SIXTH FIVE-YEAR REVIEW REPORT FOR
WASATCH CHEMICAL CO. (LOT 6) SUPERFUND SITE
SALT LAKE COUNTY, UTAH

Prepared by

U.S. Environmental Protection Agency
Region 8
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LIST OF ABBREVIATIONS AND ACRONYMS

2,4-D	2,4-Dichlorophenoxyacetic acid
AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirement
bgs	Below Ground Surface
BSHW	Bureau of Solid and Hazardous Waste
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of Concern
DCE	Dichloroethylene
DDD	4,4-Dichlorodiphenyldichloroethane
DDE	4,4-Dichlorodiphenyldichloroethylene
DDT	4,4-Dichlorodiphenyltrichloroethane
DERR	Division of Environmental Response and Remediation
DWR	Division of Water Rights
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FFS	Focused Feasibility Study
FYR	Five-Year Review
HQ	Hazard Quotient
IC	Institutional Control
ISV	In-Situ Vitrification
MCL	Maximum Contaminant Level
µg/kg	Micrograms per Kilogram
µg/L	Micrograms per Liter
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
MNA	Monitored Natural Attenuation
NA	Not Analyzed
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PCE	Tetrachloroethylene
PCP	Pentachlorophenol
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RCRA	Resource Conversation and Recovery Act
ROD	Record of Decision
RPM	Remedial Project Manager
RSL	Regional Screening Level
SVOC	Semi-Volatile Organic Compound
TBC	To-Be Considered
TCDD	Tetrachlorodibenzo-p-dioxin
TCE	Trichloroethylene
UDEQ	Utah Department of Environmental Quality
UU/UE	Unlimited Use and Unrestricted Exposure
VOC	Volatile Organic Compound

I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues, if any, found during the review and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the sixth FYR for the Wasatch Chemical Co. (Lot 6) Superfund site (the Site). The triggering action for this statutory review is the completion date of the previous FYR. The FYR has been prepared because hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of one operable unit (OU1). OU1 includes contaminated soil and groundwater.

EPA remedial project managers (RPMs) Sam Garcia and Angela Zachman led the FYR. Participants included Tony Howes from the Utah Department of Environmental Quality (UDEQ) and Treat Suomi and Kirby Webster from EPA contractor Skeo. The EPA notified Dominion Energy Services, Inc. on behalf of Questar InfoComm Inc. (Questar), the Potentially Responsible Party (PRP), of the initiation of the FYR. The EPA and UDEQ originally identified 10 PRPs. Through negotiations, Questar is the PRP that continues to conduct work at the Site. The review began on 7/6/2021. Appendix A includes a list of documents reviewed during this FYR. Appendix B provides the Site's chronology of events.

The EPA has determined in the FYR that the cleanup at the Wasatch Chemical Co. (Lot 6) Superfund site is protective in the short term. There are no completed exposure pathways to remaining contamination in soil and groundwater. Institutional controls provide land-use restrictions, notification of building demolition and groundwater restrictions. The EPA and the PRP are discussing the groundwater remediation progress to date and will develop a groundwater exit strategy.

Site Background

The 18-acre Site is near the intersection of South 700 West Street and West 2100 South Street in an industrial area of Salt Lake City in Salt Lake County, Utah (Figure 1). The Site includes property owned by the PRP and portions of adjacent properties. From 1957 to 1971, Wasatch Chemical Company used the area to warehouse, produce and package industrial chemical products. From the 1970s to 1992, site operations included blending and packaging pesticides, herbicides, fertilizers, industrial chemicals and cleaners. The company also discharged wastewater into on-site tanks and evaporation ponds and onto the ground. Releases of hazardous substances at the Site occurred primarily due to disposal practices and spills contaminating soil, sludge and groundwater. The Site is currently being used by commercial and industrial businesses (Figure 1).

The Site's topography is flat, with an elevation variance of no more than several feet. Most surface drainage flows west toward a small drainage ditch that connects to other industrial drainageways, with ultimate discharge to the Great Salt Lake. Groundwater flows horizontally west and northwest toward the Jordan River (about a half mile from the Site) and Great Salt Lake (about 25 miles from the Site). The shallow portion of the groundwater aquifer (Shallow Zone) flows to the northwest. Groundwater is not used for drinking water, although there is the potential for use in the future. The deep part of the aquifer underlying the Site is used for the region's water supply. It is separated into four zones (Deeper Zones 1-4). Groundwater contamination remains on site. Businesses at the Site connect to and receive water from the public water system, which is operated by the Salt Lake City Department of Public Utilities. The nearest residential area is about a quarter-mile northwest of the Site.

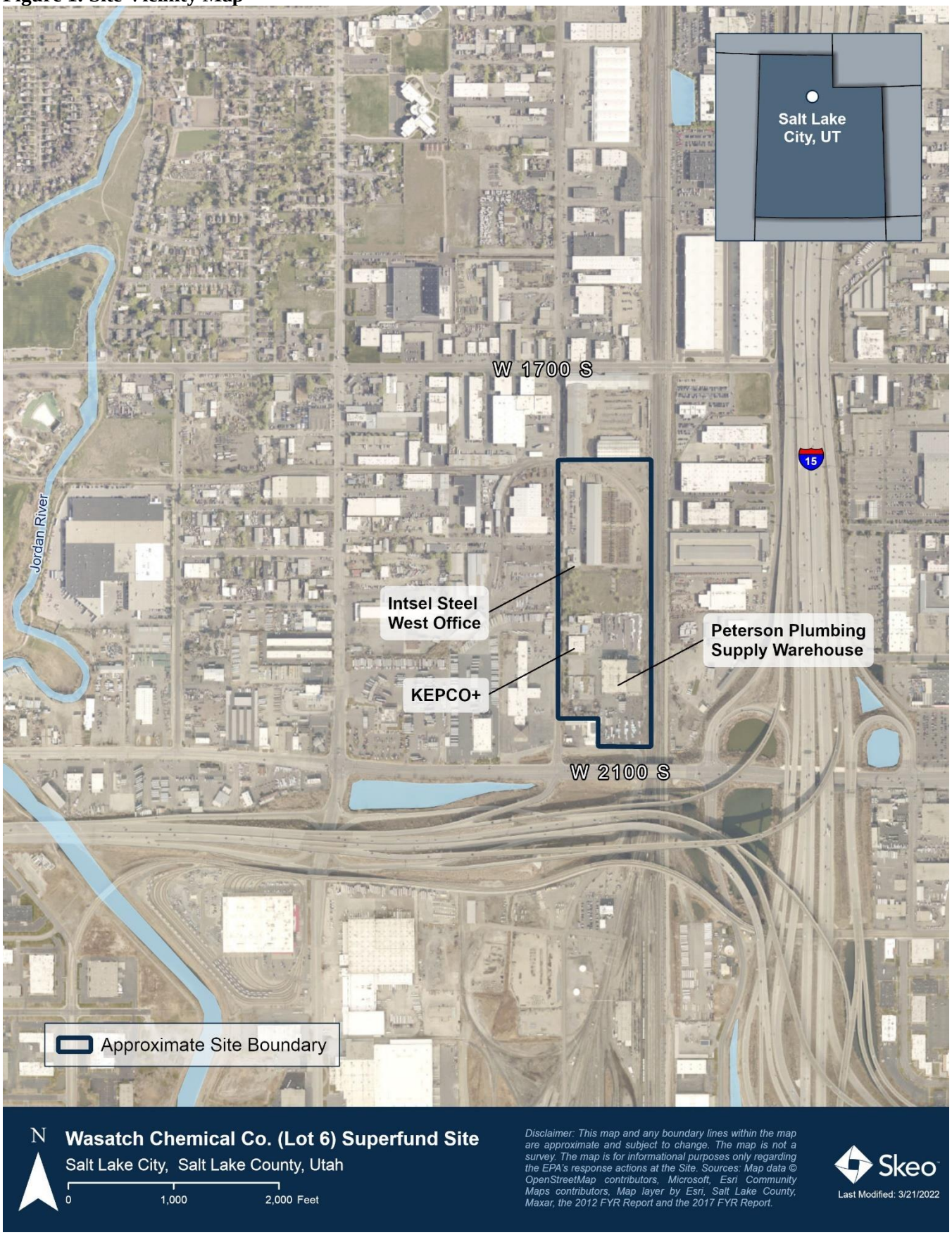
FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Wasatch Chemical Co. (Lot 6)		
EPA ID: UTD000716399		
Region: 8	State: Utah	**City/County:** Salt Lake City/Salt Lake

SITE STATUS	
NPL Status: Final	
Multiple OUs? No	**Has the Site achieved construction completion?** Yes

REVIEW STATUS
Lead agency: EPA
Author name: Sam Garcia and Angela Zachman with contractor support provided by Skeo
Author affiliation: EPA Region 8 and Skeo
Review period: 7/6/2021 – 8/31/2022
Date of site inspection: 10/26/2021
Type of review: Statutory
Review number: 6
Triggering action date: 9/27/2017
Due date *(five years after triggering action date)*: 9/27/2022

Figure 1: Site Vicinity Map



II. RESPONSE ACTION SUMMARY

Basis for Taking Action and Response Actions

In June 1984, the Utah Bureau of Solid and Hazardous Waste (BSHW) advised the Site's PRPs of an alleged release or threatened release of chemicals from the property to the environment. Based on field investigations, BSHW completed a preliminary site assessment and site investigation in 1984. BSHW and the EPA led more field investigations of groundwater, surface water, soils and sediments in 1985 and 1986. In June 1986, in cooperation with BSHW, an EPA emergency removal action removed about 50 drums, cylinders and other containers of chemical waste from the Site and provided temporary on-site storage of several drums containing dioxin waste.

In January 1987, the EPA proposed listing the Site on the Superfund program's National Priorities List (NPL). The EPA finalized the Site on the NPL in February 1991. Site PRPs conducted the remedial investigation and an endangerment assessment in 1990. Media investigated at the Site included waste (sludge and liquid), soil, sediment, surface water, groundwater and air. In each medium, samples were analyzed for target compound list chemicals, including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), herbicides, pesticides, dioxins/furans and metals. The PRPs performed an endangerment assessment to evaluate potential adverse impacts on human health and the environment. Using the data collected during the remedial investigation, the assessment chose 12 indicator chemicals and identified risks to three potential receptor populations: off-site residents, off-site workers and on-site workers. Primary exposure pathways included incidental ingestion of soil, dermal contact with soil, and inhalation of fugitive dust.

While the 1990 assessment analyzed risk present at that time, the PRPs and the EPA determined future potential risks were of greatest concern. The PRPs and the EPA made subsequent calculations to further evaluate future on-site worker exposures, residential exposures and acute exposures. The EPA performed more evaluations to assess potential acute exposure risks as well as sub-chronic exposure risks associated with direct exposure to contaminants in sludges in the process and yard drain system. In addition, based on site hydrogeology, the EPA and UDEQ identified the potential for future human exposure to contaminated groundwater. The contaminants were not found to be impacting biota at or near the Site.

Primary indicator chemicals include VOCs and SVOCs, pesticides, and dioxins and furans.[1]

The EPA selected the Site's long-term remedy in the Site's March 1991 Record of Decision (ROD) and updated it in a November 1995 Explanation of Significant Differences (ESD). Remedial action objectives (RAOs) identified in the ROD include:

- Control present and future risks posed by direct contact with and ingestion of soils, sludges and groundwater.
- Control the migration of contaminants from soils and sludges to groundwater.
- Prevent future human exposure to residual contamination in soils and dioxin removal wastes.

The remedy selected for the Site in the 1991 ROD:

- Excavation of all soils containing indicator chemicals above action levels and sludges from the yard and process drain systems and the septic system (Table 1, Figure C-1).
- Excavation and landfarming of about 1,000 cubic yards of hydrocarbon-contaminated soils (Figure C-1).
- Consolidation of these contaminated materials and dioxin removal wastes in the former evaporation pond, covered by a layer of clean soil.

[1] A wide variety of contaminants was found at the Site. In order to effectively manage the evaluation of health and environmental risks, contaminants were grouped according to chemical classification and indicator chemicals were selected from each group. Indicator chemicals represent the most prevalent, mobile, persistent, and toxic compounds found at the Site. Health-based cleanup or action levels were calculated for these indicator chemicals. The action level for dioxin was based on determinations at other sites that the 20 parts per billion level is protective for an industrial scenario. The industrial scenario is appropriate for the Site, given the Site's likely use in the foreseeable future. Indicator chemicals are used throughout the ROD to describe contamination at the Site.

- Treatment of staged soils, sludges and dioxin removal wastes by thermal destruction of contaminants of concern (COCs) through in-situ vitrification (ISV).
- Extraction of contaminated groundwater on site until maximum contaminant levels (MCLs) are met and treatment, to the extent necessary, of extracted groundwater by air stripping to meet publicly owned treatment works or Utah pollution discharge elimination system standards (Table 2).
- Disposal of any residuals remaining from the treatment of groundwater at a hazardous material disposal facility off site.
- As an extra precautionary measure, implementation of institutional controls such as deed restrictions, denial of well permits or acquisition of water rights, as practicable and to the extent allowable by law.

The 1995 ESD better delineated the site boundary and removed the requirement to pave the entire Site.

Table 1: Soil and Sludge Indicator COCs and Action Levels

Soil and Sludge COC	ROD Action Level[a] (µg/kg)
Trichloroethylene (TCE)	103,000
Tetrachloroethylene (PCE)	22,000
Hexachlorobenzene	7,000
4,4-Dichlorodiphenyldichloroethane (DDD)	26,000
4,4-Dichlorodiphenyldichloroethylene (DDE)	19,000
4,4-Dichlorodiphenyltrichloroethane (DDT)	19,000
Alpha-chlordane	7,000
Gamma-chlordane	7,000
Heptachlor	2,000
Tetrachlorodibenzo-p-dioxin (TCDD) (total)	20

Notes:
Source: Table 5.2 of the 1991 ROD (pdf page 23).
a. Action levels are health-based for industrial use (1991 ROD pdf page 5).
µg/kg = micrograms per kilogram

Table 2: Groundwater COC Action Levels

Groundwater COC	ROD Action Level[a] (µg/L)
VOCs	
PCE	5
TCE	5
1,1-Dichloroethylene (1,1-DCE)	7
SVOCs	
Pentachlorophenol (PCP)	1
Herbicides and Pesticides	
2,4-Dichlorophenoxyacetic acid (2,4-D)	70

Notes:
Source: Table 5.4 of the 1991 ROD.
a. Action levels are based on drinking water regulations under the Safe Drinking Water Act, MCLs.
µg/L = micrograms per liter

Status of Implementation

In 1991, the EPA, UDEQ and the PRP signed a Consent Decree to implement the remedy selected in the ROD. The PRP conducted the Site's remedial design from September 1991 to September 1993.

The PRP remediated source material and groundwater at the Site in four stages. Stage 1 included excavation and landfarming of hydrocarbon-contaminated material. Excavation activities took place from October 1992 to April 1993. They included removal and disposal of about 1,000 cubic yards of hydrocarbon-contaminated material in a landfarm containment cell on site. To ensure the removal of all contamination, excavation went to a depth of two feet below the groundwater table.

Nutrients and pH adjustments were added to the landfarm cell to optimize biodegradation of the hydrocarbon-contaminated material. Treated soil that met the standard was used as backfill. Soils exceeding the action levels were placed in the evaporation pond for later ISV treatment. The PRP completed the landfarming portion of Stage 1 in 1994. ISV was finished in 1996 as part of Stage 2 (Figure C-2). The ISV system vitrified 5,600 tons of contaminated soils and sludges. After ISV finished, verification samples of the vitrified material showed the ISV process effectively reduced chemical concentrations to below the required standards. The EPA and UDEQ determined that remedial activities had attained performance standards for soils, sludges and dioxin removal wastes and issued a Construction Completion Report for the soils remedy in January 1996.

Stages 3 and 4 included groundwater extraction and treatment and a groundwater pilot study of alternative remedies. Groundwater extraction and treatment (Stage 3) started in 1995. In January 2003, the PRP proposed discontinuing groundwater treatment and extraction and submitted a long-term monitoring plan to the EPA and UDEQ. In 2003, the EPA approved discontinuation of groundwater extraction and treatment and a period of monitored natural attenuation (MNA).

Additional Investigations

In an effort to accelerate the degradation of chlorinated hydrocarbons in groundwater at the Site, in 2004, the EPA approved an enhanced in-situ bioremediation pilot study. Enhanced biodegradation activities took place in May 2004 and July 2006. Results from these pilot tests indicated a substantial mass reduction of the COCs in areas of relatively higher permeability, but limited impact in areas where native silts and clays are more prevalent.

In 2010, the PRP submitted a Draft Groundwater Remediation Focused Feasibility Study (FFS) to identify goals, objectives and remediation alternatives based on the pilot study results. The EPA and the PRP are discussing the groundwater remediation progress to date and will develop a groundwater exit strategy.

Deeper Groundwater

Though ongoing groundwater monitoring had been done since 1995 for shallow groundwater (less than 25 feet below ground surface [bgs]), the deeper groundwater monitoring network was missing coverage in the southeast portion of the Site. Four deeper monitoring wells were installed in October 2011 in the Deeper Zone 1 to determine whether deeper groundwater (greater than 25 feet bgs) was affected by site contaminants. The focused deeper groundwater investigation consisted of collection of hydrogeologic and geotechnical field data and analytical data from depths ranging between 15 feet bgs and 160 feet bgs (Figure C-2). COCs were detected above MCLs north and west of MW-33D (Figure C-2). In 2017, five deeper wells were installed in Deeper Zone 2, 3 and 4. VOC and pentachlorophenol (PCP) results from these five deeper wells have been below MCLs.

Sentry Groundwater Investigation

Shallow groundwater data for MW-30, installed in 2011 and located on the downgradient (western) edge of the Site, indicated an additional sentry well was needed to monitor potential contaminant migration. The PRP installed a new shallow sentry well (MW-34) just outside the western site boundary in June 2013. The well is 20 feet deep and screened in the shallow groundwater zone. The PRP has collected samples from MW-34 over five monitoring events. Results are all below MCLs.

Shallow Soil Focused Investigation

The PRP found shallow subsurface soil and deeper groundwater contamination during installation of MW-33D in October 2011. In 2013, the PRP's contractor collected shallow soil samples in the immediate area around MW-33D. Samples were collected above the groundwater table and about 1 foot into the saturated zone using direct-push technology. The EPA regional screening levels (RSLs) for tetrachloroethylene (PCE), trichloroethylene (TCE), ethylbenzene, xylenes and PCP for industrial soil were exceeded at 17 of 53 sample locations in the 1.6-acre area. Soil contamination above the screening levels appears to be concentrated along the eastern edge of the investigation area and on the north side of the eastern part of the Peterson Plumbing supply warehouse. The PRP completed a human health risk assessment to assess whether current concentrations of chemicals detected in shallow soil and groundwater in the focused investigation area are protective of human health for an underground utility worker. This is the most likely exposure scenario, given current and reasonably anticipated future uses of the Site. Results of the risk assessment indicated that residual concentrations of contaminants in the media in the focused investigation area do not pose an unacceptable human health risk because exposures are limited by institutional controls in place. However, if in the future there are more exposure scenarios, such as planned construction, a revised human health risk assessment with an appropriately revised exposure scenario may be warranted. Given that these soils could be acting as a continuous source of contamination to the groundwater plume, the EPA is evaluating whether additional soil source control actions may be beneficial to the groundwater remedy.

Indoor Air

In 2008, in response to the third FYR Report, the PRP submitted an environmental covenant to the state of Utah that requires a risk evaluation related to contaminant vapor intrusion prior to approval of any new building permits on the property. Since the filing of the environmental covenant, sampling has detected VOCs in the shallow groundwater near two of the occupied buildings on site. In 2012, the PRP began indoor air sampling at the three occupied buildings on site to assess the potential for vapor intrusion and potential risk to workers. Due to shallow groundwater VOC contamination near occupied buildings, indoor air sampling to assess the potential for vapor intrusion took place in 2012, 2015, 2017 and 2019. No unacceptable risks were identified in 2012 or 2017. In 2015, risks exceeded the UDEQ excess lifetime cancer risk criterion (5×10^{-5}) and exceeded the hazard index of 1 (2). Naphthalene was the primary risk driver. Indoor air sampling in 2019 indicated risks at that time were within the EPA's acceptable risk range for cancer risks and below the EPA's acceptable hazard index of 1 for noncancer risks.

Institutional Control (IC) Review

The 1991 ROD required implementation of institutional controls, such as deed restrictions, denial of well permits, or acquisition of water rights, as practicable and to the extent allowable by law.

The EPA, UDEQ and the PRP signed an environmental covenant requiring land-use restrictions, notification of building demolition and groundwater restrictions. The Utah Division of Water Rights (DWR) implemented, a formal process in February 2008 to notify UDEQ's Division of Environmental Response and Remediation (DERR) and the EPA RPM whenever a well permit or groundwater use application is filed for the Site. UDEQ indicated there were no requests for well permits during the past five years. The environmental covenant was recorded with the Salt Lake County Recorder's Office in January 2009 (Appendix H). The covenant applies only to the five parcels owned by the PRP (Table 3, Figure 2). The EPA is determining whether additional institutional controls are necessary for parcels above the groundwater plume.

Table 3: Summary of Planned and/or Implemented Institutional Controls (ICs)

Media, Engineered Controls, and Areas That Do Not Support UU/UE Based on Current Conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcels[a]	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater	Yes	Yes	15133510030000[b] 15133510040000[b] 15133510060000 15133510070000 15133510080000[b]	Restrict installation of groundwater wells.	An environmental covenant filed on January 14, 2009, provides for groundwater restrictions for the portion of the Site owned by the PRP. (Instrument #10597953, Book 9674, Pages 1379-1401)
			15133010010000 15133020010000	Assess the potential risk for vapor intrusion prior to new construction.	None implemented at this time for parcels that do not currently have environmental covenants. The EPA is determining whether additional institutional controls are necessary for parcels above the groundwater plume that do not already have environmental covenants, listed below in the soil row.
			Site	Restrict installation of groundwater wells.	The State Engineer's Office implemented a process in 2008 to send a warning email notification to UDEQ-DERR and the EPA if there is a well permit or groundwater use application for the Site.

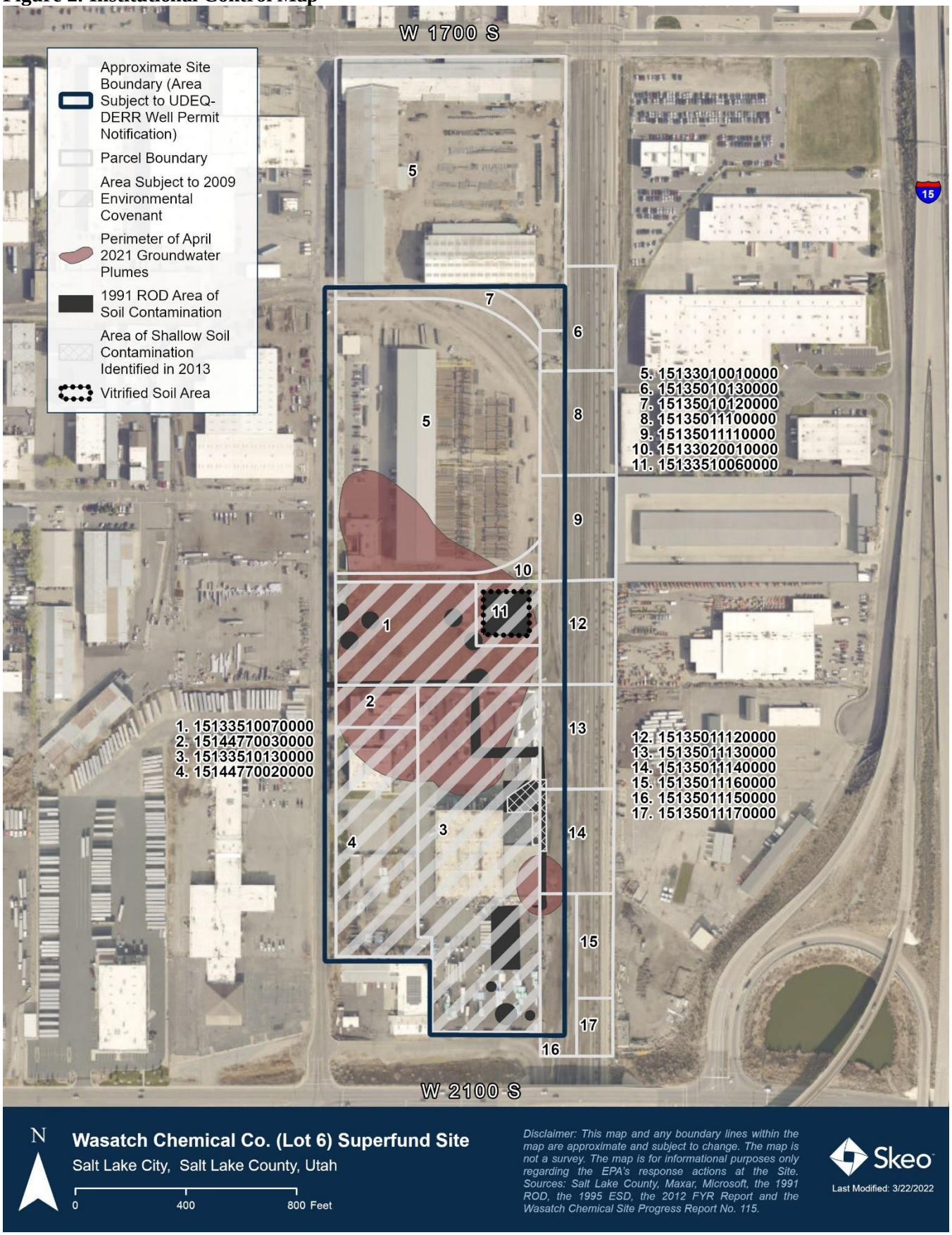
Media, Engineered Controls, and Areas That Do Not Support UU/UE Based on Current Conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcels[a]	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Soil	Yes	Yes	15133510030000[b] 15133510040000[b] 15133510060000 15133510070000 15133510080000[b]	Prohibit any activity that may disturb the integrity of the engineering controls, assess risks associated with potential vapor intrusion for new buildings, and limit future uses to industrial land uses.	An environmental covenant filed on January 14, 2009, provides for land-use restrictions for the portion of the Site owned by the PRP. (Instrument #10597953, Book 9674, Pages 1379-1401)

Notes:

a. Parcel boundaries are located at: https://slco.org/assessor/new/javaapi2/parcelviewext.cfm?parcel_ID=&query=Y

b. Since the environmental covenants were filed, these parcel boundaries have been adjusted, new parcels are shown in Figure 2, labeled as 15144770030000 (2), 15133510130000 (3) and 15144770020000 (4).

Figure 2: Institutional Control Map



Systems Operations/Operation and Maintenance (O&M)

The PRP conducts current O&M activities based on the Monitored Natural Attenuation Work Plan (2002) and the Final Indoor Air Sampling Work Plan (May 2019). The PRP conducts groundwater monitoring semi-annually. The 2020 shallow groundwater monitoring program includes 17 sampling locations, nine of which are monitored semiannually and eight of which are monitored annually, as approved by the EPA in February 2017. The PRP did not sample the eight deeper monitoring wells in April 2021 because the sampling frequency changed to once every two years, as approved by the EPA in its recent letter to the PRP dated January 26, 2021. The COC 2,4-dichlorophenoxyacetic acid (2,4-D) reached the performance standard across the Site by 1996. As approved by the EPA, it has not been monitored since 2004.

The primary objectives for fall groundwater monitoring events are to:

- Monitor groundwater contamination at off-site sentry monitoring points and monitoring points located on the downgradient (western) edges of the shallow groundwater contaminant plumes.
- Monitor groundwater levels across the Site and assess horizontal and vertical hydraulic gradients.

The primary objectives for the spring groundwater monitoring event are to:

- Monitor the extent of groundwater contamination across the Site over time.
- Evaluate overall shallow groundwater plume stability.
- Provide data to assess natural attenuation processes of contaminants in the shallow groundwater as described in the 2002 Monitored Natural Attenuation Work Plan.
- Assess potential horizontal and vertical groundwater contaminant migration.
- Monitor groundwater levels across the Site and assess horizontal and vertical hydraulic gradients.

Groundwater is monitored in the following zones:

- Shallow Groundwater Zone (Shallow Zone): Wells, piezometers and extraction trenches are completed to 25 feet bgs in this zone. The majority of monitoring points at the Site are completed in this zone and have been monitored since 1995.
- Deeper Groundwater Zone 1 (Deeper Zone 1): Wells are completed between 45 feet bgs and 56 feet bgs. Monitoring points completed in this zone include wells MW-31D, MW-32D and MW-33D installed in 2011.
- Deeper Groundwater Zone 2 (Deeper Zone 2): Wells are completed between 88 feet bgs and 91 feet bgs. Monitoring points completed in this zone include wells MW-35D2, MW-36D2 and MW-37D installed in 2017.
- Deeper Groundwater Zone 3 (Deeper Zone 3): One well, MW-38D3, was completed in this zone, to 128 feet bgs, in 2017.
- Deeper Groundwater Zone 4 (Deeper Zone 4): One well, MW-39D4, was completed in this zone, to 157.8 feet bgs, in 2017.

The PRP needs to update the O&M Plan to consolidate all current O&M activities, including air monitoring for vapor intrusion.

III. PROGRESS SINCE THE PREVIOUS REVIEW

This section includes the protectiveness determinations and statements from the previous FYR Report as well as the recommendations from the previous FYR Report and the status of those recommendations.

Table 4: Protectiveness Determinations/Statements from the 2017 FYR Report

OU #	Protectiveness Determination	Protectiveness Statement
1	Short-term Protective	The OU1 remedy is currently protective of human health and the environment because there are no current completed exposure pathways. For the remedy to be protective over the long term, the following actions need to be taken: issue a final decision documenting the final remedy; collect all necessary data for multiple lines of evidence for site-related vapor intrusion and determine if control measures are needed; and finalize the risk assessment for the identified area of soil contamination and determine if remedial actions or controls are needed to address soil contamination.

Table 5: Status of Recommendations from the 2017 FYR Report

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
1	The groundwater remedy is not currently in operation and an alternative remedy has not been selected and recorded.	Issue a final decision documenting the final remedy.	Under Discussion	A final decision had not been determined or documented regarding a final groundwater remedy. The EPA and the PRP are discussing the groundwater remediation progress to date and will develop a groundwater exit strategy.	NA
1	The vapor intrusion pathway has not been assessed fully.	Collect all necessary data for multiple lines of evidence for site-related vapor intrusion and determine if control measures are needed.	Completed	The February 2022 Indoor Air Sampling Summary Report concluded that data do not suggest potential for significant cumulative health effects through vapor intrusion of site-related contaminants.	2/1/2022
1	Soil contamination exceeding the default industrial screening levels remains on site.	Finalize the risk assessment for the newly identified area of soil contamination and determine if remedial actions or controls are needed to address soil contamination.	Completed	A site-specific human health risk assessment for an underground utility worker concluded that residual concentrations do not pose unacceptable human health risk.	8/28/2017

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Community Involvement and Site Interviews

A public notice was made available by posting notice in the *Salt Lake Tribune* (Appendix D). It stated that the FYR was underway and invited the public to submit any comments to the EPA. The results of the review and the report will be made available at the Site's information repository, the offices of UDEQ's DERR, located at 195 North 1950 West in Salt Lake City, Utah 84116 and at https://www.epa.gov/superfund/wasatch-chemical and/or http://eqedocs.utah.gov.

During the FYR process, interviews were conducted to document any perceived problems or successes with the remedy implemented to date**.** The interviews are summarized below.

Dave Allison of UDEQ-DERR indicated the remedy is functioning and protective at this time. Mr. Allison stated that no community interest has been expressed from surrounding properties and the land currently supports operating businesses. DERR has not received any complaints regarding the remedial efforts at the Site.

Mr. Donald Hintz of Dominion Energy Services, Inc. on behalf of Questar said that the remedies at the Site are protective of human health and the environment. He stated that shallow groundwater data indicate that natural attenuation is occurring at the Site and contributes to reduction of PCE, TCE and dichloroethylene (DCE) concentrations. Questar is not aware of any complaints or inquiries regarding environmental issues or remedial actions at the Site since the previous FYR.

A representative from one of the on-site businesses responded that they are somewhat aware of the former environmental issues at the Site. However, they have received no information about what has taken place on the Site, and they would like to know more information about it, especially if there are risks to their employees that they need to communicate. A representative from another of the on-site businesses said that they have received plenty of information about the Site.

Data Review

This section summarizes data collected during this FYR period and includes both groundwater and indoor air sampling. Groundwater generally flows from the southeast to northwest in the shallow zone (Figure C-3 and C-4). Groundwater contamination remains on site in the shallow zone (Figure 3). Indoor air sampling in 2019 indicated risks at that time were within the EPA's acceptable risk range for cancer risks and below the EPA's acceptable hazard index of 1 for noncancer risks. The most recent progress report, Progress Report 115 (October 2021), provided the following recommendations:

- Conduct additional air sampling to confirm that no unacceptable risks to human health are present due to vapor intrusion at the Peterson Plumbing, Intsel office and the KEPCO+ office buildings.
- Evaluate next steps for groundwater remediation, such as modifications to the shallow groundwater remedy and performance standards in the ROD and Consent Decree.
- Plan long-term groundwater monitoring once an alternative end point is agreed on that incorporates groundwater monitoring modifications approved by the regulatory agencies in 2002, 2017 and 2021.

Groundwater

Shallow groundwater samples were analyzed in an off-site laboratory for the COCs PCE, TCE, 1,1-DCE, and vinyl chloride, as well as DCE isomers cis-1,2-DCE and trans-1,2-DCE, PCP, and geochemical parameters pertinent to the assessment of biotransformation of chlorinated solvents (sulfate, sulfide, nitrate and nitrite). The PRP monitors PCP annually during spring monitoring events in five wells (ES-01, EX-02, EX-07, EX-08 and EX-11); however, once every five years during the year prior to the FYR (so for the 2022 FYR, in 2021), the PRP adds three additional wells to the PCP monitoring network (EX-04, EX-05 and EX-09). Ferrous iron and water quality parameters, dissolved oxygen (DO), pH, and oxidation reduction potential were measured and recorded in the field.

Table 7 shows exceedances of indicator chemicals during this review period in the shallow groundwater. Current concentrations appear to be fairly stable over time although there are observed seasonal fluctuations. Figure 3 shows the location of the remaining shallow aquifer groundwater contamination and results from a stability evaluation. The Annual Monitoring Reports include results of Mann-Kendall and Theil-Sen analyses to determine if concentration trends are statistically significant. Progress Report 115 (October 2021) indicates that for those wells where contaminant concentrations consistently exceed MCLs, concentrations do not have statistically significant trends. However, concentrations remain above the ROD Action Level and overall, groundwater conditions at the Site have not demonstrated a meaningful improvement since the last Five-Year Review (Figure 3). Vinyl chloride is not formally included as a COC in the 1991 ROD. Vinyl chloride concentrations are now routinely monitored at the Site as part of current work plans. Vinyl chloride will be considered as the EPA uses the decision-making process to modify the groundwater remedy.

VOCs were not detected above MCLs (equivalent to action levels) in the sentry wells (MW-34, MW-24A, MW-25 and PZ-3) during this review period (Appendix K). In November 2020, only three sentry wells were sampled. MW-34 was not accessible during the November 2020 monitoring event. It was paved over during the 2020 construction season. Therefore, samples were not collected. The PRP replaced the wellhead in December 2020 and sampled MW-34 in April 2021.

There have been no exceedances of MCLs in the deep groundwater during this FYR period (Appendix L). Deep groundwater was not monitored during the April 2021 or November 2021 monitoring events. As described above, the sampling frequency changed to once every two years.

Vapor Intrusion

Results of the 2019 risk evaluation are shown in Table 6. The 2022 Air Sampling Report (summarizing the 2019 air data) recommended air sampling once every five years in the Peterson Plumbing, KEPCO+, and Intsel buildings. Appendix M provides the indoor air sampling results.

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Table 6: 2019 Vapor Intrusion Results

Building	Cancer Risk	Hazard Index
Intsel	4×10^{-6}	0.3
KEPCO+	3×10^{-6}	0.2
Peterson Plumbing, Office	5×10^{-6}	0.1
Peterson Plumbing, Warehouse	8×10^{-6}	0.3
Source: Table 5-1 of the 2022 Final Air Sampling Report.		

Table 7: Concentrations in wells with exceedances of MCLs in Shallow Groundwater, 2017 to 2021

COC	1991 ROD Action Levels (µg/L)	Well	Apr-17	Nov-17	Apr-18	Nov-18	May-19	Nov-19	April 2020	November 2020	Apr-21	Nov-21
PCE	5	EX-02	0.59 T	not analyzed	**29**	not analyzed	<1.0	not analyzed	<1.0	not analyzed	<1.0	not analyzed
TCE	5	ES-01	**20**	not analyzed	**6.5**	not analyzed	**42**	not analyzed	**20**	not analyzed	0.66	not analyzed
		EX-02	**160 J**	not analyzed	**26**	not analyzed	**15**	not analyzed	**31**	not analyzed	**11**	not analyzed
		EX-07	**5.2**	not analyzed	**5.8**	not analyzed	3.2	not analyzed	4.1	not analyzed	1.8	not analyzed
		EX-11	**40**	not analyzed	**26**	not analyzed	**23J**	not analyzed	**15**	not analyzed	0.58T	not analyzed
1,1-DCE	7	EX-05	**10**	**9.3**	**13**	**9.8**	**12**	**8.7**	**9.5**	**8.6**	**9.2**	**9.1**
		EX-11	**12**	not analyzed	**14**	not analyzed	5.9	not analyzed	**7.7**	not analyzed	5.9	not analyzed
Vinyl chloride	--[a]	ES-01	**8.6**	not analyzed	**3.3**	not analyzed	**19**	not analyzed	**8.4**	not analyzed	0.31T	not analyzed
		EX-02	**72**	not analyzed	**120 D**	not analyzed	**62**	not analyzed	**60 D**	not analyzed	**39**	not analyzed
		EX-05	**5.8**	**4.2**	**7.7**	**6.2**	**7.6**	**4.6**	**5.7**	**4.1**	**4.6**	**2.7**
		EX-07	0.45 T	not analyzed	**2.5**	not analyzed	1.1	not analyzed	**2.6**	not analyzed	**2.6**	not analyzed
		EX-11	**340 D**	not analyzed	**510 D**	not analyzed	**260 D**	not analyzed	**400 D**	not analyzed	**490 D**	not analyzed
		MW-20	**5.2**	not analyzed	**5.8**	not analyzed	**8.8**	not analyzed	**8.1**	not analyzed	**4.8**	not analyzed
		MW-30	**41**	**62 D**	**42 D**	**57 J**	**33**	**42 J**	not analyzed	**67 D**	**53 D**	**25**
PCP	1	ES-01	**1.6**	not analyzed	<0.50	not analyzed	**2**	not analyzed	<0.50	not analyzed	<0.50	not analyzed
		EX-02	**1.6**	not analyzed	**2.4 D**	not analyzed	**2.8 D**	not analyzed	**6.4 D**	not analyzed	**10 DJ**	not analyzed

Notes:

a. The 2017 FYR Report states that "vinyl chloride, which was not included as an indicator COC in the 1991 ROD, has been detected above the MCL in several rounds of groundwater sampling. Vinyl chloride concentrations are now routinely monitored at the Site as part of current work plans. Vinyl chloride will be added as a COC when EPA modifies the remedy." The current MCL for vinyl chloride is 2 µg/L, so values greater than the MCL have been highlighted**.**

D = Sample dilution required for analysis; reported value reflects the dilution.

J = Data are estimates and potentially biased low due to associated quality control data.

T = Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

Bold = ROD Action Level or MCL (for vinyl chloride) exceedance

µg/L = micrograms per liter

Sources: Table 2 of Progress Report 107, Table 3 of Progress Report 108 and 109, and Table 4 of progress reports 110, 111, 112, 113, 114, 115 and 116.

Figure 3. TCE Concentrations in Select Wells, 2017-2021

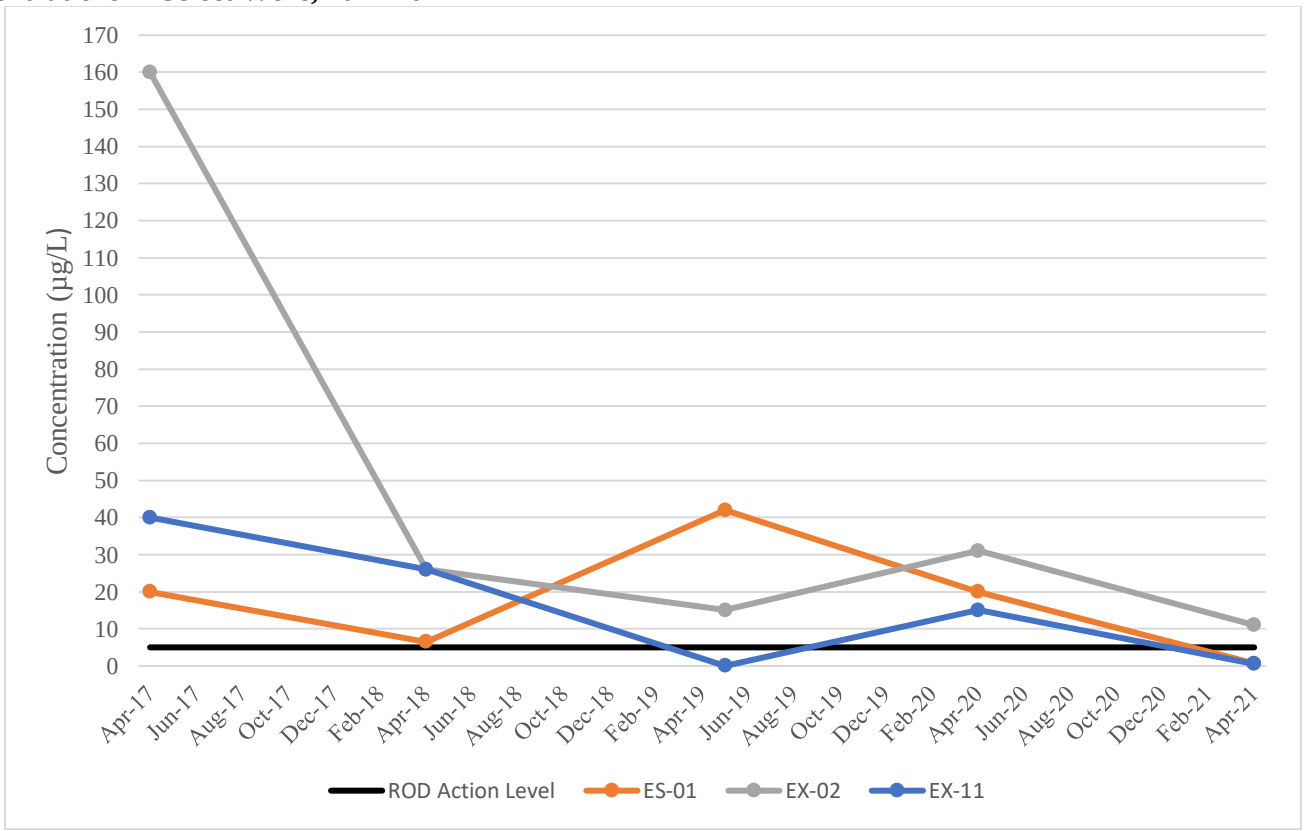
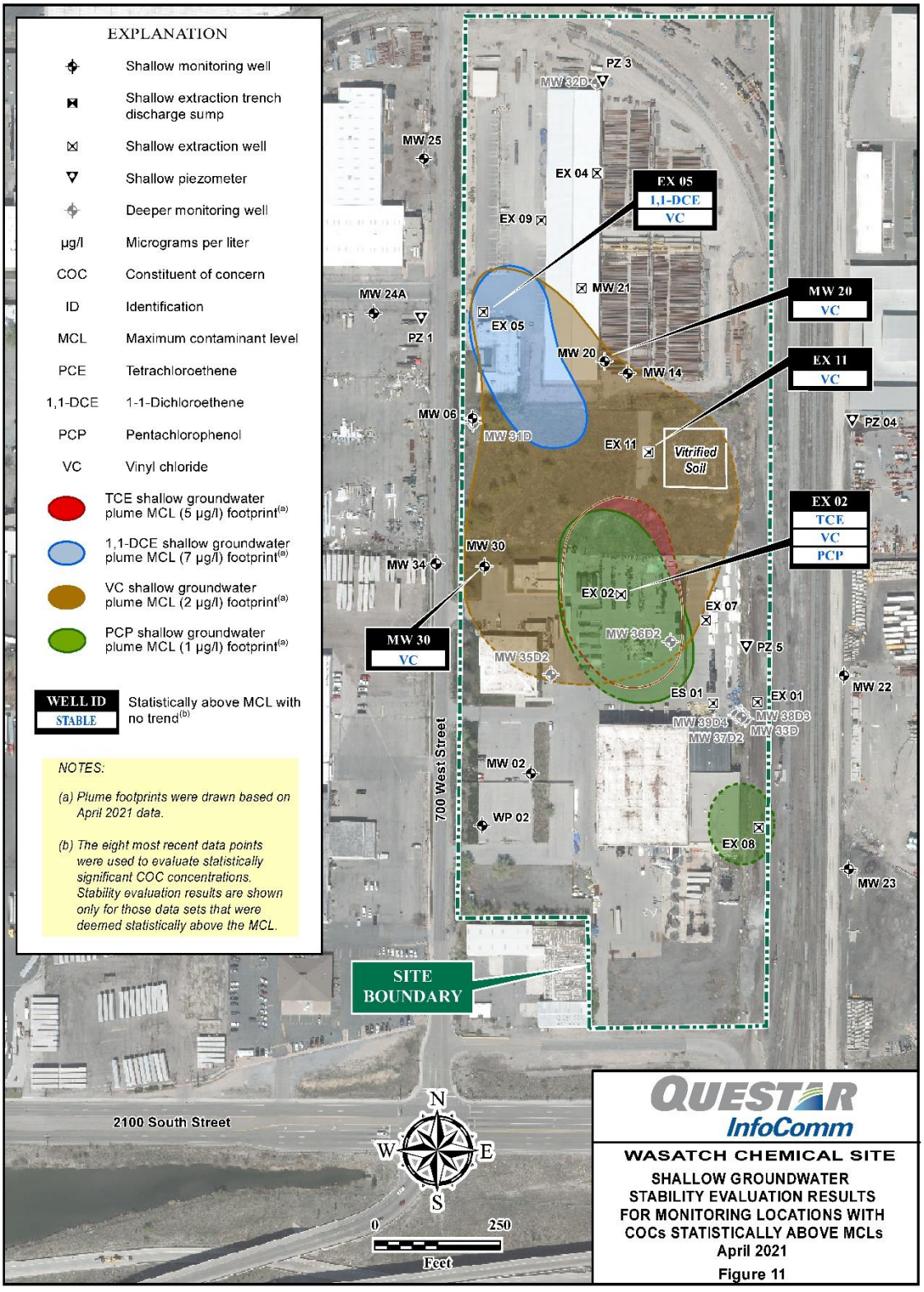


Figure 4: Shallow Groundwater Stability Evaluation Results, April 2020



Source: Progress Report 115, Figure 11.

Site Inspection

The site inspection took place on 10/26/2021. Participants included Tony Howes and Dave Allison from UDEQ, Scott Bassett, Adam Plonsky, Don Hintz, Dan Robertson and Tina Maniatis from Dominion Energy, Susan L. Eyzaguirre and Stacey Arens from Dominion Energy contractor Stantec, and Treat Suomi from EPA FYR contractor Skeo. The purpose of the inspection was to assess the protectiveness of the remedy. The inspection checklist and inspection photos are included in appendices F and G, respectively.

Participants met at the Site for a safety briefing and to conduct the Site inspection. Participants toured the Site, including the groundwater treatment system building, monitoring wells, the evaporation pond ISV area and general site conditions. Several industrial businesses operate on site. Peterson Plumbing recently expanded operations on site. Site inspection participants viewed the North Yard Drain System Replacement area on site. The system was replaced in 2021. Soil remains on site while Dominion determines appropriate disposal needs.[2] Small structures to house stray cats were observed on top of the ISV area. All wells were locked and in good condition. No issues were noted during the inspection.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Question A Summary:

The soil portion of the remedy is functioning as intended by the decision documents. The soil portion of the long-term remedy included excavation of contaminated soil and sludge; consolidation of the contaminated soil and sludge in the former evaporation pond; treatment of consolidated soil, sludge and dioxin-removal wastes; excavation and landfarming of hydrocarbon-contaminated soil; and institutional controls. Excavation and landfarming of hydrocarbon-contaminated soils finished in 1994. Excavation of contaminated soils, sludges, and debris extended to two feet below the water table to ensure the removal of all identified contamination. Following landfarming, residual soils not meeting action levels were placed on top of consolidated material in the evaporation pond for ISV treatment along with the dioxin wastes. After ISV finished, verification samples of the vitrified material showed the ISV process effectively reduced chemical concentrations to below the required standards. The EPA and UDEQ determined that remedial activities had attained performance standards for soils, sludges and dioxin removal wastes and issued a Construction Completion Report for the soils remedy in January 1996. Additional soil investigations were discussed in the Status of Implementation section of this FYR Report including shallow subsurface soil contamination identified in 2013 during the installation of a groundwater well. Given that these soils could be acting as a continuous source of contamination to the groundwater plume, the EPA is evaluating whether additional soil activities may be beneficial to the groundwater remedy.

The groundwater portion of the remedy is not functioning as intended by the decision documents. The groundwater portion of the long-term remedy included groundwater extraction and treatment and institutional controls. Groundwater extraction and treatment took place from 1995 to 2003. In January 2003, the PRP proposed discontinuing groundwater treatment and extraction and submitted a long-term monitoring plan to the EPA and UDEQ. The EPA approved discontinuation of groundwater extraction and treatment and an MNA program began in 2003. In 2008, Questar proposed a ROD Amendment be completed to record the MNA as a selected remedy however, a decision document establishing MNA as a remedy has not been completed. The EPA approved an in-situ bioremediation pilot study, which took place in 2004 and 2006. Additional investigations occurred as described in the Status of Implementation section of this FYR Report. Groundwater concentrations remain above MCLs in shallow groundwater on site. Overall ground water conditions at the Site have not demonstrated a meaningful improvement since the last Five-Year Review. Discussions to determine next steps for the groundwater remedy are ongoing.

[2] In a letter dated March 2, 2022, the PRP notified the EPA and UDEQ that the soils had been characterized and are considered Resource Conservation and Recovery Act (RCRA) non-hazardous solid waste. The PRP will make arrangements for the soils to be disposed of offsite.

Land-use restrictions and groundwater institutional controls are required as part of the selected remedy. An environmental covenant is in place for the part of the Site owned by the PRP. It includes land-use and groundwater restrictions and requires notification of the EPA and UDEQ in advance of building demolition as well as vapor intrusion risk assessment and mitigation associated with new building construction. Groundwater use at remaining parcels is controlled by a permit process that sends a warning email notification to UDEQ-DERR and the EPA if there is a well permit or groundwater use application for the Site. No permits have been filed in the last five years. The EPA is determining whether additional institutional controls are necessary for parcels above the groundwater plume.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of the remedy selection still valid?

Question B Summary:

Several changes have occurred related to the human-health-based toxicity data for COCs at the Site. For soils, sludges and dioxin removal wastes, the remedial goal was treatment so the level of contaminants remaining in these materials does not pose an unacceptable risk to industrial workers. Since there are no federal or state chemical-specific applicable or relevant and appropriate requirements (ARARs) for soils and sludges, action levels were determined through a site-specific risk analysis. Standards for the ISV treatment are based on a Resource Conservation and Recovery Act (RCRA) land disposal requirement. Appendix J of this FYR compared the action levels to the EPA's RSLs. The toxicity data and, therefore, action levels for TCE and dioxins exceed the EPA's acceptable cancer risk range and/or noncancer hazard index of 1 for industrial use. However, during remedial action, soils were excavated to two feet below the water table to ensure the removal of all contamination. For the ISV area, the treatment action level exceeds the current RSL for industrial land use. However, clean fill was placed on the evaporation pond prior to ISV treatment, and clean fill was later applied to grade the area. Institutional controls in place restrict disturbance of the soil. Therefore, the soil-removal areas remain protective for industrial uses, and the changes in the toxicity data do not affect the protectiveness of the remedy. The site inspection noted that stray cats were observed on top of the ISV area; however, according to the 1991 ROD site COCs were not found to be impacting biota at or near the Site as neither herbicides nor pesticides were detected in the animal (mammal and bird) tissue samples. Therefore, there is not expected to be any risk to cats living on site, even if they are eating animals that live on site.

Indoor air sampling events to evaluate potential vapor intrusion took place in 2012, 2015, 2017 and 2019. Results of the 2019 risk evaluation are included in Table M-1. The results showed that:

- The cumulative noncancer hazard estimates for current/future industrial workers exposed to VOCs detected in indoor air inside the three buildings are below the EPA's acceptable hazard index of 1.
- The non-COC chemicals naphthalene, benzene and chloroform detections are within the EPA's acceptable risk range of 1×10^{-6} to 1×10^{-4}.
- The 2022 Air Sampling Report (summarizing the 2019 air data) recommended air sampling once every five years in the Peterson Plumbing, KEPCO+ and Intsel buildings.

Table M-1 in the appendix highlights exceedances of 10^{-6} carcinogenic risk. The EPA continues to review all site-related reports and is determining if adjustments will need to be made to the vapor intrusion analysis.

Vinyl chloride, which was not included as an indicator COC in the 1991 ROD, has been detected above the MCL in several rounds of groundwater sampling. Vinyl chloride concentrations are now routinely monitored at the Site as part of current work plans. Vinyl chloride will be considered as the EPA uses the decision-making process to modify the groundwater remedy.

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.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the FYR:
None.

Issues and Recommendations Identified in the FYR:

OU(s): 1	Issue Category: Remedy Performance			
	Issue: The groundwater remedy is not in operation and an alternative remedy has not been formally selected and recorded.			
	Recommendation: Use the remedy selection process to select an updated groundwater remedy.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	9/30/2023

OU(s): 1	Issue Category: Institutional Controls			
	Issue: The groundwater plume is present under parcels that do not currently have any restrictions.			
	Recommendation: Evaluate whether additional parcels need land-use restrictions.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	9/30/2023

OU(s): 1	Issue Category: Remedy Performance			
	Issue: Soil contamination identified in 2013 may be contributing as an ongoing source to groundwater contamination.			
	Recommendation: Evaluate whether additional soil activities may be beneficial to the groundwater remedy.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	9/30/2023

OU(s): 1	Issue Category: Remedy Performance			
	Issue: Vinyl chloride is not formally included as a COC in the 1991 ROD. Vinyl chloride concentrations are now routinely monitored at the Site as part of current work plans.			
	Recommendation: Consider formally adding vinyl chloride as a COC.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	9/30/2023

OU(s): 1	Issue Category: Remedy Performance			
	Issue: The current O&M plan does not include annual vapor intrusion evaluations.			
	Recommendation: The PRP should prepare an updated O&M Plan, including annual vapor intrusion evaluations.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	9/30/2023

OTHER FINDINGS

Two additional recommendations were identified during the FYR. These recommendations do not affect current and/or future protectiveness.

- The EPA and the PRP are discussing the groundwater remediation progress to date and will develop a groundwater exit strategy.
- Improve communication with onsite businesses to ensure they have enough information.

VII. PROTECTIVENESS STATEMENT

Sitewide Protectiveness Statement
Protectiveness Determination: Short-term Protective
Protectiveness Statement: The remedy at the Site currently protects human health and the environment because there are no completed exposure pathways to waste that remains at the Site. For the remedy to be protective over the long term, the following action needs to be taken: use the remedy selection process to select an updated groundwater remedy, evaluate whether additional parcels need land-use restrictions, evaluate whether additional soil activities may be beneficial to the groundwater remedy, consider formally adding vinyl chloride as a COC, and the PRP should prepare an updated O&M Plan including annual vapor intrusion evaluations.

VIII. NEXT REVIEW

The next FYR Report for the Wasatch Chemical Co. (Lot 6) Superfund site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

1991. Record of Decision. Wasatch Chemical Site. Salt Lake City, Utah. U.S. Environmental Protection Agency. March 29, 1991. SEMS # 381887.

1995. EPA Superfund Explanation of Significant Differences: Wasatch Chemical Co. (Lot 6). November 30, 1995. SEMS # 383237.

1996. Construction Completion Report. Remedial Action/Remedial Design – Soils. Wasatch Chemical Site, Salt Lake City, Utah. Prepared for Entrada Industries, Inc. January 15, 1996.

2012. Five-Year Review Report, Fourth Five-Year Report for Wasatch Chemical Co. (Lot 6). Prepared by the EPA, September 2012.

2017. Fifth Five-Year Review Report for Wasatch Chemical Co. (Lot 6) Superfund Site. Salt Lake County, Utah. Prepared by the U.S. Environmental Protection Agency. Region 8. September 2017.

2017. Technical Memorandum. Subject: Human Health Risk Assessment for Shallow Soils in the Focused Investigation Area at the Wasatch Chemical Site, Salt Lake City, Utah. To Scott Bassett and Tina Maniatis, Questar Environmental Managers, From Susan Eyzaguirre, Stantec Project Manager. August 28, 2017.

2018. Wasatch Chemical Site, Progress Report No. 109. Prepared for: USEPA – Region VIII and Utah Department of Environmental Quality by Stantec Consulting Services Inc. on behalf of: Questar InfoComm, Inc. September 2018.

2019. Wasatch Chemical Site, Progress Report No. 110. Prepared for: USEPA – Region VIII and Utah Department of Environmental Quality by Stantec Consulting Services Inc. on behalf of: Questar InfoComm, Inc. February 2019.

2019. Wasatch Chemical Site, Progress Report No. 111. Prepared for: USEPA – Region VIII and Utah Department of Environmental Quality by Stantec Consulting Services Inc. on behalf of: Questar InfoComm, Inc. October 2019.

2020. Final Indoor Air Sampling Summary Report. Wasatch Chemical Site. Prepared for Questar InfoComm, Inc. by Stantec Consulting Services, Inc. April 24, 2020.

2020. Wasatch Chemical Site, Progress Report No. 112. Prepared for: USEPA – Region VIII and Utah Department of Environmental Quality by Stantec Consulting Services Inc. on behalf of: Questar InfoComm, Inc. April 2020.

2020. Wasatch Chemical Site, Progress Report No. 113. Prepared for: USEPA – Region VIII and Utah Department of Environmental Quality by Stantec Consulting Services Inc. on behalf of: Questar InfoComm, Inc. September 2020.

2021. Wasatch Chemical Site, Progress Report No. 114. Prepared for: USEPA – Region VIII and Utah Department of Environmental Quality by Stantec Consulting Services Inc. on behalf of: Questar InfoComm, Inc. May 2021.

2021. Wasatch Chemical Site Progress Report No. 115. Prepared for: USEPA – Region VIII and Utah Department of Environmental Quality by Stantec Consulting Services Inc. on behalf of: Questar InfoComm, Inc. October 13, 2021.

2022. Disposition of Excess Construction Soils, Wasatch Chemical Site, Salt Lake City, Utah. Dominion Energy. March 2, 2022.

2022. Technical Memorandum. Reference: Wasatch Chemical Site North Yard Drain System Replacement Construction Completion. To: Don Hintz and Adam Plonsky, Questar InfoComm, From Susan Eyzaguirre. Stantec. March 2, 2022.

2022. Wasatch Chemical Site Progress Report No. 116. Prepared for: USEPA – Region VIII and Utah Department of Environmental Quality by Stantec Consulting Services Inc. on behalf of Questar InfoComm, Inc. February 28, 2022.

APPENDIX B – SITE CHRONOLOGY

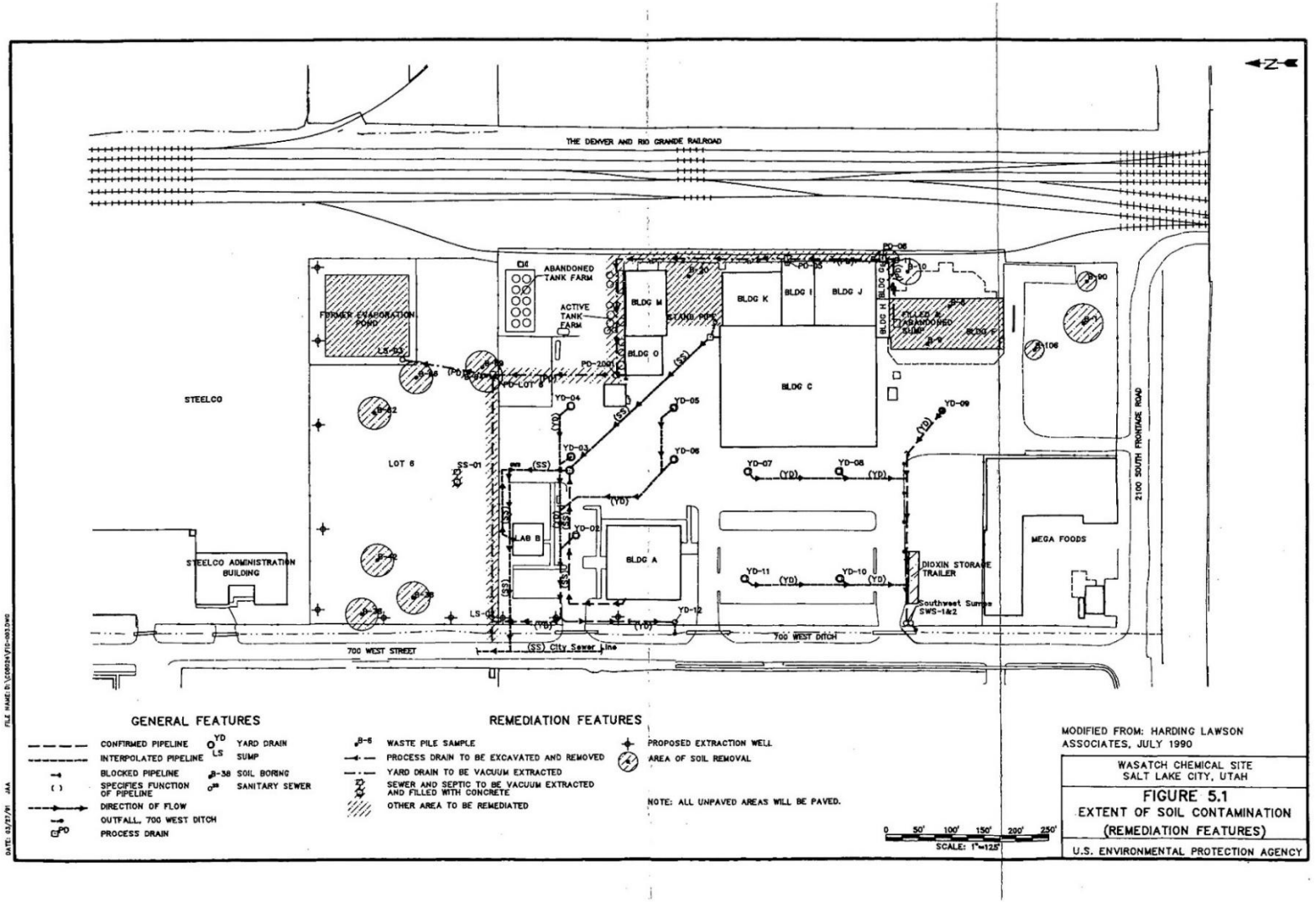
Table B-1: Site Chronology

Event	Date
The EPA discovered contamination	August 1, 1980
The EPA conducted a preliminary site assessment	April 1, 1981
State conducted a preliminary site assessment	December 1, 1984
The EPA and the PRP began removal negotiations	August 15, 1985
The EPA conducted a site inspection	September 30, 1985
The EPA issued a Unilateral Administrative Order	March 13, 1986
The EPA began short-term removal action to stabilize the Site	March 19, 1986
The EPA and PRP completed removal negotiations The EPA signed an Administrative Order on Consent (AOC)	April 1, 1986
The EPA proposed the Site for listing on NPL	January 22, 1987
The EPA completed short-term removal action to stabilize the Site	June 30, 1988
State issued a Consent Decree The EPA began an endangerment assessment and health assessment The PRP began the remedial investigation and feasibility study	September 28, 1988
The EPA completed an endangerment assessment and health assessment	October 23, 1989
The EPA performed a removal assessment	August 30, 1990
The EPA finalized the Site's listing on the NPL	February 11, 1991
The PRP completed the remedial investigation and feasibility study The EPA signed the ROD for the final selected remedy	March 29, 1991
The EPA signed an AOC	May 22, 1991
The PRP began a short-term removal action to stabilize the Site	June 12, 1991
The EPA completed a removal assessment	June 17, 1991
The PRP completed short-term removal to stabilize the Site	July 3, 1991
The EPA, UDEQ and the PRP signed a Consent Decree	September 1991
The PRP began the remedial design	September 30, 1991
Consent Decree was finalized	September 30, 1992
The PRP completed the remedial design The PRP began the remedial action for landfarming	October 16, 1992
The EPA began a removal assessment	February 18, 1993
The PRP completed the remedial design The PRP began the remedial action for ISV	September 10, 1993
The PRP completed the remedial action for landfarming	January 19, 1994
The PRP began the remedial action for groundwater extraction and water treatment	October 11, 1994
The PRP completed the remedial design	March 8, 1995
The EPA issued the Site's ESD	November 30, 1995
The PRP completed the remedial action for ISV	May 31, 1996
The PRP completed the remedial action for groundwater extraction and water treatment The PRP completed remedy construction	August 29, 1997
The EPA prepared the Site's Preliminary Close-Out Report Site achieved Construction Complete status	September 30, 1997
The EPA signed the Site's first FYR Report	October 24, 1997
The EPA signed the Site's second FYR Report	September 25, 2002
The EPA approved discontinuation of the groundwater extraction and treatment system and the start of MNA evaluation	January 2003
The PRP conducted enhanced biodegradation activities	May 2004
The PRP conducted enhanced biodegradation activities	July 2006
The EPA signed the Site's third FYR Report	September 28, 2007
The PRP assessed the 700 West Street Ditch for the purposes of potentially establishing alternate concentration limits	October 2007

Event	Date
Environmental covenant completed for part of the Site	January 2009
The PRP submitted the Site's draft FFS Report	February 2010
The EPA signed the Site's fourth FYR Report	September 29, 2012
The EPA signed the Site's fifth FYR Report	September 26, 2017
The PRP finalized the Indoor Air Sampling Report summarizing indoor air sampling conducted in 2019	February 2022

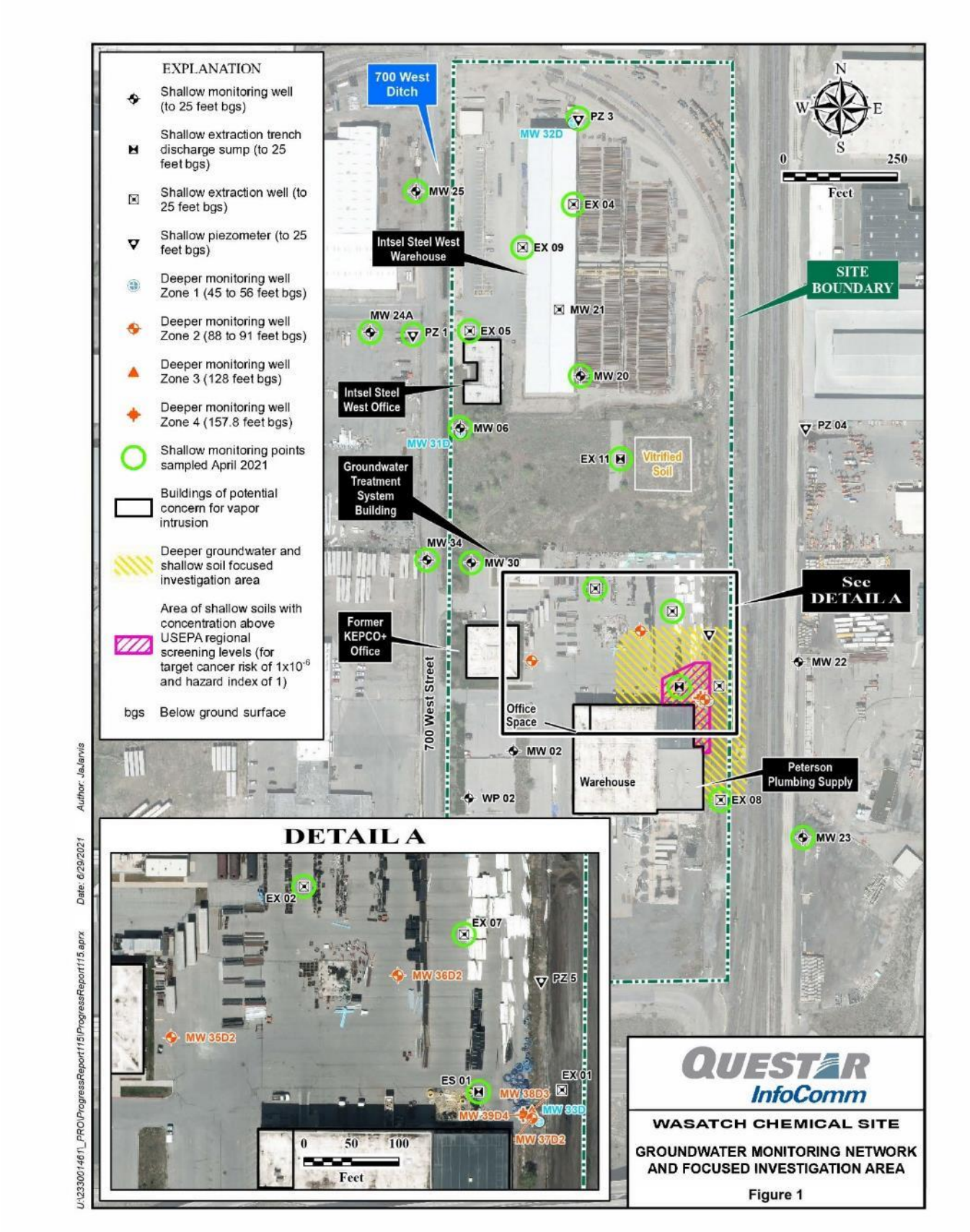
APPENDIX C – SITE MAPS

Figure C-1: Extent of Soil Contamination



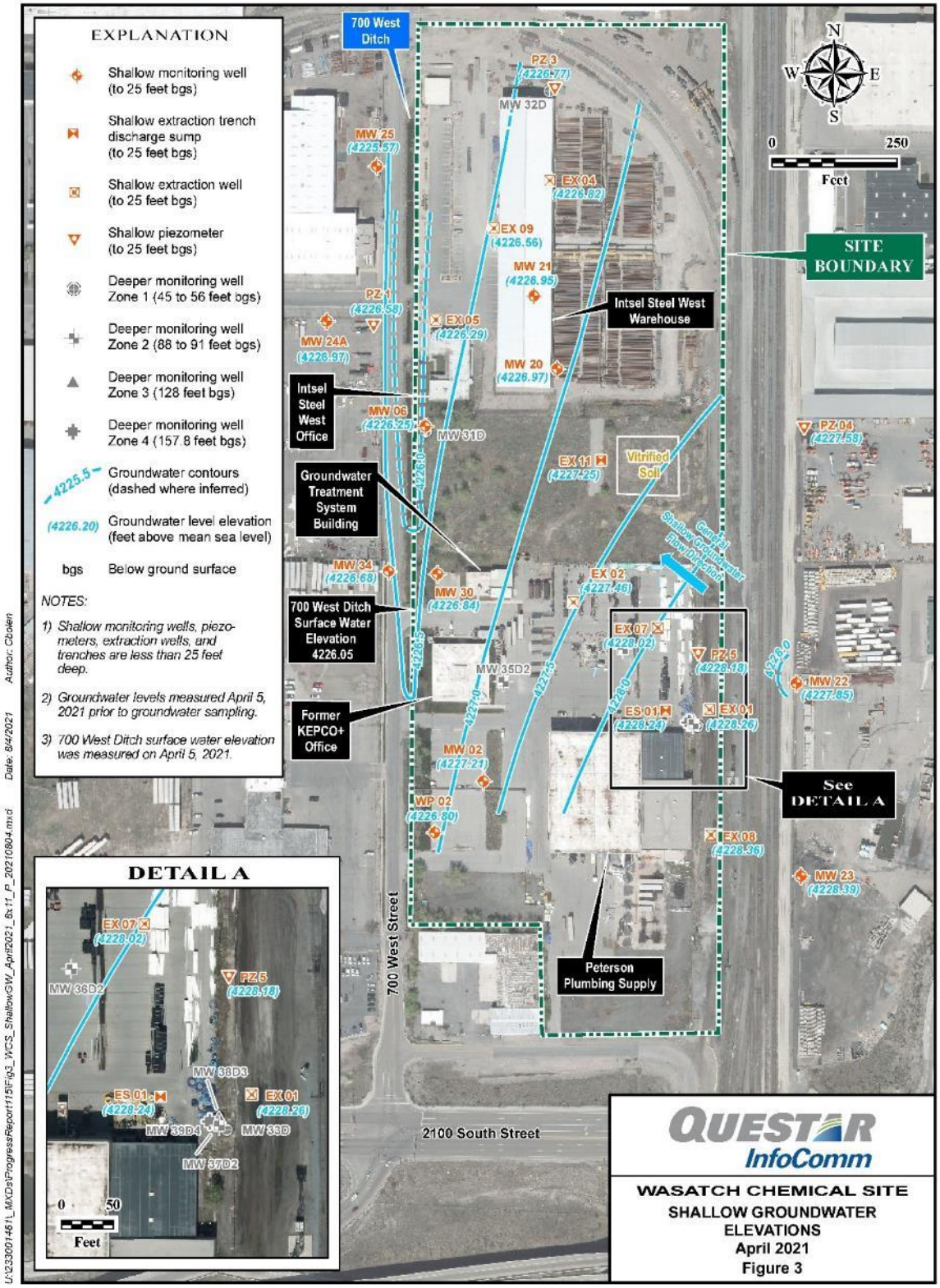
Source: 1991 ROD, Figure 5.1.

Figure C-2: Groundwater Monitoring Network and Focused Investigation Area



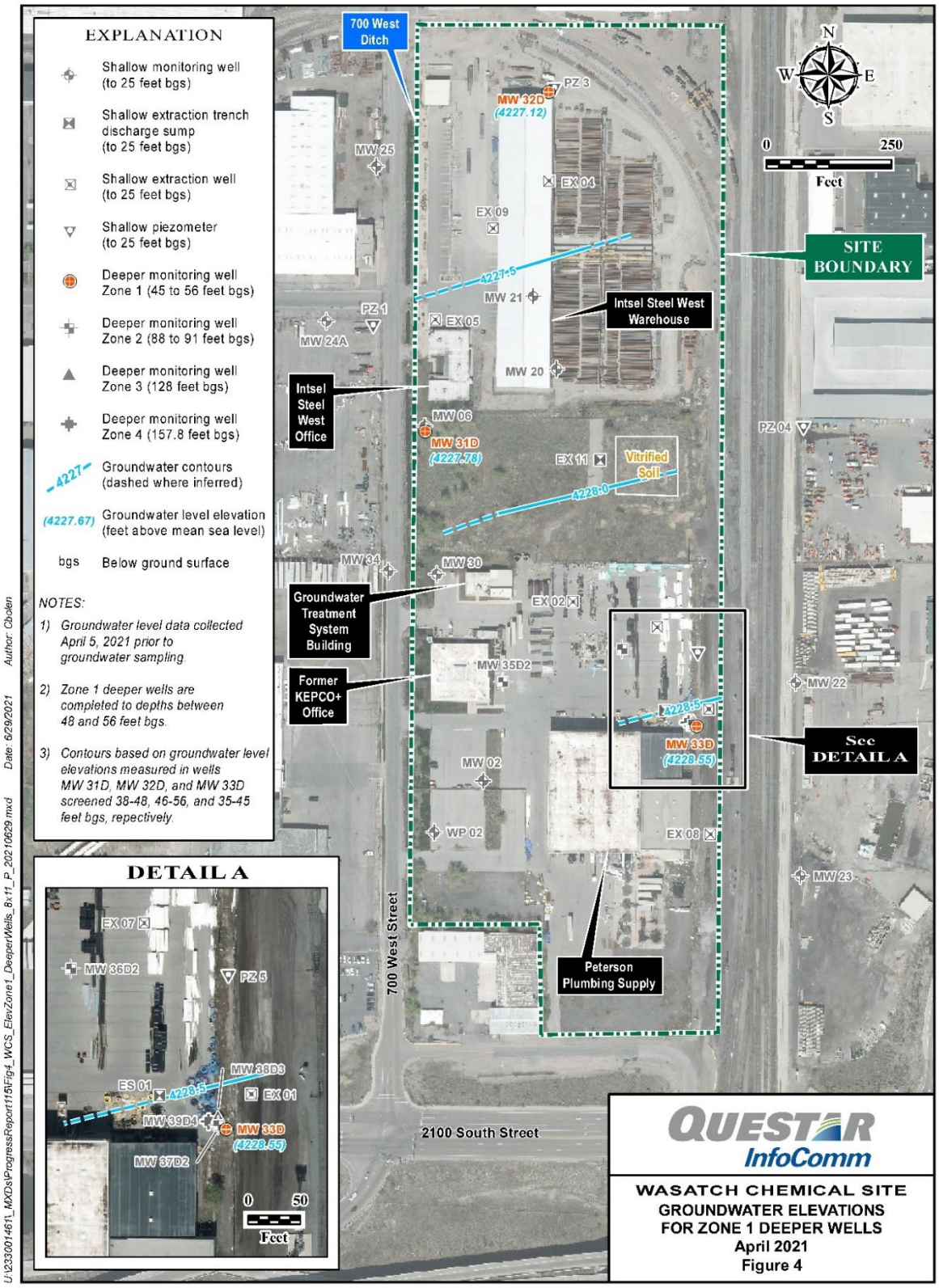
Source: Progress Report 115, Figure 1.

Figure C-3: Shallow Groundwater Elevations



Source: Progress Report 115, Figure 3.

Figure C-4: Deeper Zone 1 Groundwater Elevations



Source: Progress Report 115, Figure 4.

APPENDIX D – PRESS NOTICE

PUBLIC NOTICE
The U.S. Environmental Protection Agency, Region 8 Announces the Sixth Five-Year Review for the Wasatch Chemical Co. (Lot 6) Superfund Site in Salt Lake County, Utah

The U.S. Environmental Protection Agency (EPA), in cooperation with the State of Utah, is conducting the sixth five-year review of the Wasatch Chemical Co. (Lot 6) Superfund Site in Salt Lake County, Utah. Five-year reviews provide an opportunity to evaluate the implementation and performance of a remedy to determine whether it remains protective of human health and the environment. The sixth five-year review will be completed in 2022.

The 18-acre Site is located in Salt Lake City, Utah. From 1957 to 1971, Wasatch Chemical Company used the area to warehouse, produce and package industrial chemical products. Between the 1970s and 1992, site operations included blending and packaging pesticides, herbicides, fertilizers, industrial chemicals and cleaners. The company discharged wastewater into on-site tanks, evaporation ponds and onto the ground. These activities contaminated soil, sludge and groundwater. The site became a Superfund site when it was added to the National Priorities List in 1991. The Site's long-term remedy, selected in 1994, included: excavation, and consolidation or treatment of soil and sludge; landfarming of hydrocarbon-contaminated soil; groundwater extraction and treatment; and institutional controls.

Following cleanup, operation and maintenance activities are ongoing. Currently, an investigation is assessing shallow soil and deep groundwater contamination. We want to hear from you! Community members are encouraged to share information that may be helpful in the five-year review process.

Community members who have questions or who would like to participate in a community interview, are asked to contact:
Angela Zachman, EPA Remedial Project Manager, phone: 303-312-6923 0r email: Zachman.Angela@epa.gov, by July 29, 2022.

Due to Covid-19 the most current site information is only available online at:
https://www.epa.gov/superfund/wasatch-chemical

APPENDIX E – INTERVIEW FORMS

WASATCH CHEMICAL CO. (LOT 6) SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW FORM	
Site Name: Wasatch Chemical Co. (LOT 6)	
EPA ID: UTD000716399	
Interviewer name:	**Interviewer affiliation:**
Subject name: Dave Allison	**Subject affiliation:** UDEQ-DERR
Subject contact information: Community involvement	
Interview date: 12/9/2021	**Interview time:** N/A
Interview location:	
Interview format (circle one): In Person Phone Mail Email X Other:	
Interview category: State Agency	

1. **What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?** The majority of the cleanup work at Wasatch Chemical occurred prior to 2000, monitoring groundwater conditions is ongoing and potential indoor air was evaluated in the warehouses located on site. So, although the Monitored Natural Attenuation (MNA) is a long-term remedy, it's functioning and protective at this time. From a community involvement standpoint, the site is located in a commercial/industrial area, without a residential neighborhood, and no community interest expressed from the surrounding properties. Site conditions also do not present any current exposure pathways or health impacts to the occupying business employees. The land is still usable with operating businesses which is the best possible result at this time.

2. **What is your assessment of the current performance of the remedy in place at the Site?** The Wasatch Chemical site's soil and groundwater contamination are contained on the property and do not impede businesses operations located on or off site. Warehouse workers are protected as indoor air vapor was evaluated and, unless site conditions change, the MNA remedy is protective at this time. Institutional controls are in place and no new construction has occurred which would have disturbed groundwater or soil conditions since the last Five-Year Review. Outside of removing contaminated soils completely and the groundwater conditions clearing up, the site will always require operations and maintenance support.

3. **Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years?** DERR has not received any complaints over the years, including the last five, regarding the remedial efforts expressed by the community.

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.** There have not been any community involvement activities required for the Wasatch Chemical site. Any regular communications involve site team calls, discussing site monitoring reports with respective project managers and contractors. The UDEQ-DERR also participates in Five -Year Review site visits.

5. **Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy?** I'm not aware of any changes to state laws or permits over the last five years which have changed or affect the site remedy in any way.

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 (IC's) in place at Wasatch Chemical work and are protective of the current site use. I'm not aware of any incidents or activities regarding IC implementation

and good communication occurs with site contractors and project managers to address any potential site issues.

7. **Are you aware of any changes in projected land use(s) at the Site?** The current land use is in an area of Salt Lake City zoned only for commercial and industrial use and it is not anticipated to change in the near or distant future.

8. **Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?** No comments**.**

9. **Do you consent to have your name included along with your responses to this questionnaire in the FYR report?** I agree to have my name and responses used for the '22 Wasatch Chemical Five-Year Review.

Dominion Energy Services, Inc.
120 Tredegar Street, Richmond, VA 23219
DominionEnergy.com

BY ELECTRONIC MAIL

January 14, 2022

Mr. Treat Suomi
SKEO Solutions
100 10th St NE #101
Charlottesville, VA 22902

RE: ***Wasatch Chemical Superfund Site***
Salt Lake City, Utah
EPA Five Year Review Interview Form

Dear Mr. Suomi,

On behalf of Questar InfoComm, Inc., please find enclosed the completed EPA Five-Year Review (FYR) Questionnaire (PRP version) for the Wasatch Chemical Superfund Site located in Salt Lake City, Utah. The site is currently in a monitoring phase only, with no requirement for O&M services, therefore the FYR Questionnaire for a site O&M contractor is not applicable and not included herein.

If any questions arise regarding the form, please contact Mr. Donald Hintz at 804-273-3552 or by email at donald.hintz@dominionenergy.com, for further information.

Sincerely,

Audrey T. Bauhan
Director, Environmental

Attachment

ecc: Angela Zachman, USEPA – zachman.angela@epa.gov

Site Name: Wasatch Chemical CO. (Lot 6)	
EPA ID: UTD000716399	
Interviewer name:	**Interviewer affiliation:**
Subject name: Donald Hintz	**Subject affiliation: Dominion Energy Services, Inc. on behalf of Questar InfoComm, Inc.**
Subject contact information: Donald.hintz@dominionenergy.com	
Interview date: 1/12/22	**Interview time:**
Interview location:	
Interview format (circle one): In Person Phone Mail (Email) Other:	
Interview category: PRP	

1. **What is your overall impression of the remedial activities at the site?**

   The remedies at the site are currently protective of human health and the environment. The United States Environmental Protection Agency (USEPA) and Utah Department of Environmental Quality (UDEQ) certified completion of the land-farm remedy for soils in January 1994 and the in-situ vitrification remedial action work in May 1996 (Interstate Land, 1998). Shallow groundwater remediation and monitoring has been ongoing since 1995. Shallow groundwater data indicate that natural attenuation is occurring at the Site and has contributed to the reduction of PCE, TCE, and DCE concentrations and overall shallow groundwater plume stability. Recent Site maintenance and efficiency improvements included upgrades to the perimeter fence and replacement of the North Yard Drain System (NYDS) in 2021. The purpose of replacing the NYDS was to eliminate infiltration of groundwater into the drain system.

   Pertaining to reuse activities, in accordance with the Consent Decree and the List and Description of Institutional Controls for the Wasatch Chemical site ("Site"), Questar InfoComm notified USEPA and UDEQ in 2018 that the company had entered into an Agreement for Purchase and Sale of Real Estate with Simon Transport, LLC. The sale involved approximately 3.3 acres of Site property and an approximately 12,300 square foot office building located along 700 W Street (former KEPCO+ building). Additionally, the Peterson Plumbing Supply Company building has occupied part of the site under a lease arrangement prior to the previous Five-Year Review (FYR).

2. **What have been the effects of this Site on the surrounding community, if any?**

   Questar InfoComm is not aware of any negative effects to the local community resulting from the Wasatch Chemical Site following implementation of the remedy.

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

   The current ROD and Site Consent Decree address remediation of shallow groundwater with pump-and-treat technology and soil remediation that was deemed complete in 1994. After the

groundwater extraction and treatment system was shut down with EPA approval in 2003, remediation alternatives for shallow groundwater were evaluated in a Draft Focused Feasibility Study. With completion of the focused investigation, potential alternative endpoints for the Site, such as modifications to the shallow groundwater remedy and performance standards presented in the ROD and Site Consent Decree will be evaluated.

Shallow groundwater data indicate that natural attenuation is occurring at the Site and has contributed to the reduction of PCE, TCE, and DCE concentrations and overall shallow groundwater plume stability. Monitored Natural Attenuation (MNA) remains a potential alternative remedy for shallow groundwater at the Site, which includes a plume stability evaluation using statistical analyses following each spring monitoring event to support future decisions regarding the continued plume stability. These ongoing activities have been effective towards meeting remedial objectives at the site.

4. **Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents since implementation of the cleanup?**

Questar InfoComm is not aware of any complaints or inquiries regarding environmental issues or remedial actions at the Site since the last five-year review.

5. **Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future?**

Questar InfoComm is well-informed regarding activities at the Site given its status as responsible party under the 1991 consent decree and property owner. The Company maintains ongoing communication and coordination with U.S. EPA Region 8 and UDEQ related to site activities.

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

The Company maintains ongoing communication and coordination with U.S. EPA Region 8 and UDEQ related to the management and/or operation of the Site's remedy. With completion of the focused investigation, potential alternative remedial endpoints, modifications to the shallow groundwater remedy and performance standards as presented in the ROD and Site Consent Decree will be evaluated in the next FYR period.

7. **Do you consent to have your name included along with your responses to this questionnaire in the FYR report?**

Yes.

WASATCH CHEMICAL CO. (LOT 6) SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW FORM	
Site Name: Wasatch Chemical Co. (Lot 6)	
EPA ID: UTD000716399	
Interviewer name: Treat Suomi	**Interviewer affiliation:** Skeo
Interview date: 1/11/22	**Interview time:**
Interview location: 1887 S 700 W	
Interview format (circle one): In Person Phone Mail Email Other:	
Interview category: Local Business	

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date? Somewhat. However, we've had little or no information about what has taken place

2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)? We see the big piles of dirt but it has not impacted us.

3. What have been the effects of this Site on the surrounding community, if any? None that we are aware

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing? None that we are aware of.

5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future? We have received no information that I'm aware of

6. Do you own a private well in addition to or instead of accessing city/municipal water supplies? If so, for what purpose(s) is your private well used? No

7. Do you have any comments, suggestions or recommendations regarding any aspects of the project? We would like to know more information especially if there are risks to our employees that we need to communicate.

WASATCH CHEMICAL CO. (LOT 6) SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW FORM	
Site Name: Wasatch Chemical Co. (Lot 6)	
EPA ID: UTD000716399	
Interviewer name: Kirby Webster	**Interviewer affiliation: Skeo**
Subject name:	**Subject affiliation: Onsite Business**
Interview date: 1/18/2022	**Interview time:2:15 pm**
Interview format (circle one): In Person Phone Mail (Email) Other:	
Interview category: Local Business	

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

   Yes.

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

   I think everybody has done a good job.

3. What have been the effects of this Site on the surrounding community, if any?

   None that I am aware of.

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?

   We have had people break in and steal things from us but I don't think that has anything to do with the Site.

5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future?

   Yes. We had too much information and less would be better.

6. Do you own a private well in addition to or instead of accessing city/municipal water supplies? If so, for what purpose(s) is your private well used?

   No.

7. Do you have any comments, suggestions or recommendations regarding any aspects of the project?

   No.

APPENDIX F – SITE INSPECTION CHECKLIST

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: Wasatch Chemical Co. (Lot 6)	**Date of Inspection:** 10/26/2021
Location and Region: Salt Lake City, UT, 8	**EPA ID:** UTD000716399
Agency, Office or Company Leading the Five-Year Review: EPA Region 8	**Weather/Temperature:** Overcast, 45 degrees fahrenheit

Remedy Includes: (check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☒ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☒ Other: In-situ vitrification
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☒ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (check all that apply)

1. **O&M Site Manager** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____
   Problems, suggestions ☐ Report attached: _____

2. **O&M Staff** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____
   Problems/suggestions ☐ Report attached: _____

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 UDEQ-DERR
   Contact Dave Allison (Name) Project Manager (Title) 12/09/2021 (Date) _____ (Phone)
   Problems/suggestions ☐ Report attached: _____

   Agency _____
   Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone)
   Problems/suggestions ☐ Report attached: _____

   Agency _____
   Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone)
   Problems/suggestions ☐ Report attached: _____

   Agency _____
   Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone)
   Problems/suggestions ☐ Report attached: _____

   Agency _____

	Contact _____ Name	_____ Title	_____ Date	_____ Phone	
	Problems/suggestions ☐ Report attached: _____				
4.	**Other Interviews** (optional) ☐ Report attached: _____				
	PRP, Onsite Businesses				
	III. ON-SITE DOCUMENTS AND RECORDS VERIFIED (check all that apply)				
1.	**O&M Documents**				
	☒ O&M manual	☒ Readily available	☒ Up to date	☐ N/A	
	☒ As-built drawings	☒ Readily available	☒ Up to date	☐ N/A	
	☒ Maintenance logs	☒ Readily available	☒ Up to date	☐ 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: _____				
3.	**O&M and OSHA Training Records**	☒ Readily available	☒ Up to date	☐ N/A	
	Remarks: _____				
4.	**Permits and Service Agreements**				
	☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Other permits: _____	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
7.	**Groundwater Monitoring Records**	☒ Readily available	☐ Up to date	☐ N/A	
	Remarks: _____				
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
9.	**Discharge Compliance Records**				
	☐ Air	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	☒ N/A	

Remarks: _____

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for state

☐ PRP in-house ☒ Contractor for PRP

☐ Federal facility in-house ☐ Contractor for Federal facility

☐ _____

2. **O&M Cost Records**

☐ Readily available ☐ Up to date

☐ Funding mechanism/agreement in place ☒ Unavailable

Original O&M cost estimate: _____ ☐ Breakdown attached

Total annual cost by year for review period if available

From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs during Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing Damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A

Remarks: _____

B. Other Access Restrictions

1. **Signs and Other Security Measures** ☐ Location shown on site map ☒ N/A

Remarks: _____

C. Institutional Controls (ICs)

1. **Implementation and Enforcement**

Site conditions imply ICs not properly implemented ☒ Yes ☐ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (e.g., self-reporting, drive by): _____

Frequency: _____

Responsible party/agency: _____

Contact _____ _____ _____ _____

Name Title Date Phone no.

Reporting is up to date ☐ Yes ☐ No ☒ N/A

Reports are verified by the lead agency ☐ Yes ☐ No ☒ N/A

Specific requirements in deed or decision documents have been met ☒ Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ☒ No ☐ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks: Additional ICs are being considered.

D. General

1. **Vandalism/Trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks: _____

2. **Land Use Changes On Site** ☐ N/A

Remarks: Peterson Plumbing is now using more of the Site than before. In addition, there are now cat houses on top of the vitrified area for the use of stray cats.

3. **Land Use Changes Off Site** ☒ N/A

Remarks: _____

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☒ N/A

1. **Roads Damaged** ☐ Location shown on site map ☐ Roads adequate ☐ N/A

Remarks: _____

B. Other Site Conditions

Remarks: _____

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

IX. GROUNDWATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps and Pipelines ☒ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing and Electrical**

☒ Good condition ☐ All required wells properly operating ☐ Needs maintenance ☐ N/A

Remarks: _____

2. **Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☒ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☒ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

B. Surface Water Collection Structures, Pumps and Pipelines ☐ Applicable ☒ N/A

C. Treatment System ☒ Applicable ☐ N/A

1. **Treatment Train** (check components that apply)

☐ Metals removal ☐ Oil/water separation ☐ Bioremediation

☐ Air stripping ☐ Carbon adsorbers

☐ Filters: _____

☐ Additive (e.g., chelation agent, flocculent): _____

☐ Others: _____

☐ Good condition ☐ Needs maintenance

☐ Sampling ports properly marked and functional

☐ Sampling/maintenance log displayed and up to date

☐ Equipment properly identified

☐ Quantity of groundwater treated annually: _____

☐ Quantity of surface water treated annually: _____

Remarks: _____

2. **Electrical Enclosures and Panels** (properly rated and functional)

☐ N/A ☒ Good condition ☐ Needs maintenance

Remarks: _____

3. **Tanks, Vaults, Storage Vessels**

☐ N/A ☒ Good condition ☐ Proper secondary containment ☐ Needs maintenance

Remarks: _____

4. **Discharge Structure and Appurtenances**

☒ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

5. **Treatment Building(s)**

☐ N/A ☒ Good condition (esp. roof and doorways) ☐ Needs repair

☐ Chemicals and equipment properly stored

Remarks: _____

6. **Monitoring Wells** (pump and treatment remedy)

☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition

☐ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: _____

D. Monitoring Data

1. **Monitoring Data**

☒ Is routinely submitted on time ☒ Is of acceptable quality

2. **Monitoring Data Suggests:**

☒ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs maintenance ☒ N/A

Remarks: _____

X. OTHER REMEDIES

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.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

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).
The EPA and the PRP are discussing the groundwater remediation progress to date and will develop a groundwater exit strategy.

B. Adequacy of O&M

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.
O&M plan and requirements will be updated.

C. Early Indicators of Potential Remedy Problems

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.
None noted.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.
None noted.

Site inspection participants

Dave Allison (UDEQ)
Tony Howes (UDEQ)
Scott Bassett (Dominion Energy)
Susan Eyzaguirre (Stantec)
Stacey Arens (Stantec)
Adam Plonsky (Dominion Energy)
Don Hintz (Dominion Energy)
Dan Robertson (Dominion Energy)
Tina Maniatis (Dominion Energy)
Treat Suomi (Skeo)

APPENDIX G – SITE INSPECTION PHOTOS

New fencing and gate leading to vitrified area

New asphalt and surface water drainage in parking lot used by Peterson Plumbing

Soil from drain work

Cat houses for stray cats on vitrified area

Former evaporation pond and vitrified soil

Vitrified soil

Monitoring well MW-33D


Monitoring well cluster (MW-33, MW-37 and MW-39)

Monitoring well MW-30


Monitoring well MW-34

Intsel Steel, from the vitrified soil area

Intsel Steel

Peterson Plumbing

Peterson Plumbing storage area

New fence and former water treatment plant (not operating)

Interior of water treatment plant (not operating)

APPENDIX H – ENVIRONMENTAL COVENANT

10597953

1093304

When Recorded Return To:
David S. Andersen
Questar InfoComm, Inc.
180 East 100 South
P.O. Box 45360
Salt Lake City, Utah 84145-0360

10597953
01/14/2009 08:57 AM $59.00
Book - 9674 Pg - 1379-1401
GARY W. OTT
RECORDER, SALT LAKE COUNTY, UTAH
QUESTAR INFOCOMM INC
DAVID S ANDERSEN
PO BOX 45360
SLC UT 84145
BY: ZJM, DEPUTY - WI 23 P.

With Copy To:
Division Director
Division of Environmental Response and Remediation
Utah Department of Environmental Quality
168 North 1950 West
P.O. Box 144840
Salt Lake City, Utah 84114-4840

and

Regional Institutional Control Coordinator, EPR-SR
U.S. Environmental Protection Agency
1595 Wynkoop Street
Denver, CO 80202

ENVIRONMENTAL COVENANT

This Environmental Covenant is entered into by Questar InfoComm, Inc. ("Questar InfoComm"), the United States Environmental Protection Agency ("EPA") and the Utah Department of Environmental Quality ("UDEQ") pursuant to Utah Code Ann. §§ 57-25-101 *et seq.* for the purpose of subjecting the Property described in Paragraph 2 below to the activity and use limitations set forth herein. The EPA and UDEQ each enter into this Environmental Covenant as an agency as defined in Utah Code Ann. § 57-25-102(2). Neither the EPA nor the UDEQ affirmatively assume any obligation through the entry of this Environmental Covenant. The Property is part of the Wasatch Chemical Superfund Site, located at 1987 South 700 West, Salt Lake City, Salt Lake County, Utah, as depicted more particularly on the map attached hereto as Exhibit A and incorporated herein by this reference (the "Site"), and includes certain real property more particularly described on Exhibit B attached hereto and incorporated herein by this reference and in Paragraph 2 below. This Environmental Covenant incorporates and amends the ongoing institutional controls, referred to herein as activity and use limitations, identified in the List and Description of Institutional Controls, which was recorded in the Salt Lake County Recorder's Office (Book 7682 Pages 0014-0021), a copy of which is attached as Exhibit C and incorporated herein by this reference except as amended herein.

Questar InfoComm is the current owner of the Property. Questar InfoComm is the corporate successor by merger to Interstate Land Company, the former Owner Settling Defendant, and a corporate affiliate to Questar Market Resources, Inc., formerly known as Entrada Industries, Inc., the original Owner Settling Defendant under the Consent Decree entered by the United States District Court for the District of Utah, Central Division, in the matter of *Utah Department of Health v. Peter Ng, et al.*, Civil Action No. 86-C-0023G and *United States*

of America v. Entrada Industries, Inc., et al., Civil Action No. 91-C-1194S (consolidated with Utah Department of Health) (the "Consent Decree") on September 4, 1992. As a result of the transfer in ownership of the Property from Entrada Industries, Inc. to Interstate Land Company on April 16, 1997, the latter assumed the obligations of Entrada Industries, Inc., as Owner Settling Defendant. The Consent Decree was amended by the Court on March 17, 1997 to reflect this change in ownership. On June 1, 2004, Interstate Land Company merged into Questar InfoComm and by operation of law became the new and current owner of the Property. Thus, Questar InfoComm is the corporate successor-in-interest to Interstate Land Company, is a corporate affiliate to Questar Market Resources, Inc., formerly known as Entrada Industries, Inc., and is the successor–in-title of the Property to Entrada Industries, Inc. and Interstate Land Company.

Environmental Response Project

The Consent Decree required Entrada Industries, Inc. to conduct remedial design and remedial action activities at the Site. Remedial action activities at the Site have included the excavation and treatment of contaminated soils through *in-situ* vitrification, land farming, groundwater extraction and treatment, enhanced *in-situ* bioremediation, monitored natural attenuation and environmental monitoring programs.

In January 1996, the EPA certified the completion of the soil remedial action at the Site. Groundwater extraction and treatment operations began in August 1995. In accordance with a groundwater monitoring plan approved by the EPA, Entrada Industries, Inc. and its successors-in-title to the Property, Interstate Land Company and Questar InfoComm (collectively "QIC"), have collected and analyzed groundwater samples on the Site since March 1995. Based on groundwater monitoring data between May 2004 and April 2007, concentrations of contaminants of concern ("COC") are either below the maximum contaminant levels ("MCL") or the concentration trend is inferred to be asymptotic at a concentration above the MCL according to the EPA Third Five Year Review Report (September 28, 2007, at page 2). In addition, a fifty (50) percent reduction in COC concentrations has been achieved (since the establishment of a groundwater condition baseline in 1995) at most groundwater monitoring stations. Id. The EPA approved the discontinuation of groundwater extraction and treatment in January 2003 because significant reductions in contaminant levels were no longer evident. A monitored natural attenuation program began immediately following the discontinuation of groundwater extraction and treatment at the Site. In an effort to accelerate degradation of chlorinated hydrocarbons at the Site, enhanced biodegradation activities were conducted in May 2004 and July 2006. Monitored natural attenuation, including biannual groundwater monitoring, remain ongoing.

Because hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unrestricted use and unlimited exposure, components of the remedial action also include Proprietary and Governmental Institutional Controls.

Now therefore, Questar InfoComm, the EPA and UDEQ agree to the following:

1. Environmental Covenant. This instrument is an environmental covenant developed and executed pursuant to Utah Code Ann. §§ 57-25-101 *et seq.*

2. Property. This Environmental Covenant concerns the Wasatch Chemical portion of the Wasatch Chemical Superfund Site, an approximately 18 acre site located in an industrial area at 1987 South 700 West, Salt Lake City, Salt Lake County, Utah, as depicted more particularly on the map attached hereto as Exhibit A, and includes certain real property more particularly described on Exhibit B (the "Property").

3. Owner. The owner of the Property is Questar InfoComm, Inc., whose business address is 180 East 100 South, Salt Lake City, Utah 84111. Consistent with Paragraph 6 of this Environmental Covenant, the obligations of Owner are imposed on its assigns and successors in interest, including any Transferee. The term "Transferee" as used in this Environmental Covenant, includes the future owner of any interest in the Property or any portion thereof, including, but not limited to, owners of an interest in fee simple, mortgagees, easement holders and/or lessees.

4. Holders. Owner, Questar InfoComm, whose address is listed above, is the holder of this Environmental Covenant, as defined in Utah Code Ann. § 57-25-102(6). The Holder agrees to enforce the activity and use limitations herein.

5. Activity and Use Limitations. As part of the remedial action for the Site, the EPA and UDEQ determined that certain activity and land use limitations are necessary for the Property in order to notify any future owners who have any interest in the Property, or any portion thereof, that the Property is subject to the Consent Decree, to minimize human exposure to any residual contaminants, to prevent future residential use of the Property and to assure that any future owners of the Property, or any portion thereof, will implement, administer and maintain all activity and land use limitations concerning the Property. The activity and land use limitations are identified in the List and Description of Institutional Controls, which was previously recorded in the Salt Lake County Recorder's Office. This Environmental Covenant amends the List and Description of Institutional Controls to include an additional limitation that addresses potential contaminant vapor intrusion in Paragraph 5.2.10 below and to substitute a new groundwater institutional control in Paragraph 5.3.1 below for the groundwater institutional control in Paragraph 10 of the List and Description of Institutional Controls. Accordingly, Owner agrees to implement, administer and maintain and, in the event that it conveys or transfers an interest in the Property, or any portion thereof, to another party, to take the necessary measures to ensure that such party implements, administers and maintains, the following activity and land use limitations as they pertain to the Property:

5.1. List and Description of Institutional Controls

Owner, or its Transferees, as appropriate, shall comply with the List and Description of Institutional Controls recorded in the Salt Lake County Recorder's Office (Book 7682 Pages 0014-0021), a copy of which is attached as Exhibit C and incorporated herein by this reference, except as otherwise amended herein. If there is a conflict between the activity and use limitations in this Environmental Covenant and the List and Description of Institutional Controls, the provisions of this Environmental Covenant shall control.

5.2. Proprietary Institutional Controls

5.2.1. Owner, or its Transferees, as appropriate, shall maintain the existing fence and associated warning signs surrounding the Property perimeter to restrict access to the Property. The existing six-foot-high, galvanized, chain-link fence contains three strands of barbed wire strung along the top of the fence. Metal warning signs are posted along the fence that read "Keep Out" and "No Trespassing." To maintain these restrictions, Owner, or its Transferees, as appropriate, shall conduct monthly inspections at the Property to assure that the fence and warning signs are in good condition. These Institutional Controls shall remain in effect until the EPA certifies completion of the Remedial Action for Soils, Sludges and Dioxin Removal Wastes and also certifies completion of the Remedial Action for Ground Water, pursuant to paragraph 53 of the Consent Decree.

5.2.2. Owner, or its Transferees, as appropriate, agrees that the Holder, the Settling Defendants (which defendants are Questar Corporation, Questar Gas Company, formerly known as Mountain Fuel Supply Company and Questar Market Resources, Inc., formerly known as Entrada Industries, Inc.), the United States, the State of Utah and their respective representatives, including the EPA and UDEQ and their contractors, shall have access at all times to the Site and any other property to which access is required for the implementation of the Consent Decree. Without limiting the EPA and UDEQ's access rights in the previous sentence, Owner hereby grants to the EPA and UDEQ, their agents, contractors and employees the right to access the Property at all reasonable times for implementation or enforcement of this Environmental Covenant. In addition, Owner hereby grants the Settling Defendants under the Consent Decree and their respective successors, representatives and contractors access to the Property to monitor, sample, implement the remedial action, maintain the existing remedy and to take action necessary to protect public health and the environment. To the extent that the Site or any other property to which access is required for implementation of the Consent Decree is owned or controlled by persons other than Owner, then Owner, or its Transferees, as appropriate, shall use best efforts to secure from such persons access for itself, the Settling Defendants, the United States, the State of Utah and their respective representatives, including the EPA and UDEQ and their contractors, as necessary to effectuate the Consent Decree.

5.2.3. The Property is subject to the Consent Decree in *United States of America v. Entrada Industries, Inc., et al.*, Civil Action No. 91-C-1194S and *Utah Department of Health v. Peter Ng, et al.*, Civil Action No. 86-C-0023G and any lien retained by the United States. The Consent Decree was recorded in the Salt Lake County Recorder's Office, Book 6539, Page 2706.

5.2.4. The Property is also subject to a Notice of Obligations to: (i) provide access to the Site under Section XII (Access) of the Consent Decree and (ii) implement, administer and maintain Institutional Controls under Section X (Institutional Controls) of the Consent Decree, which was recorded in the Salt Lake County Recorder's Office at Book 6539, Page 2827. In addition, the Property is subject to the List and Description of Institutional Controls, as amended herein, that lists and describes the Institutional Controls to be implemented, administered and maintained by Questar InfoComm, which was recorded in the Salt Lake County Recorder's Office at Book 7682 Pages 0014-0021).

5.2.5. Owner, or its Transferees, as appropriate, shall prohibit the residential use of the Property.

5.2.6. Owner, or its Transferees, as appropriate, shall provide at least 30-days notice to the EPA and UDEQ prior to demolition of Buildings A, B, C, F, G, H, I, J, K, M, N or O and prior to removal of the foundation floors of those buildings at the Property.

5.2.7. In accordance with paragraph 11.c of the Consent Decree, Owner, or its Transferees, as appropriate, of the Property, or any portion thereof, shall, at least 30 days prior to the conveyance of any such interest, give written notice of the Consent Decree to the grantee and written notice to the EPA and UDEQ of the proposed conveyance, including the name and address of the grantee, and the date on which notice of the Consent Decree was given to the grantee. In the event of any such conveyance, the Settling Defendants' obligations under the Consent Decree shall continue to be met by the Settling Defendants. In addition, if the United States approves, the grantee may perform some or all of the Work. In no event shall the conveyance of an interest in the Property that includes, or is a portion of, the Site release or otherwise affect the obligation of the Settling Defendants to comply with the Consent Decree.

5.2.8. Owner, or its Transferees, as appropriate, shall not seek a change to the local zoning master plan or to rezone the Property, or any portion thereof, included within the Site to allow residential use thereof.

5.2.9. If Owner, or its Transferees, as appropriate, is advised by either Salt Lake City Corporation or the Salt Lake City Planning Department of any proposed change in zoning or land use concerning the Property, or any portion thereof, included within the Site, Owner, or its Transferees, as appropriate, shall advise the EPA and UDEQ of such proposal as soon as practicable after learning of such proposal.

5.2.10. Owner, or its Transferees, shall assess the risks related to contaminant vapor intrusion prior to seeking approval of a building permit for any newly-constructed occupied structure on the Property. If there are risks, Owner shall mitigate them. Alternatively, if no risk assessment for contaminant vapor intrusion is conducted, Owner shall install a passive vapor mitigation system on any newly-constructed occupied structure on the Property.

5.3. Governmental Institutional Controls

5.3.1. The Utah Division of Water Rights ("UDWR") has included in its computer system the groundwater area impacted by contamination at and from the Site. The system will produce a warning e-mail notification whenever there is an application to divert water from this impacted groundwater area. The UDWR will send the notification to Owner, the UDEQ and optionally to the EPA. In the event that a diversion application is filed with the UDWR, Owner, or its Transferees, as appropriate, shall file a protest to try to ensure that groundwater beneath the Site is not diverted from the Site.

5.3.2. QIC has provided copies of first quarterly and later biannual ground water monitoring reports to the UDWR since 1995. Questar InfoComm, or its

Transferees, as appropriate, shall continue to provide to the UDWR copies of biannual ground water monitoring reports prepared in connection with ground water remediation and monitoring at the Site.

6. Running with the Land. This Environmental Covenant shall be binding upon Owner and all assigns and successors in interest, including any Transferee, and shall run with the land, pursuant to Utah Code Ann. § 57-25-105, subject to amendment or termination as set forth herein.

7. Compliance Enforcement. Compliance with this Environmental Covenant may be enforced pursuant to Utah Code Ann. § 57-25-111. Failure to timely enforce compliance with this Environmental Covenant or the activity and use limitations contained herein by any party shall not bar subsequent enforcement by such party and shall not be deemed a waiver of the party's right to take action to enforce any subsequent non-compliance. Nothing in this Environmental Covenant shall restrict the EPA or UDEQ from exercising any authority under applicable law. This Environmental Covenant may also be enforced by the EPA pursuant to the Consent Decree, entered September 4, 1992.

8. Rights of Access. Rights of access to the Holder, the Settling Defendants, the United States, the State of Utah and their respective representatives, including the EPA and UDEQ and their contractors, are set forth more particularly in Paragraph 5.2.2, above.

9. Compliance Reporting. Upon request, Owner shall submit to the EPA and UDEQ written verification of compliance with the activity and use limitations contained herein.

10. Notice upon Conveyance. Each instrument hereafter conveying any interest in the Property or any portion of the Property shall contain a notice of the activity and use limitations set forth in this Environmental Covenant and provide the recorded location of this Environmental Covenant. The notice shall be substantially in the following form:

THE INTEREST CONVEYED HEREBY IS SUBJECT TO AN ENVIRONMENTAL COVENANT, DATED _____, 2008, RECORDED IN THE DEED OR OFFICIAL RECORDS OF THE SALT LAKE COUNTY RECORDER ON _____, 2008, IN [DOCUMENT ____, OR BOOK___, PAGE ____,]. THE ENVIRONMENTAL COVENANT CONTAINS THE FOLLOWING ACTIVITY AND USE LIMITATIONS:

THE LANGUAGE OF PARAGRAPH NO. 5 Of THIS ENVIRONMENTAL COVENANT, ACTIVITY AND USE LIMITATIONS, IS INCORPORATED HEREIN VERBATIM BY REFERENCE.

11. Representations and Warranties.

11.1 Questar InfoComm, the successor-in-title to Entrada Industries, Inc. and Interstate Land Company, hereby represents and warrants to the other signatories hereto:

11.1.1 that Questar InfoComm is the sole fee owner of the Property;

11.1.2. that, except for the (i) interests of Peterson Plumbing Supply, which leases a portion of the Property and owns Buildings C, K and J, (ii) Kepco+ Incorporated, which leases the office building space (Building A) on the Property and (iii) Questar Gas, which leases land on Lot 5 of the Property, Questar InfoComm holds fee simple title to the Property which is free, clear and unencumbered;

11.1.3. that Questar InfoComm has identified all other persons that own an interest in or hold an encumbrance on the Property and has notified such persons that Questar InfoComm's has entered into this Environmental Covenant;

11.1.4 that this Environmental Covenant will not materially violate or contravene or constitute a material default under any other agreement, document or instrument to which Questar InfoComm is a party or by which Questar InfoComm may be bound or affected; and

11.1.5 that to the extent that any other interests in or encumbrances on the Property conflict with the activity and use limitations set forth in this Environmental Covenant, the persons who own such interests or hold such encumbrances have agreed to subordinate such interests or encumbrances to the Environmental Covenant, pursuant to Utah Code Ann. §§ 57-25-103(4)(a).

11.2. Questar InfoComm further represents that it has the power and authority to enter into this Environmental Covenant, to grant the rights and interests herein provided and to carry out all obligations hereunder.

12. Amendment or Termination. This Environmental Covenant may be amended or terminated pursuant to Utah Code Ann. §§ 57-25-109 and 110 and other applicable law. The term "Amendment," as used in this Environmental Covenant, shall mean any changes to the Environmental Covenant, including the activity and use limitations set forth herein, or the elimination of one or more activity and use limitations when there is at least one limitation remaining. The term "Termination," as used in this Environmental Covenant, shall mean the elimination of all activity and use limitations set forth herein and all other obligations under this Environmental Covenant. Within thirty (30) days of signature by all requisite parties on any Amendment or Termination of this Environmental Covenant, Owner, or its Transferees, as appropriate, shall file such instrument for recording in the Salt Lake County Recorder's Office and shall provide a file- and date-stamped copy of the recorded instrument to the EPA, UDEQ and Settling Defendants.

13. Severability. If any provision of this Environmental Covenant is found to be unenforceable in any respect, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired.

14. Governing Law. This Environmental Covenant shall be governed by and interpreted in accordance with the laws of the State of Utah.

15. Recordation. Within thirty (30) days after the date of the final required signature upon this Environmental Covenant, Questar InfoComm shall file this Environmental Covenant for recording, in the same manner as a deed to the Property, in the Salt Lake County Recorder's Office.

16 Effective Date. The effective date of this Environmental Covenant shall be the date upon which the fully executed Environmental Covenant has been recorded as a document of record for the Property in the County Recorder.

17. Distribution of Environmental Covenant. Questar InfoComm shall distribute a file- and date-stamped copy of the recorded Environmental Covenant to: the EPA, UDEQ and Settling Defendants.

18. Notice. Unless otherwise notified in writing by or on behalf of a Holder, the EPA or UDEQ, any document or communication required by this Environmental Covenant shall be submitted to:

Owner and Holder:
Questar InfoComm, Inc.
Attn: Director of Environmental and Safety Services
1140 West 200 South
Salt Lake City, Utah 84104

With a copy to

General Counsel
Questar InfoComm, Inc.
180 East 100 South
P.O. Box 45360
Salt Lake City, Utah 84145-0360

EPA:
Regional Institutional Control Coordinator, EPR-SR
U.S. EPA
1595 Wynkoop Street
Denver, CO 80202

UDEQ:
Brad T. Johnson
Utah Department of Environmental Quality
Division of Environmental Response and Remediation
168 North 1950 West
Salt Lake City, Utah 84116

The undersigned representative of Owner represents and certifies that he is authorized to execute this Environmental Covenant.

IT IS SO AGREED:

QUESTAR INFOCOMM, INC.

By: _____
Shahab Saeed, Chief Operating Officer

12-18-08
Date

State of Utah_____)
) ss:
County of Salt Lake_____)

Before me, a notary public, in and for said county and state, personally appeared Shahab Saeed, a duly authorized representative of Questar InfoComm, Inc., who acknowledged to me that he did execute the foregoing instrument on behalf of Questar InfoComm, Inc.

IN TESTIMONY WHEREOF, I have subscribed my name and affixed my official seal this 18th day of December, 2008.

Pamela Ramos
Notary Public

NOTARY PUBLIC
PAMELA RAMOS
180 East 100 South
Salt Lake City, Utah 84111
My Commission Expires
November 27, 2010
STATE OF UTAH

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

Bill Murray, Director
Superfund Remedial Response Program
Office of Ecosystems Protection and Remediation
U.S. Environmental Protection Agency, Region 8

Date 1/6/09

State of Colorado)
) ss:
County of Denver)

Before me, a notary public, in and for said county and state, personally appeared Bill Murray, Director of the Superfund Remedial Response Program, Office of Ecosystems Protection and Remediation at the United States Environmental Protection Agency, Region 8, who acknowledged to me that they did execute the foregoing instrument.

IN TESTIMONY WHEREOF, I have subscribed my name and affixed my official seal this 6th day of January, 2009.

Notary Public

UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY

The Utah Department of Environmental Quality authorized representative identified below hereby approves the foregoing Environmental Covenant pursuant to Utah Code Ann. Sections 57-25-102(2) and 57-25-104(1)(e).

By _____ 12/23/2008
Date

Name: Brad T Johnson
Title: Director, Division of Environmental Response and Remediation,
Utah Department of Environmental Quality

STATE OF UTAH)
: ss.
County of Salt Lake)

Before me, a notary public, in and for said county and state, personally appeared Brad T Johnson, an authorized representative of the Utah Department of Environmental Quality, who acknowledged to me that he did execute the foregoing instrument this 23rd day of December, 2008.

Notary Public
My Commission expires: 7-13-2011

ROSALINDA KENWORTHY
NOTARY PUBLIC-STATE OF UTAH
12830 S. REDWOOD RD.
RIVERTON, UT 84065
COMM. EXP. 07-13-2011

4840-3036-9026.7

EXHIBIT A

MAP OF PROPERTY

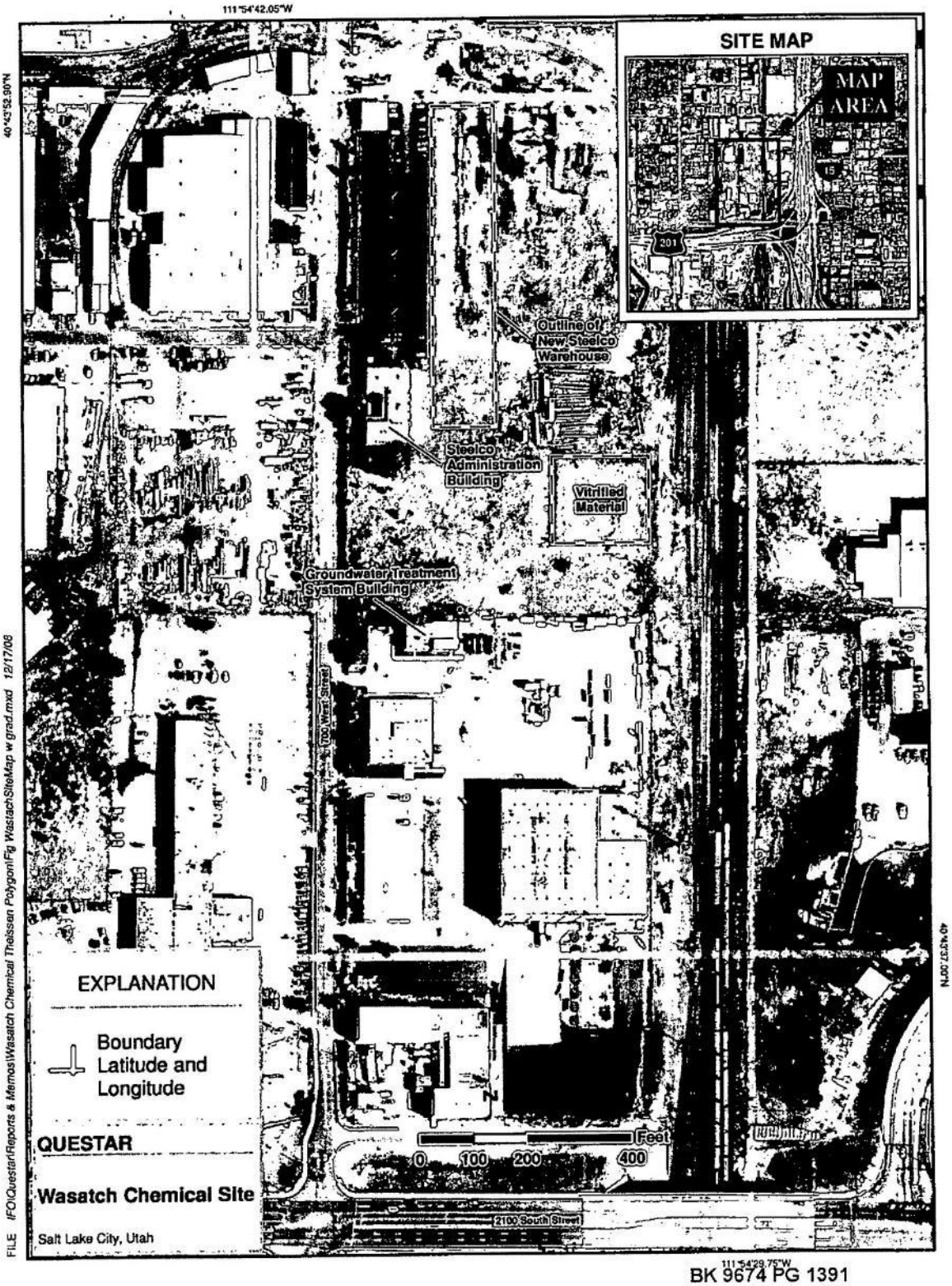


EXHIBIT B

DESCRIPTION OF PROPERTY

Beginning North 00°00'15" West 1.33 feet from the Southwest corner of Lot 6, Block 1, Five Acre Plat B, Big Field Survey; North 00°00'15" West 285.77 feet; South 89°53'34" East 384 feet; South 175 feet; East 175 feet; South 00°00'15" East 110.77 feet; North 89°53'34" West 559 feet to the point of beginning. VTDI-15-13-351-007-0000.

Beginning 200 feet West from the Northeast corner of Lot 6, Block 1, Five Acre Plat B, Big Field Survey; West 175 feet; South 175 feet; East 175 feet; North 175 feet to the point of beginning. VTDI-15-13-351-006-0000.

Beginning at the Southwest corner of Lot 6, Block 1, Five Acre Plat B, Big Field Survey; North 00°00'15" West 1.33 feet; South 89°53'34" East 559 feet; South 00°00'15" East 1.33 feet; North 89°53'34" West 559 feet to the point of beginning. VTDI-15-13-351-008-0000.

West 559 feet of Lots 4 and 5, Block 1, Five Acre Plat B, Big Field Survey. VTDI-15-13-351-003-0000.

Commencing at the Northwest corner of Lot 3, Block 1, Five Acre Plat B, Big Field Survey; South 89°53'34" East 559 feet; South 00°00'15" East 372.2 feet; North 89°58'30" West 296 feet; North 00°00'15" West 205.62 feet; North 89°53'34" West 263 feet; North 00°00'15" West 167 feet to the point of beginning. VTDI-15-13-351-004-0000.

EXHIBIT C

LIST AND DESCRIPTION OF INSTITUTIONAL CONTROLS

6659923
08/03/97 4:09 PM 27.00
NANCY WORKMAN
RECORDER, SALT LAKE COUNTY, UTAH
PARSON BEHLE & LATIMER
PO BOX 45898
SLC UT 84145
REC BY:L NISH ,DEPUTY - WI

WHEN RECORDED, RETURN TO:

Hal J. Pos
Parsons Behle & Latimer
201 South Main Street, Suite 1800
P.O. Box 45898
Salt Lake City, Utah 84145-0898

6659923

LIST AND DESCRIPTION OF INSTITUTIONAL CONTROLS

This List and Description of Institutional Controls is executed by Entrada Industries, Inc., the Owner Settling Defendant under the Consent Decree entered by the United States District Court for the District of Utah, Central Division, in the matter of Utah Department of Health v. Peter Ng, et al., Civil Action No. 86-C-0023G and United States of America v. Entrada Industries, Inc., et al., Civil Action No. 91-C-1194S (consolidated with Utah Department of Health) (the "Consent Decree") and is made with respect to the real property referred to as the Wasatch Chemical Superfund Site, located at 1987 South 700 West, Salt Lake City, Salt Lake County, Utah, as depicted more particularly on the map attached hereto as Exhibit "A" and incorporated herein by this reference (the "Site"), and includes certain real property more particularly described on Exhibit "B" attached hereto and incorporated herein by this reference.

In accordance with Paragraph 11.b. of the Consent Decree, Entrada Industries, Inc. is required to prepare and record with the Salt Lake County Recorder's Office, within fifteen (15) days of approval by the United States Environmental Protection Agency ("EPA") of Institutional Controls, this list and description of Institutional Controls to be implemented, administered, and maintained by Entrada Industries ("proprietary Institutional Controls") and this list and description of Institutional Controls relating to ground water which the State of Utah has sole authority to implement, administer, and maintain ("governmental Institutional Controls").

Entrada Industries, Inc., and its successors-in-title (collectively "Entrada Industries"), shall fully implement, administer, and maintain on behalf of all Settling Defendants (Entrada Industries, Inc., Mountain Fuel Supply Company and Questar Corporation) to the Consent Decree all "proprietary Institutional Controls" for the Site required under the Consent Decree. The following proprietary and governmental Institutional Controls have been established for the Site. All Institutional Controls shall be enforced through the Consent Decree.

A more complete description of the Institution Controls for the Site can be found in Appendix A of the Final Design Report for Soil and Appendix A of the Final Design Report for Groundwater, dated September 1996.

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Proprietary Institutional Controls

1. Entrada Industries shall maintain the existing fence and associated warning signs surrounding the Site perimeter to restrict access to the Site. The existing six-foot-high, galvanized, chain-link fence contains three strands of barbed wire strung along the top of the fence. Metal warning signs are posted along the fence that read "Keep Out" and "No Trespassing." To maintain these restrictions, Entrada Industries shall conduct monthly inspections at the Site to assure that the fence and warning signs are in good condition. These Institutional Controls shall remain in effect until EPA certifies completion of the Remedial Action for Soils, Sludges, and Dioxin Removal Wastes, and also certifies completion of the Remedial Action for Ground Water, pursuant to paragraph 53 of the Consent Decree.

2. Settling Defendants agree that the United States, the State of Utah and their respective representatives, including EPA and its contractors, shall have access at all times to the Site and any other property to which access is required for the implementation of the Consent Decree, to the extent access to the property is controlled by the Settling Defendants, for the purposes of conducting any activity related to the Consent Decree. To the extent that the Site or any other property to which access is required for implementation of the Consent Decree is owned or controlled by persons other than the Settling Defendants, the Settling Defendants shall use best efforts to secure from such persons access for the Settling Defendants, as well as for the United States, the State of Utah, and their representatives, including EPA and its contractors, as necessary to effectuate the Consent Decree.

3. EPA and the Utah Department of Environmental Quality ("UDEQ") have determined that Institutional Controls are necessary to prevent residential use of the property within the Site in the future and to notify any future owners of the property included within the Site of its status as a Superfund Site. These objectives shall be accomplished as follows:

a. Inclusion of a notice in each deed, title, or other instrument conveying an interest in the property included within the Site stating that the property is subject to the Consent Decree in United States of America v. Entrada Industries, Inc., et al., Civil Action No. 91-C-1194S and Utah Department of Health v. Peter Ng, et al., Civil Action No. 86-C-0023G, and any lien retained by the United States. The notice shall reference the recorded location of the Consent Decree (Book 6539, Page 2706).

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b. Within 15 days after the entry of the Consent Decree, the Owner Settling Defendant (Entrada Industries, Inc.) recorded with the Recorder's Office, Salt Lake County, Utah (Book 6539, Page 2827) a Notice of Obligations to: (i) provide access to the Site under Section VII (Access) of the Consent Decree, and (ii) implement, administer and maintain Institutional Controls under Section X (Institutional Controls) of the Consent Decree. Within 15 days of approval by EPA of the Institutional Controls pursuant to the Consent Decree and the Statement of Work, Entrada Industries Inc. shall record with the Recorder's Office this list and description of Institutional Controls to be implemented, administered and maintained by Entrada Industries, and this list and description of Institutional Controls relating to ground water which the State of Utah has sole authority to implement, administer and maintain. Thereafter, each subsequent deed, title or instrument conveying an interest in the property included within the Site shall reference the recorded location of such notice and covenants applicable to the property.

c. Inclusion in each deed, title or instrument conveying an interest in the property included within the Site owned by the Settling Defendants and any other persons, and any person to whom they transfer that property, of a covenant prohibiting residential use of that property.

To meet these objectives with respect to property included within the Site owned by third parties, the Settling Defendants shall sign letter agreements, which need not be recorded, with the other owners of property included within the Site, namely, Alta Industries, Ltd. and Southern Pacific Lines, assuring that those property owners shall implement the Institutional Controls identified in paragraph 3. These notice requirements in paragraph 3 shall remain in effect in perpetuity.

4. Settling Defendants shall provide at least 30-days notice to EPA and UDEQ prior to demolition of Buildings A, B, C, F, G, H, I, J, K, M, N, or O, and prior to removal of the foundation floors of those buildings at the Site. This notice requirement shall remain in effect in perpetuity.

5. In accordance with paragraph 11.a of the Consent Decree, Entrada Industries, Inc. recorded a certified copy of the Consent Decree with the Salt Lake County Recorder's Office within 15 days after entry of the Consent Decree (Book 6539 Page 2706). Entrada Industries, Inc. also prepared and recorded with the Salt Lake Recorder's Office a notice stating that each subsequent deed title or other instrument of conveyance for property included within the Site shall contain a notice stating that the property is subject to the Consent Decree and any lien retained by the

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United States and shall reference the recorded location of the Consent Decree and any restrictions applicable to the property under the Consent Decree (Book 6539, Page 2827). This notice requirement shall remain in effect in perpetuity.

6. In accordance with paragraph 11.c of the Consent Decree, Entrada Industries, Inc. and any successors-in-title to the property included within the Site shall, at least 30 days prior to the conveyance of any such interest, give written notice of the Consent Decree to the grantee and written notice to EPA and UDEQ of the proposed conveyance, including the name and address of the grantee, and the date on which notice of the Consent Decree was given to the grantee. In the event of any such conveyance, the Settling Defendants' obligations under the Consent Decree shall continue to be met by the Settling Defendants. In addition, if the United States approves, the grantee may perform some or all of the Work. In no event shall the conveyance of an interest in property that includes, or is a portion of, the Site release or otherwise affect the obligation of the Settling Defendants to comply with the Consent Decree. This notice requirement shall remain in effect in perpetuity.

7. Neither Entrada Industries nor the Settling Defendants shall seek a change to the local zoning master plan or to rezone the property included within the Site to allow residential use thereof.

8. To prevent residential use of the property included within the Site in the future, and to notify any future owners of the property included within the Site of its status as a Superfund Site, the Settling Defendants shall, upon approval by EPA of the final Institutional Controls for the Site, use their best efforts to obtain inclusion of a notice in the local zoning master plan or like plan governing land use of the property included within the Site describing its status as a Superfund Site and prohibiting the residential use of that property. In addition, Settling Defendants have advised Salt Lake City Corporation and it has agreed to include as part of the notice in the local zoning master plan or like plan that EPA and UDEQ shall be directly notified by the Salt Lake City Planning Department before any proposed change in zoning or land use concerning the property included within the Site.

9. If Entrada Industries is advised by either Salt Lake City Corporation or the Salt Lake City Planning Department of any proposed change in zoning or land use concerning the property included within the Site, Entrada Industries shall advise EPA and UDEQ of such proposal as soon as practicable after learning of

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such proposal.

Governmental Institutional Controls

10. UDEQ shall request that the State Engineer (and his successor(s)) designate the Site as a restricted area under the Salt Lake Valley Ground Water Management Plan, and deny all requests for development of water rights and granting of well permits within that area. In addition, UDEQ shall request that the State Engineer (and his successor(s)) notify UDEQ within one week after receipt of all such requests. UDEQ shall monitor the processing of all such requests to ensure that the objectives described in paragraph 10 are met.

11. To support designation of the Site as a restricted area under the Salt Lake Valley Ground Water Management Plan, Entrada Industries shall submit to the State Engineer a copy of the Final Remedial Investigation Report, dated March 30, 1990, the Final Additional Studies and Design Basis Report, dated December 24, 1992, the Final Design Report for Soils Remediation, dated July 30, 1993, and the Final Design Report for Ground Water Remediation, dated June 13, 1994. Entrada Industries shall also provide to the State Engineer copies of quarterly ground water monitoring results prepared in connection with ground water remediation at the Site.

DATED this 2d day of ~~May~~ June, 1997.

OWNER SETTLING DEFENDANT

ENTRADA INDUSTRIES, INC.

By: Clyde M Heiner

Its Vice President

29970 3

8100JH2894K

STATE OF UTAH)
: ss.
COUNTY OF SALT LAKE)

On June 2, 1997, personally appeared before me, Clyde M. Heiner, the Vice President, of Entrada Industries, Inc., who acknowledged that he executed the above instrument.

Deborah Torgerson
NOTARY PUBLIC
Residing at: _____

My Commission Expires:
_____

NOTARY PUBLIC
Deborah Torgerson
160 East First S.
Salt Lake City, Utah 84111
My Commission Expires
September 24, 2000
STATE OF UTAH

29970 J

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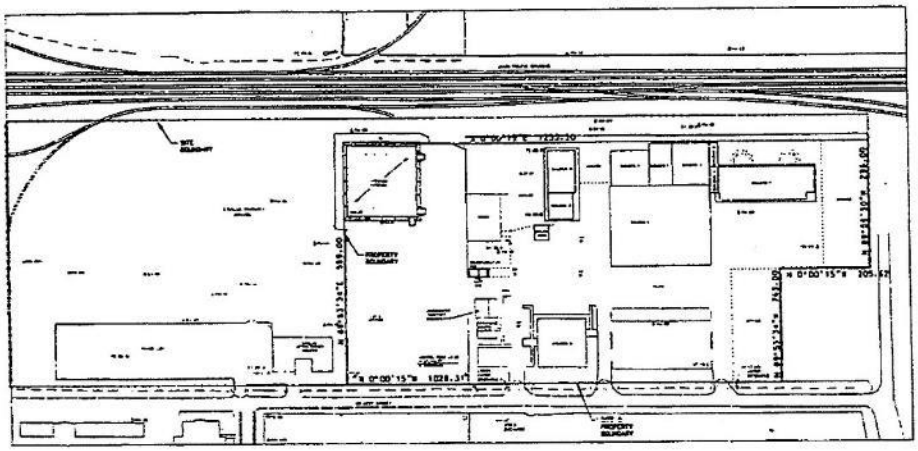
~~3K7682PG0020~~

EXHIBIT A



FOR REVIEW

MONTGOMERY WATSON

OVERALL SITE PLAN

C-2

EXHIBIT B

The following described real property located in Section 23, Township 1 South, Range 1 West, Salt Lake Base and Meridian:

1. Beginning North 00°00'15" West 1.33 feet from the Southwest corner of Lot 6, Block 1, Five Acre Plat B, Big Field Survey; North 00°00'15" West 285.77 feet; South 89°53'34" East 384 feet; South 175 feet; East 175 feet; South 00°00'15" East 110.77 feet; North 89°53'34" West 559 feet to the point of beginning. VTDI 15-13-351-007-0000.

2. Beginning 200 feet West from the Northeast corner of Lot 6, Block 1, Five Acre Plat B, Big Field Survey; West 175 feet; South 175 feet; East 175 feet; North 175 feet to the point of beginning. VTDI 15-13-351-006-0000.

3. Beginning at the Southwest corner of Lot 6, Block 1, Five Acre Plat B, Big Field Survey; North 00°00'15" West 1.33 feet; South 89°53'34" East 559 feet; South 00°00'15" East 1.33 feet; North 89°53'34" West 559 feet to the point of beginning. VTDI 15-13-351-008-0000.

4. West 559 feet of Lots 4 & 5, Block 1, Five Acre Plat B, Big Field Survey. VTDI 15-13-351-003-0000.

5. Commencing at the Northwest corner of Lot 3, Block 1, Five Acre Plat B, Big Field Survey; South 89°53'34" East 559 feet; South 00°00'15" East 372.2 feet; North 89°58'30" West 296 feet; North 00°00'15" West 205.62 feet; North 89°53'34" West 263 feet; North 00°00'15" East 167 feet to the point of beginning. VTDI 15-13-351-004-0000.

BK 7602 PG 0021

APPENDIX I – DETAILED ARARS REVIEW TABLES

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 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. In performing the FYR for compliance with ARARs, only those ARARs that address the protectiveness of the remedy are reviewed.

Groundwater

The 1991 ROD identified MCLs established under the Safe Drinking Water Act as ARARs and proposed MCLs are to-be-considered (TBCs). MCLs and proposed MCLs were therefore adopted as groundwater cleanup standards fully protective of human health. Action levels (Table 5.4) for contaminants are federal and state Safe Drinking Water Act MCLs or proposed MCLs. Table I-1 compares the groundwater ROD action levels to current state and federal MCLs. There have been no changes since the signing of the ROD. Utah's quality standards are consistent with federal standards.[3]

Table I-1: Review of Groundwater Action Levels (MCLs)

COC	1991 ROD Action Levels (µg/L)[a]	Current Federal MCLs (µg/L)[b]	Change
PCE	5	5	None
TCE	5	5	None
1,1-DCE	7	7	None
PCP	1	1	None
2,4-D	70	70	None

Notes:
a. The 1991 ROD, Table 5.4.
b. National Primary Drinking Water Regulations, located at: https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations (accessed 9/16/2021).

Soils and sludges

The 1991 ROD states that "Since no Federal or State chemical-specific ARARs exist for soils and sludges, action levels were determined for indicator chemicals through a site-specific risk analysis. Because the location, characteristics, and use of the Site make its future use for residences unlikely, action levels to be met by the remedial action for soils, sludges, and dioxin removal wastes will result in 10^{-6} carcinogenic risk for an industrial use scenario and a 10^{-5} for a residential use scenario." There have been no changes in land use since the 1991 ROD.

[3] https://deq.utah.gov/drinking-water/utah-drinking-water-standards.

APPENDIX J – SCREENING-LEVEL RISK REVIEW

The 1991 ROD states that "For soils, sludges, and dioxin removal wastes, the remedial goal is treatment so that the level of contaminants remaining in these materials poses no unacceptable risk to human health or the environment. Since no Federal or State chemical-specific ARARs exist for soils and sludges, action levels were determined for indicator chemicals through a site-specific risk analysis. Because the location, characteristics, and use of the Site make its future use for residences unlikely, action levels to be met by the remedial action for soils, sludges, and dioxin removal wastes will result in 10^{-6} carcinogenic risk for an industrial use scenario and a 10^{-5} for a residential use scenario." Table J-1 shows a screening level human health risk review of soil remedial goals for commercial/industrial use.

Table J-1: Screening-Level Human Health Risk Review of Soil Remedial Goals

COC	1991 ROD Soil Remedial Action Level (mg/kg)	Commercial/Industrial RSL[a] (mg/kg)		Cancer Risk[b]	Noncancer HQ[c]
		1 x 10^{-6} Risk	HQ = 1.0		
TCE	103	6	19	1.7 x 10^{-5}	**5**
PCE	22	100	390	2.2 x 10^{-7}	0.06
Hexachlorobenzene	7	0.96	12	7 x 10^{-6}	0.58
4,4-DDD	26	9.6	25	3 x 10^{-6}	1
4,4-DDE	19	9.3	350	2 x 10^{-6}	0.05
4,4-DDT	19	8.5	520	2 x 10^{-6}	0.04
Alpha-chlordane	7	--	500	--	0.014
Gamma-chlordane	7	--	500	--	0.014
Heptachlor	2	0.63	580	3 x 10^{-6}	0.003
TCDD (total)	0.02	0.000022	0.00072	**9 x 10^{-4}**	**28**

Notes:

a. Current EPA RSLs, dated May 2021, are available at https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables (accessed 9/16/2021).

b. The cancer risks were calculated using the following equation, based on the fact that RSLs are derived based on 1 x 10^{-6} risk: cancer risk = (cleanup level ÷ cancer-based RSL) × 10^{-6}.

c. The noncancer HQ was calculated using the following equation: HQ = cleanup level ÷ noncancer-based RSL.

HQ = hazard quotient

-- = not applicable; toxicity criteria not established.

Bold = indicates exceedance of 10^{-4} cancer risk or an HQ of 1.

mg/kg = milligrams per kilogram

APPENDIX K – SHALLOW GROUNDWATER DATA TABLES

Table K-1: April 2017 Shallow Groundwater Sampling Results[4]

TABLE 2
SHALLOW GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS
APRIL 2017
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

			Analytical Results																	*Natural Attenuation Assessment*	
	MCL	Sample Identification	ES-01	EX-02	EX-04	EX-05	EX-07	EX-08	EX-09	EX-11	MW-06	MW-20	MW-23	MW-24A	MW-25	MW-30	MW-34	PZ-1	PZ-3	Biodegradation	
		Date Collected	4/11/2017	4/10/2017	4/11/2017	4/10/2017	4/11/2017	4/13/2017	4/11/2017	4/11/2017	4/13/2017	4/11/2017	4/13/2017	4/12/2017	4/12/2017	4/13/2017	4/13/2017	4/12/2017	4/12/2017	Indicator	Purpose and/or Interpretation
Analyte/ Parameter (Units)																					
Volatile Organic Compounds (µg/l)		Analytical Method																			
Tetrachloroethene (PCE)	5	SW8260B	1.9	0.59 T	<1	<1	2.6	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	Not Applicable	Indicator chemical[3]
Trichloroethene (TCE)	5	SW8260B	**20**	**160 J-**	<1	**0.32 T**	**5.2**	<1	<1	**40**	<1	**0.66 T**	<1	<1	<1	**1.6**	**0.13 T**	<1	<1	detection	Indicator chemical(c); degradation product of PCE
1,1-Dichloroethene (1,1-DCE)	7	SW8260B	**1.2**	**7**	**0.61 T**	**10**	**0.42 T**	<1	**0.61 T**	**12**	**2.6**	**1.6**	<1	<1	<1	**4.6**	<1	<1	<1	detection	Indicator chemical[3]; degradation product of trichloroethene
cis-1,2-Dichloroethene (cis-1,2-DCE)	70	SW8260B	**42**	**330 J-**	10	**150 J-**	**5**	<1	**8.7**	**670 D**	**18**	**22**	<1	<1	**0.11 T**	**110 D**	**1.2**	<1	<1	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene (trans-1,2-DCE	100	SW8260B	**0.47 T**	**10**	**3.3**	**130 J-**	**0.14 T**	<1	**2.4**	**94**	**5**	**15**	<1	<1	<1	**1.9**	**0.42 T**	<1	<1	detection	Degradation product of trichloroethene
Vinyl Chloride (VC)	2	SW8260B	**8.6**	**72**	**0.25 T**	**5.8**	**0.45 T**	<1	<1	**340 D**	**0.9 T**	**5.2**	<1	<1	<1	**41**	<1	<1	<1	detection	Degradation product of dichloroethenes
Pesticides (µg/l)																					
Pentachlorophenol (PCP)	1	SW8151A	1.6	1.6	--	--	<0.5	0.32 T	--	<0.5	--	--	--	--	--	--	--	--	--	Not Applicable	Indicator chemical[3]
Geochemical Parameters																					
pH (standard units)	na	Field measurement	**7.50**	**6.63**	**6.98**	**6.98**	**7.16**	**6.93**	**7.00**	**6.90**	**7.04**	**6.96**	**7.05**	**7.22**	**7.10**	**6.89**	**7.12**	**7.01**	**6.83**	5 to 9[b]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	Field measurement	**-150**	**-7**	**-37**	**-78**	-19	**-55**	**-8**	**-160**	**-158**	**-119**	**-273**	**-132**	**-207**	**-246**	**-231**	**-229**	**-104**	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	Field measurement	**0.39**	**0.23**	0.57	**0.08**	**0.27**	**0.25**	**0.29**	**0.37**	**0.25**	**0.40**	**0.07**	**0.07**	**0.07**	**0.08**	**0.07**	**0.06**	**0.34**	<0.5[b]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	**0.189**	**0.598**	2.89 D	**<0.1**	2.77 D	4.96 D	**0.555**	**<0.1**	**<0.1**	2.06 D	<2 D	**<0.1**	**<0.1**	1.02	**<0.1**	**<0.1**	**<0.1**	<1 [c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	<0.1	<0.2 D	<0.1	<0.1	<0.1	<1 D	<0.1	<0.1	<0.2 D	<0.2 D	<2 D	<0.1	<0.1	<0.8 D	<0.1	<0.1	<0.3 D	>1	Evidence of nitrate reduction
Iron II (mg/l)[a,b]	na	Hach 8146	0.38	**2.38**	**2.99**	**2.84**	**>3.00**	0.52	0.73	**>3.00**	**>3.00**	**>3.00**	**>3.00**	0.09	**>3.00**	**>3.00**	**>3.00**	**>3.00**	**>3.00**	>1 [c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	88.7 D	1090 D	419 D	1120 D	131 D	495 D	460 D	983 D	440 D	945 D	347 D	42.7 D	656 D	1040 D	492 D	182 D	2280 D	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	0.216	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**1.11**	<0.1	0.104	<0.1	0.0223 T	0.02 T	0.0275 T	0.0566 T	0.0608 T	**>1** [c]	Evidence of sulfate reduction

[a] Iron II was measured in the field using Hach kits; Samples > 3.00 exceed the maximum reading of the Hach Kit.

[b] From Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater, USEPA, 1998.

[c] This chemical is a designated "indicator chemical" for the Site. The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

Laboratory results highlighted in yellow are greater than the analyte's MCL.

-- Not analyzed

na Not Applicable

MCL Regulatory drinking water maximum contaminant level

µg/l micrograms per liter.

mg/l milligrams per liter.

Bold VOC values in bold suggest biodegradation has occurred (these compounds are daughter products); geochemical values shown in bold indicate conditions are conducive to biodegradation.

D Sample dilution required for analysis; reported values reflect the dilution.

J- Result is estimated and potentially biased low due to associated quality control data.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

[4] Table 2 of Progress Report 107, pdf page 18.

Table K-2: November 2017 Shallow Groundwater Sampling Results[5]

TABLE 3
SHALLOW GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS
NOVEMBER 2017
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

			Analytical Results																	*Natural Attenuation Assessment*	
	MCL	Sample Identification Date Collected	ES-01[b] na	EX-02[b] na	EX-04 11/6/2017	EX-05 11/6/2017	EX-07[b] na	EX-08[b] na	EX-09[b] na	EX-11[b] na	MW-06 11/8/2017	MW-20[b] na	MW-23[b] na	MW-24A 11/7/2017	MW-25 11/8/2017	MW-30 11/8/2017	MW-34 11/8/2017	PZ-1 11/7/2017	PZ-3 11/7/2017	Biodegradation Indicator	Purpose and/or Interpretation
Analyte/ Parameter (Units)																					
Volatile Organic Compounds (µg/l)		Analytical Method																			
Tetrachloroethene (PCE)	5	SW8260B	--	--	<1.0	<1.0	--	--	--	--	<1.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	na	Indicator chemical[M]
Trichloroethene (TCE)	5	SW8260B	--	--	<1.0	**0.41 T**	--	--	--	--	0.23 T	--	--	<1.0	<1.0	**1.5**	**0.35 T**	<1.0	<1.0	detection	Indicator chemical[M]; degradation product of PCE
1,1-Dichloroethene (1,1-DCE)	7	SW8260B	--	--	**0.44 T**	**8.3**	--	--	--	--	**2.5**	--	--	<1.0	<1.0	**3.9**	<1.0	<1.0	<1.0	detection	Indicator chemical[M]; degradation product of TCE
cis-1,2-Dichloroethene (cis-1,2-DCE)	70	SW8260B	--	--	**8.0**	**180 D**	--	--	--	--	**18**	--	--	<1.0	**0.17 T**	**130 D**	**2.8**	<1.0	<1.0	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene (trans-1,2-DCE	100	SW8260B	--	--	**2.9**	**140 D**	--	--	--	--	**5.0**	--	--	<1.0	<1.0	**2.4**	**0.69 T**	<1.0	<1.0	detection	Degradation product of trichloroethene
Vinyl Chloride (VC)	2	SW8260B	--	--	<1.0	**4.2**	--	--	--	--	**0.95 T**	--	--	<1.0	<1.0	**62 D**	**0.13 T**	<1.0	<1.0	detection	Degradation product of dichloroethenes
Pesticides (µg/l)																					
Pentachlorophenol (PCP)	1	SW8151A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	na	Indicator chemical[M]
Geochemical Parameters																					
pH (standard units)	na	field measurement	--	--	**6.98**	**6.98**	--	--	--	--	**7.04**	--	--	**7.22**	**7.10**	**6.89**	**7.12**	**7.01**	**6.83**	5 to 9[N]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	field measurement	--	--	**-37**	**-78**	--	--	--	--	**-158**	--	--	**-132**	**-207**	**-246**	**-231**	**-229**	**-104**	<50[O]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	--	--	0.57	**0.08**	--	--	--	--	**0.25**	--	--	**0.07**	**0.07**	**0.08**	**0.07**	**0.06**	**0.34**	<0.5[O]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	--	--	**0.264**	**<0.1**	--	--	--	--	**<0.1**	--	--	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	<1[N]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	--	--	<0.1	<0.1	--	--	--	--	<0.5 D	--	--	<0.1	<0.1	<1 DUJ	<0.1	<0.1	<0.5 D	>1	Evidence of nitrate reduction
Iron II (mg/l)[P]	na	Hach 8146	--	--	<0.1	<0.1	--	--	--	--	**>3.00**	--	--	0.09	**>3.00**	**>3.00**	**>3.00**	**>3.00**	**>3.00**	>1[N]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	--	--	**335 D**	**1080 D**	--	--	--	--	363 D	--	--	72.6 D	339 D	872 D	912 D	127 D	2150 D	<20[O]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	--	--	<0.1	<0.1	--	--	--	--	0.0707 T	--	--	0.0223 T	0.0223	0.0200 T	<0.1	0.0339 T	0.134	>1[N]	Evidence of sulfate reduction

[P] Iron II was measured in the field using Hach kits; Samples > 3.00 exceed the maximum reading of the Hach Kit.

[b] Scheduled to be sampled during spring rounds only.

[O] From Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater, USEPA, 1998.

[M] This chemical is a designated "indicator chemical" for the Site. The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

Laboratory results highlighted in yellow are greater than the analyte's MCL.

-- Not analyzed
na Not Applicable
MCL Regulatory drinking water maximum contaminant level
µg/l micrograms per liter
mg/l milligrams per liter
Bold Chlorinated VOC values in bold suggest biodegradation has occurred (these compounds are daughter products); geochemical values shown in bold indicate conditions are conducive to biodegradation of chlorinated compounds.
D Sample dilution required for analysis; reported values reflect the dilution.
J Result is estimated due to associated quality control data.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

[5] Table 3 of Progress Report 108, pdf page 17.

Table K-3: April 2018 Shallow Groundwater Sampling Results[6]

TABLE 3
SHALLOW GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS
APRIL 2018
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

			Analytical Results																	*Natural Attenuation Assessment*	
	MCL	Sample Identification	ES-01[b]	EX-02[b]	EX-04	EX-05	EX-07[b]	EX-08[b]	EX-09[b]	EX-11[b]	MW-06	MW-20[b]	MW-23[b]	MW-24A	MW-25	MW-30	MW-34	PZ-1	PZ-3	Biodegradation Indicator	Purpose and/or Interpretation
		Date Collected	4/24/2018	4/24/2018	4/23/2018	4/23/2018	4/24/2018	4/26/2018	4/25/2018	4/24/2018	4/26/2018	4/24/2018	4/26/2018	4/25/2018	4/25/2018	4/27/2018	4/26/2018	4/25/2018	4/25/2018		
Analyte/ Parameter (Units)																					
Volatile Organic Compounds (µg/l)		Analytical Method																			
Tetrachloroethene (PCE)	5	SW8260B	1.3	29	<1.0	<1.0	3.2	<1.0	1.0	4.6	<1.0	1.6	<1.0	<1.0	0.22 T	<1.0	<1.0	<1.0	0.99 T	na	Indicator chemical[d]
Trichloroethene (TCE)	5	SW8260B	6.5	26	<1.0	0.37 T	5.8	0.16 TUB	1.5	26	0.22 TUB	2.6	<1.0	0.27 T	0.39 T	1.2	0.32 TUB	0.32 T	1.2	detection	Indicator chemical[d]; degradation product of PCE
1,1-Dichloroethene (1,1-DCE)	7	SW8260B	0.27 T	4.7	0.88 T	13	0.19 T	<1.0	0.78 T	14	3.5	2.0	<1.0	<1.0	<1.0	3.8	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of TCE
cis-1,2-Dichloroethene (cis-1,2-DCE)	70	SW8260B	5.4	200 D	12	210 D	7.7	<1.0	13	800 D	22	26	<1.0	<1.0	0.20 T	120 D	2.1	0.12 T	0.25 T	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene (trans-1,2-DCE	100	SW8260B	0.55 T	15	4.0	180 D	0.53 T	<1.0	3.0	150 D	6.5	21	<1.0	<1.0	<1.0	2.5	0.57 T	<1.0	<1.0	detection	Degradation product of trichloroethene
Vinyl Chloride (VC)	2	SW8260B	3.3	120 D	0.40 T	7.7	2.5	<1.0	<1.0	510 D	1.2	5.8	<1.0	<1.0	<1.0	42 D	<1.0	<1.0	<1.0	detection	Degradation product of dichloroethenes
Pesticides (µg/l)																					
Pentachlorophenol (PCP)	1	SW8151A	<0.50	2.4 D	--	--	<0.50	0.18 T	--	<0.50	--	--	--	--	--	--	--	--	--	na	Indicator chemical[d]
Geochemical Parameters																					
pH (standard units)	na	field measurement	7.33	6.39	7.01	6.78	7.06	6.94	6.85	6.83	6.99	6.86	7.01	7.07	7.09	6.83	7.02	6.78	6.73	5 to 9[c]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	field measurement	-198	-7	-45	-75	-53	-14	-2.5	-191	-137	-156	-209	-120	-140	-173	-195	-128	-85.9	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	0.2	0.21	0.02	0.01	0.26	0.01	0.15	0.05	0.2	0.1	0.02	0.05	0.03	0.01	0.02	0.04	0.1	<0.5[c]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	0.123	0.292 TD	1.76 D	<0.10	0.775	5.52 D	1.35	<0.50 D	<0.10	1.68 D	<1.0 D	<0.10	<0.10	<0.50 D	<0.10	<0.10	<0.40 D	<1[c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	<0.10	<0.50 D	0.0354 T	<0.50 D	<0.20 D	<0.50 D	<0.10	<0.50 D	<0.10	<0.40 D	<1.0 D	<0.10	<0.10	<0.50 D	<0.10	<0.10	<0.40 D	>1	Evidence of nitrate reduction
Iron II (mg/l)[a]	na	Hach 8146	0.60	>3.00	>3.00	>3.00	>3.00	0.15	1.60	>3.00	>3.00	>3.00	>3.00	>3.00	>3.00	>3.00	>3.00	>3.00	>3.00	>1[c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	88.3 D	765 D	273 D	1110 D	88.2 D	565 D	558 D	817 D	497 D	885 D	310 D	27.2 D	260 D	817 D	720 D	141 D	2070 D	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	0.257	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.0259 T	0.0280 T	0.0128 T	0.0921 T	<0.10	0.0128 T	0.0354 T	0.0494 T	0.0143 T	0.0143 T	>1[c]	Evidence of sulfate reduction

[a] Iron II was measured in the field using Hach kits; Samples > 3.00 exceed the maximum reading of the Hach Kit.

[b] Scheduled to be sampled annually, during spring rounds only.

[c] From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.

[d] This chemical is a designated "indicator chemical" for the Site. The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

Laboratory results highlighted in yellow are greater than the analyte's MCL.

-- Not analyzed
na Not Applicable
MCL Regulatory drinking water maximum contaminant level
µg/l micrograms per liter
mg/l milligrams per liter
Bold VOC values in bold suggest biodegradation has occurred (these compounds are daughter products); geochemical values shown in bold indicate conditions are conducive to biodegradation of chlorinated compounds.
D Sample dilution required for analysis; reported values reflect the dilution.
J Result is estimated due to associated quality control data.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte deemed not detected due to detection in an associated blank sample.

[6] Table 3 of Progress Report 109, pdf page 34.

Table K-4: November 2018 Shallow Groundwater Sampling Results[7]

TABLE 4
PRELIMINARY - SHALLOW GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS
NOVEMBER 2018
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

			Analytical Results																	*Natural Attenuation Assessment*	
	MCL	Sample Identification Date Collected	ES-01[a]	EX-02[b]	EX-04 11/5/2018	EX-05 11/5/2018	EX-07[b]	EX-08[a]	EX-09[b]	EX-11[a]	MW-06 11/7/2018	MW-20[a]	MW-23[b]	MW-24A 11/6/2018	MW-25 11/7/2018	MW-30 11/7/2018	MW-34 11/6/2018	PZ-1 11/7/2018	PZ-3 11/6/2018	Biodegradation Indicator	Purpose and/or Interpretation
Analyte/ Parameter (Units)																					
Volatile Organic Compounds (µg/l)		Analytical Method																			
Tetrachloroethene (PCE)	5	SW8260B	--	--	<1.0	<1.0	--	--	--	--	<1.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	na	Indicator chemical[d]
Trichloroethene (TCE)	5	SW8260B	--	--	<1.0	**0.33 T**	--	--	--	--	**0.49 T**	--	--	<1.0	<1.0	**2.8**	**0.47 T**	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of PCE
1,1-Dichloroethene (1,1-DCE)	7	SW8260B	--	--	**1.1**	**9.8**	--	--	--	--	**2.1**	--	--	<1.0	<1.0	**4.7**	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of TCE
cis-1,2-Dichloroethene (cis-1,2-DCE)	70	SW8260B	--	--	**18**	**170 D**	--	--	--	--	**15**	--	--	<1.0	0.15 T	**130 D**	**2.2**	<1.0	<1.0	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene (trans-1,2-DCE)	100	SW8260B	--	--	**6.4**	**150 D**	--	--	--	--	**3.9**	--	--	<1.0	<1.0	**2.6**	**0.67 T**	<1.0	<1.0	detection	Degradation product of trichloroethene
Vinyl Chloride (VC)	2	SW8260B	--	--	**0.80 T**	**6.2**	--	--	--	--	**0.76 TJ**	--	--	<1.0	<1.0	**67 J**	<1.0	<1.0	<1.0	detection	Degradation product of dichloroethenes
Pesticides (µg/l)																					
Pentachlorophenol (PCP)	1	SW8151A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	na	Indicator chemical[c]
Geochemical Parameters																					
pH (standard units)	na	field measurement	--	--	**6.86**	**6.74**	--	--	--	--	**6.84**	--	--	**6.72**	**6.82**	**6.64**	**6.68**	**6.75**	**6.65**	5 to 9[e]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	field measurement	--	--	**-36**	**-138.6**	--	--	--	--	**-231**	--	--	**-208**	**-222.2**	**-293.3**	**-275**	**-267.4**	**-104.7**	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	--	--	**0.02**	**0.01**	--	--	--	--	**0.05**	--	--	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.17**	<0.5[c]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	--	--	1.32 D	**<0.10**	--	--	--	--	**<0.10**	--	--	**<0.10**	**<0.10**	**<0.40 D**	**<0.10**	**<0.10**	**<0.10**	<1[c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	--	--	0.118 TD	<0.40 D	--	--	--	--	<0.20 D	--	--	<0.10	<0.10	<1.5 D	<0.10	<0.10	<0.40 D	>1	Evidence of nitrate reduction
Iron II (mg/l)[a]	na	Hach 8146	--	--	**>3.00**	**>3.00**	--	--	--	--	**>3.00**	--	--	**>3.00**	**>3.00**	**>3.00**	**>3.00**	**>3.00**	**2.93**	>1[c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	--	--	543 D	1060 D	--	--	--	--	355 D	--	--	39.8 D	244 D	643 D	869 D	84.0 D	2210 D	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	--	--	<0.10	<0.10	--	--	--	--	0.254	--	--	0.0341 T	0.0358 T	0.0446 T	0.0246 T	0.0807 T	0.0375 T	>1[c]	Evidence of sulfate reduction

[a] Iron II was measured in the field using Hach kits; results > 3.00 exceed the maximum reading of the Hach Kit.

[b] Scheduled to be sampled annually, during spring rounds only.

[c] From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*. USEPA, 1998.

[d] This chemical is a designated "indicator chemical" for the Site. The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

Laboratory results highlighted in yellow are greater than the analyte's MCL.

-- Not analyzed
na Not Applicable
MCL Regulatory drinking water maximum contaminant level
µg/l micrograms per liter
mg/l milligrams per liter
Bold VOC values in bold suggest biodegradation has occurred (these compounds are daughter products). geochemical values shown in bold indicate conditions are conducive to biodegradation of chlorinated compounds.
D Sample dilution required for analysis; reported values reflect the dilution.
J Result is estimated due to associated quality control data.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

[7] Table 4 of Progress Report 110, pdf page 30.

Table K-5: May 2019 Shallow Groundwater Sampling Results[8]

TABLE 4
SHALLOW GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS
MAY 2019
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

			Analytical Results																	*Natural Attenuation Assessment*	
	MCL	Sample Identification	ES-01[b]	EX-02[b]	EX-04	EX-05	EX-07[b]	EX-08[b]	EX-09[b]	EX-11[b]	MW-06	MW-20[b]	MW-23[b]	MW-24A	MW-25	MW-30	MW-34	PZ-1	PZ-3	Biodegradation	
		Date Collected	5/3/2019	5/2/2019	5/2/2019	5/1/2019	5/2/2019	5/6/2019	5/2/2019	5/2/2019	5/8/2019	5/3/2019	5/7/2019	5/3/2019	5/3/2019	5/8/2019	5/8/2019	5/3/2019	5/6/2019	Indicator	Purpose and/or Interpretation
Analyte/ Parameter (Units)																					
Volatile Organic Compounds (µg/l)		Analytical Method																			
Tetrachloroethene	5	SW8260B	4.5	<1.0	<1.0	<1.0	1.8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	na	Indicator chemical[d]
Trichloroethene	5	SW8260B	**42**	**15**	<1.0	**0.26 T**	**3.2**	<1.0	<1.0	**23 J**	**0.12 T**	**0.55 T**	<1.0	<1.0	<1.0	**1.5**	**0.17 T**	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of PCE
1,1-Dichloroethene	7	SW8260B	**2.7**	**3.7**	**0.60 T**	**12**	**0.11 T**	<1.0	**0.52 T**	**5.9**	**1.8**	**2.0**	<1.0	<1.0	<1.0	**2.6**	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of TCE
cis-1,2-Dichloroethene	70	SW8260B	**74**	**120 D**	**11**	**140 D**	**3.7**	<1.0	**8.9**	**310 D**	**15**	**27**	<1.0	<1.0	**0.14 T**	**100 D**	**1.1**	**<1.0**	**<1.0**	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene	100	SW8260B	**0.94 T**	**11**	**3.9**	**130 D**	**0.23 T**	<1.0	**2.2**	**120 D**	**4.4**	**19**	<1.0	<1.0	<1.0	**2.3**	**0.37 T**	<1.0	<1.0	detection	Degradation product of trichloroethene
Vinyl Chloride	2	SW8260B	**19**	**62**	**0.40 T**	**7.6**	**1.1**	<1.0	<1.0	**260 D**	**1.1**	**8.8**	<1.0	<1.0	<1.0	**33**	<1.0	<1.0	<1.0	detection	Degradation product of dichloroethenes
Pesticides (µg/l)																					
Pentachlorophenol	1	SW8151A	2.0	2.8 D	–	–	<0.50	0.26 T	–	<0.50	–	–	--	--	--	--	--	--	--	na	Indicator chemical[d]
Geochemical Parameters																					
pH (standard units)	na	field measurement	**7.4**	**6.48**	**7.0**	**6.86**	**7.17**	**6.86**	**7.02**	**6.85**	**6.89**	**6.93**	**6.98**	**7.01**	**7.09**	**6.79**	**6.95**	**6.90**	**6.77**	5 to 9[c]	Optimal range for reductive pathway
Oxidation-Reduction Potential (m\	na	field measurement	**-159**	**-7**	**-71**	**-62.3**	**-37**	**24**	**-8**	**-117**	**-91**	**-55**	**-155**	**-131**	**-119**	**-167**	**-157**	**-146**	**-41**	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	**0.08**	**0.2**	**0.08**	**0.02**	**0.09**	**0.01**	**0.06**	**0.01**	**0.29**	**0.21**	**0.02**	**0.02**	**0.03**	**0.01**	**0.02**	**0.03**	**0.12**	<0.5[c]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	**0.174**	**0.155 TD**	3.21 D	**<0.05 D**	**0.584 D**	3.18 D	**0.573 D**	**<0.05 D**	**<0.05 D**	3.00 D	**<0.25 D**	**<0.1**	**<0.1**	**<0.05 D**	**<0.05 D**	**<0.1**	**0.0591 T**	<1[c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	<0.125 D	<0.125 D	<0.05 D	<0.125 D	<0.05 D	3.07 D	<0.05 D	<0.125 D	<0.125 D	<0.05 D	<0.25 D	<0.1	<0.1	<0.25 D	<0.05 D	<0.1	**1.52 D**	>1	Evidence of nitrate reduction
Iron II (mg/l)[a]	na	Hach 8146	**1.32**	**1.93**	**3.30**	**2.78**	**2.18**	0.04	**0.61**	**1.78**	**>3.00**	**3.27**	**>3.00**	**>3.00**	**2.98**	**2.39**	**>3.00**	**2.21**	**>3.00**	>1[c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	87.0 D	836 D	402 D	1290 D	66.4 D	569 D	428 D	1140 D	385 D	801 D	--	50.6 D	249 D	988 D	494 D	53.1 D	2230 D	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	0.266 J	<0.1	0.0236 T	<0.1	<0.1	<0.1	<0.1	0.241	<0.1	<0.1	0.0486 T	0.0205 T	0.0129 T	0.0332 T	<0.1	0.137	0.0205 T	>1[c]	Evidence of sulfate reduction

[a] Iron II was measured in the field using Hach kits; Samples > 3.00 exceed the maximum reading of the Hach Kit.

[b] Scheduled to be sampled annually, during spring rounds only.

[c] From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.

[d] This chemical is a designated "indicator chemical" for the Site. The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

Laboratory results highlighted in yellow are greater than the analyte's MCL.

– Not analyzed
na Not Applicable
MCL Regulatory drinking water maximum contaminant level
µg/l micrograms per liter
mg/l milligrams per liter
Bold VOC values in bold suggest biodegradation has occurred (these compounds are daughter products); geochemical values shown in bold indicate conditions are conducive to biodegradation of chlorinated compounds.
D Sample dilution required for analysis; reported values reflect the dilution.
J Result is estimated due to associated quality control data.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

[8] Table 4 of Progress Report 111, pdf page 37.

Table K-6: November 2019 Shallow Groundwater Sampling Results[9]

TABLE 4
SHALLOW GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS
NOVEMBER 2019
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH
Page 1 of 1

			Analytical Results																	*Natural Attenuation Assessment*	
	MCL	Sample Identification Date Collected	ES-01[b]	EX-02[b]	EX-04 11/4/2019	EX-05 11/4/2019	EX-07[b]	EX-08[b]	EX-09[b]	EX-11[b]	MW-06 11/6/2019	MW-20[b]	MW-23[b]	MW-24A 11/5/2019	MW-25 11/6/2019	MW-30 11/6/2019	MW-34 11/7/2019	PZ-1 11/5/2019	PZ-3 11/5/2019	Biodegradation Indicator	Purpose and/or Interpretation
Analyte/ Parameter (Units)																					
Volatile Organic Compounds (µg/l)		Analytical Method																			
Tetrachloroethene	5	SW8260B	--	--	<1.0	<1.0	--	--	--	--	<1.0	--	--	<1.0	<1.0	<1.0 UJ	<1.0	<1.0	<1.0	na	Indicator chemical[d]
Trichloroethene	5	SW8260B	--	--	**0.13 T**	**0.33 T**	--	--	--	--	**0.22 T**	--	--	<1.0	<1.0	**1.4 J-**	**0.26 T**	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of PCE
1,1-Dichloroethene	7	SW8260B	--	--	**0.81 T**	**8.7**	--	--	--	--	**1.7**	--	--	<1.0	<1.0	**3.0**	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of TCE
cis-1,2-Dichloroethene	70	SW8260B	--	--	**19**	**120 D**	--	--	--	--	**13**	--	--	<1.0	**0.13T**	**96 D**	**2.2**	<1.0	<1.0	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene	100	SW8260B	--	--	**6.2**	**100 D**	--	--	--	--	**4.1**	--	--	<1.0	<1.0	**3.3 J-**	**0.58 T**	<1.0	<1.0	detection	Degradation product of trichloroethene
Vinyl Chloride	2	SW8260B	--	--	**0.67 T**	**4.6**	--	--	--	--	**0.78 T**	--	--	<1.0	<1.0	**42 J-**	<1.0	<1.0	<1.0	detection	Degradation product of dichloroethenes
Pesticides (µg/l)																					
Pentachlorophenol (PCP)	1	SW8151A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	na	Indicator chemical[d]
Geochemical Parameters																					
pH (standard units)	na	field measurement	--	--	**6.97**	**6.84**	--	--	--	--	**6.9**	--	--	**6.94**	**7.06**	**6.78**	**6.86**	**6.87**	**6.72**	5 to 9[c]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	field measurement	--	--	**-121.3**	**-99.4**	--	--	--	--	**-290**	--	--	**-400**	**-385**	**-418**	**-304**	**-463**	**-228**	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	--	--	**0.01**	**0.3**	--	--	--	--	**0.07**	--	--	**0.01**	**0.01**	**0.01**	**0.01**	**0.02**	**0.13**	<0.5[c]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	--	--	**0.358**	**<0.1**	--	--	--	--	**<0.2 D**	--	--	**<0.2 D**	**<0.2 D**	**<0.2 D**	**<0.2 D**	**<0.2 D**	**<0.1**	<1[c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	--	--	<0.5 D	<01.0 D	--	--	--	--	<0.5 D	--	--	<0.2 D	<0.2 D	<0.5 D	<0.2 D	<0.5 D	<0.5 D	>1	Evidence of nitrate reduction
Iron II (mg/l)[a]	na	Hach 8146	--	--	**>3.00**	**>3.00**	--	--	--	--	**>3.00**	--	--	**>3.00**	**3.00**	**>3.00**	**2.86**	**2.95**	**2.98**	>1[c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	--	--	450 D	948 D	--	--	--	--	339 D	--	--	45.6 D	242 D	900 D	739 D	76.3 D	2160 D	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	--	--	<0.1	<0.1	--	--	--	--	0.0228 T	--	--	0.0396 T	0.0504 T	0.145	0.0372 T	0.0803 T	0.0181 T	>1[c]	Evidence of sulfate reduction

[a] Iron II was measured in the field using Hach kits; Samples > 3.00 exceed the maximum reading of the Hach Kit.
[b] Scheduled to be sampled annually, during spring rounds only.
[c] From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.
[d] This chemical is a designated "indicator chemical" for the Site. The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

Laboratory results highlighted in yellow are greater than the analyte's MCL.

-- Not analyzed
na Not Applicable
MCL Regulatory drinking water maximum contaminant level
µg/l micrograms per liter
mg/l milligrams per liter
Bold VOC values in bold suggest biodegradation has occurred (these compounds are daughter products); geochemical values shown in bold indicate conditions are conducive to biodegradation of chlorinated compounds.
D Sample dilution required for analysis; reported values reflect the dilution.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
J- Data are estimated and are potentially biased low due to associated quality control data.

[9] Table 4 of Progress Report 112, pdf page 28.

Table K-7: April 2020 Shallow Groundwater Sampling Results[10]

TABLE 4
SHALLOW GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS
APRIL 2020
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH
Page 1 of 1

			Analytical Results																		*Natural Attenuation Assessment*	
	MCL	Sample Identification	ES-01[b]	EX-02[b]	EX-04	EX-05	EX-07[b]	EX-08[b]	EX-09[b]	EX-11[b]	MW-06	MW-20[b]	MW-23[b]	MW-24A	MW-25	MW-30[e]	MW-34	PZ-1	PZ-3	Biodegradation	
		Date Collected	4/17/2020	4/17/2020	4/17/2020	4/16/2020	4/20/2020	4/23/2020	4/16/2020	4/17/2020	4/21/2020	4/20/2020	4/23/2020	4/20/2020	4/20/2020	NS	4/23/2020	4/20/2020	4/21/2020	Indicator	Purpose and/or Interpretation
Analyte/ Parameter (Units)																						
Volatile Organic Compounds (µg/l)		**Analytical Method**																				
Tetrachloroethene	5	SW8260B	1.1	<1.0	<1.0	<1.0	1.9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	na	Indicator chemical[d]
Trichloroethene	5	SW8260B	20	31	<1.0	0.27 T	4.1	<1.0	0.10	15	<1.0	0.46	<1.0	<1.0	<1.0	--	0.31 T	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of PCE
1,1-Dichloroethene	7	SW8260B	0.97 T	3.5	0.76 T	9.5	0.19 T	<1.0	0.84 T	7.7	1.1	1.6	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of TCE
cis-1,2-Dichloroethene	70	SW8260B	15	180 D	14	160	7.7	<1.0	12	480 D	6.3	24	<1.0	<1.0	<1.0	--	2.2	<1.0	<1.0	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene	100	SW8260B	0.69 T	6.9	4.2	140	0.49 T	<1.0	3.3	150 D	2.6	16	<1.0	<1.0	<1.0	--	0.68 T	<1.0	<1.0	detection	Degradation product of trichloroethene
Vinyl Chloride	2	SW8260B	8.4	60 D	0.40 T	5.7	2.6	<1.0	<1.0	400 D	0.66 T	8.1	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	detection	Degradation product of dichloroethanes
Pesticides (µg/l)																						
Pentachlorophenol (PCP)	1	SW8151A	<0.50	8.4 D	--	--	<0.50	0.11 T	--	<0.50	--	--	--	--	--	--	--	--	--	na	Indicator chemical[d]
Geochemical Parameters																						
pH (standard units)	na	field measurement	**7.43**	**6.39**	**7.09**	**6.86**	**6.99**	**6.9**	**6.76**	**6.8**	**6.81**	**6.78**	**7.12**	**7**	**7.01**	--	**6.96**	**6.65**	**6.72**	5 to 9[c]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	field measurement	**-169.1**	**-12**	**-43.7**	**-73.5**	**-31**	**-24.2**	**-12**	**-146.1**	**-87.4**	**-35**	**-121.4**	**-100.4**	**-59**	--	**-133**	**-65.3**	**-58.6**	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	**0.02**	**0.17**	**0.1**	**0.02**	**0.1**	**0.01**	**0.07**	**0.01**	**0.05**	**0.11**	**0.01**	**0.01**	**0.01**	--	**0.01**	**0.01**	**0.05**	<0.5[c]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	**0.164**	**0.181**	1.40 D	**<0.2 D**	**0.447 D**	2.48 D	**0.242 D**	**<0.2 D**	**<0.2 D**	1.16 D	**<0.5 D**	**<0.2 D**	**<0.2 D**	--	**<0.2 D**	**<0.2 D**	**<0.1**	<1[c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	<0.5 D	<0.5 D	<0.2 D	<0.5 D	<0.2 D	<1 D	<0.2 D	<0.5 D	<0.2 D	< 0.5 D	<2 D	<0.2 D	<0.2 D	--	<0.2 D	<0.2 D	<0.5 D	>1	Evidence of nitrate reduction
Iron II (mg/l)[a]	na	Hach 8146	**1.08**	**2.43**	**3.24**	**2.13**	**2.99**	**0.4**	0.91	**3.25**	**3.19**	**2.58**	**2.3**	**2.92**	**2.65**	--	**1.6**	**2.4**	**3.02**	>1[c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	68.0 D	802 D	284 D	1010 D	106 D	422 D	554 D	868 D	240 D	841 D	367 D	17.9 D	223 D	--	700 D	70.0 D	2020 D	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	0.161	0.0127	0.03	<0.1	<0.1	0.0222	0.0206	0.0316	0.0357	<0.1	0.0652	0.026	0.0329	--	0.0291	0.132	0.0729	>1[c]	Evidence of sulfate reduction

[a] Iron II was measured in the field using Hach kits; Samples > 3.00 mg/l exceed the maximum reading of the Hach Kit.

[b] Scheduled to be sampled annually, during spring rounds only.

[c] From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.

[d] This chemical is a designated "indicator chemical" for the Site. The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1960s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

[e] Monitoring well MW-30 was not accessible during the sampling event due to presence of a North Yard Drain System temporary storage tank.

Laboratory results highlighted in yellow are greater than the analyte's MCL.

-- Not analyzed
na Not applicable
NS Not sampled
MCL Regulatory drinking water maximum contaminant level
mV millivolt
µg/l micrograms per liter
mg/l milligrams per liter
Bold Geochemical parameters shown in bold indicate conditions are conducive to biodegradation of chlorinated compounds.
D Sample dilution required for analysis; reported values reflect the dilution.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

[10] Table 4 of Progress Report 113, pdf page 41.

Table K-8: November 2020 Shallow Groundwater Sampling Results[11]

TABLE 4
SHALLOW GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS
NOVEMBER 2020
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH
Page 1 of 1

			Analytical Results																		*Natural Attenuation Assessment*	
	MCL	Sample Identification Date Collected	ES-01[b] NS	EX-02[b] NS	EX-04 11/3/2020	EX-05 11/3/2020	EX-07[b] NS	EX-08[b] NS	EX-09[b] NS	EX-11[b] NS	MW-06 11/4/2020	MW-20[b] NS	MW-23[b] NS	MW-24A 11/3/2020	MW-25 11/24/2020	MW-30 11/24/2020	MW-34[e] NS	PZ-1 11/3/2020	PZ-3 11/4/2020	Biodegradation Indicator	Purpose and/or Interpretation
Analyte/ Parameter (Units)																						
Volatile Organic Compounds (µg/l)		Analytical Method																				
Tetrachloroethene	5	SW8260B	--	--	<1.0	<1.0	--	--	--	--	<1.0	--	--	<1.0	<1.0	<1.0	--	<1.0	<1.0	na	Indicator chemical[d]
Trichloroethene	5	SW8260B	--	--	0.17 T	0.35 T	--	--	--	--	0.22 T	--	--	<1.0	<1.0	2.2	--	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of PCE
1,1-Dichloroethene	7	SW8260B	--	--	1.6	8.6	--	--	--	--	2.1	--	--	<1.0	<1.0	4.1	--	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of TCE
cis-1,2-Dichloroethene	70	SW8260B	--	--	45	120 D	--	--	--	--	15	--	--	<1.0	<1.0	150	--	<1.0	<1.0	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene	100	SW8260B	--	--	9.2	88 D	--	--	--	--	5.3	--	--	<1.0	<1.0	3.4	--	<1.0	<1.0	detection	Degradation product of trichloroethene
Vinyl Chloride	2	SW8260B	--	--	0.89 T	4.1	--	--	--	--	0.89 T	--	--	<1.0	<1.0	67 D	--	<1.0	<1.0	detection	Degradation product of dichloroethenes
Pesticides (µg/l)																						
Pentachlorophenol (PCP)	1	SW8151A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	na	Indicator chemical[d]
Geochemical Parameters																						
pH (standard units)	na	field measurement	--	--	**6.89**	**6.83**	--	--	--	--	**6.97**	--	--	**7.03**	**6.96**	6.66	--	**6.99**	**6.72**	5 to 9[c]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	field measurement	--	--	**-33.2**	**-80.3**	--	--	--	--	**-136.1**	--	--	**-264.2**	**-126.7**	195.3	--	**-230.0**	**-80.0**	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	--	--	**0.27**	**0.01**	--	--	--	--	**0.16**	--	--	**0.01**	**0.05**	0.01	--	**0.02**	**0.22**	<0.5[c]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	--	--	**<0.1**	**<0.1**	--	--	--	--	**<0.2 D**	--	--	<0.1	<0.1	<0.1	--	<0.1	<0.1	<1[c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	--	--	<0.5 D	<0.5 D	--	--	--	--	<0.2 D	--	--	<0.2 D	<0.2 D	<1 D	--	<0.5 D	<0.5 D	>1	Evidence of nitrate reduction
Iron II (mg/l)[a]	na	Hach 8146	--	--	**3.00**	**1.98**	--	--	--	--	**3.00**	--	--	**2.87**	**2.21**	1.12	--	**2.75**	**1.92**	>1[c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	--	--	441 D	867 D	--	--	--	--	331 D	--	--	18.3	117 D	905 D	--	70.7 D	2130 D	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	--	--	<0.1	<0.1	--	--	--	--	0.0357	--	--	0.0260	0.162	0.0686	--	0.120	0.0229	>1[c]	Evidence of sulfate reduction

[a] Iron II was measured in the field using Hach kits; Samples > 3.00 mg/l exceed the maximum reading of the Hach Kit.
[c] Scheduled to be sampled annually, during spring rounds only.
[c] From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.
[d] This chemical is a designated "indicator chemical" for the Site. The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.
[e] Monitoring well MW-34 was not accessible during the sampling event because it had been overpaved during 700 West road reconstruction during the 2020 construction season.

Laboratory results highlighted in yellow are greater than the analyte's MCL.

-- Not analyzed
na Not applicable
NS Not sampled
MCL Regulatory drinking water maximum contaminant level
mV millivolt
µg/l micrograms per liter
mg/l milligrams per liter
Bold Geochemical parameters shown in bold indicate conditions are conducive to biodegradation of chlorinated compounds.
D Sample dilution required for analysis; reported values reflect the dilution.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

[11] Table 4 of Progress Report 114, pdf page 31.

Table K-9: April 2021 Shallow Groundwater Sampling Results[12]

TABLE 4
SHALLOW GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS
APRIL 2021
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH
Page 1 of 1

			Analytical Results																	*Natural Attenuation Assessment*	
	MCL	Sample Identification	ES-01[b]	EX-02[b]	EX-04	EX-05	EX-07[b]	EX-08[b]	EX-09[b]	EX-11[b]	MW-06	MW-20[b]	MW-23[b]	MW-24A	MW-25	MW-30	MW-34[e]	PZ-1	PZ-3	Biodegradation	
		Date Collected	4/6/2021[a]	4/6/2021[f]	4/5/2021[f]	4/5/2021[f]	4/6/2021[a]	4/8/2021	4/6/2021[d]	4/7/2021	4/8/2021	4/7/2021	4/8/2021	4/7/2021	4/8/2021	4/8/2021	4/7/2021	4/7/2021	4/8/2021	Indicator	Purpose and/or Interpretation
Analyte/ Parameter (Units)																					
Volatile Organic Compounds (µg/l)		Analytical Method																			
Tetrachloroethene	5	SW8260B	<1.0	<1.0	<1.0	<1.0	0.73 T	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	na	Indicator chemical[d]
Trichloroethene	5	SW8260B	0.66	11	0.13 T	0.28 T	1.8	<1.0	<1.0	0.58 T	0.10 T	0.53 T	<1.0	<1.0	<1.0	2.1	0.27	0.12 T	<1.0	detection	Indicator chemical[d]; degradation product of PCE
1,1-Dichloroethene	7	SW8260B	<1.0	3	1.2	9.2	0.20 T	<1.0	0.94 T	5.9	2.1	1.1	<1.0	<1.0	<1.0	3.8	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of TCE
cis-1,2-Dichloroethene	70	SW8260B	0.41 T	130 D	32	130 D	5.3	<1.0	16	340 D	12	17	0.19 T	<1.0	<1.0	120	--	<1.0	<1.0	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene	100	SW8260B	0.38 T	7.9	5.8	100 D	0.77 T	<1.0	4	160	4.3	13	<1.0	<1.0	<1.0	2.5	--	<1.0	<1.0	detection	Degradation product of trichloroethene
Vinyl Chloride	2	SW8260B	0.31 T	39	0.25 T	4.6	2.6	<1.0	0.13 T	490 D	0.92 T	4.8	<1.0	<1.0	<1.0	53 D	<1.0	<1.0	<1.0	detection	Degradation product of dichloroethenes
Pesticides (µg/l)																					
Pentachlorophenol (PCP)	1	SW8151A	<0.50	10 DJ+	<0.50	<0.50	<0.50	0.19 J+	<0.50	<0.50	--	--	--	--	--	<0.50	--	--	--	na	Indicator chemical[d]
Geochemical Parameters																					
pH (standard units)	na	field measurement	**7.36**	**6.24**	**7.10**	**6.90**	**6.87**	**6.93**	**6.63**	**6.89**	**6.83**	**6.9**	**7.06**	**7.09**	**7.27**	**6.87**	**6.97**	**6.95**	**6.84**	5 to 9[c]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	field measurement	**-226.3**	**-77.7**	**-126.4**	**-148.2**	**-154.2**	**-78.7**	**-79.9**	**-234.1**	**-189.7**	**-155.6**	**-231.7**	**-256.8**	**-141.6**	**-297.8**	**-219.3**	**-245.2**	**-160.4**	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	**0.35**	**0.29**	**0.03**	**0.01**	**0.39**	0.73	**0.09**	**0.01**	**0.38**	**0.47**	**0.01**	**0.01**	**0.08**	**0.01**	**0.01**	**0.01**	2.18[g]	<0.5[c]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	**0.172**	**0.201**	1.99 D	**<0.1**	1.07	4.51 D	**0.0783 T**	**<0.1**	**<0.1**	1.90 D	**<0.5 D**	**<0.1**	**<0.1**	**<0.2 D**	**<0.1**	**<0.1**	**<0.1**	<1[c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	<1 D	<4 D	<1 D	<2 D	<2 D	<2 D	<1 D	<4 D	<0.5 D	<2 D	<0.5 D	<0.2 D	<1 D	<4 D	<0.5 D	<0.5 D	<1 D	>1	Evidence of nitrate reduction
Iron II (mg/l)[a]	na	Hach 8146	0.25	**2.92**	**2.71**	**2.95**	**1.97**	0.54	**1.36**	**1.38**	**2.89**	**2.94**	0.78	**1.48**	0.48	**2.12**	**1.22**	**1.49**	**2.11**	>1[c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	46.2	758 D	334 D	847 D	99.9 D	384 D	688 D	865 D	370 D	777 D	364 D	48.4 D	115 D	857 D	648 D	59.5 D	1950 D	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	0.0629 T	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.0246 T	<0.1	0.154	0.0801 T	0.0800 T	<0.1	<0.1	0.0160 T	0.123	<0.1	>1[c]	Evidence of sulfate reduction

[a] Iron II was measured in the field using Hach kits; Samples > 3.00 mg/l exceed the maximum reading of the Hach Kit.

[b] Scheduled to be sampled annually, during spring rounds only.

[c] From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.

[d] This chemical is a designated "indicator chemical" for the Site. The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

[e] A groundwater sample from this location was collected for PCP analysis on April 7, 2021.

[f] A groundwater sample from this location was collected for PCP analysis on April 9, 2021.

[g] Anomolous value which may be due to a measurement or transcription error.

Laboratory results highlighted in yellow are greater than the analyte's MCL.

-- Not analyzed
na Not applicable
NS Not sampled
MCL Regulatory drinking water maximum contaminant level
mV millivolt
µg/l micrograms per liter
mg/l milligrams per liter
Bold Geochemical parameters shown in bold indicate conditions are conducive to biodegradation of chlorinated compounds.
D Sample dilution required for analysis; reported values reflect the dilution.
J+ Data are estimated due to associated quality control data. The surrogate percent recovery associated with the analysis was greater than the upper control limit.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

[12] Table 4 of Progress Report 115, pdf page 27.

Table K-10: November 2021 Shallow Groundwater Sampling Results[13]

TABLE 4
SHALLOW GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS
NOVEMBER 2021
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH
Page 1 of 1

					Analytical Results																*Natural Attenuation Assessment*	
	MCL	Sample Identification	ES-01[b]	EX-02[b]	EX-04	EX-05	EX-07[b]	EX-08[b]	EX-09[b]	EX-11[b]	MW-06	MW-20[b]	MW-23[b]	MW-24A	MW-25	MW-30	MW-34[b]	PZ-1	PZ-3	Biodegradation	
		Date Collected	--	--	11/1/2021	11/3/2021	--	--	--	--	11/4/2021	--	--	11/4/2021	11/3/2021	11/2/2021	11/2/2021	11/3/2021	11/3/2021	Indicator	Purpose and/or Interpretation
Analyte/ Parameter (Units)																						
Volatile Organic Compounds (µg/l)		Analytical Method																				
Tetrachloroethene	5	SW8260B	--	--	<1.0	<1.0	--	--	--	--	<1.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	na	Indicator chemical[d]
Trichloroethene	5	SW8260B	--	--	0.15 T	0.33 T	--	--	--	--	0.17 T	--	--	<1.0	<1.0	1.7	0.28 T	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of PCE
1,1-Dichloroethene	7	SW8260B	--	--	0.85 T	9.1	--	--	--	--	2.7	--	--	<1.0	<1.0	2.9	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of TCE
cis-1,2-Dichloroethene	70	SW8260B	--	--	21	120	--	--	--	--	19	--	--	<1.0	<1.0	60	1.7	<1.0	<1.0	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene	100	SW8260B	--	--	5.5	100	--	--	--	--	5.6	--	--	<1.0	<1.0	2.1	0.55 T	<1.0	<1.0	detection	Degradation product of trichloroethene
Vinyl Chloride	2	SW8260B	--	--	<1.0	2.7	--	--	--	--	1.6	--	--	<1.0	<1.0	25	<1.0	<1.0	<1.0	detection	Degradation product of dichloroethenes
Pesticides (µg/l)																						
Pentachlorophenol (PCP)	1	SW8151A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	na	Indicator chemical[d]
Geochemical Parameters																						
pH (standard units)	na	field measurement	--	--	**7.11**	**7.08**	--	--	--	--	**6.96**	--	--	**7.03**	10.51[e]	10.12[e]	**7.54**	**7.14**	10.25[e]	5 to 9[c]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	field measurement	--	--	**-266.8**	**-8.9**	--	--	--	--	**-128.5**	--	--	**-293.4**	**-27.8**	**-96.5**	**-126.3**	**-136.2**	**-102.8**	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	--	--	**0.2**	**0.79**	--	--	--	--	**0.14**	--	--	**0.02**	2.01[e]	3.45[e]	**0.34**	**0.01**	2.88[e]	<0.5[c]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	--	--	1.67	**<0.1**	--	--	--	--	**<0.1**	--	--	**<0.1**	**<0.1**	**<0.05**	**<0.1**	**<0.1**	**0.0893 T**	<1[c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	--	--	0.887 T	<0.5	--	--	--	--	<0.125	--	--	<0.025	<0.25	26.7	0.0895 T	<0.5 D	<0.5 D	>1	Evidence of nitrate reduction
Iron II (mg/l)[a]	na	Hach 8146	--	--	**2.95**	**2.05**	--	--	--	--	**2.95**	--	--	**2.85**	0.25	**1.64**	**1.85**	**1.49**	**1.98**	>1[c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	--	--	160	746	--	--	--	--	420	--	--	44.8	187	920	381	126	1890	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	--	--	<0.1	<0.1	--	--	--	--	<0.1	--	--	0.0800 T	<0.1	<0.1	0.0160 T	0.123	<0.1	>1[c]	Evidence of sulfate reduction

[a] Iron II was measured in the field using Hach kits; Samples > 3.00 mg/l exceed the maximum reading of the Hach Kit.
[b] Scheduled to be sampled annually, during spring rounds only.
[c] From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.
[d] This chemical is a designated "indicator chemical" for the Site. The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.
[e] Anomalous value that may be due to a measurement or transcription error.

Laboratory results highlighted in yellow are greater than the analyte's MCL.

-- Not analyzed
na Not applicable
NS Not sampled
MCL Regulatory drinking water maximum contaminant level
mV millivolt
µg/l micrograms per liter
mg/l milligrams per liter
Bold Geochemical parameters shown in bold indicate conditions are conducive to biodegradation of chlorinated compounds.
D Sample dilution required for analysis; reported values reflect the dilution.
J+ Data are estimated due to associated quality control data. The surrogate percent recovery associated with the analysis was greater than the upper control limit.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

[13] Table 4 of Progress Report 116, pdf page 27.

APPENDIX L – DEEPER GROUNDWATER DATA TABLES

Table L-1: April 2017 Deeper Groundwater Zone 1 Sampling Results[14]

TABLE 3
GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS FOR DEEPER WELLS INSTALLED IN 2011
APRIL 2017
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

	Analytical Results					*Natural Attenuation Assessment*	
	MCL	Sample Identification Screened Interval (feet bgs) Date Collected	MW-31D 38 - 48 4/13/2017	MW-32D 46 - 56 4/12/2017	MW-33D 35 - 45 4/12/2017	Biodegradation Indicator	Purpose and/or Interpretation
Analyte/ Parameter (Units)							
Volatile Organic Compounds (µg/l)		Analytical Method					
Tetrachloroethene (PCE)	5	SW8260B	<1	<1	0.15 T	Not Applicable	Indicator chemical[d]
Trichloroethene (TCE)	5	SW8260B	<1	<1	**0.28 T**	detection	Indicator chemical[d]; degradation product of PCE
1,1-Dichloroethene (1,1-DCE)	7	SW8260B	<1	<1	<1	detection	Indicator chemical[d]; degradation product of trichloroethene
cis-1,2-Dichloroethene (cis-1,2-DCE)	70	SW8260B	<1	<1	**2.6**	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene (trans-1,2-DC	100	SW8260B	<1	<1	<1	detection	Degradation product of trichloroethene
Vinyl Chloride (VC)	2	SW8260B	<1	<1	**0.92 T**	detection	Degradation product of dichloroethenes
Benzene	5	SW8260B	NA	NA	<0.5	na	na
Ethylbenzene	700	SW8260B	NA	NA	0.59 T	na	na
m,p-Xylene (Sum Of Isomers)	10,000[b]	SW8260B	NA	NA	2.9	na	na
o-Xylene (1,2-Dimethylbenzene)	10,000[b]	SW8260B	NA	NA	1.4	na	na
Naphthalene	na	SW8260B	NA	NA	<1	na	na
Toluene	1,000	SW8260B	NA	NA	0.83	na	na
Pesticides (µg/l)							
Pentachlorophenol (PCP)	1	SW8151A	NA	NA	NA	Not Applicable	Indicator chemical[d]
Geochemical Parameters							
pH (standard units)	na	field measurement	**7.89**	**7.55**	**7.83**	5 to 9[c]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	field measurement	**-187**	**-176**	**-158**	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	**0.35**	**0.01**	**0.16**	<0.5[c]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	**<0.1**	**<0.1**	**<0.1**	<1[c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	<0.1	<0.1	<0.1	>1	Evidence of nitrate reduction
Iron II (mg/l)[a]	na	Hach 8146	0.45	0.57	**2.59**	>1[c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	**0.461 TUB**	**1.15 UB**	**0.856 UB**	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	0.0662 T	0.088 T	0.088 T	>1[c]	Evidence of sulfate reduction

Note: Deeper wells MW-31D, MW-32D, and MW-33D were installed in October 2011.

[a] Iron II was measured in the field using Hach kits.

[b] MCL listed is for the sum of o, m, and p xylenes.

[c] From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater* , USEPA, 1998.

[d] The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

NA	Not analyzed
MCL	Regulatory drinking water maximum contaminant level
bgs	below ground surface
µg/l	micrograms per liter.
mg/l	milligrams per liter.
Bold	VOC values in bold suggest biodegradation has occurred (these compounds are daughter products); geochemical values shown in bold indicate conditions are conducive to biodegradation.
T	Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB	Analyte considered not detected based on associated blank data.

[14] Table 3 of Progress Report 107, pdf page 19.

Table L-2: November 2017 Deeper Groundwater Zone 1 Sampling Results[15]

TABLE 4
GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS FOR WELLS COMPLETED IN DEEPER GROUNDWATER ZONE 1
NOVEMBER 2017
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

	Analytical Results					*Natural Attenuation Assessment*	
	MCL	Sample Identification Screened Interval (feet bgs) Date Collected	MW-31D 38 - 48 11/8/2017	MW-32D 46 - 56 11/7/2017	MW-33D 35 - 45 11/7/2017	Biodegradation Indicator	Purpose and/or Interpretation
Analyte/ Parameter (Units)							
Volatile Organic Compounds (µg/l)		Analytical Method					
Tetrachloroethene (PCE)	5	SW8260B	<1.0	<1.0	<1.0	Not Applicable	Indicator chemical[d]
Trichloroethene (TCE)	5	SW8260B	<1.0	<1.0	**0.17 T**	detection	Indicator chemical[d]; degradation product of PCE
1,1-Dichloroethene (1,1-DCE)	7	SW8260B	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of trichloroethene
cis-1,2-Dichloroethene (cis-1,2-DCE)	70	SW8260B	<1.0	<1.0	**1.6**	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene (trans-1,2-DC	100	SW8260B	<1.0	<1.0	<1.0	detection	Degradation product of trichloroethene
Vinyl Chloride (VC)	2	SW8260B	<1.0	<1.0	**0.92 T**	detection	Degradation product of dichloroethenes
Benzene	5	SW8260B	NA	NA	<0.5	na	na
Ethylbenzene	700	SW8260B	NA	NA	0.85 T	na	na
m,p-Xylene (Sum Of Isomers)	10,000[b]	SW8260B	NA	NA	4.6	na	na
o-Xylene (1,2-Dimethylbenzene)	10,000[b]	SW8260B	NA	NA	2.0	na	na
Naphthalene	na	SW8260B	NA	NA	<1.0	na	na
Toluene	1,000	SW8260B	NA	NA	0.91	na	na
Pesticides (µg/l)							
Pentachlorophenol (PCP)	1	SW8151A	NA	NA	NA	Not Applicable	Indicator chemical[d]
Geochemical Parameters							
pH (standard units)	na	field measurement	**8.06**	**7.90**	**7.91**	5 to 9[c]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	field measurement	**-184**	**-263**	**-248**	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	**0.22**	**0.17**	**0.18**	<0.5[c]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	**<0.1**	**<0.1**	**<0.1**	<1[c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	<0.1	<0.1	<0.1	>1	Evidence of nitrate reduction
Iron II (mg/l)[a]	na	W	0.51	0.97	**2.59**	>1[c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	**0.438 TUB**	**0.575**	**0.608**	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	0.0822 T	0.0753 T	0.0868 T	>1[c]	Evidence of sulfate reduction

Note: Deeper wells MW-31D, MW-32D, and MW-33D were installed in October 2011.

[a] Iron II was measured in the field using Hach kits.

[b] MCL listed is for the sum of o, m, and p xylenes.

[c] From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.

[d] The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

NA Not analyzed
MCL Regulatory drinking water maximum contaminant level
bgs below ground surface
µg/l micrograms per liter.
mg/l milligrams per liter.
Bold VOC values in bold suggest biodegradation has occurred (these compounds are daughter products); geochemical values shown in bold indicate conditions are conducive to biodegradation.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.
VOC volatile organic compound

[15] Table 4 of Progress Report 108, pdf page 18.

Table L-3: November 2017 Deeper Groundwater Zone 2,3,4 Sampling Results[16]

TABLE 5
GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS FOR WELLS COMPLETED IN ZONES 2, 3 AND 4
AUGUST AND NOVEMBER 2017
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

		Analytical Results										*Natural Attenuation Assessment*	
		Sample Identification	**MW-35D2**		**MW-36D2**		**MW-37D2**		**MW-38D3**		**MW-39D4**		
		Screened Interval (feet bgs)	**81 - 91**		**80 - 90**		**78 - 88**		**118 - 128**		**147.8 - 157.8**		
		Groundwater Zone	**Deeper Zone 2**		**Deeper Zone 2**		**Deeper Zone 2**		**Deeper Zone 3**		**Deeper Zone 4**		**Biodegradation**
	MCL	**Date Collected**	**8/16/2017**	**11/9/2017**	**8/16/2017**	**11/9/2017**	**8/17/2017**	**11/8/2017**	**8/16/2017**	**11/9/2017**	**8/16/2017**	**11/9/2017**	**Indicator**	**Purpose and/or Interpretation**
Analyte/ Parameter (Units)														
Volatile Organic Compounds (µg/l)		**Analytical Method**												
Tetrachloroethene (PCE)	5	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Not Applicable	Indicator chemical[17]
Trichloroethene (TCE)	5	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Indicator chemical[17]; degradation product of PCE
1,1-Dichloroethene (1,1-DCE)	7	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Indicator chemical[17]; degradation product of trichloroethene
cis-1,2-Dichloroethene (cis-1,2-DCE)	70	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene (trans-1,2-D(	100	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Degradation product of trichloroethene
Vinyl Chloride (VC)	2	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Degradation product of dichloroethenes
Benzene	5	SW8260B	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	na	na
Ethylbenzene	700	SW8260B	<1.0	<1.0	<1.0	<1.0	0.17 T	<1.0	<1.0	<1.0	<1.0	<1.0	na	na
m,p-Xylene (Sum Of Isomers)	10,000[b]	SW8260B	<1.0	<1.0	<1.0	<1.0	0.88 TUB	<1.0	<1.0	<1.0	<1.0	<1.0	na	na
o-Xylene (1,2-Dimethylbenzene)	10,000[b]	SW8260B	<0.5	<0.5	<0.5	<0.5	0.33 TUB	<0.5	<0.5	<0.5	<0.5	<0.5	na	na
Naphthalene	na	SW8260B	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<0.5	<0.5	<0.5	<0.5	na	na
Toluene	1,000	SW8260B	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	na	na
Pesticides (µg/l)														
Pentachlorophenol (PCP)	1	SW8151A	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	Not Applicable	Indicator chemical[17]
Geochemical Parameters														
pH (standard units)	na	field measurement	**7.78**	**8.04**	**8.05**	**8.05**	**8.03**	**8.14**	**7.97**	**8.07**	**8.00**	**7.97**	5 to 9[c]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	field measurement	**-82.3**	**-270.3**	**-236.8**	**-311.9**	**-168.7**	**-246.7**	**-186.2**	**-247.7**	**-212.5**	**-208.0**	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	**0.06**	**0.02**	**0.02**	**0.02**	**0.23**	**0.07**	**0.01**	**0.03**	**0.09**	**0.03**	<0.5[c]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	**<0.1**	**<0.1**	**<0.1**	**0.0543 T**	**0.0579 T**	**<0.1**	**<0.1**	**0.0584 T**	**<0.1**	**<0.1**	<1[c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	>1	Evidence of nitrate reduction
Iron II (mg/l)[a]	na	Hach 8146	0.13	0.06	0.19	0.11	**1.48**	0.17	0.21	0.37	0.34	0.75	>1[c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	74.0 D	76.7 D	46.9 D	46.6 D	73.9 D	33.4 D	**0.581 UB**	**0.623**	**0.6000 UB**	**0.267 T**	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	0.145	0.172	0.7	0.582	0.165	0.146	0.142	0.188	0.12	0.0719 T	>1[c]	Evidence of sulfate reduction

Note: Deeper wells MW-35D2, MW-36D2, MW-37D2, MW-38D3 and MW-39D4 were installed in July 2017.

[a] Iron II was measured in the field using Hach kits.

[b] MCL listed is for the sum of o, m, and p xylenes.

[c] From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.

[17] The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

NA Not analyzed
MCL Regulatory drinking water maximum contaminant level
bgs below ground surface
µg/l micrograms per liter.
mg/l milligrams per liter.
Bold Chlorinated VOC values in bold suggest biodegradation has occurred (these compounds are daughter products); geochemical values shown in bold indicate conditions are conducive to biodegradation of chlorinated compounds.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.

[16] Table 5 of Progress Report 108, pdf page 19.

Table L-4: April 2018 Deeper Groundwater Zone 1 Sampling Results[17]

TABLE 4
GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS FOR WELLS COMPLETED IN DEEPER GROUNDWATER ZONE 1
APRIL 2018
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

		Analytical Results				*Natural Attenuation Assessment*	
	MCL	Sample Identification Screened Interval (feet bgs) Date Collected	MW-31D 38 - 48 4/26/2018	MW-32D 46 - 56 4/25/2018	MW-33D 35 - 45 4/25/2018	Biodegradation Indicator	Purpose and/or Interpretation
Analyte/ Parameter (Units)							
Volatile Organic Compounds (µg/l)		Analytical Method					
Tetrachloroethene (PCE)	5	SW8260B	<1.0	**0.44 T**	**0.35 T**	Not Applicable	Indicator chemical[d]
Trichloroethene (TCE)	5	SW8260B	<1.0	**0.61 T**	**0.30 T**	detection	Indicator chemical[d]; degradation product of PCE
1,1-Dichloroethene (1,1-DCE)	7	SW8260B	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of trichloroethene
cis-1,2-Dichloroethene (cis-1,2-DCE)	70	SW8260B	<1.0	**0.11 T**	**1.9**	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene (trans-1,2-DC	100	SW8260B	<1.0	<1.0	<1.0	detection	Degradation product of trichloroethene
Vinyl Chloride (VC)	2	SW8260B	<1.0	<1.0	**1.0**	detection	Degradation product of dichloroethenes
Benzene	5	SW8260B	--	--	<0.50	na	na
Ethylbenzene	700	SW8260B	--	--	0.93 T	na	na
m,p-Xylene (Sum of Isomers)	10,000[b]	SW8260B	--	--	5.1	na	na
o-Xylene (1,2-Dimethylbenzene)	10,000[b]	SW8260B	--	--	2.2	na	na
Naphthalene	na	SW8260B	--	--	<1.0	na	na
Toluene	1,000	SW8260B	--	--	1.3	na	na
Pesticides (µg/l)							
Pentachlorophenol (PCP)	1	SW8151A	--	--	--	Not Applicable	Indicator chemical[d]
Geochemical Parameters							
pH (standard units)	na	field measurement	**7.77**	**7.91**	**7.64**	5 to 9[c]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	field measurement	**-157**	**-186**	**-158**	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	**0.45**	**0.01**	**0.17**	<0.5[c]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	**<0.10**	**<0.10**	**<0.10**	<1[c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	<0.10	<0.10	<0.10	>1	Evidence of nitrate reduction
Iron II (mg/l)[a]	na	W	0.60	0.99	**2.74**	>1[c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	**0.567 B**	**0.426 T**	**0.614**	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	0.0936 T	0.0825 T	0.0767 T	>1[c]	Evidence of sulfate reduction

Note: Deeper wells MW-31D, MW-32D, and MW-33D were installed in October 2011.

[a] Iron II was measured in the field using Hach kits.

[b] MCL listed is for the sum of o, m, and p xylenes.

[c] From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.

[d] The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

NA	Not analyzed
MCL	Regulatory drinking water maximum contaminant level
bgs	below ground surface
µg/l	micrograms per liter.
mg/l	milligrams per liter.
Bold	VOC values in bold suggest biodegradation has occurred (these compounds are daughter products); geochemical values shown in bold indicate conditions are conducive to biodegradation.
T	Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB	Analyte considered not detected based on associated blank data.
VOC	volatile organic compound

[17] Table 4 of Progress Report 109, pdf page 35.

Table L-5: April 2018 Deeper Groundwater Zone 1 Sampling Results[18]

TABLE 5
GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS FOR WELLS COMPLETED IN ZONES 2, 3 AND 4
FEBRUARY AND APRIL 2018
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

		Analytical Results											*Natural Attenuation Assessment*	
		Sample Identification	MW-35D2		MW-36D2		MW-37D2		MW-38D3		MW-39D4			
		Screened Interval (feet bgs)	81 - 91		80 - 90		78 - 88		118 - 128		147.8 - 157.8			
		Groundwater Zone	Deeper Zone 2		Deeper Zone 2		Deeper Zone 2		Deeper Zone 3		Deeper Zone 4		Biodegradation	
	MCL	Date Collected	2/6/2018	4/30/2018	2/6/2018	4/30/2018	2/7/2018	4/27/2018	2/7/2018	4/27/2018	2/6/2018	4/27/2018	Indicator	Purpose and/or Interpretation
Analyte/ Parameter (Units)														
Volatile Organic Compounds (µg/l)		Analytical Method												
Tetrachloroethene (PCE)	5	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Not Applicable	Indicator chemical[d]
Trichloroethene (TCE)	5	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of PCE
1,1-Dichloroethene (1,1-DCE)	7	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of trichloroethene
cis-1,2-Dichloroethene (cis-1,2-DCE)	70	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene (trans-1,2-DC	100	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Degradation product of trichloroethene
Vinyl Chloride (VC)	2	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Degradation product of dichloroethenes
Benzene	5	SW8260B	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	na	na
Ethylbenzene	700	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	na	na
m,p-Xylene (Sum Of Isomers)	10,000[b]	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	na	na
o-Xylene (1,2-Dimethylbenzene)	10,000[b]	SW8260B	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	na	na
Naphthalene	na	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	na	na
Toluene	1,000	SW8260B	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	na	na
Pesticides (µg/l)														
Pentachlorophenol (PCP)	1	SW8151A	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	Not Applicable	Indicator chemical[d]
Geochemical Parameters														
pH (standard units)	na	field measurement	**8.16**	**8.03**	**8.21**	**8.1**	**8.07**	**7.93**	**8.03**	**7.96**	**8.00**	**7.82**	5 to 9[c]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	field measurement	**-283.7**	**-229**	**-309**	**-264**	**-209.3**	**-243**	**-223.5**	**-218**	**-247.4**	**-208.0**	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	**0.03**	**0.01**	**0.03**	**0.01**	**0.12**	**0.01**	**0.04**	**0.01**	**0.02**	**0.03**	<0.5[c]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	**<0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.50 D**	**<0.10**	**<0.50 D**	<1[c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10 UJ	<0.50 D	<0.10	<0.50 D	>1	Evidence of nitrate reduction
Iron II (mg/l)[a]	na	Hach 8146	0.42	0.05	0.07	0.15	0.20	0.18	**1.20**	0.31	0.84	**1.30**	>1[c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	77.6 D	50.4 D	9.32 ID	54.6 D	70.8 D	65.1 D	**4.98 D**	**6.82 D**	**0.277 T**	**2.69 D**	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	0.322	0.272	**1.2**	**1.44 D**	0.242	0.165	0.34	0.257	0.101	0.0844 T	>1[c]	Evidence of sulfate reduction

Note: Deeper wells MW-35D2, MW-36D2, MW-37D2, MW-38D3 and MW-39D4 were installed in July 2017.

[a] Iron II was measured in the field using Hach kits.

[b] MCL listed is for the sum of o, m, and p xylenes.

[c] From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater* , USEPA, 1998.

[d] The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

NA Not analyzed
MCL Regulatory drinking water maximum contaminant level
bgs below ground surface
µg/l micrograms per liter.
mg/l milligrams per liter.
Bold Chlorinated VOC values in bold suggest biodegradation has occurred (these compounds are daughter products); geochemical values shown in bold indicate conditions are conducive to biodegradation of chlorinated compounds.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.

[18] Table 6 of Progress Report 109, pdf page 36.

Table L-6: November 2018 Deeper Groundwater Zone 1 Sampling Results[19]

TABLE 5
GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS FOR WELLS COMPLETED IN DEEPER GROUNDWATER ZONE 1
NOVEMBER 2018
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

	Analytical Results					*Natural Attenuation Assessment*	
	MCL	Sample Identification Screened Interval (feet bgs) Date Collected	MW-31D 38 - 48 11/7/2018	MW-32D 46 - 56 11/6/2018	MW-33D 35 - 45 11/6/2018	Biodegradation Indicator	Purpose and/or Interpretation
Analyte/ Parameter (Units)							
Volatile Organic Compounds (µg/l)		Analytical Method					
Tetrachloroethene (PCE)	5	SW8260B	<1.0	<1.0	**0.16 T**	Not Applicable	Indicator chemical[d]
Trichloroethene (TCE)	5	SW8260B	<1.0	<1.0	**0.14 T**	detection	Indicator chemical[d]; degradation product of PCE
1,1-Dichloroethene (1,1-DCE)	7	SW8260B	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of trichloroethene
cis-1,2-Dichloroethene (cis-1,2-DCE)	70	SW8260B	<1.0	<1.0	**3.0**	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene (trans-1,2-DCE)	100	SW8260B	<1.0	<1.0	<1.0	detection	Degradation product of trichloroethene
Vinyl Chloride (VC)	2	SW8260B	<1.0	<1.0	**1.1**	detection	Degradation product of dichloroethenes
Benzene	5	SW8260B	--	--	<0.5	na	na
Ethylbenzene	700	SW8260B	--	--	0.68 T	na	na
m,p-Xylene (Sum Of Isomers)	10,000[b]	SW8260B	--	--	4.1	na	na
o-Xylene (1,2-Dimethylbenzene)	10,000[b]	SW8260B	--	--	1.8	na	na
Naphthalene	na	SW8260B	--	--	<1.0	na	na
Toluene	1,000	SW8260B	--	--	0.79	na	na
Pesticides (µg/l)							
Pentachlorophenol (PCP)	1	SW8151A	--	--	--	Not Applicable	Indicator chemical[d]
Geochemical Parameters							
pH (standard units)	na	field measurement	**7.95**	**7.91**	**7.64**	5 to 9[c]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	field measurement	**-219.3**	**-186**	**-158**	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	**0.07**	**0.01**	**0.17**	<0.5[c]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	**<0.1**	**<0.1**	**<0.1**	<1[c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	<0.1	<0.1	<0.1	>1	Evidence of nitrate reduction
Iron II (mg/l)[a]	na	W	0.44	0.93	0.86	>1[c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	**0.458 T**	**0.608**	**0.609**	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	0.0832 T	0.105	0.134	>1[c]	Evidence of sulfate reduction

Note: Deeper wells MW-31D, MW-32D, and MW-33D were installed in October 2011.

[a]Iron II was measured in the field using Hach kits.

[b]MCL listed is for the sum of o, m, and p xylenes.

[c]From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.

[d]The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

-- Not analyzed
MCL Regulatory drinking water maximum contaminant level
bgs below ground surface
µg/l micrograms per liter.
mg/l milligrams per liter.
Bold VOC values in bold suggest biodegradation has occurred (these compounds are daughter products); geochemical values shown in bold indicate conditions are conducive to biodegradation.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
VOC volatile organic compound

[19] Table 5 of Progress Report 110, pdf page 31.

Table L-7: November 2018 Deeper Groundwater Zone 2,3,4 Sampling Results[20]

TABLE 6
GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS FOR WELLS COMPLETED IN ZONES 2, 3 AND 4
NOVEMBER 2018
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

		Analytical Results							*Natural Attenuation Assessment*	
		Sample Identification	**MW-35D2**	**MW-36D2**	**MW-37D2**	**MW-38D3**	**MW-39D4**			
		Screened Interval (feet bgs)	**81 - 91**	**80 - 90**	**78 - 88**	**118 - 128**	**147.8 - 157.8**			
		Groundwater Zone	**Deeper Zone 2**	**Deeper Zone 2**	**Deeper Zone 2**	**Deeper Zone 3**	**Deeper Zone 4**	**Biodegradation**		
	MCL	**Date Collected**	**11/8/2018**	**11/8/2018**	**11/8/2018**	**11/6/2018**	**11/8/2018**	**Indicator**	**Purpose and/or Interpretation**	
Analyte/ Parameter (Units)										
Volatile Organic Compounds (µg/l)		**Analytical Method**								
Tetrachloroethene (PCE)	5	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	Not Applicable	Indicator chemical[(d)]	
Trichloroethene (TCE)	5	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Indicator chemical[(d)]; degradation product of PCE	
1,1-Dichloroethene (1,1-DCE)	7	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Indicator chemical[(d)]; degradation product of trichloroethene	
cis-1,2-Dichloroethene (cis-1,2-DCE)	70	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Degradation product of trichloroethene	
trans-1,2-Dichloroethene (trans-1,2-DCE)	100	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Degradation product of trichloroethene	
Vinyl Chloride (VC)	2	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Degradation product of dichloroethenes	
Benzene	5	SW8260B	<0.50	<0.50	<0.50	<0.50	<0.50	na	na	
Ethylbenzene	700	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	na	na	
m,p-Xylene (Sum Of Isomers)	10,000[(b)]	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	na	na	
o-Xylene (1,2-Dimethylbenzene)	10,000[(b)]	SW8260B	<0.50	<0.50	<0.50	<0.50	<0.50	na	na	
Naphthalene	na	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	na	na	
Toluene	1,000	SW8260B	<0.50	<0.50	<0.50	<0.50	<0.50	na	na	
Pesticides (µg/l)										
Pentachlorophenol (PCP)	1	SW8151A	<0.50	<0.50	<0.50	<0.50	<0.50	Not Applicable	Indicator chemical[(d)]	
Geochemical Parameters										
pH (standard units)	na	field measurement	**7.93**	**7.95**	**7.95**	**7.85**	**7.82**	5 to 9[(c)]	Optimal range for reductive pathway	
Oxidation-Reduction Potential (mV)	na	field measurement	**-282.3**	**-309.14**	**-304.8**	**-271.2**	**-285.5**	<50[(c)]	Reductive pathway possible	
Dissolved Oxygen (mg/l)	na	field measurement	**0.03**	**0.04**	**0.01**	**0.01**	**0.01**	<0.5[(c)]	Reductive pathway possible	
Nitrate (mg/l)	10	E300.0	**<0.1**	**<0.1**	**0.0886 T**	**<0.1**	**<0.2 D**	<1[(c)]	Reductive pathway possible	
Nitrite (mg/l)	1	E300.0	<0.1	<0.1	<0.1	<0.1	<0.2 D	>1	Evidence of nitrate reduction	
Iron II (mg/l)[(a)]	na	Hach 8146	0.15	0.15	**0.20**	0.58	0.74	>1[(c)]	Reductive pathway possible	
Sulfate (mg/l)	na	E300.0	73.9 D	40.7 D	63.9 D	**2.04**	**0.731 TD**	<20[(c)]	At higher concentrations may compete with reductive pathway	
Sulfide, total (mg/l)	na	E376.2	0.183	1.28	0.235	0.41	0.112	>1[(c)]	Evidence of sulfate reduction	

Note: Deeper wells MW-35D2, MW-36D2, MW-37D2, MW-38D3 and MW-39D4 were installed in July 2017.

[(a)] Iron II was measured in the field using Hach kits.

[(b)] MCL listed is for the sum of o, m, and p xylenes.

[(c)] From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.

[(d)] The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

MCL Regulatory drinking water maximum contaminant level
bgs below ground surface
µg/l micrograms per liter.
mg/l milligrams per liter.
Bold Chlorinated VOC values in bold suggest biodegradation has occurred (these compounds are daughter products); geochemical values shown in bold indicate conditions are conducive to biodegradation of chlorinated compounds.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.

[20] Table 6 of Progress Report 110, pdf page 32.

Table L-8: May 2019 Deeper Groundwater Zone 1 Sampling Results[21]

TABLE 5
DEEPER GROUNDWATER ZONE 1 SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS
MAY 2019
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

	Analytical Results					*Natural Attenuation Assessment*	
	MCL	Sample Identification Screened Interval (feet bgs) Date Collected	MW-31D 38 - 48 5/8/2019	MW-32D 46 - 56 5/6/2019	MW-33D 35 - 45 5/6/2019	Biodegradation Indicator	Purpose and/or Interpretation
Analyte/ Parameter (Units)							
Volatile Organic Compounds (µg/l)		Analytical Method					
Tetrachloroethene	5	SW8260B	<1.0	<1.0	<1.0	Not Applicable	Indicator chemical[d]
Trichloroethene	5	SW8260B	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of PCE
1,1-Dichloroethene	7	SW8260B	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of trichloroethene
cis-1,2-Dichloroethene	70	SW8260B	<1.0	<1.0	**1.6**	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene	100	SW8260B	<1.0	<1.0	<1.0	detection	Degradation product of trichloroethene
Vinyl Chloride (VC)	2	SW8260B	<1.0	<1.0	**1.3**	detection	Degradation product of dichloroethenes
Benzene	5	SW8260B	--	--	<0.50	na	na
Ethylbenzene	700	SW8260B	--	--	0.56 T	na	na
m,p-Xylene (sum of isomers)	10,000[b]	SW8260B	--	--	**4.2**	na	na
o-Xylene	10,000[b]	SW8260B	--	--	**1.9**	na	na
Naphthalene	na	SW8260B	--	--	<1.0	na	na
Toluene	1,000	SW8260B	--	--	**0.88**	na	na
Pesticides (µg/l)							
Pentachlorophenol (PCP)	1	SW8151A	--	--	--	Not Applicable	Indicator chemical[d][e]
Geochemical Parameters							
pH (standard units)	na	field measurement	**7.94**	**7.91**	**7.7**	5 to 9[c]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	field measurement	**-89**	**-186**	**-103**	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	**0.1**	**0.01**	**0.19**	<0.5[c]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	**<0.05 D**	**<0.05 D**	**<0.05 D**	<1[c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	<0.05 D, UJ	0.396 D	0.397 D	>1	Evidence of nitrate reduction
Iron II (mg/l)[e]	na	W	0.28	0.21	0.28	>1[c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	**1.31 D**	**0.542 TD**	**0.803 TD**	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	0.129	0.128	0.113	>1[c]	Evidence of sulfate reduction

Note: Deeper wells MW-31D, MW-32D, and MW-33D were installed in October 2011.

[e]Iron II was measured in the field using Hach kits.

[b]MCL listed is for the sum of o, m, and p xylenes.

[c]From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.

[d]The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

[e]PCP was not detected over the initial six sampling rounds; consequently, sampling for PCP has been discontinued.

NA Not analyzed
MCL Regulatory drinking water maximum contaminant level
bgs below ground surface
µg/l micrograms per liter
mg/l milligrams per liter
Bold VOC values in bold suggest biodegradation has occurred (these compounds are daughter products); geochemical values shown in bold indicate conditions are conducive to biodegradation.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.
VOC volatile organic compound

[21] Table 5 of Progress Report 111, pdf page 38.

Table L-9: May 2019 Deeper Groundwater Zone 2,3,4 Sampling Results[22]

TABLE 6
GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS FOR WELLS COMPLETED IN DEEPER ZONES 2, 3 AND 4
MAY 2019
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

		Analytical Results						*Natural Attenuation Assessment*	
		Sample Identification	**MW-35D2**	**MW-36D2**	**MW-37D2**	**MW-38D3**	**MW-39D4**		
		Screened Interval (feet bgs)	**81 - 91**	**80 - 90**	**78 - 88**	**118 - 128**	**147.8 - 157.8**		
		Groundwater Zone	**Deeper Zone 2**	**Deeper Zone 2**	**Deeper Zone 2**	**Deeper Zone 3**	**Deeper Zone 4**	**Biodegradation**	
Analyte/ Parameter (Units)	**MCL**	**Date Collected**	**5/7/2019**	**5/7/2019**	**5/7/2019**	**5/7/2019**	**5/7/2019**	**Indicator**	**Purpose and/or Interpretation**
Volatile Organic Compounds (µg/l)		**Analytical Method**							
Tetrachloroethene (PCE)	5	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	Not Applicable	Indicator chemical[d]
Trichloroethene (TCE)	5	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of PCE
1,1-Dichloroethene (1,1-DCE)	7	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of trichloroethene
cis-1,2-Dichloroethene (cis-1,2-DCE)	70	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene (trans-1,2-DCI	100	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Degradation product of trichloroethene
Vinyl Chloride (VC)	2	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Degradation product of dichloroethenes
Benzene	5	SW8260B	<0.50	<0.50	<0.50	<0.50	<0.50	na	na
Ethylbenzene	700	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	na	na
m,p-Xylene (Sum Of Isomers)	10,000[b]	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	na	na
o-Xylene (1,2-Dimethylbenzene)	10,000[b]	SW8260B	<0.50	<0.50	<0.50	<0.50	<0.50	na	na
Naphthalene	na	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	na	na
Toluene	1,000	SW8260B	<0.50	<0.50	<0.50	<0.50	<0.50	na	na
Pesticides (µg/l)									
Pentachlorophenol (PCP)	1	SW8151A	<0.50	<0.50	<0.50	<0.50	<0.50	Not Applicable	Indicator chemical[d]
Geochemical Parameters									
pH (standard units)	na	field measurement	**8.10**	**8.11**	**8.03**	**8.02**	**7.90**	5 to 9[c]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	field measurement	**-276**	**-292**	**-218**	**-244**	**-269**	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	**0.02**	**0.01**	**0.11**	**0.02**	**0.01**	<0.5[c]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	**<0.1**	**<0.05 D**	**<0.1**	**<0.25 D**	**<0.25 D**	<1[c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	<0.1 UJ	<0.05 D	<0.1	<0.25 D	<0.25 D	>1	Evidence of nitrate reduction
Iron II (mg/l)[a]	na	Hach 8146	0.07	0.09	0.08	0.41	0.46	>1[c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	65.9 D	41.8 D	60.9 D	**4.40 TD, UB**	**4.67 TD, UB**	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	1.02	1.39 D	0.230	0.250	0.131	>1[c]	Evidence of sulfate reduction

Note: Deeper wells MW-35D2, MW-36D2, MW-37D2, MW-38D3 and MW-39D4 were installed in July 2017.

[a]Iron II was measured in the field using Hach kits.

[b]MCL listed is for the sum of o, m, and p xylenes.

[c]From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.

[d]The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

MCL Regulatory drinking water maximum contaminant level
bgs below ground surface
µg/l micrograms per liter.
mg/l milligrams per liter.
Bold Chlorinated VOC values in bold suggest biodegradation has occurred (these compounds are daughter products); geochemical values shown in bold indicate conditions are conducive to biodegradation of chlorinated compounds.
D Sample dilution required for analysis; reported values reflect the dilution.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.

[22] Table 6 of Progress Report 111, pdf page 39.

Table L-10: November 2019 Deeper Groundwater Zone 1 Sampling Results[23]

TABLE 5
DEEPER GROUNDWATER ZONE 1 SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS
NOVEMBER 2019
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH
Page 1 of 1

	Analytical Results					*Natural Attenuation Assessment*	
	MCL	Sample Identification	MW-31D	MW-32D	MW-33D	Biodegradation	
		Screened Interval (feet bgs)	38 - 48	46 - 56	35 - 45	Indicator	Purpose and/or Interpretation
Analyte/ Parameter (Units)		Date Collected	11//6/2019	11/5/2019	11/5/2019		
Volatile Organic Compounds (µg/l)		Analytical Method					
Tetrachloroethene	5	SW8260B	<1.0	<1.0	<1.0	Not Applicable	Indicator chemical[d]
Trichloroethene	5	SW8260B	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of PCE
1,1-Dichloroethene	7	SW8260B	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of trichloroethene
cis-1,2-Dichloroethene	70	SW8260B	<1.0	<1.0	**1.3**	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene	100	SW8260B	<1.0	<1.0	<1.0	detection	Degradation product of trichloroethene
Vinyl Chloride (VC)	2	SW8260B	<1.0	<1.0	**0.42T**	detection	Degradation product of dichloroethenes
Benzene	5	SW8260B	–	--	<0.5	na	na
Ethylbenzene	700	SW8260B	–	--	0.44 T	na	na
m,p-Xylene (sum of isomers)	10,000[b]	SW8260B	–	--	3.7	na	na
o-Xylene	10,000[b]	SW8260B	–	--	1.2	na	na
Naphthalene	na	SW8260B	–	--	<1.0	na	na
Toluene	1,000	SW8260B	–	--	0.44 T	na	na
Pesticides (µg/l)							
Pentachlorophenol (PCP)	1	SW8151A	–	--	–	Not Applicable	Indicator chemical[d][e]
Geochemical Parameters							
pH (standard units)	na	field measurement	**7.91**	**7.79**	**7.82**	5 to 9[c]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	field measurement	**-264**	**-336**	**-265**	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	**0.38**	**0.09**	1.05	<0.5[c]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	**<0.2 D**	**<0.2 D**	**<0.2 D**	<1[c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	<0.2 D	<0.2 D	<0.2 D	>1	Evidence of nitrate reduction
Iron II (mg/l)[a]	na	Hach 8146	0.39	0.68	0.71	>1[c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	**0.752 TD**	**1.12 D**	**0.958 TD**	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	0.0684 T	0.0672 T	0.116	>1[c]	Evidence of sulfate reduction

[a] Iron II was measured in the field using Hach kits.

[b] MCL listed is for the sum of o, m, and p xylenes.

[c] From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.

[d] The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

[e] PCP was not detected over the initial six sampling rounds; consequently, sampling for PCP has been discontinued.

NA Not analyzed
MCL Regulatory drinking water maximum contaminant level
bgs below ground surface
µg/l micrograms per liter
mg/l milligrams per liter
Bold VOC values in bold suggest biodegradation has occurred (these compounds are daughter products); geochemical values shown in bold indicate conditions are conducive to biodegradation.
D Sample dilution required for analysis; reported values reflect the dilution.
J Data are estimated due to associated quality control data.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
VOC volatile organic compound

[23] Table 5 of Progress Report 112, pdf page 29.

Table L-11: November 2019 Deeper Groundwater Zone 2,3,4 Sampling Results[24]

TABLE 6
GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS FOR WELLS COMPLETED IN DEEPER ZONES 2, 3 AND 4
NOVEMBER 2019
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH
Page 1 of 1

		Analytical Results							*Natural Attenuation Assessment*
		Sample Identification	**MW-35D2**	**MW-36D2**	**MW-37D2**	**MW-38D3**	**MW-39D4**		
		Screened Interval (feet bgs)	**81 - 91**	**80 - 90**	**78 - 88**	**118 - 128**	**147.8 - 157.8**		
		Groundwater Zone	**Deeper Zone 2**	**Deeper Zone 2**	**Deeper Zone 2**	**Deeper Zone 3**	**Deeper Zone 4**	**Biodegradation**	
	MCL	**Date Collected**	**11/6/2019**	**11/6/2019**	**11/7/2019**	**11/5/2019**	**11/7/2019**	**Indicator**	**Purpose and/or Interpretation**
Analyte/ Parameter (Units)									
Volatile Organic Compounds (µg/l)		**Analytical Method**							
Tetrachloroethene (PCE)	5	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	Not Applicable	Indicator chemical[d]
Trichloroethene (TCE)	5	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of PCE
1,1-Dichloroethene (1,1-DCE)	7	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of trichloroethene
cis-1,2-Dichloroethene (cis-1,2-DCE)	70	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene (trans-1,2-DCE)	100	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Degradation product of trichloroethene
Vinyl Chloride (VC)	2	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Degradation product of dichloroethenes
Benzene	5	SW8260B	<0.50	<0.50	<0.50	<0.50	<0.50	na	na
Ethylbenzene	700	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	na	na
m,p-Xylene (Sum Of Isomers)	10,000[b]	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	na	na
o-Xylene (1,2-Dimethylbenzene)	10,000[b]	SW8260B	<0.50	<0.50	<0.50	<0.50	<0.50	na	na
Naphthalene	na	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	na	na
Toluene	1,000	SW8260B	<0.50	<0.50	<0.50	<0.50	<0.50	na	na
Pesticides (µg/l)									
Pentachlorophenol (PCP)	1	SW8151A	<0.50	<0.50	<0.50	<0.50	<0.50	Not Applicable	Indicator chemical[d]
Geochemical Parameters									
pH (standard units)	na	field measurement	**8.00**	**8.07**	**8.01**	**8.00**	**7.92**	5 to 9[c]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	field measurement	**-384**	**-412**	**-346.9**	**-359**	**-325**	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	<0.5[c]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	**<0.1**	**<0.1**	**<0.1**	**<0.5 D**	**<0.5 D**	<1[c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	<0.1	<0.1	<0.1	<0.5 D	<0.5 D	>1	Evidence of nitrate reduction
Iron II (mg/l)[a]	na	Hach 8146	0.1	0.1	0.15	0.63	0.49	>1[c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	64.0 D	40.9 D	62.4 D	**2.47 DT**	**2.93 D**	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	<0.1	0.877 D	0.150	0.168	0.0983 T	>1[c]	Evidence of sulfate reduction

[a] Iron II was measured in the field using Hach kits.

[b] MCL listed is for the sum of o, m, and p xylenes.

[c] From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.

[d] The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

MCL Regulatory drinking water maximum contaminant level
bgs below ground surface
µg/l micrograms per liter.
mg/l milligrams per liter.
Bold Chlorinated VOC values in bold suggest biodegradation has occurred (these compounds are daughter products); geochemical values shown in bold indicate conditions are conducive to biodegradation of chlorinated compounds.
D Sample dilution required for analysis; reported values reflect the dilution.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

[24] Table 6 of Progress Report 112, pdf page 30.

Table L-12: April 2020 Deeper Groundwater Zone 1 Sampling Results[25]

TABLE 5
DEEPER GROUNDWATER ZONE 1 SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS
APRIL 2020
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH
Page 1 of 1

	Analytical Results					*Natural Attenuation Assessment*	
	MCL	Sample Identification Screened Interval (feet bgs) Date Collected	MW-31D 38 - 48 4/21/2020	MW-32D 46 - 56 4/21/2020	MW-33D 35 - 45 4/21/2020	Biodegradation Indicator	Purpose and/or Interpretation
Analyte/ Parameter (Units)							
Volatile Organic Compounds (µg/l)		Analytical Method					
Tetrachloroethene	5	SW8260B	<1.0	<1.0	<1.0	Not Applicable	Indicator chemical[(d)]
Trichloroethene	5	SW8260B	<1.0	<1.0	<1.0	detection	Indicator chemical[(d)]; degradation product of PCE
1,1-Dichloroethene	7	SW8260B	<1.0	<1.0	<1.0	detection	Indicator chemical[(d)]; degradation product of trichloroethene
cis-1,2-Dichloroethene	70	SW8260B	<1.0	<1.0	1.0	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene	100	SW8260B	<1.0	<1.0	<1.0	detection	Degradation product of trichloroethene
Vinyl Chloride (VC)	2	SW8260B	<1.0	<1.0	0.68 T	detection	Degradation product of dichloroethenes
Benzene	5	SW8260B	--	--	<0.5	na	na
Ethylbenzene	700	SW8260B	--	--	0.33 T	na	na
m,p-Xylene (sum of isomers)	10,000[(b)]	SW8260B	--	--	3.7	na	na
o-Xylene	10,000[(b)]	SW8260B	--	--	0.90 T	na	na
Naphthalene	na	SW8260B	--	--	<1.0	na	na
Toluene	1,000	SW8260B	--	--	0.40 T	na	na
Geochemical Parameters							
pH (standard units)	na	field measurement	**7.79**	**7.91**	**7.63**	5 to 9[(c)]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	field measurement	**-143.7**	**-186**	**-145.3**	<50[(c)]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	**0.37**	**0.01**	**0.21**	<0.5[(c)]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	**<0.2 D**	**<0.2 D**	**<0.2 D**	<1[(c)]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	<0.2 D	<0.2 D	<0.2 D	>1	Evidence of nitrate reduction
Iron II (mg/l)[(a)]	na	Hach 8146	0.31	0.37	0.52	>1[(c)]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	**1.22 DB**	**1.12 DB**	**1.28 DB**	<20[(c)]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	0.0756 T	0.109	0.132	>1[(c)]	Evidence of sulfate reduction

[(a)] Iron II was measured in the field using Hach kits.

[(b)] MCL listed is for the sum of o, m, and p xylenes.

[(c)] From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.

[(d)] This chemical is a designated "indicator chemical" for the Site. The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

NA Not analyzed
MCL Regulatory drinking water maximum contaminant level
bgs below ground surface
µg/l micrograms per liter
mg/l milligrams per liter
Bold Geochemical parameters shown in bold indicate conditions are conducive to biodegradation of chlorinated compounds.
B Analyte was detected in associated blank sample.
D Sample dilution required for analysis; reported values reflect the dilution.
J Data are estimated due to associated quality control data.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
VOC volatile organic compound

[25] Table 5 of Progress Report 113, pdf page 42.

Table L-13: April 2020 Deeper Groundwater Zone 2,3,4 Sampling Results[26]

TABLE 6
GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS FOR WELLS COMPLETED IN DEEPER ZONES 2, 3 AND 4
APRIL 2020
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH
Page 1 of 1

		Analytical Results							*Natural Attenuation Assessment*
		Sample Identification	**MW-35D2**	**MW-36D2**	**MW-37D2**	**MW-38D3**	**MW-39D4**		
		Screened Interval (feet bgs)	**81 - 91**	**80 - 90**	**78 - 88**	**118 - 128**	**147.8 - 157.8**		
		Groundwater Zone	**Deeper Zone 2**	**Deeper Zone 2**	**Deeper Zone 2**	**Deeper Zone 3**	**Deeper Zone 4**		
	MCL	**Date Collected**	**4/22/2020**	**4/22/2020**	**4/22/2020**	**4/22/2020**	**4/22/2020**	**Biodegradation Indicator**	**Purpose and/or Interpretation**
Analyte/ Parameter (Units)									
Volatile Organic Compounds (µg/l)		**Analytical Method**							
Tetrachloroethene (PCE)	5	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	Not Applicable	Indicator chemical[d]
Trichloroethene (TCE)	5	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of PCE
1,1-Dichloroethene (1,1-DCE)	7	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of trichloroethene
cis-1,2-Dichloroethene (cis-1,2-DCE)	70	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene (trans-1,2-DCE)	100	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Degradation product of trichloroethene
Vinyl Chloride (VC)	2	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Degradation product of dichloroethenes
Benzene	5	SW8260B	<0.50	<0.50	<0.50	<0.50	<0.50	na	na
Ethylbenzene	700	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	na	na
m,p-Xylene (Sum Of Isomers)	10,000[b]	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	na	na
o-Xylene (1,2-Dimethylbenzene)	10,000[b]	SW8260B	<0.50	<0.50	<0.50	<0.50	<0.50	na	na
Naphthalene	na	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	na	na
Toluene	1,000	SW8260B	<0.50	<0.50	<0.50	<0.50	<0.50	na	na
Pesticides (µg/l)									
Pentachlorophenol (PCP)	1	SW8151A	<0.50	<0.50	<0.50	<0.50	<0.50	Not Applicable	Indicator chemical[d]
Geochemical Parameters									
pH (standard units)	na	field measurement	**7.85**	**8.07**	**8.00**	**7.96**	**7.9**	5 to 9[c]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	field measurement	**-158.2**	**-190**	**-206**	**-211.1**	**-193**	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	**0.01**	**0.01**	**0.01**	**0.02**	**0.01**	<0.5[c]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	**<0.1**	**<0.1**	**<0.1**	**<0.2 D**	**<0.2 DUJ**	<1[c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	<0.1	<0.1	<0.1	<0.2 D	<0.2 D	>1	Evidence of nitrate reduction
Iron II (mg/l)[a]	na	Hach 8146	0.07	0.03	0.12	0.36	0.65	>1[c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	62.1 D	37.1 D	58.9 D	**1.45 D**	**1.03 D**	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	0.274	**1.40 D**	0.194	0.245	0.119	>1[c]	Evidence of sulfate reduction

[a]Iron II was measured in the field using Hach kits.

[b]MCL listed is for the sum of o, m, and p xylenes.

[c]From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.

[d]The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

MCL Regulatory drinking water maximum contaminant level
bgs below ground surface
µg/l micrograms per liter
mg/l milligrams per liter
mV millivolt
Bold Geochemical parameters shown in bold indicate conditions are conducive to biodegradation of chlorinated compounds.
D Sample dilution required for analysis; reported values reflect the dilution.
J Value was estimated.
U Analyte not detected above the method detection limit.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

[26] Table 6 of Progress Report 113, pdf page 43.

Table L-14: November 2020 Deeper Groundwater Zone 1 Sampling Results[27]

TABLE 5
DEEPER GROUNDWATER ZONE 1 SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS
NOVEMBER 2020
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH
Page 1 of 1

	Analytical Results					*Natural Attenuation Assessment*	
	MCL	Sample Identification Screened Interval (feet bgs) Date Collected	MW-31D 38 - 48 11/4/2020	MW-32D 46 - 56 11/4/2020	MW-33D 35 - 45 11/4/2020	Biodegradation Indicator	Purpose and/or Interpretation
Analyte/ Parameter (Units)							
Volatile Organic Compounds (µg/l)		Analytical Method					
Tetrachloroethene	5	SW8260B	<1.0	<1.0	<1.0	na	Indicator chemical[d]
Trichloroethene	5	SW8260B	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of tetrachloroethene
1,1-Dichloroethene	7	SW8260B	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of trichloroethene
cis-1,2-Dichloroethene	70	SW8260B	<1.0	<1.0	1.5	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene	100	SW8260B	<1.0	<1.0	<1.0	detection	Degradation product of trichloroethene
Vinyl Chloride (VC)	2	SW8260B	<1.0	<1.0	0.61 T	detection	Degradation product of dichloroethenes
Benzene	5	SW8260B	--	--	<0.50	na	na
Ethylbenzene	700	SW8260B	--	--	0.41 T	na	na
m,p-Xylene (sum of isomers)	10,000[b]	SW8260B	--	--	5.2	na	na
o-Xylene	10,000[b]	SW8260B	--	--	1.5	na	na
Naphthalene	na	SW8260B	--	--	<1.0	na	na
Toluene	1,000	SW8260B	--	--	0.52	na	na
Geochemical Parameters							
pH (standard units)	na	field measurement	7.82	7.62	7.75	5 to 9[c]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	field measurement	-200.6	-176.5	-188.0	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	0.02	0.08	0.05	<0.5[c]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	**<0.1**	**<0.2 D**	**<0.2 D**	<1[c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	<0.1	<0.2 D	<0.2 D	>1	Evidence of nitrate reduction
Iron II (mg/l)[a]	na	Hach 8146	0.33	0.57	0.52	>1[c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	**0.52 B**	**1.24 DB**	**1.01 DB**	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	0.102 T	0.0530 T	0.136	>1[c]	Evidence of sulfate reduction

[a] Iron II was measured in the field using Hach kits.

[b] MCL listed is for the sum of o, m, and p xylenes.

[c] From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.

[d] This chemical is a designated "indicator chemical" for the Site. The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

-- Not analyzed
na not applicable
MCL Regulatory drinking water maximum contaminant level
bgs below ground surface
µg/l micrograms per liter
mg/l milligrams per liter
Bold Geochemical parameters shown in bold indicate conditions are conducive to biodegradation of chlorinated compounds.
B Analyte was detected in associated blank sample.
D Sample dilution required for analysis; reported values reflect the dilution.
J Data are estimated due to associated quality control data.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
VOC volatile organic compound

[27] Table 5 of Progress Report 114, pdf page 32.

Table L-15: November 2020 Deeper Groundwater Zone 2,3, and 4 Sampling Results[28]

TABLE 6
GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS FOR WELLS COMPLETED IN DEEPER ZONES 2, 3 AND 4
NOVEMBER 2020
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH
Page 1 of 1

		Analytical Results							*Natural Attenuation Assessment*
		Sample Identification	**MW-35D2**	**MW-36D2**	**MW-37D2**	**MW-38D3**	**MW-39D4**		
		Screened Interval (feet bgs)	**81 - 91**	**80 - 90**	**78 - 88**	**118 - 128**	**147.8 - 157.8**		
		Groundwater Zone	**Deeper Zone 2**	**Deeper Zone 2**	**Deeper Zone 2**	**Deeper Zone 3**	**Deeper Zone 4**	**Biodegradation**	
	MCL	**Date Collected**	**11/3/2020**	**11/5/2020**	**11/5/2020**	**11/5/2020**	**4/22/2020**	**Indicator**	**Purpose and/or Interpretation**
Analyte/ Parameter (Units)									
Volatile Organic Compounds (µg/l)		**Analytical Method**							
Tetrachloroethene (PCE)	5	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	na	Indicator chemical[d]
Trichloroethene (TCE)	5	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of tetrachloroethene
1,1-Dichloroethene (1,1-DCE)	7	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Indicator chemical[d]; degradation product of trichloroethene
cis-1,2-Dichloroethene (cis-1,2-DCE)	70	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene (trans-1,2-DCE)	100	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Degradation product of trichloroethene
Vinyl Chloride (VC)	2	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	detection	Degradation product of dichloroethenes
Benzene	5	SW8260B	<0.50	<0.50	<0.50	<0.50	<0.50	na	na
Ethylbenzene	700	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	na	na
m,p-Xylene (Sum Of Isomers)	10,000[b]	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	na	na
o-Xylene (1,2-Dimethylbenzene)	10,000[b]	SW8260B	<0.50	<0.50	<0.50	<0.50	<0.50	na	na
Naphthalene	na	SW8260B	<1.0	<1.0	<1.0	<1.0	<1.0	na	na
Toluene	1,000	SW8260B	<0.50	<0.50	<0.50	<0.50	<0.50	na	na
Pesticides (µg/l)									
Pentachlorophenol (PCP)	1	SW8151A	<0.50	<0.50	<0.50	<0.50	<0.50	Not Applicable	Indicator chemical[d]
Geochemical Parameters									
pH (standard units)	na	field measurement	**8.06**	**8.01**	**8.01**	**7.94**	**7.85**	5 to 9[c]	Optimal range for reductive pathway
Oxidation-Reduction Potential (mV)	na	field measurement	**-273.9**	**-269.5**	**-235.8**	**-234.2**	**-254.3**	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	**0.04**	**0.07**	**0.06**	**0.01**	**0.00**	<0.5[c]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	**<0.1**	**<0.1**	**<0.1**	**<0.2 D**	**<0.2 D**	<1[c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	<0.1	<0.1	<0.1	<0.2 D	<0.2 D	>1	Evidence of nitrate reduction
Iron II (mg/l)[a]	na	Hach 8146	0.06	0.00	0.00	0.38	0.22	>1[c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	64.1 D	43.5 D	55.2 D	**1.12 D**	**0.927 TD**	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	0.202	**1.26 D**	0.254	0.293	0.115	>1[c]	Evidence of sulfate reduction

[a] Iron II was measured in the field using Hach kits.

[b] MCL listed is for the sum of o, m, and p xylenes.

[c] From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.

[d] The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities in the late 1980s were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

Bold Geochemical parameters shown in bold indicate conditions are conducive to biodegradation of chlorinated compounds.

µg/l micrograms per liter
bgs below ground surface
D Sample dilution required for analysis; reported values reflect the dilution.
mg/l milligrams per liter
mV millivolt
MCL Regulatory drinking water maximum contaminant level
na not applicable

[28] Table 6 of Progress Report 114, pdf page 33.

APPENDIX M – 2019 VAPOR INTRUSTION SAMPLING RESULTS

Table M-1: 2019 Vapor Intrusion Sampling Results[29]

TABLE 4-1
AIR SAMPLING RESULTS - JULY - AUGUST 2019
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

Sample Location				Results for Intsel Steel West Office Building July 2019			Results for Former KEPCO+ Office Building August 2019 (a)			Results for Peterson Plumbing Building (Office and Warehouse Spaces) July 2019					
				Indoor Air	Outdoor Air North	Outdoor Air South	Indoor Air	Outdoor Air Northwest Corner	Outdoor Air South	Indoor Air Office Space	Indoor Air Warehouse	Indoor Air Warehouse DUPLICATE	Outdoor Air East	Peterson North Warehouse Dock	Outdoor Ambient South of Peterson
Sample Identification				I-NIA-07/2019	IN-NOA-07/2019	IS-NOA-07/2019	K-NIA-08/2019	KN-NOA-08/2019	KS-NOA-08/2019	PO-NIA-07/2019	PW-NIA-07/2019	DPW-NIA-07/2019	KS-NOA-07.2019	PWD-NOA-07/2019	PWS-NOA-07/2019
Date Collected				7/29/2019	7/29/2019	7/29/2019	8/8/2019	8/8/2019	8/8/2019	7/29/2019	7/29/2019	7/29/2019	7/29/2019	7/29/2019	7/29/2019
Volatile Organic Compounds (µg/m³)	USEPA Industrial Air RSLs (b) (µg/m³) Carcinogenic (c)	Noncancer HQ = 1	Noncancer HQ = 0.1												
1,1-Dichloroethane	7.7	NE	NE	0.0062 T	<0.040	0.027 T	0.0067 T	0.014 T	<0.040	0.0056 T	0.023 T	0.024 T	<0.040	<0.040	<0.040
1,1-Dichloroethene	NE	880	88	0.0041 T	<0.020	<0.018	0.0077 T	0.0055 T	<0.020	<0.015	<0.020	0.0041 T	<0.020	<0.020	<0.020
1,2,4-Trimethylbenzene	NE	260	26	0.56	0.42	0.27	0.25	0.24	0.21	0.42	0.89	0.80	0.23	0.25	0.23
1,2-Dichloroethane	0.47	31	3.1	0.11	0.074	0.065	0.039 T	0.027 T	0.047	0.16	0.15	0.13	0.097	0.052	0.11
1,3,5-Trimethylbenzene (Mesitylene)	NE	260	26	0.18	0.16	0.11	0.11	0.096 T	0.081 T	0.16	0.41	0.37	0.075 T	0.091 T	0.092 T
2-Chlorotoluene	NE	NE	NE	<0.10	<0.10	<0.093	<0.10	<0.10	<0.10	<0.079	<0.10	<0.10	<0.10	<0.10	<0.10
Benzene	1.6	130	13	0.54	0.99	0.44	0.58 B	0.54 B	0.56 B	**2.1**	**5.1**	**5.0**	0.39	1.0	0.58
Chloroform	0.53	430	43	**0.65**	0.12	0.11	0.37	0.12	0.090	0.22	0.26	0.23	0.081	0.11	0.072
cis-1,2-Dichloroethene	NE	NE	NE	<0.040	<0.040	<0.036	0.019 T	<0.040	<0.040	<0.030	0.019 T	0.036 T	<0.040	0.030 T	<0.040
Ethylbenzene	4.9	4,400	440	0.54	0.43	0.30	0.38	0.29	0.30	0.98	2.3	1.9	0.31	0.48	0.35
m,p-Xylene (Sum of Isomers)	NE	440	44	2.7	1.9	0.77	1.2 B	1.3 B	1.2 B	3.6	6.0	5.3	1.0	1.5	1.1
Naphthalene	0.36	13	1.3	**0.50**	**0.39**	**0.48**	**0.37**	0.21	0.18	**0.56**	**0.62**	**0.66**	0.29	0.35	**0.59**
o-Xylene (1,2-Dimethylbenzene)	NE	440	44	2.3	0.60	0.43	0.42 B	0.46 B	0.41 B	1.2	1.8	1.7	1.2	0.53	0.43
Tetrachloroethene (PCE)	47	180	18	39	0.24	0.14	31	0.19	0.17	0.47	18	20	0.25	0.53	0.18
Trichloroethene (TCE)	3.0	8.8	0.88	0.031 T	0.019 T	0.036 T	0.042 T	0.059	0.067	0.037 T	0.10	0.099	0.048 T	0.022 T	0.12
Vinyl chloride	2.8	440	44	0.0046 T	0.020	0.0074 T	0.0091 T	<0.013	0.0071 T	<0.0096	<0.013	0.0049 T	0.0083 T	0.022	<0.013

(a) The KEPCO+ building was flooded in July 2019; therefore, sampling personnel returned in August 2019 to collect the KEPCO+ samples.
(b) November 2019 United States Environmental Protection Agency (USEPA) Industrial Air Regional Screening Levels (RSLs).
(c) USEPA RSL values relate to carcinogenic target risk = 1E-06

(µg/m³) micrograms per cubic meter
Results in bold type and highlighted in yellow indicate a detection above USEPA RSLs for carcinogenic and/or noncancer HQ of 1.
Results highlighted in gray indicate a detection above USEPA RSL for noncancer HQ of 1.
< Result not detected above laboratory method detection limit.
HQ hazard quotient
NE not established
T Analyte was positively identified but reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
B Method blank contamination. Concentrations of benzene and isopropylbenzene were detected in the method blank; detections are estimated and biased high.

[29] Table 4-1 of the Final Indoor Air Sampling Summary Report, February 2022.