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Winter 12-17-2021

Request for Change (RFC) to the Final Butte Reduction Works (BRW) Smelter Area Mine Waste Remediation and Contaminated Groundwater Hydraulic Control Site Phase III Quality Assurance Project Plan (QAPP) (RFC-BRW-2021-03)

Josh Bryson

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Atlantic Richfield Company

Josh Bryson
Liability Manager

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December 17, 2021

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Helena, Montana 59620-0901

Jonathan Morgan, Esq.
DEQ, Legal Counsel
P.O. Box 200901
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RE: Request for Change (RFC) to the Final Butte Reduction Works (BRW) Smelter Area Mine Waste Remediation and Contaminated Groundwater Hydraulic Control Site Phase III Quality Assurance Project Plan (QAPP) (RFC-BRW-2021-03)

Agency Representatives:

I am writing you on behalf of Atlantic Richfield Company to submit the *request for change (RFC) to the Final Butte Reduction Works (BRW) Smelter Area Mine Waste Remediation and Contaminated Groundwater Hydraulic Control Site Phase III Quality Assurance Project Plan (QAPP) (RFC-BRW-2021-03)* for your review and approval. In short, the RFC provides the procedures and protocols necessary for Atlantic Richfield Company to install additional piezometers at two locations upgradient of the NorthWestern Energy property to satisfy Data Quality Objectives outlined in the Phase III QAPP. Fieldwork is anticipated to begin in February 2022. A proposed schedule is included in the RFC.

The report may be downloaded at the following link:

<https://pioneertechnicalservices.sharepoint.com/:b:/s/submitted/Eft7EvSArgxDjzy9Tr5iB1kBFvTw5rfljdC-6zluCfwtQ>

Atlantic Richfield Company

Josh Bryson
Liability Manager

317 Anaconda Road
Butte MT 59701
Direct (406) 782-9964
Fax (406) 782-9980

If you have any questions or comments, please call me at (406) 723-1834.

Sincerely,



Josh Bryson, PE, PMP
Liability Manager
Remediation Management Services Company
An affiliate of **Atlantic Richfield Company**

Cc: Patricia Gallery / Atlantic Richfield - email
Chris Greco / Atlantic Richfield – email
Mike Mc Anulty / Atlantic Richfield - email
Loren Burmeister / Atlantic Richfield – email
Dave Griffis / Atlantic Richfield - email
Jean Martin / Atlantic Richfield - email
Irene Montero / Atlantic Richfield - email
David A. Gratson / Environmental Standards / email
Mave Gasaway / DGS - email
John Davis / PRR - email
Joe Vranka / EPA - email
David Shanight / CDM - email
Curt Coover / CDM - email
James Freeman / DOJ - email
John Sither / DOJ - email
Jenny Chambers / DEQ - email
Dave Bowers / DEQ - email
Carolina Balliew / DEQ - email
Matthew Dorrington / DEQ - email
Jim Ford / NRDP - email
Ray Vinkey / NRDP - email
Harley Harris / NRDP - email
Katherine Hausrath / NRDP - email
Meranda Flugge / NRDP - email
Ted Duaine / MBMG - email
Gary Icopini / MBMG - email
Becky Summerville / MR - email
Kristen Stevens / UP - email

Robert Bylsma / UP - email
John Gilmour / Kelley Drye - email
Leo Berry / BNSF - email
Robert Lowry / BNSF - email
Brooke Kuhl / BNSF – email
Mark Engdahl / BNSF - email
Jeremie Maehr / Kennedy Jenks - email
Annika Silverman / Kennedy Jenks - email
Matthew Mavrinac / RARUS - email
Harrison Roughton / RARUS - email
Brad Gordon / RARUS - email
Mark Neary / BSB - email
Eric Hassler / BSB - email
Julia Crain / BSB - email
Chad Anderson / BSB - email
Brandon Warner / BSB – email
Abigail Peltomaa / BSB - email
Eileen Joyce / BSB – email
Sean Peterson/BSB – email
Gordon Hart / BSB – email
Jeremy Grotbo / BSB – email
Karen Maloughney / BSB – email
Josh Vincent / WET - email
Craig Deeney / TREC - email
Scott Bradshaw / TREC - email
Brad Archibald / Pioneer - email
Pat Sampson / Pioneer - email
Mike Borduin / Pioneer - email
Joe McElroy / Pioneer – email
Andy Dare / Pioneer – email
Karen Helfrich / Pioneer - email
Leesla Jonart / Pioneer - email
Connie Logan/ Pioneer – email
Ian Magruder/ CTEC- email
CTEC of Butte / email
Scott Juskiewicz / Montana Tech – email

File: MiningSharePoint@bp.com - email
BPSOU SharePoint - upload

ATLANTIC RICHFIELD COMPANY

RFC - REQUEST FOR CHANGE

DATE December 17, 2021	RFC NO. RFC-BRW-2021-03	CONTRACTOR Pioneer Technical Services, Inc.	RFP NO.
CONTRACT DESCRIPTION: Butte Reduction Works Smelter Area Site		ATTENTION OF: Josh Bryson Liability Manager & Global Risk Champion	
SUBJECT: Installation of Additional Piezometers Upgradient of NorthWestern Energy Property <input type="radio"/> ELECTRICAL <input type="radio"/> MECHANICAL <input type="radio"/> CIVIL <input type="radio"/> STRUCTURAL/ARCHITECTURAL <input type="radio"/> INSTRUMENTATION <input checked="" type="checkbox"/> ENVIRONMENTAL			
OPERABLE UNIT: Butte Priority Soils Operable Unit MAJOR WORK TASKS: Addition of piezometers upgradient of NorthWestern Energy property.		REFERENCE DWG., P.O., TAG, SPECIFICATION NO. (FOR DEVIATIONS OR DEFICIENCIES) ETC.: Final Butte Reduction Works (BRW) Smelter Area Mine Waste Remediation and Contaminated Groundwater Hydraulic Control Site Phase III Quality Assurance Project Plan (QAPP).	
<p>PROBLEM DESCRIPTION:</p> <p>This request for change (RFC) to the <i>Final Butte Reduction Works (BRW) Smelter Area Mine Waste Remediation and Contaminated Groundwater Hydraulic Control Site Phase III Quality Assurance Project Plan (QAPP)</i> (Atlantic Richfield, 2021) (Phase III QAPP) provides the procedures and protocols necessary for Atlantic Richfield Company to install additional piezometers at two locations to satisfy Data Quality Objectives outlined in the Phase III QAPP. Specifically, the Groundwater Characterization objective includes determining the baseline conditions hydraulically upgradient of the BRW Site and the neighboring sites of Montana Pole and Treating Plant (MPTP) and NorthWestern Energy (NWE) along with estimating how the BRW hydraulic control and/or remedial action construction dewatering may affect the hydraulic gradient and concentrations of pentachlorophenol (PCP)-impacted groundwater located to the west of the Site. The additional piezometer identification is as follows:</p> <ul style="list-style-type: none"> • BRW22-PZ55S and BRW22-PZ55D – paired • BRW22-PZ56S and BRW22-PZ56D – paired <p>Adding these piezometers will help with the following:</p> <ol style="list-style-type: none"> 1. Collect additional information on aquifer geometry, lithology, bedrock depth, aquifer hydraulic conductivity, groundwater quality, soil characteristics, and groundwater flow direction to inform the BRW Site numerical groundwater model and to guide the BRW hydraulic control and construction dewatering design. Additional information will be collected during drilling and installation of the piezometers and during the upcoming Butte Treatment Lagoons (BTL) Stress Test. 2. Paired piezometers will be installed at BRW22-PZ55 and BRW22-PZ56 to obtain information pertaining to vertical heterogeneities between anticipated upper and lower lithologic units to maintain consistency between the BRW Site numerical groundwater model and previous groundwater modeling at the MPTP. It is anticipated that the additional paired piezometers will facilitate direct correlation to existing information as well as to distinguish variability in groundwater chemistry and hydraulic connectivity between upper and lower units. 3. Piezometers will potentially help define an “early detection network” to monitor potential changes in chemistry and flow direction of groundwater upgradient of the BRW Site and MPTP Site during and after remedial action construction. The piezometers may also be monitored as part of the “early detection network” for the BTL Stress Test. <p>Piezometers are anticipated to be installed on Butte-Silver Bow property with a sonic drilling rig, or equivalent, per the same criteria outlined in the Phase III QAPP, and in the approximate locations identified on Figure 1. All installations will be risk-assessed for safety and access per the internal BRW Site Site-Specific Health and Safety Plan (SSHASP). The borehole for the deep piezometers will extend to bedrock and the lithology from the deep borehole will be documented on the combined lithology / completion log. Piezometer screens will be installed in the shallow (approximately 9 feet -19 feet below ground surface) and deep (approximately 22 feet – 35 feet below ground surface) conductive units, or as determined by the Field Team Leader and Contractor Project Manager in consultation with the Contractor Quality Assurance Officer. Exact locations of piezometers will be adjusted in the field, as necessary, to allow for safe installation and monitoring as well as property access. Installation will occur according to the project schedule on Figure 2.</p>			



Groundwater quality characterization data will be obtained after installation of the piezometers for at least one low-flow sampling event and according to the schedule in Figure 2. Groundwater samples will be taken for analytical groups 1, 2a, 2b, 3, 4, 5, 6, and 7 as listed in Table 1. Soil samples will be collected for each dominant lithologic layer that yields enough sample for characterization encountered above and below the water table for limited soil characterization within analytical groups 8 and 9 as listed in Table 1. All samples will be collected following the Standard Operating Procedures, methods, and protocols specified in the Phase III QAPP. Borehole locations will be backfilled with bentonite hole plug as per the Phase III QAPP.

All additional quality control details for this project are included in the Phase III QAPP, including documentation; quality assurance/quality control samples; instrument/equipment testing, inspection, maintenance, and calibration; data management procedures; assessment and oversight; and data validation and usability. Additionally, the Phase III QAPP includes the health and safety concerns and project organization and responsibilities. All work completed by Pioneer Technical Services, Inc. and its subcontractor during execution of the work under this RFC will be performed in accordance with all procedures outlined in the internal BRW SSHASP. The BRW SSHASP may be updated to include unique hazards that materialize during field activities for the drilling and/or installation of additional piezometers and boreholes.

References:

Atlantic Richfield Company, 2021. Silver Bow Creek/Butte Area NPL Site Butte Priority Soils Operable Unit Draft Final Butte Reduction Works (BRW) Smelter Area Mine Waste Remediation and Contaminated Groundwater Hydraulic Control Site Phase III Quality Assurance Project Plan (QAPP). Prepared by Pioneer Technical Services, Inc. April 30, 2021.

Figures:

Figure 1. Proposed Piezometer Locations
Figure 2. Project Schedule

Tables:

Table 1. Sample Collection, Preservation, and Holding Times



- | | |
|--|--|
| <input type="radio"/> Design Deficiency | <input type="radio"/> Material Substitution |
| <input type="radio"/> Engineering Change Request | <input type="radio"/> Vendor Material Deficiency |
| <input type="radio"/> Agency Directive | <input checked="" type="checkbox"/> Scope |
| <input type="radio"/> Construction Deficiency | <input checked="" type="checkbox"/> Additional Data Collection |
| <input type="radio"/> Schedule | <input type="radio"/> Clarification/Information |
| | <input type="radio"/> Other |

RESPONSE/DIRECTIVE

1. Approve the installation of additional piezometers.

Project Manager *Karen Helfrich* Date 12/17/2021.

Atlantic Richfield Co. Representative *Scott Boyer* Date 12/17/2021.

EPA Representative _____ Date _____.

DEQ Representative _____ Date _____.

CC: See Cover Letter

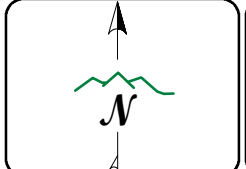




Legend

- Groundwater Contours (Estimated shallow aquifer contours produced using low groundwater elevation data gathered in Feb 2021)
- Silver Bow Parcel Boundaries (Approximate)
- BRW Site Boundary
- Proposed Piezometers
- Sanitary Sewer
- Water Main
- Underground Gas Main (Approximate)

Notes:
PROPERTY BOUNDARIES AND UTILITIES ARE CONSIDERED APPROXIMATE.



DISPLAYED AS:
 PROJECTION/ZONE: MSP
 DATUM: NAD 83
 UNITS: INT'L FEET
 SOURCE: PIONEER/CAD/EARTH 2014

FIGURE 1

PROPOSED PIEZOMETER LOCATIONS

DATE: 12/16/2021

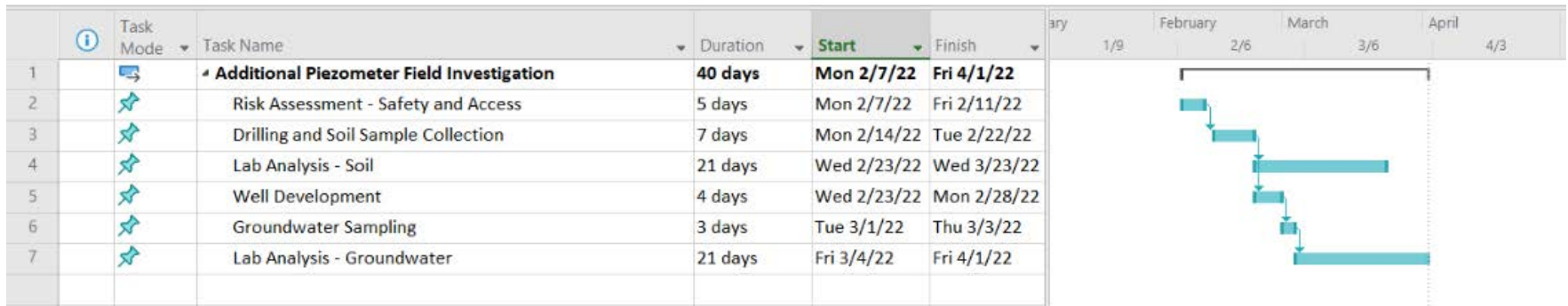


Figure 2. Project Schedule

Table 1. Sample Collection, Preservation, and Holding Times

Analytical Group	Analytical Lab/Company ¹	Analyte	Analytical Method	Lab Reporting Limit (CRQL for Data Validation Purposes)	Lab Method Detection Limit ²	Holding Time	Container Size	Preservation ³	Justification						
Groundwater and Surface Water Field Parameters															
(1)	Pioneer	Water level	NA	NA	NA	NA	NA	NA	Determine depth-to-water to monitor seasonal groundwater and surface water conditions.						
(2a)	Pioneer	Temperature							Determine general stabilization parameters during sampling activities.						
		Specific conductance (SC)													
		Dissolved Oxygen (DO)	NA	NA	NA	NA	NA	NA							
		pH													
		Oxidation Reduction Potential (ORP)													
		Turbidity													
(2b)	Pioneer	Modern Water RaPID Assay Pentachlorophenol (PCP)	NA	NA	NA	7 Days	NA	NA	Identify any pre-existing concentrations of PCP upgradient of the Site.						
Groundwater and Surface Water Laboratory Samples															
(3)	Pace Analytical	Total recoverable and dissolved arsenic (As)	EPA 200.8 (Rev 5.4)	0.5 µg/L	0.0829 µg/L	180 Days	2, 250-mL high-density polyethylene (HDPE) bottles	Acidified with HNO ₃ , (1) bottle field filtered with 0.45 µm filter (dissolved).	Define the effect of groundwater conditions on unimpacted and impacted groundwater.						
		Total recoverable and dissolved cadmium (Cd)		0.08 µg/L	0.0159 µg/L										
		Total recoverable and dissolved copper (Cu)		1 µg/L	0.5 µg/L										
		Total recoverable and dissolved iron (Fe)		50 µg/L	12.1 µg/L										
		Total recoverable and dissolved lead (Pb)		0.1 µg/L	0.0284 µg/L										
		Total recoverable and dissolved silver (Ag)		0.5 µg/L	0.163 µg/L										
		Total recoverable and dissolved zinc (Zn)		5 µg/L	1.97 µg/L										
		Total recoverable and dissolved mercury (Hg)	EPA 1631E	0.5 ng/L	0.5 ng/L										
		Total recoverable Phosphate (PO ₄)	EPA 365.1	1 mg/L	0.464 mg/L										
		Nitrate (NO ₂) and Nitrite (NO ₃)	EPA 353.2	100 µg/L	17.7 µg/L					28 Days	1, 250-mL HDPE bottle	Acidified with H ₂ SO ₄ .			
(4)	Pace Analytical	Dissolved Calcium (Ca)	EPA 200.7 (Rev 4.4)	500 µg/L	23.1 µg/L	180 Days	250-mL HDPE bottle	Acidified with HNO ₃ , field filtered with 0.45 µm filter (dissolved).	Provide additional confirmation on similarity of groundwater at these locations and within BRW.						
		Dissolved Potassium (K)		2,500 µg/L	86.7 µg/L										
		Dissolved Sodium (Na)		1000 µg/L	65.7 µg/L										
		Dissolved Boron (B)		150 µg/L	7.22 µg/L										
		Dissolved Cobalt (Co)		10 µg/L	0.828 µg/L										
		Dissolved Magnesium (Mg)		500 µg/L	7.83 µg/L										
		Dissolved Aluminum (Al)	EPA 200.8 (Rev 5.4)	20 µg/L	8.01 µg/L										
		Dissolved Barium (Ba)		0.3 µg/L	0.0548 µg/L										
		Lithium (Li)		0.5 µg/L	0.135 µg/L										
		Dissolved Manganese (Mn)		0.5 µg/L	0.199 µg/L										
		Dissolved Molybdenum (Mo)		0.5 µg/L	0.0942 µg/L										
		Dissolved Nickel (Ni)		0.5 µg/L	0.171 µg/L										
		Dissolved Silica (SiO ₂)		214 µg/L	75.9 µg/L										
		Dissolved Strontium (Sr)		0.5 µg/L	0.199 µg/L										
		Dissolved Palladium (Pd)		0.5 µg/L	0.105 µg/L										
		Total Hardness	Calculation	1.1 mg/L	0.0037 mg/L										
		Bicarbonate (HCO ₃)	SM 2320B	5 mg/L	1.82 mg/L					14 Days	250-mL HDPE bottle	Raw			
		Carbonate (CO ₃)		5 mg/L	1.82 mg/L										
		Alkalinity, Total (as CaCO ₃)		5 mg/L	1.82 mg/L										
		Chloride (Cl)	EPA 300.0	1.2 mg/L	0.387 mg/L					28 Days					
		Sulfate (SO ₄)		1.2 mg/L	0.345 mg/L										
		Fluoride (F)		0.05 mg/L	0.0151 mg/L										
		Total Dissolved Solids (TDS)	SM2540C	10 mg/L	5 mg/L					7 days	1-L HDPE bottle	Raw			
		(5)	Pace Analytical	Polychlorinated biphenyls (PCB)	EPA 8082A					0.1 µg/L	0.0398 µg/L	1 Year	2, 250 mL amber glass	Raw	Identify if PCB, PCP, Dioxins and/or any similar compounds exists near the BRW area at concentrations above regulatory limits. Determine if any of the similar compounds are present in sufficient quantities to interfere with field and/or laboratory detection.
				Pentachlorophenol (PCP)	EPA 8270E SIM					0.6 µg/L	0.193 µg/L	7 Days	2, 250 mL amber glass	Raw	
2,3,4,6-Tetrachlorophenol	EPA 8270E			5 µg/L	5 µg/L	7 Days	2-1L amber glass	Raw							
2,3,5,6-Tetrachlorophenol				5 µg/L	5 µg/L										
2,4,6-Trichlorophenol				1 µg/L	1.21 µg/L										
2,4-Dichlorophenol				1 µg/L	0.963 µg/L										
2-Chlorophenol				1 µg/L	0.648 µg/L										
2,3,7,8-TCDD	EPA 1613B			10 pg/L	2.48 pg/L	1 Year	2-1L amber glass	Raw							
2,3,7,8-TCDF				10 pg/L	2 pg/L										
1,2,3,7,8-PeCDD				50 pg/L	3.01 pg/L										
1,2,3,7,8-PeCDF				50 pg/L	3.37 pg/L										
2,3,4,7,8-PeCDF				50 pg/L	3.05 pg/L										
1,2,3,4,7,8-HxCDD				50 pg/L	5.32 pg/L										
1,2,3,6,7,8-HxCDD				50 pg/L	4.29 pg/L										
1,2,3,7,8,9-HxCDD				50 pg/L	5.41 pg/L										
1,2,3,4,7,8-HxCDF				50 pg/L	4.83 pg/L										
1,2,3,6,7,8-HxCDF				50 pg/L	4.19 pg/L										
1,2,3,7,8,9-HxCDF				50 pg/L	4.96 pg/L										
2,3,4,6,7,8-HxCDF				50 pg/L	4.18 pg/L										
1,2,3,4,6,7,8-HpCDD				50 pg/L	4.54 pg/L										
1,2,3,4,6,7,8-HpCDF		50 pg/L	4.88 pg/L												
1,2,3,4,7,8,9-HpCDF		50 pg/L	5.22 pg/L												
OCDD		100 pg/L	13.6 pg/L												
OCDF		100 pg/L	12.4 pg/L												
(6)	Pace Analytical	Volatile Petroleum Hydrocarbons (VPH)	MT VPH						14 Days	3, 40-mL clear glass VOA vials	Unfiltered, acidified with HCl	Identify if hydrocarbons exist near the BRW area at concentrations above regulatory action limits, and determine breakdown of petroleum components.			
		Extractable Petroleum Hydrocarbons (EPH) Fractionation	MT EPH						14 Days	2, 1-L amber glass	Unfiltered, acidified with HCl				
		Polycyclic Aromatic Hydrocarbons (PAHs)	EPA 8270E SIM						7 Days	2, 250-mL amber glass	Raw				
		1, 2 dichloroethane (1,2 DCA)	EPA 8260D			14 Days	3, 40-mL clear glass VOA vials	Unfiltered, acidified with HCl							
		1, 2 dibromoethane (EDB)	EPA 8011			14 Days	3, 40-mL clear glass VOA vials	Unpreserved							

¹Atlantic Richfield may choose to use a different laboratory based on project needs. Regardless of the laboratory chosen, Atlantic Richfield will ensure the necessary reporting limits, required methodology, and the specified quality assurance/quality control and data validation requirements are followed as detailed in the Phase III QAPP. Agencies will be informed of any changes in the reporting limits, methodology, or the quality assurance/quality control and data validation procedures.

²Pace Analytical will report results to the method detection limit. The analytical lab's reporting limits and detection limits are subject to change as these values are updated periodically to reflect analytical sensitivity and capability. Atlantic Richfield will ensure that any updates to the reporting limits or detection limits do not affect the ability for the Data Quality Objectives to be met and the updates will be specified in the Phase III Data Summary Report.

³In addition to the preservation listed, all samples will be cooled to <6 °C. Not all analyses require this but because multiple containers will be collected at most sites, all samples will be cooled.

⁴DEQ, 2017. Circular DEQ-7 Montana Numeric Water Quality Standards. Montana Department of Environmental Quality, May 2017.

⁵DEQ, 2018. Montana Risk-Based Corrective Action Guidance for Petroleum Releases, Montana Department of Environmental Quality, May 2018.

⁶3 days, if Shelby tubes are sealed with plastic caps and duct tape. The hold time can be extended by sealing the plastic caps with wax.

Units:
 pg/L - picograms per liter
 µg/L - microgram per liter
 mg/L - milligram per liter
 ng/L - nanogram per liter
 pCi/L - picocurie per liter
 S.U. - Standard Unit
 umhos/cm or µS/cm - microsiemens per centimeter
 mg/kg - milligram per kilogram

Table 1. Sample Collection, Preservation, and Holding Times

Analytical Group	Analytical Lab/Company ¹	Analyte	Analytical Method	Lab Reporting Limit (CRQL for Data Validation Purposes)	Lab Method Detection Limit ²	Holding Time	Container Size	Preservation ³	Justification			
LNAPL Laboratory Samples												
(7)	Pace Analytical	Volatile Petroleum Hydrocarbons (VPH)	MTVPH	Analyte Specific - DEQ Risk-Based Screening Level ⁵ where applicable.		Depends on nature and purity of LNAPL sample. If the interface probe indicates there is an LNAPL layer on the surface of the groundwater, Pace Analytical will be contacted prior to sampling to determine appropriate sample containers, preservation and hold times.			Identify the chemical components and concentrations of any LNAPL sample collected from near the BRW area.			
		Extractable Petroleum Hydrocarbons (EPH) Fractionation	MTEPH									
		Polycyclic Aromatic Hydrocarbons (PAHs)	EPA 8270E SIM									
Soil Laboratory Samples												
(8)	Pace Analytical	Volatile Petroleum Hydrocarbons (VPH)	MTVPH	Analyte Specific - Meets DEQ Risk-Based Screening Level ⁵ where applicable.		14 Days	4-oz. amber glass container	None	Identify if hydrocarbons exist near the BRW area at concentrations above regulatory action limits.			
		1, 2 dichloroethane (1,2 DCA)	EPA 8260D						Identify if lead scavengers exist in the BRW area at concentrations above regulatory action limits.			
		Extractable Petroleum Hydrocarbons (EPH) Fractionation	MTEPH						14 Days	4-oz. amber glass container	None	Identify if hydrocarbons exist near the BRW area at concentrations above regulatory action limits, and determine breakdown of petroleum components. Laboratory to perform silica gel cleanup to remove potential interferences to diesel range organics (DRO).
		Polycyclic Aromatic Hydrocarbons (PAHs)	EPA 8270E SIM									Identify if lead scavengers exist near the BRW area at concentrations above regulatory action limits.
		1, 2 dibromoethane (EDB)	EPA 8260									Identify the level of TOC near the BRW area to help inform dioxin mobility.
		Total Organic Carbon (TOC)	Walkley-Black						150mg/kg	100mg/kg	28 Days	2, 4-oz amber glass container
(9)	Pioneer's Material Testing Laboratory	Moisture Content	ASTM D2216	NA	NA	10 Days	500 grams	None	Identify soil parameters for use in constituents of concern migration calculations.			
		pH	AASHTO T289							15 minutes	300 grams	
		Soil Bulk Density	ASTM D4254							None	5 gallons	
		Total Porosity	API RP40							None	5 gallons	

¹Atlantic Richfield may choose to use a different laboratory based on project needs. Regardless of the laboratory chosen, Atlantic Richfield will ensure the necessary reporting limits, required methodology, and the specified quality assurance/quality control and data validation requirements are followed as detailed in the Phase III QAPP. Agencies will be informed of any changes in the reporting limits, methodology, or the quality assurance/quality control and data validation procedures.

²Pace Analytical will report results to the method detection limit. The analytical lab's reporting limits and detection limits are subject to change as these values are updated periodically to reflect analytical sensitivity and capability. Atlantic Richfield will ensure that any updates to the reporting limits or detection limits do not affect the ability for the Data Quality Objectives to be met and the updates will be specified in the Phase III Data Summary Report.

³In addition to the preservation listed, all samples will be cooled to <6 °C. Not all analyses require this but because multiple containers will be collected at most sites, all samples will be cooled.

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⁶3 days, if Shelby tubes are sealed with plastic caps and duct tape. The hold time can be extended by sealing the plastic caps with wax.

Units:

- pg/L - picograms per liter
- µg/L - microgram per liter
- mg/L - milligram per liter
- ng/L - nanogram per liter
- pCi/L - picocurie per liter
- S.U. - Standard Unit
- umhos/cm or µS/cm - microsiemen per centimeter
- mg/kg - milligram per kilogram