/3/2013)	(1 - 1)/(14 - 5)	0
ND<1 (12/2/2014)	ND<1 (6/2/2014)	(1 - 1)/(7 - 6)	0
ND<1 (6/1/2015)	ND<1 (6/2/2014)	(1 - 1)/(8 - 6)	0
ND<1 (12/7/2015)	ND<1 (6/2/2014)	(1 - 1)/(9 - 6)	0
ND<1 (6/6/2016)	ND<1 (6/2/2014)	(1 - 1)/(10 - 6)	0
ND<1 (12/5/2016)	ND<1 (6/2/2014)	(1 - 1)/(11 - 6)	0
ND<1 (6/20/2017)	ND<1 (6/2/2014)	(1 - 1)/(12 - 6)	0
ND<1 (12/4/2017)	ND<1 (6/2/2014)	(1 - 1)/(13 - 6)	0
ND<1 (6/4/2018)	ND<1 (6/2/2014)	(1 - 1)/(14 - 6)	0
ND<1 (6/1/2015)	ND<1 (12/2/2014)	(1 - 1)/(8 - 7)	0
ND<1 (12/7/2015)	ND<1 (12/2/2014)	(1 - 1)/(9 - 7)	0
ND<1 (6/6/2016)	ND<1 (12/2/2014)	(1 - 1)/(10 - 7)	0
ND<1 (12/5/2016)	ND<1 (12/2/2014)	(1 - 1)/(11 - 7)	0
ND<1 (6/20/2017)	ND<1 (12/2/2014)	(1 - 1)/(12 - 7)	0
ND<1 (12/4/2017)	ND<1 (12/2/2014)	(1 - 1)/(13 - 7)	0
ND<1 (6/4/2018)	ND<1 (12/2/2014)	(1 - 1)/(14 - 7)	0
ND<1 (12/7/2015)	ND<1 (6/1/2015)	(1 - 1)/(9 - 8)	0
ND<1 (6/6/2016)	ND<1 (6/1/2015)	(1 - 1)/(10 - 8)	0
ND<1 (12/5/2016)	ND<1 (6/1/2015)	(1 - 1)/(11 - 8)	0
ND<1 (6/20/2017)	ND<1 (6/1/2015)	(1 - 1)/(12 - 8)	0
ND<1 (12/4/2017)	ND<1 (6/1/2015)	(1 - 1)/(13 - 8)	0
ND<1 (6/4/2018)	ND<1 (6/1/2015)	(1 - 1)/(14 - 8)	0
ND<1 (6/6/2016)	ND<1 (12/7/2015)	(1 - 1)/(10 - 9)	0
ND<1 (12/5/2016)	ND<1 (12/7/2015)	(1 - 1)/(11 - 9)	0
ND<1 (6/20/2017)	ND<1 (12/7/2015)	(1 - 1)/(12 - 9)	0
ND<1 (12/4/2017)	ND<1 (12/7/2015)	(1 - 1)/(13 - 9)	0
ND<1 (6/4/2018)	ND<1 (12/7/2015)	(1 - 1)/(14 - 9)	0
ND<1 (12/5/2016)	ND<1 (6/6/2016)	(1 - 1)/(11 - 10)	0
ND<1 (6/20/2017)	ND<1 (6/6/2016)	(1 - 1)/(12 - 10)	0
ND<1 (12/4/2017)	ND<1 (6/6/2016)	(1 - 1)/(13 - 10)	0
ND<1 (6/4/2018)	ND<1 (6/6/2016)	(1 - 1)/(14 - 10)	0
ND<1 (6/20/2017)	ND<1 (12/5/2016)	(1 - 1)/(12 - 11)	0
ND<1 (12/4/2017)	ND<1 (12/5/2016)	(1 - 1)/(13 - 11)	0
ND<1 (6/4/2018)	ND<1 (12/5/2016)	(1 - 1)/(14 - 11)	0
ND<1 (12/4/2017)	ND<1 (6/20/2017)	(1 - 1)/(13 - 12)	0
ND<1 (6/4/2018)	ND<1 (6/20/2017)	(1 - 1)/(14 - 12)	0
ND<1 (6/4/2018)	ND<1 (12/4/2017)	(1 - 1)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	1	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Sen's Slope Analysis
Parameter: Lead, total
Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<1 0.3J (6/4/2012)	ND<1 (12/13/2011)	(1 - 1)/(2 - 1)	0
ND<1 0.3J (12/11/2012)	ND<1 (12/13/2011)	(1 - 1)/(3 - 1)	0
ND<1 (6/3/2013)	ND<1 (12/13/2011)	(1 - 1)/(4 - 1)	0
ND<1 (12/3/2013)	ND<1 (12/13/2011)	(1 - 1)/(5 - 1)	0
ND<1 (6/2/2014)	ND<1 (12/13/2011)	(1 - 1)/(6 - 1)	0
ND<1 (12/2/2014)	ND<1 (12/13/2011)	(1 - 1)/(7 - 1)	0
ND<1 (6/1/2015)	ND<1 (12/13/2011)	(1 - 1)/(8 - 1)	0
ND<1 (12/7/2015)	ND<1 (12/13/2011)	(1 - 1)/(9 - 1)	0
ND<1 (6/6/2016)	ND<1 (12/13/2011)	(1 - 1)/(10 - 1)	0
ND<1 (12/5/2016)	ND<1 (12/13/2011)	(1 - 1)/(11 - 1)	0
ND<1 (6/20/2017)	ND<1 (12/13/2011)	(1 - 1)/(12 - 1)	0
ND<1 (12/4/2017)	ND<1 (12/13/2011)	(1 - 1)/(13 - 1)	0
ND<1 (6/4/2018)	ND<1 (12/13/2011)	(1 - 1)/(14 - 1)	0
ND<1 0.3J (12/11/2012)	ND<1 0.3J (6/4/2012)	(1 - 1)/(3 - 2)	0
ND<1 (6/3/2013)	ND<1 0.3J (6/4/2012)	(1 - 1)/(4 - 2)	0
ND<1 (12/3/2013)	ND<1 0.3J (6/4/2012)	(1 - 1)/(5 - 2)	0
ND<1 (6/2/2014)	ND<1 0.3J (6/4/2012)	(1 - 1)/(6 - 2)	0
ND<1 (12/2/2014)	ND<1 0.3J (6/4/2012)	(1 - 1)/(7 - 2)	0
ND<1 (6/1/2015)	ND<1 0.3J (6/4/2012)	(1 - 1)/(8 - 2)	0
ND<1 (12/7/2015)	ND<1 0.3J (6/4/2012)	(1 - 1)/(9 - 2)	0
ND<1 (6/6/2016)	ND<1 0.3J (6/4/2012)	(1 - 1)/(10 - 2)	0
ND<1 (12/5/2016)	ND<1 0.3J (6/4/2012)	(1 - 1)/(11 - 2)	0
ND<1 (6/20/2017)	ND<1 0.3J (6/4/2012)	(1 - 1)/(12 - 2)	0
ND<1 (12/4/2017)	ND<1 0.3J (6/4/2012)	(1 - 1)/(13 - 2)	0
ND<1 (6/4/2018)	ND<1 0.3J (6/4/2012)	(1 - 1)/(14 - 2)	0
ND<1 (6/3/2013)	ND<1 0.3J (12/11/2012)	(1 - 1)/(4 - 3)	0
ND<1 (12/3/2013)	ND<1 0.3J (12/11/2012)	(1 - 1)/(5 - 3)	0
ND<1 (6/2/2014)	ND<1 0.3J (12/11/2012)	(1 - 1)/(6 - 3)	0
ND<1 (12/2/2014)	ND<1 0.3J (12/11/2012)	(1 - 1)/(7 - 3)	0
ND<1 (6/1/2015)	ND<1 0.3J (12/11/2012)	(1 - 1)/(8 - 3)	0
ND<1 (12/7/2015)	ND<1 0.3J (12/11/2012)	(1 - 1)/(9 - 3)	0
ND<1 (6/6/2016)	ND<1 0.3J (12/11/2012)	(1 - 1)/(10 - 3)	0
ND<1 (12/5/2016)	ND<1 0.3J (12/11/2012)	(1 - 1)/(11 - 3)	0
ND<1 (6/20/2017)	ND<1 0.3J (12/11/2012)	(1 - 1)/(12 - 3)	0
ND<1 (12/4/2017)	ND<1 0.3J (12/11/2012)	(1 - 1)/(13 - 3)	0
ND<1 (6/4/2018)	ND<1 0.3J (12/11/2012)	(1 - 1)/(14 - 3)	0
ND<1 (12/3/2013)	ND<1 (6/3/2013)	(1 - 1)/(5 - 4)	0
ND<1 (6/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(6 - 4)	0
ND<1 (12/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(7 - 4)	0
ND<1 (6/1/2015)	ND<1 (6/3/2013)	(1 - 1)/(8 - 4)	0
ND<1 (12/7/2015)	ND<1 (6/3/2013)	(1 - 1)/(9 - 4)	0
ND<1 (6/6/2016)	ND<1 (6/3/2013)	(1 - 1)/(10 - 4)	0
ND<1 (12/5/2016)	ND<1 (6/3/2013)	(1 - 1)/(11 - 4)	0
ND<1 (6/20/2017)	ND<1 (6/3/2013)	(1 - 1)/(12 - 4)	0
ND<1 (12/4/2017)	ND<1 (6/3/2013)	(1 - 1)/(13 - 4)	0
ND<1 (6/4/2018)	ND<1 (6/3/2013)	(1 - 1)/(14 - 4)	0
ND<1 (6/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(6 - 5)	0
ND<1 (12/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(7 - 5)	0

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ND<1 (6/1/2015)	ND<1 (12/3/2013)	(1 - 1)/(8 - 5)	0
ND<1 (12/7/2015)	ND<1 (12/3/2013)	(1 - 1)/(9 - 5)	0
ND<1 (6/6/2016)	ND<1 (12/3/2013)	(1 - 1)/(10 - 5)	0
ND<1 (12/5/2016)	ND<1 (12/3/2013)	(1 - 1)/(11 - 5)	0
ND<1 (6/20/2017)	ND<1 (12/3/2013)	(1 - 1)/(12 - 5)	0
ND<1 (12/4/2017)	ND<1 (12/3/2013)	(1 - 1)/(13 - 5)	0
ND<1 (6/4/2018)	ND<1 (12/3/2013)	(1 - 1)/(14 - 5)	0
ND<1 (12/2/2014)	ND<1 (6/2/2014)	(1 - 1)/(7 - 6)	0
ND<1 (6/1/2015)	ND<1 (6/2/2014)	(1 - 1)/(8 - 6)	0
ND<1 (12/7/2015)	ND<1 (6/2/2014)	(1 - 1)/(9 - 6)	0
ND<1 (6/6/2016)	ND<1 (6/2/2014)	(1 - 1)/(10 - 6)	0
ND<1 (12/5/2016)	ND<1 (6/2/2014)	(1 - 1)/(11 - 6)	0
ND<1 (6/20/2017)	ND<1 (6/2/2014)	(1 - 1)/(12 - 6)	0
ND<1 (12/4/2017)	ND<1 (6/2/2014)	(1 - 1)/(13 - 6)	0
ND<1 (6/4/2018)	ND<1 (6/2/2014)	(1 - 1)/(14 - 6)	0
ND<1 (6/1/2015)	ND<1 (12/2/2014)	(1 - 1)/(8 - 7)	0
ND<1 (12/7/2015)	ND<1 (12/2/2014)	(1 - 1)/(9 - 7)	0
ND<1 (6/6/2016)	ND<1 (12/2/2014)	(1 - 1)/(10 - 7)	0
ND<1 (12/5/2016)	ND<1 (12/2/2014)	(1 - 1)/(11 - 7)	0
ND<1 (6/20/2017)	ND<1 (12/2/2014)	(1 - 1)/(12 - 7)	0
ND<1 (12/4/2017)	ND<1 (12/2/2014)	(1 - 1)/(13 - 7)	0
ND<1 (6/4/2018)	ND<1 (12/2/2014)	(1 - 1)/(14 - 7)	0
ND<1 (12/7/2015)	ND<1 (6/1/2015)	(1 - 1)/(9 - 8)	0
ND<1 (6/6/2016)	ND<1 (6/1/2015)	(1 - 1)/(10 - 8)	0
ND<1 (12/5/2016)	ND<1 (6/1/2015)	(1 - 1)/(11 - 8)	0
ND<1 (6/20/2017)	ND<1 (6/1/2015)	(1 - 1)/(12 - 8)	0
ND<1 (12/4/2017)	ND<1 (6/1/2015)	(1 - 1)/(13 - 8)	0
ND<1 (6/4/2018)	ND<1 (6/1/2015)	(1 - 1)/(14 - 8)	0
ND<1 (6/6/2016)	ND<1 (12/7/2015)	(1 - 1)/(10 - 9)	0
ND<1 (12/5/2016)	ND<1 (12/7/2015)	(1 - 1)/(11 - 9)	0
ND<1 (6/20/2017)	ND<1 (12/7/2015)	(1 - 1)/(12 - 9)	0
ND<1 (12/4/2017)	ND<1 (12/7/2015)	(1 - 1)/(13 - 9)	0
ND<1 (6/4/2018)	ND<1 (12/7/2015)	(1 - 1)/(14 - 9)	0
ND<1 (12/5/2016)	ND<1 (6/6/2016)	(1 - 1)/(11 - 10)	0
ND<1 (6/20/2017)	ND<1 (6/6/2016)	(1 - 1)/(12 - 10)	0
ND<1 (12/4/2017)	ND<1 (6/6/2016)	(1 - 1)/(13 - 10)	0
ND<1 (6/4/2018)	ND<1 (6/6/2016)	(1 - 1)/(14 - 10)	0
ND<1 (6/20/2017)	ND<1 (12/5/2016)	(1 - 1)/(12 - 11)	0
ND<1 (12/4/2017)	ND<1 (12/5/2016)	(1 - 1)/(13 - 11)	0
ND<1 (6/4/2018)	ND<1 (12/5/2016)	(1 - 1)/(14 - 11)	0
ND<1 (12/4/2017)	ND<1 (6/20/2017)	(1 - 1)/(13 - 12)	0
ND<1 (6/4/2018)	ND<1 (6/20/2017)	(1 - 1)/(14 - 12)	0
ND<1 (6/4/2018)	ND<1 (12/4/2017)	(1 - 1)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

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8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	1	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Sen's Slope Analysis

Parameter: Nickel, total

Location: MW-2R

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<10 (6/4/2012)	ND<10 (12/13/2011)	(10 - 10)/(2 - 1)	0
ND<10 (12/11/2012)	ND<10 (12/13/2011)	(10 - 10)/(3 - 1)	0
ND<10 (6/3/2013)	ND<10 (12/13/2011)	(10 - 10)/(4 - 1)	0
ND<10 (12/3/2013)	ND<10 (12/13/2011)	(10 - 10)/(5 - 1)	0
ND<10 (6/2/2014)	ND<10 (12/13/2011)	(10 - 10)/(6 - 1)	0
ND<10 (12/2/2014)	ND<10 (12/13/2011)	(10 - 10)/(7 - 1)	0
ND<10 (6/1/2015)	ND<10 (12/13/2011)	(10 - 10)/(8 - 1)	0
ND<10 (12/7/2015)	ND<10 (12/13/2011)	(10 - 10)/(9 - 1)	0
ND<10 (6/6/2016)	ND<10 (12/13/2011)	(10 - 10)/(10 - 1)	0
ND<10 (12/5/2016)	ND<10 (12/13/2011)	(10 - 10)/(11 - 1)	0
ND<10 (6/20/2017)	ND<10 (12/13/2011)	(10 - 10)/(12 - 1)	0
ND<10 (12/4/2017)	ND<10 (12/13/2011)	(10 - 10)/(13 - 1)	0
ND<10 (6/4/2018)	ND<10 (12/13/2011)	(10 - 10)/(14 - 1)	0
ND<10 (12/11/2012)	ND<10 (6/4/2012)	(10 - 10)/(3 - 2)	0
ND<10 (6/3/2013)	ND<10 (6/4/2012)	(10 - 10)/(4 - 2)	0
ND<10 (12/3/2013)	ND<10 (6/4/2012)	(10 - 10)/(5 - 2)	0
ND<10 (6/2/2014)	ND<10 (6/4/2012)	(10 - 10)/(6 - 2)	0
ND<10 (12/2/2014)	ND<10 (6/4/2012)	(10 - 10)/(7 - 2)	0
ND<10 (6/1/2015)	ND<10 (6/4/2012)	(10 - 10)/(8 - 2)	0
ND<10 (12/7/2015)	ND<10 (6/4/2012)	(10 - 10)/(9 - 2)	0
ND<10 (6/6/2016)	ND<10 (6/4/2012)	(10 - 10)/(10 - 2)	0
ND<10 (12/5/2016)	ND<10 (6/4/2012)	(10 - 10)/(11 - 2)	0
ND<10 (6/20/2017)	ND<10 (6/4/2012)	(10 - 10)/(12 - 2)	0
ND<10 (12/4/2017)	ND<10 (6/4/2012)	(10 - 10)/(13 - 2)	0
ND<10 (6/4/2018)	ND<10 (6/4/2012)	(10 - 10)/(14 - 2)	0
ND<10 (6/3/2013)	ND<10 (12/11/2012)	(10 - 10)/(4 - 3)	0
ND<10 (12/3/2013)	ND<10 (12/11/2012)	(10 - 10)/(5 - 3)	0
ND<10 (6/2/2014)	ND<10 (12/11/2012)	(10 - 10)/(6 - 3)	0
ND<10 (12/2/2014)	ND<10 (12/11/2012)	(10 - 10)/(7 - 3)	0
ND<10 (6/1/2015)	ND<10 (12/11/2012)	(10 - 10)/(8 - 3)	0
ND<10 (12/7/2015)	ND<10 (12/11/2012)	(10 - 10)/(9 - 3)	0
ND<10 (6/6/2016)	ND<10 (12/11/2012)	(10 - 10)/(10 - 3)	0
ND<10 (12/5/2016)	ND<10 (12/11/2012)	(10 - 10)/(11 - 3)	0
ND<10 (6/20/2017)	ND<10 (12/11/2012)	(10 - 10)/(12 - 3)	0
ND<10 (12/4/2017)	ND<10 (12/11/2012)	(10 - 10)/(13 - 3)	0
ND<10 (6/4/2018)	ND<10 (12/11/2012)	(10 - 10)/(14 - 3)	0
ND<10 (12/3/2013)	ND<10 (6/3/2013)	(10 - 10)/(5 - 4)	0
ND<10 (6/2/2014)	ND<10 (6/3/2013)	(10 - 10)/(6 - 4)	0
ND<10 (12/2/2014)	ND<10 (6/3/2013)	(10 - 10)/(7 - 4)	0
ND<10 (6/1/2015)	ND<10 (6/3/2013)	(10 - 10)/(8 - 4)	0
ND<10 (12/7/2015)	ND<10 (6/3/2013)	(10 - 10)/(9 - 4)	0
ND<10 (6/6/2016)	ND<10 (6/3/2013)	(10 - 10)/(10 - 4)	0
ND<10 (12/5/2016)	ND<10 (6/3/2013)	(10 - 10)/(11 - 4)	0
ND<10 (6/20/2017)	ND<10 (6/3/2013)	(10 - 10)/(12 - 4)	0
ND<10 (12/4/2017)	ND<10 (6/3/2013)	(10 - 10)/(13 - 4)	0
ND<10 (6/4/2018)	ND<10 (6/3/2013)	(10 - 10)/(14 - 4)	0
ND<10 (6/2/2014)	ND<10 (12/3/2013)	(10 - 10)/(6 - 5)	0
ND<10 (12/2/2014)	ND<10 (12/3/2013)	(10 - 10)/(7 - 5)	0

ND<10 (6/1/2015)	ND<10 (12/3/2013)	(10 - 10)/(8 - 5)	0
ND<10 (12/7/2015)	ND<10 (12/3/2013)	(10 - 10)/(9 - 5)	0
ND<10 (6/6/2016)	ND<10 (12/3/2013)	(10 - 10)/(10 - 5)	0
ND<10 (12/5/2016)	ND<10 (12/3/2013)	(10 - 10)/(11 - 5)	0
ND<10 (6/20/2017)	ND<10 (12/3/2013)	(10 - 10)/(12 - 5)	0
ND<10 (12/4/2017)	ND<10 (12/3/2013)	(10 - 10)/(13 - 5)	0
ND<10 (6/4/2018)	ND<10 (12/3/2013)	(10 - 10)/(14 - 5)	0
ND<10 (12/2/2014)	ND<10 (6/2/2014)	(10 - 10)/(7 - 6)	0
ND<10 (6/1/2015)	ND<10 (6/2/2014)	(10 - 10)/(8 - 6)	0
ND<10 (12/7/2015)	ND<10 (6/2/2014)	(10 - 10)/(9 - 6)	0
ND<10 (6/6/2016)	ND<10 (6/2/2014)	(10 - 10)/(10 - 6)	0
ND<10 (12/5/2016)	ND<10 (6/2/2014)	(10 - 10)/(11 - 6)	0
ND<10 (6/20/2017)	ND<10 (6/2/2014)	(10 - 10)/(12 - 6)	0
ND<10 (12/4/2017)	ND<10 (6/2/2014)	(10 - 10)/(13 - 6)	0
ND<10 (6/4/2018)	ND<10 (6/2/2014)	(10 - 10)/(14 - 6)	0
ND<10 (6/1/2015)	ND<10 (12/2/2014)	(10 - 10)/(8 - 7)	0
ND<10 (12/7/2015)	ND<10 (12/2/2014)	(10 - 10)/(9 - 7)	0
ND<10 (6/6/2016)	ND<10 (12/2/2014)	(10 - 10)/(10 - 7)	0
ND<10 (12/5/2016)	ND<10 (12/2/2014)	(10 - 10)/(11 - 7)	0
ND<10 (6/20/2017)	ND<10 (12/2/2014)	(10 - 10)/(12 - 7)	0
ND<10 (12/4/2017)	ND<10 (12/2/2014)	(10 - 10)/(13 - 7)	0
ND<10 (6/4/2018)	ND<10 (12/2/2014)	(10 - 10)/(14 - 7)	0
ND<10 (12/7/2015)	ND<10 (6/1/2015)	(10 - 10)/(9 - 8)	0
ND<10 (6/6/2016)	ND<10 (6/1/2015)	(10 - 10)/(10 - 8)	0
ND<10 (12/5/2016)	ND<10 (6/1/2015)	(10 - 10)/(11 - 8)	0
ND<10 (6/20/2017)	ND<10 (6/1/2015)	(10 - 10)/(12 - 8)	0
ND<10 (12/4/2017)	ND<10 (6/1/2015)	(10 - 10)/(13 - 8)	0
ND<10 (6/4/2018)	ND<10 (6/1/2015)	(10 - 10)/(14 - 8)	0
ND<10 (6/6/2016)	ND<10 (12/7/2015)	(10 - 10)/(10 - 9)	0
ND<10 (12/5/2016)	ND<10 (12/7/2015)	(10 - 10)/(11 - 9)	0
ND<10 (6/20/2017)	ND<10 (12/7/2015)	(10 - 10)/(12 - 9)	0
ND<10 (12/4/2017)	ND<10 (12/7/2015)	(10 - 10)/(13 - 9)	0
ND<10 (6/4/2018)	ND<10 (12/7/2015)	(10 - 10)/(14 - 9)	0
ND<10 (12/5/2016)	ND<10 (6/6/2016)	(10 - 10)/(11 - 10)	0
ND<10 (6/20/2017)	ND<10 (6/6/2016)	(10 - 10)/(12 - 10)	0
ND<10 (12/4/2017)	ND<10 (6/6/2016)	(10 - 10)/(13 - 10)	0
ND<10 (6/4/2018)	ND<10 (6/6/2016)	(10 - 10)/(14 - 10)	0
ND<10 (6/20/2017)	ND<10 (12/5/2016)	(10 - 10)/(12 - 11)	0
ND<10 (12/4/2017)	ND<10 (12/5/2016)	(10 - 10)/(13 - 11)	0
ND<10 (6/4/2018)	ND<10 (12/5/2016)	(10 - 10)/(14 - 11)	0
ND<10 (12/4/2017)	ND<10 (6/20/2017)	(10 - 10)/(13 - 12)	0
ND<10 (6/4/2018)	ND<10 (6/20/2017)	(10 - 10)/(14 - 12)	0
ND<10 (6/4/2018)	ND<10 (12/4/2017)	(10 - 10)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

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8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	10	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

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Sen's Slope Analysis

Parameter: Nickel, total

Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<10 (6/4/2012)	ND<10 (12/13/2011)	(10 - 10)/(2 - 1)	0
ND<10 (12/11/2012)	ND<10 (12/13/2011)	(10 - 10)/(3 - 1)	0
ND<10 (6/3/2013)	ND<10 (12/13/2011)	(10 - 10)/(4 - 1)	0
ND<10 (12/3/2013)	ND<10 (12/13/2011)	(10 - 10)/(5 - 1)	0
ND<10 (6/2/2014)	ND<10 (12/13/2011)	(10 - 10)/(6 - 1)	0
ND<10 (12/2/2014)	ND<10 (12/13/2011)	(10 - 10)/(7 - 1)	0
ND<10 (6/1/2015)	ND<10 (12/13/2011)	(10 - 10)/(8 - 1)	0
ND<10 (12/7/2015)	ND<10 (12/13/2011)	(10 - 10)/(9 - 1)	0
ND<10 (6/6/2016)	ND<10 (12/13/2011)	(10 - 10)/(10 - 1)	0
ND<10 (12/5/2016)	ND<10 (12/13/2011)	(10 - 10)/(11 - 1)	0
ND<10 (6/20/2017)	ND<10 (12/13/2011)	(10 - 10)/(12 - 1)	0
ND<10 (12/4/2017)	ND<10 (12/13/2011)	(10 - 10)/(13 - 1)	0
ND<10 (6/4/2018)	ND<10 (12/13/2011)	(10 - 10)/(14 - 1)	0
ND<10 (12/11/2012)	ND<10 (6/4/2012)	(10 - 10)/(3 - 2)	0
ND<10 (6/3/2013)	ND<10 (6/4/2012)	(10 - 10)/(4 - 2)	0
ND<10 (12/3/2013)	ND<10 (6/4/2012)	(10 - 10)/(5 - 2)	0
ND<10 (6/2/2014)	ND<10 (6/4/2012)	(10 - 10)/(6 - 2)	0
ND<10 (12/2/2014)	ND<10 (6/4/2012)	(10 - 10)/(7 - 2)	0
ND<10 (6/1/2015)	ND<10 (6/4/2012)	(10 - 10)/(8 - 2)	0
ND<10 (12/7/2015)	ND<10 (6/4/2012)	(10 - 10)/(9 - 2)	0
ND<10 (6/6/2016)	ND<10 (6/4/2012)	(10 - 10)/(10 - 2)	0
ND<10 (12/5/2016)	ND<10 (6/4/2012)	(10 - 10)/(11 - 2)	0
ND<10 (6/20/2017)	ND<10 (6/4/2012)	(10 - 10)/(12 - 2)	0
ND<10 (12/4/2017)	ND<10 (6/4/2012)	(10 - 10)/(13 - 2)	0
ND<10 (6/4/2018)	ND<10 (6/4/2012)	(10 - 10)/(14 - 2)	0
ND<10 (6/3/2013)	ND<10 (12/11/2012)	(10 - 10)/(4 - 3)	0
ND<10 (12/3/2013)	ND<10 (12/11/2012)	(10 - 10)/(5 - 3)	0
ND<10 (6/2/2014)	ND<10 (12/11/2012)	(10 - 10)/(6 - 3)	0
ND<10 (12/2/2014)	ND<10 (12/11/2012)	(10 - 10)/(7 - 3)	0
ND<10 (6/1/2015)	ND<10 (12/11/2012)	(10 - 10)/(8 - 3)	0
ND<10 (12/7/2015)	ND<10 (12/11/2012)	(10 - 10)/(9 - 3)	0
ND<10 (6/6/2016)	ND<10 (12/11/2012)	(10 - 10)/(10 - 3)	0
ND<10 (12/5/2016)	ND<10 (12/11/2012)	(10 - 10)/(11 - 3)	0
ND<10 (6/20/2017)	ND<10 (12/11/2012)	(10 - 10)/(12 - 3)	0
ND<10 (12/4/2017)	ND<10 (12/11/2012)	(10 - 10)/(13 - 3)	0
ND<10 (6/4/2018)	ND<10 (12/11/2012)	(10 - 10)/(14 - 3)	0
ND<10 (12/3/2013)	ND<10 (6/3/2013)	(10 - 10)/(5 - 4)	0
ND<10 (6/2/2014)	ND<10 (6/3/2013)	(10 - 10)/(6 - 4)	0
ND<10 (12/2/2014)	ND<10 (6/3/2013)	(10 - 10)/(7 - 4)	0
ND<10 (6/1/2015)	ND<10 (6/3/2013)	(10 - 10)/(8 - 4)	0
ND<10 (12/7/2015)	ND<10 (6/3/2013)	(10 - 10)/(9 - 4)	0
ND<10 (6/6/2016)	ND<10 (6/3/2013)	(10 - 10)/(10 - 4)	0
ND<10 (12/5/2016)	ND<10 (6/3/2013)	(10 - 10)/(11 - 4)	0
ND<10 (6/20/2017)	ND<10 (6/3/2013)	(10 - 10)/(12 - 4)	0
ND<10 (12/4/2017)	ND<10 (6/3/2013)	(10 - 10)/(13 - 4)	0
ND<10 (6/4/2018)	ND<10 (6/3/2013)	(10 - 10)/(14 - 4)	0
ND<10 (6/2/2014)	ND<10 (12/3/2013)	(10 - 10)/(6 - 5)	0
ND<10 (12/2/2014)	ND<10 (12/3/2013)	(10 - 10)/(7 - 5)	0

ND<10 (6/1/2015)	ND<10 (12/3/2013)	(10 - 10)/(8 - 5)	0
ND<10 (12/7/2015)	ND<10 (12/3/2013)	(10 - 10)/(9 - 5)	0
ND<10 (6/6/2016)	ND<10 (12/3/2013)	(10 - 10)/(10 - 5)	0
ND<10 (12/5/2016)	ND<10 (12/3/2013)	(10 - 10)/(11 - 5)	0
ND<10 (6/20/2017)	ND<10 (12/3/2013)	(10 - 10)/(12 - 5)	0
ND<10 (12/4/2017)	ND<10 (12/3/2013)	(10 - 10)/(13 - 5)	0
ND<10 (6/4/2018)	ND<10 (12/3/2013)	(10 - 10)/(14 - 5)	0
ND<10 (12/2/2014)	ND<10 (6/2/2014)	(10 - 10)/(7 - 6)	0
ND<10 (6/1/2015)	ND<10 (6/2/2014)	(10 - 10)/(8 - 6)	0
ND<10 (12/7/2015)	ND<10 (6/2/2014)	(10 - 10)/(9 - 6)	0
ND<10 (6/6/2016)	ND<10 (6/2/2014)	(10 - 10)/(10 - 6)	0
ND<10 (12/5/2016)	ND<10 (6/2/2014)	(10 - 10)/(11 - 6)	0
ND<10 (6/20/2017)	ND<10 (6/2/2014)	(10 - 10)/(12 - 6)	0
ND<10 (12/4/2017)	ND<10 (6/2/2014)	(10 - 10)/(13 - 6)	0
ND<10 (6/4/2018)	ND<10 (6/2/2014)	(10 - 10)/(14 - 6)	0
ND<10 (6/1/2015)	ND<10 (12/2/2014)	(10 - 10)/(8 - 7)	0
ND<10 (12/7/2015)	ND<10 (12/2/2014)	(10 - 10)/(9 - 7)	0
ND<10 (6/6/2016)	ND<10 (12/2/2014)	(10 - 10)/(10 - 7)	0
ND<10 (12/5/2016)	ND<10 (12/2/2014)	(10 - 10)/(11 - 7)	0
ND<10 (6/20/2017)	ND<10 (12/2/2014)	(10 - 10)/(12 - 7)	0
ND<10 (12/4/2017)	ND<10 (12/2/2014)	(10 - 10)/(13 - 7)	0
ND<10 (6/4/2018)	ND<10 (12/2/2014)	(10 - 10)/(14 - 7)	0
ND<10 (12/7/2015)	ND<10 (6/1/2015)	(10 - 10)/(9 - 8)	0
ND<10 (6/6/2016)	ND<10 (6/1/2015)	(10 - 10)/(10 - 8)	0
ND<10 (12/5/2016)	ND<10 (6/1/2015)	(10 - 10)/(11 - 8)	0
ND<10 (6/20/2017)	ND<10 (6/1/2015)	(10 - 10)/(12 - 8)	0
ND<10 (12/4/2017)	ND<10 (6/1/2015)	(10 - 10)/(13 - 8)	0
ND<10 (6/4/2018)	ND<10 (6/1/2015)	(10 - 10)/(14 - 8)	0
ND<10 (6/6/2016)	ND<10 (12/7/2015)	(10 - 10)/(10 - 9)	0
ND<10 (12/5/2016)	ND<10 (12/7/2015)	(10 - 10)/(11 - 9)	0
ND<10 (6/20/2017)	ND<10 (12/7/2015)	(10 - 10)/(12 - 9)	0
ND<10 (12/4/2017)	ND<10 (12/7/2015)	(10 - 10)/(13 - 9)	0
ND<10 (6/4/2018)	ND<10 (12/7/2015)	(10 - 10)/(14 - 9)	0
ND<10 (12/5/2016)	ND<10 (6/6/2016)	(10 - 10)/(11 - 10)	0
ND<10 (6/20/2017)	ND<10 (6/6/2016)	(10 - 10)/(12 - 10)	0
ND<10 (12/4/2017)	ND<10 (6/6/2016)	(10 - 10)/(13 - 10)	0
ND<10 (6/4/2018)	ND<10 (6/6/2016)	(10 - 10)/(14 - 10)	0
ND<10 (6/20/2017)	ND<10 (12/5/2016)	(10 - 10)/(12 - 11)	0
ND<10 (12/4/2017)	ND<10 (12/5/2016)	(10 - 10)/(13 - 11)	0
ND<10 (6/4/2018)	ND<10 (12/5/2016)	(10 - 10)/(14 - 11)	0
ND<10 (12/4/2017)	ND<10 (6/20/2017)	(10 - 10)/(13 - 12)	0
ND<10 (6/4/2018)	ND<10 (6/20/2017)	(10 - 10)/(14 - 12)	0
ND<10 (6/4/2018)	ND<10 (12/4/2017)	(10 - 10)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	10	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Sen's Slope Analysis

Parameter: Nickel, total

Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<10 (6/4/2012)	ND<10 (12/13/2011)	(10 - 10)/(2 - 1)	0
ND<10 (12/11/2012)	ND<10 (12/13/2011)	(10 - 10)/(3 - 1)	0
ND<10 (6/3/2013)	ND<10 (12/13/2011)	(10 - 10)/(4 - 1)	0
ND<10 (12/3/2013)	ND<10 (12/13/2011)	(10 - 10)/(5 - 1)	0
ND<10 (6/2/2014)	ND<10 (12/13/2011)	(10 - 10)/(6 - 1)	0
ND<10 (12/2/2014)	ND<10 (12/13/2011)	(10 - 10)/(7 - 1)	0
ND<10 (6/1/2015)	ND<10 (12/13/2011)	(10 - 10)/(8 - 1)	0
ND<10 (12/7/2015)	ND<10 (12/13/2011)	(10 - 10)/(9 - 1)	0
ND<10 (6/6/2016)	ND<10 (12/13/2011)	(10 - 10)/(10 - 1)	0
ND<10 (12/5/2016)	ND<10 (12/13/2011)	(10 - 10)/(11 - 1)	0
ND<10 (6/20/2017)	ND<10 (12/13/2011)	(10 - 10)/(12 - 1)	0
ND<10 (12/4/2017)	ND<10 (12/13/2011)	(10 - 10)/(13 - 1)	0
ND<10 (6/4/2018)	ND<10 (12/13/2011)	(10 - 10)/(14 - 1)	0
ND<10 (12/11/2012)	ND<10 (6/4/2012)	(10 - 10)/(3 - 2)	0
ND<10 (6/3/2013)	ND<10 (6/4/2012)	(10 - 10)/(4 - 2)	0
ND<10 (12/3/2013)	ND<10 (6/4/2012)	(10 - 10)/(5 - 2)	0
ND<10 (6/2/2014)	ND<10 (6/4/2012)	(10 - 10)/(6 - 2)	0
ND<10 (12/2/2014)	ND<10 (6/4/2012)	(10 - 10)/(7 - 2)	0
ND<10 (6/1/2015)	ND<10 (6/4/2012)	(10 - 10)/(8 - 2)	0
ND<10 (12/7/2015)	ND<10 (6/4/2012)	(10 - 10)/(9 - 2)	0
ND<10 (6/6/2016)	ND<10 (6/4/2012)	(10 - 10)/(10 - 2)	0
ND<10 (12/5/2016)	ND<10 (6/4/2012)	(10 - 10)/(11 - 2)	0
ND<10 (6/20/2017)	ND<10 (6/4/2012)	(10 - 10)/(12 - 2)	0
ND<10 (12/4/2017)	ND<10 (6/4/2012)	(10 - 10)/(13 - 2)	0
ND<10 (6/4/2018)	ND<10 (6/4/2012)	(10 - 10)/(14 - 2)	0
ND<10 (6/3/2013)	ND<10 (12/11/2012)	(10 - 10)/(4 - 3)	0
ND<10 (12/3/2013)	ND<10 (12/11/2012)	(10 - 10)/(5 - 3)	0
ND<10 (6/2/2014)	ND<10 (12/11/2012)	(10 - 10)/(6 - 3)	0
ND<10 (12/2/2014)	ND<10 (12/11/2012)	(10 - 10)/(7 - 3)	0
ND<10 (6/1/2015)	ND<10 (12/11/2012)	(10 - 10)/(8 - 3)	0
ND<10 (12/7/2015)	ND<10 (12/11/2012)	(10 - 10)/(9 - 3)	0
ND<10 (6/6/2016)	ND<10 (12/11/2012)	(10 - 10)/(10 - 3)	0
ND<10 (12/5/2016)	ND<10 (12/11/2012)	(10 - 10)/(11 - 3)	0
ND<10 (6/20/2017)	ND<10 (12/11/2012)	(10 - 10)/(12 - 3)	0
ND<10 (12/4/2017)	ND<10 (12/11/2012)	(10 - 10)/(13 - 3)	0
ND<10 (6/4/2018)	ND<10 (12/11/2012)	(10 - 10)/(14 - 3)	0
ND<10 (12/3/2013)	ND<10 (6/3/2013)	(10 - 10)/(5 - 4)	0
ND<10 (6/2/2014)	ND<10 (6/3/2013)	(10 - 10)/(6 - 4)	0
ND<10 (12/2/2014)	ND<10 (6/3/2013)	(10 - 10)/(7 - 4)	0
ND<10 (6/1/2015)	ND<10 (6/3/2013)	(10 - 10)/(8 - 4)	0
ND<10 (12/7/2015)	ND<10 (6/3/2013)	(10 - 10)/(9 - 4)	0
ND<10 (6/6/2016)	ND<10 (6/3/2013)	(10 - 10)/(10 - 4)	0
ND<10 (12/5/2016)	ND<10 (6/3/2013)	(10 - 10)/(11 - 4)	0
ND<10 (6/20/2017)	ND<10 (6/3/2013)	(10 - 10)/(12 - 4)	0
ND<10 (12/4/2017)	ND<10 (6/3/2013)	(10 - 10)/(13 - 4)	0
ND<10 (6/4/2018)	ND<10 (6/3/2013)	(10 - 10)/(14 - 4)	0
ND<10 (6/2/2014)	ND<10 (12/3/2013)	(10 - 10)/(6 - 5)	0
ND<10 (12/2/2014)	ND<10 (12/3/2013)	(10 - 10)/(7 - 5)	0

ND<10 (6/1/2015)	ND<10 (12/3/2013)	(10 - 10)/(8 - 5)	0
ND<10 (12/7/2015)	ND<10 (12/3/2013)	(10 - 10)/(9 - 5)	0
ND<10 (6/6/2016)	ND<10 (12/3/2013)	(10 - 10)/(10 - 5)	0
ND<10 (12/5/2016)	ND<10 (12/3/2013)	(10 - 10)/(11 - 5)	0
ND<10 (6/20/2017)	ND<10 (12/3/2013)	(10 - 10)/(12 - 5)	0
ND<10 (12/4/2017)	ND<10 (12/3/2013)	(10 - 10)/(13 - 5)	0
ND<10 (6/4/2018)	ND<10 (12/3/2013)	(10 - 10)/(14 - 5)	0
ND<10 (12/2/2014)	ND<10 (6/2/2014)	(10 - 10)/(7 - 6)	0
ND<10 (6/1/2015)	ND<10 (6/2/2014)	(10 - 10)/(8 - 6)	0
ND<10 (12/7/2015)	ND<10 (6/2/2014)	(10 - 10)/(9 - 6)	0
ND<10 (6/6/2016)	ND<10 (6/2/2014)	(10 - 10)/(10 - 6)	0
ND<10 (12/5/2016)	ND<10 (6/2/2014)	(10 - 10)/(11 - 6)	0
ND<10 (6/20/2017)	ND<10 (6/2/2014)	(10 - 10)/(12 - 6)	0
ND<10 (12/4/2017)	ND<10 (6/2/2014)	(10 - 10)/(13 - 6)	0
ND<10 (6/4/2018)	ND<10 (6/2/2014)	(10 - 10)/(14 - 6)	0
ND<10 (6/1/2015)	ND<10 (12/2/2014)	(10 - 10)/(8 - 7)	0
ND<10 (12/7/2015)	ND<10 (12/2/2014)	(10 - 10)/(9 - 7)	0
ND<10 (6/6/2016)	ND<10 (12/2/2014)	(10 - 10)/(10 - 7)	0
ND<10 (12/5/2016)	ND<10 (12/2/2014)	(10 - 10)/(11 - 7)	0
ND<10 (6/20/2017)	ND<10 (12/2/2014)	(10 - 10)/(12 - 7)	0
ND<10 (12/4/2017)	ND<10 (12/2/2014)	(10 - 10)/(13 - 7)	0
ND<10 (6/4/2018)	ND<10 (12/2/2014)	(10 - 10)/(14 - 7)	0
ND<10 (12/7/2015)	ND<10 (6/1/2015)	(10 - 10)/(9 - 8)	0
ND<10 (6/6/2016)	ND<10 (6/1/2015)	(10 - 10)/(10 - 8)	0
ND<10 (12/5/2016)	ND<10 (6/1/2015)	(10 - 10)/(11 - 8)	0
ND<10 (6/20/2017)	ND<10 (6/1/2015)	(10 - 10)/(12 - 8)	0
ND<10 (12/4/2017)	ND<10 (6/1/2015)	(10 - 10)/(13 - 8)	0
ND<10 (6/4/2018)	ND<10 (6/1/2015)	(10 - 10)/(14 - 8)	0
ND<10 (6/6/2016)	ND<10 (12/7/2015)	(10 - 10)/(10 - 9)	0
ND<10 (12/5/2016)	ND<10 (12/7/2015)	(10 - 10)/(11 - 9)	0
ND<10 (6/20/2017)	ND<10 (12/7/2015)	(10 - 10)/(12 - 9)	0
ND<10 (12/4/2017)	ND<10 (12/7/2015)	(10 - 10)/(13 - 9)	0
ND<10 (6/4/2018)	ND<10 (12/7/2015)	(10 - 10)/(14 - 9)	0
ND<10 (12/5/2016)	ND<10 (6/6/2016)	(10 - 10)/(11 - 10)	0
ND<10 (6/20/2017)	ND<10 (6/6/2016)	(10 - 10)/(12 - 10)	0
ND<10 (12/4/2017)	ND<10 (6/6/2016)	(10 - 10)/(13 - 10)	0
ND<10 (6/4/2018)	ND<10 (6/6/2016)	(10 - 10)/(14 - 10)	0
ND<10 (6/20/2017)	ND<10 (12/5/2016)	(10 - 10)/(12 - 11)	0
ND<10 (12/4/2017)	ND<10 (12/5/2016)	(10 - 10)/(13 - 11)	0
ND<10 (6/4/2018)	ND<10 (12/5/2016)	(10 - 10)/(14 - 11)	0
ND<10 (12/4/2017)	ND<10 (6/20/2017)	(10 - 10)/(13 - 12)	0
ND<10 (6/4/2018)	ND<10 (6/20/2017)	(10 - 10)/(14 - 12)	0
ND<10 (6/4/2018)	ND<10 (12/4/2017)	(10 - 10)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	10	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis
Parameter: Potassium, total
Location: MW-2R

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
5800 (6/21/2010)	4700 (12/2/2009)	(5800 - 4700)/(2 - 1)	1100
6900 (12/6/2010)	4700 (12/2/2009)	(6900 - 4700)/(3 - 1)	1100
6500 (6/21/2011)	4700 (12/2/2009)	(6500 - 4700)/(4 - 1)	600
5800 (12/13/2011)	4700 (12/2/2009)	(5800 - 4700)/(5 - 1)	275
5800 (6/4/2012)	4700 (12/2/2009)	(5800 - 4700)/(6 - 1)	220
5800 (12/11/2012)	4700 (12/2/2009)	(5800 - 4700)/(7 - 1)	183.333
5800 (6/3/2013)	4700 (12/2/2009)	(5800 - 4700)/(8 - 1)	157.143
5900 (12/3/2013)	4700 (12/2/2009)	(5900 - 4700)/(9 - 1)	150
6100 (6/2/2014)	4700 (12/2/2009)	(6100 - 4700)/(10 - 1)	155.556
5200 (12/2/2014)	4700 (12/2/2009)	(5200 - 4700)/(11 - 1)	50
5800 (6/1/2015)	4700 (12/2/2009)	(5800 - 4700)/(12 - 1)	100
6000 (12/7/2015)	4700 (12/2/2009)	(6000 - 4700)/(13 - 1)	108.333
6400 (6/6/2016)	4700 (12/2/2009)	(6400 - 4700)/(14 - 1)	130.769
5800 (12/5/2016)	4700 (12/2/2009)	(5800 - 4700)/(15 - 1)	78.5714
5700 (6/20/2017)	4700 (12/2/2009)	(5700 - 4700)/(16 - 1)	66.6667
5800 (12/4/2017)	4700 (12/2/2009)	(5800 - 4700)/(17 - 1)	68.75
5000 (6/4/2018)	4700 (12/2/2009)	(5000 - 4700)/(18 - 1)	17.6471
6900 (12/6/2010)	5800 (6/21/2010)	(6900 - 5800)/(3 - 2)	1100
6500 (6/21/2011)	5800 (6/21/2010)	(6500 - 5800)/(4 - 2)	350
5800 (12/13/2011)	5800 (6/21/2010)	(5800 - 5800)/(5 - 2)	0
5800 (6/4/2012)	5800 (6/21/2010)	(5800 - 5800)/(6 - 2)	0
5800 (12/11/2012)	5800 (6/21/2010)	(5800 - 5800)/(7 - 2)	0
5800 (6/3/2013)	5800 (6/21/2010)	(5800 - 5800)/(8 - 2)	0
5900 (12/3/2013)	5800 (6/21/2010)	(5900 - 5800)/(9 - 2)	14.2857
6100 (6/2/2014)	5800 (6/21/2010)	(6100 - 5800)/(10 - 2)	37.5
5200 (12/2/2014)	5800 (6/21/2010)	(5200 - 5800)/(11 - 2)	-66.6667
5800 (6/1/2015)	5800 (6/21/2010)	(5800 - 5800)/(12 - 2)	0
6000 (12/7/2015)	5800 (6/21/2010)	(6000 - 5800)/(13 - 2)	18.1818
6400 (6/6/2016)	5800 (6/21/2010)	(6400 - 5800)/(14 - 2)	50
5800 (12/5/2016)	5800 (6/21/2010)	(5800 - 5800)/(15 - 2)	0
5700 (6/20/2017)	5800 (6/21/2010)	(5700 - 5800)/(16 - 2)	-7.14286
5800 (12/4/2017)	5800 (6/21/2010)	(5800 - 5800)/(17 - 2)	0
5000 (6/4/2018)	5800 (6/21/2010)	(5000 - 5800)/(18 - 2)	-50
6500 (6/21/2011)	6900 (12/6/2010)	(6500 - 6900)/(4 - 3)	-400
5800 (12/13/2011)	6900 (12/6/2010)	(5800 - 6900)/(5 - 3)	-550
5800 (6/4/2012)	6900 (12/6/2010)	(5800 - 6900)/(6 - 3)	-366.667
5800 (12/11/2012)	6900 (12/6/2010)	(5800 - 6900)/(7 - 3)	-275
5800 (6/3/2013)	6900 (12/6/2010)	(5800 - 6900)/(8 - 3)	-220
5900 (12/3/2013)	6900 (12/6/2010)	(5900 - 6900)/(9 - 3)	-166.667
6100 (6/2/2014)	6900 (12/6/2010)	(6100 - 6900)/(10 - 3)	-114.286
5200 (12/2/2014)	6900 (12/6/2010)	(5200 - 6900)/(11 - 3)	-212.5
5800 (6/1/2015)	6900 (12/6/2010)	(5800 - 6900)/(12 - 3)	-122.222
6000 (12/7/2015)	6900 (12/6/2010)	(6000 - 6900)/(13 - 3)	-90
6400 (6/6/2016)	6900 (12/6/2010)	(6400 - 6900)/(14 - 3)	-45.4545
5800 (12/5/2016)	6900 (12/6/2010)	(5800 - 6900)/(15 - 3)	-91.6667
5700 (6/20/2017)	6900 (12/6/2010)	(5700 - 6900)/(16 - 3)	-92.3077
5800 (12/4/2017)	6900 (12/6/2010)	(5800 - 6900)/(17 - 3)	-78.5714
5000 (6/4/2018)	6900 (12/6/2010)	(5000 - 6900)/(18 - 3)	-126.667

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5800 (12/13/2011)	6500 (6/21/2011)	(5800 - 6500)/(5 - 4)	-700
5800 (6/4/2012)	6500 (6/21/2011)	(5800 - 6500)/(6 - 4)	-350
5800 (12/11/2012)	6500 (6/21/2011)	(5800 - 6500)/(7 - 4)	-233.333
5800 (6/3/2013)	6500 (6/21/2011)	(5800 - 6500)/(8 - 4)	-175
5900 (12/3/2013)	6500 (6/21/2011)	(5900 - 6500)/(9 - 4)	-120
6100 (6/2/2014)	6500 (6/21/2011)	(6100 - 6500)/(10 - 4)	-66.6667
5200 (12/2/2014)	6500 (6/21/2011)	(5200 - 6500)/(11 - 4)	-185.714
5800 (6/1/2015)	6500 (6/21/2011)	(5800 - 6500)/(12 - 4)	-87.5
6000 (12/7/2015)	6500 (6/21/2011)	(6000 - 6500)/(13 - 4)	-55.5556
6400 (6/6/2016)	6500 (6/21/2011)	(6400 - 6500)/(14 - 4)	-10
5800 (12/5/2016)	6500 (6/21/2011)	(5800 - 6500)/(15 - 4)	-63.6364
5700 (6/20/2017)	6500 (6/21/2011)	(5700 - 6500)/(16 - 4)	-66.6667
5800 (12/4/2017)	6500 (6/21/2011)	(5800 - 6500)/(17 - 4)	-53.8462
5000 (6/4/2018)	6500 (6/21/2011)	(5000 - 6500)/(18 - 4)	-107.143
5800 (6/4/2012)	5800 (12/13/2011)	(5800 - 5800)/(6 - 5)	0
5800 (12/11/2012)	5800 (12/13/2011)	(5800 - 5800)/(7 - 5)	0
5800 (6/3/2013)	5800 (12/13/2011)	(5800 - 5800)/(8 - 5)	0
5900 (12/3/2013)	5800 (12/13/2011)	(5900 - 5800)/(9 - 5)	25
6100 (6/2/2014)	5800 (12/13/2011)	(6100 - 5800)/(10 - 5)	60
5200 (12/2/2014)	5800 (12/13/2011)	(5200 - 5800)/(11 - 5)	-100
5800 (6/1/2015)	5800 (12/13/2011)	(5800 - 5800)/(12 - 5)	0
6000 (12/7/2015)	5800 (12/13/2011)	(6000 - 5800)/(13 - 5)	25
6400 (6/6/2016)	5800 (12/13/2011)	(6400 - 5800)/(14 - 5)	66.6667
5800 (12/5/2016)	5800 (12/13/2011)	(5800 - 5800)/(15 - 5)	0
5700 (6/20/2017)	5800 (12/13/2011)	(5700 - 5800)/(16 - 5)	-9.09091
5800 (12/4/2017)	5800 (12/13/2011)	(5800 - 5800)/(17 - 5)	0
5000 (6/4/2018)	5800 (12/13/2011)	(5000 - 5800)/(18 - 5)	-61.5385
5800 (12/11/2012)	5800 (6/4/2012)	(5800 - 5800)/(7 - 6)	0
5800 (6/3/2013)	5800 (6/4/2012)	(5800 - 5800)/(8 - 6)	0
5900 (12/3/2013)	5800 (6/4/2012)	(5900 - 5800)/(9 - 6)	33.3333
6100 (6/2/2014)	5800 (6/4/2012)	(6100 - 5800)/(10 - 6)	75
5200 (12/2/2014)	5800 (6/4/2012)	(5200 - 5800)/(11 - 6)	-120
5800 (6/1/2015)	5800 (6/4/2012)	(5800 - 5800)/(12 - 6)	0
6000 (12/7/2015)	5800 (6/4/2012)	(6000 - 5800)/(13 - 6)	28.5714
6400 (6/6/2016)	5800 (6/4/2012)	(6400 - 5800)/(14 - 6)	75
5800 (12/5/2016)	5800 (6/4/2012)	(5800 - 5800)/(15 - 6)	0
5700 (6/20/2017)	5800 (6/4/2012)	(5700 - 5800)/(16 - 6)	-10
5800 (12/4/2017)	5800 (6/4/2012)	(5800 - 5800)/(17 - 6)	0
5000 (6/4/2018)	5800 (6/4/2012)	(5000 - 5800)/(18 - 6)	-66.6667
5800 (6/3/2013)	5800 (12/11/2012)	(5800 - 5800)/(8 - 7)	0
5900 (12/3/2013)	5800 (12/11/2012)	(5900 - 5800)/(9 - 7)	50
6100 (6/2/2014)	5800 (12/11/2012)	(6100 - 5800)/(10 - 7)	100
5200 (12/2/2014)	5800 (12/11/2012)	(5200 - 5800)/(11 - 7)	-150
5800 (6/1/2015)	5800 (12/11/2012)	(5800 - 5800)/(12 - 7)	0
6000 (12/7/2015)	5800 (12/11/2012)	(6000 - 5800)/(13 - 7)	33.3333
6400 (6/6/2016)	5800 (12/11/2012)	(6400 - 5800)/(14 - 7)	85.7143
5800 (12/5/2016)	5800 (12/11/2012)	(5800 - 5800)/(15 - 7)	0
5700 (6/20/2017)	5800 (12/11/2012)	(5700 - 5800)/(16 - 7)	-11.1111
5800 (12/4/2017)	5800 (12/11/2012)	(5800 - 5800)/(17 - 7)	0
5000 (6/4/2018)	5800 (12/11/2012)	(5000 - 5800)/(18 - 7)	-72.7273
5900 (12/3/2013)	5800 (6/3/2013)	(5900 - 5800)/(9 - 8)	100
6100 (6/2/2014)	5800 (6/3/2013)	(6100 - 5800)/(10 - 8)	150
5200 (12/2/2014)	5800 (6/3/2013)	(5200 - 5800)/(11 - 8)	-200
5800 (6/1/2015)	5800 (6/3/2013)	(5800 - 5800)/(12 - 8)	0
6000 (12/7/2015)	5800 (6/3/2013)	(6000 - 5800)/(13 - 8)	40
6400 (6/6/2016)	5800 (6/3/2013)	(6400 - 5800)/(14 - 8)	100
5800 (12/5/2016)	5800 (6/3/2013)	(5800 - 5800)/(15 - 8)	0
5700 (6/20/2017)	5800 (6/3/2013)	(5700 - 5800)/(16 - 8)	-12.5
5800 (12/4/2017)	5800 (6/3/2013)	(5800 - 5800)/(17 - 8)	0

5000 (6/4/2018)	5800 (6/3/2013)	(5000 - 5800)/(18 - 8)	-80
6100 (6/2/2014)	5900 (12/3/2013)	(6100 - 5900)/(10 - 9)	200
5200 (12/2/2014)	5900 (12/3/2013)	(5200 - 5900)/(11 - 9)	-350
5800 (6/1/2015)	5900 (12/3/2013)	(5800 - 5900)/(12 - 9)	-33.3333
6000 (12/7/2015)	5900 (12/3/2013)	(6000 - 5900)/(13 - 9)	25
6400 (6/6/2016)	5900 (12/3/2013)	(6400 - 5900)/(14 - 9)	100
5800 (12/5/2016)	5900 (12/3/2013)	(5800 - 5900)/(15 - 9)	-16.6667
5700 (6/20/2017)	5900 (12/3/2013)	(5700 - 5900)/(16 - 9)	-28.5714
5800 (12/4/2017)	5900 (12/3/2013)	(5800 - 5900)/(17 - 9)	-12.5
5000 (6/4/2018)	5900 (12/3/2013)	(5000 - 5900)/(18 - 9)	-100
5200 (12/2/2014)	6100 (6/2/2014)	(5200 - 6100)/(11 - 10)	-900
5800 (6/1/2015)	6100 (6/2/2014)	(5800 - 6100)/(12 - 10)	-150
6000 (12/7/2015)	6100 (6/2/2014)	(6000 - 6100)/(13 - 10)	-33.3333
6400 (6/6/2016)	6100 (6/2/2014)	(6400 - 6100)/(14 - 10)	75
5800 (12/5/2016)	6100 (6/2/2014)	(5800 - 6100)/(15 - 10)	-60
5700 (6/20/2017)	6100 (6/2/2014)	(5700 - 6100)/(16 - 10)	-66.6667
5800 (12/4/2017)	6100 (6/2/2014)	(5800 - 6100)/(17 - 10)	-42.8571
5000 (6/4/2018)	6100 (6/2/2014)	(5000 - 6100)/(18 - 10)	-137.5
5800 (6/1/2015)	5200 (12/2/2014)	(5800 - 5200)/(12 - 11)	600
6000 (12/7/2015)	5200 (12/2/2014)	(6000 - 5200)/(13 - 11)	400
6400 (6/6/2016)	5200 (12/2/2014)	(6400 - 5200)/(14 - 11)	400
5800 (12/5/2016)	5200 (12/2/2014)	(5800 - 5200)/(15 - 11)	150
5700 (6/20/2017)	5200 (12/2/2014)	(5700 - 5200)/(16 - 11)	100
5800 (12/4/2017)	5200 (12/2/2014)	(5800 - 5200)/(17 - 11)	100
5000 (6/4/2018)	5200 (12/2/2014)	(5000 - 5200)/(18 - 11)	-28.5714
6000 (12/7/2015)	5800 (6/1/2015)	(6000 - 5800)/(13 - 12)	200
6400 (6/6/2016)	5800 (6/1/2015)	(6400 - 5800)/(14 - 12)	300
5800 (12/5/2016)	5800 (6/1/2015)	(5800 - 5800)/(15 - 12)	0
5700 (6/20/2017)	5800 (6/1/2015)	(5700 - 5800)/(16 - 12)	-25
5800 (12/4/2017)	5800 (6/1/2015)	(5800 - 5800)/(17 - 12)	0
5000 (6/4/2018)	5800 (6/1/2015)	(5000 - 5800)/(18 - 12)	-133.333
6400 (6/6/2016)	6000 (12/7/2015)	(6400 - 6000)/(14 - 13)	400
5800 (12/5/2016)	6000 (12/7/2015)	(5800 - 6000)/(15 - 13)	-100
5700 (6/20/2017)	6000 (12/7/2015)	(5700 - 6000)/(16 - 13)	-100
5800 (12/4/2017)	6000 (12/7/2015)	(5800 - 6000)/(17 - 13)	-50
5000 (6/4/2018)	6000 (12/7/2015)	(5000 - 6000)/(18 - 13)	-200
5800 (12/5/2016)	6400 (6/6/2016)	(5800 - 6400)/(15 - 14)	-600
5700 (6/20/2017)	6400 (6/6/2016)	(5700 - 6400)/(16 - 14)	-350
5800 (12/4/2017)	6400 (6/6/2016)	(5800 - 6400)/(17 - 14)	-200
5000 (6/4/2018)	6400 (6/6/2016)	(5000 - 6400)/(18 - 14)	-350
5700 (6/20/2017)	5800 (12/5/2016)	(5700 - 5800)/(16 - 15)	-100
5800 (12/4/2017)	5800 (12/5/2016)	(5800 - 5800)/(17 - 15)	0
5000 (6/4/2018)	5800 (12/5/2016)	(5000 - 5800)/(18 - 15)	-266.667
5800 (12/4/2017)	5700 (6/20/2017)	(5800 - 5700)/(17 - 16)	100
5000 (6/4/2018)	5700 (6/20/2017)	(5000 - 5700)/(18 - 16)	-350
5000 (6/4/2018)	5800 (12/4/2017)	(5000 - 5800)/(18 - 17)	-800

Number of Q values = 153

Ordered Q Values

n	Q
1	-900

Royalton Road LF

2	-800
3	-700
4	-600
5	-550
6	-400
7	-366.667
8	-350
9	-350
10	-350
11	-350
12	-350
13	-275
14	-266.667
15	-233.333
16	-220
17	-212.5
18	-200
19	-200
20	-200
21	-185.714
22	-175
23	-166.667
24	-150
25	-150
26	-137.5
27	-133.333
28	-126.667
29	-122.222
30	-120
31	-120
32	-114.286
33	-107.143
34	-100
35	-100
36	-100
37	-100
38	-100
39	-92.3077
40	-91.6667
41	-90
42	-87.5
43	-80
44	-78.5714
45	-72.7273
46	-66.6667
47	-66.6667
48	-66.6667
49	-66.6667
50	-66.6667
51	-63.6364
52	-61.5385
53	-60
54	-55.5556
55	-53.8462
56	-50
57	-50
58	-45.4545
59	-42.8571
60	-33.3333
61	-33.3333
62	-28.5714
63	-28.5714
64	-25

65	-16.6667
66	-12.5
67	-12.5
68	-11.1111
69	-10
70	-10
71	-9.09091
72	-7.14286
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0
92	0
93	0
94	0
95	0
96	0
97	0
98	0
99	0
100	0
101	14.2857
102	17.6471
103	18.1818
104	25
105	25
106	25
107	28.5714
108	33.3333
109	33.3333
110	37.5
111	40
112	50
113	50
114	50
115	60
116	66.6667
117	66.6667
118	68.75
119	75
120	75
121	75
122	78.5714
123	85.7143
124	100
125	100
126	100
127	100

128	100
129	100
130	100
131	100
132	108.333
133	130.769
134	150
135	150
136	150
137	155.556
138	157.143
139	183.333
140	200
141	200
142	220
143	275
144	300
145	350
146	400
147	400
148	400
149	600
150	600
151	1100
152	1100
153	1100

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	5800	8

Time Period	Observations
12/2/2009	1
6/21/2010	1
12/6/2010	1
6/21/2011	1
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 1176
B = 0
C = 336
D = 0
E = 56
F = 0
a = 12546
b = 44064
c = 612
Group Variance = 631.667

Royalton Road LF

For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 64.7384
M1 = (153 - 64.7384)/2.0 = 44.1308
M2 = (153 + 64.7384)/2.0 + 1 = 109.869
Lower limit is -78.5714 = Q(44)
Upper limit is 37.5 = Q(110)
-78.5714 < 0 < 37.5 indicating no trend in data.

Sen's Slope Analysis

Parameter: Potassium, total

Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
8500 (6/21/2010)	8400 (12/2/2009)	(8500 - 8400)/(2 - 1)	100
6300 (12/6/2010)	8400 (12/2/2009)	(6300 - 8400)/(3 - 1)	-1050
9800 (6/21/2011)	8400 (12/2/2009)	(9800 - 8400)/(4 - 1)	466.667
9100 (12/13/2011)	8400 (12/2/2009)	(9100 - 8400)/(5 - 1)	175
9400 (6/4/2012)	8400 (12/2/2009)	(9400 - 8400)/(6 - 1)	200
8800 (12/11/2012)	8400 (12/2/2009)	(8800 - 8400)/(7 - 1)	66.6667
9200 (6/3/2013)	8400 (12/2/2009)	(9200 - 8400)/(8 - 1)	114.286
9200 (12/3/2013)	8400 (12/2/2009)	(9200 - 8400)/(9 - 1)	100
8100 (6/2/2014)	8400 (12/2/2009)	(8100 - 8400)/(10 - 1)	-33.3333
8400 (12/2/2014)	8400 (12/2/2009)	(8400 - 8400)/(11 - 1)	0
6800 (6/1/2015)	8400 (12/2/2009)	(6800 - 8400)/(12 - 1)	-145.455
8000 (12/7/2015)	8400 (12/2/2009)	(8000 - 8400)/(13 - 1)	-33.3333
7900 (6/6/2016)	8400 (12/2/2009)	(7900 - 8400)/(14 - 1)	-38.4615
7400 (12/5/2016)	8400 (12/2/2009)	(7400 - 8400)/(15 - 1)	-71.4286
7800 (6/20/2017)	8400 (12/2/2009)	(7800 - 8400)/(16 - 1)	-40
7100 (12/4/2017)	8400 (12/2/2009)	(7100 - 8400)/(17 - 1)	-81.25
8300 (6/4/2018)	8400 (12/2/2009)	(8300 - 8400)/(18 - 1)	-5.88235
6300 (12/6/2010)	8500 (6/21/2010)	(6300 - 8500)/(3 - 2)	-2200
9800 (6/21/2011)	8500 (6/21/2010)	(9800 - 8500)/(4 - 2)	650
9100 (12/13/2011)	8500 (6/21/2010)	(9100 - 8500)/(5 - 2)	200
9400 (6/4/2012)	8500 (6/21/2010)	(9400 - 8500)/(6 - 2)	225
8800 (12/11/2012)	8500 (6/21/2010)	(8800 - 8500)/(7 - 2)	60
9200 (6/3/2013)	8500 (6/21/2010)	(9200 - 8500)/(8 - 2)	116.667
9200 (12/3/2013)	8500 (6/21/2010)	(9200 - 8500)/(9 - 2)	100
8100 (6/2/2014)	8500 (6/21/2010)	(8100 - 8500)/(10 - 2)	-50
8400 (12/2/2014)	8500 (6/21/2010)	(8400 - 8500)/(11 - 2)	-11.1111
6800 (6/1/2015)	8500 (6/21/2010)	(6800 - 8500)/(12 - 2)	-170
8000 (12/7/2015)	8500 (6/21/2010)	(8000 - 8500)/(13 - 2)	-45.4545
7900 (6/6/2016)	8500 (6/21/2010)	(7900 - 8500)/(14 - 2)	-50
7400 (12/5/2016)	8500 (6/21/2010)	(7400 - 8500)/(15 - 2)	-84.6154
7800 (6/20/2017)	8500 (6/21/2010)	(7800 - 8500)/(16 - 2)	-50
7100 (12/4/2017)	8500 (6/21/2010)	(7100 - 8500)/(17 - 2)	-93.3333
8300 (6/4/2018)	8500 (6/21/2010)	(8300 - 8500)/(18 - 2)	-12.5
9800 (6/21/2011)	6300 (12/6/2010)	(9800 - 6300)/(4 - 3)	3500
9100 (12/13/2011)	6300 (12/6/2010)	(9100 - 6300)/(5 - 3)	1400
9400 (6/4/2012)	6300 (12/6/2010)	(9400 - 6300)/(6 - 3)	1033.33
8800 (12/11/2012)	6300 (12/6/2010)	(8800 - 6300)/(7 - 3)	625
9200 (6/3/2013)	6300 (12/6/2010)	(9200 - 6300)/(8 - 3)	580
9200 (12/3/2013)	6300 (12/6/2010)	(9200 - 6300)/(9 - 3)	483.333
8100 (6/2/2014)	6300 (12/6/2010)	(8100 - 6300)/(10 - 3)	257.143
8400 (12/2/2014)	6300 (12/6/2010)	(8400 - 6300)/(11 - 3)	262.5
6800 (6/1/2015)	6300 (12/6/2010)	(6800 - 6300)/(12 - 3)	55.5556
8000 (12/7/2015)	6300 (12/6/2010)	(8000 - 6300)/(13 - 3)	170
7900 (6/6/2016)	6300 (12/6/2010)	(7900 - 6300)/(14 - 3)	145.455
7400 (12/5/2016)	6300 (12/6/2010)	(7400 - 6300)/(15 - 3)	91.6667
7800 (6/20/2017)	6300 (12/6/2010)	(7800 - 6300)/(16 - 3)	115.385
7100 (12/4/2017)	6300 (12/6/2010)	(7100 - 6300)/(17 - 3)	57.1429
8300 (6/4/2018)	6300 (12/6/2010)	(8300 - 6300)/(18 - 3)	133.333

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9100 (12/13/2011)	9800 (6/21/2011)	(9100 - 9800)/(5 - 4)	-700
9400 (6/4/2012)	9800 (6/21/2011)	(9400 - 9800)/(6 - 4)	-200
8800 (12/11/2012)	9800 (6/21/2011)	(8800 - 9800)/(7 - 4)	-333.333
9200 (6/3/2013)	9800 (6/21/2011)	(9200 - 9800)/(8 - 4)	-150
9200 (12/3/2013)	9800 (6/21/2011)	(9200 - 9800)/(9 - 4)	-120
8100 (6/2/2014)	9800 (6/21/2011)	(8100 - 9800)/(10 - 4)	-283.333
8400 (12/2/2014)	9800 (6/21/2011)	(8400 - 9800)/(11 - 4)	-200
6800 (6/1/2015)	9800 (6/21/2011)	(6800 - 9800)/(12 - 4)	-375
8000 (12/7/2015)	9800 (6/21/2011)	(8000 - 9800)/(13 - 4)	-200
7900 (6/6/2016)	9800 (6/21/2011)	(7900 - 9800)/(14 - 4)	-190
7400 (12/5/2016)	9800 (6/21/2011)	(7400 - 9800)/(15 - 4)	-218.182
7800 (6/20/2017)	9800 (6/21/2011)	(7800 - 9800)/(16 - 4)	-166.667
7100 (12/4/2017)	9800 (6/21/2011)	(7100 - 9800)/(17 - 4)	-207.692
8300 (6/4/2018)	9800 (6/21/2011)	(8300 - 9800)/(18 - 4)	-107.143

9400 (6/4/2012)	9100 (12/13/2011)	(9400 - 9100)/(6 - 5)	300
8800 (12/11/2012)	9100 (12/13/2011)	(8800 - 9100)/(7 - 5)	-150
9200 (6/3/2013)	9100 (12/13/2011)	(9200 - 9100)/(8 - 5)	33.3333
9200 (12/3/2013)	9100 (12/13/2011)	(9200 - 9100)/(9 - 5)	25
8100 (6/2/2014)	9100 (12/13/2011)	(8100 - 9100)/(10 - 5)	-200
8400 (12/2/2014)	9100 (12/13/2011)	(8400 - 9100)/(11 - 5)	-116.667
6800 (6/1/2015)	9100 (12/13/2011)	(6800 - 9100)/(12 - 5)	-328.571
8000 (12/7/2015)	9100 (12/13/2011)	(8000 - 9100)/(13 - 5)	-137.5
7900 (6/6/2016)	9100 (12/13/2011)	(7900 - 9100)/(14 - 5)	-133.333
7400 (12/5/2016)	9100 (12/13/2011)	(7400 - 9100)/(15 - 5)	-170
7800 (6/20/2017)	9100 (12/13/2011)	(7800 - 9100)/(16 - 5)	-118.182
7100 (12/4/2017)	9100 (12/13/2011)	(7100 - 9100)/(17 - 5)	-166.667
8300 (6/4/2018)	9100 (12/13/2011)	(8300 - 9100)/(18 - 5)	-61.5385

8800 (12/11/2012)	9400 (6/4/2012)	(8800 - 9400)/(7 - 6)	-600
9200 (6/3/2013)	9400 (6/4/2012)	(9200 - 9400)/(8 - 6)	-100
9200 (12/3/2013)	9400 (6/4/2012)	(9200 - 9400)/(9 - 6)	-66.6667
8100 (6/2/2014)	9400 (6/4/2012)	(8100 - 9400)/(10 - 6)	-325
8400 (12/2/2014)	9400 (6/4/2012)	(8400 - 9400)/(11 - 6)	-200
6800 (6/1/2015)	9400 (6/4/2012)	(6800 - 9400)/(12 - 6)	-433.333
8000 (12/7/2015)	9400 (6/4/2012)	(8000 - 9400)/(13 - 6)	-200
7900 (6/6/2016)	9400 (6/4/2012)	(7900 - 9400)/(14 - 6)	-187.5
7400 (12/5/2016)	9400 (6/4/2012)	(7400 - 9400)/(15 - 6)	-222.222
7800 (6/20/2017)	9400 (6/4/2012)	(7800 - 9400)/(16 - 6)	-160
7100 (12/4/2017)	9400 (6/4/2012)	(7100 - 9400)/(17 - 6)	-209.091
8300 (6/4/2018)	9400 (6/4/2012)	(8300 - 9400)/(18 - 6)	-91.6667

9200 (6/3/2013)	8800 (12/11/2012)	(9200 - 8800)/(8 - 7)	400
9200 (12/3/2013)	8800 (12/11/2012)	(9200 - 8800)/(9 - 7)	200
8100 (6/2/2014)	8800 (12/11/2012)	(8100 - 8800)/(10 - 7)	-233.333
8400 (12/2/2014)	8800 (12/11/2012)	(8400 - 8800)/(11 - 7)	-100
6800 (6/1/2015)	8800 (12/11/2012)	(6800 - 8800)/(12 - 7)	-400
8000 (12/7/2015)	8800 (12/11/2012)	(8000 - 8800)/(13 - 7)	-133.333
7900 (6/6/2016)	8800 (12/11/2012)	(7900 - 8800)/(14 - 7)	-128.571
7400 (12/5/2016)	8800 (12/11/2012)	(7400 - 8800)/(15 - 7)	-175
7800 (6/20/2017)	8800 (12/11/2012)	(7800 - 8800)/(16 - 7)	-111.111
7100 (12/4/2017)	8800 (12/11/2012)	(7100 - 8800)/(17 - 7)	-170
8300 (6/4/2018)	8800 (12/11/2012)	(8300 - 8800)/(18 - 7)	-45.4545

9200 (12/3/2013)	9200 (6/3/2013)	(9200 - 9200)/(9 - 8)	0
8100 (6/2/2014)	9200 (6/3/2013)	(8100 - 9200)/(10 - 8)	-550
8400 (12/2/2014)	9200 (6/3/2013)	(8400 - 9200)/(11 - 8)	-266.667
6800 (6/1/2015)	9200 (6/3/2013)	(6800 - 9200)/(12 - 8)	-600
8000 (12/7/2015)	9200 (6/3/2013)	(8000 - 9200)/(13 - 8)	-240
7900 (6/6/2016)	9200 (6/3/2013)	(7900 - 9200)/(14 - 8)	-216.667
7400 (12/5/2016)	9200 (6/3/2013)	(7400 - 9200)/(15 - 8)	-257.143
7800 (6/20/2017)	9200 (6/3/2013)	(7800 - 9200)/(16 - 8)	-175
7100 (12/4/2017)	9200 (6/3/2013)	(7100 - 9200)/(17 - 8)	-233.333

8300 (6/4/2018)	9200 (6/3/2013)	(8300 - 9200)/(18 - 8)	-90
8100 (6/2/2014)	9200 (12/3/2013)	(8100 - 9200)/(10 - 9)	-1100
8400 (12/2/2014)	9200 (12/3/2013)	(8400 - 9200)/(11 - 9)	-400
6800 (6/1/2015)	9200 (12/3/2013)	(6800 - 9200)/(12 - 9)	-800
8000 (12/7/2015)	9200 (12/3/2013)	(8000 - 9200)/(13 - 9)	-300
7900 (6/6/2016)	9200 (12/3/2013)	(7900 - 9200)/(14 - 9)	-260
7400 (12/5/2016)	9200 (12/3/2013)	(7400 - 9200)/(15 - 9)	-300
7800 (6/20/2017)	9200 (12/3/2013)	(7800 - 9200)/(16 - 9)	-200
7100 (12/4/2017)	9200 (12/3/2013)	(7100 - 9200)/(17 - 9)	-262.5
8300 (6/4/2018)	9200 (12/3/2013)	(8300 - 9200)/(18 - 9)	-100
8400 (12/2/2014)	8100 (6/2/2014)	(8400 - 8100)/(11 - 10)	300
6800 (6/1/2015)	8100 (6/2/2014)	(6800 - 8100)/(12 - 10)	-650
8000 (12/7/2015)	8100 (6/2/2014)	(8000 - 8100)/(13 - 10)	-33.3333
7900 (6/6/2016)	8100 (6/2/2014)	(7900 - 8100)/(14 - 10)	-50
7400 (12/5/2016)	8100 (6/2/2014)	(7400 - 8100)/(15 - 10)	-140
7800 (6/20/2017)	8100 (6/2/2014)	(7800 - 8100)/(16 - 10)	-50
7100 (12/4/2017)	8100 (6/2/2014)	(7100 - 8100)/(17 - 10)	-142.857
8300 (6/4/2018)	8100 (6/2/2014)	(8300 - 8100)/(18 - 10)	25
6800 (6/1/2015)	8400 (12/2/2014)	(6800 - 8400)/(12 - 11)	-1600
8000 (12/7/2015)	8400 (12/2/2014)	(8000 - 8400)/(13 - 11)	-200
7900 (6/6/2016)	8400 (12/2/2014)	(7900 - 8400)/(14 - 11)	-166.667
7400 (12/5/2016)	8400 (12/2/2014)	(7400 - 8400)/(15 - 11)	-250
7800 (6/20/2017)	8400 (12/2/2014)	(7800 - 8400)/(16 - 11)	-120
7100 (12/4/2017)	8400 (12/2/2014)	(7100 - 8400)/(17 - 11)	-216.667
8300 (6/4/2018)	8400 (12/2/2014)	(8300 - 8400)/(18 - 11)	-14.2857
8000 (12/7/2015)	6800 (6/1/2015)	(8000 - 6800)/(13 - 12)	1200
7900 (6/6/2016)	6800 (6/1/2015)	(7900 - 6800)/(14 - 12)	550
7400 (12/5/2016)	6800 (6/1/2015)	(7400 - 6800)/(15 - 12)	200
7800 (6/20/2017)	6800 (6/1/2015)	(7800 - 6800)/(16 - 12)	250
7100 (12/4/2017)	6800 (6/1/2015)	(7100 - 6800)/(17 - 12)	60
8300 (6/4/2018)	6800 (6/1/2015)	(8300 - 6800)/(18 - 12)	250
7900 (6/6/2016)	8000 (12/7/2015)	(7900 - 8000)/(14 - 13)	-100
7400 (12/5/2016)	8000 (12/7/2015)	(7400 - 8000)/(15 - 13)	-300
7800 (6/20/2017)	8000 (12/7/2015)	(7800 - 8000)/(16 - 13)	-66.6667
7100 (12/4/2017)	8000 (12/7/2015)	(7100 - 8000)/(17 - 13)	-225
8300 (6/4/2018)	8000 (12/7/2015)	(8300 - 8000)/(18 - 13)	60
7400 (12/5/2016)	7900 (6/6/2016)	(7400 - 7900)/(15 - 14)	-500
7800 (6/20/2017)	7900 (6/6/2016)	(7800 - 7900)/(16 - 14)	-50
7100 (12/4/2017)	7900 (6/6/2016)	(7100 - 7900)/(17 - 14)	-266.667
8300 (6/4/2018)	7900 (6/6/2016)	(8300 - 7900)/(18 - 14)	100
7800 (6/20/2017)	7400 (12/5/2016)	(7800 - 7400)/(16 - 15)	400
7100 (12/4/2017)	7400 (12/5/2016)	(7100 - 7400)/(17 - 15)	-150
8300 (6/4/2018)	7400 (12/5/2016)	(8300 - 7400)/(18 - 15)	300
7100 (12/4/2017)	7800 (6/20/2017)	(7100 - 7800)/(17 - 16)	-700
8300 (6/4/2018)	7800 (6/20/2017)	(8300 - 7800)/(18 - 16)	250
8300 (6/4/2018)	7100 (12/4/2017)	(8300 - 7100)/(18 - 17)	1200

Number of Q values = 153

Ordered Q Values

n	Q
1	-2200

Royalton Road LF

2	-1600
3	-1100
4	-1050
5	-800
6	-700
7	-700
8	-650
9	-600
10	-600
11	-550
12	-500
13	-433.333
14	-400
15	-400
16	-375
17	-333.333
18	-328.571
19	-325
20	-300
21	-300
22	-300
23	-283.333
24	-266.667
25	-266.667
26	-262.5
27	-260
28	-257.143
29	-250
30	-240
31	-233.333
32	-233.333
33	-225
34	-222.222
35	-218.182
36	-216.667
37	-216.667
38	-209.091
39	-207.692
40	-200
41	-200
42	-200
43	-200
44	-200
45	-200
46	-200
47	-200
48	-190
49	-187.5
50	-175
51	-175
52	-170
53	-170
54	-170
55	-166.667
56	-166.667
57	-166.667
58	-160
59	-150
60	-150
61	-150
62	-145.455
63	-142.857
64	-140

65	-137.5
66	-133.333
67	-133.333
68	-128.571
69	-120
70	-120
71	-118.182
72	-116.667
73	-111.111
74	-107.143
75	-100
76	-100
77	-100
78	-100
79	-93.3333
80	-91.6667
81	-90
82	-84.6154
83	-81.25
84	-71.4286
85	-66.6667
86	-66.6667
87	-61.5385
88	-50
89	-50
90	-50
91	-50
92	-50
93	-50
94	-45.4545
95	-45.4545
96	-40
97	-38.4615
98	-33.3333
99	-33.3333
100	-33.3333
101	-14.2857
102	-12.5
103	-11.1111
104	-5.88235
105	0
106	0
107	25
108	25
109	33.3333
110	55.5556
111	57.1429
112	60
113	60
114	60
115	66.6667
116	91.6667
117	100
118	100
119	100
120	100
121	114.286
122	115.385
123	116.667
124	133.333
125	145.455
126	170
127	175

128	200
129	200
130	200
131	200
132	225
133	250
134	250
135	250
136	257.143
137	262.5
138	300
139	300
140	300
141	400
142	400
143	466.667
144	483.333
145	550
146	580
147	625
148	650
149	1033.33
150	1200
151	1200
152	1400
153	3500

Sen's Estimator (Median Q) is -100

Tied Group	Value	Members
1	8400	2
2	9200	2

Time Period	Observations
12/2/2009	1
6/21/2010	1
12/6/2010	1
6/21/2011	1
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 12546
b = 44064
c = 612

Royalton Road LF

Group Variance = 695
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 67.9063
M1 = (153 - 67.9063)/2.0 = 42.5468
M2 = (153 + 67.9063)/2.0 + 1 = 111.453
Lower limit is -200 = Q(43)
Upper limit is 57.1429 = Q(111)
-200 < 0 < 57.1429 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis
Parameter: Potassium, total
Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
11900 (6/21/2010)	11500 (12/2/2009)	(11900 - 11500)/(2 - 1)	400
12000 (12/6/2010)	11500 (12/2/2009)	(12000 - 11500)/(3 - 1)	250
12900 (6/21/2011)	11500 (12/2/2009)	(12900 - 11500)/(4 - 1)	466.667
12200 (12/13/2011)	11500 (12/2/2009)	(12200 - 11500)/(5 - 1)	175
12100 (6/4/2012)	11500 (12/2/2009)	(12100 - 11500)/(6 - 1)	120
11800 (12/11/2012)	11500 (12/2/2009)	(11800 - 11500)/(7 - 1)	50
12300 (6/3/2013)	11500 (12/2/2009)	(12300 - 11500)/(8 - 1)	114.286
12000 (12/3/2013)	11500 (12/2/2009)	(12000 - 11500)/(9 - 1)	62.5
12000 (6/2/2014)	11500 (12/2/2009)	(12000 - 11500)/(10 - 1)	55.5556
11300 (12/2/2014)	11500 (12/2/2009)	(11300 - 11500)/(11 - 1)	-20
10900 (6/1/2015)	11500 (12/2/2009)	(10900 - 11500)/(12 - 1)	-54.5455
11900 (12/7/2015)	11500 (12/2/2009)	(11900 - 11500)/(13 - 1)	33.3333
11600 (6/6/2016)	11500 (12/2/2009)	(11600 - 11500)/(14 - 1)	7.69231
12100 (12/5/2016)	11500 (12/2/2009)	(12100 - 11500)/(15 - 1)	42.8571
11600 (6/20/2017)	11500 (12/2/2009)	(11600 - 11500)/(16 - 1)	6.66667
11400 (12/4/2017)	11500 (12/2/2009)	(11400 - 11500)/(17 - 1)	-6.25
11400 (6/4/2018)	11500 (12/2/2009)	(11400 - 11500)/(18 - 1)	-5.88235
12000 (12/6/2010)	11900 (6/21/2010)	(12000 - 11900)/(3 - 2)	100
12900 (6/21/2011)	11900 (6/21/2010)	(12900 - 11900)/(4 - 2)	500
12200 (12/13/2011)	11900 (6/21/2010)	(12200 - 11900)/(5 - 2)	100
12100 (6/4/2012)	11900 (6/21/2010)	(12100 - 11900)/(6 - 2)	50
11800 (12/11/2012)	11900 (6/21/2010)	(11800 - 11900)/(7 - 2)	-20
12300 (6/3/2013)	11900 (6/21/2010)	(12300 - 11900)/(8 - 2)	66.6667
12000 (12/3/2013)	11900 (6/21/2010)	(12000 - 11900)/(9 - 2)	14.2857
12000 (6/2/2014)	11900 (6/21/2010)	(12000 - 11900)/(10 - 2)	12.5
11300 (12/2/2014)	11900 (6/21/2010)	(11300 - 11900)/(11 - 2)	-66.6667
10900 (6/1/2015)	11900 (6/21/2010)	(10900 - 11900)/(12 - 2)	-100
11900 (12/7/2015)	11900 (6/21/2010)	(11900 - 11900)/(13 - 2)	0
11600 (6/6/2016)	11900 (6/21/2010)	(11600 - 11900)/(14 - 2)	-25
12100 (12/5/2016)	11900 (6/21/2010)	(12100 - 11900)/(15 - 2)	15.3846
11600 (6/20/2017)	11900 (6/21/2010)	(11600 - 11900)/(16 - 2)	-21.4286
11400 (12/4/2017)	11900 (6/21/2010)	(11400 - 11900)/(17 - 2)	-33.3333
11400 (6/4/2018)	11900 (6/21/2010)	(11400 - 11900)/(18 - 2)	-31.25
12900 (6/21/2011)	12000 (12/6/2010)	(12900 - 12000)/(4 - 3)	900
12200 (12/13/2011)	12000 (12/6/2010)	(12200 - 12000)/(5 - 3)	100
12100 (6/4/2012)	12000 (12/6/2010)	(12100 - 12000)/(6 - 3)	33.3333
11800 (12/11/2012)	12000 (12/6/2010)	(11800 - 12000)/(7 - 3)	-50
12300 (6/3/2013)	12000 (12/6/2010)	(12300 - 12000)/(8 - 3)	60
12000 (12/3/2013)	12000 (12/6/2010)	(12000 - 12000)/(9 - 3)	0
12000 (6/2/2014)	12000 (12/6/2010)	(12000 - 12000)/(10 - 3)	0
11300 (12/2/2014)	12000 (12/6/2010)	(11300 - 12000)/(11 - 3)	-87.5
10900 (6/1/2015)	12000 (12/6/2010)	(10900 - 12000)/(12 - 3)	-122.222
11900 (12/7/2015)	12000 (12/6/2010)	(11900 - 12000)/(13 - 3)	-10
11600 (6/6/2016)	12000 (12/6/2010)	(11600 - 12000)/(14 - 3)	-36.3636
12100 (12/5/2016)	12000 (12/6/2010)	(12100 - 12000)/(15 - 3)	8.33333
11600 (6/20/2017)	12000 (12/6/2010)	(11600 - 12000)/(16 - 3)	-30.7692
11400 (12/4/2017)	12000 (12/6/2010)	(11400 - 12000)/(17 - 3)	-42.8571
11400 (6/4/2018)	12000 (12/6/2010)	(11400 - 12000)/(18 - 3)	-40

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12200 (12/13/2011)	12900 (6/21/2011)	(12200 - 12900)/(5 - 4)	-700
12100 (6/4/2012)	12900 (6/21/2011)	(12100 - 12900)/(6 - 4)	-400
11800 (12/11/2012)	12900 (6/21/2011)	(11800 - 12900)/(7 - 4)	-366.667
12300 (6/3/2013)	12900 (6/21/2011)	(12300 - 12900)/(8 - 4)	-150
12000 (12/3/2013)	12900 (6/21/2011)	(12000 - 12900)/(9 - 4)	-180
12000 (6/2/2014)	12900 (6/21/2011)	(12000 - 12900)/(10 - 4)	-150
11300 (12/2/2014)	12900 (6/21/2011)	(11300 - 12900)/(11 - 4)	-228.571
10900 (6/1/2015)	12900 (6/21/2011)	(10900 - 12900)/(12 - 4)	-250
11900 (12/7/2015)	12900 (6/21/2011)	(11900 - 12900)/(13 - 4)	-111.111
11600 (6/6/2016)	12900 (6/21/2011)	(11600 - 12900)/(14 - 4)	-130
12100 (12/5/2016)	12900 (6/21/2011)	(12100 - 12900)/(15 - 4)	-72.7273
11600 (6/20/2017)	12900 (6/21/2011)	(11600 - 12900)/(16 - 4)	-108.333
11400 (12/4/2017)	12900 (6/21/2011)	(11400 - 12900)/(17 - 4)	-115.385
11400 (6/4/2018)	12900 (6/21/2011)	(11400 - 12900)/(18 - 4)	-107.143

12100 (6/4/2012)	12200 (12/13/2011)	(12100 - 12200)/(6 - 5)	-100
11800 (12/11/2012)	12200 (12/13/2011)	(11800 - 12200)/(7 - 5)	-200
12300 (6/3/2013)	12200 (12/13/2011)	(12300 - 12200)/(8 - 5)	33.3333
12000 (12/3/2013)	12200 (12/13/2011)	(12000 - 12200)/(9 - 5)	-50
12000 (6/2/2014)	12200 (12/13/2011)	(12000 - 12200)/(10 - 5)	-40
11300 (12/2/2014)	12200 (12/13/2011)	(11300 - 12200)/(11 - 5)	-150
10900 (6/1/2015)	12200 (12/13/2011)	(10900 - 12200)/(12 - 5)	-185.714
11900 (12/7/2015)	12200 (12/13/2011)	(11900 - 12200)/(13 - 5)	-37.5
11600 (6/6/2016)	12200 (12/13/2011)	(11600 - 12200)/(14 - 5)	-66.6667
12100 (12/5/2016)	12200 (12/13/2011)	(12100 - 12200)/(15 - 5)	-10
11600 (6/20/2017)	12200 (12/13/2011)	(11600 - 12200)/(16 - 5)	-54.5455
11400 (12/4/2017)	12200 (12/13/2011)	(11400 - 12200)/(17 - 5)	-66.6667
11400 (6/4/2018)	12200 (12/13/2011)	(11400 - 12200)/(18 - 5)	-61.5385

11800 (12/11/2012)	12100 (6/4/2012)	(11800 - 12100)/(7 - 6)	-300
12300 (6/3/2013)	12100 (6/4/2012)	(12300 - 12100)/(8 - 6)	100
12000 (12/3/2013)	12100 (6/4/2012)	(12000 - 12100)/(9 - 6)	-33.3333
12000 (6/2/2014)	12100 (6/4/2012)	(12000 - 12100)/(10 - 6)	-25
11300 (12/2/2014)	12100 (6/4/2012)	(11300 - 12100)/(11 - 6)	-160
10900 (6/1/2015)	12100 (6/4/2012)	(10900 - 12100)/(12 - 6)	-200
11900 (12/7/2015)	12100 (6/4/2012)	(11900 - 12100)/(13 - 6)	-28.5714
11600 (6/6/2016)	12100 (6/4/2012)	(11600 - 12100)/(14 - 6)	-62.5
12100 (12/5/2016)	12100 (6/4/2012)	(12100 - 12100)/(15 - 6)	0
11600 (6/20/2017)	12100 (6/4/2012)	(11600 - 12100)/(16 - 6)	-50
11400 (12/4/2017)	12100 (6/4/2012)	(11400 - 12100)/(17 - 6)	-63.6364
11400 (6/4/2018)	12100 (6/4/2012)	(11400 - 12100)/(18 - 6)	-58.3333

12300 (6/3/2013)	11800 (12/11/2012)	(12300 - 11800)/(8 - 7)	500
12000 (12/3/2013)	11800 (12/11/2012)	(12000 - 11800)/(9 - 7)	100
12000 (6/2/2014)	11800 (12/11/2012)	(12000 - 11800)/(10 - 7)	66.6667
11300 (12/2/2014)	11800 (12/11/2012)	(11300 - 11800)/(11 - 7)	-125
10900 (6/1/2015)	11800 (12/11/2012)	(10900 - 11800)/(12 - 7)	-180
11900 (12/7/2015)	11800 (12/11/2012)	(11900 - 11800)/(13 - 7)	16.6667
11600 (6/6/2016)	11800 (12/11/2012)	(11600 - 11800)/(14 - 7)	-28.5714
12100 (12/5/2016)	11800 (12/11/2012)	(12100 - 11800)/(15 - 7)	37.5
11600 (6/20/2017)	11800 (12/11/2012)	(11600 - 11800)/(16 - 7)	-22.2222
11400 (12/4/2017)	11800 (12/11/2012)	(11400 - 11800)/(17 - 7)	-40
11400 (6/4/2018)	11800 (12/11/2012)	(11400 - 11800)/(18 - 7)	-36.3636

12000 (12/3/2013)	12300 (6/3/2013)	(12000 - 12300)/(9 - 8)	-300
12000 (6/2/2014)	12300 (6/3/2013)	(12000 - 12300)/(10 - 8)	-150
11300 (12/2/2014)	12300 (6/3/2013)	(11300 - 12300)/(11 - 8)	-333.333
10900 (6/1/2015)	12300 (6/3/2013)	(10900 - 12300)/(12 - 8)	-350
11900 (12/7/2015)	12300 (6/3/2013)	(11900 - 12300)/(13 - 8)	-80
11600 (6/6/2016)	12300 (6/3/2013)	(11600 - 12300)/(14 - 8)	-116.667
12100 (12/5/2016)	12300 (6/3/2013)	(12100 - 12300)/(15 - 8)	-28.5714
11600 (6/20/2017)	12300 (6/3/2013)	(11600 - 12300)/(16 - 8)	-87.5
11400 (12/4/2017)	12300 (6/3/2013)	(11400 - 12300)/(17 - 8)	-100

11400 (6/4/2018)	12300 (6/3/2013)	(11400 - 12300)/(18 - 8)	-90
12000 (6/2/2014)	12000 (12/3/2013)	(12000 - 12000)/(10 - 9)	0
11300 (12/2/2014)	12000 (12/3/2013)	(11300 - 12000)/(11 - 9)	-350
10900 (6/1/2015)	12000 (12/3/2013)	(10900 - 12000)/(12 - 9)	-366.667
11900 (12/7/2015)	12000 (12/3/2013)	(11900 - 12000)/(13 - 9)	-25
11600 (6/6/2016)	12000 (12/3/2013)	(11600 - 12000)/(14 - 9)	-80
12100 (12/5/2016)	12000 (12/3/2013)	(12100 - 12000)/(15 - 9)	16.6667
11600 (6/20/2017)	12000 (12/3/2013)	(11600 - 12000)/(16 - 9)	-57.1429
11400 (12/4/2017)	12000 (12/3/2013)	(11400 - 12000)/(17 - 9)	-75
11400 (6/4/2018)	12000 (12/3/2013)	(11400 - 12000)/(18 - 9)	-66.6667
11300 (12/2/2014)	12000 (6/2/2014)	(11300 - 12000)/(11 - 10)	-700
10900 (6/1/2015)	12000 (6/2/2014)	(10900 - 12000)/(12 - 10)	-550
11900 (12/7/2015)	12000 (6/2/2014)	(11900 - 12000)/(13 - 10)	-33.3333
11600 (6/6/2016)	12000 (6/2/2014)	(11600 - 12000)/(14 - 10)	-100
12100 (12/5/2016)	12000 (6/2/2014)	(12100 - 12000)/(15 - 10)	20
11600 (6/20/2017)	12000 (6/2/2014)	(11600 - 12000)/(16 - 10)	-66.6667
11400 (12/4/2017)	12000 (6/2/2014)	(11400 - 12000)/(17 - 10)	-85.7143
11400 (6/4/2018)	12000 (6/2/2014)	(11400 - 12000)/(18 - 10)	-75
10900 (6/1/2015)	11300 (12/2/2014)	(10900 - 11300)/(12 - 11)	-400
11900 (12/7/2015)	11300 (12/2/2014)	(11900 - 11300)/(13 - 11)	300
11600 (6/6/2016)	11300 (12/2/2014)	(11600 - 11300)/(14 - 11)	100
12100 (12/5/2016)	11300 (12/2/2014)	(12100 - 11300)/(15 - 11)	200
11600 (6/20/2017)	11300 (12/2/2014)	(11600 - 11300)/(16 - 11)	60
11400 (12/4/2017)	11300 (12/2/2014)	(11400 - 11300)/(17 - 11)	16.6667
11400 (6/4/2018)	11300 (12/2/2014)	(11400 - 11300)/(18 - 11)	14.2857
11900 (12/7/2015)	10900 (6/1/2015)	(11900 - 10900)/(13 - 12)	1000
11600 (6/6/2016)	10900 (6/1/2015)	(11600 - 10900)/(14 - 12)	350
12100 (12/5/2016)	10900 (6/1/2015)	(12100 - 10900)/(15 - 12)	400
11600 (6/20/2017)	10900 (6/1/2015)	(11600 - 10900)/(16 - 12)	175
11400 (12/4/2017)	10900 (6/1/2015)	(11400 - 10900)/(17 - 12)	100
11400 (6/4/2018)	10900 (6/1/2015)	(11400 - 10900)/(18 - 12)	83.3333
11600 (6/6/2016)	11900 (12/7/2015)	(11600 - 11900)/(14 - 13)	-300
12100 (12/5/2016)	11900 (12/7/2015)	(12100 - 11900)/(15 - 13)	100
11600 (6/20/2017)	11900 (12/7/2015)	(11600 - 11900)/(16 - 13)	-100
11400 (12/4/2017)	11900 (12/7/2015)	(11400 - 11900)/(17 - 13)	-125
11400 (6/4/2018)	11900 (12/7/2015)	(11400 - 11900)/(18 - 13)	-100
12100 (12/5/2016)	11600 (6/6/2016)	(12100 - 11600)/(15 - 14)	500
11600 (6/20/2017)	11600 (6/6/2016)	(11600 - 11600)/(16 - 14)	0
11400 (12/4/2017)	11600 (6/6/2016)	(11400 - 11600)/(17 - 14)	-66.6667
11400 (6/4/2018)	11600 (6/6/2016)	(11400 - 11600)/(18 - 14)	-50
11600 (6/20/2017)	12100 (12/5/2016)	(11600 - 12100)/(16 - 15)	-500
11400 (12/4/2017)	12100 (12/5/2016)	(11400 - 12100)/(17 - 15)	-350
11400 (6/4/2018)	12100 (12/5/2016)	(11400 - 12100)/(18 - 15)	-233.333
11400 (12/4/2017)	11600 (6/20/2017)	(11400 - 11600)/(17 - 16)	-200
11400 (6/4/2018)	11600 (6/20/2017)	(11400 - 11600)/(18 - 16)	-100
11400 (6/4/2018)	11400 (12/4/2017)	(11400 - 11400)/(18 - 17)	0

Number of Q values = 153

Ordered Q Values

n	Q
1	-700

Royalton Road LF

2	-700
3	-550
4	-500
5	-400
6	-400
7	-366.667
8	-366.667
9	-350
10	-350
11	-350
12	-333.333
13	-300
14	-300
15	-300
16	-250
17	-233.333
18	-228.571
19	-200
20	-200
21	-200
22	-185.714
23	-180
24	-180
25	-160
26	-150
27	-150
28	-150
29	-150
30	-130
31	-125
32	-125
33	-122.222
34	-116.667
35	-115.385
36	-111.111
37	-108.333
38	-107.143
39	-100
40	-100
41	-100
42	-100
43	-100
44	-100
45	-100
46	-90
47	-87.5
48	-87.5
49	-85.7143
50	-80
51	-80
52	-75
53	-75
54	-72.7273
55	-66.6667
56	-66.6667
57	-66.6667
58	-66.6667
59	-66.6667
60	-66.6667
61	-63.6364
62	-62.5
63	-61.5385
64	-58.3333

65	-57.1429
66	-54.5455
67	-54.5455
68	-50
69	-50
70	-50
71	-50
72	-42.8571
73	-40
74	-40
75	-40
76	-37.5
77	-36.3636
78	-36.3636
79	-33.3333
80	-33.3333
81	-33.3333
82	-31.25
83	-30.7692
84	-28.5714
85	-28.5714
86	-28.5714
87	-25
88	-25
89	-25
90	-22.2222
91	-21.4286
92	-20
93	-20
94	-10
95	-10
96	-6.25
97	-5.88235
98	0
99	0
100	0
101	0
102	0
103	0
104	0
105	6.66667
106	7.69231
107	8.33333
108	12.5
109	14.2857
110	14.2857
111	15.3846
112	16.6667
113	16.6667
114	16.6667
115	20
116	33.3333
117	33.3333
118	33.3333
119	37.5
120	42.8571
121	50
122	50
123	55.5556
124	60
125	60
126	62.5
127	66.6667

128	66.6667
129	83.3333
130	100
131	100
132	100
133	100
134	100
135	100
136	100
137	100
138	114.286
139	120
140	175
141	175
142	200
143	250
144	300
145	350
146	400
147	400
148	466.667
149	500
150	500
151	500
152	900
153	1000

Sen's Estimator (Median Q) is -36.3636

Tied Group	Value	Members
1	11900	2
2	12000	3
3	12100	2
4	11600	2
5	11400	2

Time Period	Observations
12/2/2009	1
6/21/2010	1
12/6/2010	1
6/21/2011	1
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 138
B = 0
C = 6
D = 0
E = 14
F = 0

Royalton Road LF

a = 12546
b = 44064
c = 612
Group Variance = 689.333
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 67.6289
M1 = (153 - 67.6289)/2.0 = 42.6855
M2 = (153 + 67.6289)/2.0 + 1 = 111.314
Lower limit is -100 = Q(43)
Upper limit is 15.3846 = Q(111)
-100 < 0 < 15.3846 indicating no trend in data.

Sen's Slope Analysis

Parameter: Selenium, total

Location: MW-2R

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<1 (6/4/2012)	ND<1 (12/13/2011)	(1 - 1)/(2 - 1)	0
ND<1 (12/11/2012)	ND<1 (12/13/2011)	(1 - 1)/(3 - 1)	0
ND<1 (6/3/2013)	ND<1 (12/13/2011)	(1 - 1)/(4 - 1)	0
ND<1 (12/3/2013)	ND<1 (12/13/2011)	(1 - 1)/(5 - 1)	0
ND<1 (6/2/2014)	ND<1 (12/13/2011)	(1 - 1)/(6 - 1)	0
ND<1 (12/2/2014)	ND<1 (12/13/2011)	(1 - 1)/(7 - 1)	0
ND<1 (6/1/2015)	ND<1 (12/13/2011)	(1 - 1)/(8 - 1)	0
ND<1 (12/7/2015)	ND<1 (12/13/2011)	(1 - 1)/(9 - 1)	0
ND<1 (6/6/2016)	ND<1 (12/13/2011)	(1 - 1)/(10 - 1)	0
ND<1 (12/5/2016)	ND<1 (12/13/2011)	(1 - 1)/(11 - 1)	0
ND<1 (6/20/2017)	ND<1 (12/13/2011)	(1 - 1)/(12 - 1)	0
ND<1 (12/4/2017)	ND<1 (12/13/2011)	(1 - 1)/(13 - 1)	0
ND<1 (6/4/2018)	ND<1 (12/13/2011)	(1 - 1)/(14 - 1)	0
ND<1 (12/11/2012)	ND<1 (6/4/2012)	(1 - 1)/(3 - 2)	0
ND<1 (6/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(4 - 2)	0
ND<1 (12/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(5 - 2)	0
ND<1 (6/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(6 - 2)	0
ND<1 (12/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(7 - 2)	0
ND<1 (6/1/2015)	ND<1 (6/4/2012)	(1 - 1)/(8 - 2)	0
ND<1 (12/7/2015)	ND<1 (6/4/2012)	(1 - 1)/(9 - 2)	0
ND<1 (6/6/2016)	ND<1 (6/4/2012)	(1 - 1)/(10 - 2)	0
ND<1 (12/5/2016)	ND<1 (6/4/2012)	(1 - 1)/(11 - 2)	0
ND<1 (6/20/2017)	ND<1 (6/4/2012)	(1 - 1)/(12 - 2)	0
ND<1 (12/4/2017)	ND<1 (6/4/2012)	(1 - 1)/(13 - 2)	0
ND<1 (6/4/2018)	ND<1 (6/4/2012)	(1 - 1)/(14 - 2)	0
ND<1 (6/3/2013)	ND<1 (12/11/2012)	(1 - 1)/(4 - 3)	0
ND<1 (12/3/2013)	ND<1 (12/11/2012)	(1 - 1)/(5 - 3)	0
ND<1 (6/2/2014)	ND<1 (12/11/2012)	(1 - 1)/(6 - 3)	0
ND<1 (12/2/2014)	ND<1 (12/11/2012)	(1 - 1)/(7 - 3)	0
ND<1 (6/1/2015)	ND<1 (12/11/2012)	(1 - 1)/(8 - 3)	0
ND<1 (12/7/2015)	ND<1 (12/11/2012)	(1 - 1)/(9 - 3)	0
ND<1 (6/6/2016)	ND<1 (12/11/2012)	(1 - 1)/(10 - 3)	0
ND<1 (12/5/2016)	ND<1 (12/11/2012)	(1 - 1)/(11 - 3)	0
ND<1 (6/20/2017)	ND<1 (12/11/2012)	(1 - 1)/(12 - 3)	0
ND<1 (12/4/2017)	ND<1 (12/11/2012)	(1 - 1)/(13 - 3)	0
ND<1 (6/4/2018)	ND<1 (12/11/2012)	(1 - 1)/(14 - 3)	0
ND<1 (12/3/2013)	ND<1 (6/3/2013)	(1 - 1)/(5 - 4)	0
ND<1 (6/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(6 - 4)	0
ND<1 (12/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(7 - 4)	0
ND<1 (6/1/2015)	ND<1 (6/3/2013)	(1 - 1)/(8 - 4)	0
ND<1 (12/7/2015)	ND<1 (6/3/2013)	(1 - 1)/(9 - 4)	0
ND<1 (6/6/2016)	ND<1 (6/3/2013)	(1 - 1)/(10 - 4)	0
ND<1 (12/5/2016)	ND<1 (6/3/2013)	(1 - 1)/(11 - 4)	0
ND<1 (6/20/2017)	ND<1 (6/3/2013)	(1 - 1)/(12 - 4)	0
ND<1 (12/4/2017)	ND<1 (6/3/2013)	(1 - 1)/(13 - 4)	0
ND<1 (6/4/2018)	ND<1 (6/3/2013)	(1 - 1)/(14 - 4)	0
ND<1 (6/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(6 - 5)	0
ND<1 (12/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(7 - 5)	0

Royalton Road LF

ND<1 (6/1/2015)	ND<1 (12/3/2013)	(1 - 1)/(8 - 5)	0
ND<1 (12/7/2015)	ND<1 (12/3/2013)	(1 - 1)/(9 - 5)	0
ND<1 (6/6/2016)	ND<1 (12/3/2013)	(1 - 1)/(10 - 5)	0
ND<1 (12/5/2016)	ND<1 (12/3/2013)	(1 - 1)/(11 - 5)	0
ND<1 (6/20/2017)	ND<1 (12/3/2013)	(1 - 1)/(12 - 5)	0
ND<1 (12/4/2017)	ND<1 (12/3/2013)	(1 - 1)/(13 - 5)	0
ND<1 (6/4/2018)	ND<1 (12/3/2013)	(1 - 1)/(14 - 5)	0

ND<1 (12/2/2014)	ND<1 (6/2/2014)	(1 - 1)/(7 - 6)	0
ND<1 (6/1/2015)	ND<1 (6/2/2014)	(1 - 1)/(8 - 6)	0
ND<1 (12/7/2015)	ND<1 (6/2/2014)	(1 - 1)/(9 - 6)	0
ND<1 (6/6/2016)	ND<1 (6/2/2014)	(1 - 1)/(10 - 6)	0
ND<1 (12/5/2016)	ND<1 (6/2/2014)	(1 - 1)/(11 - 6)	0
ND<1 (6/20/2017)	ND<1 (6/2/2014)	(1 - 1)/(12 - 6)	0
ND<1 (12/4/2017)	ND<1 (6/2/2014)	(1 - 1)/(13 - 6)	0
ND<1 (6/4/2018)	ND<1 (6/2/2014)	(1 - 1)/(14 - 6)	0

ND<1 (6/1/2015)	ND<1 (12/2/2014)	(1 - 1)/(8 - 7)	0
ND<1 (12/7/2015)	ND<1 (12/2/2014)	(1 - 1)/(9 - 7)	0
ND<1 (6/6/2016)	ND<1 (12/2/2014)	(1 - 1)/(10 - 7)	0
ND<1 (12/5/2016)	ND<1 (12/2/2014)	(1 - 1)/(11 - 7)	0
ND<1 (6/20/2017)	ND<1 (12/2/2014)	(1 - 1)/(12 - 7)	0
ND<1 (12/4/2017)	ND<1 (12/2/2014)	(1 - 1)/(13 - 7)	0
ND<1 (6/4/2018)	ND<1 (12/2/2014)	(1 - 1)/(14 - 7)	0

ND<1 (12/7/2015)	ND<1 (6/1/2015)	(1 - 1)/(9 - 8)	0
ND<1 (6/6/2016)	ND<1 (6/1/2015)	(1 - 1)/(10 - 8)	0
ND<1 (12/5/2016)	ND<1 (6/1/2015)	(1 - 1)/(11 - 8)	0
ND<1 (6/20/2017)	ND<1 (6/1/2015)	(1 - 1)/(12 - 8)	0
ND<1 (12/4/2017)	ND<1 (6/1/2015)	(1 - 1)/(13 - 8)	0
ND<1 (6/4/2018)	ND<1 (6/1/2015)	(1 - 1)/(14 - 8)	0

ND<1 (6/6/2016)	ND<1 (12/7/2015)	(1 - 1)/(10 - 9)	0
ND<1 (12/5/2016)	ND<1 (12/7/2015)	(1 - 1)/(11 - 9)	0
ND<1 (6/20/2017)	ND<1 (12/7/2015)	(1 - 1)/(12 - 9)	0
ND<1 (12/4/2017)	ND<1 (12/7/2015)	(1 - 1)/(13 - 9)	0
ND<1 (6/4/2018)	ND<1 (12/7/2015)	(1 - 1)/(14 - 9)	0

ND<1 (12/5/2016)	ND<1 (6/6/2016)	(1 - 1)/(11 - 10)	0
ND<1 (6/20/2017)	ND<1 (6/6/2016)	(1 - 1)/(12 - 10)	0
ND<1 (12/4/2017)	ND<1 (6/6/2016)	(1 - 1)/(13 - 10)	0
ND<1 (6/4/2018)	ND<1 (6/6/2016)	(1 - 1)/(14 - 10)	0

ND<1 (6/20/2017)	ND<1 (12/5/2016)	(1 - 1)/(12 - 11)	0
ND<1 (12/4/2017)	ND<1 (12/5/2016)	(1 - 1)/(13 - 11)	0
ND<1 (6/4/2018)	ND<1 (12/5/2016)	(1 - 1)/(14 - 11)	0

ND<1 (12/4/2017)	ND<1 (6/20/2017)	(1 - 1)/(13 - 12)	0
ND<1 (6/4/2018)	ND<1 (6/20/2017)	(1 - 1)/(14 - 12)	0

ND<1 (6/4/2018)	ND<1 (12/4/2017)	(1 - 1)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	1	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis
Parameter: Selenium, total
Location: MW-3
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<1 (6/4/2012)	ND<1 0.5J (12/13/2011)	(1 - 1)/(2 - 1)	0
ND<1 (12/11/2012)	ND<1 0.5J (12/13/2011)	(1 - 1)/(3 - 1)	0
ND<1 (6/3/2013)	ND<1 0.5J (12/13/2011)	(1 - 1)/(4 - 1)	0
ND<1 (12/3/2013)	ND<1 0.5J (12/13/2011)	(1 - 1)/(5 - 1)	0
ND<1 (6/2/2014)	ND<1 0.5J (12/13/2011)	(1 - 1)/(6 - 1)	0
ND<1 (12/2/2014)	ND<1 0.5J (12/13/2011)	(1 - 1)/(7 - 1)	0
ND<1 (6/1/2015)	ND<1 0.5J (12/13/2011)	(1 - 1)/(8 - 1)	0
ND<1 (12/7/2015)	ND<1 0.5J (12/13/2011)	(1 - 1)/(9 - 1)	0
ND<1 (6/6/2016)	ND<1 0.5J (12/13/2011)	(1 - 1)/(10 - 1)	0
ND<1 (12/5/2016)	ND<1 0.5J (12/13/2011)	(1 - 1)/(11 - 1)	0
ND<1 (6/20/2017)	ND<1 0.5J (12/13/2011)	(1 - 1)/(12 - 1)	0
ND<1 (12/4/2017)	ND<1 0.5J (12/13/2011)	(1 - 1)/(13 - 1)	0
ND<1 (6/4/2018)	ND<1 0.5J (12/13/2011)	(1 - 1)/(14 - 1)	0
ND<1 (12/11/2012)	ND<1 (6/4/2012)	(1 - 1)/(3 - 2)	0
ND<1 (6/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(4 - 2)	0
ND<1 (12/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(5 - 2)	0
ND<1 (6/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(6 - 2)	0
ND<1 (12/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(7 - 2)	0
ND<1 (6/1/2015)	ND<1 (6/4/2012)	(1 - 1)/(8 - 2)	0
ND<1 (12/7/2015)	ND<1 (6/4/2012)	(1 - 1)/(9 - 2)	0
ND<1 (6/6/2016)	ND<1 (6/4/2012)	(1 - 1)/(10 - 2)	0
ND<1 (12/5/2016)	ND<1 (6/4/2012)	(1 - 1)/(11 - 2)	0
ND<1 (6/20/2017)	ND<1 (6/4/2012)	(1 - 1)/(12 - 2)	0
ND<1 (12/4/2017)	ND<1 (6/4/2012)	(1 - 1)/(13 - 2)	0
ND<1 (6/4/2018)	ND<1 (6/4/2012)	(1 - 1)/(14 - 2)	0
ND<1 (6/3/2013)	ND<1 (12/11/2012)	(1 - 1)/(4 - 3)	0
ND<1 (12/3/2013)	ND<1 (12/11/2012)	(1 - 1)/(5 - 3)	0
ND<1 (6/2/2014)	ND<1 (12/11/2012)	(1 - 1)/(6 - 3)	0
ND<1 (12/2/2014)	ND<1 (12/11/2012)	(1 - 1)/(7 - 3)	0
ND<1 (6/1/2015)	ND<1 (12/11/2012)	(1 - 1)/(8 - 3)	0
ND<1 (12/7/2015)	ND<1 (12/11/2012)	(1 - 1)/(9 - 3)	0
ND<1 (6/6/2016)	ND<1 (12/11/2012)	(1 - 1)/(10 - 3)	0
ND<1 (12/5/2016)	ND<1 (12/11/2012)	(1 - 1)/(11 - 3)	0
ND<1 (6/20/2017)	ND<1 (12/11/2012)	(1 - 1)/(12 - 3)	0
ND<1 (12/4/2017)	ND<1 (12/11/2012)	(1 - 1)/(13 - 3)	0
ND<1 (6/4/2018)	ND<1 (12/11/2012)	(1 - 1)/(14 - 3)	0
ND<1 (12/3/2013)	ND<1 (6/3/2013)	(1 - 1)/(5 - 4)	0
ND<1 (6/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(6 - 4)	0
ND<1 (12/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(7 - 4)	0
ND<1 (6/1/2015)	ND<1 (6/3/2013)	(1 - 1)/(8 - 4)	0
ND<1 (12/7/2015)	ND<1 (6/3/2013)	(1 - 1)/(9 - 4)	0
ND<1 (6/6/2016)	ND<1 (6/3/2013)	(1 - 1)/(10 - 4)	0
ND<1 (12/5/2016)	ND<1 (6/3/2013)	(1 - 1)/(11 - 4)	0
ND<1 (6/20/2017)	ND<1 (6/3/2013)	(1 - 1)/(12 - 4)	0
ND<1 (12/4/2017)	ND<1 (6/3/2013)	(1 - 1)/(13 - 4)	0
ND<1 (6/4/2018)	ND<1 (6/3/2013)	(1 - 1)/(14 - 4)	0
ND<1 (6/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(6 - 5)	0
ND<1 (12/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(7 - 5)	0

ND<1 (6/1/2015)	ND<1 (12/3/2013)	(1 - 1)/(8 - 5)	0
ND<1 (12/7/2015)	ND<1 (12/3/2013)	(1 - 1)/(9 - 5)	0
ND<1 (6/6/2016)	ND<1 (12/3/2013)	(1 - 1)/(10 - 5)	0
ND<1 (12/5/2016)	ND<1 (12/3/2013)	(1 - 1)/(11 - 5)	0
ND<1 (6/20/2017)	ND<1 (12/3/2013)	(1 - 1)/(12 - 5)	0
ND<1 (12/4/2017)	ND<1 (12/3/2013)	(1 - 1)/(13 - 5)	0
ND<1 (6/4/2018)	ND<1 (12/3/2013)	(1 - 1)/(14 - 5)	0
ND<1 (12/2/2014)	ND<1 (6/2/2014)	(1 - 1)/(7 - 6)	0
ND<1 (6/1/2015)	ND<1 (6/2/2014)	(1 - 1)/(8 - 6)	0
ND<1 (12/7/2015)	ND<1 (6/2/2014)	(1 - 1)/(9 - 6)	0
ND<1 (6/6/2016)	ND<1 (6/2/2014)	(1 - 1)/(10 - 6)	0
ND<1 (12/5/2016)	ND<1 (6/2/2014)	(1 - 1)/(11 - 6)	0
ND<1 (6/20/2017)	ND<1 (6/2/2014)	(1 - 1)/(12 - 6)	0
ND<1 (12/4/2017)	ND<1 (6/2/2014)	(1 - 1)/(13 - 6)	0
ND<1 (6/4/2018)	ND<1 (6/2/2014)	(1 - 1)/(14 - 6)	0
ND<1 (6/1/2015)	ND<1 (12/2/2014)	(1 - 1)/(8 - 7)	0
ND<1 (12/7/2015)	ND<1 (12/2/2014)	(1 - 1)/(9 - 7)	0
ND<1 (6/6/2016)	ND<1 (12/2/2014)	(1 - 1)/(10 - 7)	0
ND<1 (12/5/2016)	ND<1 (12/2/2014)	(1 - 1)/(11 - 7)	0
ND<1 (6/20/2017)	ND<1 (12/2/2014)	(1 - 1)/(12 - 7)	0
ND<1 (12/4/2017)	ND<1 (12/2/2014)	(1 - 1)/(13 - 7)	0
ND<1 (6/4/2018)	ND<1 (12/2/2014)	(1 - 1)/(14 - 7)	0
ND<1 (12/7/2015)	ND<1 (6/1/2015)	(1 - 1)/(9 - 8)	0
ND<1 (6/6/2016)	ND<1 (6/1/2015)	(1 - 1)/(10 - 8)	0
ND<1 (12/5/2016)	ND<1 (6/1/2015)	(1 - 1)/(11 - 8)	0
ND<1 (6/20/2017)	ND<1 (6/1/2015)	(1 - 1)/(12 - 8)	0
ND<1 (12/4/2017)	ND<1 (6/1/2015)	(1 - 1)/(13 - 8)	0
ND<1 (6/4/2018)	ND<1 (6/1/2015)	(1 - 1)/(14 - 8)	0
ND<1 (6/6/2016)	ND<1 (12/7/2015)	(1 - 1)/(10 - 9)	0
ND<1 (12/5/2016)	ND<1 (12/7/2015)	(1 - 1)/(11 - 9)	0
ND<1 (6/20/2017)	ND<1 (12/7/2015)	(1 - 1)/(12 - 9)	0
ND<1 (12/4/2017)	ND<1 (12/7/2015)	(1 - 1)/(13 - 9)	0
ND<1 (6/4/2018)	ND<1 (12/7/2015)	(1 - 1)/(14 - 9)	0
ND<1 (12/5/2016)	ND<1 (6/6/2016)	(1 - 1)/(11 - 10)	0
ND<1 (6/20/2017)	ND<1 (6/6/2016)	(1 - 1)/(12 - 10)	0
ND<1 (12/4/2017)	ND<1 (6/6/2016)	(1 - 1)/(13 - 10)	0
ND<1 (6/4/2018)	ND<1 (6/6/2016)	(1 - 1)/(14 - 10)	0
ND<1 (6/20/2017)	ND<1 (12/5/2016)	(1 - 1)/(12 - 11)	0
ND<1 (12/4/2017)	ND<1 (12/5/2016)	(1 - 1)/(13 - 11)	0
ND<1 (6/4/2018)	ND<1 (12/5/2016)	(1 - 1)/(14 - 11)	0
ND<1 (12/4/2017)	ND<1 (6/20/2017)	(1 - 1)/(13 - 12)	0
ND<1 (6/4/2018)	ND<1 (6/20/2017)	(1 - 1)/(14 - 12)	0
ND<1 (6/4/2018)	ND<1 (12/4/2017)	(1 - 1)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

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8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	1	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis
Parameter: Selenium, total
Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<1 (6/4/2012)	ND<1 (12/13/2011)	(1 - 1)/(2 - 1)	0
ND<1 (12/11/2012)	ND<1 (12/13/2011)	(1 - 1)/(3 - 1)	0
ND<1 (6/3/2013)	ND<1 (12/13/2011)	(1 - 1)/(4 - 1)	0
ND<1 (12/3/2013)	ND<1 (12/13/2011)	(1 - 1)/(5 - 1)	0
ND<1 (6/2/2014)	ND<1 (12/13/2011)	(1 - 1)/(6 - 1)	0
ND<1 (12/2/2014)	ND<1 (12/13/2011)	(1 - 1)/(7 - 1)	0
ND<1 (6/1/2015)	ND<1 (12/13/2011)	(1 - 1)/(8 - 1)	0
ND<1 (12/7/2015)	ND<1 (12/13/2011)	(1 - 1)/(9 - 1)	0
ND<1 (6/6/2016)	ND<1 (12/13/2011)	(1 - 1)/(10 - 1)	0
ND<1 (12/5/2016)	ND<1 (12/13/2011)	(1 - 1)/(11 - 1)	0
ND<1 (6/20/2017)	ND<1 (12/13/2011)	(1 - 1)/(12 - 1)	0
ND<1 (12/4/2017)	ND<1 (12/13/2011)	(1 - 1)/(13 - 1)	0
ND<1 (6/4/2018)	ND<1 (12/13/2011)	(1 - 1)/(14 - 1)	0
ND<1 (12/11/2012)	ND<1 (6/4/2012)	(1 - 1)/(3 - 2)	0
ND<1 (6/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(4 - 2)	0
ND<1 (12/3/2013)	ND<1 (6/4/2012)	(1 - 1)/(5 - 2)	0
ND<1 (6/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(6 - 2)	0
ND<1 (12/2/2014)	ND<1 (6/4/2012)	(1 - 1)/(7 - 2)	0
ND<1 (6/1/2015)	ND<1 (6/4/2012)	(1 - 1)/(8 - 2)	0
ND<1 (12/7/2015)	ND<1 (6/4/2012)	(1 - 1)/(9 - 2)	0
ND<1 (6/6/2016)	ND<1 (6/4/2012)	(1 - 1)/(10 - 2)	0
ND<1 (12/5/2016)	ND<1 (6/4/2012)	(1 - 1)/(11 - 2)	0
ND<1 (6/20/2017)	ND<1 (6/4/2012)	(1 - 1)/(12 - 2)	0
ND<1 (12/4/2017)	ND<1 (6/4/2012)	(1 - 1)/(13 - 2)	0
ND<1 (6/4/2018)	ND<1 (6/4/2012)	(1 - 1)/(14 - 2)	0
ND<1 (6/3/2013)	ND<1 (12/11/2012)	(1 - 1)/(4 - 3)	0
ND<1 (12/3/2013)	ND<1 (12/11/2012)	(1 - 1)/(5 - 3)	0
ND<1 (6/2/2014)	ND<1 (12/11/2012)	(1 - 1)/(6 - 3)	0
ND<1 (12/2/2014)	ND<1 (12/11/2012)	(1 - 1)/(7 - 3)	0
ND<1 (6/1/2015)	ND<1 (12/11/2012)	(1 - 1)/(8 - 3)	0
ND<1 (12/7/2015)	ND<1 (12/11/2012)	(1 - 1)/(9 - 3)	0
ND<1 (6/6/2016)	ND<1 (12/11/2012)	(1 - 1)/(10 - 3)	0
ND<1 (12/5/2016)	ND<1 (12/11/2012)	(1 - 1)/(11 - 3)	0
ND<1 (6/20/2017)	ND<1 (12/11/2012)	(1 - 1)/(12 - 3)	0
ND<1 (12/4/2017)	ND<1 (12/11/2012)	(1 - 1)/(13 - 3)	0
ND<1 (6/4/2018)	ND<1 (12/11/2012)	(1 - 1)/(14 - 3)	0
ND<1 (12/3/2013)	ND<1 (6/3/2013)	(1 - 1)/(5 - 4)	0
ND<1 (6/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(6 - 4)	0
ND<1 (12/2/2014)	ND<1 (6/3/2013)	(1 - 1)/(7 - 4)	0
ND<1 (6/1/2015)	ND<1 (6/3/2013)	(1 - 1)/(8 - 4)	0
ND<1 (12/7/2015)	ND<1 (6/3/2013)	(1 - 1)/(9 - 4)	0
ND<1 (6/6/2016)	ND<1 (6/3/2013)	(1 - 1)/(10 - 4)	0
ND<1 (12/5/2016)	ND<1 (6/3/2013)	(1 - 1)/(11 - 4)	0
ND<1 (6/20/2017)	ND<1 (6/3/2013)	(1 - 1)/(12 - 4)	0
ND<1 (12/4/2017)	ND<1 (6/3/2013)	(1 - 1)/(13 - 4)	0
ND<1 (6/4/2018)	ND<1 (6/3/2013)	(1 - 1)/(14 - 4)	0
ND<1 (6/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(6 - 5)	0
ND<1 (12/2/2014)	ND<1 (12/3/2013)	(1 - 1)/(7 - 5)	0

ND<1 (6/1/2015)	ND<1 (12/3/2013)	(1 - 1)/(8 - 5)	0
ND<1 (12/7/2015)	ND<1 (12/3/2013)	(1 - 1)/(9 - 5)	0
ND<1 (6/6/2016)	ND<1 (12/3/2013)	(1 - 1)/(10 - 5)	0
ND<1 (12/5/2016)	ND<1 (12/3/2013)	(1 - 1)/(11 - 5)	0
ND<1 (6/20/2017)	ND<1 (12/3/2013)	(1 - 1)/(12 - 5)	0
ND<1 (12/4/2017)	ND<1 (12/3/2013)	(1 - 1)/(13 - 5)	0
ND<1 (6/4/2018)	ND<1 (12/3/2013)	(1 - 1)/(14 - 5)	0
ND<1 (12/2/2014)	ND<1 (6/2/2014)	(1 - 1)/(7 - 6)	0
ND<1 (6/1/2015)	ND<1 (6/2/2014)	(1 - 1)/(8 - 6)	0
ND<1 (12/7/2015)	ND<1 (6/2/2014)	(1 - 1)/(9 - 6)	0
ND<1 (6/6/2016)	ND<1 (6/2/2014)	(1 - 1)/(10 - 6)	0
ND<1 (12/5/2016)	ND<1 (6/2/2014)	(1 - 1)/(11 - 6)	0
ND<1 (6/20/2017)	ND<1 (6/2/2014)	(1 - 1)/(12 - 6)	0
ND<1 (12/4/2017)	ND<1 (6/2/2014)	(1 - 1)/(13 - 6)	0
ND<1 (6/4/2018)	ND<1 (6/2/2014)	(1 - 1)/(14 - 6)	0
ND<1 (6/1/2015)	ND<1 (12/2/2014)	(1 - 1)/(8 - 7)	0
ND<1 (12/7/2015)	ND<1 (12/2/2014)	(1 - 1)/(9 - 7)	0
ND<1 (6/6/2016)	ND<1 (12/2/2014)	(1 - 1)/(10 - 7)	0
ND<1 (12/5/2016)	ND<1 (12/2/2014)	(1 - 1)/(11 - 7)	0
ND<1 (6/20/2017)	ND<1 (12/2/2014)	(1 - 1)/(12 - 7)	0
ND<1 (12/4/2017)	ND<1 (12/2/2014)	(1 - 1)/(13 - 7)	0
ND<1 (6/4/2018)	ND<1 (12/2/2014)	(1 - 1)/(14 - 7)	0
ND<1 (12/7/2015)	ND<1 (6/1/2015)	(1 - 1)/(9 - 8)	0
ND<1 (6/6/2016)	ND<1 (6/1/2015)	(1 - 1)/(10 - 8)	0
ND<1 (12/5/2016)	ND<1 (6/1/2015)	(1 - 1)/(11 - 8)	0
ND<1 (6/20/2017)	ND<1 (6/1/2015)	(1 - 1)/(12 - 8)	0
ND<1 (12/4/2017)	ND<1 (6/1/2015)	(1 - 1)/(13 - 8)	0
ND<1 (6/4/2018)	ND<1 (6/1/2015)	(1 - 1)/(14 - 8)	0
ND<1 (6/6/2016)	ND<1 (12/7/2015)	(1 - 1)/(10 - 9)	0
ND<1 (12/5/2016)	ND<1 (12/7/2015)	(1 - 1)/(11 - 9)	0
ND<1 (6/20/2017)	ND<1 (12/7/2015)	(1 - 1)/(12 - 9)	0
ND<1 (12/4/2017)	ND<1 (12/7/2015)	(1 - 1)/(13 - 9)	0
ND<1 (6/4/2018)	ND<1 (12/7/2015)	(1 - 1)/(14 - 9)	0
ND<1 (12/5/2016)	ND<1 (6/6/2016)	(1 - 1)/(11 - 10)	0
ND<1 (6/20/2017)	ND<1 (6/6/2016)	(1 - 1)/(12 - 10)	0
ND<1 (12/4/2017)	ND<1 (6/6/2016)	(1 - 1)/(13 - 10)	0
ND<1 (6/4/2018)	ND<1 (6/6/2016)	(1 - 1)/(14 - 10)	0
ND<1 (6/20/2017)	ND<1 (12/5/2016)	(1 - 1)/(12 - 11)	0
ND<1 (12/4/2017)	ND<1 (12/5/2016)	(1 - 1)/(13 - 11)	0
ND<1 (6/4/2018)	ND<1 (12/5/2016)	(1 - 1)/(14 - 11)	0
ND<1 (12/4/2017)	ND<1 (6/20/2017)	(1 - 1)/(13 - 12)	0
ND<1 (6/4/2018)	ND<1 (6/20/2017)	(1 - 1)/(14 - 12)	0
ND<1 (6/4/2018)	ND<1 (12/4/2017)	(1 - 1)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	1	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Sen's Slope Analysis
Parameter: Silver, total
Location: MW-2R

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<5 (6/4/2012)	ND<5 (12/13/2011)	(5 - 5)/(2 - 1)	0
ND<5 (12/11/2012)	ND<5 (12/13/2011)	(5 - 5)/(3 - 1)	0
ND<5 (6/3/2013)	ND<5 (12/13/2011)	(5 - 5)/(4 - 1)	0
ND<5 (12/3/2013)	ND<5 (12/13/2011)	(5 - 5)/(5 - 1)	0
ND<5 (6/2/2014)	ND<5 (12/13/2011)	(5 - 5)/(6 - 1)	0
ND<5 (12/2/2014)	ND<5 (12/13/2011)	(5 - 5)/(7 - 1)	0
ND<5 (6/1/2015)	ND<5 (12/13/2011)	(5 - 5)/(8 - 1)	0
ND<5 (12/7/2015)	ND<5 (12/13/2011)	(5 - 5)/(9 - 1)	0
ND<5 (6/6/2016)	ND<5 (12/13/2011)	(5 - 5)/(10 - 1)	0
ND<5 (12/5/2016)	ND<5 (12/13/2011)	(5 - 5)/(11 - 1)	0
ND<5 (6/20/2017)	ND<5 (12/13/2011)	(5 - 5)/(12 - 1)	0
ND<5 (12/4/2017)	ND<5 (12/13/2011)	(5 - 5)/(13 - 1)	0
ND<5 (6/4/2018)	ND<5 (12/13/2011)	(5 - 5)/(14 - 1)	0
ND<5 (12/11/2012)	ND<5 (6/4/2012)	(5 - 5)/(3 - 2)	0
ND<5 (6/3/2013)	ND<5 (6/4/2012)	(5 - 5)/(4 - 2)	0
ND<5 (12/3/2013)	ND<5 (6/4/2012)	(5 - 5)/(5 - 2)	0
ND<5 (6/2/2014)	ND<5 (6/4/2012)	(5 - 5)/(6 - 2)	0
ND<5 (12/2/2014)	ND<5 (6/4/2012)	(5 - 5)/(7 - 2)	0
ND<5 (6/1/2015)	ND<5 (6/4/2012)	(5 - 5)/(8 - 2)	0
ND<5 (12/7/2015)	ND<5 (6/4/2012)	(5 - 5)/(9 - 2)	0
ND<5 (6/6/2016)	ND<5 (6/4/2012)	(5 - 5)/(10 - 2)	0
ND<5 (12/5/2016)	ND<5 (6/4/2012)	(5 - 5)/(11 - 2)	0
ND<5 (6/20/2017)	ND<5 (6/4/2012)	(5 - 5)/(12 - 2)	0
ND<5 (12/4/2017)	ND<5 (6/4/2012)	(5 - 5)/(13 - 2)	0
ND<5 (6/4/2018)	ND<5 (6/4/2012)	(5 - 5)/(14 - 2)	0
ND<5 (6/3/2013)	ND<5 (12/11/2012)	(5 - 5)/(4 - 3)	0
ND<5 (12/3/2013)	ND<5 (12/11/2012)	(5 - 5)/(5 - 3)	0
ND<5 (6/2/2014)	ND<5 (12/11/2012)	(5 - 5)/(6 - 3)	0
ND<5 (12/2/2014)	ND<5 (12/11/2012)	(5 - 5)/(7 - 3)	0
ND<5 (6/1/2015)	ND<5 (12/11/2012)	(5 - 5)/(8 - 3)	0
ND<5 (12/7/2015)	ND<5 (12/11/2012)	(5 - 5)/(9 - 3)	0
ND<5 (6/6/2016)	ND<5 (12/11/2012)	(5 - 5)/(10 - 3)	0
ND<5 (12/5/2016)	ND<5 (12/11/2012)	(5 - 5)/(11 - 3)	0
ND<5 (6/20/2017)	ND<5 (12/11/2012)	(5 - 5)/(12 - 3)	0
ND<5 (12/4/2017)	ND<5 (12/11/2012)	(5 - 5)/(13 - 3)	0
ND<5 (6/4/2018)	ND<5 (12/11/2012)	(5 - 5)/(14 - 3)	0
ND<5 (12/3/2013)	ND<5 (6/3/2013)	(5 - 5)/(5 - 4)	0
ND<5 (6/2/2014)	ND<5 (6/3/2013)	(5 - 5)/(6 - 4)	0
ND<5 (12/2/2014)	ND<5 (6/3/2013)	(5 - 5)/(7 - 4)	0
ND<5 (6/1/2015)	ND<5 (6/3/2013)	(5 - 5)/(8 - 4)	0
ND<5 (12/7/2015)	ND<5 (6/3/2013)	(5 - 5)/(9 - 4)	0
ND<5 (6/6/2016)	ND<5 (6/3/2013)	(5 - 5)/(10 - 4)	0
ND<5 (12/5/2016)	ND<5 (6/3/2013)	(5 - 5)/(11 - 4)	0
ND<5 (6/20/2017)	ND<5 (6/3/2013)	(5 - 5)/(12 - 4)	0
ND<5 (12/4/2017)	ND<5 (6/3/2013)	(5 - 5)/(13 - 4)	0
ND<5 (6/4/2018)	ND<5 (6/3/2013)	(5 - 5)/(14 - 4)	0
ND<5 (6/2/2014)	ND<5 (12/3/2013)	(5 - 5)/(6 - 5)	0
ND<5 (12/2/2014)	ND<5 (12/3/2013)	(5 - 5)/(7 - 5)	0

ND<5 (6/1/2015)	ND<5 (12/3/2013)	(5 - 5)/(8 - 5)	0
ND<5 (12/7/2015)	ND<5 (12/3/2013)	(5 - 5)/(9 - 5)	0
ND<5 (6/6/2016)	ND<5 (12/3/2013)	(5 - 5)/(10 - 5)	0
ND<5 (12/5/2016)	ND<5 (12/3/2013)	(5 - 5)/(11 - 5)	0
ND<5 (6/20/2017)	ND<5 (12/3/2013)	(5 - 5)/(12 - 5)	0
ND<5 (12/4/2017)	ND<5 (12/3/2013)	(5 - 5)/(13 - 5)	0
ND<5 (6/4/2018)	ND<5 (12/3/2013)	(5 - 5)/(14 - 5)	0
ND<5 (12/2/2014)	ND<5 (6/2/2014)	(5 - 5)/(7 - 6)	0
ND<5 (6/1/2015)	ND<5 (6/2/2014)	(5 - 5)/(8 - 6)	0
ND<5 (12/7/2015)	ND<5 (6/2/2014)	(5 - 5)/(9 - 6)	0
ND<5 (6/6/2016)	ND<5 (6/2/2014)	(5 - 5)/(10 - 6)	0
ND<5 (12/5/2016)	ND<5 (6/2/2014)	(5 - 5)/(11 - 6)	0
ND<5 (6/20/2017)	ND<5 (6/2/2014)	(5 - 5)/(12 - 6)	0
ND<5 (12/4/2017)	ND<5 (6/2/2014)	(5 - 5)/(13 - 6)	0
ND<5 (6/4/2018)	ND<5 (6/2/2014)	(5 - 5)/(14 - 6)	0
ND<5 (6/1/2015)	ND<5 (12/2/2014)	(5 - 5)/(8 - 7)	0
ND<5 (12/7/2015)	ND<5 (12/2/2014)	(5 - 5)/(9 - 7)	0
ND<5 (6/6/2016)	ND<5 (12/2/2014)	(5 - 5)/(10 - 7)	0
ND<5 (12/5/2016)	ND<5 (12/2/2014)	(5 - 5)/(11 - 7)	0
ND<5 (6/20/2017)	ND<5 (12/2/2014)	(5 - 5)/(12 - 7)	0
ND<5 (12/4/2017)	ND<5 (12/2/2014)	(5 - 5)/(13 - 7)	0
ND<5 (6/4/2018)	ND<5 (12/2/2014)	(5 - 5)/(14 - 7)	0
ND<5 (12/7/2015)	ND<5 (6/1/2015)	(5 - 5)/(9 - 8)	0
ND<5 (6/6/2016)	ND<5 (6/1/2015)	(5 - 5)/(10 - 8)	0
ND<5 (12/5/2016)	ND<5 (6/1/2015)	(5 - 5)/(11 - 8)	0
ND<5 (6/20/2017)	ND<5 (6/1/2015)	(5 - 5)/(12 - 8)	0
ND<5 (12/4/2017)	ND<5 (6/1/2015)	(5 - 5)/(13 - 8)	0
ND<5 (6/4/2018)	ND<5 (6/1/2015)	(5 - 5)/(14 - 8)	0
ND<5 (6/6/2016)	ND<5 (12/7/2015)	(5 - 5)/(10 - 9)	0
ND<5 (12/5/2016)	ND<5 (12/7/2015)	(5 - 5)/(11 - 9)	0
ND<5 (6/20/2017)	ND<5 (12/7/2015)	(5 - 5)/(12 - 9)	0
ND<5 (12/4/2017)	ND<5 (12/7/2015)	(5 - 5)/(13 - 9)	0
ND<5 (6/4/2018)	ND<5 (12/7/2015)	(5 - 5)/(14 - 9)	0
ND<5 (12/5/2016)	ND<5 (6/6/2016)	(5 - 5)/(11 - 10)	0
ND<5 (6/20/2017)	ND<5 (6/6/2016)	(5 - 5)/(12 - 10)	0
ND<5 (12/4/2017)	ND<5 (6/6/2016)	(5 - 5)/(13 - 10)	0
ND<5 (6/4/2018)	ND<5 (6/6/2016)	(5 - 5)/(14 - 10)	0
ND<5 (6/20/2017)	ND<5 (12/5/2016)	(5 - 5)/(12 - 11)	0
ND<5 (12/4/2017)	ND<5 (12/5/2016)	(5 - 5)/(13 - 11)	0
ND<5 (6/4/2018)	ND<5 (12/5/2016)	(5 - 5)/(14 - 11)	0
ND<5 (12/4/2017)	ND<5 (6/20/2017)	(5 - 5)/(13 - 12)	0
ND<5 (6/4/2018)	ND<5 (6/20/2017)	(5 - 5)/(14 - 12)	0
ND<5 (6/4/2018)	ND<5 (12/4/2017)	(5 - 5)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	5	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Sen's Slope Analysis

Parameter: Silver, total

Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<5 (6/4/2012)	ND<5 (12/13/2011)	(5 - 5)/(2 - 1)	0
ND<5 (12/11/2012)	ND<5 (12/13/2011)	(5 - 5)/(3 - 1)	0
ND<5 (6/3/2013)	ND<5 (12/13/2011)	(5 - 5)/(4 - 1)	0
ND<5 (12/3/2013)	ND<5 (12/13/2011)	(5 - 5)/(5 - 1)	0
ND<5 (6/2/2014)	ND<5 (12/13/2011)	(5 - 5)/(6 - 1)	0
ND<5 (12/2/2014)	ND<5 (12/13/2011)	(5 - 5)/(7 - 1)	0
ND<5 (6/1/2015)	ND<5 (12/13/2011)	(5 - 5)/(8 - 1)	0
ND<5 (12/7/2015)	ND<5 (12/13/2011)	(5 - 5)/(9 - 1)	0
ND<5 (6/6/2016)	ND<5 (12/13/2011)	(5 - 5)/(10 - 1)	0
ND<5 (12/5/2016)	ND<5 (12/13/2011)	(5 - 5)/(11 - 1)	0
ND<5 (6/20/2017)	ND<5 (12/13/2011)	(5 - 5)/(12 - 1)	0
ND<5 (12/4/2017)	ND<5 (12/13/2011)	(5 - 5)/(13 - 1)	0
ND<5 (6/4/2018)	ND<5 (12/13/2011)	(5 - 5)/(14 - 1)	0
ND<5 (12/11/2012)	ND<5 (6/4/2012)	(5 - 5)/(3 - 2)	0
ND<5 (6/3/2013)	ND<5 (6/4/2012)	(5 - 5)/(4 - 2)	0
ND<5 (12/3/2013)	ND<5 (6/4/2012)	(5 - 5)/(5 - 2)	0
ND<5 (6/2/2014)	ND<5 (6/4/2012)	(5 - 5)/(6 - 2)	0
ND<5 (12/2/2014)	ND<5 (6/4/2012)	(5 - 5)/(7 - 2)	0
ND<5 (6/1/2015)	ND<5 (6/4/2012)	(5 - 5)/(8 - 2)	0
ND<5 (12/7/2015)	ND<5 (6/4/2012)	(5 - 5)/(9 - 2)	0
ND<5 (6/6/2016)	ND<5 (6/4/2012)	(5 - 5)/(10 - 2)	0
ND<5 (12/5/2016)	ND<5 (6/4/2012)	(5 - 5)/(11 - 2)	0
ND<5 (6/20/2017)	ND<5 (6/4/2012)	(5 - 5)/(12 - 2)	0
ND<5 (12/4/2017)	ND<5 (6/4/2012)	(5 - 5)/(13 - 2)	0
ND<5 (6/4/2018)	ND<5 (6/4/2012)	(5 - 5)/(14 - 2)	0
ND<5 (6/3/2013)	ND<5 (12/11/2012)	(5 - 5)/(4 - 3)	0
ND<5 (12/3/2013)	ND<5 (12/11/2012)	(5 - 5)/(5 - 3)	0
ND<5 (6/2/2014)	ND<5 (12/11/2012)	(5 - 5)/(6 - 3)	0
ND<5 (12/2/2014)	ND<5 (12/11/2012)	(5 - 5)/(7 - 3)	0
ND<5 (6/1/2015)	ND<5 (12/11/2012)	(5 - 5)/(8 - 3)	0
ND<5 (12/7/2015)	ND<5 (12/11/2012)	(5 - 5)/(9 - 3)	0
ND<5 (6/6/2016)	ND<5 (12/11/2012)	(5 - 5)/(10 - 3)	0
ND<5 (12/5/2016)	ND<5 (12/11/2012)	(5 - 5)/(11 - 3)	0
ND<5 (6/20/2017)	ND<5 (12/11/2012)	(5 - 5)/(12 - 3)	0
ND<5 (12/4/2017)	ND<5 (12/11/2012)	(5 - 5)/(13 - 3)	0
ND<5 (6/4/2018)	ND<5 (12/11/2012)	(5 - 5)/(14 - 3)	0
ND<5 (12/3/2013)	ND<5 (6/3/2013)	(5 - 5)/(5 - 4)	0
ND<5 (6/2/2014)	ND<5 (6/3/2013)	(5 - 5)/(6 - 4)	0
ND<5 (12/2/2014)	ND<5 (6/3/2013)	(5 - 5)/(7 - 4)	0
ND<5 (6/1/2015)	ND<5 (6/3/2013)	(5 - 5)/(8 - 4)	0
ND<5 (12/7/2015)	ND<5 (6/3/2013)	(5 - 5)/(9 - 4)	0
ND<5 (6/6/2016)	ND<5 (6/3/2013)	(5 - 5)/(10 - 4)	0
ND<5 (12/5/2016)	ND<5 (6/3/2013)	(5 - 5)/(11 - 4)	0
ND<5 (6/20/2017)	ND<5 (6/3/2013)	(5 - 5)/(12 - 4)	0
ND<5 (12/4/2017)	ND<5 (6/3/2013)	(5 - 5)/(13 - 4)	0
ND<5 (6/4/2018)	ND<5 (6/3/2013)	(5 - 5)/(14 - 4)	0
ND<5 (6/2/2014)	ND<5 (12/3/2013)	(5 - 5)/(6 - 5)	0
ND<5 (12/2/2014)	ND<5 (12/3/2013)	(5 - 5)/(7 - 5)	0

ND<5 (6/1/2015)	ND<5 (12/3/2013)	(5 - 5)/(8 - 5)	0
ND<5 (12/7/2015)	ND<5 (12/3/2013)	(5 - 5)/(9 - 5)	0
ND<5 (6/6/2016)	ND<5 (12/3/2013)	(5 - 5)/(10 - 5)	0
ND<5 (12/5/2016)	ND<5 (12/3/2013)	(5 - 5)/(11 - 5)	0
ND<5 (6/20/2017)	ND<5 (12/3/2013)	(5 - 5)/(12 - 5)	0
ND<5 (12/4/2017)	ND<5 (12/3/2013)	(5 - 5)/(13 - 5)	0
ND<5 (6/4/2018)	ND<5 (12/3/2013)	(5 - 5)/(14 - 5)	0
ND<5 (12/2/2014)	ND<5 (6/2/2014)	(5 - 5)/(7 - 6)	0
ND<5 (6/1/2015)	ND<5 (6/2/2014)	(5 - 5)/(8 - 6)	0
ND<5 (12/7/2015)	ND<5 (6/2/2014)	(5 - 5)/(9 - 6)	0
ND<5 (6/6/2016)	ND<5 (6/2/2014)	(5 - 5)/(10 - 6)	0
ND<5 (12/5/2016)	ND<5 (6/2/2014)	(5 - 5)/(11 - 6)	0
ND<5 (6/20/2017)	ND<5 (6/2/2014)	(5 - 5)/(12 - 6)	0
ND<5 (12/4/2017)	ND<5 (6/2/2014)	(5 - 5)/(13 - 6)	0
ND<5 (6/4/2018)	ND<5 (6/2/2014)	(5 - 5)/(14 - 6)	0
ND<5 (6/1/2015)	ND<5 (12/2/2014)	(5 - 5)/(8 - 7)	0
ND<5 (12/7/2015)	ND<5 (12/2/2014)	(5 - 5)/(9 - 7)	0
ND<5 (6/6/2016)	ND<5 (12/2/2014)	(5 - 5)/(10 - 7)	0
ND<5 (12/5/2016)	ND<5 (12/2/2014)	(5 - 5)/(11 - 7)	0
ND<5 (6/20/2017)	ND<5 (12/2/2014)	(5 - 5)/(12 - 7)	0
ND<5 (12/4/2017)	ND<5 (12/2/2014)	(5 - 5)/(13 - 7)	0
ND<5 (6/4/2018)	ND<5 (12/2/2014)	(5 - 5)/(14 - 7)	0
ND<5 (12/7/2015)	ND<5 (6/1/2015)	(5 - 5)/(9 - 8)	0
ND<5 (6/6/2016)	ND<5 (6/1/2015)	(5 - 5)/(10 - 8)	0
ND<5 (12/5/2016)	ND<5 (6/1/2015)	(5 - 5)/(11 - 8)	0
ND<5 (6/20/2017)	ND<5 (6/1/2015)	(5 - 5)/(12 - 8)	0
ND<5 (12/4/2017)	ND<5 (6/1/2015)	(5 - 5)/(13 - 8)	0
ND<5 (6/4/2018)	ND<5 (6/1/2015)	(5 - 5)/(14 - 8)	0
ND<5 (6/6/2016)	ND<5 (12/7/2015)	(5 - 5)/(10 - 9)	0
ND<5 (12/5/2016)	ND<5 (12/7/2015)	(5 - 5)/(11 - 9)	0
ND<5 (6/20/2017)	ND<5 (12/7/2015)	(5 - 5)/(12 - 9)	0
ND<5 (12/4/2017)	ND<5 (12/7/2015)	(5 - 5)/(13 - 9)	0
ND<5 (6/4/2018)	ND<5 (12/7/2015)	(5 - 5)/(14 - 9)	0
ND<5 (12/5/2016)	ND<5 (6/6/2016)	(5 - 5)/(11 - 10)	0
ND<5 (6/20/2017)	ND<5 (6/6/2016)	(5 - 5)/(12 - 10)	0
ND<5 (12/4/2017)	ND<5 (6/6/2016)	(5 - 5)/(13 - 10)	0
ND<5 (6/4/2018)	ND<5 (6/6/2016)	(5 - 5)/(14 - 10)	0
ND<5 (6/20/2017)	ND<5 (12/5/2016)	(5 - 5)/(12 - 11)	0
ND<5 (12/4/2017)	ND<5 (12/5/2016)	(5 - 5)/(13 - 11)	0
ND<5 (6/4/2018)	ND<5 (12/5/2016)	(5 - 5)/(14 - 11)	0
ND<5 (12/4/2017)	ND<5 (6/20/2017)	(5 - 5)/(13 - 12)	0
ND<5 (6/4/2018)	ND<5 (6/20/2017)	(5 - 5)/(14 - 12)	0
ND<5 (6/4/2018)	ND<5 (12/4/2017)	(5 - 5)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	5	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Sen's Slope Analysis

Parameter: Silver, total

Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<5 (6/4/2012)	ND<5 (12/13/2011)	(5 - 5)/(2 - 1)	0
ND<5 (12/11/2012)	ND<5 (12/13/2011)	(5 - 5)/(3 - 1)	0
ND<5 (6/3/2013)	ND<5 (12/13/2011)	(5 - 5)/(4 - 1)	0
ND<5 (12/3/2013)	ND<5 (12/13/2011)	(5 - 5)/(5 - 1)	0
ND<5 (6/2/2014)	ND<5 (12/13/2011)	(5 - 5)/(6 - 1)	0
ND<5 (12/2/2014)	ND<5 (12/13/2011)	(5 - 5)/(7 - 1)	0
ND<5 (6/1/2015)	ND<5 (12/13/2011)	(5 - 5)/(8 - 1)	0
ND<5 (12/7/2015)	ND<5 (12/13/2011)	(5 - 5)/(9 - 1)	0
ND<5 (6/6/2016)	ND<5 (12/13/2011)	(5 - 5)/(10 - 1)	0
ND<5 (12/5/2016)	ND<5 (12/13/2011)	(5 - 5)/(11 - 1)	0
ND<5 (6/20/2017)	ND<5 (12/13/2011)	(5 - 5)/(12 - 1)	0
ND<5 (12/4/2017)	ND<5 (12/13/2011)	(5 - 5)/(13 - 1)	0
ND<5 (6/4/2018)	ND<5 (12/13/2011)	(5 - 5)/(14 - 1)	0
ND<5 (12/11/2012)	ND<5 (6/4/2012)	(5 - 5)/(3 - 2)	0
ND<5 (6/3/2013)	ND<5 (6/4/2012)	(5 - 5)/(4 - 2)	0
ND<5 (12/3/2013)	ND<5 (6/4/2012)	(5 - 5)/(5 - 2)	0
ND<5 (6/2/2014)	ND<5 (6/4/2012)	(5 - 5)/(6 - 2)	0
ND<5 (12/2/2014)	ND<5 (6/4/2012)	(5 - 5)/(7 - 2)	0
ND<5 (6/1/2015)	ND<5 (6/4/2012)	(5 - 5)/(8 - 2)	0
ND<5 (12/7/2015)	ND<5 (6/4/2012)	(5 - 5)/(9 - 2)	0
ND<5 (6/6/2016)	ND<5 (6/4/2012)	(5 - 5)/(10 - 2)	0
ND<5 (12/5/2016)	ND<5 (6/4/2012)	(5 - 5)/(11 - 2)	0
ND<5 (6/20/2017)	ND<5 (6/4/2012)	(5 - 5)/(12 - 2)	0
ND<5 (12/4/2017)	ND<5 (6/4/2012)	(5 - 5)/(13 - 2)	0
ND<5 (6/4/2018)	ND<5 (6/4/2012)	(5 - 5)/(14 - 2)	0
ND<5 (6/3/2013)	ND<5 (12/11/2012)	(5 - 5)/(4 - 3)	0
ND<5 (12/3/2013)	ND<5 (12/11/2012)	(5 - 5)/(5 - 3)	0
ND<5 (6/2/2014)	ND<5 (12/11/2012)	(5 - 5)/(6 - 3)	0
ND<5 (12/2/2014)	ND<5 (12/11/2012)	(5 - 5)/(7 - 3)	0
ND<5 (6/1/2015)	ND<5 (12/11/2012)	(5 - 5)/(8 - 3)	0
ND<5 (12/7/2015)	ND<5 (12/11/2012)	(5 - 5)/(9 - 3)	0
ND<5 (6/6/2016)	ND<5 (12/11/2012)	(5 - 5)/(10 - 3)	0
ND<5 (12/5/2016)	ND<5 (12/11/2012)	(5 - 5)/(11 - 3)	0
ND<5 (6/20/2017)	ND<5 (12/11/2012)	(5 - 5)/(12 - 3)	0
ND<5 (12/4/2017)	ND<5 (12/11/2012)	(5 - 5)/(13 - 3)	0
ND<5 (6/4/2018)	ND<5 (12/11/2012)	(5 - 5)/(14 - 3)	0
ND<5 (12/3/2013)	ND<5 (6/3/2013)	(5 - 5)/(5 - 4)	0
ND<5 (6/2/2014)	ND<5 (6/3/2013)	(5 - 5)/(6 - 4)	0
ND<5 (12/2/2014)	ND<5 (6/3/2013)	(5 - 5)/(7 - 4)	0
ND<5 (6/1/2015)	ND<5 (6/3/2013)	(5 - 5)/(8 - 4)	0
ND<5 (12/7/2015)	ND<5 (6/3/2013)	(5 - 5)/(9 - 4)	0
ND<5 (6/6/2016)	ND<5 (6/3/2013)	(5 - 5)/(10 - 4)	0
ND<5 (12/5/2016)	ND<5 (6/3/2013)	(5 - 5)/(11 - 4)	0
ND<5 (6/20/2017)	ND<5 (6/3/2013)	(5 - 5)/(12 - 4)	0
ND<5 (12/4/2017)	ND<5 (6/3/2013)	(5 - 5)/(13 - 4)	0
ND<5 (6/4/2018)	ND<5 (6/3/2013)	(5 - 5)/(14 - 4)	0
ND<5 (6/2/2014)	ND<5 (12/3/2013)	(5 - 5)/(6 - 5)	0
ND<5 (12/2/2014)	ND<5 (12/3/2013)	(5 - 5)/(7 - 5)	0

ND<5 (6/1/2015)	ND<5 (12/3/2013)	(5 - 5)/(8 - 5)	0
ND<5 (12/7/2015)	ND<5 (12/3/2013)	(5 - 5)/(9 - 5)	0
ND<5 (6/6/2016)	ND<5 (12/3/2013)	(5 - 5)/(10 - 5)	0
ND<5 (12/5/2016)	ND<5 (12/3/2013)	(5 - 5)/(11 - 5)	0
ND<5 (6/20/2017)	ND<5 (12/3/2013)	(5 - 5)/(12 - 5)	0
ND<5 (12/4/2017)	ND<5 (12/3/2013)	(5 - 5)/(13 - 5)	0
ND<5 (6/4/2018)	ND<5 (12/3/2013)	(5 - 5)/(14 - 5)	0
ND<5 (12/2/2014)	ND<5 (6/2/2014)	(5 - 5)/(7 - 6)	0
ND<5 (6/1/2015)	ND<5 (6/2/2014)	(5 - 5)/(8 - 6)	0
ND<5 (12/7/2015)	ND<5 (6/2/2014)	(5 - 5)/(9 - 6)	0
ND<5 (6/6/2016)	ND<5 (6/2/2014)	(5 - 5)/(10 - 6)	0
ND<5 (12/5/2016)	ND<5 (6/2/2014)	(5 - 5)/(11 - 6)	0
ND<5 (6/20/2017)	ND<5 (6/2/2014)	(5 - 5)/(12 - 6)	0
ND<5 (12/4/2017)	ND<5 (6/2/2014)	(5 - 5)/(13 - 6)	0
ND<5 (6/4/2018)	ND<5 (6/2/2014)	(5 - 5)/(14 - 6)	0
ND<5 (6/1/2015)	ND<5 (12/2/2014)	(5 - 5)/(8 - 7)	0
ND<5 (12/7/2015)	ND<5 (12/2/2014)	(5 - 5)/(9 - 7)	0
ND<5 (6/6/2016)	ND<5 (12/2/2014)	(5 - 5)/(10 - 7)	0
ND<5 (12/5/2016)	ND<5 (12/2/2014)	(5 - 5)/(11 - 7)	0
ND<5 (6/20/2017)	ND<5 (12/2/2014)	(5 - 5)/(12 - 7)	0
ND<5 (12/4/2017)	ND<5 (12/2/2014)	(5 - 5)/(13 - 7)	0
ND<5 (6/4/2018)	ND<5 (12/2/2014)	(5 - 5)/(14 - 7)	0
ND<5 (12/7/2015)	ND<5 (6/1/2015)	(5 - 5)/(9 - 8)	0
ND<5 (6/6/2016)	ND<5 (6/1/2015)	(5 - 5)/(10 - 8)	0
ND<5 (12/5/2016)	ND<5 (6/1/2015)	(5 - 5)/(11 - 8)	0
ND<5 (6/20/2017)	ND<5 (6/1/2015)	(5 - 5)/(12 - 8)	0
ND<5 (12/4/2017)	ND<5 (6/1/2015)	(5 - 5)/(13 - 8)	0
ND<5 (6/4/2018)	ND<5 (6/1/2015)	(5 - 5)/(14 - 8)	0
ND<5 (6/6/2016)	ND<5 (12/7/2015)	(5 - 5)/(10 - 9)	0
ND<5 (12/5/2016)	ND<5 (12/7/2015)	(5 - 5)/(11 - 9)	0
ND<5 (6/20/2017)	ND<5 (12/7/2015)	(5 - 5)/(12 - 9)	0
ND<5 (12/4/2017)	ND<5 (12/7/2015)	(5 - 5)/(13 - 9)	0
ND<5 (6/4/2018)	ND<5 (12/7/2015)	(5 - 5)/(14 - 9)	0
ND<5 (12/5/2016)	ND<5 (6/6/2016)	(5 - 5)/(11 - 10)	0
ND<5 (6/20/2017)	ND<5 (6/6/2016)	(5 - 5)/(12 - 10)	0
ND<5 (12/4/2017)	ND<5 (6/6/2016)	(5 - 5)/(13 - 10)	0
ND<5 (6/4/2018)	ND<5 (6/6/2016)	(5 - 5)/(14 - 10)	0
ND<5 (6/20/2017)	ND<5 (12/5/2016)	(5 - 5)/(12 - 11)	0
ND<5 (12/4/2017)	ND<5 (12/5/2016)	(5 - 5)/(13 - 11)	0
ND<5 (6/4/2018)	ND<5 (12/5/2016)	(5 - 5)/(14 - 11)	0
ND<5 (12/4/2017)	ND<5 (6/20/2017)	(5 - 5)/(13 - 12)	0
ND<5 (6/4/2018)	ND<5 (6/20/2017)	(5 - 5)/(14 - 12)	0
ND<5 (6/4/2018)	ND<5 (12/4/2017)	(5 - 5)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

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8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	5	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

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Sen's Slope Analysis
Parameter: Sodium
Location: MW-2R

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
62600 (6/21/2010)	57600 (12/2/2009)	(62600 - 57600)/(2 - 1)	5000
74300 (12/6/2010)	57600 (12/2/2009)	(74300 - 57600)/(3 - 1)	8350
61100 (6/21/2011)	57600 (12/2/2009)	(61100 - 57600)/(4 - 1)	1166.67
57400 (12/13/2011)	57600 (12/2/2009)	(57400 - 57600)/(5 - 1)	-50
65500 (6/4/2012)	57600 (12/2/2009)	(65500 - 57600)/(6 - 1)	1580
61000 (12/11/2012)	57600 (12/2/2009)	(61000 - 57600)/(7 - 1)	566.667
63800 (6/3/2013)	57600 (12/2/2009)	(63800 - 57600)/(8 - 1)	885.714
63700 (12/3/2013)	57600 (12/2/2009)	(63700 - 57600)/(9 - 1)	762.5
66200 (6/2/2014)	57600 (12/2/2009)	(66200 - 57600)/(10 - 1)	955.556
62000 (12/2/2014)	57600 (12/2/2009)	(62000 - 57600)/(11 - 1)	440
78600 (12/7/2015)	57600 (12/2/2009)	(78600 - 57600)/(12 - 1)	1909.09
82300 (6/6/2016)	57600 (12/2/2009)	(82300 - 57600)/(13 - 1)	2058.33
66500 (12/5/2016)	57600 (12/2/2009)	(66500 - 57600)/(14 - 1)	684.615
68700 (6/20/2017)	57600 (12/2/2009)	(68700 - 57600)/(15 - 1)	792.857
61700 (12/4/2017)	57600 (12/2/2009)	(61700 - 57600)/(16 - 1)	273.333
82700 (6/4/2018)	57600 (12/2/2009)	(82700 - 57600)/(17 - 1)	1568.75
74300 (12/6/2010)	62600 (6/21/2010)	(74300 - 62600)/(3 - 2)	11700
61100 (6/21/2011)	62600 (6/21/2010)	(61100 - 62600)/(4 - 2)	-750
57400 (12/13/2011)	62600 (6/21/2010)	(57400 - 62600)/(5 - 2)	-1733.33
65500 (6/4/2012)	62600 (6/21/2010)	(65500 - 62600)/(6 - 2)	725
61000 (12/11/2012)	62600 (6/21/2010)	(61000 - 62600)/(7 - 2)	-320
63800 (6/3/2013)	62600 (6/21/2010)	(63800 - 62600)/(8 - 2)	200
63700 (12/3/2013)	62600 (6/21/2010)	(63700 - 62600)/(9 - 2)	157.143
66200 (6/2/2014)	62600 (6/21/2010)	(66200 - 62600)/(10 - 2)	450
62000 (12/2/2014)	62600 (6/21/2010)	(62000 - 62600)/(11 - 2)	-66.6667
78600 (12/7/2015)	62600 (6/21/2010)	(78600 - 62600)/(12 - 2)	1600
82300 (6/6/2016)	62600 (6/21/2010)	(82300 - 62600)/(13 - 2)	1790.91
66500 (12/5/2016)	62600 (6/21/2010)	(66500 - 62600)/(14 - 2)	325
68700 (6/20/2017)	62600 (6/21/2010)	(68700 - 62600)/(15 - 2)	469.231
61700 (12/4/2017)	62600 (6/21/2010)	(61700 - 62600)/(16 - 2)	-64.2857
82700 (6/4/2018)	62600 (6/21/2010)	(82700 - 62600)/(17 - 2)	1340
61100 (6/21/2011)	74300 (12/6/2010)	(61100 - 74300)/(4 - 3)	-13200
57400 (12/13/2011)	74300 (12/6/2010)	(57400 - 74300)/(5 - 3)	-8450
65500 (6/4/2012)	74300 (12/6/2010)	(65500 - 74300)/(6 - 3)	-2933.33
61000 (12/11/2012)	74300 (12/6/2010)	(61000 - 74300)/(7 - 3)	-3325
63800 (6/3/2013)	74300 (12/6/2010)	(63800 - 74300)/(8 - 3)	-2100
63700 (12/3/2013)	74300 (12/6/2010)	(63700 - 74300)/(9 - 3)	-1766.67
66200 (6/2/2014)	74300 (12/6/2010)	(66200 - 74300)/(10 - 3)	-1157.14
62000 (12/2/2014)	74300 (12/6/2010)	(62000 - 74300)/(11 - 3)	-1537.5
78600 (12/7/2015)	74300 (12/6/2010)	(78600 - 74300)/(12 - 3)	477.778
82300 (6/6/2016)	74300 (12/6/2010)	(82300 - 74300)/(13 - 3)	800
66500 (12/5/2016)	74300 (12/6/2010)	(66500 - 74300)/(14 - 3)	-709.091
68700 (6/20/2017)	74300 (12/6/2010)	(68700 - 74300)/(15 - 3)	-466.667
61700 (12/4/2017)	74300 (12/6/2010)	(61700 - 74300)/(16 - 3)	-969.231
82700 (6/4/2018)	74300 (12/6/2010)	(82700 - 74300)/(17 - 3)	600
57400 (12/13/2011)	61100 (6/21/2011)	(57400 - 61100)/(5 - 4)	-3700
65500 (6/4/2012)	61100 (6/21/2011)	(65500 - 61100)/(6 - 4)	2200
61000 (12/11/2012)	61100 (6/21/2011)	(61000 - 61100)/(7 - 4)	-33.3333

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63800 (6/3/2013)	61100 (6/21/2011)	(63800 - 61100)/(8 - 4)	675
63700 (12/3/2013)	61100 (6/21/2011)	(63700 - 61100)/(9 - 4)	520
66200 (6/2/2014)	61100 (6/21/2011)	(66200 - 61100)/(10 - 4)	850
62000 (12/2/2014)	61100 (6/21/2011)	(62000 - 61100)/(11 - 4)	128.571
78600 (12/7/2015)	61100 (6/21/2011)	(78600 - 61100)/(12 - 4)	2187.5
82300 (6/6/2016)	61100 (6/21/2011)	(82300 - 61100)/(13 - 4)	2355.56
66500 (12/5/2016)	61100 (6/21/2011)	(66500 - 61100)/(14 - 4)	540
68700 (6/20/2017)	61100 (6/21/2011)	(68700 - 61100)/(15 - 4)	690.909
61700 (12/4/2017)	61100 (6/21/2011)	(61700 - 61100)/(16 - 4)	50
82700 (6/4/2018)	61100 (6/21/2011)	(82700 - 61100)/(17 - 4)	1661.54

65500 (6/4/2012)	57400 (12/13/2011)	(65500 - 57400)/(6 - 5)	8100
61000 (12/11/2012)	57400 (12/13/2011)	(61000 - 57400)/(7 - 5)	1800
63800 (6/3/2013)	57400 (12/13/2011)	(63800 - 57400)/(8 - 5)	2133.33
63700 (12/3/2013)	57400 (12/13/2011)	(63700 - 57400)/(9 - 5)	1575
66200 (6/2/2014)	57400 (12/13/2011)	(66200 - 57400)/(10 - 5)	1760
62000 (12/2/2014)	57400 (12/13/2011)	(62000 - 57400)/(11 - 5)	766.667
78600 (12/7/2015)	57400 (12/13/2011)	(78600 - 57400)/(12 - 5)	3028.57
82300 (6/6/2016)	57400 (12/13/2011)	(82300 - 57400)/(13 - 5)	3112.5
66500 (12/5/2016)	57400 (12/13/2011)	(66500 - 57400)/(14 - 5)	1011.11
68700 (6/20/2017)	57400 (12/13/2011)	(68700 - 57400)/(15 - 5)	1130
61700 (12/4/2017)	57400 (12/13/2011)	(61700 - 57400)/(16 - 5)	390.909
82700 (6/4/2018)	57400 (12/13/2011)	(82700 - 57400)/(17 - 5)	2108.33

61000 (12/11/2012)	65500 (6/4/2012)	(61000 - 65500)/(7 - 6)	-4500
63800 (6/3/2013)	65500 (6/4/2012)	(63800 - 65500)/(8 - 6)	-850
63700 (12/3/2013)	65500 (6/4/2012)	(63700 - 65500)/(9 - 6)	-600
66200 (6/2/2014)	65500 (6/4/2012)	(66200 - 65500)/(10 - 6)	175
62000 (12/2/2014)	65500 (6/4/2012)	(62000 - 65500)/(11 - 6)	-700
78600 (12/7/2015)	65500 (6/4/2012)	(78600 - 65500)/(12 - 6)	2183.33
82300 (6/6/2016)	65500 (6/4/2012)	(82300 - 65500)/(13 - 6)	2400
66500 (12/5/2016)	65500 (6/4/2012)	(66500 - 65500)/(14 - 6)	125
68700 (6/20/2017)	65500 (6/4/2012)	(68700 - 65500)/(15 - 6)	355.556
61700 (12/4/2017)	65500 (6/4/2012)	(61700 - 65500)/(16 - 6)	-380
82700 (6/4/2018)	65500 (6/4/2012)	(82700 - 65500)/(17 - 6)	1563.64

63800 (6/3/2013)	61000 (12/11/2012)	(63800 - 61000)/(8 - 7)	2800
63700 (12/3/2013)	61000 (12/11/2012)	(63700 - 61000)/(9 - 7)	1350
66200 (6/2/2014)	61000 (12/11/2012)	(66200 - 61000)/(10 - 7)	1733.33
62000 (12/2/2014)	61000 (12/11/2012)	(62000 - 61000)/(11 - 7)	250
78600 (12/7/2015)	61000 (12/11/2012)	(78600 - 61000)/(12 - 7)	3520
82300 (6/6/2016)	61000 (12/11/2012)	(82300 - 61000)/(13 - 7)	3550
66500 (12/5/2016)	61000 (12/11/2012)	(66500 - 61000)/(14 - 7)	785.714
68700 (6/20/2017)	61000 (12/11/2012)	(68700 - 61000)/(15 - 7)	962.5
61700 (12/4/2017)	61000 (12/11/2012)	(61700 - 61000)/(16 - 7)	77.7778
82700 (6/4/2018)	61000 (12/11/2012)	(82700 - 61000)/(17 - 7)	2170

63700 (12/3/2013)	63800 (6/3/2013)	(63700 - 63800)/(9 - 8)	-100
66200 (6/2/2014)	63800 (6/3/2013)	(66200 - 63800)/(10 - 8)	1200
62000 (12/2/2014)	63800 (6/3/2013)	(62000 - 63800)/(11 - 8)	-600
78600 (12/7/2015)	63800 (6/3/2013)	(78600 - 63800)/(12 - 8)	3700
82300 (6/6/2016)	63800 (6/3/2013)	(82300 - 63800)/(13 - 8)	3700
66500 (12/5/2016)	63800 (6/3/2013)	(66500 - 63800)/(14 - 8)	450
68700 (6/20/2017)	63800 (6/3/2013)	(68700 - 63800)/(15 - 8)	700
61700 (12/4/2017)	63800 (6/3/2013)	(61700 - 63800)/(16 - 8)	-262.5
82700 (6/4/2018)	63800 (6/3/2013)	(82700 - 63800)/(17 - 8)	2100

66200 (6/2/2014)	63700 (12/3/2013)	(66200 - 63700)/(10 - 9)	2500
62000 (12/2/2014)	63700 (12/3/2013)	(62000 - 63700)/(11 - 9)	-850
78600 (12/7/2015)	63700 (12/3/2013)	(78600 - 63700)/(12 - 9)	4966.67
82300 (6/6/2016)	63700 (12/3/2013)	(82300 - 63700)/(13 - 9)	4650
66500 (12/5/2016)	63700 (12/3/2013)	(66500 - 63700)/(14 - 9)	560
68700 (6/20/2017)	63700 (12/3/2013)	(68700 - 63700)/(15 - 9)	833.333

61700 (12/4/2017)	63700 (12/3/2013)	(61700 - 63700)/(16 - 9)	-285.714
82700 (6/4/2018)	63700 (12/3/2013)	(82700 - 63700)/(17 - 9)	2375

62000 (12/2/2014)	66200 (6/2/2014)	(62000 - 66200)/(11 - 10)	-4200
78600 (12/7/2015)	66200 (6/2/2014)	(78600 - 66200)/(12 - 10)	6200
82300 (6/6/2016)	66200 (6/2/2014)	(82300 - 66200)/(13 - 10)	5366.67
66500 (12/5/2016)	66200 (6/2/2014)	(66500 - 66200)/(14 - 10)	75
68700 (6/20/2017)	66200 (6/2/2014)	(68700 - 66200)/(15 - 10)	500
61700 (12/4/2017)	66200 (6/2/2014)	(61700 - 66200)/(16 - 10)	-750
82700 (6/4/2018)	66200 (6/2/2014)	(82700 - 66200)/(17 - 10)	2357.14

78600 (12/7/2015)	62000 (12/2/2014)	(78600 - 62000)/(12 - 11)	16600
82300 (6/6/2016)	62000 (12/2/2014)	(82300 - 62000)/(13 - 11)	10150
66500 (12/5/2016)	62000 (12/2/2014)	(66500 - 62000)/(14 - 11)	1500
68700 (6/20/2017)	62000 (12/2/2014)	(68700 - 62000)/(15 - 11)	1675
61700 (12/4/2017)	62000 (12/2/2014)	(61700 - 62000)/(16 - 11)	-60
82700 (6/4/2018)	62000 (12/2/2014)	(82700 - 62000)/(17 - 11)	3450

82300 (6/6/2016)	78600 (12/7/2015)	(82300 - 78600)/(13 - 12)	3700
66500 (12/5/2016)	78600 (12/7/2015)	(66500 - 78600)/(14 - 12)	-6050
68700 (6/20/2017)	78600 (12/7/2015)	(68700 - 78600)/(15 - 12)	-3300
61700 (12/4/2017)	78600 (12/7/2015)	(61700 - 78600)/(16 - 12)	-4225
82700 (6/4/2018)	78600 (12/7/2015)	(82700 - 78600)/(17 - 12)	820

66500 (12/5/2016)	82300 (6/6/2016)	(66500 - 82300)/(14 - 13)	-15800
68700 (6/20/2017)	82300 (6/6/2016)	(68700 - 82300)/(15 - 13)	-6800
61700 (12/4/2017)	82300 (6/6/2016)	(61700 - 82300)/(16 - 13)	-6866.67
82700 (6/4/2018)	82300 (6/6/2016)	(82700 - 82300)/(17 - 13)	100

68700 (6/20/2017)	66500 (12/5/2016)	(68700 - 66500)/(15 - 14)	2200
61700 (12/4/2017)	66500 (12/5/2016)	(61700 - 66500)/(16 - 14)	-2400
82700 (6/4/2018)	66500 (12/5/2016)	(82700 - 66500)/(17 - 14)	5400

61700 (12/4/2017)	68700 (6/20/2017)	(61700 - 68700)/(16 - 15)	-7000
82700 (6/4/2018)	68700 (6/20/2017)	(82700 - 68700)/(17 - 15)	7000

82700 (6/4/2018)	61700 (12/4/2017)	(82700 - 61700)/(17 - 16)	21000

Number of Q values = 136

Ordered Q Values

n	Q
1	-15800
2	-13200
3	-8450
4	-7000
5	-6866.67
6	-6800
7	-6050
8	-4500
9	-4225
10	-4200
11	-3700
12	-3325
13	-3300
14	-2933.33
15	-2400
16	-2100
17	-1766.67
18	-1733.33
19	-1537.5

Royalton Road LF

20	-1157.14
21	-969.231
22	-850
23	-850
24	-750
25	-750
26	-709.091
27	-700
28	-600
29	-600
30	-466.667
31	-380
32	-320
33	-285.714
34	-262.5
35	-100
36	-66.6667
37	-64.2857
38	-60
39	-50
40	-33.3333
41	50
42	75
43	77.7778
44	100
45	125
46	128.571
47	157.143
48	175
49	200
50	250
51	273.333
52	325
53	355.556
54	390.909
55	440
56	450
57	450
58	469.231
59	477.778
60	500
61	520
62	540
63	560
64	566.667
65	600
66	675
67	684.615
68	690.909
69	700
70	725
71	762.5
72	766.667
73	785.714
74	792.857
75	800
76	820
77	833.333
78	850
79	885.714
80	955.556
81	962.5
82	1011.11

Royalton Road LF

83	1130
84	1166.67
85	1200
86	1340
87	1350
88	1500
89	1563.64
90	1568.75
91	1575
92	1580
93	1600
94	1661.54
95	1675
96	1733.33
97	1760
98	1790.91
99	1800
100	1909.09
101	2058.33
102	2100
103	2108.33
104	2133.33
105	2170
106	2183.33
107	2187.5
108	2200
109	2200
110	2355.56
111	2357.14
112	2375
113	2400
114	2500
115	2800
116	3028.57
117	3112.5
118	3450
119	3520
120	3550
121	3700
122	3700
123	3700
124	4650
125	4966.67
126	5000
127	5366.67
128	5400
129	6200
130	7000
131	8100
132	8350
133	10150
134	11700
135	16600
136	21000

Sen's Estimator (Median Q) is 695.455

Time Period	Observations
12/2/2009	1
6/21/2010	1
12/6/2010	1
6/21/2011	1
12/13/2011	1

6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 10608
b = 36720
c = 544
Group Variance = 589.333
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 62.5314
M1 = (136 - 62.5314)/2.0 = 36.7343
M2 = (136 + 62.5314)/2.0 + 1 = 100.266
Lower limit is -64.2857 = Q(37)
Upper limit is 1909.09 = Q(100)
-64.2857 < 0 < 1909.09 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis
Parameter: Sodium
Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
112000 (6/21/2010)	111000 (12/2/2009)	(112000 - 111000)/(2 - 1)	1000
124000 (12/6/2010)	111000 (12/2/2009)	(124000 - 111000)/(3 - 1)	6500
131000 (6/21/2011)	111000 (12/2/2009)	(131000 - 111000)/(4 - 1)	6666.67
115000 (12/13/2011)	111000 (12/2/2009)	(115000 - 111000)/(5 - 1)	1000
122000 (6/4/2012)	111000 (12/2/2009)	(122000 - 111000)/(6 - 1)	2200
124000 (12/11/2012)	111000 (12/2/2009)	(124000 - 111000)/(7 - 1)	2166.67
116000 (6/3/2013)	111000 (12/2/2009)	(116000 - 111000)/(8 - 1)	714.286
120000 (12/3/2013)	111000 (12/2/2009)	(120000 - 111000)/(9 - 1)	1125
121000 (6/2/2014)	111000 (12/2/2009)	(121000 - 111000)/(10 - 1)	1111.11
122000 (12/2/2014)	111000 (12/2/2009)	(122000 - 111000)/(11 - 1)	1100
111000 (6/1/2015)	111000 (12/2/2009)	(111000 - 111000)/(12 - 1)	0
108000 (12/7/2015)	111000 (12/2/2009)	(108000 - 111000)/(13 - 1)	-250
118000 (6/6/2016)	111000 (12/2/2009)	(118000 - 111000)/(14 - 1)	538.462
117000 (12/5/2016)	111000 (12/2/2009)	(117000 - 111000)/(15 - 1)	428.571
115000 (6/20/2017)	111000 (12/2/2009)	(115000 - 111000)/(16 - 1)	266.667
112000 (12/4/2017)	111000 (12/2/2009)	(112000 - 111000)/(17 - 1)	62.5
123000 (6/4/2018)	111000 (12/2/2009)	(123000 - 111000)/(18 - 1)	705.882
124000 (12/6/2010)	112000 (6/21/2010)	(124000 - 112000)/(3 - 2)	12000
131000 (6/21/2011)	112000 (6/21/2010)	(131000 - 112000)/(4 - 2)	9500
115000 (12/13/2011)	112000 (6/21/2010)	(115000 - 112000)/(5 - 2)	1000
122000 (6/4/2012)	112000 (6/21/2010)	(122000 - 112000)/(6 - 2)	2500
124000 (12/11/2012)	112000 (6/21/2010)	(124000 - 112000)/(7 - 2)	2400
116000 (6/3/2013)	112000 (6/21/2010)	(116000 - 112000)/(8 - 2)	666.667
120000 (12/3/2013)	112000 (6/21/2010)	(120000 - 112000)/(9 - 2)	1142.86
121000 (6/2/2014)	112000 (6/21/2010)	(121000 - 112000)/(10 - 2)	1125
122000 (12/2/2014)	112000 (6/21/2010)	(122000 - 112000)/(11 - 2)	1111.11
111000 (6/1/2015)	112000 (6/21/2010)	(111000 - 112000)/(12 - 2)	-100
108000 (12/7/2015)	112000 (6/21/2010)	(108000 - 112000)/(13 - 2)	-363.636
118000 (6/6/2016)	112000 (6/21/2010)	(118000 - 112000)/(14 - 2)	500
117000 (12/5/2016)	112000 (6/21/2010)	(117000 - 112000)/(15 - 2)	384.615
115000 (6/20/2017)	112000 (6/21/2010)	(115000 - 112000)/(16 - 2)	214.286
112000 (12/4/2017)	112000 (6/21/2010)	(112000 - 112000)/(17 - 2)	0
123000 (6/4/2018)	112000 (6/21/2010)	(123000 - 112000)/(18 - 2)	687.5
131000 (6/21/2011)	124000 (12/6/2010)	(131000 - 124000)/(4 - 3)	7000
115000 (12/13/2011)	124000 (12/6/2010)	(115000 - 124000)/(5 - 3)	-4500
122000 (6/4/2012)	124000 (12/6/2010)	(122000 - 124000)/(6 - 3)	-666.667
124000 (12/11/2012)	124000 (12/6/2010)	(124000 - 124000)/(7 - 3)	0
116000 (6/3/2013)	124000 (12/6/2010)	(116000 - 124000)/(8 - 3)	-1600
120000 (12/3/2013)	124000 (12/6/2010)	(120000 - 124000)/(9 - 3)	-666.667
121000 (6/2/2014)	124000 (12/6/2010)	(121000 - 124000)/(10 - 3)	-428.571
122000 (12/2/2014)	124000 (12/6/2010)	(122000 - 124000)/(11 - 3)	-250
111000 (6/1/2015)	124000 (12/6/2010)	(111000 - 124000)/(12 - 3)	-1444.44
108000 (12/7/2015)	124000 (12/6/2010)	(108000 - 124000)/(13 - 3)	-1600
118000 (6/6/2016)	124000 (12/6/2010)	(118000 - 124000)/(14 - 3)	-545.455
117000 (12/5/2016)	124000 (12/6/2010)	(117000 - 124000)/(15 - 3)	-583.333
115000 (6/20/2017)	124000 (12/6/2010)	(115000 - 124000)/(16 - 3)	-692.308
112000 (12/4/2017)	124000 (12/6/2010)	(112000 - 124000)/(17 - 3)	-857.143
123000 (6/4/2018)	124000 (12/6/2010)	(123000 - 124000)/(18 - 3)	-66.6667

115000 (12/13/2011)	131000 (6/21/2011)	(115000 - 131000)/(5 - 4)	-16000
122000 (6/4/2012)	131000 (6/21/2011)	(122000 - 131000)/(6 - 4)	-4500
124000 (12/11/2012)	131000 (6/21/2011)	(124000 - 131000)/(7 - 4)	-2333.33
116000 (6/3/2013)	131000 (6/21/2011)	(116000 - 131000)/(8 - 4)	-3750
120000 (12/3/2013)	131000 (6/21/2011)	(120000 - 131000)/(9 - 4)	-2200
121000 (6/2/2014)	131000 (6/21/2011)	(121000 - 131000)/(10 - 4)	-1666.67
122000 (12/2/2014)	131000 (6/21/2011)	(122000 - 131000)/(11 - 4)	-1285.71
111000 (6/1/2015)	131000 (6/21/2011)	(111000 - 131000)/(12 - 4)	-2500
108000 (12/7/2015)	131000 (6/21/2011)	(108000 - 131000)/(13 - 4)	-2555.56
118000 (6/6/2016)	131000 (6/21/2011)	(118000 - 131000)/(14 - 4)	-1300
117000 (12/5/2016)	131000 (6/21/2011)	(117000 - 131000)/(15 - 4)	-1272.73
115000 (6/20/2017)	131000 (6/21/2011)	(115000 - 131000)/(16 - 4)	-1333.33
112000 (12/4/2017)	131000 (6/21/2011)	(112000 - 131000)/(17 - 4)	-1461.54
123000 (6/4/2018)	131000 (6/21/2011)	(123000 - 131000)/(18 - 4)	-571.429
122000 (6/4/2012)	115000 (12/13/2011)	(122000 - 115000)/(6 - 5)	7000
124000 (12/11/2012)	115000 (12/13/2011)	(124000 - 115000)/(7 - 5)	4500
116000 (6/3/2013)	115000 (12/13/2011)	(116000 - 115000)/(8 - 5)	333.333
120000 (12/3/2013)	115000 (12/13/2011)	(120000 - 115000)/(9 - 5)	1250
121000 (6/2/2014)	115000 (12/13/2011)	(121000 - 115000)/(10 - 5)	1200
122000 (12/2/2014)	115000 (12/13/2011)	(122000 - 115000)/(11 - 5)	1166.67
111000 (6/1/2015)	115000 (12/13/2011)	(111000 - 115000)/(12 - 5)	-571.429
108000 (12/7/2015)	115000 (12/13/2011)	(108000 - 115000)/(13 - 5)	-875
118000 (6/6/2016)	115000 (12/13/2011)	(118000 - 115000)/(14 - 5)	333.333
117000 (12/5/2016)	115000 (12/13/2011)	(117000 - 115000)/(15 - 5)	200
115000 (6/20/2017)	115000 (12/13/2011)	(115000 - 115000)/(16 - 5)	0
112000 (12/4/2017)	115000 (12/13/2011)	(112000 - 115000)/(17 - 5)	-250
123000 (6/4/2018)	115000 (12/13/2011)	(123000 - 115000)/(18 - 5)	615.385
124000 (12/11/2012)	122000 (6/4/2012)	(124000 - 122000)/(7 - 6)	2000
116000 (6/3/2013)	122000 (6/4/2012)	(116000 - 122000)/(8 - 6)	-3000
120000 (12/3/2013)	122000 (6/4/2012)	(120000 - 122000)/(9 - 6)	-666.667
121000 (6/2/2014)	122000 (6/4/2012)	(121000 - 122000)/(10 - 6)	-250
122000 (12/2/2014)	122000 (6/4/2012)	(122000 - 122000)/(11 - 6)	0
111000 (6/1/2015)	122000 (6/4/2012)	(111000 - 122000)/(12 - 6)	-1833.33
108000 (12/7/2015)	122000 (6/4/2012)	(108000 - 122000)/(13 - 6)	-2000
118000 (6/6/2016)	122000 (6/4/2012)	(118000 - 122000)/(14 - 6)	-500
117000 (12/5/2016)	122000 (6/4/2012)	(117000 - 122000)/(15 - 6)	-555.556
115000 (6/20/2017)	122000 (6/4/2012)	(115000 - 122000)/(16 - 6)	-700
112000 (12/4/2017)	122000 (6/4/2012)	(112000 - 122000)/(17 - 6)	-909.091
123000 (6/4/2018)	122000 (6/4/2012)	(123000 - 122000)/(18 - 6)	83.3333
116000 (6/3/2013)	124000 (12/11/2012)	(116000 - 124000)/(8 - 7)	-8000
120000 (12/3/2013)	124000 (12/11/2012)	(120000 - 124000)/(9 - 7)	-2000
121000 (6/2/2014)	124000 (12/11/2012)	(121000 - 124000)/(10 - 7)	-1000
122000 (12/2/2014)	124000 (12/11/2012)	(122000 - 124000)/(11 - 7)	-500
111000 (6/1/2015)	124000 (12/11/2012)	(111000 - 124000)/(12 - 7)	-2600
108000 (12/7/2015)	124000 (12/11/2012)	(108000 - 124000)/(13 - 7)	-2666.67
118000 (6/6/2016)	124000 (12/11/2012)	(118000 - 124000)/(14 - 7)	-857.143
117000 (12/5/2016)	124000 (12/11/2012)	(117000 - 124000)/(15 - 7)	-875
115000 (6/20/2017)	124000 (12/11/2012)	(115000 - 124000)/(16 - 7)	-1000
112000 (12/4/2017)	124000 (12/11/2012)	(112000 - 124000)/(17 - 7)	-1200
123000 (6/4/2018)	124000 (12/11/2012)	(123000 - 124000)/(18 - 7)	-90.9091
120000 (12/3/2013)	116000 (6/3/2013)	(120000 - 116000)/(9 - 8)	4000
121000 (6/2/2014)	116000 (6/3/2013)	(121000 - 116000)/(10 - 8)	2500
122000 (12/2/2014)	116000 (6/3/2013)	(122000 - 116000)/(11 - 8)	2000
111000 (6/1/2015)	116000 (6/3/2013)	(111000 - 116000)/(12 - 8)	-1250
108000 (12/7/2015)	116000 (6/3/2013)	(108000 - 116000)/(13 - 8)	-1600
118000 (6/6/2016)	116000 (6/3/2013)	(118000 - 116000)/(14 - 8)	333.333
117000 (12/5/2016)	116000 (6/3/2013)	(117000 - 116000)/(15 - 8)	142.857
115000 (6/20/2017)	116000 (6/3/2013)	(115000 - 116000)/(16 - 8)	-125
112000 (12/4/2017)	116000 (6/3/2013)	(112000 - 116000)/(17 - 8)	-444.444

123000 (6/4/2018)	116000 (6/3/2013)	(123000 - 116000)/(18 - 8)	700
121000 (6/2/2014)	120000 (12/3/2013)	(121000 - 120000)/(10 - 9)	1000
122000 (12/2/2014)	120000 (12/3/2013)	(122000 - 120000)/(11 - 9)	1000
111000 (6/1/2015)	120000 (12/3/2013)	(111000 - 120000)/(12 - 9)	-3000
108000 (12/7/2015)	120000 (12/3/2013)	(108000 - 120000)/(13 - 9)	-3000
118000 (6/6/2016)	120000 (12/3/2013)	(118000 - 120000)/(14 - 9)	-400
117000 (12/5/2016)	120000 (12/3/2013)	(117000 - 120000)/(15 - 9)	-500
115000 (6/20/2017)	120000 (12/3/2013)	(115000 - 120000)/(16 - 9)	-714.286
112000 (12/4/2017)	120000 (12/3/2013)	(112000 - 120000)/(17 - 9)	-1000
123000 (6/4/2018)	120000 (12/3/2013)	(123000 - 120000)/(18 - 9)	333.333
122000 (12/2/2014)	121000 (6/2/2014)	(122000 - 121000)/(11 - 10)	1000
111000 (6/1/2015)	121000 (6/2/2014)	(111000 - 121000)/(12 - 10)	-5000
108000 (12/7/2015)	121000 (6/2/2014)	(108000 - 121000)/(13 - 10)	-4333.33
118000 (6/6/2016)	121000 (6/2/2014)	(118000 - 121000)/(14 - 10)	-750
117000 (12/5/2016)	121000 (6/2/2014)	(117000 - 121000)/(15 - 10)	-800
115000 (6/20/2017)	121000 (6/2/2014)	(115000 - 121000)/(16 - 10)	-1000
112000 (12/4/2017)	121000 (6/2/2014)	(112000 - 121000)/(17 - 10)	-1285.71
123000 (6/4/2018)	121000 (6/2/2014)	(123000 - 121000)/(18 - 10)	250
111000 (6/1/2015)	122000 (12/2/2014)	(111000 - 122000)/(12 - 11)	-11000
108000 (12/7/2015)	122000 (12/2/2014)	(108000 - 122000)/(13 - 11)	-7000
118000 (6/6/2016)	122000 (12/2/2014)	(118000 - 122000)/(14 - 11)	-1333.33
117000 (12/5/2016)	122000 (12/2/2014)	(117000 - 122000)/(15 - 11)	-1250
115000 (6/20/2017)	122000 (12/2/2014)	(115000 - 122000)/(16 - 11)	-1400
112000 (12/4/2017)	122000 (12/2/2014)	(112000 - 122000)/(17 - 11)	-1666.67
123000 (6/4/2018)	122000 (12/2/2014)	(123000 - 122000)/(18 - 11)	142.857
108000 (12/7/2015)	111000 (6/1/2015)	(108000 - 111000)/(13 - 12)	-3000
118000 (6/6/2016)	111000 (6/1/2015)	(118000 - 111000)/(14 - 12)	3500
117000 (12/5/2016)	111000 (6/1/2015)	(117000 - 111000)/(15 - 12)	2000
115000 (6/20/2017)	111000 (6/1/2015)	(115000 - 111000)/(16 - 12)	1000
112000 (12/4/2017)	111000 (6/1/2015)	(112000 - 111000)/(17 - 12)	200
123000 (6/4/2018)	111000 (6/1/2015)	(123000 - 111000)/(18 - 12)	2000
118000 (6/6/2016)	108000 (12/7/2015)	(118000 - 108000)/(14 - 13)	10000
117000 (12/5/2016)	108000 (12/7/2015)	(117000 - 108000)/(15 - 13)	4500
115000 (6/20/2017)	108000 (12/7/2015)	(115000 - 108000)/(16 - 13)	2333.33
112000 (12/4/2017)	108000 (12/7/2015)	(112000 - 108000)/(17 - 13)	1000
123000 (6/4/2018)	108000 (12/7/2015)	(123000 - 108000)/(18 - 13)	3000
117000 (12/5/2016)	118000 (6/6/2016)	(117000 - 118000)/(15 - 14)	-1000
115000 (6/20/2017)	118000 (6/6/2016)	(115000 - 118000)/(16 - 14)	-1500
112000 (12/4/2017)	118000 (6/6/2016)	(112000 - 118000)/(17 - 14)	-2000
123000 (6/4/2018)	118000 (6/6/2016)	(123000 - 118000)/(18 - 14)	1250
115000 (6/20/2017)	117000 (12/5/2016)	(115000 - 117000)/(16 - 15)	-2000
112000 (12/4/2017)	117000 (12/5/2016)	(112000 - 117000)/(17 - 15)	-2500
123000 (6/4/2018)	117000 (12/5/2016)	(123000 - 117000)/(18 - 15)	2000
112000 (12/4/2017)	115000 (6/20/2017)	(112000 - 115000)/(17 - 16)	-3000
123000 (6/4/2018)	115000 (6/20/2017)	(123000 - 115000)/(18 - 16)	4000
123000 (6/4/2018)	112000 (12/4/2017)	(123000 - 112000)/(18 - 17)	11000

Number of Q values = 153

Ordered Q Values

n	Q
1	-16000

2	-11000
3	-8000
4	-7000
5	-5000
6	-4500
7	-4500
8	-4333.33
9	-3750
10	-3000
11	-3000
12	-3000
13	-3000
14	-3000
15	-2666.67
16	-2600
17	-2555.56
18	-2500
19	-2500
20	-2333.33
21	-2200
22	-2000
23	-2000
24	-2000
25	-2000
26	-1833.33
27	-1666.67
28	-1666.67
29	-1600
30	-1600
31	-1600
32	-1500
33	-1461.54
34	-1444.44
35	-1400
36	-1333.33
37	-1333.33
38	-1300
39	-1285.71
40	-1285.71
41	-1272.73
42	-1250
43	-1250
44	-1200
45	-1000
46	-1000
47	-1000
48	-1000
49	-1000
50	-909.091
51	-875
52	-875
53	-857.143
54	-857.143
55	-800
56	-750
57	-714.286
58	-700
59	-692.308
60	-666.667
61	-666.667
62	-666.667
63	-583.333
64	-571.429

65	-571.429
66	-555.556
67	-545.455
68	-500
69	-500
70	-500
71	-444.444
72	-428.571
73	-400
74	-363.636
75	-250
76	-250
77	-250
78	-250
79	-125
80	-100
81	-90.9091
82	-66.6667
83	0
84	0
85	0
86	0
87	0
88	62.5
89	83.3333
90	142.857
91	142.857
92	200
93	200
94	214.286
95	250
96	266.667
97	333.333
98	333.333
99	333.333
100	333.333
101	384.615
102	428.571
103	500
104	538.462
105	615.385
106	666.667
107	687.5
108	700
109	705.882
110	714.286
111	1000
112	1000
113	1000
114	1000
115	1000
116	1000
117	1000
118	1000
119	1100
120	1111.11
121	1111.11
122	1125
123	1125
124	1142.86
125	1166.67
126	1200
127	1250

128	1250
129	2000
130	2000
131	2000
132	2000
133	2000
134	2166.67
135	2200
136	2333.33
137	2400
138	2500
139	2500
140	3000
141	3500
142	4000
143	4000
144	4500
145	4500
146	6500
147	6666.67
148	7000
149	7000
150	9500
151	10000
152	11000
153	12000

Sen's Estimator (Median Q) is -250

Tied Group	Value	Members
1	111000	2
2	112000	2
3	124000	2
4	115000	2
5	122000	2

Time Period	Observations
12/2/2009	1
6/21/2010	1
12/6/2010	1
6/21/2011	1
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 90
B = 0
C = 0
D = 0
E = 10
F = 0

Royalton Road LF

a = 12546
b = 44064
c = 612
Group Variance = 692
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 67.7596
M1 = (153 - 67.7596)/2.0 = 42.6202
M2 = (153 + 67.7596)/2.0 + 1 = 111.38
Lower limit is -1250 = Q(43)
Upper limit is 1000 = Q(111)
-1250 < 0 < 1000 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis
Parameter: Sodium
Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
61800 (6/21/2010)	62200 (12/2/2009)	(61800 - 62200)/(2 - 1)	-400
63300 (12/6/2010)	62200 (12/2/2009)	(63300 - 62200)/(3 - 1)	550
68800 (6/21/2011)	62200 (12/2/2009)	(68800 - 62200)/(4 - 1)	2200
68300 (12/13/2011)	62200 (12/2/2009)	(68300 - 62200)/(5 - 1)	1525
66500 (6/4/2012)	62200 (12/2/2009)	(66500 - 62200)/(6 - 1)	860
65900 (12/11/2012)	62200 (12/2/2009)	(65900 - 62200)/(7 - 1)	616.667
64900 (6/3/2013)	62200 (12/2/2009)	(64900 - 62200)/(8 - 1)	385.714
67700 (12/3/2013)	62200 (12/2/2009)	(67700 - 62200)/(9 - 1)	687.5
65400 (6/2/2014)	62200 (12/2/2009)	(65400 - 62200)/(10 - 1)	355.556
68000 (12/2/2014)	62200 (12/2/2009)	(68000 - 62200)/(11 - 1)	580
61700 (6/1/2015)	62200 (12/2/2009)	(61700 - 62200)/(12 - 1)	-45.4545
68200 (12/7/2015)	62200 (12/2/2009)	(68200 - 62200)/(13 - 1)	500
66600 (6/6/2016)	62200 (12/2/2009)	(66600 - 62200)/(14 - 1)	338.462
72300 (12/5/2016)	62200 (12/2/2009)	(72300 - 62200)/(15 - 1)	721.429
65300 (6/20/2017)	62200 (12/2/2009)	(65300 - 62200)/(16 - 1)	206.667
69100 (12/4/2017)	62200 (12/2/2009)	(69100 - 62200)/(17 - 1)	431.25
69700 (6/4/2018)	62200 (12/2/2009)	(69700 - 62200)/(18 - 1)	441.176
63300 (12/6/2010)	61800 (6/21/2010)	(63300 - 61800)/(3 - 2)	1500
68800 (6/21/2011)	61800 (6/21/2010)	(68800 - 61800)/(4 - 2)	3500
68300 (12/13/2011)	61800 (6/21/2010)	(68300 - 61800)/(5 - 2)	2166.67
66500 (6/4/2012)	61800 (6/21/2010)	(66500 - 61800)/(6 - 2)	1175
65900 (12/11/2012)	61800 (6/21/2010)	(65900 - 61800)/(7 - 2)	820
64900 (6/3/2013)	61800 (6/21/2010)	(64900 - 61800)/(8 - 2)	516.667
67700 (12/3/2013)	61800 (6/21/2010)	(67700 - 61800)/(9 - 2)	842.857
65400 (6/2/2014)	61800 (6/21/2010)	(65400 - 61800)/(10 - 2)	450
68000 (12/2/2014)	61800 (6/21/2010)	(68000 - 61800)/(11 - 2)	688.889
61700 (6/1/2015)	61800 (6/21/2010)	(61700 - 61800)/(12 - 2)	-10
68200 (12/7/2015)	61800 (6/21/2010)	(68200 - 61800)/(13 - 2)	581.818
66600 (6/6/2016)	61800 (6/21/2010)	(66600 - 61800)/(14 - 2)	400
72300 (12/5/2016)	61800 (6/21/2010)	(72300 - 61800)/(15 - 2)	807.692
65300 (6/20/2017)	61800 (6/21/2010)	(65300 - 61800)/(16 - 2)	250
69100 (12/4/2017)	61800 (6/21/2010)	(69100 - 61800)/(17 - 2)	486.667
69700 (6/4/2018)	61800 (6/21/2010)	(69700 - 61800)/(18 - 2)	493.75
68800 (6/21/2011)	63300 (12/6/2010)	(68800 - 63300)/(4 - 3)	5500
68300 (12/13/2011)	63300 (12/6/2010)	(68300 - 63300)/(5 - 3)	2500
66500 (6/4/2012)	63300 (12/6/2010)	(66500 - 63300)/(6 - 3)	1066.67
65900 (12/11/2012)	63300 (12/6/2010)	(65900 - 63300)/(7 - 3)	650
64900 (6/3/2013)	63300 (12/6/2010)	(64900 - 63300)/(8 - 3)	320
67700 (12/3/2013)	63300 (12/6/2010)	(67700 - 63300)/(9 - 3)	733.333
65400 (6/2/2014)	63300 (12/6/2010)	(65400 - 63300)/(10 - 3)	300
68000 (12/2/2014)	63300 (12/6/2010)	(68000 - 63300)/(11 - 3)	587.5
61700 (6/1/2015)	63300 (12/6/2010)	(61700 - 63300)/(12 - 3)	-177.778
68200 (12/7/2015)	63300 (12/6/2010)	(68200 - 63300)/(13 - 3)	490
66600 (6/6/2016)	63300 (12/6/2010)	(66600 - 63300)/(14 - 3)	300
72300 (12/5/2016)	63300 (12/6/2010)	(72300 - 63300)/(15 - 3)	750
65300 (6/20/2017)	63300 (12/6/2010)	(65300 - 63300)/(16 - 3)	153.846
69100 (12/4/2017)	63300 (12/6/2010)	(69100 - 63300)/(17 - 3)	414.286
69700 (6/4/2018)	63300 (12/6/2010)	(69700 - 63300)/(18 - 3)	426.667

Royalton Road LF

68300 (12/13/2011)	68800 (6/21/2011)	(68300 - 68800)/(5 - 4)	-500
66500 (6/4/2012)	68800 (6/21/2011)	(66500 - 68800)/(6 - 4)	-1150
65900 (12/11/2012)	68800 (6/21/2011)	(65900 - 68800)/(7 - 4)	-966.667
64900 (6/3/2013)	68800 (6/21/2011)	(64900 - 68800)/(8 - 4)	-975
67700 (12/3/2013)	68800 (6/21/2011)	(67700 - 68800)/(9 - 4)	-220
65400 (6/2/2014)	68800 (6/21/2011)	(65400 - 68800)/(10 - 4)	-566.667
68000 (12/2/2014)	68800 (6/21/2011)	(68000 - 68800)/(11 - 4)	-114.286
61700 (6/1/2015)	68800 (6/21/2011)	(61700 - 68800)/(12 - 4)	-887.5
68200 (12/7/2015)	68800 (6/21/2011)	(68200 - 68800)/(13 - 4)	-66.6667
66600 (6/6/2016)	68800 (6/21/2011)	(66600 - 68800)/(14 - 4)	-220
72300 (12/5/2016)	68800 (6/21/2011)	(72300 - 68800)/(15 - 4)	318.182
65300 (6/20/2017)	68800 (6/21/2011)	(65300 - 68800)/(16 - 4)	-291.667
69100 (12/4/2017)	68800 (6/21/2011)	(69100 - 68800)/(17 - 4)	23.0769
69700 (6/4/2018)	68800 (6/21/2011)	(69700 - 68800)/(18 - 4)	64.2857

66500 (6/4/2012)	68300 (12/13/2011)	(66500 - 68300)/(6 - 5)	-1800
65900 (12/11/2012)	68300 (12/13/2011)	(65900 - 68300)/(7 - 5)	-1200
64900 (6/3/2013)	68300 (12/13/2011)	(64900 - 68300)/(8 - 5)	-1133.33
67700 (12/3/2013)	68300 (12/13/2011)	(67700 - 68300)/(9 - 5)	-150
65400 (6/2/2014)	68300 (12/13/2011)	(65400 - 68300)/(10 - 5)	-580
68000 (12/2/2014)	68300 (12/13/2011)	(68000 - 68300)/(11 - 5)	-50
61700 (6/1/2015)	68300 (12/13/2011)	(61700 - 68300)/(12 - 5)	-942.857
68200 (12/7/2015)	68300 (12/13/2011)	(68200 - 68300)/(13 - 5)	-12.5
66600 (6/6/2016)	68300 (12/13/2011)	(66600 - 68300)/(14 - 5)	-188.889
72300 (12/5/2016)	68300 (12/13/2011)	(72300 - 68300)/(15 - 5)	400
65300 (6/20/2017)	68300 (12/13/2011)	(65300 - 68300)/(16 - 5)	-272.727
69100 (12/4/2017)	68300 (12/13/2011)	(69100 - 68300)/(17 - 5)	66.6667
69700 (6/4/2018)	68300 (12/13/2011)	(69700 - 68300)/(18 - 5)	107.692

65900 (12/11/2012)	66500 (6/4/2012)	(65900 - 66500)/(7 - 6)	-600
64900 (6/3/2013)	66500 (6/4/2012)	(64900 - 66500)/(8 - 6)	-800
67700 (12/3/2013)	66500 (6/4/2012)	(67700 - 66500)/(9 - 6)	400
65400 (6/2/2014)	66500 (6/4/2012)	(65400 - 66500)/(10 - 6)	-275
68000 (12/2/2014)	66500 (6/4/2012)	(68000 - 66500)/(11 - 6)	300
61700 (6/1/2015)	66500 (6/4/2012)	(61700 - 66500)/(12 - 6)	-800
68200 (12/7/2015)	66500 (6/4/2012)	(68200 - 66500)/(13 - 6)	242.857
66600 (6/6/2016)	66500 (6/4/2012)	(66600 - 66500)/(14 - 6)	12.5
72300 (12/5/2016)	66500 (6/4/2012)	(72300 - 66500)/(15 - 6)	644.444
65300 (6/20/2017)	66500 (6/4/2012)	(65300 - 66500)/(16 - 6)	-120
69100 (12/4/2017)	66500 (6/4/2012)	(69100 - 66500)/(17 - 6)	236.364
69700 (6/4/2018)	66500 (6/4/2012)	(69700 - 66500)/(18 - 6)	266.667

64900 (6/3/2013)	65900 (12/11/2012)	(64900 - 65900)/(8 - 7)	-1000
67700 (12/3/2013)	65900 (12/11/2012)	(67700 - 65900)/(9 - 7)	900
65400 (6/2/2014)	65900 (12/11/2012)	(65400 - 65900)/(10 - 7)	-166.667
68000 (12/2/2014)	65900 (12/11/2012)	(68000 - 65900)/(11 - 7)	525
61700 (6/1/2015)	65900 (12/11/2012)	(61700 - 65900)/(12 - 7)	-840
68200 (12/7/2015)	65900 (12/11/2012)	(68200 - 65900)/(13 - 7)	383.333
66600 (6/6/2016)	65900 (12/11/2012)	(66600 - 65900)/(14 - 7)	100
72300 (12/5/2016)	65900 (12/11/2012)	(72300 - 65900)/(15 - 7)	800
65300 (6/20/2017)	65900 (12/11/2012)	(65300 - 65900)/(16 - 7)	-66.6667
69100 (12/4/2017)	65900 (12/11/2012)	(69100 - 65900)/(17 - 7)	320
69700 (6/4/2018)	65900 (12/11/2012)	(69700 - 65900)/(18 - 7)	345.455

67700 (12/3/2013)	64900 (6/3/2013)	(67700 - 64900)/(9 - 8)	2800
65400 (6/2/2014)	64900 (6/3/2013)	(65400 - 64900)/(10 - 8)	250
68000 (12/2/2014)	64900 (6/3/2013)	(68000 - 64900)/(11 - 8)	1033.33
61700 (6/1/2015)	64900 (6/3/2013)	(61700 - 64900)/(12 - 8)	-800
68200 (12/7/2015)	64900 (6/3/2013)	(68200 - 64900)/(13 - 8)	660
66600 (6/6/2016)	64900 (6/3/2013)	(66600 - 64900)/(14 - 8)	283.333
72300 (12/5/2016)	64900 (6/3/2013)	(72300 - 64900)/(15 - 8)	1057.14
65300 (6/20/2017)	64900 (6/3/2013)	(65300 - 64900)/(16 - 8)	50
69100 (12/4/2017)	64900 (6/3/2013)	(69100 - 64900)/(17 - 8)	466.667

69700 (6/4/2018)	64900 (6/3/2013)	(69700 - 64900)/(18 - 8)	480
65400 (6/2/2014)	67700 (12/3/2013)	(65400 - 67700)/(10 - 9)	-2300
68000 (12/2/2014)	67700 (12/3/2013)	(68000 - 67700)/(11 - 9)	150
61700 (6/1/2015)	67700 (12/3/2013)	(61700 - 67700)/(12 - 9)	-2000
68200 (12/7/2015)	67700 (12/3/2013)	(68200 - 67700)/(13 - 9)	125
66600 (6/6/2016)	67700 (12/3/2013)	(66600 - 67700)/(14 - 9)	-220
72300 (12/5/2016)	67700 (12/3/2013)	(72300 - 67700)/(15 - 9)	766.667
65300 (6/20/2017)	67700 (12/3/2013)	(65300 - 67700)/(16 - 9)	-342.857
69100 (12/4/2017)	67700 (12/3/2013)	(69100 - 67700)/(17 - 9)	175
69700 (6/4/2018)	67700 (12/3/2013)	(69700 - 67700)/(18 - 9)	222.222
68000 (12/2/2014)	65400 (6/2/2014)	(68000 - 65400)/(11 - 10)	2600
61700 (6/1/2015)	65400 (6/2/2014)	(61700 - 65400)/(12 - 10)	-1850
68200 (12/7/2015)	65400 (6/2/2014)	(68200 - 65400)/(13 - 10)	933.333
66600 (6/6/2016)	65400 (6/2/2014)	(66600 - 65400)/(14 - 10)	300
72300 (12/5/2016)	65400 (6/2/2014)	(72300 - 65400)/(15 - 10)	1380
65300 (6/20/2017)	65400 (6/2/2014)	(65300 - 65400)/(16 - 10)	-16.6667
69100 (12/4/2017)	65400 (6/2/2014)	(69100 - 65400)/(17 - 10)	528.571
69700 (6/4/2018)	65400 (6/2/2014)	(69700 - 65400)/(18 - 10)	537.5
61700 (6/1/2015)	68000 (12/2/2014)	(61700 - 68000)/(12 - 11)	-6300
68200 (12/7/2015)	68000 (12/2/2014)	(68200 - 68000)/(13 - 11)	100
66600 (6/6/2016)	68000 (12/2/2014)	(66600 - 68000)/(14 - 11)	-466.667
72300 (12/5/2016)	68000 (12/2/2014)	(72300 - 68000)/(15 - 11)	1075
65300 (6/20/2017)	68000 (12/2/2014)	(65300 - 68000)/(16 - 11)	-540
69100 (12/4/2017)	68000 (12/2/2014)	(69100 - 68000)/(17 - 11)	183.333
69700 (6/4/2018)	68000 (12/2/2014)	(69700 - 68000)/(18 - 11)	242.857
68200 (12/7/2015)	61700 (6/1/2015)	(68200 - 61700)/(13 - 12)	6500
66600 (6/6/2016)	61700 (6/1/2015)	(66600 - 61700)/(14 - 12)	2450
72300 (12/5/2016)	61700 (6/1/2015)	(72300 - 61700)/(15 - 12)	3533.33
65300 (6/20/2017)	61700 (6/1/2015)	(65300 - 61700)/(16 - 12)	900
69100 (12/4/2017)	61700 (6/1/2015)	(69100 - 61700)/(17 - 12)	1480
69700 (6/4/2018)	61700 (6/1/2015)	(69700 - 61700)/(18 - 12)	1333.33
66600 (6/6/2016)	68200 (12/7/2015)	(66600 - 68200)/(14 - 13)	-1600
72300 (12/5/2016)	68200 (12/7/2015)	(72300 - 68200)/(15 - 13)	2050
65300 (6/20/2017)	68200 (12/7/2015)	(65300 - 68200)/(16 - 13)	-966.667
69100 (12/4/2017)	68200 (12/7/2015)	(69100 - 68200)/(17 - 13)	225
69700 (6/4/2018)	68200 (12/7/2015)	(69700 - 68200)/(18 - 13)	300
72300 (12/5/2016)	66600 (6/6/2016)	(72300 - 66600)/(15 - 14)	5700
65300 (6/20/2017)	66600 (6/6/2016)	(65300 - 66600)/(16 - 14)	-650
69100 (12/4/2017)	66600 (6/6/2016)	(69100 - 66600)/(17 - 14)	833.333
69700 (6/4/2018)	66600 (6/6/2016)	(69700 - 66600)/(18 - 14)	775
65300 (6/20/2017)	72300 (12/5/2016)	(65300 - 72300)/(16 - 15)	-7000
69100 (12/4/2017)	72300 (12/5/2016)	(69100 - 72300)/(17 - 15)	-1600
69700 (6/4/2018)	72300 (12/5/2016)	(69700 - 72300)/(18 - 15)	-866.667
69100 (12/4/2017)	65300 (6/20/2017)	(69100 - 65300)/(17 - 16)	3800
69700 (6/4/2018)	65300 (6/20/2017)	(69700 - 65300)/(18 - 16)	2200
69700 (6/4/2018)	69100 (12/4/2017)	(69700 - 69100)/(18 - 17)	600

Number of Q values = 153

Ordered Q Values

n	Q
1	-7000

Royalton Road LF

2	-6300
3	-2300
4	-2000
5	-1850
6	-1800
7	-1600
8	-1600
9	-1200
10	-1150
11	-1133.33
12	-1000
13	-975
14	-966.667
15	-966.667
16	-942.857
17	-887.5
18	-866.667
19	-840
20	-800
21	-800
22	-800
23	-650
24	-600
25	-580
26	-566.667
27	-540
28	-500
29	-466.667
30	-400
31	-342.857
32	-291.667
33	-275
34	-272.727
35	-220
36	-220
37	-220
38	-188.889
39	-177.778
40	-166.667
41	-150
42	-120
43	-114.286
44	-66.6667
45	-66.6667
46	-50
47	-45.4545
48	-16.6667
49	-12.5
50	-10
51	12.5
52	23.0769
53	50
54	64.2857
55	66.6667
56	100
57	100
58	107.692
59	125
60	150
61	153.846
62	175
63	183.333
64	206.667

65	222.222
66	225
67	236.364
68	242.857
69	242.857
70	250
71	250
72	266.667
73	283.333
74	300
75	300
76	300
77	300
78	300
79	318.182
80	320
81	320
82	338.462
83	345.455
84	355.556
85	383.333
86	385.714
87	400
88	400
89	400
90	414.286
91	426.667
92	431.25
93	441.176
94	450
95	466.667
96	480
97	486.667
98	490
99	493.75
100	500
101	516.667
102	525
103	528.571
104	537.5
105	550
106	580
107	581.818
108	587.5
109	600
110	616.667
111	644.444
112	650
113	660
114	687.5
115	688.889
116	721.429
117	733.333
118	750
119	766.667
120	775
121	800
122	807.692
123	820
124	833.333
125	842.857
126	860
127	900

128	900
129	933.333
130	1033.33
131	1057.14
132	1066.67
133	1075
134	1175
135	1333.33
136	1380
137	1480
138	1500
139	1525
140	2050
141	2166.67
142	2200
143	2200
144	2450
145	2500
146	2600
147	2800
148	3500
149	3533.33
150	3800
151	5500
152	5700
153	6500

Sen's Estimator (Median Q) is 300

Time Period	Observations
12/2/2009	1
6/21/2010	1
12/6/2010	1
6/21/2011	1
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 12546
b = 44064
c = 612
Group Variance = 697
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 68.004
M1 = (153 - 68.004)/2.0 = 42.498

Royalton Road LF

M2 = (153 + 68.004)/2.0 + 1 = 111.502
Lower limit is -120 = Q(42)
Upper limit is 650 = Q(112)
-120 < 0 < 650 indicating no trend in data.

Sen's Slope Analysis
Parameter: Thallium, total
Location: MW-2R
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<0.2 (6/4/2012)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(2 - 1)	0
ND<0.2 (12/11/2012)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(3 - 1)	0
ND<0.2 (6/3/2013)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(4 - 1)	0
ND<0.2 (12/3/2013)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(5 - 1)	0
ND<0.2 (6/2/2014)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(6 - 1)	0
ND<0.2 (12/2/2014)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(7 - 1)	0
ND<0.2 (6/1/2015)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(8 - 1)	0
ND<0.2 (12/7/2015)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(9 - 1)	0
ND<0.2 (6/6/2016)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(10 - 1)	0
ND<0.2 (12/5/2016)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(11 - 1)	0
ND<0.2 (6/20/2017)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(12 - 1)	0
ND<0.2 (12/4/2017)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(13 - 1)	0
ND<0.2 (6/4/2018)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(14 - 1)	0
ND<0.2 (12/11/2012)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(3 - 2)	0
ND<0.2 (6/3/2013)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(4 - 2)	0
ND<0.2 (12/3/2013)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(5 - 2)	0
ND<0.2 (6/2/2014)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(6 - 2)	0
ND<0.2 (12/2/2014)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(7 - 2)	0
ND<0.2 (6/1/2015)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(8 - 2)	0
ND<0.2 (12/7/2015)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(9 - 2)	0
ND<0.2 (6/6/2016)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(10 - 2)	0
ND<0.2 (12/5/2016)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(11 - 2)	0
ND<0.2 (6/20/2017)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(12 - 2)	0
ND<0.2 (12/4/2017)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(13 - 2)	0
ND<0.2 (6/4/2018)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(14 - 2)	0
ND<0.2 (6/3/2013)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(4 - 3)	0
ND<0.2 (12/3/2013)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(5 - 3)	0
ND<0.2 (6/2/2014)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(6 - 3)	0
ND<0.2 (12/2/2014)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(7 - 3)	0
ND<0.2 (6/1/2015)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(8 - 3)	0
ND<0.2 (12/7/2015)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(9 - 3)	0
ND<0.2 (6/6/2016)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(10 - 3)	0
ND<0.2 (12/5/2016)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(11 - 3)	0
ND<0.2 (6/20/2017)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(12 - 3)	0
ND<0.2 (12/4/2017)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(13 - 3)	0
ND<0.2 (6/4/2018)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(14 - 3)	0
ND<0.2 (12/3/2013)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(5 - 4)	0
ND<0.2 (6/2/2014)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(6 - 4)	0
ND<0.2 (12/2/2014)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(7 - 4)	0
ND<0.2 (6/1/2015)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(8 - 4)	0
ND<0.2 (12/7/2015)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(9 - 4)	0
ND<0.2 (6/6/2016)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(10 - 4)	0
ND<0.2 (12/5/2016)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(11 - 4)	0
ND<0.2 (6/20/2017)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(12 - 4)	0
ND<0.2 (12/4/2017)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(13 - 4)	0
ND<0.2 (6/4/2018)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(14 - 4)	0
ND<0.2 (6/2/2014)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(6 - 5)	0
ND<0.2 (12/2/2014)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(7 - 5)	0

ND<0.2 (6/1/2015)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(8 - 5)	0
ND<0.2 (12/7/2015)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(9 - 5)	0
ND<0.2 (6/6/2016)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(10 - 5)	0
ND<0.2 (12/5/2016)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(11 - 5)	0
ND<0.2 (6/20/2017)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(12 - 5)	0
ND<0.2 (12/4/2017)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(13 - 5)	0
ND<0.2 (6/4/2018)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(14 - 5)	0
ND<0.2 (12/2/2014)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(7 - 6)	0
ND<0.2 (6/1/2015)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(8 - 6)	0
ND<0.2 (12/7/2015)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(9 - 6)	0
ND<0.2 (6/6/2016)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(10 - 6)	0
ND<0.2 (12/5/2016)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(11 - 6)	0
ND<0.2 (6/20/2017)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(12 - 6)	0
ND<0.2 (12/4/2017)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(13 - 6)	0
ND<0.2 (6/4/2018)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(14 - 6)	0
ND<0.2 (6/1/2015)	ND<0.2 (12/2/2014)	(0.2 - 0.2)/(8 - 7)	0
ND<0.2 (12/7/2015)	ND<0.2 (12/2/2014)	(0.2 - 0.2)/(9 - 7)	0
ND<0.2 (6/6/2016)	ND<0.2 (12/2/2014)	(0.2 - 0.2)/(10 - 7)	0
ND<0.2 (12/5/2016)	ND<0.2 (12/2/2014)	(0.2 - 0.2)/(11 - 7)	0
ND<0.2 (6/20/2017)	ND<0.2 (12/2/2014)	(0.2 - 0.2)/(12 - 7)	0
ND<0.2 (12/4/2017)	ND<0.2 (12/2/2014)	(0.2 - 0.2)/(13 - 7)	0
ND<0.2 (6/4/2018)	ND<0.2 (12/2/2014)	(0.2 - 0.2)/(14 - 7)	0
ND<0.2 (12/7/2015)	ND<0.2 (6/1/2015)	(0.2 - 0.2)/(9 - 8)	0
ND<0.2 (6/6/2016)	ND<0.2 (6/1/2015)	(0.2 - 0.2)/(10 - 8)	0
ND<0.2 (12/5/2016)	ND<0.2 (6/1/2015)	(0.2 - 0.2)/(11 - 8)	0
ND<0.2 (6/20/2017)	ND<0.2 (6/1/2015)	(0.2 - 0.2)/(12 - 8)	0
ND<0.2 (12/4/2017)	ND<0.2 (6/1/2015)	(0.2 - 0.2)/(13 - 8)	0
ND<0.2 (6/4/2018)	ND<0.2 (6/1/2015)	(0.2 - 0.2)/(14 - 8)	0
ND<0.2 (6/6/2016)	ND<0.2 (12/7/2015)	(0.2 - 0.2)/(10 - 9)	0
ND<0.2 (12/5/2016)	ND<0.2 (12/7/2015)	(0.2 - 0.2)/(11 - 9)	0
ND<0.2 (6/20/2017)	ND<0.2 (12/7/2015)	(0.2 - 0.2)/(12 - 9)	0
ND<0.2 (12/4/2017)	ND<0.2 (12/7/2015)	(0.2 - 0.2)/(13 - 9)	0
ND<0.2 (6/4/2018)	ND<0.2 (12/7/2015)	(0.2 - 0.2)/(14 - 9)	0
ND<0.2 (12/5/2016)	ND<0.2 (6/6/2016)	(0.2 - 0.2)/(11 - 10)	0
ND<0.2 (6/20/2017)	ND<0.2 (6/6/2016)	(0.2 - 0.2)/(12 - 10)	0
ND<0.2 (12/4/2017)	ND<0.2 (6/6/2016)	(0.2 - 0.2)/(13 - 10)	0
ND<0.2 (6/4/2018)	ND<0.2 (6/6/2016)	(0.2 - 0.2)/(14 - 10)	0
ND<0.2 (6/20/2017)	ND<0.2 (12/5/2016)	(0.2 - 0.2)/(12 - 11)	0
ND<0.2 (12/4/2017)	ND<0.2 (12/5/2016)	(0.2 - 0.2)/(13 - 11)	0
ND<0.2 (6/4/2018)	ND<0.2 (12/5/2016)	(0.2 - 0.2)/(14 - 11)	0
ND<0.2 (12/4/2017)	ND<0.2 (6/20/2017)	(0.2 - 0.2)/(13 - 12)	0
ND<0.2 (6/4/2018)	ND<0.2 (6/20/2017)	(0.2 - 0.2)/(14 - 12)	0
ND<0.2 (6/4/2018)	ND<0.2 (12/4/2017)	(0.2 - 0.2)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	0.2	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Sen's Slope Analysis
Parameter: Thallium, total
Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<0.2 (6/4/2012)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(2 - 1)	0
ND<0.2 (12/11/2012)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(3 - 1)	0
ND<0.2 (6/3/2013)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(4 - 1)	0
ND<0.2 (12/3/2013)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(5 - 1)	0
ND<0.2 (6/2/2014)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(6 - 1)	0
ND<0.2 (12/2/2014)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(7 - 1)	0
ND<0.2 (6/1/2015)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(8 - 1)	0
ND<0.2 (12/7/2015)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(9 - 1)	0
ND<0.2 (6/6/2016)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(10 - 1)	0
ND<0.2 (12/5/2016)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(11 - 1)	0
ND<0.2 (6/20/2017)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(12 - 1)	0
ND<0.2 (12/4/2017)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(13 - 1)	0
ND<0.2 (6/4/2018)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(14 - 1)	0
ND<0.2 (12/11/2012)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(3 - 2)	0
ND<0.2 (6/3/2013)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(4 - 2)	0
ND<0.2 (12/3/2013)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(5 - 2)	0
ND<0.2 (6/2/2014)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(6 - 2)	0
ND<0.2 (12/2/2014)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(7 - 2)	0
ND<0.2 (6/1/2015)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(8 - 2)	0
ND<0.2 (12/7/2015)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(9 - 2)	0
ND<0.2 (6/6/2016)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(10 - 2)	0
ND<0.2 (12/5/2016)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(11 - 2)	0
ND<0.2 (6/20/2017)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(12 - 2)	0
ND<0.2 (12/4/2017)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(13 - 2)	0
ND<0.2 (6/4/2018)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(14 - 2)	0
ND<0.2 (6/3/2013)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(4 - 3)	0
ND<0.2 (12/3/2013)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(5 - 3)	0
ND<0.2 (6/2/2014)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(6 - 3)	0
ND<0.2 (12/2/2014)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(7 - 3)	0
ND<0.2 (6/1/2015)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(8 - 3)	0
ND<0.2 (12/7/2015)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(9 - 3)	0
ND<0.2 (6/6/2016)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(10 - 3)	0
ND<0.2 (12/5/2016)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(11 - 3)	0
ND<0.2 (6/20/2017)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(12 - 3)	0
ND<0.2 (12/4/2017)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(13 - 3)	0
ND<0.2 (6/4/2018)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(14 - 3)	0
ND<0.2 (12/3/2013)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(5 - 4)	0
ND<0.2 (6/2/2014)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(6 - 4)	0
ND<0.2 (12/2/2014)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(7 - 4)	0
ND<0.2 (6/1/2015)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(8 - 4)	0
ND<0.2 (12/7/2015)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(9 - 4)	0
ND<0.2 (6/6/2016)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(10 - 4)	0
ND<0.2 (12/5/2016)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(11 - 4)	0
ND<0.2 (6/20/2017)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(12 - 4)	0
ND<0.2 (12/4/2017)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(13 - 4)	0
ND<0.2 (6/4/2018)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(14 - 4)	0
ND<0.2 (6/2/2014)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(6 - 5)	0
ND<0.2 (12/2/2014)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(7 - 5)	0

ND<0.2 (6/1/2015)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(8 - 5)	0
ND<0.2 (12/7/2015)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(9 - 5)	0
ND<0.2 (6/6/2016)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(10 - 5)	0
ND<0.2 (12/5/2016)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(11 - 5)	0
ND<0.2 (6/20/2017)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(12 - 5)	0
ND<0.2 (12/4/2017)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(13 - 5)	0
ND<0.2 (6/4/2018)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(14 - 5)	0
ND<0.2 (12/2/2014)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(7 - 6)	0
ND<0.2 (6/1/2015)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(8 - 6)	0
ND<0.2 (12/7/2015)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(9 - 6)	0
ND<0.2 (6/6/2016)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(10 - 6)	0
ND<0.2 (12/5/2016)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(11 - 6)	0
ND<0.2 (6/20/2017)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(12 - 6)	0
ND<0.2 (12/4/2017)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(13 - 6)	0
ND<0.2 (6/4/2018)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(14 - 6)	0
ND<0.2 (6/1/2015)	ND<0.2 (12/2/2014)	(0.2 - 0.2)/(8 - 7)	0
ND<0.2 (12/7/2015)	ND<0.2 (12/2/2014)	(0.2 - 0.2)/(9 - 7)	0
ND<0.2 (6/6/2016)	ND<0.2 (12/2/2014)	(0.2 - 0.2)/(10 - 7)	0
ND<0.2 (12/5/2016)	ND<0.2 (12/2/2014)	(0.2 - 0.2)/(11 - 7)	0
ND<0.2 (6/20/2017)	ND<0.2 (12/2/2014)	(0.2 - 0.2)/(12 - 7)	0
ND<0.2 (12/4/2017)	ND<0.2 (12/2/2014)	(0.2 - 0.2)/(13 - 7)	0
ND<0.2 (6/4/2018)	ND<0.2 (12/2/2014)	(0.2 - 0.2)/(14 - 7)	0
ND<0.2 (12/7/2015)	ND<0.2 (6/1/2015)	(0.2 - 0.2)/(9 - 8)	0
ND<0.2 (6/6/2016)	ND<0.2 (6/1/2015)	(0.2 - 0.2)/(10 - 8)	0
ND<0.2 (12/5/2016)	ND<0.2 (6/1/2015)	(0.2 - 0.2)/(11 - 8)	0
ND<0.2 (6/20/2017)	ND<0.2 (6/1/2015)	(0.2 - 0.2)/(12 - 8)	0
ND<0.2 (12/4/2017)	ND<0.2 (6/1/2015)	(0.2 - 0.2)/(13 - 8)	0
ND<0.2 (6/4/2018)	ND<0.2 (6/1/2015)	(0.2 - 0.2)/(14 - 8)	0
ND<0.2 (6/6/2016)	ND<0.2 (12/7/2015)	(0.2 - 0.2)/(10 - 9)	0
ND<0.2 (12/5/2016)	ND<0.2 (12/7/2015)	(0.2 - 0.2)/(11 - 9)	0
ND<0.2 (6/20/2017)	ND<0.2 (12/7/2015)	(0.2 - 0.2)/(12 - 9)	0
ND<0.2 (12/4/2017)	ND<0.2 (12/7/2015)	(0.2 - 0.2)/(13 - 9)	0
ND<0.2 (6/4/2018)	ND<0.2 (12/7/2015)	(0.2 - 0.2)/(14 - 9)	0
ND<0.2 (12/5/2016)	ND<0.2 (6/6/2016)	(0.2 - 0.2)/(11 - 10)	0
ND<0.2 (6/20/2017)	ND<0.2 (6/6/2016)	(0.2 - 0.2)/(12 - 10)	0
ND<0.2 (12/4/2017)	ND<0.2 (6/6/2016)	(0.2 - 0.2)/(13 - 10)	0
ND<0.2 (6/4/2018)	ND<0.2 (6/6/2016)	(0.2 - 0.2)/(14 - 10)	0
ND<0.2 (6/20/2017)	ND<0.2 (12/5/2016)	(0.2 - 0.2)/(12 - 11)	0
ND<0.2 (12/4/2017)	ND<0.2 (12/5/2016)	(0.2 - 0.2)/(13 - 11)	0
ND<0.2 (6/4/2018)	ND<0.2 (12/5/2016)	(0.2 - 0.2)/(14 - 11)	0
ND<0.2 (12/4/2017)	ND<0.2 (6/20/2017)	(0.2 - 0.2)/(13 - 12)	0
ND<0.2 (6/4/2018)	ND<0.2 (6/20/2017)	(0.2 - 0.2)/(14 - 12)	0
ND<0.2 (6/4/2018)	ND<0.2 (12/4/2017)	(0.2 - 0.2)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	0.2	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Sen's Slope Analysis
Parameter: Thallium, total
Location: MW-12
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<0.2 (6/4/2012)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(2 - 1)	0
ND<0.2 (12/11/2012)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(3 - 1)	0
ND<0.2 (6/3/2013)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(4 - 1)	0
ND<0.2 (12/3/2013)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(5 - 1)	0
ND<0.2 (6/2/2014)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(6 - 1)	0
ND<0.2 (12/2/2014)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(7 - 1)	0
ND<0.2 (6/1/2015)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(8 - 1)	0
ND<0.2 (12/7/2015)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(9 - 1)	0
ND<0.2 (6/6/2016)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(10 - 1)	0
ND<0.2 (12/5/2016)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(11 - 1)	0
ND<0.2 (6/20/2017)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(12 - 1)	0
ND<0.2 (12/4/2017)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(13 - 1)	0
ND<0.2 (6/4/2018)	ND<0.2 (12/13/2011)	(0.2 - 0.2)/(14 - 1)	0
ND<0.2 (12/11/2012)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(3 - 2)	0
ND<0.2 (6/3/2013)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(4 - 2)	0
ND<0.2 (12/3/2013)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(5 - 2)	0
ND<0.2 (6/2/2014)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(6 - 2)	0
ND<0.2 (12/2/2014)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(7 - 2)	0
ND<0.2 (6/1/2015)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(8 - 2)	0
ND<0.2 (12/7/2015)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(9 - 2)	0
ND<0.2 (6/6/2016)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(10 - 2)	0
ND<0.2 (12/5/2016)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(11 - 2)	0
ND<0.2 (6/20/2017)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(12 - 2)	0
ND<0.2 (12/4/2017)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(13 - 2)	0
ND<0.2 (6/4/2018)	ND<0.2 (6/4/2012)	(0.2 - 0.2)/(14 - 2)	0
ND<0.2 (6/3/2013)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(4 - 3)	0
ND<0.2 (12/3/2013)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(5 - 3)	0
ND<0.2 (6/2/2014)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(6 - 3)	0
ND<0.2 (12/2/2014)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(7 - 3)	0
ND<0.2 (6/1/2015)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(8 - 3)	0
ND<0.2 (12/7/2015)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(9 - 3)	0
ND<0.2 (6/6/2016)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(10 - 3)	0
ND<0.2 (12/5/2016)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(11 - 3)	0
ND<0.2 (6/20/2017)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(12 - 3)	0
ND<0.2 (12/4/2017)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(13 - 3)	0
ND<0.2 (6/4/2018)	ND<0.2 (12/11/2012)	(0.2 - 0.2)/(14 - 3)	0
ND<0.2 (12/3/2013)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(5 - 4)	0
ND<0.2 (6/2/2014)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(6 - 4)	0
ND<0.2 (12/2/2014)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(7 - 4)	0
ND<0.2 (6/1/2015)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(8 - 4)	0
ND<0.2 (12/7/2015)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(9 - 4)	0
ND<0.2 (6/6/2016)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(10 - 4)	0
ND<0.2 (12/5/2016)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(11 - 4)	0
ND<0.2 (6/20/2017)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(12 - 4)	0
ND<0.2 (12/4/2017)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(13 - 4)	0
ND<0.2 (6/4/2018)	ND<0.2 (6/3/2013)	(0.2 - 0.2)/(14 - 4)	0
ND<0.2 (6/2/2014)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(6 - 5)	0
ND<0.2 (12/2/2014)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(7 - 5)	0

ND<0.2 (6/1/2015)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(8 - 5)	0
ND<0.2 (12/7/2015)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(9 - 5)	0
ND<0.2 (6/6/2016)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(10 - 5)	0
ND<0.2 (12/5/2016)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(11 - 5)	0
ND<0.2 (6/20/2017)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(12 - 5)	0
ND<0.2 (12/4/2017)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(13 - 5)	0
ND<0.2 (6/4/2018)	ND<0.2 (12/3/2013)	(0.2 - 0.2)/(14 - 5)	0
ND<0.2 (12/2/2014)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(7 - 6)	0
ND<0.2 (6/1/2015)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(8 - 6)	0
ND<0.2 (12/7/2015)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(9 - 6)	0
ND<0.2 (6/6/2016)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(10 - 6)	0
ND<0.2 (12/5/2016)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(11 - 6)	0
ND<0.2 (6/20/2017)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(12 - 6)	0
ND<0.2 (12/4/2017)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(13 - 6)	0
ND<0.2 (6/4/2018)	ND<0.2 (6/2/2014)	(0.2 - 0.2)/(14 - 6)	0
ND<0.2 (6/1/2015)	ND<0.2 (12/2/2014)	(0.2 - 0.2)/(8 - 7)	0
ND<0.2 (12/7/2015)	ND<0.2 (12/2/2014)	(0.2 - 0.2)/(9 - 7)	0
ND<0.2 (6/6/2016)	ND<0.2 (12/2/2014)	(0.2 - 0.2)/(10 - 7)	0
ND<0.2 (12/5/2016)	ND<0.2 (12/2/2014)	(0.2 - 0.2)/(11 - 7)	0
ND<0.2 (6/20/2017)	ND<0.2 (12/2/2014)	(0.2 - 0.2)/(12 - 7)	0
ND<0.2 (12/4/2017)	ND<0.2 (12/2/2014)	(0.2 - 0.2)/(13 - 7)	0
ND<0.2 (6/4/2018)	ND<0.2 (12/2/2014)	(0.2 - 0.2)/(14 - 7)	0
ND<0.2 (12/7/2015)	ND<0.2 (6/1/2015)	(0.2 - 0.2)/(9 - 8)	0
ND<0.2 (6/6/2016)	ND<0.2 (6/1/2015)	(0.2 - 0.2)/(10 - 8)	0
ND<0.2 (12/5/2016)	ND<0.2 (6/1/2015)	(0.2 - 0.2)/(11 - 8)	0
ND<0.2 (6/20/2017)	ND<0.2 (6/1/2015)	(0.2 - 0.2)/(12 - 8)	0
ND<0.2 (12/4/2017)	ND<0.2 (6/1/2015)	(0.2 - 0.2)/(13 - 8)	0
ND<0.2 (6/4/2018)	ND<0.2 (6/1/2015)	(0.2 - 0.2)/(14 - 8)	0
ND<0.2 (6/6/2016)	ND<0.2 (12/7/2015)	(0.2 - 0.2)/(10 - 9)	0
ND<0.2 (12/5/2016)	ND<0.2 (12/7/2015)	(0.2 - 0.2)/(11 - 9)	0
ND<0.2 (6/20/2017)	ND<0.2 (12/7/2015)	(0.2 - 0.2)/(12 - 9)	0
ND<0.2 (12/4/2017)	ND<0.2 (12/7/2015)	(0.2 - 0.2)/(13 - 9)	0
ND<0.2 (6/4/2018)	ND<0.2 (12/7/2015)	(0.2 - 0.2)/(14 - 9)	0
ND<0.2 (12/5/2016)	ND<0.2 (6/6/2016)	(0.2 - 0.2)/(11 - 10)	0
ND<0.2 (6/20/2017)	ND<0.2 (6/6/2016)	(0.2 - 0.2)/(12 - 10)	0
ND<0.2 (12/4/2017)	ND<0.2 (6/6/2016)	(0.2 - 0.2)/(13 - 10)	0
ND<0.2 (6/4/2018)	ND<0.2 (6/6/2016)	(0.2 - 0.2)/(14 - 10)	0
ND<0.2 (6/20/2017)	ND<0.2 (12/5/2016)	(0.2 - 0.2)/(12 - 11)	0
ND<0.2 (12/4/2017)	ND<0.2 (12/5/2016)	(0.2 - 0.2)/(13 - 11)	0
ND<0.2 (6/4/2018)	ND<0.2 (12/5/2016)	(0.2 - 0.2)/(14 - 11)	0
ND<0.2 (12/4/2017)	ND<0.2 (6/20/2017)	(0.2 - 0.2)/(13 - 12)	0
ND<0.2 (6/4/2018)	ND<0.2 (6/20/2017)	(0.2 - 0.2)/(14 - 12)	0
ND<0.2 (6/4/2018)	ND<0.2 (12/4/2017)	(0.2 - 0.2)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	0.2	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Sen's Slope Analysis
Parameter: Vanadium, total
Location: MW-2R
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<5 (6/4/2012)	ND<5 (12/13/2011)	(5 - 5)/(2 - 1)	0
ND<5 (12/11/2012)	ND<5 (12/13/2011)	(5 - 5)/(3 - 1)	0
ND<5 (6/3/2013)	ND<5 (12/13/2011)	(5 - 5)/(4 - 1)	0
ND<5 (12/3/2013)	ND<5 (12/13/2011)	(5 - 5)/(5 - 1)	0
ND<5 (6/2/2014)	ND<5 (12/13/2011)	(5 - 5)/(6 - 1)	0
ND<5 (12/2/2014)	ND<5 (12/13/2011)	(5 - 5)/(7 - 1)	0
ND<5 (6/1/2015)	ND<5 (12/13/2011)	(5 - 5)/(8 - 1)	0
ND<5 (12/7/2015)	ND<5 (12/13/2011)	(5 - 5)/(9 - 1)	0
ND<5 (6/6/2016)	ND<5 (12/13/2011)	(5 - 5)/(10 - 1)	0
ND<5 (12/5/2016)	ND<5 (12/13/2011)	(5 - 5)/(11 - 1)	0
ND<5 (6/20/2017)	ND<5 (12/13/2011)	(5 - 5)/(12 - 1)	0
ND<5 (12/4/2017)	ND<5 (12/13/2011)	(5 - 5)/(13 - 1)	0
ND<5 (6/4/2018)	ND<5 (12/13/2011)	(5 - 5)/(14 - 1)	0
ND<5 (12/11/2012)	ND<5 (6/4/2012)	(5 - 5)/(3 - 2)	0
ND<5 (6/3/2013)	ND<5 (6/4/2012)	(5 - 5)/(4 - 2)	0
ND<5 (12/3/2013)	ND<5 (6/4/2012)	(5 - 5)/(5 - 2)	0
ND<5 (6/2/2014)	ND<5 (6/4/2012)	(5 - 5)/(6 - 2)	0
ND<5 (12/2/2014)	ND<5 (6/4/2012)	(5 - 5)/(7 - 2)	0
ND<5 (6/1/2015)	ND<5 (6/4/2012)	(5 - 5)/(8 - 2)	0
ND<5 (12/7/2015)	ND<5 (6/4/2012)	(5 - 5)/(9 - 2)	0
ND<5 (6/6/2016)	ND<5 (6/4/2012)	(5 - 5)/(10 - 2)	0
ND<5 (12/5/2016)	ND<5 (6/4/2012)	(5 - 5)/(11 - 2)	0
ND<5 (6/20/2017)	ND<5 (6/4/2012)	(5 - 5)/(12 - 2)	0
ND<5 (12/4/2017)	ND<5 (6/4/2012)	(5 - 5)/(13 - 2)	0
ND<5 (6/4/2018)	ND<5 (6/4/2012)	(5 - 5)/(14 - 2)	0
ND<5 (6/3/2013)	ND<5 (12/11/2012)	(5 - 5)/(4 - 3)	0
ND<5 (12/3/2013)	ND<5 (12/11/2012)	(5 - 5)/(5 - 3)	0
ND<5 (6/2/2014)	ND<5 (12/11/2012)	(5 - 5)/(6 - 3)	0
ND<5 (12/2/2014)	ND<5 (12/11/2012)	(5 - 5)/(7 - 3)	0
ND<5 (6/1/2015)	ND<5 (12/11/2012)	(5 - 5)/(8 - 3)	0
ND<5 (12/7/2015)	ND<5 (12/11/2012)	(5 - 5)/(9 - 3)	0
ND<5 (6/6/2016)	ND<5 (12/11/2012)	(5 - 5)/(10 - 3)	0
ND<5 (12/5/2016)	ND<5 (12/11/2012)	(5 - 5)/(11 - 3)	0
ND<5 (6/20/2017)	ND<5 (12/11/2012)	(5 - 5)/(12 - 3)	0
ND<5 (12/4/2017)	ND<5 (12/11/2012)	(5 - 5)/(13 - 3)	0
ND<5 (6/4/2018)	ND<5 (12/11/2012)	(5 - 5)/(14 - 3)	0
ND<5 (12/3/2013)	ND<5 (6/3/2013)	(5 - 5)/(5 - 4)	0
ND<5 (6/2/2014)	ND<5 (6/3/2013)	(5 - 5)/(6 - 4)	0
ND<5 (12/2/2014)	ND<5 (6/3/2013)	(5 - 5)/(7 - 4)	0
ND<5 (6/1/2015)	ND<5 (6/3/2013)	(5 - 5)/(8 - 4)	0
ND<5 (12/7/2015)	ND<5 (6/3/2013)	(5 - 5)/(9 - 4)	0
ND<5 (6/6/2016)	ND<5 (6/3/2013)	(5 - 5)/(10 - 4)	0
ND<5 (12/5/2016)	ND<5 (6/3/2013)	(5 - 5)/(11 - 4)	0
ND<5 (6/20/2017)	ND<5 (6/3/2013)	(5 - 5)/(12 - 4)	0
ND<5 (12/4/2017)	ND<5 (6/3/2013)	(5 - 5)/(13 - 4)	0
ND<5 (6/4/2018)	ND<5 (6/3/2013)	(5 - 5)/(14 - 4)	0
ND<5 (6/2/2014)	ND<5 (12/3/2013)	(5 - 5)/(6 - 5)	0
ND<5 (12/2/2014)	ND<5 (12/3/2013)	(5 - 5)/(7 - 5)	0

ND<5 (6/1/2015)	ND<5 (12/3/2013)	(5 - 5)/(8 - 5)	0
ND<5 (12/7/2015)	ND<5 (12/3/2013)	(5 - 5)/(9 - 5)	0
ND<5 (6/6/2016)	ND<5 (12/3/2013)	(5 - 5)/(10 - 5)	0
ND<5 (12/5/2016)	ND<5 (12/3/2013)	(5 - 5)/(11 - 5)	0
ND<5 (6/20/2017)	ND<5 (12/3/2013)	(5 - 5)/(12 - 5)	0
ND<5 (12/4/2017)	ND<5 (12/3/2013)	(5 - 5)/(13 - 5)	0
ND<5 (6/4/2018)	ND<5 (12/3/2013)	(5 - 5)/(14 - 5)	0
ND<5 (12/2/2014)	ND<5 (6/2/2014)	(5 - 5)/(7 - 6)	0
ND<5 (6/1/2015)	ND<5 (6/2/2014)	(5 - 5)/(8 - 6)	0
ND<5 (12/7/2015)	ND<5 (6/2/2014)	(5 - 5)/(9 - 6)	0
ND<5 (6/6/2016)	ND<5 (6/2/2014)	(5 - 5)/(10 - 6)	0
ND<5 (12/5/2016)	ND<5 (6/2/2014)	(5 - 5)/(11 - 6)	0
ND<5 (6/20/2017)	ND<5 (6/2/2014)	(5 - 5)/(12 - 6)	0
ND<5 (12/4/2017)	ND<5 (6/2/2014)	(5 - 5)/(13 - 6)	0
ND<5 (6/4/2018)	ND<5 (6/2/2014)	(5 - 5)/(14 - 6)	0
ND<5 (6/1/2015)	ND<5 (12/2/2014)	(5 - 5)/(8 - 7)	0
ND<5 (12/7/2015)	ND<5 (12/2/2014)	(5 - 5)/(9 - 7)	0
ND<5 (6/6/2016)	ND<5 (12/2/2014)	(5 - 5)/(10 - 7)	0
ND<5 (12/5/2016)	ND<5 (12/2/2014)	(5 - 5)/(11 - 7)	0
ND<5 (6/20/2017)	ND<5 (12/2/2014)	(5 - 5)/(12 - 7)	0
ND<5 (12/4/2017)	ND<5 (12/2/2014)	(5 - 5)/(13 - 7)	0
ND<5 (6/4/2018)	ND<5 (12/2/2014)	(5 - 5)/(14 - 7)	0
ND<5 (12/7/2015)	ND<5 (6/1/2015)	(5 - 5)/(9 - 8)	0
ND<5 (6/6/2016)	ND<5 (6/1/2015)	(5 - 5)/(10 - 8)	0
ND<5 (12/5/2016)	ND<5 (6/1/2015)	(5 - 5)/(11 - 8)	0
ND<5 (6/20/2017)	ND<5 (6/1/2015)	(5 - 5)/(12 - 8)	0
ND<5 (12/4/2017)	ND<5 (6/1/2015)	(5 - 5)/(13 - 8)	0
ND<5 (6/4/2018)	ND<5 (6/1/2015)	(5 - 5)/(14 - 8)	0
ND<5 (6/6/2016)	ND<5 (12/7/2015)	(5 - 5)/(10 - 9)	0
ND<5 (12/5/2016)	ND<5 (12/7/2015)	(5 - 5)/(11 - 9)	0
ND<5 (6/20/2017)	ND<5 (12/7/2015)	(5 - 5)/(12 - 9)	0
ND<5 (12/4/2017)	ND<5 (12/7/2015)	(5 - 5)/(13 - 9)	0
ND<5 (6/4/2018)	ND<5 (12/7/2015)	(5 - 5)/(14 - 9)	0
ND<5 (12/5/2016)	ND<5 (6/6/2016)	(5 - 5)/(11 - 10)	0
ND<5 (6/20/2017)	ND<5 (6/6/2016)	(5 - 5)/(12 - 10)	0
ND<5 (12/4/2017)	ND<5 (6/6/2016)	(5 - 5)/(13 - 10)	0
ND<5 (6/4/2018)	ND<5 (6/6/2016)	(5 - 5)/(14 - 10)	0
ND<5 (6/20/2017)	ND<5 (12/5/2016)	(5 - 5)/(12 - 11)	0
ND<5 (12/4/2017)	ND<5 (12/5/2016)	(5 - 5)/(13 - 11)	0
ND<5 (6/4/2018)	ND<5 (12/5/2016)	(5 - 5)/(14 - 11)	0
ND<5 (12/4/2017)	ND<5 (6/20/2017)	(5 - 5)/(13 - 12)	0
ND<5 (6/4/2018)	ND<5 (6/20/2017)	(5 - 5)/(14 - 12)	0
ND<5 (6/4/2018)	ND<5 (12/4/2017)	(5 - 5)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	5	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis
Parameter: Vanadium, total
Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<5 (6/4/2012)	ND<5 (12/13/2011)	(5 - 5)/(2 - 1)	0
ND<5 (12/11/2012)	ND<5 (12/13/2011)	(5 - 5)/(3 - 1)	0
ND<5 (6/3/2013)	ND<5 (12/13/2011)	(5 - 5)/(4 - 1)	0
ND<5 (12/3/2013)	ND<5 (12/13/2011)	(5 - 5)/(5 - 1)	0
ND<5 (6/2/2014)	ND<5 (12/13/2011)	(5 - 5)/(6 - 1)	0
ND<5 (12/2/2014)	ND<5 (12/13/2011)	(5 - 5)/(7 - 1)	0
ND<5 (6/1/2015)	ND<5 (12/13/2011)	(5 - 5)/(8 - 1)	0
ND<5 (12/7/2015)	ND<5 (12/13/2011)	(5 - 5)/(9 - 1)	0
ND<5 (6/6/2016)	ND<5 (12/13/2011)	(5 - 5)/(10 - 1)	0
ND<5 (12/5/2016)	ND<5 (12/13/2011)	(5 - 5)/(11 - 1)	0
ND<5 (6/20/2017)	ND<5 (12/13/2011)	(5 - 5)/(12 - 1)	0
ND<5 (12/4/2017)	ND<5 (12/13/2011)	(5 - 5)/(13 - 1)	0
ND<5 (6/4/2018)	ND<5 (12/13/2011)	(5 - 5)/(14 - 1)	0
ND<5 (12/11/2012)	ND<5 (6/4/2012)	(5 - 5)/(3 - 2)	0
ND<5 (6/3/2013)	ND<5 (6/4/2012)	(5 - 5)/(4 - 2)	0
ND<5 (12/3/2013)	ND<5 (6/4/2012)	(5 - 5)/(5 - 2)	0
ND<5 (6/2/2014)	ND<5 (6/4/2012)	(5 - 5)/(6 - 2)	0
ND<5 (12/2/2014)	ND<5 (6/4/2012)	(5 - 5)/(7 - 2)	0
ND<5 (6/1/2015)	ND<5 (6/4/2012)	(5 - 5)/(8 - 2)	0
ND<5 (12/7/2015)	ND<5 (6/4/2012)	(5 - 5)/(9 - 2)	0
ND<5 (6/6/2016)	ND<5 (6/4/2012)	(5 - 5)/(10 - 2)	0
ND<5 (12/5/2016)	ND<5 (6/4/2012)	(5 - 5)/(11 - 2)	0
ND<5 (6/20/2017)	ND<5 (6/4/2012)	(5 - 5)/(12 - 2)	0
ND<5 (12/4/2017)	ND<5 (6/4/2012)	(5 - 5)/(13 - 2)	0
ND<5 (6/4/2018)	ND<5 (6/4/2012)	(5 - 5)/(14 - 2)	0
ND<5 (6/3/2013)	ND<5 (12/11/2012)	(5 - 5)/(4 - 3)	0
ND<5 (12/3/2013)	ND<5 (12/11/2012)	(5 - 5)/(5 - 3)	0
ND<5 (6/2/2014)	ND<5 (12/11/2012)	(5 - 5)/(6 - 3)	0
ND<5 (12/2/2014)	ND<5 (12/11/2012)	(5 - 5)/(7 - 3)	0
ND<5 (6/1/2015)	ND<5 (12/11/2012)	(5 - 5)/(8 - 3)	0
ND<5 (12/7/2015)	ND<5 (12/11/2012)	(5 - 5)/(9 - 3)	0
ND<5 (6/6/2016)	ND<5 (12/11/2012)	(5 - 5)/(10 - 3)	0
ND<5 (12/5/2016)	ND<5 (12/11/2012)	(5 - 5)/(11 - 3)	0
ND<5 (6/20/2017)	ND<5 (12/11/2012)	(5 - 5)/(12 - 3)	0
ND<5 (12/4/2017)	ND<5 (12/11/2012)	(5 - 5)/(13 - 3)	0
ND<5 (6/4/2018)	ND<5 (12/11/2012)	(5 - 5)/(14 - 3)	0
ND<5 (12/3/2013)	ND<5 (6/3/2013)	(5 - 5)/(5 - 4)	0
ND<5 (6/2/2014)	ND<5 (6/3/2013)	(5 - 5)/(6 - 4)	0
ND<5 (12/2/2014)	ND<5 (6/3/2013)	(5 - 5)/(7 - 4)	0
ND<5 (6/1/2015)	ND<5 (6/3/2013)	(5 - 5)/(8 - 4)	0
ND<5 (12/7/2015)	ND<5 (6/3/2013)	(5 - 5)/(9 - 4)	0
ND<5 (6/6/2016)	ND<5 (6/3/2013)	(5 - 5)/(10 - 4)	0
ND<5 (12/5/2016)	ND<5 (6/3/2013)	(5 - 5)/(11 - 4)	0
ND<5 (6/20/2017)	ND<5 (6/3/2013)	(5 - 5)/(12 - 4)	0
ND<5 (12/4/2017)	ND<5 (6/3/2013)	(5 - 5)/(13 - 4)	0
ND<5 (6/4/2018)	ND<5 (6/3/2013)	(5 - 5)/(14 - 4)	0
ND<5 (6/2/2014)	ND<5 (12/3/2013)	(5 - 5)/(6 - 5)	0
ND<5 (12/2/2014)	ND<5 (12/3/2013)	(5 - 5)/(7 - 5)	0

ND<5 (6/1/2015)	ND<5 (12/3/2013)	(5 - 5)/(8 - 5)	0
ND<5 (12/7/2015)	ND<5 (12/3/2013)	(5 - 5)/(9 - 5)	0
ND<5 (6/6/2016)	ND<5 (12/3/2013)	(5 - 5)/(10 - 5)	0
ND<5 (12/5/2016)	ND<5 (12/3/2013)	(5 - 5)/(11 - 5)	0
ND<5 (6/20/2017)	ND<5 (12/3/2013)	(5 - 5)/(12 - 5)	0
ND<5 (12/4/2017)	ND<5 (12/3/2013)	(5 - 5)/(13 - 5)	0
ND<5 (6/4/2018)	ND<5 (12/3/2013)	(5 - 5)/(14 - 5)	0
ND<5 (12/2/2014)	ND<5 (6/2/2014)	(5 - 5)/(7 - 6)	0
ND<5 (6/1/2015)	ND<5 (6/2/2014)	(5 - 5)/(8 - 6)	0
ND<5 (12/7/2015)	ND<5 (6/2/2014)	(5 - 5)/(9 - 6)	0
ND<5 (6/6/2016)	ND<5 (6/2/2014)	(5 - 5)/(10 - 6)	0
ND<5 (12/5/2016)	ND<5 (6/2/2014)	(5 - 5)/(11 - 6)	0
ND<5 (6/20/2017)	ND<5 (6/2/2014)	(5 - 5)/(12 - 6)	0
ND<5 (12/4/2017)	ND<5 (6/2/2014)	(5 - 5)/(13 - 6)	0
ND<5 (6/4/2018)	ND<5 (6/2/2014)	(5 - 5)/(14 - 6)	0
ND<5 (6/1/2015)	ND<5 (12/2/2014)	(5 - 5)/(8 - 7)	0
ND<5 (12/7/2015)	ND<5 (12/2/2014)	(5 - 5)/(9 - 7)	0
ND<5 (6/6/2016)	ND<5 (12/2/2014)	(5 - 5)/(10 - 7)	0
ND<5 (12/5/2016)	ND<5 (12/2/2014)	(5 - 5)/(11 - 7)	0
ND<5 (6/20/2017)	ND<5 (12/2/2014)	(5 - 5)/(12 - 7)	0
ND<5 (12/4/2017)	ND<5 (12/2/2014)	(5 - 5)/(13 - 7)	0
ND<5 (6/4/2018)	ND<5 (12/2/2014)	(5 - 5)/(14 - 7)	0
ND<5 (12/7/2015)	ND<5 (6/1/2015)	(5 - 5)/(9 - 8)	0
ND<5 (6/6/2016)	ND<5 (6/1/2015)	(5 - 5)/(10 - 8)	0
ND<5 (12/5/2016)	ND<5 (6/1/2015)	(5 - 5)/(11 - 8)	0
ND<5 (6/20/2017)	ND<5 (6/1/2015)	(5 - 5)/(12 - 8)	0
ND<5 (12/4/2017)	ND<5 (6/1/2015)	(5 - 5)/(13 - 8)	0
ND<5 (6/4/2018)	ND<5 (6/1/2015)	(5 - 5)/(14 - 8)	0
ND<5 (6/6/2016)	ND<5 (12/7/2015)	(5 - 5)/(10 - 9)	0
ND<5 (12/5/2016)	ND<5 (12/7/2015)	(5 - 5)/(11 - 9)	0
ND<5 (6/20/2017)	ND<5 (12/7/2015)	(5 - 5)/(12 - 9)	0
ND<5 (12/4/2017)	ND<5 (12/7/2015)	(5 - 5)/(13 - 9)	0
ND<5 (6/4/2018)	ND<5 (12/7/2015)	(5 - 5)/(14 - 9)	0
ND<5 (12/5/2016)	ND<5 (6/6/2016)	(5 - 5)/(11 - 10)	0
ND<5 (6/20/2017)	ND<5 (6/6/2016)	(5 - 5)/(12 - 10)	0
ND<5 (12/4/2017)	ND<5 (6/6/2016)	(5 - 5)/(13 - 10)	0
ND<5 (6/4/2018)	ND<5 (6/6/2016)	(5 - 5)/(14 - 10)	0
ND<5 (6/20/2017)	ND<5 (12/5/2016)	(5 - 5)/(12 - 11)	0
ND<5 (12/4/2017)	ND<5 (12/5/2016)	(5 - 5)/(13 - 11)	0
ND<5 (6/4/2018)	ND<5 (12/5/2016)	(5 - 5)/(14 - 11)	0
ND<5 (12/4/2017)	ND<5 (6/20/2017)	(5 - 5)/(13 - 12)	0
ND<5 (6/4/2018)	ND<5 (6/20/2017)	(5 - 5)/(14 - 12)	0
ND<5 (6/4/2018)	ND<5 (12/4/2017)	(5 - 5)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

Royalton Road LF

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	5	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis
Parameter: Vanadium, total
Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<5 (6/4/2012)	ND<5 (12/13/2011)	(5 - 5)/(2 - 1)	0
ND<5 (12/11/2012)	ND<5 (12/13/2011)	(5 - 5)/(3 - 1)	0
ND<5 (6/3/2013)	ND<5 (12/13/2011)	(5 - 5)/(4 - 1)	0
ND<5 (12/3/2013)	ND<5 (12/13/2011)	(5 - 5)/(5 - 1)	0
ND<5 (6/2/2014)	ND<5 (12/13/2011)	(5 - 5)/(6 - 1)	0
ND<5 (12/2/2014)	ND<5 (12/13/2011)	(5 - 5)/(7 - 1)	0
ND<5 (6/1/2015)	ND<5 (12/13/2011)	(5 - 5)/(8 - 1)	0
ND<5 (12/7/2015)	ND<5 (12/13/2011)	(5 - 5)/(9 - 1)	0
ND<5 (6/6/2016)	ND<5 (12/13/2011)	(5 - 5)/(10 - 1)	0
ND<5 (12/5/2016)	ND<5 (12/13/2011)	(5 - 5)/(11 - 1)	0
ND<5 (6/20/2017)	ND<5 (12/13/2011)	(5 - 5)/(12 - 1)	0
ND<5 (12/4/2017)	ND<5 (12/13/2011)	(5 - 5)/(13 - 1)	0
ND<5 (6/4/2018)	ND<5 (12/13/2011)	(5 - 5)/(14 - 1)	0
ND<5 (12/11/2012)	ND<5 (6/4/2012)	(5 - 5)/(3 - 2)	0
ND<5 (6/3/2013)	ND<5 (6/4/2012)	(5 - 5)/(4 - 2)	0
ND<5 (12/3/2013)	ND<5 (6/4/2012)	(5 - 5)/(5 - 2)	0
ND<5 (6/2/2014)	ND<5 (6/4/2012)	(5 - 5)/(6 - 2)	0
ND<5 (12/2/2014)	ND<5 (6/4/2012)	(5 - 5)/(7 - 2)	0
ND<5 (6/1/2015)	ND<5 (6/4/2012)	(5 - 5)/(8 - 2)	0
ND<5 (12/7/2015)	ND<5 (6/4/2012)	(5 - 5)/(9 - 2)	0
ND<5 (6/6/2016)	ND<5 (6/4/2012)	(5 - 5)/(10 - 2)	0
ND<5 (12/5/2016)	ND<5 (6/4/2012)	(5 - 5)/(11 - 2)	0
ND<5 (6/20/2017)	ND<5 (6/4/2012)	(5 - 5)/(12 - 2)	0
ND<5 (12/4/2017)	ND<5 (6/4/2012)	(5 - 5)/(13 - 2)	0
ND<5 (6/4/2018)	ND<5 (6/4/2012)	(5 - 5)/(14 - 2)	0
ND<5 (6/3/2013)	ND<5 (12/11/2012)	(5 - 5)/(4 - 3)	0
ND<5 (12/3/2013)	ND<5 (12/11/2012)	(5 - 5)/(5 - 3)	0
ND<5 (6/2/2014)	ND<5 (12/11/2012)	(5 - 5)/(6 - 3)	0
ND<5 (12/2/2014)	ND<5 (12/11/2012)	(5 - 5)/(7 - 3)	0
ND<5 (6/1/2015)	ND<5 (12/11/2012)	(5 - 5)/(8 - 3)	0
ND<5 (12/7/2015)	ND<5 (12/11/2012)	(5 - 5)/(9 - 3)	0
ND<5 (6/6/2016)	ND<5 (12/11/2012)	(5 - 5)/(10 - 3)	0
ND<5 (12/5/2016)	ND<5 (12/11/2012)	(5 - 5)/(11 - 3)	0
ND<5 (6/20/2017)	ND<5 (12/11/2012)	(5 - 5)/(12 - 3)	0
ND<5 (12/4/2017)	ND<5 (12/11/2012)	(5 - 5)/(13 - 3)	0
ND<5 (6/4/2018)	ND<5 (12/11/2012)	(5 - 5)/(14 - 3)	0
ND<5 (12/3/2013)	ND<5 (6/3/2013)	(5 - 5)/(5 - 4)	0
ND<5 (6/2/2014)	ND<5 (6/3/2013)	(5 - 5)/(6 - 4)	0
ND<5 (12/2/2014)	ND<5 (6/3/2013)	(5 - 5)/(7 - 4)	0
ND<5 (6/1/2015)	ND<5 (6/3/2013)	(5 - 5)/(8 - 4)	0
ND<5 (12/7/2015)	ND<5 (6/3/2013)	(5 - 5)/(9 - 4)	0
ND<5 (6/6/2016)	ND<5 (6/3/2013)	(5 - 5)/(10 - 4)	0
ND<5 (12/5/2016)	ND<5 (6/3/2013)	(5 - 5)/(11 - 4)	0
ND<5 (6/20/2017)	ND<5 (6/3/2013)	(5 - 5)/(12 - 4)	0
ND<5 (12/4/2017)	ND<5 (6/3/2013)	(5 - 5)/(13 - 4)	0
ND<5 (6/4/2018)	ND<5 (6/3/2013)	(5 - 5)/(14 - 4)	0
ND<5 (6/2/2014)	ND<5 (12/3/2013)	(5 - 5)/(6 - 5)	0
ND<5 (12/2/2014)	ND<5 (12/3/2013)	(5 - 5)/(7 - 5)	0

ND<5 (6/1/2015)	ND<5 (12/3/2013)	(5 - 5)/(8 - 5)	0
ND<5 (12/7/2015)	ND<5 (12/3/2013)	(5 - 5)/(9 - 5)	0
ND<5 (6/6/2016)	ND<5 (12/3/2013)	(5 - 5)/(10 - 5)	0
ND<5 (12/5/2016)	ND<5 (12/3/2013)	(5 - 5)/(11 - 5)	0
ND<5 (6/20/2017)	ND<5 (12/3/2013)	(5 - 5)/(12 - 5)	0
ND<5 (12/4/2017)	ND<5 (12/3/2013)	(5 - 5)/(13 - 5)	0
ND<5 (6/4/2018)	ND<5 (12/3/2013)	(5 - 5)/(14 - 5)	0
ND<5 (12/2/2014)	ND<5 (6/2/2014)	(5 - 5)/(7 - 6)	0
ND<5 (6/1/2015)	ND<5 (6/2/2014)	(5 - 5)/(8 - 6)	0
ND<5 (12/7/2015)	ND<5 (6/2/2014)	(5 - 5)/(9 - 6)	0
ND<5 (6/6/2016)	ND<5 (6/2/2014)	(5 - 5)/(10 - 6)	0
ND<5 (12/5/2016)	ND<5 (6/2/2014)	(5 - 5)/(11 - 6)	0
ND<5 (6/20/2017)	ND<5 (6/2/2014)	(5 - 5)/(12 - 6)	0
ND<5 (12/4/2017)	ND<5 (6/2/2014)	(5 - 5)/(13 - 6)	0
ND<5 (6/4/2018)	ND<5 (6/2/2014)	(5 - 5)/(14 - 6)	0
ND<5 (6/1/2015)	ND<5 (12/2/2014)	(5 - 5)/(8 - 7)	0
ND<5 (12/7/2015)	ND<5 (12/2/2014)	(5 - 5)/(9 - 7)	0
ND<5 (6/6/2016)	ND<5 (12/2/2014)	(5 - 5)/(10 - 7)	0
ND<5 (12/5/2016)	ND<5 (12/2/2014)	(5 - 5)/(11 - 7)	0
ND<5 (6/20/2017)	ND<5 (12/2/2014)	(5 - 5)/(12 - 7)	0
ND<5 (12/4/2017)	ND<5 (12/2/2014)	(5 - 5)/(13 - 7)	0
ND<5 (6/4/2018)	ND<5 (12/2/2014)	(5 - 5)/(14 - 7)	0
ND<5 (12/7/2015)	ND<5 (6/1/2015)	(5 - 5)/(9 - 8)	0
ND<5 (6/6/2016)	ND<5 (6/1/2015)	(5 - 5)/(10 - 8)	0
ND<5 (12/5/2016)	ND<5 (6/1/2015)	(5 - 5)/(11 - 8)	0
ND<5 (6/20/2017)	ND<5 (6/1/2015)	(5 - 5)/(12 - 8)	0
ND<5 (12/4/2017)	ND<5 (6/1/2015)	(5 - 5)/(13 - 8)	0
ND<5 (6/4/2018)	ND<5 (6/1/2015)	(5 - 5)/(14 - 8)	0
ND<5 (6/6/2016)	ND<5 (12/7/2015)	(5 - 5)/(10 - 9)	0
ND<5 (12/5/2016)	ND<5 (12/7/2015)	(5 - 5)/(11 - 9)	0
ND<5 (6/20/2017)	ND<5 (12/7/2015)	(5 - 5)/(12 - 9)	0
ND<5 (12/4/2017)	ND<5 (12/7/2015)	(5 - 5)/(13 - 9)	0
ND<5 (6/4/2018)	ND<5 (12/7/2015)	(5 - 5)/(14 - 9)	0
ND<5 (12/5/2016)	ND<5 (6/6/2016)	(5 - 5)/(11 - 10)	0
ND<5 (6/20/2017)	ND<5 (6/6/2016)	(5 - 5)/(12 - 10)	0
ND<5 (12/4/2017)	ND<5 (6/6/2016)	(5 - 5)/(13 - 10)	0
ND<5 (6/4/2018)	ND<5 (6/6/2016)	(5 - 5)/(14 - 10)	0
ND<5 (6/20/2017)	ND<5 (12/5/2016)	(5 - 5)/(12 - 11)	0
ND<5 (12/4/2017)	ND<5 (12/5/2016)	(5 - 5)/(13 - 11)	0
ND<5 (6/4/2018)	ND<5 (12/5/2016)	(5 - 5)/(14 - 11)	0
ND<5 (12/4/2017)	ND<5 (6/20/2017)	(5 - 5)/(13 - 12)	0
ND<5 (6/4/2018)	ND<5 (6/20/2017)	(5 - 5)/(14 - 12)	0
ND<5 (6/4/2018)	ND<5 (12/4/2017)	(5 - 5)/(14 - 13)	0

Number of Q values = 91

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0

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8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0

72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	5	14

Time Period	Observations
12/13/2011	1
6/4/2012	1
12/11/2012	1
6/3/2013	1
12/3/2013	1
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 6006
B = 0
C = 2184
D = 0
E = 182
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (91 - 0)/2.0 = 45.5
M2 = (91 + 0)/2.0 + 1 = 46.5
Lower limit is 0 = Q(46)
Upper limit is 0 = Q(47)
0 < 0 < 0 indicating no trend in data.

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Sen's Slope Analysis

Parameter: Zinc, total

Location: MW-2R

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<10 (12/2/2014)	ND<10 0.01J (6/2/2014)	(10 - 10)/(2 - 1)	0
ND<10 (12/7/2015)	ND<10 0.01J (6/2/2014)	(10 - 10)/(3 - 1)	0
ND<10 (6/6/2016)	ND<10 0.01J (6/2/2014)	(10 - 10)/(4 - 1)	0
ND<10 0.004J (12/5/2016)	ND<10 0.01J (6/2/2014)	(10 - 10)/(5 - 1)	0
ND<10 (6/20/2017)	ND<10 0.01J (6/2/2014)	(10 - 10)/(6 - 1)	0
ND<10 (12/4/2017)	ND<10 0.01J (6/2/2014)	(10 - 10)/(7 - 1)	0
ND<10 (6/4/2018)	ND<10 0.01J (6/2/2014)	(10 - 10)/(8 - 1)	0
ND<10 (12/7/2015)	ND<10 (12/2/2014)	(10 - 10)/(3 - 2)	0
ND<10 (6/6/2016)	ND<10 (12/2/2014)	(10 - 10)/(4 - 2)	0
ND<10 0.004J (12/5/2016)	ND<10 (12/2/2014)	(10 - 10)/(5 - 2)	0
ND<10 (6/20/2017)	ND<10 (12/2/2014)	(10 - 10)/(6 - 2)	0
ND<10 (12/4/2017)	ND<10 (12/2/2014)	(10 - 10)/(7 - 2)	0
ND<10 (6/4/2018)	ND<10 (12/2/2014)	(10 - 10)/(8 - 2)	0
ND<10 (6/6/2016)	ND<10 (12/7/2015)	(10 - 10)/(4 - 3)	0
ND<10 0.004J (12/5/2016)	ND<10 (12/7/2015)	(10 - 10)/(5 - 3)	0
ND<10 (6/20/2017)	ND<10 (12/7/2015)	(10 - 10)/(6 - 3)	0
ND<10 (12/4/2017)	ND<10 (12/7/2015)	(10 - 10)/(7 - 3)	0
ND<10 (6/4/2018)	ND<10 (12/7/2015)	(10 - 10)/(8 - 3)	0
ND<10 0.004J (12/5/2016)	ND<10 (6/6/2016)	(10 - 10)/(5 - 4)	0
ND<10 (6/20/2017)	ND<10 (6/6/2016)	(10 - 10)/(6 - 4)	0
ND<10 (12/4/2017)	ND<10 (6/6/2016)	(10 - 10)/(7 - 4)	0
ND<10 (6/4/2018)	ND<10 (6/6/2016)	(10 - 10)/(8 - 4)	0
ND<10 (6/20/2017)	ND<10 0.004J (12/5/2016)	(10 - 10)/(6 - 5)	0
ND<10 (12/4/2017)	ND<10 0.004J (12/5/2016)	(10 - 10)/(7 - 5)	0
ND<10 (6/4/2018)	ND<10 0.004J (12/5/2016)	(10 - 10)/(8 - 5)	0
ND<10 (12/4/2017)	ND<10 (6/20/2017)	(10 - 10)/(7 - 6)	0
ND<10 (6/4/2018)	ND<10 (6/20/2017)	(10 - 10)/(8 - 6)	0
ND<10 (6/4/2018)	ND<10 (12/4/2017)	(10 - 10)/(8 - 7)	0

Number of Q values = 28

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0

11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	10	8

Time Period	Observations
6/2/2014	1
12/2/2014	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 1176
B = 0
C = 336
D = 0
E = 56
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 0
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (28 - 0)/2.0 = 14
M2 = (28 + 0)/2.0 + 1 = 15
Lower limit is 0 = Q(14)
Upper limit is 0 = Q(15)
0 < 0 < 0 indicating no trend in data.

Sen's Slope Analysis
Parameter: Zinc, total
Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
93 (12/2/2014)	186 (6/2/2014)	(93 - 186)/(2 - 1)	-93
145 (6/1/2015)	186 (6/2/2014)	(145 - 186)/(3 - 1)	-20.5
107 (12/7/2015)	186 (6/2/2014)	(107 - 186)/(4 - 1)	-26.3333
98 (6/6/2016)	186 (6/2/2014)	(98 - 186)/(5 - 1)	-22
109 (12/5/2016)	186 (6/2/2014)	(109 - 186)/(6 - 1)	-15.4
95 (6/20/2017)	186 (6/2/2014)	(95 - 186)/(7 - 1)	-15.1667
111 (12/4/2017)	186 (6/2/2014)	(111 - 186)/(8 - 1)	-10.7143
80 (6/4/2018)	186 (6/2/2014)	(80 - 186)/(9 - 1)	-13.25
145 (6/1/2015)	93 (12/2/2014)	(145 - 93)/(3 - 2)	52
107 (12/7/2015)	93 (12/2/2014)	(107 - 93)/(4 - 2)	7
98 (6/6/2016)	93 (12/2/2014)	(98 - 93)/(5 - 2)	1.66667
109 (12/5/2016)	93 (12/2/2014)	(109 - 93)/(6 - 2)	4
95 (6/20/2017)	93 (12/2/2014)	(95 - 93)/(7 - 2)	0.4
111 (12/4/2017)	93 (12/2/2014)	(111 - 93)/(8 - 2)	3
80 (6/4/2018)	93 (12/2/2014)	(80 - 93)/(9 - 2)	-1.85714
107 (12/7/2015)	145 (6/1/2015)	(107 - 145)/(4 - 3)	-38
98 (6/6/2016)	145 (6/1/2015)	(98 - 145)/(5 - 3)	-23.5
109 (12/5/2016)	145 (6/1/2015)	(109 - 145)/(6 - 3)	-12
95 (6/20/2017)	145 (6/1/2015)	(95 - 145)/(7 - 3)	-12.5
111 (12/4/2017)	145 (6/1/2015)	(111 - 145)/(8 - 3)	-6.8
80 (6/4/2018)	145 (6/1/2015)	(80 - 145)/(9 - 3)	-10.8333
98 (6/6/2016)	107 (12/7/2015)	(98 - 107)/(5 - 4)	-9
109 (12/5/2016)	107 (12/7/2015)	(109 - 107)/(6 - 4)	1
95 (6/20/2017)	107 (12/7/2015)	(95 - 107)/(7 - 4)	-4
111 (12/4/2017)	107 (12/7/2015)	(111 - 107)/(8 - 4)	1
80 (6/4/2018)	107 (12/7/2015)	(80 - 107)/(9 - 4)	-5.4
109 (12/5/2016)	98 (6/6/2016)	(109 - 98)/(6 - 5)	11
95 (6/20/2017)	98 (6/6/2016)	(95 - 98)/(7 - 5)	-1.5
111 (12/4/2017)	98 (6/6/2016)	(111 - 98)/(8 - 5)	4.33333
80 (6/4/2018)	98 (6/6/2016)	(80 - 98)/(9 - 5)	-4.5
95 (6/20/2017)	109 (12/5/2016)	(95 - 109)/(7 - 6)	-14
111 (12/4/2017)	109 (12/5/2016)	(111 - 109)/(8 - 6)	1
80 (6/4/2018)	109 (12/5/2016)	(80 - 109)/(9 - 6)	-9.66667
111 (12/4/2017)	95 (6/20/2017)	(111 - 95)/(8 - 7)	16
80 (6/4/2018)	95 (6/20/2017)	(80 - 95)/(9 - 7)	-7.5
80 (6/4/2018)	111 (12/4/2017)	(80 - 111)/(9 - 8)	-31

Number of Q values = 36

Ordered Q Values

n	Q
1	-93

2	-38
3	-31
4	-26.3333
5	-23.5
6	-22
7	-20.5
8	-15.4
9	-15.1667
10	-14
11	-13.25
12	-12.5
13	-12
14	-10.8333
15	-10.7143
16	-9.66667
17	-9
18	-7.5
19	-6.8
20	-5.4
21	-4.5
22	-4
23	-1.85714
24	-1.5
25	0.4
26	1
27	1
28	1
29	1.66667
30	3
31	4
32	4.33333
33	7
34	11
35	16
36	52

Sen's Estimator (Median Q) is -7.15

Time Period	Observations
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1656
b = 4536
c = 144
Group Variance = 92
For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 24.7065
M1 = (36 - 24.7065)/2.0 = 5.64673

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M2 = (36 + 24.7065)/2.0 + 1 = 31.3533
Lower limit is -22 = Q(6)
Upper limit is 4 = Q(31)
-22 < 0 < 4 indicating no trend in data.

Royalton Road LF

Sen's Slope Analysis

Parameter: Zinc, total

Location: MW-12

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

99% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<10 (12/2/2014)	ND<10 (6/2/2014)	(10 - 10)/(2 - 1)	0
ND<10 (6/1/2015)	ND<10 (6/2/2014)	(10 - 10)/(3 - 1)	0
ND<10 (12/7/2015)	ND<10 (6/2/2014)	(10 - 10)/(4 - 1)	0
ND<10 (6/6/2016)	ND<10 (6/2/2014)	(10 - 10)/(5 - 1)	0
ND<10 (12/5/2016)	ND<10 (6/2/2014)	(10 - 10)/(6 - 1)	0
ND<10 (6/20/2017)	ND<10 (6/2/2014)	(10 - 10)/(7 - 1)	0
ND<10 (12/4/2017)	ND<10 (6/2/2014)	(10 - 10)/(8 - 1)	0
ND<10 (6/4/2018)	ND<10 (6/2/2014)	(10 - 10)/(9 - 1)	0
ND<10 (6/1/2015)	ND<10 (12/2/2014)	(10 - 10)/(3 - 2)	0
ND<10 (12/7/2015)	ND<10 (12/2/2014)	(10 - 10)/(4 - 2)	0
ND<10 (6/6/2016)	ND<10 (12/2/2014)	(10 - 10)/(5 - 2)	0
ND<10 (12/5/2016)	ND<10 (12/2/2014)	(10 - 10)/(6 - 2)	0
ND<10 (6/20/2017)	ND<10 (12/2/2014)	(10 - 10)/(7 - 2)	0
ND<10 (12/4/2017)	ND<10 (12/2/2014)	(10 - 10)/(8 - 2)	0
ND<10 (6/4/2018)	ND<10 (12/2/2014)	(10 - 10)/(9 - 2)	0
ND<10 (12/7/2015)	ND<10 (6/1/2015)	(10 - 10)/(4 - 3)	0
ND<10 (6/6/2016)	ND<10 (6/1/2015)	(10 - 10)/(5 - 3)	0
ND<10 (12/5/2016)	ND<10 (6/1/2015)	(10 - 10)/(6 - 3)	0
ND<10 (6/20/2017)	ND<10 (6/1/2015)	(10 - 10)/(7 - 3)	0
ND<10 (12/4/2017)	ND<10 (6/1/2015)	(10 - 10)/(8 - 3)	0
ND<10 (6/4/2018)	ND<10 (6/1/2015)	(10 - 10)/(9 - 3)	0
ND<10 (6/6/2016)	ND<10 (12/7/2015)	(10 - 10)/(5 - 4)	0
ND<10 (12/5/2016)	ND<10 (12/7/2015)	(10 - 10)/(6 - 4)	0
ND<10 (6/20/2017)	ND<10 (12/7/2015)	(10 - 10)/(7 - 4)	0
ND<10 (12/4/2017)	ND<10 (12/7/2015)	(10 - 10)/(8 - 4)	0
ND<10 (6/4/2018)	ND<10 (12/7/2015)	(10 - 10)/(9 - 4)	0
ND<10 (12/5/2016)	ND<10 (6/6/2016)	(10 - 10)/(6 - 5)	0
ND<10 (6/20/2017)	ND<10 (6/6/2016)	(10 - 10)/(7 - 5)	0
ND<10 (12/4/2017)	ND<10 (6/6/2016)	(10 - 10)/(8 - 5)	0
ND<10 (6/4/2018)	ND<10 (6/6/2016)	(10 - 10)/(9 - 5)	0
ND<10 (6/20/2017)	ND<10 (12/5/2016)	(10 - 10)/(7 - 6)	0
ND<10 (12/4/2017)	ND<10 (12/5/2016)	(10 - 10)/(8 - 6)	0
ND<10 (6/4/2018)	ND<10 (12/5/2016)	(10 - 10)/(9 - 6)	0
ND<10 (12/4/2017)	ND<10 (6/20/2017)	(10 - 10)/(8 - 7)	0
ND<10 (6/4/2018)	ND<10 (6/20/2017)	(10 - 10)/(9 - 7)	0
ND<10 (6/4/2018)	ND<10 (12/4/2017)	(10 - 10)/(9 - 8)	0

Number of Q values = 36

Ordered Q Values

n	Q
1	0

2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	10	9

Time Period	Observations
6/2/2014	1
12/2/2014	1
6/1/2015	1
12/7/2015	1
6/6/2016	1
12/5/2016	1
6/20/2017	1
12/4/2017	1
6/4/2018	1

There are 0 time periods with multiple data

A = 1656
B = 0
C = 504
D = 0
E = 72
F = 0
a = 1656
b = 4536
c = 144
Group Variance = 0

Royalton Road LF

For 99% confidence interval (two-tailed), Z at (1-0.99)/2 = 2.57583
C = 0
M1 = (36 - 0)/2.0 = 18
M2 = (36 + 0)/2.0 + 1 = 19
Lower limit is 0 = Q(18)
Upper limit is 0 = Q(19)
0 < 0 < 0 indicating no trend in data.

APPENDIX B.

CLOSURE CERTIFICATON LETTER
ROYALTON ROAD SANITARY LANDFILL

Ohio | **Environmental Protection Agency**

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Scott J. Nally, Director

February 1, 2011

RE: ROYALTON ROAD SANITARY LANDFILL CLOSURE CERTIFICATION

Mr. Joseph Balog
Norton Environmental
6055 Rockside Woods Boulevard, Suite 100
Independence, Ohio 44131

Dear Mr. Balog:

On September 8, 2010, Ohio EPA Northeast District Office received information regarding the closure of the Royalton Road Landfill. Additional information was received on October 22, 2010.

Information received by the Ohio EPA Northeast District Office indicates that the Royalton Road Landfill has been closed in accordance with applicable authorizing documents and Ohio Administrative Code 3745-27-11 and has completed all closure obligations. You are no longer obligated to maintain closure financial assurance.

The 30 year post-closure care period commenced on October 22, 2010, and will be complete on October 21, 2040. Upon completion of the post-closure care period, the owner, operator, or permittee shall submit to the director written certification that the sanitary landfill facility has completed post-closure activities in accordance with this rule and the "final closure/post-closure plan." Based on such factors as the inspection, or monitoring results or reports and whether human health or safety or the environment is or will be protected, the director may either discontinue or extend the post-closure care period.

If you have any questions regarding this letter, please contact me at (330) 963-1238.

Sincerely,

Judy Bowman

Judy Bowman
Division of Solid and
Infectious Waste Management

Authorized By

Lynn Sowers

Lynn Sowers
Environmental Supervisor
Division of Solid and
Infectious Waste Management

JB/LS/cl

cc: Matt Boyer, DSIWM-CO
Thomas Kovacic, P.E., URS
Dane Tussel, Cuyahoga County Health Department
File: [LAND/Royalton Road Landfill/AUT/18]
DSIWM #3495

Northeast District Office
2110 East Aurora Road
Twinsburg, OH 44087-1924

330 | 963 1200
330 | 487 0769 (fax)
www.epa.ohio.gov

APPENDIX C.

GROUNDWATER QUALITY SUMMARY TABLES FOR PARAMETERS ABOVE BACKGROUND

Data Summary Table for Alkalinity

Name: Royalton Road

Parameter: Alkalinity (calcium carbonate)
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	mg/L	--	388	389	387	388	376	392	394	392
MW-10S	mg/L	--	1580	1519	1442	1420	1140	1540	1580	1510
MW-11S	mg/L	--	1516	1772	1749	1760	1760	1790	1930	1890
MW-12	mg/L	--	449	463	467	452	457	354	451	458
MW-13	mg/L	--	609	611	592	590	588	599	595	595
MW-14D	mg/L	1649	1837	1602	1417	1590	1400	1560	1370	1440
MW-15D	mg/L	2026	2120	2080	2054	2050	2050	2100	2100	2020
MW-16	mg/L	759	--	--	901	991	535	952	650	870
MW-17S	mg/L	1880	1727	1883	1887	1760	1680	1700	1800	1800
MW-1R	mg/L	--	1020	979	901	905	791	881	930	905
MW-2R	mg/L	--	339	334	335	333	333	344	343	335
MW-3	mg/L	--	464	469	468	481	490	424	507	507
MW-6	mg/L	--	761	688	635	665	759	646	648	587
MW-8	mg/L	--	1820	1833	1715	1750	1680	1720	1720	1730
MW-9M	mg/L	--	772	746	720	711	703	696	685	660
MW-9S	mg/L	--	280	370	362	441	321	406	379	255
MW4-97	mg/L	--	--	--	1029	--	--	1080	1090	1060
WMW-2	mg/L	--	154	178	196	184	192	199	227	221
WMW-3	mg/L	--	--	--	--	--	--	452	--	433

Parameter: Alkalinity (calcium carbonate)
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	mg/L	392	392	389	391	394	399	390	384	404
MW-10S	mg/L	1500	1580	1550	1390	1650	1580	1610	1560	1530
MW-11S	mg/L	1460	1410	1430	1600	1510	1400	1440	1380	1330
MW-12	mg/L	449	454	459	465	463	466	493	490	484
MW-13	mg/L	579	596	577	538	566	553	564	579	585
MW-14D	mg/L	1340	1490	1390	1430	1410	1490	1180	1140	1030
MW-15D	mg/L	1940	1930	1900	1910	1810	1920	1730	1660	1650

Parameter: Alkalinity (calcium carbonate)
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-16	mg/L	846	1020	701	1050	714	1080	847	1040	1020
MW-17S	mg/L	1720	1770	1680	1780	1920	1700	381	606	688
MW-1R	mg/L	871	893	944	923	985	954	925	937	995
MW-2R	mg/L	334	337	329	304	338	342	279	339	348
MW-3	mg/L	506	521	524	487	503	487	483	449	432
MW-6	mg/L	652	755	692	776	650	637	621	708	617
MW-8	mg/L	1730	1690	1670	1670	1710	1720	1700	1670	1650
MW-9M	mg/L	660	668	659	663	680	666	669	655	647
MW-9S	mg/L	276	259	293	326	301	371	235	247	249
MW4-97	mg/L	1070	--	1090	1100	1150	--	--	--	--
WMW-2	mg/L	247	243	267	237	310	277	267	226	243
WMW-3	mg/L	--	--	--	--	--	--	--	--	--

Parameter: Alkalinity (calcium carbonate)
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	mg/L	409	402	384	388	392	392	387	388	374
MW-10S	mg/L	1630	1510	1490	1690	1540	1600	1630	1590	1910
MW-11S	mg/L	1440	1420	1300	1380	1360	1340	1170	1330	1320
MW-12	mg/L	493	488	469	480	479	484	473	476	461
MW-13	mg/L	570	562	547	570	567	551	518	529	452
MW-14D	mg/L	1140	1020	1020	1050	1440	1270	1430	1360	1410
MW-15D	mg/L	1540	1490	1510	1570	1570	1620	1670	1620	1690
MW-16	mg/L	1040	940	1070	902	1020	1030	956	1030	793
MW-17S	mg/L	571	353	967	1370	1750	1900	1860	1740	1820
MW-1R	mg/L	1090	1030	908	909	916	886	890	937	876
MW-2R	mg/L	345	282	350	342	325	338	338	345	338
MW-3	mg/L	469	479	469	443	427	443	410	437	393
MW-6	mg/L	789	760	694	759	738	754	745	776	743
MW-8	mg/L	1610	1550	1570	1560	1470	1450	1450	1520	1490
MW-9M	mg/L	631	637	625	628	644	658	655	658	638
MW-9S	mg/L	192	245	230	233	256	234	263	270	237
MW4-97	mg/L	--	--	--	--	--	--	--	--	--

Parameter: Alkalinity (calcium carbonate)
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
WMW-2	mg/L	287	346	449	324	289	410	327	402	324
WMW-3	mg/L	--	--	--	--	--	--	--	--	--

Parameter: Alkalinity (calcium carbonate)
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018			
MW-10D	mg/L	385	385	384	380	386	390			
MW-10S	mg/L	1660	1640	1620	1560	1610	1470			
MW-11S	mg/L	1260	1230	1280	1300	1230	1190			
MW-12	mg/L	466	464	461	459	481	478			
MW-13	mg/L	472	433	405	492	410	414			
MW-14D	mg/L	1310	1360	1370	1420	1400	1440			
MW-15D	mg/L	1720	1680	1710	1660	1640	1650			
MW-16	mg/L	1120	949	891	914	830	894			
MW-17S	mg/L	1900	2000	1860	1880	1860	1750			
MW-1R	mg/L	873	846	896	807	1230	838			
MW-2R	mg/L	342	337	343	337	344	340			
MW-3	mg/L	406	396	396	396	392	396			
MW-6	mg/L	739	746	762	719	758	723			
MW-8	mg/L	1520	1580	1590	1500	1520	1480			
MW-9M	mg/L	655	642	641	646	639	645			
MW-9S	mg/L	277	315	264	388	225	350			
MW4-97	mg/L	1150	--	1100	--	--	765			
WMW-2	mg/L	362	335	368	343	366	332			
WMW-3	mg/L	--	--	540	--	--	--			

Data Summary Table for Ammonia Nitrogen

Name: Royalton Road

Parameter: Ammonia Nitrogen
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	mg/l	--	2.72	2.85	3.01	2.49	3.72	3.06	2.51	2.67
MW-10S	mg/l	--	14.5	18.7	12.4	13.3	17.8	20.8	18.5	27.2
MW-11S	mg/l	--	39.4	94.2	106	136	63.1	115	121	76.9
MW-12	mg/l	--	0.83	0.82	0.88	0.93	0.83	1.27	0.63	0.68
MW-13	mg/l	--	0.15	<0.1	0.37	0.29	0.43	0.62	0.37	0.46
MW-14D	mg/l	89.5	115	87.3	48.3	<0.1	74.6	289	69	66.9
MW-15D	mg/l	282	269	258	298	288	274	262	263	273
MW-16	mg/l	<0.1	--	--	<0.1	<0.1	0.13	<0.1	<0.1	<0.1
MW-17S	mg/l	241	141	171	161	164	145	164	186	171
MW-1R	mg/l	--	13.4	13.8	18.9	12.4	13.8	12.2	5.59	3.43
MW-2R	mg/l	--	1.11	1.23	1.35	1.2	1.29	1.27	1.12	1.14
MW-3	mg/l	--	1.59	1.75	1.92	1.9	2.08	1.91	1.72	1.63
MW-6	mg/l	--	1.64	3.08	2.01	2.09	1.86	1.59	1.95	1.19
MW-8	mg/l	--	113	128	125	121	122	146	106	124
MW-9M	mg/l	--	0.22	2.38	2.37	2.27	2.12	2.53	1.83	2.2
MW-9S	mg/l	--	4.94	6.56	7.59	6.68	8.71	6.46	5.36	4.57
MW4-97	mg/l	--	--	--	9.24	--	16	18.9	18	10.4
WMW-2	mg/l	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
WMW-3	mg/l	--	--	--	--	--	--	<0.1	--	<0.1

Parameter: Ammonia Nitrogen
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	mg/l	2.44	2.33	2.57	2.72	1.9	3.22	2.71	<0.1	2.44
MW-10S	mg/l	27.9	29.3	40.8	38.3	24.1	40.2	47.4	40.8	36.4
MW-11S	mg/l	74.9	47.4	37.8	57	41.2	36.4	38.8	35.2	24.3
MW-12	mg/l	0.62	0.58	0.71	0.86	0.84	0.82	0.68	0.82	0.58
MW-13	mg/l	0.4	0.48	0.57	0.89	0.72	0.65	1.07	1	0.81
MW-14D	mg/l	63.8	86.6	62.4	136	57.6	66.7	31.2	33.5	26.2
MW-15D	mg/l	277	280	242	265	229	234	235	234	230

Parameter: Ammonia Nitrogen
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-16	mg/l	<0.1	<0.1	<0.1	<0.1	0.28	<0.1	0.28	0.32	0.2
MW-17S	mg/l	158	210	175	196	177	218	59.9	54.4	60.6
MW-1R	mg/l	5.8	4.81	5.75	5.75	9.58	8.27	8.33	7.7	6.21
MW-2R	mg/l	1.09	1.04	1.22	1.25	1.4	1.21	1.08	1.26	1.08
MW-3	mg/l	1.64	1.55	1.82	2.05	2.17	1.96	2.22	1.77	1.66
MW-6	mg/l	2.33	1.91	1.09	1.35	1.81	2.69	2.92	2.44	2.37
MW-8	mg/l	134	121	110	122	134	113	79.7	82.4	59
MW-9M	mg/l	2.07	1.77	2	2.53	2.45	2.16	2.61	<0.1	2.45
MW-9S	mg/l	3.65	3.96	4.34	5.47	7.08	5.56	3.66	6.85	3.71
MW4-97	mg/l	21.6	--	17.8	28.3	26.4	--	--	--	<0.1
WMW-2	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
WMW-3	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Ammonia Nitrogen
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	mg/l	2.9	2.48	2.46	2.64	2.65	2.62	2.88	2.36	2.31
MW-10S	mg/l	35.1	31.8	25	43.3	28.2	39.2	41.1	43.7	98.1
MW-11S	mg/l	40.6	41.6	32.8	25.7	33.9	34.2	34.4	35.1	39.7
MW-12	mg/l	0.69	0.72	0.7	0.64	0.73	0.69	0.9	0.7	0.75
MW-13	mg/l	1.33	0.74	0.82	0.79	0.83	0.81	1.18	1.16	1.24
MW-14D	mg/l	33.4	27.9	29.6	34.1	73.6	63.6	84.6	47.7	58.3
MW-15D	mg/l	220	216	222	203	230	217	224	210	229
MW-16	mg/l	0.4	0.14	0.22	0.17	0.2	0.46	0.39	0.19	0.2
MW-17S	mg/l	60.2	34.5	97	131	158	203	196	186	213
MW-1R	mg/l	3.23	2.68	6.83	5.68	6.6	5.57	6.33	4.5	5.77
MW-2R	mg/l	0.94	1.01	1.19	1.25	1.25	1.2	1.46	1.31	1.4
MW-3	mg/l	2.07	2.12	2.11	2.09	2.18	2.36	2.27	2.2	1.85
MW-6	mg/l	1.36	1.58	1.92	1.52	1.75	1.66	1.49	1.44	1.47
MW-8	mg/l	76.5	61.1	44.7	65.2	77.6	70.2	62.8	49.3	66.1
MW-9M	mg/l	3.06	2.44	2.77	2.94	2.17	1.88	2.12	1.88	2.15
MW-9S	mg/l	3.09	2.35	2.58	2.47	3.06	2.95	3.73	4.29	4.37
MW4-97	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Ammonia Nitrogen
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
WMW-2	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
WMW-3	mg/l	--	<0.1	--	--	--	--	--	--	--

Parameter: Ammonia Nitrogen
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018			
MW-10D	mg/l	2.71	2.3	2.43	2.45	2.51	2.72			
MW-10S	mg/l	52.4	39.7	49.2	41.1	46.1	42.3			
MW-11S	mg/l	37.6	37.2	30	39.4	36.6	39.2			
MW-12	mg/l	0.68	0.71	0.71	0.69	0.7	0.71			
MW-13	mg/l	1.34	1.17	1.1	0.89	1.21	1.42			
MW-14D	mg/l	29.5	32.7	27.5	31	25	5.33			
MW-15D	mg/l	211	218	223	208	202	216			
MW-16	mg/l	0.22	0.2	0.14	0.2	0.16	0.25			
MW-17S	mg/l	204	229	203	221	214	221			
MW-1R	mg/l	3.94	4.08	2.09	4.41	1.95	4.11			
MW-2R	mg/l	1.32	1.3	1.09	1.12	1.04	1.13			
MW-3	mg/l	1.98	2.02	1.69	1.94	1.67	1.93			
MW-6	mg/l	1.58	1.32	1.12	1.33	1.13	1.45			
MW-8	mg/l	65.1	73.6	73.7	71.9	60.7	67.5			
MW-9M	mg/l	2.01	1.96	2.03	1.75	2.04	1.97			
MW-9S	mg/l	4.08	4.62	3.77	5.7	3.7	5.09			
MW4-97	mg/l	52.5	--	39.7	--	40	27.5			
WMW-2	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			
WMW-3	mg/l	--	--	<0.1	--	<0.1	<0.1			

Data Summary Table for Arsenic, total

Name: Royalton Road

Parameter: Arsenic, total
Number of Sampling Dates: 33
Units ug/L

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	ug/L	--	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	<2	<2	<1	<1	<1
MW-10S	ug/L	--	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	13.4	20.5	5.3	4	<5
MW-11S	ug/L	--	0.031 mg/l	0.017 mg/l	0.027 mg/l	23.7	22.4	20.9	16	<5
MW-12	ug/L	--	0.017 mg/l	0.01 mg/l	0.016 mg/l	12.7	15.7	14.9	13	10.8
MW-13	ug/L	--	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	3.5	2.8	2.3	2	<1
MW-14D	ug/L	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	11.6	33.9	2.4	3	<5
MW-15D	ug/L	0.099 mg/l	0.051 mg/l	0.036 mg/l	0.05 mg/l	64.8	78.9	65.4	56	15.5
MW-16	ug/L	<0.009 mg/l	--	--	0.015 mg/l	17.8	23.2	14.4	9	14.7
MW-17S	ug/L	0.017 mg/l	0.017 mg/l	<0.009 mg/l	0.013 mg/l	7	32.7	14.3	10	<5
MW-1R	ug/L	--	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	3.4	12.9	3.4	9	2.3
MW-2R	ug/L	--	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	<2	<2	3.7	<1	<1
MW-3	ug/L	--	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	<2	<2	<1	1	1.2
MW-6	ug/L	--	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	<2	2.2	2.2	5	1.4
MW-8	ug/L	--	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	16.1	23.3	<1	12	<5
MW-9M	ug/L	--	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	3.5	15.9	5.2	10	3.5
MW-9S	ug/L	--	<0.009 mg/l	<0.009 mg/l	0.011 mg/l	3.1	2.5	2.6	3	1.8
MW4-97	ug/L	--	--	--	<0.009 mg/l	7.3	8	5	8	6.1
WMW-2	ug/L	--	<0.009 mg/l	<0.009 mg/l	<0.009 mg/l	<2	<2	2	3	1.8
WMW-3	ug/L	--	--	<0.009 mg/l	--	13.7	--	<1	--	3.2

Parameter: Arsenic, total
Number of Sampling Dates: 33
Units ug/L

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-10S	ug/L	<5	10	<5	4.6	5.5	4.1	<5	4.3	6.7
MW-11S	ug/L	12.3	10.9	11.9	14.6	8.7	9.6	5.9	5.7	4.1
MW-12	ug/L	<5	15.4	15.1	14.9	12.5	14.5	24.9	24.1	25
MW-13	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-14D	ug/L	<5	2.3	7.8	<3	<2	<1	3.9	1.3	3.7
MW-15D	ug/L	84.1	58.5	52.7	52.8	52.2	54.8	62.9	56.6	53.6
MW-16	ug/L	19.2	11.8	25.5	14.9	10.7	8.9	3.1	3.6	45.5
MW-17S	ug/L	27.6	12.4	15.5	11.9	13.3	12.7	7.8	8.2	10.7

Parameter: Arsenic, total
Number of Sampling Dates: 33
Units ug/L

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-1R	ug/L	<5	1.3	3.3	2	2.6	<1	<5	1.2	4.1
MW-2R	ug/L	<1	<1	<1	<1	<1	<1	<1	1.1	<1
MW-3	ug/L	<1	1.9	<1	2.8	<1	4.5	<1	<1	<1
MW-6	ug/L	<5	<1	<1	<1	<1	<1	<1	<1	1.2
MW-8	ug/L	<5	2.2	5.4	5	3	<2	<5	2.9	10
MW-9M	ug/L	8.3	<1	<2	<2	<2	1.7	<1	<1	3.1
MW-9S	ug/L	2.2	2.5	2.2	2.9	3.5	1.9	<1	<1	<1
MW4-97	ug/L	13.1	--	7.1	6	10.5	--	--	--	23.2
WMW-2	ug/L	1.5	<1	<1	<1	<1	<1	<1	3	10.3
WMW-3	ug/L	--	--	--	--	--	--	--	--	--

Parameter: Arsenic, total
Number of Sampling Dates: 33
Units ug/L

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-10S	ug/L	<2	5.9	4.7	5.3	3.7	1.7	1.5	2	3
MW-11S	ug/L	8.6	6.7	5.7	6.9	4.6	5.7	3.8	3.7	4
MW-12	ug/L	26.3	24.1	15.5	20.6	16.5	19.8	20	17.9	19.2
MW-13	ug/L	1.8	<2	1.7	<1	1.4	1.9	<1	1.5	<1
MW-14D	ug/L	5.1	<2	<1	3.2	2.4	6.1	1.3	<1	<1
MW-15D	ug/L	53.8	54.8	55	54.2	44.1	57.8	50.7	48.8	54.5
MW-16	ug/L	51.7	6	57.7	77.7	16.7	70	15.4	65.7	8.7
MW-17S	ug/L	9.6	9.2	10.4	12.9	11.7	12	11.4	12.1	11.9
MW-1R	ug/L	2.9	9.4	1.2	1.3	<2	<1	<1	1.2	<1
MW-2R	ug/L	<2	2.2	<1	1.9	<1	1.2	<1	1.4	1.9
MW-3	ug/L	<2	<1	<1	<1	<1	<1	<1	<1	<1
MW-6	ug/L	1.8	1.9	<1	1.1	<1	<1	<1	<1	<1
MW-8	ug/L	5.4	<5	2.1	7.5	2.7	11.1	1.1	1	1
MW-9M	ug/L	<1	<5	<2	2.4	<1	1	<1	<1	<1
MW-9S	ug/L	<1	1.1	<1	1	<1	1.3	1.2	1.5	1.1
MW4-97	ug/L	--	--	--	--	--	--	--	--	--
WMW-2	ug/L	3.8	<1	<1	<1	<1	<1	<1	<1	<1
WMW-3	ug/L	--	--	--	--	--	--	--	--	--

Parameter: Arsenic, total
Number of Sampling Dates: 33
Units ug/L

Location I D	**Units**	**12/7/2015**	**6/6/2016**	**12/5/2016**	**6/20/2017**	**12/4/2017**	**6/4/2018**			
MW-10D	ug/L	<1	<1	<1	<1	<1	<1			
MW-10S	ug/L	2.2	2.1	2.5	1.9	1.8	1.5			
MW-11S	ug/L	4	4	3	4.4	4.1	3.7			
MW-12	ug/L	24.2	22.1	32.4	21.2	29.7	19.4			
MW-13	ug/L	<1	<1	<1	2.4	<1	<1			
MW-14D	ug/L	<1	<1	<1	<1	<1	<1			
MW-15D	ug/L	64.9	68.3	68	67.2	64.9	69			
MW-16	ug/L	23.9	20.2	31.5	19	49.5	16.9			
MW-17S	ug/L	14.5	15.2	11.9	13.7	13.5	12.9			
MW-1R	ug/L	<1	<1	<1	<1	<1	<1			
MW-2R	ug/L	1	<1	2.2	1.4	2.3	2			
MW-3	ug/L	1.8	<1	<1	<1	<1	<1			
MW-6	ug/L	<1	<1	<1	<1	<1	<1			
MW-8	ug/L	1.4	1.7	1.8	1.2	1.2	1.5			
MW-9M	ug/L	<1	<1	<1	<1	<1	<1			
MW-9S	ug/L	1.5	1.4	1.3	<1	<1	<1			
MW4-97	ug/L	6.2	--	7.2	--	7.1	4.2			
WMW-2	ug/L	<1	<1	<1	<1	<1	<1			
WMW-3	ug/L	--	--	<1	--	--	--			

Data Summary Table for Barium, total

Name: Royalton Road

Parameter: Barium, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	mg/l	--	0.24	0.02	0.0199	0.021	0.02	0.016	0.0168	0.0181
MW-10S	mg/l	--	4.15	3.61	4.76	4.61	5.49	4.05	4.54	3.97
MW-11S	mg/l	--	0.49	0.43	0.75	0.779	0.76	0.757	1.02	0.591
MW-12	mg/l	--	0.23	0.01032	<0.01	0.01	0.01	<0.01	<0.01	<0.01
MW-13	mg/l	--	0.06	0.07	0.07	0.073	<0.01	0.0745	0.0757	0.0835
MW-14D	mg/l	2.76	0.33	1.95	1.64	2.31	1.41	1.83	1.19	1.41
MW-15D	mg/l	1.86	2.02	1.85	1.99	1.83	1.72	1.63	1.72	1.55
MW-16	mg/l	0.31	--	--	0.4	0.246	0.21	0.189	0.146	0.17
MW-17S	mg/l	1.11	1.06	1.11	1.37	0.352	1.1	0.389	0.688	0.823
MW-1R	mg/l	--	0.11	0.11	0.1	0.103	0.1	0.0921	0.171	0.197
MW-2R	mg/l	--	0.0124	<0.02	0.01328	0.013	0.02	0.0422	0.013	0.0162
MW-3	mg/l	--	0.02	0.01846	0.0183	0.023	0.03	0.0283	0.0268	0.0433
MW-6	mg/l	--	0.08	0.1	0.07	0.123	0.08	0.0824	0.118	0.0995
MW-8	mg/l	--	2.41	2.7	2.9	2.74	2.76	2.72	2.63	2.65
MW-9M	mg/l	--	0.33	0.08	0.1	0.096	0.1	0.0978	0.0988	0.141
MW-9S	mg/l	--	0.5	0.18	0.47	0.29	0.25	0.185	0.212	0.219
MW4-97	mg/l	--	--	--	0.63	0.475	0.8	0.672	1.08	0.89
WMW-2	mg/l	--	0.019	0.03	0.02	0.032	0.03	0.0387	0.0338	0.0309
WMW-3	mg/l	--	--	0.37	--	0.11	--	0.0236	--	0.0514

Parameter: Barium, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	mg/l	0.018	0.0186	0.017	0.018	0.02	0.016	0.017	0.018	0.016
MW-10S	mg/l	4.09	4.46	4.19	3.91	4.65	4.07	4.44	4.04	4.05
MW-11S	mg/l	0.382	0.226	0.22	0.461	0.368	0.321	0.239	0.257	0.209
MW-12	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-13	mg/l	0.082	0.0855	0.083	0.086	0.09	1.35	0.062	0.057	0.063
MW-14D	mg/l	1.2	1.59	1.34	1.2	1.15	1.39	0.626	0.716	0.574
MW-15D	mg/l	1.54	1.4	1.39	1.4	1.43	1.42	1.31	1.39	1.39

Parameter: Barium, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-16	mg/l	0.218	0.189	0.23	0.237	0.198	0.246	0.252	0.264	0.419
MW-17S	mg/l	0.893	0.88	0.895	0.974	0.956	0.825	0.121	0.29	0.305
MW-1R	mg/l	0.116	0.0786	0.134	0.203	0.144	0.127	0.072	0.062	0.098
MW-2R	mg/l	0.012	0.012	<0.01	0.011	0.01	0.014	0.015	0.01	0.015
MW-3	mg/l	0.026	0.0477	0.037	0.053	0.03	0.051	0.043	0.047	0.034
MW-6	mg/l	0.098	0.0946	0.069	0.065	0.089	0.109	0.095	0.09	0.093
MW-8	mg/l	2.51	2.47	2.44	2.58	2.57	2.28	1.86	2	1.65
MW-9M	mg/l	0.129	0.0979	0.107	0.109	0.084	0.092	0.184	0.176	0.179
MW-9S	mg/l	0.201	0.173	0.213	0.154	0.163	0.368	0.262	0.285	0.233
MW4-97	mg/l	1.25	--	1.33	1.33	1.19	--	--	--	0.436
WMW-2	mg/l	0.031	0.0483	0.031	0.048	0.05	0.059	0.051	0.147	0.309
WMW-3	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Barium, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	mg/l	0.018	0.025	0.02	0.017	0.018	0.018	0.018	0.019	0.017
MW-10S	mg/l	4.32	4.2	3.94	4.16	4.62	4.34	4.6	4.36	4.71
MW-11S	mg/l	0.315	0.392	0.354	0.385	0.493	0.499	0.43	0.571	0.703
MW-12	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-13	mg/l	0.067	0.066	0.068	0.064	0.068	0.068	0.053	0.044	0.037
MW-14D	mg/l	0.879	0.632	0.676	0.808	1.71	0.876	1.45	0.955	1.14
MW-15D	mg/l	1.42	1.45	1.41	1.43	1.42	1.34	1.21	1.23	1.27
MW-16	mg/l	0.357	0.308	0.323	0.321	0.369	0.344	0.377	0.36	0.37
MW-17S	mg/l	0.232	0.115	0.484	0.831	1.1	1.13	1.07	1.01	1.01
MW-1R	mg/l	0.171	0.167	0.0666	0.065	0.07	0.05	0.063	0.119	0.048
MW-2R	mg/l	0.017	0.013	0.0129	0.011	0.011	0.011	0.011	0.012	0.02
MW-3	mg/l	0.037	0.031	0.0379	0.043	0.036	0.03	0.035	0.048	0.047
MW-6	mg/l	0.064	0.069	0.075	0.064	0.071	0.062	0.063	0.056	0.056
MW-8	mg/l	1.9	1.55	1.49	1.61	1.89	1.41	1.09	1.08	1.29
MW-9M	mg/l	0.223	0.206	0.216	0.176	0.071	0.074	0.061	0.071	0.087
MW-9S	mg/l	0.218	0.167	0.182	0.161	0.184	0.152	0.208	0.206	0.257
MW4-97	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Barium, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
WMW-2	mg/l	0.062	0.02	0.0449	0.027	0.032	0.025	0.018	0.019	0.018
WMW-3	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Barium, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018			
MW-10D	mg/l	0.018	0.019	0.019	0.017	0.02	0.021			
MW-10S	mg/l	4.48	4.35	4.38	4.36	4.25	4.23			
MW-11S	mg/l	0.761	0.778	0.606	1.02	1.12	1.26			
MW-12	mg/l	<0.01	0.01	<0.01	<0.01	<0.01	<0.01			
MW-13	mg/l	0.035	0.031	0.027	0.032	0.022	0.023			
MW-14D	mg/l	0.784	0.864	0.774	0.869	0.747	0.773			
MW-15D	mg/l	1.34	1.19	1.21	1.2	1.12	1.22			
MW-16	mg/l	0.578	0.583	0.533	0.547	0.491	0.51			
MW-17S	mg/l	1.14	1.2	1.05	1.14	1.13	1.13			
MW-1R	mg/l	0.134	0.045	0.068	0.055	0.154	0.08			
MW-2R	mg/l	0.014	0.013	0.014	0.015	0.013	0.013			
MW-3	mg/l	0.061	0.049	0.045	0.036	0.049	0.044			
MW-6	mg/l	0.065	0.06	0.057	0.062	0.054	0.055			
MW-8	mg/l	1.39	1.62	1.64	1.54	1.38	1.56			
MW-9M	mg/l	0.081	0.061	0.084	0.053	0.1	0.075			
MW-9S	mg/l	0.219	0.245	0.216	0.287	0.205	0.291			
MW4-97	mg/l	0.481	--	0.398	--	0.333	0.197			
WMW-2	mg/l	0.022	0.026	0.026	0.021	0.024	0.02			
WMW-3	mg/l	--	--	0.024	--	--	--			

Data Summary Table for Chloride

Name: Royalton Road

Parameter: Chloride
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	mg/l	--	6	4	3	3	5	4	4	8.12
MW-10S	mg/l	--	3590	3020	2790	2970	2440	2490	3490	3060
MW-11S	mg/l	--	311	535	549	748	558	600	758	757
MW-12	mg/l	--	8	10	8	9	8	14	21.8	24.7
MW-13	mg/l	--	375	403	336	434	366	423	514	483
MW-14D	mg/l	2540	1810	1500	1080	1510	964	1290	1250	1280
MW-15D	mg/l	2320	2160	2110	2040	2100	1840	1970	2330	2130
MW-16	mg/l	21	--	--	18	58	7	31	23.2	38.8
MW-17S	mg/l	1410	994	1270	1080	1130	1030	1110	1330	1260
MW-1R	mg/l	--	855	668	614	762	578	640	678	602
MW-2R	mg/l	--	5	5	5	3	3	5	4.7	4.77
MW-3	mg/l	--	68	53	66	83	88	117	145	162
MW-6	mg/l	--	446	348	349	435	304	324	334	319
MW-8	mg/l	--	1780	1850	1620	1820	1670	1720	2020	1900
MW-9M	mg/l	--	1360	1390	1270	1450	1260	1680	1790	1980
MW-9S	mg/l	--	150	182	202	129	104	76	151	173
MW4-97	mg/l	--	--	--	330	--	269	358	466	395
WMW-2	mg/l	--	67	140	62	222	84	309	185	189
WMW-3	mg/l	--	--	--	--	--	--	19	--	15

Parameter: Chloride
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	mg/l	5	5.8	7	5.5	7	7	10	10	9
MW-10S	mg/l	2560	2480	2700	2600	3000	2200	2500	2380	2400
MW-11S	mg/l	612	487	498	645	670	565	560	559	523
MW-12	mg/l	26	24.8	26	19.9	19	16	35	24	44
MW-13	mg/l	435	460	454	444	500	412	410	413	483
MW-14D	mg/l	1100	1360	1220	1180	1400	1130	790	792	736
MW-15D	mg/l	1850	1940	1890	1820	1900	1760	1900	1770	1880

Parameter: Chloride
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-16	mg/l	29	48.9	33	81	61	99	71	88	105
MW-17S	mg/l	1150	1290	1310	1360	1400	1250	260	535	477
MW-1R	mg/l	543	597	696	711	700	706	640	666	648
MW-2R	mg/l	4	6.1	5	4.8	5	23	22	9	6
MW-3	mg/l	147	187	211	208	190	139	130	90	95
MW-6	mg/l	299	320	348	338	370	311	330	320	320
MW-8	mg/l	1760	1780	1750	1660	2000	1610	<250	1510	1560
MW-9M	mg/l	1860	1690	1740	1610	1500	1390	1600	1790	1840
MW-9S	mg/l	133	244	126	146	140	178	1500	265	201
MW4-97	mg/l	416	--	482	516	680	--	--	--	346
WMW-2	mg/l	231	277	334	347	460	423	780	487	2540
WMW-3	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Chloride
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	mg/l	8	14	10	15	10	13	23	16	12
MW-10S	mg/l	2210	2580	1950	2140	2090	2020	2000	2090	2900
MW-11S	mg/l	588	583	535	518	495	471	533	518	519
MW-12	mg/l	37	43	38	45	39	53	45	61	61
MW-13	mg/l	515	521	487	469	484	450	432	399	155
MW-14D	mg/l	928	775	769	800	1360	925	1300	1010	1120
MW-15D	mg/l	1810	1980	1660	1590	1600	1550	1670	1490	1540
MW-16	mg/l	82	56	84	50	63	88	63	79	40
MW-17S	mg/l	408	215	492	586	1110	1150	1240	1130	1150
MW-1R	mg/l	761	712	626	604	607	542	586	594	581
MW-2R	mg/l	4	7	4	11	3	6	5	5	136
MW-3	mg/l	104	121	112	93	72	73	79	83	76
MW-6	mg/l	360	339	336	317	338	329	341	337	323
MW-8	mg/l	1600	1710	1440	1450	1390	1280	1240	1230	1300
MW-9M	mg/l	2170	2200	1950	1940	1220	1300	1260	1150	1200
MW-9S	mg/l	299	129	207	148	198	169	353	223	329
MW4-97	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Chloride
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
WMW-2	mg/l	623	82	551	137	288	58	45	42	40
WMW-3	mg/l	--	89	--	--	--	--	--	--	--

Parameter: Chloride
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018			
MW-10D	mg/l	13	15	16	16	21	22			
MW-10S	mg/l	2000	2200	2190	1960	1960	1930			
MW-11S	mg/l	469	483	427	446	496	521			
MW-12	mg/l	75	65	76	73	80	76			
MW-13	mg/l	171	111	87	317	65	62			
MW-14D	mg/l	907	881	822	866	905	871			
MW-15D	mg/l	1530	1390	1460	1290	1280	1380			
MW-16	mg/l	122	49	53	46	70	39			
MW-17S	mg/l	1270	1210	1100	1150	1330	1170			
MW-1R	mg/l	544	548	575	478	594	512			
MW-2R	mg/l	37	23	11	11	6	23			
MW-3	mg/l	73	83	83	89	114	119			
MW-6	mg/l	384	331	319	335	366	370			
MW-8	mg/l	1320	1340	1220	1120	1140	1220			
MW-9M	mg/l	1350	1230	1130	981	1290	1180			
MW-9S	mg/l	269	257	192	188	175	291			
MW4-97	mg/l	1360	--	934	--	830	447			
WMW-2	mg/l	103	30	38	24	31	25			
WMW-3	mg/l	--	--	39	--	33	27			

Data Summary Table for Chromium, total

Name: Royalton Road

Parameter: Chromium, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-10S	mg/l	--	<0.01	<0.01	<0.01	<0.01	0.011	<0.01	<0.01	<0.01
MW-11S	mg/l	--	<0.01	<0.01	<0.01	0.015	0.015	<0.01	0.013	<0.01
MW-12	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-13	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-14D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-15D	mg/l	0.01	0.01	<0.01	0.01	0.013	0.014	0.011	0.012	<0.01
MW-16	mg/l	<0.01	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-17S	mg/l	0.01	0.02	0.01	0.01	<0.01	0.011	<0.01	<0.01	<0.01
MW-1R	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-2R	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-3	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-6	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-8	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-9M	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-9S	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW4-97	mg/l	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WMW-2	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WMW-3	mg/l	--	--	0.02	--	0.023	--	<0.01	--	0.018

Parameter: Chromium, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-10S	mg/l	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
MW-11S	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-12	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-13	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
MW-14D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-15D	mg/l	<0.01	<0.01	<0.01	0.012	0.01	0.01	<0.01	<0.01	<0.01

Parameter: Chromium, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-16	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-17S	mg/l	<0.01	<0.01	<0.01	0.013	0.012	<0.01	<0.01	<0.01	<0.01
MW-1R	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-2R	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-3	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-6	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-8	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-9M	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-9S	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW4-97	mg/l	<0.01	--	<0.01	<0.01	<0.01	--	--	--	<0.01
WMW-2	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WMW-3	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Chromium, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-10S	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
MW-11S	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-12	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-13	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-14D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-15D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-16	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-17S	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.011	<0.01	0.011
MW-1R	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-2R	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-3	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-6	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-8	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-9M	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-9S	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW4-97	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Chromium, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
WMW-2	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WMW-3	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Chromium, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018			
MW-10D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-10S	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-11S	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-12	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-13	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-14D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-15D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-16	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-17S	mg/l	0.013	0.015	0.012	0.014	0.012	0.015			
MW-1R	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-2R	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-3	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-6	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-8	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-9M	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-9S	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW4-97	mg/l	<0.01	--	<0.01	--	<0.01	<0.01			
WMW-2	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
WMW-3	mg/l	--	--	<0.01	--	--	--			

Data Summary Table for Cobal, total

Name: Royalton Road

Parameter: Cobalt, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
MW-10S	mg/l	--	0.03	0.03	<0.01	0.024	0.019	0.022	0.023	0.023
MW-11S	mg/l	--	<0.01	<0.01	<0.01	<0.01	0.01	0.006	0.009	0.005
MW-12	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
MW-13	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
MW-14D	mg/l	0.01	0.01	<0.01	<0.01	0.012	<0.01	0.008	0.006	0.007
MW-15D	mg/l	0.02	0.02	0.02	0.02	0.022	0.023	0.017	0.018	0.015
MW-16	mg/l	0.02	--	--	0.03	0.024	0.041	0.016	0.015	0.014
MW-17S	mg/l	0.02	0.02	0.02	0.01	0.019	0.021	0.018	0.017	0.014
MW-1R	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
MW-2R	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
MW-3	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
MW-6	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
MW-8	mg/l	--	0.01	0.01	0.01	0.015	0.015	0.011	0.013	0.012
MW-9M	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
MW-9S	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
MW4-97	mg/l	--	--	--	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
WMW-2	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
WMW-3	mg/l	--	--	<0.01	--	0.018	--	<0.005	--	0.005

Parameter: Cobalt, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-10S	mg/l	0.014	0.012	0.023	0.01	0.018	0.011	0.011	0.009	0.012
MW-11S	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-12	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-13	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	0.014	<0.005	<0.005	<0.005
MW-14D	mg/l	0.006	0.007	0.006	0.006	0.006	0.006	<0.005	<0.005	<0.005
MW-15D	mg/l	0.015	0.014	0.014	0.014	0.013	0.014	0.012	0.013	0.012

Parameter: Cobalt, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-16	mg/l	0.022	0.01	0.023	0.011	<0.005	<0.005	<0.005	<0.005	0.006
MW-17S	mg/l	0.012	0.014	0.014	0.014	0.015	0.014	<0.005	<0.005	<0.005
MW-1R	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-2R	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-3	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-6	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-8	mg/l	0.011	0.01	0.01	0.011	0.011	0.01	0.009	0.01	0.01
MW-9M	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-9S	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW4-97	mg/l	<0.005	--	<0.005	0.009	<0.005	--	--	--	0.025
WMW-2	mg/l	<0.005	<0.005	0.006	0.013	0.012	0.013	0.008	0.024	0.039
WMW-3	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Cobalt, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-10S	mg/l	0.01	0.01	0.008	0.011	0.009	0.008	<0.005	0.01	0.021
MW-11S	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-12	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-13	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-14D	mg/l	<0.005	<0.005	<0.005	<0.005	0.008	<0.005	0.008	<0.005	0.005
MW-15D	mg/l	0.012	0.012	0.012	0.013	0.013	0.011	0.012	0.01	0.012
MW-16	mg/l	0.006	<0.005	0.009	<0.005	0.008	<0.005	0.006	<0.005	<0.005
MW-17S	mg/l	<0.005	<0.005	<0.005	<0.005	0.01	0.012	0.012	0.011	0.011
MW-1R	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-2R	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-3	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-6	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-8	mg/l	0.009	0.009	0.01	0.011	0.011	0.007	0.008	0.007	0.007
MW-9M	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-9S	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW4-97	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Cobalt, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
WMW-2	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
WMW-3	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Cobalt, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018			
MW-10D	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-10S	mg/l	0.01	0.012	0.013	0.008	0.009	0.01			
MW-11S	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-12	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-13	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-14D	mg/l	<0.005	0.006	<0.005	<0.005	<0.005	<0.005			
MW-15D	mg/l	0.011	0.012	0.011	0.01	0.01	0.011			
MW-16	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-17S	mg/l	0.011	0.014	0.011	0.011	0.01	0.012			
MW-1R	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-2R	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-3	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-6	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-8	mg/l	0.007	0.01	0.007	0.007	0.008	0.009			
MW-9M	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-9S	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW4-97	mg/l	0.009	--	0.01	--	0.007	<0.005			
WMW-2	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
WMW-3	mg/l	--	--	<0.005	--	--	--			

Data Summary Table for Copper, total

Name: Royalton Road

Parameter: Copper, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-10S	mg/l	--	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01
MW-11S	mg/l	--	0.04	<0.01	<0.01	0.035	0.01	<0.01	<0.01	<0.01
MW-12	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-13	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-14D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-15D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-16	mg/l	<0.01	--	--	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
MW-17S	mg/l	<0.01	0.01	<0.01	0.02	<0.01	0.02	<0.01	<0.01	<0.01
MW-1R	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-2R	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-3	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-6	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-8	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-9M	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-9S	mg/l	--	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW4-97	mg/l	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WMW-2	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WMW-3	mg/l	--	--	0.02	--	0.023	--	<0.01	--	<0.01

Parameter: Copper, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-10S	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-11S	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-12	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-13	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-14D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-15D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Parameter: Copper, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-16	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-17S	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-1R	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.024	<0.01	<0.01	<0.01
MW-2R	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-3	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-6	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-8	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-9M	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-9S	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW4-97	mg/l	<0.01	--	<0.01	<0.01	<0.01	--	--	--	<0.01
WMW-2	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WMW-3	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Copper, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-10S	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-11S	mg/l	0.047	0.063	0.033	0.094	0.017	0.018	0.014	0.012	0.012
MW-12	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-13	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-14D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-15D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-16	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-17S	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-1R	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-2R	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-3	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-6	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-8	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-9M	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-9S	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW4-97	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Copper, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
WMW-2	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WMW-3	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Copper, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018			
MW-10D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-10S	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-11S	mg/l	0.023	<0.01	0.022	0.011	0.045	0.012			
MW-12	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-13	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-14D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-15D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-16	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-17S	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-1R	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-2R	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-3	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-6	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-8	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-9M	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-9S	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW4-97	mg/l	<0.01	--	<0.01	--	<0.01	<0.01			
WMW-2	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
WMW-3	mg/l	--	--	<0.01	--	--	--			

Data Summary Table for Iron, total

Name: Royalton Road

Parameter: Iron, total
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	mg/L	--	3.75	1.17	1.71	1.77	1.57	1.21	1.05	1.17
MW-10S	mg/L	--	13.1	17	14.1	19.8	18.1	16.6	15.1	14.9
MW-11S	mg/L	--	10.6	3.54	3.56	6.87	6.36	3.15	4.5	3
MW-12	mg/L	--	6.35	5.46	5.49	5.72	6.27	5.96	6.03	6.45
MW-13	mg/L	--	2.36	2.31	2.22	1.63	1.22	1.1	0.97	0.83
MW-14D	mg/L	11.3	11.6	6.92	6.11	9.37	5.93	7.59	5.16	6.15
MW-15D	mg/L	21.2	21.3	20.2	20.5	22	20.2	19.3	21.3	18
MW-16	mg/L	1.92	--	--	8.47	8.88	8.56	10.8	7.53	10
MW-17S	mg/L	15.9	33.7	17.1	21.1	2.31	14.9	4.93	10.3	9.31
MW-1R	mg/L	--	1.35	1.34	0.85	0.67	0.56	0.81	0.17	0.08
MW-2R	mg/L	--	1.59	2.12	2.33	2.2	3.27	11.3	2.33	2.77
MW-3	mg/L	--	1.87	1.82	1.91	1.93	1.87	1.84	1.84	1.43
MW-6	mg/L	--	0.92	1.08	1.8	2.11	0.09	0.52	1.56	0.46
MW-8	mg/L	--	9.96	9.53	9.65	9.79	11.8	12.2	11.1	10.6
MW-9M	mg/L	--	0.3	0.26	0.22	0.32	0.27	0.27	0.24	0.61
MW-9S	mg/L	--	23.3	49.1	39.8	52.2	39.4	73.3	49.5	27.9
MW4-97	mg/L	--	--	--	5.1	5.32	4.49	3.34	5.87	5.84
WMW-2	mg/L	--	0.04	0.09	0.06	0.17	0.23	0.08	0.08	<0.05
WMW-3	mg/L	--	--	14.2	--	30.2	--	0.84	--	9.84

Parameter: Iron, total
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	mg/L	1.12	1.94	1.44	1.89	2.51	0.84	1.01	0.7	0.74
MW-10S	mg/L	12.3	10.9	13.8	9.27	13	10.2	10.7	9.32	9.37
MW-11S	mg/L	3.67	5.45	2.8	2.15	1.67	1.38	0.23	0.1	0.08
MW-12	mg/L	6.09	5.92	5.83	5.82	5.45	6.38	8.46	7.09	7.89
MW-13	mg/L	0.84	0.81	0.95	0.88	0.98	18.9	0.59	0.66	0.87
MW-14D	mg/L	5.14	6.36	5.62	4.47	4.48	5.94	2.54	2.69	2.21
MW-15D	mg/L	19.2	17	16.1	17.7	18.2	19.4	16.2	17.4	17

Parameter: Iron, total
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-16	mg/L	7.62	7.05	5.51	4.83	3.22	7.28	5.69	6.3	4.1
MW-17S	mg/L	16.2	12.3	16.6	14	17.7	17.3	3.74	10.6	10.1
MW-1R	mg/L	0.99	0.13	0.31	0.12	0.19	2.65	0.87	0.13	0.85
MW-2R	mg/L	1.55	1.71	1.37	1.47	1.07	2.06	1.05	1.93	1.69
MW-3	mg/L	2.04	2.55	1.96	3.26	2	4.68	1.89	0.91	0.8
MW-6	mg/L	0.66	0.94	0.21	0.1	0.37	1.3	0.38	0.15	0.21
MW-8	mg/L	9.18	7.68	6.67	8.78	8.49	4.85	6.36	6.14	6.34
MW-9M	mg/L	0.33	0.23	0.23	0.22	0.21	0.22	0.55	0.36	0.82
MW-9S	mg/L	28	52.1	33.3	52.8	60.2	26.9	18.5	15.9	19.7
MW4-97	mg/L	6.94	--	6.72	2.7	8.16	--	--	--	15.2
WMW-2	mg/L	<0.05	<0.05	0.14	0.36	0.14	0.19	<0.05	0.08	0.11
WMW-3	mg/L	--	--	--	--	--	--	--	--	--

Parameter: Iron, total
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	mg/L	0.51	1.36	0.73	0.57	0.66	0.62	0.56	0.66	0.82
MW-10S	mg/L	8.93	8.61	6.8	8.41	7.53	6.91	7.86	6.62	9.19
MW-11S	mg/L	0.08	0.09	0.08	0.07	0.08	<0.05	0.05	0.15	0.24
MW-12	mg/L	8.66	8.82	7.08	6.98	7.41	7.54	7.31	6.6	7.31
MW-13	mg/L	1.74	1.78	1.78	1.41	1.75	1.72	0.96	1.11	0.85
MW-14D	mg/L	3.13	2.3	2.58	3.01	5.91	3.29	5.74	3.27	3.9
MW-15D	mg/L	18	18.2	18.4	21.6	19.6	19.7	17.8	16.7	17.7
MW-16	mg/L	6.09	5.83	3.07	3.57	2.18	3.51	1.86	4.34	3.49
MW-17S	mg/L	7.13	4.43	13.3	21.6	22.5	20.4	19.7	17.6	18.3
MW-1R	mg/L	1.26	1.22	0.19	0.6	0.57	0.5	0.43	0.62	0.41
MW-2R	mg/L	3.14	2.72	1.38	2	1.58	1.95	1.56	1.81	2.83
MW-3	mg/L	1.49	1.98	1.99	2.4	1.68	1.44	1.12	1.81	1.42
MW-6	mg/L	0.11	0.17	0.11	0.09	0.06	<0.05	<0.05	0.07	0.07
MW-8	mg/L	6.34	6.33	4.49	5.34	5.43	4.86	3.21	3.09	3.63
MW-9M	mg/L	0.4	0.41	0.43	0.48	0.26	0.27	0.16	0.32	0.23
MW-9S	mg/L	14.8	15.5	12.2	20.4	21.5	23.4	29.4	24.1	25.4
MW4-97	mg/L	--	--	--	--	--	--	--	--	--

Parameter: Iron, total
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
WMW-2	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WMW-3	mg/L	--	--	--	--	--	--	--	--	--

Parameter: Iron, total
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018			
MW-10D	mg/L	1.08	0.46	0.66	0.63	0.97	1.37			
MW-10S	mg/L	6.74	6.35	6.57	5.87	5.83	6.27			
MW-11S	mg/L	0.16	0.09	0.14	0.65	0.39	0.26			
MW-12	mg/L	8.18	7.41	8.35	7.75	7.74	8.2			
MW-13	mg/L	0.97	0.9	0.75	1.49	0.8	0.94			
MW-14D	mg/L	2.66	2.82	2.42	2.81	2.33	2.26			
MW-15D	mg/L	18	16.3	16.2	15.9	15.5	17.1			
MW-16	mg/L	1.17	1.73	1.49	2.27	3.06	1.95			
MW-17S	mg/L	20.2	20	18.3	17.8	16.9	18.5			
MW-1R	mg/L	0.48	0.21	0.38	0.31	0.36	0.42			
MW-2R	mg/L	1.75	1.53	2.08	1.95	2.12	2.34			
MW-3	mg/L	2.27	1.51	0.79	0.76	0.71	0.85			
MW-6	mg/L	0.07	0.06	<0.05	<0.05	<0.05	<0.05			
MW-8	mg/L	3.81	4.52	4.28	4.17	3.66	3.8			
MW-9M	mg/L	0.25	0.18	0.25	0.37	0.24	0.22			
MW-9S	mg/L	25.5	30.8	20.9	41.3	11.7	19.4			
MW4-97	mg/L	4.31	--	3.32	--	2.98	1.89			
WMW-2	mg/L	<0.05	0.08	<0.05	<0.05	<0.05	<0.05			
WMW-3	mg/L	--	--	1.64	--	--	--			

Data Summary Table for Lead, total

Name: Royalton Road

Parameter: Lead, total
Number of Sampling Dates: 33
Units ug/L

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	ug/L	--	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<1
MW-10S	ug/L	--	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	5.4	3	1.5	<5
MW-11S	ug/L	--	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	2.4	1.6	<1	1.1	<5
MW-12	ug/L	--	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<1
MW-13	ug/L	--	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<1
MW-14D	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<5
MW-15D	ug/L	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	1.1	<5
MW-16	ug/L	<0.005 mg/l	--	--	<0.005 mg/l	<1	4.5	<1	<1	<1
MW-17S	ug/L	<0.005 mg/l	0.01 mg/l	<0.005 mg/l	0.016 mg/l	<1	6.4	2.1	5.6	5.8
MW-1R	ug/L	--	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	4.9	4.9
MW-2R	ug/L	--	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	1.3	4.9	<1	<1
MW-3	ug/L	--	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<1
MW-6	ug/L	--	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	2	<1	<1	1.8	<1
MW-8	ug/L	--	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	1	<1	<1	<1	<5
MW-9M	ug/L	--	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<1
MW-9S	ug/L	--	<0.005 mg/l	<0.005 mg/l	0.017 mg/l	<1	1.2	<1	<1	<1
MW4-97	ug/L	--	--	--	<0.005 mg/l	2	<1	<1	1.2	1.2
WMW-2	ug/L	--	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<1	<1	<1	<1	<1
WMW-3	ug/L	--	--	0.142 mg/l	--	60	--	1.1	--	11.9

Parameter: Lead, total
Number of Sampling Dates: 33
Units ug/L

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-10S	ug/L	<5	<1	<2	<2	<2	1.1	<5	<1	<1
MW-11S	ug/L	<1	2.3	<2	<3	<1	<1	<1	<1	<1
MW-12	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-13	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-14D	ug/L	<5	<1	<1	<3	<2	<1	<1	<1	<1
MW-15D	ug/L	<1	<1	<2	<3	<2	<2	<5	<2	<1
MW-16	ug/L	1.3	<1	2	<1	<1	<1	<1	<1	<1
MW-17S	ug/L	4.5	4.5	4.6	4.7	4.4	4	11.8	8.5	8.6

Parameter: Lead, total
Number of Sampling Dates: 33
Units ug/L

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-1R	ug/L	9.9	8.6	7.4	5	8.1	10.2	<5	<1	<1
MW-2R	ug/L	<1	<1	<1	<1	<1	2.3	<1	<1	<1
MW-3	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-6	ug/L	<1	<1	<1	<1	<1	1.1	<1	<1	<1
MW-8	ug/L	<5	<2	<2	<3	<1	<2	<5	<2	<1
MW-9M	ug/L	<1	<1	<1	<2	<2	<1	<1	<1	<1
MW-9S	ug/L	<1	<1	<1	<2	<1	<1	<1	<1	<1
MW4-97	ug/L	1.5	--	<1	2.8	<2	--	--	--	7
WMW-2	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
WMW-3	ug/L	--	--	--	--	--	--	--	--	--

Parameter: Lead, total
Number of Sampling Dates: 33
Units ug/L

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-10S	ug/L	<1	<2	<2	<2	<2	<1	<1	<1	<1
MW-11S	ug/L	<1	<1	<1	2.3	<2	<1	<1	<1	<1
MW-12	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-13	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-14D	ug/L	<1	<1	<1	<1	<2	<1	<1	<1	<1
MW-15D	ug/L	<1	<2	<2	<1	<2	<1	<1	<1	<1
MW-16	ug/L	<1	<1	<1	<1	<1	<1	<1	1.1	<1
MW-17S	ug/L	8	18.9	4.2	1.7	<2	<1	<1	<1	<1
MW-1R	ug/L	<1	<1	<1	<1	<2	<1	<1	<1	<1
MW-2R	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-3	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-6	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-8	ug/L	<1	<2	<2	<2	<2	<1	<1	<1	<1
MW-9M	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-9S	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW4-97	ug/L	--	--	--	--	--	--	--	--	--
WMW-2	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
WMW-3	ug/L	--	--	--	--	--	--	--	--	--

Parameter: Lead, total
Number of Sampling Dates: 33
Units ug/L

Location I D	Units	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018			
MW-10D	ug/L	<1	<1	<1	<1	<1	<1			
MW-10S	ug/L	<1	<1	<1	<1	<1	<1			
MW-11S	ug/L	1.2	<1	<1	<1	1.8	<1			
MW-12	ug/L	<1	<1	<1	<1	<1	<1			
MW-13	ug/L	<1	<1	<1	<1	<1	<1			
MW-14D	ug/L	<1	<1	<1	<1	<1	<1			
MW-15D	ug/L	<1	<1	<1	<1	<1	<1			
MW-16	ug/L	<1	<1	<1	<1	<1	<1			
MW-17S	ug/L	<1	<1	<1	<1	<1	<1			
MW-1R	ug/L	<1	<1	<1	<1	<1	<1			
MW-2R	ug/L	<1	<1	<1	<1	<1	<1			
MW-3	ug/L	<1	<1	<1	<1	<1	<1			
MW-6	ug/L	<1	<1	<1	<1	<1	<1			
MW-8	ug/L	<1	<1	<1	<1	<1	<1			
MW-9M	ug/L	<1	<1	<1	<1	<1	<1			
MW-9S	ug/L	<1	<1	<1	<1	<1	<1			
MW4-97	ug/L	<1	--	<1	--	<1	<1			
WMW-2	ug/L	<1	<1	<1	<1	<1	<1			
WMW-3	ug/L	--	--	1.3	--	--	--			

Data Summary Table for Manganese, total

Name: Royalton Road

Parameter: Manganese, total
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	mg/L	--	0.03	0.02	0.03	0.023	0.03	0.016	0.018	0.018
MW-10S	mg/L	--	2.46	3.75	1.23	2.82	1.56	2.33	2.02	2.74
MW-11S	mg/L	--	0.16	0.09	0.09	0.14	0.1	0.1	0.084	0.112
MW-12	mg/L	--	0.09	0.09	0.09	0.088	0.1	0.091	0.094	0.101
MW-13	mg/L	--	5.25	5.23	5.26	5.18	5.14	5	4.74	4.8
MW-14D	mg/L	2.21	2.36	1.47	1.19	1.84	1.13	1.42	0.952	1.08
MW-15D	mg/L	0.76	0.83	0.82	0.75	0.763	0.68	0.719	0.765	0.656
MW-16	mg/L	5.78	--	--	11.3	8.45	6.11	6.95	5.35	6.29
MW-17S	mg/L	2.76	5.7	6.17	7.58	16.8	13.6	16.3	9.6	6.43
MW-1R	mg/L	--	0.18	0.14	0.14	0.134	0.13	0.121	0.042	0.029
MW-2R	mg/L	--	0.2	0.18	0.2	0.194	0.21	0.317	0.188	0.205
MW-3	mg/L	--	0.19	0.12	0.13	0.165	0.16	0.2	0.237	0.481
MW-6	mg/L	--	0.03	0.03	0.03	0.032	0.01	0.011	0.033	0.019
MW-8	mg/L	--	1.92	1.92	1.93	2.01	1.98	1.92	1.85	1.71
MW-9M	mg/L	--	0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.01
MW-9S	mg/L	--	0.74	1.35	0.89	1.45	1.05	1.36	1.09	0.687
MW4-97	mg/L	--	--	--	0.49	0.622	0.6	0.58	0.581	0.682
WMW-2	mg/L	--	0.43	1.4	0.69	1.2	1.23	1.78	1.7	0.385
WMW-3	mg/L	--	--	0.38	--	0.688	--	0.361	--	0.167

Parameter: Manganese, total
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	mg/L	0.02	0.018	0.022	0.02	0.02	0.016	0.017	0.012	0.019
MW-10S	mg/L	1.56	1.34	2.3	1.24	1.69	1	1.14	0.959	1.05
MW-11S	mg/L	0.14	0.142	0.166	0.098	0.122	0.121	0.143	0.131	0.143
MW-12	mg/L	0.096	0.098	0.096	0.093	0.089	0.094	0.132	0.112	0.129
MW-13	mg/L	4.54	4.56	3.88	4.08	4.22	0.552	2.88	3.19	3.51
MW-14D	mg/L	0.929	1.2	0.968	0.869	0.81	0.975	0.501	0.54	0.437
MW-15D	mg/L	0.587	0.528	0.567	0.583	0.598	0.535	0.481	0.528	0.541

Parameter: Manganese, total
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-16	mg/L	6.44	5.72	5.17	5.67	4.72	6.31	5.2	5.69	6.06
MW-17S	mg/L	4.19	5.42	5.66	5.77	6.72	8.1	1.24	0.724	1.39
MW-1R	mg/L	0.064	0.092	0.082	0.064	0.081	0.112	0.083	0.082	0.08
MW-2R	mg/L	0.192	0.184	0.167	0.172	0.159	0.199	0.164	0.242	0.272
MW-3	mg/L	0.168	0.272	0.246	0.787	0.21	0.867	0.243	0.152	0.132
MW-6	mg/L	0.019	0.022	<0.01	<0.01	0.017	0.028	0.05	0.028	0.043
MW-8	mg/L	1.77	1.62	1.54	1.64	1.48	1.4	1.05	1.11	0.818
MW-9M	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.013	0.01	0.018
MW-9S	mg/L	0.726	1.04	0.877	1.14	1.02	0.76	0.686	0.587	0.71
MW4-97	mg/L	0.726	--	0.869	0.569	1.18	--	--	--	1.19
WMW-2	mg/L	0.486	2.36	2.54	5.69	3.61	4.16	5.44	13.2	23.9
WMW-3	mg/L	--	--	--	--	--	--	--	--	--

Parameter: Manganese, total
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	mg/L	0.021	0.036	0.025	0.038	0.024	0.026	0.021	0.019	0.018
MW-10S	mg/L	0.998	0.85	0.655	0.866	0.66	0.59	0.613	0.602	0.977
MW-11S	mg/L	0.101	0.102	0.081	0.076	0.084	0.076	0.076	0.078	0.079
MW-12	mg/L	0.147	0.15	0.1	0.135	0.126	0.126	0.119	0.11	0.106
MW-13	mg/L	4.37	4.06	4.2	3.81	3.9	3.84	2.41	2.21	1.43
MW-14D	mg/L	0.643	0.486	0.533	0.568	1.23	0.641	1.09	0.65	0.783
MW-15D	mg/L	0.581	0.587	0.583	0.625	0.641	0.618	0.583	0.511	0.514
MW-16	mg/L	6.3	6.29	5.75	5.07	5.11	5.22	5.17	4.42	4.22
MW-17S	mg/L	0.854	0.457	0.594	0.939	1.72	2.7	3.37	3.75	1.86
MW-1R	mg/L	0.059	0.054	0.073	0.064	0.064	0.057	0.057	0.042	0.049
MW-2R	mg/L	0.365	0.327	0.205	0.261	0.213	0.268	0.221	0.243	0.304
MW-3	mg/L	0.162	0.173	0.236	0.372	0.174	0.104	0.145	0.347	0.429
MW-6	mg/L	0.02	0.047	0.024	0.017	0.011	<0.01	<0.01	<0.01	<0.01
MW-8	mg/L	1	0.74	0.757	0.737	1.02	0.75	0.553	0.461	0.618
MW-9M	mg/L	0.013	0.014	0.016	0.012	<0.01	<0.01	<0.01	<0.01	<0.01
MW-9S	mg/L	0.535	0.497	0.421	0.511	0.577	0.567	0.708	0.583	0.656
MW4-97	mg/L	--	--	--	--	--	--	--	--	--

Parameter: Manganese, total
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
WMW-2	mg/L	1.72	0.045	0.039	0.022	0.022	0.014	0.051	0.014	0.026
WMW-3	mg/L	--	--	--	--	--	--	--	--	--

Parameter: Manganese, total
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018			
MW-10D	mg/L	0.015	0.016	0.019	0.015	0.027	0.035			
MW-10S	mg/L	0.564	0.54	0.557	0.477	0.429	0.446			
MW-11S	mg/L	0.084	0.08	0.113	0.12	0.105	0.094			
MW-12	mg/L	0.111	0.119	0.159	0.127	0.133	0.131			
MW-13	mg/L	1.51	1.32	1.22	2.15	1.05	1.15			
MW-14D	mg/L	0.577	0.6	0.592	0.627	0.534	0.548			
MW-15D	mg/L	0.522	0.502	0.47	0.499	0.438	0.493			
MW-16	mg/L	5.04	4.7	3.94	4.88	4.12	4.39			
MW-17S	mg/L	3.19	2.41	4.01	3.02	3.57	3.25			
MW-1R	mg/L	0.04	0.052	0.049	0.056	0.034	0.043			
MW-2R	mg/L	0.263	0.214	0.313	0.305	0.311	0.275			
MW-3	mg/L	0.695	0.449	0.298	0.173	0.259	0.203			
MW-6	mg/L	<0.01	<0.01	0.015	<0.01	<0.01	<0.01			
MW-8	mg/L	0.676	0.787	0.877	0.784	0.667	0.777			
MW-9M	mg/L	<0.01	<0.01	0.01	<0.01	<0.01	<0.01			
MW-9S	mg/L	0.629	0.727	0.554	0.936	0.347	0.567			
MW4-97	mg/L	1.27	--	1.34	--	1.01	1.01			
WMW-2	mg/L	0.015	0.452	0.045	0.016	0.041	<0.01			
WMW-3	mg/L	--	--	0.043	--	--	--			

Data Summary Table for Nickel, total

Name: Royalton Road

Parameter: Nickel, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-10S	mg/l	--	0.12	0.13	0.1	0.14	0.14	0.139	0.161	0.142
MW-11S	mg/l	--	0.04	0.06	0.08	0.08	0.084	0.072	0.083	0.059
MW-12	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-13	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-14D	mg/l	0.05	0.06	0.03466	0.03407	0.05	0.035	0.034	0.027	0.029
MW-15D	mg/l	0.07	0.07	0.06	0.06	0.08	0.074	0.065	0.063	0.055
MW-16	mg/l	0.01515	--	--	0.0126	0.01	0.032	0.0108	<0.01	0.011
MW-17S	mg/l	0.05	0.05	0.03633	0.02908	<0.01	0.032	0.014	0.028	0.03
MW-1R	mg/l	--	0.028	0.021	0.022	0.023	0.026	0.017	0.02	0.018
MW-2R	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	0.011	<0.01	<0.01
MW-3	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-6	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-8	mg/l	--	0.06	0.05	0.06	0.06	0.058	0.048	0.051	0.045
MW-9M	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.033
MW-9S	mg/l	--	<0.01	<0.01	0.02186	<0.01	<0.01	<0.01	<0.01	<0.01
MW4-97	mg/l	--	--	--	0.02034	0.02	0.025	0.021	0.028	0.024
WMW-2	mg/l	--	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
WMW-3	mg/l	--	--	0.02657	--	0.05	--	<0.01	--	0.024

Parameter: Nickel, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-10S	mg/l	0.133	0.147	0.17	0.13	0.18	0.133	0.153	0.133	0.146
MW-11S	mg/l	0.056	0.057	0.05	0.063	0.048	0.049	0.049	0.043	0.038
MW-12	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-13	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	<0.01	<0.01	<0.01
MW-14D	mg/l	0.026	0.033	0.03	0.027	0.03	0.033	0.018	0.018	0.016
MW-15D	mg/l	0.061	0.053	0.055	0.058	0.056	0.06	0.057	0.052	0.053

Parameter: Nickel, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-16	mg/l	0.019	0.013	0.018	0.016	0.01	0.014	0.011	<0.01	0.022
MW-17S	mg/l	0.037	0.036	0.038	0.043	0.041	0.036	0.012	0.014	0.015
MW-1R	mg/l	0.018	0.018	0.025	0.025	0.028	0.032	0.029	0.025	0.032
MW-2R	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-3	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-6	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-8	mg/l	0.051	0.047	0.048	0.051	0.05	0.047	0.047	0.046	0.046
MW-9M	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-9S	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW4-97	mg/l	0.032	--	0.034	0.04	0.05	--	--	--	0.033
WMW-2	mg/l	<0.01	0.015	0.014	0.022	0.02	0.021	0.03	0.043	0.069
WMW-3	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Nickel, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-10S	mg/l	0.132	0.131	0.107	0.125	0.119	0.111	0.136	0.119	0.172
MW-11S	mg/l	0.043	0.039	0.033	0.031	0.032	0.029	0.028	0.028	0.027
MW-12	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-13	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-14D	mg/l	0.021	0.014	0.015	0.019	0.036	0.017	0.031	0.018	0.023
MW-15D	mg/l	0.05	0.047	0.044	0.048	0.046	0.045	0.04	0.042	0.043
MW-16	mg/l	0.018	<0.01	0.019	<0.01	0.013	<0.01	<0.01	0.012	<0.01
MW-17S	mg/l	0.013	<0.01	0.015	0.02	0.04	0.041	0.037	0.03	0.034
MW-1R	mg/l	0.034	0.031	0.034	0.022	0.021	0.02	0.02	0.018	0.019
MW-2R	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-3	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-6	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-8	mg/l	0.05	0.043	0.041	0.047	0.042	0.036	0.032	0.03	0.033
MW-9M	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-9S	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW4-97	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Nickel, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
WMW-2	mg/l	0.015	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WMW-3	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Nickel, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018			
MW-10D	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-10S	mg/l	0.131	0.131	0.134	0.126	0.121	0.127			
MW-11S	mg/l	0.029	0.035	0.026	0.029	0.027	0.029			
MW-12	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-13	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-14D	mg/l	0.017	0.02	0.016	0.019	0.017	0.017			
MW-15D	mg/l	0.045	0.04	0.043	0.04	0.035	0.04			
MW-16	mg/l	0.01	0.01	<0.01	<0.01	<0.01	<0.01			
MW-17S	mg/l	0.039	0.049	0.034	0.04	0.034	0.041			
MW-1R	mg/l	0.018	0.018	0.014	0.015	0.014	0.013			
MW-2R	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-3	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-6	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-8	mg/l	0.034	0.038	0.039	0.035	0.032	0.035			
MW-9M	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW-9S	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
MW4-97	mg/l	0.077	--	0.062	--	0.05	0.03			
WMW-2	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
WMW-3	mg/l	--	--	<0.01	--	--	--			

Data Summary Table for Potassium, total

Name: Royalton Road

Parameter: Potassium, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	mg/l	--	9	8.2	8.9	9.8	9.7	9.6	8.9	9.6
MW-10S	mg/l	--	36	35	26	29.8	33.7	35	44	44
MW-11S	mg/l	--	55	101	104	101	116	116	119	97.9
MW-12	mg/l	--	10	10	10	10.7	10.5	11	11.1	10.8
MW-13	mg/l	--	3.6	3.8	3.6	4	4.1	4.3	4.8	4.6
MW-14D	mg/l	96	130	100	90	121	84.2	111	75.4	86.8
MW-15D	mg/l	242	253	241	280	281	286	268	228	237
MW-16	mg/l	4.2	--	--	4.4	5	4	4.7	4.5	4.6
MW-17S	mg/l	223	170	156	149	21.5	77.9	33.7	103	145
MW-1R	mg/l	--	28	26	24	25.2	24.7	24.4	15.3	12
MW-2R	mg/l	--	6.9	5.3	5.5	5.9	5.9	6.8	6.3	5.7
MW-3	mg/l	--	7.2	7.3	7.9	8.5	8.6	8.8	8.4	9.4
MW-6	mg/l	--	4.5	5.8	6	5.8	3.3	4.1	4.7	5
MW-8	mg/l	--	124	136	136	132	135	134	136	141
MW-9M	mg/l	--	6.2	6.2	5.9	6.1	6.2	6.1	6.2	7.7
MW-9S	mg/l	--	15	15	18	16.8	14.9	15.2	18	12.8
MW4-97	mg/l	--	--	--	24	24.3	24.9	28.1	34.6	27.5
WMW-2	mg/l	--	1.6	1.7	1.7	2.1	2	2.4	2.3	2.4
WMW-3	mg/l	--	--	9	--	9.6	--	4.5	--	4.8

Parameter: Potassium, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	mg/l	9.7	9.8	8.8	9.2	9.8	9.2	8.8	9.4	9.7
MW-10S	mg/l	53.8	60.7	61	51.8	72.7	49.3	65.5	53.2	62.4
MW-11S	mg/l	89	65.3	66	75.1	55.1	50.8	52.2	48.4	47.7
MW-12	mg/l	10.7	11.5	10.4	11.6	11.7	10.8	11.5	11.9	12
MW-13	mg/l	4.3	5.4	4.8	4.8	5	230	6.4	6.1	6.5
MW-14D	mg/l	81.3	101	83.5	75.5	60.4	75	34.7	42.4	36.3
MW-15D	mg/l	259	197	232	219	211	232	226	229	240

Parameter: Potassium, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-16	mg/l	5.2	4.9	4.7	5	4.7	5.3	4.8	5.3	6.7
MW-17S	mg/l	181	173	174	170	159	123	58.5	69.9	78.2
MW-1R	mg/l	14.4	20.8	18.4	18	19.5	17.9	15.1	16.4	14.4
MW-2R	mg/l	5.7	6.1	5.6	5.8	5.8	5.8	4.7	5.8	6.9
MW-3	mg/l	8.6	9.4	9.2	9	9.4	9	8.4	8.5	6.3
MW-6	mg/l	4.9	4.9	3.3	3.5	5.9	5.6	5.4	5.4	6
MW-8	mg/l	133	130	126	126	121	111	79.7	88.7	73.7
MW-9M	mg/l	8.8	7.4	7.1	8.1	6.7	6.3	7	8.4	9.1
MW-9S	mg/l	13.7	14.3	14.1	14.2	16.7	14.4	12	13.1	12.9
MW4-97	mg/l	33.5	--	30.9	35.5	38.6	--	--	--	31.2
WMW-2	mg/l	2.8	2.8	2.7	3	3.5	3	3.8	4.9	7.9
WMW-3	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Potassium, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	mg/l	10.1	10	9.7	9.4	9.5	9.8	9.5	8.8	8.7
MW-10S	mg/l	51.4	51.2	40.7	65.1	55.9	56.6	56.2	52.4	93.5
MW-11S	mg/l	58.6	57	45.8	41.2	53	49.2	46.4	45.4	46.3
MW-12	mg/l	12.9	12.2	12.1	11.8	12.3	12	12	11.3	10.9
MW-13	mg/l	5.8	5.1	5.3	5.8	5.3	5.5	6.5	6.4	7.1
MW-14D	mg/l	49.5	37.5	36.5	46.5	91.9	48.2	78.3	46.6	50.8
MW-15D	mg/l	235	226	207	209	215	203	183	164	196
MW-16	mg/l	6	5.3	5.7	4.8	5.3	6.6	5.5	5.6	4.6
MW-17S	mg/l	72.2	46.6	99.3	155	184	209	195	178	176
MW-1R	mg/l	9.7	8.3	16.1	12.8	13.5	12	14.1	6.8	11.2
MW-2R	mg/l	6.5	5.8	5.8	5.8	5.8	5.9	6.1	5.2	5.8
MW-3	mg/l	9.8	9.1	9.4	8.8	9.2	9.2	8.1	8.4	6.8
MW-6	mg/l	3.4	4	3.9	3.2	3.9	3.2	3.6	3.3	3.4
MW-8	mg/l	86.2	61.5	57.9	72.5	92.8	66	47.6	42.5	60.4
MW-9M	mg/l	10	10.8	8.4	12.4	6.3	5.7	5.2	4.6	6
MW-9S	mg/l	11.4	9.9	9.8	9.9	10.8	10.4	12.5	11.4	12.9
MW4-97	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Potassium, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
WMW-2	mg/l	3.2	2.2	3	2.2	2.5	2	1.8	2.1	1.6
WMW-3	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Potassium, total
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018			
MW-10D	mg/l	9.4	9.7	9.4	9.3	9.6	9.5			
MW-10S	mg/l	66.8	60.9	68	53	57.5	54			
MW-11S	mg/l	51.3	54.1	46.9	48.9	49.8	51.4			
MW-12	mg/l	11.9	11.6	12.1	11.6	11.4	11.4			
MW-13	mg/l	7.7	7.6	8.1	7.8	7.5	7.4			
MW-14D	mg/l	36.2	44.9	34.6	37.3	31.7	33.1			
MW-15D	mg/l	209	186	202	189	179	181			
MW-16	mg/l	6.3	5.6	5.4	5.4	5.5	4.6			
MW-17S	mg/l	211	236	184	207	196	193			
MW-1R	mg/l	8.7	13	9.1	11.6	5.6	7.4			
MW-2R	mg/l	6	6.4	5.8	5.7	5.8	5			
MW-3	mg/l	8	7.9	7.4	7.8	7.1	8.3			
MW-6	mg/l	3.4	3.4	3.3	3.5	3.2	3			
MW-8	mg/l	64.8	81.8	79	70	59.6	67.9			
MW-9M	mg/l	6.1	6.6	6.2	5.2	5.9	5.3			
MW-9S	mg/l	12.1	14.1	12	17.3	9.9	13.9			
MW4-97	mg/l	59.9	--	55.1	--	48	32.7			
WMW-2	mg/l	2.5	1.9	2.1	1.6	2	1.6			
WMW-3	mg/l	--	--	5.9	--	--	--			

Data Summary Table for Sodium, total

Name: Royalton Road

Parameter: Sodium
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	mg/l	--	68.1	63.4	73.1	83.7	79.3	81.4	83.5	82.4
MW-10S	mg/l	--	1140	1140	1080	1190	1270	1250	1640	1490
MW-11S	mg/l	--	203	388	408	424	394	446	389	360
MW-12	mg/l	--	50.6	49	52	54.9	54.3	56.3	60	56.6
MW-13	mg/l	--	61.2	65.1	68.5	76.9	76.9	83.1	90	86.4
MW-14D	mg/l	1380	1350	1130	1150	1160	1150	1340	1100	1220
MW-15D	mg/l	1220	1310	1200	1310	1650	1470	1460	1490	1410
MW-16	mg/l	13.8	--	--	14.3	20.6	10.3	19.7	16	22.1
MW-17S	mg/l	801	724	636	648	129	336	165	446	664
MW-1R	mg/l	--	496	470	463	459	485	503	892	840
MW-2R	mg/l	--	48	56.3	57.5	64.4	61.8	64.8	71.3	63.1
MW-3	mg/l	--	79.8	81.7	89.9	96.1	97.8	101	109	113
MW-6	mg/l	--	663	581	624	581	742	699	706	634
MW-8	mg/l	--	1310	1160	1290	1530	1360	1480	1340	1430
MW-9M	mg/l	--	1180	1140	1110	1110	1310	1410	1520	1610
MW-9S	mg/l	--	97.4	78.9	108	96	82.6	52.7	74.1	110
MW4-97	mg/l	--	--	--	214	218	217	255	306	243
WMW-2	mg/l	--	32.4	39.3	39.4	50.8	40.3	66	67.4	78.2
WMW-3	mg/l	--	--	26.5	--	28.4	--	25	--	26.8

Parameter: Sodium
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	mg/l	82.7	82.5	79.2	69.2	84.3	78.1	70.4	68.1	84.4
MW-10S	mg/l	1150	1400	1590	1170	1620	1250	1280	1360	1380
MW-11S	mg/l	312	265	296	352	289	274	272	261	234
MW-12	mg/l	56.7	56.6	59.9	57.6	61.1	56.6	62.2	61.8	63.3
MW-13	mg/l	82.8	86.9	93.2	86.6	89.2	1180	100	99	105
MW-14D	mg/l	1020	1180	1320	989	1100	1160	925	1040	914
MW-15D	mg/l	1300	1290	1470	1240	1410	1240	1260	1350	1300

Parameter: Sodium
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-16	mg/l	19.5	28	19.9	30.2	24.4	40.1	29.5	38.1	44.5
MW-17S	mg/l	686	742	1230	778	805	587	172	373	350
MW-1R	mg/l	677	574	862	691	721	642	742	767	930
MW-2R	mg/l	64.4	63.2	68	62.5	65.1	78.9	57.6	62.6	74.3
MW-3	mg/l	98.9	105	118	105	111	105	111	112	124
MW-6	mg/l	624	604	709	620	626	588	588	636	624
MW-8	mg/l	1190	1290	1520	1270	1340	1190	1400	1510	1520
MW-9M	mg/l	1480	1420	1600	1420	1270	1260	1450	1750	1560
MW-9S	mg/l	98.3	87.4	101	50.8	55.3	119	136	170	139
MW4-97	mg/l	291	--	292	307	336	--	--	--	232
WMW-2	mg/l	93.2	124	126	129	166	167	232	328	645
WMW-3	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Sodium
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	mg/l	110	84.7	82.2	72.1	76.3	77.2	69.4	73	61.9
MW-10S	mg/l	1280	1230	1150	1440	1270	1260	1260	1260	1860
MW-11S	mg/l	303	300	256	236	277	253	240	246	246
MW-12	mg/l	68.8	68.3	66.5	65.9	64.9	67.7	65.4	68	61.7
MW-13	mg/l	104	101	104	105	102	108	108	102	116
MW-14D	mg/l	1030	934	1000	931	1260	1110	1210	1120	1150
MW-15D	mg/l	1220	1220	1210	1150	1180	1090	994	1110	1120
MW-16	mg/l	41.1	32.3	38.8	28	35	50.9	33	40.7	25.2
MW-17S	mg/l	313	181	408	512	806	900	877	779	889
MW-1R	mg/l	1160	1170	820	830	842	781	785	926	774
MW-2R	mg/l	61.1	57.4	65.5	61	63.8	63.7	66.2	62	125
MW-3	mg/l	131	115	122	124	116	120	121	122	111
MW-6	mg/l	644	614	659	604	652	608	655	583	582
MW-8	mg/l	1510	1560	1650	1530	1360	1250	1150	1320	1270
MW-9M	mg/l	1720	1830	1610	1640	1240	1140	1150	1020	1000
MW-9S	mg/l	157	102	147	106	150	121	182	157	206
MW4-97	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Sodium
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
WMW-2	mg/l	183	39	165	72.5	102	48.6	42.2	42.6	39.1
WMW-3	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Sodium
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018			
MW-10D	mg/l	64.6	68.7	73.7	75.2	53.9	67.3			
MW-10S	mg/l	1310	1210	1290	1260	1260	1280			
MW-11S	mg/l	234	254	232	268	263	267			
MW-12	mg/l	68.2	66.6	72.3	65.3	69.1	69.7			
MW-13	mg/l	106	121	112	113	122	125			
MW-14D	mg/l	990	1100	1170	1150	1110	1210			
MW-15D	mg/l	1040	1010	1150	1020	1010	1110			
MW-16	mg/l	55	31.9	32.3	30	36.4	25.5			
MW-17S	mg/l	864	960	779	935	904	900			
MW-1R	mg/l	908	734	773	737	906	810			
MW-2R	mg/l	78.6	82.3	66.5	68.7	61.7	82.7			
MW-3	mg/l	108	118	117	115	112	123			
MW-6	mg/l	629	597	598	589	615	607			
MW-8	mg/l	1170	1250	1240	1280	1260	1290			
MW-9M	mg/l	1060	1040	1040	976	1100	1060			
MW-9S	mg/l	171	170	148	131	134	196			
MW4-97	mg/l	651	--	588	--	486	357			
WMW-2	mg/l	55.9	42.2	42.9	41.2	42.4	42.2			
WMW-3	mg/l	--	--	24.1	--	--	--			

Data Summary Table for Sulfide

Name: Royalton Road

Parameter: Sulfide
Number of Sampling Dates: 32
Units mg/l

Location I D	Units	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006	11/13/2006
MW-10D	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05
MW-10S	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05
MW-11S	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05
MW-12	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05
MW-13	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05
MW-14D	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05
MW-15D	mg/l	0.03	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05
MW-16	mg/l	--	--	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05
MW-17S	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05
MW-1R	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05
MW-2R	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05
MW-3	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05
MW-6	mg/l	0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05
MW-8	mg/l	0.1	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05
MW-9M	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05
MW-9S	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05
MW4-97	mg/l	--	--	--	--	--	--	<0.05	<0.05	<0.05
WMW-2	mg/l	<0.02	<0.02	<0.02	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05
WMW-3	mg/l	--	--	--	--	--	--	--	<0.05	--

Parameter: Sulfide
Number of Sampling Dates: 32
Units mg/l

Location I D	Units	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010	6/21/2011
MW-10D	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-10S	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-11S	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-12	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-13	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-14D	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-15D	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Parameter: Sulfide
Number of Sampling Dates: 32
Units mg/l

Location I D	Units	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010	6/21/2011
MW-16	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-17S	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-1R	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-2R	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-3	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-6	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-8	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-9M	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-9S	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW4-97	mg/l	--	--	--	<0.1	--	--	--	--	--
WMW-2	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
WMW-3	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Sulfide
Number of Sampling Dates: 32
Units mg/l

Location I D	Units	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015	12/7/2015
MW-10D	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-10S	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-11S	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-12	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-13	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-14D	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-15D	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-16	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-17S	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-1R	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-2R	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-3	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-6	mg/l	<0.1	0.2	0.2	0.2	0.2	<0.1	<0.1	<0.1	<0.1
MW-8	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-9M	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-9S	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW4-97	mg/l	--	--	--	--	--	--	--	--	<0.1

Parameter: Sulfide
Number of Sampling Dates: 32
Units mg/l

Location I D	Units	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015	12/7/2015
WMW-2	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
WMW-3	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Sulfide
Number of Sampling Dates: 32
Units mg/l

Location I D	Units	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018				
MW-10D	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1				
MW-10S	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1				
MW-11S	mg/l	<0.1	<0.1	<0.1	<0.1	0.2				
MW-12	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1				
MW-13	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1				
MW-14D	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1				
MW-15D	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1				
MW-16	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1				
MW-17S	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1				
MW-1R	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1				
MW-2R	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1				
MW-3	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1				
MW-6	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1				
MW-8	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1				
MW-9M	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1				
MW-9S	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1				
MW4-97	mg/l	--	<0.1	--	--	--				
WMW-2	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1				
WMW-3	mg/l	--	<0.1	--	--	--				

Data Summary Table for Total Dissolved Solids

Name: Royalton Road

Parameter: Total Dissolved Solids
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	mg/l	--	814	856	848	806	850	930	824	818
MW-10S	mg/l	--	6130	6110	6210	6570	5860	7140	6410	6310
MW-11S	mg/l	--	2800	3260	3140	3250	3160	3420	3240	3030
MW-12	mg/l	--	2550	2840	2830	2620	2750	2700	2760	2850
MW-13	mg/l	--	1410	1310	1230	1370	1270	1390	1350	1410
MW-14D	mg/l	4590	4530	3610	3280	3980	2920	3530	3030	3270
MW-15D	mg/l	5160	4860	4750	4940	4650	4680	4820	4620	4480
MW-16	mg/l	916	--	--	1010	1140	614	1090	726	1000
MW-17S	mg/l	3730	3380	3440	3310	3210	3120	3310	3240	3150
MW-1R	mg/l	--	2350	2330	2250	2070	2130	2110	2330	2150
MW-2R	mg/l	--	1260	1290	1280	1260	1270	1260	1290	1300
MW-3	mg/l	--	1190	1210	1190	1190	1220	1220	1240	1270
MW-6	mg/l	--	1490	1500	1530	1460	1440	1450	1510	1420
MW-8	mg/l	--	4310	5050	4610	4660	4300	4350	4420	4240
MW-9M	mg/l	--	3070	3100	3040	2940	2930	3070	3140	3580
MW-9S	mg/l	--	724	762	714	630	596	652	612	614
MW4-97	mg/l	--	--	--	1430	--	--	1600	1790	1590
WMW-2	mg/l	--	396	592	446	756	442	962	622	788
WMW-3	mg/l	--	--	--	--	--	--	1280	--	826

Parameter: Total Dissolved Solids
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	mg/l	822	834	850	836	848	832	834	832	856
MW-10S	mg/l	5580	6280	5910	5740	6090	5500	5670	5830	5430
MW-11S	mg/l	2710	2710	2620	2870	2530	2480	480	2650	474
MW-12	mg/l	2730	2830	2820	2840	2810	2900	3110	3110	3160
MW-13	mg/l	1340	1530	1360	1420	1550	1710	1420	1430	1450
MW-14D	mg/l	2900	3290	3040	3170	3110	3150	2310	2480	2130
MW-15D	mg/l	4350	4220	4180	4200	3870	4170	3930	4190	3970

Parameter: Total Dissolved Solids
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-16	mg/l	904	1100	792	1040	844	1260	5000	1200	1150
MW-17S	mg/l	3070	3200	3350	3370	3350	3230	840	1460	1270
MW-1R	mg/l	2070	2160	2240	2180	2280	2370	2240	2240	2350
MW-2R	mg/l	1230	1260	1250	1270	1210	1320	1030	1340	1300
MW-3	mg/l	1270	1270	1430	1310	1350	1360	1280	1170	1020
MW-6	mg/l	1410	1530	1430	1420	1390	1410	1360	1370	1360
MW-8	mg/l	4070	4230	4040	3730	4270	3950	4000	3980	4070
MW-9M	mg/l	3470	3230	3300	3240	2960	2940	3550	3430	3590
MW-9S	mg/l	602	786	620	720	568	746	752	876	710
MW4-97	mg/l	1620	--	1750	1760	2360	--	--	--	--
WMW-2	mg/l	754	1060	928	1040	1250	1620	1890	3260	4780
WMW-3	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Total Dissolved Solids
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	mg/l	878	842	876	832	860	878	794	834	796
MW-10S	mg/l	5320	5440	5410	5820	5530	5320	5490	5240	6530
MW-11S	mg/l	2410	1920	2390	2300	2380	2290	2190	2050	1810
MW-12	mg/l	3160	3360	3070	3100	3140	3150	2960	3040	2970
MW-13	mg/l	1660	1480	1610	1340	1610	1500	1290	1350	1340
MW-14D	mg/l	2510	2220	2330	2350	3690	2870	2970	2810	3010
MW-15D	mg/l	3830	744	4000	3830	3940	3730	3800	3600	3630
MW-16	mg/l	1130	1020	1240	962	1150	774	1030	1130	872
MW-17S	mg/l	1120	736	1650	2060	3330	3750	3540	3330	3260
MW-1R	mg/l	2510	2170	2460	2220	2280	2230	2130	2250	1720
MW-2R	mg/l	1390	1450	1260	1310	1250	1350	1280	1320	1540
MW-3	mg/l	1250	1330	1270	1180	1250	1320	994	1210	968
MW-6	mg/l	1440	1480	1430	1390	1450	1400	1370	1400	1370
MW-8	mg/l	4010	3920	4230	4000	3880	3690	3480	3360	3460
MW-9M	mg/l	4010	3910	4060	3760	2740	2710	2560	2460	2520
MW-9S	mg/l	780	574	792	598	746	694	924	776	936
MW4-97	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Total Dissolved Solids
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
WMW-2	mg/l	1790	716	1580	824	1130	886	746	794	730
WMW-3	mg/l	--	--	--	--	--	--	--	--	--

Parameter: Total Dissolved Solids
Number of Sampling Dates: 33
Units mg/l

Location I D	Units	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018			
MW-10D	mg/l	844	770	850	844	812	830			
MW-10S	mg/l	5600	5330	5040	5230	6990	4750			
MW-11S	mg/l	2330	2270	2100	2250	1840	2010			
MW-12	mg/l	3100	2990	3110	3180	3120	3100			
MW-13	mg/l	1490	1320	1320	1470	1310	1340			
MW-14D	mg/l	2880	2910	2960	3150	2530	2910			
MW-15D	mg/l	3760	3670	3510	3680	3170	3200			
MW-16	mg/l	1240	1010	880	1010	914	948			
MW-17S	mg/l	3590	3310	3300	3740	3040	3320			
MW-1R	mg/l	2230	1990	2200	2040	2130	2000			
MW-2R	mg/l	1390	1310	1300	1380	1350	1380			
MW-3	mg/l	1070	978	1000	1060	994	1070			
MW-6	mg/l	1410	1340	1300	1300	1380	1380			
MW-8	mg/l	3650	3540	3960	3840	3200	3310			
MW-9M	mg/l	2710	2610	2650	2420	2690	2570			
MW-9S	mg/l	812	832	710	860	730	890			
MW4-97	mg/l	3410	--	2900	--	--	1820			
WMW-2	mg/l	896	688	760	734	760	674			
WMW-3	mg/l	--	--	1300	--	--	--			

Data Summary Table for Vanadium, total

Name: Royalton Road

Parameter: Vanadium, total
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	mg/L	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-10S	mg/L	--	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	<0.005
MW-11S	mg/L	--	0.0151	0.00656	0.00679	0.01	0.01	0.005	0.008	<0.005
MW-12	mg/L	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-13	mg/L	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-14D	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-15D	mg/L	0.00516	0.0055	<0.005	<0.005	0.006	0.008	<0.005	0.007	0.005
MW-16	mg/L	<0.005	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-17S	mg/L	0.00726	0.0201	0.00766	0.01153	<0.005	0.008	<0.005	<0.005	<0.005
MW-1R	mg/L	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-2R	mg/L	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.009	<0.005	<0.005
MW-3	mg/L	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-6	mg/L	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-8	mg/L	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-9M	mg/L	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-9S	mg/L	--	<0.005	<0.005	0.0117	<0.005	<0.005	<0.005	<0.005	<0.005
MW4-97	mg/L	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
WMW-2	mg/L	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
WMW-3	mg/L	--	--	0.02155	--	0.025	--	<0.005	--	0.011

Parameter: Vanadium, total
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-10S	mg/L	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-11S	mg/L	0.006	0.006	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-12	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-13	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-14D	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-15D	mg/L	0.008	0.006	0.008	0.009	<0.005	<0.005	<0.005	<0.005	<0.005

Parameter: Vanadium, total
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-16	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-17S	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-1R	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-2R	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-3	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-6	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-8	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-9M	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-9S	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW4-97	mg/L	<0.005	--	<0.005	<0.005	<0.005	--	--	--	0.007
WMW-2	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
WMW-3	mg/L	--	--	--	--	--	--	--	--	--

Parameter: Vanadium, total
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-10S	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-11S	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-12	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-13	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-14D	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-15D	mg/L	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-16	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-17S	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-1R	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-2R	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-3	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-6	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-8	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-9M	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-9S	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW4-97	mg/L	--	--	--	--	--	--	--	--	--

Parameter: Vanadium, total
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
WMW-2	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
WMW-3	mg/L	--	--	--	--	--	--	--	--	--

Parameter: Vanadium, total
Number of Sampling Dates: 33
Units mg/L

Location I D	Units	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018			
MW-10D	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-10S	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-11S	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-12	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-13	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-14D	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-15D	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-16	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-17S	mg/L	<0.005	0.006	0.006	<0.005	0.007	<0.005			
MW-1R	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-2R	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-3	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-6	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-8	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-9M	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW-9S	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
MW4-97	mg/L	<0.005	--	<0.005	--	<0.005	<0.005			
WMW-2	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			
WMW-3	mg/L	--	--	<0.005	--	--	--			

Data Summary Table for Acetone

Name: Royalton Road

Parameter: Acetone
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	ug/l	--	<100	<100	<100	<10	<10	<10	<10	<10
MW-10S	ug/l	--	<100	<100	<100	11.5	<10	13.1	<10	<10
MW-11S	ug/l	--	<100	<100	<100	10.8	<10	<10	<10	<10
MW-12	ug/l	--	<100	<100	<100	<10	<10	<10	<10	<10
MW-13	ug/l	--	<100	<100	<100	<10	<10	<10	<10	<10
MW-14D	ug/l	<100	<100	<100	<100	22.2	14.3	14.7	39.1	<10
MW-15D	ug/l	<100	<100	<100	<100	26.7	16.8	17.5	<10	<10
MW-16	ug/l	<100	--	--	<100	<10	35.3	<10	14.2	<10
MW-17S	ug/l	<100	<100	<100	<100	<10	<10	<10	26.7	11.7
MW-1R	ug/l	--	<100	<100	<100	<10	<10	<10	<10	<10
MW-2R	ug/l	--	<100	<100	<100	<10	<10	<10	<10	<10
MW-3	ug/l	--	<100	<100	<100	<10	<10	<10	<10	<10
MW-6	ug/l	--	<100	<100	<100	<10	<10	<10	<10	<10
MW-8	ug/l	--	<100	<100	<100	17.8	11.2	17.6	<10	<10
MW-9M	ug/l	--	<100	<100	<100	<10	<10	<10	<10	<10
MW-9S	ug/l	--	<100	<100	<100	<10	<10	<10	<10	<10
MW4-97	ug/l	--	--	--	<100	<10	<10	<10	<10	<10
WMW-2	ug/l	--	<100	<100	<100	<10	<10	<10	<10	<10
WMW-3	ug/l	--	--	<100	--	<10	--	<10	--	<10

Parameter: Acetone
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
MW-10S	ug/l	<10	<10	<10	10.9	<10	11	<10	<10	<10
MW-11S	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
MW-12	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
MW-13	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
MW-14D	ug/l	<10	10.9	<10	11.3	14	12	<10	<10	<10
MW-15D	ug/l	<10	16.8	<10	10.3	<10	<50	<10	10.4	<10

Parameter: Acetone
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-16	ug/l	<10	<10	<10	<10	33	<10	18	<10	<10
MW-17S	ug/l	10.1	22	12	40.3	<10	<50	<10	<10	<10
MW-1R	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
MW-2R	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
MW-3	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
MW-6	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	13
MW-8	ug/l	11.1	13.5	15.7	15	<10	<10	<10	<10	<10
MW-9M	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
MW-9S	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
MW4-97	ug/l	<10	11.4	<10	<10	<10	--	<10	<10	<10
WMW-2	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
WMW-3	ug/l	--	--	<10	<10	--	--	--	--	--

Parameter: Acetone
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
MW-10S	ug/l	<10	<10	<10	<10	12.3	<10	<10	<10	<10
MW-11S	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
MW-12	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
MW-13	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
MW-14D	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
MW-15D	ug/l	<10	<10	<10	<10	14.7	<10	<10	<10	<10
MW-16	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
MW-17S	ug/l	<10	<10	<10	<10	12	<10	<10	<10	<10
MW-1R	ug/l	<10	<10	<10	<10	<10	<10	16.4	<10	<10
MW-2R	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
MW-3	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
MW-6	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
MW-8	ug/l	<10	<10	<10	<10	10.2	<10	<10	<10	<10
MW-9M	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
MW-9S	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
MW4-97	ug/l	<10	<10	--	--	--	--	--	--	--

Parameter: Acetone
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
WMW-2	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
WMW-3	ug/l	--	<10	--	--	--	--	--	--	--

Parameter: Acetone
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018			
MW-10D	ug/l	<10	<10	<10	<10	<10	<10			
MW-10S	ug/l	<10	13	<10	<10	<10	<10			
MW-11S	ug/l	<10	<10	<10	17.7	10.5	<10			
MW-12	ug/l	<10	<10	<10	<10	<10	<10			
MW-13	ug/l	<10	<10	<10	<10	<10	<10			
MW-14D	ug/l	<10	<10	<10	<10	<10	<10			
MW-15D	ug/l	<10	<10	<10	<10	<10	<10			
MW-16	ug/l	<10	<10	<10	<10	<10	<10			
MW-17S	ug/l	<10	<10	<10	13.8	<10	<10			
MW-1R	ug/l	<10	<10	<10	<10	<10	<10			
MW-2R	ug/l	<10	<10	<10	<10	<10	<10			
MW-3	ug/l	<10	<10	<10	<10	<10	<10			
MW-6	ug/l	<10	<10	<10	<10	<10	<10			
MW-8	ug/l	<10	<10	<10	<10	<10	<10			
MW-9M	ug/l	<10	<10	<10	<10	<10	<10			
MW-9S	ug/l	<10	<10	<10	<10	<10	<10			
MW4-97	ug/l	21.3	--	<10	--	<10	<10			
WMW-2	ug/l	<10	<10	<10	<10	<10	<10			
WMW-3	ug/l	--	--	<10	--	<10	<10			

Data Summary Table for Benzene

Name: Royalton Road

Parameter: Benzene
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	ug/l	--	<1	<4	<1	<1	<1	<1	<1	<1
MW-10S	ug/l	--	2	<4	2	2.12	1.1	2.2	2.1	1.7
MW-11S	ug/l	--	7	6	6	5.02	7	6.2	4.9	4.7
MW-12	ug/l	--	<1	<4	<1	<1	<1	<1	<1	<1
MW-13	ug/l	--	2	<4	2	1.7	1.4	<1	<1	<1
MW-14D	ug/l	<4	4	<4	2	3.17	2.4	3.2	2.5	2.6
MW-15D	ug/l	30	28	30	20	24.9	22.5	26.1	22.2	20.6
MW-16	ug/l	<4	--	--	3	1.64	2.1	1.5	1.6	1.4
MW-17S	ug/l	15	12	9	11	3.75	1	<1	4.3	10.8
MW-1R	ug/l	--	<1	<4	<1	<1	<1	<1	<1	<1
MW-2R	ug/l	--	<1	<4	<1	<1	<1	<1	<1	<1
MW-3	ug/l	--	<1	<4	<1	<1	<1	<1	<1	<1
MW-6	ug/l	--	<1	<4	<1	<1	<1	<1	<1	<1
MW-8	ug/l	--	3	<4	3	3.24	2.9	3.4	3.2	2.9
MW-9M	ug/l	--	<1	<4	<1	<1	<1	<1	<1	<1
MW-9S	ug/l	--	<1	<4	<1	<1	<1	<1	<1	<1
MW4-97	ug/l	--	--	--	2	1.17	2.1	1.8	1.7	1.3
WMW-2	ug/l	--	<1	<4	<1	<1	<1	<1	<1	<1
WMW-3	ug/l	--	--	<4	--	<1	--	<1	--	<1

Parameter: Benzene
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-10S	ug/l	1.3	1.5	1.6	1.6	1.1	1.6	1.7	1.6	1.6
MW-11S	ug/l	4.2	3.1	3	5.2	4.8	4.7	4.9	<1	1.2
MW-12	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-13	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-14D	ug/l	2.1	3.5	1.3	2.8	1.5	2.9	1.6	1.5	1.4
MW-15D	ug/l	23.4	1.6	22.3	21.7	21	17.3	23	18.8	26

Parameter: Benzene
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-16	ug/l	1.2	1.6	1.4	1.5	<1	1.8	1.2	1.5	1.4
MW-17S	ug/l	8.2	9.9	8.4	10.4	14	14.9	4.6	4.3	3.9
MW-1R	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-2R	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-3	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-6	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-8	ug/l	2.6	3	2.9	3.4	2.8	2.8	2.5	1.2	2
MW-9M	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-9S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW4-97	ug/l	1.7	<1	1.3	<1	2.7	--	<1	<1	<1
WMW-2	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
WMW-3	ug/l	--	--	<1	<1	--	--	--	--	--

Parameter: Benzene
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-10S	ug/l	1.6	1.4	1.5	<1	1.4	1.2	1.1	<1	1.4
MW-11S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-12	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-13	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-14D	ug/l	2	1.4	1.7	1.4	3.3	1.9	3	1.7	2.4
MW-15D	ug/l	21.6	18	23	15	23.3	21.4	19.9	18.4	22
MW-16	ug/l	1.5	1.4	1.5	1.1	1.5	1.4	1.1	1.1	1.1
MW-17S	ug/l	4.3	<1	4	6	16.6	11.8	9.4	8.2	10.8
MW-1R	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-2R	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-3	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-6	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-8	ug/l	2.1	1.8	1.5	<1	1.9	<1	<1	<1	1.3
MW-9M	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-9S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW4-97	ug/l	<1	<1	--	--	--	--	--	--	--

Parameter: Benzene
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
WMW-2	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
WMW-3	ug/l	--	<1	--	--	--	--	--	--	--

Parameter: Benzene
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018			
MW-10D	ug/l	<1	<1	<1	<1	<1	<1			
MW-10S	ug/l	<1	<1	<1	<1	<1	<1			
MW-11S	ug/l	<1	<1	<1	<1	<1	<1			
MW-12	ug/l	<1	<1	<1	<1	<1	<1			
MW-13	ug/l	<1	<1	<1	<1	<1	<1			
MW-14D	ug/l	1.4	1.4	1.1	1.4	<1	1.1			
MW-15D	ug/l	20.5	22	20.3	19.8	15	18.8			
MW-16	ug/l	1.5	1	<1	<1	<1	<1			
MW-17S	ug/l	9.4	9.6	8.1	5.6	6.4	6.6			
MW-1R	ug/l	<1	<1	<1	<1	<1	<1			
MW-2R	ug/l	<1	<1	<1	<1	<1	<1			
MW-3	ug/l	<1	<1	<1	<1	<1	<1			
MW-6	ug/l	<1	<1	<1	<1	<1	<1			
MW-8	ug/l	<1	1.4	1.2	<1	<1	<1			
MW-9M	ug/l	<1	<1	<1	<1	<1	<1			
MW-9S	ug/l	<1	<1	<1	<1	<1	<1			
MW4-97	ug/l	<1	--	<1	--	<1	<1			
WMW-2	ug/l	<1	<1	<1	<1	<1	<1			
WMW-3	ug/l	--	--	<1	--	<1	<1			

Data Summary Table for Chlorobenzene

Name: Royalton Road

Parameter: Chlorobenzene
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	ug/l	--	<1	<1	<1	<1	<1	<1	<1	<1
MW-10S	ug/l	--	<1	<1	<1	<1	<1	<1	<1	<1
MW-11S	ug/l	--	1	<1	<1	<1	<1	<1	<1	<1
MW-12	ug/l	--	<1	<1	<1	<1	<1	<1	<1	<1
MW-13	ug/l	--	<1	<1	<1	1.03	1.1	1.5	<1	1.4
MW-14D	ug/l	<5	<1	<1	<1	<1	<1	<1	<1	<1
MW-15D	ug/l	5	5	<1	4	4.76	4.4	4.9	3.4	3.6
MW-16	ug/l	<5	--	--	2	<1	<1	<1	<1	<1
MW-17S	ug/l	7	5	<1	6	1.77	<1	<1	2.2	5.5
MW-1R	ug/l	--	<1	<1	<1	<1	<1	<1	<1	<1
MW-2R	ug/l	--	<1	<5	<1	<1	<1	<1	<1	<1
MW-3	ug/l	--	<1	<1	<1	<1	<1	<1	<1	<1
MW-6	ug/l	--	<1	<1	<1	<1	<1	<1	<1	<1
MW-8	ug/l	--	<1	<1	<1	<1	<1	<1	<1	<1
MW-9M	ug/l	--	<1	<1	<1	<1	<1	<1	<1	<1
MW-9S	ug/l	--	<1	<1	<1	<1	<1	<1	<1	<1
MW4-97	ug/l	--	--	--	<1	<1	<1	<1	<1	<1
WMW-2	ug/l	--	<1	<1	<1	<1	<1	<1	<1	<1
WMW-3	ug/l	--	--	<1	--	<1	--	<1	--	<1

Parameter: Chlorobenzene
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-10S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-11S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-12	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-13	ug/l	1.3	1.1	1.1	1.1	1.1	1	<1	<1	<1
MW-14D	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-15D	ug/l	4.5	2.8	4	4.2	4	<5	4.3	4.9	5.3

Parameter: Chlorobenzene
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-16	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-17S	ug/l	4	4.6	4.7	6.1	8.9	7.9	5.5	4.6	4.6
MW-1R	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-2R	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-3	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-6	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-8	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-9M	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-9S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW4-97	ug/l	<1	<1	<1	<1	<1	--	<1	<1	<1
WMW-2	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
WMW-3	ug/l	--	--	<1	<1	--	--	--	--	--

Parameter: Chlorobenzene
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-10S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-11S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-12	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-13	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-14D	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-15D	ug/l	5	5	4.6	3.1	4.7	4.5	4.4	4.2	5
MW-16	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-17S	ug/l	3.8	3.8	3.8	3.9	8.7	7.7	7.3	6.5	8.3
MW-1R	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-2R	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-3	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-6	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-8	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-9M	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-9S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW4-97	ug/l	<1	<1	--	--	--	--	--	--	--

Parameter: Chlorobenzene
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
WMW-2	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
WMW-3	ug/l	--	<1	--	--	--	--	--	--	--

Parameter: Chlorobenzene
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018			
MW-10D	ug/l	<1	<1	<1	<1	<1	<1			
MW-10S	ug/l	<1	<1	<1	<1	<1	<1			
MW-11S	ug/l	<1	<1	<1	<1	<1	<1			
MW-12	ug/l	<1	<1	<1	<1	<1	<1			
MW-13	ug/l	<1	<1	<1	<1	<1	<1			
MW-14D	ug/l	<1	<1	<1	<1	<1	<1			
MW-15D	ug/l	5	5.6	5.4	4.4	4.4	5			
MW-16	ug/l	<1	<1	<1	<1	<1	<1			
MW-17S	ug/l	8.4	9	7	4.8	6.6	7			
MW-1R	ug/l	<1	<1	<1	<1	<1	<1			
MW-2R	ug/l	<1	<1	<1	<1	<1	<1			
MW-3	ug/l	<1	<1	<1	<1	<1	<1			
MW-6	ug/l	<1	<1	<1	<1	<1	<1			
MW-8	ug/l	<1	<1	<1	<1	<1	<1			
MW-9M	ug/l	<1	<1	<1	<1	<1	<1			
MW-9S	ug/l	<1	<1	<1	<1	<1	<1			
MW4-97	ug/l	<1	--	<1	--	<1	<1			
WMW-2	ug/l	<1	<1	<1	<1	<1	<1			
WMW-3	ug/l	--	--	<1	--	<1	<1			

Data Summary Table for Chloroethane

Name: Royalton Road

Parameter: Chloroethane
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-10S	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-11S	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-12	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-13	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-14D	ug/l	13	17	14	8	16	7.8	10.7	7.9	7.7
MW-15D	ug/l	41	45	51	37	63.7	36.2	40.1	36.6	33.4
MW-16	ug/l	<5	--	--	<5	<1	<1	<1	<1	<1
MW-17S	ug/l	<5	<5	<5	<5	<1	<1	<1	<1	<1
MW-1R	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-2R	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-3	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-6	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-8	ug/l	--	9	8	6	8.38	4.9	5.4	4.8	4.6
MW-9M	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-9S	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW4-97	ug/l	--	--	--	<5	<1	1.1	1	<1	<1
WMW-2	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
WMW-3	ug/l	--	--	<5	--	<1	--	<1	--	<1

Parameter: Chloroethane
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-10S	ug/l	<1	<1	<1	<1	<1	1.1	<1	1.4	1.4
MW-11S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-12	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-13	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-14D	ug/l	6.8	9.3	4.9	7.1	2.5	6.5	1.6	3.4	3.4
MW-15D	ug/l	33.9	38.6	26.1	29.6	16	26.6	48	26.8	29

Parameter: Chloroethane
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-16	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-17S	ug/l	1.9	<1	<1	<1	<1	<5	<1	<1	1.3
MW-1R	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-2R	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-3	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-6	ug/l	<1	<1	<1	<1	<1	<1	1.2	<1	<1
MW-8	ug/l	4.1	3.1	4	2.4	2	2.9	2.6	1.7	2.1
MW-9M	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-9S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW4-97	ug/l	<1	<1	<1	<1	<1	--	<1	<1	<1
WMW-2	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
WMW-3	ug/l	--	--	<1	<1	--	--	--	--	--

Parameter: Chloroethane
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-10S	ug/l	1.4	1.1	1.4	<1	1.8	<1	2	1.2	1.2
MW-11S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-12	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-13	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-14D	ug/l	4.4	3	3.7	3.3	8.7	4.9	10.2	5.2	7.7
MW-15D	ug/l	30.4	30	25.3	18	24.8	22.3	18.7	18	18.6
MW-16	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-17S	ug/l	1.2	<1	1.4	1.6	1.2	<1	<1	<1	<1
MW-1R	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-2R	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-3	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-6	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-8	ug/l	1.9	1.6	1.4	1.2	3	1.2	2.3	2	3.9
MW-9M	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-9S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW4-97	ug/l	<1	<1	--	--	--	--	--	--	--

Parameter: Chloroethane
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
WMW-2	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
WMW-3	ug/l	--	<1	--	--	--	--	--	--	--

Parameter: Chloroethane
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018			
MW-10D	ug/l	<1	<1	<1	<1	<1	<1			
MW-10S	ug/l	1.3	<1	1.2	<1	<1	1.5			
MW-11S	ug/l	<1	<1	<1	<1	<1	<1			
MW-12	ug/l	<1	<1	<1	<1	<1	<1			
MW-13	ug/l	<1	<1	<1	<1	<1	<1			
MW-14D	ug/l	4.6	4	3.8	4.5	2.6	6.8			
MW-15D	ug/l	20.2	13.1	18.4	19.5	14.1	16.7			
MW-16	ug/l	<1	<1	<1	<1	<1	<1			
MW-17S	ug/l	<1	<1	<1	<1	<1	<1			
MW-1R	ug/l	<1	<1	<1	<1	<1	<1			
MW-2R	ug/l	<1	<1	<1	<1	<1	<1			
MW-3	ug/l	<1	<1	<1	<1	<1	<1			
MW-6	ug/l	<1	<1	<1	<1	<1	<1			
MW-8	ug/l	3.3	2.1	3.2	2.3	1.5	<1			
MW-9M	ug/l	<1	<1	<1	<1	<1	<1			
MW-9S	ug/l	<1	<1	<1	<1	<1	<1			
MW4-97	ug/l	<1	--	<1	--	<1	<1			
WMW-2	ug/l	<1	<1	<1	<1	<1	<1			
WMW-3	ug/l	--	--	<1	--	<1	<1			

Data Summary Table for Cis-1,2-Dichloroethene

Name: Royalton Road

Parameter: cis-1,2-Dichloroethene
Number of Sampling Dates: 33
Units ug/L

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	ug/L	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-10S	ug/L	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-11S	ug/L	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-12	ug/L	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-13	ug/L	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-14D	ug/L	<5	<5	<5	<5	<1	<1	<1	<1	<1
MW-15D	ug/L	<5	<5	<5	<5	<1	<1	<1	<1	<1
MW-16	ug/L	<5	--	--	<5	2.97	<1	3.1	2.1	2.6
MW-17S	ug/L	<5	<5	<5	<5	1.73	1.8	2.5	1.4	<1
MW-1R	ug/L	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-2R	ug/L	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-3	ug/L	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-6	ug/L	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-8	ug/L	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-9M	ug/L	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-9S	ug/L	--	<5	<5	<5	<1	<1	<1	<1	<1
MW4-97	ug/L	--	--	--	<5	<1	<1	<1	<1	<1
WMW-2	ug/L	--	<5	<5	<5	<1	<1	<1	<1	<1
WMW-3	ug/L	--	--	<5	--	<1	--	<1	--	<1

Parameter: cis-1,2-Dichloroethene
Number of Sampling Dates: 33
Units ug/L

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-10S	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-11S	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-12	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-13	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-14D	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-15D	ug/L	<1	<1	<1	<1	<1	<5	<1	<1	<1

Parameter: cis-1,2-Dichloroethene
Number of Sampling Dates: 33
Units ug/L

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-16	ug/L	2.6	2.5	2.6	2.5	1.3	2.8	2.2	3	1.9
MW-17S	ug/L	1.4	1.1	1	<1	<1	<5	<1	<1	<1
MW-1R	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-2R	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-3	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-6	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-8	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-9M	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-9S	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW4-97	ug/L	<1	<1	<1	<1	<1	--	<1	<1	<1
WMW-2	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
WMW-3	ug/L	--	--	<1	<1	--	--	--	--	--

Parameter: cis-1,2-Dichloroethene
Number of Sampling Dates: 33
Units ug/L

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-10S	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-11S	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-12	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-13	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-14D	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-15D	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-16	ug/L	2.9	3.1	2.9	2.4	3	<1	3.3	2	2.3
MW-17S	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-1R	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-2R	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-3	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-6	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-8	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-9M	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-9S	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW4-97	ug/L	<1	<1	--	--	--	--	--	--	--

Parameter: cis-1,2-Dichloroethene
Number of Sampling Dates: 33
Units ug/L

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
WMW-2	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
WMW-3	ug/L	--	<1	--	--	--	--	--	--	--

Parameter: cis-1,2-Dichloroethene
Number of Sampling Dates: 33
Units ug/L

Location I D	Units	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018			
MW-10D	ug/L	<1	<1	<1	<1	<1	<1			
MW-10S	ug/L	<1	<1	<1	<1	<1	<1			
MW-11S	ug/L	<1	<1	<1	<1	<1	<1			
MW-12	ug/L	<1	<1	<1	<1	<1	<1			
MW-13	ug/L	<1	<1	<1	<1	<1	<1			
MW-14D	ug/L	<1	<1	<1	<1	<1	<1			
MW-15D	ug/L	<1	<1	<1	<1	<1	<1			
MW-16	ug/L	2.1	2.4	1.6	2.3	1.5	2.1			
MW-17S	ug/L	<1	<1	<1	<1	<1	<1			
MW-1R	ug/L	<1	<1	<1	<1	<1	<1			
MW-2R	ug/L	<1	<1	<1	<1	<1	<1			
MW-3	ug/L	<1	<1	<1	<1	<1	<1			
MW-6	ug/L	<1	<1	<1	<1	<1	<1			
MW-8	ug/L	<1	<1	<1	<1	<1	<1			
MW-9M	ug/L	<1	<1	<1	<1	<1	<1			
MW-9S	ug/L	<1	<1	<1	<1	<1	<1			
MW4-97	ug/L	<1	--	<1	--	<1	<1			
WMW-2	ug/L	<1	<1	<1	<1	<1	<1			
WMW-3	ug/L	--	--	<1	--	<1	<1			

Data Summary Table for 1,4-Dichloroethane

Name: Royalton Road

Parameter: 1,1-Dichloroethane
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-10S	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<0.5
MW-11S	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-12	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-13	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-14D	ug/l	<5	<5	<5	<5	<1	<1	<1	<1	<1
MW-15D	ug/l	<5	<5	<5	<5	<1	<1	<1	<1	<1
MW-16	ug/l	<5	--	--	<5	2.31	1.4	1.4	1.2	1.4
MW-17S	ug/l	<5	<5	<5	<5	1.28	<1	1.4	<1	<1
MW-1R	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-2R	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-3	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-6	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-8	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-9M	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-9S	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW4-97	ug/l	--	--	--	<5	1.25	1.4	1	1.1	<1
WMW-2	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
WMW-3	ug/l	--	--	<5	--	<1	--	<1	--	<1

Parameter: 1,1-Dichloroethane
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-10S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-11S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-12	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-13	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-14D	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-15D	ug/l	<1	<1	<1	<1	<1	<5	<1	<1	<1

Parameter: 1,1-Dichloroethane
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-16	ug/l	1.3	1.5	1.3	1.3	<1	1.4	1.5	1.4	1.1
MW-17S	ug/l	<1	<1	<1	<1	<1	<5	<1	<1	<1
MW-1R	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-2R	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-3	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-6	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-8	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-9M	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-9S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW4-97	ug/l	1.1	1.1	1.1	<1	1.1	--	1.3	<1	<1
WMW-2	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
WMW-3	ug/l	--	--	<1	<1	--	--	--	--	--

Parameter: 1,1-Dichloroethane
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-10S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-11S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-12	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-13	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-14D	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-15D	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-16	ug/l	1.3	1.6	1.3	1.1	1.3	1.1	1.3	<1	<1
MW-17S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-1R	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-2R	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-3	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-6	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-8	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-9M	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-9S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW4-97	ug/l	<1	<1	--	--	--	--	--	--	--

Parameter: 1,1-Dichloroethane
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
WMW-2	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
WMW-3	ug/l	--	<1	--	--	--	--	--	--	--

Parameter: 1,1-Dichloroethane
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018			
MW-10D	ug/l	<1	<1	<1	<1	<1	<1			
MW-10S	ug/l	<1	<1	<1	<1	<1	<1			
MW-11S	ug/l	<1	<1	<1	<1	<1	<1			
MW-12	ug/l	<1	<1	<1	<1	<1	<1			
MW-13	ug/l	<1	<1	<1	<1	<1	<1			
MW-14D	ug/l	<1	<1	<1	<1	<1	<1			
MW-15D	ug/l	<1	<1	<1	<1	<1	<1			
MW-16	ug/l	<1	1	<1	<1	<1	<1			
MW-17S	ug/l	<1	<1	<1	<1	<1	<1			
MW-1R	ug/l	<1	<1	<1	<1	<1	<1			
MW-2R	ug/l	<1	<1	<1	<1	<1	<1			
MW-3	ug/l	<1	<1	<1	<1	<1	<1			
MW-6	ug/l	<1	<1	<1	<1	<1	<1			
MW-8	ug/l	<1	<1	<1	<1	<1	<1			
MW-9M	ug/l	<1	<1	<1	<1	<1	<1			
MW-9S	ug/l	<1	<1	<1	<1	<1	<1			
MW4-97	ug/l	<1	--	<1	--	<1	<1			
WMW-2	ug/l	<1	<1	<1	<1	<1	<1			
WMW-3	ug/l	--	--	<1	--	<1	<1			

Data Summary Table for 1,4-Dichlorobenzene

Name: Royalton Road

Parameter: 1,4-Dichlorobenzene
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	5/14/2002	10/14/2002	4/14/2003	11/3/2003	5/10/2004	12/6/2004	5/23/2005	11/14/2005	5/22/2006
MW-10D	ug/l	--	<5	<5	<5	<1	<10	<1	<1	<1
MW-10S	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-11S	ug/l	--	11	11	10	7.68	<10	11.2	8.1	6.9
MW-12	ug/l	--	<5	<5	<5	<1	<10	<1	<1	<1
MW-13	ug/l	--	<5	<5	<5	<1	<10	1.2	1	<1
MW-14D	ug/l	<5	<5	<5	<5	<1	<10	<1	<1	<1
MW-15D	ug/l	<5	<5	<5	<5	<1	<1	<1	<1	<1
MW-16	ug/l	<5	--	--	<5	<1	<10	<1	1.4	1
MW-17S	ug/l	<5	<5	<5	<5	<1	<10	<1	<1	1.8
MW-1R	ug/l	--	<5	<5	<5	<1	<10	<1	<1	<1
MW-2R	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-3	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-6	ug/l	--	<5	<5	<5	<1	<10	<1	<1	<1
MW-8	ug/l	--	<5	<5	<5	<1	<10	<1	<1	<1
MW-9M	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW-9S	ug/l	--	<5	<5	<5	<1	<1	<1	<1	<1
MW4-97	ug/l	--	--	--	<5	<1	<1	<1	<1	<1
WMW-2	ug/l	--	<5	<5	<5	<1	<10	<1	<1	<1
WMW-3	ug/l	--	--	<5	--	<1	--	<1	--	<1

Parameter: 1,4-Dichlorobenzene
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-10D	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-10S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-11S	ug/l	6.2	4.7	4.3	7.6	7.5	5.9	2.7	5.7	6.1
MW-12	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-13	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-14D	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-15D	ug/l	<1	<1	<1	<1	<1	<5	<1	<1	<1

Parameter: 1,4-Dichlorobenzene
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	11/13/2006	6/25/2007	12/17/2007	6/16/2008	12/2/2008	6/1/2009	12/2/2009	6/21/2010	12/6/2010
MW-16	ug/l	<1	<1	1.2	<1	<1	<1	<1	<1	<1
MW-17S	ug/l	1.4	1.5	1.6	2.2	3	<5	1.9	1.6	1.6
MW-1R	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-2R	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-3	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-6	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-8	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-9M	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-9S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW4-97	ug/l	<1	<1	<1	<1	<1	--	<1	<1	<1
WMW-2	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
WMW-3	ug/l	--	--	<1	<1	--	--	--	--	--

Parameter: 1,4-Dichlorobenzene
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
MW-10D	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-10S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-11S	ug/l	4.9	4.2	3.8	2.5	3.1	3	3	2.5	2.5
MW-12	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-13	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-14D	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-15D	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-16	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-17S	ug/l	1.3	1.3	1.2	1.1	2.1	2.1	2.2	1.9	2.5
MW-1R	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-2R	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-3	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-6	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-8	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-9M	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-9S	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW4-97	ug/l	<1	<1	--	--	--	--	--	--	--

Parameter: 1,4-Dichlorobenzene
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	6/21/2011	12/13/2011	6/4/2012	12/11/2012	6/3/2013	12/3/2013	6/2/2014	12/2/2014	6/1/2015
WMW-2	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1
WMW-3	ug/l	--	<1	--	--	--	--	--	--	--

Parameter: 1,4-Dichlorobenzene
Number of Sampling Dates: 33
Units ug/l

Location I D	Units	12/7/2015	6/6/2016	12/5/2016	6/20/2017	12/4/2017	6/4/2018			
MW-10D	ug/l	<1	<1	<1	<1	<1	<1			
MW-10S	ug/l	<1	<1	<1	<1	<1	<1			
MW-11S	ug/l	2.4	2.5	2.6	1.6	1.8	2.1			
MW-12	ug/l	<1	<1	<1	<1	<1	<1			
MW-13	ug/l	<1	<1	<1	<1	<1	<1			
MW-14D	ug/l	<1	<1	<1	<1	<1	<1			
MW-15D	ug/l	<1	<1	<1	<1	<1	<1			
MW-16	ug/l	<1	<1	<1	<1	<1	<1			
MW-17S	ug/l	2.5	2.6	2.1	1.3	2.1	2.2			
MW-1R	ug/l	<1	<1	<1	<1	<1	<1			
MW-2R	ug/l	<1	<1	<1	<1	<1	<1			
MW-3	ug/l	<1	<1	<1	<1	<1	<1			
MW-6	ug/l	<1	<1	<1	<1	<1	<1			
MW-8	ug/l	<1	<1	<1	<1	<1	<1			
MW-9M	ug/l	<1	<1	<1	<1	<1	<1			
MW-9S	ug/l	<1	<1	<1	<1	<1	<1			
MW4-97	ug/l	<1	--	<1	--	<1	<1			
WMW-2	ug/l	<1	<1	<1	<1	<1	<1			
WMW-3	ug/l	--	--	<1	--	<1	<1			

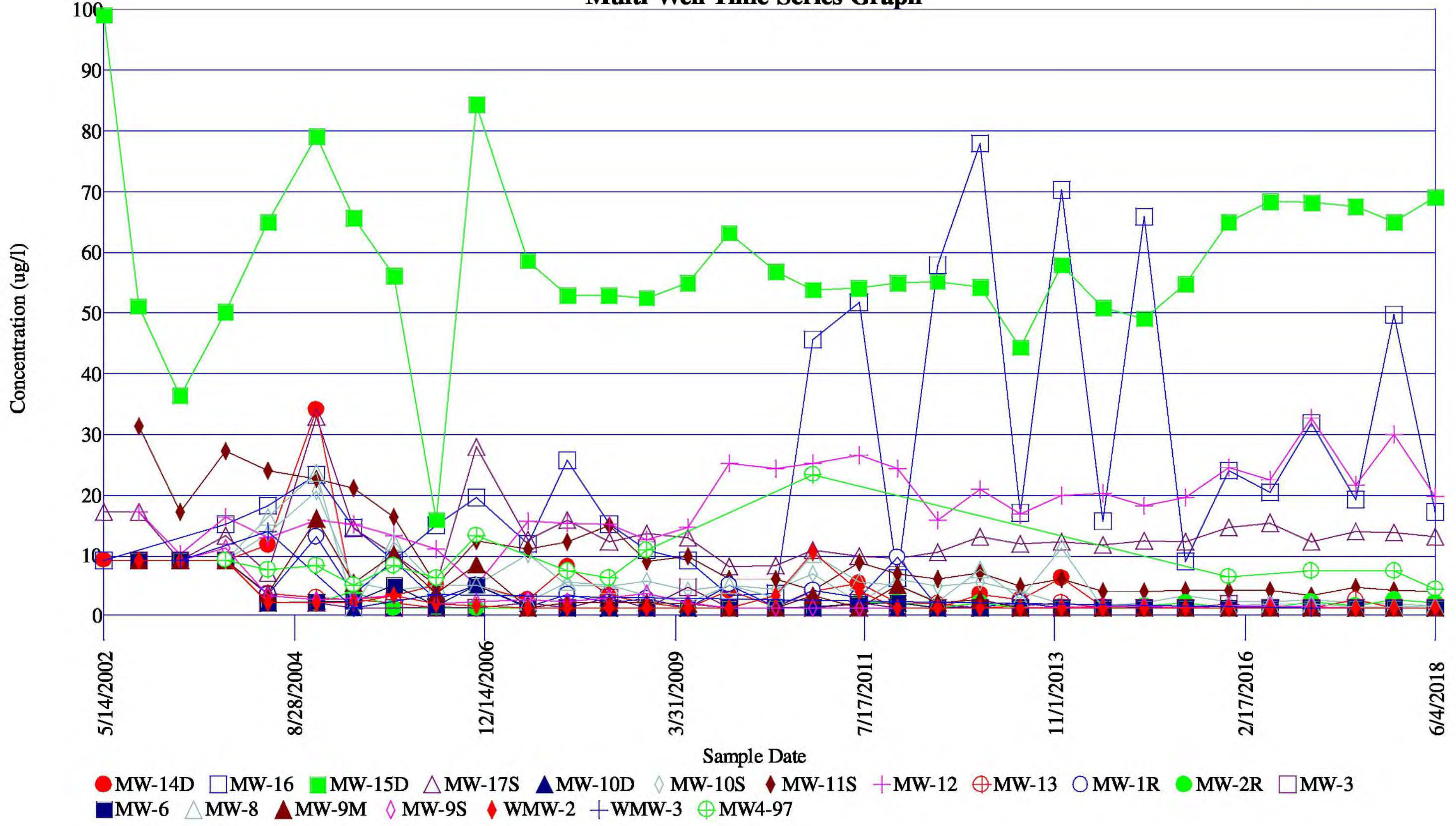
APPENDIX D.

TREND PLOTS FOR PARAMETERS AND WELLS ABOVE BACKGROUND

Royalton Road LF

Arsenic, total

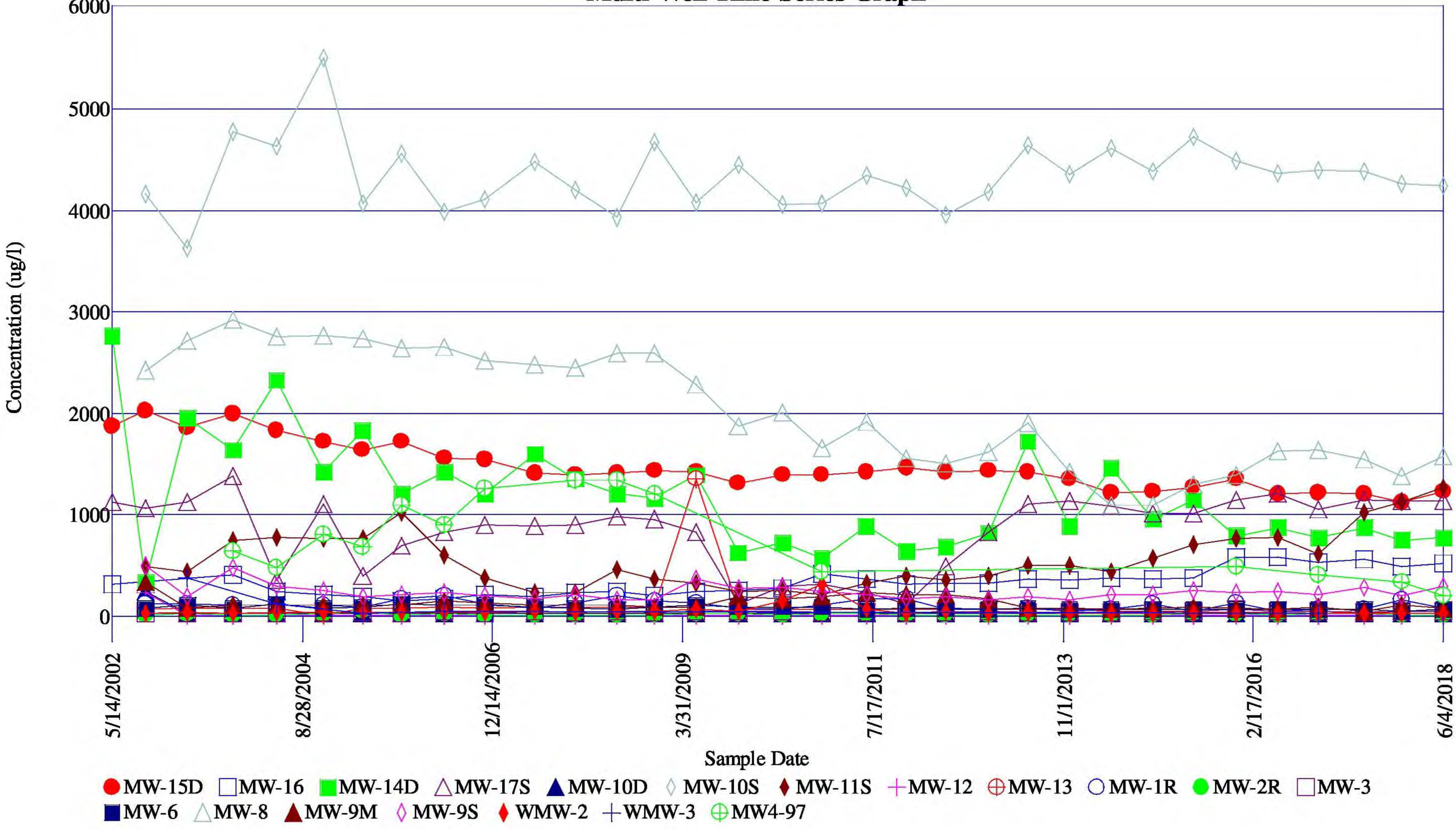
Multi-Well Time-Series Graph



Royalton Road LF

Barium, total

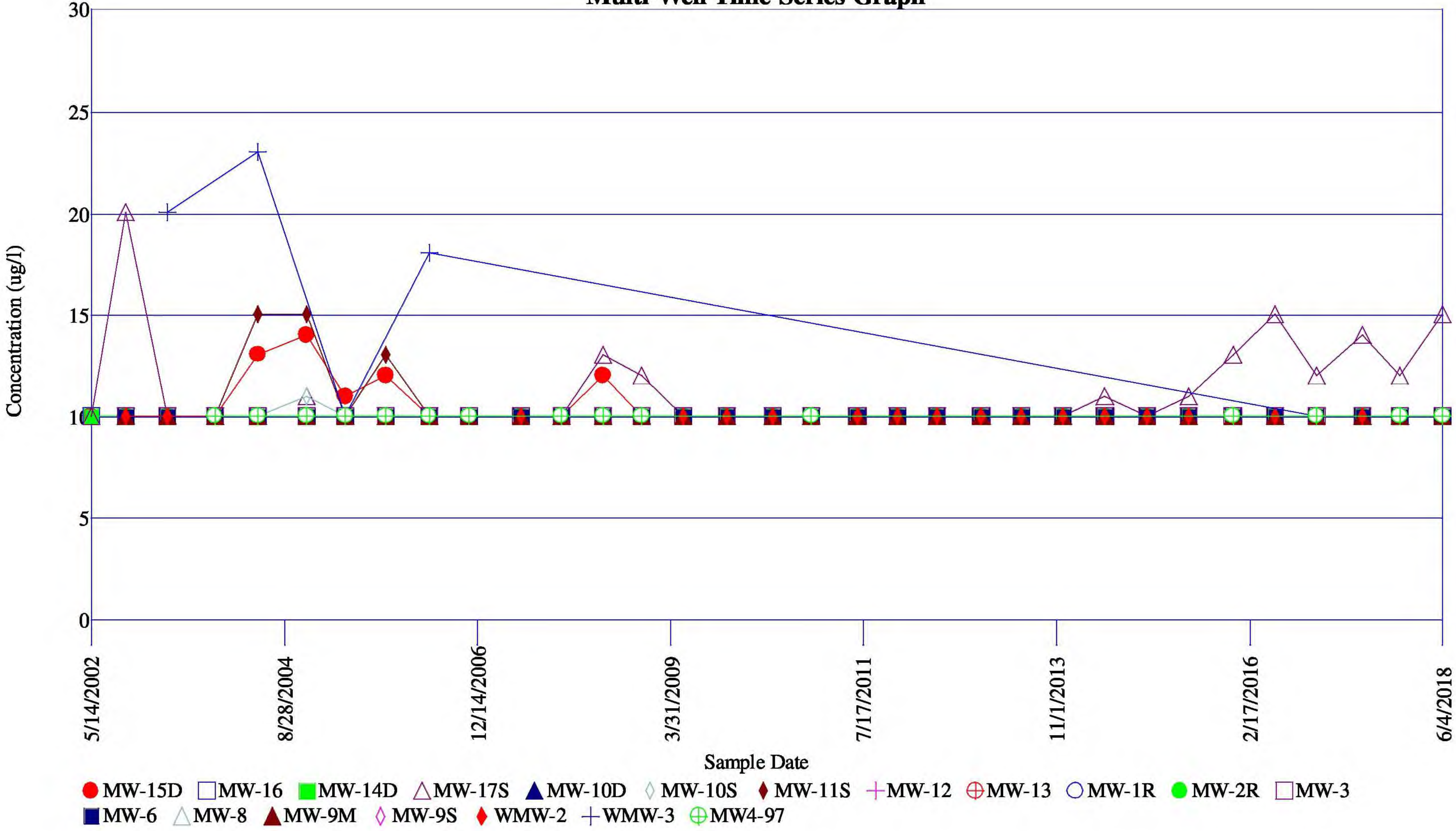
Multi-Well Time-Series Graph



Royalton Road LF

Chromium, total

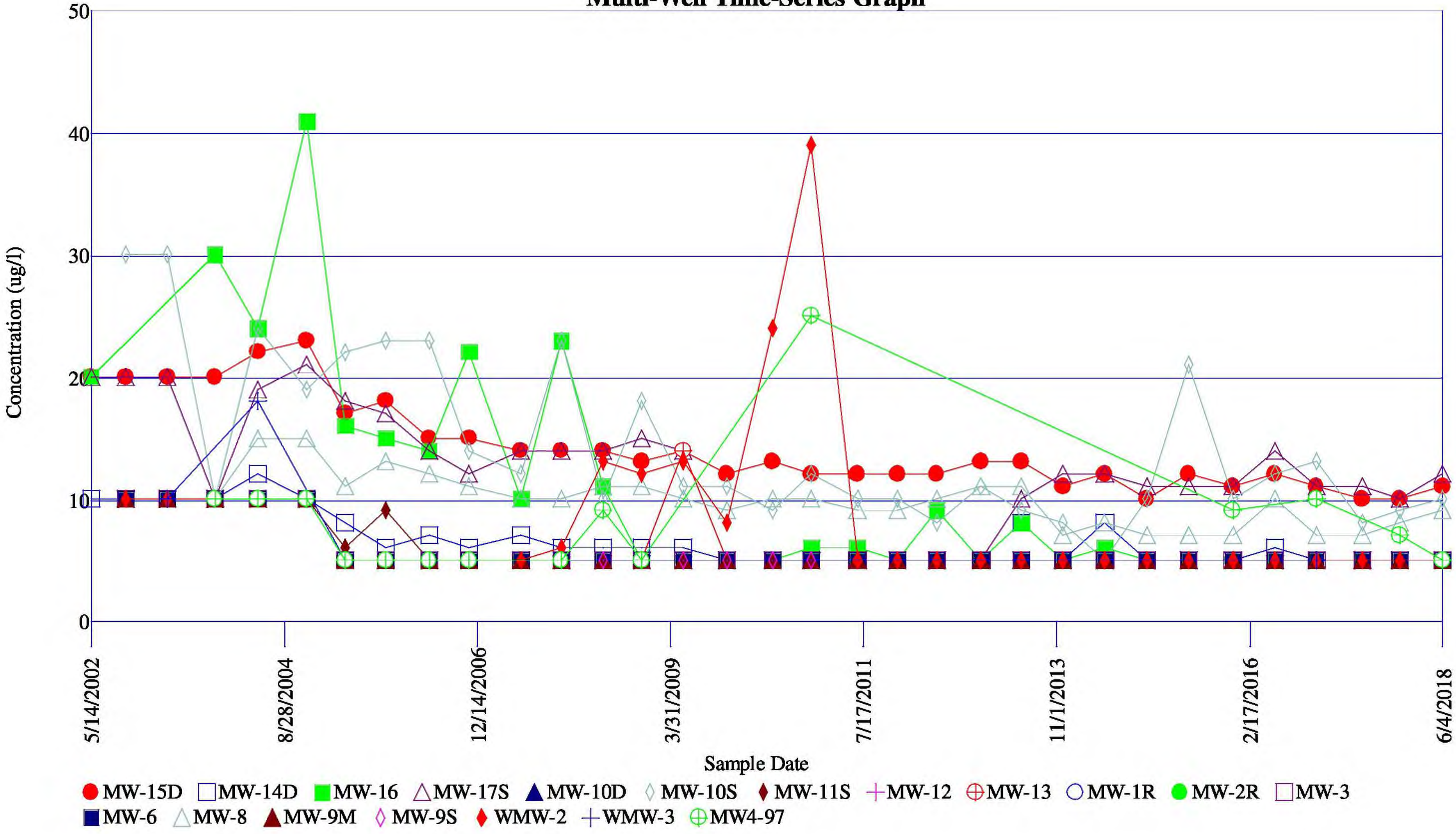
Multi-Well Time-Series Graph



Royalton Road LF

Cobalt, total

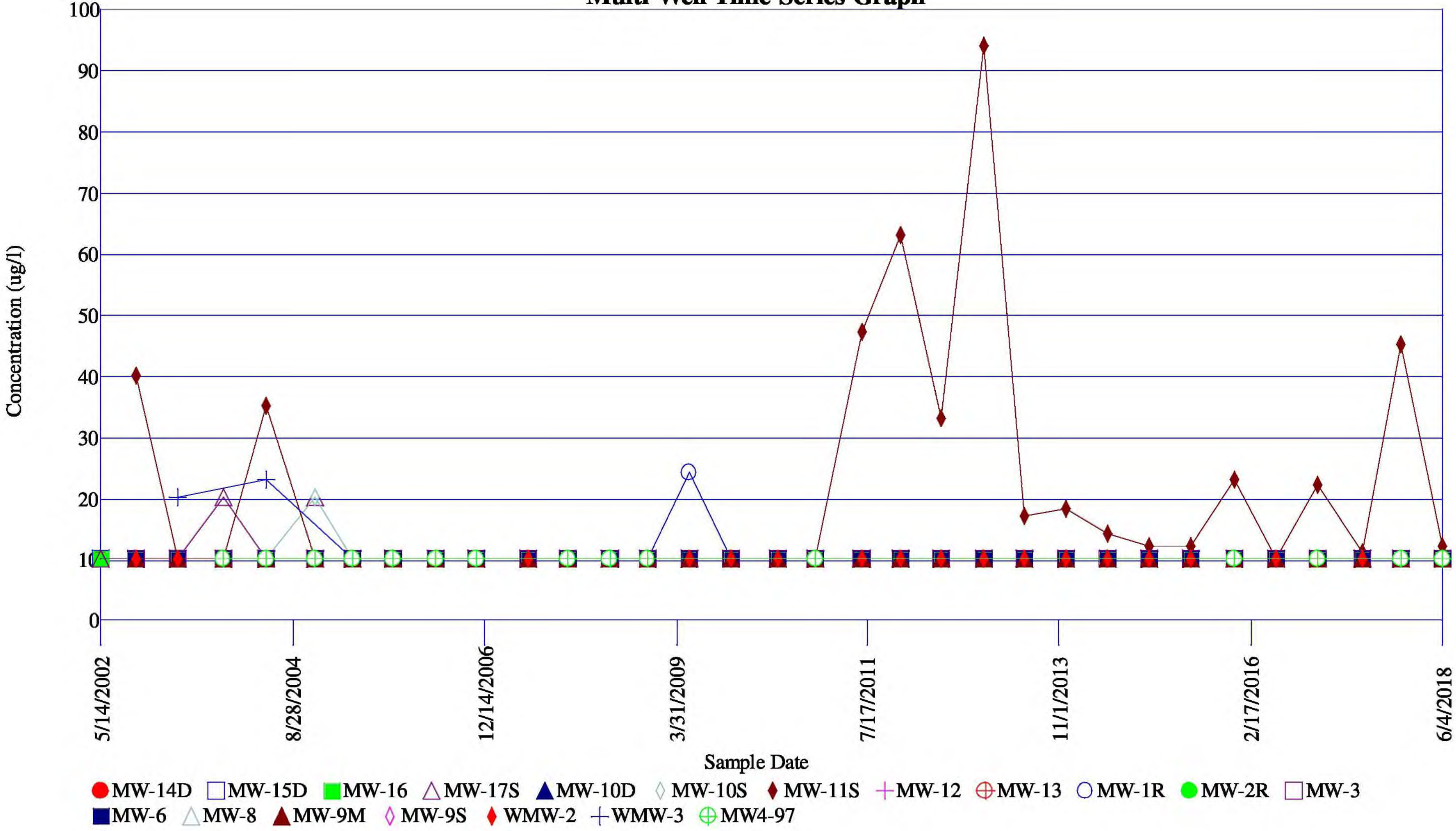
Multi-Well Time-Series Graph



Royalton Road LF

Copper, total

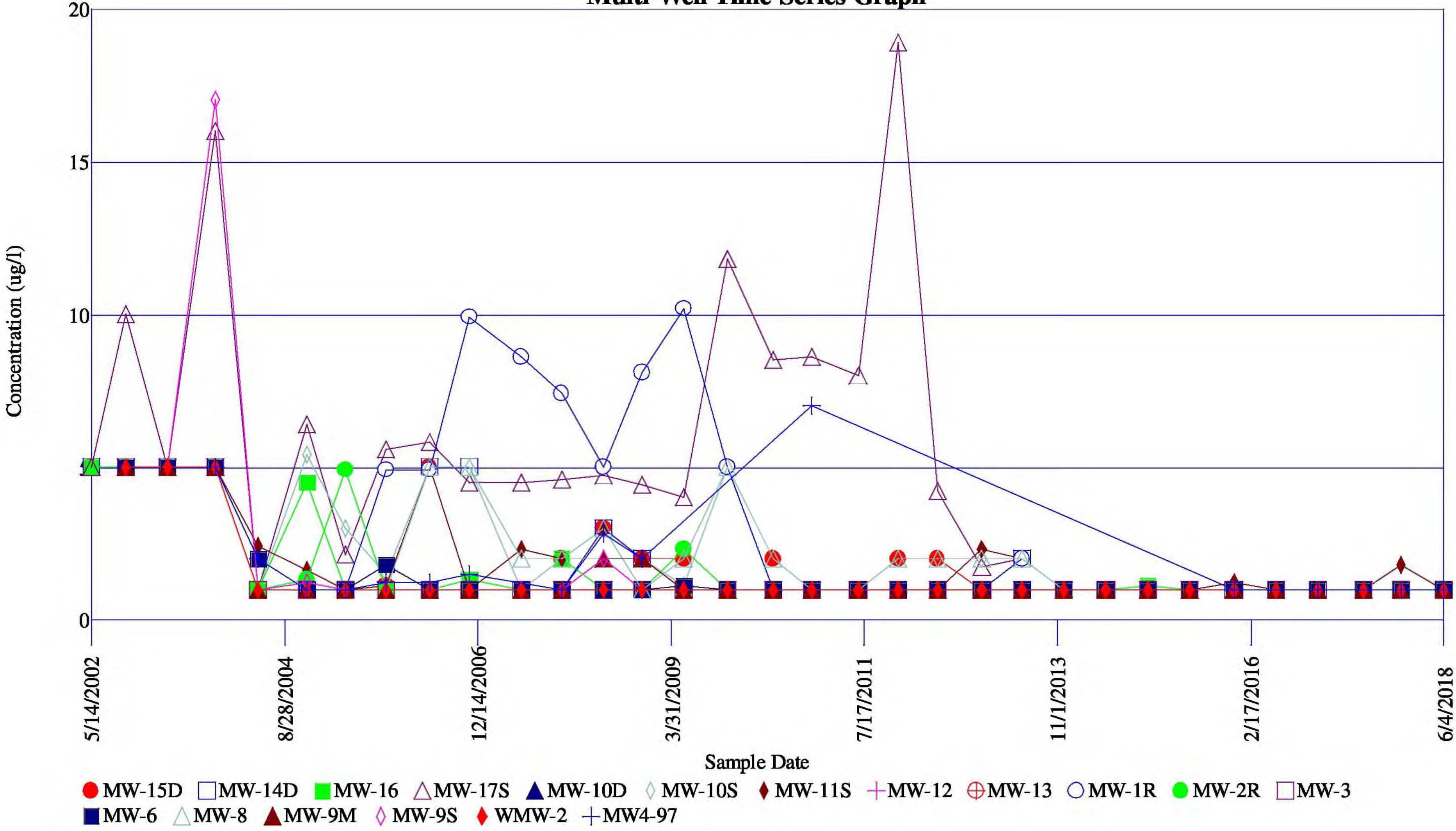
Multi-Well Time-Series Graph



Royalton Road LF

Lead, total

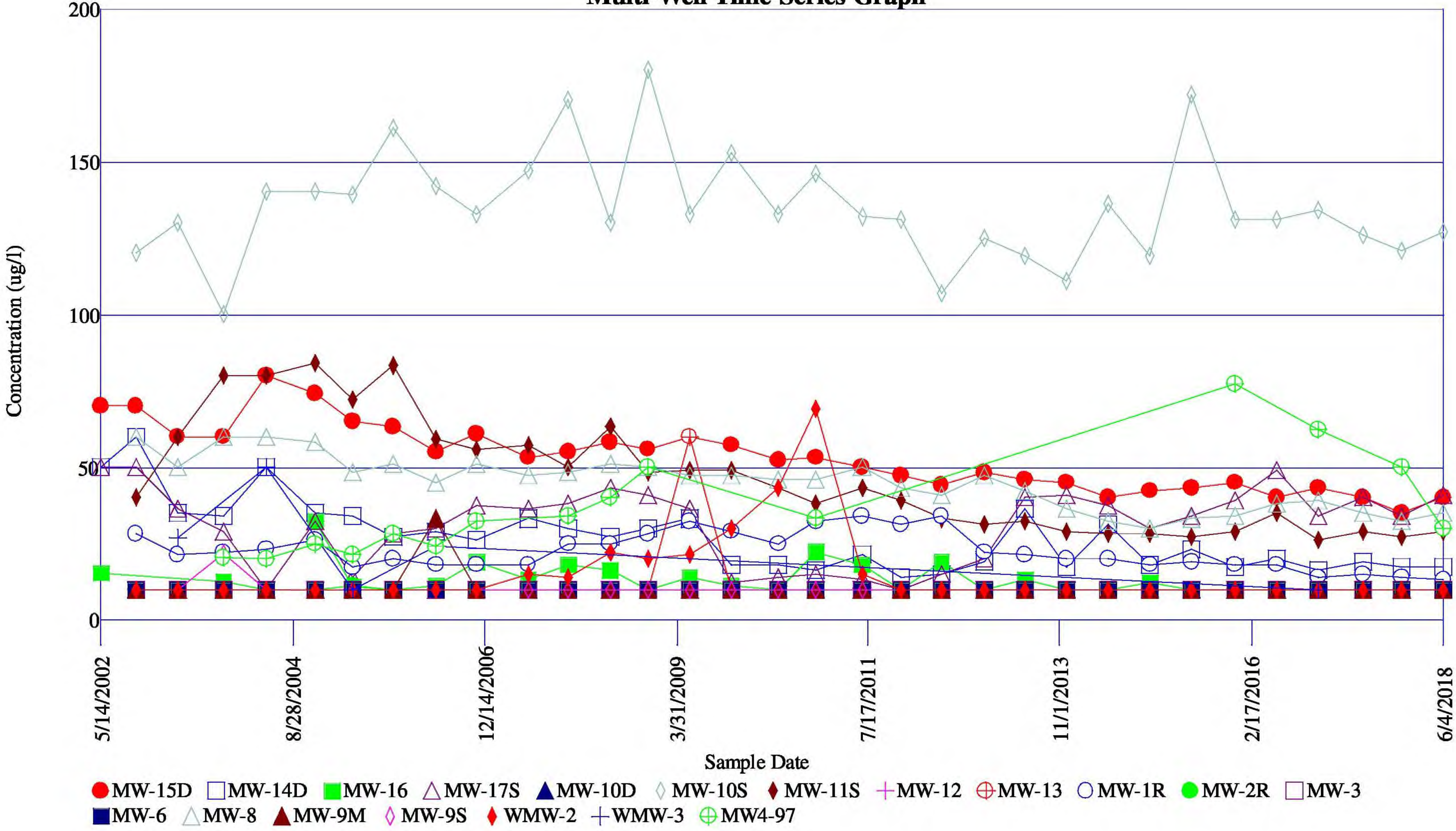
Multi-Well Time-Series Graph



Royalton Road LF

Nickel, total

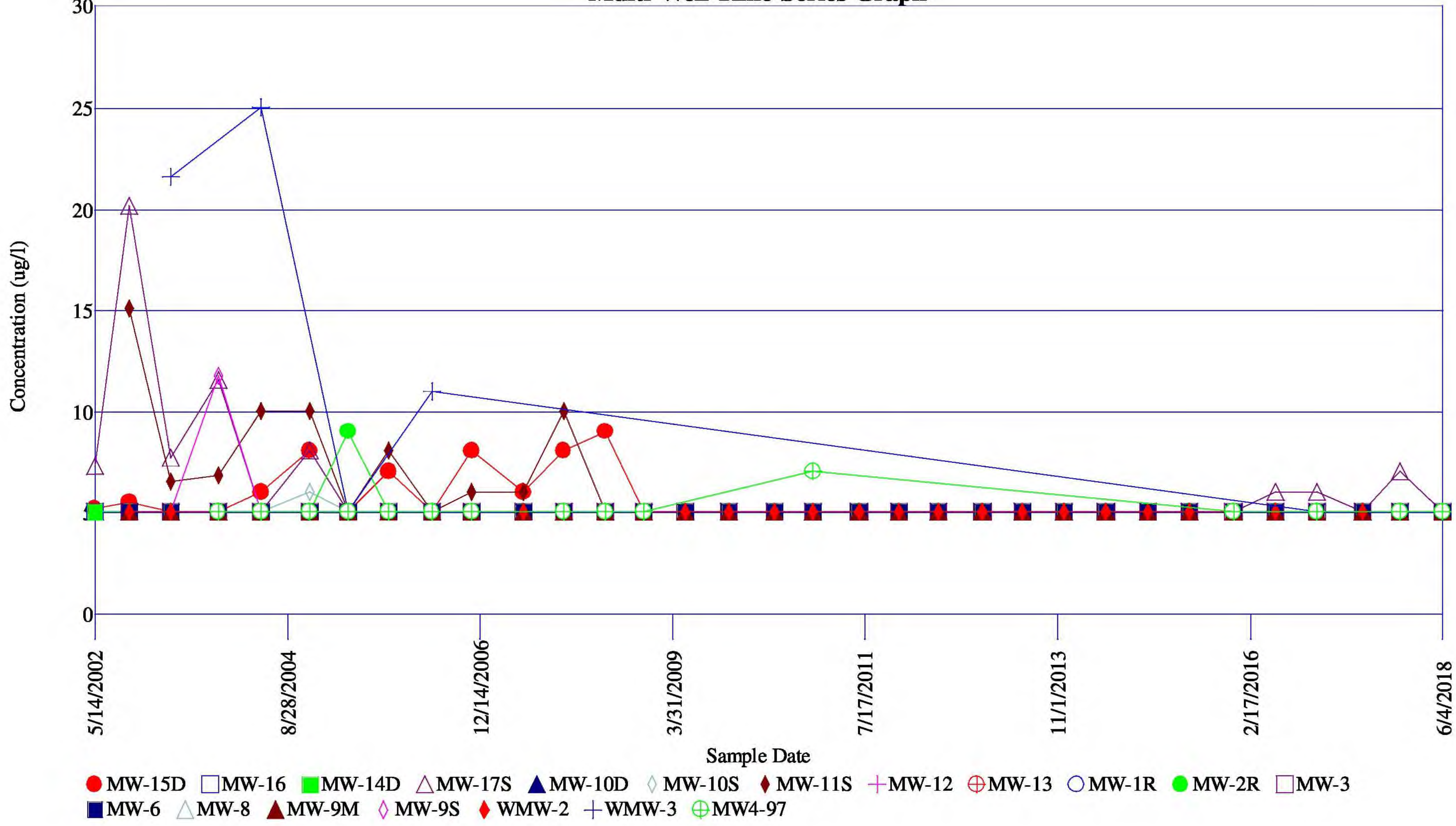
Multi-Well Time-Series Graph



Royalton Road LF

Vanadium, total

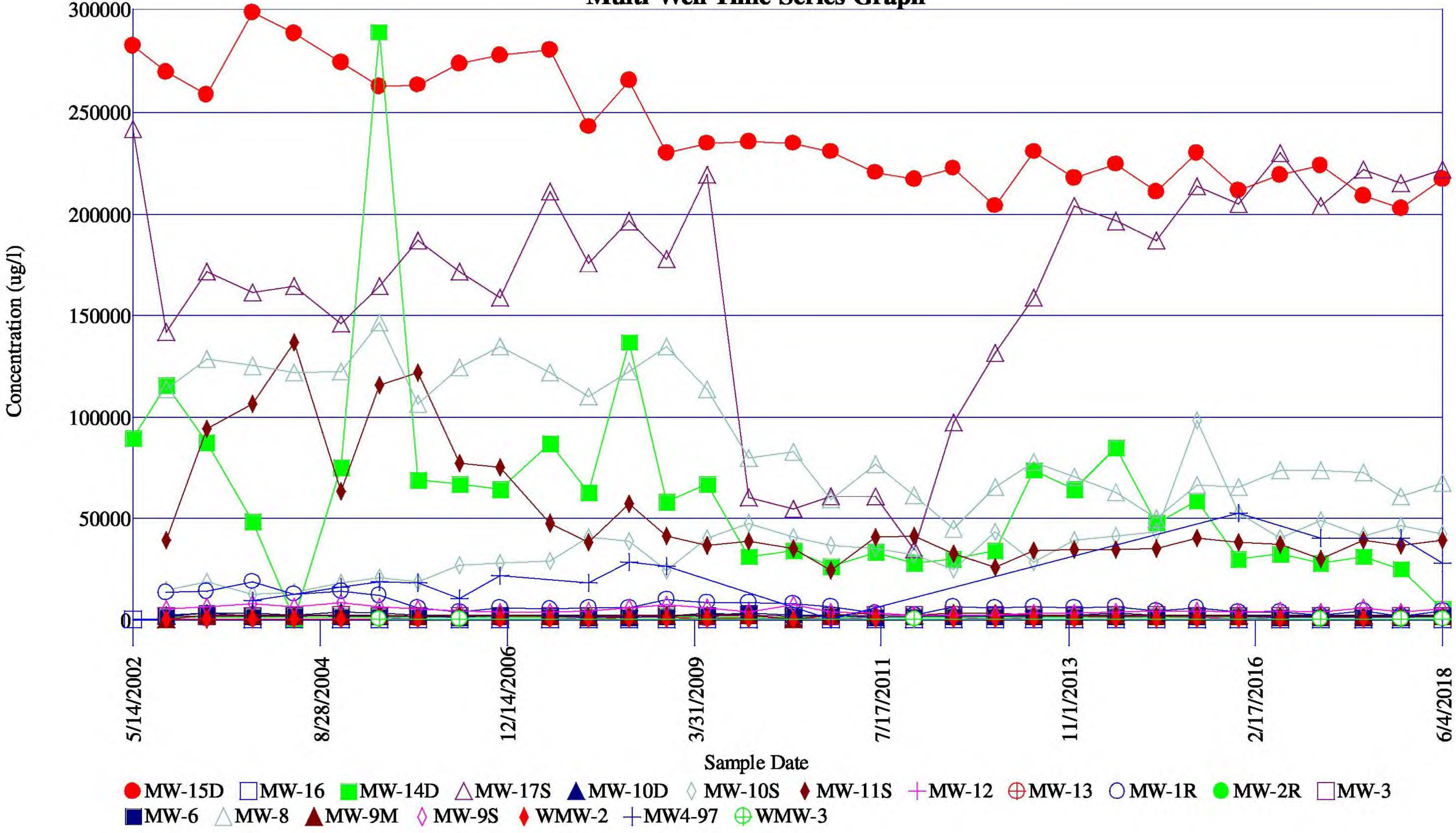
Multi-Well Time-Series Graph



Royalton Road LF

Ammonia Nitrogen

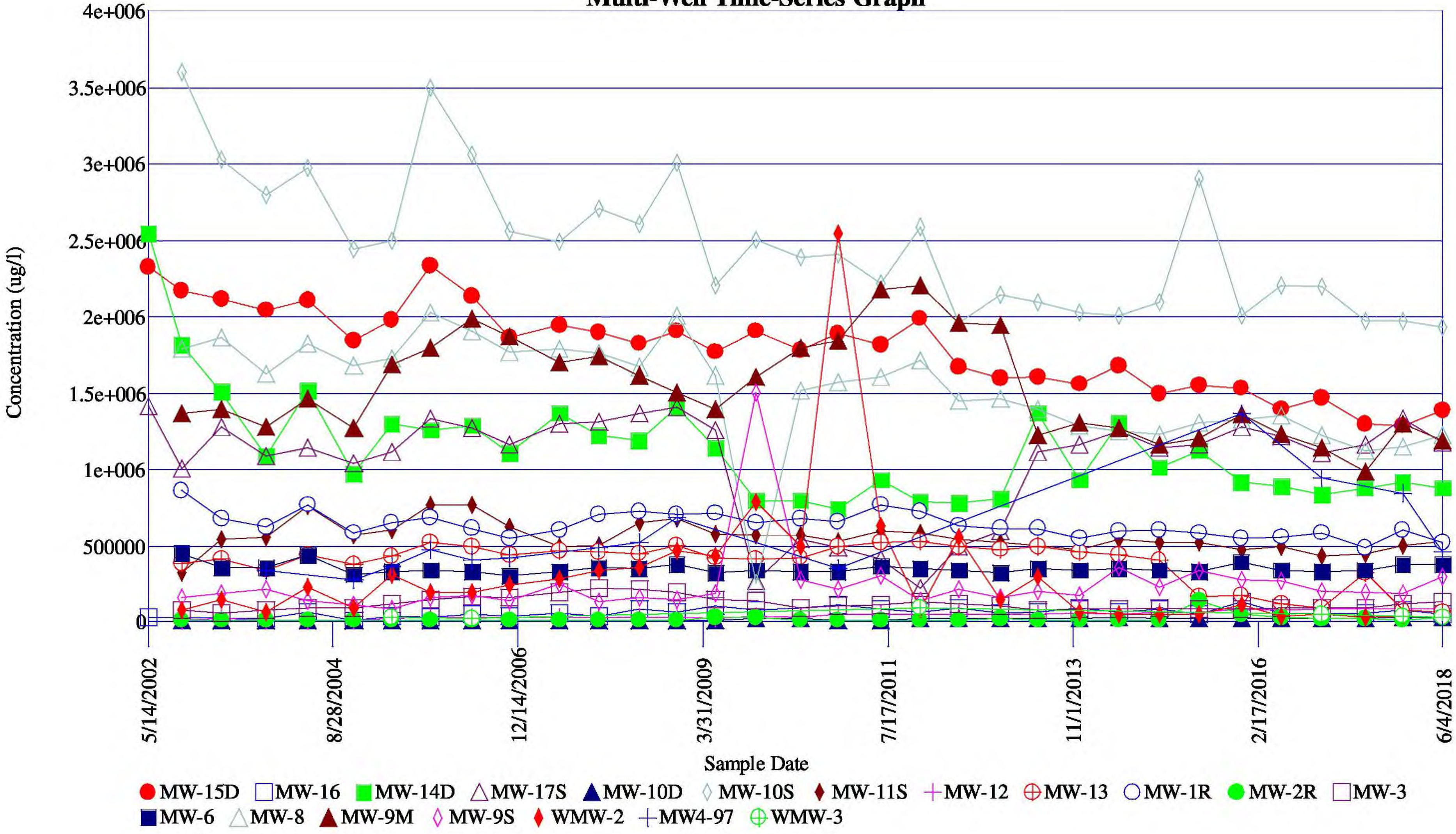
Multi-Well Time-Series Graph



Royalton Road LF

Chloride

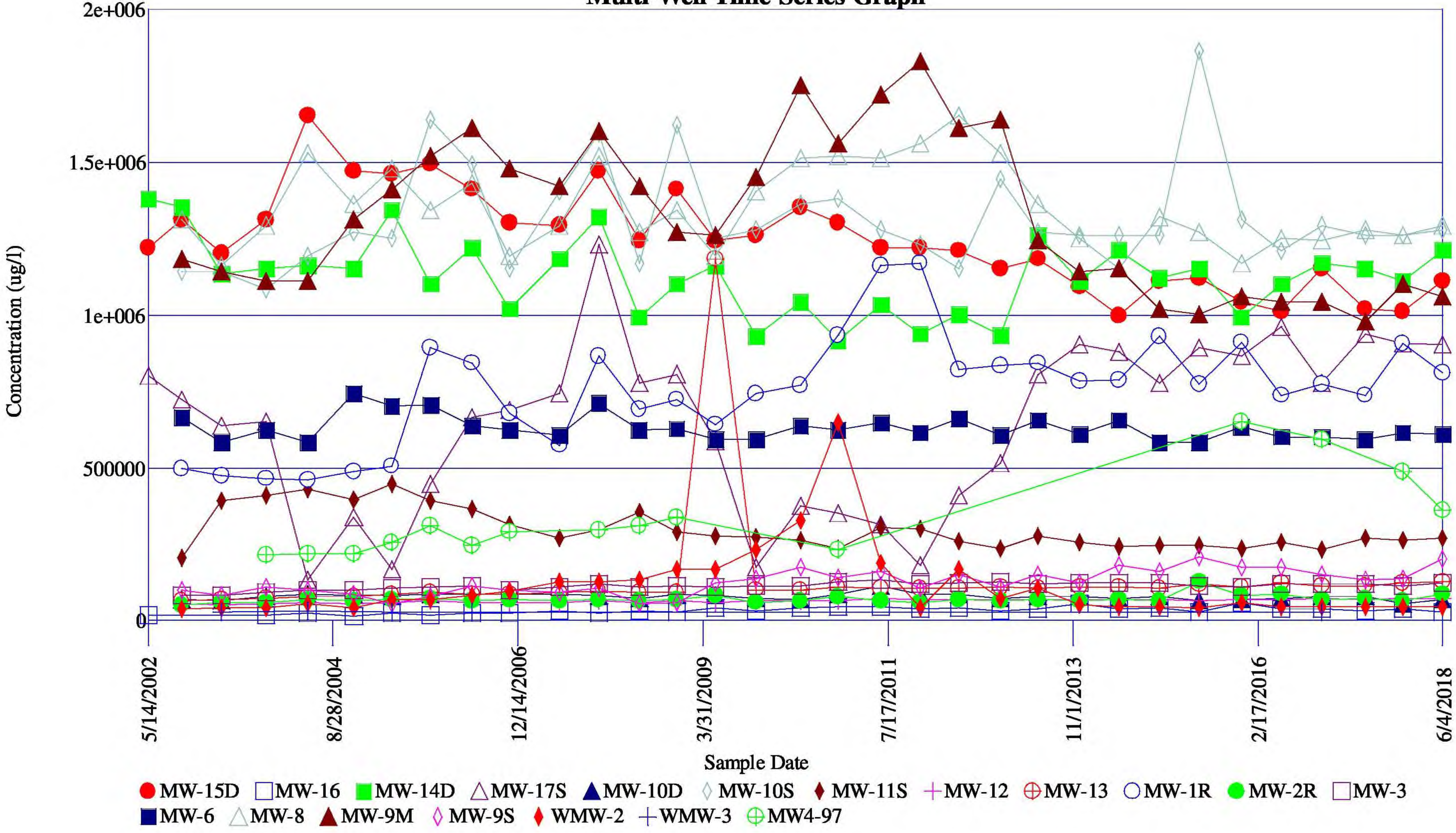
Multi-Well Time-Series Graph



Royalton Road LF

Sodium

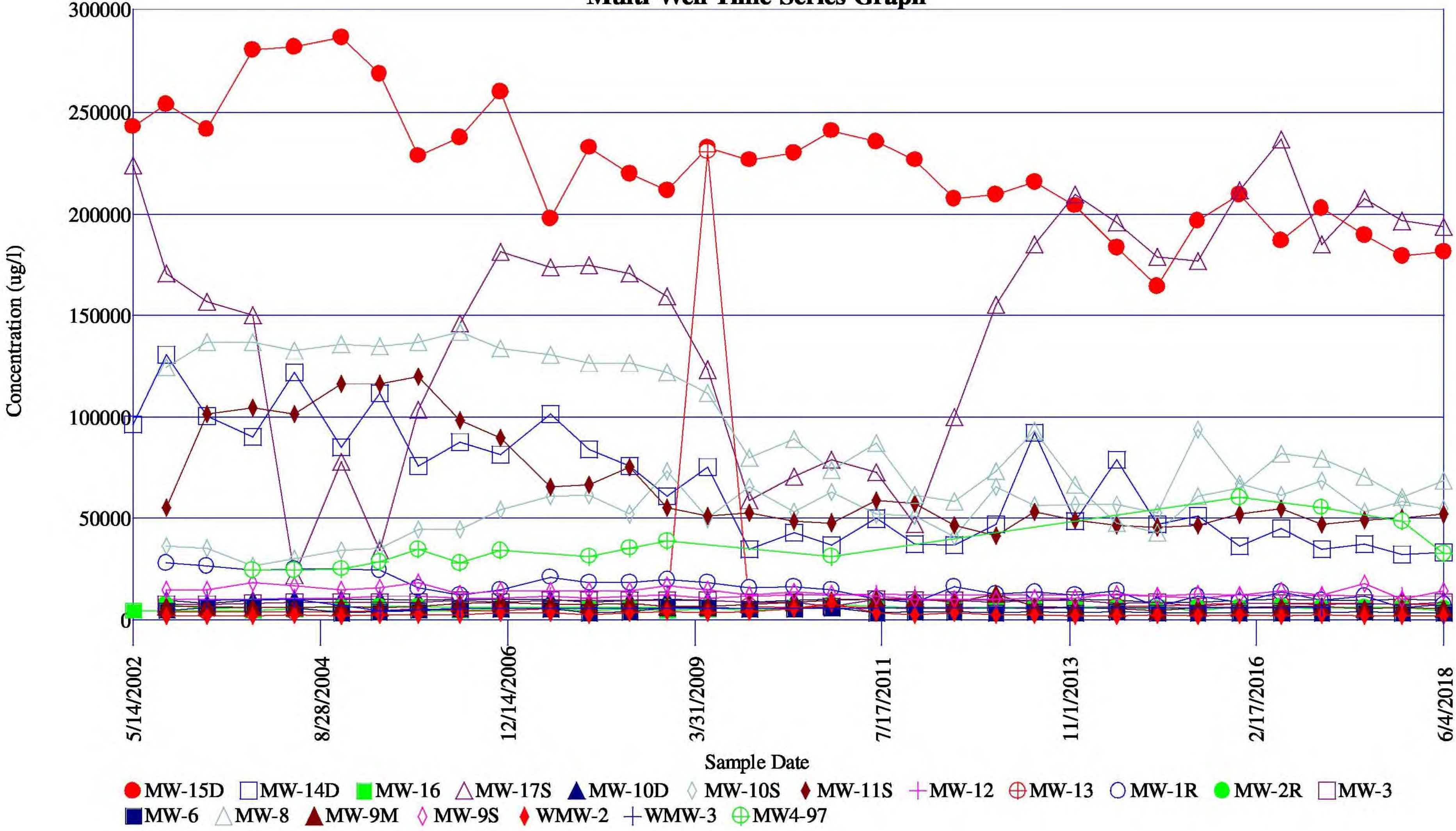
Multi-Well Time-Series Graph



Royalton Road LF

Potassium, total

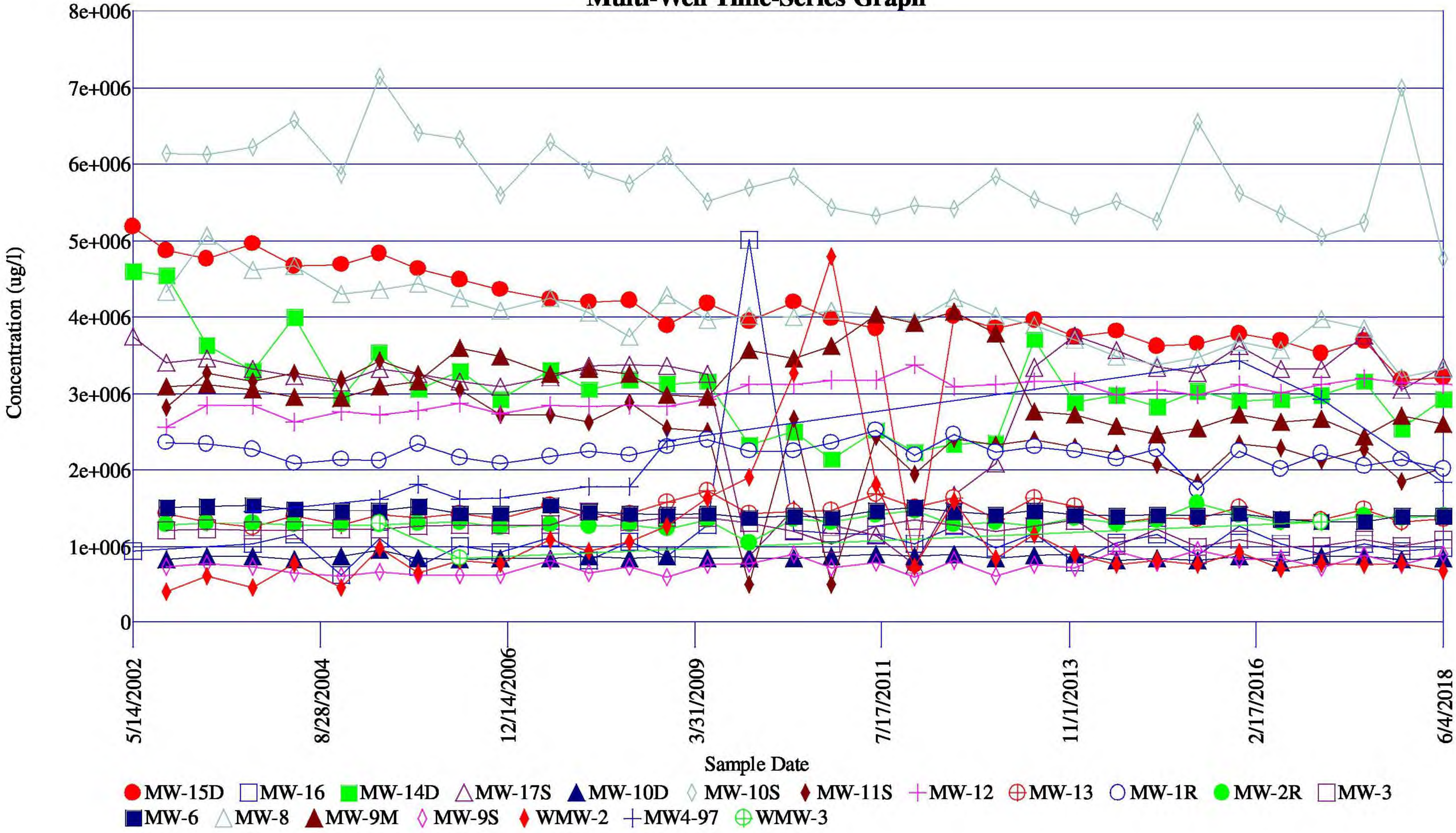
Multi-Well Time-Series Graph



Royalton Road LF

Total Dissolved Solids

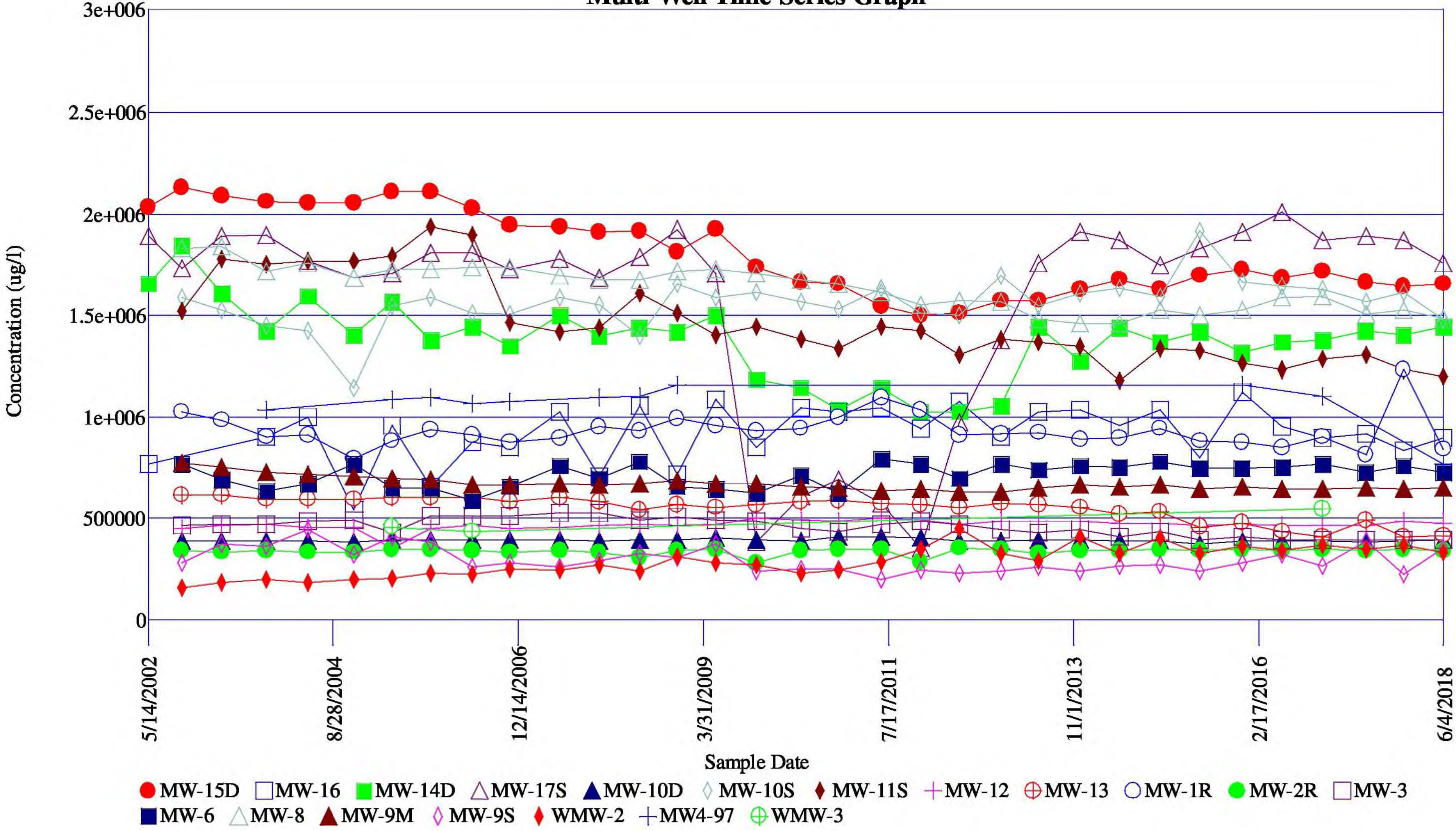
Multi-Well Time-Series Graph



Royalton Road LF

Alkalinity (calcium carbonate)

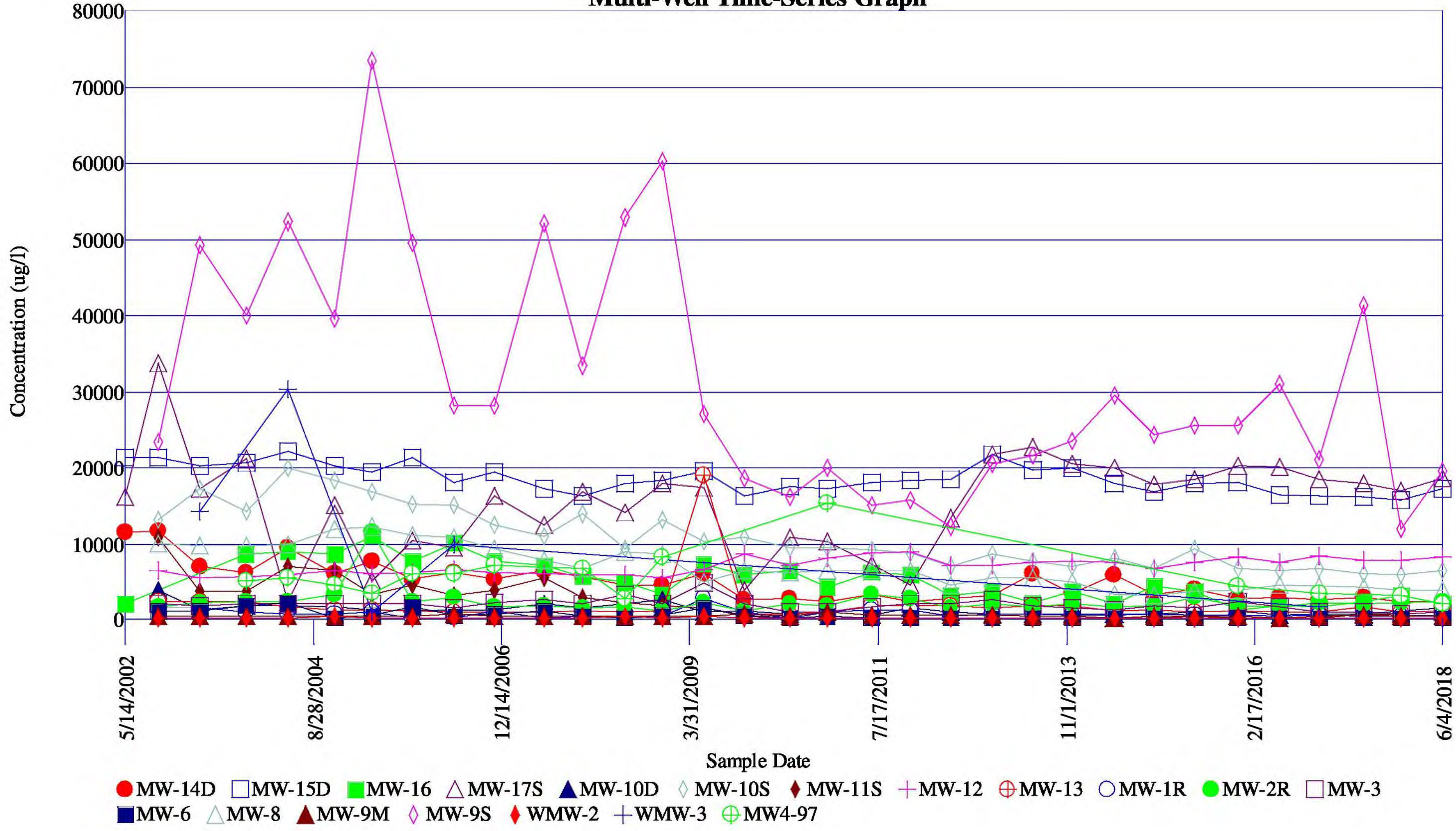
Multi-Well Time-Series Graph



Royalton Road LF

Iron, total

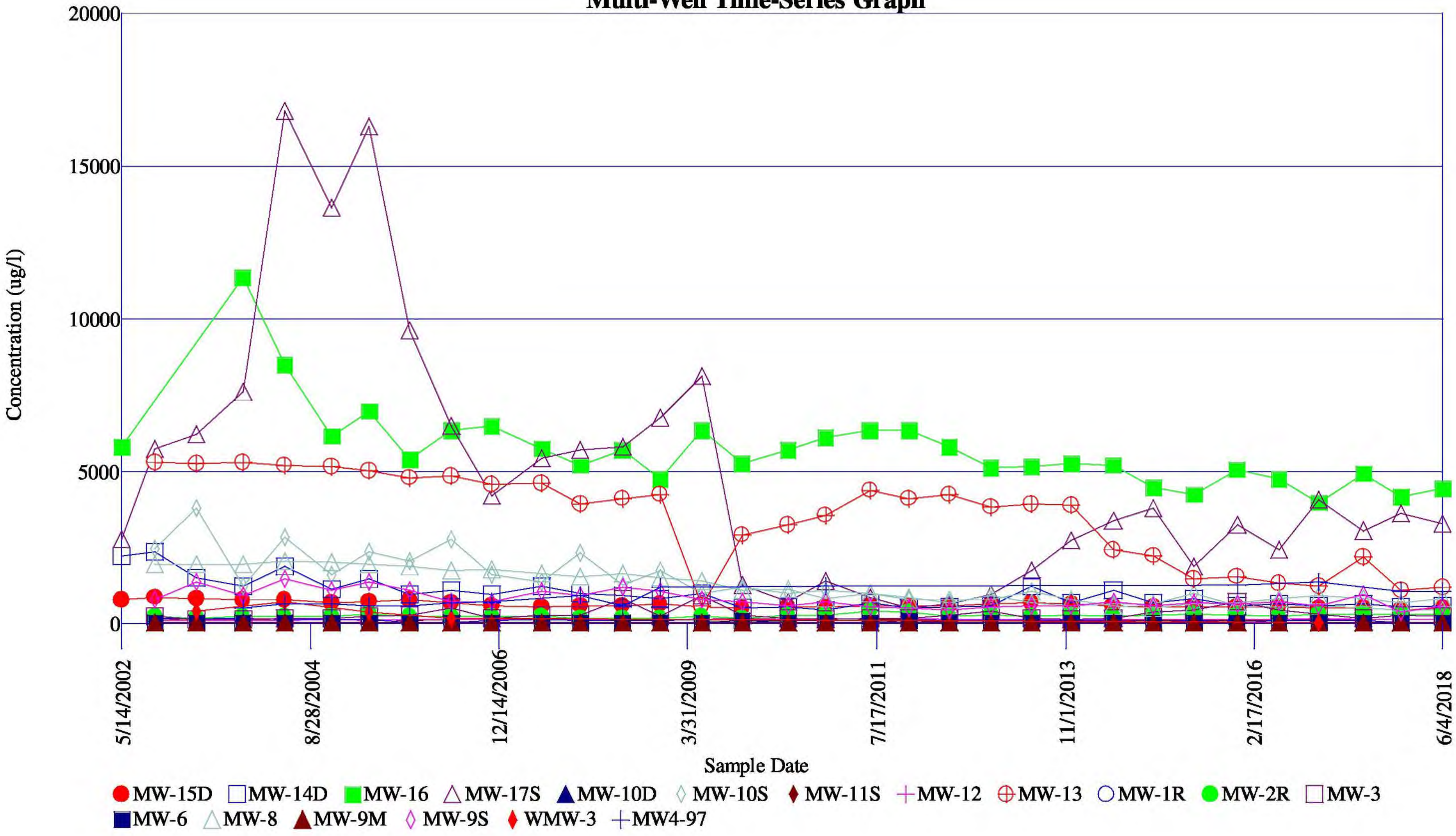
Multi-Well Time-Series Graph



Royalton Road LF

Manganese, total

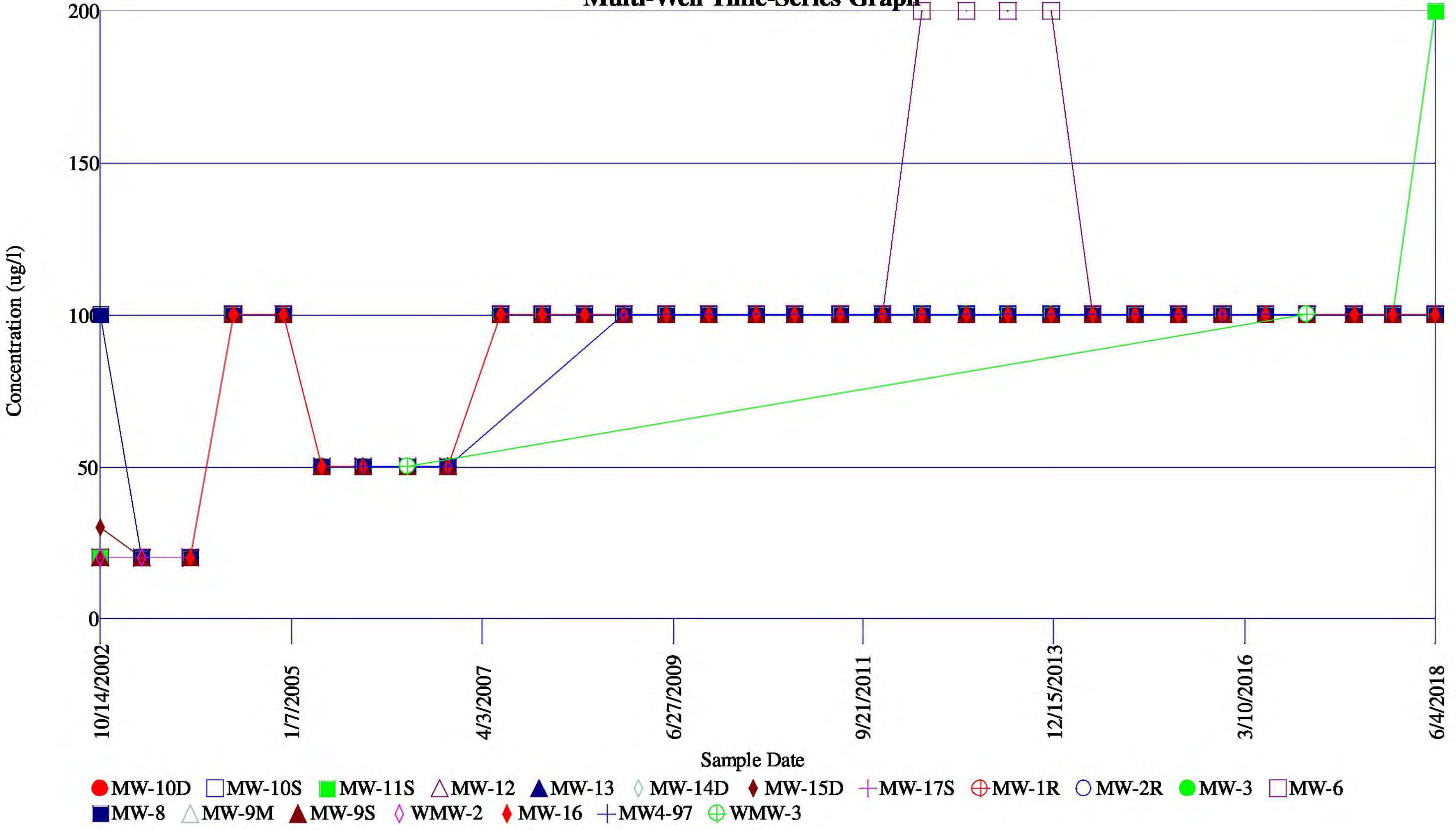
Multi-Well Time-Series Graph



Royalton Road LF

Sulfide

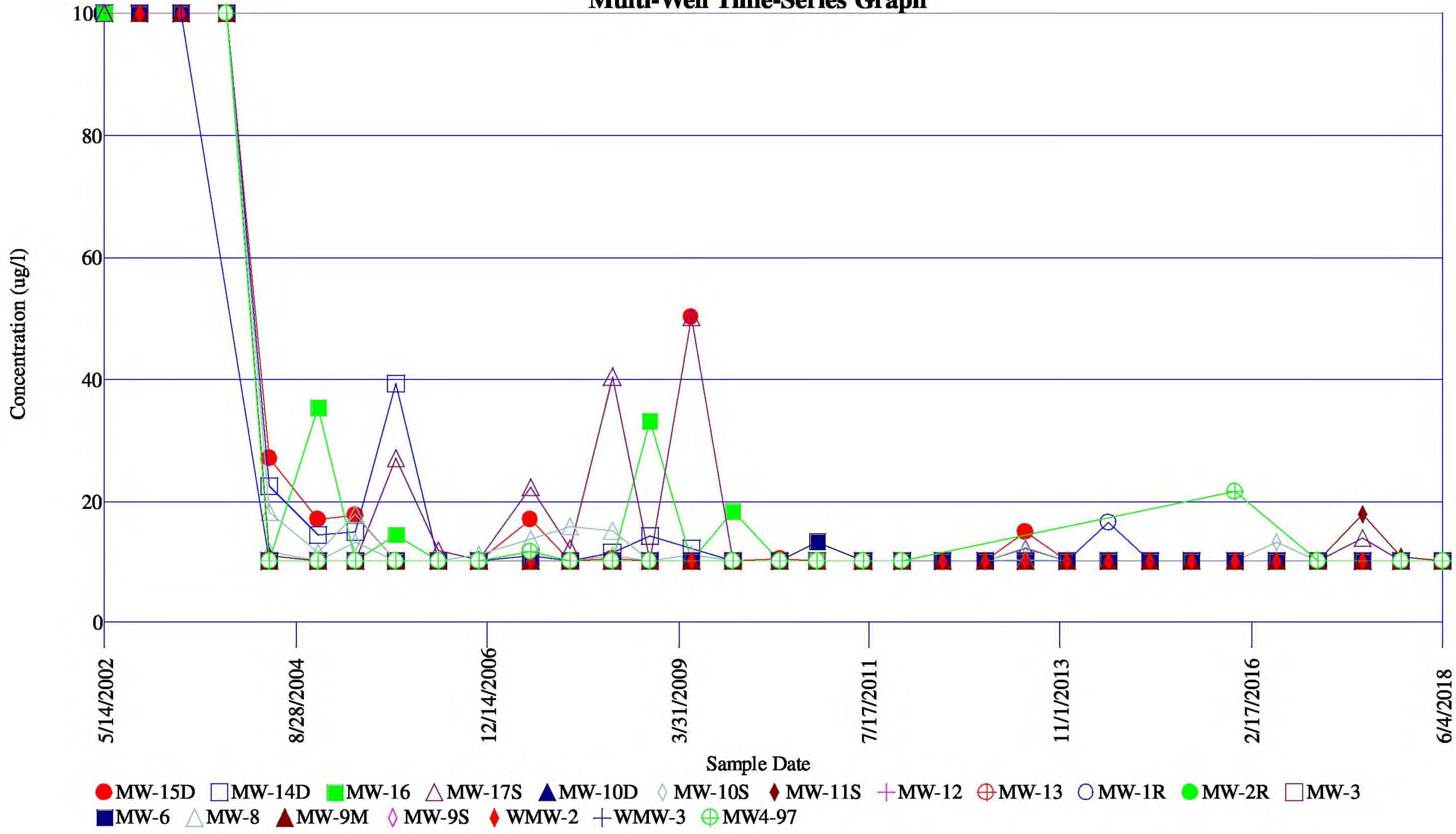
Multi-Well Time-Series Graph



Royalton Road LF

Acetone

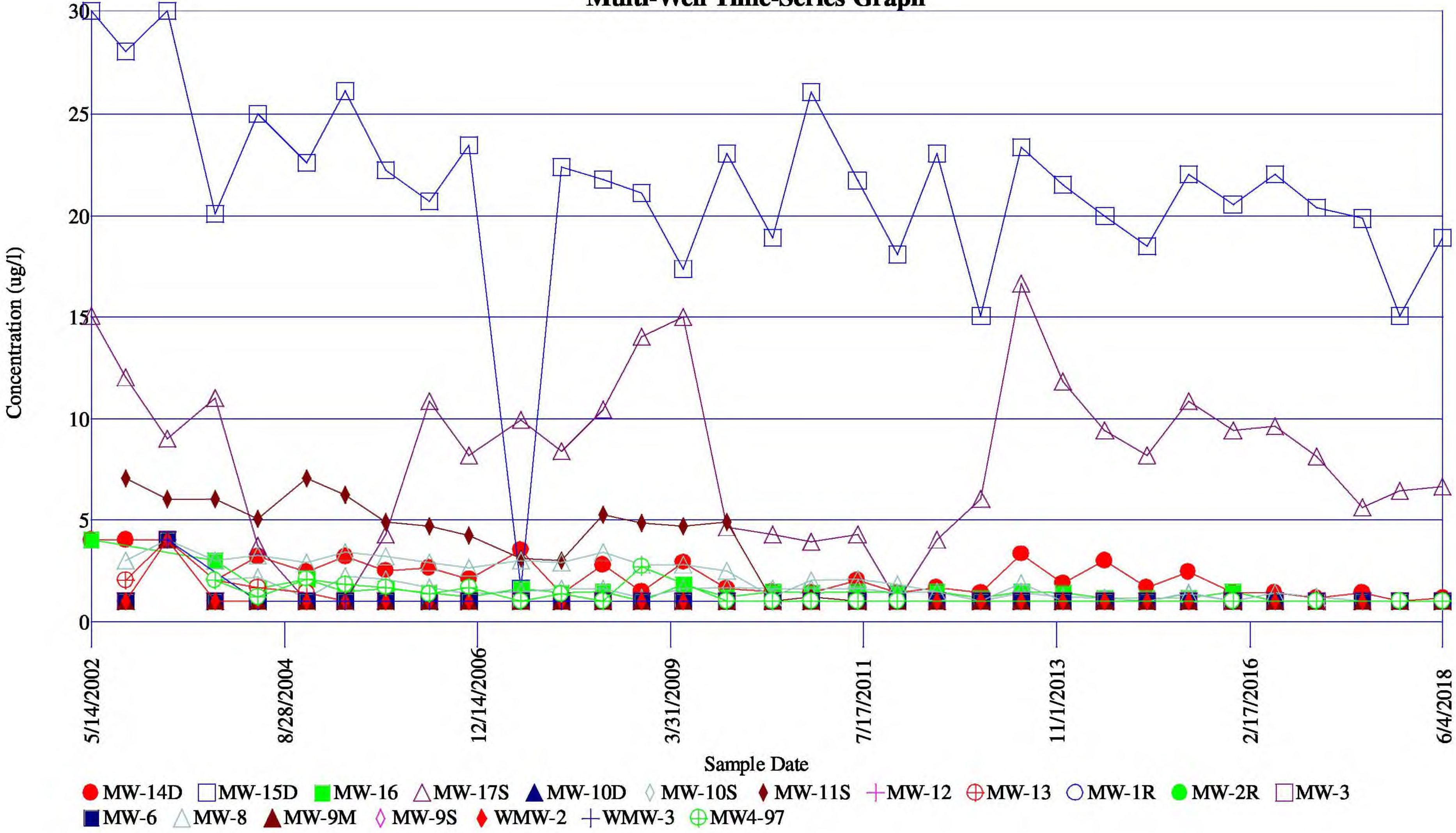
Multi-Well Time-Series Graph



Royalton Road LF

Benzene

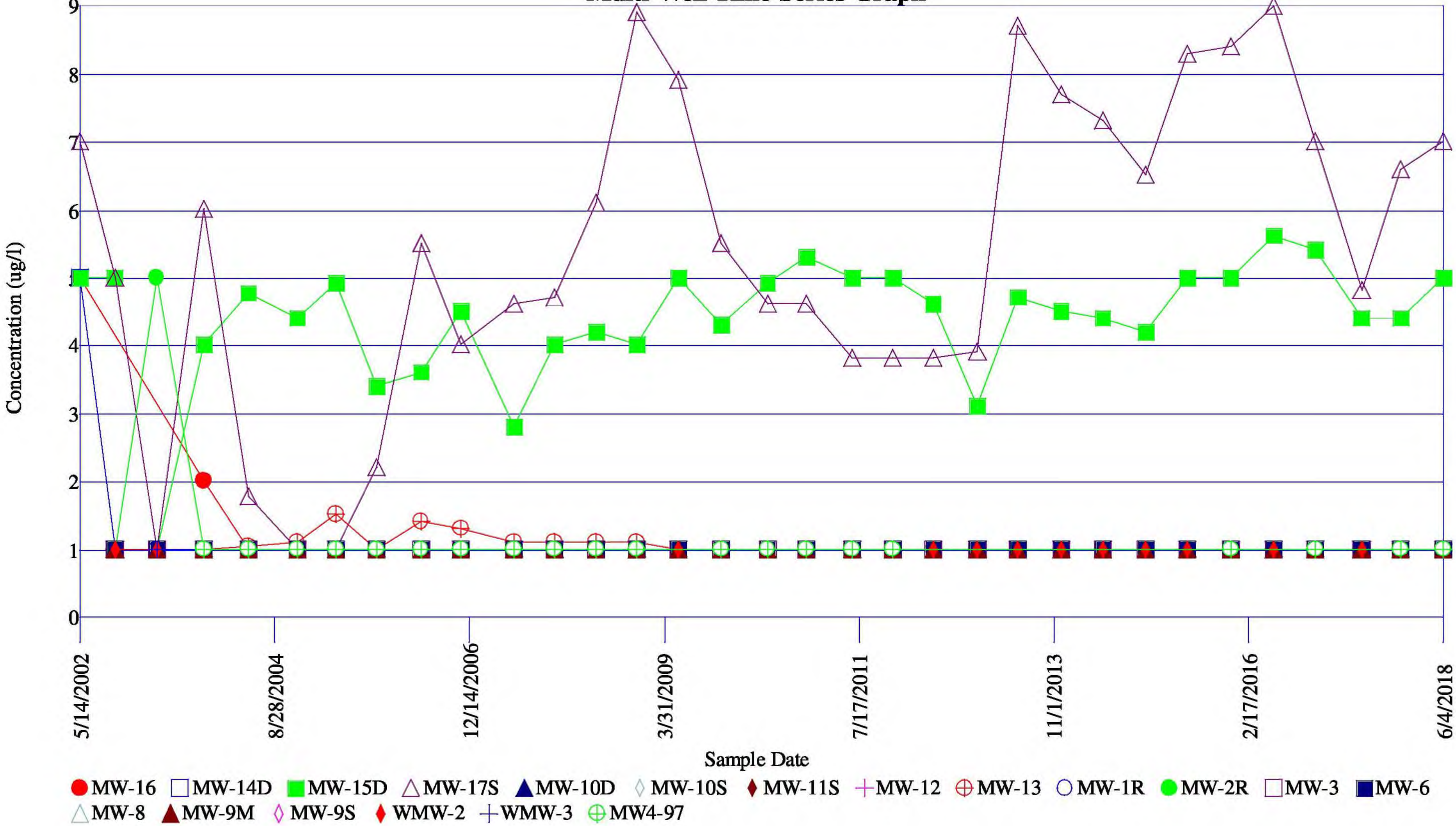
Multi-Well Time-Series Graph



Royalton Road LF

Chlorobenzene

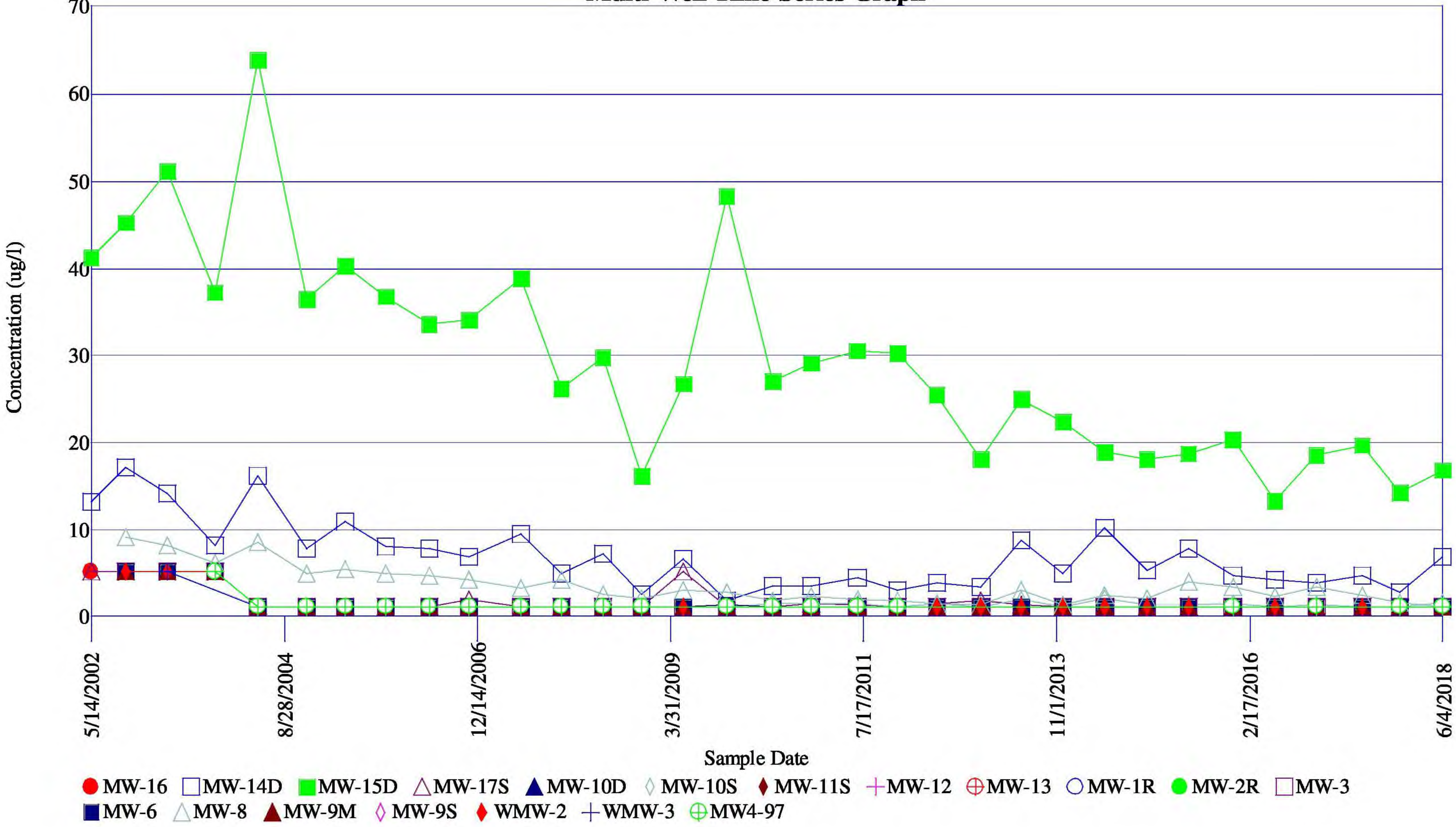
Multi-Well Time-Series Graph



Royalton Road LF

Chloroethane

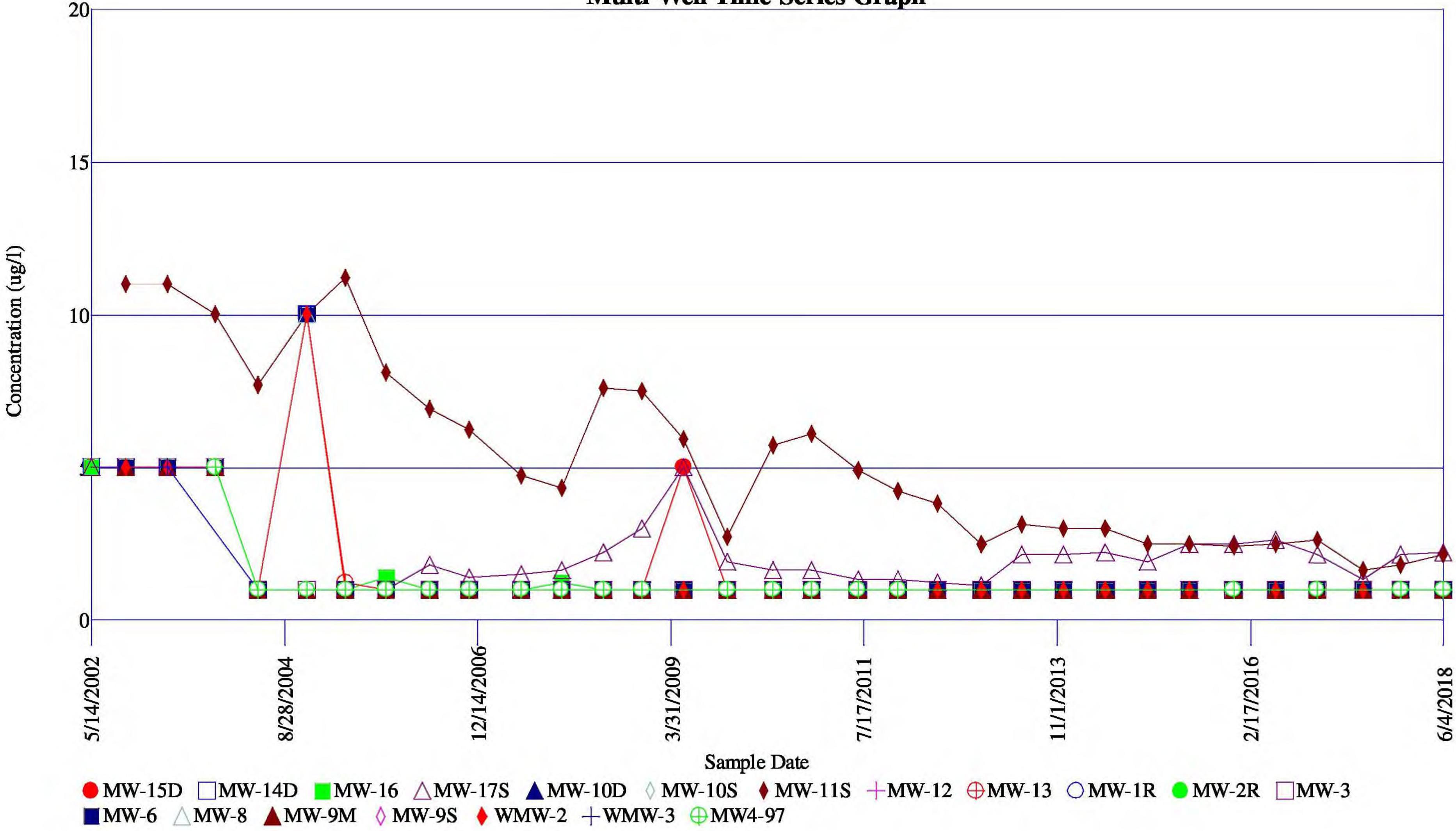
Multi-Well Time-Series Graph



Royalton Road LF

1,4-Dichlorobenzene

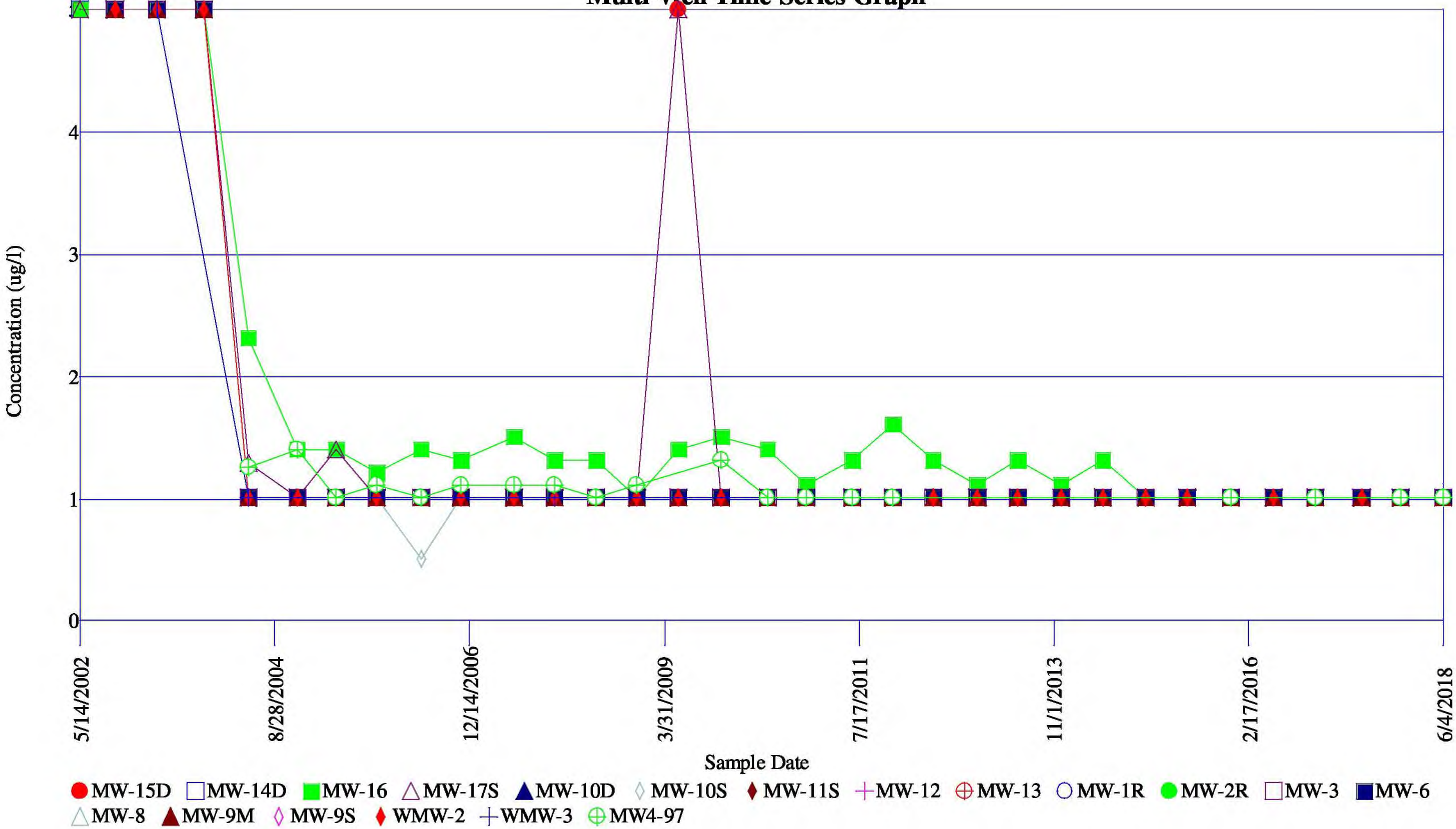
Multi-Well Time-Series Graph



Royalton Road LF

1,1-Dichloroethane

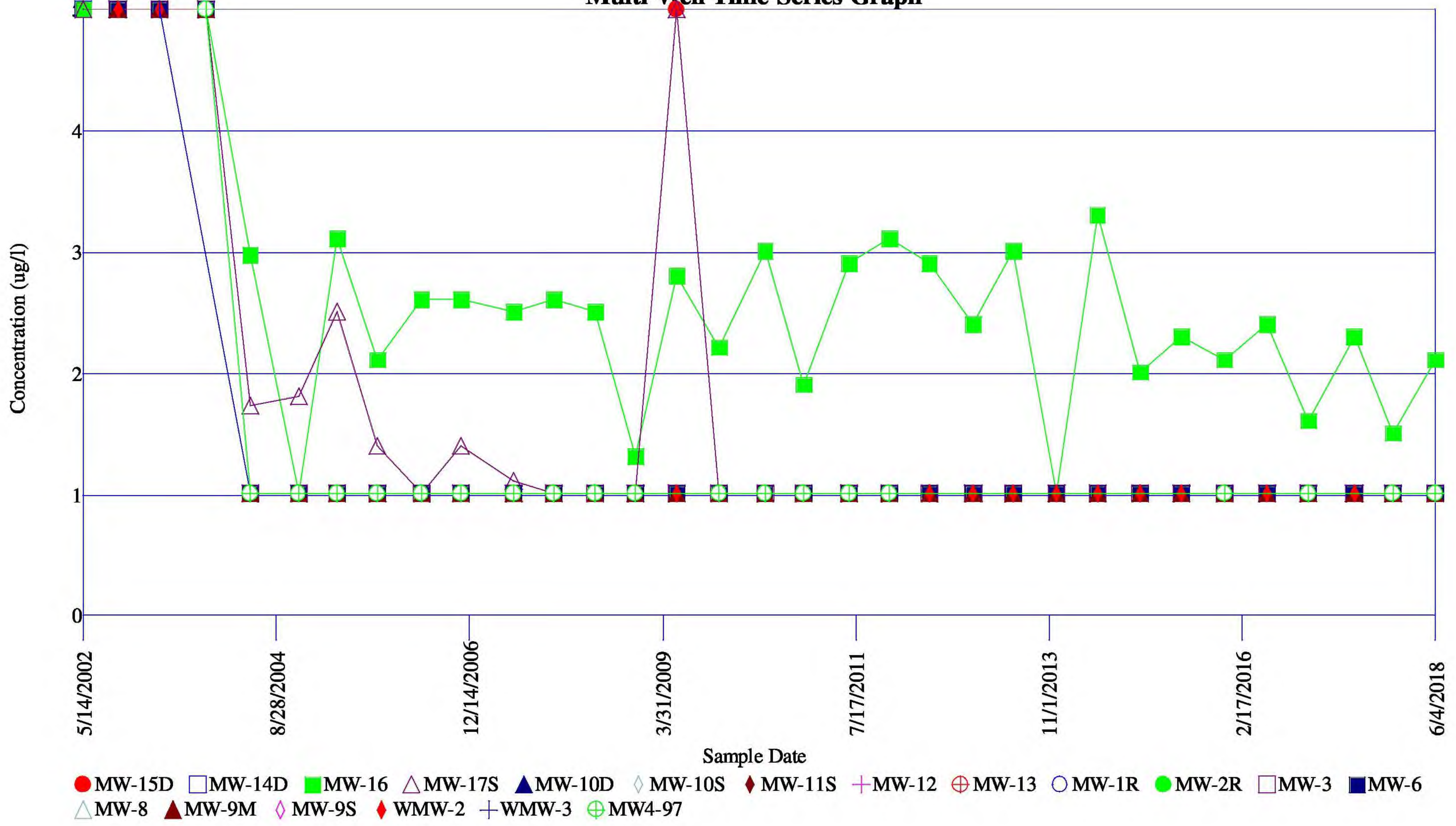
Multi-Well Time-Series Graph



Royalton Road LF

cis-1,2-Dichloroethene

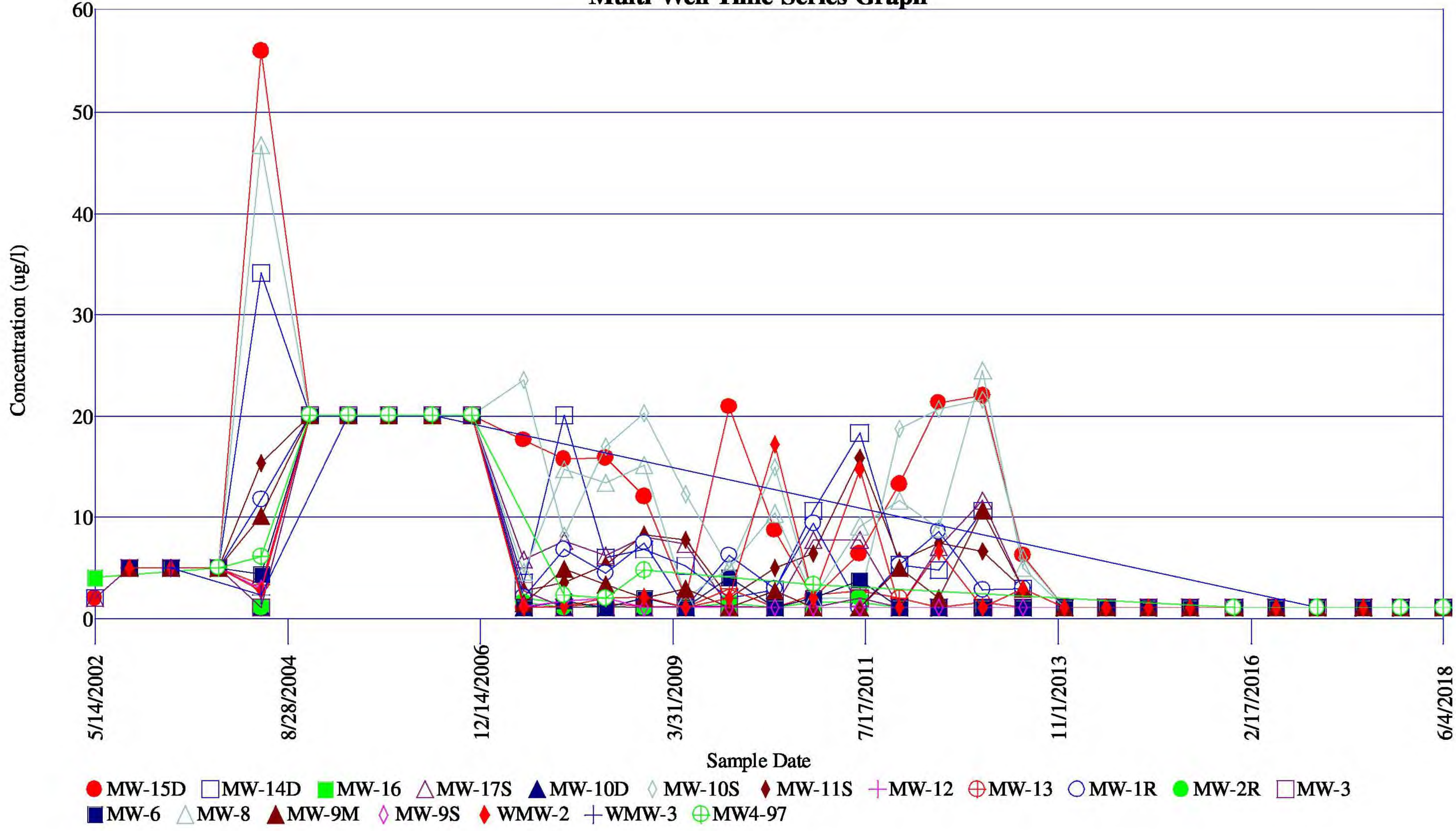
Multi-Well Time-Series Graph



Royalton Road LF

Selenium, total

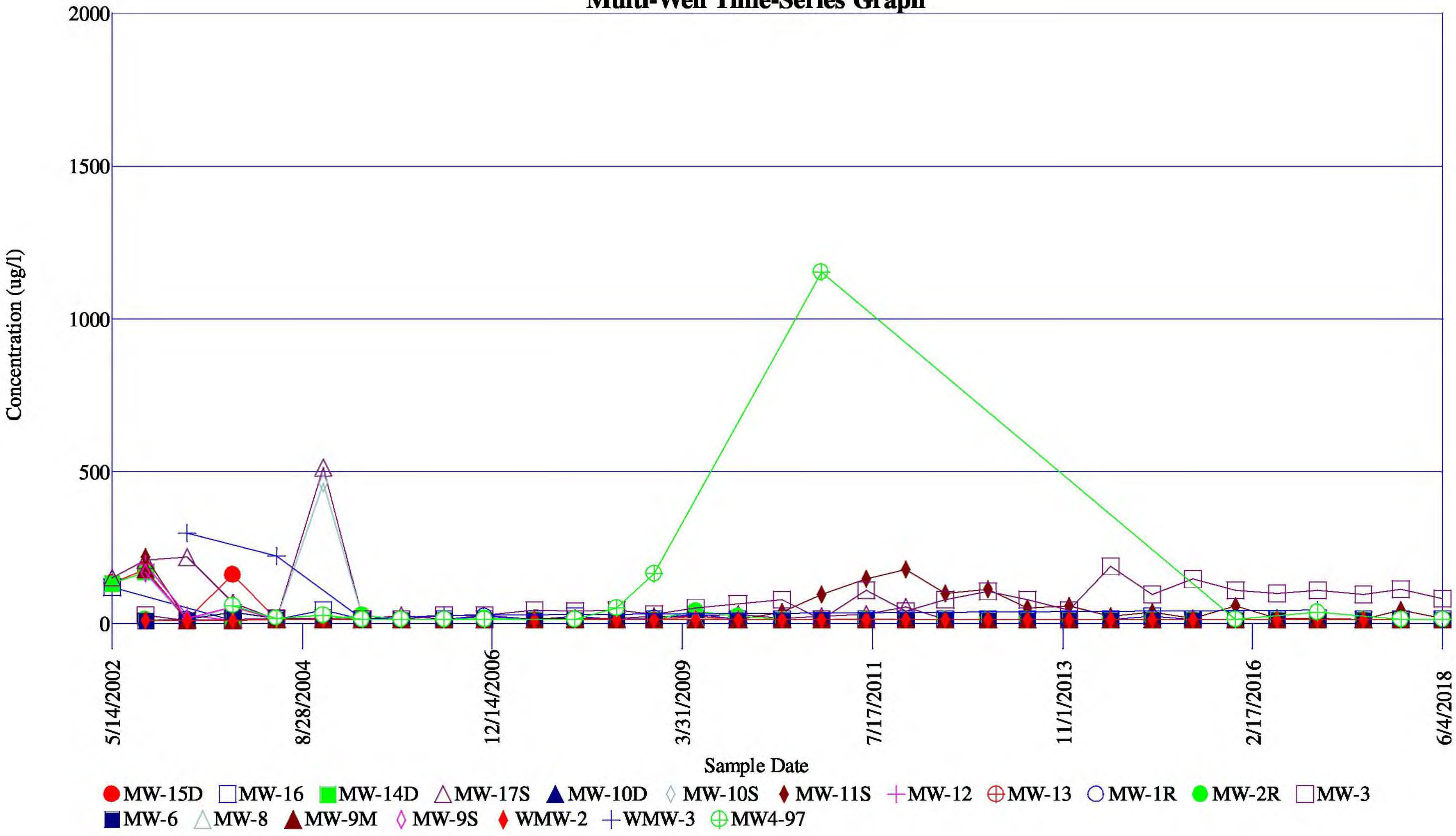
Multi-Well Time-Series Graph



Royalton Road LF

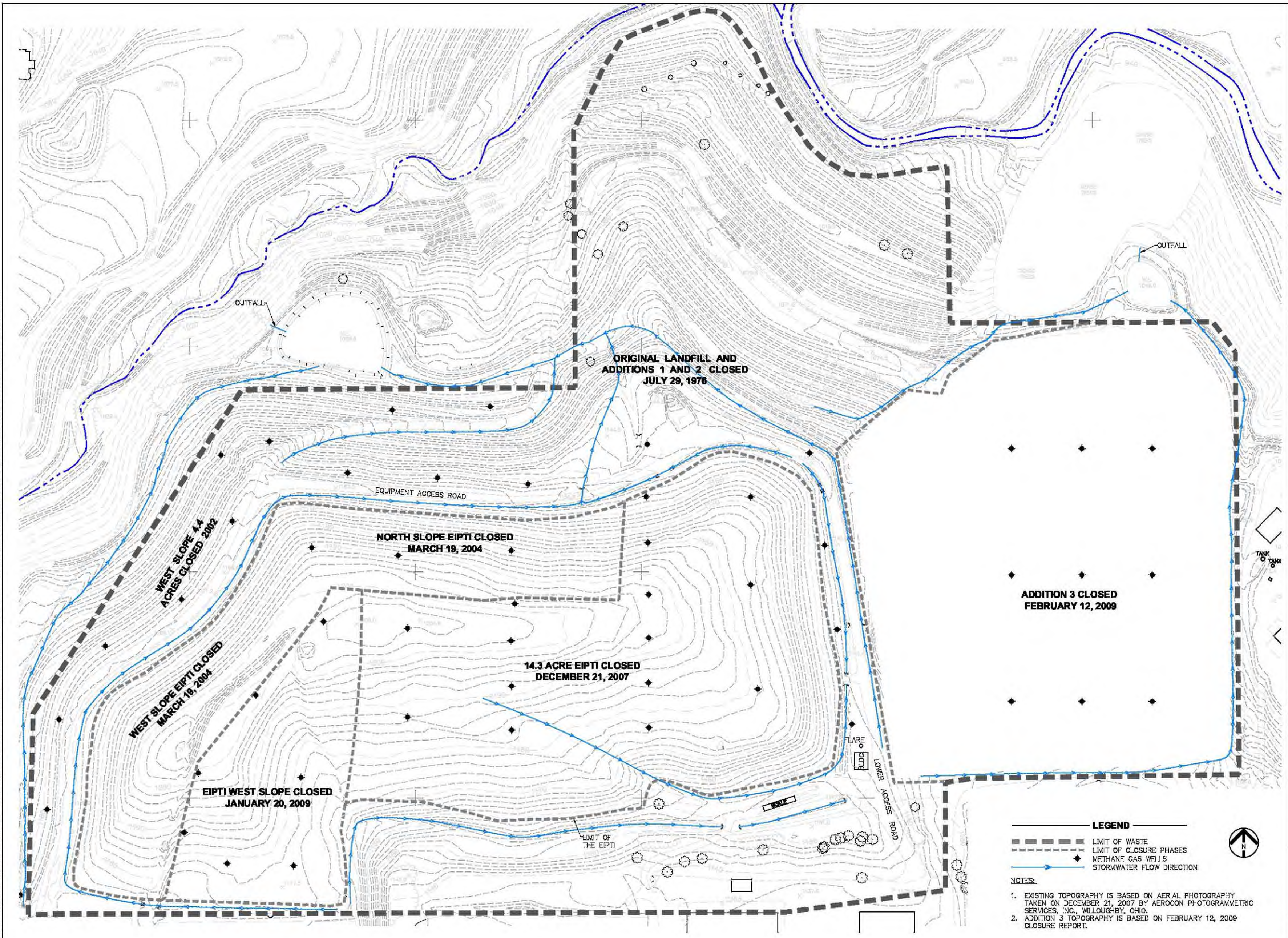
Zinc, total

Multi-Well Time-Series Graph



APPENDIX E.

CLOSURE PHASES AND DATES
ROYALTON ROAD SANITARY LANDFILL



NOTES:

1. EXISTING TOPOGRAPHY IS BASED ON AERIAL PHOTOGRAPHY TAKEN ON DECEMBER 21, 2007 BY AEROCON PHOTOGRAMMETRIC SERVICES, INC., WILLOUGHBY, OHIO.
2. ADDITION 3 TOPOGRAPHY IS BASED ON FEBRUARY 12, 2009 CLOSURE REPORT.

URS

ISSUED FOR BIDDING DATE BY

ADDENDUM REVISIONS

ADDENDUM NO	ADDENDUM DATE	BY

ISSUED FOR CONSTRUCTION DATE BY

CONSTRUCTION REVISIONS

NO.	DESCRIPTION	DATE	BY

RECORD DRAWINGS DATE BY

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DRAWN BY: KV	DATE: 10-14-2010
CHECKED BY: TAK	PROJECT #: 13814102
APPROVED BY: TAK	SCALE:

0 50 100 200
APPROXIMATE SCALE IN FEET
GRAPHIC SCALE

CLOSURE PHASES AND DATES

ROYALTON ROAD LANDFILL TOPOGRAPHIC MAP

FIGURE 1

APPENDIX F.

“CERTIFICATION OF LEACHATE MANAGEMENT SYSTEM INSTALLATION”, URS, JANUARY 2, 2007

URS

January 2, 2007

Mr. John R. Hujar, P.E.
Environmental Specialist
Ohio Environmental Protection Agency
Northeast District Office
Division of Solid and Infectious Waste Management
2110 E. Aurora Road
Twinsburg, Ohio 44087

Subject: Certification of Leachate Management System Installation
Royalton Road Sanitary Landfill
Cuyahoga County, Ohio

Dear Mr. Hujar:

On behalf of The Norton Construction Company dba Norton Environmental (Norton Environmental or Norton) and in accordance with the Ohio Administrative Code (OAC) Rule 3745-27-08, URS Corporation (URS) has prepared this certification report to document construction of the Leachate Management System (LMS) Extension at the Royalton Road Sanitary Landfill (RRLF). In addition, we are providing tabulated summaries of the volume of water removed from former methane gas extraction wells and from the newly installed sump, and of water level measurements made in nearby piezometers.

In a letter dated June 19, 2006, the Ohio EPA notified Norton Environmental that they had no objection to commencing the planned activities at the landfill. The objective of the plan was to extend the existing collection system to intercept the potential groundwater flow from the toe of the landfill toward the north and improve the water quality in this area of the landfill. Norton Environmental proceeded with the installation of Geoprobes (GP) and piezometers in two phases in November and December 2005. Based on a review of the Geoprobe logs, the installation of a large diameter sump near the location of GP-9, to the top of bedrock, was proposed by URS and approved by the Ohio EPA.

Certification of Sump Installation and Leachate Management System Extension

On October 11, 2006, McKinney Drilling Company (McKinney) drilled one, 48-inch-diameter boring at the proposed location to a depth of 26 feet, 5 inches. The new sump location is shown in Figure 1. McKinney used a large diameter auger to drill the boring to termination depth and then cleaned the hole using a bucket attachment as shown in the photo log. When the bucket was removed an 18-inch diameter, PVC sump was installed in the open hole to a depth of 25 feet. The pipe was perforated from the bottom to within 6-feet of ground surface (for a total of 19 feet) by drilling 3/8-inch-diameter holes 6-inches on center in eight rows along the axis of the pipe. An end cap was placed on the bottom and top of the sump. Details are shown on Figure 2.

URS Corporation
1375 Euclid Ave., Suite 600
Cleveland, OH 44115-1808
Tel: 216.622.2400
Fax: 216.622.2428

The annulus around the pipe was filled with 30 to 35 tons of #8 washed river gravel placed to within three feet of ground surface. Bentonite was placed above the gravel pack to reduce infiltration of surface water and the remainder of the hole was backfilled to ground surface and graded to divert surface water away from the sump. The entire area was then seeded and mulched. Several photos that illustrate the sump installation are presented at the end of this report.

The soil removed from the hole during the drilling operation was stockpiled adjacent to the boring for a short period. The soil was very wet and, at a depth of approximately 8 feet, a one-foot-zone was encountered that included some steel and wood debris. Because it was too difficult to separate the small amount of wood and steel from the soil, all auger cuttings were removed from the area and placed in a roll-off dumpster. The dumpster was later removed from the site and its contents were then routed through the transfer station for offsite disposal as solid waste.

Norton Environmental installed a 4-inch diameter, electric, submersible pump near the bottom of the sump. The pump is capable of pumping more than 20 gallons per minute. The source of electricity is a direct drop from electric lines on an adjacent pole that provides service to the Chippewa Creek Pump Station. The pump is positioned to hang one-foot off the bottom of the sump so that excessive sediment is not removed during pumping. The pump includes an internal switch that will stop and start the pump as necessary. It has been operating since October 14, 2006. Water that collects in the sump is being pumped via double-cased (one-inch inside two-inch) polyethylene piping to the existing gravity drain as shown on Figure 1. The line was buried a minimum of three-feet deep from the sump to the gravity drain line at the toe of the landfill. The flow rate is being monitored currently manually, by timing the on and off cycles of the pump and estimating the flow rate when the pump is running. The data for water removed from the sump is presented in Table 1. In addition, Table 1 provides data of the water removed from all former gas extraction wells that Norton Environmental has pumped since December 2005.

Norton intends to continue to operate this system for the next several months. The effect of pumping from this sump, the relative pump rates and volumes, and the resultant water levels in adjacent piezometers (data from all piezometers measured during 2006 are presented in Table 2) will be evaluated in the future to further determine whether additional work will be necessary. In addition, Norton Environmental will continue to remove leachate from the gas extraction wells in the same manner during this period.

Because all of this work could have an effect on the water levels in several shallow groundwater monitoring wells at the facility, Norton Environmental requested that this data be used to develop the Groundwater Quality Assessment Report. That report is currently being prepared.

Site Dewatering and Groundwater Measurements

The dewatering efforts conducted by Norton Environmental as mentioned in this report began on December 23, 2005, in methane gas extraction well EW - 3. Locations of all existing gas wells, all piezometers installed in 2005, and the new sump are shown on Figure 1. The extraction wells shown on Figure 1 were installed several years ago in the oldest portion of this landfill. They have not been operated for several years for extracting methane gas because no gas was present and the header line was disconnected. Norton Environmental has pumped water from EWs 3 and 5 since late December 2005, and in 2006 added well EW-2 and the new sump into the pumping cycle. We have included Norton's pumping records as Table 1. The records document that as of December 1, 2006, Norton Environmental had removed approximately 460,000 gallons from EW-2; 660,000 gallons from EW-3; 1,500,000 gallons from EW-5; and, 229,000 gallons from the sump installed in October. All liquid removed from these wells is being piped to the cleanout along the toe-of-slope, gravity drain system as shown on Figure 1. Norton Environmental will continue to pump from these wells during the next several months.

If you have any questions or comments, please do not hesitate to contact Tom Kovacic at (216) 622-2420 or Steve Viny at 216-447-0070.

Sincerely,
URS Corporation

Thomas A. Kovacic, P.E.
Principal Civil Engineer

File: 13810285.00000

cc: Russ Kocher, DGW-NEDO w/out attachments
Dane Tussel, Cuyahoga County Board of Health
Steve Viny, Norton
Al Razem, Eagon and Associates

ENGINEER'S NOTARIZED STATEMENT

ROYLATON ROAD SANITARY LANDFILL
LEACHATE MANAGEMENT SYSTEM EXTENSION CONSTRUCTION

I, Thomas A. Kovacic, being a Registered Professional Engineer in the State of Ohio, do hereby state, to the best of my knowledge, information, and belief, that the information contained in this Construction Certification Report for the extension of the leachate management system is accurate and contains the information required by Paragraph H of OAC Rule 3745-27-08 effective August 15, 2003.

SIGNATURE: Thomas A. Kovacic DATE: 1/2/07

ADDRESS: URS Corporation
1375 Euclid Avenue, Suite 600
Cleveland, Ohio 44115

THOMAS A. KOVACIC
E-53846

STATE OF OHIO
COUNTY OF CUYAHOGA

On this, the 2nd day of January, 2007, before me a notary public, the above signed personally appeared THOMAS A. KOVACIC, known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument and acknowledged that he executed the same for purposes therein contained.

In witness whereof, I hereunto set my hand and official seal.

Marguerite Gudat
Notary Public

MARGUERITE GUDAT
NOTARY PUBLIC, STATE OF OHIO
Recorded In Cuyahoga County
My Comm. Expires Dec. 14, 2008

OPERATOR'S NOTARIZED STATEMENT

ROYLATON ROAD SANITARY LANDFILL
LEACHATE MANAGEMENT SYSTEM EXTENSION CONSTRUCTION

I, Steven M. Viny, President, as the Operator's Representative of the Royalton Road Sanitary Landfill, do hereby certify that, to the best of my knowledge, the information included in the certification report is true, accurate, and contains all information required by Paragraph H of OAC Rule 3745-27-08 effective August 15, 2003.

Signature: ______________________ Date: 01/02/2007

Address: Norton Environmental
6200 Rockside Woods Blvd.
Independence, Ohio 44131

Telephone: 216-447-0070

On this, the 2 day of January, 2007, before me, a notary public, the above-signed personally appeared Steve Viny, known to be (or satisfactorily proved) to be the person whose name is subscribed to the within instrument and acknowledged that he executed the same for purposes therein contained. In witness whereof, I hereunto set my hand and official seal.

Deborah A. Sideris
Notary Public

DEBORAH A. SIDERIS
Notary Public, State of Ohio, Cuy. Cty.
My commission expires Sept. 14, 2011

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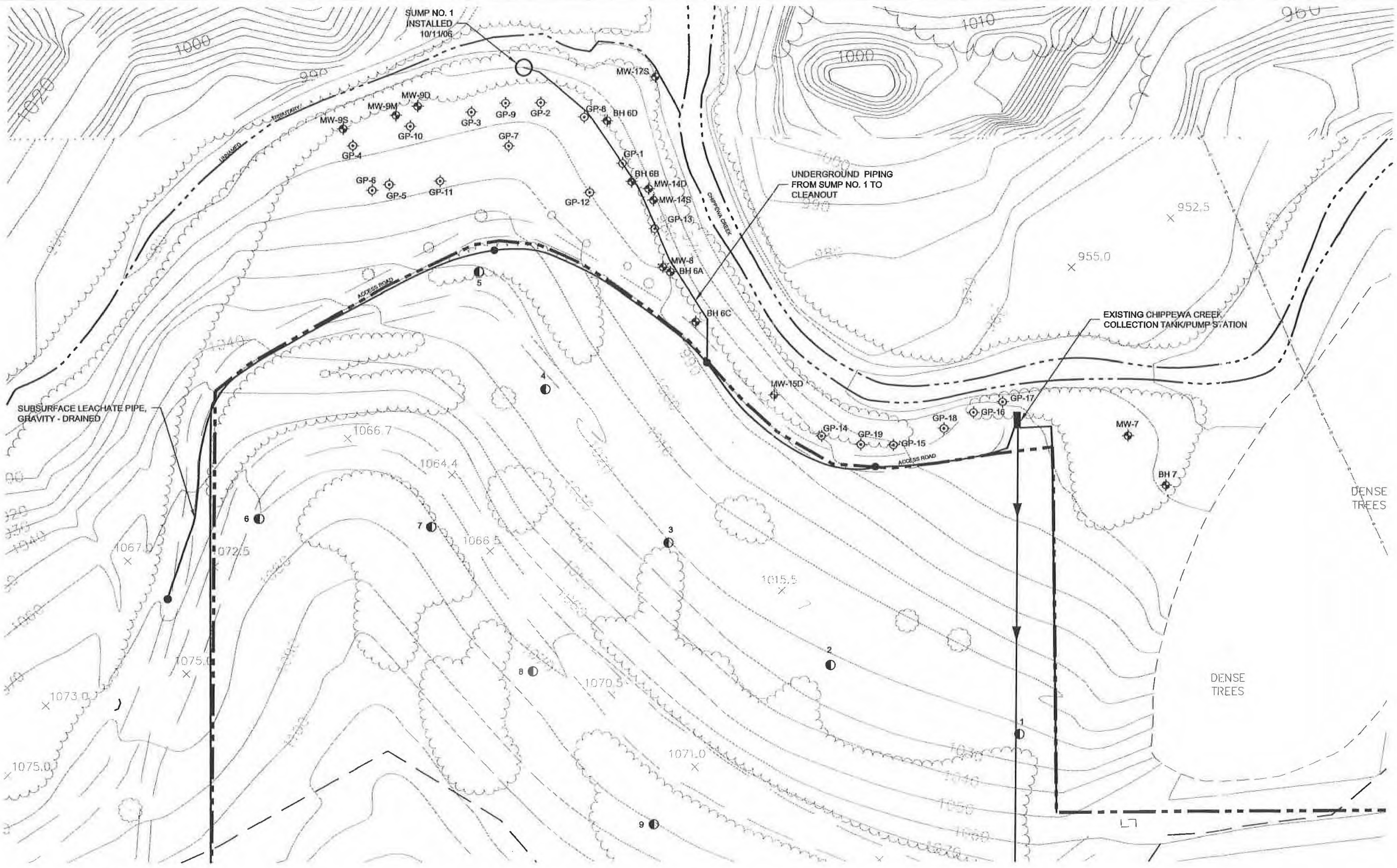
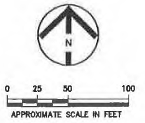


LEGEND

- ⊕ MW-# MONITORING WELL
- ⊕ BH-# SOIL BORING
- ▬ ▪ ▪ ▬ APPROXIMATE LIMIT OF WASTE
- ⊕ GP-1 GEOPROBE
- ● CLEANOUT
- ◐ 2 GAS EXTRACTION WELL

NOTE:

1. GEOPROBES GP-1 THROUGH GP-13 WERE COMPLETED DURING THE FIRST MOBILIZATION, NOVEMBER 21 AND 22, 2005.
2. GEOPROBES GP-14 THROUGH GP-19 WERE COMPLETED DURING THE SECOND MOBILIZATION, DECEMBER 12, 2005.



BAR IS ONE-INCH ON ORIGINAL DRAWING
0 ½ 1
IF NOT ONE-INCH, THEN ADJUST SCALES ACCORDINGLY

ISSUED FOR BIDDING — DATE BY

ADDENDUM REVISIONS

ADDENDUM NO	ADDENDUM DATE	BY

ISSUED FOR CONSTRUCTION — DATE BY

REVISIONS

NO.	DESCRIPTION	DATE	BY

RECORD DRAWINGS — DATE BY

DRAWN JMF	DATE APRIL 2006
CHECKED TK	JOB NO 13810285
SCALE: AS SHOWN	

LEACHATE
MANAGEMENT SYSTEM
PLAN VIEW
RECORD DRAWING

ROYALTON ROAD
SANITARY LANDFILL
NORTON ENVIRONMENTAL

URS

FIGURE 1 OF 2

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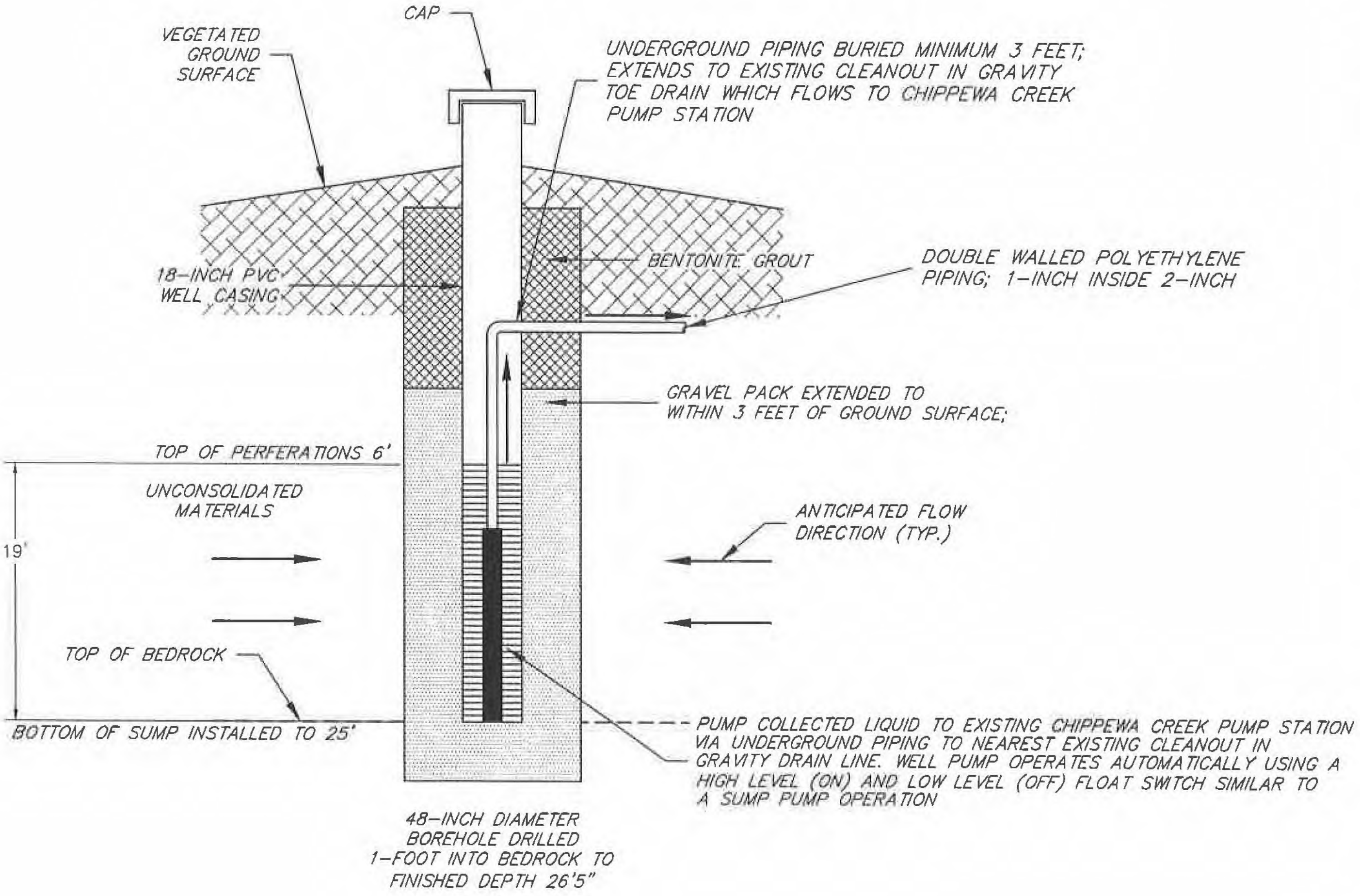

SUMP DETAIL AS-BUILT

N.T.S.

ISSUED FOR BIDDING DATE BY

ADDENDUM REVISIONS

ADDENDUM NO	ADDENDUM DATE	BY

ISSUED FOR CONSTRUCTION DATE BY

REVISIONS

NO.	DESCRIPTION	DATE	BY

RECORD DRAWINGS DATE BY

DRAWN JMF	DATE APRIL 2006
CHECKED TK	JOB NO 13810285
SCALE: AS SHOWN	

DETAILS
RECORD DRAWING

ROYALTON ROAD
SANITARY LANDFILL
NORTON ENVIRONMENTAL

URS

FIGURE 2 OF 2

BAR IS ONE-INCH ON ORIGINAL DRAWING
0 ½ 1
IF NOT ONE-INCH, THEN ADJUST SCALES ACCORDINGLY

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P.O. BOX 46268
BEDFORD, OHIO 44146

SUPERINTENDENT'S DAILY REPORT

JOB NO.: 1206-357

PROJECT: Norton Environmental

DATE: 10-11-06

LOCATION: Broadview Hts OH

WEATHER: Rain

DRILLED PIER NUMBER	SHAFT DIAMETER	BELL DIAMETER	SUBGRADE ELEVATION	TOP ELEV. OF CONCRETE	PLAN BOTTOM ELEV.	ACTUAL BOTTOM ELEV.	TOP ELEV. OF ROCK	ROCK SOCKET LENGTH
1	48"	NA	Ground	NA	-26'	-25'	NA	NA

REMARKS: Well point Steve the Land fill owner stopped us at 25' from fear of creek bed washing in. Set Drain pipe and they back filled with stone

BY:
McKINNEY DRILLING COMPANY

BY:
INSPECTOR OR CONTRACTOR

	TODAY	TO DATE
DRILLED	1	1
POURED	NA	NA
CONCRETE USED	NA	NA

WHITE COPY - McKINNEY OFFICE YELLOW COPY - CLIENT

Table 1
Dewatering Efforts in Gas Extraction Wells and Sump Installed
Royalton Road Sanitary Landfill
Norton Environmental

	GEW - 1	GEW-2		GEW-3		GEW - 4	GEW-5		SUMP	
Date	Depth to Water Surface (ft)	Vol (Gals)	Depth to Water Surface (ft)	Vol (Gals)	Depth to Water Surface (ft)	Depth to Water Surface (ft)	Vol (Gals)	Depth to Water Surface (ft)	Vol (Gals)	Depth to Water Surface (ft)
12/23/2005				1,440	7		0			
12/26/2005				6,840	7		0			
12/26/2005				2,700	7		0			
1/9/2006				17,280	7		0			
1/11/2006				5,760			0			
1/12/2006				5,760			0			
1/13/2006				2,520			0			
1/20/2006				5,760			0			
1/23/2006				2,520			0			
1/24/2006				5,760			0			
1/30/2006				5,760			0			
3/6/2006				17,280	17		17,280	34		
3/7/2006				5,760			17,280			
3/8/2006				5,760			17,280			
3/9/2006				5,760			17,280			
3/10/2006				5,760			17,280			
3/11/2006				5,760			17,280			
3/12/2006				5,760			17,280			
3/13/2006				5,760			17,280			
3/14/2006				5,760			17,280			
3/15/2006				5,760			17,280			
3/16/2006				5,760	43		17,280			
3/17/2006				5,760			17,280			
3/18/2006				5,760			17,280			
3/19/2006				5,760			17,280			
3/20/2006				5,760			17,280			
3/21/2006				5,760			17,280			
3/22/2006				2,880			8,640			
3/23/2006				2,880			8,640			
3/24/2006				2,880			8,640			
3/25/2006				2,880			8,640			
3/26/2006				2,880			8,640			
3/27/2006				2,880			8,640			
3/28/2006				2,880			8,640			
3/29/2006				2,880			8,640			
3/30/2006				2,880			8,640			
3/31/2006				2,880			8,640			
4/1/2006				2,880	21.3		4,320	55.3		
4/2/2006				2,880			8,640			
4/3/2006				2,880			8,640			
4/4/2006				2,880			8,640			
4/5/2006				2,880			8,640			
4/6/2006				2,880			8,640			
4/7/2006				2,880			8,640			
4/8/2006				2,880			8,640			
4/9/2006				2,880			8,640			
4/10/2006				2,880			8,640			
4/11/2006				2,880			8,640			
4/12/2006				2,880			8,640			
4/13/2006				2,880			8,640			
4/14/2006				2,880			8,640			
4/15/2006				2,880			8,640			
4/16/2006				2,880			8,640			
4/17/2006				0			0			
5/3/2006				2,880			4,320			
5/4/2006				2,880			8,640			
5/5/2006				2,880			8,640			
5/6/2006				2,880			8,640			
5/7/2006				2,880			8,640			
5/8/2006				2,880			8,640			
5/9/2006	30.3		2.6	2,880	25.3	35.9	8,640	56.5		
5/10/2006				2,880			8,640			
5/11/2006				2,880			8,640			
5/12/2006				2,880			8,640			
5/13/2006				2,880			8,640			
5/14/2006				2,880			8,640			
5/15/2006				2,880			8,640			
5/16/2006				2,880			8,640			
5/17/2006				2,880			8,640			
5/18/2006				2,880			8,640			
5/19/2006				2,880			8,640			
5/20/2006				2,880			8,640			
5/21/2006				2,880			8,640			
5/22/2006				2,880			8,640			
5/23/2006				2,880			8,640			

Table 1
Dewatering Efforts in Gas Extraction Wells and Sump Installed
Royalton Road Sanitary Landfill
Norton Environmental

	GEW - 1	GEW-2		GEW-3		GEW - 4	GEW-5		SUMP	
Date	Depth to Water Surface (ft)	Vol (Gals)	Depth to Water Surface (ft)	Vol (Gals)	Depth to Water Surface (ft)	Depth to Water Surface (ft)	Vol (Gals)	Depth to Water Surface (ft)	Vol (Gals)	Depth to Water Surface (ft)
5/24/2006				2,880			8,640			
5/25/2006				2,880			8,640			
5/26/2006				2,880			8,640			
5/27/2006				2,880			8,640			
5/28/2006				2,880			8,640			
5/29/2006				2,880			8,640			
5/30/2006				2,880			8,640			
5/31/2006				2,880			8,640			
6/1/2006	39.0		2.0	2,880		26.8	8,640	60.5		
6/2/2006				2,880			8,640			
6/3/2006				2,880			8,640			
6/4/2006				2,880			8,640			
6/5/2006				2,880			8,640			
6/6/2006				2,880			8,640			
6/7/2006				2,880			8,640			
6/8/2006				2,880			8,640			
6/9/2006				2,880			8,640			
6/10/2006				2,880			8,640			
6/11/2006				2,880			8,640			
6/12/2006				2,880			8,640			
6/13/2006				2,880			8,640			
6/14/2006				2,880			8,640			
6/15/2006				2,880			8,640			
6/16/2006				2,880			8,640			
6/17/2006				2,880			8,640			
6/18/2006				2,880			8,640			
6/19/2006				2,880			8,640			
6/20/2006				2,880			8,640			
6/21/2006				3,460			8,640			
6/22/2006				3,460			8,640			
6/23/2006				3,460			8,640			
6/24/2006		3,600	2	3,460			8,640			
6/25/2006		0		3,460			8,640			
6/26/2006		8,100		3,460			8,640			
6/27/2006		10,800		3,460			8,640			
6/28/2006		10,800		3,460			8,640			
6/29/2006		9,900		3,460			8,640			
6/30/2006				3,460			8,640			
7/1/2006				3,460			8,640			
7/1/2006				3,460			8,640			
7/2/2006				3,460			8,640			
7/3/2006				3,460			8,640			
7/4/2006				3,460			8,640			
7/5/2006				3,460			8,640			
7/6/2006				3,460			8,640			
7/7/2006				3,460			8,640			
7/8/2006				0			0			
7/9/2006				0			0			
7/10/2006				0			0			
7/11/2006				0			0			
7/12/2006				3,460			8,640			
7/13/2006				3,460			8,640			
7/14/2006		2,700	2	3,460			8,640			
7/15/2006		0		0			0			
7/16/2006		0		0			0			
7/17/2006		0		0			0			
7/18/2006		10,800		3,460			8,640			
7/19/2006		10,800		3,460			8,640			
7/20/2006		9,000		3,460			8,640			
7/21/2006		9,000		3,460			8,640			
7/22/2006		0		0			0			
7/23/2006		0		0			0			
7/24/2006		8,640		3,460			8,640			
7/25/2006		8,640		3,460			8,640			
7/26/2006		5,760		3,460			8,640			
7/27/2006		5,760		3,460			8,640			
7/28/2006		5,760		3,460			8,640			
7/29/2006		5,760		3,460			8,640			
7/30/2006		5,760		3,460			8,640			
7/31/2006		5,760		3,460			8,640			
8/1/2006		5,760		3,460			8,640			
8/2/2006		5,760		3,460			3,460			
8/3/2006		5,760		3,460			3,460			
8/4/2006		5,760		3,460			3,460			
8/5/2006		5,760		3,460			3,460			

Table 1
Dewatering Efforts in Gas Extraction Wells and Sump Installed
Royalton Road Sanitary Landfill
Norton Environmental

	GEW - 1	GEW-2		GEW-3		GEW - 4	GEW-5		SUMP	
Date	Depth to Water Surface (ft)	Vol (Gals)	Depth to Water Surface (ft)	Vol (Gals)	Depth to Water Surface (ft)	Depth to Water Surface (ft)	Vol (Gals)	Depth to Water Surface (ft)	Vol (Gals)	Depth to Water Surface (ft)
8/6/2006		5,760		3,460			3,460			
8/7/2006		5,760		3,460			3,460			
8/8/2006		5,760		3,460			3,460			
8/9/2006		5,760		3,460			3,460			
8/10/2006		5,760		3,460			3,460			
8/11/2006		0		3,460			3,460			
8/12/2006		0		3,460			3,460			
8/13/2006		0		3,460			3,460			
8/14/2006		0		3,460			3,460			
8/15/2006		0		3,460			3,460			
8/16/2006		0		3,460			3,460			
8/17/2006		0		3,460			3,460			
8/18/2006		0		3,460			3,460			
8/19/2006		0		3,460			3,460			
8/20/2006		0		3,460			3,460			
8/21/2006		0		3,460			3,460			
8/22/2006		0		3,460			3,460			
8/23/2006		0		3,460			3,460			
8/24/2006		0		3,460			3,460			
8/25/2006		0		3,460			3,460			
8/26/2006		0		3,460			3,460			
8/27/2006		0		3,460			3,460			
8/28/2006		0		3,460			3,460			
8/29/2006		0		1,230			1,230			
8/30/2006		0		1,230			1,230			
8/31/2006		0		1,230			1,230			
9/1/2006		0		1,230			1,230			
9/2/2006		0		1,230			1,230			
9/3/2006		0		1,230			1,230			
9/4/2006		0		1,230			1,230			
9/5/2006		0		1,230			1,230			
9/6/2006		0		1,230			1,230			
9/7/2006		0		1,230			1,230			
9/8/2006		0		1,230			1,230			
9/9/2006		0		1,230			1,230			
9/10/2006		0		1,230			1,230			
9/11/2006		0		1,230			1,230			
9/12/2006		8,640	6	1,230			1,230			
9/13/2006		3,840		1,230			1,230			
9/14/2006		3,840		1,230			1,230			
9/15/2006		3,840		1,230			1,230			
9/16/2006		3,840		2,880			2,880			
9/17/2006		3,840		2,880			2,880			
9/18/2006		3,840		2,880			2,880			
9/19/2006		3,840		2,880			2,880			
9/20/2006		3,840		2,880			2,880			
9/21/2006		2,160		665			665			
9/22/2006		2,160		665			665			
9/23/2006		2,160		665			665			
9/24/2006		2,160		665			665			
9/25/2006		2,160		665			665			
9/26/2006		2,160		665			665			
9/27/2006		2,160		665			665			
9/28/2006		2,160		665			665			
9/29/2006		2,160		665			665			
9/30/2006		2,160		665			665			
10/1/2006		2,880		2,160			2,160			
10/2/2006		2,880		2,160			2,160			
10/3/2006		2,880		2,160			2,160			
10/4/2006		2,880		2,160			2,160			
10/5/2006		2,880		2,160			2,160			
10/6/2006		2,880		2,160			2,160			
10/7/2006		2,880		2,160			2,160			
10/8/2006		2,880		2,160			2,160			
10/9/2006		2,880		2,160			2,160			
10/11/2006		2,880		2,160			2,160			
10/12/2006		2,880		2,160			2,160			
10/13/2006		2,880		0			2,160			
10/14/2006		2,880		0			2,160		360	
10/15/2006		2,880		0			2,160		0	
10/16/2006		2,880		0			2,160		4,320	
10/17/2006		2,880		0			2,160		8,640	
10/18/2006		2,880		0			2,160		8,640	
10/19/2006		2,880		0			2,160		8,640	
10/20/2006		2,880		0			2,160		8,640	

Table 1
Dewatering Efforts in Gas Extraction Wells and Sump Installed
Royalton Road Sanitary Landfill
Norton Environmental

	GEW - 1	GEW-2		GEW-3		GEW - 4	GEW-5		SUMP	
Date	Depth to Water Surface (ft)	Vol (Gals)	Depth to Water Surface (ft)	Vol (Gals)	Depth to Water Surface (ft)	Depth to Water Surface (ft)	Vol (Gals)	Depth to Water Surface (ft)	Vol (Gals)	Depth to Water Surface (ft)
10/21/2006		2,880		0			2,160		8,640	
10/22/2006		2,880		0			2,160		8,640	
10/23/2006		2,880		0			2,160		8,640	
10/24/2006		2,880		0			2,160		8,640	
10/25/2006		2,880		0			2,160		8,640	
10/26/2006		2,880		0			2,160		8,640	
10/27/2006		2,880		0			2,160		8,640	
10/28/2006		2,880		0			2,160		8,640	
10/29/2006		2,880		0			2,160		8,640	
10/30/2006		2,880		0			2,160		8,640	
10/31/2006		2,880		0			2,160		8,640	21.9
11/1/2006	39.1	2,880	18	0	16.2	21.5	2,160	51.5	8,640	21
11/2/2006		2,880		0			2,160		2,160	
11/3/2006		2,880		0			2,160		2,160	
11/4/2006		2,880		0			2,160		2,160	
11/5/2006		2,880		0			2,160		2,160	
11/6/2006		2,880		0			2,160		2,160	
11/7/2006		2,880		0			2,160		2,160	
11/8/2006		2,880		0			2,160		2,160	
11/9/2006		2,880		0			2,160		2,160	
11/10/2006		2,880		0			2,160		2,160	
11/11/2006		2,880		0			2,160		2,160	
11/12/2006		2,880		0			2,160		2,160	
11/13/2006		2,880		0			2,160		2,160	
11/14/2006		2,880		0			2,160		2,160	
11/15/2006		2,880		0			2,160		2,160	
11/16/2006		2,880		0			2,160		2,160	
11/17/2006		2,880		0			2,160		2,160	
11/18/2006		2,880		0			2,160		2,160	
11/19/2006		2,880		0			2,160		2,160	
11/20/2006		2,880		0			2,160		2,160	
11/21/2006		2,880		0			2,160		2,160	
11/22/2006		2,880		0			2,160		2,160	
11/23/2006		2,880		0			2,160		2,160	
11/24/2006		2,880		0			2,160		2,160	
11/25/2006		2,880		0			2,160		2,160	
11/26/2006		2,880		0			2,160		2,160	
11/27/2006		2,880		0			2,160		2,160	
11/28/2006		2,880		0			2,160		2,160	
11/29/2006		2,880		0			2,160		2,160	
11/30/2006		2,880		0			2,160		2,160	
12/1/2006		2,880		0			2,160		2,160	
12/2/2006		2,880		0			2,160		2,160	
12/3/2006		2,880		0			2,160		2,160	
12/4/2006		2,880		0			2,160		2,160	
12/5/2006		2,880		0			2,160		2,160	
12/6/2006		2,880		0			2,160		2,160	
12/7/2006		2,880		0			2,160		2,160	
12/8/2006		2,880		0			2,160		2,160	
12/9/2006		2,880		0			2,160		2,160	
12/10/2006		2,880		0			2,160		2,160	
12/11/2006		2,880		0			2,160		2,160	
Totals		460,380		659,790			1,499,570		229,320	

Grand Total 2,849,060 gallons

Notes:
All measurements made by Norton Environmental and tabulated by URS. Volumes are estimated by recording pump run-time and calculating volume.
GEW - Gas Extraction Well. Pumps were moved manually to listed gas extraction wells and water pumped on days specified.
The sump and pumping system is a permanent installation and pump controls are automatic.
Blanks in this table mean that no pumping occurred or no measurements were made on that day. Thus, GEW - 1 and 4 were never pumped.

Table 2
Water Level Measurement Comparisons
Piezometers Installed Along North Toe of Landfill
Royalton Road Sanitary Landfill

Well No.	Elevation[1]	Depth to Water Encountered In Drilling[3]	Water Elevation After Drilling[4]	Depth to Water Measured March 21, 2006	Water Elevation March 21, 2006	Depth to Water Measured April 10, 2006	Water Elevation April 10, 2006	Depth to Water Measured May 2006	Water Elevation May 2006	Depth to Water Measured June 2006	Water Elevation June 2006	Depth to Water Measured July 2006	Water Elevation July 2006	Depth to Water Measured August 2006	Water Elevation August 2006	Depth to Water Measured September 2006	Water Elevation September 2006	Depth to Water Measured October 2006	Water Elevation October 2006
GP-1	987.6	9.0	975.5	10.2	977.4	12.3	975.3	11.3	976.3	13.6	974.0	12.9	974.7	13.4	974.2	12.6	975.0	15.3	972.3
GP-2	990.0	12.0	974.2	8.4	981.6	11.4	978.6	11.7	978.3	12.0	978.0	11.7	978.3	12.3	977.7	11.9	978.1	12.2	977.8
GP-3[2]	988.7	6.0	980.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP-4	988.4	dry	dry to 977.8	9.0	979.4	6.4	982.0	9.9	978.5	9.1	979.3	4.8	983.6	3.8	984.6	7.4	981.0	3.7	984.7
GP-5[3]	993.2	dry	dry to 988.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP-6[3]	993.8	dry	dry to 987.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP-7	994.2	8.0	984.5	10.1	984.1	12.2	982.0	13.8	980.4	13.9	980.3	14.5	979.7	14.6	979.6	15.0	979.2	14.9	979.3
GP-8	985.3	5.0	979.3	6.7	978.6	5.6	979.7	6.3	979.0	5.6	979.7	6.2	979.1	6.5	978.8	6.6	978.7	6.9	978.4
GP-9	989.2	0.0	987.3	5.8	983.4	8.1	981.1	8.3	980.9	6.9	982.3	5.3	983.9	6.4	982.8	4.5	984.7	4.4	984.8
GP-10	NA	5.0	dry	NA	NA	NA	NA	11.2	NA	11.2	NA	9.4	NA	10.3	NA	10.5	NA	11.0	NA
GP-11[3]	996.0	dry	dry to 991.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP-12	NA	dry	dry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP-13	988.7	dry	dry to 976.2	10.0	978.7	12.1	976.6	12.2	976.5	12.0	976.7	12.1	976.6	11.8	976.9	12.1	976.6	11.8	976.9
GP-14	984.5	10.0	971.6	11.8	972.7	12.2	972.3	12.2	972.3	12.2	972.3	NA	NA	NA	NA	NA	NA	NA	NA
GP-15[3]	971.5	dry	dry to 959	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP-16[3]	962.2	dry	dry to 949.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP-17	963.4	dry	951.5	11.9	951.5	4.4	959.0	5.0	958.4	4.5	958.9	4.7	958.7	4.5	958.9	4.8	958.6	3.7	959.7
GP-18	968.3	13.5	952.1	20.3	948.0	15.6	952.7	16.9	951.4	15.6	952.8	15.8	952.5	16.6	951.7	16.2	952.1	15.8	952.5
GP-19[3]	976.0	dry	dry to 952.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

NA - Not applicable, indicating no measurement could be made, no piezometer was set, etc.

1. Elevation of top of riser based on surveyed top of the 1" riser unless noted otherwise.
2. Elevation based on ground survey plus measured stickup of riser.
3. Measured from ground elevation, one time water level encountered during drilling
4. All measurements made from ground surface during drilling.

URS

PHOTOGRAPHIC LOG

Client Name: Norton Environmental – Royalton Road Landfill Sump Installation	**Site Location:** Broadview Heights, OH	**Project No.** **13810285**

Photo No. 1 **Date:** 10/11/06

Description:

McKinney drill rig drilling the sump.

Photo No. 2 **Date:** 10/11/06

Description:

Four-foot diameter auger used to drill hole to refusal.

URS

PHOTOGRAPHIC LOG

Client Name: Norton Environmental – Royalton Road Landfill Sump Installation

Site Location:
Broadview Heights, OH

Project No.
13810285

Photo No.
3

Date:
10/11/06

Description:

Cleaning the hole to finished depth of 26’ 5”.

Photo No.
4

Date:
10/11/06

Description:

18-inch-diameter sump placed to a depth of 25 feet below ground surface.

URS

PHOTOGRAPHIC LOG

Client Name: Norton Environmental – Royalton Road Landfill Sump Installation

Site Location: Broadview Heights, OH

Project No. 13810285

Photo No. 5

Date: 10/13/06

Description:

Installed 1-inch diameter line from pump inside a 2-inch-diameter HDPE line discharges to 4-inch HDPE line to pump station tank. All piping was installed at least 3 feet deep for frost protection.

Photo No. 6

Date: 10/13/06

Description:

18-inch Sump, 1-inch line inside 2-inch HDPE line.

URS

PHOTOGRAPHIC LOG

Client Name: Norton Environmental – Royalton Road Landfill Sump Installation	**Site Location:** Broadview Heights, OH	**Project No.** 13810285

Photo No. 7

Date: 10/16/06

Description:

Seeded and mulched around new sump.