April 10, 2023
File No. 25222265.00

Mr. Bruce LeRoy
Wisconsin Department of Natural Resources
1027 W. St. Paul Ave
Milwaukee, WI 53233

Subject: Proposed Modifications to Long-Term Sampling and Analysis Plan (LTSAP)
Boundary Road Landfill
Menomonee Falls, Wisconsin
WDNR License #11
EPA ID #WID058735994

Dear Mr. LeRoy:

On behalf of Waste Management of Wisconsin, Inc. (WMWI), SCS Engineers (SCS) is submitting proposed modifications to the Long-Term Sampling and Analysis Plan (LTSAP) for the Boundary Road Landfill. The proposed modifications are needed for and will be coordinated with the removal of waste from the Boundary Road Landfill and phased construction of the Orchard Ridge Recycling and Disposal Facility (RDF) Eastern Expansion, Southern Unit.

If you have any questions about the proposed modifications to the LTSAP, please contact Eric Oelkers at 608-444-3934 or eoelkers@scsengineers.com.

Sincerely,

Sherren Clark, PE, PG
Project Director
SCS Engineers

Eric Oelkers, PG
Senior Hydrogeologist
SCS Engineers

SCC/lmh_jsn/EO

cc: David Buser, WDNR
Alicia Zewicki, WDNR
Ann Bekta, WDNR
Larry Buechel, WMWI
Dan Roche, WMWI
Brett Coogan, WMWI
Greg Konsionowski, WMWI

Encl. Proposed Modification to the Long-Term Sampling and Analysis Plan

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Proposed Modification to the Long-Term Sampling and Analysis Plan

Boundary Road Landfill
Menomonee Falls, Wisconsin
WDNR License #11
EPA ID #WID058735994

Prepared for:

Waste Management of Wisconsin, Inc.
W132 N10487 Grant Drive
Germantown, Wisconsin 53022

SCS ENGINEERS

25222265.00 | April 10, 2023

2830 Dairy Drive
Madison, WI 53718-6751
608-224-2830

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Tables

Figures

Appendices

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1.0 INTRODUCTION

On behalf of Waste Management of Wisconsin, Inc. (WMWI), SCS Engineers (SCS) is submitting proposed modifications to the Long-Term Sampling and Analysis Plan (LTSAP) for the Boundary Road Landfill (BRL). The proposed modifications are needed for and will be coordinated with the removal of waste from the Boundary Road Landfill and phased construction of the Orchard Ridge Recycling and Disposal Facility (RDF) Eastern Expansion, Southern Unit.

BRL is a National Priorities List (NPL) site (WDNR Landfill License #11, EPA ID #WID0558735994) located on the Orchard Ridge complex. The plans for the exhumation of BRL waste and construction of the East Expansion, Southern Unit in the BRL footprint were detailed in the Plan of Operation for the East Expansion, Southern Unit, which was approved by the WDNR on December 15, 2022.

Phased construction of the new East Expansion, Southern Unit landfill area will be sequenced with the excavation of the existing BRL waste. Development of the East Expansion, Southern Unit site will involve excavating BRL waste (both inside and outside the footprint of the Southern Unit) and re-disposing of the waste within the adjacent Orchard Ridge RDF.

Modifications to the sampling program are proposed to occur over the next several years as the phased removal of BRL waste is completed. This modification to the LTSAP is intended to identify and obtain approval for changes that will be implemented over the waste removal period, including the final plan to be implemented when all BRL waste has been relocated.

2.0 CURRENT MONITORING PROGRAM

The current BRL monitoring program was outlined in the Proposed Modification to Long-Term Sampling and Analysis Plan (LTSAP) submitted to the WDNR by WMWI on October 22, 2013. The proposed modification to the LTSAP was approved by WDNR in a letter dated April 2, 2014. The modification approved in 2014 did not change the landfill gas monitoring program, which was detailed in the 1999 LTSAP. The 2014 LTSAP approval letter, 2013 proposed LTSAP modification request, and 1999 LTSAP landfill gas monitoring program are provided in **Appendix A**.

The current monitoring locations and frequencies are summarized in **Table 1**. The current monitoring parameters for groundwater and leachate are summarized in **Table 2**. Monitoring locations for the current monitoring program are shown on **Figure 1**.

3.0 PROPOSED MODIFICATIONS

The proposed modifications to the LTSAP are described in the following sections. The modifications primarily reflect the abandonment of monitoring points as the BRL waste is removed and the Orchard Ridge RDF East Expansion, Southern Unit is constructed.

The approximate schedule for abandonment or decommissioning of BRL monitoring points is shown in **Table 3**. The proposed future monitoring program after waste removal is complete is shown in **Table 4**. The waste removal is anticipated to occur in 6 phases over a period of approximately 6 to 8 years. The approximate phased construction schedule provided in the Southern Unit Plan of Operation is as follows:

- Construction of Phase 5, Module 1 – 2023
- Construction of Phase 5, Module 2 – 2024

- Construction of Phase 6, Module 1 – 2025
- Construction of Phase 6, Module 2 – 2026
- Construction of Phase 7, Module 1 – 2027
- Construction of Phase 7, Module 2 – 2029

Each phase of construction will begin with removal of BRL waste in the area of planned construction. The liner construction phases and the future monitoring program after waste removal are shown on Figure 2.

3.1 GROUNDWATER MONITORING

3.1.1 Monitoring Wells

Monitoring wells that are located within the construction limits for the East Expansion, Southern Unit will be abandoned as required for construction. The approximate abandonment schedule is shown in Table 3. The proposed future monitoring program after waste removal is complete is shown in Table 4. No changes to the leachate monitoring parameters are proposed.

Monitoring wells that are not located within the construction footprint for the East Expansion, Southern Unit will continue to be monitored during and after the Boundary Road waste removal and Southern Unit construction. In addition, the monitoring wells installed to monitor the Orchard Ridge Southern Unit will monitor the BRL area. The monitoring wells in the current BRL sampling program that will be abandoned include the following:

- TW-9RR: Abandoned with Phase 7, Module 1. Southern Unit monitoring well S-224 will monitor groundwater west of BRL in this area of the site.

- P-101: Abandoned with Phase 5, Module 1. This well is located between BRL and the existing Orchard Ridge East Expansion, within the Southern Unit footprint. Monitoring between the two landfills will no longer be needed.

- P-104R: Abandoned with Phase 7, Module 2. Southern Unit piezometer S-403B will monitor groundwater south of BRL at a similar elevation.

Monitoring wells TW-2R, TW-3R, and TW-22 are currently monitored for water level only, and will be abandoned. Specific well replacements are not proposed for these wells, but the monitoring wells installed to monitor the Orchard Ridge East Expansion, Southern Unit, will supplement the remaining BRL monitoring wells to monitor water levels and groundwater flow directions in the BRL area.

Monitoring wells P105A, P105B, P105C, P106A, P106B, and P106C are located adjacent to the groundwater/leachate collection trench on the south side of BRL, and are not part of the approved monitoring program. These wells will be abandoned when the collection trench is abandoned as part of the Phase 7, Module 2 construction event.

Monitoring well P-101 and water-level-only monitoring wells TW2R and TW3R were abandoned in November 2022 in preparation for the initial phase of waste removal and liner construction (Phase 5, Module 1). Abandonment documentation for these wells is included in Appendix B.

3.1.2 Water Supply Wells

No changes to the water supply well monitoring program are proposed.

3.2 LEACHATE MONITORING

3.2.1 Leachate Quality

Leachate monitoring will continue at monitoring point LMP-1 until the leachate/groundwater collection trench pumping system is shut down during the final phase of waste removal (Phase 7, Module 2). No changes to the leachate monitoring parameters are proposed.

The three leachate extraction wells were decommissioned prior to the start of waste removal for Phase 5, Module 1, because the electrical service to the pumps and the leachate forcemain from the wells to the sewer discharge ran through the Phase 5, Module 1 excavation area. The three leachate extraction wells will be excavated with the waste during the Phase 5, Module 2 construction.

3.2.2 Leachate Head

Leachate head wells will be abandoned by removal as the waste is removed from each phase. The approximate abandonment schedule is shown in Table 3. Leachate head wells LH1 to LH5 are part of the approved monitoring program. Leachate head wells LH6 to LH8 are supplemental leachate head wells installed as part of the waste characterization investigation completed in 2019.

3.3 LANDFILL GAS MONITORING

3.3.1 Gas Extraction Wells and Blower/Flare

The landfill gas collection system will continue to operate to the extent practicable as the waste is removed. Each gas extraction wellhead (G1 – G10) is connected to one or more horizontal collection pipes installed near the top of the waste, below the final cover. The approximate abandonment schedule is shown in Table 3.

The blower and flare will continue to operate to the extent practicable as the waste is removed. Monitoring will continue until gas collection is terminated. The blower and flare currently run on an intermittent schedule due to limited gas generation and associated low methane concentrations, and intermittent operation is anticipated to continue through the waste removal period.

3.3.2 Gas Monitoring Probes

Gas monitoring probes for BRL will be abandoned as the waste is removed, following the schedule shown in Table 3. Gas probe LGP01R will continue to be monitored (renamed as GP01RB) as part of the monitoring program for the East Expansion, Southern Unit, but will no longer be reported for BRL.

3.4 SURFACE WATER MONITORING

Upstream surface water monitoring location SW01 is located within the first phase of construction and is no longer available for sampling. Downstream surface water monitoring location SW02 will be sampled under the BRL monitoring program until the existing pond is reconstructed as the South Sedimentation Basin for the East Expansion, Southern Unit, which is anticipated to occur with construction of Phase 7, Module 1.

4.0 CONCLUSIONS

The proposed modifications to the LTSAP will provide for ongoing monitoring of BRL throughout the waste removal process and long-term groundwater monitoring in the BRL area after waste removal is complete. Documentation of monitoring point abandonments will be included in the waste removal documentation report that will be submitted to the WDNR after each phase of waste removal.

Tables

Table 1. Approved Monitoring Locations and Frequency

Monitoring Location	Frequency	Parameters
MW-111 MW-116 MW-110 P102 TW-9RR P104R TW-16R P101 MW-117 P103R MW-107 P107 TW-24R P117 TW-5R	Semi-Annual	Protocol 3
	Annual	Protocol 1
TW-2R TW-3R TW-22R	Semi-Annual	Groundwater Levels Only
PW-7 PW-8 PW-9	Annual	Protocols 1, 2, and 3
Leachate Monitoring Point (LMP-1)	Annual	Protocols 1, 2, and 3
Leachate Head Wells (LH1-LH5)	Semi-Annual	Leachate Levels Only
Surface Water Monitoring Points (SW-1, SW-2)	Annual	Protocol 1
Gas Extraction Wells (G-1 through G-10)	Quarterly	Methane, oxygen, temperature, flow
Gas Monitoring Probes (LGP-1R, LGP-3 through LGP-7)	Quarterly	Methane, oxygen, pressure
Blower/Flare Station	Quarterly	Methane, oxygen, temperature, flow

Table 2. Approved Monitoring Parameters for Groundwater and Leachate

PROTOCOL 1: Volatile Organic Compounds, Method 8260B (Target Reporting Limit)		
1,1,1,2-Tetrachloroethane (1 µg/L)	Bromochloromethane (1 µg/L)	Iodomethane (1 µg/L)
1,1,1-Trichloroethane (1 µg/L)	Bromodichloromethane (1 µg/L)	Methyl tert-butyl ether (1 µg/L)
1,1,2,2-Tetrachloroethane (1 µg/L)	Bromoform (1 µg/L)	Methylene Bromide (1 µg/L)
1,1,2-Trichloroethane (1 µg/L)	Bromomethane (1 µg/L)	Methylene Chloride (1 µg/L)
1,2,3-Trichloropropane (1 µg/L)	Carbon Disulfide (1 µg/L)	Naphthalene (1 µg/L)
1,1-Dichloroethane (1 µg/L)	Carbon Tetrachloride (1 µg/L)	Styrene (1 µg/L)
1,1-Dichloroethene (1 µg/L)	Chlorobenzene (1 µg/L)	Tetrachloroethene (1 µg/L)
1,2-Dibromo-3-chloropropane (1 µg/L)	Chloroethane (1 µg/L)	Tetrahydrofuran (5 µg/L)
1,2-Dibromoethane (1 µg/L)	Chloroform (1 µg/L)	Toluene (1 µg/L)
1,2-Dichloroethane (1 µg/L)	Chloromethane (1 µg/L)	Trichloroethene (1 µg/L)
1,2-Dichloropropane (1 µg/L)	Cis-1,2-Dichloroethene (1 µg/L)	Trichlorotrifluoromethane (1 µg/L)
2-Butanone (1 µg/L)	Cis-1,3-Dichloropropene (1 µg/L)	Trans-1,2-Dichloro-2-Butene (5 µg/L)
2-Hexanone (5 µg/L)	Dibromochloromethane (4 µg/L)	Trans-1,2-Dichloroethene (1 µg/L)
4-Methyl-2-pentanone (5 µg/L)	m-Dichlorobenzene (1,3) (1 µg/L)	Trans-1,3-Dichloropropene (1 µg/L)
Acetone (10 µg/L)	o-Dichlorobenzene (1,2) (1 µg/L)	Vinyl Chloride (1 µg/L)
Acrolein (20 µg/L)	p-Dichlorobenzene (1,4) (1 µg/L)	Vinyl Acetate (5 µg/L)
Acrylonitrile (5 µg/L)	Dichlorodifluoromethane (1 µg/L)	Xylene, Total (2 µg/L)
Benzene (1 µg/L)	Ethylbenzene (1 µg/L)	
PROTOCOL 2: Metals and Methods (Target Reporting Limit)		
Aluminum, 6010 (200 µg/L)	Barium, 6010 (200 µg/L)	Iron, 6010 (100 µg/L)
Antimony, 6020 (0.5 µg/L)	Cadmium, 6020 (0.2 µg/L)	Manganese, 6010 (15 µg/L)
Arsenic, 6020 (1 µg/L)	Chromium, 6010 (10 µg/L)	Selenium, 6020 (1 µg/L)
PROTOCOL 3: Field and Indicator Parameters and Methods (Target Reporting Limit)		
Boron, 6010B (10 µg/L)	Sodium, 6010B (1,000 µg/L)	Conductivity (SC)
Chloride, SM4110B (500 µg/L)	Alkalinity, 310.2 (10,000 µg/L)	Temperature
Fluoride, 300.0_28D (250 µg/L)	Water Level	Hardness
Sulfate, SM4110B (2,000 µg/L)	pH	

Table 3. Proposed Monitoring Point Abandonments

Feature Label	Feature Type	Approximate Schedule for Abandonment	Abandonment/ Removal Method
Monitoring Wells			
P101	Piezometer	Phase 5, Module 1	Overdrill per NR 141
P104R	Piezometer	Phase 7, Module 2	Overdrill per NR 141
P105A	Piezometer	Phase 7, Module 2	Overdrill per NR 141
P105B	Piezometer	Phase 7, Module 2	Overdrill per NR 141
P105C	Piezometer	Phase 7, Module 2	Overdrill per NR 141
P106A	Piezometer	Phase 7, Module 2	Grout casing (outside LOW)
P106B	Piezometer	Phase 7, Module 2	Grout casing (outside LOW)
P106C	Piezometer	Phase 7, Module 2	Grout casing (outside LOW)
TW02R	Monitoring Well	Phase 5, Module 1	Overdrill per NR 141
TW03R	Monitoring Well	Phase 5, Module 1	Overdrill per NR 141
TW09RR	Monitoring Well	Phase 7, Module 1	Grout casing (outside LOW)
TW22	Monitoring Well	Phase 7, Module 2	Overdrill per NR 141
Leachate Head Wells			
LHW1	Leachate Head Well	Phase 5, Module 1	Remove with waste
LHW2	Leachate Head Well	Phase 7, Module 1	Remove with waste
LHW3	Leachate Head Well	Phase 6, Module 1	Remove with waste
LHW4	Leachate Head Well	Phase 5, Module 1	Remove with waste
LHW5	Leachate Head Well	Phase 6, Module 1	Remove with waste
LHW6	Leachate Head Well	Phase 5, Module 1	Remove with waste
LHW7	Leachate Head Well	Phase 6, Module 2	Remove with waste
LHW8	Leachate Head Well	Phase 6, Module 2	Remove with waste
Leachate Extraction Wells			
LEW101	Leachate Extr. Well	Phase 5, Module 1	Decommission with Phase 5, Module 1 construction (electrical and forcemain removed). Remove well with waste during Phase 5, Module 2 construction.
LEW102	Leachate Extr. Well	Phase 5, Module 1	Same as LEW101

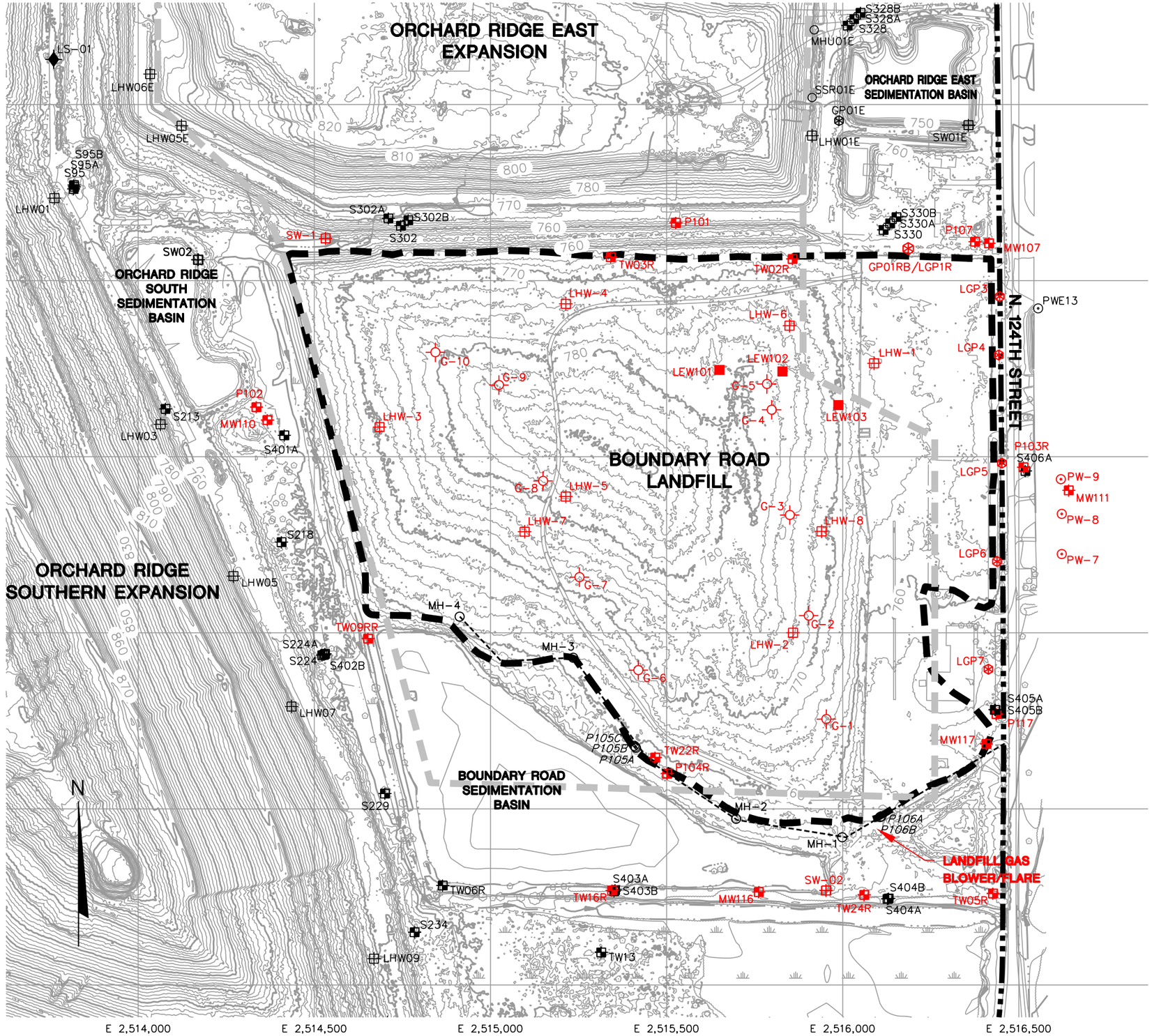
Feature Label	Feature Type	Approximate Schedule for Abandonment	Abandonment/ Removal Method
LEW103	Leachate Extr. Well	Phase 5, Module 1	Same as LEW101
Gas Extraction Wells			
G-1	Gas Extraction Well	Phase 7, Module 1	Remove with waste
G-2	Gas Extraction Well	Phase 7, Module 1	Remove with waste
G-3	Gas Extraction Well	Phase 6, Module 1	Remove with waste
G-4	Gas Extraction Well	Phase 6, Module 1	Remove with waste
G-5	Gas Extraction Well	Phase 5, Module 2	Remove with waste
G-6	Gas Extraction Well	Phase 7, Module 1	Remove with waste
G-7	Gas Extraction Well	Phase 6, Module 2	Remove with waste
G-8	Gas Extraction Well	Phase 6, Module 1	Remove with waste
G-9	Gas Extraction Well	Phase 5, Module 2	Remove with waste
G-10	Gas Extraction Well	Phase 5, Module 1	Remove with waste
Gas Probes			
LGP01R	Gas Probe	Phase 5, Module 1	Not abandoned, but going forward will be monitored under the Orchard Ridge monitoring program as GP01RB
LGP3	Gas Probe	Phase 5, Module 2	Overdrill and remove
LGP4	Gas Probe	Phase 5, Module 2	Overdrill and remove
LGP5	Gas Probe	Phase 6, Module 2	Overdrill and remove
LGP6	Gas Probe	Phase 6, Module 2	Overdrill and remove
LGP7	Gas Probe	Phase 7, Module 1	Overdrill and remove

Table 4. Post-Waste Removal Monitoring Locations and Frequency

Monitoring Location	Frequency	Parameters
MW-107 MW-110 MW-111* MW-116 MW-117* P102 P103R* P107 P117* TW-5R TW-16R * TW-24R * S-224* S-403B	Semi-Annual	Protocol 3
	Annual	Protocol 1
PW-7* PW-8* PW-9*	Annual	Protocols 1, 2, and 3

Notes: * indicates well will also be sampled under the approved monitoring program for Orchard Ridge RDF East Expansion.

Figures



LEGEND

- PROPERTY LINE (WMWI)
- APPROXIMATE BOUNDARY ROAD LANDFILL LIMITS OF WASTE
- APPROVED EAST EXPANSION LIMITS OF WASTE
- EXISTING CONTOUR (2' INTERVAL)
- EXISTING CONTOUR (10' INTERVAL)
- EXISTING SPOT ELEVATION
- EXISTING TREE/TREELINE
- EXISTING FENCE
- EXISTING EDGE OF WATER/CREEK
- APPROXIMATE WETLAND LOCATION
- EXISTING CULVERT
- EXISTING LEACHATE FORCEMAIN
- EXISTING LEACHATE COLLECTION TRENCH/SLURRY WALL
- TW02R — EXISTING MONITORING WELL
- MH-3 — EXISTING MANHOLE
- LHW-8 — EXISTING LEACHATE HEADWELL
- LEW103 — EXISTING LEACHATE EXTRACTION WELL
- G-7 — EXISTING GAS EXTRACTION WELL
- LGP1 — EXISTING GAS PROBE
- PWE13 — EXISTING PRIVATE WATER SUPPLY WELL
- SW01E — EXISTING SURFACE WATER MONITORING POINT

RED SYMBOLS ARE MONITORING POINTS IN APPROVED BOUNDARY ROAD LANDFILL MONITORING PROGRAM.

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL SURVEY PREFORMED BY TETRA TECH ON MAY 31, 2022.
2. TOPOGRAPHIC CONTOUR INTERVAL IS TWO FEET.
3. ELEVATIONS ARE BASED ON U.S.G.S. MEAN SEA LEVEL DATUM.
4. GRID BASED ON WISCONSIN STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (NAD27).
5. MONITORING POINT LOCATIONS ARE APPROXIMATE.

300 0 300

SCALE: 1" = 300'

MONITORING LOCATIONS

LTSAP MODIFICATION
BOUNDARY ROAD LANDFILL
WAUKESHA COUNTY, WISCONSIN

SITE

WASTE MANAGEMENT OF WISCONSIN, INC.

CLIENT

FIGURE 1

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

ENGINEER

DRAWN BY:	KP	CHECKED BY:	SCC
PROJECT NO.	25222265.00	DATE:	03/07/2023
DRAWN:		DATE:	03/10/2023
REVISED:		APPROVED BY:	SCC 04/10/2023

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ORCHARD RIDGE EAST EXPANSION

ORCHARD RIDGE EAST SEDIMENTATION BASIN

PHASE 5 MODULE 1

PHASE 5 MODULE 2

PHASE 6 MODULE 1

PHASE 6 MODULE 2

ORCHARD RIDGE EAST EXPANSION SOUTHERN UNIT

PHASE 7 MODULE 1

PHASE 7 MODULE 2

ORCHARD RIDGE SOUTH SEDIMENTATION BASIN

ORCHARD RIDGE SOUTHERN EXPANSION

BOUNDARY ROAD SEDIMENTATION BASIN

N. 124TH STREET

LANDFILL GAS BLOWER/FLARE

LS-01, LHW06E, LHW05E, S95B, S95A, S95, LHW01, SW-1, S302A, S302B, S302, P101, SW02, TW03R, TW02R, GP01RB, LHW-4, LHW-6, LHW-1, LGP3, LGP4, LGP5, LGP6, LGP7, PWE13, C-10, G-9, G-5, G-4, LEW102, LEW101, LEW103, LHW-3, P102, MW110, S213, LHW03, S401A, P103R, S406A, PW-9, MW111, PW-8, PW-7, G-8, LHW-5, G-3, LHW-7, LHW-8, S218, LHW05, G-7, MH-3, TW09RR, S224A, S224, S402B, LHW07, G-2, LHW-2, G-6, G-1, P105C, P105B, P105A, TW22, P104R, S229, MH-2, P106A, P106B, MH-1, TW06R, S403A, S403B, TW16R, MW116, SW-02, TW24R, S404B, S404A, TW05R, S234, LHW09, TW13, MHU01E, S328B, S328A, S328, SSR01E, GP01E, LHW01E, SW01E, S330B, S330A, S330, P107, MW107, S405A, S405B, P117, MW117

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LEGEND

- PROPERTY LINE (WMWI)
- APPROVED EAST EXPANSION LIMITS OF WASTE
- APPROVED EAST EXPANSION PHASE LIMITS
- APPROXIMATE BOUNDARY ROAD LANDFILL LIMITS OF WASTE
- EXISTING CONTOUR (2' INTERVAL)
- EXISTING CONTOUR (10' INTERVAL)
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- LGP1 EXISTING GAS PROBE
- PWE13 EXISTING PRIVATE WATER SUPPLY WELL
- SW01E EXISTING SURFACE WATER MONITORING POINT

RED SYMBOLS ARE MONITORING POINTS IN PROPOSED POST-WASTE REMOVAL BOUNDARY ROAD LANDFILL MONITORING PROGRAM.

GREEN SYMBOLS ARE BOUNDARY ROAD MONITORING POINTS ABANDONED DURING WASTE REMOVAL AND SITE CONSTRUCTION.

NOTES

1. SEE FIGURE 1, MONITORING LOCATIONS, FOR SITE PLAN BASE MAP NOTES.

300 0 300

SCALE: 1" = 300'

I:\25222265.00\Drawings\LTSAP Mod\Future Monitoring Points.dwg, 4/10/2023 4:14:10 PM

FUTURE MONITORING LOCATIONS

SITE

LTSAP MODIFICATION
BOUNDARY ROAD LANDFILL
WAUKESHA COUNTY, WISCONSIN

CLIENT

WASTE MANAGEMENT OF WISCONSIN, INC.

FIGURE 2

ENGINEER

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

PROJECT NO.	25222265.00	DRAWN BY:	KP
DRAWN:	03/07/2023	CHECKED BY:	SCC
REVISED:	03/10/2023	APPROVED BY:	SCC 04/10/2023

Appendix A

Approved LTSAP Correspondence

A1 April 2014 LTSAP Approval Letter

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
Plymouth Service Center
1155 Pilgrim Road
Plymouth WI 53073

Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

WISCONSIN
DEPT. OF NATURAL RESOURCES

April 2, 2014

Mr. Lawrence Buechel
Waste Management of Wisconsin, Inc.
Closed Sites Management Group
W124 N9355 Boundary Road
Menomonee Falls WI 53051

Subject: Proposed Modification to Long-Term Sampling and Analysis Plan – Boundary Road Landfill

Dear Mr. Buechel:

I have reviewed your request for modifications to the Boundary Road Landfill, Long-Term Sampling and Analysis Plan which was contained in a report entitled "Proposed Modification to the Long-Term Sampling and Analysis Plan – Boundary Road Landfill, October 2013". The Department's authority to grant modifications to the plan is contained in Section VIII, 8, i, The Selected Remedy, of the EPA Superfund Record of Decision: Lauer I (aka) Boundary Road Sanitary Landfill,(ROD).

The proposed changes are in keeping with the intent of the monitoring plan required by the ROD, which is to monitor the protectiveness of the remedy and are therefore approved. The modifications can be implemented at your earliest convenience. Submittal of sampling results to the GEMS database is still required; your cover letter should reference the approved modifications.

If you have any questions please call me at 920-893-8528.

Sincerely,

Thomas A. Wentland
Remediation and Redevelopment Section

A2 October 2013 Proposed Modification to the LTSAP

WASTE MANAGEMENT

WASTE MANAGEMENT
Closed Sites Management Group
W124N9355 Boundary Road
Menomonee Falls, WI 53051
(262) 253-8626
(262) 255-3798 Fax

October 22, 2013

Mr. Thomas Wentland
Wisconsin Department of Natural Resources
Southeast Region - Plymouth Service Center
1155 Pilgrim Road
Plymouth, WI 53073-4294

RE: Proposed Modification to Long-Term Sampling and Analysis Plan (LTSAP)
Boundary Road Landfill
Menomonee Falls, Wisconsin
WID058735994

Dear Mr. Wentland:

Section IX - Recommendations and Follow-Up Actions, of the Third Five-Year Review Report for the Boundary Road Landfill Superfund Site (September 2012) includes a recommendation that a proposal be developed for optimization of the facility's groundwater monitoring program. Based on that recommendation, Waste Management of Wisconsin, Inc. (WMWI) hereby submits two copies of the enclosed document entitled "Proposed Modification to the Long-Term Sampling and Analysis Plan - Boundary Road Landfill, October 2013". This proposed modification has been prepared on behalf of WMWI by TRC Environmental Corporation. The modifications contained in the enclosed document include proposed changes to monitoring locations, testing frequency, and analytical parameters contained in the current LTSAP. These modifications are discussed in detail in the attached proposal.

WMWI requests your review and approval of these proposed modifications. During your review, if you have any questions or are in need of any additional information, please do not hesitate to contact me at (262) 509-5639.

Sincerely,

Waste Management of Wisconsin, Inc.

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Enclosures

c: Boundary Road Masterfile
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Proposed Modification to the Long-Term Sampling and Analysis Plan

Boundary Road Landfill
Menomonee Falls, Wisconsin

October 2013

Prepared For
Waste Management of Wisconsin, Inc.

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Section 1
Introduction

From June 20, 2012 through September 20, 2012, the Wisconsin Department of Natural Resources (WDNR), in consultation with Region 5 of the United States Environmental Protection Agency (U.S. EPA), conducted the Third Five-Year Review of the remedy at the Boundary Road Landfill in Menomonee Falls, Wisconsin. The review examined significant site developments over the past five years which included: operation and maintenance of a groundwater cut-off slurry wall, a landfill final cover, a leachate collection system, a landfill gas extraction system, access control features; monitoring of groundwater, surface water, leachate and landfill gas; and the filing of necessary deed instruments to recognize the risk posed by the waste material left on site.

The conclusion of the Five-year Review Report (5YRR) as stated in the Technical Assessment Summary was as follows:

> "According to the data reviewed, the site inspection, and the interviews, the remedy is functioning as intended by the ROD [Record of Decision]. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. Most groundwater cleanup goals, identified as ARARs [Applicable or Relevant and Appropriate Requirements] in the ROD, have already been met; groundwater quality sampling results show only limited exceedences of WAC [Wisconsin Administrative Code] NR 140 water quality standards. Continued implementation of the selected remedy at the site is expected to result in eventually achieving those standards. There is no other information that calls into question the protectiveness of the remedy."

One issue, the incomplete Institutional Control (IC) Plan, was identified in the Third 5YRR as potentially affecting the future protectiveness of the remedy; however, completion of the IC Plan falls under the responsibility of the WDNR and U.S. EPA.

As part of the "Recommendations and Follow-Up Actions" contained in the Third 5YRR, the WDNR recommended that Waste Management Wisconsin Inc. (WMWI) review and optimize the current long-term groundwater monitoring plan for the future sampling to be conducted at the site. As stated in the ROD (USEPA, 1996), the department may approve revisions to the monitoring frequency and the parameters to be sampled for during the implementation of the remedy without a revision to the decision document itself. Therefore, TRC, Inc. (TRC), on

behalf of WMWI, is submitting this request to modify the groundwater, surface water, and leachate monitoring programs for the Boundary Road Landfill.

Specifically, the following four changes are being proposed to the existing Long-Term Sampling and Analysis Plan (LTSAP):

- The current monitoring plan contains the analysis of groundwater, surface water, and leachate samples for parameters that have not (or rarely) been detected to date or are naturally occurring and provide little value to assess the remedy's protectiveness of human health and the environment. Therefore, WMWI is proposing to remove these parameters from the monitoring program.
- The current monitoring program contains several groundwater monitoring locations where the monitoring results for the past five years do not indicate that the groundwater in that area is impacted by the landfill and provide little value to the assessment of the remedy's protectiveness of human health and the environment. Therefore, WMWI is proposing to remove these sampling points from the monitoring program.
- Several monitoring locations are currently monitored on a quarterly or semi-annual basis for indicator parameters and liquid elevations. An analysis of the historical data suggests that the current sampling frequency does not provide significant value. Therefore, WMWI is proposing to reduce the frequency of sampling for these parameters and elevations.
- The current groundwater monitoring program for the Boundary Road Landfill represents one of four monitoring programs at the WMWI Landfill Complex (Complex) in Germantown/Menomonee Falls, WI. The facilities within the Complex include the Boundary Road Landfill, the Omega Hills Landfill, the Parkview Recycling and Disposal Facility (RDF), and the Orchard Ridge RDF. Therefore, it is appropriate to implement a groundwater monitoring plan for the Boundary Road Landfill that is more consistent with the other landfills (e.g. consistent parameter lists, detection limits, sampling frequencies, and monitoring schedules) for a comprehensive and complete assessment of the water quality in the area of the Complex.

The following text discusses how we evaluated the current LTSAP, our findings, and conclusions.

Section 2
Scope/Methodology

To determine what parameters could be eliminated from the monitoring program, each set of parameters, grouped by testing method, was analyzed for the frequency of detections, frequency of exceedences of the WAC NR 140 water quality standards, and the value to the analysis of the effectiveness of the remedy. If it was found that a group of parameters was not providing data used to assess the remedy, the group of parameters was considered for removal from the monitoring program.

To determine whether monitoring locations provided value to the monitoring plan, each groundwater, surface water and leachate monitoring location was analyzed for the frequency and significance of the detection(s) of volatile organic compounds (VOCs). If limited VOC detections were observed at a monitoring location and the sample point was not considered integral for the remedy's assessment, the monitoring location was considered for removal from the monitoring program.

Various sampling locations and parameters are sampled on a quarterly or semi-annual basis. To determine whether the monitoring frequency provided value to the monitoring plan, figures were created to compare all of the collected data at each monitoring location to the hypothetical trend line if the sampling had occurred on a less frequent basis. If it was determined that the less inclusive data set's trend line was a sufficient representation of the complete data set, reduction of the monitoring frequency was considered.

Any potential changes to the plan were then analyzed against historical data and site conditions to ensure that ability to assess the remedy will not be compromised. No revisions to the monitoring plan were proposed if it was determined that the change would affect the ability to confirm that the site continues to be protective of human health and the environment.

TRC and WMWI lastly conducted a comparison of the Boundary Road Landfill monitoring plan to the other monitoring plans in the Complex (primarily Orchard Ridge RDF), to identify what changes could to be made to the Boundary Road Landfill LTSAP to make it more consistent with the other monitoring plans within the Complex.

Section 3
Findings

The current LTSAP is outlined in Tables 1-3. Table 1 is a list of the current parameters that are being monitored for in the groundwater, leachate, and surface water at the Boundary Road Landfill. Table 2 is a list of the groundwater, leachate, and surface water monitoring locations and Table 3 summarizes the current testing frequency. The following sections outline the proposed modifications to the parameter list, monitoring locations, and testing schedule at the Boundary Road Landfill.

3.1 Parameter List

Currently, the groundwater and leachate are being sampled for 9 metal parameters (aluminum, antimony, arsenic, barium, cadmium, chromium, iron, manganese, selenium). Due to naturally occurring levels around the site, metals including arsenic and iron are commonly detected in the groundwater monitoring wells (including the up-gradient wells) at the site but are also regularly detected across southern Wisconsin. Other metals including aluminum, antimony, barium, cadmium, chromium and selenium are detected in groundwater at the site, but are typically flagged as unquantifiable and detected at concentrations well below the NR 140 Enforcement Standards (ES) values (Refer to Appendix A).

Historically, this group of metals has not been used to assess the remedy at the facility since they are poor indicators of landfill related impacts. These parameters have a propensity to precipitate out of the groundwater and are typically immobile due to redox reactions in the geologic formation. Therefore, removing these parameters from the LTSAP for the 18 groundwater monitoring wells is not expected to impact the ability to assess the remedy's protectiveness of human health and the environment.

The leachate is currently being monitored for 7 additional metals (copper, cyanide, lead, mercury, nickel, silver, and zinc), which were originally included as part of the monitoring plan to assess the leachate's continuing acceptability for discharge to a municipal waste water treatment plant. WMWI is currently testing for these parameters at another location at the Complex, which combines the leachate from Orchard Ridge RDF to that of the Boundary Road Landfill for disposal at the municipal waste water treatment plant. Testing at the leachate monitoring point for the last 5 years indicates that the leachate at the Boundary Road Landfill is well below the discharge regulations of the Milwaukee Metropolitan Sewer District (refer to Table 5). Therefore, testing for these parameters in the Boundary Road Landfill leachate and at another location at the Complex is redundant and the Boundary Road Landfill leachate

monitoring can be removed from the LTSAP without compromising the ability to assess the remedy's protectiveness of human health and the environment.

The surface water sampling currently takes place annually at two locations in the ditch that runs from the northeastern corner of the site to the southern perimeter of the landfill (Refer to Appendix B). During the 5-year monitoring period from 2007 to 2012, nine (9) SVOCs were detected at the upstream surface water sampling point, but not at the downstream location. During this same period, 4 SVOC parameters were detected in both the upstream and downstream surface water samples. In only one instance was the concentration of any SVOC higher downstream than upstream and the parameter (bis(2-ethylhexyl)phthalate) was flagged by the laboratory as being found in the method blank. The fact that there were no SVOC parameters detected at the downstream location that were not detected at the upstream location clearly demonstrates that the presence of SVOCs is not a result of the Boundary Road Landfill. Therefore, SVOCs are not an integral part of the LTSAP at the Boundary Road Landfill and can be removed from the surface water monitoring program without compromising the ability to assess the remedy's protectiveness of human health and the environment.

Currently, the groundwater, leachate, and surface water are being sampled for 43 volatile organic compounds (VOC) parameters at the Boundary Road Landfill. The data indicates that even the most persistent VOC parameters at the site (THF and benzene) are typically below the NR 140 ESs and PALs and trending downward (Refer to Appendix A). However, to remain consistent with the other monitoring programs in the Complex, WMWI proposed to add nine additional VOC parameters to the Boundary Road Landfill LTSAP (Refer to Table 4). Additionally, methods and reporting limits for the VOC parameters have evolved since the LTSAP was approved. Therefore, an update to the reporting limits for those monitoring parameters is also presented in Table 4.

The groundwater and leachate monitoring points are currently sampled for chloride, sulfate, alkalinity, conductivity, pH, and temperature. Reviews of historical monitoring results indicate that dissolved sulfate and chloride may potentially be increasing in concentration over time at certain wells at the site (MW-117, MW-116, P102, TW-9RR, TW-16R); however, the increasing concentrations are either typically below the NR 140 ESs or above the levels observed in the leachate samples (refer to Appendices A and D). The cause for the possible increasing trends is unclear; therefore all the current indicator parameters will continue to be monitored at the site. Additionally, to make the LTSAP consistent with the other monitoring plans at the Complex, several parameters (boron, hardness, sodium and fluoride) are proposed to be added to the Boundary Road Landfill LTSAP (Refer to Table 4).

3.2 Sampling Locations

Currently, there are 27 sampling locations at the site (21 groundwater monitoring wells, 3 private wells, 1 leachate sampling location, 2 surface monitoring locations.) In May 2012, one private well, PW-10 was abandoned and therefore should be removed from the monitoring program. Refer to Appendix C for the abandonment log.

Based on a review of the sampling locations, nine groundwater monitoring wells (MW-108, TW-8R, TW-6R, TW-16R, MW-107, TW-5R, P102, P101, and P117) have had no or limited (less than 2) VOC detections over the past 5-year review period (Refer to Table 2). Of these wells, three monitoring wells (TW-8R, TW-6R and P117) have had no VOC detections over the past 5-year review period. Monitoring well P-117 was determined to be necessary for the assessment of the deep groundwater at the site. Monitoring wells TW-6R and TW-8R are shallow wells that are side gradient to the Boundary Road Landfill and do not show signs of landfill related impacts. Therefore, monitoring wells TW-6R and TW-8R are not considered to be an integral part of the LTSAP at the Boundary Road Landfill and can be removed from the groundwater monitoring program without compromising the ability to assess the remedy's protectiveness of human health and the environment.

Over the past 5-year review period, only one VOC detection has occurred at MW-108. The detection of 1,4-Dichlorobenzene (0.3 µg/l), occurred during the 2009 monitoring event and was flagged as unquantifiable. In addition, concentrations of indicator parameters at MW-108 have been below the NR 140 Preventative Action Limits (PALs) and have been relatively steady over the 5-year review period (refer to Appendix D). Therefore, monitoring well MW-108 is not considered an integral part of the LTSAP at the Boundary Road Landfill and can be removed from the groundwater monitoring program without compromising the ability to assess remedy's protectiveness of human health and the environment.

3.3 Sampling Frequency and Schedule

Currently the private wells, groundwater monitoring wells, and leachate are sampled for VOC parameters annually during the month of June. In addition, three of the monitoring wells (MW-116, TW-05R, TW-24R) are also sampled in December due to their location relative to known VOC presence. Of the three wells that are sampled semi-annually, TW-05R and MW-116 have had limited VOC detections since 2007 (refer to Table 2). At TW-24R, there have been detections of benzene, chloroethane, and tetrahydrofuron; however, concentrations have been trending downward since 2007. In the most recent monitoring event evaluated (December 2012), there was only one VOC detection at TW-24R (chloroethane at 0.44 µg/l), which was well below the NR 140 PAL (80 µg/l) and flagged as unquantifiable by the laboratory. With a functioning remedy and limited detections of VOCs at MW-116, TW-05R, and TW-24R during

the most recent monitoring events, annual sampling for VOC parameters at these wells will not affect the ability to assess the remedy's protectiveness of human health and the environment.

In addition, to remain consistent with the other sites in the Complex and allow a more comparable data set, we are proposing to conduct the annual sampling at the Boundary Road Landfill in September rather than in June.

Groundwater monitoring wells are currently sampled quarterly for indicator and field parameters. A comparison of quarterly data with semi-annual data is included in Appendix D. The semi-annual sampling graph does not display the data for June and December monitoring events and presents the hypothetical trend if sampling had occurred on a semi-annual basis. This comparison indicates that switching from quarterly to semi-annual sampling for the indicator parameters does not significantly alter the observed trends in the groundwater quality at the site. Occasionally, peak concentrations are not captured by the semi-annual monitoring; however, the overall trend was not lost. Therefore, performing quarterly monitoring of the indicator parameters is not an integral part of the LTSAP at the Boundary Road Landfill and thus semi-annual monitoring of these parameters in the months of March and September can be done without compromising the ability to assess the remedy's protectiveness of human health and the environment.

The leachate is currently monitored on a quarterly basis for indicator and field parameters. A similar analysis of monitoring frequency, as described above, indicates that significant data will not be lost by monitoring annually in September (Refer to Appendix D). Over the past 5-year period, the chloride concentrations fluctuated between approximately 600 mg/L and 1,100 mg/L and exhibit a stable or decreasing trend. Similarly, the sulfate concentrations fluctuated between approximately 20 and 60 mg/L and exhibit a stable or decreasing trend as well. Considering the concentrations of the primary indicator parameters used for assessing the remedy are relatively steady, performing annual monitoring of the leachate can be done without compromising the ability to assess the remedy's protectiveness of human health and the environment.

Groundwater elevations and leachate head levels are also obtained on a quarterly basis at the Boundary Road Landfill. A review of several wells indicates that if liquid levels were obtained semi-annually verses quarterly significant information will not be lost (Refer to Appendix E). Generally, the highest groundwater or leachate elevation occurs in June, which would not be captured if sampling is reduced to semi-annual frequency; however, at this time there is not a reason to require the documentation of the seasonal high groundwater elevation. Therefore, performing quarterly monitoring of the groundwater elevations is not an integral part of the LTSAP at the Boundary Road Landfill and thus semi-annual monitoring in the months of March and September can be done without compromising the ability to assess the remedy's protectiveness of human health and the environment.

Section 4
Conclusions

Based on the above findings, the proposed LTSAP for the Boundary Road Landfill is summarized in Table 4 and 6. The proposed changes include the following:

- discontinuing sampling of 9 metal parameters at the groundwater monitoring wells,
- discontinuing sampling of 7 metal parameters at the leachate monitoring point,
- discontinuing analysis of SVOCs at the surface water monitoring points,
- adding 9 VOC parameters to the groundwater, leachate, and surface water sampling plans and updating the reporting limits and methods that are currently used by the laboratory,
- adding 4 indicator parameters to the groundwater and leachate monitoring plan,
- discontinuing groundwater sampling at TW-8R, TW-6R, and MW-108,
- conducting annual VOC sampling at MW-116, TW-05R, and TW-24 verses semi-annual sampling,
- conducting sampling for metals and field and indicator parameters at the leachate monitoring point on an annual basis verses the current quarterly basis,
- conducting the annual sampling event in the month of September versus the current sampling month of June,
- conducting the groundwater sampling for indicator parameters, groundwater elevation, and leachate elevation on a semi-annual basis versus the current quarterly basis,
- conducting the semi-annual sampling in the months of March and September verses June and December.

The Third 5YRR for the Boundary Road Landfill, states that the remedy is functioning as intended by the ROD and these proposed modifications are not expected to affect the continued ability to assess the protectiveness of the Remedy of human health and the environment. The data supporting these proposed revisions to the parameter list, monitoring locations, and the sampling frequency are located in quarterly environmental data submittals for the Boundary Road landfill during the years 2007 through 2012; in the tables referenced herein; and the Attachments. Furthermore, the modifications would be most advantageous if they are implemented before the December 2013 monitoring event is scheduled to occur.

Table 1
Current Monitoring Parameters
Boundary Road Landfill
Menomonee Falls, Wisconsin

PROTOCOL 1: Volatile Organic Compounds, *Method 8260 (Target Reporting Limit)*					
1,1,1- Trichloroethane	*(5 ug/l)*	Bromoform	*(5 ug/l)*	Methyl tert-butyl ether	*(5 ug/l)*
1,1,2,2-Tetrachloroethane	*(5 ug/l)*	Bromomethane	*(10 ug/l)*	Methylene Bromide	*(5 ug/l)*
1,1,2-Trichloroethane	*(5 ug/l)*	Carbon Disulfide	*(5 ug/l)*	Methylene Chloride	*(5 ug/l)*
1,1-Dichloroethane	*(5 ug/l)*	Carbon Tetrachloride	*(5 ug/l)*	Naphthalene	*(10 ug/l)*
1,1-Dichloroethene	*(5 ug/l)*	Chlorobenzene	*(5 ug/l)*	Styrene	*(5 ug/l)*
1,2-Dibromo-3-chloropropane	*(5 ug/l)*	Chloroethane	*(10 ug/l)*	Tetrachloroethene	*(5 ug/l)*
1,2-Dibromoethane	*(5 ug/l)*	Chloroform	*(5 ug/l)*	Tetrahydrofuran	*(10 ug/l)*
1,2-Dichloroethane	*(5 ug/l)*	Chloromethane	*(10 ug/l)*	Toluene	*(5 ug/l)*
1,2-Dichloroethene (total)	*(10 ug/l)*	cis-1,3-Dichloropropene	*(5 ug/l)*	Trichloroethene	*(5 ug/l)*
1,2-Dichloropropane	*(5 ug/l)*	Dibromochloromethane	*(5 ug/l)*	Trichlorotrifluoromethane	*(10 ug/l)*
2-Butanone	*(10 ug/l)*	m-Dichlorobenzene (1,3)	*(10 ug/l)*	trans-1,3-Dichloropropene	*(5 ug/l)*
4-Methyl-2-pentanone	*(10 ug/l)*	o-Dichlorobenzene (1,2)	*(10 ug/l)*	Vinyl Chloride	*(10 ug/l)*
Acetone	*(34 ug/l)*	p-Dichlorobenzene (1,4)	*(10 ug/l)*	Xylenes, Total	*(10 ug/l)*
Benzene	*(5 ug/l)*	Dichlorodifluoromethane	*(2 ug/l)*		
Bromodichloromethane	*(5 ug/l)*	Ethylbenzene	*(5 ug/l)*		
PROTOCOL 2: Metals, *Method 6010/200.7 (Target Reporting Limit)*					
Aluminum	*(200 ug/l)*	Barium	*(200 ug/l)*	Iron	*(100 ug/l)*
Antimony	*(60 ug/l)*	Cadmium	*(5 ug/l)*	Manganese	*(15 ug/l)*
Arsenic	*(10 ug/l)*	Chromium	*(10 ug/l)*	Selenium	*(5 ug/l)*
PROTOCOL 3: Field and Indicator Parameters and *Methods* (Target Reporting Limit)					
Chloride, *4110C*	*(500 ug/l)*	Conductivity (SC)		Water Level	
Sulfate, *375.2*	*(5,000 ug/l)*	pH			
Alkalinity, *2320B*	*(5,000 ug/l)*	Temperature			
PROTOCOL 4: Metals and *Methods (Reporting Limit)*					
Copper, *6010*	*(10 ug/l)*	Mercury, *7470*	*(0.2 ug/l)*	Zinc, *6010*	*(5 ug/l)*
Cyanide, *9012*	*(20 ug/l)*	Nickel, *6010*	*(12 ug/l)*		
Lead, *6010*	*(5 ug/l)*	Silver, *6010*	*(25 ug/l)*		
PROTOCOL 5: Semi-Volatile Organic Compounds, *Method 8270*					
1,2-Dichlorobenzene		4-Chloro-3-methylphenol		Dibenzofuran	
1,3-Dichlorobenzene		4-Chloroaniline		Diethylphthalate	
1,4-Dichlorobenzene		4-Chlorophenyl-phenylether		Dimethylphthalate	
2,2-oxybis(1-Chloropropane)		4-Methylphenol		Di-n-butylphthalate	
2,4,5-Trichlorophenol		4-Nitroaniline		Di-n-octylphthalate	
2,4,6-Trichlorophenol		4-Nitrophenol		Fluoranthene	
2,4-Dichlorophenol		Acenaphthene		Fluorene	
2,4-Dimethylphenol		Acenaphthylene		Hexachlorobenzene	
2,4-Dinitrophenol		Anthracene		Hexachlorobutadiene	
2,4-Dinitrotoluene		Benzo (a) anthracene		Hexachlorocyclopentadiene	
2,6-Dinitrotoluene		Benzo (a) pyrene		Hexachloroethane	
2-Chloronaphthalene		Benzo (b) fluoranthene		Indeno (1,2,3-cd) pyrene	
2-Chlorophenol		Benzo (g,h,i) perylene		Isophorone	
2-Methylnaphthalene		Benzo (k) fluoranthene		Naphthalene	
2-Methylphenol		bis (2-Chloroethoxy) methane		Nitrobenzene	
2-Nitroaniline		bis (2-Chloroethyl) ether		N-Nitroso-di-n-propylamine	
2-Nitrophenol		bis (2-Ethylhexyl) phthalate		N-Nitrosodiphenylamine (I)	
3,3'-Dichlorobenzidine		Butylbenzylphthalate		Pentachlorophenol	
3-Nitroaniline		Carbazole		Phenanthrene	
4,6-Dinitro-2-methylphenol		Chrysene		Phenol	
4-Bromophenyl-phenylether		Dibenz (a,h) anthracene		Pyrene	

Notes:
(1) Parameters and reporting limits obtained from Long-Term Sampling and Analysis Plan, 1999, by Earth Tech, Inc.

Table 2
Current Sampling Locations
Boundary Road Landfill
Menomonee Falls, Wisconsin

WELL	LOCATION	RATIONALE FOR SAMPLING [1]	NUMBER OF VOC DETECTIONS [2]
Groundwater Monitoring Wells:			
Shallow (Group A):			
MW-111	436944.83N, 2516524.84E	Shallow side/downgradient across road to E	14
MW-108	437863.05N, 2515360.13E	Shallow downgradient across railroad tracks to N	1
MW-110	437066.70N, 2514413.70E	Shallow downgradient at perimeter to W	5
TW-9RR	436570.42N, 2514640.23E	Shallow downgradient at perimeter to SW	6
TW-8R	436187N, 2514721E[3]	Shallow downgradient at perimeter to SW	0
TW-6R	435767.04N, 2514838.33E	Shallow downgradient at perimeter to S-SW	0
TW-16R	435768N, 2515345E[3]	Shallow downgradient at perimeter to S	1
MW-117	43627n, 2516436E	Shallow downgradient at perimeter to E-SE	38
MW-107	437612N, 2516406E[4]	Shallow sidegradient at perimeter to NE	1
Shallow (Group B):			
TW-24R	435736N, 2516122E[3]	Shallow downgradient to S	32
TW-5R	435736.01N, 2516439.04E	Shallow downgradient at perimeter to SE	3
MW-116	435735N, 2515869E[3]	Shallow downgradient to S	2
Shallow (Group C):			
TW-2R	437568N, 2515857E[5]	Shallow, evaluate inward gradient	NA
TW-3R	437566.4N, 2515342.7E	Shallow, evaluate inward gradient	NA
TW-22	436146N, 2515375E[5]	Shallow, evaluate inward gradient	NA
Deep (Group D):			
P102	437062.17N, 2514405.34E	Deep upgradient off-site to W	1
P104	436141.95N, 2515382.16E	Deep up/sidegradient to S	13
P101	437663.66N, 2515525.65E	Deep down/sidegradient across railroad tracks to N	1
P103/103R	436943.41N, 2516519.51E	Deep downgradient across road to E	11
P107	437616N, 2516405E[3]	Deep downgradient at perimeter to NE	10
P117	436269N, 2516436E[4]	Deep downgradient at perimeter to E-SE	0
Private Wells (Group E):			
PW-7	9050 North 124th Street	Private well, downgradient	0
PW-8	9060 North 124th Street	Private well, downgradient	1
PW-9	9100 North 124th Street	Private well, downgradient	1
PW-10[6]	W124 N9391 Boundary Road	Private well, downgradient	1
Leachate Sampling Point:			
LMP-1	At metering manhole	Collection of sample prior to discharge from system	
Leachate Head Wells:			
LHW-1	437265N, 2516089E[7]	NE portion of fill	NA
LHW-2	436500N, 2515859E[7]	SE portion of fill	NA
LHW-3	437084N, 2514685E[7]	W portion of fill	NA
LHW-4	437434N, 2515214E[7]	N portion of fill	NA
LHW-5	436887N, 2515214E[7]	Central portion of fill	NA
Surface Water Monitoring Locations:			
SW-1	437615N, 2514640E	Upstream sampling location	1
SW-2	435700N, 2516075E	Downstream sampling location	6

Notes:

(1) Shallow refers to monitoring zone in the shallow unconsolidated deposits. Deep refers to monitoring deeper unconsolidated deposits.

(2) Number of VOC detections represents the total number of VOC detections over the review period of 2007-2012.

(3) Surveyed location after well installation.

(4) Installed in December 2006.

(5) Updated surveyed location.

(6) Abandoned on May 25, 2012.

(7) Installed in April 2007.

Table 3
Current Sampling Frequency
Boundary Road Landfill
Menomonee Falls, Wisconsin

Group A and Group D - Groundwater Wells	Quarterly	Protocol 3
	Annual	Protocol 1
	Annual	Protocol 2
Group B - Groundwater Wells	Quarterly	Protocol 3
	Semi-Annual	Protocol 1
	Annual	Protocol 2
Group E - Groundwater Wells	Annual	Protocols 1, 2, and 3
Group C - Groundwater Wells	Quarterly	Water Levels Only
Leachate (LMP-I)	Quarterly	Protocol 2, 3, and 4
	Annual	Protocol 1
Leachate Head Wells	Quarterly	Leachate levels only
Surface Water Monitoring Locations	Annual	Protocol 1, 5

Table 4
Proposed Monitoring Parameters
Boundary Road Landfill
Menomonee Falls, Wisconsin

PROTOCOL 1: Volatile Organic Compounds, *Method 8260B (Target Reporting Limit)*					
1,1,1,2-Tetrachloroethane	***(1 ug/l)***	**Bromochloromethane**	***(1 ug/l)***	Methylene Chloride	*(1 ug/l)*
1,1,1- Trichloroethane	*(1ug/l)*	Bromodichloromethane	*(1 ug/l)*	Naphthalene	*(1 ug/l)*
1,1,2,2-Tetrachloroethane	*(1 ug/l)*	Bromoform	*(1 ug/l)*	Styrene	*(1 ug/l)*
1,1,2-Trichloroethane	*(1 ug/l)*	Bromomethane	*(1 ug/l)*	Tetrachloroethene	*(1 ug/l)*
1,2,3-Trichloropropane	***(1 ug/l)***	Carbon Disulfide	*(1 ug/l)*	Tetrahydrofuran	*(5 ug/l)*
1,1-Dichloroethane	*(1 ug/l)*	Carbon Tetrachloride	*(1 ug/l)*	Toluene	*(1 ug/l)*
1,1-Dichloroethene	*(1 ug/l)*	Chlorobenzene	*(1 ug/l)*	Trichloroethene	*(1 ug/l)*
1,2-Dibromo-3-chloropropane	*(1 ug/l)*	Chloroethane	*(1ug/l)*	Trichlorotrifluoromethane	*(1 ug/l)*
1,2-Dibromoethane	*(1 ug/l)*	Chloroform	*(1 ug/l)*	**trans-1,2-Dichloro-2-Butene**	***(5 ug/l)***
1,2-Dichloroethane	*(1 ug/l)*	Chloromethane	*(1 ug/l)*	**trans-1,2-Dichloroethene**	***(1 ug/l)***
~~1,2-Dichloroethene (total)~~ [1]	~~*(ug/l)*~~	**cis-1,2-Dichloroethene**	***(1 ug/l)***	trans-1,3-Dichloropropene	*(1 ug/l)*
1,2-Dichloropropane	*(1 ug/l)*	cis-1,3-Dichloropropene	*(1 ug/l)*	Vinyl Chloride	*(1 ug/l)*
2-Butanone	*(10 ug/l)*	Dibromochloromethane	*(4 ug/l)*	**Vinyl Acetate**	***(5 ug/l)***
2-Hexanone	***(5ug/l)***	m-Dichlorobenzene (1,3)	*(1 ug/l)*	Xylene, Total	*(2 ug/l)*
4-Methyl-2-pentanone	*(5 ug/l)*	o-Dichlorobenzene (1,2)	*(1 ug/l)*		
Acetone	*(10 ug/l)*	p-Dichlorobenzene (1,4)	*(1 ug/l)*		
Acrolein	***(20 ug/l)***	Dichlorodifluoromethane	*(1 ug/l)*		
Acrylonitrile	***(5 ug/l)***	Ehylbenzene	*(1 ug/l)*		
Benzene	*(1 ug/l)*	**Iodomethane**	***(1 ug/l)***		
		Methyl tert-butyl ether	*(1 ug/l)*		
		Methylene Bromide	*(1 ug/l)*		
PROTOCOL 2: Metals and *Methods (Target Reporting Limit)*					
Aluminum, *6010*	*(200 ug/l)*	Barium, *6010*	*(200 ug/l)*	Iron, *6010*	*(100 ug/l)*
Antimony, *6020*	*(0.5 ug/l)*	Cadmium, *6020*	*(0.2 ug/l)*	Manganese, *6010*	*(15 ug/l)*
Arsenic, *6020*	*(1 ug/l)*	Chromium, *6010*	*(10 ug/l)*	Selenium, *6020*	*(1 ug/l)*
PROTOCOL 3: Field and Indicator Parameters and *Methods (Target Reporting Limit)*					
Boron, *6010B*	*(10 ug/l)*	**Sodium, *6010B***	*(1,000 ug/l)*	Conductivity (SC)	
Chloride, *SM4110B*	*(500 ug/l)*	Alkalinity, *310.2*	*(10,000 ug/l)*	Temperature	
Fluoride, *300.0_28D*	*(250 ug/l)*	Water Level		**Hardness**	
Sulfate, *SM4110B*	*(2,000 ug/l)*	pH			

Notes:

BOLD = Proposed parameter addition

[1] Methods and reporting limited obtained from Test America, Inc. 3/1/2013.

Table 5
Milwaukee Metropolitan Sewer District (MMSD) Discharge Regulations
Boundary Road Landfill
Menomonee Falls, Wisconsin

PARAMETER	LIMIT (mg/L)	MAX. CONCENTRATION 2007-2012 (mg/L)
Copper, total	6	0.0138
Cyanide, total	2.9	0.012
Lead, total	2	0.0115
Mercury, total	0.0026	ND
Nickel, total	4	0.0413
Silver, total	5.8	0.0011
Zinc, total	8	0.0296

Notes:

(1) Discharge regulations obtained from Chapter 11 of the MMSD Rules accessed from the Village of Germantown, WI's web site at http://www.village.germantown.wi.us/Index.aspx?NID=266

Table 6
Proposed Monitoring Locations and Frequency
Boundary Road Landfill
Menomonee Falls, Wisconsin

MONITORING LOCATION		FREQUENCY	PARAMETERS
MW-111	MW-116	Semi -Annual	Protocol 3
MW-110	P102		
TW-9RR	P104		
TW-16R	P101		
MW-117	P103/103R	Annual	Protocol 1
MW-107	P107		
TW-24R	P117		
TW-5R			
TW-2R		Semi- Annual	Groundwater Levels Only
TW-3R			
TW-22R			
PW-7		Annual	Protocol 1,2, and 3
PW-8			
PW-9			
Leachate Monitoring Point (LMP-1)		Annual	Protocol 1,2 and 3
Leachate Head Wells (LH1-LH-5)		Semi-Annual	Leachate Levels Only
Surface Water Monitoring Points (SW-1, SW-2)		Annual	Protocol 1

Appendix A
2007 – 2012 Exceedence Report

PARAMETERS THAT EXCEED CURRENT NR140 STANDARDS
BOUNDARY ROAD LANDFILL
MENOMONEE FALLS, WISCONSIN
2007 - 2012

CHEMICAL PARAMETER	UNITS	NR140 PAL	NR140 ES	WELL ID	DATE	RESULT	DATA FLAGS	EXCEEDANCE
1,1-DICHLOROETHENE	UG/L	0.7	7	MW-117	6/13/2007	2	J	PAL
				MW-117	6/8/2009	1.2	J	PAL
				MW-117	6/3/2010	1.5	J	PAL
1,2-DICHLOROETHANE	UG/L	0.5	5	MW-117	6/8/2009	0.94	J	PAL
				MW-117	6/3/2010	1.3	J	PAL
ALUMINUM, DISSOLVED	UG/L	40	200	MW-107	6/8/2009	48	J	PAL
				MW-107	6/3/2010	48	B	PAL
				MW-108	6/13/2007	40.1	J	PAL
				MW-108	6/16/2008	62.8	J	PAL
				MW-108	6/15/2009	185		PAL
				MW-108	6/3/2010	103	B	PAL
				MW-108	6/7/2011	83.6	B	PAL
				MW-110	6/8/2009	42	J	PAL
				MW-110	6/3/2010	69	B	PAL
				MW-111	6/8/2009	55	J	PAL
				MW-111	6/3/2010	99	B	PAL
				MW-116	6/8/2009	91	J	PAL
				MW-116	6/3/2010	82	B	PAL
				MW-117	6/16/2008	77.8	J	PAL
				MW-117	6/8/2009	71	J	PAL
				MW-117	6/3/2010	67	B	PAL
				P101	6/15/2009	128	B	PAL
				P101	6/3/2010	143	B	PAL
				P102	6/8/2009	45	J	PAL
				P102	6/3/2010	79	B	PAL
				P103R	6/8/2009	62	J	PAL
				P103R	6/3/2010	66	B	PAL
				P103R	6/7/2012	64.2	J	PAL
				P104	6/8/2009	54	J	PAL
				P104	6/3/2010	94	B	PAL
				P104	6/7/2012	130	J	PAL
				P107	6/8/2009	61	J	PAL
				P107	6/3/2010	69	B	PAL
				P117	6/8/2009	80	J	PAL
				P117	6/3/2010	75	B	PAL
				TW-05R	6/8/2009	108	J	PAL
				TW-05R	6/3/2010	542		ES
				TW-06R	6/8/2009	70	J	PAL
				TW-06R	6/3/2010	100	B	PAL
				TW-08R	6/8/2009	69	J	PAL
				TW-08R	6/3/2010	126	B	PAL
				TW-09RR	6/8/2009	65	J	PAL
				TW-09RR	6/3/2010	127	B	PAL
				TW-16R	6/13/2007	62.2	J	PAL
				TW-16R	6/8/2009	73	J	PAL
				TW-16R	6/3/2010	112	B	PAL

PARAMETERS THAT EXCEED CURRENT NR140 STANDARDS
BOUNDARY ROAD LANDFILL
MENOMONEE FALLS, WISCONSIN
2007 - 2012

CHEMICAL PARAMETER	UNITS	NR140 PAL	NR140 ES	WELL ID	DATE	RESULT	DATA FLAGS	EXCEEDANCE
ALUMINUM, DISSOLVED	UG/L	40	200	TW-16R	6/7/2011	72.2	B	PAL
				TW-24R	6/13/2007	42.1	J	PAL
				TW-24R	6/8/2009	67	J	PAL
				TW-24R	6/3/2010	90	B	PAL
				TW-24R	6/7/2012	60.9	J	PAL
ALUMINUM, TOTAL	UG/L	40	200	PW-07	6/10/2010	62	J	PAL
				PW-08	6/10/2010	58	J	PAL
				PW-09	6/10/2010	45	J	PAL
				PW-10	6/18/2007	367		ES
				PW-10	6/10/2010	150	J	PAL
ANTIMONY, DISSOLVED	UG/L	1.2	6	MW-117	6/16/2008	1.9		PAL
ARSENIC, DISSOLVED	UG/L	1	10	MW-107	6/7/2011	1.1		PAL
				MW-107	6/7/2012	1.9		PAL
				MW-108	6/13/2007	2.8		PAL
				MW-108	6/16/2008	3.7		PAL
				MW-108	6/15/2009	3.2		PAL
				MW-108	6/3/2010	3.8		PAL
				MW-108	6/7/2011	3.8		PAL
				MW-108	6/7/2012	2.5		PAL
				MW-110	6/13/2007	4.8		PAL
				MW-110	6/17/2008	4.4		PAL
				MW-110	6/8/2009	5.4		PAL
				MW-110	6/3/2010	4.9		PAL
				MW-110	6/7/2011	5		PAL
				MW-110	6/7/2012	4.1		PAL
				MW-111	6/13/2007	8.4		PAL
				MW-111	6/16/2008	9.3		PAL
				MW-111	6/8/2009	9.1		PAL
				MW-111	6/3/2010	6.3		PAL
				MW-111	6/7/2011	8.4		PAL
				MW-111	6/7/2012	4.8		PAL
				MW-116	6/13/2007	4		PAL
				MW-116	6/17/2008	4.5		PAL
				MW-116	6/8/2009	5.2		PAL
				MW-116	6/3/2010	4.7		PAL
				MW-116	6/7/2011	3.5		PAL
				MW-116	6/7/2012	2.6		PAL
				P101	6/13/2007	3.1		PAL
				P101	6/16/2008	3.3		PAL
				P101	6/15/2009	3		PAL
				P101	6/3/2010	3.9		PAL
				P101	6/7/2011	3.8		PAL
				P101	6/7/2012	3.5		PAL
				P102	6/13/2007	4.4		PAL
				P102	6/17/2008	4.7		PAL
				P102	6/8/2009	1.7		PAL
				P102	6/3/2010	2		PAL

PARAMETERS THAT EXCEED CURRENT NR140 STANDARDS
BOUNDARY ROAD LANDFILL
MENOMONEE FALLS, WISCONSIN
2007 - 2012

CHEMICAL PARAMETER	UNITS	NR140 PAL	NR140 ES	WELL ID	DATE	RESULT	DATA FLAGS	EXCEEDANCE
ARSENIC, DISSOLVED	UG/L	1	10	P102	6/7/2011	1.6		PAL
				P102	6/7/2012	1.8		PAL
				P103	6/13/2007	14.5		ES
				P103	6/16/2008	15.1		ES
				P103R	6/8/2009	15.5		ES
				P103R	6/3/2010	15.8		ES
				P103R	6/7/2011	16.5		ES
				P103R	6/7/2012	18		ES
				P104	6/13/2007	5		PAL
				P104	6/16/2008	5		PAL
				P104	6/8/2009	5		PAL
				P104	6/3/2010	5		PAL
				P104	6/7/2011	5		PAL
				P104	6/7/2012	5.3		PAL
				P107	6/13/2007	9.2		PAL
				P107	6/16/2008	8.5		PAL
				P107	6/8/2009	8.2		PAL
				P107	6/3/2010	7		PAL
				P107	6/7/2011	8.2		PAL
				P107	6/7/2012	7.3		PAL
				P117	6/16/2008	6.8		PAL
				P117	6/8/2009	7		PAL
				P117	6/3/2010	7.1		PAL
				P117	6/7/2011	7.3		PAL
				P117	6/7/2012	7.4		PAL
				TW-05R	6/13/2007	1.2		PAL
				TW-05R	6/17/2008	1.6		PAL
				TW-05R	6/8/2009	1.6		PAL
				TW-05R	6/3/2010	1.2		PAL
				TW-05R	6/7/2011	1.5		PAL
				TW-05R	6/7/2012	1.1		PAL
				TW-06R	6/13/2007	3.3		PAL
				TW-06R	6/17/2008	4		PAL
				TW-06R	6/8/2009	3.4		PAL
				TW-06R	6/3/2010	3.5		PAL
				TW-06R	6/7/2011	3.4		PAL
				TW-06R	6/7/2012	3.6		PAL
				TW-09RR	6/13/2007	4		PAL
				TW-09RR	6/17/2008	4		PAL
				TW-09RR	6/8/2009	3.4		PAL
				TW-09RR	6/3/2010	3.9		PAL
				TW-09RR	6/7/2011	5.2		PAL
				TW-09RR	6/7/2012	4.3		PAL
				TW-16R	6/13/2007	4.3		PAL
				TW-16R	6/17/2008	4.1		PAL
				TW-16R	6/8/2009	2.6		PAL
				TW-16R	6/3/2010	2.2		PAL
				TW-16R	6/7/2011	4.3		PAL
				TW-16R	6/7/2012	2.2		PAL
				TW-24R	6/13/2007	7.1		PAL

PARAMETERS THAT EXCEED CURRENT NR140 STANDARDS
BOUNDARY ROAD LANDFILL
MENOMONEE FALLS, WISCONSIN
2007 - 2012

CHEMICAL PARAMETER	UNITS	NR140 PAL	NR140 ES	WELL ID	DATE	RESULT	DATA FLAGS	EXCEEDANCE
ARSENIC, DISSOLVED	UG/L	1	10	TW-24R	6/17/2008	6.8		PAL
				TW-24R	6/8/2009	6.4		PAL
				TW-24R	6/3/2010	4.1		PAL
				TW-24R	6/7/2011	26.7		ES
				TW-24R	6/7/2012	4.5		PAL
ARSENIC, TOTAL	UG/L	1	10	PW-07	6/13/2007	7.3		PAL
				PW-07	6/16/2008	7.2		PAL
				PW-07	6/8/2009	7.6		PAL
				PW-07	6/10/2010	7.1		PAL
				PW-07	6/7/2011	7.2		PAL
				PW-07	6/13/2012	7.1		PAL
				PW-08	6/13/2007	8.4		PAL
				PW-08	6/16/2008	7.1		PAL
				PW-08	6/8/2009	8.1		PAL
				PW-08	6/10/2010	7.5		PAL
				PW-08	6/7/2011	8.7		PAL
				PW-08	6/13/2012	7.7		PAL
				PW-09	6/13/2007	6.5		PAL
				PW-09	6/16/2008	7		PAL
				PW-09	6/8/2009	7.4		PAL
				PW-09	6/10/2010	6.1		PAL
				PW-09	6/7/2011	7.7		PAL
				PW-09	6/13/2012	8.7		PAL
				PW-10	6/18/2007	6.3		PAL
				PW-10	6/16/2008	6.3		PAL
				PW-10	6/8/2009	6.4		PAL
				PW-10	6/10/2010	6.9		PAL
				PW-10	6/7/2011	7.2		PAL
BARIUM, DISSOLVED	UG/L	400	2000	MW-111	6/13/2007	632		PAL
				MW-111	6/16/2008	606		PAL
				MW-111	6/8/2009	558		PAL
				MW-111	6/3/2010	424		PAL
				MW-111	6/7/2011	402		PAL
				MW-117	6/13/2007	420		PAL
				P103	6/13/2007	413		PAL
				P103R	6/7/2011	407		PAL
				P103R	6/7/2012	496		PAL
				P107	6/13/2007	875		PAL
				P107	6/16/2008	899		PAL
				P107	6/8/2009	918		PAL
				P107	6/3/2010	962		PAL
				P107	6/7/2011	997		PAL
				P107	6/7/2012	922		PAL
				TW-09RR	6/13/2007	865		PAL
				TW-09RR	6/17/2008	622		PAL
				TW-09RR	6/8/2009	885		PAL
				TW-09RR	6/3/2010	1180		PAL
				TW-09RR	6/7/2011	1190		PAL
				TW-09RR	6/7/2012	1310		PAL
				TW-24R	6/3/2010	469		PAL
				TW-24R	6/7/2011	402		PAL
				TW-24R	6/7/2012	428		PAL
BENZENE	UG/L	0.5	5	MW-117	6/13/2007	0.8	J	PAL
				P104	6/13/2007	2		PAL
				P104	6/8/2009	6.7		ES
				P104	6/3/2010	3.4		PAL

PARAMETERS THAT EXCEED CURRENT NR140 STANDARDS
BOUNDARY ROAD LANDFILL
MENOMONEE FALLS, WISCONSIN
2007 - 2012

CHEMICAL PARAMETER	UNITS	NR140 PAL	NR140 ES	WELL ID	DATE	RESULT	DATA FLAGS	EXCEEDANCE
BENZENE	UG/L	0.5	5	P104	6/7/2012	0.89	J	PAL
				P107	6/13/2007	24		ES
				P107	6/16/2008	25		ES
				P107	6/8/2009	19		ES
				P107	6/3/2010	17		ES
				P107	6/7/2011	20		ES
				P107	6/7/2012	16		ES
				TW-24R	6/13/2007	5	J	ES
				TW-24R	6/17/2008	1	J	PAL
				TW-24R	12/9/2008	0.9		PAL
				TW-24R	6/8/2009	1.1		PAL
				TW-24R	6/3/2010	0.96	J	PAL
				TW-24R	12/9/2010	0.51	J	PAL
				TW-24R	6/7/2011	0.86	J	PAL
				TW-24R	6/7/2012	0.98	J	PAL
BENZO(A)PYRENE	UG/L	0.02	0.2	SW-01	6/13/2007	0.2	J	ES
BENZO(B)FLUORANTHENE	UG/L	0.02	0.2	SW-01	6/13/2007	0.4	J	ES
BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	0.6	6	SW-01	6/5/2009	2.9	J	PAL
				SW-02	6/13/2007	5	B	PAL
				SW-02	6/5/2009	3.4	J	PAL
BROMODICHLOROMETHANE	UG/L	0.06	0.6	MW-117	6/16/2008	51		ES
CARBON TETRACHLORIDE	UG/L	0.5	5	MW-117	6/13/2007	2	J	PAL
				MW-117	6/16/2008	4		PAL
				MW-117	6/7/2011	0.69	J	PAL
CHLORIDE, DISSOLVED	MG/L	125	250	MW-107	3/5/2008	134		PAL
				MW-107	3/2/2009	220		PAL
				MW-107	3/3/2011	362		ES
				MW-107	3/2/2012	138		PAL
				MW-110	9/4/2012	138		PAL
				MW-111	3/7/2007	760		ES
				MW-111	6/13/2007	960		ES
				MW-111	9/11/2007	616		ES
				MW-111	12/10/2007	577		ES
				MW-111	3/5/2008	686		ES
				MW-111	6/16/2008	965		ES
				MW-111	9/2/2008	686		ES

PARAMETERS THAT EXCEED CURRENT NR140 STANDARDS
BOUNDARY ROAD LANDFILL
MENOMONEE FALLS, WISCONSIN
2007 - 2012

CHEMICAL PARAMETER	UNITS	NR140 PAL	NR140 ES	WELL ID	DATE	RESULT	DATA FLAGS	EXCEEDANCE
CHLORIDE, DISSOLVED	MG/L	125	250	MW-111	12/9/2008	630		ES
				MW-111	3/2/2009	640		ES
				MW-111	6/8/2009	900		ES
				MW-111	9/1/2009	659		ES
				MW-111	12/9/2009	661		ES
				MW-111	3/1/2010	647		ES
				MW-111	6/3/2010	623		ES
				MW-111	9/9/2010	455		ES
				MW-111	12/9/2010	512		ES
				MW-111	3/3/2011	591		ES
				MW-111	6/7/2011	599		ES
				MW-111	9/2/2011	615		ES
				MW-111	12/6/2011	503		ES
				MW-111	3/2/2012	492		ES
				MW-111	6/7/2012	436		ES
				MW-111	9/4/2012	431		ES
				MW-111	12/10/2012	487		ES
				MW-116	3/1/2010	130		PAL
				MW-116	6/7/2011	162		PAL
				MW-116	9/2/2011	159		PAL
				MW-116	12/6/2011	196		PAL
				MW-116	3/2/2012	203		PAL
				MW-116	6/7/2012	184		PAL
				MW-116	9/4/2012	176		PAL
				MW-116	12/10/2012	130		PAL
				MW-117	3/7/2007	1200		ES
				MW-117	6/13/2007	1220		ES
				MW-117	9/11/2007	987		ES
				MW-117	12/10/2007	1150		ES
				MW-117	3/5/2008	1140		ES
				MW-117	6/16/2008	1010		ES
				MW-117	9/2/2008	1160		ES
				MW-117	12/9/2008	1340		ES
				MW-117	3/2/2009	1500		ES
				MW-117	6/8/2009	1400		ES
				MW-117	9/1/2009	1530		ES
				MW-117	12/9/2009	2430		ES
				MW-117	3/1/2010	1180		ES
				MW-117	6/3/2010	1860		ES
				MW-117	9/9/2010	1160		ES
				MW-117	12/9/2010	2400		ES
				MW-117	3/3/2011	1880		ES
				MW-117	6/7/2011	1350		ES
				MW-117	9/2/2011	2330		ES
				MW-117	12/6/2011	2590		ES
				MW-117	3/2/2012	3110		ES
				MW-117	6/7/2012	1700		ES
				MW-117	9/4/2012	2730		ES
				MW-117	12/10/2012	2690		ES
				P103	3/7/2007	567		ES

PARAMETERS THAT EXCEED CURRENT NR140 STANDARDS
BOUNDARY ROAD LANDFILL
MENOMONEE FALLS, WISCONSIN
2007 - 2012

CHEMICAL PARAMETER	UNITS	NR140 PAL	NR140 ES	WELL ID	DATE	RESULT	DATA FLAGS	EXCEEDANCE
CHLORIDE, DISSOLVED	MG/L	125	250	P103	6/13/2007	642		ES
				P103	9/11/2007	488		ES
				P103	12/10/2007	528		ES
				P103	3/5/2008	479		ES
				P103	6/16/2008	516		ES
				P103	9/2/2008	514		ES
				P103	12/9/2008	439		ES
				P103R	3/2/2009	550		ES
				P103R	6/8/2009	550		ES
				P103R	9/1/2009	530		ES
				P103R	12/9/2009	540		ES
				P103R	3/1/2010	509		ES
				P103R	6/3/2010	499		ES
				P103R	9/9/2010	535		ES
				P103R	12/9/2010	508		ES
				P103R	3/3/2011	604		ES
				P103R	6/7/2011	470		ES
				P103R	9/2/2011	552		ES
				P103R	12/6/2011	490		ES
				P103R	3/2/2012	490		ES
				P103R	6/7/2012	580		ES
				P103R	9/4/2012	501		ES
				P103R	12/10/2012	450		ES
				P107	3/7/2007	132		PAL
				P117	12/10/2012	248		PAL
				TW-05R	3/7/2007	400		ES
				TW-05R	6/13/2007	320		ES
				TW-05R	9/11/2007	406		ES
				TW-05R	12/10/2007	370		ES
				TW-05R	3/5/2008	362		ES
				TW-05R	6/17/2008	359		ES
				TW-05R	9/3/2008	351		ES
				TW-05R	12/9/2008	315		ES
				TW-05R	3/2/2009	450		ES
				TW-05R	6/8/2009	340		ES
				TW-05R	9/1/2009	374		ES
				TW-05R	12/7/2009	376		ES
				TW-05R	3/1/2010	451		ES
				TW-05R	6/3/2010	366		ES
				TW-05R	9/9/2010	359		ES
				TW-05R	12/9/2010	386		ES
				TW-05R	3/3/2011	473		ES
				TW-05R	6/7/2011	331		ES
				TW-05R	9/2/2011	395		ES
				TW-05R	12/6/2011	386		ES
				TW-05R	3/2/2012	480		ES
				TW-05R	6/7/2012	419		ES
				TW-05R	9/4/2012	372		ES
				TW-05R	12/10/2012	422		ES
				TW-09RR	9/2/2011	134		PAL

PARAMETERS THAT EXCEED CURRENT NR140 STANDARDS
BOUNDARY ROAD LANDFILL
MENOMONEE FALLS, WISCONSIN
2007 - 2012

CHEMICAL PARAMETER	UNITS	NR140 PAL	NR140 ES	WELL ID	DATE	RESULT	DATA FLAGS	EXCEEDANCE
CHLORIDE, DISSOLVED	MG/L	125	250	TW-24R	3/7/2007	596		ES
				TW-24R	6/13/2007	622		ES
				TW-24R	9/11/2007	392		ES
				TW-24R	12/10/2007	271		ES
				TW-24R	3/5/2008	500		ES
				TW-24R	6/17/2008	560		ES
				TW-24R	9/3/2008	519		ES
				TW-24R	12/9/2008	328		ES
				TW-24R	3/2/2009	510		ES
				TW-24R	6/8/2009	520		ES
				TW-24R	9/1/2009	290		ES
				TW-24R	12/7/2009	408		ES
				TW-24R	3/1/2010	462		ES
				TW-24R	6/3/2010	458		ES
				TW-24R	9/9/2010	363		ES
				TW-24R	12/9/2010	413		ES
				TW-24R	3/3/2011	415		ES
				TW-24R	6/7/2011	395		ES
				TW-24R	9/2/2011	512		ES
				TW-24R	12/6/2011	327		ES
				TW-24R	3/2/2012	321		ES
				TW-24R	6/7/2012	357		ES
				TW-24R	9/4/2012	330		ES
				TW-24R	12/10/2012	371		ES
CHLOROFORM	UG/L	0.6	6	MW-117	6/13/2007	37		ES
				MW-117	6/16/2008	51		ES
				MW-117	6/8/2009	12		ES
				MW-117	6/3/2010	3		PAL
				MW-117	6/7/2011	29		ES
				MW-117	6/7/2012	2.1		PAL
CHRYSENE	UG/L	0.02	0.2	SW-01	6/17/2008	0.5	B	ES
				SW-02	6/17/2008	0.5	B	ES
IRON, DISSOLVED	UG/L	150	300	MW-107	6/8/2009	380		ES
				MW-107	6/3/2010	150		PAL
				MW-107	6/7/2011	650		ES
				MW-110	6/13/2007	1400		ES
				MW-110	6/17/2008	420		ES
				MW-110	6/8/2009	1990		ES
				MW-110	6/3/2010	1300		ES
				MW-110	6/7/2011	1600		ES
				MW-110	6/7/2012	180		PAL
				MW-111	6/13/2007	4700		ES
				MW-111	6/16/2008	10000		ES
				MW-111	6/8/2009	10100		ES
				MW-111	6/3/2010	3950		ES
				MW-111	6/7/2011	7900		ES
				MW-116	6/13/2007	2000		ES

PARAMETERS THAT EXCEED CURRENT NR140 STANDARDS
BOUNDARY ROAD LANDFILL
MENOMONEE FALLS, WISCONSIN
2007 - 2012

CHEMICAL PARAMETER	UNITS	NR140 PAL	NR140 ES	WELL ID	DATE	RESULT	DATA FLAGS	EXCEEDANCE
IRON, DISSOLVED	UG/L	150	300	MW-116	6/17/2008	1300		ES
				MW-116	6/8/2009	2760		ES
				MW-116	6/3/2010	2480		ES
				MW-116	6/7/2011	1800		ES
				MW-116	6/7/2012	720		ES
				P103	6/16/2008	160		PAL
				P103R	6/8/2009	196		PAL
				P107	6/8/2009	257		PAL
				P107	6/7/2011	270		PAL
				TW-06R	6/13/2007	210		PAL
				TW-06R	6/17/2008	670		ES
				TW-08R	6/17/2008	690		ES
				TW-09RR	6/13/2007	480		ES
				TW-09RR	6/17/2008	1200		ES
				TW-09RR	6/3/2010	256		PAL
				TW-09RR	6/7/2011	3500		ES
				TW-16R	6/13/2007	3400		ES
				TW-16R	6/17/2008	2500		ES
				TW-16R	6/8/2009	2310		ES
				TW-16R	6/3/2010	1560		ES
				TW-16R	6/7/2011	3200		ES
				TW-16R	6/7/2012	2800		ES
				TW-24R	6/13/2007	1000		ES
				TW-24R	6/17/2008	2600		ES
				TW-24R	6/8/2009	1100		ES
				TW-24R	6/3/2010	544		ES
IRON, TOTAL	UG/L	150	300	PW-07	6/13/2007	1000		ES
				PW-07	6/16/2008	1100		ES
				PW-07	6/8/2009	945		ES
				PW-07	6/10/2010	1390		ES
				PW-07	6/7/2011	2200		ES
				PW-07	6/13/2012	1500		ES
				PW-08	6/13/2007	770		ES
				PW-08	6/16/2008	860		ES
				PW-08	6/8/2009	959		ES
				PW-08	6/10/2010	533		ES
				PW-08	6/7/2011	660		ES
				PW-08	6/13/2012	800		ES
				PW-09	6/16/2008	170		PAL
				PW-09	6/7/2011	420		ES
				PW-09	6/13/2012	340		ES
				PW-10	6/18/2007	270		PAL
				PW-10	6/16/2008	210		PAL
				PW-10	6/8/2009	271		PAL
				PW-10	6/10/2010	313		ES
				PW-10	6/7/2011	220		PAL
MANGANESE, DISSOLVED	UG/L	25	50	MW-107	6/16/2008	48.4		PAL
				MW-107	6/8/2009	98.6		ES
				MW-107	6/3/2010	61.1		ES
				MW-107	6/7/2011	54.8		ES
				MW-107	6/7/2012	53.7		ES

PARAMETERS THAT EXCEED CURRENT NR140 STANDARDS
BOUNDARY ROAD LANDFILL
MENOMONEE FALLS, WISCONSIN
2007 - 2012

CHEMICAL PARAMETER	UNITS	NR140 PAL	NR140 ES	WELL ID	DATE	RESULT	DATA FLAGS	EXCEEDANCE
MANGANESE, DISSOLVED	UG/L	25	50	MW-111	6/13/2007	69.2		ES
				MW-111	6/16/2008	106		ES
				MW-111	6/8/2009	131		ES
				MW-111	6/3/2010	134		ES
				MW-111	6/7/2011	146		ES
				MW-111	6/7/2012	147		ES
				MW-116	6/13/2007	329		ES
				MW-116	6/17/2008	248		ES
				MW-116	6/8/2009	350		ES
				MW-116	6/3/2010	360		ES
				MW-116	6/7/2011	295		ES
				MW-116	6/7/2012	329		ES
				MW-117	6/13/2007	183		ES
				MW-117	6/8/2009	114		ES
				MW-117	6/3/2010	233		ES
				MW-117	6/7/2011	78.9		ES
				MW-117	6/7/2012	529		ES
				P102	6/13/2007	53.9		ES
				P102	6/17/2008	39.6		PAL
				P102	6/8/2009	52.5		ES
				P102	6/3/2010	28		PAL
				P103	6/13/2007	43.3		PAL
				P103	6/16/2008	42.6		PAL
				P103R	6/8/2009	62.5		ES
				P103R	6/3/2010	57.3		ES
				P103R	6/7/2011	45.5		PAL
				P103R	6/7/2012	36.6		PAL
				TW-05R	6/8/2009	149		ES
				TW-09RR	6/13/2007	38.7		PAL
				TW-09RR	6/17/2008	106		ES
				TW-09RR	6/8/2009	33.7		PAL
				TW-09RR	6/3/2010	42.5		PAL
				TW-09RR	6/7/2011	43.4		PAL
				TW-09RR	6/7/2012	50.3		ES
				TW-16R	6/13/2007	118		ES
				TW-16R	6/17/2008	140		ES
				TW-16R	6/8/2009	127		ES
				TW-16R	6/3/2010	106		ES
				TW-16R	6/7/2011	203		ES
				TW-16R	6/7/2012	137		ES
				TW-24R	6/13/2007	64.2		ES
				TW-24R	6/17/2008	64.1		ES
				TW-24R	6/8/2009	53.5		ES
				TW-24R	6/3/2010	44.4		PAL
				TW-24R	6/7/2011	38.1		PAL
				TW-24R	6/7/2012	38.9		PAL
MANGANESE, TOTAL	UG/L	25	50	PW-07	6/7/2011	32.2		PAL
				PW-09	6/10/2010	28.7		PAL

PARAMETERS THAT EXCEED CURRENT NR140 STANDARDS
BOUNDARY ROAD LANDFILL
MENOMONEE FALLS, WISCONSIN
2007 - 2012

CHEMICAL PARAMETER	UNITS	NR140 PAL	NR140 ES	WELL ID	DATE	RESULT	DATA FLAGS	EXCEEDANCE
METHYLENE CHLORIDE	UG/L	0.5	5	MW-111	6/13/2007	1	J	PAL
				MW-116	12/10/2007	4	B	PAL
				MW-116	6/7/2011	2.3	J	PAL
				MW-117	6/13/2007	1	J	PAL
				P103	6/13/2007	1	J	PAL
				TW-05R	12/10/2007	4	B	PAL
				TW-05R	6/7/2011	3.7	J	PAL
				TW-24R	12/10/2007	4	B	PAL
SULFATE	MG/L	125	250	MW-111	3/7/2007	216		PAL
				MW-111	6/13/2007	281		ES
				MW-111	9/11/2007	263		ES
				MW-111	12/10/2007	236		PAL
				MW-111	3/5/2008	262		ES
				MW-111	6/16/2008	246		PAL
				MW-111	9/2/2008	330		ES
				MW-111	12/9/2008	248		PAL
				MW-111	3/2/2009	260		ES
				MW-111	6/8/2009	220		PAL
				MW-111	9/1/2009	221		PAL
				MW-111	12/9/2009	190		PAL
				MW-111	3/1/2010	167		PAL
				MW-111	6/3/2010	226		PAL
				MW-111	9/9/2010	176		PAL
				MW-111	12/9/2010	208		PAL
				MW-111	3/3/2011	186		PAL
				MW-111	6/7/2011	176		PAL
				MW-111	9/2/2011	186		PAL
				MW-111	12/6/2011	139		PAL
				MW-111	3/2/2012	137		PAL
				MW-111	6/7/2012	152		PAL
				MW-111	9/4/2012	158		PAL
				MW-111	12/10/2012	161		PAL
				MW-116	3/7/2007	127		PAL
				MW-116	6/13/2007	260		ES
				MW-116	12/9/2008	177		PAL
				MW-116	3/2/2009	140		PAL
				MW-116	6/8/2009	290		ES
				MW-116	9/1/2009	221		PAL
				MW-116	12/7/2009	185		PAL
				MW-116	3/1/2010	267		ES
				MW-116	6/3/2010	270		ES
				MW-116	6/7/2011	160		PAL
				MW-116	9/2/2011	157		PAL
				MW-116	12/6/2011	133		PAL

PARAMETERS THAT EXCEED CURRENT NR140 STANDARDS
BOUNDARY ROAD LANDFILL
MENOMONEE FALLS, WISCONSIN
2007 - 2012

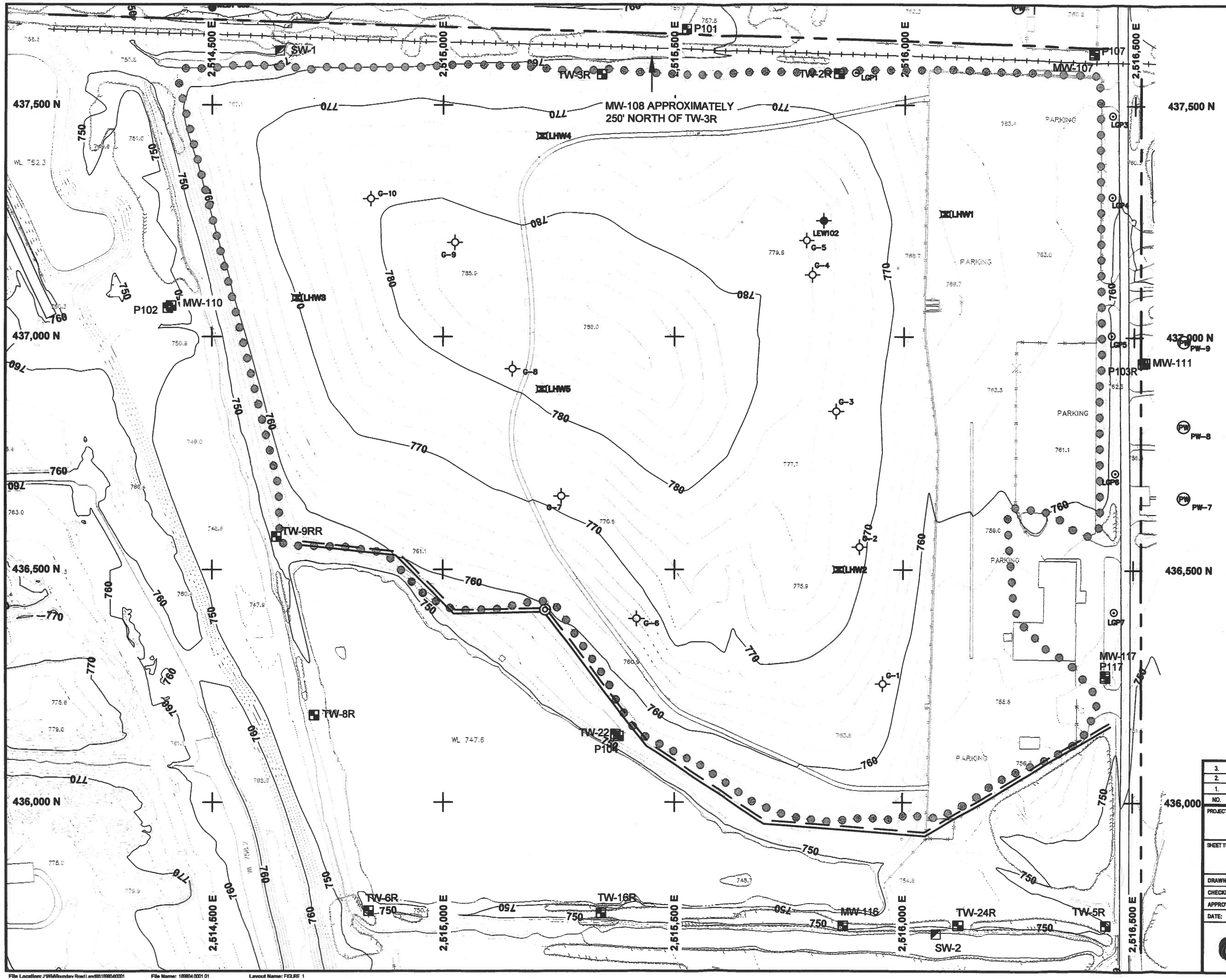
CHEMICAL PARAMETER	UNITS	NR140 PAL	NR140 ES	WELL ID	DATE	RESULT	DATA FLAGS	EXCEEDANCE
SULFATE	MG/L	125	250	MW-116	3/2/2012	157		PAL
				MW-116	6/7/2012	196		PAL
				MW-116	9/4/2012	238		PAL
				MW-116	12/10/2012	249		PAL
				MW-117	3/7/2007	171		PAL
				MW-117	6/13/2007	194		PAL
				MW-117	9/11/2007	156		PAL
				MW-117	12/10/2007	200		PAL
				MW-117	3/5/2008	184		PAL
				MW-117	9/2/2008	161		PAL
				MW-117	12/9/2008	140		PAL
				MW-117	6/8/2009	130		PAL
				MW-117	12/9/2009	148		PAL
				MW-117	12/9/2010	145		PAL
				MW-117	9/2/2011	132		PAL
				MW-117	12/6/2011	127		PAL
				MW-117	3/2/2012	136		PAL
				TW-05R	3/7/2007	144		PAL
				TW-05R	6/13/2007	166		PAL
				TW-05R	9/11/2007	154		PAL
				TW-05R	12/10/2007	130		PAL
				TW-05R	3/5/2008	133		PAL
				TW-05R	6/17/2008	150		PAL
				TW-05R	9/3/2008	147		PAL
				TW-05R	3/2/2009	150		PAL
				TW-05R	6/8/2009	160		PAL
				TW-05R	9/1/2009	144		PAL
				TW-05R	12/7/2009	140		PAL
				TW-05R	3/1/2010	148		PAL
				TW-05R	6/3/2010	138		PAL
				TW-05R	9/9/2010	136		PAL
				TW-05R	9/2/2011	131		PAL
				TW-05R	3/2/2012	131		PAL
				TW-05R	6/7/2012	136		PAL
				TW-05R	12/10/2012	159		PAL
				TW-16R	9/4/2012	269		ES
				TW-16R	12/10/2012	443		ES
				TW-24R	6/13/2007	138		PAL
				TW-24R	9/11/2007	285		ES
				TW-24R	12/10/2007	496		ES
				TW-24R	3/5/2008	180		PAL
				TW-24R	12/9/2008	291		ES
				TW-24R	3/2/2009	150		PAL
				TW-24R	9/1/2009	275		ES
				TW-24R	12/7/2009	160		PAL
				TW-24R	12/9/2010	158		PAL
				TW-24R	9/4/2012	307		ES
				TW-24R	12/10/2012	415		ES

PARAMETERS THAT EXCEED CURRENT NR140 STANDARDS
BOUNDARY ROAD LANDFILL
MENOMONEE FALLS, WISCONSIN
2007 - 2012

CHEMICAL PARAMETER	UNITS	NR140 PAL	NR140 ES	WELL ID	DATE	RESULT	DATA FLAGS	EXCEEDANCE
TETRAHYDROFURAN	UG/L	10	50	MW-111	6/13/2007	18		PAL
				MW-111	6/16/2008	10	J	PAL
				MW-111	6/8/2009	11		PAL
				MW-111	6/3/2010	12		PAL
				MW-111	6/7/2011	12		PAL
				MW-111	6/7/2012	16		PAL
				P103	6/13/2007	36		PAL
				P103	6/16/2008	22		PAL
				P103R	6/8/2009	31		PAL
				P103R	6/3/2010	20		PAL
				P103R	6/7/2011	21		PAL
				P103R	6/7/2012	20		PAL
				P107	6/13/2007	13	J	PAL
VINYL CHLORIDE	UG/L	0.02	0.2	MW-117	6/13/2007	1	J	ES
				MW-117	6/8/2009	1.6	J	ES

DATA FLAGS:
B - Analyte present in method blank.
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

Appendix B
Site Map



LEGEND

- APPROXIMATE PROPERTY LINE
- TOE COLLECTION SYSTEM
- SLURRY WALL LOCATION
- x 762.5 — EXISTING SPOT ELEVATION
- 780 — EXISTING GROUND ELEVATION CONTOUR
- APPROXIMATE LIMITS OF WASTE
- TW-23 / MW-111 — EXISTING MONITORING WELL LOCATION AND NUMBER
- SW-2 — SURFACE WATER SAMPLING POINT
- PW-7 — PRIVATE WELL
- LEW102 — LEACHATE EXTRACTION WELL
- LHW1 — LEACHATE HEAD WELL LOCATION AND NUMBER
- LGP5 — GAS PROBE
- G-1 — GAS EXTRACTION WELLHEAD

NOTES

1. BASE MAP PREPARED BY SURDEX CORPORATION CHESTERFIELD, MO. DATE OF PHOTOGRAPHY FEBRUARY 6, 2006.
2. VERTICAL DATUM IS BASED ON USGS MEAN SEA LEVEL.
3. HORIZONTAL DATUM IS BASED ON WISCONSIN STATE PLANE COORDINATE SYSTEM.
4. MONITORING WELLS DESIGNATED WITH A "TW" OR "MW" SYMBOL MONITOR SHALLOW GROUNDWATER SYSTEM IN THE UN-CONSOLIDATED DEPOSITS. THOSE DESIGNATED WITH A "P" SYMBOL MONITOR THE DEEP GROUNDWATER SYSTEM IN THE UN-CONSOLIDATED DEPOSITS.

0 200 400

SCALE IN FEET

NO.	BY	DATE	REVISION	APP'D.
3.				
2.				
1.				

PROJECT: REVISION TO LONG-TERM SAMPLING AND ANALYSIS PLAN
BOUNDARY ROAD LANDFILL
WASTE MANAGEMENT OF WISCONSIN, INC.
VILLAGE OF MENOMONEE FALLS, WISCONSIN

SHEET TITLE: MONITORING PLAN

DRAWN BY:	LSTORMER	SCALE: 1"=200'	PROJ. NO. 189804.0001
CHECKED BY:	RW		FILE NO. 189804.0001.01.dwg
APPROVED BY:	MJA	DATE PRINTED: OCT 0 3 2013	FIGURE 1
DATE:	OCTOBER 2013		

TRC
708 Heartland Trail
Suite 3000
Madison, WI 53717
Phone: 608.826.3600

File Location: J:\WM\Boundary Road Landfill\189804\0001 File Name: 189804 0001 01 Layout Name: FIGURE 1

Appendix C
Well Abandonment Log

State of Wisconsin
Department of Natural Resources
PO Box 7921, Madison WI 53707-7921
dnr.wi.gov

Well / Drillhole / Borehole Filling & Sealing

Form 3300-005 (R 8/07)

Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between $10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information.

Route to:
☒ Drinking Water ☐ Watershed/Wastewater ☐ Waste Management ☐ Remediation/Redevelopment ☐ Other: _____

1. Well Location Information

County: Waukesha
WI Unique Well # of Removed Well: _ _ _ _ _ _ _
Fed/Tribal # / Hicap #:
Latitude / Longitude (Degrees and Minutes): 43 · 11 · 090 N / 88 · 43 · 970 W
Method Code (see instructions): GPS.
¼ / ¼: ¼
Section:
Township: N
Range: ☐ E ☐ W
or Gov't Lot #:
Well Street Address: N124 W9391 Boundary Rd
Well City, Village or Town: Menomonee Falls
Well ZIP Code: 53051
Subdivision Name:
Lot #:
Reason For Removal From Service:
WI Unique Well # of Replacement Well: _ _ _ _ _ _ _

2. Facility/Owner Information

Facility Name:
Facility ID (FID or PWS):
License/Permit/Monitoring #:
Original Well Owner:
Present Well Owner: Waste Management
Mailing Address of Present Owner: W124 N9355 Boundary Rd
City of Present Owner: Menomonee Falls
State: WI
ZIP Code: 53051

3. Well / Drillhole / Borehole Information

☐ Monitoring Well
☒ Water Well
☐ Borehole / Drillhole
Original Construction Date (mm/dd/yyyy):
If a Well Construction Report is available, please attach.

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (specify): _____

Formation Type:
☐ Unconsolidated Formation ☒ Bedrock

Total Well Depth From Ground Surface (ft.): 187'
Casing Diameter (in.): 6
Lower Drillhole Diameter (in.):
Casing Depth (ft.): 187'

Was well annular space grouted? ☐ Yes ☐ No ☐ Unknown
If yes, to what depth (feet)?
Depth to Water (feet): 19'

4. Pump and Pipe, Casing & Sealing Material

Pump and piping removed?	☒ Yes	☐ No	☐ N/A
Liner(s) removed?	☐ Yes	☐ No	☒ N/A
Screen removed?	☐ Yes	☐ No	☒ N/A
Casing left in place?	☒ Yes	☐ No	☐ N/A
Was casing cut off below surface?	☒ Yes	☐ No	☐ N/A
Did sealing material rise to surface?	☒ Yes	☐ No	☐ N/A
Did material settle after 24 hours?	☐ Yes	☒ No	☐ N/A
If yes, was hole retopped?	☐ Yes	☐ No	☐ N/A
If bentonite chips were used, were they hydrated with water from a known safe source?	☒ Yes	☐ No	☐ N/A

Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☒ Screened & Poured (Bentonite Chips) ☐ Other (Explain): _____

Sealing Materials
☐ Neat Cement Grout ☐ Clay-Sand Slurry (11 lb./gal. wt.)
☐ Sand-Cement (Concrete) Grout ☐ Bentonite-Sand Slurry " "
☐ Concrete ☒ Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:
☐ Bentonite Chips ☐ Bentonite - Cement Grout
☐ Granular Bentonite ☐ Bentonite - Sand Slurry

5. Material Used To Fill Well / Drillhole

Material	From (ft.)	To (ft.)	Amount (bags or volume/calculation)	Mix Ratio or Mud Weight
3/8" Bentonite Chips	Surface	187		

6. Comments

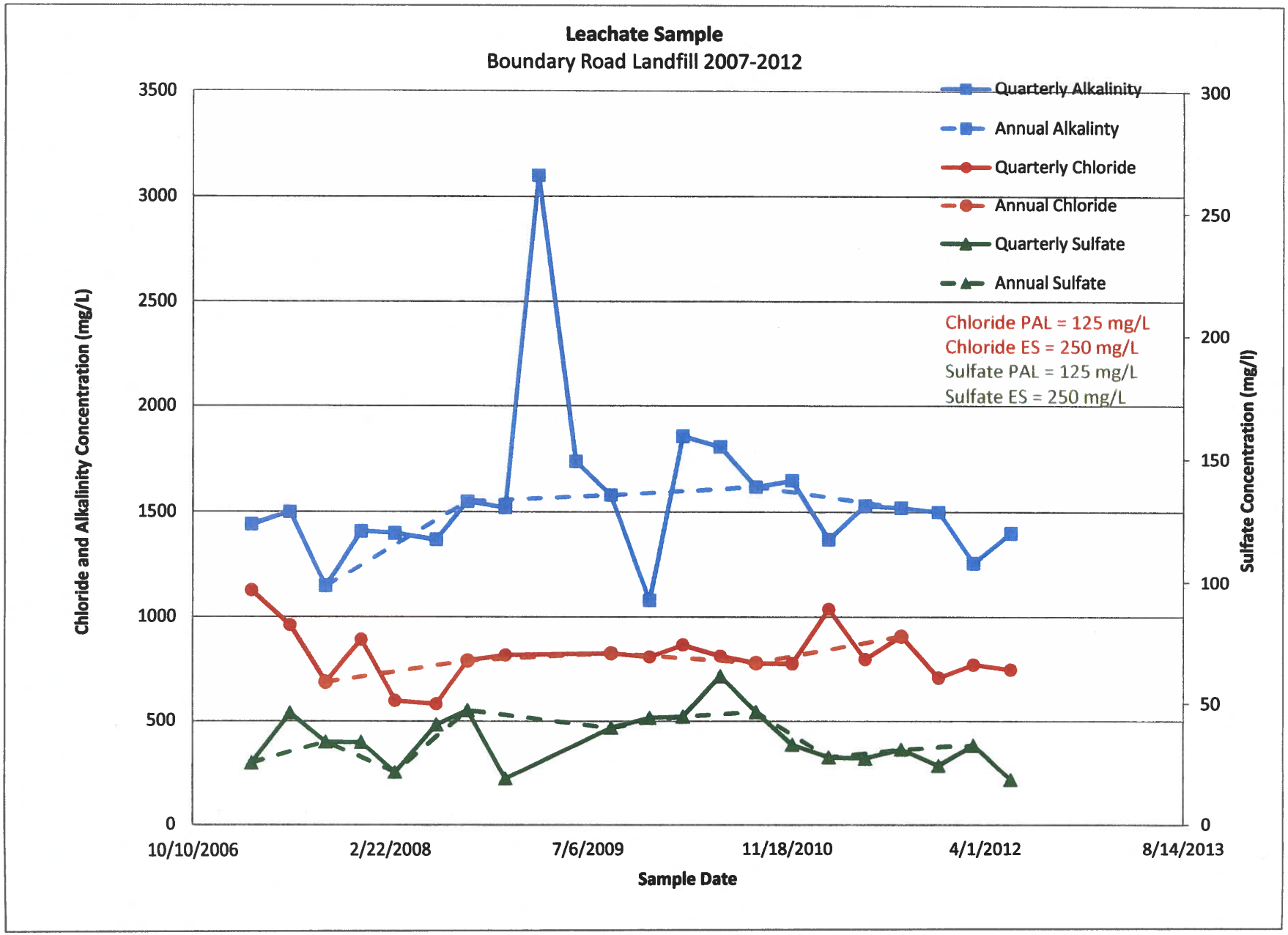
7. Supervision of Work

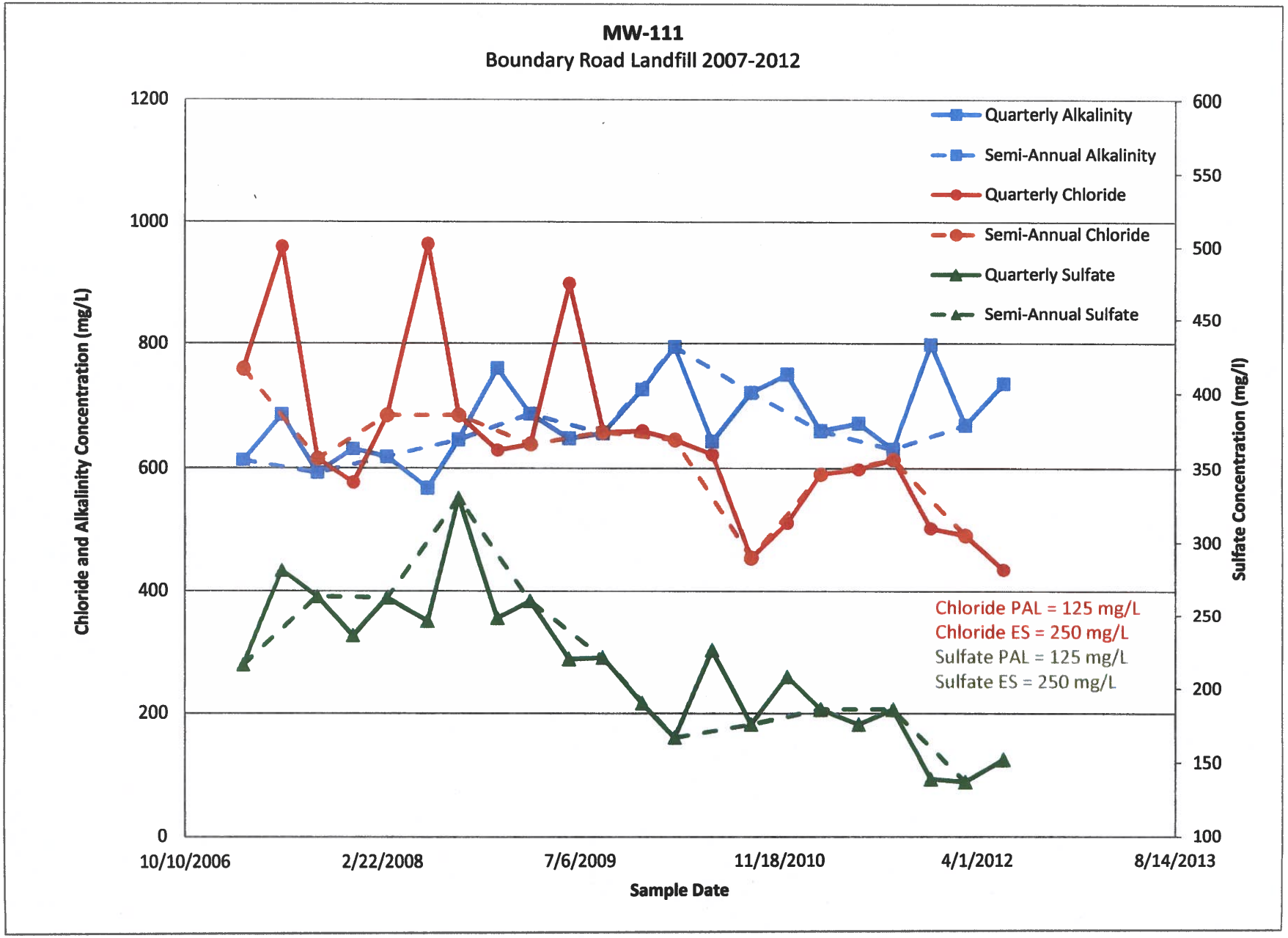
Name of Person or Firm Doing Filling & Sealing: [illegible]
License #: 2411
Date of Filling & Sealing (mm/dd/yyyy): 5-25-12
Street or Route: N96 W14965 Commerce Drive
Telephone Number: (262) 251-2630
City: Germantown
State: WI
ZIP Code: 53051
Signature of Person Doing Work: [illegible]
Date Signed: 6-4-12

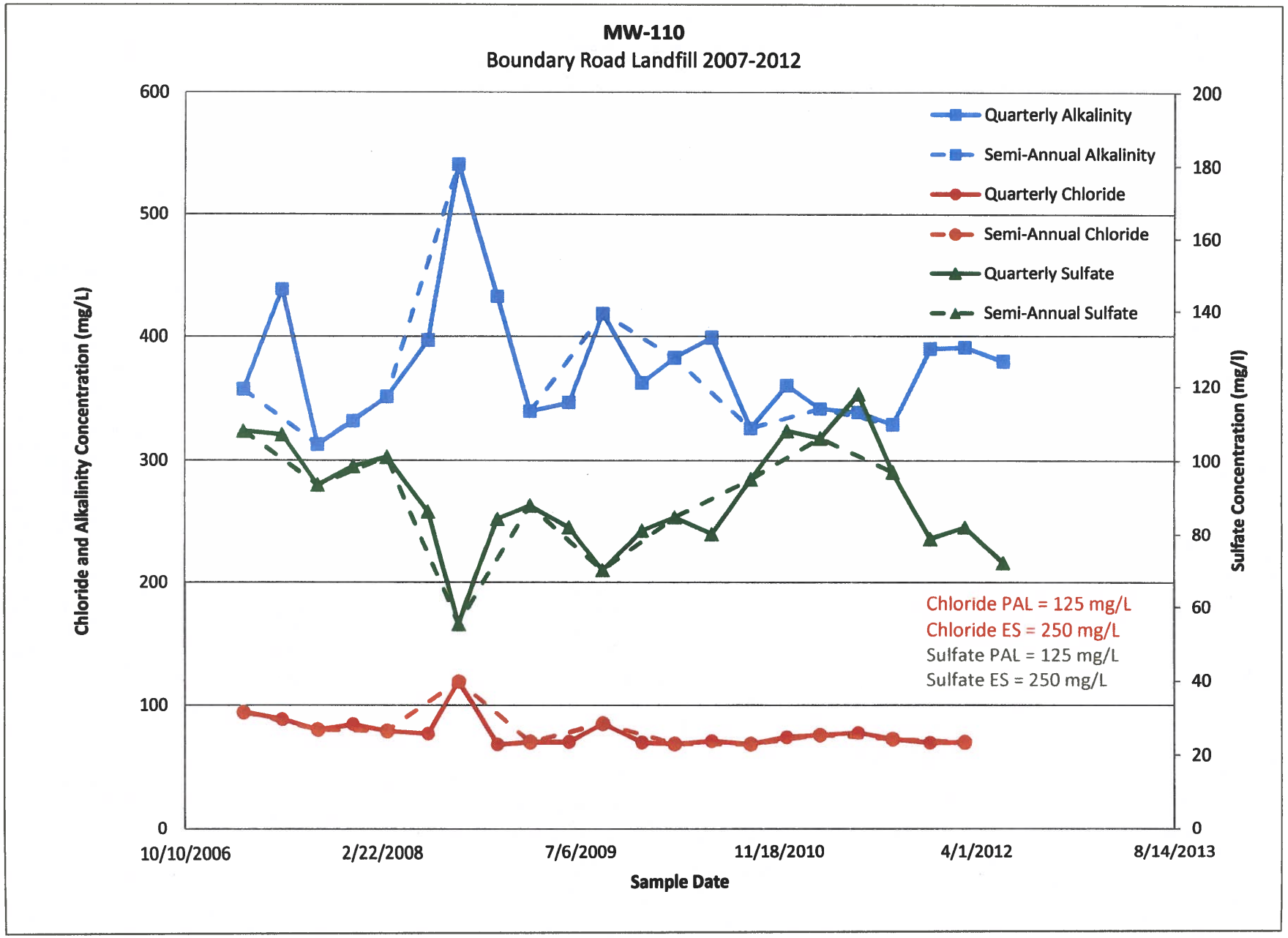
DNR Use Only
Date Received: _____ Reviewed by: _____
Comments:

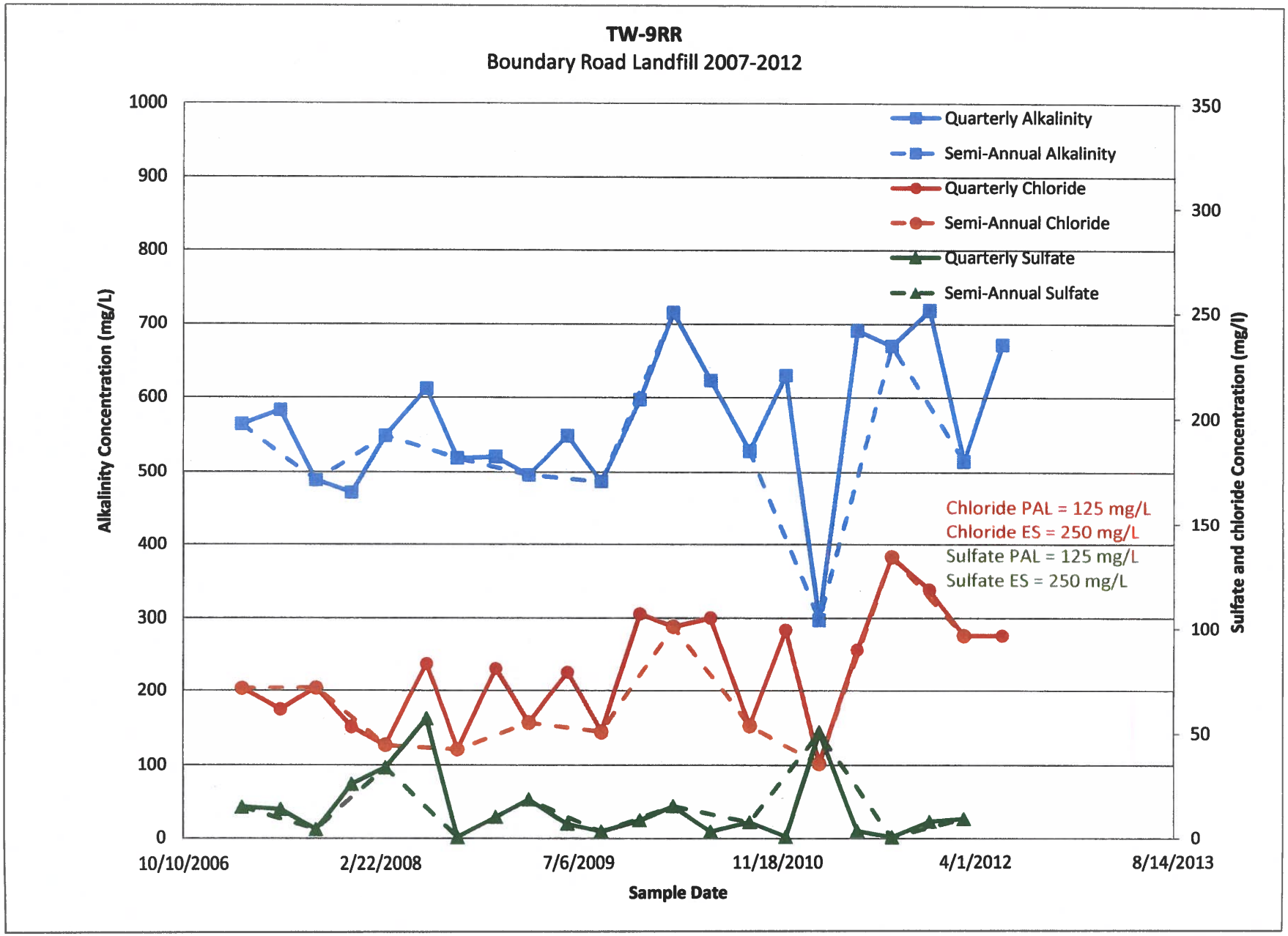
WELL/DRILL/BOREHOLE OWNER

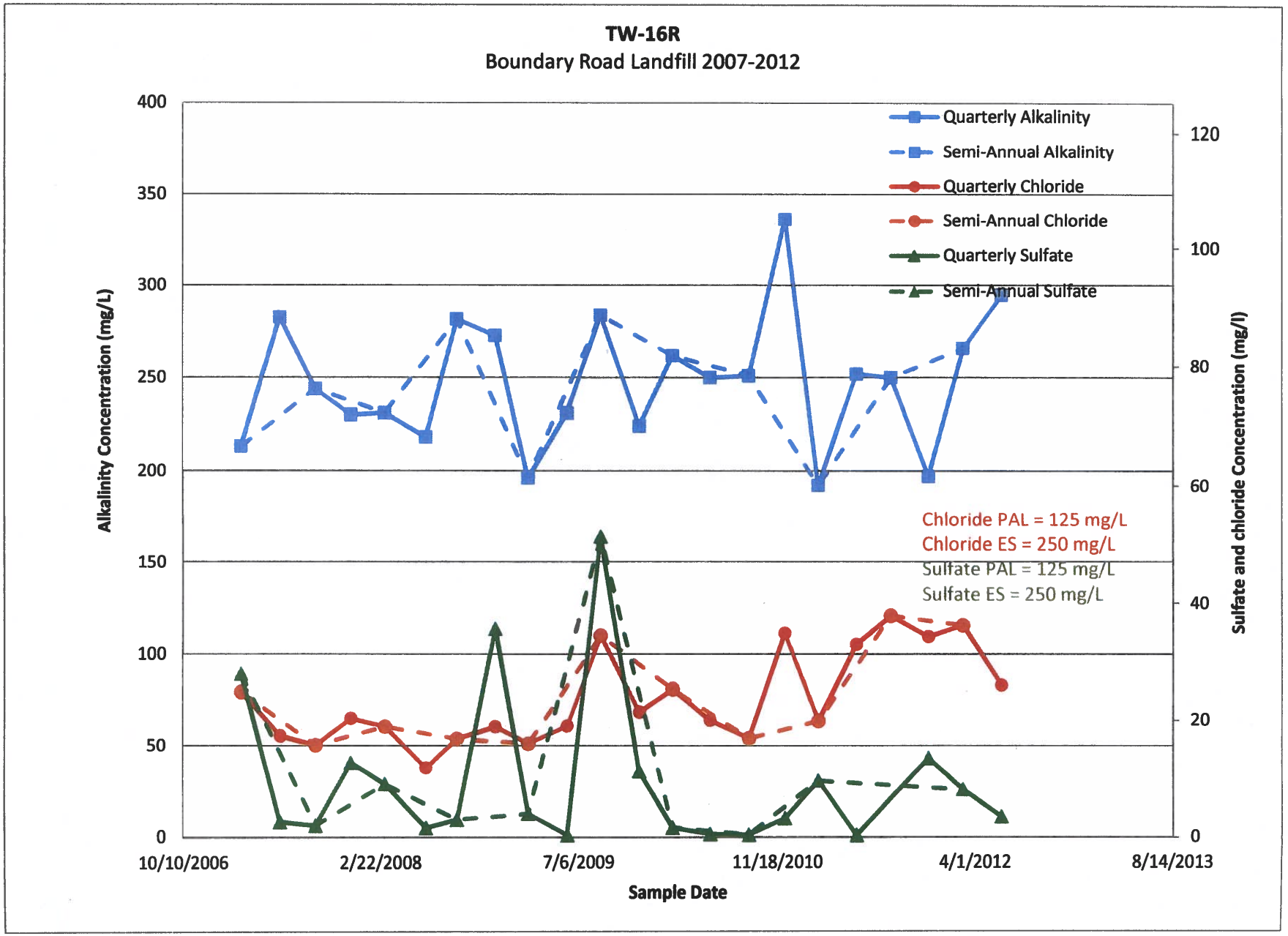
Appendix D
Monitoring Frequency Comparison

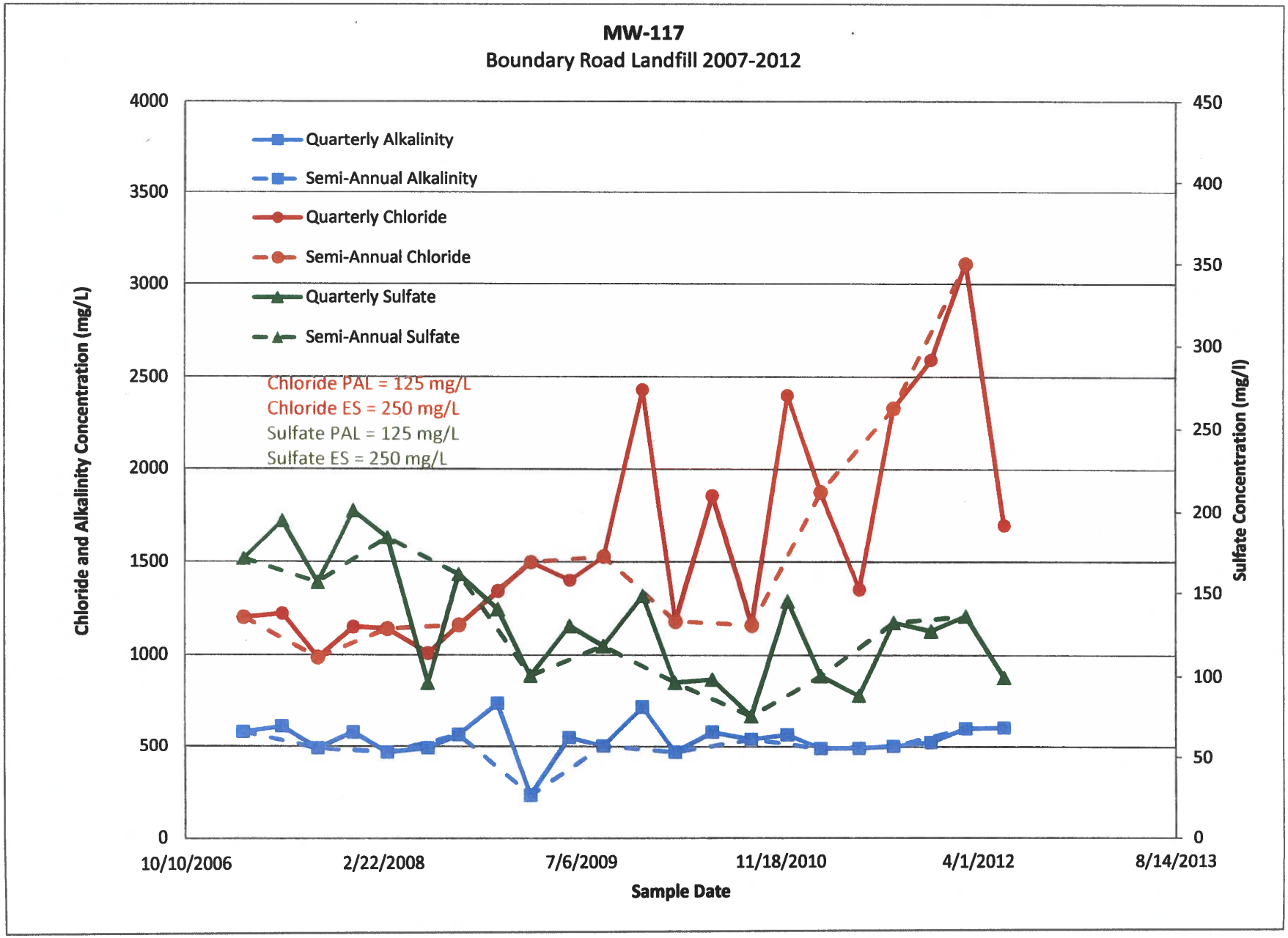

Leachate Sample
Boundary Road Landfill 2007-2012
Chloride and Alkalinity Concentration (mg/L)
Sulfate Concentration (mg/l)
Sample Date
3500
3000
2500
2000
1500
1000
500
0
300
250
200
150
100
50
0
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
Quarterly Alkalinity
Annual Alkalinty
Quarterly Chloride
Annual Chloride
Quarterly Sulfate
Annual Sulfate
Chloride PAL = 125 mg/L
Chloride ES = 250 mg/L
Sulfate PAL = 125 mg/L
Sulfate ES = 250 mg/L

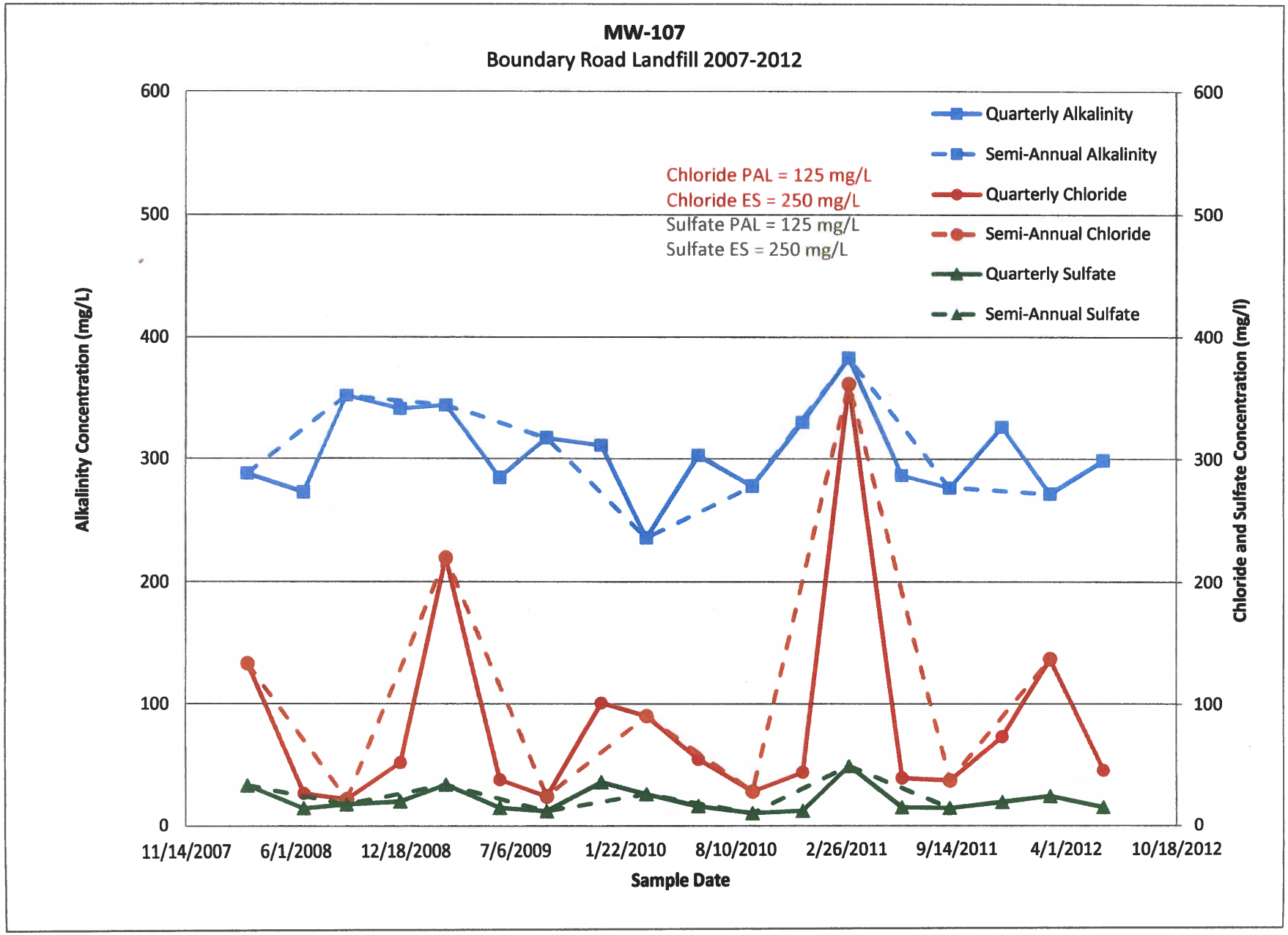

MW-111
Boundary Road Landfill 2007-2012
Chloride and Alkalinity Concentration (mg/L)
Sulfate Concentration (mg/l)
Sample Date
1200
1000
800
600
400
200
0
600
550
500
450
400
350
300
250
200
150
100
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
Quarterly Alkalinity
Semi-Annual Alkalinity
Quarterly Chloride
Semi-Annual Chloride
Quarterly Sulfate
Semi-Annual Sulfate
Chloride PAL = 125 mg/L
Chloride ES = 250 mg/L
Sulfate PAL = 125 mg/L
Sulfate ES = 250 mg/L

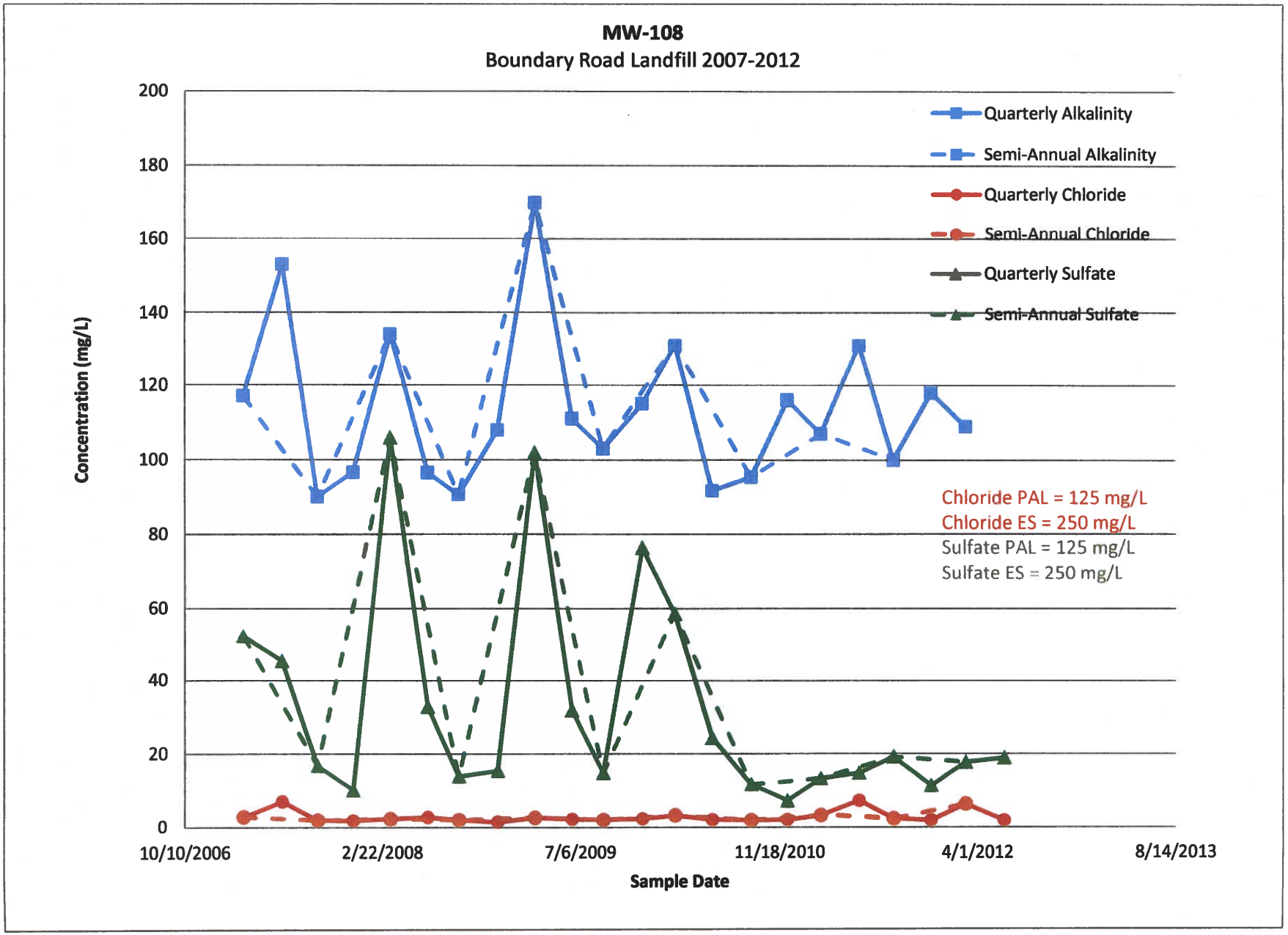

MW-110
Boundary Road Landfill 2007-2012
Chloride and Alkalinity Concentration (mg/L)
Sulfate Concentration (mg/l)
Sample Date
600
500
400
300
200
100
0
200
180
160
140
120
100
80
60
40
20
0
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
Quarterly Alkalinity
Semi-Annual Alkalinity
Quarterly Chloride
Semi-Annual Chloride
Quarterly Sulfate
Semi-Annual Sulfate
Chloride PAL = 125 mg/L
Chloride ES = 250 mg/L
Sulfate PAL = 125 mg/L
Sulfate ES = 250 mg/L

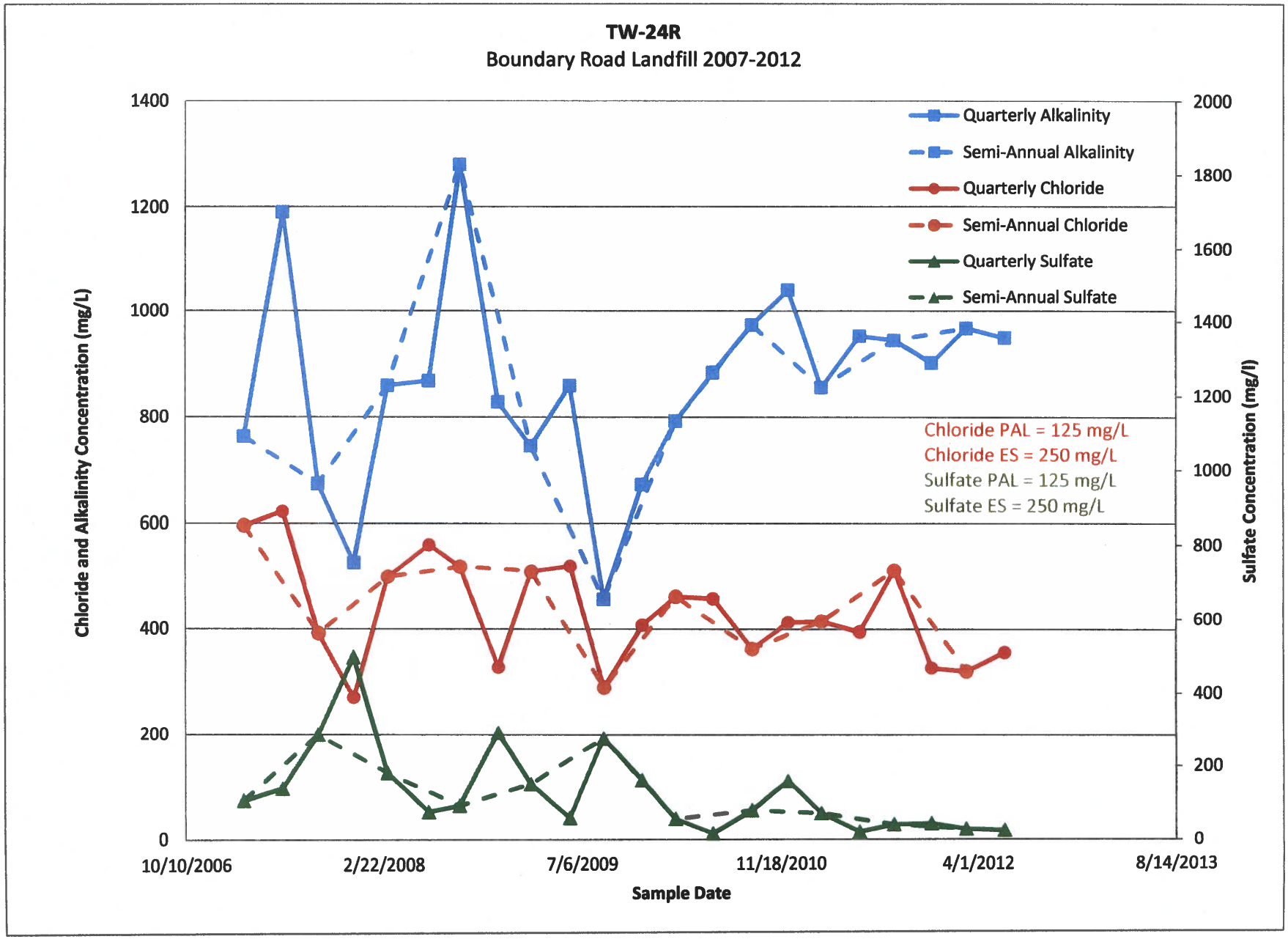

TW-9RR
Boundary Road Landfill 2007-2012
Alkalinity Concentration (mg/L)
Sulfate and chloride Concentration (mg/l)
Sample Date
1000
900
800
700
600
500
400
300
200
100
0
350
300
250
200
150
100
50
0
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
Quarterly Alkalinity
Semi-Annual Alkalinity
Quarterly Chloride
Semi-Annual Chloride
Quarterly Sulfate
Semi-Annual Sulfate
Chloride PAL = 125 mg/L
Chloride ES = 250 mg/L
Sulfate PAL = 125 mg/L
Sulfate ES = 250 mg/L

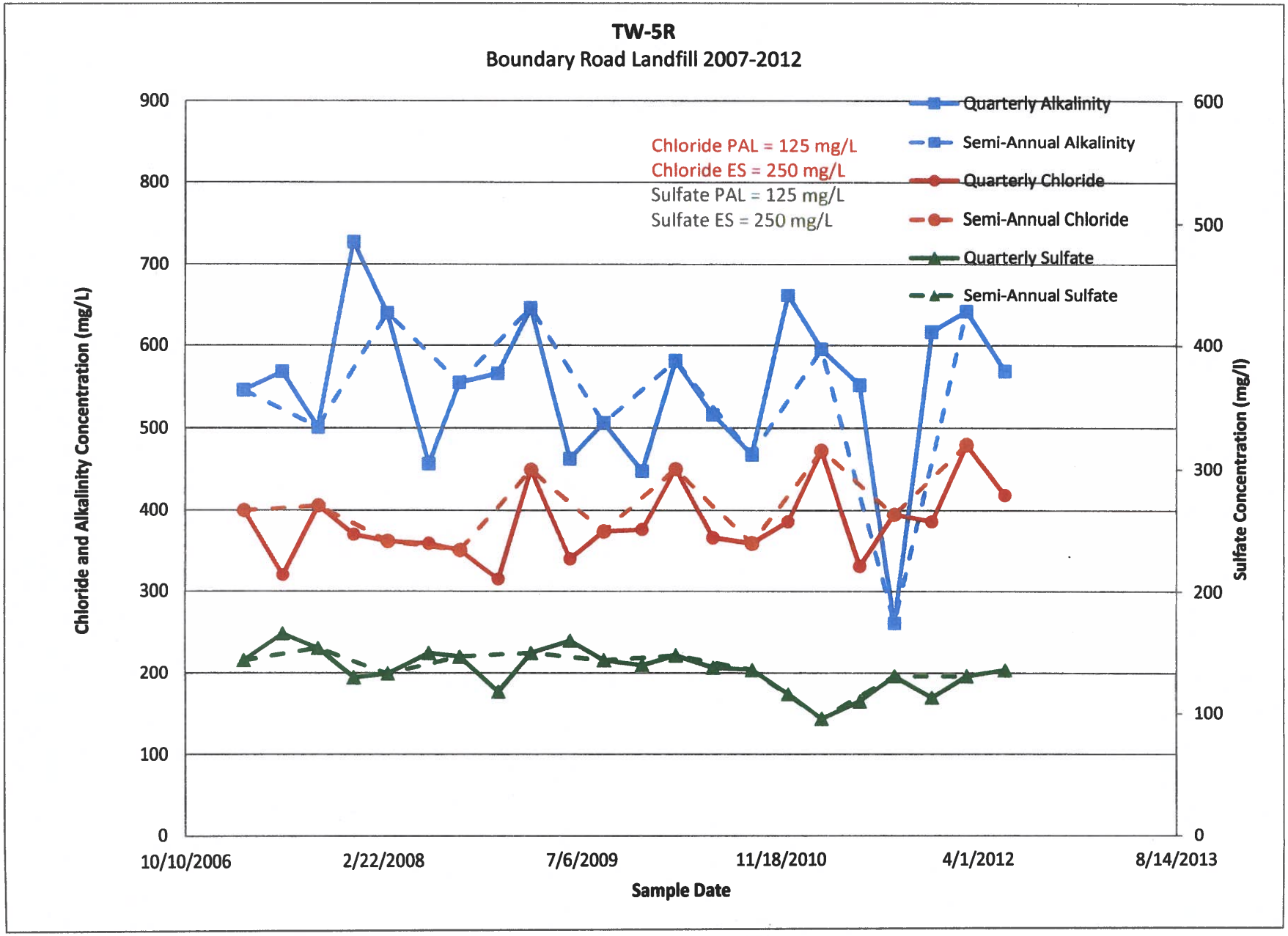

TW-16R
Boundary Road Landfill 2007-2012
Alkalinity Concentration (mg/L)
Sulfate and chloride Concentration (mg/l)
Sample Date
Quarterly Alkalinity
Semi-Annual Alkalinity
Quarterly Chloride
Semi-Annual Chloride
Quarterly Sulfate
Semi-Annual Sulfate
Chloride PAL = 125 mg/L
Chloride ES = 250 mg/L
Sulfate PAL = 125 mg/L
Sulfate ES = 250 mg/L
400
350
300
250
200
150
100
50
0
120
100
80
60
40
20
0
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013

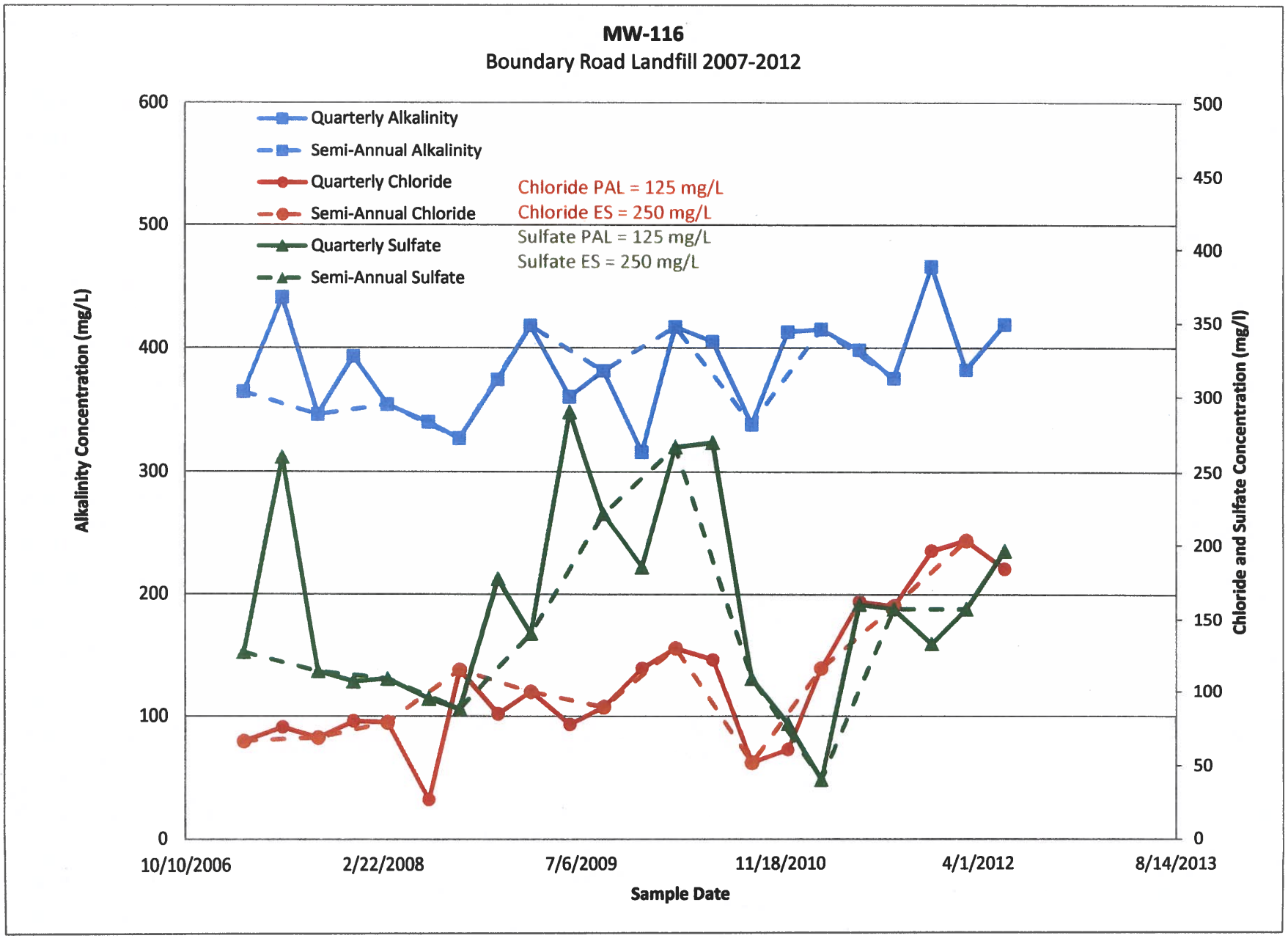

MW-117
Boundary Road Landfill 2007-2012
Quarterly Alkalinity
Semi-Annual Alkalinity
Quarterly Chloride
Semi-Annual Chloride
Quarterly Sulfate
Semi-Annual Sulfate
Chloride PAL = 125 mg/L
Chloride ES = 250 mg/L
Sulfate PAL = 125 mg/L
Sulfate ES = 250 mg/L
Chloride and Alkalinity Concentration (mg/L)
Sulfate Concentration (mg/l)
Sample Date
4000
3500
3000
2500
2000
1500
1000
500
0
450
400
350
300
250
200
150
100
50
0
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013

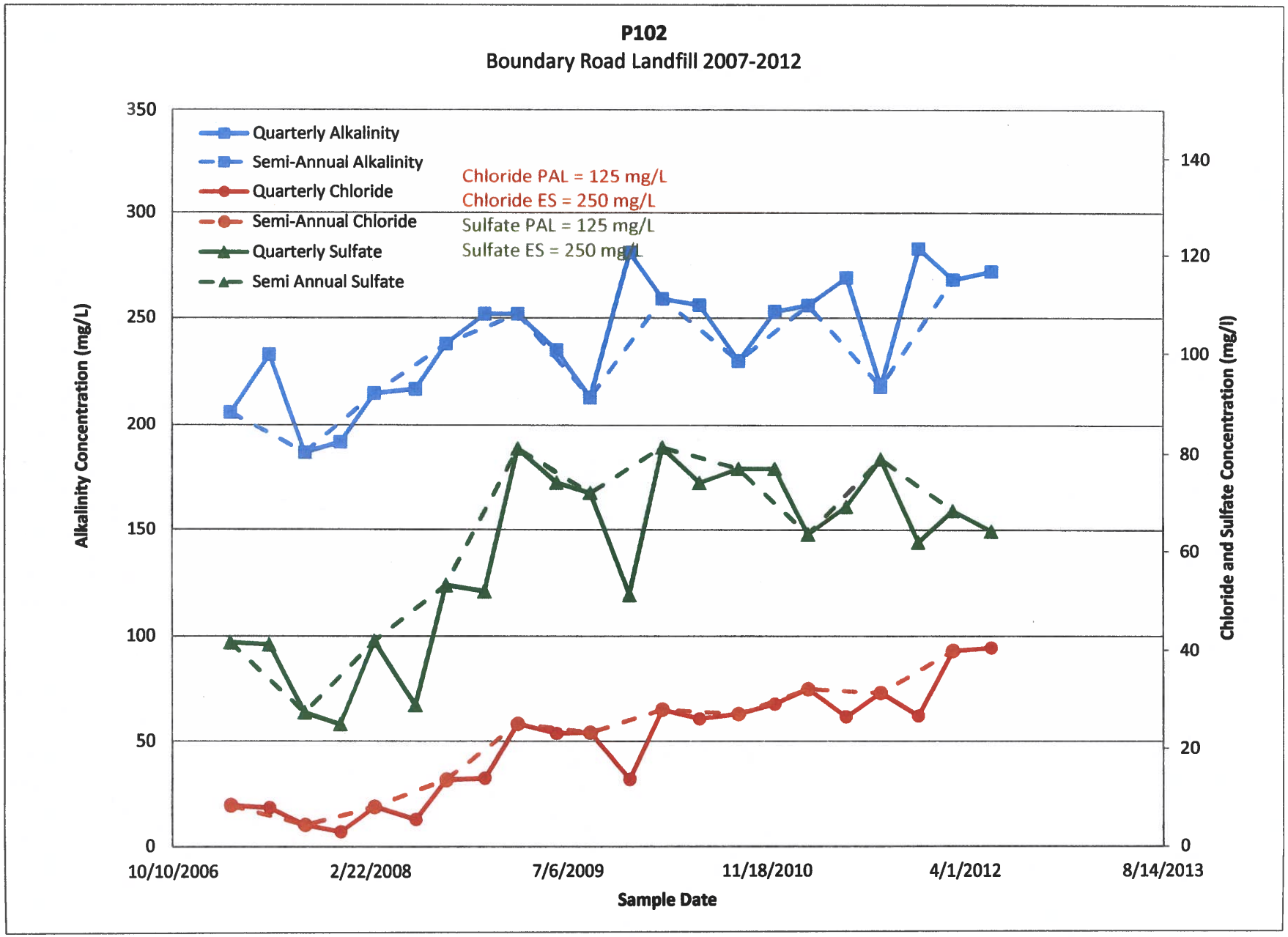

MW-107
Boundary Road Landfill 2007-2012
Chloride PAL = 125 mg/L
Chloride ES = 250 mg/L
Sulfate PAL = 125 mg/L
Sulfate ES = 250 mg/L
Quarterly Alkalinity
Semi-Annual Alkalinity
Quarterly Chloride
Semi-Annual Chloride
Quarterly Sulfate
Semi-Annual Sulfate
Alkalinity Concentration (mg/L)
Chloride and Sulfate Concentration (mg/l)
600
500
400
300
200
100
0
11/14/2007
6/1/2008
12/18/2008
7/6/2009
1/22/2010
8/10/2010
2/26/2011
9/14/2011
4/1/2012
10/18/2012
Sample Date

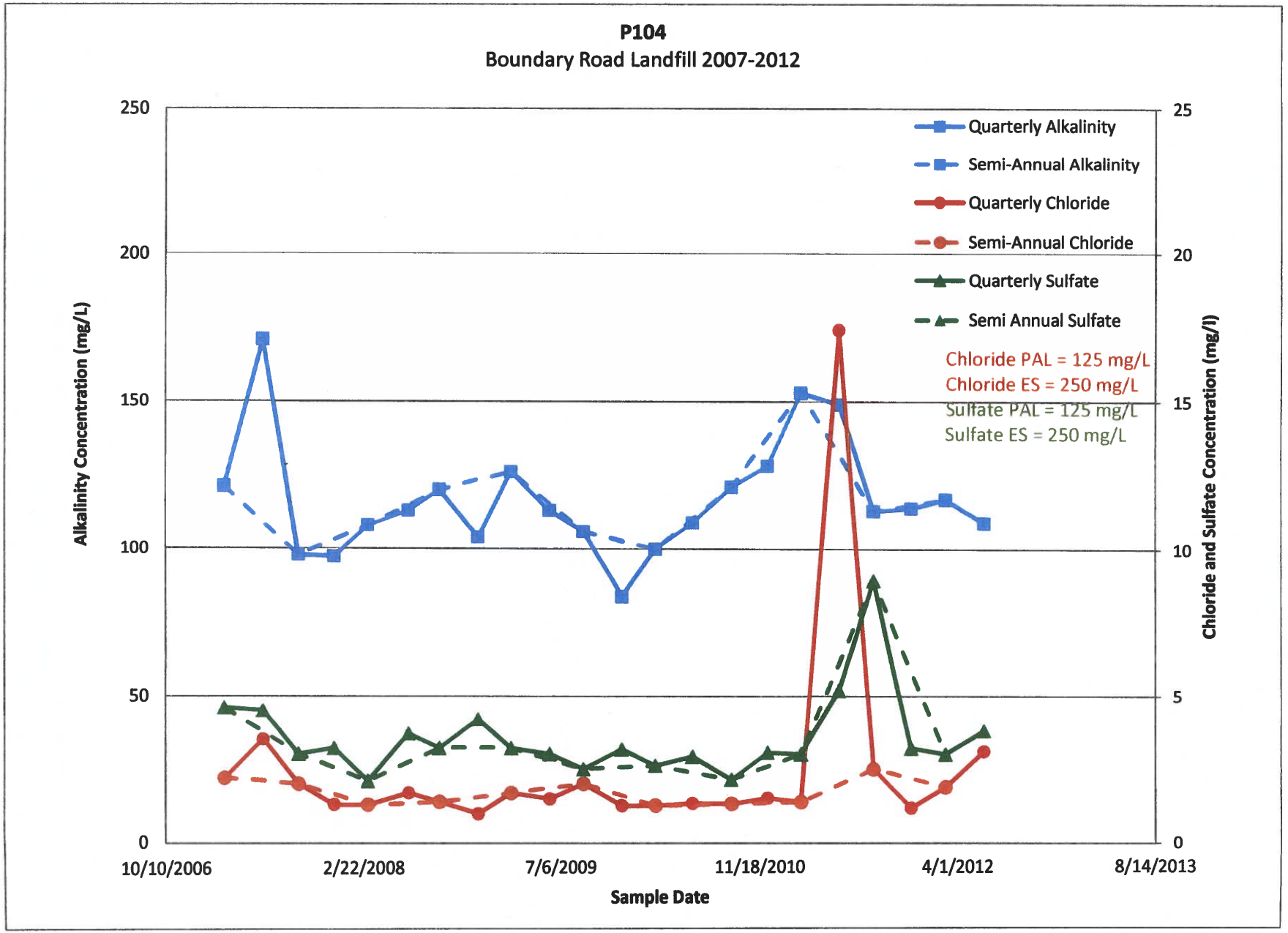

MW-108
Boundary Road Landfill 2007-2012
Concentration (mg/L)
200
180
160
140
120
100
80
60
40
20
0
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
Sample Date
Quarterly Alkalinity
Semi-Annual Alkalinity
Quarterly Chloride
Semi-Annual Chloride
Quarterly Sulfate
Semi-Annual Sulfate
Chloride PAL = 125 mg/L
Chloride ES = 250 mg/L
Sulfate PAL = 125 mg/L
Sulfate ES = 250 mg/L

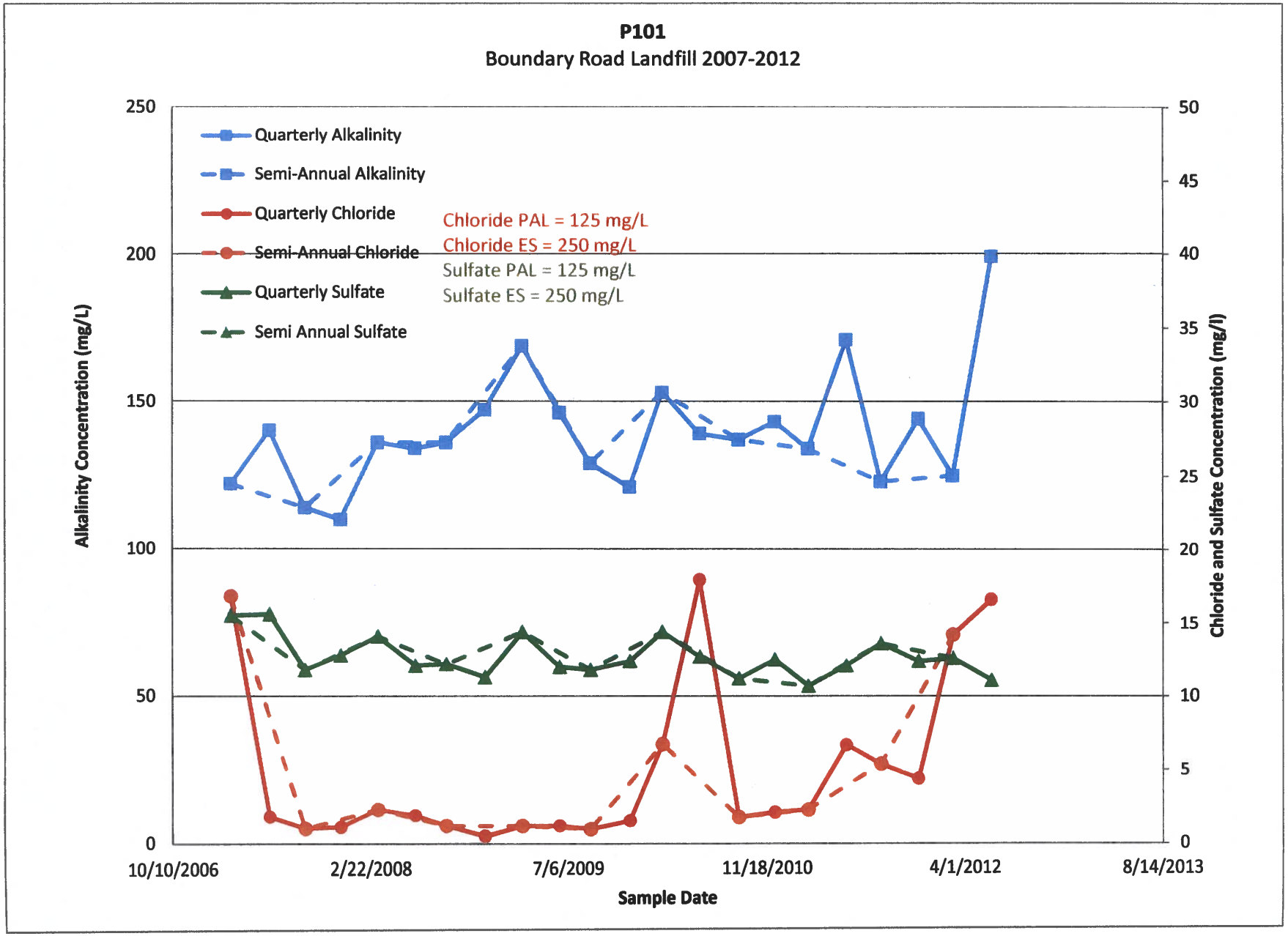

TW-24R
Boundary Road Landfill 2007-2012
Chloride and Alkalinity Concentration (mg/L)
Sulfate Concentration (mg/l)
Sample Date
1400
1200
1000
800
600
400
200
0
2000
1800
1600
1400
1200
1000
800
600
400
200
0
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
Quarterly Alkalinity
Semi-Annual Alkalinity
Quarterly Chloride
Semi-Annual Chloride
Quarterly Sulfate
Semi-Annual Sulfate
Chloride PAL = 125 mg/L
Chloride ES = 250 mg/L
Sulfate PAL = 125 mg/L
Sulfate ES = 250 mg/L

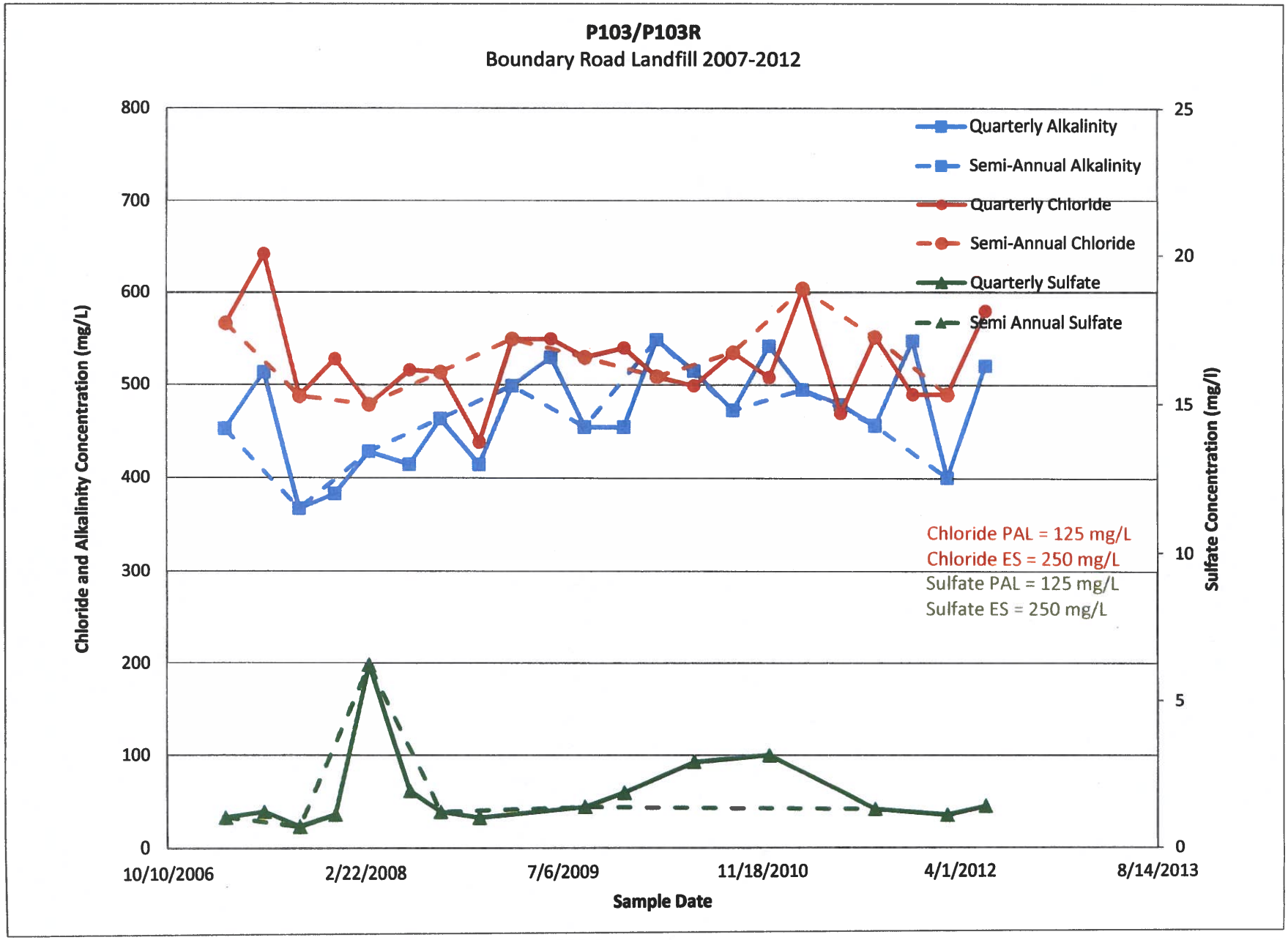

TW-5R
Boundary Road Landfill 2007-2012
Chloride PAL = 125 mg/L
Chloride ES = 250 mg/L
Sulfate PAL = 125 mg/L
Sulfate ES = 250 mg/L
Quarterly Alkalinity
Semi-Annual Alkalinity
Quarterly Chloride
Semi-Annual Chloride
Quarterly Sulfate
Semi-Annual Sulfate
Chloride and Alkalinity Concentration (mg/L)
Sulfate Concentration (mg/l)
Sample Date
900
800
700
600
500
400
300
200
100
0
600
500
400
300
200
100
0
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013

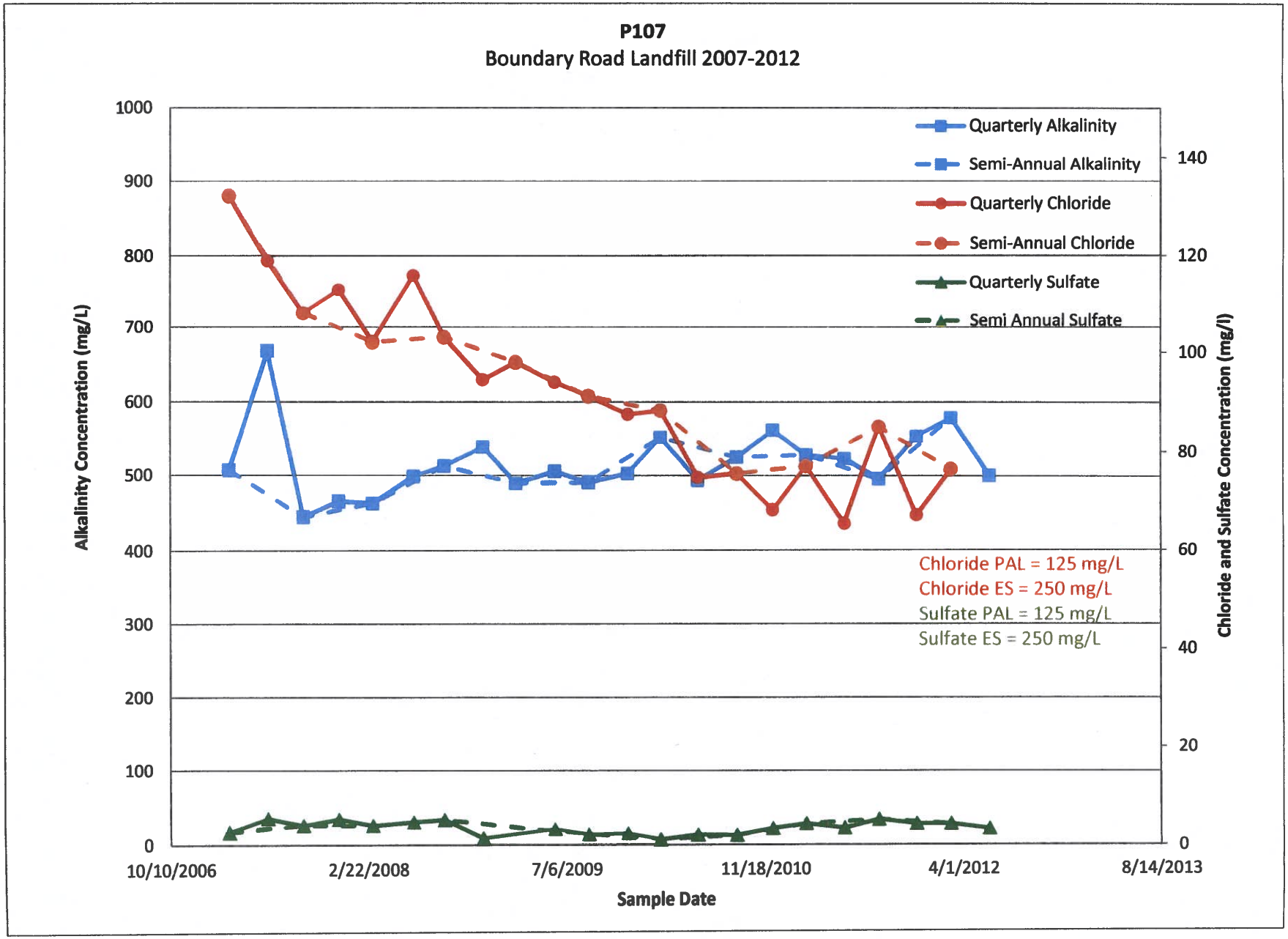

MW-116
Boundary Road Landfill 2007-2012
Quarterly Alkalinity
Semi-Annual Alkalinity
Quarterly Chloride
Semi-Annual Chloride
Quarterly Sulfate
Semi-Annual Sulfate
Chloride PAL = 125 mg/L
Chloride ES = 250 mg/L
Sulfate PAL = 125 mg/L
Sulfate ES = 250 mg/L
Alkalinity Concentration (mg/L)
Chloride and Sulfate Concentration (mg/l)
600
500
400
300
200
100
0
500
450
400
350
300
250
200
150
100
50
0
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
Sample Date

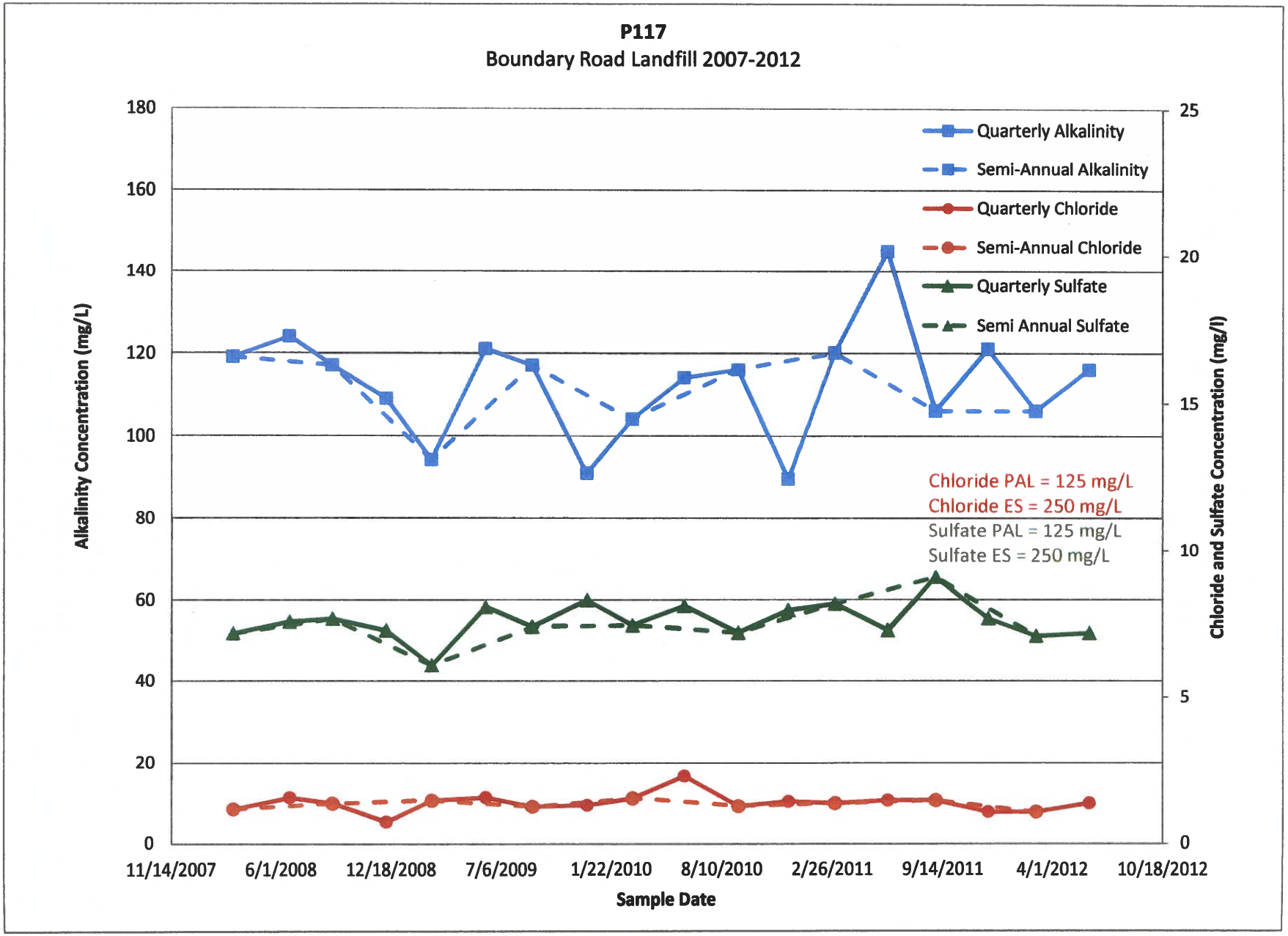

P102
Boundary Road Landfill 2007-2012
Quarterly Alkalinity
Semi-Annual Alkalinity
Quarterly Chloride
Semi-Annual Chloride
Quarterly Sulfate
Semi Annual Sulfate
Chloride PAL = 125 mg/L
Chloride ES = 250 mg/L
Sulfate PAL = 125 mg/L
Sulfate ES = 250 mg/L
Alkalinity Concentration (mg/L)
Chloride and Sulfate Concentration (mg/l)
Sample Date
350
300
250
200
150
100
50
0
140
120
100
80
60
40
20
0
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013


P104
Boundary Road Landfill 2007-2012
Alkalinity Concentration (mg/L)
Chloride and Sulfate Concentration (mg/l)
Sample Date
250
200
150
100
50
0
25
20
15
10
5
0
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
Quarterly Alkalinity
Semi-Annual Alkalinity
Quarterly Chloride
Semi-Annual Chloride
Quarterly Sulfate
Semi Annual Sulfate
Chloride PAL = 125 mg/L
Chloride ES = 250 mg/L
Sulfate PAL = 125 mg/L
Sulfate ES = 250 mg/L

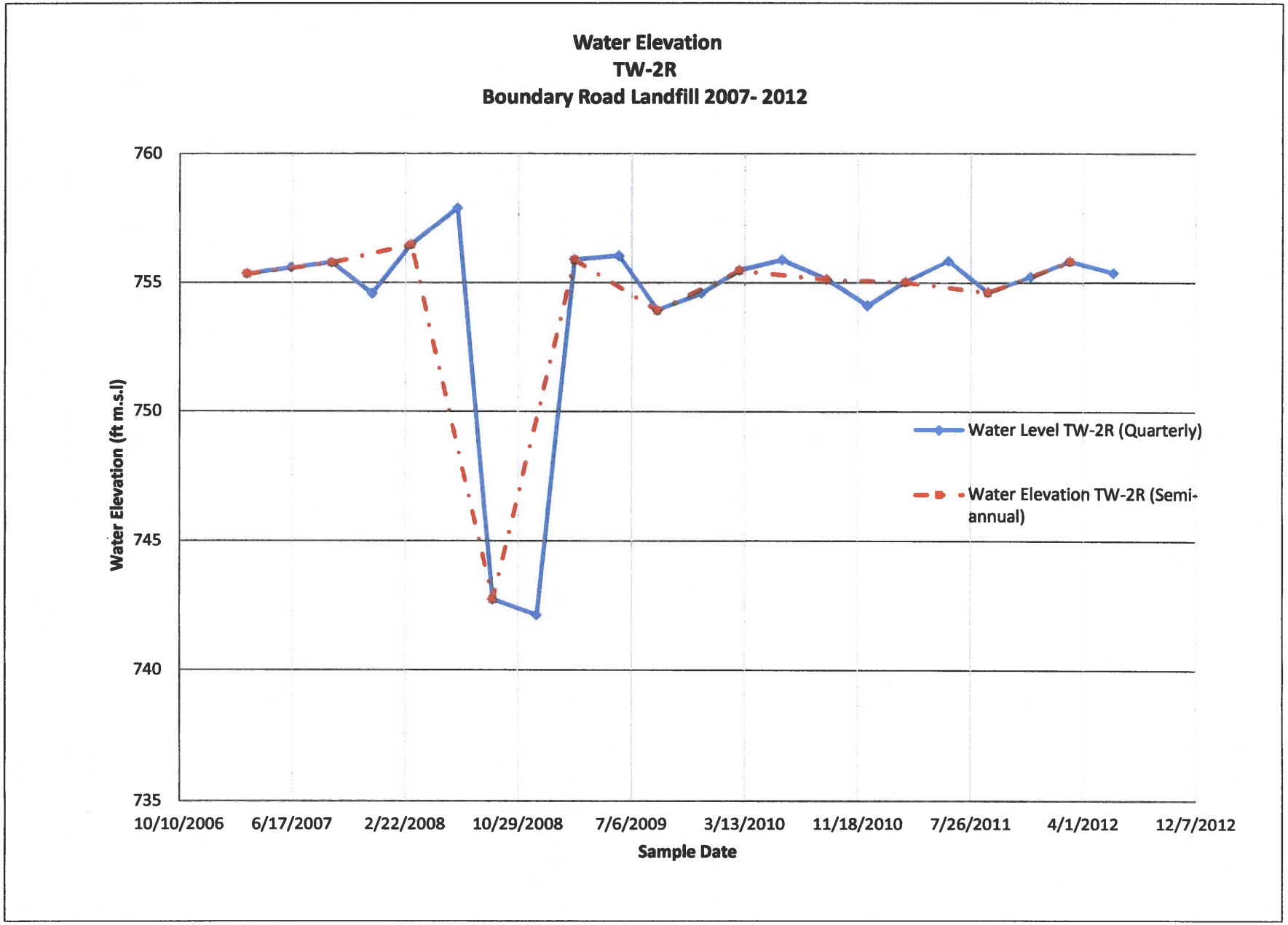

P101
Boundary Road Landfill 2007-2012
Quarterly Alkalinity
Semi-Annual Alkalinity
Quarterly Chloride
Semi-Annual Chloride
Quarterly Sulfate
Semi Annual Sulfate
Chloride PAL = 125 mg/L
Chloride ES = 250 mg/L
Sulfate PAL = 125 mg/L
Sulfate ES = 250 mg/L
Alkalinity Concentration (mg/L)
Chloride and Sulfate Concentration (mg/l)
250
200
150
100
50
0
50
45
40
35
30
25
20
15
10
5
0
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
Sample Date

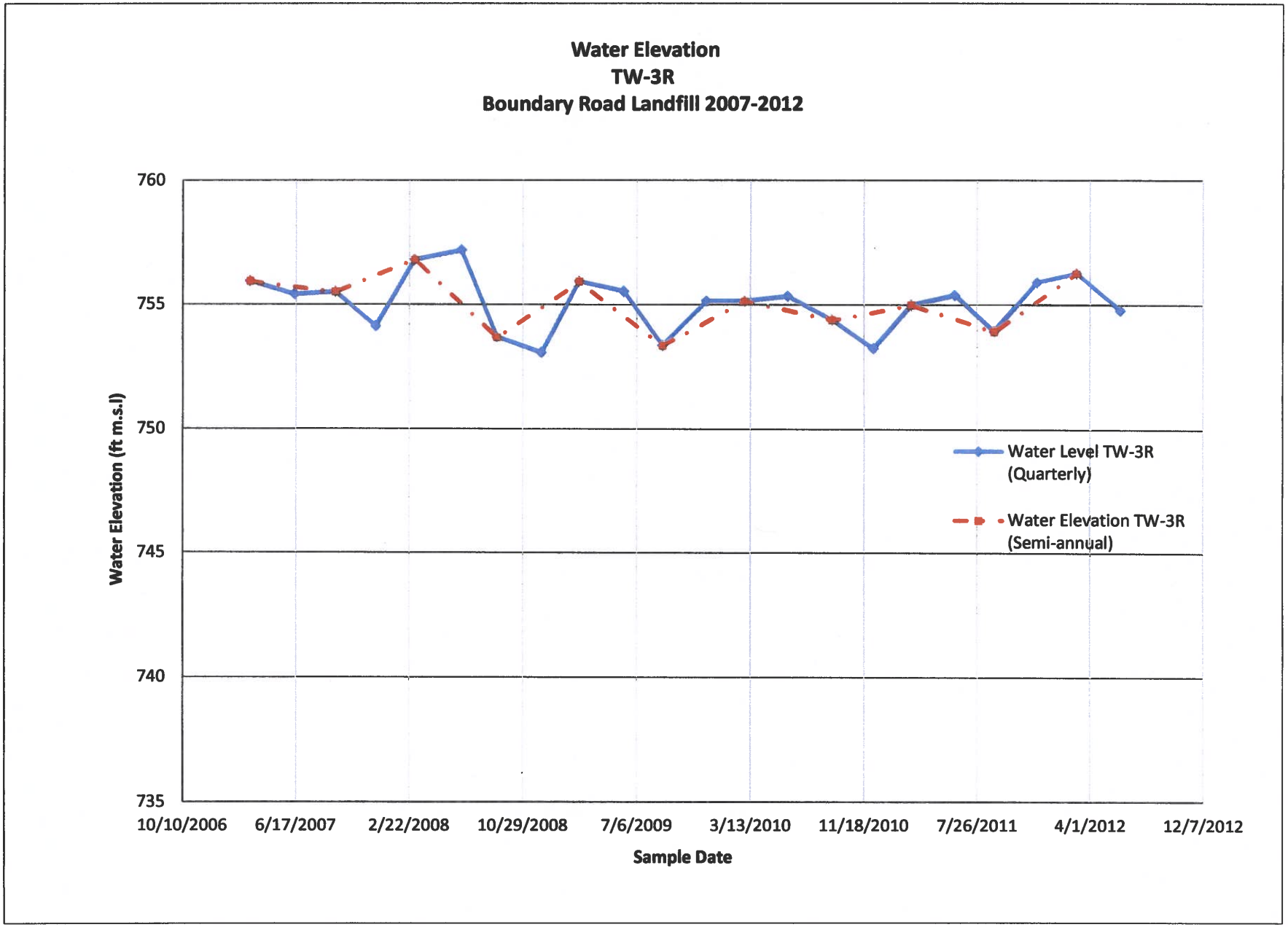

P103/P103R
Boundary Road Landfill 2007-2012
Chloride and Alkalinity Concentration (mg/L)
Sulfate Concentration (mg/l)
Sample Date
800
700
600
500
400
300
200
100
0
25
20
15
10
5
0
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
Quarterly Alkalinity
Semi-Annual Alkalinity
Quarterly Chloride
Semi-Annual Chloride
Quarterly Sulfate
Semi Annual Sulfate
Chloride PAL = 125 mg/L
Chloride ES = 250 mg/L
Sulfate PAL = 125 mg/L
Sulfate ES = 250 mg/L

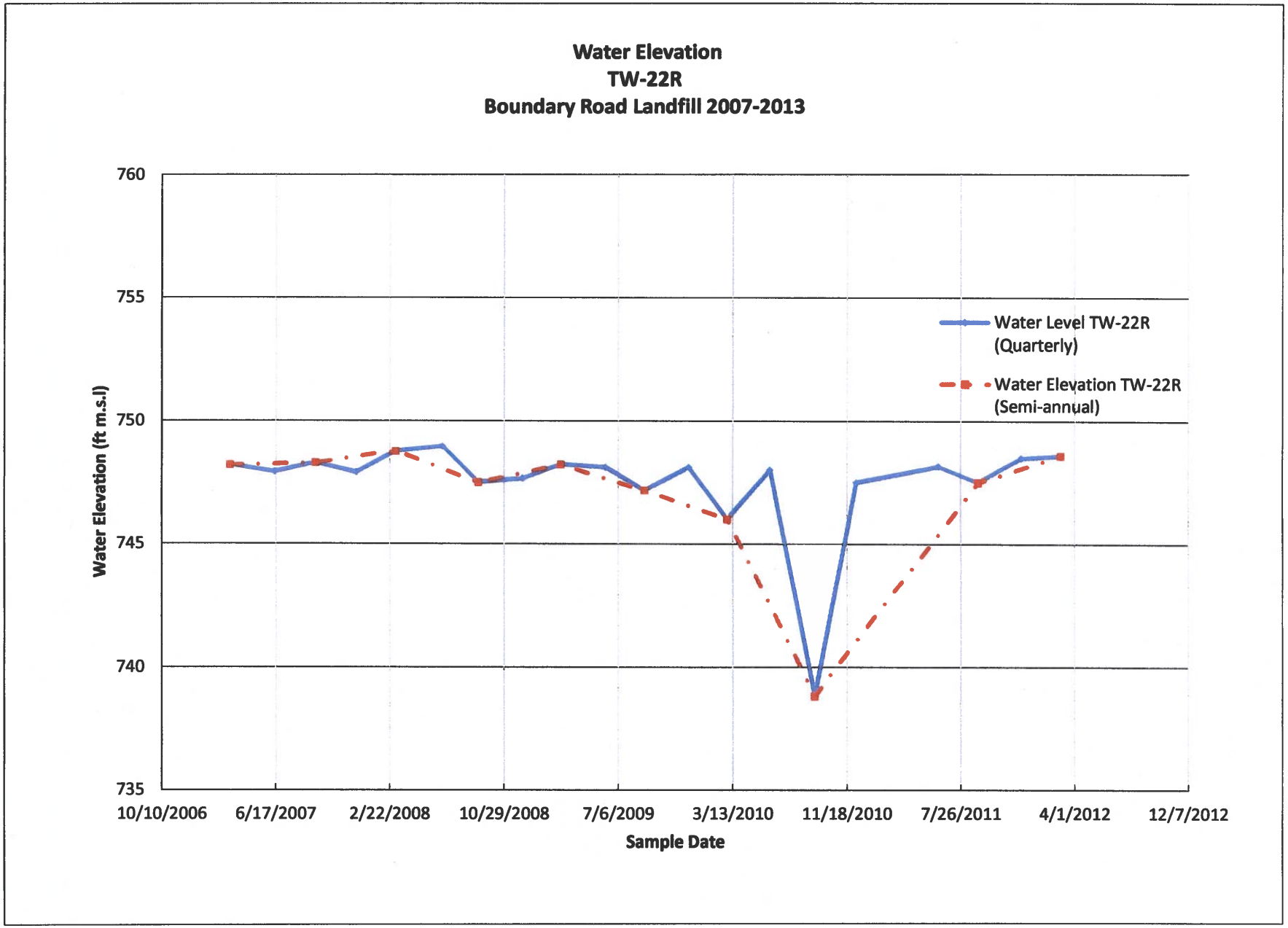

P107
Boundary Road Landfill 2007-2012
Alkalinity Concentration (mg/L)
Chloride and Sulfate Concentration (mg/l)
Sample Date
1000
900
800
700
600
500
400
300
200
100
0
140
120
100
80
60
40
20
0
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
Quarterly Alkalinity
Semi-Annual Alkalinity
Quarterly Chloride
Semi-Annual Chloride
Quarterly Sulfate
Semi Annual Sulfate
Chloride PAL = 125 mg/L
Chloride ES = 250 mg/L
Sulfate PAL = 125 mg/L
Sulfate ES = 250 mg/L


P117
Boundary Road Landfill 2007-2012
Alkalinity Concentration (mg/L)
Chloride and Sulfate Concentration (mg/l)
Sample Date
180
160
140
120
100
80
60
40
20
0
25
20
15
10
5
0
11/14/2007
6/1/2008
12/18/2008
7/6/2009
1/22/2010
8/10/2010
2/26/2011
9/14/2011
4/1/2012
10/18/2012
Quarterly Alkalinity
Semi-Annual Alkalinity
Quarterly Chloride
Semi-Annual Chloride
Quarterly Sulfate
Semi Annual Sulfate
Chloride PAL = 125 mg/L
Chloride ES = 250 mg/L
Sulfate PAL = 125 mg/L
Sulfate ES = 250 mg/L

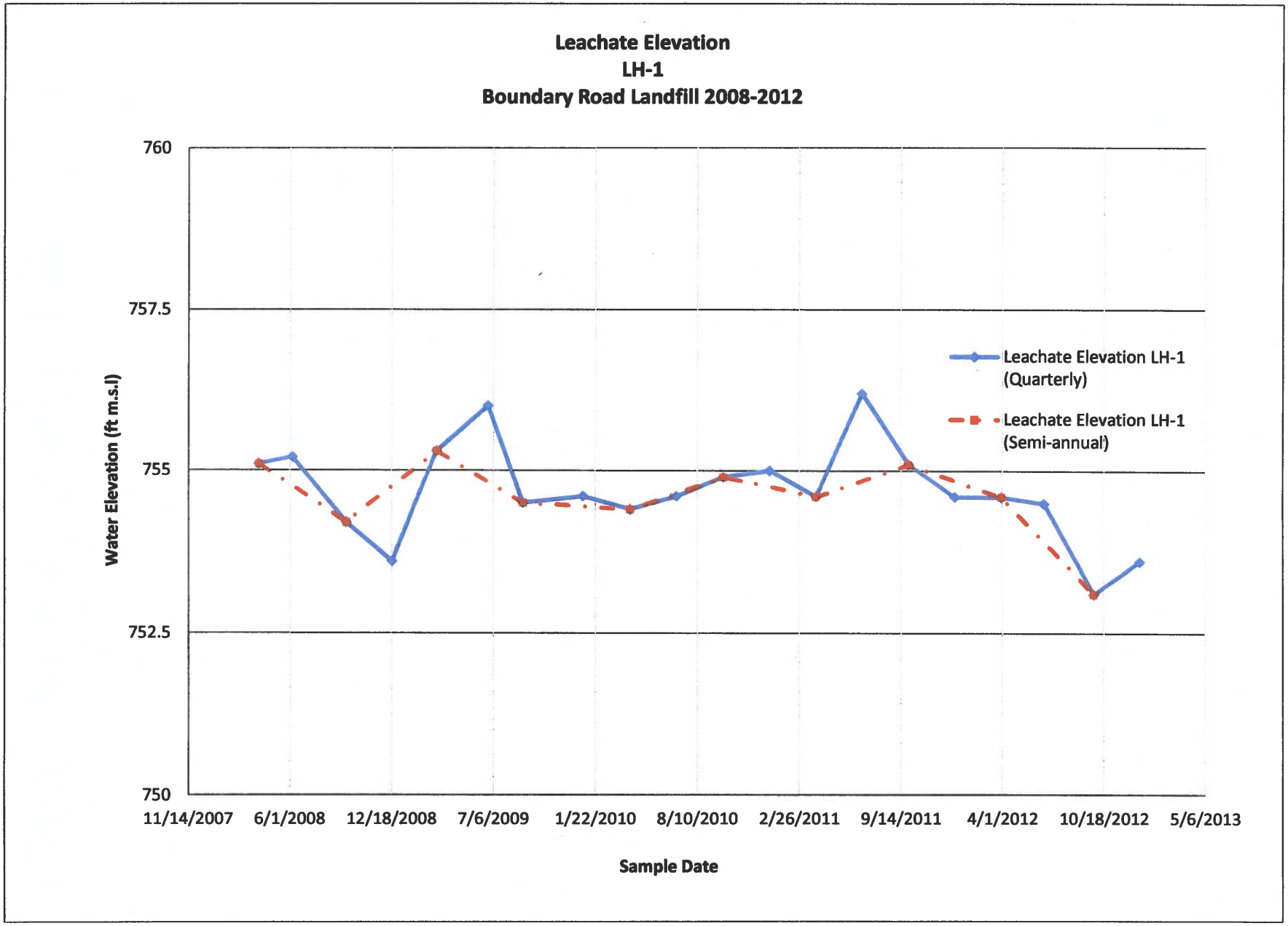
Appendix E
Groundwater and Leachate Level Monitoring Frequency Comparison


Water Elevation
TW-2R
Boundary Road Landfill 2007- 2012
760
755
750
745
740
735
Water Elevation (ft m.s.l)
10/10/2006
6/17/2007
2/22/2008
10/29/2008
7/6/2009
3/13/2010
11/18/2010
7/26/2011
4/1/2012
12/7/2012
Sample Date
Water Level TW-2R (Quarterly)
Water Elevation TW-2R (Semi-annual)

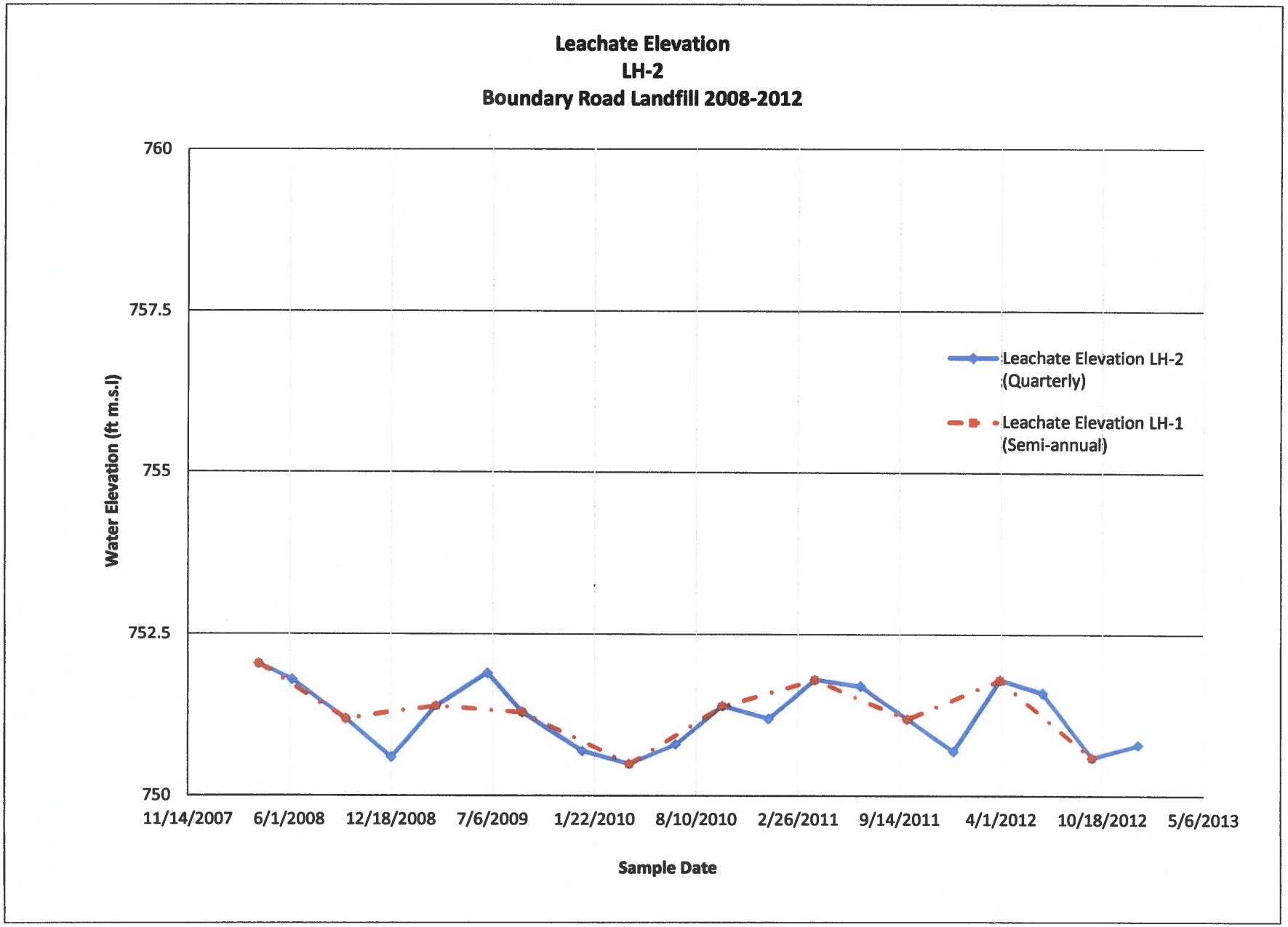

Water Elevation
TW-3R
Boundary Road Landfill 2007-2012
760
755
750
745
740
735
Water Elevation (ft m.s.l)
10/10/2006
6/17/2007
2/22/2008
10/29/2008
7/6/2009
3/13/2010
11/18/2010
7/26/2011
4/1/2012
12/7/2012
Sample Date
Water Level TW-3R (Quarterly)
Water Elevation TW-3R (Semi-annual)

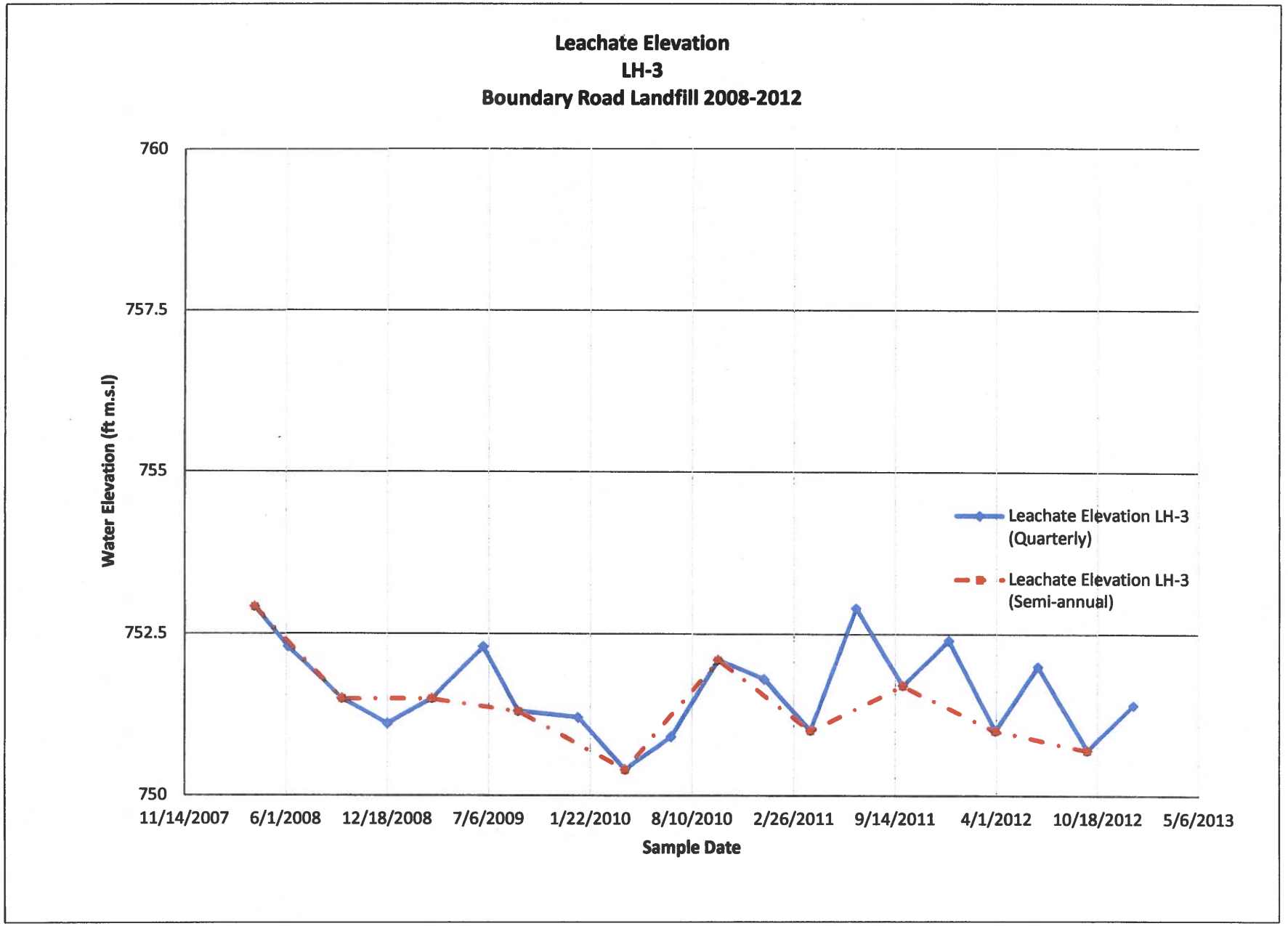


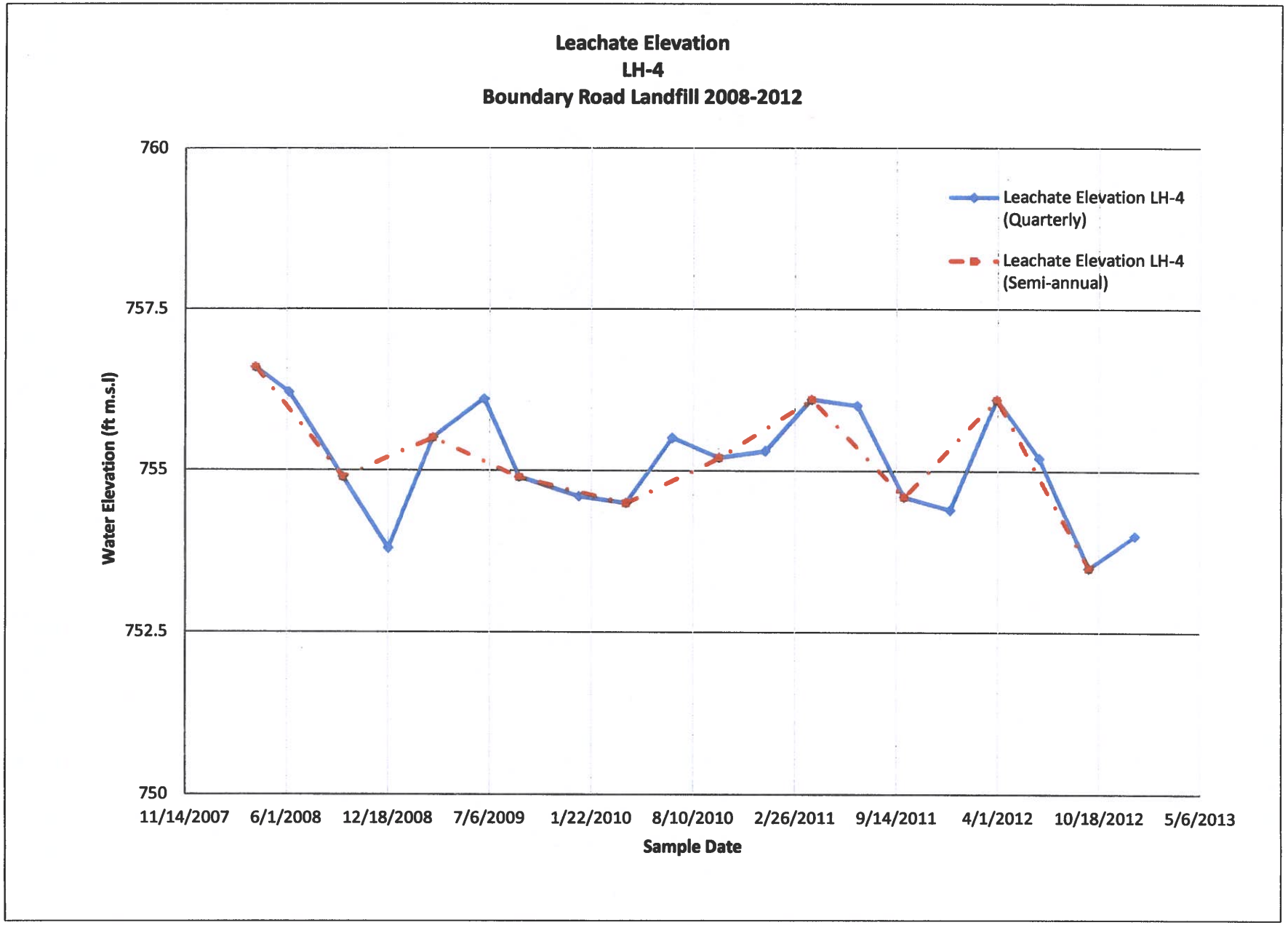
\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\189804\0001\LTSAP_Appendix E.xlsx

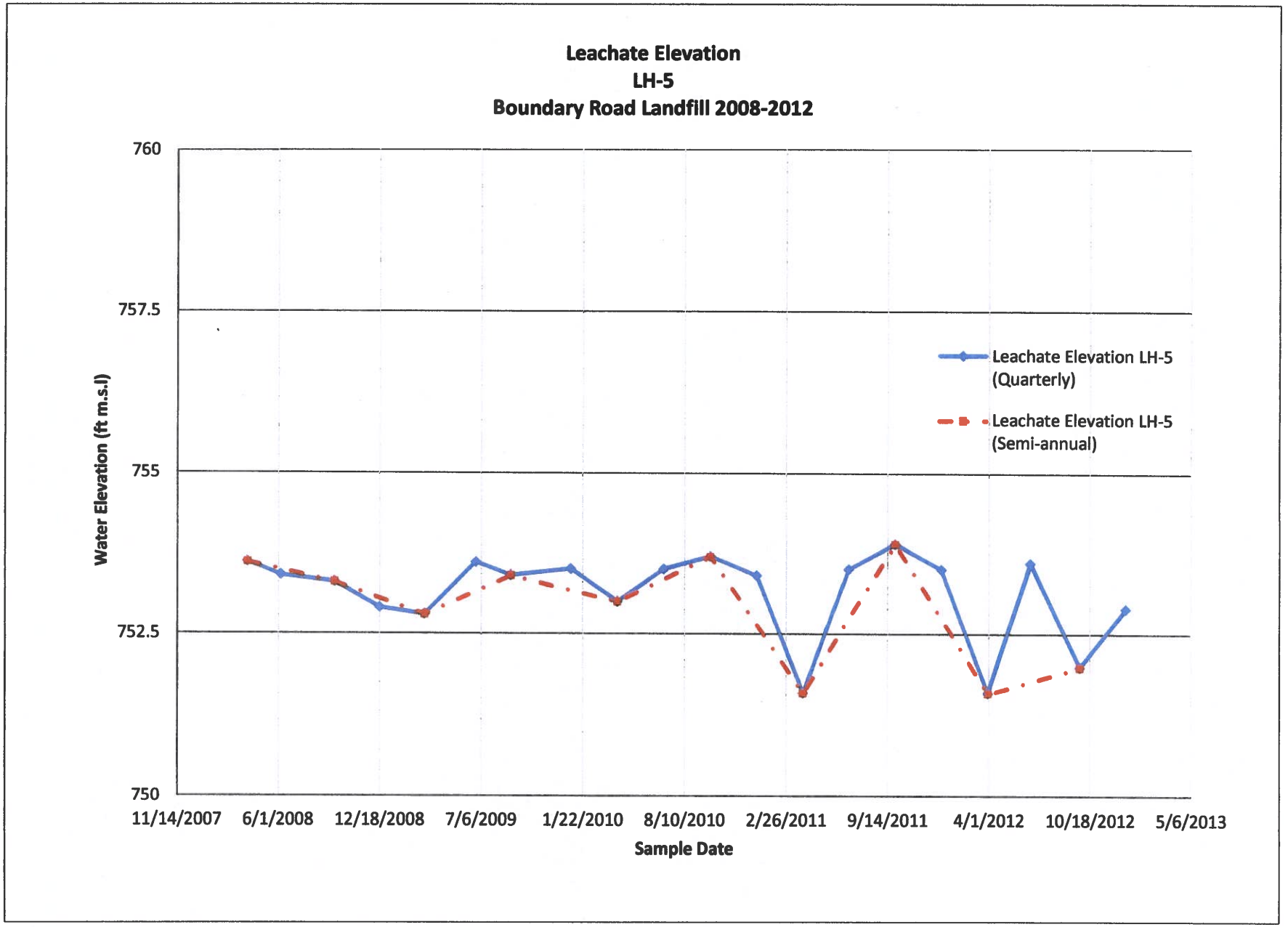


\\ntapb-madison\msn-vol6\-\WPMSN\PJT2\189804\0001\LTSAP_Appendix E.xlsx


Leachate Elevation
LH-2
Boundary Road Landfill 2008-2012
760
757.5
755
752.5
750
Water Elevation (ft m.s.l)
11/14/2007
6/1/2008
12/18/2008
7/6/2009
1/22/2010
8/10/2010
2/26/2011
9/14/2011
4/1/2012
10/18/2012
5/6/2013
Sample Date
Leachate Elevation LH-2 (Quarterly)
Leachate Elevation LH-1 (Semi-annual)


Leachate Elevation
LH-3
Boundary Road Landfill 2008-2012
760
757.5
755
752.5
750
Water Elevation (ft m.s.l)
11/14/2007
6/1/2008
12/18/2008
7/6/2009
1/22/2010
8/10/2010
2/26/2011
9/14/2011
4/1/2012
10/18/2012
5/6/2013
Sample Date
Leachate Elevation LH-3 (Quarterly)
Leachate Elevation LH-3 (Semi-annual)


Leachate Elevation
LH-4
Boundary Road Landfill 2008-2012
760
757.5
755
752.5
750
Water Elevation (ft m.s.l)
Leachate Elevation LH-4 (Quarterly)
Leachate Elevation LH-4 (Semi-annual)
11/14/2007
6/1/2008
12/18/2008
7/6/2009
1/22/2010
8/10/2010
2/26/2011
9/14/2011
4/1/2012
10/18/2012
5/6/2013
Sample Date


Leachate Elevation
LH-5
Boundary Road Landfill 2008-2012
760
757.5
755
752.5
750
Water Elevation (ft m.s.l)
Leachate Elevation LH-5 (Quarterly)
Leachate Elevation LH-5 (Semi-annual)
11/14/2007
6/1/2008
12/18/2008
7/6/2009
1/22/2010
8/10/2010
2/26/2011
9/14/2011
4/1/2012
10/18/2012
5/6/2013
Sample Date

A3 December 1999 LTSAP Landfill Gas Monitoring Program

4.0 LANDFILL GAS MONITORING PROGRAM

4.1 INTRODUCTION

This LFG Monitoring Plan identifies procedures for collection of data. The monitoring and test data will be used to verify that the site is in compliance with Chapter NR 445 of the Wisconsin Administrative Code (WAC) emission limits for hazardous pollutants and with the requirements identified in s. NR 506.07(3) WAC relative to LFG migration. Monitoring locations and rationale are provided in Table 4-1. The landfill gas monitoring points include gas collection wellheads, the blower/flare station on the gas collection system, and gas monitoring probes outside the landfill. Monitoring of the gas collection system will be used to determine landfill gas quality and quantity, while gas monitoring at the probes outside the landfill will verify that gas is not migrating from the landfill.

4.2 GAS MONITORING PROBES

Monitoring for potential landfill gas migration is conducted at select points near the perimeter of the BRL. Following gas extraction system start-up, gas probes will be monitored quarterly for methane, oxygen content, and pressure. At the time of sampling, notations will be made regarding observations of ground settlement, vegetative stress, and physical condition of the aboveground components of the probe. This data will be used to determine the overall condition of the gas monitoring probes and the effectiveness of the landfill gas extraction system.

Monitoring probe screens are installed to intercept the geologic interval and soil type most likely to allow transport of landfill gas. The gas probes will be used to verify the landfill gas is not migrating toward any off-site structures. Five gas monitoring probes are located along the eastern boundary of the site, just west of Boundary Road, and one gas monitoring probe is located north of the site. No gas monitoring probes are proposed for the west and south sides of the facility because of the high water table at the site, the existing pond to the south, and drainage channel to the west, and because the adjoining property is uninhabited and owned by WMWI.

4.3 LANDFILL GAS EXTRACTION SYSTEM

The landfill gas extraction system will be monitored at least quarterly for oxygen and methane content, gas temperature, and flow. At the time of sampling, notations will be made regarding any observations of cover settlement, cover desiccation, vegetative stress, and physical condition of the exposed piping, valves and sample ports. This data will be used to determine the overall physical condition and operating status of the extraction system. Any system damage will be repaired or replaced.

The gas extraction system is designed to allow regular monitoring of the necessary parameters without interruption of the system. At the header pipe connections, the gas pressure (vacuum) can be read and flow calculated by connecting gauges to applicable ports across an orifice plate. Gas quality and temperature can also be determined using these ports.

Gas flow rate at the header pipe connections is measured by calculations based on the orifice plate dimensions, gas pressure, gas temperature and gas composition. At the blower/flare station, gas ports are available for pressure readings and raw gas sampling.

4.4 BLOWER/FLARE STATION

The blower/flare station will be monitored quarterly for oxygen and methane content, gas temperature, and pressure differential across an orifice plate. The flow rate of the system will be calculated from this data. At

TABLE 4-1

LANDFILL GAS MONITORING LOCATIONS
BOUNDARY ROAD LANDFILL
MENOMONEE FALLS, WISCONSIN

Sampling Site	Location	Rationale for Sampling
LGP 1	2515892.83E 437569.32N	Between Limits of Waste and Off-Site Structure
LGP 3	2516446.89E 437478.55N	Between Limits of Waste and Off-Site Structure
LGP 4	2516447.34E 437302.74N	Between Limits of Waste and Off-Site Structure
LGP 5	2516447.19E 437003.37N	Between Limits of Waste and Off-Site Structure
LGP 6	25164455.90E 436706.84N	Between Limits of Waste and Off-Site Structure
LGP 7	2516455.05E 436410.17N	Between Limits of Waste and Off-Site Structure
G-1	2515954E [1] 436254N	Operating Status of Extraction System
G-2	2515903E [1] 436548N	Operating Status of Extraction System
G-3	2515851E [1] 436839N	Operating Status of Extraction System
G-4	2515799E 437133N [1]	Operating Status of Extraction System
G-5	2515786E 437207N [1]	Operating Status of Extraction System
G-6	2515419E 436394N [1]	Operating Status of Extraction System
G-7	2515254E [1] 436657N	Operating Status of Extraction System
G-8	2515148E [1] 436931N	Operating Status of Extraction System
G-9	2515024E [1] 437203N	Operating Status of Extraction System
G-10	2514843E [1] 437296N	Operating Status of Extraction System
Blower/Flare Station	2516067E [1] 435943N	Operating Status of Extraction System

NOTES:

[1] Approximate location. Final location to be determined in the field.
[2] LGPs = Landfill Gas Probes
[3] Gs = Landfill Gas Extraction System Wellheads

the time of sampling, notations will also be made of blower amps, and physical condition of equipment. This data will be used to determine the overall physical condition and operating status of the blower/flare station.

LFG monitoring will include sampling and testing of the raw LFG at the blower quarterly over a 1-year period. During the testing, the LFG flow rate will be measured. Laboratory data and flow volume measurements will be combined to estimate the mass emission rate of NR 445 compounds found in the LFG. The following is a more detailed discussion of the emission testing.

4.4.1 LFG Emissions Testing

In order to evaluate air emissions associated with the LFG collection system at the BRL, extracted LFG samples (raw) will be collected from the header at the flare station and analyzed to determine compliance with the emission criteria for specific constituents from NR 445 WAC (see Table 4-2 for specific compounds). The LFG flow rate will be measured at the time of the test. The observed flow rates and constituent concentrations in the raw LFG will be used to calculate contaminant mass emission rates for the system.

In accordance with the NR 445 WAC compliance evaluation program approved by WDNR, four quarterly LFG samples will be analyzed to determine constituent concentrations in the landfill gas. The first quarter LFG samples from the header pipe at the flare station will be analyzed for the specific constituents from NR 445 WAC (Table 4-2) that may be found in LFG. Mass emission rates will be calculated for those compounds which are detected to determine whether the site has the potential to emit hazardous contaminants in excess of regulated levels (NR 445 WAC). In accordance with the approved program, second, third, and fourth quarter LFG samples will then be analyzed for those compounds detected in first quarter testing which have the potential to exceed air emission limits in NR 445 WAC. At a minimum, volatile organic compounds benzene and vinyl chloride will be analyzed during the second, third, and fourth quarterly events. Following completion of the four quarterly tests, a report will be prepared to summarize the results of the emissions testing. The report will include recommendations for a long-term monitoring program, if necessary. If the calculated mass emission rates are above the permitted levels, appropriate treatment measures (BACT/LAER) will also be identified in the report.

4.4.2 LFG Emission Rate Calculations

The volumetric flow rate of LFG will be determined using static pressure readings across an orifice by the following equation:

$Q = 6KD^2 ((h/\rho)^2)$ where

Q = volumetric rate of flow in ft^3/min (cfm)
K = coefficient of air flow (dimensionless)
D = orifice diameter in inches
h = static pressure drop across orifice, in inches of water
ρ = LFG density, lb/ft^3
(from ACGIH 1992)

The following is an example calculation for typical conditions:

Given: K = 0.6
D = 2 inches
Pressure Drop = 18 inches of water
LFG Density = 0.07 lb/ft^3

Calculate: $Q = 6 \times 0.6 \times 2^2 \times (18/0/07)^2 = 231$ cfm

Mass emission rates will be estimated by using the following method.

TABLE 4-2

WISCONSIN ADMINISTRATIVE CODE NR 445 EMISSION RATES
BOUNDARY ROAD LANDFILL
MENOMONEE FALLS, WISCONSIN

NR 445 Compound	Allowable Emission Rate (lbs/yr)
Table A	
Benzene	300.0
Vinyl Chloride	300.0
Table B	
o-Toluidine	25.0
Urethane (Ethyl carbamate)	250.0
Polycyclic Organic Matter (a total of all listed compounds) Benz(a)anthracene Benzo(b)fluoranthene Benzo(a)pyrene Dibenz(a,h)acridine Dibenz(a,j)acridine Dibenz(a,h)anthracene 7H-Dibenzo(c,g)carbazole) Dibenzo(a,h)pyrene Dibenzo(ai,)pyrene Indeno(1,2,3-cd)pyrene	250.0
Nitrosoamines (a total of all listed compounds) N-Nitrosodi-n-butylamine N-Nitrosodiethanolamine N-Nitrosodiethylamine N-Nitrosodimethylamine p-Nitrosodiphenylamine N-Nitrosodi-n-propylamine N-Nitroso-N-ethylurea N-Nitroso-N-methylurea N-Nitrosomethylvinylamine N-Nitrosomorpholine N-Nitrosonornicotine N-Nitrosopiperidine N-Nitrosopyrrolidine N-Nitrososarcosine	250.0
Acrylonitrile	25.0
Aflatoxins	25.0
2-Aminoanthraquinone	250.0
o-Anisidine and o-anisidine hydrochloride	250.0
Benzotrichloride	250.0
Beryllium and beryllium compounds, as Be	25.0
Cadmium and cadmium compounds, as Cd	25.0

TABLE 4-2 (Continued)

WISCONSIN ADMINISTRATIVE CODE NR 445 EMISSION RATES
BOUNDARY ROAD LANDFILL
MENOMONEE FALLS, WISCONSIN

NR 445 Compound	Allowable Emission Rate (lbs/yr)
Carbon tetrachloride	25.0
Chloroform	250.0
p-Cresidine	250.0
2,4-Diaminoanisole sulfate	250.0
2,4-Diaminotoluene	250.0
1,2-Dibromo-3-chloropropane (DBCP)	250.0
1,2-Dibromoethane (EDB)	250.0
3,3'-Dichlorobenzidine	250.0
1,2-Dichloroethane (EDC)	25.0
Di(2-ethhyhexyl)phthalate (DEHP)	250.0
Diethyl sulphate	25.0
3,3'-Dimethoxybenzidine (o-Dianisidine)	250.0
4-Dimethylaminoazobenzene	250.0
3,3'-Dimethylbenzidine (o-Tolidine)	250.0
Dimethyl carbamoyl chloride	250.0
1,1-Dimethyl hydrazine	250.0
Dimethyl sulfate	25.0
1,4-Dioxane	250.0
Epichlorohydrin	300.0
Ethylene oxide	25.0
Ethylene thiourea	250.0
Formaldehyde	250.0
Hexachlorobenzene (HCB)	25.0
Hexamethyl phosphoramide	250.0
Hydrazine and hydrazine sulfate	250.0
Hydrazobenzene	250.0
Lindane and other hexachlorocyclohexane isomers	25.0
4,4'-Methylene bis(2-chloroaniline)(MOCA)	250.0
4,4'-Methylenedianiline (and dihydrochloride)	250.0
Methyl iodide	250.0
Nickel compounds other than nickel subsulfide, as Ni	250.0
2-Nitropropane	250.0
Polychlorinated biphenyls (PCB)	0.10
1,3-Propane sultone	250.0

TABLE 4-2 (Continued)

WISCONSIN ADMINISTRATIVE CODE NR 445 EMISSION RATES
BOUNDARY ROAD LANDFILL
MENOMONEE FALLS, WISCONSIN

NR 445 Compound	Allowable Emission Rate (lbs/yr)
β-Propiolactone	250.0
Propylene oxide	250.0
Propylenimine	250.0
2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.0001
Thiourea	250.0

Given: ug contaminant/volume of sample, dry standard cubic feet (DSCF) bulk LFG flow rate in SCF/min

Calculate: lb/contaminant/DSCF = ug/DSCF x 1 g/10^6 ug x 1 kg/10^3g x 2.2 lb/kg
lb contaminant/min = lb contaminant/DSCF x DSCF/min
lb contaminant/yr = lb contaminant/min x 60 min/hr x 24 hr/day x 365 day/yr

Appendix B

Monitoring Well Abandonment Documentation

March 24, 2023
File No. 25222265.00

Mr. Bruce LeRoy
Wisconsin Department of Natural Resources
1027 W. St. Paul Ave.
Milwaukee, WI 53233

Subject: Monitoring Well Abandonment Documentation
Boundary Road Landfill
Menomonee Falls, Wisconsin
License #0011
EPA ID #WID058735994

Dear Mr. LeRoy:

On behalf of Waste Management of Wisconsin, Inc. (WMWI), SCS Engineers (SCS) is submitting the enclosed documentation for the abandonment of three monitoring wells located at the WMWI Boundary Road Landfill.

The wells were abandoned as proposed in the Plan of Operation for the Orchard Ridge Recycling and Disposal Facility (RDF) Eastern Expansion, Southern Unit, which was approved by the Wisconsin Department of Natural Resources (WDNR) on December 15, 2022.

The three monitoring wells (P101, TW2R, and TW3R) were abandoned because they were located within the area affected by the first phase of the Boundary Road Landfill waste exhumation project, which is being performed in conjunction with construction of the Orchard Ridge East Expansion, Southern Unit.

In accordance with Wisconsin Administrative Code NR 507.04(2), SCS provided a professional geologist or qualified technician directly supervised by a professional geologist to observe the abandonment of the wells. The abandonment complied with NR 507.08. The monitoring well abandonment forms are included in Attachment A. Details of the abandonment are presented below.

The well casings and protective covers were removed from the wells prior to abandonment. In addition, dedicated well tubing and the associated dedicated pump were removed from P101 prior to abandonment.

Each monitoring well was overdrilled utilizing a roto-sonic track rig equipped with a water rotary drill bit. The bit had a welded steel extension rod designed to keep the drill bit centered within the 2-inch PVC riser pipe and screen, preventing deviation from the original borehole. PVC fragments were observed in the drill cuttings for each well overdrill, indicating that the wells were properly overdrilled according to plan. For all wells, the total well depth was reached or exceeded during overdrilling.

Once the final depth of each overdrill was reached, the drill crew pumped bentonite-cement grout to the bottom of the hole using the water rotary drill stem. The drill stem was then retracted in sections, with grout pumped as each section was withdrawn to displace the groundwater and seal the well

bore from the bottom up. Grout reached the surface and was circulated within the borehole at each former well location.

If you have any questions about the enclosed documentation, please contact Eric Oelkers at 608-444-3934 or eoelkers@scsengineers.com.

Sincerely,

Aaron C. Lofberg
Staff Professional
SCS Engineers

Eric Oelkers, PG
Senior Project Manager / Hydrogeologist
SCS Engineers

ACL/jsn/EO/SCC

cc: David Buser, WDNR
Alicia Zewicki, WDNR
Ann Bekta, WDNR
Larry Buechel, WMWI
Dan Roche, WMWI
Brett Coogan, WMWI
Greg Konsionowski, WMWI

Encl. Attachment A – Boundary Road Landfill Monitoring Well Abandonment Forms

I:\25222265.00\Deliverables\221128 BRL November 2022 Well Abandonment Documentation\230323_BRL Well Abandonment Letter.docx

Attachment A

Boundary Road Landfill
Monitoring Well Abandonment Forms

State of Wis., Dept. of Natural Resources SCS No. 25222265
dnr.wi.gov

Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and chs. NR 141 and 812, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between $10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information.

☐ **Verification Only of Fill and Seal**

Route to DNR Bureau:
☐ Drinking Water ☐ Watershed/Wastewater ☒ Remediation/Redevelopment
☒ Waste Management ☐ Other:

1. Well Location Information

County	WI Unique Well # of Removed Well	Hicap #
Waukesha		

Latitude / Longitude (see instructions): ____ N ____ W
Format Code: ☐ DD ☐ DDM
Method Code: ☐ GPS008 ☐ SCR002 ☐ OTH001

¼ / ¼	¼ SE	Section	Township	Range
or Gov't Lot #		1	8 N	21 ☒ E ☐ W

Well Street Address: W124 N8925, Boundary Rd

Well City, Village or Town	Well ZIP Code
Menomonee Falls	53051

Subdivision Name	Lot #

Reason for Removal from Service	WI Unique Well # of Replacement Well
Landfill Expansion	

2. Facility / Owner Information

Facility Name: Boundary Road Landfill
Facility ID (FID or PWS): 268152390
License/Permit/Monitoring #: License #0011
Original Well Owner: Waste Management of Wisconsin, Inc.
Present Well Owner: Waste Management of Wisconsin, Inc.
Mailing Address of Present Owner: W124 N8925 Boundary Road

City of Present Owner	State	ZIP Code
Menomonee Falls	WI	53051

3. Filled & Sealed Well / Drillhole / Borehole Information

☒ Monitoring Well ☐ Water Well ☐ Borehole / Drillhole

Original Construction Date (mm/dd/yyyy): 10/02/1991

If a Well Construction Report is available, please attach.

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug ☐ Other (specify):

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth From Ground Surface (ft.)	Casing Diameter (in.)
82	2

Lower Drillhole Diameter (in.)	Casing Depth (ft.)
8.5	72

Was well annular space grouted? ☒ Yes ☐ No ☐ Unknown

If yes, to what depth (feet)?	Depth to Water (feet)
68	17.25

4. Pump, Liner, Screen, Casing & Sealing Material

Pump and piping removed?	☐ Yes	☐ No	☒ N/A
Liner(s) removed?	☐ Yes	☐ No	☒ N/A
Liner(s) perforated?	☐ Yes	☐ No	☒ N/A
Screen removed?	☐ Yes	☐ No	☒ N/A
Casing left in place?	☐ Yes	☒ No	☐ N/A
Was casing cut off below surface?	☐ Yes	☒ No	☐ N/A
Did sealing material rise to surface?	☐ Yes	☐ No	☒ N/A
Did material settle after 24 hours?	☐ Yes	☐ No	☒ N/A
If yes, was hole retopped?	☐ Yes	☐ No	☒ N/A
If bentonite chips were used, were they hydrated with water from a known safe source?	☐ Yes	☐ No	☒ N/A

Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☒ Conductor Pipe-Pumped
☐ Screened & Poured (Bentonite Chips) ☐ Other (Explain):

Sealing Materials
☐ Neat Cement Grout ☐ Concrete
☐ Sand-Cement (Concrete) Grout ☐ Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:
☐ Bentonite Chips ☒ Bentonite - Cement Grout
☐ Granular Bentonite ☐ Bentonite - Sand Slurry

5. Material Used to Fill Well / Drillhole

Material	From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
Bentonite-Cement Grout	Surface	90	80 gallons	

6. Comments

P101, overdrilled and grouted well, DNR Well ID Number: 069

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing	License #	Date of Filling & Sealing or Verification (mm/dd/yyyy)
Horizon Construction & Exploration		11/16/2022

Street or Route	Telephone Number
764 Tower Drive	(262) 692-3348

City	State	ZIP Code	Signature of Person Doing Work	Date Signed
Fredonia	WI	53021	Aaron Tolley	11/22/2022

DNR Use Only

Date Received	Noted By

Comments:

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste ☐ Haz. Waste
☒ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Other

SOIL BORING LOG INFORMATION

Form 4400-122 7-91

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Boundary Road Landfill 1537101		P101

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
Exploration Technology, Inc. - Ken Tainter	9/30/91	10/2/91	4 1/4" I.D. HSA 0-100'

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		P101	744.9 Feet MSL	758.0 Feet MSL	8.5 inches

Boring Location
State Plane 437664.0 N, 2515526.0 E (S)/C/N Lat ___ ___ ___
-- 1/4 of SE 1/4 of Section 1, T 8 N, R 21 (E)/W Long ___ ___ ___

Local Grid Location (if applicable)
☐ N ☐ E
___ Feet ☐ S ___ Feet ☐ W

County	DNR County Code	Civil Town/City/or Village
Waukesha	68	Menomonee Falls

Sample Number	Sample Length Recovered (in.)	Blow Counts	Depth In Ft	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	ROD/ Comments
1	24	16		Stiff, Light Brown Lean CLAY, Trace Gravel, Moist (CL)	CL									SS
2	24	7												SS
				Loose, Light Brown Clayey SAND, Moist (SC)	SC									
3	24	4	5	Soft, Black Organic CLAY, Trace Plastic, Moist (OL)	OL			0.0	1.0 TSF					SS
				Loose, Light Brown Gravelly SAND, Moist (SP)	SP									
4	20	6		Stiff to Very Stiff, Light Brown Lean CLAY, Trace Gravel, Moist (CL)	CL				2.5 TSF					SS
5	24	15		Change to Light Gray at 8.0 ft					2.0 TSF					SS
6	24	13	10					0.0	3.0 TSF					SS
7	24	27							4.0 TSF					SS
8	24	17	15						4.0 TSF					SS
9	24	28							2.5 TSF					SS
10	24	22							4.0 TSF					SS
11	24	28	20											SS
12	24	38		Very Stiff, Light Gray Silty CLAY, Little to Some Fine Sand, Trace Gravel, Moist (CL-ML)	CL-ML									SS
13	24	62	25											SS
				Medium Dense, Light Gray Silty SAND, Wet (SM) No Sample 26-28 ft	SM									
14	24	27		Hydro Punch 28-29 ft, Hammered 26-29 ft, Hydro Punch Duplicate Attempted (No Water)					3.5 TSF					SS

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Thomas J. Karwoski M. Osten / RJR/JEM Firm WARZYN INC.

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

WDNR 8/91

Sample Number	Length Recovered (in.)	Blow Counts	Depth In Ft	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
15	24	21		Very Stiff, Brown to Gray Lean CLAY, Little to Some Gravel, Moist (CL)	CL				3.3 TSF					SS
16	24	24							3.0 TSF					SS
17	24	13	35						2.8 TSF					SS
18	24	26							3.4 TSF					SS
19	24	25		Brown					3.8 TSF					SS
20	24	27	40						3.0 TSF					SS
21	24	13							1.8 TSF					SS
22	24	28	45						2.5 TSF					SS
23	24	12		Medium Dense, Gray to Brown Silty SAND, Wet (SM)	SM									SS
24	24	11		Stiff to Very Stiff, Gray to Brown Lean CLAY, Trace to Little Gravel, Moist (CL)	CL				1.0 TSF					SS
25	24	23	50						0.5 TSF					SS
26	24	15							2.5 TSF					SS
27	24	47	55						3.5 TSF					SS
28	24	22		Soft					0.5 TSF					SS
29	24	37		Hard					4.5 TSF					SS
30	24	64	60						3.5 TSF					SS
31	24	24							1.5 TSF					SS
32	24	36	65						2.5 TSF					SS
33	24	16		1/2" Sand Seam at 68 ft					2.5 TSF					SS
34	12	9		Dense to Very Dense, Light Brown to Gray Fine SAND, Little Silt and Clay, Wet (SP-SM)	SP-SM									SS
			70	No Sample Taken 69-72 ft Hydro Punch 71-72 ft										
35	24	39											11.0	SS
36	24	67	75											SS
37	24	141												SS
38	24	52		More Silt with Depth										SS

Sample Number	Sample Length Recovered (in.)	Blow Counts	Depth In Ft	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plastic Limit	Soil Properties: P 200	RQD/ Comments
39	24	48	80						2.5 TSF					SS
40	24	28		Stiff to Very Stiff, Gray Lean CLAY, Trace Gravel, Moist (CL)	CL				1.5 TSF		37	17	99.5	SS
41	24	34	85						1.7 TSF					SS
42	24	20							1.5 TSF					SS
43	24	24							1.7 TSF					SS
44	24	17	90						1.0 TSF					SS
45	24	36							2.5 TSF					SS
46	24	24	95						1.7 TSF					SS
47	24	34							1.5 TSF					SS
48	24	25							1.0 TSF					SS
			100	End of Boring at 100.0 ft										
			105											
			110											
			115											
			120											
			125											

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☒ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name: Boundary Road Landfill

Facility License, Permit or Monitoring Number: _____

Type of Well: Water Table Observation Well ☒ 11 / Piezometer ☐ 12

Distance Well Is From Waste/Source Boundary: 25 ft.

Is Well A Point of Enforcement Std. Application? ☒ Yes ☐ No

Local Grid Location of Well: _____ ft. ☒ N. ☐ S. _____ ft. ☒ E. ☐ W.

Grid Origin Location: Lat. _____ Long. _____ or

St. Plane 437568 ft. N. 2515857 ft. E.

Section Location of Waste/Source: 1/4 of SE 1/4 of Sec. 1, T. 8 N. R. 21 ☒ E. ☐ W.

Location of Well Relative to Waste/Source: u ☒ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known

Well Name: TW2R

Wis. Unique Well Number: _____ DNR Well Number: _____

Date Well Installed: 10/31/91 (mm/dd/yy)

Well Installed By: (Person's Name and Firm)
Terry March
Warzyn Inc.

A. Protective pipe, top elevation 766.48 ft. MSL

B. Well casing, top elevation 766.39 ft. MSL

C. Land surface elevation 763.8 ft. MSL

D. Surface seal, bottom 758.3 ft. MSL or 5.5 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☒ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

13. Sieve analysis attached? ☒ Yes ☐ No

14. Drilling method used: Rotary ☐ 50 / Hollow Stem Auger ☒ 41 / Other ☐ __

15. Drilling fluid used: Water ☐ 02 / Air ☐ 01 / Drilling Mud ☐ 03 / None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No

Describe _____

17. Source of water (attach analysis):

E. Bentonite seal, top 763.5 ft. MSL or 0.3 ft.

F. Fine sand, top 758.3 ft. MSL or 5.5 ft.

G. Filter pack, top 757.4 ft. MSL or 6.4 ft.

H. Screen joint, top 756.8 ft. MSL or 7.0 ft.

I. Well bottom 746.7 ft. MSL or 17.1 ft.

J. Filter pack, bottom 746.3 ft. MSL or 17.5 ft.

K. Borehole, bottom 745.8 ft. MSL or 18.0 ft.

L. Borehole, diameter 8.5 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 1.97 in.

1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 3.8 in.
b. Length: 8.0 ft.
c. Material: Anodized Aluminum — Steel ☐ 04 / Other ☒ __
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____

3. Surface seal: Bentonite ☒ 30 / Concrete ☐ 01 / Other ☐ __

4. Material between well casing and protective pipe: Bentonite ☒ 30 / Annular space seal ☐ __ / Other ☒ __
#30 filter sand above ground surf

5. Annular space seal: a. Granular Bentonite ☒ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. _____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. 2.1 Ft³ volume added for any of the above
f. How installed: Tremie ☐ 01 / Tremie pumped ☐ 02 / Gravity ☒ 08

6. Bentonite seal: a. Bentonite granules ☒ 33
b. ☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☐ 32
c. _____ Other ☐ __

7. Fine sand material: Manufacturer, product name & mesh size
a. Badger Mining Corp.-fine mesh silica
b. Volume added 0.5 ft³

8. Filter pack material: Manufacturer, product name and mesh size
a. Red flint sand #30
b. Volume added 2.0 ft³

9. Well casing: Flush threaded PVC schedule 40 ☒ 2 / Flush threaded PVC schedule 80 ☐ 24 / Other ☐ __

10. Screen material: Schedule 40 PVC
a. Screen type: Factory cut ☒ 1 / Continuous slot ☐ 01 / Other ☐ __
b. Manufacturer Diedrich
c. Slot size: 0.010 in.
d. Slotted length: 9.7 ft.

11. Backfill material (below filter pack): None ☐ / Other ☒ __
Collapsed natural sand

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: Terry J. March /RJR | Firm: Warzyn Inc.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more th... In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for ea... $5000 for each day of violation. See instructions for more information including where the completed form should be sent.

State of Wis., Dept. of Natural Resources SCS No. 25222265
dnr.wi.gov

Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and chs. NR 141 and 812, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between $10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information.

☐ **Verification Only of Fill and Seal**

Route to DNR Bureau:
☐ Drinking Water ☐ Watershed/Wastewater ☒ Remediation/Redevelopment
☒ Waste Management ☐ Other:

1. Well Location Information

County	WI Unique Well # of Removed Well	Hicap #
Waukesha		

Latitude / Longitude (see instructions): ____ N ____ W
Format Code: ☐ DD ☐ DDM
Method Code: ☐ GPS008 ☐ SCR002 ☐ OTH001

¼ / ¼	¼	Section	Township	Range
or Gov't Lot #	SE	1	8 N	21 ☒ E ☐ W

Well Street Address: W124 N8925, Boundary Rd

Well City, Village or Town	Well ZIP Code
Menomonee Falls	53051

Subdivision Name	Lot #

Reason for Removal from Service	WI Unique Well # of Replacement Well
Landfill Expansion	

2. Facility / Owner Information

Facility Name: Boundary Road Landfill
Facility ID (FID or PWS): 268152390
License/Permit/Monitoring #: License #0011
Original Well Owner: Waste Management of Wisconsin, Inc.
Present Well Owner: Waste Management of Wisconsin, Inc.
Mailing Address of Present Owner: W124 N8925 Boundary Road

City of Present Owner	State	ZIP Code
Menomonee Falls	WI	53051

3. Filled & Sealed Well / Drillhole / Borehole Information

☒ Monitoring Well ☐ Water Well ☐ Borehole / Drillhole

Original Construction Date (mm/dd/yyyy): 10/31/1991

If a Well Construction Report is available, please attach.

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (specify):

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth From Ground Surface (ft.)	Casing Diameter (in.)
18	2

Lower Drillhole Diameter (in.)	Casing Depth (ft.)
8.5	7

Was well annular space grouted? ☒ Yes ☐ No ☐ Unknown

If yes, to what depth (feet)?	Depth to Water (feet)
5.5	13.6

4. Pump, Liner, Screen, Casing & Sealing Material

Pump and piping removed?	☐ Yes	☐ No	☒ N/A
Liner(s) removed?	☐ Yes	☐ No	☒ N/A
Liner(s) perforated?	☐ Yes	☐ No	☒ N/A
Screen removed?	☐ Yes	☐ No	☒ N/A
Casing left in place?	☐ Yes	☒ No	☐ N/A
Was casing cut off below surface?	☐ Yes	☒ No	☐ N/A
Did sealing material rise to surface?	☐ Yes	☐ No	☒ N/A
Did material settle after 24 hours?	☐ Yes	☐ No	☒ N/A
If yes, was hole retopped?	☐ Yes	☐ No	☒ N/A
If bentonite chips were used, were they hydrated with water from a known safe source?	☐ Yes	☐ No	☒ N/A

Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☒ Conductor Pipe-Pumped
☐ Screened & Poured (Bentonite Chips) ☐ Other (Explain):

Sealing Materials
☐ Neat Cement Grout ☐ Concrete
☐ Sand-Cement (Concrete) Grout ☐ Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:
☐ Bentonite Chips ☒ Bentonite - Cement Grout
☐ Granular Bentonite ☐ Bentonite - Sand Slurry

5. Material Used to Fill Well / Drillhole

	From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
Bentonite-Cement Grout	Surface	22	25 gallons	

6. Comments

TW2R, overdrilled and grouted well, DNR Well ID Number: 059

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing	License #	Date of Filling & Sealing or Verification (mm/dd/yyyy)
Horizon Construction & Exploration		11/14/2022

Street or Route	Telephone Number
764 Tower Drive	(262) 692-3348

City	State	ZIP Code	Signature of Person Doing Work	Date Signed
Fredonia	WI	53021	Aaron Tolley	11/22/2022

DNR Use Only

Date Received	Noted By

Comments:

State of Wis., Dept. of Natural Resources SCS No. 25222265
dnr.wi.gov

Well / Drillhole / Borehole Filling & Sealing Report

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Waukesha		

Latitude / Longitude (see instructions) ____ N ____ W
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Method Code: ☐ GPS008 ☐ SCR002 ☐ OTH001

¼ / ¼	¼ SE	Section	Township	Range
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Well Street Address: W124 N8925, Boundary Rd

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Facility ID (FID or PWS): 268152390
License/Permit/Monitoring #: License #0011
Original Well Owner: Waste Management of Wisconsin, Inc.
Present Well Owner: Waste Management of Wisconsin, Inc.
Mailing Address of Present Owner: W124 N8925 Boundary Road

City of Present Owner	State	ZIP Code
Menomonee Falls	WI	53051

3. Filled & Sealed Well / Drillhole / Borehole Information

☒ Monitoring Well ☐ Water Well ☐ Borehole / Drillhole

Original Construction Date (mm/dd/yyyy): 10/24/1991

If a Well Construction Report is available, please attach.

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (specify):

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth From Ground Surface (ft.)	Casing Diameter (in.)
31.5	2

Lower Drillhole Diameter (in.)	Casing Depth (ft.)
unconfirmed- 8.5 assumed	20

Was well annular space grouted? ☒ Yes ☐ No ☐ Unknown

If yes, to what depth (feet)?	Depth to Water (feet)
18	12.5

4. Pump, Liner, Screen, Casing & Sealing Material

Pump and piping removed?	☐ Yes	☐ No	☒ N/A
Liner(s) removed?	☐ Yes	☐ No	☒ N/A
Liner(s) perforated?	☐ Yes	☐ No	☒ N/A
Screen removed?	☐ Yes	☐ No	☒ N/A
Casing left in place?	☐ Yes	☒ No	☐ N/A
Was casing cut off below surface?	☐ Yes	☒ No	☐ N/A
Did sealing material rise to surface?	☐ Yes	☐ No	☒ N/A
Did material settle after 24 hours?	☐ Yes	☐ No	☒ N/A
If yes, was hole retopped?	☐ Yes	☐ No	☒ N/A
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Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☒ Conductor Pipe-Pumped
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Sealing Materials
☐ Neat Cement Grout ☐ Concrete
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For Monitoring Wells and Monitoring Well Boreholes Only:
☐ Bentonite Chips ☒ Bentonite - Cement Grout
☐ Granular Bentonite ☐ Bentonite - Sand Slurry

5. Material Used to Fill Well / Drillhole

Material	From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
Bentonite-Cement Grout	Surface	34	35 gallons	

6. Comments

TW3R, overdrilled and grouted well, DNR Well ID Number: 061

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing	License #	Date of Filling & Sealing or Verification (mm/dd/yyyy)
Horizon Construction & Exploration		11/14/2022

Street or Route	Telephone Number
764 Tower Drive	(262) 692-3348

City	State	ZIP Code	Signature of Person Doing Work	Date Signed
Fredonia	WI	53021	Aaron Tolley	11/22/2022

DNR Use Only

Date Received	Noted By

Comments: