

**Third Five-Year Review Report**

**For**

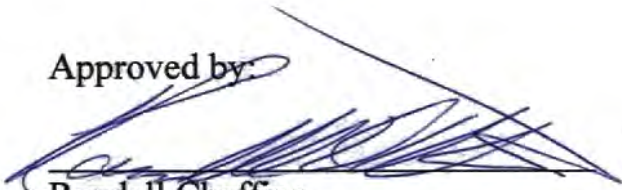
**Helena Chemical Co. Landfill  
SCD058753971**

**City of Fairfax  
Allendale County, South Carolina**

September 2014

United States Environmental Protection Agency  
Region 4  
Atlanta, Georgia

Approved by:



Randall Chaffins  
Acting Director, Superfund Division

Date:

9/16/14



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## Table of Contents

Executive Summary .....	5
1.0 Introduction.....	12
2.0 Site Chronology .....	14
3.0 Background.....	16
3.1 Physical Characteristics .....	16
3.2 Land and Resource Use .....	21
3.3 History of Contamination .....	21
3.4 Initial Response.....	21
3.5 Basis for Taking Action .....	22
4.0 Remedial Actions.....	23
4.1 Remedy Selection .....	23
4.2 Remedy Implementation.....	28
4.3 Operation and Maintenance .....	30
5.0 Progress Since the Last Five-Year Review.....	33
6.0 Five-Year Review Process.....	35
6.1 Administrative Components .....	35
6.2 Community Involvement .....	35
6.3 Document Review.....	36
6.4 Data Review.....	43
6.5 Site Inspection.....	50
6.6 Interviews.....	50
7.0 Remedy Evaluation.....	52
7.1 Question A: Is the remedy functioning as intended by the decision documents? .....	52
7.2 Question B. Are the exposure assumptions, toxicity data, clean up levels and RAOs used at the time of remedy selection still valid?.....	52
7.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?.....	53
7.4 Technical Assessment Summary .....	53
8.0 Issues.....	54
9.0 Recommendations and Follow-up Actions.....	55
10.0 Protectiveness Statement .....	58
11.0 Next Review.....	59

## TABLES

Table 1: Chronology of Site Events

Table 2: Groundwater Remedial Goals

Table 3: Annual Operation and Maintenance Costs (2009-2013)

Table 4: Progress on Recommendations from 2009 FYR

Table 5 - Summary of Groundwater ARAR Changes

Table 6 - Summary of Soil and Sediment ARAR Changes

Table 7: IC Summary Table

Table 8: Summary of Total Pesticide Concentrations in Sediment from 1999 to 2013

Table 9: Number of Site Wells Exceeding the PRG

Table 10: Recommendations to Address Current Issues at the HCC Landfill Site

## FIGURES

Figure 1 –Site Vicinity Map

Figure 2 - Site Map

Figure 2-1 Potentiometric Surface Map Shallow and Deep Wells

Figure 3 – Institutional Control Base Map

Figure 4 – Sediment Sampling Locations

## APPENDICES

- Appendix A List of Documents Reviewed
- Appendix B Copy of Newspaper Ad in the Allendale County Citizen Leader
- Appendix C Interview Forms
- Appendix D Site Inspection Checklist
- Appendix E Groundwater Monitoring Data 2003 – 2014
- Appendix F Photographs of Site Inspection Visit

## LIST OF ACRONYMS

AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirement
bgs	below ground surface
BHC	Benzene Hexachloride
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIC	Community Involvement Coordinator
COC	Contaminants of Concern
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
EPA	United States Environmental Protection Agency
EPN	Ethyl p-nitrophenyl thionobenzene phosphonate
ESD	Explanation of Significant Difference
FS	Feasibility Study
FYR	Five-Year Review
gpm	gallons per minute
HCC	Helena Chemical Company
HRS	Hazard Ranking System
IC	Institutional Control
LTTD	Low Temperature Thermal Desorption
MCL	Maximum Contaminant Level
mg/kg	milligram per kilogram
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPDES	National Pollution Discharge Elimination System
NPDWR	National Primary Drinking Water Regulations
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
POTW	Publicly owned treatment works
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RG	Remedial Goal
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
SARA	Superfund Amendments and Reauthorization Act
SCDHEC	South Carolina Department of Health and Environmental Control
TBC	To Be Considered
TBD	To Be Decided
VOC	Volatile Organic Compound
µg/L	microgram per liter

## **Executive Summary**

The Helena Chemical Company (HHC) Landfill Superfund site (the Site) is located in Fairfax, South Carolina. Agricultural pesticides were produced at the Site from the 1960's to 1979. A 4-acre area on the northeast portion of the Site was utilized as a former landfill. The former landfill contained pesticide residues and other waste materials generated on-site. The United States Environmental Protection Agency (EPA) placed the Site on the Superfund program's National Priorities List (NPL) in 1990. In 1993, the EPA issued a Record of Decision (ROD), selecting a remedy for the Site. The ROD was amended in 1995 and again in 1998.

The selected remedy for the HCC Landfill site in Fairfax, South Carolina included excavation of contaminated soils and sediments on-site, institutional controls (IC), and extraction of contaminated groundwater by means of a single recovery well. The Remedial Action Objectives (RAOs) for this remedy were to control risks posed by direct contact to contaminated media including; soil, sediment and groundwater, and to minimize migration of contaminants in groundwater.

The remedial action addressed on-site soil contamination, the principal threat at the Site; as well as on-site and off-site groundwater contamination. The major components of the selected remedy included the following:

### **Source Control**

Excavation of contaminated surface and subsurface soil to 3 feet, with verification sampling; Site re-grading to prevent uncontrolled storm-water runoff into waters of the State or the United States.

### **Groundwater**

Extraction of contaminated groundwater from the surface (shallow) aquifer; Treatment and discharge of the treated groundwater to a local Publicly-Owned Treatment Works (POTW) facility.

### **Mitigation for Adverse Impacts to Wetlands**

Mitigation for adverse impacts to environmental receptors in accordance with regulatory guidelines established under the authority of Section 404 of the Clean Water Act.

### **Site Monitoring**

Quarterly sampling of groundwater and nearby public water supply to monitor the concentrations and movement of contaminants in affected and potentially affected aquifers. The goal of the selected remedial action was to restore the impacted groundwater to levels below that of applicable Maximum Contaminant Levels (MCLs), i.e., drinking water standards. The Site achieved construction completion with the signing of the Preliminary Closeout Report on September 13, 1999.

### **Technical Assessment**

Both the shallow and deep groundwater plumes appear to have migrated beyond perimeter wells located on-site and the groundwater plume is undefined. The migration of groundwater and increasing contaminant concentrations in groundwater wells at the Site indicate the remedy is not performing as intended. Increasing sediment contaminant concentration data also indicates potential source material may remain onsite, and could potentially be contributing to the increasing Contaminants of Concern (COC) concentrations in the shallow aquifer. Additionally, the extent of the pesticide contamination in soils has increased in the wetland. It was assumed that contamination measured in the surface water and sediments in the RI would diminish once the remedy was implemented. The increasing contamination in the wetland represents a new exposure pathway. Additionally, the migration of contamination offsite in surface water, or leaching of contamination to groundwater should be considered as new or expanding exposure pathways.

During this Five-Year Review, institutional controls were also evaluated. On May 23, 2014 Helena Chemical Company submitted a copy of a Notice of Hazardous Waste that has been placed on parcel 124-00-00-013. Additional review by EPA determined that a restrictive covenant should be placed on parcel 124-00-00-014, 124-00-00-024 and any properties that have been impacted by the migration of contaminated groundwater.



During the FYR local authorities and nearby residents were interviewed. The vapor intrusion pathway was evaluated during the previous FYR. During the evaluation, it was determined the pathway was incomplete, and despite the presence of Volatile Organic Compounds (VOCs) present in groundwater at elevated concentrations, the current levels of VOCs in groundwater at the site do not exceed EPA risk targets for potential indoor air risk for both a commercial/industrial and the residential use scenario. However, vapor intrusion data should be verified with soil gas data if residential development is considered for the Site.

At this time, the remedy at the HCC Landfill is not protective of human health and the environment because of the increasing soil contaminant concentrations. Additionally, the migration of contamination offsite in surface water or leaching of contamination to groundwater should be considered as new or expanding exposure pathways. Contaminated groundwater migration is not under control and institutional controls (ICs) have not been implemented.

Contaminated sediment and surface water in the wetland area should be delineated and remediated. Additional monitoring wells need to be installed to determine the extent of groundwater contamination and additional recovery wells may need to be installed to fully capture the contaminated groundwater plume. Institutional Controls governing groundwater should be implemented on the Site property as well as on any adjacent properties onto which the contaminated groundwater plume has migrated.

Five-Year Review Summary Form

<b>SITE IDENTIFICATION</b>		
<b>Site name (from WasteLAN): HCC LANDFILL</b>		
<b>EPA ID (from WasteLAN): SCD058753971</b>		
<b>Region: 4</b>	<b>State: South Carolina</b>	<b>City/County: Fairfax/Allendale</b>
<b>SITE STATUS</b>		
<b>NPL status:</b> <input checked="" type="checkbox"/> Final <input type="checkbox"/> Deleted <input type="checkbox"/> Other (specify)		
<b>Remediation status</b> (choose all that apply): <input type="checkbox"/> Under Construction <input checked="" type="checkbox"/> Operating <input type="checkbox"/> Complete		
<b>Multiple OUs?*</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	<b>Construction completion date:</b> 09/13/1999	
<b>Has Site been put into reuse?</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
<b>REVIEW STATUS</b>		
<b>Lead agency:</b> <input checked="" type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency		
<b>Author name: Timothy Kadar</b>		
<b>Author title: Environmental Health Manager</b>	<b>Author affiliation: SCDHEC</b>	
<b>Review period**:</b> 03/18/2014 – 06/06/2014		
<b>Date(s) of site inspection:</b> 03/25/2014		
<b>Type of review:</b>		
<input checked="" type="checkbox"/> Post-SARA** <input type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only <input type="checkbox"/> Non-NPL Remedial Action-site <input type="checkbox"/> NPL State/Tribe-lead <input type="checkbox"/> Regional Discretion		
<b>Review number:</b> <input type="checkbox"/> 1 (first) <input type="checkbox"/> 2 (second) <input checked="" type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify)		
<b>Triggering action:</b>		
<input type="checkbox"/> Actual RA*** On-site Construction at OU# <input type="checkbox"/> Actual RA Start at OU# 1 <input type="checkbox"/> Construction Completion <input checked="" type="checkbox"/> Previous Five-Year Review Report <input type="checkbox"/> Other (specify)		
<b>Triggering action date (from WasteLAN):</b> 09/17/2009		
<b>Due date (five years after triggering action date):</b> 09/17/2014		

\*  
 \*\*["SARA" refers to Superfund Amendments and Reauthorization Act]  
 \*\*\*["RA" refers to Remedial Action]  
 # [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

**Five-Year Review Summary Form (continued)**

<b>Issues/Recommendations</b>				
<b>OU(s) without Issues/Recommendations Identified in the Five-Year Review:</b>				
None				
<b>Issues and Recommendations Identified in the Five-Year Review:</b>				
<b>OU(s): OU1</b>	<b>Issue Category:</b> Monitoring			
	<b>Issue:</b> Extent of groundwater plume not adequately delineated.			
	<b>Recommendation:</b> Install additional groundwater wells to adequately define the extent of the contaminated groundwater.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
No	Yes	PRP	EPA/State	06/01/2015
<b>OU(s): OU1</b>	<b>Issue Category:</b> Remedy Performance			
	<b>Issue:</b> The current groundwater recovery system is not fully capturing the contaminated groundwater plume.			
	<b>Recommendation:</b> Additional recovery wells need to be installed or the current groundwater recovery system needs to be improved to fully capture the contaminated groundwater plume.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
No	Yes	PRP	EPA/State	06/01/2015
<b>OU(s): OU1</b>	<b>Issue Category:</b> Institutional Controls			
	<b>Issue:</b> There are no institutional controls in place to prevent access to contaminated ground water.			
	<b>Recommendation:</b> Institutional controls should be implemented on parcel 124-00-00-014 and all other parcels affected by the migration of contaminated groundwater.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
No	Yes	PRP	EPA/State	06/01/2015

**Five-Year Review Summary Form (continued)**

<b>OU(s): OU1</b>	<b>Issue Category:</b> Monitoring			
	<b>Issue:</b> Chromium speciation in groundwater needs to be performed to determine the percent of Cr+6.			
	<b>Recommendation:</b> Chromium speciation should be performed on 20% of the samples to provide information that can be used to determine the potential percentages of Cr+6 in the total chromium results.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
No	Yes	PRP	EPA/State	06/01/2015

<b>OU(s): OU1</b>	<b>Issue Category:</b> Changed Site Conditions			
	<b>Issue:</b> Ecological risk assessment data needs to be updated.			
	<b>Recommendation:</b> Additional risk assessment work should be conducted to incorporate the wider set of receptors including aquatic-dependent wildlife and carnivorous wildlife, as was originally proposed. The contamination in the wetland has increased in magnitude and extent. The current ecological risks at the site exceed the degree of risks understood at the time the wetland mitigation remedy was selected. The increasing concentrations of pesticides in the wetland represent a new exposure pathway. Recommended inclusion of an assessment endpoint to protect the soil invertebrate community.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
Yes	Yes	PRP	EPA/State	06/01/2015

<b>OU(s): OU1</b>	<b>Issue Category:</b> Changed Site Conditions			
	<b>Issue:</b> Toxicity data needs to be updated.			
	<b>Recommendation:</b> The cleanup goal for wetland soils should be revised to create separate goals for individual pesticides using updated toxicity values and exposure assumptions.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
Yes	Yes	PRP	EPA/State	06/01/2015

**Environmental Indicators**

- Current human exposures at the Site are not under control.
- Current ground water migration is not under control.

**Are Necessary Institutional Controls in Place?**

All  Some  None

*Additional institutional controls need to be implemented*

**Has EPA Designated the Site as Sitewide Ready for Anticipated Use?**

Yes  No

**Has the Site Been Put into Reuse?**

Yes  No

**Sitewide Protectiveness Statement**

*Protectiveness Determination:*  
Not Protective

*Addendum Due Date (if applicable):*  
N/A

*Protectiveness Statement:*

At this time, the remedy at the HCC Landfill is not protective of human health and the environment because of the increasing soil contaminant concentrations. Additionally, the migration of contamination offsite in surface water or leaching of contamination to groundwater should be considered as new or expanding exposure pathways. Contaminated groundwater migration is not under control and institutional controls (ICs) have not been implemented. Contaminated sediment and surface water in the wetland area should be delineated and remediated. Additional monitoring wells need to be installed to determine the extent of groundwater contamination and additional recovery wells may need to be installed to fully capture the contaminated groundwater plume. Institutional Controls governing groundwater should be implemented on the Site property as well as on any adjacent properties onto which the contaminated groundwater plume has migrated.

## 1.0 Introduction

The purpose of a FYR is to evaluate the implementation and performance of a remedy in order to determine if the remedy will continue to be protective of human health and the environment. FYR reports document FYR methods, findings and conclusions. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The EPA prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121 states:

*If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

The EPA interpreted this requirement further in the NCP. The Code of Federal Regulations (CFR) states, in 40 CFR §300.430(f)(4)(ii):

*If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

The South Carolina Department of Health and Environmental Control (SCDHEC) conducted the FYR and prepared this report regarding the remedy implemented at the Helena Chemical Company Landfill Superfund site in Fairfax, Allendale County, South Carolina. The SCDHEC

personnel conducted this review from March 2014 to June 2014. The EPA is the lead agency for developing and implementing the remedy for the potentially responsible party (PRP)-financed cleanup at the Site.

This is the third FYR for the Site. The triggering action for this review is the signature date of the second FYR. The FYR is required because hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. This FYR Report addresses the entire Site.

## 2.0 Site Chronology

Table 1 lists the dates of important events for the Site.

**Table 1: Chronology of Site Events**

Date	Event
prior to the mid-1960's	Agricultural Pesticide Production by Atlas Chemical Company
mid-1960's - 1971	Agricultural Pesticide Production by Blue Chemical Company
1971-1978	Agricultural Pesticide Production by HCC
1979	Pesticide Production ceased; retail location created by HCC
November 1980	Site Initially Investigated by South Carolina Department of Health and Environmental Control SCDHEC
December 1980	Initial Soil Samples collected from SCDHEC
July 1981	Site Discovery - SCDHEC issued NOV for waste disposal operation
October 1, 1981	Administrative Order of Consent for RI/FS
October 1981 - July 1982	Preliminary Assessment / Site Inspection Activities
September 14, 1982	Identification and Preliminary Assessment Report
March 29, 1985	Preliminary Site Inspection Report
August 8, 1985	Site Inspection Report
June 1987	Hazardous Ranking Score Complete
June 24, 1988	Proposal to NPL
March 31, 1989	RI/FS Negotiations
April 12, 1989	Administrative Order of Consent
February 21, 1990	Final Listing on NPL
December 31, 1992	Final Remedial Investigation Report
January 13, 1993	Feasibility Study
September 8, 1993	Record of Decision
September 22, 1993	Administrative records
May 25, 1994	RD/RA Negotiations
June 14, 1994	Unilateral Administrative Order
September 1, 1995	ROD Amendment (First Amendment)
April 30, 1997	Final Design Report
May 28, 1997	PRP RD
February 11, 1999	ROD Amendment (Second Amendment)
September 13, 1999	Preliminary Close-out Report
December 19, 2002	2002 Groundwater and Sediment Monitoring Report
March 1, 2004	2003 Groundwater and Sediment Monitoring Report
September 17, 2004	First Five-Year Review Report
March 1, 2005	2004 Groundwater and Sediment Monitoring Report



Date	Event
March 1, 2006	2005 Groundwater and Sediment Monitoring Report
April 3, 2007	2006 Groundwater and Sediment Monitoring Report
March 14, 2008	2007 Groundwater and Sediment Monitoring Report
March 12, 2009	2008 Groundwater and Sediment Monitoring Report
September 17, 2009	Second Five-Year Review Report
February 23, 2010	Field Sampling Plan and Quality Assurance Project Plan
May 28, 2010	2009 Groundwater and Sediment Monitoring Report
June 15, 2010	Second Five Year Review: Work Plan in Response to EPA Recommendations to Address Current Issues at the Helena Chemical Company Landfill Site
March 24, 2011	2010 Groundwater and Sediment Monitoring Report
April 19, 2012	2011 Groundwater and Sediment Monitoring Report
July 23, 2012	Second Five Year Review: Work Plan in Response to EPA Recommendations to Address Current Issues at the Helena Chemical Company Landfill Site, Revision 01
August 24, 2012	Permit Request for Shallow and Deep Well Installation
April 17, 2013	2012 Supplemental Activities & Annual Monitoring Report

## **3.0 Background**

### **3.1 Physical Characteristics**

The Site, in Fairfax, South Carolina is located on 13.5 acres adjacent to Highway 321 in Allendale County, South Carolina (Figure 1). Located at the facility is a former landfill, which contains pesticide residues and other waste materials generated on-Site.

The former landfill occupies approximately four (4) acres on the northeast portion of the Site. A chain link security fence topped with barbed wire encircles the Site. A municipal water supply well that is utilized by a population of approximately 2,300 is located 200 feet west of the property. Three buildings exist on the Fairfax property, two warehouses and an office building (Figure 2).

The north warehouse, which was once utilized to house the liquid insecticide formulation operation, is currently used to store various pesticides, herbicides, and fertilizers, which are sold to farmers. There are several significant features of the liquid formulation building which were focal points of the investigation. Two 22,000 gallon above ground solvent tanks were once located near the north entrance to the "kettle room" in the former liquid formulation building. These tanks were present prior to Helena's occupancy of the property. Solvents used in the formulation process were delivered to the Site by rail car via a rail spur, which borders the Site to the east. The solvents were offloaded by pressurizing the tanker cars and pumping the solvents through product lines, which ran under the formulation building to the storage tanks. The solvent tanks are no longer present; however, the concrete slab on which the tank saddles rested still exists.

An additional warehouse formerly located at the Site, where powdered insecticides were formulated, has been demolished and disposed. A septic tank system that serviced the Site is located between the north liquid formulation building and the office.

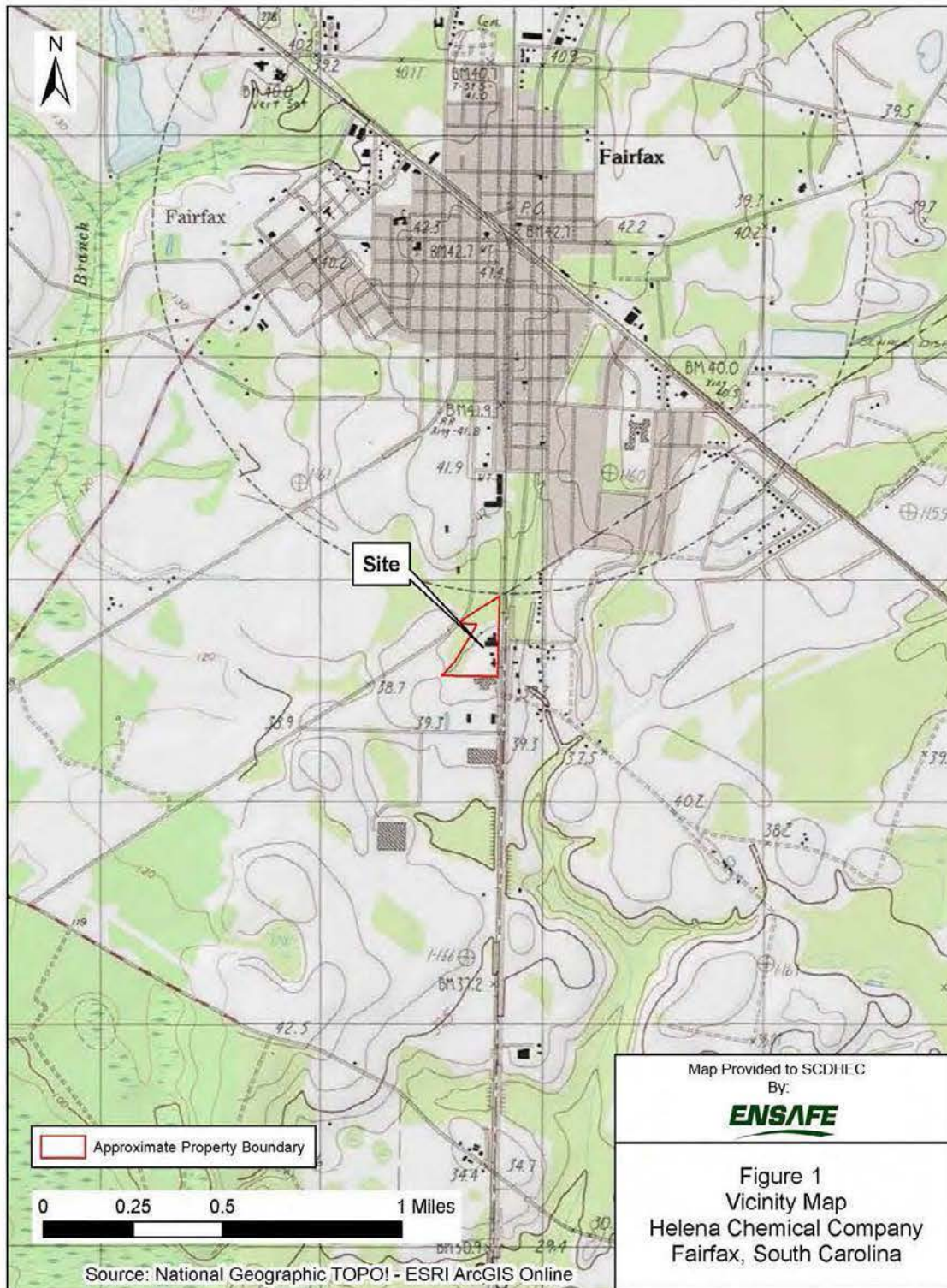
The local topography of the Fairfax area exhibits little relief (Figure 2). The Site property slopes slightly to the north. North of the property is a topographically low area that collects

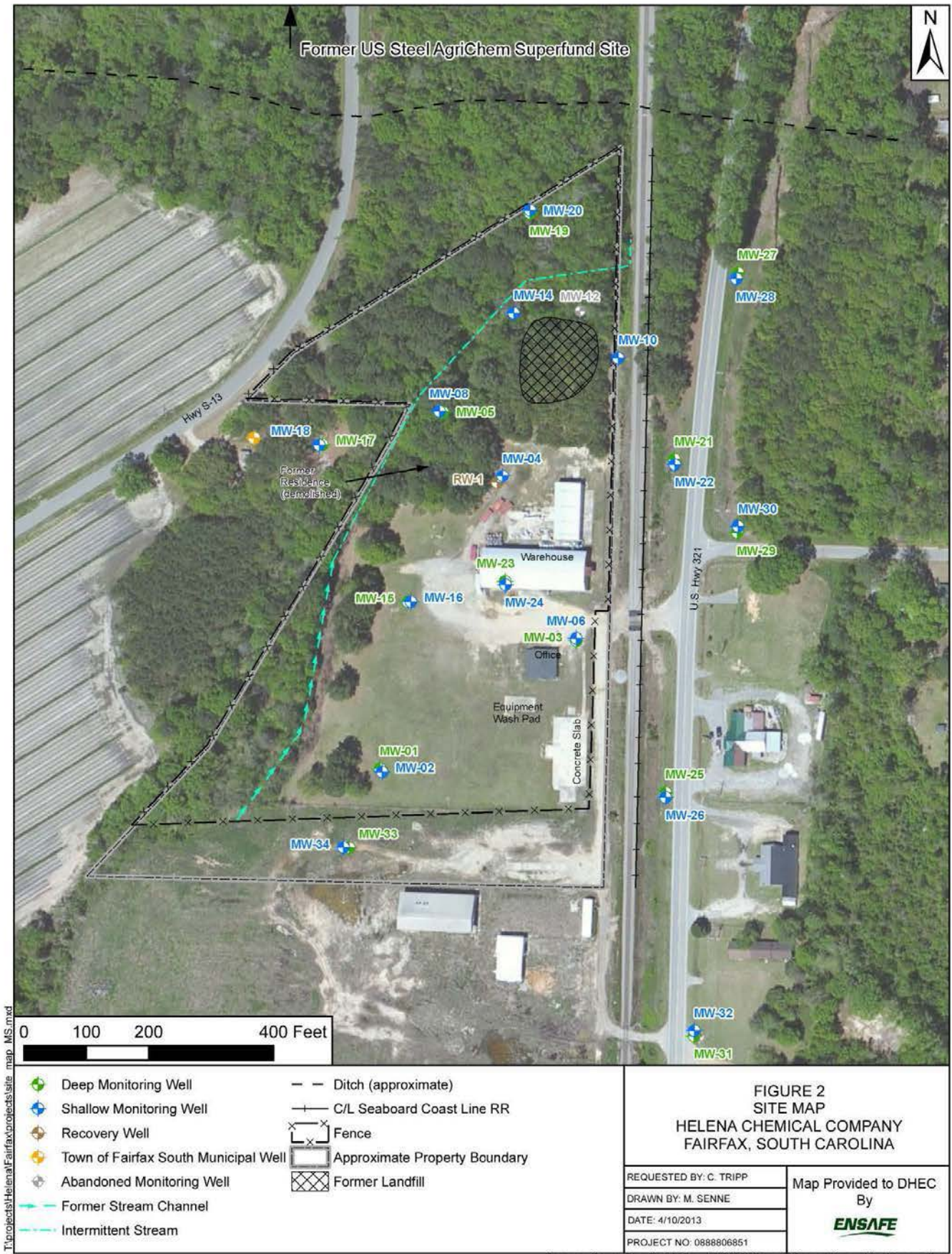
surface water during period of high rainfall. Additionally, surface water from the facility drains into a small ditch that parallels the property to the northwest. This ditch carries the water to Duck Creek, a tributary located northwest of the property, which in turn flows into the Coosawatchie River located to the west of the Fairfax property. The creek and the river are located within a three (3) mile radius of the Site.

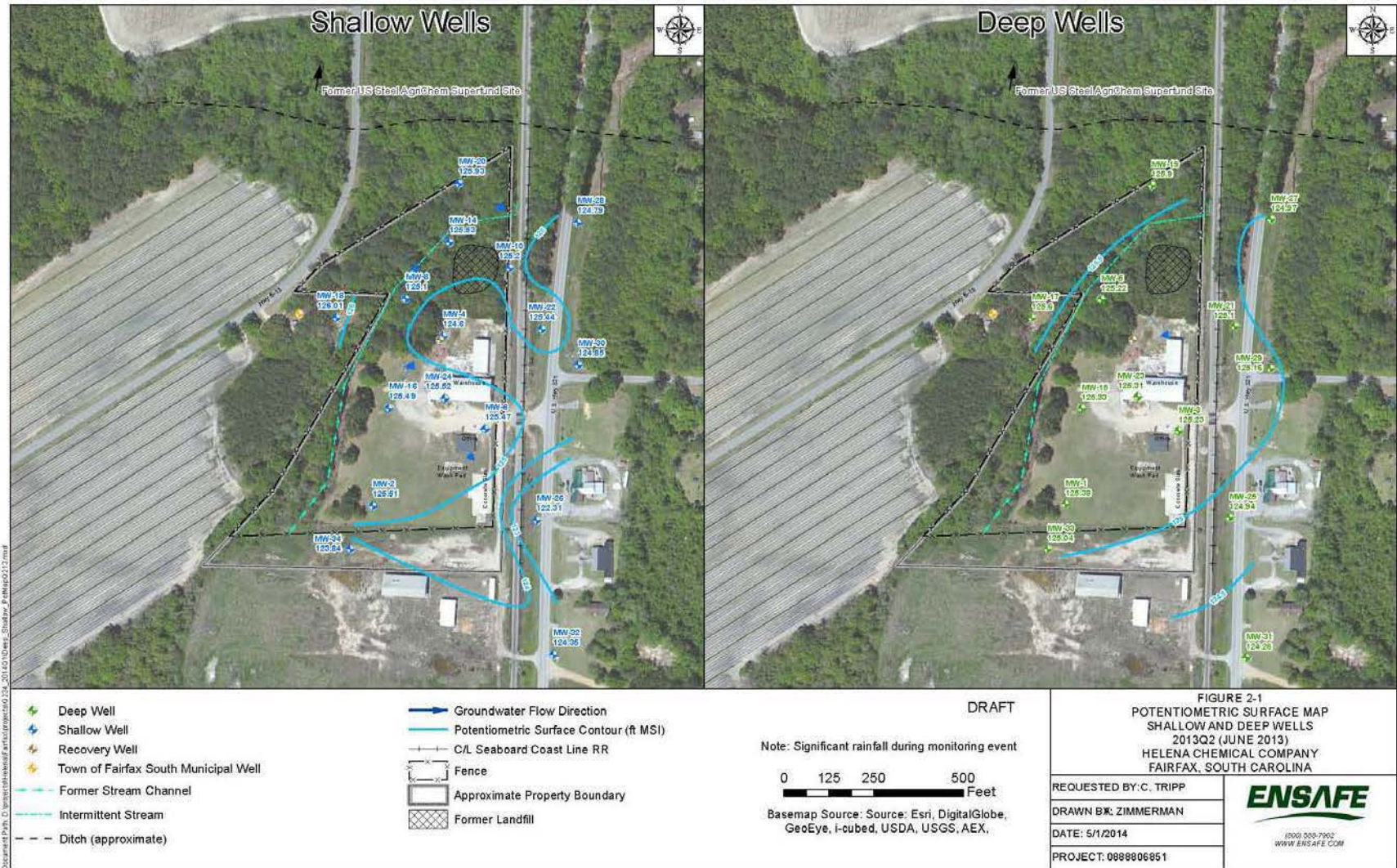
The facility property is bordered to the south by an abandoned manufacturing company, Corbett Plywood; to the north by heavily wooded undeveloped property, railroad tracks and U.S. Hwy 321 to the east, and a combination of cultivated and partially wooded property to the west.

Site-specific geological and stratigraphic information was developed during the installation of test borings and monitoring well boring. Three distinct stratigraphic units were observed in the upper 145 feet of the unconsolidated sediments encountered at the Site. Two aquifers occur at the Site. The uppermost aquifer (shallow aquifer) occurs within the sands of the Barnwell Group and the lower portion of the Duplin Formation. The deeper aquifer occurs within the lower Barnwell Group. No distinct confining unit separates the water table aquifer from the deeper aquifer

Groundwater flow at the Site is described as being seasonally variable. However, based on potentiometric data collected groundwater flow in the shallow and deeper aquifer is generally towards the southeast (Figure 2-1).







### **3.2 Land and Resource Use**

Several companies have owned and operated pesticide formulation facilities at the Site currently owned by HCC. Prior to the mid-1960s, the Site was owned by Atlas Chemical Company then from the mid-1960s until 1971 it was owned by Blue Chemical Company. Between the years 1971-1978, HCC used the Site for the formulation of both liquid and dry agricultural insecticides. HCC ceased formulation operations at the Site in 1979 and currently operates a retail facility that sells fertilizers, herbicides, pesticides and seed.

Drinking water at the Site and surrounding residential properties is provided by the City of Fairfax.

### **3.3 History of Contamination**

As described above, several companies have owned and operated pesticide formulation facilities at the Site, currently owned and occupied by HCC. Chemicals that have been stored and/or formulated at the facility during its active life include dichlorodiphenyltrichloroethane (DDT), aldrin, toxaphene, disulfoton, dieldrin, chlordane, benzene hexachloride (BHC), ethoprop, methyl parathion and ethyl p-nitrophenyl thionobenzene-phosphonate (EPN). During the formulation process, these chemicals were mixed with carrying agents including diesel fuel, volatile organic chemicals and adsorbent materials.

### **3.4 Initial Response**

The first regulatory actions taken at the Site occurred in November 1980, as a result of reports by a former employee of HCC and a newspaper report that a waste dump was being operated on the Site. The Site was investigated at that time by the SCDHEC. Numerous soil samples were collected and analyzed in December 1980. High levels of various pesticides, including aldrin, BHC isomers, chlordane, dieldrin, disulfoton, endrin and toxaphene were detected in these samples.

The SCDHEC issued a Notice of Violation to HCC in July 1981, for the operation of a waste disposal facility in violation of applicable South Carolina regulations. Administrative Order of Consent (AOC) No. 81-05-SW was issued on October 1, 1981.

In compliance with the terms of this Consent Order, HCC conducted investigations at the Site lasting from October 1981, to July 1982. The results of these studies indicated that surficial soils were heavily contaminated with pesticides, including those identified in the earlier sampling described above. Groundwater sampling for this investigation was contradictory. The positive results reported from the first sampling event were not confirmed. Surface water samples, taken from water standing in the wetland areas in the northern portion of the Site were found to be heavily contaminated with site-related pesticides.

HCC prepared a plan for site remediation which was submitted to the SCDHEC for review, and, under the terms of an amendment to Administrative Consent Order No. 81-05-SW, dated March 12, 1984, remediation efforts were conducted that consisted mainly of the removal of approximately 500 cubic yards of contaminated soils to a permitted hazardous waste landfill. In 1985, the EPA, in conjunction with the SCDHEC, conducted a Site Screening Investigation at the Site in order to prepare a Hazard Ranking System (HRS) package to determine whether the Site should be included on the National Priorities List (NPL). The HRS package was completed in June 1987, and the Site was proposed for listing in June 1988. The Site was finalized on the NPL in February 1990.

### **3.5 Basis for Taking Action**

In April 1989, the EPA entered into an AOC with HCC to perform a remedial investigation. HCC completed the investigation in December 1992. Investigation results indicated that soil, surface water, and groundwater contaminant concentrations presented unacceptable risk to human health and the environment. The pathways included:

- Current and future dermal exposure and ingestion to on-site contaminated surface soils
- Current and future direct contact with surface water
- Future ingestion of contaminated groundwater



## 4.0 Remedial Actions

In accordance with CERCLA and the NCP, the overriding goals for any remedial action are protection of human health and the environment and compliance with Applicable or Relevant and Appropriate Requirements (ARARs). A number of remedial alternatives were considered for the Site, and final selection was made based on an evaluation of each alternative against nine evaluation criteria that are specified in Section 300.430(f)(5)(i) of the NCP. The nine criteria include:

1. Overall Protectiveness of Human Health and the Environment
2. Compliance with ARARs
3. Long-Term Effectiveness and Permanence
4. Reduction of Toxicity, Mobility or Volume of Contaminants through Treatment
5. Short-term Effectiveness
6. Implementability
7. Cost
8. State Acceptance
9. Community Acceptance

## 4.1 Remedy Selection

The EPA selected the remedy for the Site in the September 1993 Record of Decision (ROD). The ROD listed the following RAOs:

- The remedial action objective for contaminated groundwater is to restore the affected aquifer to a condition that renders it suitable for use as a potable water supply.
- The overall remedial action objective for the surface and subsurface soils is to remove and remediate contaminated soils to such a degree that both groundwater quality (in conjunction with ground-water extraction and treatment) and human health are protected.

- The remedial action objective for the fill and the contaminated sediments is to mitigate for the impacts that have resulted in these unacceptable levels of risk to environmental receptors.

The selected remedy, as stated in the ROD, included several major components and a contingency remedy:

### **Source Control**

Excavation of contaminated surface and subsurface soil, with verification sampling; treatment of the contaminated soils by means of hydrolytic/photolytic dechlorination and biological degradation; placement of the treated soils into on-site excavations.<sup>1</sup>

Site re-grading to prevent uncontrolled storm-water runoff into waters of the State or the United States.

### **Groundwater**

Extraction of contaminated groundwater from the surface (shallow) aquifer and treatment and discharge of the treated groundwater to a local Publicly Owned Treatment Works (POTW).

### **Mitigation for adverse impacts to wetlands**

Mitigation for adverse impacts in the wetlands to environmental receptors in accordance with regulatory guidelines established under the authority of Section 404 of the Clean Water Act.

### **Site Monitoring**

Annual sampling of groundwater and nearby public water supply to monitor the concentrations and movement of contaminants in affected and potentially affected aquifers.

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<sup>1</sup> Subsequent ROD amendments changed this treatment option.

### **Contingency Remedy**

Low temperature thermal desorption (LTTD) is a contingency remedy for soil treatment, to be implemented should the chosen soil treatment technology prove incapable of achieving performance standards.

The 1993 ROD was amended in 1995 and again in 1999. Both amendments addressed the selected treatment technology and remedial alternative for the treatment of contaminated soils at the Site. The September 1, 1995 ROD amendment changed the treatment technology for contaminated soils from on-site hydrolytic/photolytic dechlorination, and bioremediation, to off-site incineration at a Resource Conservation and Recovery Act (RCRA)-permitted incinerator located in Clive, Utah. All other requirements of the September 1993, ROD remained unaffected.

The February 11, 1999 ROD amendment also addressed the treatment of contaminated soils at the Site. The modification of the remedy for contaminated soils included the excavation of approximately 6,500 cubic yards of pesticide contaminated waste and segregation of the waste into three categories consisting of demolition debris, soils with low and high contamination concentrations.

Soils with high concentrations of contaminants would be sent to the Sarnia hazardous waste landfill, regulated by the Ontario Ministry of Environment and Energy in Canada. Pre-excavation sampling indicated that 34 of the 46 waste samples exhibited contamination below the cutoff level for Sarnia. Helena then petitioned EPA to amend the 1995 ROD Amendment to allow for portions of the site waste to be sent to Sarnia, thereby reducing the overall remedy costs estimates from \$3,517,000 (incineration only) to \$2,361,900 (combination of incineration and landfill). All demolition debris would be sent to a RCRA regulated Subtitle C landfill.

The ROD required a remediation goal of 5 ppm of total pesticides for soils and sediments. The ROD selected cleanup goals for soils and sediments based on the potential for direct contact with and/or ingestion of the contaminated soil above health-

based levels and to eliminate soil as a potential source of groundwater contamination. The ROD identified sixteen contaminants of concern for the Site's groundwater (Table 2). The ROD based groundwater cleanup goals on the EPA National Primary Drinking Water Regulations (NPDWRs) Maximum Contaminant Levels (MCLs) for direct contact or ingestion.

**Table 2: Groundwater Remedial Goals**

<b>Groundwater Remedial Goals</b>	
<b>Contaminant of Concern</b>	<b>ROD Established Remedial Goal (µg/l)*</b>
<i>Volatile Organic Compound</i>	
Benzene	5
<i>Inorganics</i>	
Chromium	100
Lead	15
<i>Pesticides</i>	
4,4'-DDT	0.1
4,4'-DDD**	0.1
4,4'-DDE***	0.1
Aldrin	0.002
Alpha-BHC	0.006
Beta-BHC	0.02
Chlordane	2
Delta-BHC	0.006
Dieldrin	0.002
Endrin	2
Gamma-BHC (Lindane)	0.2
Heptachlor	0.4
Toxaphene	3

\*µg/L refers to micrograms per liter

\*DDD refers to Dichlorodiphenyldichloroethane

\*\*DDE refers to Dichlorodiphenyldichloroethylene

## 4.2 Remedy Implementation

In June 1994, EPA issued a Unilateral Administrative Order to HCC, which required HCC to conduct the Remedial Design and Remedial Actions prescribed by the ROD.

### **Soil/Sediment Remedy**

Since 1983, soil and part of the landfill has been removed from the Site during four separate actions. The March 1984 and April 1992 removals are discussed in Section 3.4, Initial Response.

The Remedial Design for the Soil/Sediment remedy began in 1995 and was completed in 1997 by the PRP with EPA oversight.

In the summer of 1995, approximately 700 cubic yards of soil were excavated from the Site and incinerated. Except for soil in and around the landfill, all soils exceeding the removal standard of 50 milligrams per kilogram (mg/kg) total pesticides as specified in the ROD, was excavated and shipped to Laidlaw Environmental Services' incinerator facility in Clive, Utah.

Excavation of the landfill occurred during the time frame of September to October 1998. The soil removal and off-site disposal occurred in conformance with the 1999 ROD amendment. Confirmation samples were collected prior to backfilling the excavation, to determine if the remediation goal of 50 mg/kg total pesticide concentrations had been attained. The confirmation sample concentrations ranged from 3.3 mg/kg to 42.7 mg/kg with an average of 12.1 mg/kg.

Remedial Action activities in the wetland area were conducted from September 14-16, 1998. The area north of the landfill was heavily vegetated. After the vegetation was cleared, the soil berm located in the wetland was easily distinguished from the surrounding wetland because it was approximately 75 feet long by 15 feet wide and up to 6 feet high. To disturb as little of the wetland as possible, the entire berm and 1 foot of material below it was removed. The concrete pad next to the north warehouse was first

covered with plastic sheeting so the material removed from the wetland could be stockpiled on top of it. A track hoe excavator was then used to excavate the soil berm and frontend loaders transported it from the north edge of the landfill to the concrete pad next to the north warehouse. The need to move the wetland material across the length of the landfill was the reason why the wetland area was excavated before the landfill.

A second low berm of soil near the northwest corner of the landfill was investigated after the first berm was removed. This berm was approximately 15 feet long by 5 feet wide by 2 feet high. Initial excavation uncovered numerous crushed and rusted metal drums. Continued excavation showed that the berm was attached to the landfill. EnSafe and USEPA discussed the northwest berm and decided to consider it part of the landfill, not the wetland, which changed the RAO for this area. Ultimately, much more soil was removed from the northwest corner of the landfill than the northwest berm of soil, so excavation of this berm is dealt with as if it was another part of the landfill. See Section 3 for further discussion of the berm in the landfill's northwest corner.

All wetland and landfill excavation activities were complete by October 1998.

### **Groundwater Remediation**

The Remedial Design for the groundwater remediation system began in 1995 and was completed in 1997 by HCC with EPA oversight. During the April/May 1995 preliminary design investigation, the aquifer was tested to establish the nature of groundwater representative of full-scale extraction, and to obtain best estimates of hydraulic conductivity, transmissivity, and storativity of the shallow aquifer for use in extraction system design. A single recovery well, RW-1, was installed for the test. Various recovery wells scenarios were studied for implementation; however a single recovery well was determined to be sufficient.

The recovery well was determined to recover groundwater at an average rate of 40 gallons per minute (gpm).

The groundwater recovery system consists of one recovery well, RW-1, fitted with an electrical submersible pump. The system began operating in September 1999. No pretreatment of recovered groundwater occurs prior to being pumped and discharged to an on-site sanitary sewer manhole. The discharge requirements are regulated through an Industrial User Discharge Permit with the Town of Allendale. Water flows by gravity to a lift station, which is located approximately 200 feet to the northwest. An electronic control panel regulates the pump, pump cycle, and low-water-level sensor. The recovered groundwater is treated in the Town of Allendale's wastewater treatment plant under the terms of an industrial sewer user permit.

Routine water level measurements are used to record the actual radius of influence from the drawdown at the recovery well during start-up. Groundwater samples are collected and analyzed for contaminants of concern (COCs) annually, to determine remediation system progress. The expected time frame for significant restoration of the groundwater was 9 to 15 years from the time the remedial system began operating.

The Remedial Action was determined to be construction complete with the signing of the Preliminary Close-Out Report on September 13, 1999.

### **4.3 Operation and Maintenance**

Fifteen years of site operation and maintenance (O&M) activities have been completed at the Site. O&M activities at the Site are conducted by EnSafe from Memphis, Tennessee on behalf of HCC. Groundwater and sediment samples are collected annually at the Site. In addition to annual groundwater and sediment monitoring, groundwater discharge samples are collected and analyzed quarterly as required by the Industrial User Discharge Permit.

The 2014 FYR site inspection revealed the need for some minor site maintenance. Damaged sections of the perimeter fence need to be repaired. The perimeter fence within the wooded and wetland areas need to be cleared of ice/wind damaged trees. The southern perimeter fence (running east to west) needs to be moved approximately 130



feet south to the property line. This will place MW-34 within the secured perimeter of the Site. The volunteer growth pines located on the former landfill area should be assessed for any potential impact to the Site.

This summary includes the annual costs for the operation and maintenance of the extraction/recovery well, which includes the drilling subcontractor and labor to remove and replace the pump and maintain the flow meter. Annual costs for the monitoring of groundwater wells, sediment in the wetlands, the municipal drinking water wells, along with all quarterly monitoring events of the recovery well are also included. Costs for the quarterly documentation and reporting requirements to the Town of Allendale under the Industrial User Discharge Permit, and for the annual data validation, documentation, and reporting requirements to the USEPA and SCDHEC are also calculated into the total.

**Table 3: Annual Operation and Maintenance Costs (2009-2013)**

Year	O & M Costs for Extraction & Recovery Well	Monitoring and Reporting Costs
2009	\$4,700	\$61,200
2010	\$3,500	\$113,000
2011	\$5,050	\$52,200
2012	\$21,710	\$186,290
2013	\$13,550	\$130,500

Significant deviations in the range of costs are detailed below:

**2010**

Monitoring and reporting costs increased due to the required preparation and production of a new Sampling and Analysis Plan and Quality Assurance Project Plan to address issues identified in the 2009 5-Year Review.

**2012**

O&M costs increased due to purchase and installation of new pump and flow meter, and additional maintenance required for the flow meter.

Monitoring and reporting costs increased due to the installation and sampling of eight (8) new monitoring wells, and a water use survey conducted to address issues identified in the 2009 FYR.

**2013**

O&M costs increased due to repair and replacement of the discharge pipe for the recovery well and additional maintenance required for the flow meter.

Monitoring and reporting costs increased due to the monitoring of eight (8) new monitoring wells and additional quarterly monitoring events during 2013.

Table 4 summarizes the O&M costs during the previous five years. O&M costs average approximately \$118,340 per year. O&M costs were estimated during the Feasibility Study for O&M of the groundwater remediation and the on-site landfill area. Current O&M costs at the Site are below cost estimates developed during the Feasibility Study.

## **5.0 Progress Since the Last Five-Year Review**

In September 2009, the second Five-Year Review's protectiveness statement read as follows:

"The remedy at the HCC Landfill protects human health and the environment in the short-term because there are no exposure pathways. According to local authorities and nearby residents interviewed during this Five Year Review, drinking water is obtained from the Town of Fairfax, and no drinking water wells are located nearby. The vapor intrusion pathway was evaluated however a thorough evaluation of specific data indicated that the vapor intrusion pathway is not a complete pathway at this time. The direct exposure soil pathway has been addressed through excavation and removal of contaminated soils.

However, in order for the remedy to be protective in the long-term, the following actions need to be taken. Additional recovery wells need to be installed to fully capture the contaminated groundwater plume. Additional monitoring wells need to be installed to determine the extent of groundwater contamination. Sampling of the nearby Fairfax Municipal well should be continued. Sampling for metals in groundwater at the Site should be continued. The ROD needs to be modified through either an Explanation of Significant Difference (ESD) or ROD Amendment to require Institutional Controls on the Site property as well as on any adjacent properties onto which the contaminated groundwater plume has migrated. The current Restrictive Covenant needs to be modified to correct inaccurate information and to include the entire Site.

The 2009 FYR included eleven issues recommendations. This report summarizes each recommendation and its status below.

**Table 4: Progress on Recommendations from 2009 FYR**

<b>Issue</b>	<b>Party Responsible</b>	<b>Milestone Date</b>	<b>Action Taken and Outcome</b>	<b>Date of Action</b>
Additional wells should be installed and sampled to define the extent of groundwater contamination.	HCC	03/17/2010	Additional wells were installed	October 2012
Based upon the information collected in response to the above issue; additional recovery wells may need to be installed at the Site or the existing system may need to be upgraded in an effort to capture the migrating groundwater contamination.	HCC	09/17/2010	TBD – Design Conceptual Site Model	In Progress
Considering the extent of groundwater contamination is unknown at this time, a water use survey should be performed within a 1-mile radius of the Site.	HCC	03/17/2010	Water Use Survey Conducted.	2012
The ROD needs to be modified through either an ESD or ROD Amendment to require Institutional Controls.	EPA	09/17/2010	ROD Amendment or ESD.	In Progress
Institutional controls should be reviewed and revised for the Site as necessary.	HCC	09/17/2010	Place a restrictive covenant on the Site property.	In Progress
Any surrounding impacted properties should have ICs in the form of a restrictive covenant placed on the deed to the impacted property.	HCC	09/17/2010	Place restrictive covenants on properties impacted by Site related contaminants.	In Progress
The nearby Fairfax Municipal well should be sampled annually for Site related COCs and analyzed utilizing a low pesticide concentration method.	HCC	2009 Annual Sampling Event	Fairfax Municipal well analyzed annually utilizing CLP low pesticide concentration methods.	Complete/Ongoing
Sampling for metals in groundwater at the Site should resume.	HCC	2009 Annual Sampling Event	Sampling for metals in groundwater has resumed.	Complete/Ongoing
A QAPP* should be developed for the Site.	HCC	11/01/2009	QAPP was completed in 2010.	February 23, 2010
Evaluate increasing contaminant concentrations in sediment.	HCC	2009 Annual Sampling Event	Additional sediment samples collected to delineate the extent of sediment contamination.	In Progress/Ongoing
Update Site Repository information or location.	EPA	03/17/2010	Site Repository re-established and updated.	2012

\*"QAPP" refers to Quality Assurance Project Plan

## **6.0 Five-Year Review Process**

### **6.1 Administrative Components**

EPA Region 4 initiated the FYR in March 2014 and scheduled its completion for June 2014. The SCDHEC review team, led by Timothy Kadar, also included the Remedial Project Manager Kayse Jarman, Environmental Health Manager Robert Cole, and the Community Liaison Donna Moye. The review schedule established consisted of the following activities:

- Community Notification
- Site Inspection (EPA, HCC and SCDHEC)
- Community Interviews
- Document Review
- Data Review
- FYR Report Development and Review

### **6.2 Community Involvement**

In March 2014, the SCDHEC placed a public notice in the *Allendale Sun* newspaper announcing the commencement of the FYR process for the Site. The notice requested community participation in the FYR process and provided contact information for RPM Candice Teichert and Community Liason Donna Moye. The press notice is available in Appendix B. No contact was made to EPA as a result of the advertisement.

The FYR report will be made available to the public once it has been issued. Copies of this document will be placed in the designated public repository: Fairfax City Hall, 635 Allendale Fairfax Highway, Fairfax, South Carolina.

On March 25, 2014, the SCDHEC Community Liason Donna Moye and SCDHEC RPM Charles Williams interviewed several residents that live near the Site. A summary of the interviews are provided in Section 6.6.

### **6.3 Document Review**

This FYR included a review of relevant, site-related documents including the ROD, remedial action reports, and recent monitoring data. Appendix A includes a complete list of the documents reviewed.

#### **ARARs Review**

CERCLA Section 121(d)(1) requires that Superfund remedial actions attain “a degree of cleanup of hazardous substance, pollutants, and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the environment.” The remedial action must achieve a level of cleanup that at least attains those requirements that are legally applicable or relevant and appropriate. Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility citing laws that specifically address a hazardous substance, remedial action, location, or other circumstance found at a CERCLA site. Relevant and appropriate requirements are those standards that, while not “applicable,” address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those state standards that are more stringent than federal requirements may be applicable or relevant and appropriate. To-Be-Considered criteria are non-promulgated advisories and guidance that are not legally binding, but should be considered in determining the necessary remedial action. For example, To-Be-Considered criteria may be particularly useful in determining health-based levels where no ARARs exist or in developing the appropriate method for conducting a remedial action.

Chemical-specific ARARs are health- or risk-based numerical values or methodologies which, when applied to site-specific conditions, result in the establishment of numerical values. These values establish an acceptable amount or concentration of a chemical that may remain in, or discharged to, the ambient environment. Examples of chemical-specific ARARs include maximum contaminant levels (MCLs) under the federal Safe Drinking Water Act and ambient water quality criteria enumerated under the federal Clean Water Act.

Action-specific ARARs are technology- or activity-based requirements or limits on actions taken with respect to a particular hazardous substance. These requirements are triggered by a particular remedial activity, such as discharge of contaminated ground water or in-situ remediation.

Location-specific ARARs are restrictions on hazardous substances or the conduct of the response activities solely based on their location in a special geographic area. Examples include restrictions on activities in wetlands, sensitive habitats and historic places.

Remedial actions are required to comply with the chemical-specific ARARs identified in the ROD. In performing the FYR for compliance with ARARs, only those ARARs that address the protectiveness of the remedy are reviewed.

#### *Ground Water ARARs*

According to the Site's 1993 ROD, the ground water ARARs are the National Primary Drinking Water Standards (40 CFR Part 141). The ROD also identified South Carolina chemical-specific ground water ARARs for the Site. However, the State of South Carolina adopted the federal drinking water standards in their entirety. As shown in Table 5, drinking water standards have not changed.

**Table 5: Summary of Groundwater ARAR Changes**

<b>Contaminants of Concern</b>	<b>1993 ROD ARARs (µg/L)</b>	<b>Current ARARs (µg/L)</b>	<b>ARAR Change</b>
Aldrin	0.002	0.002	No
Alpha-BHC	0.006	0.006	No
Beta-BHC	0.02	0.02	No
Dieldrin	0.002	0.002	No
DDE	0.1	0.1	No
South Carolina Drinking Water MCLs are found at <a href="http://www.scdhec.gov/environment/water/regs/r61-58.pdf">http://www.scdhec.gov/environment/water/regs/r61-58.pdf</a> To be considered Cleanup Goal Federal Maximum Contaminant Level Secondary Drinking Water Standards			

*Soil and Sediment ARARs*

Changes in toxicity and other contaminant characteristics were evaluated for soil and sediment data for this FYR. Both carcinogenic and non-carcinogenic values were re-evaluated based on the new or revised toxicity values and they are still within EPA’s acceptable risk range.



**Table 6: Summary of Soil and Sediment ARAR Changes**

Contaminant	CAS Number	1993 ROD values		2014 5 Year Review values		Date Last Revised	Has the Value Changed Since the 1993 ROD?
		Slope Factor (SF) (mg/kg/day) <sup>-1</sup>	RfD (mg/kg/day)	2014 Slope Factor (SF) (mg/kg/day) <sup>-1</sup>	2014 RfD (mg/kg/day)		
Chlordane	12789-03-6	1.3	0.00006	0.35	0.0005	2/7/1998	Yes
Endrin	72-20-8	NA	0.0003	NA	0.0003	4/1/1991	No
Heptachlor	76-44-8	4.5	0.0005	4.5	0.0005	3/1/1991	No
Heptachlor Epoxide	1024-57-3	9.1	0.000013	9.1	0.000013	3/1/1991	No
Disulfoton	298-04-4	NA	0.00004	NA	0.00004	3/1/1988	No
Benzene	71-43-2	0.029	NA	.015-.055	0.004	4/17/2003	Yes
Aldrin	309-00-2	17	0.00003	0.00003	17	3/1/1988	No
α-BHC (α-HCH)	319-84-6	6.3	NA	6.3	NA	No Data	No
β-BHC (β-HCH)	319-85-7	1.8	NA	1.8	NA	No Data	No
gamma-BHC (Lindane)	58-89-9	1.3	0.0003	NA	0.0003	3/1/1988	No
delta-BHC (delta-HCH)	319-86-8	NA	NA	NA	NA	No Data	No
Dieldrin	60-57-1	16	0.00005	16	0.00005	9/1/1990	No
Endosulfan	115-29-7	NA	0.00005	NA	0.006	10/1/1994	Yes
DDD	72-54-8	0.24	NA	0.24	NA	No Data	No
DDE	72-55-9	0.34	NA	0.34	NA	No Data	No
DDT	50-29-3	0.34	0.0005	0.34	0.0005	2/1/1996	No
Toxaphene	8001-35-2	1.1	NA	1.1	NA	No Data	No
TBPT		NA	NA	NA	NA	No Data	No
Methoxychlor	72-43-5	NA	0.005	NA	0.005	8/1/1991	No
Chlorobenzilate	510-15-6	NA	0.02	NA	0.02	12/1/1989	No
Chromium [Chromium (III)]	16065-83-1	NA	1	NA	1.5	9/3/1998	Yes
Lead	7439-92-1	NA	0.0014	NA	NA	7/8/2004	Yes

*Institutional Control Review*

In March 2014, DHEC staff visited the Allendale County Public Records Office and found no recorded institutional controls for Site properties. On April 30, 2014, HCC recorded a Notice of Hazardous Waste on the 3.5 acre parcel (parcel 124-00-00-013) that contained the former landfill. Allendale County identifies the following parcels within the Site property boundary: 124-00-00-013, 124-00-00-014, 124-00-00-024 (Figure 3).

The 1993 ROD, and both the 1995 and 1999 Amendments to the ROD did not require institutional controls. Ground water contamination remains on-site and has migrated off-site; therefore, ground water use restrictions should be implemented on any impacted properties.

**Table 7: IC Summary Table**

<b>Area of Interest – OU1 Groundwater at Helena Chemical Co.                      (Parcels: 124-00-00-013, 124-00-00-014, and 124-00-00-024)</b>						
<b>Media</b>	<b>ICs Needed</b>	<b>ICs Called for in the Decision Documents</b>	<b>Impacted Parcel(s)</b>	<b>IC Objective</b>	<b>Instrument in Place</b>	<b>Notes</b>
Ground Water	Yes	No	Site and unknown surrounding parcels	Restrict installation of groundwater wells.	Notice of Hazardous Waste placed on deed for Parcel 124-00-00-013	Parcel 124-00-00-014, 124-00-00-024, and unknown surrounding parcels still need ICs



**FIGURE 3**  
 Institutional Control Base Map  
 HELENA CHEMICAL COMPANY  
 FAIRFAX, SOUTH CAROLINA

Imagery provided  
 Allendale County Assessors Office  
 Drawn By: Timothy Kadar  
 Date: 6/12/2014  
 3rd FYR IC Base Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

## 6.4 Data Review

Per the ROD, groundwater is monitored annually in 12 shallow wells that are screened between 15 and 25 feet below ground surface (bgs) and in nine deep wells that are screened between 90 and 100 feet bgs. In 2012, four shallow and four deep supplemental wells were installed and incorporated into the monitoring system. The objectives of the monitoring system are to monitor mass contaminate removal and to evaluate plume degradation over time in the shallow aquifer and to monitor contaminant trends and evaluate plume degradation over time in the deep aquifer. Groundwater remediation standards are listed in Table 2 and documented in the 1993 ROD. Groundwater shall be extracted until the remediation goals are obtained.

All groundwater samples that are collected from both the shallow and deep aquifers are analyzed for the COCs identified in Table 5. Groundwater samples that are collected from monitoring wells MW-3, MW-4 and MW-23 are additionally analyzed for volatile organic compounds (VOCs).

Extracted groundwater is discharged directly to the POTW, per an Industrial User Permit with the town of Allendale in accordance with the town's Sewer Use Ordinance and Pretreatment Regulations. Samples are collected quarterly and analyzed for a specified list of parameters, to verify that appropriate limits are achieved.

In addition to monitoring groundwater, pesticide concentrations in sediment within the wetland area are monitored in accordance with the Remedial Action Work Plan. Samples are collected annually from 10 locations. A five-point composite sample is collected from each grid and submitted for analysis (Figure 4). The objectives of the sampling include verifying compliance with the established remediation goal (RG) of 5 mg/kg total pesticide concentration cleanup criterion, monitoring natural degradation of pesticides and potential deposition of contaminated sediments within the wetland.

This section of the report includes an evaluation of current ground water conditions and considers potential options for enhancement of the ground water remedial action. The data are systematically evaluated as follows:

- Sediment data
- Shallow aquifer data from monitoring wells
- Deep aquifer data from monitoring wells
- Overall recovery well system evaluation

#### Sediment

Five-point composite samples are collected annually from each grid as shown on Figure 4. The objectives of the sampling include verifying compliance with the established RG of 5 mg/kg total pesticide concentration cleanup criterion, monitoring natural degradation of pesticides and potential deposition of contaminated sediments within the wetland.

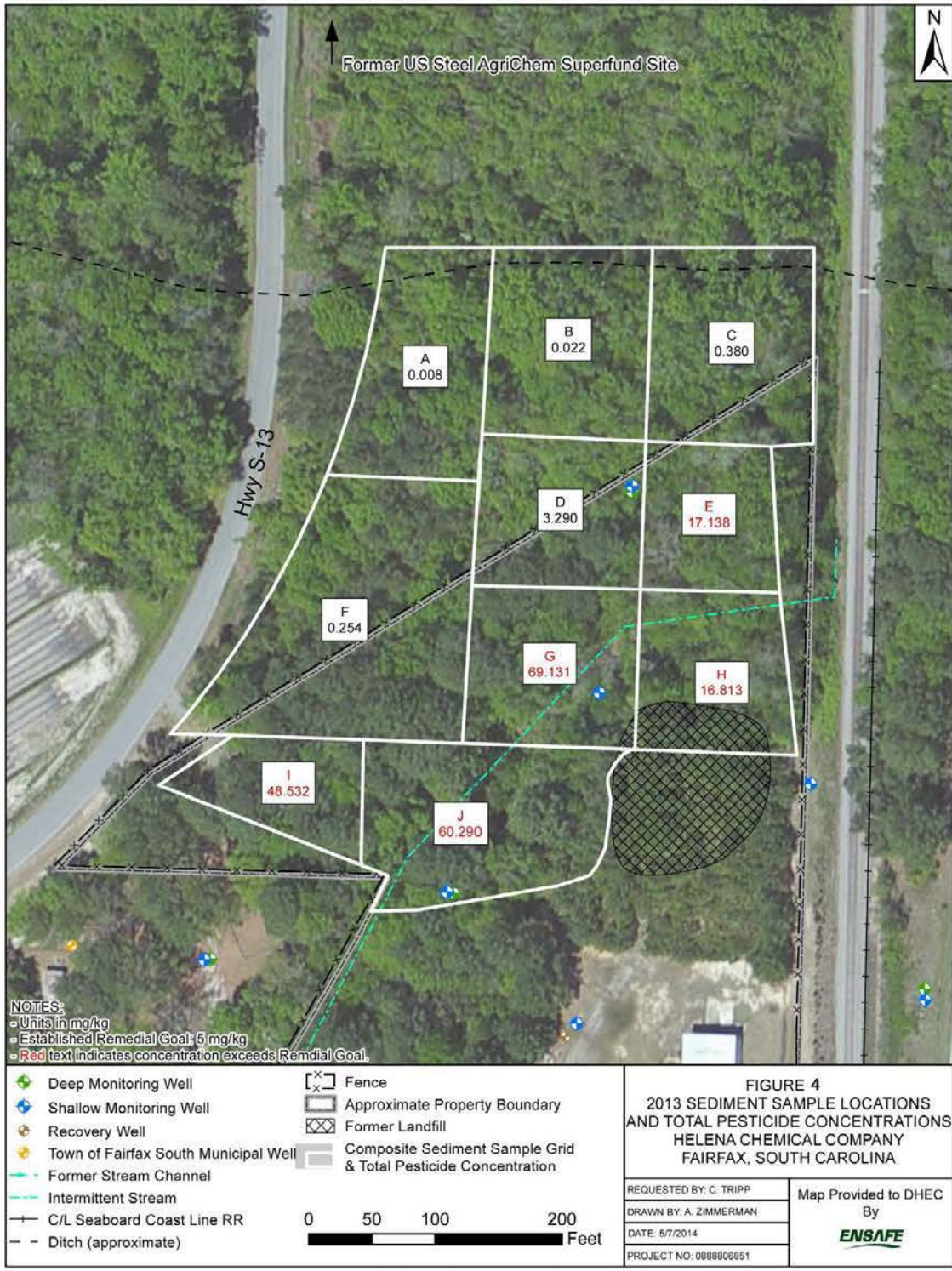
Five of the ten sample grid locations exhibited total pesticide concentrations above the RG of 5 mg/kg in 2013:

- Grid E = 17.138 mg/kg
- Grid G = 69.131 mg/kg (historical high)
- Grid H = 16.813 mg/kg
- Grid I = 48.532 mg/kg (historical high)
- Grid J = 60.290 mg/kg

Sediment sampling from 1999 to 2002 indicated all grids were below the RG for total pesticide concentrations. The first exceedences of the RG was detected in Grid E and Grid I in 2003. Grid E exhibited an increasing trend of total pesticides with a historical high in 2012 of 21.848 mg/kg. Grid I exhibited a fluctuating trend reaching a high in 2010. From 2012 to 2013 the total pesticide concentration again began an upward trend reaching a historical high of 48.532 mg/kg in 2013. Grid G has been exhibiting a fluctuating trend since 2004. The lowest concentration of total pesticides was 16.537 mg/kg in 2006. The highest concentration of total pesticides was in 2012 at 65.38 mg/kg and 2013 at 69.131 mg/kg. Grid H reached a historical high concentration of total pesticides in 2007. For the next three years, Grid H had a decreasing trend until 2011. The 2013 concentration of total pesticides at 16.813 mg/kg for Grid H is the highest

detection since 2007. After 2002, Grid J exhibited a fluctuating trend reaching a historical low of 5.031 mg/kg in 2008 and a historical high of 66.204 mg/kg in 2009.

Increasing sediment contaminant concentration data also indicates potential source material may remain onsite, and could potentially be contributing to the increasing Contaminants of Concern (COC) concentrations in the shallow aquifer. Additionally, the extent of the pesticide contamination in soils has increased, especially in the wetland area. It was assumed that contamination measured in the surface water and sediments in the RI would diminish once the remedy was implemented. The increasing contamination in the wetland represents a new exposure pathway. Migration of contamination off site in surface water or leaching of contamination to groundwater should be considered as new or expanding exposure pathways.



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



**Table 8: Summary of Total Pesticide Concentrations in Sediment from 1999 to 2013.**

Sample Grid	Sample Date													
	Dec-99	Feb-01	May-02	Aug-03	Sep-04	Nov-05	Dec-06	Dec-07	Dec-08	Dec-09	Dec-10	Dec-11	Dec-12	Dec-13
A	0.009	0.045	0.072	0.044	0.036	0.110	0.073	0.032	0.027	0.049	<b><i>0.336</i></b>	0.035	0.04	0.008
B	0.006	0.031	0.048	0.054	0.028	0.073	0.032	0.009	0.011	0.046	<b><i>0.313</i></b>	0.022	0.007	0.022
C	0.066	0.740	0.729	0.389	0.977	1.144	0.785	0.594	0.425	0.791	2.340	<b><i>4.538</i></b>	0.632	0.380
D	0.301	0.836	0.262	0.220	1.574	3.315	0.999	0.744	0.609	1.290	<b><i>4.142</i></b>	0.908	1.556	3.290
E	0.560	3.671	4.706	7.240	14.600	1.933	5.073	9.094	1.716	9.361	11.346	12.812	<b><i>21.848</i></b>	17.138
F	0.050	0.101	0.556	0.451	0.194	0.187	0.095	0.119	0.081	0.211	0.575	0.603	<b><i>0.617</i></b>	0.254
G	3.070	2.936	0.866	0.849	52.410	51.292	16.537	48.106	28.077	30.670	35.466	21.38	65.38	<b><i>69.131</i></b>
H	0.349	ND	3.138	0.175	3.640	17.480	14.363	<b><i>45.137</i></b>	10.468	5.563	7.800	14.705	14.277	16.813
I	0.297	2.289	2.180	5.915	14.901	11.600	32.607	26.637	21.710	19.051	43.091	11.82	34.896	<b><i>48.532</i></b>
J	0.128	0.238	0.199	0.157	23.490	13.622	13.965	21.460	5.031	<b><i>66.204</i></b>	25.719	5.318	48.195	60.290
<b>Average concentration</b>	0.484	1.210	1.276	1.550	11.185	10.076	8.453	15.193	6.816	13.324	13.113	7.214	18.745	<b><i>21.586</i></b>

**Notes:**

ND = Not detected

All concentrations are in mg/kg (milligrams per kilograms)

***Bold and Italic Text Indicate a Historical High.***

Yellow Highlight Indicates Value Exceeds Total Pesticides Remedial Goal (5 mg/kg)

## Groundwater Data

### **Recovery Well Pumping Rates**

The recovery well pumping rate is measured by a dedicated flow meter. The average flow rate is approximately 30-40 gpm. Between 34,000 and 36,000 gallons of water is discharged daily to the POTW for treatment, which is well within the Site's permitted discharge limit of 70,000 gallons per day.

### **Monitoring Well Sampling Frequency**

All monitoring wells at the Site are sampled quarterly as recommended in the Remedial Action Work Plan (1997).

No pesticides were detected in groundwater collected from the town of Fairfax's south municipal well and private residential wells located approximately 0.25 and 0.5 miles downgradient to the south of the Site's property line.

Ten pesticides have historically exceeded their respective RGs in Site monitoring wells: 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, aldrin, alpha-, beta-, delta-, and gamma-BHC, dieldrin, and toxaphene. The highest concentrations of pesticides were reported at wells within the Site property boundary. Analytical results and groundwater flow direction suggest low concentration pesticides above RGs extend beyond the current shallow monitoring network to the upgradient north and west, and downgradient east and southeast. No significant variations in groundwater flow direction or pesticide concentrations were attributable to seasonal fluctuations.

Historically since 2003, the highest pesticide concentrations exceeding RGs were reported in 2008, 2010, 2013Q3, and 2014Q1 at monitoring wells MW-4 and MW-23, located within the Site property boundary. Based on historical analyte trends per well, concentrations of each pesticide above the RG have either decreased or were stable, with the exception of aldrin and toxaphene, which appear to have increased at six wells located in the vicinity of the former landfill, and on the northern upgradient property line. Historical total pesticide concentrations also suggest increased concentrations on the southeastern Site property line.

Benzene was not detected above the RG in 2013Q4. Historically, low-level concentrations of benzene were detected above the RG of 5 µg/L at deep well MW-3 in 2006 at 7.5 µg/L, 2010 at 6.5 µg/L, and 2011 at 7.45 µg/L.

Chromium and lead were not detected above their respective RGs in 2013Q4. Since 1999, chromium was reported above the RG of 100 µg/L at shallow well MW-24 in 1999 at 1400 µg/L and 2011 at 1600 µg/L, and estimated at deep well MW-23 in 1999 at 160 µg/L. Monitoring wells MW-23 and MW-24 are a nested well pair.

Since 1999, lead was only reported above the RG at shallow well MW-24 during the 1999 monitoring event, with a concentration of 46 µg/L.

**Table 9: Number of Site Wells Exceeding the PRG**

Parameter Name	Number of Site Wells Exceeding the RG													
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013Q2	2013Q3	2013Q4	2014Q1
<b>Pesticides</b>														
4,4'-DDD	0	0	1	0	2	3	2	1	0	0	2/0	0	1/0	1/0
4,4'-DDE	0	1	1	1	2	2	2	2	2	1/0	0	2/0	2/0	3/0
4,4'-DDT	0	0	2	0	2	2	1	0	0	0	1/0	1/0	1/0	2/0
Aldrin	9	4	2	4	3	5	9	2	2	3/1	3/2	9/2	4/0	4/0
alpha-BHC	10	10	9	5	7	8	7	6	8	7/2	7/2	8/2	9/2	8/2
beta-BHC	13	14	14	12	13	15	14	12	13	13/1	12/3	12/3	13/3	11/2
delta-BHC	8	8	7	5	5	7	7	6	8	6/1	8/1	7/0	7/1	5/0
Dieldrin	10	13	12	12	12	15	14	16	15	12/1	11/0	16/2	12/1	15/1
gamma-BHC (Lindane)	2	1	1	2	1	1	2	3	3	2/0	2/0	2/0	3/0	3/0
Toxaphene	1	2	2	4	1	0	0	3	7	5/1	4/0	4/0	3/0	4/0
<b>Volatile Organic Compounds</b>														
Benzene	0	0	0	1	0	0	0	1	1	0	0	0	0	0
<b>Metals</b>														
Chromium	NA	NA	NA	NA	NA	NA	0	1	1	0	0	0	0	0

**Notes:**

RG = Remedial Goal

NA = Not analyzed

Well count does not include duplicate samples.

2/3 indicates Historical well network/ Supplemental well network

Based on the groundwater data collected, the recovery system is not performing as intended and groundwater contamination has migrated off-site. In addition to the potential migration of groundwater beyond existing well locations, sediment data collected during 2003-2014 indicate an increasing trend above the RGs in several of the grid locations.

## Soil

Soil remediation activities at the Site finished in 1993. No new soil data were collected during the past ten years.

### **6.5 Site Inspection**

The site inspection was conducted on March 25, 2014. A tour of the Site was provided by Edward Brister from Helena Chemical, followed by an inspection of the Site. The inspection team consisted of the following personnel: Candice Teichert (EPA), Charles Williams (SCDHEC), Kayse Jarman (SCDHEC), Donna Moye (SCDHEC), Robert Cole (SCDHEC), and Timothy Kadar (SCDHEC).

A visual inspection of the extraction well, monitoring wells, former landfill area and wetland area was conducted. The groundwater treatment system and associated wells appeared to be in good condition and operational. The sanitary sewer discharge location for the groundwater pumping system was also observed and appeared to be in good condition. Additionally, visual inspection of the two nearby Fairfax Municipal wells was also conducted.

### **6.6 Interviews**

On March 20, 2014, SCDHEC placed a public notice in the Allendale Sun newspaper announcing the commencement of the FYR process for the Site. The notice requested community participation in the FYR process and provided contact information for EPA RPM Candice Teichert and SCDHEC Community Liason Donna Moye. The public comment period closed on April 30, 2014. The public notice is available in Appendix B.

On March 25, 2014, SCDHEC Community Liason Donna Moye, SCDHEC RPM Charles Williams, and SCDHEC Region Staff Tim Pearson interviewed six residents during door-to-door visits on Charleston Avenue, Tinker Town Road, and Byrd Street. Copies of the public notice and EPA Fact Sheet - Superfund Today were left at an additional five homes where no one came to the door. A summary of the interviews is provided in Section 6.6.

A resident's daughter contacted RPM Candice Teichert by email on April 21, 2014 with concerns about how chemicals may have affected her father's health. Her father has been a resident of the

area for 70 years and has worked outdoors for most of that time. RPM Candice Teichert responded by email on April 22, 2014, indicating that cleanup of contaminated groundwater was ongoing and sediment contamination levels are being monitored. Contact information for additional questions was also given in the email, along with the link to the EPA website for more information about the Site. Attempts by RPM Candice Teichert and EPA Community Involvement Coordinator (CIC) Angela Miller to contact the daughter by phone to discuss her concerns were unsuccessful.

The FYR report will be made available for public review once it has been issued. Copies of this document will be placed in the designated public repository: Fairfax City Hall, 635 Allendale Fairfax Highway, Fairfax, South Carolina.

## **7.0 Remedy Evaluation**

### **7.1 Question A: Is the remedy functioning as intended by the decision documents?**

The review of the ground water data, documents, ARARs, risk assumptions, and the site inspection indicate the groundwater recovery remedy is not functioning as intended by the ROD. Groundwater data indicates the groundwater plume is undefined and may have extended beyond the perimeter wells. The Site continues to be enclosed by a chain-link fence to restrict access to the Site. Although the ROD did not require ICs, Ed Brister from Helena Chemical was contacted during the FYR, regarding the status of a restrictive covenant on the Site property. On April 30, 2014, HCC filed a restrictive covenant in the form of a Notice of Hazardous Waste on parcel 124-00-00-013, with the State of South Carolina, County of Allendale. Upon further review, EPA has discovered that restrictive covenants should be placed on additional parcels encompassing the HCC Landfill Site, parcel 124-00-00-014 and 124-00-00-024. ICs should also be placed on adjacent properties that have been impacted by the migration of contaminated groundwater. The ICs are to ensure that future users do not come in contact with contaminated groundwater. Additionally, increasing sediment contaminant concentration data indicates potential source material may remain onsite, and could potentially be contributing to the increasing Contaminants of Concern (COC) concentrations in the shallow aquifer. Additionally, the extent of the pesticide contamination in soils has increased, especially around the wetland area. The increasing contamination in the wetland represents a new exposure pathway.

### **7.2 Question B. Are the exposure assumptions, toxicity data, clean up levels and RAOs used at the time of remedy selection still valid?**

ARARs used at the time of the remedy selection are still valid. The ground water ARARs have not changed for the COCs since the 1993 ROD.

### **7.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?**

No other information has come to light that could call into question the protectiveness of the remedy.

### **7.4 Technical Assessment Summary**

The remedy at the HCC Landfill is not functioning as intended. Groundwater data indicates the groundwater plume is undefined and has extended beyond the perimeter wells.

Increasing sediment contaminant concentration data indicates potential source material may remain onsite, and could potentially be contributing to the increasing Contaminants of Concern (COC) concentrations in the shallow aquifer. Additionally, the extent of the pesticide contamination in soils has increased, especially around the wetland area. It was assumed that contamination measured in the surface water and sediments in the RI would diminish once the remedy was implemented. The increasing contamination in the wetland represents a new exposure pathway. Migration of contamination off site in surface water or leaching of contamination to groundwater should also be considered as new or expanding exposure pathways.

Additional restrictive covenants should be placed on parcel 124-00-00-014, 124-00-00-024 and any properties that have been impacted by the migration of contaminated groundwater.

## **8.0 Issues**

Following 15 years of monitoring and treatment, the remedy is not performing as intended in the ROD. Groundwater data indicates that contamination located in both the shallow and deep aquifers has migrated beyond perimeter wells and potentially off-site. Recent sediment samples collected indicate an increasing trend in contaminant concentration and may be contributing to the increasing groundwater contaminant concentrations. The ROD did not require ICs, however groundwater contamination is present at the Site and has potentially migrated off-site.



## **9.0 Recommendations and Follow-up Actions**

Table 10 provides recommendations to address the current issues at the Helena Chemical Co. Landfill Site.

**Table 10: Recommendations to Address Current Issues at the HCC Landfill Site**

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Yes or No)	
					Current	Future
Extent of groundwater plume is not adequately delineated.	Install additional groundwater wells to adequately define the extent of the contaminated groundwater	HCC	EPA	3/1/2015	YES	YES
The current groundwater recovery system is not fully capturing the contaminated groundwater plume.	Additional recovery wells need to be installed or the current groundwater recovery system needs to be improved to fully capture the contaminated	HCC	EPA	6/1/2015	NO	YES
There are no institutional controls in place to prevent access to contaminated ground water.	Institutional controls should be implemented on parcel 124-00-00-014 and all other parcels affected by the migration of contaminated groundwater.	HCC	EPA	3/1/2015	YES	YES
Chromium speciation in groundwater needs to be performed to determine the percent of Cr+6.	Chromium speciation should be performed on 20% of the samples to provide information that can be used to determine the potential percentages of Cr+6 in the total chromium results.	HCC	EPA	6/1/2015	NO	YES

<p>Ecological risk assessment data needs to be updated.</p>	<p>Additional risk assessment work should be conducted to incorporate the wider set of receptors including aquatic-dependent wildlife and carnivorous wildlife, as was originally proposed. The contamination in the wetland has increased in magnitude and extent. The current ecological risks at the site exceed the degree of risks understood at the time the wetland mitigation remedy was selected. The increasing concentrations of pesticides in the wetland represent a new exposure pathway. Recommended inclusion of an assessment endpoint to protect the soil invertebrate community.</p>	<p>HCC</p>	<p>EPA</p>	<p>6/1/2015</p>	<p>YES</p>	<p>YES</p>
<p>Toxicity data needs to be updated</p>	<p>The cleanup goal for wetland soils should be revised to create separate goals for individual pesticides using updated toxicity values and exposure assumptions.</p>	<p>HCC</p>	<p>EPA</p>	<p>6/1/2015</p>	<p>NO</p>	<p>YES</p>

\*\*TBD\*\* refers to To Be Decided

## **10.0 Protectiveness Statement**

At this time, the remedy at the HCC Landfill is not protective of human health and the environment because of the increasing soil contaminant concentrations in the wetland area. Additionally, the migration of contamination offsite in surface water or leaching of contamination to groundwater should be considered as new or expanding exposure pathways. Contaminated groundwater migration is not under control and institutional controls (ICs) have not been implemented.

Contaminated sediment and surface water in the wetland area should be delineated and remediated. Additional monitoring wells need to be installed to determine the extent of groundwater contamination and additional recovery wells may need to be installed to fully capture the contaminated groundwater plume. Institutional Controls governing groundwater should be implemented on the Site property as well as on any adjacent properties onto which the contaminated groundwater plume has migrated.

## **11.0 Next Review**

Five-Year Reviews are to be conducted at this Site until contaminant levels are below the cleanup goals established by EPA in Table 9.2 of the ROD (i.e., drinking water standards for identified COCs). Because Site contaminant levels remain above cleanup levels, the next Five-Year Review will be completed within five years of the date of this report. The due date for the next Five Year Review will be in September 2019.

## Appendix A: List of Documents Reviewed

Date	Document
April 12, 1989	Administrative Order of Consent
February 21, 1990	NPL Site Narrative for Helena Chemical Company Landfill, Helena Chemical Company Landfill, Fairfax, South Carolina.
September 9, 1991	Preliminary Health Assessment Report: Helena Chemical Company Landfill
December 31, 1992	Final Remedial Investigation Report: Helena Chemical Company Landfill
January 13, 1993	Feasibility Study: Helena Chemical Company Landfill
September 8, 1993	EPA Superfund Record of Decision: Helena Chemical Company Landfill
September 1, 1995	EPA Superfund Record of Decision: Helena Chemical Company Landfill (First Amendment)
February 5, 1997	Ecological Risk Assessment: Helena Chemical Company Landfill
April 30, 1997	Final Design Report: Helena Chemical Company Landfill
February 11, 1999	ROD Amendment (Second Amendment)
July 21, 1999	Landfill and Wetland Remedial Action Report
September 17, 2004	First Five-Year Review Report: Helena Chemical Company Landfill
September 17, 2009	Second Five-Year Review Report: Helena Chemical Company Landfill
February 23, 2010	Field Sampling Plan and Quality Assurance Project Plan: Helena Chemical Company Landfill
May 28, 2010	2009 Groundwater and Sediment Monitoring Report: Helena Chemical Company Landfill
June 15, 2010	Second Five Year Review: Work Plan in Response to EPA Recommendations to Address Current Issues at the Helena Chemical Company Landfill Site
March 24, 2011	2010 Groundwater and Sediment Monitoring Report: Helena Chemical Company Landfill
April 19, 2012	2011 Groundwater and Sediment Monitoring Report: Helena Chemical Company Landfill
July 23, 2012	Second Five Year Review: Work Plan in Response to EPA Recommendations to Address Current Issues at the Helena Chemical Company Landfill Site, Revision 01
April 17, 2013	2012 Supplemental Activities & Annual Monitoring Report: Helena Chemical Company Landfill
May 28, 2014	2013 Quarterly & Annual Monitoring Report & First Quarter 2014 Report: Helena Chemical Company Landfill

## Appendix B: Press Notice

### Public Notice

## Helena Chemical Company Landfill Fairfax, South Carolina

The U.S. Environmental Protection Agency (EPA) and the South Carolina Department of Health and Environmental Control (DHEC) are conducting a 5-year review of the Helena Chemical Company Landfill site in Allendale County. This is a federal Superfund site with ongoing cleanup activities. The purpose of the review is to evaluate remedial activities of the past 5 years and make sure that the cleanup continues to protect human health and the environment. During the review, DHEC will conduct interviews with local residents, officials, and others who are familiar with the site. We value input about site conditions and want to hear any concerns of the local community. **You are encouraged to participate in the review by contacting us with your comments or questions through April 30, 2014.**

The 5-year review process is expected to be complete in fall 2014, at which time a report will be written on our findings. Comments about the site will be summarized in the report. The report will be available on EPA's website and at Fairfax City Hall in Fairfax. For more information about this site, please visit:

<http://www.epa.gov/region4/superfund/sites/npl/southcarolina/helchemsc.html>.

For comments, questions, or to participate in an interview, please contact:

**Community Involvement:** Donna Moye, DHEC Community Liaison, at (803) 898-1382, or by e-mail at [moyedd@dhec.sc.gov](mailto:moyedd@dhec.sc.gov).

**Technical Comments:** Candice Teichert, EPA Project Manager, at (404) 562-8821, or by e-mail at [teichert.candice@epa.gov](mailto:teichert.candice@epa.gov).

Please share this with others you know who might be interested.



## Appendix C: Interview Forms

### Interview Form for Five-Year Review

**Site Name:** Helena Chemical Company Landfill

**Interviewer's Name:** Timothy Kadar **Affiliation:** SCDHEC

**Interviewee's Name:** Candice Teichert, Project Manager **Affiliation:** EPA, SRSEB

**Contact Information:** U.S. EPA Region 4

61 Forsyth Street

Atlanta, GA 30303

[Teichert.Candice@epa.gov](mailto:Teichert.Candice@epa.gov)

P: 404-562-8821

**Type of Interview:** Email

**Date:** April 2, 2014

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

Additional contamination at the Site needs to be characterized.

2. What is your assessment of the current performance of the remedy in place at the Site?

The current remedy needs to be optimized and additional contamination needs to be characterized.

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years? No

4. Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities. No

5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy? No

6. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?

The institutional controls currently implemented on the PRP owned property need to be amended.

7. Are you aware of any changes in projected land use(s) at the Site? No

8. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

The groundwater remedy needs to be optimized and additional contamination needs to be characterized.



## Interview Form for Five-Year Review

**Site Name: Helena Chemical Company Landfill**

**Interviewer's Name:** Timothy Kadar **Affiliation:** SCDHEC

**Interviewee's Name:** Kayse Jarman, Project Manager **Affiliation:** SCDHEC

**Contact Information:** 2600 Bull Street  
Columbia, SC 29201  
[jarmankb@dhec.sc.gov](mailto:jarmankb@dhec.sc.gov)  
P: 803.898.0832

**Type of Interview:** Email

**Date:** May 6, 2014

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)? *The pump and treat system needs to be optimized and the sediment in the wetlands area needs to be investigated and addressed. There have been no maintenance issues since the last 5 Year Review. Reuse activities have not been discussed.*
2. What is your assessment of the current performance of the remedy in place at the Site? *The remedy needs to be optimized in several ways concerning the groundwater and sediment contamination. A capture zone analysis should be conducted for the groundwater recovery system to verify whether capture of the contaminated groundwater is being achieved. If capture is not being achieved, another recovery well should be installed. The source of the continued sediment contamination should be investigated and addressed. The sediment with elevated levels of contaminants should be remediated.*
3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years? *No*
4. Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities. *Several site visits have been conducted to observe sampling methodology used at the site.*
5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy? *No*
6. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues? *Institutional controls need to be corrected and implemented at the site and any other property that is found to be impacted by the groundwater and/or sediment contamination.*
7. Are you aware of any changes in projected land use(s) at the Site? *No*
8. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy? *Although optimization needs to be implemented, the current remedy is working as designed.*

## Interview Form for Five-Year Review

**Site Name:** Helena Chemical Company Landfill

**Interviewer's Name:** Timothy Kadar

**Affiliation:** SCDHEC

**Interviewee's Name:** Greg Temple, Project Manager

**Affiliation:** EnSafe

**Contact Information:** 5724 Summer Trees Drive  
Memphis, TN 38134  
[gtemple@ensafe.com](mailto:gtemple@ensafe.com)  
P: 901.372.7962

**Type of Interview:** In person during site inspection

**Date:** March 25, 2014

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)? *The pump and treat system is operating as designed. Pesticides in wetlands are continue to exceed RGs in half of the grids (5 out of 10) indicating a possible upgradient influence. No maintenance issues other than routine service during the past five years.*
2. What is your assessment of the current performance of the remedy in place at the Site? *The remedy is operating as designed.*
3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years? *No*
4. What is the frequency of Operation and Maintenance activities and site inspections? To your knowledge, has the maintenance been implemented at the site? *Groundwater at the Site is sampled quarterly. Sediments are sampled annually. The results are compiled in an annual report submitted to the EPA and SCDHEC. Maintenance of the pump and treat system are carried out as needed.*
5. Are you aware of any changes in projected land use(s) at the Site? *No*
6. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy? *The town of Fairfax's north water supply well is located about 0.7 miles upgradient of the site. We would like to remove it from the sampling schedule.*

## Interview Form for Five-Year Review

**Site Name: Helena Chemical Company Landfill**

**Interviewer's Name:** Timothy Kadar

**Affiliation:** SCDHEC

**Interviewee's Name:** Rodney Stanley, Fire Chief

**Affiliation:** Allendale County

**Contact Information:** 803.686.1080

**Type of Interview:** Phone

**Date:** March 21, 2014

**Interview Category: Local Government**

1. Are you aware of the environmental issues and/or cleanup activities at the Helena Chemical Co. Landfill site? *Yes.*
2. What are your views or concerns about site conditions, problems, or related concerns? *None. However, Chief Stanley expressed concerns regarding the former Helena Chemical Company site located at 431 Frontage Road, Allendale, Allendale County, SC. The site has been operating as a metal recycler including crushing cars (Don's Scrap Metal Recycling). The company has erected a metal fence obscuring the site from view. County officials aren't sure what is happening on site anymore.*
3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years? *None. Residents have been complaining of gasoline odors at Don's Scrap Metal Recycling.*
4. What effect has this site had on the surrounding community? *None.*
5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy? *No.*
6. Are you aware of any changes in projected land use(s) at or near the Site? *None. Some industries are reopening near Don's Scrap Metal Recycling.*
7. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy? *None.*

## Interview Form for Five-Year Review

**Site Name:** Helena Chemical Company Landfill

**Interviewer's Name:** Timothy Kadar

**Affiliation:** SCDHEC

**Interviewee's Name:** James Rice, Utilities Director

**Affiliation:** Town of Fairfax

**Contact Information:** 803.632.3799

**Type of Interview:** In person

**Date:** March 25, 2014

**Interview Category:** Local Government

1. Are you aware of the environmental issues and/or cleanup activities at the Helena Chemical Co. Landfill site? *Yes.*
2. What are your views or concerns about site conditions, problems, or related concerns? *None.*
3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years? *None.*
4. What effect has this site had on the surrounding community? *None.*
5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy? *No.*
6. Are you aware of any changes in projected land use(s) at or near the Site? *None.*
7. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy? *None.*



3. **Local Regulatory Authorities and Response Agencies** (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply.

Agency EPA Region 4  
 Contact Candice Teichart Remedial 04/02/2014 (404) 562-8821  
 Name Title Date Phone No.  
Managar  
 Title

Problems/suggestions  Report attached: Appendix C includes interview forms for FYR

Agency SCDHEC  
 Contact Kayse Jarman Environmental 05/06/2014 (803) 898-0832  
 Name Title Date Phone No.  
Engineer  
 Title

Problems/suggestions  Report attached: Appendix C includes interview forms for FYR

Agency Fire Department of Allendale County  
 Contact Rodney Stanley Fire Chief 3/21/2014 (803) 584-2586  
 Name Title Date Phone No.

Problems/suggestions  Report attached: Appendix C includes interview forms for FYR

Agency Town of Fairfax  
 Contact James Rice Utilities 03/25/2014 (803) 632-3799  
 Name Title Date Phone No.  
Director  
 Title

Problems/suggestions  Report attached: Appendix C includes interview forms for FYR

Agency \_\_\_\_\_  
 Contact \_\_\_\_\_  
 Name Title Date Phone No.

Problems/suggestions  Report attached: \_\_\_\_\_

4. **Other Interviews** (optional)  Report attached:

**III. ON-SITE DOCUMENTS AND RECORDS VERIFIED** (check all that apply)

1. **O&M Documents**

<input checked="" type="checkbox"/> O&M manual	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
<input type="checkbox"/> As-built drawings	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
<input checked="" type="checkbox"/> Maintenance logs	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A

Remarks: \_\_\_\_\_

2. **Site-Specific Health and Safety Plan**  Readily available  Up to date  N/A

Contingency plan/emergency response plan  Readily available  Up to date  N/A

Remarks: EnSafe was conducting a sampling event during our site inspection. All documents were available and current.

3.	<b>O&amp;M and OSHA Training Records</b>	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
Remarks: _____				
4.	<b>Permits and Service Agreements</b>			
	<input type="checkbox"/> Air discharge permit	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	<input type="checkbox"/> Effluent discharge	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	<input checked="" type="checkbox"/> Waste disposal, POTW	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
	<input checked="" type="checkbox"/> Other permits: <u>NPDES</u>	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
Remarks: _____				
5.	<b>Gas Generation Records</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____				
6.	<b>Settlement Monument Records</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____				
7.	<b>Ground Water Monitoring Records</b>	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
Remarks: _____				
8.	<b>Leachate Extraction Records</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____				
9.	<b>Discharge Compliance Records</b>			
	<input type="checkbox"/> Air	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	<input checked="" type="checkbox"/> Water (effluent)	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
Remarks: _____				
10.	<b>Daily Access/Security Logs</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____				
<b>IV. O&amp;M COSTS</b>				
1.	<b>O&amp;M Organization</b>			
	<input type="checkbox"/> State in-house	<input type="checkbox"/> Contractor for state		
	<input type="checkbox"/> PRP in-house	<input checked="" type="checkbox"/> Contractor for PRP		
	<input type="checkbox"/> Federal facility in-house	<input type="checkbox"/> Contractor for Federal facility		
	<input type="checkbox"/> _____			







<p>1. <b>Pumps, Wellhead Plumbing and Electrical</b></p> <p><input checked="" type="checkbox"/> Good condition    <input checked="" type="checkbox"/> All required wells properly operating    <input type="checkbox"/> Needs maintenance    <input type="checkbox"/> N/A</p> <p>Remarks: _____</p>
<p>2. <b>Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances</b></p> <p><input checked="" type="checkbox"/> Good condition    <input type="checkbox"/> Needs maintenance</p> <p>Remarks: _____</p>
<p>3. <b>Spare Parts and Equipment</b></p> <p><input checked="" type="checkbox"/> Readily available    <input checked="" type="checkbox"/> Good condition    <input type="checkbox"/> Requires upgrade    <input type="checkbox"/> Needs to be provided</p> <p>Remarks: _____</p>
<p><b>B. Surface Water Collection Structures, Pumps and Pipelines</b>    <input type="checkbox"/> Applicable    <input checked="" type="checkbox"/> N/A</p>
<p>1. <b>Collection Structures, Pumps and Electrical</b></p> <p><input type="checkbox"/> Good condition    <input type="checkbox"/> Needs maintenance</p> <p>Remarks: _____</p>
<p>2. <b>Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances</b></p> <p><input type="checkbox"/> Good condition    <input type="checkbox"/> Needs maintenance</p> <p>Remarks: _____</p>
<p>3. <b>Spare Parts and Equipment</b></p> <p><input type="checkbox"/> Readily available    <input type="checkbox"/> Good condition    <input type="checkbox"/> Requires upgrade    <input type="checkbox"/> Needs to be provided</p> <p>Remarks: _____</p>
<p><b>C. Treatment System</b>    <input type="checkbox"/> Applicable    <input checked="" type="checkbox"/> N/A</p>
<p>1. <b>Treatment Train</b> (check components that apply)</p> <p><input type="checkbox"/> Metals removal    <input type="checkbox"/> Oil/water separation    <input type="checkbox"/> Bioremediation</p> <p><input type="checkbox"/> Air stripping    <input type="checkbox"/> Carbon adsorbers</p> <p><input type="checkbox"/> Filters: _____</p> <p><input type="checkbox"/> Additive (e.g., chelation agent, flocculent): _____</p> <p><input type="checkbox"/> Others: _____</p> <p><input type="checkbox"/> Good condition    <input type="checkbox"/> Needs maintenance</p> <p><input type="checkbox"/> Sampling ports properly marked and functional</p> <p><input type="checkbox"/> Sampling/maintenance log displayed and up to date</p> <p><input type="checkbox"/> Equipment properly identified</p> <p><input type="checkbox"/> Quantity of ground water treated annually: _____</p> <p><input type="checkbox"/> Quantity of surface water treated annually: _____</p> <p>Remarks: _____</p>

2.	<b>Electrical Enclosures and Panels</b> (properly rated and functional) <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance Remarks: _____
3.	<b>Tanks, Vaults, Storage Vessels</b> <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition <input checked="" type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs maintenance Remarks: _____
4.	<b>Discharge Structure and Appurtenances</b> <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance Remarks: _____
5.	<b>Treatment Building(s)</b> <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good condition (esp. roof and doorways) <input type="checkbox"/> Needs repair <input type="checkbox"/> Chemicals and equipment properly stored Remarks: _____
6.	<b>Monitoring Wells</b> (pump and treatment remedy) <input checked="" type="checkbox"/> Properly secured/locked <input checked="" type="checkbox"/> Functioning <input checked="" type="checkbox"/> Routinely sampled <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs maintenance <input type="checkbox"/> N/A Remarks: <u>Wells were in the process of being sampled during visit. Any faulty lock, broken hinge, etc., etc., were addressed during site inspection.</u>
<b>D. Monitoring Data</b>	
1.	<b>Monitoring Data</b> <input checked="" type="checkbox"/> Is routinely submitted on time <input checked="" type="checkbox"/> Is of acceptable quality
2.	<b>Monitoring Data Suggests:</b> <input type="checkbox"/> Ground water plume is effectively contained <input type="checkbox"/> Contaminant concentrations are declining
<b>E. Monitored Natural Attenuation</b>	
1.	<b>Monitoring Wells</b> (natural attenuation remedy) <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs maintenance <input checked="" type="checkbox"/> N/A Remarks: _____
<b>VIII. OTHER REMEDIES</b>	
If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.	
<b>IX. OVERALL OBSERVATIONS</b>	
A.	<b>Implementation of the Remedy</b> Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions). <u>The remedy needs to be optimized in order to contain and remove contaminants from the ground water.</u>
B.	<b>Adequacy of O&amp;M</b>

	Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. <u>There are no known O&amp;M issues.</u>
<b>C.</b>	<b>Early Indicators of Potential Remedy Problems</b>
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. <u>There are no known early indications of potential remedy problems.</u>
<b>D.</b>	<b>Opportunities for Optimization</b>
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. <u>There are no known opportunities for optimization.</u>

Appendix E: Groundwater Monitoring Data 2003-2014

Appendix E  
 Historical Groundwater Results from 2003 to 2014Q1  
 Pesticides and Metals for MW-1

Analyte	RG	Units	Sample Location:	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-1		
			Sample Date:	08/21/2003	08/21/2003	09/10/2004	09/10/2004	11/16/2005	11/16/2005	12/13/2006	12/13/2006	12/04/2007	12/04/2007	12/03/2008	12/03/2008	12/09/2009	03/17/2010	11/30/2010	12/01/2011	12/12/2012	06/18/2013	09/04/2013	12/11/2013	03/26/2014
			Sample Type:	N	FD	N	FD	N	FD	N	FD	N	FD	N	FD	N	N	N	N	N	N	N	N	
<b>Pesticides</b>																								
4,4'-DDD	0.1	µg/L		0.02 U	0.02 U	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.021 U	0.021 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.0013 J
4,4'-DDE	0.1	µg/L		0.02 U	0.02 U	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.021 U	0.021 U	NA	0.0015 J	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
4,4'-DDT	0.1	µg/L		0.02 U	0.02 U	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.021 U	0.021 U	NA	0.04 U	0.026 U	0.0069 J	0.026 U	0.005 J	0.0083 J	0.025 U	0.025 U
Aldrin	0.002	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	0.0094 U	0.0098 U	0.01 U	0.0095 U	0.01 U	0.01 U	0.011 U	0.011 U	NA	0.00048 J	0.0021 U	0.002 U	0.0021 U	0.002 U	0.002 U	0.002 U	0.002 U
alpha-BHC	0.006	µg/L		0.038 J a	0.026 J a	0.033 a	0.035 J a	0.022 a	0.014 J a	0.01 U	0.0095 U	0.01 U	0.01 U	0.011 U	0.011 U	NA	0.0017 J	0.0018 J	0.0061 U	0.0022 J	0.0024 J	0.006 U	0.006 U	0.0065 a
alpha-Chlordane	2	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	0.0094 U	0.0098 U	0.01 U	0.0095 U	0.01 U	0.01 U	0.011 U	0.011 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.0022 J	0.025 U	0.025 U
beta-BHC	0.02	µg/L		0.2 D J a	0.12 J a	0.37 D a	0.35 D a	0.29 D a	0.25 D a	0.16 a	0.21 a	0.13 J a	0.12 J a	0.089 a	0.093 a	NA	0.094 J a	0.068 a	0.053 a	0.042 a	0.055 a	0.073 a	0.05 a	0.011 J
delta-BHC	0.006	µg/L		0.0058 J	0.0041 J	0.01 U	0.01 U	0.0094 U	0.0098 U	0.01 U	0.0095 U	0.01 U	0.01 U	0.011 U	0.011 U	NA	0.006 U	0.0062 U	0.0061 U	0.0062 U	0.006 U	0.0021 J	0.006 U	0.006 U
Dieldrin	0.002	µg/L		0.02 U	0.02 U	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.021 U	0.021 U	NA	0.0037 J a	0.0047 J a	0.0022 a	0.0025 a	0.0012 J	0.0037 a	0.0015 J	0.0095 a
Endosulfan I		µg/L		0.01 U	0.01 U	0.01 U	0.01 U	0.0094 U	0.0098 U	0.01 U	0.0095 U	0.01 U	0.01 U	0.011 U	0.011 U	NA	0.002 J	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan II		µg/L		0.02 U	0.02 U	0.02 U	0.02 U	0.019 U	0.02 U	0.025	0.026	0.018 J	0.019 J	0.02 J	0.018 J	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan sulfate		µg/L		0.02 U	0.02 U	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.021 U	0.021 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Endrin	2	µg/L		0.02 U	0.02 U	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.021 U	0.021 U	NA	0.0014 J	0.0053 J	0.025 U	0.0041 J	0.025 U	0.025 U	0.0017 J	0.031
Endrin aldehyde		µg/L		0.02 U	0.02 U	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.021 U	0.021 U	NA	0.04 U	0.0065 J	0.025 U	0.026 U	0.025 U	0.012 J	0.025 U	0.025 U
Endrin ketone		µg/L		0.058	0.042 J	0.097	0.12	0.11 J	0.084 J	0.072 J	0.099	0.092 J	0.078 J	0.087	0.081	NA	0.078 J	0.072	0.06	0.048	0.06	0.06	0.057	0.048
gamma-BHC (Lindane)	0.2	µg/L		0.052 J	0.037 J	0.01 U	0.01 U	0.0094 U	0.0098 U	0.01 U	0.0095 U	0.01 U	0.01 U	0.011 U	0.011 U	NA	0.0013 J	0.026 U	0.005 J	0.0058 J	0.02 U	0.012 J	0.0074 J	0.017 J
gamma-Chlordane	2	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	0.0094 U	0.0098 U	0.01 U	0.0095 U	0.01 U	0.01 U	0.011 U	0.011 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Heptachlor	0.4	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	0.0094 U	0.0098 U	0.01 U	0.0095 U	0.01 U	0.01 U	0.011 U	0.011 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Heptachlor epoxide		µg/L		0.01 U	0.01 U	0.01 U	0.01 U	0.0094 U	0.0098 U	0.01 U	0.0095 U	0.01 U	0.01 U	0.011 U	0.011 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Methoxychlor		µg/L		0.1 U	0.1 U	0.1 U	0.1 U	0.094 U	0.098 U	0.1 U	0.095 U	0.1 U	0.1 U	0.11 U	0.11 U	NA	0.2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.0025 J	0.1 U	0.1 U
Toxaphene	3	µg/L		1 U	1 U	0.6 U	0.6 U	0.94 U	0.98 U	1.1 J	0.47 J	1 U	1 U	1.1 U	1.1 U	NA	1 U	0.26 U	0.25 U	0.26 U	0.25 U	0.23 J	0.25 U	0.25 U
Total Pesticides		µg/L		0.3538	0.2291	0.5	0.505	0.422	0.348	1.357	0.8095	0.265	0.239	0.1994	0.1987	NA	0.18408	0.1583	0.1271	0.1046	0.1236	0.4058	0.1176	0.1243
<b>Metals</b>																								
Chromium	100	µg/L		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.4 J	NA	6.2	4.4 J	3.5 J	NA	NA	5.4	NA
Lead	15	µg/L		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.9 J	NA	10 U	10 U	6.7 J	NA	NA	10 U	NA

- Notes:
- µg/L = Micrograms per liter
  - RG = Remedial Goal
  - a = Concentration Exceeds RG
  - N = Normal/Primary Sample
  - FD = Field Duplicate
  - U = Not detected
  - J = Estimated value
  - D = The value was obtained during a secondary dilution.
  - ND = Analyte was presumptively present and tentatively identified at the approximate concentration listed.
  - NA = Not analyzed
  - = Highest concentration exceeding RG during posted timeframe

**Appendix E**  
**Historical Groundwater Results from 2003 to 2014Q1**  
**Pesticides and Metals for MW-2**

	Sample Location:	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2
	Sample Date:	08/21/2003	09/10/2004	11/16/2005	12/13/2006	12/04/2007	12/03/2008	12/09/2009	03/17/2010	11/30/2010	11/30/2011	12/10/2012	06/18/2013	09/04/2013	12/11/2013	03/26/2014	
	Sample Type:	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte	RG	Units															
<b>Pesticides</b>																	
4,4'-DDD	0.1	µg/L	0.02 U	0.02 U	<b>0.0067 J</b>	0.021 U	0.02 UJ	0.02 U	NA	0.04 UJ	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
4,4'-DDE	0.1	µg/L	0.02 U	0.02 U	0.02 U	0.021 U	0.02 UJ	0.02 U	NA	0.04 UJ	0.026 U	0.025 U	0.025 UJ	0.025 U	0.025 U	0.025 U	0.025 U
4,4'-DDT	0.1	µg/L	0.02 U	0.02 U	<b>0.0067 J</b>	0.021 U	0.02 UJ	0.02 U	NA	0.04 UJ	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Aldrin	0.002	µg/L	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 UJ	0.01 U	NA	<b>0.00059 J</b>	0.0021 UJ	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
alpha-BHC	0.006	µg/L	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 UJ	0.01 U	NA	0.004 UJ	0.0062 U	0.0061 U	0.0061 U	0.006 U	0.006 U	0.006 U	0.006 U
alpha-Chlordane	2	µg/L	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 UJ	0.01 U	NA	0.02 UJ	0.026 U	0.025 U	0.025 UJ	0.025 U	0.025 U	0.025 U	0.025 U
beta-BHC	0.02	µg/L	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 UJ	0.01 U	NA	0.02 UJ	0.021 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
delta-BHC	0.006	µg/L	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 UJ	0.01 U	NA	0.006 UJ	0.0062 U	0.0061 U	0.0061 U	0.006 U	0.006 U	0.006 U	0.006 U
Dieldrin	0.002	µg/L	0.02 U	0.02 U	<b>0.0066 J a</b>	0.021 U	0.02 UJ	0.02 U	NA	<b>0.00089 J</b>	0.0021 UJ	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Endosulfan I		µg/L	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 UJ	0.01 U	NA	0.02 UJ	0.026 U	0.025 U	0.025 UJ	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan II		µg/L	0.02 U	0.02 U	0.02 U	0.021 U	0.02 UJ	0.02 U	NA	0.04 UJ	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan sulfate		µg/L	0.02 U	0.02 U	0.02 U	0.021 U	0.02 UJ	0.02 U	NA	0.04 UJ	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Endrin	2	µg/L	0.02 U	0.02 U	0.02 U	0.021 U	0.02 UJ	0.02 U	NA	0.04 UJ	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Endrin aldehyde		µg/L	0.02 U	0.02 U	0.02 U	0.021 U	0.02 UJ	0.02 U	NA	0.04 UJ	0.026 U	0.025 UJ	0.025 UJ	0.025 U	0.025 U	0.025 U	0.025 U
Endrin ketone		µg/L	0.02 U	0.02 U	<b>0.005 J</b>	0.021 U	0.02 UJ	0.02 U	NA	<b>0.0012 J</b>	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
gamma-BHC (Lindane)	0.2	µg/L	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 UJ	0.01 U	NA	0.02 UJ	0.026 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
gamma-Chlordane	2	µg/L	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 UJ	0.01 U	NA	0.02 UJ	0.026 U	0.025 U	0.025 UJ	0.025 U	0.025 U	0.025 U	0.025 U
Heptachlor	0.4	µg/L	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 UJ	0.01 U	NA	0.02 UJ	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Heptachlor epoxide		µg/L	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 UJ	0.01 U	NA	0.02 UJ	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Methoxychlor		µg/L	0.1 U	0.1 U	0.098 U	0.1 U	0.1 UJ	0.1 U	NA	0.2 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U
Toxaphene	3	µg/L	1 U	0.6 U	0.98 U	1 U	1 UJ	1 U	NA	1 UJ	0.26 U	0.25 U	0.25 UJ	0.25 U	0.25 U	0.25 UJ	0.25 U
Total Pesticides		µg/L	U	U	0.025	U	U	U	NA	0.00268	U	U	U	U	U	U	U
<b>Metals</b>																	
Chromium	100	µg/L	NA	NA	NA	NA	NA	NA	<b>5 J</b>	NA	5 U	5 U	5 U	NA	NA	5 U	NA
Lead	15	µg/L	NA	NA	NA	NA	NA	NA	<b>1.4 J</b>	NA	10 U	10 U	10 U	NA	NA	10 U	NA

**Notes:**

- µg/L = Micrograms per liter
- RG = Remedial Goal
- a = Concentration Exceeds RG
- N = Normal/Primary Sample
- FD = Field Duplicate
- U = Not detected
- J = Estimated value
- D = The value was obtained during a secondary dilution.
- NJ = Analyte was presumptively present and tentitively identified at the approximate concentration listed.
- NA = Not analyzed
- = Highest concentration exceeding RG during posted timeframe

Appendix E  
Historical Groundwater Results from 2003 to 2014Q1  
VOCs, Pesticides and Metals for MW-3

Sample Location:	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3		
Sample Date:	08/20/2003	09/09/2004	11/17/2005	12/13/2006	12/05/2007	12/05/2007	12/02/2008	12/09/2009	12/09/2009	03/16/2010	03/16/2010	12/02/2010	12/02/2010	12/06/2011	12/06/2011	12/11/2012	12/11/2012	06/19/2013	06/19/2013	09/05/2013	12/12/2013	12/12/2013	03/25/2014	03/25/2014			
Sample Type:	N	N	N	N	N	FD	N	N	FD	N	FD	N	FD	N	FD	N	FD	N	FD	N	N	FD	N	FD			
Analyte	RG	Units																									
<b>VOCs</b>																											
Benzene	5	µg/L	0.14 J	4.8	1 U	7.4 a	1 U	NA	1 U	0.5 U	0.5 U	NA	NA	6.5 a	6.5 a	7.1 a	7.4 a	1 U	0.56 J	NA	NA	NA	0.64 J	3.6 J	NA	NA	
Toluene		µg/L	0.99 U	1.7	1 U	1.4	1 U	NA	1 U	0.5 U	0.5 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.39 J	NA	NA	NA
Ethylbenzene		µg/L	3.7	2.8	1.7	3.8	1 U	NA	1 U	0.3 J	0.31 J	NA	NA	1 U	1 U	1 U	1 U	1 U	0.33 J	NA	NA	NA	1 U	1 U	NA	NA	NA
Methyl tert-butyl ether		µg/L	NA	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.3 J	18 J	NA	NA	NA
m-Xylene		µg/L	NA	NA	NA	NA	NA	NA	NA	0.6 J	0.63 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene		µg/L	NA	NA	NA	NA	NA	NA	NA	12	13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylene (Total)		µg/L	21	74 D	6.3	150	2 U	NA	2 U	13	14	NA	NA	58	60	45	48	1 U	5.9	NA	NA	NA	1.3 J	18 J	NA	NA	NA
<b>Pesticides</b>																											
4,4'-DDD	0.1	µg/L	0.018 J	0.02 U	0.038 U	0.02 U	0.02 UJ	0.014 J	0.034 J	NA	NA	0.054 J	0.04 J	0.26 U	0.26 U	0.26 U	0.26 U	0.025 U	0.13 U	0.09	0.11 J a	0.025 U	0.25 UJ	0.13 U	0.25 U	0.25 U	0.25 U
4,4'-DDE	0.1	µg/L	0.02 U	0.02 U	0.038 U	0.022 J	0.02 UJ	0.02 UJ	0.013 J	NA	NA	0.017 J	0.013 J	0.26 U	0.26 U	0.19 J a	0.19 J a	0.025 U	0.13 U	0.025 U	0.13 U	0.05 J	0.25 U	0.083 J	0.16 J a	0.17 J a	0.17 J a
4,4'-DDT	0.1	µg/L	0.011 J	0.02 U	0.038 U	0.02 U	0.02 UJ	0.014 J	0.071 J	NA	NA	0.038 J	0.02 NJ	0.26 U	0.26 U	0.26 U	0.26 U	0.025 U	0.13 U	0.025 U	0.13 U	0.036 J	0.25 U	0.13 U	0.091 J	0.099 J	0.099 J
Aldrin	0.002	µg/L	0.019 a	0.01 U	0.019 U	0.0084 J a	0.01 UJ	0.028 J a	0.01 U	NA	NA	0.022 J a	0.029 J a	0.02 U	0.021 U	0.12 NJ a	0.17 J a	0.002 U	0.01 U	0.002 U	0.01 U	0.034 a	0.02 U	0.018 NJ a	0.11 J a	0.1 J a	0.1 J a
alpha-BHC	0.006	µg/L	0.11 D a	0.069 a	0.31 J a	0.9 a	0.072 J a	0.19 J a	0.15 D a	NA	NA	0.23 DJ a	0.39 DJ a	1.7 a	1.6 a	1.8 a	1.5 J a	0.4 J a	0.95 J a	0.31 J a	0.42 J a	0.3 a	0.33 J a	0.84 J a	2.4 J a	2.5 J a	2.5 J a
alpha-Chlordane	2	µg/L	0.01 U	0.0066 J	0.019 U	0.012	0.01 UJ	0.01 UJ	0.01 U	NA	NA	0.041 J	0.025 J	0.065 J	0.041 J	0.058 J	0.016 NJ	0.0013 J	0.13 U	0.025 U	0.13 U	0.025 U	0.25 U	0.042 J	0.079 J	0.1 J	0.1 J
beta-BHC	0.02	µg/L	0.41 D a	0.46 D a	2 DJ a	3 a	1 DJ a	1.3 DJ a	1 D a	NA	NA	1.5 DJ a	1.9 DJ a	2.7 a	2.7 a	3.3 J a	3 J a	1.7 a	2.3 a	1.6 a	2 a	1.9 a	1.9 J a	2.6 J a	4.3 J a	4.3 J a	4.3 J a
delta-BHC	0.006	µg/L	0.01 U	0.01 U	0.019 U	0.01 U	0.01 UJ	0.01 UJ	0.01 U	NA	NA	0.034 NJ a	0.048 NJ a	0.2 J a	0.16 NJ a	0.24 a	0.19 J a	0.02 J a	0.059 J a	0.024 J a	0.043 J a	0.006 U	0.06 U	0.03 U	0.48 J a	0.5 a	0.5 a
Dieldrin	0.002	µg/L	0.02 U	0.02 J a	0.038 U	0.018 J a	0.011 J a	0.015 J a	0.041 J a	NA	NA	0.048 J a	0.05 J a	0.075 J a	0.074 J a	0.11 a	0.1 J a	0.002 U	0.01 U	0.017 J a	0.026 J a	0.0091 a	0.02 U	0.011 J a	0.16 a	0.2 J a	0.2 J a
Endosulfan I		µg/L	0.01 U	0.01 U	0.019 U	0.026	0.01 UJ	0.01 UJ	0.01 U	NA	NA	0.02 UJ	0.022 NJ	0.26 U	0.26 U	0.26 U	0.26 U	0.025 U	0.13 U	0.025 U	0.13 U	0.066 J	0.014 NJ	0.25 U	0.13 U	0.072 J	0.047 NJ
Endosulfan II		µg/L	0.02 U	0.02 U	0.038 U	0.089 J	0.021 J	0.026 J	0.037 J	NA	NA	0.095 J	0.11 J	0.26 UJ	0.26 UJ	0.26 U	0.26 U	0.025 U	0.13 U	0.036 NJ	0.061 J	0.025 U	0.25 U	0.13 U	0.25 U	0.25 U	0.25 U
Endosulfan sulfate		µg/L	0.02 UJ	0.02 U	0.038 U	0.02 U	0.018 J	0.027 J	0.02 U	NA	NA	0.04 UJ	0.04 UJ	0.26 U	0.26 U	0.26 U	0.26 U	0.025 U	0.13 U	0.025 U	0.13 U	0.025 U	0.25 UJ	0.13 U	0.25 U	0.25 U	0.25 U
Endrin	2	µg/L	0.02 U	0.02 U	0.038 U	0.025	0.02 UJ	0.01 J	0.019 J	NA	NA	0.019 NJ	0.027 J	0.15 J	0.13 J	0.19 J	0.19 J	0.025 UJ	0.13 UJ	0.025 U	0.13 U	0.049	0.25 U	0.015 J	0.27	0.28	0.28
Endrin aldehyde		µg/L	0.02 U	0.02 U	0.038 U	0.013 J	0.02 UJ	0.02 UJ	0.02 U	NA	NA	0.04 UJ	0.04 UJ	0.03 J	0.031 J	0.026 J	0.025 J	0.025 NJ	0.012 J	0.025 U	0.13 U	0.025 U	0.031 NJ	0.033 J	0.054 J	0.046 NJ	0.046 NJ
Endrin ketone		µg/L	0.067	0.02 U	0.24 J	1.2	0.07 J	0.1 J	0.14	NA	NA	0.23 J	0.36 DJ	2.8	2.9	3.1 J	2.9 J	0.62 J	1.4 J	0.28 J	0.41 J	0.43 J	0.46 J	1.4 J	4.6 J	4.9 J	4.9 J
gamma-BHC (Lindane)	0.2	µg/L	0.11 D	0.044 J	0.15 J	0.93 a	0.09 J	0.11 J	0.12	NA	NA	0.21 DJ a	0.36 DJ a	1.6 a	1.5 a	1.8 a	1.6 J a	0.42 J a	1 J a	0.26 a	0.35 a	0.3 a	0.35 J a	0.84 J a	2 J a	2.1 J a	2.1 J a
gamma-Chlordane	2	µg/L	0.01 U	0.01 U	0.019 U	0.01 U	0.011 J	0.016 J	0.012	NA	NA	0.011 J	0.012 J	0.028 J	0.021 J	0.045 J	0.047 J	0.011 J	0.13 U	0.025 U	0.13 U	0.025 U	0.25 U	0.0099 J	0.054 J	0.043 NJ	0.043 NJ
Heptachlor	0.4	µg/L	0.01 U	0.01 U	0.019 U	0.01 U	0.01 UJ	0.01 UJ	0.01 U	NA	NA	0.02 UJ	0.02 UJ	0.26 UJ	0.26 UJ	0.26 U	0.26 U	0.025 U	0.13 U	0.025 U	0.13 U	0.025 U	0.25 U	0.13 U	0.25 U	0.25 U	0.25 U
Heptachlor epoxide		µg/L	0.01 U	0.01 U	0.019 U	0.01 U	0.01 UJ	0.01 UJ	0.01 U	NA	NA	0.01 NJ	0.021 J	0.26 U	0.26 U	0.047 J	0.043 NJ	0.002 J	0.13 U	0.012 NJ	0.049 J	0.019 NJ	0.25 U	0.13 U	0.25 U	0.25 U	0.25 U
Methoxychlor		µg/L	0.1 U	0.1 U	0.19 U	0.1 U	0.011 J	0.012 J	0.1 U	NA	NA	0.044 J	0.027 NJ	0.058 J	0.074 J	1 U	1 U	0.021 J	0.51 U	0.1 U	0.5 U	0.1 U	0.056 NJ	0.5 UJ	1 U	1 U	1 U
Toxaphene	3	µg/L	1 U	0.6 U	1.9 U	3.9 J a	1 UJ	1 UJ	1 U	NA	NA	1 UJ	1 UJ	6.1 J a	3.7 J a	8.3 J a	8.5 J a	5.7 J a	6.1 J a	4.3 a	4.6 J a	5.8 a	3.4 NJ a	5.8 J a	15 NJ a	18 NJ a	18 NJ a
Total Pesticides		µg/L	0.745	0.5996	2.7	10.1434	1.304	1.862	1.637	NA	NA	2.603	3.454	15.506	12.931	19.326	18.471	8.8953	11.821	6.954	8.135	8.9411	6.527	11.6919	29.83	33.385	33.385
<b>Metals</b>																											
Chromium	100	µg/L	NA	NA	NA	NA	NA	NA	NA	8.1 J	7.6 J	NA	NA	7.4 J	2.7 J	13	10	21	16	NA	NA	NA	7.8 J	2.8 J	NA	NA	NA
Lead	15	µg/L	NA	NA	NA	NA	NA	NA	NA	3 U	1.5 J	NA	NA	10 U	10 U	6.4 U	7.5 U	10 U	10 U	NA	NA	NA	10 U	10 U	NA	NA	NA

- Notes:
- µg/L = Micrograms per liter
  - RG = Remedial Goal
  - a = Concentration Exceeds RG
  - N = Normal/Primary Sample
  - FD = Field Duplicate
  - U = Not detected
  - J = Estimated value
  - D = The value was obtained during a secondary dilution.
  - NJ = Analyte was presumptively present and tentatively identified at the approximate concentration listed.
  - NA = Not analyzed
  - █ = Highest concentration exceeding RG during posted timeframe

**Appendix E**  
**Historical Groundwater Results from 2003 to 2014Q1**  
**Pesticides and Metals for MW-4**

Analyte	RG	Units	Sample Location:	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4
			Sample Date:	08/20/2003	09/10/2004	11/16/2005	12/13/2006	12/06/2007	12/03/2008	12/11/2009	03/18/2010	12/02/2010	12/07/2011	12/12/2012	06/20/2013	09/05/2013	12/13/2013
Sample Type:	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
<b>VOCs</b>																	
Benzene	5	µg/L	100 U	0.3 J	0.63 J	1 U	0.49 J	0.41 J	25 U	NA	0.33 J	0.58 J	5 U	NA	NA	1 U	NA
Toluene		µg/L	590	5.1	24	1.1	0.78 J	6.6	52	NA	43	6.3	1.9 J	NA	NA	0.48 J	NA
Ethylbenzene		µg/L	150	130 D	330 D	21	5.5	19	330	NA	320	120	170	NA	NA	5.4	NA
Methyl tert-butyl ether		µg/L	NA	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	27	NA
m-Xylene		µg/L	NA	NA	NA	NA	NA	NA	2800	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene		µg/L	NA	NA	NA	NA	NA	NA	1200	NA	NA	NA	NA	NA	NA	NA	NA
Xylene (Total)		µg/L	860	460 D	2000 D	130	96	700 D	4300	NA	5100	1000	1100	NA	NA	27	NA
<b>Pesticides</b>																	
4,4'-DDD	0.1	µg/L	0.2 U	0.4 U	0.38 U	0.21 U	0.12 J a	1.1 J a	NA	0.54 DJ a	1.3 U	2.5 U	0.51 U	1.3 U	1.3 U	0.28 J a	0.59 J a
4,4'-DDE	0.1	µg/L	0.2 U	0.4 U	0.38 U	0.38 J a	1.5 J a	1.2 J a	NA	0.73 DNJ a	1.4 a	1.5 J a	0.51 U	1.3 U	1.9 a	0.71 NJ a	1.4 a
4,4'-DDT	0.1	µg/L	0.2 U	0.4 U	0.38 U	0.21 U	0.36 J a	0.21 U	NA	0.21 U	1.3 U	2.5 U	0.51 U	1.3 U	0.67 J a	1.4 a	1.6 J a
Aldrin	0.002	µg/L	0.32 J a	0.4 J a	0.19 U	0.29 J a	0.1 U	0.53 a	NA	0.33 DNJ a	0.1 U	0.2 U	0.59 a	2.1 a	1.2 J a	0.04 U	1.4 J a
alpha-BHC	0.006	µg/L	6.3 D a	2.9 a	4.3 DJ a	1.4 J a	3.8 DJ a	1.6 a	NA	11 DJ a	2.9 a	6.2 a	5.9 a	3.1 J a	2.1 a	1.6 a	1.7 a
alpha-Chlordane	2	µg/L	0.1 U	0.2 U	0.19 U	0.77 J	0.11 J	1.1	NA	1.4 DJ	0.81 J	0.55 J	0.51 U	0.64 J	0.47 J	0.47 J	1.3 U
beta-BHC	0.02	µg/L	11 DJ a	19 D a	21 DJ a	13 J a	22 DJ a	12 D a	NA	20 DJ a	19 a	11 a	11 a	20 a	30 a	14 a	19 a
delta-BHC	0.006	µg/L	2.8 D a	2.8 J a	2.6 J a	1.4 J a	1.7 J a	1.6 a	NA	4.5 DJ a	7.5 a	3.1 a	1.4 a	3.1 a	8.4 a	2.8 a	3.5 a
Dieldrin	0.002	µg/L	6.9 D a	12 D a	12 DJ a	9.6 J a	13 DJ a	12 D a	NA	14 DJ a	10 J a	6.2 a	8.8 a	15 a	18 a	13 a	17 a
Endosulfan I		µg/L	0.1 U	0.2 U	0.19 U	0.47 J	0.42 J	1.1 J	NA	0.35 DJ	1.3 U	2.5 U	0.51 U	0.77 J	1.3 U	0.5 U	1.3 U
Endosulfan II		µg/L	0.2 U	0.4 U	0.38 U	1.8 J	0.27 J	3.1	NA	0.21 U	0.32 NJ	0.91 J	0.51 U	0.75 J	1.1 J	0.5 U	1.3 U
Endosulfan sulfate		µg/L	0.2 U	0.4 U	0.38 U	0.21 U	10 DJ	0.21 U	NA	0.042 U	1.5 J	2.5 U	0.51 U	1.3 U	5.6	2 J	1.3 U
Endrin	2	µg/L	0.2 U	0.4 U	0.38 U	0.34 J	0.2 J	1.1 J	NA	0.78 DJ	1 J	1.3 J	0.51 U	1.9	0.67 J	0.49 J	0.88 J
Endrin aldehyde		µg/L	0.2 U	0.4 U	0.38 U	0.16 J	1.1 J	0.21 U	NA	0.29 DNJ	0.85 J	0.65 J	1	1.3 U	2.1	1.9	2.4
Endrin ketone		µg/L	14 D	32 D	26 DJ	18 J	22 DJ	19 D	NA	10 DJ	13	21 J	28	26	30	22	28 J
gamma-BHC (Lindane)	0.2	µg/L	1.2 D a	2.5 J a	3.6 J a	1.1 J a	1.5 DJ a	0.95 a	NA	5.6 DJ a	1.9 a	2.5 a	2 a	1.6 a	1 U	1 J a	1 a
gamma-Chlordane	2	µg/L	0.1 U	0.2 U	0.19 U	0.16 J	0.2 J	1 J	NA	1.1 DJ	0.22 U	2.5 U	0.51 U	0.86 J	1.3 U	0.5 U	1.3 U
Heptachlor	0.4	µg/L	0.12	0.2 U	0.19 U	0.1 U	0.1 U	0.3	NA	0.21 DNJ	1.3 U	2.5 U	0.51 U	1.3 U	1.3 U	0.5 U	1.3 U
Heptachlor epoxide		µg/L	0.1 U	0.2 U	0.19 U	0.25 J	0.2 J	1.2 J	NA	0.49 DNJ	1.3 U	2.5 U	0.51 U	1.3 U	1.3 U	0.5 U	1.3 U
Methoxychlor		µg/L	1 U	2 U	1.9 U	1 U	1 U	1.2	NA	0.7 NJ	5.2 U	10 U	2 U	5 U	0.64 J	1.2 J	5 U
Toxaphene	3	µg/L	10 U	12 U	19 U	48 J a	10 U	11 U	NA	1.1 U	50 NJ a	110 a	77 J a	110 J a	290 a	140 J a	270 a
Total Pesticides		µg/L	45.64	71.6	69.5	97.12	81.48	60.08	NA	72.02	140.6	164.91	135.69	185.82	392.85	202.85	348.47
<b>Metals</b>																	
Chromium	100	µg/L	NA	NA	NA	NA	NA	NA	10 U	NA	5 U	5 U	5 U	NA	NA	5 U	NA
Lead	15	µg/L	NA	NA	NA	NA	NA	NA	3 U	NA	10 U	10 U	4.1 J	NA	NA	10 U	NA

**Notes:**

- µg/L = Micrograms per liter
- RG = Remedial Goal
- a = Concentration Exceeds RG
- N = Normal/Primary Sample
- FD = Field Duplicate
- U = Not detected
- J = Estimated value
- D = The value was obtained during a secondary dilution.
- NJ = Analyte was presumptively present and tentatively identified at the approximate concentration listed.
- NA = Not analyzed
- [Red Box] = Highest concentration exceeding RG during posted timeframe



Appendix E  
Historical Groundwater Results from 2003 to 2014Q1  
Pesticides and Metals for MW-19

Sample Location:	MW-19	MW-19	MW-19	MW-19	MW-19	MW-19	MW-19	MW-19	MW-19	MW-19	MW-19	MW-19	MW-19	MW-19	MW-19	MW-19
Sample Date:	08/20/2003	09/08/2004	11/16/2005	12/12/2006	12/06/2007	12/03/2008	12/10/2009	03/17/2010	11/30/2010	12/05/2011	12/11/2012	06/19/2013	09/04/2013	12/12/2013	03/25/2014	
Sample Type:	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte	RG	Units														
<b>Pesticides</b>																
4,4'-DDD	0.1	µg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.022 U	NA	0.04 U	0.026 U	0.026 U	0.026 U	0.025 U	0.025 U	0.025 U
4,4'-DDE	0.1	µg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.022 U	NA	0.04 U	0.026 U	0.026 U	0.026 U	0.025 U	0.025 U	0.025 U
4,4'-DDT	0.1	µg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.022 U	NA	0.04 U	0.026 U	0.026 U	0.026 U	0.025 U	0.025 U	0.025 U
Aldrin	0.002	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	NA	0.004 U	0.0021 U	0.0021 U	0.0021 U	0.002 U	0.002 U	0.002 U
alpha-BHC	0.006	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	NA	0.004 U	0.0062 U	0.0062 U	0.0062 U	0.006 U	0.0061 U	0.006 U
alpha-Chlordane	2	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	NA	0.02 U	0.026 U	0.026 U	0.026 U	0.025 U	0.025 U	0.025 U
beta-BHC	0.02	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.02 J	NA	0.013 J	0.021 U	0.021 U	0.021 U	0.02 U	0.02 U	0.02 U
delta-BHC	0.006	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	NA	0.006 U	0.0062 U	0.0062 U	0.0062 U	0.006 U	0.0061 U	0.006 U
Dieldrin	0.002	µg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.0085 J a	NA	0.002 U	0.0021 U	0.0021 U	0.0021 U	0.002 U	0.002 U	0.002 U
Endosulfan I		µg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	NA	0.02 U	0.026 U	0.026 U	0.026 U	0.025 U	0.025 U	0.025 U
Endosulfan II		µg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.012 J	NA	0.04 U	0.026 U	0.026 U	0.026 U	0.025 U	0.025 U	0.025 U
Endosulfan sulfate		µg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.022 U	NA	0.04 U	0.026 U	0.026 U	0.026 U	0.025 U	0.025 U	0.025 U
Endrin	2	µg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.022 U	NA	0.04 U	0.026 U	0.026 U	0.026 U	0.025 U	0.025 U	0.025 U
Endrin aldehyde		µg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.022 U	NA	0.04 U	0.026 U	0.026 U	0.026 U	0.025 U	0.025 U	0.025 U
Endrin ketone		µg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 J	NA	0.04 U	0.026 U	0.026 U	0.026 U	0.025 U	0.025 U	0.0061 J
gamma-BHC (Lindane)	0.2	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	NA	0.02 U	0.026 U	0.026 U	0.026 U	0.025 U	0.0019 J	0.002 J
gamma-Chlordane	2	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	NA	0.02 U	0.026 U	0.026 U	0.026 U	0.025 U	0.025 U	0.025 U
Heptachlor	0.4	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	NA	0.02 U	0.026 U	0.026 U	0.026 U	0.025 U	0.025 U	0.025 U
Heptachlor epoxide		µg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	NA	0.02 U	0.026 U	0.026 U	0.026 U	0.025 U	0.025 U	0.025 U
Methoxychlor		µg/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NA	0.2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Toxaphene	3	µg/L	1 U	0.6 U	1 U	1 U	1 U	1 U	NA	1 U	0.26 U	0.26 U	0.26 U	0.25 U	0.25 U	0.25 U
Total Pesticides		µg/L	U	U	U	U	0.012	0.0485	NA	0.013	U	U	U	U	0.0019	0.002
<b>Metals</b>																
Chromium	100	µg/L	NA	NA	NA	NA	NA	NA	41.6	NA	11	19	18	NA	NA	5.3
Lead	15	µg/L	NA	NA	NA	NA	NA	NA	2.2 J	NA	10 U	5.6 U	10 U	NA	NA	10 U

- Notes:**
- µg/L = Micrograms per liter
  - RG = Remedial Goal
  - a = Concentration Exceeds RG
  - N = Normal/Primary Sample
  - FD = Field Duplicate
  - U = Not detected
  - J = Estimated value
  - D = The value was obtained during a secondary dilution.
  - NJ = Analyte was presumptively present and tentatively identified at the approximate concentration listed.
  - NA = Not analyzed

**Appendix E**  
**Historical Groundwater Results from 2003 to 2014Q1**  
**Pesticides and Metals for MW-5**

Analyte	RG	Units	Sample Location:	MW-5	MW-5	MW-5	MW-5	MW-5	MW-5	MW-5	MW-5	MW-5	MW-5	MW-5	MW-5	MW-5	MW-5
			Sample Date:	08/20/2003	09/09/2004	11/17/2005	12/12/2006	12/07/2007	12/04/2008	12/09/2009	03/16/2010	11/30/2010	12/01/2011	12/11/2012	06/18/2013	09/04/2013	12/12/2013
			Sample Type:	N	N	N	N	N	N	N	N	N	N	N	N	N	N
<b>Pesticides</b>																	
4,4'-DDD	0.1	µg/L		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.021 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U
4,4'-DDE	0.1	µg/L		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.021 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U
4,4'-DDT	0.1	µg/L		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.021 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U
Aldrin	0.002	µg/L		0.01 U	0.01 U	0.0098 U	0.0099 U	0.01 U	0.01 U	0.01 U	NA	0.001 U	0.0021 U	0.002 U	0.002 U	0.002 U	<b>0.0038 a</b>
alpha-BHC	0.006	µg/L		0.01 U	0.01 U	0.0098 U	0.0099 U	0.01 U	0.01 U	0.01 U	NA	0.004 U	0.0062 U	0.0061 U	0.0061 U	0.006 U	0.006 U
alpha-Chlordane	2	µg/L		0.01 U	0.01 U	0.0098 U	0.0099 U	0.01 U	0.01 U	0.01 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U
beta-BHC	0.02	µg/L		0.01 U	0.01 U	0.0098 U	0.0099 U	<b>0.049 J a</b>	0.01 U	0.01 U	NA	0.02 U	0.021 U	0.02 U	0.02 U	0.02 U	0.02 U
delta-BHC	0.006	µg/L		0.01 U	0.01 U	0.0098 U	0.0099 U	0.01 U	0.01 U	0.01 U	NA	0.006 U	0.0062 U	0.0061 U	0.0061 U	0.006 U	0.006 U
Dieldrin	0.002	µg/L		0.02 U	0.02 U	0.02 U	0.02 U	<b>0.11 J a</b>	0.021 U	0.021 U	NA	<b>0.0012 J</b>	0.0021 U	0.002 U	0.002 U	0.002 U	0.002 U
Endosulfan I		µg/L		0.01 U	0.01 U	0.0098 U	0.0099 U	0.01 U	0.01 U	0.01 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U
Endosulfan II		µg/L		0.02 U	0.02 U	0.02 U	0.02 U	<b>0.016 J</b>	0.021 U	0.021 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U
Endosulfan sulfate		µg/L		0.02 U	0.02 U	0.02 U	0.02 U	<b>0.033 J</b>	0.021 U	0.021 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	<b>0.0017 J</b>
Endrin	2	µg/L		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.021 U	0.021 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U
Endrin aldehyde		µg/L		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.021 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U
Endrin ketone		µg/L		<b>0.0043 J</b>	0.02 U	0.02 U	0.02 U	<b>0.066 J</b>	0.021 U	0.021 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	<b>0.0069 J</b>
gamma-BHC (Lindane)	0.2	µg/L		0.01 U	0.01 U	0.0098 U	0.0099 U	0.01 U	0.01 U	0.01 U	NA	0.02 U	0.026 U	<b>0.0013 J</b>	0.02 U	0.02 U	0.02 U
gamma-Chlordane	2	µg/L		0.01 U	0.01 U	0.0098 U	0.0099 U	0.01 U	0.01 U	0.01 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U
Heptachlor	0.4	µg/L		0.01 U	0.01 U	0.0098 U	0.0099 U	0.01 U	0.01 U	0.01 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U
Heptachlor epoxide		µg/L		0.01 U	0.01 U	0.0098 U	0.0099 U	0.01 U	0.01 U	0.01 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U
Methoxychlor		µg/L		0.1 U	0.1 U	0.098 U	0.099 U	0.1 U	0.1 U	0.1 U	NA	0.2 U	0.1 U	0.1 U	0.1 U	0.1 U	<b>0.0037 J</b>
Toxaphene	3	µg/L		1 U	0.6 U	0.98 U	0.99 U	1 U	1 U	1 U	NA	1 U	0.26 U	0.25 U	0.26 U	0.25 U	0.25 U
Total Pesticides		µg/L		0.0043	U	U	U	0.274	U	U	NA	0.0012	U	0.0013	U	U	0.0092
<b>Metals</b>																	
Chromium	100	µg/L		NA	NA	NA	NA	NA	NA	10 U	NA	5 U	<b>15</b>	<b>7.3</b>	NA	NA	<b>4.2 J</b>
Lead	15	µg/L		NA	NA	NA	NA	NA	NA	<b>1.3 J</b>	NA	10 U	10 U	10 U	NA	NA	10 U

- Notes:**
- µg/L = Micrograms per liter
  - RG = Remedial Goal
  - a = Concentration Exceeds RG
  - N = Normal/Primary Sample
  - FD = Field Duplicate
  - U = Not detected
  - J = Estimated value
  - D = The value was obtained during a secondary dilution.
  - NJ = Analyte was presumptively present and tentatively identified at the approximate concentration listed.
  - NA = Not analyzed

Appendix E  
 Historical Groundwater Results from 2003 to 2014Q1  
 Pesticides and Metals for MW-6

Analyte	RG	Units	Sample Location: MW-6																					
			Sample Date:																					
			08/20/2003	09/09/2004	11/17/2005	12/13/2006	12/05/2007	12/02/2008	12/09/2009	12/09/2009	12/01/2010	12/01/2010	03/16/2010	03/16/2010	12/05/2011	12/05/2011	12/10/2012	12/10/2012	06/19/2013	06/19/2013	09/04/2013	09/04/2013	12/11/2013	03/24/2014
Sample Type:	N	N	N	N	N	N	N	FD	N	FD	N	FD	N	FD	N	FD	N	FD	N	FD	N	N		
<b>Pesticides</b>																								
4,4'-DDD	0.1	µg/L	0.02 U	0.02 U	0.015 J	0.022 U	0.02 UJ	0.022 U	NA	NA	0.026 U	0.026 U	0.04 UJ	0.04 UJ	0.026 U	0.026 U	0.026 U	0.0066 J	0.025 U	0.025 U	0.004 J	0.0039 J	0.0055 J	0.0036 J
4,4'-DDE	0.1	µg/L	0.029 J	0.019 J	0.014 J	0.014 J	0.019 J	0.021 J	NA	NA	0.026 U	0.016 J	0.04 UJ	0.04 UJ	0.026 U	0.026 U	0.013 J	0.014 J	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
4,4'-DDT	0.1	µg/L	0.058 J	0.05	0.049 J	0.026 J	0.013 J	0.028 J	NA	NA	0.023 J	0.026	0.03 J	0.013 J	0.012 NJ	0.014 J	0.015 J	0.021 J	0.012 J	0.013 J	0.018 NJ	0.019 J	0.019 J	0.012 J
Aldrin	0.002	µg/L	0.0029 J a	0.01 U	0.0098 U	0.011 U	0.01 UJ	0.011 U	NA	NA	0.0021 U	0.002 U	0.0012 J	0.0011 J	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
alpha-BHC	0.006	µg/L	0.01 U	0.01 U	0.0098 U	0.011 U	0.01 UJ	0.011 U	NA	NA	0.0025 J	0.0061 U	0.004 UJ	0.004 UJ	0.0063 U	0.0063 U	0.0062 U	0.0062 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.0016 J
alpha-Chlordane	2	µg/L	0.01 U	0.0096 J	0.0098 U	0.011 U	0.01 UJ	0.012	NA	NA	0.026 UJ	0.0032 J	0.012 J	0.009 J	0.0029 J	0.003 J	0.0019 J	0.0017 J	0.0031 J	0.0023 J	0.0026 J	0.0024 J	0.025 U	0.025 U
beta-BHC	0.02	µg/L	0.01 U	0.066 a	0.024 a	0.015 J	0.014 J	0.043 a	NA	NA	0.06 J a	0.063 J a	0.027 J a	0.026 J a	0.058 a	0.055 a	0.0052 J	0.0059 NJ	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
delta-BHC	0.006	µg/L	0.01 U	0.01 U	0.0098 U	0.011 U	0.01 UJ	0.011 U	NA	NA	0.0062 U	0.0061 U	0.006 UJ	0.006 UJ	0.0063 U	0.0063 U	0.0062 U	0.0062 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U
Dieldrin	0.002	µg/L	0.26 a	0.13 a	0.1 a	0.07 a	0.13 J a	0.12 a	NA	NA	0.081 J a	0.086 J a	0.087 J a	0.066 J a	0.1 J a	0.12 a	0.14 a	0.14 a	0.095 a	0.098 a	0.12 a	0.11 a	0.091 a	0.075 a
Endosulfan I		µg/L	0.01 U	0.01 U	0.0098 U	0.008 J	0.01 UJ	0.01 J	NA	NA	0.026 U	0.026 U	0.017 J	0.0042 NJ	0.026 U	0.026 U	0.026 U	0.026 U	0.025 U	0.0022 J	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan II		µg/L	0.02 U	0.02 U	0.02 U	0.022 U	0.034 J	0.029 J	NA	NA	0.026 U	0.026 U	0.05 J	0.031 J	0.026 U	0.026 U	0.026 U	0.026 U	0.005 J	0.0052 J	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan sulfate		µg/L	0.02 U	0.02 U	0.02 U	0.022 U	0.02 UJ	0.0099 J	NA	NA	0.026 U	0.026 U	0.0012 NJ	0.0031 J	0.026 U	0.026 U	0.026 U	0.026 U	0.025 U	0.025 U	0.0064 NJ	0.01 J	0.025 U	0.025 U
Endrin	2	µg/L	0.02 U	0.02 U	0.02 U	0.022 U	0.02 UJ	0.011 J	NA	NA	0.013 J	0.016 J	0.04 UJ	0.04 UJ	0.026 U	0.026 U	0.026 UJ	0.026 UJ	0.025	0.027	0.0069 J	0.0059 J	0.025 U	0.025 U
Endrin aldehyde		µg/L	0.02 U	0.02 U	0.02 U	0.023 J	0.015 J	0.029 J	NA	NA	0.039 J	0.031 NJ	0.04 UJ	0.04 UJ	0.034 J	0.039 J	0.046	0.05	0.0052 J	0.0052 J	0.034	0.027 J	0.031	0.022 J
Endrin ketone		µg/L	0.045 J	0.075	0.068 J	0.047 J	0.055 J	0.087	NA	NA	0.048 J	0.043 J	0.1 J	0.088 J	0.051	0.047	0.025 J	0.025 J	0.016 J	0.016 J	0.021 J	0.017 J	0.015 J	0.012 J
gamma-BHC (Lindane)	0.2	µg/L	0.01 U	0.01 U	0.0098 U	0.011 U	0.01 UJ	0.011 U	NA	NA	0.026 U	0.0019 J	0.0011 J	0.02 UJ	0.021 U	0.021 U	0.021 U	0.02 U	0.02 U	0.0022 NJ	0.0025 J	0.02 U	0.0014 J	
gamma-Chlordane	2	µg/L	0.016 J	0.013	0.012	0.011 U	0.01 UJ	0.0082 J	NA	NA	0.012 J	0.013 J	0.0055 J	0.0016 NJ	0.026 U	0.026 U	0.0019 J	0.026 U	0.0035 J	0.025 U	0.0034 J	0.025 U	0.025 U	0.025 U
Heptachlor	0.4	µg/L	0.01 U	0.01 U	0.0098 U	0.011 U	0.01 UJ	0.011 U	NA	NA	0.026 UJ	0.026 UJ	0.02 UJ	0.02 UJ	0.026 U	0.026 U	0.026 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Heptachlor epoxide		µg/L	0.01 U	0.01 U	0.0098 U	0.011 U	0.01 UJ	0.0078 J	NA	NA	0.0048 NJ	0.026 U	0.02 UJ	0.02 UJ	0.026 U	0.026 U	0.026 U	0.026 U	0.0075 J	0.0095 J	0.025 U	0.025 U	0.025 U	0.025 U
Methoxychlor		µg/L	0.1 U	0.1 U	0.098 U	0.11 U	0.1 UJ	0.056 J	NA	NA	0.0093 J	0.013 J	0.02 NJ	0.024 J	0.11 U	0.11 U	0.1 U	0.1 U	0.0096 J	0.013 NJ	0.1 U	0.1 U	0.02 J	0.1 U
Toxaphene	3	µg/L	1.5	1.2	0.98 U	0.98 J	1 UJ	1.1 U	NA	NA	1.2	1.1 J	1 UJ	1 UJ	2.6	3.2 a	1.7 J	2.5 J	0.25 U	0.25 U	1.5	1.3	0.25 U	0.25 U
Total Pesticides		µg/L	1.9109	1.5626	0.282	1.183	0.28	0.4719	NA	NA	0.352	0.267	1.4926	1.4121	2.8579	3.478	1.948	2.7642	0.1836	0.1914	1.7185	1.4977	0.1815	0.1276
<b>Metals</b>																								
Chromium	100	µg/L	NA	NA	NA	NA	NA	10 U	10 U	5 U	5 U	NA	NA	5 U	5 U	2.4 J	5 U	NA	NA	NA	NA	2.4 J	NA	NA
Lead	15	µg/L	NA	NA	NA	NA	NA	3 U	1.2 J	10 U	10 U	NA	NA	7.3 U	8.1 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA

- Notes:
- µg/L = Micrograms per liter
  - RG = Remedial Goal
  - a = Concentration Exceeds RG
  - N = Normal/Primary Sample
  - FD = Field Duplicate
  - U = Not detected
  - J = Estimated value
  - D = The value was obtained during a secondary dilution.
  - NJ = Analyte was presumptively present and tentatively identified at the approximate concentration listed.
  - NA = Not analyzed
  - [Red Box] = Highest concentration exceeding RG during posted timeframe

Appendix E  
 Historical Groundwater Results from 2003 to 2014Q1  
 Pesticides and Metals for MW-8

Analyte	RG	Units	Sample Location:	MW-8	MW-8	MW-8	MW-8	MW-8	MW-8	MW-8	MW-8	MW-8	MW-8	MW-8	MW-8	MW-8	
			Sample Date:	08/20/2003	09/09/2004	11/17/2005	12/12/2006	12/07/2007	12/04/2008	12/09/2009	03/16/2010	11/30/2010	12/01/2011	12/11/2012	06/18/2013	09/04/2013	12/12/2013
			Sample Type:	N	N	N	N	N	N	N	N	N	N	N	N	N	
<b>Pesticides</b>																	
4,4'-DDD	0.1	µg/L	0.021 J	0.02 U	0.02 U	0.019 U	0.02 U	0.021 U	NA	0.0022 J	0.0017 J	0.0012 J	0.0016 J	0.025 U	0.0032 J	0.0025 J	0.0024 J
4,4'-DDE	0.1	µg/L	0.036 J	0.02 U	0.02 U	0.019 U	0.02 U	0.021 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
4,4'-DDT	0.1	µg/L	0.1 U	0.02 U	0.013 J	0.019 U	0.02 U	0.021 U	NA	0.04 U	0.026 U	0.0025 J	0.026 U	0.025 U	0.025 U	0.025 U	0.0025 J
Aldrin	0.002	µg/L	0.025 J a	0.014 J a	0.0041 J a	0.0093 U	0.01 U	0.011 U	NA	0.001 U	0.0021 U	0.002 U	0.002 U	0.002 U	0.0029 J a	0.0025 J a	0.0022 a
alpha-BHC	0.006	µg/L	1.2 D a	0.31 D a	0.034 a	0.014 a	0.01 U	0.018 a	NA	0.028 J a	0.0036 J	0.018 a	0.01 a	0.018 a	0.015 a	0.019 a	0.012 a
alpha-Chlordane	2	µg/L	0.05 U	0.01 U	0.0052 J	0.0093 U	0.01 U	0.011 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.0016 J	0.025 U
beta-BHC	0.02	µg/L	1.0 a	0.55 D a	0.047 J a	0.03 J a	0.01 U	0.042 a	NA	0.074 J a	0.0075 J	0.032 a	0.022 a	0.059 a	0.057 a	0.059 a	0.047 a
delta-BHC	0.006	µg/L	0.3 J a	0.11 a	0.013 J a	0.0093 U	0.01 U	0.0082 J a	NA	0.01 J a	0.0017 J	0.0065 a	0.0036 J	0.0064 a	0.0075 a	0.0065 J a	0.0053 J
Dieldrin	0.002	µg/L	1.3 a	0.45 D a	0.072 J a	0.038 a	0.016 J a	0.043 a	NA	0.058 J a	0.013 J a	0.022 a	0.017 a	0.051 a	0.056 a	0.049 a	0.044 a
Endosulfan I		µg/L	0.05 U	0.01 U	0.01 U	0.0093 U	0.01 U	0.011 U	NA	0.00091 J	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan II		µg/L	0.1 U	0.02 U	0.02 U	0.019 U	0.015 J	0.021 U	NA	0.04 U	0.026 U	0.0041 J	0.026 U	0.025 U	0.0036 J	0.025 U	0.0028 J
Endosulfan sulfate		µg/L	0.1 U	0.02 U	0.02 U	0.019 U	0.02 U	0.021 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Endrin	2	µg/L	0.1 U	0.02 U	0.02 U	0.019 U	0.02 U	0.021 U	NA	0.0012 J	0.026 U	0.025 U	0.026 U	0.0031 J	0.025 U	0.025 U	0.025 U
Endrin aldehyde		µg/L	0.1 U	0.02 U	0.02 U	0.019 U	0.02 U	0.021 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Endrin ketone		µg/L	0.11 J	0.03 J	0.02 U	0.019 U	0.02 U	0.021 U	NA	0.0021 J	0.026 U	0.025 U	0.026 U	0.0018 J	0.0033 J	0.0018 J	0.0026 J
gamma-BHC (Lindane)	0.2	µg/L	0.28 J a	0.01 U	0.0026 J	0.0093 U	0.01 U	0.011 U	NA	0.0014 J	0.026 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.0012 J
gamma-Chlordane	2	µg/L	0.05 U	0.01 U	0.01 U	0.0093 U	0.01 U	0.011 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Heptachlor	0.4	µg/L	0.05 U	0.01 U	0.01 U	0.0093 U	0.01 U	0.011 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Heptachlor epoxide		µg/L	0.05 U	0.01 U	0.01 U	0.0093 U	0.01 U	0.011 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.0027 J	0.025 U	0.025 U	0.025 U
Methoxychlor		µg/L	0.5 U	0.1 U	0.1 U	0.093 U	0.1 U	0.11 U	NA	0.2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.002 J
Toxaphene	3	µg/L	5 U	0.6 U	1 U	0.93 U	1 U	1.1 U	NA	1 U	0.26 U	0.25 U	0.26 U	0.25 U	0.25 U	0.25 U	0.25 U
Total Pesticides		µg/L	4.273	1.464	0.1909	0.082	0.031	0.1112	NA	0.17781	0.0275	0.0863	0.0542	0.142	0.1485	0.1419	0.124
<b>Metals</b>																	
Chromium	100	µg/L	NA	NA	NA	NA	NA	NA	3.5 J	NA	5 U	5 U	5 U	NA	NA	5 U	NA
Lead	15	µg/L	NA	NA	NA	NA	NA	NA	1.9 J	NA	10 U	10 U	10 U	NA	NA	10 U	NA

- Notes:**
- µg/L = Micrograms per liter
  - RG = Remedial Goal
  - a = Concentration Exceeds RG
  - N = Normal/Primary Sample
  - FD = Field Duplicate
  - U = Not detected
  - J = Estimated value
  - D = The value was obtained during a secondary dilution.
  - NJ = Analyte was presumptively present and tentatively identified at the approximate concentration listed.
  - NA = Not analyzed
  - [Red Box] = Highest concentration exceeding RG during posted timeframe

Appendix E  
Historical Groundwater Results from 2003 to 2014Q1  
Pesticides and Metals for MW-10

Analyte	RG	Units	Sample Location:	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10
			Sample Date:	08/20/2003	09/09/2004	11/16/2005	12/13/2006	12/06/2007	12/02/2008	12/11/2009	03/18/2010	12/02/2010	12/07/2011	12/12/2012	06/19/2013	09/05/2013	12/13/2013
		Sample Type:	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
<b>Pesticides</b>																	
4,4'-DDD	0.1	µg/L	0.02 U	0.02 U	0.22 DJ a	0.019 U	0.22 J a	0.2 J a	NA	0.13 J a	0.08 J	0.25 U	0.098	0.25 a	0.06 J	0.025 U	0.25 U
4,4'-DDE	0.1	µg/L	0.02 U	0.26 J a	0.27 J a	0.059 J	0.13 J a	0.23 J a	NA	0.15 J a	0.24 a	0.25 U	0.2 J a	0.05 U	0.19 J a	0.17 a	0.19 J a
4,4'-DDT	0.1	µg/L	0.02 U	0.02 U	0.2 J a	0.019 U	0.11 J a	0.2 J a	NA	0.14 NJ a	0.043 J	0.25 U	0.056 J	0.11 a	0.025 U	0.025 U	0.11 J a
Aldrin	0.002	µg/L	0.026 J a	0.01 U	0.01 U	0.023 J a	0.023 J a	0.04 J a	NA	0.029 J a	0.01 U	0.02 U	0.004 U	0.004 U	0.075 J a	0.069 J a	0.02 U
alpha-BHC	0.006	µg/L	0.0046 J	0.0042 J	0.01 U	0.0093 U	0.013 J a	0.0092 J a	NA	0.0018 J	0.03 U	0.06 U	0.012 U	0.012 U	0.006 U	0.0011 J	0.06 U
alpha-Chlordane	2	µg/L	0.01 U	0.01 U	0.01 U	0.044 J	0.015 J	0.12 J	NA	0.084 NJ	0.13 U	0.25 U	0.019 J	0.05 U	0.025 U	0.025 U	0.082 J
beta-BHC	0.02	µg/L	0.25 D a	0.34 D a	0.16 J a	0.47 a	0.15 J a	0.41 D a	NA	0.092 DJ a	0.13 a	0.25 J a	0.1 a	0.16 a	0.22 J a	0.17 a	0.2 a
delta-BHC	0.006	µg/L	0.02 a	0.028 a	0.011 J a	0.028 a	0.01 U	0.023 J a	NA	0.0051 NJ	0.048 a	0.049 J a	0.04 a	0.012 U	0.046 J a	0.023 J a	0.06 U
Dieldrin	0.002	µg/L	1.2 D a	1.7 D a	1.4 DJ a	1.2 a	1 DJ a	1.1 DJ a	NA	0.43 DJ a	0.88 J a	0.96 a	1 a	1.2 a	0.93 J a	0.91 a	1 a
Endosulfan I		µg/L	0.01 U	0.01 U	0.01 U	0.043 J	0.026 J	0.23 J	NA	0.026 NJ	0.13 U	0.25 U	0.051 U	0.05 U	0.026 J	0.025 U	0.25 U
Endosulfan II		µg/L	0.02 U	0.02 U	0.021 U	0.4 J	0.24 J	0.54 DJ	NA	0.18 DJ	0.13 U	0.25 U	0.051 U	0.23	0.025 U	0.025 U	0.25 U
Endosulfan sulfate		µg/L	0.02 U	0.02 U	0.021 U	0.019 U	0.074 J	0.021 U	NA	0.041 U	0.46	0.25 U	0.051 U	0.35 J	0.025 U	0.025 U	0.25 U
Endrin	2	µg/L	0.02 U	0.02 U	0.021 U	0.39 J	0.14 J	0.23 J	NA	0.041 U	0.13 U	0.16 J	0.051 U	0.32 J	0.025 U	0.11 J	0.11 J
Endrin aldehyde		µg/L	0.02 U	0.02 U	0.21 U	0.019 U	0.37 DJ	0.3 DJ	NA	0.19 NJ	0.2 J	0.25 U	0.27 J	0.05 U	0.22 J	0.025 U	0.25 U
Endrin ketone		µg/L	1.2 D	1.5 D	0.21 U	1.2	0.65 J	0.86 D	NA	0.51 DJ	0.3	0.33 J	0.23	0.67	0.54 J	0.35	0.65 J
gamma-BHC (Lindane)	0.2	µg/L	0.05 J	0.042 J	0.027	0.038 J	0.013 J	0.05	NA	0.015 J	0.016 J	0.2 U	0.011 J	0.04 U	0.015 J	0.017 J	0.018 J
gamma-Chlordane	2	µg/L	0.01 U	0.01 U	0.01 U	0.027 J	0.08 J	0.13	NA	0.083	0.13 U	0.25 U	0.051 U	0.05 U	0.061 J	0.07 J	0.093 J
Heptachlor	0.4	µg/L	0.01 U	0.01 U	0.01 U	0.0093 U	0.01 U	0.01 U	NA	0.0076 J	0.13 U	0.25 U	0.051 U	0.05 U	0.025 U	0.025 U	0.25 U
Heptachlor epoxide		µg/L	0.01 U	0.01 U	0.01 U	0.0093 U	0.02 J	0.12 J	NA	0.072 J	0.13 U	0.25 U	0.051 U	0.15 J	0.025 U	0.025 U	0.25 U
Methoxychlor		µg/L	0.1 U	0.1 U	0.1 U	0.093 U	0.071 J	0.34 J	NA	0.22 J	0.51 U	1 U	0.2 U	0.2 U	0.1 U	0.1 U	1 U
Toxaphene	3	µg/L	10 J a	25 DJ a	13 a	18 a	9.8 DJ a	1 U	NA	1 U	20 J a	26 a	25 J a	24 J a	26 a	20 a	27 a
Total Pesticides		µg/L	12.7506	28.8742	15.288	21.922	13.145	5.1322	NA	2.3655	22.397	27.749	27.024	27.44	28.383	21.8901	29.453
<b>Metals</b>																	
Chromium	100	µg/L	NA	NA	NA	NA	NA	NA	10 U	NA	5 U	5 U	5 U	NA	NA	2.9 J	NA
Lead	15	µg/L	NA	NA	NA	NA	NA	NA	3 U	NA	10 U	5.4 U	4 J	NA	NA	10 U	NA

- Notes:**
- µg/L = Micrograms per liter
  - RG = Remedial Goal
  - a = Concentration Exceeds RG
  - N = Normal/Primary Sample
  - FD = Field Duplicate
  - U = Not detected
  - J = Estimated value
  - D = The value was obtained during a secondary dilution.
  - NJ = Analyte was presumptively present and tentatively identified at the approximate concentration listed.
  - NA = Not analyzed
  - [Red Box] = Highest concentration exceeding RG during posted timeframe

**Appendix E**  
**Historical Groundwater Results from 2003 to 2014Q1**  
**Pesticides and Metals for MW-14**

Analyte	RG	Units	Sample Location:	MW-14	MW-14	MW-14	MW-14	MW-14	MW-14	MW-14	MW-14	MW-14	MW-14	MW-14	MW-14	MW-14	MW-14	MW-14	MW-14	MW-14			
			Sample Date:	08/20/2003	09/08/2004	11/16/2005	12/12/2006	12/07/2007	12/03/2008	12/10/2009	12/10/2009	03/18/2010	03/18/2010	12/01/2010	12/01/2010	12/06/2011	12/06/2011	12/11/2012	06/19/2013	09/04/2013	12/12/2013	03/25/2014	
			Sample Type:	N	N	N	N	N	N	FD	N	FD	N	FD	N	FD	N	N	N	N	N		
<b>Pesticides</b>																							
4,4'-DDD	0.1	µg/L		0.2 U	0.04 U	<b>0.061</b>	0.02 U	0.02 UJ	<b>0.004 J</b>	NA	NA	<b>0.0059 J</b>	<b>0.013 J</b>	0.13 U	0.13 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	<b>0.002 J</b>	<b>0.0012 J</b>	
4,4'-DDE	0.1	µg/L		0.2 U	0.04 U	0.041 U	0.02 U	0.02 UJ	0.02 U	NA	NA	0.043 U	0.041 U	0.13 U	0.13 U	<b>0.012 J</b>	<b>0.013 J</b>	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	
4,4'-DDT	0.1	µg/L		0.2 U	0.04 U	0.041 U	0.02 U	0.02 UJ	0.02 U	NA	NA	0.043 U	0.041 U	0.13 U	0.13 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	
Aldrin	0.002	µg/L		0.1 U	0.02 U	0.02 U	0.0099 U	0.01 UJ	0.01 U	NA	NA	<b>0.0021 NJ a</b>	<b>0.012 J a</b>	0.01 UJ	0.01 UJ	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
alpha-BHC	0.006	µg/L		<b>2.4 D a</b>	<b>1.8 D a</b>	<b>1.9 D a</b>	<b>3.1 a</b>	<b>2.6 J a</b>	<b>1.8 D a</b>	NA	NA	<b>1.1 D a</b>	<b>1.3 D a</b>	<b>1.6 a</b>	<b>1.7 a</b>	<b>0.87 a</b>	<b>0.92 a</b>	<b>0.47 a</b>	<b>0.21 a</b>	<b>0.11 a</b>	<b>0.15 a</b>	<b>0.2 a</b>	
alpha-Chlordane	2	µg/L		0.1 U	0.02 U	0.02 U	0.0099 U	0.01 UJ	0.01 U	NA	NA	0.022 U	0.021 U	0.13 UJ	0.13 UJ	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	
beta-BHC	0.02	µg/L		<b>0.54 a</b>	<b>0.61 D a</b>	<b>0.67 D a</b>	<b>1.1 a</b>	<b>0.72 J a</b>	<b>0.83 D a</b>	NA	NA	<b>0.49 D a</b>	<b>0.59 D a</b>	<b>0.68 a</b>	<b>0.74 a</b>	<b>0.4 a</b>	<b>0.39 a</b>	<b>0.2 J a</b>	<b>0.093 a</b>	<b>0.048 a</b>	<b>0.064 a</b>	<b>0.086 a</b>	
delta-BHC	0.006	µg/L		<b>0.48 a</b>	<b>0.5 D a</b>	<b>0.54 DJ a</b>	<b>0.94 a</b>	<b>0.69 J a</b>	<b>0.64 D a</b>	NA	NA	<b>0.34 D a</b>	<b>0.38 D a</b>	<b>0.59 a</b>	<b>0.62 a</b>	<b>0.34 a</b>	<b>0.35 a</b>	<b>0.15 a</b>	<b>0.065 a</b>	<b>0.036 a</b>	<b>0.048 a</b>	<b>0.066 a</b>	
Dieldrin	0.002	µg/L		0.2 U	<b>0.012 J a</b>	<b>0.017 J a</b>	0.02 U	0.02 UJ	<b>0.016 J a</b>	NA	NA	<b>0.017 a</b>	<b>0.024 a</b>	<b>0.019 J a</b>	<b>0.02 J a</b>	<b>0.018 a</b>	<b>0.02 a</b>	<b>0.011 a</b>	<b>0.0078 a</b>	<b>0.0054 a</b>	<b>0.0059 a</b>	<b>0.0055 a</b>	
Endosulfan I		µg/L		0.1 U	0.02 U	0.02 U	0.0099 U	0.01 UJ	0.01 U	NA	NA	0.022 U	0.021 U	0.13 U	0.13 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	
Endosulfan II		µg/L		0.2 U	0.04 U	0.041 U	0.02 U	<b>0.016 J</b>	0.02 U	NA	NA	0.043 U	0.041 U	0.13 UJ	0.13 UJ	<b>0.0061 J</b>	<b>0.003 NJ</b>	0.025 U	0.025 U	<b>0.0034 J</b>	0.025 U	0.025 U	
Endosulfan sulfate		µg/L		0.2 U	0.04 U	0.041 U	0.02 U	0.02 UJ	<b>0.008 J</b>	NA	NA	<b>0.0023 J</b>	<b>0.023 NJ</b>	0.13 U	0.13 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	
Endrin	2	µg/L		0.2 U	0.04 U	0.041 U	0.02 U	0.02 UJ	<b>0.0061 J</b>	NA	NA	<b>0.0057 J</b>	<b>0.0012 NJ</b>	0.13 U	0.13 U	0.025 U	<b>0.011 J</b>	0.025 UJ	0.025 U	0.025 U	0.025 U	0.025 U	
Endrin aldehyde		µg/L		0.2 U	0.04 U	0.041 U	0.02 U	0.02 UJ	0.02 U	NA	NA	0.043 U	0.041 U	0.13 U	0.13 U	0.025 UJ	0.025 UJ	0.025 U	0.025 U	0.025 U	0.025 U	0.025 UJ	
Endrin ketone		µg/L		0.2 U	0.04 U	0.041 U	0.02 U	0.02 UJ	0.02 U	NA	NA	<b>0.0013 J</b>	<b>0.00093 NJ</b>	0.13 U	0.13 U	<b>0.0095 J</b>	0.025 U	0.025 U	0.025 U	<b>0.0016 J</b>	0.025 U	0.025 UJ	
gamma-BHC (Lindane)	0.2	µg/L		0.1 U	0.02 U	0.02 U	0.0099 U	0.01 UJ	<b>0.0039 J</b>	NA	NA	0.022 U	0.021 U	0.13 U	0.13 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	
gamma-Chlordane	2	µg/L		0.1 U	0.02 U	0.02 U	0.0099 U	<b>0.022 J</b>	0.01 U	NA	NA	<b>0.003 NJ</b>	<b>0.0063 J</b>	0.13 U	0.13 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	
Heptachlor	0.4	µg/L		0.1 U	0.02 U	0.02 U	0.0099 U	0.01 UJ	0.01 U	NA	NA	0.022 U	0.021 U	0.13 UJ	0.13 UJ	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	
Heptachlor epoxide		µg/L		0.1 U	0.02 U	0.02 U	0.0099 U	0.01 UJ	0.01 U	NA	NA	0.022 U	0.021 U	0.13 U	0.13 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	
Methoxychlor		µg/L		1 U	0.2 U	0.2 U	0.099 U	0.1 UJ	0.1 U	NA	NA	0.22 U	0.21 U	0.51 U	0.51 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	
Toxaphene	3	µg/L		10 U	1.2 U	2 U	0.99 U	1 UJ	1 U	NA	NA	1.1 U	1 U	1.3 U	1.3 U	0.25 U	0.25 U	0.25 UJ	0.25 U	0.25 U	0.25 U	0.25 U	
Total Pesticides		µg/L		3.42	2.922	3.188	5.14	4.048	3.308	NA	NA	1.9673	2.35043	2.889	3.08	1.6556	1.707	0.831	0.3758	0.2044	0.2699	0.3587	
<b>Metals</b>																							
Chromium	100	µg/L		NA	NA	NA	NA	NA	10 U	10 U	NA	NA	5 U	5 U	5 U	5 U	5 U	NA	NA	5 U	NA		
Lead	15	µg/L		NA	NA	NA	NA	NA	<b>1.8 J</b>	3 UJ	NA	NA	10 U	10 U	9.6 U	3 U	10 U	NA	NA	10 U	NA		

**Notes:**

- µg/L = Micrograms per liter
- RG = Remedial Goal
- a = Concentration Exceeds RG
- N = Normal/Primary Sample
- FD = Field Duplicate
- U = Not detected
- J = Estimated value
- D = The value was obtained during a secondary dilution.
- NJ = Analyte was presumptively present and tentatively identified at the approximate concentration listed.
- NA = Not analyzed
- [Red Box] = Highest concentration exceeding RG during posted timeframe

**Appendix E**  
**Historical Groundwater Results from 2003 to 2014Q1**  
**Pesticides and Metals for MW-15**

Analyte	RG	Units	Sample Location:	MW-15	MW-15	MW-15	MW-15	MW-15	MW-15	MW-15	MW-15	MW-15	MW-15	MW-15	MW-15	MW-15	MW-15	
			Sample Date:	08/21/2003	09/10/2004	11/16/2005	12/13/2006	12/04/2007	12/03/2008	12/09/2009	03/17/2010	11/30/2010	12/01/2011	12/11/2012	06/18/2013	09/04/2013	12/11/2013	03/25/2014
			Sample Type:	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
<b>Pesticides</b>																		
4,4'-DDD	0.1	µg/L	0.02 U	0.02 U	0.016 J	0.02 U	0.02 U	0.021 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
4,4'-DDE	0.1	µg/L	0.02 U	0.02 U	0.0095 J	0.02 U	0.02 U	0.021 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
1,1'-DDT	0.1	µg/L	0.02 U	0.02 U	0.14 a	0.02 U	0.02 U	0.021 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
Aldrin	0.002	µg/L	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.011 U	NA	0.001 U	0.0021 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
alpha-BHC	0.006	µg/L	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.011 U	NA	0.004 U	0.0063 U	0.0061 U	0.0061 U	0.006 U	0.006 U	0.006 U	0.006 U	
alpha-Chlordane	2	µg/L	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.011 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
beta-BHC	0.02	µg/L	0.01 U	0.01 U	0.002 J	0.01 U	0.01 U	0.028 a	NA	0.02 U	0.021 U	0.0041 J	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	
delta-BHC	0.006	µg/L	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.011 U	NA	0.006 U	0.0063 U	0.0061 U	0.0061 U	0.006 U	0.006 U	0.006 U	0.006 U	
Dieldrin	0.002	µg/L	0.0028 J a	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.0057 J a	NA	0.0023 J a	0.0023 J a	0.003 a	0.0019 J	0.0014 J	0.0023 a	0.0012 J	0.002 U
Endosulfan I		µg/L	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.011 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
Endosulfan II		µg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.03 J	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
Endosulfan sulfate		µg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.021 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.0014 J	0.025 U	
Endrin	2	µg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.021 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
Endrin aldehyde		µg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.021 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
Endrin ketone		µg/L	0.0058 J	0.02 U	0.02 U	0.02 U	0.02 U	0.021 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.0029 J	
gamma-BHC (Lindane)	0.2	µg/L	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.011 U	NA	0.02 U	0.026 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	
gamma-Chlordane	2	µg/L	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.011 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
Heptachlor	0.4	µg/L	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.011 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
Heptachlor epoxide		µg/L	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.011 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
Methoxychlor		µg/L	0.1 U	0.1 U	0.098 U	0.1 U	0.1 U	0.11 U	NA	0.2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
Toxaphene	3	µg/L	1 U	0.6 U	0.98 U	1 U	1 U	1.1 U	NA	1 U	0.26 U	0.25 U	0.26 U	0.25 U	0.25 U	0.25 U	0.25 U	
Total Pesticides		µg/L	0.0086	U	0.1675	U	0.03	0.0337	NA	0.0023	0.0023	0.0071	0.0019	0.0014	0.0023	0.0026	0.0029	
<b>Metals</b>																		
Chromium	100	µg/L	NA	NA	NA	NA	NA	NA	10 U	NA	5 U	2.5 J	1.8 J	NA	NA	21	NA	
Lead	15	µg/L	NA	NA	NA	NA	NA	NA	3 U	NA	2 J	10 U	10 U	NA	NA	10 U	NA	

**Notes:**

- µg/L = Micrograms per liter
- RG = Remedial Goal
- a = Concentration Exceeds RG
- N = Normal/Primary Sample
- FD = Field Duplicate
- U = Not detected
- J = Estimated value
- D = The value was obtained during a secondary dilution.
- NJ = Analyte was presumptively present and tentatively identified at the approximate concentration listed.
- NA = Not analyzed
- = Highest concentration exceeding RG during posted timeframe

Appendix E  
Historical Groundwater Results from 2003 to 2014Q1  
Pesticides and Metals for MW-16

Analyte	RG	Units	Sample Location:	MW-16	MW-16	MW-16	MW-16	MW-16	MW-16	MW-16	MW-16	MW-16	MW-16	MW-16	MW-16	MW-16	MW-16		
			Sample Date:	08/21/2003	09/10/2004	11/16/2005	12/13/2006	12/04/2007	12/03/2008	03/17/2010	12/09/2009	12/01/2010	12/06/2011	12/10/2012	06/19/2013	09/05/2013	12/12/2013	03/25/2014	
			Sample Type:	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
<b>Pesticides</b>																			
4,4'-DDD	0.1	µg/L		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.021 U	0.04 U	NA	0.009 J	0.025 U	0.025 U	0.025 U	0.025 U	0.25 U	0.0036 J	
4,4'-DDE	0.1	µg/L		0.0082 J	0.02 U	0.02 U	0.02 U	0.02 U	0.021 U	0.04 U	NA	0.052 U	0.025 U	0.025 U	0.025 U	0.025 U	0.25 U	0.025 U	
4,4'-DDT	0.1	µg/L		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.026 J	0.012 J	0.04 U	NA	0.052 U	0.025 U	0.025 U	0.025 U	0.025 U	0.25 U	0.025 U
Aldrin	0.002	µg/L		0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.011 U	0.001 U	NA	0.0041 U	0.002 U	0.002 U	0.002 U	0.002 U	0.02 U	0.002 U	
alpha-BHC	0.006	µg/L		0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.011 U	0.001 J	NA	0.0054 J	0.0061 U	0.0061 U	0.006 U	0.006 U	0.1 a	0.006 U	
alpha-Chlordane	2	µg/L		0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.011 U	0.0039 J	NA	0.052 U	0.025 U	0.0025 J	0.025 U	0.0035 J	0.25 U	0.025 U	
beta-BHC	0.02	µg/L		0.078 a	0.081 J a	0.049 J a	0.037 J a	0.034 J a	0.038 J a	0.037 J a	NA	0.027 J a	0.019 J	0.033 a	0.02 U	0.02 U	0.15 J a	0.015 J	
delta-BHC	0.006	µg/L		0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.011 U	0.006 U	NA	0.012 U	0.0061 U	0.0061 U	0.006 U	0.006 U	0.089 a	0.006 U	
Dieldrin	0.002	µg/L		0.43 D a	0.62 D a	0.47 D J a	0.47 J a	0.54 J a	0.34 D a	0.31 J a	NA	0.86 J a	0.73 a	0.66 a	0.61 a	0.67 a	0.62 a	0.6 a	
Endosulfan I		µg/L		0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.011 U	0.003 J	NA	0.052 U	0.025 U	0.025 U	0.025 U	0.025 U	0.25 U	0.025 U	
Endosulfan II		µg/L		0.02 U	0.02 U	0.02 U	0.014 J	0.036 J	0.06	0.04 U	NA	0.052 U	0.025 U	0.025 U	0.0029 J	0.025 U	0.25 U	0.025 U	
Endosulfan sulfate		µg/L		0.02 U	0.02 U	0.02 U	0.02 U	0.012 J	0.021 U	0.0042 J	NA	0.023 J	0.025 U	0.023 J	0.025 U	0.016 J	0.25 U	0.025 U	
Endrin	2	µg/L		0.02 U	0.02 U	0.02 U	0.026 J	0.013 J	0.021 U	0.04 U	NA	0.052 U	0.018 J	0.025 U	0.029 J	0.025 U	0.25 U	0.025 U	
Endrin aldehyde		µg/L		0.02 U	0.02 U	0.02 U	0.035 J	0.028 J	0.012 J	0.04 U	NA	0.052 U	0.025 U	0.025 U	0.033 J	0.025 U	0.25 U	0.025 U	
Endrin ketone		µg/L		0.044	0.063 J	0.039 J	0.025 J	0.028 J	0.022	0.014 J	NA	0.037 J	0.025	0.019 J	0.019 J	0.023 J	0.036 J	0.017 J	
gamma-BHC (Lindane)	0.2	µg/L		0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.011 U	0.02 U	NA	0.052 U	0.02 U	0.02 U	0.02 U	0.02 U	0.2 U	0.02 U	
gamma-Chlordane	2	µg/L		0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.011 U	0.02 U	NA	0.0094 J	0.025 U	0.025 U	0.025 U	0.0063 J	0.25 U	0.025 U	
Heptachlor	0.4	µg/L		0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.011 U	0.02 U	NA	0.052 U	0.025 U	0.025 U	0.025 U	0.025 U	0.25 U	0.025 U	
Heptachlor epoxide		µg/L		0.027 J	0.051 J	0.033	0.029 J	0.031 J	0.025 J	0.019 J	NA	0.046 J	0.043	0.034	0.16	0.033	0.04 J	0.028	
Methoxychlor		µg/L		0.1 U	0.1 U	0.098 U	0.1 U	0.1 U	0.11 U	0.2 U	NA	0.21 U	0.1 U	0.1 U	0.0073 J	0.1 U	0.14 J	0.1 U	
Toxaphene	3	µg/L		1 U	0.6 U	0.98 U	1.1 J	1 U	1.1 U	1 U	NA	1.8 NJ	3.7 a	2.8 J	1.5	0.25 U	1.6 J	0.25 U	
Total Pesticides		µg/L		0.5872	0.815	0.591	1.736	0.762	0.509	0.3921	NA	2.8168	4.535	3.5715	2.3612	0.7518	2.775	0.6636	
<b>Metals</b>																			
Chromium	100	µg/L		NA	NA	NA	NA	NA	NA	NA	10 U	5 U	7.6	5 U	NA	NA	5 U	NA	
Lead	15	µg/L		NA	NA	NA	NA	NA	NA	NA	3 U	10 U	4.5 U	10 U	NA	NA	10 U	NA	

- Notes:**
- µg/L = Micrograms per liter
  - RG = Remedial Goal
  - a = Concentration Exceeds RG
  - N = Normal/Primary Sample
  - FD = Field Duplicate
  - U = Not detected
  - J = Estimated value
  - D = The value was obtained during a secondary dilution.
  - NJ = Analyte was presumptively present and tentatively identified at the approximate concentration listed.
  - NA = Not analyzed
  - [Red Box] = Highest concentration exceeding RG during posted timeframe



**Appendix E**  
**Historical Groundwater Results from 2003 to 2014Q1**  
**Pesticides and Metals for MW-17**

Analyte	RG	Units	Sample Location:	MW-17	MW-17	MW-17	MW-17	MW-17	MW-17	MW-17	MW-17	MW-17	MW-17	MW-17	MW-17	MW-17	MW-17
			Sample Date:	08/21/2003	09/09/2004	11/17/2005	12/12/2006	12/06/2007	12/04/2008	12/10/2009	03/18/2010	11/30/2010	12/02/2011	12/11/2012	06/19/2013	09/05/2013	12/12/2013
			Sample Type:	N	N	N	N	N	N	N	N	N	N	N	N	N	N
<b>Pesticides</b>																	
4,4'-DDD	0.1	µg/L	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.02 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
4,4'-DDE	0.1	µg/L	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.02 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
4,4'-DDT	0.1	µg/L	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.02 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Aldrin	0.002	µg/L	0.01 U	0.01 U	0.0096 U	0.0099 U	0.01 U	0.01 U	NA	0.001 U	0.0021 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
alpha-BHC	0.006	µg/L	0.01 U	0.01 U	0.0096 U	0.0099 U	0.01 U	0.01 U	NA	0.004 U	0.0063 U	0.0061 U	0.0061 U	0.006 U	0.006 U	0.006 U	0.006 U
alpha-Chlordane	2	µg/L	0.01 U	0.01 U	0.0096 U	0.0099 U	0.01 U	0.01 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
beta-BHC	0.02	µg/L	0.01 U	0.01 U	0.0096 U	0.0099 U	0.01 U	<b>0.02 J</b>	NA	0.02 U	0.021 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
delta-BHC	0.006	µg/L	0.01 U	0.01 U	0.0096 U	0.0099 U	0.01 U	0.01 U	NA	0.006 U	0.0063 U	0.0061 U	0.0061 U	0.006 U	0.006 U	0.006 U	0.006 U
Dieldrin	0.002	µg/L	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.02 U	NA	0.002 U	0.0021 U	0.002 U	<b>0.0013 J</b>	0.002 U	0.002 U	0.002 U	0.002 U
Endosulfan I		µg/L	0.01 U	0.01 U	0.0096 U	0.0099 U	0.01 U	0.01 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan II		µg/L	0.02 U	0.02 U	0.019 U	0.02 U	<b>0.022 J</b>	0.02 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan sulfate		µg/L	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.02 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Endrin	2	µg/L	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.02 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Endrin aldehyde		µg/L	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.02 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Endrin ketone		µg/L	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.02 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
gamma-BHC (Lindane)	0.2	µg/L	0.01 U	0.01 U	0.0096 U	0.0099 U	0.01 U	0.01 U	NA	0.02 U	0.026 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
gamma-Chlordane	2	µg/L	0.01 U	0.01 U	0.0096 U	0.0099 U	0.01 U	0.01 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Heptachlor	0.4	µg/L	0.01 U	0.01 U	0.0096 U	0.0099 U	0.01 U	0.01 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Heptachlor epoxide		µg/L	0.01 U	0.01 U	0.0096 U	0.0099 U	0.01 U	0.01 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Methoxychlor		µg/L	0.1 U	0.1 U	0.096 U	0.099 U	0.1 U	0.1 U	NA	0.2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Toxaphene	3	µg/L	1 U	0.6 U	0.96 U	0.99 U	1 U	1 U	NA	1 U	0.26 U	0.25 U	0.26 U	0.25 U	0.25 U	0.25 U	0.25 U
Total Pesticides		µg/L	U	U	U	U	0.022	0.02	NA	U	U	U	0.0013	U	U	U	U
<b>Metals</b>																	
Chromium	100	µg/L	NA	NA	NA	NA	NA	NA	10 U	NA	5 U	<b>6.9</b>	<b>16</b>	NA	NA	<b>21</b>	NA
Lead	15	µg/L	NA	NA	NA	NA	NA	NA	<b>2.1 J</b>	NA	<b>2.6 J</b>	10 U	10 U	NA	NA	10 U	NA

- Notes:**
- µg/L = Micrograms per liter
  - RG = Remedial Goal
  - a** = Concentration Exceeds RG
  - N = Normal/Primary Sample
  - FD = Field Duplicate
  - U = Not detected
  - J = Estimated value
  - D = The value was obtained during a secondary dilution.
  - NJ = Analyte was presumptively present and tentatively identified at the approximate concentration listed.
  - NA = Not analyzed
  - █** = Highest concentration exceeding RG during posted timeframe

**Appendix E**  
**Historical Groundwater Results from 2003 to 2014Q1**  
**Pesticides and Metals for MW-18**

Analyte	RG	Units	Sample Location:	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18
			Sample Date:	08/21/2003	09/09/2004	11/17/2005	12/12/2006	12/06/2007	12/04/2008	12/10/2009	03/18/2010	12/01/2010	12/02/2011	12/12/2012	06/19/2013	09/05/2013	12/12/2013
			Sample Type:	N	N	N	N	N	N	N	N	N	N	N	N	N	N
<b>Pesticides</b>																	
4,4'-DDD	0.1	µg/L	0.04 U	0.02 U	0.046 J	0.02 U	0.02 U	0.022 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
4,4'-DDE	0.1	µg/L	0.02 J	0.021 J	0.014 J	0.02 U	0.02 U	0.022 U	NA	0.0012 J	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
4,4'-DDT	0.1	µg/L	0.04 U	0.02 U	0.024 J	0.02 U	0.02 U	0.039	NA	0.04 U	0.0046 J	0.025 U	0.0022 J	0.025 U	0.025 U	0.025 U	0.025 U
Aldrin	0.002	µg/L	0.018 J a	0.013 a	0.0098 U	0.0099 U	0.01 U	0.011 U	NA	0.0021 J a	0.002 U	0.002 U	0.0041 J a	0.002 U	0.002 U	0.002 U	0.002 U
alpha-BHC	0.006	µg/L	0.028 a	0.036 a	0.012 a	0.0099 U	0.01 U	0.011 U	NA	0.0039 J	0.0061 U	0.0061 U	0.0062 U	0.006 U	0.006 U	0.006 U	0.006 U
alpha-Chlordane	2	µg/L	0.11 J	0.11	0.038 J	0.034 J	0.015 J	0.029 J	NA	0.02 U	0.011 J	0.011 J	0.011 J	0.025 U	0.01 J	0.0099 J	0.0088 J
beta-BHC	0.02	µg/L	0.91 J a	1.1 D a	0.33 D a	0.084 J a	0.056 J a	0.11 a	NA	0.17 D J a	0.014 J	0.037 a	0.12 a	0.15 a	0.13 a	0.098 a	0.11 a
delta-BHC	0.006	µg/L	0.016 J a	0.011 a	0.005 J	0.0099 U	0.01 U	0.011 U	NA	0.006 U	0.0061 U	0.0061 U	0.0062 U	0.006 U	0.006 U	0.006 U	0.006 U
Dieldrin	0.002	µg/L	0.58 a	0.7 D a	0.18 a	0.051 a	0.02 J a	0.031 a	NA	0.028 J a	0.0075 J a	0.0092 a	0.014 a	0.012 a	0.012 a	0.012 a	0.011 a
Endosulfan I		µg/L	0.02 U	0.01 U	0.0098 U	0.0099 U	0.01 U	0.0015 J	NA	0.0011 J	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan II		µg/L	0.04 U	0.02 U	0.02 U	0.02 U	0.02 U	0.033 J	NA	0.0048 J	0.026 U	0.0059 J	0.026 U	0.025 U	0.003 J	0.025 U	0.0021 J
Endosulfan sulfate		µg/L	0.04 U	0.02 U	0.02 U	0.02 U	0.02 U	0.022 U	NA	0.04 U	0.026 U	0.0012 J	0.0027 J	0.025 U	0.025 U	0.025 U	0.025 U
Endrin	2	µg/L	0.04 U	0.02 U	0.02 U	0.02 U	0.02 U	0.022 U	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.0058 J	0.025 U	0.025 U
Endrin aldehyde		µg/L	0.04 U	0.02 U	0.02 U	0.019 J	0.02 U	0.017 J	NA	0.04 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Endrin ketone		µg/L	0.37	0.26	0.13 J	0.019 J	0.011 J	0.019 J	NA	0.02 J	0.0022 J	0.025 U	0.0071 J	0.0068 J	0.0067 J	0.0056 J	0.0059 J
gamma-BHC (Lindane)	0.2	µg/L	0.13 J	0.059 J	0.022 J	0.0099 U	0.01 U	0.0035 J	NA	0.004 J	0.026 U	0.02 U	0.021 U	0.02 U	0.0011 J	0.0012 J	0.02 U
gamma-Chlordane	2	µg/L	0.075 J	0.094	0.043 J	0.025 J	0.012 J	0.027 J	NA	0.02 J	0.0094 J	0.0096 J	0.011 J	0.0062 J	0.0089 J	0.01 J	0.0082 J
Heptachlor	0.4	µg/L	0.02 U	0.01 U	0.0098 U	0.0099 U	0.01 U	0.011 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Heptachlor epoxide		µg/L	0.035 J	0.01 U	0.0098 U	0.0099 U	0.01 U	0.011 U	NA	0.02 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Methoxychlor		µg/L	0.2 U	0.1 U	0.098 U	0.099 U	0.1 U	0.11 U	NA	0.0094 J	0.0027 J	0.1 U	0.1 U	0.0075 J	0.0027 J	0.1 U	0.1 U
Toxaphene	3	µg/L	1.3 J	2.1	0.98 U	0.59 J	1 U	1.1 U	NA	1 U	0.26 U	0.25 U	0.26 J	0.22 J	0.31	0.25 U	0.25 U
Total Pesticides		µg/L	3.642	4.504	0.844	0.822	0.147	0.2866	NA	0.2645	0.0514	0.0739	0.4321	0.4083	0.4844	0.1367	0.146
<b>Metals</b>																	
Chromium	100	µg/L	NA	NA	NA	NA	NA	NA	6.9 J	NA	13	9.5	9.7	NA	NA	6.7	NA
Lead	15	µg/L	NA	NA	NA	NA	NA	NA	3 U	NA	3.3 J	10 U	10 U	NA	NA	10 U	NA

- Notes:**
- µg/L = Micrograms per liter
  - RG = Remedial Goal
  - a = Concentration Exceeds RG
  - N = Normal/Primary Sample
  - FD = Field Duplicate
  - U = Not detected
  - J = Estimated value
  - D = The value was obtained during a secondary dilution.
  - NJ = Analyte was presumptively present and tentatively identified at the approximate concentration listed.
  - NA = Not analyzed
  - [Red Box] = Highest concentration exceeding RG during posted timeframe

**Appendix E**  
**Historical Groundwater Results from 2003 to 2014Q1**  
**Pesticides and Metals for MW-20**

Analyte	RG	Units	Sample Location:	MW-20	MW-20	MW-20	MW-20	MW-20	MW-20	MW-20	MW-20	MW-20	MW-20	MW-20	MW-20	MW-20	MW-20	
			Sample Date:	08/20/2003	09/08/2004	11/16/2005	12/12/2006	12/06/2007	12/03/2008	12/10/2009	03/17/2010	12/01/2010	12/06/2011	12/12/2012	06/20/2013	09/04/2013	12/13/2013	03/25/2014
			Sample Type:	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
<b>Pesticides</b>																		
4,4'-DDD	0.1	µg/L		0.1 U	0.2 U	0.19 U	0.02 U	0.02 U	0.1 U	NA	0.04 U	0.26 U	0.026 U	0.025 U	0.025 U	0.025 U	0.05 U	0.025 U
4,4'-DDE	0.1	µg/L		0.1 U	0.2 U	0.19 U	0.02 U	<b>0.019 J</b>	0.1 U	NA	0.04 U	0.26 U	<b>0.022 J</b>	0.025 U	0.025 U	0.025 U	0.05 U	0.025 U
4,4'-DDT	0.1	µg/L		0.1 U	0.2 U	0.19 U	0.02 U	0.02 U	0.1 U	NA	0.04 U	0.26 U	0.026 U	0.025 U	0.025 U	0.025 U	0.05 U	<b>0.005 J</b>
Aldrin	0.002	µg/L		0.05 U	0.1 U	0.096 U	0.0099 U	0.01 U	0.05 U	NA	0.001 U	0.02 U	0.002 U	0.002 U	0.002 U	<b>0.0073 J a</b>	0.004 U	0.002 U
alpha-BHC	0.006	µg/L		<b>2.8 D a</b>	<b>5.9 D a</b>	<b>6.3 D a</b>	0.0099 U	<b>7.8 D J a</b>	<b>4.7 D a</b>	NA	<b>5.2 D J a</b>	<b>4.6 a</b>	<b>3 a</b>	<b>1.9 a</b>	<b>1.4 a</b>	<b>1.1 a</b>	<b>1.1 a</b>	<b>1.1 a</b>
alpha-Chlordane	2	µg/L		0.05 U	0.1 U	0.096 U	0.0099 U	0.01 U	0.05 U	NA	0.02 U	0.26 U	0.026 U	0.025 U	<b>0.0021 J</b>	0.025 U	0.05 U	0.025 U
beta-BHC	0.02	µg/L		<b>0.34 a</b>	<b>1.4 a</b>	<b>1.4 a</b>	<b>2.6 a</b>	<b>2.6 D J a</b>	<b>2 D a</b>	NA	<b>2.7 D J a</b>	<b>2.3 a</b>	<b>1.9 J a</b>	<b>1.1 a</b>	<b>0.85 a</b>	<b>0.67 a</b>	<b>0.66 a</b>	<b>0.6 a</b>
delta-BHC	0.006	µg/L		<b>0.49 a</b>	<b>1.6 a</b>	<b>1.5 J a</b>	<b>2.3 a</b>	<b>2 D J a</b>	<b>1.5 D a</b>	NA	<b>1.6 D J a</b>	<b>1.4 a</b>	<b>0.94 a</b>	<b>0.61 a</b>	<b>0.44 a</b>	<b>0.35 a</b>	<b>0.39 a</b>	<b>0.4 a</b>
Dieldrin	0.002	µg/L		0.1 U	0.2 U	0.19 U	<b>0.018 J a</b>	<b>0.025 J a</b>	0.1 U	NA	<b>0.05 J a</b>	<b>0.017 J a</b>	<b>0.017 a</b>	<b>0.036 a</b>	<b>0.032 a</b>	<b>0.032 a</b>	<b>0.025 a</b>	<b>0.021 a</b>
Endosulfan I		µg/L		0.05 U	0.1 U	0.096 U	0.0099 U	0.01 U	0.05 U	NA	0.02 U	0.26 U	0.026 U	0.025 U	0.025 U	0.025 U	0.05 U	0.025 U
Endosulfan II		µg/L		0.1 U	0.2 U	0.19 U	0.02 U	0.02 U	0.1 U	NA	0.04 U	0.26 U	<b>0.016 J</b>	<b>0.008 J</b>	0.025 U	<b>0.0061 J</b>	<b>0.0065 J</b>	<b>0.0052 J</b>
Endosulfan sulfate		µg/L		0.1 U	0.2 U	0.19 U	0.02 U	0.02 U	0.1 U	NA	0.04 U	0.26 U	0.026 U	0.025 U	0.025 U	0.025 U	0.05 U	0.025 U
Endrin	2	µg/L		0.1 U	0.2 U	0.19 U	0.02 U	0.02 U	0.1 U	NA	0.04 U	0.26 U	0.026 U	0.025 U	<b>0.012 J</b>	0.025 U	0.05 U	0.025 U
Endrin aldehyde		µg/L		0.1 U	0.2 U	0.19 U	0.02 U	0.02 U	0.1 U	NA	<b>0.013 J</b>	0.26 U	0.026 U	0.025 U	0.025 U	0.025 U	0.05 U	0.025 U
Endrin ketone		µg/L		0.1 U	0.2 U	0.19 U	0.02 U	<b>0.012 J</b>	0.1 U	NA	<b>0.016 J</b>	0.26 U	0.026 U	0.025 U	0.025 U	0.025 U	0.05 U	0.025 U
gamma-BHC (Lindane)	0.2	µg/L		0.05 U	<b>0.099 J</b>	<b>0.043 J</b>	<b>0.063 J</b>	<b>0.1 J</b>	<b>0.098</b>	NA	<b>0.11 J</b>	<b>0.18 J</b>	<b>0.062 J</b>	<b>0.024</b>	<b>0.03</b>	<b>0.019 J</b>	<b>0.029 J</b>	<b>0.0033 J</b>
gamma-Chlordane	2	µg/L		0.05 U	0.1 U	0.096 U	0.0099 U	0.01 U	0.05 U	NA	0.02 U	0.26 U	0.026 U	<b>0.0024 J</b>	0.025 U	0.025 U	0.05 U	0.025 U
Heptachlor	0.4	µg/L		0.05 U	0.1 U	0.096 U	0.0099 U	<b>0.012 J</b>	0.05 U	NA	0.02 U	0.26 U	0.026 U	0.025 U	0.025 U	0.025 U	0.05 U	0.025 U
Heptachlor epoxide		µg/L		0.05 U	0.1 U	0.096 U	0.0099 U	0.01 U	0.05 U	NA	0.02 U	0.26 U	0.026 U	0.025 U	<b>0.0066 J</b>	0.025 U	0.05 U	0.025 U
Methoxychlor		µg/L		0.5 U	1 U	0.96 U	0.099 U	0.1 U	0.5 U	NA	0.2 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 U	0.1 U
Toxaphene	3	µg/L		5 U	6 U	9.6 U	0.99 U	1 U	5 U	NA	1 U	2.6 U	2.6 U	0.25 U	0.25 U	<b>0.53 J</b>	<b>0.35 J</b>	0.25 U
Total Pesticides		µg/L		3.63	8.999	9.243	4.981	12.568	8.298	NA	9.689	8.527	5.987	3.6804	2.7727	2.7144	2.5605	2.1375
<b>Metals</b>																		
Chromium	100	µg/L		NA	NA	NA	NA	NA	10 U	NA	5 U	5 U	<b>2.6 J</b>	NA	NA	<b>2.2 J</b>	NA	NA
Lead	15	µg/L		NA	NA	NA	NA	NA	<b>1.7 J</b>	NA	10 U	5.4 U	<b>3.4 J</b>	NA	NA	10 U	NA	NA

- Notes:**
- µg/L = Micrograms per liter
  - RG = Remedial Goal
  - a = Concentration Exceeds RG
  - N = Normal/Primary Sample
  - FD = Field Duplicate
  - U = Not detected
  - J = Estimated value
  - D = The value was obtained during a secondary dilution.
  - NJ = Analyte was presumptively present and tentatively identified at the approximate concentration listed.
  - NA = Not analyzed
  - [Red Box] = Highest concentration exceeding RG during posted timeframe

**Appendix E**  
**Historical Groundwater Results from 2003 to 2014Q1**  
**Pesticides and Metals for MW-21**

Analyte	RG	Units	Sample Location: MW-21															
			Sample Date:															
			08/20/2003	09/08/2004	11/16/2005	12/13/2006	12/05/2007	12/03/2008	12/10/2009	03/18/2010	12/01/2010	12/06/2011	12/11/2012	06/19/2013	09/04/2013	12/12/2013	03/24/2014	
Sample Type:	N																	
<b>Pesticides</b>																		
4,4'-DDD	0.1	µg/L	0.04 U	0.02 U	0.019 U	0.022 U	0.02 U	0.025 J	NA	0.024 J	0.026 U	0.025 U	0.013 J	0.036 J	0.025 U	0.025 U	0.0076 J	
4,4'-DDE	0.1	µg/L	0.04 U	0.064 J	0.019 U	0.022 U	0.02 U	0.069 J	NA	0.042 U	0.026 U	0.025 U	0.063 J	0.025 U	0.025 U	0.02 J	0.025 U	
4,4'-DDT	0.1	µg/L	0.04 U	0.02 U	0.024 J	0.022 U	0.02 U	0.021 U	NA	0.017 J	0.026 U	0.025 U	0.012 J	0.016 J	0.025 U	0.012 J	0.013 J	
Aldrin	0.002	µg/L	0.026 a	0.01 U	0.0096 U	0.011 U	0.01 U	0.018 J a	NA	0.014 a	0.014 J a	0.056 a	0.059 J a	0.029 a	0.002 U	0.002 U	0.002 U	
alpha-BHC	0.006	µg/L	0.066 a	0.066 a	0.044 a	0.011 U	0.07 J a	0.073 a	NA	0.073 J a	0.065 a	0.16 a	0.096 a	0.05 a	0.014 a	0.038 a	0.022 a	
alpha-Chlordane	2	µg/L	0.02 U	0.01 U	0.0096 U	0.011 U	0.011 J	0.034	NA	0.036	0.026 U	0.025 U	0.025 U	0.025 U	0.0032 J	0.0063 J	0.0048 J	
beta-BHC	0.02	µg/L	0.32 D a	0.32 D a	0.26 D a	0.019 J	0.37 J a	0.24 D a	NA	0.40 D a	0.17 a	0.52 a	0.52 a	0.25 a	0.12 a	0.11 a	0.12 a	
delta-BHC	0.006	µg/L	0.017 J a	0.033 a	0.051 a	0.011 U	0.046 J a	0.05 a	NA	0.044 a	0.054 a	0.16 a	0.084 a	0.031 J a	0.0082 J a	0.006 U	0.013 J a	
Dieldrin	0.002	µg/L	0.27 J a	0.18 a	0.2 a	0.018 J a	0.041 J a	0.15 a	NA	0.14 a	0.13 J a	0.14 J a	0.14 a	0.13 a	0.032 a	0.002 U	0.13 a	
Endosulfan I		µg/L	0.02 U	0.01 U	0.0096 U	0.011 U	0.01 U	0.011 U	NA	0.014 NJ	0.0091 J	0.024 J	0.025 U	0.024 J	0.025 U	0.025 U	0.0035 J	
Endosulfan II		µg/L	0.04 U	0.02 U	0.019 U	0.022 U	0.026 J	0.086	NA	0.042 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	
Endosulfan sulfate		µg/L	0.04 U	0.02 U	0.019 U	0.022 U	0.02 U	0.021 U	NA	0.042 U	0.026 U	0.025 U	0.025 U	0.045	0.025 U	0.025 U	0.025 U	
Endrin	2	µg/L	0.04 U	0.02 U	0.019 U	0.022 U	0.02 U	0.016 J	NA	0.03 J	0.008 J	0.025 U	0.016 J	0.025 U	0.025 U	0.0067 J	0.0093 J	
Endrin aldehyde		µg/L	0.04 U	0.02 U	0.019 U	0.022 U	0.011 J	0.021 U	NA	0.042 U	0.026 U	0.025 U	0.025 U	0.0097 J	0.025 U	0.025 U	0.025 U	
Endrin ketone		µg/L	0.41	0.38 DJ	0.28	0.029 J	0.34 J	0.24	NA	0.25	0.19	0.45	0.31	0.14	0.058	0.13	0.083 J	
gamma-BHC (Lindane)	0.2	µg/L	0.072	0.077	0.061	0.011 U	0.077 J	0.078	NA	0.048	0.04	0.24 J a	0.11	0.044	0.012 J	0.018 J	0.017 J	
gamma-Chlordane	2	µg/L	0.02 U	0.01 U	0.0096 U	0.011 U	0.01 U	0.013 J	NA	0.014 J	0.026 U	0.0098 J	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	
Heptachlor	0.4	µg/L	0.011 J	0.0076 J	0.0096 U	0.011 U	0.01 U	0.011 U	NA	0.0086 J	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	
Heptachlor epoxide		µg/L	0.02 U	0.01 U	0.0096 U	0.011 U	0.01 U	0.033 J	NA	0.021 U	0.026 U	0.025 U	0.025 U	0.071	0.025 U	0.025 U	0.025 U	
Methoxychlor		µg/L	0.2 U	0.1 U	0.096 U	0.11 U	0.1 U	0.11 U	NA	0.21 NJ	0.1 U	0.1 U	0.0035 J	0.1 U	0.1 U	0.1 U	0.0068 J	
Toxaphene	3	µg/L	2 U	0.6 U	0.96 U	1.1 U	1 U	1.1 U	NA	1.1 U	0.85	1.3 a	1.8 J a	0.63 NJ	0.68	1.2	2.5	
Total Pesticides		µg/L	1.192	1.1276	0.92	0.066	0.992	1.125	NA	1.1476	1.5301	6.0798	6.2265	1.5057	0.9274	1.541	2.955	
<b>Metals</b>																		
Chromium	100	µg/L	NA	NA	NA	NA	NA	NA	5.2 J	NA	5 U	5 U	4.7 J	NA	NA	15	NA	
Lead	15	µg/L	NA	NA	NA	NA	NA	NA	3 U	NA	10 U	6.7 U	10 U	NA	NA	1.9 J	NA	

- Notes:**
- µg/L = Micrograms per liter
  - RG = Remedial Goal
  - a = Concentration Exceeds RG
  - N = Normal/Primary Sample
  - FD = Field Duplicate
  - U = Not detected
  - J = Estimated value
  - D = The value was obtained during a secondary dilution.
  - NJ = Analyte was presumptively present and tentatively identified at the approximate concentration listed.
  - NA = Not analyzed
  - [Red Box] = Highest concentration exceeding RG during posted timeframe

Appendix E  
Historical Groundwater Results from 2003 to 2014Q1  
Pesticides and Metals for MW-22

Analyte	RG	Units	Sample Location:	MW-22	MW-22	MW-22	MW-22	MW-22	MW-22	MW-22	MW-22	MW-22	MW-22	MW-22	MW-22	MW-22	MW-22	
			Sample Date:	08/20/2003	09/08/2004	11/16/2005	12/13/2006	12/05/2007	12/03/2008	12/10/2009	03/17/2010	11/30/2010	12/05/2011	12/12/2012	06/19/2013	09/04/2013	12/12/2013	03/25/2014
			Sample Type:	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
<b>Pesticides</b>																		
4,4'-DDD	0.1	µg/L	0.02 U	0.02 U	0.027 J	0.011 J	0.02 UJ	0.026 J	NA	0.012 J	0.0093 J	0.026 U	0.0059 J	0.025 U	0.0062 J	0.0075 J	0.0092 J	
4,4'-DDE	0.1	µg/L	0.02 U	0.02 U	0.016 J	0.019 U	0.02 UJ	0.013 J	NA	0.0059 J	0.012 J	0.026 U	0.026 U	0.011 J	0.025 U	0.025 U	0.025 U	
4,4'-DDT	0.1	µg/L	0.02 U	0.02 U	0.029 J	0.019 U	0.02 UJ	0.02 U	NA	0.04 UJ	0.014 J	0.012 J	0.0096 J	0.025 U	0.025 U	0.025 U	0.018 J	
Aldrin	0.002	µg/L	0.0029 J a	0.01 U	0.01 U	0.0093 U	0.01 UJ	0.01 U	NA	0.001 UJ	0.0021 UJ	0.0021 U	0.0021 U	0.002 U	0.004 J a	0.002 U	0.003 J a	
alpha-BHC	0.006	µg/L	0.01 U	0.01 U	0.01 U	0.0093 U	0.01 UJ	0.01 U	NA	0.001 UJ	0.0062 U	0.0063 U	0.0062 U	0.006 U	0.006 U	0.006 U	0.0013 J	
alpha-Chlordane	2	µg/L	0.01 U	0.01 U	0.01 U	0.0064 J	0.01 UJ	0.0089 J	NA	0.0056 J	0.026 U	0.026 U	0.026 U	0.0028 J	0.002 J	0.0014 J	0.025 U	
beta-BHC	0.02	µg/L	0.011 J	0.018 J	0.0059 J	0.0078 J	0.01 UJ	0.01 U	NA	0.02 UJ	0.0058 J	0.0067 J	0.021 U	0.02 U	0.02 U	0.0057 J	0.0052 J	
delta-BHC	0.006	µg/L	0.01 U	0.01 U	0.01 U	0.0093 U	0.01 UJ	0.01 U	NA	0.006 UJ	0.0022 J	0.0063 U	0.0019 J	0.0017 J	0.006 U	0.006 U	0.006 U	
Dieldrin	0.002	µg/L	0.053 a	0.052 J a	0.037 J a	0.027 J a	0.02 UJ	0.028 a	NA	0.025 J a	0.042 J a	0.039 a	0.03 a	0.002 U	0.033 a	0.027 a	0.025 a	
Endosulfan I		µg/L	0.01 U	0.01 U	0.01 U	0.0093 U	0.01 UJ	0.0071 J	NA	0.0055 J	0.026 U	0.026 U	0.026 U	0.0035 J	0.025 U	0.025 U	0.025 U	
Endosulfan II		µg/L	0.02 U	0.02 U	0.02 U	0.017 J	0.018 J	0.028	NA	0.02 J	0.0017 NJ	0.026 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
Endosulfan sulfate		µg/L	0.02 U	0.02 U	0.02 U	0.019 U	0.02 UJ	0.014 J	NA	0.0086 J	0.026 U	0.026 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
Endrin	2	µg/L	0.02 U	0.02 U	0.02 U	0.012 J	0.02 UJ	0.016 J	NA	0.018 J	0.026 U	0.014 J	0.026 UJ	0.025 U	0.011 J	0.025 U	0.012 J	
Endrin aldehyde		µg/L	0.02 U	0.02 U	0.02 U	0.013 J	0.02 UJ	0.034 J	NA	0.04 UJ	0.026 U	0.026 UJ	0.026 U	0.025 U	0.019 J	0.025 U	0.025 U	
Endrin ketone		µg/L	0.02 U	0.014 J	0.01 J	0.019 U	0.02 UJ	0.02 U	NA	0.0039 J	0.026 U	0.026 U	0.026 U	0.0025 J	0.0029 J	0.0037 J	0.0034 J	
gamma-BHC (Lindane)	0.2	µg/L	0.01 U	0.01 U	0.0015 J	0.0093 U	0.01 UJ	0.01 U	NA	0.02 UJ	0.026 U	0.021 U	0.021 U	0.02 U	0.02 U	0.02 U	0.02 U	
gamma-Chlordane	2	µg/L	0.01 U	0.01 U	0.01 U	0.0093 U	0.01 UJ	0.0051 J	NA	0.0032 J	0.026 U	0.026 U	0.026 U	0.025 U	0.0025 J	0.0032 J	0.025 U	
Heptachlor	0.4	µg/L	0.0051 J	0.01 U	0.01 U	0.0093 U	0.01 UJ	0.01 U	NA	0.02 UJ	0.026 UJ	0.026 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
Heptachlor epoxide		µg/L	0.01 U	0.01 U	0.01 U	0.0093 U	0.01 UJ	0.0058 J	NA	0.02 UJ	0.0026 J	0.026 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
Methoxychlor		µg/L	0.1 U	0.1 U	0.1 U	0.093 U	0.014 J	0.034 J	NA	0.016 J	0.0099 NJ	0.0055 J	0.1 U	0.1 U	0.011 J	0.1 UJ	0.014 J	
Toxaphene	3	µg/L	0.93 J	1.6	1	1	1 U	1 U	NA	1 U	1.1 J	1.3 J	1.1 J	1	1.5	1.4	0.25 U	
Total Pesticides		µg/L	1.002	1.684	1.1264	1.0942	0.032	0.2199	NA	0.1237	1.1995	1.3772	1.1474	1.0215	1.5916	1.4485	0.0911	
<b>Metals</b>																		
Chromium	100	µg/L	NA	NA	NA	NA	NA	NA	4.1 J	NA	3.9 J	8.4	4 J	NA	NA	5 U	NA	
Lead	15	µg/L	NA	NA	NA	NA	NA	NA	3 U	NA	2.6 J	3.5 U	4.7 J	NA	NA	10 U	NA	

- Notes:**
- µg/L = Micrograms per liter
  - RG = Remedial Goal
  - a = Concentration Exceeds RG
  - N = Normal/Primary Sample
  - FD = Field Duplicate
  - U = Not detected
  - J = Estimated value
  - D = The value was obtained during a secondary dilution.
  - NJ = Analyte was presumptively present and tentatively identified at the approximate concentration listed.
  - NA = Not analyzed
  - [Red Box] = Highest concentration exceeding RG during posted timeframe

Appendix E  
Historical Groundwater Results from 2003 to 2014Q1  
Pesticides and Metals for MW-23

Analyte	RG	Units	Sample Location:	MW-23	MW-23	MW-23	MW-23	MW-23	MW-23	MW-23	MW-23	MW-23	MW-23	MW-23	MW-23	MW-23	MW-23	MW-23	MW-23	MW-23	MW-23	MW-23	
			Sample Date:	08/20/2003	09/09/2004	09/09/2004	11/15/2005	11/15/2005	12/14/2006	12/14/2006	12/07/2007	12/02/2008	12/02/2008	12/09/2009	03/17/2010	12/01/2010	12/06/2011	12/11/2012	06/19/2013	09/05/2013	09/05/2013	12/12/2013	03/24/2014
			Sample Type:	N	N	FD	N	FD	N	FD	N	N	FD	N	N	N	N	N	N	N	FD	N	N
<b>VOCs</b>																							
Benzene	5	µg/L	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	NA	1 UJ	<b>0.18 J</b>	1 UJ	NA	NA	NA	1 UJ	NA
Toluene		µg/L	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	NA	1 UJ	1 U	1 UJ	NA	NA	NA	1 U	NA
Ethylbenzene		µg/L	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	NA	1 UJ	1 U	1 UJ	NA	NA	NA	1 U	NA
Methyl tert-butyl ether		µg/L	NA	10 U	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m-Xylene		µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene		µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.5 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylene (Total)		µg/L	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	0.5 U	NA	1 UJ	1 U	1 U	NA	NA	NA	1 U	NA
<b>Pesticides</b>																							
4,4'-DDD	0.1	µg/L	0.02 U	0.04 U	0.08 U	0.042 U	0.08 U	0.02 U	0.2 U	<b>0.036 J</b>	<b>0.13 J a</b>	<b>0.11 J a</b>	NA	<b>0.043 J</b>	<b>0.3 J a</b>	0.026 U	0.025 U	0.025 U	0.025 U	<b>0.0017 J</b>	0.05 U	0.025 U	
4,4'-DDE	0.1	µg/L	0.02 U	0.04 U	0.08 U	0.042 U	0.08 U	0.02 U	0.2 U	<b>0.024 J</b>	<b>0.031 J</b>	<b>0.024 J</b>	NA	<b>0.031 J</b>	1.3 UJ	0.026 U	0.025 UJ	0.025 U	0.025 U	0.025 U	0.05 U	0.025 U	
4,4'-DDT	0.1	µg/L	0.02 U	0.04 U	0.08 U	0.042 U	0.08 U	<b>0.046 J</b>	0.2 UJ	<b>0.02 J</b>	<b>0.052 J</b>	<b>0.053 J</b>	NA	<b>0.023 NJ</b>	1.3 U	0.026 U	0.025 U	<b>0.0057 J</b>	<b>0.002 J</b>	0.025 U	0.05 U	0.025 U	
Aldrin	0.002	µg/L	0.01 U	<b>0.29 J a</b>	<b>0.34 J a</b>	<b>0.1 a</b>	<b>0.082 a</b>	<b>0.082 J a</b>	<b>0.16 J a</b>	<b>0.063 J a</b>	<b>0.043 a</b>	<b>0.045 a</b>	NA	<b>0.022 J a</b>	<b>2.3 J a</b>	0.002 U	0.002 U	<b>0.0002 J</b>	<b>0.002 U</b>	0.002 U	<b>0.0035 J a</b>	0.002 U	
alpha-BHC	0.006	µg/L	<b>0.0082 J a</b>	<b>0.22 a</b>	<b>0.3 a</b>	<b>0.31 a</b>	<b>0.31 a</b>	<b>0.095 J a</b>	<b>0.17 J a</b>	<b>0.14 J a</b>	<b>0.12 a</b>	<b>0.13 a</b>	NA	0.004 UJ	<b>2.9 J a</b>	0.0061 U	0.0061 U	0.006 U	0.006 U	0.0061 U	0.012 U	0.006 U	
alpha-Chlordane	2	µg/L	0.01 U	<b>0.041 J</b>	<b>0.058 J</b>	<b>0.046 J</b>	<b>0.046 J</b>	<b>0.08 J</b>	<b>0.1 J</b>	<b>0.016 J</b>	<b>0.042 J</b>	<b>0.043 J</b>	NA	<b>0.07 J</b>	1.3 UJ	0.026 U	0.025 UJ	<b>0.0017 J</b>	<b>0.002 J</b>	<b>0.0018 J</b>	0.05 U	0.025 U	
beta-BHC	0.02	µg/L	<b>0.12 a</b>	<b>2.2 DJ a</b>	<b>3.2 DJ a</b>	<b>2.2 D a</b>	<b>2.3 D a</b>	<b>3.5 a</b>	<b>3.2 a</b>	<b>2.8 DJ a</b>	<b>1.8 D a</b>	<b>2.1 D a</b>	NA	<b>0.8 DJ a</b>	<b>41 a</b>	<b>0.11 a</b>	<b>0.07 a</b>	<b>0.083 a</b>	<b>0.15 a</b>	<b>0.14 a</b>	<b>1.1 a</b>	<b>0.054 a</b>	
delta-BHC	0.006	µg/L	0.01 U	<b>0.18 J a</b>	<b>0.31 J a</b>	<b>0.29 J a</b>	<b>0.25 J a</b>	<b>0.25 J a</b>	<b>0.23 J a</b>	<b>0.22 J a</b>	<b>0.13 J a</b>	<b>0.13 J a</b>	NA	<b>0.0072 J a</b>	0.3 U	<b>0.0014 J</b>	0.0061 U	<b>0.0016 J</b>	0.006 U	0.0061 U	0.012 U	0.006 U	
Dieldrin	0.002	µg/L	0.02 U	<b>1.7 D a</b>	<b>2.2 D a</b>	<b>2.1 D a</b>	<b>2.5 DJ a</b>	<b>2.2 a</b>	<b>2.1 a</b>	<b>1.9 DJ a</b>	<b>1.3 D a</b>	<b>1.5 D a</b>	NA	0.002 UJ	<b>19 J a</b>	<b>0.0029 a</b>	<b>0.0016 J</b>	<b>0.0018 J</b>	<b>0.0048 J a</b>	<b>0.0034 J a</b>	<b>0.026 a</b>	<b>0.0044 a</b>	
Endosulfan I		µg/L	0.01 U	0.02 U	0.04 U	0.021 U	0.04 U	0.01 U	0.1 U	0.01 UJ	<b>0.076 J</b>	<b>0.013 J</b>	NA	<b>0.042 J</b>	<b>0.5 J</b>	0.026 U	0.025 UJ	<b>0.0027 J</b>	0.025 U	0.025 U	0.05 U	0.025 U	
Endosulfan II		µg/L	0.02 U	0.04 U	0.08 U	0.042 U	0.08 U	<b>0.31 J</b>	<b>0.12 J</b>	<b>0.081 J</b>	<b>0.19 J</b>	<b>0.2</b>	NA	0.04 UJ	1.3 UJ	<b>0.011 J</b>	0.025 U	<b>0.0019 J</b>	0.025 U	0.025 U	0.05 U	0.025 U	
Endosulfan sulfate		µg/L	0.02 U	0.04 U	0.08 U	0.042 U	0.08 U	0.02 U	0.2 U	<b>0.14 J</b>	0.021 U	0.021 U	NA	0.04 UJ	<b>0.89 J</b>	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	0.05 U	0.025 U	
Endrin	2	µg/L	0.02 U	0.04 U	0.08 U	0.042 U	0.08 U	<b>0.02 J</b>	0.2 UJ	<b>0.013 J</b>	<b>0.076 J</b>	<b>0.081 J</b>	NA	<b>0.02 NJ</b>	1.3 U	0.026 U	0.025 UJ	0.025 U	<b>0.002 J</b>	<b>0.0021 J</b>	0.05 U	0.025 U	
Endrin aldehyde		µg/L	0.02 U	0.04 U	0.08 U	0.042 U	0.08 U	<b>0.087 J</b>	<b>0.11 J</b>	<b>0.13 J</b>	<b>0.25 J</b>	0.021 UJ	NA	0.04 UJ	1.3 UJ	0.026 UJ	0.025 UJ	0.025 U	0.025 U	0.025 U	0.05 U	0.025 UJ	
Endrin ketone		µg/L	<b>0.0053 J</b>	<b>1.5 DJ</b>	<b>2.1 DJ</b>	<b>2 D</b>	<b>2.5 DJ</b>	<b>1.8</b>	<b>1.6</b>	<b>1.9 DJ</b>	<b>1 D</b>	<b>1.2 D</b>	NA	<b>0.013 J</b>	<b>13</b>	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	0.05 U	0.025 UJ	
gamma-BHC (Lindane)	0.2	µg/L	0.01 U	<b>0.028 J</b>	<b>0.038 J</b>	<b>0.079 J</b>	<b>0.054 J</b>	<b>0.021 J</b>	<b>0.05 J</b>	<b>0.033 J</b>	<b>0.027</b>	<b>0.028</b>	NA	<b>0.0092 J</b>	<b>0.38 J a</b>	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	<b>0.0054 J</b>	0.02 U	
gamma-Chlordane	2	µg/L	0.01 U	0.02 U	0.04 U	0.021 U	0.04 U	0.01 U	0.1 U	<b>0.014 J</b>	<b>0.056</b>	<b>0.047</b>	NA	<b>0.02 J</b>	1.3 U	0.026 U	<b>0.0019 J</b>	0.025 U	<b>0.0033 J</b>	<b>0.0022 J</b>	<b>0.013 J</b>	0.025 U	
Heptachlor	0.4	µg/L	0.01 U	0.02 U	0.04 U	0.021 U	0.04 U	0.01 U	0.1 U	<b>0.027 J</b>	0.01 U	0.011 U	NA	0.02 UJ	1.3 UJ	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	0.05 U	0.025 U	
Heptachlor epoxide		µg/L	0.01 U	0.02 U	0.04 U	0.021 U	0.04 U	<b>0.034 J</b>	0.1 UJ	0.01 UJ	<b>0.049</b>	<b>0.039 J</b>	NA	0.02 UJ	1.3 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	0.05 U	0.025 U	
Methoxychlor		µg/L	0.1 U	0.2 U	0.4 U	0.21 U	0.4 U	0.1 U	1 U	0.1 UJ	<b>0.23 J</b>	<b>0.2 J</b>	NA	<b>0.035 J</b>	5.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	<b>0.013 J</b>	0.1 U	
Toxaphene	3	µg/L	1 U	<b>8.3 J a</b>	<b>12 J a</b>	<b>8.8 a</b>	<b>7.4 a</b>	<b>4.7 J a</b>	<b>5.5 J a</b>	1 UJ	1 U	1.1 U	NA	1 UJ	13 U	0.26 U	0.25 UJ	0.25 U	0.25 U	0.25 U	<b>1.4</b>	0.25 U	
Total Pesticides		µg/L	0.1335	14.459	20.546	15.925	15.442	13.225	13.34	7.557	5.602	5.943	NA	1.1354	80.27	0.1253	0.0735	0.0984	0.1641	0.1512	2.5609	0.0584	
<b>Metals</b>																							
Chromium	100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<b>9.4 J</b>	NA	<b>160 J a</b>	5 U	<b>4.3 J</b>	NA	NA	NA	5 U	NA	
Lead	15	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<b>1.6 J</b>	NA	<b>4.5 J</b>	<b>8.2 U</b>	10 U	NA	NA	NA	10 U	NA	

Notes:

- µg/L = Micrograms per liter
- RG = Remedial Goal
- a = Concentration Exceeds RG
- N = Normal/Primary Sample
- FD = Field Duplicate
- U = Not detected
- J = Estimated value
- D = The value was obtained during a secondary dilution.
- NJ = Analyte was presumptively present and tentatively identified at the approximate concentration listed.
- NA = Not analyzed
- [Red Box] = Highest concentration exceeding RG during posted timeframe

**Appendix E**  
**Historical Groundwater Results from 2003 to 2014Q1**  
**Pesticides and Metals for MW-25**

Analyte	RG	Units	Sample Location:	MW-25	MW-25	MW-25	MW-25	MW-25	MW-25	MW-25	MW-25	MW-25	MW-25	MW-25	MW-25	MW-25	MW-25
			Sample Date:	08/20/2003	09/08/2004	11/16/2005	12/13/2006	12/05/2007	12/02/2008	12/10/2009	03/18/2010	12/01/2010	12/05/2011	12/10/2012	06/19/2013	09/05/2013	12/12/2013
			Sample Type:	N	N	N	N	N	N	N	N	N	N	N	N	N	N
<b>Pesticides</b>																	
4,4'-DDD	0.1	µg/L	0.02 U	0.02 U	0.019 U	0.019 U	0.02 U	0.022 U	NA	0.04 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.0084 J	0.25 U
4,4'-DDE	0.1	µg/L	0.02 U	0.015 J	0.019 U	0.019 U	0.02 U	0.0098 J	NA	0.012 J	0.025 U	0.026 U	0.025 U	0.014 J	0.019 J	0.021 J	0.25 U
4,4'-DDT	0.1	µg/L	0.02 U	0.02 U	0.019 U	0.019 U	0.02 U	0.012 J	NA	0.0065 J	0.025 U	0.026 U	0.025 U	0.025 U	0.016 J	0.0065 J	0.25 U
Aldrin	0.002	µg/L	0.01 U	0.01 U	0.0096 U	0.0096 U	0.01 U	0.011 U	NA	0.0036 J a	0.002 U	0.0021 U	0.002 U	0.002 U	0.004 J a	0.0094 J a	0.02 U
alpha-BHC	0.006	µg/L	0.01 U	0.0081 J a	0.0096 U	0.0096 U	0.01 U	0.011 U	NA	0.004 U	0.0061 U	0.0078 J a	0.0016 J	0.088 a	0.33 a	0.41 a	0.59 J a
alpha-Chlordane	2	µg/L	0.01 U	0.01 U	0.0096 U	0.0096 U	0.01 U	0.011 U	NA	0.02 U	0.011 J	0.026 U	0.025 U	0.025 U	0.007 J	0.0062 J	0.02 J
beta-BHC	0.02	µg/L	0.2 D a	0.29 D a	0.3 D a	0.34 a	0.35 J a	0.23 D J a	NA	0.37 D J a	0.3 a	0.24 a	0.21 a	0.53 a	0.64 a	0.59 J a	0.77 J a
delta-BHC	0.006	µg/L	0.01 U	0.01 U	0.0096 U	0.0096 U	0.01 U	0.011 U	NA	0.0053 J	0.0061 U	0.0054 J	0.0061 U	0.02 a	0.053 a	0.05 a	0.06 U
Dieldrin	0.002	µg/L	0.02 U	0.014 J a	0.019 U	0.019 U	0.02 U	0.011 J a	NA	0.002 U	0.0032 J a	0.0021 U	0.0014 J	0.002 U	0.02 a	0.026 a	0.045 a
Endosulfan I		µg/L	0.01 U	0.01 U	0.0096 U	0.0096 U	0.01 U	0.0085 J	NA	0.02 U	0.025 U	0.026 U	0.025 U	0.028	0.025 U	0.025 U	0.25 U
Endosulfan II		µg/L	0.02 U	0.02 U	0.019 U	0.011 J	0.01 J	0.013 J	NA	0.04 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.029	0.035 J
Endosulfan sulfate		µg/L	0.02 U	0.02 U	0.019 U	0.019 U	0.02 U	0.022 U	NA	0.04 U	0.025 U	0.026 U	0.025 U	0.035 J	0.025 U	0.025 U	0.25 U
Endrin	2	µg/L	0.02 U	0.02 U	0.019 U	0.019 U	0.02 U	0.013 J	NA	0.04 U	0.025 U	0.026 U	0.025 U	0.018 J	0.025 U	0.012 J	0.25 U
Endrin aldehyde		µg/L	0.02 U	0.02 U	0.019 U	0.019 U	0.02 U	0.022 U	NA	0.04 U	0.025 U	0.026 U	0.025 U	0.025 U	0.0062 J	0.025 U	0.25 U
Endrin ketone		µg/L	0.02 U	0.02 U	0.019 U	0.019 U	0.02 U	0.022 U	NA	0.0028 NJ	0.025 U	0.026 U	0.025 U	0.04	0.13	0.16	0.23 J
gamma-BHC (Lindane)	0.2	µg/L	0.01 U	0.01 U	0.0096 U	0.0096 U	0.01 U	0.011 U	NA	0.0088 J	0.0065 J	0.0095 J	0.0011 J	0.062	0.27 a	0.37 J a	0.48 J a
gamma-Chlordane	2	µg/L	0.01 U	0.01 U	0.0096 U	0.0096 U	0.01 U	0.011 U	NA	0.02 U	0.025 U	0.026 U	0.025 U	0.01 J	0.016 J	0.016 J	0.024 J
Heptachlor	0.4	µg/L	0.01 U	0.01 U	0.0096 U	0.0096 U	0.01 U	0.011 U	NA	0.02 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	0.25 U
Heptachlor epoxide		µg/L	0.01 U	0.01 U	0.0096 U	0.0096 U	0.01 U	0.011 U	NA	0.02 U	0.025 U	0.026 U	0.025 U	0.033	0.025 U	0.025 U	0.25 U
Methoxychlor		µg/L	0.1 U	0.1 U	0.096 U	0.096 U	0.1 U	0.11 U	NA	0.2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.01 J	0.1 U	1 U
Toxaphene	3	µg/L	1 U	0.6 U	0.96 U	0.22 J	1 U	1.1 U	NA	1 U	0.25 U	0.26 U	0.25 U	0.25 U	1.9	1.2 J	2.5 U
Total Pesticides		µg/L	0.2	0.32/1	0.3	0.5/1	0.36	0.29/3	NA	0.409	0.320/	0.262/	0.2141	0.8/8	3.4212	2.9145	2.194
<b>Metals</b>																	
Chromium	100	µg/L	NA	NA	NA	NA	NA	NA	4.2 J	NA	6.7	16	22	NA	NA	4.2 J	NA
Lead	15	µg/L	NA	NA	NA	NA	NA	NA	1.4 J	NA	10 U	5.1 U	10 U	NA	NA	10 U	NA

- Notes:**
- µg/L = Micrograms per liter
  - RG = Remedial Goal
  - a = Concentration Exceeds RG
  - N = Normal/Primary Sample
  - FD = Field Duplicate
  - U = Not detected
  - J = Estimated value
  - D = The value was obtained during a secondary dilution.
  - NJ = Analyte was presumptively present and tentatively identified at the approximate concentration listed.
  - NA = Not analyzed
  - [Red Box] = Highest concentration exceeding RG during posted timeframe

**Appendix E**  
**Historical Groundwater Results from 2003 to 2014Q1**  
**Pesticides and Metals for MW-26**

Analyte	RG	Units	Sample Location:	MW-26	MW-26	MW-26	MW-26	MW-26	MW-26	MW-26	MW-26	MW-26	MW-26	MW-26	MW-26	MW-26	MW-26	
			Sample Date:	08/20/2003	09/08/2004	11/16/2005	12/13/2006	12/05/2007	12/02/2008	03/18/2010	12/10/2009	11/30/2010	12/02/2011	12/11/2012	06/19/2013	09/05/2013	12/12/2013	03/24/2014
			Sample Type:	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
<b>Pesticides</b>																		
4,4'-DDD	0.1	µg/L	0.02 U	0.02 U	0.02 U	0.022 U	0.02 U	0.02 U	0.041 U	NA	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
4,4'-DDE	0.1	µg/L	0.02 U	0.02 U	0.02 U	<b>0.012 J</b>	0.02 U	0.02 U	0.041 U	NA	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
4,4'-DDT	0.1	µg/L	0.02 U	0.02 U	<b>0.0079 J</b>	0.022 U	0.02 U	0.02 U	<b>0.0011 J</b>	NA	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
Aldrin	0.002	µg/L	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U	0.001 U	NA	0.0021 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
alpha-BHC	0.006	µg/L	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U	0.0041 U	NA	0.0062 U	0.0061 U	0.0061 U	0.006 U	0.006 U	0.006 U	0.006 U	
alpha-Chlordane	2	µg/L	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U	0.021 U	NA	<b>0.0013 J</b>	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
beta-BHC	0.02	µg/L	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U	0.021 U	NA	0.021 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	
delta-BHC	0.006	µg/L	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U	0.0062 U	NA	0.0062 U	0.0061 U	0.0061 U	0.006 U	0.006 U	0.006 U	0.006 U	
Dieldrin	0.002	µg/L	0.02 U	0.02 U	0.02 U	<b>0.012 J a</b>	0.02 U	0.02 U	0.0021 U	NA	0.0021 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Endosulfan I		µg/L	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U	0.021 U	NA	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
Endosulfan II		µg/L	0.02 U	0.02 U	0.02 U	0.022 U	0.02 U	0.02 U	0.041 U	NA	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
Endosulfan sulfate		µg/L	0.02 U	0.02 U	0.02 U	<b>0.015 J</b>	0.02 U	0.02 U	0.041 U	NA	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
Endrin	2	µg/L	0.02 U	0.02 U	0.02 U	<b>0.012 J</b>	0.02 U	0.02 U	0.041 U	NA	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
Endrin aldehyde		µg/L	0.02 U	0.02 U	0.02 U	0.022 U	0.02 U	0.02 U	0.041 U	NA	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
Endrin ketone		µg/L	<b>0.0066 J</b>	0.02 U	0.02 U	0.022 U	0.02 U	0.02 U	0.041 U	NA	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
gamma-BHC (Lindane)	0.2	µg/L	0.01 U	0.01 U	0.01 U	<b>0.0046 J</b>	0.01 U	0.01 U	0.021 U	NA	0.026 U	<b>0.0019 J</b>	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	
gamma-Chlordane	2	µg/L	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U	0.021 U	NA	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
Heptachlor	0.4	µg/L	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U	0.021 U	NA	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
Heptachlor epoxide		µg/L	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U	0.021 U	NA	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	
Methoxychlor		µg/L	0.1 U	0.1 U	0.1 U	0.11 U	0.1 U	0.1 U	0.21 U	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
Toxaphene	3	µg/L	1 U	0.6 U	1 U	1.1 U	1 U	1 U	1 U	NA	0.26 U	0.25 U	0.26 U	0.25 U	0.25 U	0.25 U	0.25 U	
Total Pesticides		µg/L	U	U	0.0079	0.0556	U	U	0.0011	NA	0.0013	0.0019	U	U	U	U	U	
<b>Metals</b>																		
Chromium	100	µg/L	NA	NA	NA	NA	NA	NA	NA	<b>54.5</b>	<b>5.5</b>	<b>3.3 J</b>	<b>8.4</b>	NA	NA	<b>2.8 J</b>	NA	
Lead	15	µg/L	NA	NA	NA	NA	NA	NA	NA	<b>6.7 J</b>	<b>2.5 J</b>	10 U	<b>6 J</b>	NA	NA	10 U	NA	

- Notes:**
- µg/L = Micrograms per liter
  - RG = Remedial Goal
  - a = Concentration Exceeds RG
  - N = Normal/Primary Sample
  - FD = Field Duplicate
  - U = Not detected
  - J = Estimated value
  - D = The value was obtained during a secondary dilution.
  - NJ = Analyte was presumptively present and tentatively identified at the approximate concentration listed.
  - NA = Not analyzed



**Appendix E**  
**Historical Groundwater Results from 2012 to 2014Q1**  
**VOCS, Pesticides, and Metals for MW-27**

		Sample Location:	MW-27	MW-27	MW-27	MW-27	MW-27
		Sample Date:	12/12/2012	06/18/2013	09/04/2013	12/11/2013	03/24/2014
		Sample Type:	N	N	N	N	N
Analyte	RG	Units					
<b>VOCS</b>							
Benzene	5	µg/L	1 U	NA	NA	NA	NA
Toluene		µg/L	1 U	NA	NA	NA	NA
Ethylbenzene		µg/L	1 U	NA	NA	NA	NA
Xylene (Total)		µg/L	1 U	NA	NA	NA	NA
<b>Pesticides</b>							
4,4'-DDD	0.1	µg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
4,4'-DDE	0.1	µg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
4,4'-DDT	0.1	µg/L	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Aldrin	0.002	µg/L	0.0021 U	0.002 U	0.002 U	0.002 U	0.002 U
alpha-BHC	0.006	µg/L	0.0062 U	0.006 U	0.006 U	0.006 U	0.006 U
alpha-Chlordane	2	µg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
beta-BHC	0.02	µg/L	<b>0.0049 J</b>	0.02 U	0.02 U	0.02 U	0.02 U
delta-BHC	0.006	µg/L	0.0062 U	0.006 U	0.006 U	0.006 U	0.006 U
Dieldrin	0.002	µg/L	0.0021 UJ	0.002 U	0.002 U	0.002 U	0.002 U
Endosulfan I		µg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan II		µg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan sulfate		µg/L	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Endrin	2	µg/L	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Endrin aldehyde		µg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 UJ
Endrin ketone		µg/L	0.026 U	0.025 U	0.025 U	0.025 U	0.025 UJ
gamma-BHC (Lindane)	0.2	µg/L	0.021 U	0.02 U	0.02 U	0.02 U	0.02 U
gamma-Chlordane	2	µg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
Heptachlor	0.4	µg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
Heptachlor epoxide		µg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
Methoxychlor		µg/L	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U
Toxaphene	3	µg/L	0.26 UJ	0.25 U	0.25 U	0.25 UJ	0.25 U
Total Pesticides		µg/L	0.0049	U	U	U	U
<b>Metals</b>							
Chromium	100	µg/L	5 U	NA	NA	5 U	NA
Lead	15	µg/L	<b>3.8 J</b>	NA	NA	10 U	NA

**Notes:**

µg/L = Micrograms per liter

**Appendix E**  
**Historical Groundwater Results from 2012 to 2014Q1**  
**VOCS, Pesticides, and Metals for MW-28**

		Sample Location:	MW-28	MW-28	MW-28	MW-28	MW-28
		Sample Date:	12/12/2012	06/18/2013	09/04/2013	12/11/2013	03/24/2014
		Sample Type:	N	N	N	N	N
Analyte	RG	Units					
<b>VOCS</b>							
Benzene	5	µg/L	1 U	NA	NA	NA	NA
Toluene		µg/L	1 U	NA	NA	NA	NA
Ethylbenzene		µg/L	1 U	NA	NA	NA	NA
Xylene (Total)		µg/L	1 U	NA	NA	NA	NA
<b>Pesticides</b>							
4,4'-DDD	0.1	µg/L	0.026 UJ	<b>0.0016 J</b>	0.025 U	0.025 U	0.025 U
4,4'-DDE	0.1	µg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
4,4'-DDT	0.1	µg/L	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Aldrin	0.002	µg/L	0.002 U	0.002 U	0.002 U	<b>0.002 J</b>	0.002 U
alpha-BHC	0.006	µg/L	0.0061 U	<b>0.0036 J</b>	0.006 U	0.006 U	0.006 U
alpha-Chlordane	2	µg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
beta-BHC	0.02	µg/L	0.02 U	<b>0.15 a</b>	<b>0.24 a</b>	<b>0.096 a</b>	<b>0.17 a</b>
delta-BHC	0.006	µg/L	0.0061 U	0.006 U	0.006 U	0.006 U	0.006 U
Dieldrin	0.002	µg/L	0.002 UJ	0.002 U	<b>0.0026 a</b>	0.002 U	0.002 U
Endosulfan I		µg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan II		µg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan sulfate		µg/L	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Endrin	2	µg/L	0.026 U	<b>0.0011 J</b>	0.025 U	0.025 U	0.025 U
Endrin aldehyde		µg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 UJ
Endrin ketone		µg/L	0.026 U	<b>0.0041 J</b>	<b>0.0087 J</b>	<b>0.0033 J</b>	<b>0.0056 J</b>
gamma-BHC (Lindane)	0.2	µg/L	0.02 U	0.02 U	<b>0.0057 J</b>	0.02 U	<b>0.0034 J</b>
gamma-Chlordane	2	µg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
Heptachlor	0.4	µg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
Heptachlor epoxide		µg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
Methoxychlor		µg/L	<b>0.002 J</b>	0.1 U	0.1 U	0.1 UJ	<b>0.0021 J</b>
Toxaphene	3	µg/L	0.26 UJ	0.25 U	0.25 U	0.25 UJ	0.25 U
Total Pesticides		µg/L	0.002	0.1604	0.257	0.1013	0.1811
<b>Metals</b>							
Chromium	100	µg/L	5 U	NA	NA	<b>2.2 J</b>	NA
Lead	15	µg/L	<b>4.3 J</b>	NA	NA	10 U	NA

**Notes:**

- µg/L = Micrograms per liter
- RG = Remedial Goal
- a = Concentration Exceeds RG

**Appendix E**  
**Historical Groundwater Results from 2012 to 2014Q1**  
**VOCS, Pesticides, and Metals for MW-29**

	Sample Location:	MW-29	MW-29	MW-29	MW-29	MW-29
	Sample Date:	12/11/2012	06/18/2013	09/03/2013	12/11/2013	03/24/2014
	Sample Type:	N	N	N	N	N
Analyte	RG	Units				
<b>VOCS</b>						
Benzene	5	µg/L	1 U	NA	NA	NA
Toluene		µg/L	1 U	NA	NA	NA
Ethylbenzene		µg/L	1 U	NA	NA	NA
Xylene (Total)		µg/L	1 U	NA	NA	NA
<b>Pesticides</b>						
4,4'-DDD	0.1	µg/L	0.025 U	0.025 U	0.025 U	0.025 U
4,4'-DDE	0.1	µg/L	0.025 U	0.025 U	0.025 U	0.025 U
4,4'-DDT	0.1	µg/L	0.025 U	0.025 U	0.025 U	0.025 U
Aldrin	0.002	µg/L	0.002 U	<b>0.0045 J a</b>	0.002 U	0.002 U
alpha-BHC	0.006	µg/L	0.0061 U	0.006 U	0.006 U	0.006 U
alpha-Chlordane	2	µg/L	0.025 U	0.025 U	0.025 U	0.025 U
beta-BHC	0.02	µg/L	0.02 U	0.02 U	0.02 U	0.02 U
delta-BHC	0.006	µg/L	0.0061 U	0.006 U	0.006 U	0.006 U
Dieldrin	0.002	µg/L	0.002 U	0.002 U	0.002 U	0.002 U
Endosulfan I		µg/L	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan II		µg/L	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan sulfate		µg/L	0.025 U	<b>0.0011 J</b>	0.025 U	0.025 U
Endrin	2	µg/L	0.025 U	0.025 U	0.025 U	0.025 U
Endrin aldehyde		µg/L	0.025 U	0.025 U	0.025 U	0.025 UJ
Endrin ketone		µg/L	0.025 U	0.025 U	0.025 U	0.025 UJ
gamma-BHC (Lindane)	0.2	µg/L	0.02 U	0.02 U	0.02 U	0.02 U
gamma-Chlordane	2	µg/L	0.025 U	0.025 U	0.025 U	0.025 U
Heptachlor	0.4	µg/L	0.025 U	0.025 U	0.025 U	0.025 U
Heptachlor epoxide		µg/L	0.025 U	0.025 U	<b>0.0032 J</b>	0.025 U
Methoxychlor		µg/L	0.1 U	0.1 U	0.1 U	0.1 UJ
Toxaphene	3	µg/L	0.25 U	0.25 U	0.25 U	0.25 UJ
Total Pesticides		µg/L	U	0.0056	0.0032	U
<b>Metals</b>						
Chromium	100	µg/L	<b>8.6</b>	NA	NA	<b>8.8</b>
Lead	15	µg/L	<b>2.6 J</b>	NA	NA	10 U

**Notes:**

µg/L = Micrograms per liter  
 RG = Remedial Goal

**Appendix E**  
**Historical Groundwater Results from 2012 to 2014Q1**  
**VOCS, Pesticides, and Metals for MW-33**

Analyte	RG	Units	Sample Location: MW 33											
			MW 33	MW 33	MW 33	MW 33	MW 33	MW 33	MW 33	MW 33	MW 33	MW 33	MW 33	MW 33
Sample Date:			12/11/2012	12/11/2012	06/18/2013	06/18/2013	09/04/2013	09/04/2013	12/11/2013	12/11/2013	03/25/2014	03/25/2014		
Sample Type:			N	FD	N	FD	N	FD	N	FD	N	FD		
<b>VOCS</b>														
Benzene	5	µg/L	1 U	1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene		µg/L	1 U	1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene		µg/L	1 U	1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylene (Total)		µg/L	1 U	1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Pesticides</b>														
4,4'-DDD	0.1	µg/L	0.025 U	0.025 U	0.025 U	0.025 U	<b>0.0012 J</b>	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
4,4'-DDE	0.1	µg/L	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
4,4'-DDT	0.1	µg/L	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	<b>0.0027 NJ</b>	<b>0.0031 J</b>	0.025 U	0.025 U	0.025 U	0.025 U
Aldrin	0.002	µg/L	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
alpha-BHC	0.006	µg/L	0.0061 U	0.0061 U	0.006 U	<b>0.0011 J</b>	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U
alpha-Chlordane	2	µg/L	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
beta BHC	0.02	µg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
delta-BHC	0.006	µg/L	0.0061 U	0.0061 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U
Dieldrin	0.002	µg/L	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Endosulfan I		µg/L	0.025 U	0.025 U	<b>0.0024 J</b>	0.025 U	<b>0.0032 J</b>	<b>0.0024 J</b>	<b>0.0028 J</b>	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan II		µg/L	0.025 U	0.025 U	<b>0.0051 J</b>	<b>0.003 J</b>	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan sulfate		µg/L	0.025 U	0.025 U	0.025 U	<b>0.0025 J</b>	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Endrin	2	µg/L	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Endrin aldehyde		µg/L	0.025 U	0.025 U	0.025 U	0.025 U	<b>0.0054 J</b>	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Endrin ketone		µg/L	0.025 U	0.025 U	<b>0.0012 J</b>	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
gamma-BHC (Lindane)	0.2	µg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
gamma-Chlordane	2	µg/L	<b>0.0039 J</b>	<b>0.0042 J</b>	0.025 U	0.025 U	<b>0.0028 J</b>	<b>0.019 J</b>	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Heptachlor	0.4	µg/L	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Heptachlor epoxide		µg/L	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Methoxychlor		µg/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	<b>0.0021 J</b>
Toxaphene	3	µg/L	0.25 U	0.25 U	<b>0.15 NJ</b>	<b>0.14 NJ</b>	<b>0.48 J</b>	<b>0.42 J</b>	<b>0.24 J</b>	U	0.25 U	0.25 U	0.25 U	0.25 U
Total Pesticides		µg/L	0.0039	0.0042	0.1587	0.1466	0.4926	0.4414	0.2455	0.0031	U		0.0021	
<b>Metals</b>														
Chromium	100	µg/L	<b>5.2</b>	<b>3.2 J</b>	NA	NA	NA	NA	5 U	<b>5</b>	NA	NA	NA	NA
Lead	15	µg/L	<b>5.2 J</b>	<b>4.2 J</b>	NA	NA	NA	NA	10 U	10 U	NA	NA	NA	NA

**Notes:**

- µg/L = Micrograms per liter
- RG = Remedial Goal
- a** = Concentration Exceeds RG
- N = Normal/Primary Sample
- FD = Field Duplicate
- U = Not detected
- J = Estimated value
- D = The value was obtained during a secondary dilution.
- NJ = Analyte was presumptively present and tentatively identified at the approximate concentration listed.
- NA = Not analyzed
- █** = Highest concentration exceeding RG during posted timeframe

**Appendix E**  
**Historical Groundwater Results from 2012 to 2014Q1**  
**VOCS, Pesticides, and Metals for MW-34**

	<b>Sample Location:</b>	MW-34	MW-34	MW-34	MW-34	MW-34
	<b>Sample Date:</b>	12/10/2012	06/18/2013	09/04/2013	12/11/2013	03/26/2014
	<b>Sample Type:</b>	N	N	N	N	N
<b>Analyte</b>	<b>RG</b>	<b>Units</b>				
<b>VOCS</b>						
Benzene	5	µg/L	1 U	NA	NA	NA
Toluene		µg/L	1 U	NA	NA	NA
Ethylbenzene		µg/L	1 U	NA	NA	NA
Xylene (Total)		µg/L	1 U	NA	NA	NA
<b>Pesticides</b>						
4,4'-DDD	0.1	µg/L	<b>0.0072 J</b>	0.025 U	0.025 U	0.025 U
4,4'-DDE	0.1	µg/L	0.025 UR	0.025 U	0.025 U	0.025 U
4,4'-DDT	0.1	µg/L	<b>0.015 J</b>	0.025 U	0.025 U	<b>0.022 J</b>
Aldrin	0.002	µg/L	0.002 UR	0.002 U	0.002 U	0.002 U
alpha-BHC	0.006	µg/L	0.0061 UR	0.006 U	<b>0.0011 J</b>	0.006 U
alpha-Chlordane	2	µg/L	0.025 UR	0.025 U	0.025 U	0.025 U
beta-BHC	0.02	µg/L	0.02 UR	0.02 U	0.02 U	0.02 U
delta-BHC	0.006	µg/L	0.0061 UR	0.006 U	0.006 U	0.006 U
Dieldrin	0.002	µg/L	0.002 UR	<b>0.001 J</b>	0.002 U	0.002 U
Endosulfan I		µg/L	0.025 UR	0.025 U	0.025 U	0.025 U
Endosulfan II		µg/L	0.025 UR	0.025 U	0.025 U	0.025 U
Endosulfan sulfate		µg/L	0.025 UR	<b>0.0054 J</b>	0.025 U	0.025 U
Endrin	2	µg/L	0.025 UR	0.025 U	0.025 U	0.025 U
Endrin aldehyde		µg/L	<b>0.01 J</b>	<b>0.047</b>	0.025 U	0.025 U
Endrin ketone		µg/L	0.025 UR	0.025 U	0.025 U	<b>0.0024 J</b>
gamma-BHC (Lindane)	0.2	µg/L	0.02 UR	0.02 U	0.02 U	0.02 U
gamma-Chlordane	2	µg/L	0.025 UJ	0.025 U	0.025 U	0.025 U
Heptachlor	0.4	µg/L	0.025 UR	0.025 U	0.025 U	0.025 U
Heptachlor epoxide		µg/L	0.025 UR	0.025 U	<b>0.0032 J</b>	0.025 U
Methoxychlor		µg/L	0.1 UR	<b>0.0055 J</b>	0.1 U	0.1 UJ
Toxaphene	3	µg/L	0.25 UR	0.25 U	<b>0.78 J</b>	0.25 U
Total Pesticides		µg/L	0.0322	0.0589	0.7843	0.0024
<b>Metals</b>						
Chromium	100	µg/L	5 U	NA	NA	<b>11</b>
Lead	15	µg/L	<b>3.1 J</b>	NA	NA	10 U

Notes:

## Appendix F: Photographs from Site Inspection Visit

Photo Log for Site Inspection – Helena Chemical - Fairfax

March 25, 2014



Photo 1 – South towards office and inspection team



Photo 2 – Warehouse



Photo 3 – Fence on east side of property



Photo 4 – Eastern side of the warehouse



Photo 5 – Fire hydrant on east side of property



Photo 6 – MW14

Photo Log for Site Inspection – Helena Chemical - Fairfax

March 25, 2014



Photo 7 – monitoring wells 19 and 20



Photo 8 – Tree on fence; northeast corner of grid C



Photo 9 – MWs 5 and 8



Photo 10 – Warehouse (facing south)



Photo 11 – MW4



Photo 12 – Pump and treat system shed

Photo Log for Site Inspection – Helena Chemical - Fairfax

March 25, 2014



Photo 13 – recovery well cluster and MW4



Photo 14 – MW south of recovery well and MW4



Photo 15 – Out of service monitoring well



Photo 16 – Western loading dock of warehouse



Photo 17 – Facing north towards recovery well



Photo 18 – Sampling at MW 15 and 16



Photo Log for Site Inspection – Helena Chemical - Fairfax

March 25, 2014



Photo 19 – Limbs on fence (western edge of property)



Photo 20 – Facing east



Photo 21 – Fence along western edge of property



Photo 22 – Hole under fence on southern side of property



Photo 23 – Facing south toward MW cluster at old lumber mill



Photo 24 – MWs 1 and 2

Photo Log for Site Inspection – Helena Chemical - Fairfax

March 25, 2014



Photo 25 – Facing north



Photo 26 – Trash dumped outside fence south of site



Photo 27 – Trash dumped outside fence south of site



Photo 28 – Trash dumped outside fence south of site



Photo 29 – MWs 33 and 34



Photo 30 – Former lumber mill

Photo Log for Site Inspection – Helena Chemical - Fairfax

March 25, 2014



Photo 31 – Former lumber mill



Photo 32 – MWs 31 and 32 being sampled in distance



Photo 33 – MW 10



Photo 34 – Helena Chemical Company sign

Photo Log for Site Inspection – Helena Chemical - Fairfax

March 25, 2014



Photo 35 – Corbett Plywood sign



Photo 36 – MW 22



Photo 37 – MW 21



Photo 38 – MW 21 and 22 facing north



Photo 39 – MW 28



Photo 40 – MW 27

Photo Log for Site Inspection – Helena Chemical - Fairfax

March 25, 2014



Photo 41 – MWs 27 and 28 facing south



Photo 42 – MW 29



Photo 43 – MW 30



Photo 44 – MWs 29 and 30 facing west



Photo 45 – MW 32



Photo 46 – MW 31

Photo Log for Site Inspection – Helena Chemical - Fairfax

March 25, 2014



Photo 47 – MWs 31 and 32 facing north



Photo 48 – MW 26



Photo 49 – MW 25



Photo 50 – MWs 25 and 26 facing south



Photo 51 – MW 3 and 6



Photo 52 – MWs 17 and 18

Photo Log for Site Inspection – Helena Chemical - Fairfax

March 25, 2014



Photo 53 – Public water well near MW 17



Photo 54 – Public water well tag (off of Aiken Ave)



Photo 55 – Public well off of Aiken Ave



Photo 56 – New pumps/backup generators off of Aiken Ave