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MAIN OPERATION COMPLEX AREA Phase I In-Situ Chemical Oxidation SUMMARY REPORT FINAL

AUGUST 2010





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Draft SUMMARY REPORT

MAIN OPERATIONS COMPLEX AREA PHASE I IN-SITU CHEMICAL OXIDATION

NORTHEAST CAPE

St. Lawrence Island, Alaska

Prepared for:

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ACRONYMS AND ABBREVIATIONS

'	minutes
%	percent
0	degrees
°C	degrees Celsius
ACWS	Aircraft Control and Warning Station
ANCSA	Alaska Native Claims Settlement Act
AOI	Area of Interest
ATS	AECOM Technical Services, Inc.
bgs	below ground surface
bls	below land surface
Bristol	Bristol Environmental Remediation Services, LLC
COCs	contaminant of concerns
CSM	conceptual site model
DO	dissolved oxygen
DRO	diesel range organics
EC	electrical conductivity
Fe	iron
FeEDTA	iron ethylenediaminetetraacetic acid
FMC	FMC Environmental Solutions
ft	feet or foot
gpm	gallon per minute
GRO	gasoline range organics
H_2O_2	hydrogen peroxide
ISCO	in-situ chemical oxidation
mg/kg	milligrams per kilogram
mg/L	milligram per liter
mL	milliliter
MOC	Main Operations Complex
mV	millivolt
$Na_2S_2O_3$	sodium thiosulfate
$Na_2S_2O_8$	sodium persuflate

ACRONYMS AND ABBREVIATIONS (continued)

NE Cape	Northeast Cape
no.	number
OH	hydroxyl radical
OL/ML	organic clayey silt
ORP	oxidation reduction potential
OVA	organic vapor analyzer
pН	hydrogen ion concentration
PLO	Public Land Order
ppm	parts per million
PT	peat
PVC	polyvinyl chloride
QC	quality control
ROI	radius of influence
RRO	residual range organics
$S_{2}O_{8}$	persulfate
SOW	Scope of Work
TestAmerica	TestAmerica Laboratories, Inc.
TOC	total organic carbon
TOD	total oxidant demand
TPH	total petroleum hydrocarbons
TSL	Treatability Study Laboratory
USACE	U.S. Army Corps of Engineers
USAF	United States Air Force
WP	work plan

1.0 INTRODUCTION

This Summary Report presents results of the Phase I in-situ chemical oxidation (ISCO) testing conducted at Northeast Cape (NE Cape), St. Lawrence Island, Alaska (Figure 1). NE Cape was the site of former military surveillance and communications stations that operated from about 1954 until 1972. The Phase I ISCO testing was performed to collect data about the implementability and effectiveness of ISCO to treat groundwater and soil media in the Main Operations Complex (MOC) area of the site.

This work was performed for the U.S. Army Corps of Engineers (USACE), Alaska District, under Bristol Environmental Remediation Services, LLC's (Bristol's) contract number (no.) W911KB-09-C-0013. Phase I ISCO activities were largely performed by AECOM Technical Services, Inc. (ATS), a Bristol subcontractor. The scope of services for this project is based on the Final Scope of Work (SOW) provided by the Alaska District of the USACE, dated 11 March 2009. Phase I ISCO testing was performed in accordance with the *Final Work Plan In-Situ Chemical Oxidation (Phase I) and Intrusive Drum Removal/Landfill Cap* (Bristol, 2009).

The SOW for the MOC Area Phase I ISCO Treatment included the following:

- Performing bench scale study to assess site-specific parameters affecting treatability
- Designing and performing a feasible Phase I ISCO technology in an isolated MOC location
- Evaluating the ability of ISCO to achieve remediation goals for chemicals of concern (COCs)
- Post-treatment monitoring (at least one round) preparation of a draft and final technical memorandum to summarize results
- Preparing a draft and final report detailing results of the Phase I treatment and feasibility of the technology for Phase II implementation

1.1 **PROJECT PURPOSE AND OBJECTIVES**

The purpose of this project was to evaluate the use of ISCO as a remediation technology for soil and groundwater contamination previously identified in the MOC area of the site. The primary objectives of the Phase I ISCO effort was to evaluate the feasibility of ISCO technology for application in an isolated location, and to evaluate the ability of ISCO to

achieve remediation goals for the COCs and corresponding media of concern. Table 1 summarizes the remediation goals for the COCs and corresponding media of concern. Tables 1 through 15 are located in the Tables Section at the end of this document.

Secondary objectives of the pilot study were to:

- Determine the field soil oxidant demand
- Collect site-specific data to establish a rate of injection for the oxidant solutions
- Assess lateral and vertical distribution of oxidant
- Use distribution data to evaluate the appropriate lateral and vertical spacing for injection points during full-scale ISCO remediation
- Determine the volume and concentration of oxidant to be injected during full-scale ISCO remediation
- Collect time-series data post-injection to evaluate COC transport and propagation of an oxidant front, useful for full-scale remediation and monitoring design
- Evaluate rebound of chemical concentrations following one round of oxidant injections

2.0 SITE DESCRIPTION

2.1 LOCATION

The NE Cape site is located on St. Lawrence Island, in the Bering Sea, near the territorial waters of Russia, approximately 135 air miles southwest of Nome. The Village of Savoonga is the closest community, located 60 miles northwest of the site. The NE Cape site, at 63 degrees (°) 19 minutes (') north, 168°58' west, is 9 miles west of the northeastern cape of St. Lawrence Island. The NE Cape site originally encompassed 4,800 acres (7.5 square miles). The site is bounded by Kitnagak Bay to the northeast, Kangighsak Point to the northwest, and the Kinipaghulghat Mountains to the south. Figure 2 provides an overview of the site location on St. Lawrence Island.

2.2 SITE HISTORY

St. Lawrence Island was established as a reindeer reservation by Executive Order on 7 January 1903. The present project site was acquired by the U.S. Air Force (USAF) on 16 January 1952, under Public Land Order (PLO) 970, which removed 21,013 acres from the reserve. In 1952, the USAF Aircraft Control and Warning Station (ACWS) was formally activated by the assignment of the 712th ACWS Squadron and the 689th Security Squadron. The original site was designed to support 212 men. Throughout its existence, the NE Cape facility has been a surveillance station, providing radar coverage for the Alaskan Air Command, and later, for the North American Air Defense Command, as part of an Alaskawide system constructed to reduce potential vulnerability to bomber attacks across the polar regions. The White Alice Station area remained in operation with minimal military staff until 1972. All lands were then withdrawn from the military under PLO 5178 for classification under Section 17(d)(1) of the Alaska Native Claims Settlement Act (ANCSA) of 1971, which entitled local community village corporations to select and receive specific tracts of federal land. Interim Conveyance No. 203 (June 1979) conveyed unsurveyed lands of St. Lawrence Island to Sivuqaq, Inc., and Savoonga Native Corporation, later renamed Kukulget, Inc. Excluded from transfer were surveyed lands, easements, and land-use permits effective before conveyance.

FINAL

In 1982, transfer of the White Alice Station area, south of the MOC, to the U.S. Department of the Navy was initiated. However, this transaction was not formally completed as it was superseded by ANSCA. The Navy conducted a removal action under its Comprehensive Long-Term Environmental Action Navy program. The action included removal of specified hazardous items and containerized hazardous and toxic wastes. In 2000, the White Alice Station was reclassified as a Formerly-Used-Defense-Sites-eligible property and, in response, the USACE included the area in the ongoing cleanup program for NE Cape (USACE, 2002).

The former military installation operated from about 1954 until 1972 as a surveillance station and a White Alice Communications station. In 1982, the Navy obtained the former White Alice Property (26 acres), but did not utilize the site as a communications site. The land transfer was later deemed invalid, and property ownership reverted to Sivuqaq, Inc., and Savoonga Native Corporation. Demolition of buildings and structures has been completed under multiple USACE contracts. The runway, improved gravel roads, and concrete slabs of some of the former structures remain intact.

The MOC at the NE Cape installation encompassed the majority of the site infrastructure including buildings, heat and power supply, fuel storage tanks, maintenance, and housing quarters. Individual sites were grouped together to evaluate an overall response action for the known contamination. These sites are located on the northeast portion of the main complex gravel pad and include Sites 10, 11, 13, 15, 19, and 27. The locations of Sites 11, 13, 15, 19, 27, and adjacent sites, are illustrated on Figure 3.

2.3 PREVIOUS STUDIES AND ACTIONS

Remedial investigations were conducted in 1994, 1996, 1998, 2001, 2002, and 2004. The sampling results demonstrate that soils and groundwater contain petroleum compounds at elevated levels. No measurable free product was observed in the monitoring wells during the various phases of remedial investigation. A summary of groundwater and soil contaminant concentrations and field parameters is provided in Table 2 and Table 3, respectively.

All of the MOC structures have been demolished. Tanks and piping were reportedly removed. Contaminated concrete, polychlorinated-biphenyl-contaminated soils, and fuel-

stained soils were also excavated and transported off site during removal actions from 2000 to 2005.

The USACE issued the *Draft Decision Document for NE Cape, Formerly Used Defense Site* (*FUDS*) in January 2009. The selected remedy for soil and groundwater at the MOC was chemical oxidation.

2.4 CONTAMINANTS OF CONCERN AND ASSOCIATED REMEDIATION GOALS

2.4.1 Soils

The primary COCs in the soil at the MOC are total petroleum hydrocarbons (TPH) as diesel range organics (DRO). Surface and subsurface soils are also contaminated with petroleum fuels as gasoline range organics (GRO), naphthalene, and benzene at depths up to 16 feet (ft) below ground surface (bgs). The fuel contamination is assumed to have created a smear zone along the shallow groundwater interface.

2.4.2 Groundwater

Shallow groundwater at the site is contaminated throughout the northern portion of the site. The primary COCs in groundwater are DRO, GRO, residual range organics (RRO), and benzene. Lead is also elevated at various locations, but was not identified as a remediation objective of the project.

2.4.3 Phase I ISCO Remediation Goals

The COCs and their target cleanup levels are summarized in Table 1.

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3.0 FIELD METHODS

In general, field work performed as a part of the Phase I ISCO evaluation was conducted as described in the *Final Work Plan In-Situ Chemical Oxidation (Phase I) and Intrusive Drum Removal/Landfill Cap* (Bristol, 2009). Phase I ISCO activities included the following work components:

- Hydrogeological evaluation
- Test-pit based site characterization
- Bench scale soil oxidant demand testing
- Bench scale treatability testing
- Pilot study design and construction
- Chemical oxidant injection
- ISCO performance monitoring

The field methods used to perform these tasks are discussed in greater detail in the sections that follow. Field notes recorded by on-site personnel during the execution of these efforts are provided in Appendix A.

Appendices A through M are located in the Appendices Section at the end of this document.

3.1 HYDROGEOLOGICAL EVALUATION

To evaluate hydrogeological conditions at the site, existing monitoring wells at the MOC were opened and groundwater allowed to equilibrate prior to gauging depth to water in each monitoring well. Groundwater levels were measured using an electronic water level indicator and measured to the nearest 1/100th of a foot. In addition to water level gauging, slug tests were also conducted in a subset of the existing monitoring wells to evaluate conductivity and permeability.

3.2 TEST PIT SITE CHARACTERIZATION

To rapidly evaluate the lithology and characterize soil conditions, test pit excavations were conducted at the site. Test pitting was selected based on the ability to collect detailed site lithologic data during excavation and the impracticality of using another rapid assessment method, such as direct-push soil sampling, in the soils at this site. Descriptive soil

characteristic information provided valuable data regarding small- and large-scale variations of lithology at the site. In addition, direct observations were made about the contaminant distribution (i.e., stained soils).

To confirm the presence of contamination in the potential study area, an assessment grid was established in the field, and 12 test pits were installed to evaluate lithologic and pre-ISCO soil contaminant conditions. A CAT 322B excavator was used to dig each test pit to an approximate depth of 10 ft below land surface (bls) or to the water table, which ever was encountered first. Soil excavated from the test pits was visually evaluated, photographed, logged, and screened with an organic vapor analyzer (OVA).

Soil samples were collected to characterize soil contamination at locations where OVA readings suggested the presence of petroleum impacts. Selected soil samples underwent field screening analysis for TPH-DRO and -GRO using a siteLAB® field test kit. During the test pitting effort, samples were collected from the excavator bucket based on visual observations and OVA screening results.

The dimensions of each test pit were determined in the field based on visual observations and field screening. Each test pit was logged on a separate form as it was excavated, including types and relative percentages of materials encountered and depth to the water table (if encountered). Each pit was uniquely numbered on a base map. The sidewalls of each test pit were photographed.

The test pits were backfilled with excavated material in reverse order of excavation following completion of the test pitting activities.

3.2.1 TVA-1000B OVA Photoionization Detector/Flame Ionization Detector

A Thermo Electron Corporation TVA-1000B OVA equipped with a combination photoionization detector and flame-ionization detector was used to screen soils recovered during test pitting and soil boring activities. Soil samples were collected into 1-gallon zip-tolock style plastic bags and sealed. The headspace was allowed to equilibrate for approximately 30 minutes, and the instrument sampling nozzle was introduced to the headspace via a slight opening in the zip seal. The instrument was calibrated at the beginning of the day of use, and calibration was confirmed at the end of the same day of use.

3.2.2 siteLAB UVF-3100 Analyzer

Field screening of test pit soils was performed using a siteLAB UVF 3100 Analyzer (siteLAB), supplied by Sitelab Corporation. The instrument was shipped calibrated to run a TPH-DRO method. For field screening of soils for DRO using the siteLAB kit, soil samples were collected in 1-gallon zip-to-lock style plastic bags, double bagged, and transported to the on-site field laboratory for screening analysis. Soil subsamples were weighed on a digital scale and extracted with methanol solvent. The liquid extract filtered through a syringe-mounted filter, and the resulting sample was diluted to read within the range of the instruments detector. The instrument was calibrated before each use; initial control standards, periodic standards, and final standards, were run during sample analysis.

3.3 BENCH SCALE TOTAL OXIDANT DEMAND TESTING

Prior to performing oxidant injections at the site, bench scale testing to evaluate the natural oxidant demand of site soils was conducted. This testing was conducted on site using site soil and groundwater media obtained during the test pit characterization efforts described above.

3.4 BENCH SCALE TREATABILITY TESTING

In addition to the total oxidant demand (TOD) testing discussed above, a bench scale treatability test was also conducted. A treatability study would normally have been conducted prior to the formulation of a field study work plan (WP); however, project schedules and limitations (frozen ground versus manual sampling versus cost) on the ability to collect representative samples prior to the summer field season caused this phase to be performed while ISCO-related site characterization and baseline sampling was underway. The objective of the bench scale treatability study was to supplement the in-situ approach by varying oxidant dosages and examining catalyzed hydrogen peroxide (H_2O_2), iron-activated persulfate, and hydrogen-peroxide-activated sodium persulfate as independent treatability scenarios. Evaluation of oxidant effectiveness and oxidant efficiencies in the bench typically help refine the design of the pilot study WP. In this situation, the results became available to help explain observations of ISCO pilot study behavior, and refine the development of the next phase of ISCO work.

The bench scale treatability test was conducted at an off-site laboratory. Testing was conducted using site soil and groundwater media obtained during the test pit characterization efforts described above. Bulk samples of soil were collected in 5-gallon pails lined with plastic bags, and bulk groundwater samples were collected in collapsible bulk containers. Groundwater samples were packed in coolers with ice packs and shipped to ATS' treatability lab facility in Orlando, Florida. Details regarding laboratory treatability testing procedures are also provided in Section 6.3.

3.5 PILOT STUDY INJECTION AND MONITORING WELL CONSTRUCTION

The pilot study was implemented at a single location where elevated concentrations of COCs were detected during previous investigation activities. The well layout for the pilot study included a single injection well and eight monitoring wells. The monitoring well locations were distributed throughout the expected area of influence and the anticipated flow path of the injected reagent. The field pilot study was designed to evaluate system performance, critical design, and operational parameters, including achievable radius of influence, oxidant consumption, and contaminant removal. These parameters were evaluated using monitoring wells strategically placed at varying radial distances from the point of injection to facilitate a better understanding of the effects of oxidant injection on the subsurface contamination.

3.5.1 Injection Well

The injection well was installed using standard hollow-stem auger drilling techniques. The injection well was installed and screened from approximately 1 ft above the groundwater table to 4 ft below the groundwater table. The injection well was completed with 5 ft of 2-inch-diameter stainless steel, wire-wrapped 0.010-inch screen and 2-inch-diameter stainless steel well casing. The well filter pack material was 10/20 silica sand placed from bottom of screen to 0.5 ft above the well screen. A 1-ft-thick finer-grained 30/70 silica sand seal pack was placed over the well filter pack to mitigate the penetration of cement into the well filter pack. Portland Type II cement was poured into place above the fine sand seal to ground surface for

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wellhead completion. The injection well was completed as a flush-mount well. The identity of the well was permanently marked on the well cap.

3.5.2 Monitoring Wells

A total of nine monitoring wells were installed as a part of the Phase I ISCO activities. Monitoring wells were installed using standard hollow-stem auger drilling techniques. Monitoring wells for the pilot study were screened from approximately one foot above to 4 feet below the groundwater surface interface. All monitoring wells were completed with 5 ft of 2-inch-diameter polyvinyl chloride (PVC) vee-wire 0.006-inch screens and 2-inch-diameter PVC well casings. The well filter pack material was 10/20 silica sand placed from bottom of screen to 0.5 ft above the well screen. One foot of finer-grained 30/70 silica sand was placed over the well filter pack to mitigate the penetration of fines from the neat cement into the well filter pack. Neat cement was poured into place above the sand-sealed pack to ground surface for wellhead completion. Monitoring wells were completed as flush mounts. The identity of the wells was permanently marked on the well caps.

3.5.3 Well Development

Well development was conducted no sooner than 24 hours after completion of the monitoring and injection wells. Monitoring wells and the injections wells were developed by a combination of surging, bailing, and over pumping or sustained pumping. During this process, groundwater quality parameters were recorded. All investigation-derived wastes, including soil cuttings and development fluids, were containerized or treated on site at the Hazardous Waste Accumulation Point in accordance with the Waste Management Plan.

3.6 OXIDANT INJECTIONS

3.6.1 Injectate Solution Composition

For the ISCO pilot study, H_2O_2 , sodium persulfate, and iron activation (FeEDTA [ferric ethylenediaminetetraacetic acid]) chemical solutions were prepared by mixing the individual oxidants and activator with water obtained from natural springs or flowing streams located in the region of the site. Individual solutions of H_2O_2 , sodium persulfate, and iron activator were prepared for injection in a sequential pulse fashion, where a small batch pulse of H_2O_2

solution was injected followed by a similar pulse of sodium persulfate and iron activator solution.

3.6.2 Injection Equipment and Process

The pilot study employed a temporary injection set-up. Injectate solution mixing and injection was accomplished using a network of transfer piping/hoses in line with centrifugal-style injection pumps, flow meters, flow totalizers, flow-control valves and pressure-relief circuits. A portable diesel-powered generator was used to supply power to the injection equipment. In general, the injection process for the pilot study involved mixing reagents with water obtained from site surface water bodies in small batches. Injections were performed by pumping the injectate solution into the injection well where it was forced through the well screen and into the target saturated zone. Oxidant injections were conducted using an alternating pulse sequence approach where small batches (<100 gallons) of the individual oxidants were injected in an alternating fashion.

3.7 PERFORMANCE MONITORING

The monitoring plan established for the pilot study consisted of three discrete sampling periods:

- Baseline monitoring
- Injection performance monitoring
- Post-injection performance monitoring

Each component of the monitoring plan is described further below:

3.7.1 Baseline Monitoring

Baseline sampling of soil and groundwater media was conducted prior to the initiation of ISCO injection activities. Results obtained during this sampling served as the basis for evaluating the overall efficacy of the treatment process.

Following well installation and development activities, but before injection activities, baseline samples were collected from all monitoring wells. The proposed monitoring plan was specific to the objectives of the study and generally included the following parameters:

- Static water level elevations
- Field parameters including temperature, hydrogen ion concentration (pH) specific conductivity, oxidation-reduction potential (ORP), and dissolved oxygen (DO)
- Field analysis of residual (i.e., unreacted) persulfate, H₂O₂, and activator
- Target COCs

Baseline soil samples were collected from the smear zone soils during monitoring well installation. Samples were collected and analyzed in accordance with the Sampling and Analysis Plan.

3.7.2 Injection Monitoring

Groundwater data from the monitoring wells within the target injection region of influence, and immediately downgradient, were collected while solution was being injected. Water levels were measured periodically during the injection process at monitoring wells surrounding the injection well using an electronic water level indicator.

Vertically-discrete downhole water quality field parameters were monitored during the injection event in all pilot study monitoring wells. Field parameters, specifically, conductivity, ORP, DO, and temperature, were used as a qualitative means to evaluate injection radius of influence during injection activities. Periodically (a minimum of four times daily) throughout the course of the injection monitoring, a downhole water quality meter was slowly lowered through the screened interval and data corresponding to a discrete depth recorded to determine if injection solution initially arrived in a stratified manner. Periodic field monitoring of groundwater for injected reagents (using field-screening kits) was also conducted to gauge reagent distribution. These techniques are discussed in the following subsections.

3.7.2.1 CHEMets® Sodium Persulfate Test Kit

Field screening of groundwater samples for the presence of sodium persulfate was performed using CHEMets sodium persulfate test kits provided by CHEMetrics, Inc. This kit is an ampule reagent test kit. An aliquot of groundwater was placed into a volumetric sample cup and a factory-prepared chemical reagent ampule was opened within the sample and mixed. A colorimetric change was compared to factory provided standards, and a concentration estimate was made. Where necessary, groundwater samples were diluted with deionized water to bring the colorimetric range within the detection limit of the test kit.

3.7.2.2 Total and Ferrous Iron Test Kits

Hach Method 8146 for ferrous iron and Hach Method 8008 for total iron were performed using Hach-provided reagent packets and a DR890 portable colorimeter. Reagent packets were added to an aliquot of groundwater sample in a sample cuvette, and the concentration of iron was measured directly using the DR890, according to the method instructions.

3.7.2.3 Hydrogen Peroxide Test Kit

A drop test kit, Hach hydrogen peroxide test kit Model HYP-1, was used to test groundwater for the presence of un-reacted H_2O_2 . This test kit provided a high- and low-range test method. Testing follows a titration method using ammonium molybdate, a sulfite reagent, and sodium thiosulfate to achieve a colorimetric determination of H_2O_2 concentrations.

3.7.3 Post-Injection Monitoring

After completing the injection event, monitoring wells within the pilot study area were tested periodically over the one-month study duration. Post-injection performance monitoring sampling of groundwater were conducted on a schedule corresponding to 3, 7, 14, and 28 days following the completion of oxidant injections. Data collected during this phase of monitoring was utilized to track changes in contaminant concentrations in response to the applied ISCO treatment. In addition to groundwater samples, soil samples were collected at day 7 and day 28 to evaluate the gross efficacy of the applied ISCO process on soils located within the pilot study area. Post-injection soil borings were installed within 3 to 5 feet of the installed monitoring wells to avoid damaging the constructed monitoring well while collecting samples from adjacent soils. Applicable soil and groundwater sample collection procedures are discussed below.

3.7.4 Analytical Sample Collection

The following sections detail analytical sample collection methods used in the Phase I ISCO efforts.

3.7.4.1 Soil Sample Collection

Soils collected for submittal to an off-site analytical laboratory (i.e., the sample for GRO and benzene) was collected first by placing approximately 25 grams dry-weight soil into the 4-ounce sample container. Immediately after loosely filling the container with soil, the methanol preservative was poured into the container over the soil. Enough methanol was added to cover the soil, the lid was closed tightly, and the jar swirled gently to make sure the soil was saturated with the methanol. If the soil absorbed the methanol, additional methanol was added until a thin layer of methanol persisted on the soil surface, before placing it into the sample cooler. The volume of methanol added to the sample jar was recorded on the sample jar label.

The sample for DRO, RRO, and naphthalene was filled next. The 8-ounce jar for these analyses was filled with soil, removing large gravel and rocks, and not packed. The sample for total organic carbon (TOC) was collected last by filling the 4-ounce container.

3.7.4.2 Groundwater Sample Collection

Groundwater samples were collected from the installed monitoring wells using these procedures:

- Before purging and sampling, the depth to groundwater was established by manual means with a water level sounder to an accuracy of 0.01 foot.
- The Mini-Typhoon brand centrifugal pump was used during the purging procedure.
- During purging, groundwater passed through a flow-through cell while parameters were analyzed using a YSI water quality meter. Parameters measured and recorded include pH, DO, conductivity, temperature, turbidity, and ORP.
- The mini-Typhoon brand centrifugal pump was used to collect the groundwater sample. When collecting volatile organic compounds, the flow rate of the pump was lowered as close to 100 milliliters (mL) per minute as practicable.
- Disposable polyethylene tubing was used with the pump. The pump was decontaminated between each well with an Alconox[®] and water solution.
- An aliquot from each reaction vessel was collected and the residual oxidant measured using H_2O_2 and sodium-persulfate-specific field test kits.
- Groundwater purging and sampling proceeded from the least contaminated to most contaminated well to minimize potential cross-contamination.

- In the case of a very-low-yield well where the well is purged "dry," the well was allowed to recover, and then water samples collected.
- Each well was purged until the measured turbidity was below 5 nephelometric turbidity units on two consecutive measurements, and the indicated parameters stabilized.
- All purged water was collected and containerized in 55-gallon drums.
- Water samples were collected using pre-cleaned containers provided by the laboratory.
- Sample vessels were chemically quenched to inhibit continuing oxidation, which would otherwise result in continual oxidation of organic compounds as the samples are transferred to the analytical laboratory. Sample containers were dosed with enough mass of solid sodium thiosulfate pentahydrate to quench the maximum concentration of persulfate in groundwater observed from residual persulfate field test kit results. This reaction is not vigorous because of the diluted concentrations of sodium persulfate expected in groundwater.

3.8 SAMPLING EQUIPMENT DECONTAMINATION

Disposable sampling equipment was used when possible. Pre-cleaned sample containers were provided by the analytical laboratory. Nondisposable field-sampling equipment was decontaminated as follows:

- Trowels or spoons used for soil sampling were scraped clean of gross contamination and washed in an Alconox solution, followed by potable and deionized water rinses.
- Sampling equipment was allowed to air dry before reuse.
- Fluids generated during sampling equipment decontamination activities were added to contaminated soil for disposal.
- Water sampling equipment was disposable (e.g., tubing for peristaltic pump).

3.9 DRILLING EQUIPMENT DECONTAMINATION

Drilling equipment (hollow-stem auger rig) used to collect samples from boreholes was decontaminated using the following procedures before moving to a new excavation or site:

- 1. Gross contamination was removed from sample spoons and auger with a broom or scrub brush.
- 2. Sampling equipment was placed into bucket containing Alconox solution and water.
- 3. Sample equipment in the bucket was scrubbed using a brush.
- 4. The sample spoon was double rinsed in potable water, followed by a deionized water final rinse.

- 5. Used wash water was disposed of at the water treatment impoundment.
- 6. Decontamination activities were documented in the field logbook.

3.10 SURVEYING

The location of test pits, soil borings, and monitoring wells and injection wells, were staked and flagged for identification. A professional land surveyor registered in the State of Alaska surveyed the locations in feet, as referenced to the North American Datum of 1983, State Plane, Zone 9. Surveying activities were performed by ECO-LAND, LLC using RTK/GPS Surveying Techniques.

3.11 WP VARIANCES

The following sections summarize deviations and additions to the WP. Where appropriate, the original WP detail is provided first in italics and is followed by an explanation of the deviation.

3.11.1 Deviations from the WP (Field)

Section 3.5: The detailed well layout for the pilot study will include an adjacent pair of injection wells and up to seven monitoring wells.

- A total of nine monitoring wells were installed. Two of these monitoring wells were installed as a part of site characterization efforts in order to better discern the vertical distribution of contaminants at the site. A total of one injection wells and seven monitoring wells were installed for the purpose of ISCO testing. Monitoring well ICOMW09 was subsequently used as an injection well after short-circuiting occurred during injection at ICOIW01.
- Following a teleconference between ATS, Bristol, and USACE, a single injection well was installed in the upper aquifer system identified during test-pit and soil-boring activities. Please see Section 3.4 of the Technical Memorandum (Appendix K) for further discussion of injection well installation activities.
- During the injection event, the short circuiting of oxidants solutions into the adjacent wetland area via a sidewall seep mandated a cessation of injection at the established injection well ICOIW01. Another attempt at injection was made via the conversion of monitoring well ICOMW09 to an injection location.

Section 3.5.1: Injection wells will be installed as a vertical pair with the shallow well screened from approximately 1 ft above the groundwater table to 4 ft below the groundwater table and the deeper well screened from approximately 4 to 9 ft below the groundwater table. Injection wells will be completed with 5 ft of 2-inch diameter stainless steel wire wrapped

screen, 2-inch diameter stainless steel well casing, and will be grouted in place with neat cement.

• Based on observations of contaminant distribution, a shallow injection well screened from 5 ft to 10 ft bgs was installed. Based on the observations of the multiple aquifer system, the apparent distribution of contaminants as understood following evaluation of the analysis of screening soil and groundwater samples, and verbal approval to modify the approach from the USACE, a single injection well was installed rather than multiple injection wells focusing on multiple vertical intervals. The installed injection well focused injection in the vertical horizon showing the greatest levels of contamination.

Section 3.5.2: Monitoring wells for the pilot study will be screened from approximately 1 ft above to 9 ft below the groundwater surface interface.

• Monitoring wells for the pilot study were screened from approximately 5 ft to 10 ft bgs. This interval intersected the expected vertical interval of oxidant delivery and treatment.

3.11.2 Deviations from the WP (Treatability Study)

Section 2.0, Page A2: Sampling points for sodium persulfate reaction vessels are set at 1, 2, 3, and 4 weeks to monitor the reaction of the oxidants with the COCs at both 2X and 5X concentrations.

• Sampling points for sodium persulfate reaction vessels were at 1, 3, 5, and 7 weeks to monitor the reaction of the oxidants with the COCs at both 2X and 5X concentrations. Within the WP text, the submitted *Attachment 1, Analytical Matrix* indicated a 1, 3, 5, and 7-week sampling interval while the text within the body of the document had not been updated to indicate the proposed interval.

3.11.3 Additions to the WP

Based on observations of soil and groundwater during the test pit excavation activities, ATS installed four soil borings (ICOSB01 through ICOSB04) and two monitoring wells (ICOMW01 and ICOMW02) in the ISCO study area that were not proposed as part of the WP, but were necessary to confirm field conditions. The four soil-screening samples split with the off-site laboratory to confirm the siteLab soil-screening results were an addition to the WP. Groundwater samples collected from the two newly installed monitoring wells and from existing monitoring well MW88-5, and submitted for off-site laboratory analysis, were also an addition to the WP.

4.0 ANALYTICAL DATA

4.1 IN-SITU CHEMICAL OXIDATION (PHASE I) SAMPLES

Table 4 summarizes the area of concern and target parameters. Table 5 presents a summary of soil samples collected during the Phase I ISCO study. Table 6 presents a summary of groundwater samples collected during the Phase I ISCO study.

Baseline soil samples were collected during the installation of each of the proposed ISCO pilot study monitoring wells. Soil samples were selected for analysis based on screening with an OVA. Soil samples displaying the highest OVA results within depths, corresponding to the proposed screened intervals of the monitoring wells, were collected for laboratory analysis. Subsequent performance monitoring samples were collected from adjacent borings at similar depths to baseline soil samples. Soil samples were analyzed for GRO, DRO, RRO, benzene, naphthalene, and TOC in accordance with Table 7.

Baseline groundwater samples were collected from the seven proposed ISCO pilot study monitoring wells. Groundwater samples were analyzed for GRO, DRO/RRO, benzene, naphthalene, sulfate, arsenic, chromium, and lead. Subsequent performance monitoring samples were collected from these monitoring wells in accordance with Table 8.

4.2 SAMPLE IDENTIFICATION

The samples were numbered as directed by the Sample Analysis Plan. Sample numbering was as follows: ##NCXXXMMZZ, where ## is the year, NC indicates NE Cape, XXX is the site identifier, MM is the sample type, and ZZ is the sample number. Field quality control (QC) samples were labeled and numbered in the same manner to prevent the laboratory from distinguishing them from other site samples. The site identifier (XXX in the sample number) used was ITA. The sample types (YY in the sample number) were designated as GW for groundwater and SB for soil.

Labels were required for analytical samples. Site- and time-dependent information was added to the labels using indelible ink. The labels were protected from water and solvents with clear label protection tape and contained the following information:

- Project name
- Date and time of collection
- Sample number
- Analysis to be performed
- Preservative (if applicable)
- Sampler's name

4.3 SAMPLE PACKAGING AND TRANSPORT

All analytical samples were shipped in accordance with International Air Transport Association 2.7, Dangerous Goods in Excepted Quantities, by charter aircraft from NE Cape to Nome, Alaska, and then transported via express delivery service for overnight delivery, when possible, to the contracted laboratory.

4.3.1 Sample Preservation

The sample collection containers, preservatives, and holding times for soil samples from the Phase I ISCO are shown on Table 7. Table 8 shows the sample containers, preservatives, and holding times for groundwater samples collected during the Phase I ISCO.

4.3.2 Sample Packaging

Analytical samples were packaged in the following manner:

- Each sample was placed in a plastic Ziploc[®] bag and sealed.
- Frozen ice packs were placed on the bottom of an analytical laboratory-supplied cooler.
- Each individual sample enclosed by a Ziploc bag was then surrounded in bubble wrap and placed in the cooler.
- The headspace of the cooler was filled with frozen ice packs.
- The chain-of-custody form was reviewed by Bristol's Contractor Quality Control System Manager and placed inside a sealed Ziploc bag, which was then taped to the inside surface of the cooler's lid.
- A custody seal was taped across the seam where the cooler lid and body meets, signed, and dated.
- The analytical laboratory was notified of approximately when and how many samples were to arrive.

4.3.3 Sample Shipment and Contacts

Samples were staged for pickup during periodic re-supply flights from Nome. Samples were shipped via Bering Air cargo plane to Nome, transferred to Alaska Airlines' air freight service using their Goldstreak next-available flight service, and flown to the TestAmerica Laboratories, Inc.'s (TestAmerica's) analytical laboratory located in Tacoma, Washington.

4.4 LABORATORY DATA VERIFICATION

Data verification was performed on the data collected as part of the NE Cape ISCO Study field effort. Data verification was performed to evaluate the completeness, correctness, consistency, compliance with method procedures and QC requirements, and identification of anomalous data. The reported project sample values, as well as any method laboratory control samples extracted or prepared with the project samples, were reviewed. Appendix B contains the laboratory data verification report generated based on the review of laboratory analytical data associated with the field portion of the Phase I ISCO activities. ADEC Checklists are found in Appendix L. (Intentionally blank)

5.0 PHASE I ISCO AREA OF INTEREST EVALUATION AND STUDY SITE SELECTION

As a prerequisite to ISCO testing, development of a robust conceptual site model (CSM) is necessary to fully understand the distribution of contamination with respect to both lateral and vertical extents, as well as provide insight into site geology and hydrogeology. A review of historical site data indicated that within the MOC area, several areas of the site have historically displayed both soil and groundwater concentrations in excess of the target cleanup levels. Table 2 and Table 3 summarize historical groundwater and soils results respectively for select sample locations with the MOC area.

Given this information the area displaying the broadest contiguous distribution of soils exceeding target cleanup levels is the area between SB88-16 and SB88-11. In addition to soil concentrations exceeding target cleanup levels, groundwater contaminant concentrations in this area (as indicated by samples collected from MW88-5) have also been shown to exceed target cleanup levels and appear to remain stable over time. While groundwater concentrations at MW88-5 are not the highest observed within the MOC area, they also have not shown broad swings in observed contaminant concentrations, like other monitoring wells within the MOC area, and groundwater has historically been encountered at relatively shallow depths within this portion of the site. Given the available data density and presence of relatively shallow groundwater observed within this area, it was selected as the Phase I ISCO Area of Interest (AOI). Figure 4 shows the approximate bounds of the selected Phase I ISCO AOI. Prior to initiating ISCO testing within this area, additional site evaluation was performed. This Phase I ISCO AOI evaluation included the following work components:

- Site hydrogeologic conditions
- Test-pit based site characterization

Observations made during, and results obtained from, the Phase I ISCO AOI evaluation efforts are discussed in the following sections.

5.1 HYDROGEOLOGIC EVALUATION

5.1.1 Groundwater Level Gauging

To evaluate hydrogeologic conditions at the site, existing monitoring wells at the MOC were gauged for depth to water. Wells included in the gauging effort were MW88-1, MW88-3, MW88-4, MW88-5, MW88-10, MW16-1, MW16-2, MW16-3, 18MW1, 17MW1, 22MW2, 22MW3, 20MW1, and 26MW1. Monitoring wells MW16-1, MW16-2, and MW16-3 were observed to be dry during groundwater-level gauging events. Additionally, monitoring well 18MW1 was observed to be obstructed at an approximate depth of 7.82 ft bgs. As such, groundwater levels at these locations could not be measured and were not included in groundwater surface mapping. Based on the data collected, a groundwater elevation contour map was generated in the field to evaluate regional groundwater flow direction and gradient. Figure 5 displays the groundwater elevation contour map generated from water level data collected on 23 July 2009. Based on the groundwater contours, the groundwater flow direction is approximately northwest across the MOC area. The groundwater flow direction observed in the MOC area is consistent with previous observations and suggests that the groundwater trends with the surface topography of the site. A calculated horizontal gradient of 0.0313 ft/foot, as measured as the head differential between monitoring wells MW88-10 and MW88-5. Groundwater elevations for gauged monitor wells are summarized in Table 9.

5.1.2 Hydraulic Testing

In addition to water-level gauging, slug tests were conducted at a subset of the existing monitoring wells to evaluate conductivity and permeability. Wells where slug testing was performed include 20MW1, MW88-5, ICOMW01, and ICOMW02. Table 10 summarizes the conductivity values obtained from slug-testing activities at the site. Calculated conductivity values ranged from a low of 0.57 ft/day at MW88-5 to a high of 8.39 ft/day at 20MW1. Based on this data, hydraulic conductivities appear to decrease, moving northward towards the drainage basin at the site.

5.2 TEST PIT SITE CHARACTERIZATION

To rapidly evaluate the lithology and characterize soil conditions within the Phase I ISCO AOI, test pit excavations were conducted within a localized area of the MOC. Testing pitting

was selected based on the ability to rapidly collect detailed site lithologic data during excavation using equipment available at the site. This area was selected based on historical data density, historical indication of contaminant concentrations exceeding cleanup criteria for both soil and groundwater media, and the likelihood of encountering groundwater at a relatively shallow depth. The locations of the test pits installed during the characterization effort are illustrated on Figure 6. Test pits were excavated using a CAT 322B excavator equipped with a 4.5-foot-wide, 2 cubic yard bucket. Test pits were excavated to a depth of 10 feet bgs or the water table, whichever was encountered first. Soil excavated from the test pits was visually evaluated, photographed, logged, and screened with an OVA. Test pitting was conducted under the supervision of a geologist that was responsible for soil characterization and soil screening.

During test pit sidewall exposure, a shallow perched water-bearing zone was observed approximately 4 to 4.5 feet bgs at Test Pits TP-2, TP-7, TP-8, TP-12, and TP-13. These test pits fall generally within the drainage basin of the MOC area, as indicated by the surface contours. The perched water zone observations are noted on Figure 7. Logs generated during the test pitting efforts are provided in Appendix C. Photographs illustrating test pitting activities being conducted at the Phase I ISCO AOI are provided in Appendix J. After test pit characterization activities were completed, the test pits were backfilled with excavated material in reverse order of excavation following completion of the test pitting activities.

5.2.1 Test Pit Soil Screening

During the test pitting efforts, soil samples were routinely screened using an OVA. Table 11 summarizes the OVA readings collected during the test pitting effort. Soil samples were collected to characterize soil contamination at locations where OVA readings or visual inspection suggested the presence of petroleum impacts. Selected soil samples underwent field-screening analysis for DRO using a siteLAB field test kit. Results of the DRO field analyses are provided in Table 12. Photographs of example extractions in sample vials are provided in Appendix J. During field screening, it was determined that screening kit results were biased significantly low. The determination that site screening kits were biased low was based on a combination of control-spiking experiments run in the field where high organic content and clean beach sand samples were spiked with known concentrations of neat diesel

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and analyzed using the test kits. These spike test results indicated a significant low bias in samples with high organic content. Further confirmation of the potential for low bias was obtained by direct comparison of field-screening data to off-site laboratory data for a series of split samples. It is hypothesized that naturally occurring humic and fulvic acids associated with the high organic content of the soil sample matrix may have resulted in the quenching of the flouresence used to measure DRO concentrations using the siteLAB testing kits. Based on the significant potential for low bias, data obtained using the siteLAB test kits should be considered highly qualitative at best.

5.3 PRE-ISCO SOIL BORING AND MONITORING WELL INSTALLATION

Upon completion of the test pitting efforts, four soil borings and two temporary monitoring wells were installed in the vicinity of the proposed Phase I ISCO demonstration site. Figure 6 shows the location of the four soil borings and two monitoring wells installed as a part of the characterization effort. The soil borings were designated as ICOSB01, ICOSB02, ICOSB03, and ICOSB04, and the monitoring wells were designated as ICOMW01 and ICOMW02. Screening samples for soil were collected from ICOSB01, ICOSB02, ICOSB03, and ICOSB04. Screening samples from these locations were submitted for off-site analysis to confirm the appropriateness of the proposed Phase I ISCO site. Screening results for DRO in soils measured 98 milligrams per kilograms (mg/kg) 130 mg/kg, 13 mg/kg, and 260 mg/kg in samples collected from ICOSB01, 02, 03, and 04, respectively. Data obtained from these screening samples are summarized in Table 13. Photographs of soil boring-installation-related activities are included in Appendix J.

During the installation of ICOSB01, saturated soils were initially encountered at a depth of approximately 13.5 ft bgs; however, groundwater levels were observed to rise to a depth of approximately 7 ft bgs within the augers. A similar observation was also noted during the installation of ICOSB04, providing an indication of confined aquifer conditions. The indication of a deeper (approximately 13 to 14 ft bgs) confined aquifer coupled with the observation of a previously unreported thin, shallow/perched water-bearing zone, prompted a closer look at the potential for multiple aquifers within the Phase I ISCO study area. To evaluate the potential for multiple water-bearing zones, and further evaluate contaminant distribution between these two zones, two temporary monitoring wells were installed. The

first of the wells, ICOMW01, was constructed as a deeper monitoring well with a screened interval corresponding to approximately 12 to 17 ft bgs. This well was intended to isolate the confined aquifer observed during the installation of ICOSB01 and ICOSB04. A second temporary monitoring well, ICOMW02, was constructed as a shallow monitoring well with a screened interval corresponding to approximately 3.5 to 8.5 ft bgs. This monitoring well was intended to isolate the shallow/perched water-bearing zone noted in the area during test pitting activities. Also, monitoring well construction logs for the existing and adjacent monitoring well MW88-5 were reviewed. It was determined that monitoring well MW88-5 was screened from 6.5 to 16.5 ft bgs, with a sand pack from 4.5 to 16.5 ft bgs. Based on this information, it is likely that this monitoring well was screened across multiple water bearing zones.

To quickly evaluate the vertical contaminant distribution between the observed water-bearing zones, screening samples of groundwater were collected from ICOMW01, ICOMW02, and MW88-5. Results from the screening samples indicated that the shallow water-bearing zone was significantly more impacted than the lower, confined water-bearing zone. The DRO levels in the shallow zone (ICOMW02) measured 32.8 milligrams per Liter (mg/L) while DRO concentrations in the lower zone (ICOMW01) were measured at 1.18 mg/L (less than groundwater cleanup goals). The DRO concentrations in groundwater at MW88-5 measured 7.53 mg/L falling between the values observed in the shallow and deep zone, respectively. Data obtained from these screening samples are summarized in Table 13. Soil boring and well completion logs are attached in Appendix D and Appendix E, respectively.

5.4 ISCO DEMONSTRATION AREA SELECTION

Based on information gathered during test pitting and the pre-ISCO soil boring and monitoring well installation observations presented above, the shallow vertical horizon extending from approximately 5 to 10 ft bgs in the area between ICOSB04 and ICOSB02 was selected for the Phase I ISCO demonstration. This area was selected based on observations including the presence of significantly elevated soil and groundwater concentrations consistent with a continuing source of contamination and the general lack of contaminant concentrations exceeding target cleanup levels observed within the lower confined aquifer zone. Despite the area's high organic soil content, it was determined that the geologic and hydrogeologic conditions were likely representative of conditions across the broader area. It was further determined that in order for ISCO to be an effective remedy, it would have to be capable of treating similar geologic and hydrogeologic conditions across the MOC area. The nature of historical contaminant releases, either to the ground surface or to shallow subsurface soils, and the observed prevalence of high organic content soils at the site dictate that an effective remedy be selected capable of remediation under these conditions.

5.5 PHASE I ISCO SOIL BORING, INJECTION, AND MONITORING WELL INSTALLATION

Based on the characterization information obtained during the test pitting and pre-ISCO soil and groundwater screening efforts noted above, the Phase I ISCO study was constructed to target the shallow soil and groundwater impacts identified. Figure 8 shows the installed configuration of the Phase I ISCO study monitor and injection wells. The primary injection well was identified as ICOIW01. The Phase I ISCO study monitoring wells were sequentially identified as ICOMW02 through ICOMW09. During well installation, soil borings were continuously screened using an OVA, and samples from the interval displaying the highest OVA readings were submitted for off-site laboratory analysis. Table 14 summarizes the OVA readings from the borings associated with the Phase I ISCO monitoring wells. Off-site analytical data associated with soil samples submitted to the off-site laboratory are presented in Table 15, along with historical data associated with soil borings adjacent to the selected Phase I ISCO demonstration area. Concentrations of DRO measured as a part of this effort were significantly elevated as compared to historical data (Table 15) from points in the adjacent areas, and represent the highest levels observed at the site to date.

5.6 PHASE I ISCO AOI EVALUATION SUMMARY AND REVISED SITE CONCEPTUAL MODEL

Based on information collected during test pitting, soil boring, and monitoring well installations, a series of geologic cross sections were generated. Figure 9 shows the location of two transects: one trending roughly east to west or approximately perpendicular to groundwater flow at the site, and the other trending approximately southeast to northwest or parallel to groundwater flow at the site. Figure 10 provides a visualization of the southeast to northwest, while Figure 11 provides a visualization of the east-west cross section. From these cross sections and their supporting raw data, several key observations can be made. Observations include the following:

- Fill material was consistently observed during test pitting and soil boring activities within the Phase I ISCO AOI. The fill material observed during test pitting typically ranged from 2 to 5 feet in thickness. In general, increasing fill material thickness was observed at locations closest to the drainage basin, as might be expected assuming that fill material was intended to develop a level area along the natural slope of the native topography for site construction.
- Peat and/or organic silt layers were commonly observed within the Phase I ISCO AOI. These peat and/or organic silt layers were observed at 10 of the 12 test pits excavated. The observed thickness of these layers was variable ranging from a few inches to several feet in thickness. The thickness of the peat and/or organic silt layers was generally observed to increase in locations closest to the drainage basin. The observed peat and organic silt lithologies were typically located a short vertical distance from the bottom of the fill material and were typically underlain by tighter silty lithologies.
- Frozen soil layers were intermittently encountered during test pitting. Observations of frozen or partially frozen soils were typically associated with finer-grained soils.
- A shallow water-bearing zone was observed through the central portion of the area evaluated by test pitting. This shallow water-bearing zone was observed at TP2, TP7, TP8, and TP12, at an approximate depth of 4 to 5 ft bgs.

With respect to the CSM, each of these observations are of particular interest and are likely to some extent govern the observed distribution of contamination at the site. Fill material observed at the site likely acts as a solar conductor, allowing for the seasonal development of shallow groundwater flow zones. The frequent observation of peat and organics silts, especially at shallow vertical intervals, suggests that these materials have a high potential to serve as an ongoing reservoir for contamination at the site. This potential stems from the nature of releases at the site (surface spills from leaking tanks and overfill events, and leaks from broken and separated joints of shallow underground piping), their high organic content and shallow depth of the deposition of these materials. The high fraction of organic carbon and porosity of these materials gives them increased sorptive capacity for contaminants. Additionally, their relatively shallow depth places them in direct contact with subsurface fuel transfer infrastructure, such as pipes and utilidors, as observed at Test Pit 12/13, and also leaves them ideally suited to capture vertical migration of contamination associated with surface spills. The potential for these soils to serve as an ongoing source to groundwater contamination is further exacerbated by the presence of shallow groundwater flow zones observed at the site that put groundwater in direct contact with soils having a high contaminant holding potential. Furthermore, the observed peat/organic silt soils were typically underlain by finer-grained and potentially frozen silts layers. These layers have the

potential to serve as a barrier preventing excessive migration of contamination from the shallow water-bearing zone to the deeper confined aquifer and likely contribute to the reason confined conditions are observed within the deeper water-bearing zone. Frozen zones also have the potential to dramatically impact the vertical and horizontal distribution and transport of groundwater across the area.

6.0 PILOT STUDY ACTIVITIES AND OBSERVATIONS

Phase I ISCO pilot study activities included the following work components:

- Bench scale soil oxidant demand testing
- Bench scale treatability testing
- Pilot study design and construction
- Chemical oxidant injection
- Performance monitoring

The Phase I ISCO test results are discussed in the following sections.

6.1 FIELD LABORATORY SETUP

ATS utilized an on-site construction trailer to construct a temporary on-site field laboratory facility. A bench-top ventilation hood was installed, and a shower and eyewash station and tables were set up to provide work stations for an equipment calibration station, analytical equipment, and the TOC study.

6.2 OXIDANT DEMAND TESTING

Prior to performing oxidant injections at the site, bench scale testing was done to evaluate the natural oxidant demand of soil and groundwater from the MOC area. Iron- and hydrogen-peroxide-catalyzed sodium persulfate ($Na_2S_2O_8$), and FMC Environmental Solutions' (FMC's) commercially available Klozur[®] sodium persulfate, were used for the bench-scale TOD study.

6.2.1 Sample Collection and Preparation

Soil samples were collected at various times during July 2009 site soil and groundwater investigation activities for characterization and reaction behavior evaluation. Soil samples for TOD testing were collected on 19 and 20 July 2009 during installation of temporary soil borings. Soil samples collected at soil boring ICOSB03 were organic clayey silts (OL/ML) collected at 5 to 7 ft bls. Soil samples collected at soil boring ICOSB02 (6 to 7 ft bls) and ICOSB01 (5 to 6 ft bls) were primarily peat (PT), while those from ICOSB03 (9-11) were gray silt (ML). Groundwater samples were collected on 18 July 2009, from monitoring wells 88MW-4 and 88MW-5. Groundwater samples were composited.

The determination was made in the field lab to examine the TOD exerted by each of the three predominant soil types encountered in the MOC area: PT, OL/ML ML. To prepare for the treatability study, soil samples from the three soil types were composited by type. Soil/groundwater slurry vessels were then prepared to perform TOD tests. The slurries were prepared by placing 100 grams of site soil in 0.5-liter bottles. For each soil type, composite groundwater was added to the soil to create a liquid slurry. Photographs of the field laboratory bench set-ups are provided in Appendix J.

6.2.2 TOD Testing Activities

Duplicate vessel soil and groundwater slurry tests from each soil sampling interval were prepared for TOD study at room temperature, and single-vessel slurry tests were prepared for 4 degrees Celsius (4 °C) tests. In total, nine test vessels per location were used for the TOD study: three Na₂S₂O₈ only, three iron-catalyzed Na₂S₂O₈, and three H₂O₂-catalyzed Na₂S₂O₈ test vessels. Each vessel was composed of soil and groundwater slurry amended with 20 grams per kilogram of FMC Klozur sodium persulfate. The H₂O₂-catalyzed TOD tests were prepared and also dosed with an appropriate volume of 8 percent (%) by weight hydrogen peroxide solution. For the iron-catalyzed TOD tests, each slurry vessel was additionally dosed with an appropriate mass of FeEDTA to generate a 300 parts per million (ppm) concentration of iron in solution.

Each vessel was then mixed briefly by hand swirling, and allowed to sit undisturbed for five days. The ORP and pH were measured and recorded at 24-hour intervals to monitor oxidant consumption. At the end of treatment, all vessels were iodometrically titrated to an endpoint, or monitored for an ORP inflection point, and the TOD was calculated.

Periodic laboratory parameter checks from set-up through day five indicated an immediate drop in pH from 5 to 6 downward to approximately 2 to 2.5 for the monitored period. Baseline ORP values ranged from approximately 80 millivolts (mV) to 125 mV for the various soil types. Following addition of reagents, ORP increased to values greater than 400 mV in nearly all reactions. The ORP remained elevated for the duration of the TOD study. The TOD results for the soil-groundwater slurries are reported in Table G-1 (Appendix G).

6.3 TREATABILITY TESTING

In addition to the field demonstration effort, a bench scale treatability study was also conducted. A treatability study would normally be conducted prior to formulating a field study WP; however, project schedule and limitations (frozen ground versus manual sampling versus cost) on the ability to collect representative samples prior to the summer field season committed this phase to be performed following ISCO-related site characterization.

The objective of the bench scale treatability study was to supplement the *in-situ* approach by varying oxidant dosages and examining catalyzed H_2O_2 , iron-activated persulfate, and hydrogen-peroxide-activated sodium persulfate, as independent treatability scenarios. Evaluation of oxidant effectiveness and oxidant efficiencies in the bench typically help refine the design of the pilot study WP.

ATS's Treatability Study Laboratory (TSL) in Orlando, Florida, conducted a bench-scale treatability study from August to December 2009, using site soils and groundwater from the NE Cape USACE site. Soil and groundwater samples were collected on 8 August 2009, from one monitoring well on site, ICOMW07. Soil samples were collected from hollow-stem auger flights, and immediately transferred to a 5-gallon bucket lined with a thick polyethylene bag, to assist with moisture retention as well as to minimize volatilization of contaminants. Groundwater samples were collected using a mini Typhoon centrifugal pump, as described previously. Groundwater samples were collected in 5-liter collapsible polyethylene bottles and immediately packed with reusable ice packs prior to transportation. A total of four 5-liter bottles of site groundwater and one 5-gallon Nalgene[®] polypropylene bucket of site soils were collected for the bench scale treatability study. Groundwater and soil samples were shipped from the site on ice, under chain of custody, via FedEx to ATS's TSL in Orlando, Florida, as follows:

Groundwater samples from the site were received at the TSL on 21 August 2009, via FedEx courier. Soil samples were delayed in transit, and were received in good condition at the TSL on 26 August 2009. Once received, samples were checked for condition of container, appearance, temperature, and pH. The TSL logged in approximately 20 kilograms of soil. Samples were moist, brown in color, with a strong petroleum odor noted. Groundwater samples were checked and three of the four 5-liter bottles of groundwater were observed to be intact. One sample bottle was

noted to have a cracked cap, which may have resulted in sample volume loss during transportation. The 5-liter groundwater sample bottle was received with approximately 4.5 liters of sample. Samples appeared cloudy and had an orange-brown color, with a slight petroleum odor. A login temperature of 4 °C and a pH range of 5 to 6.5 were recorded for groundwater samples. Soil pH was not measured. A sample aliquot of both the groundwater and soil was collected following sample login and submitted to TestAmerica, an Alaska-certified laboratory, in Tacoma, Washington, for baseline analyses of parameters listed in Table G-2 (Appendix G). The remaining samples were transferred to a 4 °C in-house refrigerator for storage until use in the bench-scale treatability study.

Baseline sampling of site groundwater and soil samples from the NE Cape site was conducted on 21 August 2009 and 26 August 2009, respectively. Two different remedial approaches were studied in the bench scale treatability study: activated $Na_2S_2O_8$ and catalyzed H_2O_2 . Detectable levels of the key COCs (DRO, GRO, and RRO) were observed in both matrices.

On 15 September 2009, a treatability study was set up following completion of the TOD study in Alaska. Based on results obtained from the TOD study, two $Na_2S_2O_8$ concentrations were selected for the bench-scale treatability study, a 2% (low) and a 10% (high) concentration. Hydrogen peroxide and FeEDTA were used as activators in the $Na_2S_2O_8$ treatment set-ups. The study was set to run for seven weeks, with five sampling events scheduled at set-up and at weeks 1, 3, 5, and 7. Additionally, a cumulative 7-hour catalyzed H_2O_2 study was planned with five sampling events scheduled at set-up and hours 1, 3, 5, and 7.

6.3.1 Setup and Sampling

6.3.1.1 Activated Sodium Persulfate

Reaction vessels were set up on 15 September 2009, using approximately 500 grams of site soil and 1,000 mL of site groundwater. An untreated control of site soil and site groundwater only was sampled and submitted to TestAmerica for analysis on 15 September 2009. A list of analyses is presented in Table G-2 (Appendix G). Vessels for the four remaining study periods, weeks 1, 3, 5 and 7 were set up as illustrated in Table G-3 (Appendix G).

Each vessel was dosed with a 2% or 10% FMC Klozur $Na_2S_2O_8$ solution, except for the soil and groundwater only control. The low and high persulfate (S_2O_8) treatment reactions were then activated by adding the target volume of 8% H_2O_2 solution or mass of FeEDTA to obtain an iron (Fe) concentration of 300 ppm. Five vessels were set up for each of the four sampling events for a total of 20 study vessels. To avoid loss of contaminant during testing, corresponding reaction vessels were set up for pH and ORP monitoring. All reaction vessels were hand swirled and allowed to sit undisturbed for the duration of the respective study periods. Fermentation corks were attached to each vessel to aid with release of pressure buildup during the oxidation reaction. The pH and ORP measurements were taken following set-up and at each sampling event.

Sacrificial samples were collected on 23 September, 8 October, 22 October, and 10 November 2009, corresponding to the four sampling events at weeks 1, 3, 5, and 7, respectively. At the end of each study period, reaction vessels were quenched with a 0.5 molar sodium thiosulfate solution (Na₂S₂O₃) to quench sodium persulfate prior to sampling. Samples were collected in the appropriate sample containers and immediately placed on ice. They were shipped under chain of custody to TestAmerica via FedEx overnight courier for laboratory analysis. The pH, ORP, and residual oxidant measurements were obtained from the duplicate vessels at the time of sampling.

6.3.1.2 Catalyzed Hydrogen Peroxide

On 18 November 2009, a modified catalyzed H_2O_2 study was set up. Catalyzed H_2O_2 is an advanced oxidation process by which H_2O_2 reactions produce highly reactive radical species. These radicals subsequently serve as the active oxidants. Hydrogen peroxide is typically catalyzed by exposure to a divalent metal, e.g., ferrous iron (Fe+2). The reaction of Fe+2 with H_2O_2 produces a highly reactive hydroxyl radical (OH), which is the strongest oxidant used for ISCO. Only fluorine, which is not used because of its hazardous properties, is a stronger chemical oxidant. The driving force as an oxidant is illustrated by the thermodynamic standard electrode potential for the hydroxide as shown in the half-reaction below.

$2 \cdot OH + 2H^+ + 2e^- \rightarrow 2H_2O \quad E^\circ = +2.8V$

In addition to OH production, H_2O_2 and catalyzed H_2O_2 can also result in the formation of a number of other reactive species capable of degrading common organic contaminant species. Half reactions for some of these additional reactive species are shown below.

 $H_2O_2 + 2H^+ + 2e^- \rightarrow 2H_2O \qquad E^\circ = +1.8V$ $HO_2 + 2H^+ + 2e^- \rightarrow 2H_2O \qquad E^\circ = +1.7V$ $O_2^- + 4H^+ + 3e^- \rightarrow 2H_2O \qquad E^\circ = -2.4V$ $HO_2^- + H_2O + 2e^- \rightarrow 3OH^- \qquad E^\circ = -0.88V$

Advantages offered by application of catalyzed H_2O_2 include the very rapid generation of highly reactive, non-specific hydroxyl radicals and intermediate reactive species as described above.

Reaction vessels were made up of approximately 500 grams of site soil and 1,000 mL of site groundwater. A low (5%) and a high (10%) hydrogen peroxide-dosed treatment vessel were set up to estimate the efficacy of the tested oxidants to mineralize the targeted contaminants. An untreated vessel containing site soil and groundwater only was also set up to serve as a control. The catalyzed H_2O_2 experimental set-up is illustrated in Table G-4 (Appendix G).

FeEDTA (as indicated in Table G-3, Appendix G) was added to the low and the high reaction vessels to obtain a target iron concentration of 30 ppm and 60 ppm, respectively. The reaction was conducted in an ice bath to control the temperature rise caused by the addition of H_2O_2 to FeEDTA, generally an exothermic reaction. A 5% and 10% H_2O_2 solution was slowly added to the 30 ppm and 60 ppm FeEDTA-dosed reaction vessels, respectively. A bubbling effect as well as generation of fumes was observed in the containers. A slow addition of H_2O_2 with continuous adjustment to the pH, as needed, controlled changes in the pH and temperature during the reaction. A temperature range of 20° C – 30° C was noted. The reaction pH was observed to be stable within the range of pH 3 to pH 5. Fermentation corks were attached to each vessels consisting of 1 control, 4 low-level treatments, and 4 high-level treatments were assembled. Reaction vessels setup began with the 7-hour reaction vessels and ended with the 1-hour reaction vessels. Reactions started immediately following setup. Reaction start and stop times were logged for each of the study periods.

At the end of each study period the reactions were quenched with Sigma-Aldrich[®] brand C3155, bovine catalase, which has approximately 35,000 units of enzyme per milligram of protein. Determination of residual H_2O_2 concentrations was done via spectrophotometric

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analysis by using the HACH test kit Model HYP-1. The specific model measured H_2O_2 concentrations in the range of 0.2 mg/L – 10 mg/L.

Gas bubble generation within sample containers suggested occasional incomplete quenching of H₂O₂. All samples were collected and stored in a 4 °C refrigerator overnight for observation to determine if sample containers would crack from pressure buildup. All sample bottles were observed to be in good condition on 20 November 2009. Samples were packaged and shipped under chain of custody via FedEx overnight courier to TestAmerica for analysis of parameters listed in Table G-2 (Appendix G).

6.3.2 Results

An overview of key findings for the soil and water matrices is presented in the following sections. Generally, the presence of organics in the treatability study samples appeared to competitively inhibit the oxidation of the target contaminants. Persulfate was persistent through the study period, suggesting that quantity of oxidant utilized for testing was adequate, but that oxidation of the organic matter would continue for an extended period of time. Additional oxidant would likely consume a greater relative proportion of the organic matter present, and would likely do so preferentially to the contaminants of concern.

6.3.2.1 <u>Activated Sodium Persulfate – Groundwater</u>

Four sampling events were completed for each treatment condition. Analytical results for the groundwater samples are presented in Table G-5 (Appendix G). In general, an increase in contaminant concentrations following treatment was universal for all reaction conditions. The 10% S_2O_8 reaction vessels exhibited greater initial increases in apparent contaminant concentrations than their 2% S_2O_8 counterpart.

The pH, ORP, Fe, and residual oxidant measurements were obtained from the duplicate reaction vessels. Ferrous iron was measured in-house at weeks 5 and 7 using the HACH model IR-18C kit. Results are presented in Appendix G, Figures G-1 and G-2 for pH and ORP, respectively.

The pH in the untreated samples was in the pH 5 to 6 range. The pH in the treated samples ranged from pH 1 to 3. The 10% S_2O_8 were observed to have the lowest pH. The ORP

ranged between 100 mV and 300 mV for the untreated sample during the course of the treatability study. A 300 mV to 650 mV ORP range was observed in the treated samples. The 10% S_2O_8 treatments were observed to have the highest ORP. Exaggerated ORP values may be a result of the inverse relationship between depressed pH and high ORP, which is a function of sensing electrode design.

6.3.2.2 Activated Sodium Persulfate – Soil

Frequently, soil samples were more slurry-like in composition, as organic matter had structurally collapsed following oxidation. Laboratory results are presented in Table G-6 (Appendix G). The DRO concentrations in soil for all set-ups is relatively unaffected by oxidation treatment with persulfate, as compared to baseline concentrations. There are fluctuations in concentrations over multiple sampling events, notably a downward inflection at the week 5 sampling event. However, no trend in soil contaminant response is evident over the study duration. A decrease in naphthalene was observed in the 10% treatments.

6.3.2.3 <u>Catalyzed Hydrogen Peroxide – Groundwater</u>

Soil and groundwater samples were submitted to TestAmerica for laboratory analysis. Groundwater results are presented in Table G-5 (Appendix G). Rapid increases in groundwater concentrations of DRO and RRO are observed immediately, as compared to baseline. This suggests desorption of DRO/RRO compounds during oxidation of natural organic matter. A decrease in DRO in the 5% H₂O₂ set-up by day 3 may be due to aqueous phase oxidation. Significant increases in contaminant concentrations in 10% H₂O₂ reaction vessels may be a product of proportionately greater oxidation of natural organic matter. Aqueous-phase destruction may have started to overcome desorption effects by the 7-hour sampling event, as indicated by declining contaminant concentrations

6.3.2.4 Catalyzed Hydrogen Peroxide – Soil

Soil DRO concentrations decrease from baseline; however, this may be due more to desorption into the aqueous phase, and less to do with direct oxidation. Soil GRO concentrations increased significantly for the 10% H_2O_2 , while remaining less affected for the 5% H_2O_2 reaction vessels. Results for soil sample analysis are presented in Table G-6 (Appendix G).

Visual observations of the soil matrix in the reaction vessels with significant peat soil indicated that over time, bulk organic matter was reduced in volume and fiber size appeared to decrease. The TOC analytical results for groundwater were significantly greater compared to baseline, supporting the concept of oxidation of the soil matrix and its conversion to soluble organic carbon compounds. Desorption of COCs is likely continuous as the soil organic matter degrades and releases sorbed petroleum hydrocarbon. Increasing contaminant concentrations in groundwater for multiple COCs is similar in response to the post-ISCO monitoring results from the field effort. Higher concentrations of oxidants appear to result in greater concentrations of COCs for both activated persulfate and catalyzed H₂O₂ systems. This result may be due to either desorption of contaminants from organic matter as it is degraded, or creation of matrix interference due to the reaction between higher oxidant concentrations and the soil organic matter.

6.3.3 Data Quality Assurance/Quality Control Review

ATS performed independent QC checks of laboratory procedures that were used in collecting and analyzing the data. This review addressed holding times, blanks, laboratory control samples, surrogate recoveries, and matrix spike/matrix duplicates to verify that the data collected adhered to method, standard, or laboratory-specific QC requirements.

A review of laboratory data collected in the current reporting period identified these QC notations:

- Hexavalent chromium analysis was completed out of hold for each event due to time taken to get samples to the laboratory. The analysis has a 24-hour hold time for both soil and groundwater samples. Samples were shipped from the TSL overnight via FedEx courier to TestAmerica in Tacoma, Washington, but were unable to be logged in to complete analysis within specified hold times.
- pH was in the 1 to 3 range in a number of the treated samples. This was below the pH required to analyze for alkalinity by U.S. Environmental Protection Agency Method 310.1. Therefore, alkalinity results were not reported for a number of samples.
- Sample volume was lost. A few samples were lost in the catalyzed H₂O₂ reaction study when expulsion of sample from the container occurred due to sample vessel pressurization during transport. Due to limited sample availability, a number of the metals analyses could not be completed.

• Sample preservation methods were modified. When gas bubbles accumulated and generated headspace in volatile samples submitted to the laboratory for analysis in the early stages of the study, subsequent samples were collected in unpreserved 40 mL volatile organic analysis vials and were preserved by the laboratory prior to analysis.

The notations listed above should be considered when reviewing the applicable analytical data. No additional QC issues were encountered requiring qualification of the data.

6.4 PILOT STUDY DESIGN AND CONSTRUCTION

Details regarding the design and construction of the pilot study injection and monitoring well network are provided in Section 3.5. Prior to accepting use of surface water for makeup water in the chemical mixing process, measurements of pH, ORP, temperature, and ferrous iron were made. No iron was detected, ORP was 73 mV, pH was 6.44, and the temperature was 16.2 °C. No parameter was such that it would disqualify use of the surface water body as a water source.

6.5 OXIDANT INJECTIONS

Oxidant injections started on the morning of 9 August 2009, at ICOIW01. Injection system pressure, flow rates, total volume delivered, and temperature of injection solution were recorded during injection. Throughout the injection program, injection pressures at the system and the injection head were maintained below 15 pounds per square inch. Flow rates averaged 4 gallons per minute (gpm), with maximum flow rates less than 7 gpm. Injections continued at ICOIW01 through the afternoon of 10 August 2009. Mechanical problems with injection pumps forced a shutdown on the late afternoon of 10 August 2009. Following repairs on the morning on 11 August 2009, injections were restarted and continued until site reconnaissance noted release from a seep and the related collection of oxidant solution in a depression/pond 40 feet northeast of the injection well ICOIW01 in the late afternoon. Based on observations of color and depth of collected liquid in the depression/pond, it is estimated that the release to surface was less than 15 gallons.

Following this observation, injection activities were transitioned to ICOMW09 in an effort to achieve the target volumes and mass of oxidants estimated for the Phase I ISCO study area. Unfortunately, short circuiting of injected fluids was once again observed through the side wall in the same low-lying area immediately adjacent to the Phase I ISCO study area. As a

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result, no further injection activities were attempted. Target injection volumes and oxidant masses were not achieved because of the occurrence of the short circuit and resulting surface release.

6.5.1 Injectate Solution Composition and Volume

Individual solutions of H_2O_2 , sodium persulfate, and iron activator (as FeEDTA) were prepared for injection in a sequential pulse fashion. Photographs of chemical mixing stations are provided in Appendix J.

Stabilized H_2O_2 concentrations ranging from 8% to 12% were prepared from 35% H_2O_2 . The 35% H_2O_2 was delivered in U.S. Department of Transportation-approved 55-gallon drums and stored in the chemical container until needed. A pallet holding four drums of H_2O_2 was transferred from the chemical container to a pallet containment staging area adjacent to the injection system container, and diluted in an 80-gallon over-pack drum with on-site water. On-site water, collected from an upgradient contaminant-free stream, was delivered to the injection system container by Bristol on an as-needed basis.

A 26% to 36% solution of sodium persulfate was prepared, as needed, with on-site water and dry sodium persulfate. Dilution of the higher concentration persulfate solutions to delivered concentrations was accomplished by combining liquid volumes of iron solution via an in-line mixer, thus achieving the delivery concentration of both reagents via dilution with the other. The sodium persulfate was shipped to the site in 55-pound plastic bags stacked on pallets. Pallets of sodium persulfate were stored adjacent to the chemical container and covered with plastic sheeting to protect from rain, and bags were transferred by hand to the injection system and mixed with on-site water in an 80-gallon over-pack drum using an electric mixing motor with attached mixing blade.

A maximum concentration of 3,280 ppm iron as FeEDTA catalyst was mixed in an 80-gallon over-pack drum using on-site water, using an electric mixing motor with attached mixing blade. The catalyst consisted of a chelated iron complex and was staged separately from the two oxidants.

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Because personal protective equipment and spill prevention measures were utilized in the field and chemicals were staged and mixed on-site (in lieu of shipping prepared solutions), a safe staging area was maintained to ensure very limited risk to field workers and site personnel.

Oxidant injections were conducted as an alternating pulse sequence where small batches of H₂O₂ solution were staggered between small batches of a combined sodium persulfate and FeEDTA activator solution. Injection volumes totaled approximately 1,090 gallons of oxidant/activator solution at ICOIW01 and 646 gallons of oxidant/activator solution at ICOMW09. The concentration of H₂O₂ in the injectate solution ranged between approximately 8% and 12%. The total mass of H₂O₂ injected at ICOIW01 was approximately 1,320 pounds and the approximate total mass of H₂O₂ injected at ICOMW09 was 944 pounds. The concentration of sodium persulfate in the injectate ranged between 13% and 18%, and the total mass of sodium persulfate injected was approximately 660 pounds at ICOIW01 and 932 pounds at ICOMW09. The maximum concentration of iron delivered via injection was 1,640 ppm. Approximately 51 pounds of FeEDTA was injected in ICOIW01, and approximately 43 pounds of FeEDTA was delivered to ICOMW09. Injection rates and quantities are presented in Table H-1 (Appendix H). A visual overview of the injection system set-up is presented in Appendix J.

Based on the 1,090-gallon volume of injectate applied to the subsurface at ICOIW01 across a 5-foot screen interval, the theoretical radius of influence (ROI) of the injection was expected to range between 4.8 and 9.6 feet based on a total porosity of 40%, and a mobile porosity in the range of one-half to one-eighth of the total porosity. Similarly, based on the 646-gallon volume of injectate applied to the subsurface at ICOMW09, the theoretical ROI was calculated to be between 3.7 and 7.4 feet.

6.6 PERFORMANCE MONITORING

The monitoring plan for the pilot study consisted of three discrete sampling periods:

- Baseline monitoring
- Injection performance monitoring
- Post-Injection performance monitoring

Each component of the monitoring plan is described further in the following sections:

6.6.1 Baseline Monitoring

Baseline sampling of soil and groundwater media was conducted prior to the initiation of ISCO injection activities. Baseline soil samples were collected from the smear zone soils during monitoring well installation. Following well installation and development activities, and prior to injection activities, baseline groundwater samples were collected from all monitoring wells. Results obtained during baseline monitoring are presented in conjunction with post injection monitoring results below.

6.6.2 Injection Performance Monitoring

Groundwater data from the monitoring wells within the target injection ROI and immediately downgradient, were collected while oxidant/activator solution was being injected. Field parameters, including electrical conductivity (EC), ORP, DO, pH, and temperature were used as a qualitative means to evaluate injection ROI during injection activities. Table H-2 in Appendix H contains the vertically discrete downhole water quality field parameters collected during the injection event. Based on the field-parameter data collected during the injection event, the injected oxidant combination was evident at monitoring wells ICOMW03, ICOMW05, and ICOMW06. The EC data at these locations displayed a greater than tenfold increase, and ORP levels at these locations were observed to exceed 400 mV during the injection process. These locations also displayed the greatest concentrations of total iron, ferrous iron, sodium persulfate, and H₂O₂, based on field test kit results for these parameters. Further discussion of temperature and conductivity stratification is provided in the following sections. Figures, which illustrate the stratification characteristics for these two parameters at multiple monitoring locations, are provided in Appendix H. Examples of performance monitoring activities are illustrated in Appendix J.

A coarse layer of, broadly, silty gravel is present, which lays atop the peat layer of significant thickness in the treatment area. Beneath the peat is a dense, not infrequently frozen, silt layer, acting as a confining unit. The perched aquifer normally sits atop the silts, and flows at the base of the peat. When injections started, the injected solution mounded within the peat and into the gravels, where present. This layer was a preferential flow path and horizontal

conduit, thus allowing warm oxidant solution to move rapidly into and across the upper zone of the shallow aquifer, appearing at ICOMW03, ICOMW05, and ICOMW06.

6.6.2.1 <u>Temperature Stratification</u>

The progression of in-situ performance indicators spatially and over time at the site suggest preferential flow paths are driven by inhibited groundwater flows due to intermittently occurring permafrost within peat and dense silts and the presence of dense silt lenses underlaying shallow non-frozen peat and gravel layers. The observed spatial and temporal distributions of performance indicators provides additional lines of supporting evidence for site features observed grossly in the cross sectional observations of test pit sidewalls and discreet profiles from soil borings and well installations.

On the first day of the injection-monitoring period, the appearance of temperature increases from baseline were observed at monitoring well ICOMW05. Within hours of initiating injections at injection well ICOIW01, temperatures increased in the upper few feet of the water column. Immediately evident is that temperature was highly stratified with depth, ranging from highs of 30 °C in the upper few feet of the water table, to less than 6 °C at the bottom of the shallow aquifer, at the same monitoring time point.

Examining the pattern of temperature rise over time reveals that the temperature in the upper few feet of the shallow aquifer can increase from baseline rapidly, while temperature in the bottom of the shallow aquifer, while capable of increasing, is quenched rapidly when the influence of oxidant injection is removed. Note the approximate temperature progression in ICOMW05 illustrated on the vertical profile figures (Appendix H): 4, 7.5, 8 (increasing on August 9); 24.5 (on August 10); and rapidly returning back to 5 °C (on August 12 and 13). However, the upper layer of the shallow aquifer maintains elevated temperatures (20 °C to 30 °C) once achieved. An explanation for this observation lies in the presence of a permafrost silt lens at deeper intervals previously observed at test pits and in soil boring samples, which rapidly quenches the temperature increase made possible by introducing the oxidant cocktail. This same response pattern of temperature stratification is evident at monitoring wells ICOMW03 and ICOMW06, which are monitoring wells that were most directly impacted by the chemical injections. Examination of temperature stratification in ICOMW07, ICOMW02, and ICOMW04, reveals overall temperatures across the monitored vertical interval never exceeded 7 °C. There are indications that the upper interval reached 7 °C at ICOMW02 during active injection. However, lower interval temperatures remained less than 2 °C for all three locations throughout the active injection period.

Temperatures at ICOMW02, ICOMW04, and ICOMW07, exhibited further increases by 2 to 4 degrees within a few days post-injection and remained a few degrees higher than measured during active injection at all three locations through the last sampling event 28 days post injection. This suggests that the groundwater that was treated by oxidation addition was eventually migrating into these wells.

Oxidant temperature effects did not appear at ICOMW02 during injection because preferential flow paths were established towards the seep at the sidewall of the pond, and release to the surface occurred there, prior to injection solution propagation much further than ICOMW06. Had the short circuit not occurred, projected additional oxidant volume would have covered the approximate 10-foot interval from ICOMW06 to ICOMW02. Further, the shift to ICOMW09 for injection added an additional 10 feet to the distance from the injection point, reducing the likelihood that influence would be observed at ICOMW02.

Oxidant temperature effects did not appear at ICOMW07 because of permafrost. At this location, ice crystals and frozen peat was observed from approximately 4 feet to a depth of 7.5 feet. The surficial gravel/fill layer here is notably thinner than at the other boring locations, allowing a thicker permafrost lens to form at shallow depths. The preferential flow path is through the peat layer, and flow towards this location was inhibited by the permafrost. Flow that does occur at this well is in the lower 2 feet of the well screen, as suggested by the wet-to-saturated condition at 8.5 to 9 feet.

6.6.2.2 <u>Electrical Conductivity Stratification</u>

The order of appearance of EC changes at the performance monitoring wells follows the pattern for temperature effects. Interestingly, the graphical representation of EC for the wells exhibiting influence suggest EC is slow to change in the shallow vertical interval, while the middle and bottom vertical intervals are increasing rapidly. This is in fact an artifact of the

height of the water column within the monitoring well in relation to top of screen height. For ICOMW03, ICOMW05, and ICOMW06, the water column was above the well screen throughout the monitoring events.

The EC values at the middle and bottom monitoring points (within the well screen) are exhibiting the expected increasing response resulting from the presence of sodium persulfate. The vertical distribution of EC across the screen interval is usually slightly higher at the middle interval, than at the bottom interval, which is similar to the apparent behavior suggested by temperature distribution data.

Neither groundwater nor oxidant appeared at ICOMW08 because of the presence of permafrost, and dense, low-moisture content silt-inhibiting flow to 3.5 feet of the 5-foot well screen. An apparent perched water table at 5.5 feet, which was present at the time of installation, was approximately 6 inches thick. The formation at this location was poorly transmissive. Oxidant solution flow trended away from this location towards preferential flow paths.

6.6.2.3 Oxidation-Reduction Potential

The ORP values in the 400 mV plus range at monitoring wells ICOMW03, ICOMW05, and ICOMW06 are typical for the oxidants applied. The ORP at ICOMW07 increased from slightly positive (10 - 15 mV) to over 200 mV from 12 August to 13 August 2009. However, post-injection performance monitoring ORP values at ICOMW07 were consistently negative from the 3-day post injection sampling event through the rebound sampling event, suggesting direct oxidation influence at the well, if any, was short-lived.

6.6.2.4 Hydrogen Peroxide Monitoring

Hydrogen peroxide injection concentrations ranged from approximately 8% to 12%. Measured H_2O_2 concentrations at ICOMW05, located 5 feet away, were no greater than 15 mg/L. This concentration and the greatest sitewide H_2O_2 concentration of 33 mg/L at ICOMW06, were both measured on the final day of injections during a 12% H_2O_2 injection event. These results suggest that peroxide is nearly entirely consumed within 5 to 10 feet of the injection point, the distance variance is likely a function of travel along preferential flow paths.

6.6.2.5 Sodium Persulfate Monitoring

Injection concentration of $Na_2S_2O_8$ was approximately 13% to 18%. Field-kit-measured concentrations of $Na_2S_2O_8$ were 1400 to 3000 mg/L in oxidant-influenced monitoring wells. Previous experience injecting $Na_2S_2O_8$ into low organic content soils at other sites has indicated that a 20% persulfate solution can frequently be measured at a 2% concentration within 10 feet of the injection well, once detected at the monitoring point, and is usually assignable to fractional pore volume dilution effects. The residual $Na_2S_2O_8$ at this study area is 1% to 1.5% of this typical pore volume dilution percentage.

6.6.2.6 Iron Monitoring

Generally, the iron activator is present at the oxidant-affected monitoring wells at the same time as the oxidants. At these wells, ferrous iron concentrations are a fraction of the apparent total iron concentration, suggesting consumption of iron by the H_2O_2 . Total and ferrous iron concentrations in monitoring wells that did not exhibit influence by oxidant were also close in value, indicating most of the iron was in ferrous form. Field-kit evaluation of total and ferrous iron concentrations at monitoring wells ICOMW03, ICOMW05, and ICOMW06 required substantial dilution, and the reported values are of questionable use as direct measures of iron concentration.

6.6.2.7 Radius of Influence

Based on the distance of the monitoring wells from the injection location at ICOIW01, and the evidence for distribution of oxidant to the wells ICOMW03, ICOMW05, and ICOMW06, it is suggested that the ROI achieved by the injection was approximately 5 feet, which agrees well with the calculated theoretical ROI derived from the injected volumes. However, the influence was not radially symmetrical due to the presence of intermittent permafrost and variations in silt and peat thicknesses across the study area. Additionally, the oxidants appear to be nearly expended at this distance.

6.6.3 Post-Injection Performance Monitoring

Post injection performance monitoring of groundwater was conducted on a schedule corresponding to 3, 7, 14, and 28 days following the completion of oxidant injections. In addition to groundwater samples, soil samples were also collected in conjunction with the day 7 and day 28 post injection sampling event, to evaluate the gross efficacy of the applied ISCO process on soils located within the pilot study area. Baseline soils were collected at depths ranging from 5.5 to 7.5 feet below surface, and subsequent samples were collected from the same depth interval for each sampling event. Table 16 contains the groundwater baseline and performance monitoring data, and Table 17 contains the soil baseline and performance monitoring data. Performance monitoring soil sample locations are shown on Figure 12. Low-flow groundwater sampling forms are attached as Appendix F. Photographs of soil sample access casings and example day 28 soil samples are provided in Appendix J.

Groundwater analytical results at day 3 indicated an immediate significant increase in concentrations of DRO, GRO, RRO, and benzene for most sampling locations. This response may be due to desorption of fuels from the highly organic soils. However, it was noted that concentrations of the groundwater COCs were decreasing by day 7, potentially due to aqueous-phase oxidation of desorbed COCs. By day 28, concentrations were at or slightly below baseline levels, and the oxidants were mostly consumed. This response is attributed to a continual shift of petroleum hydrocarbons from the highly organic soil matrix into the aqueous phase, with the concomitant oxidation of a portion of this petroleum hydrocarbon mass in the presence of the injected oxidants. The significant source mass sorbed to the highly organic soils may have led to an apparent equilibrium between aqueous-phase oxidation and desorption from the soil matrix, and thus the static groundwater concentrations. Additionally, the aquifer system was under dosed with oxidants, given the apparent preferential path and release to the surface described in previous sections, thus reducing the system's capacity for aqueous-phase oxidative treatment. Cleanup target goals were met by day 28 for GRO at ICOMW08. Cleanup target goals for groundwater were not met at the locations sampled for the remaining COCs.

Some treatment of groundwater, as indicated by decreasing GRO concentrations towards the end of the post-injection monitoring period, occurs at wells outside the ROI of the injection

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wells. This is most likely a function of treated groundwater flow and contaminant transport from the upgradient zone surrounding ICOMW09. Ultimately, the post-injection groundwater dataset is constrained by the limitations of a 28-day monitoring period.

Analytical results for soil suggest a significant decreasing trend for benzene and naphthalene from baseline to day 7, which may be a function of aggressive initial oxidation effects. However, benzene results are variable through day 28, and DRO and naphthalene apparently increased through day 28. These results may be attributed to variation in the soil types over short lateral distances (e.g., horizontal horizon). These variations are problematic because pre-injection baseline soil samples may have had lower starting concentrations than the soils sampled post ISCO. Thus, the same relative reduction would not seem to be as effective in the soils with higher starting concentrations. Target cleanup goals were met by day 28 for DRO at ICOMW07 and ICOMW04; however, these results may be attributable to soil sample heterogeneity. Cleanup target goals for soil were not met at the locations sampled for the remaining COCs.

6.6.3.1 Post-Injection Sodium Persulfate Monitoring

The persulfate concentrations measured by field kit during the post-injection monitoring period illustrate the dichotomy of contact between ICOMW03, ICOMW5, and ICOMW06, and little to no contact at ICOMW02, ICOMW04, ICOMW07, and ICOMW08. However, it also illustrates the effect of injection at ICOMW09, post-injection. Persulfate concentrations increase at both MW07 and MW08 from 1 day post injection through 7 days post injection. The appearance of persulfate at MW04 at 7 days post injection, and the upward trend in concentration through the final post-injection sampling event at wells which did not exhibit influence during injections at ICOIW01, suggest that the injected solution at MW09 has migrated downgradient through the study area.

6.6.3.2 Contaminant Mass Reduction

Baseline DRO mass in soil is estimated to have been approximately 21,000 pounds for the AOI [ISCO Study area]. A calculation of contaminant mass reduction in soil for the site is not achievable based on the results, which exhibit higher DRO and RRO soil concentrations at most locations for the final sampling event (Appendix I). This is likely a result of the

confounding effects of soil sample location selection on the ability to attain comparative

samples, as was discussed previously.

7.0 CONCLUSIONS

Characterization efforts associated with the Phase I ISCO AOI unveiled a number of key items related to the MOC area's CSM. These items included observing locally extensive peat and organic silt layers within the shallow site lithology, shallow perched water-bearing zone, locally confined aquifer conditions at greater depths, and at least locally, higher than expected DRO concentrations in shallow subsurface soils. The greatest concentrations of DRO observed in the Phase I ISCO area of the site appear to correspond well with the occurrence of high organic content soils layers and the shallow perched water aquifer identified in the area of study, which happen to further correspond and locally intersect with the historical underground storage tank excavation areas associated with Sites 13 and 27.

The primary objectives of the Phase I ISCO effort were to evaluate the feasibility of ISCO technology for application in an isolated location, and to evaluate the ability of ISCO to achieve remediation goals for the COCs and corresponding media of concern. Based on field observations and monitoring data collected during Phase I ISCO, it appears that it will be difficult to reach target cleanup levels for the COCs and corresponding media of concern at the site. These difficulties stem primarily from the prevalence of shallow peat and organic silt lithologies. These layers have been demonstrated to retain high concentrations of contamination (especially DRO), and the natural organics that comprise these materials exhibit significant oxidant demand resulting in excessive competition for the oxidants applied, ultimately limiting the treatment effectiveness. Based on the results obtained during the Phase I ISCO testing, it does not appear that ISCO is well suited to achieve remediation goals for the COCs and corresponding media of goals of the COCs and corresponding media of during the Phase I ISCO testing, it does not appear that ISCO is well suited to achieve remediation goals for the COCs and corresponding media of concern in areas where peat or organic silts predominates the lithology. However, ISCO may be a viable and applicable technology at other areas of the site where peat and organic silts do not predominate the lithology.

Secondary objectives of the Phase I ISCO testing centered on the implementability of ISCO technology. The application of ISCO at this isolated location proved to be challenging due to a number of unforeseen conditions encountered in the field. Some of the conditions include the presence of high organic soils (peats and organic silts), the presence of permafrost and/or semi-permafrost zones, and the observation of preferential flow zones. Despite these challenges, the overall process was demonstrated to be manageable and implementable.

In addition to the field testing, bench scale treatability was also conducted using contaminated site media to evaluate additional oxidant and activator combinations not tested in the field. The results of the laboratory treatability studies did not suggest that the additional tested oxidant and activator combinations were more effective than the approach selected for the field application. Results of the laboratory treatability study closely mimicked those observed during the field pilot testing and confirm that ISCO is not likely to achieve target treatment levels for site COCs and the corresponding media of concern under high organic conditions.

Comments on the draft ISCO Summary Report are provided in Appendix M.

8.0 **RECOMMENDATIONS**

The shallow high organic content soils observed across much of the Phase I ISCO AOI have demonstrated the ability to serve as a significant contaminant reservoir with a limited potential for treatment via ISCO. The sorptive capacity of these soils combined with the high organic content, results in a poor match for ISCO as a primary treatment technology. The relative shallow deposition of these highly impacted soils make them an excellent candidate for excavation and ex-situ treatment through off-site disposal, or on-site treatment technologies such as thermal treatment or aggressive landfarming techniques. Prior to, or in conjunction with, evaluation of alternative remedial strategies for the shallow high organic content soils, it is strongly suggested that additional site characterization be performed to better define the horizontal and vertical extents of contamination at the site, and, where possible, tie the distribution of contaminants observed at the site to specific geologic and hydrogeologic units. One potential mechanism for accomplishing this would be through the application direct-sensing technologies such as Laser-Induce Fluorescence/UltraViolet Optical Screening Tool and conductivity logging to develop a three-dimensional model of contaminant deposition and site lithology. As a part of these additional characterization efforts, performing a geophysical survey is also recommended to aid in identifying subsurface features, such as the fuel line observed during test pitting efforts, which have the potential to serve as continuing sources of contamination.

If, following further site characterization, it is determined that other areas of the site display significant soils and groundwater concentrations of site COCs associated with lithologies that are not dominated by high organic soils, Phase II ISCO testing could be recommended. Potential areas that could meet these conditions include the southern and/or eastern portions of the MOC area, for example, around SB13B1 and upgradient near MW88-10. However, insufficient information currently exists regarding the lateral, vertical, and lithologic association of contaminants in these area to warrant Phase II ISCO testing at this time.

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9.0 **REFERENCES**

- Bristol Environmental Remediation Services (Bristol). 2009. *Final Work Plan In-Situ Chemical Oxidation (Phase I) and Intrusive Drum Removal/Landfill Cap, Northeast Cape, St. Lawrence Island, Alaska.* May.
- U.S. Army Corps of Engineers (USACE). 2002. Engineering Evaluation and Cost Analysis, Environmental Assessment and Finding of No Significant Impact, White Alice Removal Action, Northeast Cape, St. Lawrence Island, Alaska. March.
- USACE. 2009. Draft Decision Document for NE Cape, Formerly Used Defense Site (FUDS). January.

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TABLES

Table 1 - Phase I ISCO Remediation Goals

Contaminant of Concern	Soil Cleanup Level (mg/kg)	Groundwater Cleanup Level (mg/L)
Diesel Range Organics		
(DRO)	9,200	1.5
Gasoline Range		
Organics (GRO)	N/A	1.3
Residual Range		
Organics (RRO)	N/A	1.1
Naphthalene	120	N/A
Benzene	2	0.005

Notes: N/A – not applicable

ISCO = in-situ chemical oxidation

mg/L = milligrams per liter

	DRO (mg/l)		GRO (mg/L)		RRO (mg/L)		Benzene (µg/L)		Lead (µg/L)	
Well ID	2002	2004	2002	2004	2002	2004	2002	2004	2002	2004
MW88-1	1.2	[0.345]B	0.024 VJ	0.0141J	0.43	0.168J	0.58	[0.4]	-	[1.00]B
MW88-2	0.71	0.421B	ND (0.05)	0.0492J	1.3	[0.543]B	0.92	0.26J	-	54.6
MW88-3	34	0.768B	0.42	0.104	0.22	[0.549]B	0.57	[0.4]	-	[1.00]B
MW88-4	72	3.89	1.2	1.25	1.9	1.46B	30	33.7	-	5.02
MW88-5	9.8	11.3	1.3	1.5J	2.3	2.28B	19	29.7	-	12
MW88-6	69	4.56J	1.1	1.02	2.1	0.651B	0.74	1.18	-	8.87
MW88-7	6.1 VLB	-	1.5	-	0.32	-	14	-	-	-
MW88-8	20	3.37	0.52	0.415	0.18 VJ	0.816B	0.12 VJ	[0.4]	-	4.07B
MW88-10	55	1.38	0.12	.0357J	1.3	[0.549]B	2.7	[0.4]	-	37.6
17MW1	-	[0.337]B	-	[0.090]	-	[0.562]B	-	[0.4]	-	7.08
18MW1	-	[0.341]B	-	0.0191J	-	[0.568]B	-	[0.4]	-	1.21B
20MW1	-	[0.333]B	-	0.0194J	-	[0.556]B	-	[0.4]	-	51.7

Table 2 - Summary Historical Groundwater Analytical Results

Notes:

Source: Phase IV RI, Shannon & Wilson, June 2005 and Phase III RI, MWH, 2003, Figure 2-6.

Well MW88-4 associated with primary, duplicate and triplicate. Highest value included.

[#] B = Result qualified as non detected due to method, trip or equipment blank detection

ND = Not detected above reporting limit

VJ = estimated value

VLB = Result negatively biased

Sample Location	Sample Depth (ft bgs)	DRO (mg/kg)	GRO (mg/kg)	RRO (mg/kg)	Benzene (mg/kg)	Naphthalene (mg/kg)	Chromium (mg/kg)
MW 88-1	15.5-17.5	5,000	19	39 VJ	ND(0.012)	0.0022 VJ	6.5
MW 88-1	17.5-20	1,400	4.9	16 VJ	ND(0.011)	0.00038 VJ	4.38
MW 88-2	8-10	ND (12)	ND (3)	6 VJ	ND(0.014)	.0001 VJ	16.1
MW 88-2	10-12	ND (11)	ND (3.6)	7.1 VJ	ND (0.015)	.00056 VJ	8
MW 88-3	4-6	7.6 VJ	ND (6)	120 VJ	ND(0.023)	.00081 VJ	22.3
MW 88-3	16-18	3,700	51	24 VJ	ND(0.021)	1.5	13.1
MW 88-4	9-11	12,000	44	3,700	0.047	5.9 VHB	17.3
MW 88-4	11-13	2,600	54 VHB	16 VJ	ND(0.018)	2.3	3.73
MW 88-5	1-3	380	ND(2.8)	3,400	ND(0.012)	0.0041 VJ	42.3
MW 88-5	11-13	21	ND (4)	25 VJ	ND (0.014)	.0037 VJ	4.5
MW 88-6	7-9	3,100	130 VHB	23 VJ	ND(0.012)	4.1	12.8
MW 88-6	11-13	1,200	83 VHB	30 VJ	ND(0.012)	1.1	8.3
MW 88-7	7-9	12,000	140 VHB	55 VJ	ND(0.012)	7.9	17
MW 88-7	11-13	9,200	130 VHB	54 VJ	ND(0.011)	8.4	11.6
MW 88-8	10-12	5,200	68 VHB	11 VJ	ND(0.018)	3.3	9.63
MW 88-8	14-16	2,300	73 VHB	7.4 VJ	ND(0.018)	2.3	8.34
MW 88-10	22-24	1,400	31	ND (110)	ND(0.015)	0.48	10
MW 88-10	24-26	750	19	ND (110)	ND(0.015)	0.11	4.8
SB 88-11	3-5	13,000	70	5,100	0.12	12	16.5
SB 88-11	7-9	51,000	99	6,000	0.19	81	23.7
SB 88-12	4-6	190	ND (5.2)	1,500	ND (0.022)	0.0045 VJ	12.4
SB 88-12	10-12	20	ND (3.8)	33 VJ	ND (0.017)	0.0011 VJ	9.52
SB 88-13	6-8	430	11 VJ	4,600	0.37	0.042	16.5
SB 88-13	14-16	77	ND (6.1)	420	ND (0.022)	0.0018 VJ	14.3
SB 88-14	2-4	47,000	220 VHB	3,000	0.019	79	22.7
SB 88-14	12-14	210	62	900	0.24	0.041	22.8
SB 88-15	10-12	33	ND (4.9)	150	ND (0.018)	0.018	23
SB 88-15	12-14	79	ND (4.4)	590	ND (0.021)	0.0047 VJ	23.4
SB 88-16	6-8	16,000	110 VHB	33 VJ	ND(0.015)	28	15.6
SB 88-16	10-12	4,200	60 VHB	12 VJ	ND(0.017)	0.9 VLB	6.7
SB 88-17	8-10	4,700	130 VHB	450	ND(0.013)	12	18.2
SB 88-17	12-14	4,300	140 VHB	110 VJ	ND(0.012)	3.6	8.31
SB 88-18	8-10	7,300	100 VHB	24 VJ	0.018 VHB	10	14
SB 88-18	10-12	4,000 VJ	170 VHB	226	0.062 VJ	6.9 VJ	16.7 VJ

Notes:

Source: Phase III RI, MWH, 2003, Figure 2-6 (NOTE SAMPLES COLLECTED IN 2002)

[#} B = Result qualified as non detected due to method, trip or equipment blank detection

DRO = diesel range organics

ft = feet

GRO = gasoline range organics

mg/kg = milligrams per kilogram

ND = Not detected above reporting limit

RRO = residual range organics

VHB = Result is an estimate with high bias

VJ = estimated value

VLB = Result negatively biased

Table 4 - Phase I ISCO Sampling Areas

Site Description	Area	Depth (bgs)	Target Parameters
Phase I ISCO Pilot Study Area	25 x 25 feet	~5 to ~20 feet	GRO, DRO/RRO, Benzene, Naphthalene, TOC, arsenic, lead, chromium, and sulfate

Notes:

1) Actual injection well screen depths to be determined in the field.

bgs = below ground surface	ISCO = in-situ chemical oxidation
DRO = diesel-range organics	RRO = residual-range organics

GRO = gasoline-range organics TOC = total organic carbon

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Table 5 - Sample Quantities for ISCO Soil Samples

	Parameter	Preparation/Analytical Method	Analytical Samples	QC	MS/MSD
Pilot S	tudy Characterization				
Soil	GRO/Benzene and Napthalene	AK 101/ EPA 5035A/8260B	7	1	1
Soil	DRO/RRO	AK 102/103	7	1	1
Soil	TOC	EPA 9060	7	1	1
Perfor	mance Monitoring (2 events)				
Soil	GRO/Benzene and Napthalene	AK 101/ EPA 5035A/8260B	14	2	1
Soil	DRO/RRO	AK 102/103	14	2	1
Soil	TOC	EPA 9060	7	1	1

Notes:

Clear glass may be substituted for amber if samples are protected from exposure to light; this exception does not apply to metals.

AK = Alaska Method

DRO = disel-range organics

EPA = U.S. Environmental Protection Agency

GRO = gasoline-range organics

ISCO = in-situ chemical oxidation

MS = matrix spike MSD = matrix spike duplicate QC = quality control RRO = residual range organics TOC = total organic carbon

Table 6 - Sample Quantities for ISCO Water Samples

	Parameter	Preparation/Analytical Method	Analytical Samples	QC	MS/MSD
Pilot Study C	haracterization				
Groundwater	GRO/ Benzene	AK 101/ EPA 5030B/8260B	7	1	1
Groundwater	DRO/RRO	AK 102/103	7	1	1
Groundwater	Napthalene	EPA 3510C/8270C SIM	7	1	1
Groundwater	Sulfate	EPA 300	7	1	1
Groundwater	Metals (As, Cr, Pb)	EPA 3005A/6020	7	1	1
Performance	Monitoring (4 even	ts)			
Groundwater	GRO/ Benzene	AK 101/ EPA 5030B/8260B	28	3	2
Groundwater	DRO/RRO	AK 102/103	28	3	2
Groundwater	Napthalene	EPA 3510C/8270C SIM	28	3	2
Groundwater	Sulfate	EPA 300	7	1	1
Groundwater	Metals (As, Cr, Pb)	EPA 3005A/6020	7	1	1

Notes:

Clear glass may be substituted for amber if samples are protected from exposure to light; this exception does not apply to metals.

AK =	Alaska Method	ISCO	in-situ chemical oxidation
As =	arsenic	MS/MSD	matrix spike/matrix spike duplicate
Cr =	chromium	Pb	lead
DRO =	diesel-range organics	QC	quality control
EPA =	U.S. Environmental Protection Agency	RRO	residual-range organics
GRO =	gasoline range organics	SIM	selective ion monitoring

Table 7 - Sample Collection, Preservatives, and Holding Times for ISCO Soil Samples

	Parameter	Preparation/ Analytical Method	Container Description (Minimum) ¹	Preservation/Holding Time
Soil	GRO/Benzene	AK 101/ EPA 5035A/8260B	4-oz wide-mouth, amber glass jar with Teflon [®] -lined silicon rubber septum seal	Methanol preservative, Cool 4° ± 2°C / 14 days to analysis
Soil	DRO/RRO and Napthalene	AK 102/103 and EPA 3550B/8270C SIM	8-oz wide-mouth, clear glass jar, TLC	Unpreserved, Cool 4° ± 2°C / 7 days to extraction/ 40 days to analysis
Soil	тос	EPA 9060	4-oz wide-mouth, clear glass jar, TLC	Unpreserved, Cool 4° ± 2°C / 28 days to analysis

Notes:

¹Clear glass may be substituted for amber if samples are protected from exposure to light; this exception does not apply to metals.

 $\pm =$ plus or minus

°C = degrees Celsius

AK = Alaska Method

DRO = diesel-range organics

EPA = U.S. Environmental Protection Agency

GRO = gasoline-range organics

ISCO = in-situ chemical oxidation oz = ounce RRO = residual-range organics SIM = selective ion monitoring TLC = Teflon-lined screw cap TOC = total organic carbon

	Parameter	Preparation/ Analytical Method	Container Description (Minimum) ¹	Preservation/Holding Time
Groundwater	GRO/Benzene	AK 101/ EPA 5030B/8260B	6, 40-ml VOA vials	HCl, Cool 4° \pm 2°C / 14 days to analysis
Groundwater	DRO/RRO	AK 102/103	1-Liter amber glass	HCl, Cool $4^{\circ} \pm 2^{\circ}$ C / 14 days/ 14 days to extraction/ 40 days to analysis
Groundwater	Napthalene	EPA 3510C/8270C SIM	1-Liter amber glass	Unpreserved, Cool $4^{\circ} \pm 2^{\circ}C / 7$ days to extraction/ 40 days to analysis
Groundwater	Sulfate	EPA 300	Plastic, 250 ml	Unpreserved, Cool $4^{\circ} \pm 2^{\circ}$ C / 28 days to analysis
Groundwater	Metals (As, Pb, Cr)	EPA 3005A/6020	Plastic, 250 ml	Nitric Acid, Cool $4^{\circ} \pm 2^{\circ}C$ / 6 months to extraction and analysis

Table 8 - Sample Collection, Preservatives, and Holding Times for ISCO Groundwater Samples

Notes:

¹Clear glass may be substituted for amber if samples are protected from exposure to light; this exception does not apply to metals.

 $\pm = plus or minus$

°C = degrees Celsius

AK = Alaska Method

As = arsenic

Cr = chromium

DRO = diesel-range organics

EPA = U.S. Environmental Protection Agency

GRO = gasoline-range organics

HCI = hydrochloric acid ISCO = in-situ chemical oxidation ml = milliliter oz = ounce Pb = lead RRO = residual-range organics SIM = selective ion monitoring VOA = volatile organic analysis

Well ID	Date	Top of Casing NAD83	Depth to	Groundwater
		NADXX	Groundwater	Elevation*
		ISCO AOI	Oroundwater	Licvation
ICOiW01	23-Jul-09	69.54	NG	
	05-Aug-09	09.04	5.02	64.52
	05-Aug-09 06-Aug-09		5.06	64.48
	8-Aug-09, 09:00 hrs		NG	
	8-Aug-09, 18:25 hrs		7.40	62.14
	9-Aug-09, 07:05 hrs		8.11	61.43
	9-Aug-09, 12:05 hrs		NG	
	10-Aug-09		NG	
	11-Aug-09		NG	
	12-Aug-09		3.64	65.90
	13-Aug-09		NG	
	15-Aug-09		4.27	65.27
	16-Aug-09		4.82	64.72
	-			
ICOMW01	23-Jul-09	70.66	9.35	61.31
	05-Aug-09		NG	
	06-Aug-09		NG	
	8-Aug-09, 09:00 hrs		9.48	61.18
	8-Aug-09, 18:25 hrs		9.46	61.20
	9-Aug-09, 07:05 hrs		9.48	61.18
	9-Aug-09, 12:05 hrs		9.46	61.20
	9-Aug-09, 13:13 hrs		9.48	61.18
	10-Aug-09, 10:00 hrs		9.45	61.21
	11-Aug-09		9.52	61.14
	12-Aug-09		9.52	61.14
	13-Aug-09		9.46 9.35	61.20
	15-Aug-09		9.35 4.67	61.31 65.99
	16-Aug-09		4.07	05.99
ICOMW02	23-Jul-09	67.27	5.38	61.89
	05-Aug-09		4.53	62.74
	06-Aug-09		4.59	62.68
	8-Aug-09, 09:00 hrs		4.70	62.57
	8-Aug-09, 18:25 hrs		4.70	62.57
	9-Aug-09, 07:05 hrs		4.70	62.57
	9-Aug-09, 12:00 hrs		4.66	62.61
	9-Aug-09, 13:13 hrs		4.75	62.52
	9-Aug-09, 16:00 hrs		4.71	62.56
	9-Aug-09, 18:35 hrs		4.72	62.55
	10-Aug-09, 10:00 hrs		4.63	62.64
	10-Aug-09, 13:49 hrs		4.61	62.66
	10-Aug-09, 16:32 hrs		4.64	62.63
	11-Aug-09, 13:00 hrs		4.69	62.58
	11-Aug-09, 15:58 hrs		4.71	62.56 62.58
	12-Aug-09, 08:30 hrs 12-Aug-09, 11:35 hrs		4.69 3.95	63.32
	12-Aug-09, 11:35 hrs 12-Aug-09, 15:30 hrs		3.95 4.48	62.79
	12-Aug-09, 15:30 hrs 13-Aug-09		4.48 4.70	62.79 62.57
	15-Aug-09		4.70	62.50
	19-Aug-09		4.88	62.39
	25-Aug-09		5.61	61.66
	11-Sep-09		7.49	59.78

Table 9 - Summary of Groundwater Elevations

Well ID	Date	Top of Casing	Depth to	Groundwater
		NAD83	Groundwater	Elevation*
ICOMW03	04-Aug-09	69.31	3.08	66.23
	05-Aug-09		3.07	66.24
	06-Aug-09		3.15	66.16
	8-Aug-09, 09:00 hrs		3.34	65.97
	8-Aug-09, 18:25 hrs		3.24	66.07
	9-Aug-09, 07:05 hrs		3.35	65.96
	9-Aug-09, 12:00 hrs		3.17	66.14
	9-Aug-09, 12:33 hrs		3.34	65.97
	9-Aug-09, 17:19 hrs		3.22	66.09
	10-Aug-09, 10:00 hrs		3.48	65.83
	10-Aug-09, 13:12 hrs		3.15	66.16
	10-Aug-09, 16:00 hrs		3.25	66.06
	11-Aug-09, 13:00 hrs		3.58	65.73
	12-Aug-09, 08:30 hrs		3.11	66.20
	12-Aug-09, 11:40 hrs		2.74	66.57
	12-Aug-09, 15:25 hrs		2.80	66.51
	13-Aug-09		2.85	66.46
	15-Aug-09		3.48	65.83
	19-Aug-09		4.81	64.50
	25-Aug-09		4.58	64.73
	11-Sep-09		4.38	64.93
ICOMW04	23-Jul-09	69.31	NG	
	05-Aug-09		7.33	61.98
	06-Aug-09		7.52	61.79
	8-Aug-09, 09:00 hrs		7.55	61.76
	8-Aug-09, 18:25 hrs		6.05	63.26
	9-Aug-09, 07:05 hrs		6.58	62.73
	9-Aug-09, 12:00 hrs		6.46	62.85
	9-Aug-09, 12:19 hrs		6.51	62.80
	9-Aug-09, 15:28 hrs		6.40	62.91
	9-Aug-09, 18:00 hrs		6.42	62.89
	10-Aug-09, 10:00 hrs		6.47	62.84
	10-Aug-09, 13:18 hrs		6.50	62.81
	11-Aug-09, 13:00 hrs		6.49	62.82
	11-Aug-09, 16:11 hrs		6.49	62.82
	11-Aug-09, 16:17 hrs		6.35	62.96
	12-Aug-09, 08:30 hrs		6.27	63.04
	12-Aug-09, 09:32 hrs		6.27	63.04
	12-Aug-09, 11:47 hrs		6.15	63.16
	12-Aug-09, 15:20 hrs		6.53	62.78
	13-Aug-09		7.30	62.01
	15-Aug-09		6.98	62.33
	18-Aug-09		btp	
	25-Aug-09		8.11	61.20
	11-Sep-09		7.67	61.64

Well ID	Date	Top of Casing	Depth to	Groundwater
		NAD83	Groundwater	Elevation*
ICOMW05	04-Aug-09	69.35	3.08	66.27
	05-Aug-09		2.95	66.40
	06-Aug-09		3.10	66.25
	8-Aug-09, 09:00 hrs		3.48	65.87
	8-Aug-09, 18:25 hrs		3.47	65.88
	9-Aug-09, 07:05 hrs		4.39	64.96
	9-Aug-09, 12:00 hrs		4.16	65.19
	9-Aug-09, 12:41 hrs		3.48	65.87
	9-Aug-09, 15:16 hrs		4.16	65.19
	10-Aug-09, 10:00 hrs		4.05	65.30
	11-Aug-09, 13:00 hrs		3.91	65.44
	11-Aug-09, 16:30 hrs		3.44	65.91
	12-Aug-09, 08:30 hrs		3.65	65.70
	12-Aug-09, 09:39 hrs		3.70	65.65
	12-Aug-09, 11:53 hrs		2.95	66.40
	12-Aug-09, 14:40 hrs		2.70	66.65
	13-Aug-09		3.65	65.70
	15-Aug-09		3.84	65.51
	19-Aug-09		5.68	63.67
	25-Aug-09		btp	
	11-Sep-09		5.40	63.95
	11-Sep-09		5.40	03.95
ICOMW06	05-Aug-09	68.49	4.03	64.46
	06-Aug-09		3.92	64.57
	8-Aug-09, 09:00 hrs		3.80	64.69
	8-Aug-09, 18:25 hrs		3.71	64.78
	9-Aug-09, 07:05 hrs		3.84	64.65
	9-Aug-09, 12:00 hrs		3.82	64.67
	9-Aug-09, 13:06 hrs		3.84	64.65
	9-Aug-09, 15:50 hrs		3.85	64.64
	9-Aug-09, 18:09 hrs		3.72	64.77
	10-Aug-09, 10:00 hrs		3.62	64.87
	10-Aug-09, 13:30 hrs		3.68	64.81
	11-Aug-09, 13:00 hrs		3.93	64.56
	11-Aug-09, 15:50 hrs		4.10	64.39
	12-Aug-09, 08:30 hrs		3.97	64.52
	12-Aug-09, 11:25 hrs		3.95	64.54
	12-Aug-09, 14:45 hrs		3.70	64.79
	13-Aug-09		4.11	64.38
	15-Aug-09		4.29	64.20
	19-Aug-09		btp	
	25-Aug-09		5.59	62.90
	11-Sep-09		5.30	63.19
	11-0ep-08		0.00	05.19

Table 9 - Summary of Groundwater Elevations

Well ID	Date	Top of Casing	Depth to	Groundwater
		NAD83	Groundwater	Elevation*
ICOMW07	05-Aug-09	68.03	5.68	62.35
	06-Aug-09		5.72	62.31
	8-Aug-09, 09:00 hrs		5.74	62.29
	8-Aug-09, 18:25 hrs		5.68	62.35
	9-Aug-09, 07:05 hrs		5.70	62.33
	9-Aug-09, 12:00 hrs		5.67	62.36
	9-Aug-09, 12:58 hrs		5.70	62.33
	9-Aug-09, 16:09 hrs		5.72	62.31
	9-Aug-09, 18:25 hrs		5.68	62.35
	10-Aug-09, 10:00 hrs		5.66	62.37
	10-Aug-09, 13:37 hrs		5.69	62.34
	10-Aug-09, 16:32 hrs		5.65	62.38
	11-Aug-09, 13:00 hrs		5.72	62.31
	11-Aug-09, 17:00 hrs		5.69	62.34
	12-Aug-09, 08:30 hrs		5.71	62.32
	12-Aug-09, 10:20 hrs		5.65	62.38
	12-Aug-09, 12:13 hrs		5.36	62.67
	12-Aug-09, 14:50 hrs		5.50	62.53
	13-Aug-09		5.69	62.34
	19-Aug-09		5.77	62.26
	25-Aug-09		5.66	62.37
	11-Sep-09		5.51	62.52
ICOMW08	05-Aug-09	69.41	8.16	61.25
	06-Aug-09		7.52	61.89
	8-Aug-09, 09:00 hrs		7.55	61.86
	8-Aug-09, 18:25 hrs		7.34	62.07
	9-Aug-09, 07:05 hrs		7.19	62.22
	9-Aug-09, 12:00 hrs		7.13	62.28
	9-Aug-09, 13:54 hrs		7.19	62.22
	9-Aug-09, 16:25 hrs		7.22	62.19
	9-Aug-09, 18:45 hrs		7.16	62.25
	10-Aug-09, 10:00 hrs		6.89	62.52
	10-Aug-09, 13:26 hrs		7.05	62.36
	11-Aug-09, 13:00 hrs		6.84	62.57
	11-Aug-09, 17:35 hrs		6.92	62.49
	11-Aug-09, 20:15 hrs		6.89	62.52
	12-Aug-09, 08:30 hrs		7.43	61.98
	12-Aug-09, 10:10 hrs		btp	
	12-Aug-09, 12:02 hrs		8.25	61.16
	12-Aug-09, 15:05 hrs		7.81	61.60
	13-Aug-09		6.96	62.45
	15-Aug-09		6.65	62.76
	19-Aug-09		btp	
	25-Aug-09		btp	
	11-Sep-09		btp	

Table 9 - Summary of Groundwater Elevations

Well ID	Date	Top of Casing	Depth to	Groundwater
		NAD83	Groundwater	Elevation*
ICOMW09	05-Aug-09	69.87	7.86	62.01
	06-Aug-09		7.58	62.29
	8-Aug-09, 09:00 hrs		7.36	62.51
	8-Aug-09, 18:25 hrs		7.40	62.47
	9-Aug-09. 07:05 hrs		7.68	62.19
	9-Aug-09. 12:00 hrs		7.70	62.17
	9-Aug-09. 13:30 hrs		7.68	62.19
	10-Aug-09, 10:00 hrs		6.89	62.98
	11-Aug-09, 13:00 hrs		7.28	62.59
	12-Aug-09, 08:30 hrs		8.18	61.69
	15-Aug-09		7.97	61.90
	44 4 4 6 6	MOC AREA WELLS		
MW88-1	11-Jul-09	84.49	14.45	70.04
	23-Jul-09		14.63	69.86
	01-Aug-09		15.26	69.23
MW88-3	11-Jul-09	79.99	10.12	69.87
	23-Jul-09		10.24	69.75
	01-Aug-09		10.74	69.25
MW88-4	11-Jul-09	70.64	7.38	63.26
	23-Jul-09		9.02	61.62
	01-Aug-09		9.69	60.95
MW88-5	11-Jul-09	70.35	8.91	61.44
	23-Jul-09		9.11	61.24
	01-Aug-09		NG	
	08-Aug-09 09:00 hrs		9.22	61.13
	08-Aug-09 18:25 hrs		9.21	61.14
	9-Aug-09, 07:05 hrs		9.24	61.11
	10-Aug-09, 10:00 hrs		9.22	61.13
	11-Aug-09, 13:00 hrs		9.27	61.08
	12-Aug-09, 08:30 hrs		9.27	61.08
	13-Aug-09		9.21	61.14
	15-Aug-09		9.09	61.26

Table 9 - Summary of Groundwater Elevations

Well ID	Date	Top of Casing	Depth to	Groundwater
		NAD83	Groundwater	Elevation*
MW88-10	11-Jul-09	89.03	18.32	70.71
	23-Jul-09		18.57	70.46
	01-Aug-09		19.02	70.01
17MW1	11-Jul-09	74.11	9.81	64.30
	23-Jul-09		10.43	63.68
	01-Aug-09		10.85	63.26
18MW1		85.78		85.78
20MW1	11-Jul-09	91.71	19.93	71.78
	23-Jul-09		20.26	71.45
	01-Aug-09		21.06	70.65
22MW2	11-Jul-09	96.38	24.33	72.05
	23-Jul-09		25.43	70.95
	01-Aug-09		26.46	69.92
22MW3	11-Jul-09	101.97		101.97
	23-Jul-09			101.97
	01-Aug-09			101.97
26MW1	11-Jul-09		32.21	
	23-Jul-09		32.35	
	01-Aug-09		33.50	

Notes:

The specific gravity (SP) used for the free product is 0.81 (Diesel). The SP for Diesel is used in elevation correction calculations when free product is present in the monitoring well. (TOC - [FP Thickness * 0.81) + DTW]) All elevation and measurements are in feet.

Elevations are in U.S. Feet, based on the NAD 1983.

--- = no data AOI = area of interest btp = ISCO = in-situ chemical oxidation MOC = Main Operations Complex NAD = Normal American Datum NG = not gauged

Well	Test #	K (ft/day)
20MW1	1	8.96
	2	8.96
	3	7.24
	Average	8.39
MW 88-5	1	0.556
	2	0.611
	3	0.561
	4	0.51
	5	0.51
	6	0.533
	Average	0.547
MW 88-3	Unable to create e	nough drawdown for test
MW 88-10	Unable to create e	nough drawdown for test
ICOMW01	1	1.368
	2	1.625
	3	1.872
	Average	1.62
ICOMW02	1	1.45
	2	1.76
	3	1.77
	4	3.64
	5	1.66
	6	1.87
	Average	2.03

Table 10 - MOC Area Slug Testing Results

Notes:

ft/day = feet per day

MOC = Main Operations Complex

Teet Dit	Danth	FID	
Test Pit	Depth	Reading	PID Reading
Location	(ft bgs)	(ppm)	(ppm)
TP1	3.0-4.0	52.1	18.5
	4.0-5.0	556	144
	5.0-6.0	902	200
TP2	3.5-4.0	740	160
	6.0-6.5	1,040	420
	7.0-7.5	720	140
	9.5-10.0	580	204
TP3	2.0-2.5	bkg	bkg
	4.0-4.5	42	48
	6.0-6.5	3.2	4
	7.5-8.0	41.5	16.8
	8.5-9.0	51	4.8
	10.5-11.0	37.5	2.9
TP4	2.0-2.5	1.2	2.3
	5.0-5.5	138	17
	7.0-7.5	1,280	205
TP5	2.0-2.5	40	bkg
	3.5-4.0	30	bkg
	6.5-7.0	60	3.2
	9.0-9.5	30	bkg
TP6	3.5-4.0	10	3
	6.5-7.0	30	15
TP7	3.5-4.0	11	1.4
	7.5-8.0	327	70
TP8	3.5-4.0	1,925	380
	7.5-8.0	1,750	350
	9.5-10	40	4
TP9	5.5-6.0	3.2	2.1
	8.0-8.5	17.6	69
	9.5-10	305	94
TP10	4.0-4.5	19	34
	6.5-7.0	742	151
	9.5-10	305	192
TP11	3.5-4.0	78	3.2
	7.0-7.5	720	3.5
	9.5-10	1,300	2.5
TP12/13	2.0-2.5	bkg	bkg
	3.5-4.0	1058	201
	4.5-5.0	555	125
	6.5-7.0	1,635	238

Table 11 - Test Pit Soil Headspace Screening Readings

Notes:

bkg = reading was less than or equal to background

FID = flame-ionization detector

ft bgs = feet below ground surface

PID = photoionization detector

ppm = parts per million

Test Pits		Soil Borings		
Sample Location (depth)	Reading (ppm)	Sample Location (depth)	Reading (ppm)	
TP-1 (3-4)	1736.5	TP-12 (2-2.5)	108.3	
TP-1 (4.5-5)	2074.5	TP-12 (3.5-4)	605	
TP-1 (5-6)	1695	TP-13 (4.5-5)	3604	
TP-2 (3.5-4)	3509	TP-13 (6.5-7) (dup)	5142 (5186)	
TP-2 (6-6.5)	2801	SB01 (5-6)	8722	
TP-2 (7-7.5)	2021	SB01 (6-7)	3490	
TP-2 (9.5-10)	367.8	SB01 (7-8)	4032	
TP-3 (2-2.5)	110.3	SB01 (9-10)	8.536	
TP-3 (4-4.5)	20.7	SB01 (10-11)	96.3	
TP-3 (7.5-8)	12.7	SB01 (11-12)	25.7	
TP-3 (10.5-11)	108	SB01 (12-13)	28	
TP-4 (2-2.5) (dup)	4.4 (7.628)	SB01 (13-14)	14.8	
TP-4 (2-2.5)	7.628	SB02 (4-5)	2578	
TP-4 (5-5.5)	29.2	SB02 (5-6)	4065	
TP-4 (7-7.5)	1276	SB02 (6-7)	856	
TP-5 (2-2.5)	4.7	SB02 (9-10)	2517	
TP-5 (3.5-4)	1.3	SB03 (5-7)	2963	
TP-5 (6.5-7)	6.1	SB03 (7-9)	326	
TP-5 (9-9.5)	0.97	SB03 (9-11)	10.934	
TP-6 (3.5-4)	168.5	SB04 (5-6)	1122	
TP-6 (6.5-7)	18.7	SB04 (6-7)	412	
TP-7 (3.5-4)	27.7	SB04 (10-12)	1125	
TP-7 (7.5-8)	2798	SB04 (12.5-14.5)	19.092	
TP-8 (3.5-4) (dup)	4267 (4382)	MW01 (4-5)	2330	
TP-8 (7.5-8)	5466	MW01 (6-7)	3772	
TP-8 (9.5-10)	85.4	MW01 (7-8)	3766	
TP-9 (6-6.5)	69	MW01 (8-9)	8638	
TP-9 (8-8.5)	50.8	MW01 (9-10)	21.8	
TP-9 (9.5-10) (dup)	347.3 (316.3)	MW01 (12-13)	375	
TP-10 (4-4.5) (dup)	3.206 (2.91)	MW01 (14-16)	42.1	
TP-10 (6.5-7) (dup)	304.9 (290.4)	MW01 (5-6)	3852	
TP-10 (9.5-10) (dup)	1377.5 (1420)			
TP-11 (3.5-4) (dup)	48.5 (44.4)			
TP-11 (7-7.5) (dup)	14.8 (14.2)			
TP-11 (9.5-10) (dup)	19.8 (22.7)			

Table 12 - siteLAB DRO Screening Results

Notes:

Sample depth interval in feet below ground surface

DRO = diesel-range organics

dup = duplicate sample

ppm = parts per million

Table 13 - Screening Sample Analytical Data

Sample Location	Depth Interval (ft bgs)	DRO (mg/kg)
ICOSB01	5-6	98 B
ICOSB02	5-6	130,000 B, X
ICOSB03	9-11	13,000 B
ICOSB04	5-6	260,000 B,X
Sample Location	Screen Interval (ft bgs)	DRO (mg/L)
•		
Location	(ft bgs)	(mg/L)

Notes:

B - Compound was found in blank and sample.

X - Surrogate not quantitated due to high dilution

DRO = diesel range organics

ft bgs = feet below ground surface

mg/kg = milligrams per kilogram

mg/L = milligrams per liter

Table 14 - Soil Boring Headspace Screening Readings

Location	Depth (ft bgs)	FID Reading (ppm)	PID Reading (ppm)
ICOSB01	4.0-5.0	6,200	58
	5.0-6.0	5,400	48
	6.0-7.0	7,500	42
	7.0-8.0	650	29
	8.0-9.0	4,230	41
	9.0-10.0	750	37
	10.0-11.0	4,260	58
	11.0-12.0	25	2.5
	12.0-13.0	3,700	24
	13.0-14.0	5,600	21
ICOSB02	4.0-5.0	2,600	22
1003002	5.0-6.0	24,000	140
	6.0-7.0	4,750	46
	9.0-10	3,800	29
ICOSB03	5.0-7.0	1,305	258
1003603	7.0-9.0	530	130
		375	150
1000004	9.0-11.0		
ICOSB04	4.0-5.0	1,050	240
	5.0-6.0	530	200
	6.0-7.0	2,150	850
	10.0-12.0	810	370
	12.5-14.5	610	150
ICOMW01	4.0-5.0	350	95
	5.0-6.0	630	150
	6.0-7.0	320	81
	7.0-8.0	620	168
	8.0-9.0	850	130
	9.0-10.0	200	37
	10.0-12.0	480	68
	12.0-13.0	200	40
	14.0-16.0	420	90
ICOMW02		See ICOSB02	
ICOMW03	4.5-5.0	490	93
	5-6.5	2,010	3.7
	6.5-7.0	309	35
	7.0-8.5	318	32
	8.5-9.5	740	100
	9.5-10	40	5
ICOMW04	6-7.5	250	1500
	7.5-9.0	950	165
	9-9.5	140	24
ICOMW05	5.0-6.0	590	240
	6.5-8.0	820	140
	8-8.5	68	10
ICOMW06	4.0-5.0	145	42
	5.0-6.0	630	124
	6.0-7.0	116	35
ICOMW07	5.5-6.5	650	50
	6.5-7.5	1,150	229
	7.5-8.5	240	114
ICOMW08	4.5-5.5	1,050	190
	5.5-6.5	89	17
	7.5-9.5	48	10
ICOMW09	5-5-6.5	1,300	180
	6.5-8.0	450	60
I	9.0-10.0	82	12

Notes:

FID = flame-ionization detector

ft bgs = feet below ground surface

PID = photoionization detector ppm = parts per million

Table 15 - Summary Comparison of Soil Sample Results

		Depth (ft)	Year	Benzene (mg/kg)	Naphthalene (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)	TOC (mg/kg)
Soil Cleanu	o Level (mg/kg)			2	120	NA	9,200	NA	NA
AECOM	ICOMW02	5 - 6					140,000		
(pre-ISCO)		6 - 7	2009	NS	NS	NS	13,000	NS	NS
		9 - 11					100		
	ICOMW03	5 - 6.5	2009	1 QL	120 QL	1000 B	170,000	7,200	213000 Q
	ICOMW04	6 - 7.5	2009	0.93 QL	81 QL	470 B, QL	17000 QH	4400 QH	185000 Q
	ICOMW05	5 - 6	2009	1 QL	93 QL	680 B	130000 X	7700 X	199000 Q
	ICOMW06	5 - 6	2009	0.58 QH	240 QH	2100 QH, B	110000 X	8400 X	215000 Q
	ICOMW07	6.5 - 7.5	2009	0.27	25	480 B	13000 QH	2800 X	190000 Q
	ICOMW08	4.5 - 5.5	2009	3.6 QH	300 QH	4400 QH	240000 X	5300 X	453000 Q
	ICOMW09	5.5 - 6.5	2009	4.3 QH, M	270 QH	1600 QH, B	6,500	5300 X	261000 Q
S&W	19B1	5	2004	NS	NS	1	4.68	23.8	NS
		12	2004	NS	NS	91.6	3,590	489	NS
		18	2004	NS	NS	4.9	3,080	109	2,490
MWH	SB 88-11	4	2002	0.12	12	70	13,000	5,100	NS
		8	2002	0.19	81	99	51,000	6,000	NS
	SB 88-14	3	2002	0.019	79	220	47,000	3,000	NS
		13	2002	0.024	0.041	62	210	900	NS
	MW 88-5	2	2002	<0.012	0.0041	<2.8	380	3,400	NS

Notes:

Bold results exceed soil cleanup target levels

DRO = diesel range organics

ft = feet

GRO = gasoline range organics

mg/kg = milligrams per kilogram

MWH = Montgomery Watson Harza (Phase III RI, MWH, 2003, Figure 2-6 [Note: Samples collected in 2002]

NS = not sampled

RRO = residual range organics

S&W = Shannon & Wilson (Phase IV RI, S&W, 2005, Table 5-9b [Note: Samples collected in 2004]

TOC = total organic carbon

X-Surrogate not reported due to sample dilution in the presence of high target analytes

B-Contamination was reported in the method blank below the reporting limit

QH-Sample result may be biased high based on high surrogate recoveries

QL-Sample result may be biased low due to low surrogate recoveries.

M-A matrix effect was present

Q -Quality control failure

Table 16 - Phase I ISCO Study Groundwater Results

Well ID	Sampling Event	Benzene (µg/L)	Naphthalene (µg/L)	GRO (mg/L)	DRO (mg/L)	RRO (mg/L)	As (mg/L)	Cr (mg/L)	Pb (mg/L)	SO₄ (mg/L)
Groundwater cl	leanup levels	5	NA	1.3	1.5	1.1	NA	NA	NA	NA
ICOMW03	Baseline	0.74 J	29	0.37	21	1.7	0.0016 J	0.0056 B	0.0020 J	34 H,I
	Day 3	1.3	49	14	2.7 L	1.6 L	NA	NA	NA	NA
	Day 7	3 J,X	50 X	0.70	24 D	2.7 D	NA	NA	NA	NA
	Day 14	2.4	87	0.81	18 X	1.5 X	NA	NA	NA	NA
	Day 28	2.5	110	0.8	14	1.2	0.0046 B	0.023	0.042	1000 J
ICOMW04	Baseline	63	74	0.92	11	2	0.0041	0.0045 B	0.001 J	16
	Day 3	86	34	21	20 L	0.76 L	NA	NA	NA	NA
	Day 7	56 X	7.4 X	0.54	7.9 D	1.2 D	NA	NA	NA	NA
	Day 14	53	4.6	0.54	5.7 X	1.7 X	NA	NA	NA	NA
	Day 28	70	7	0.66	9.5	1.7	0.007 B	0.008	0.0058	130
ICOMW05	Baseline	1.1	31	0.29	13	1.9	0.0012 J	0.0091 B	0.0024	40 H
	Day 3	4.6	81	23	22 L	1.8 L	NA	NA	NA	NA
	Day 7	6.1 J	83 H	0.93	18 D	2.4 D	NA	NA	NA	NA
	Day 14	11	100	0.85	9.9 X	1.5 X	NA	NA	NA	NA
	Day 28	34	68	1.1	14	2.1	0.023 B	0.092	0.094	1900
ICOMW06	Baseline	4.9	100	0.97	19	2.3	0.0034	0.0039 B	0.0013 J	29
	Day 3	1.7	57	11	18 L,X,D	2.4 L,X,D	NA	NA	NA	NA
	Day 7	1.7 J	58 H,X	0.62	19 D	2.8 D	NA	NA	NA	NA
	Day 14	1.7	56	0.56	17 X	2.3 X	NA	NA	NA	NA
	Day 28	2.1	51	0.37	18	2.2	0.066 B	0.041	0.044	2300
ICOMW07	Baseline	45	4	1.4	8.5	1.2	0.0038	0.0093 B	0.0006 J	13
	Day 3	34	4.6	32	12 L,X,D	2.0 L,X,D	NA	NA	NA	NA
	Day 7	36	6.7 J,H	1.8	10 D	1.4 D	NA	NA	NA	NA
	Day 14	40	4.9	1.4	9.1 X	1.4 X	NA	NA	NA	NA
	Day 28	32	3.7	1.5	11	1.2	0.0036 B	0.0057	0.00028 J	4800
ICOMW08	Baseline	69	120	39	11 L	1.3 L,I,X	NA	NA	NA	NA
	Day 3	70	88	29	13 L	1.0 L	NA	NA	NA	NA
	Day 7	76	90	1.5	10 D	2.0 D	NA	NA	NA	NA
	Day 14	43	ND (1.0)	0.63	8.6 X	1.6 X	NA	NA	NA	NA
	Day 28	32	16	0.91	9.5	1.4	0.0048 B	0.0061	0.0043	24
ICOMW02	Baseline	72	380	2.6	24 X	2.3 L,X	0.0052	0.016 B	0.013	25
	Day 3	86	300	54	21 L	1.3 L	NA	NA	NA	NA
	Day 7	46 X	340 H,X	2.8 X	18 D,X	1.6 D,X	NA	NA	NA	NA
	Day 14	71	290 H	2.8	28 X	1.8 X	NA	NA	NA	NA
	Day 28	97	260	3.1	110	4.5	0.0038 B	0.011	0.0025	3700
ICOMW09	Baseline	57	33	0.88	5.7 X	0.78 L,X	0.0030	0.0064 B	0.0027	10

Notes:

B-Compound was found in the blank and sample.

D-Samples were diluted due to presence of target analytes. The dilution made quantitition of surrogate recoveries impractical.

H-Sample analyzed past recommended 14 day holding time.

I-Indicates the presence of an interference; recovery is not calculated.

J-Result is an estimate. The reported concentration is between the method MDL and PQL.

L-Result is an estimate due to the LCS/LCSD exceeding the method RPD limit.

X-Surrogate recovery outside of acceptance limits due to target analyte interference.

As = arsenic

NA = not analyzed ND (value) = Analyte not detected above (reporting limit)

Well ID	Sampling Event	Benzene (µg/kg)	Naphthalene (mg/kg)	DRO (mg/kg)	RRO (mg/kg)	GRO (mg/kg)	TOC (mg/kg)
Soil Clea	nup Criteria	2,000	NA	9,200	NA	NA	NA
ICOMW03	Baseline	1,000	120	170,000	7,200	1000 B,X	213,000 Q
	Day 7	520 H	610 H,X	330,000 D	13,000 D	9000 X	400,000 H
	Day 28	230	310	360,000 X	16,000 X	3100 X	410,000
ICOMW04	Baseline	930	81	17,000	4,400	470 B	185,000 Q
	Day 7	95 H	15 H	4,600	5,400	170	200,000 H
	Day 28	240	9	6,400	2,500	98 X	180,000
ICOMW05	Baseline	1,000	93	130,000	7,700	680 B	199,000 Q
	Day 7	240 H	600 H,X	250,000 D	17,000 D	7,500 X	290,000 H
	Day 28	260	440	390,000 X	24,000 X	3,800 X	260,000
ICOMW06	Baseline	580	240	110,000	8,400	2,100 B	215,000 Q
	Day 7	1,000 H	64	77,000	6,800	490 X	150,000 H
	Day 28	1,400	270	170,000 X	7,600	1900 X	200,000
ICOMW07	Baseline	270	25	13,000	2,800	480 B	190,000 Q
	Day 7	ND (69) H	ND (0.17) H	540	6,300	6.7 J	240,000 H
	Day 28	ND (110)	ND (0.26)	370	3,000	12 J	150,000
ICOMW08	Baseline	3,600	300	240,000	5,300	4,400 B	453,000 Q
	Day 7	490 H	190 H,X	77,000 D	7,600 D	1,000 X	150,000 H
	Day 28	3,700	460	360,000 X	20,000 X	3,200 X	250,000
ICOMW09	Baseline	4,300	270	6,500	5,300	1,900 B	261,000 Q
	Day 7	220 H	65 H,X	44,000 D	11,000 D	270 X	260,000 H
	Day 28	2,000	280	150,000 X	8,100 J,X,Q	2,000 X	200,000
ICOMW02	Baseline	NA	NA	13,000	NA	NA	NA
	Day 7	280 H,X	3,100 H,X	2,700	11,000	73	300,000 H
	Day 28	750	760	17,000	3,000	26 X	320,000

Table 17 - Phase I ISCO Study Soil Results

Notes:

B-Compound was found in blank and sample.

D-Samples were diluted due to presence of target analytes. The dilution made quantitition of surrogate recoveries impractical

H-Sample analyzed past recommended 14-day holding time.

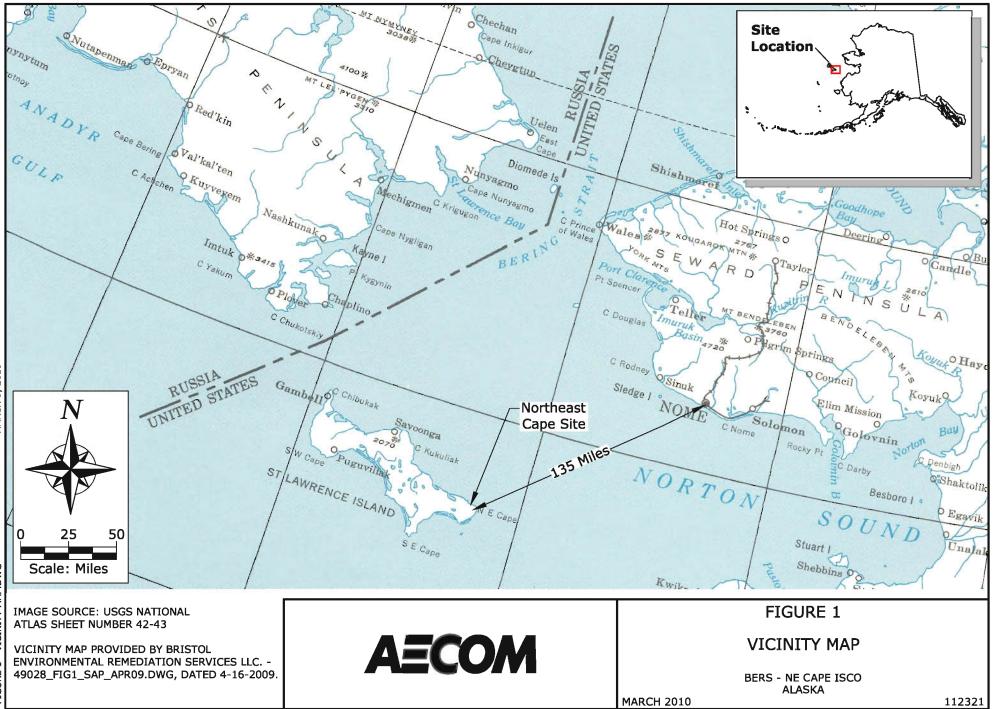
J-Result is an estimate. The reported concentration is between the method MDL and PQL.

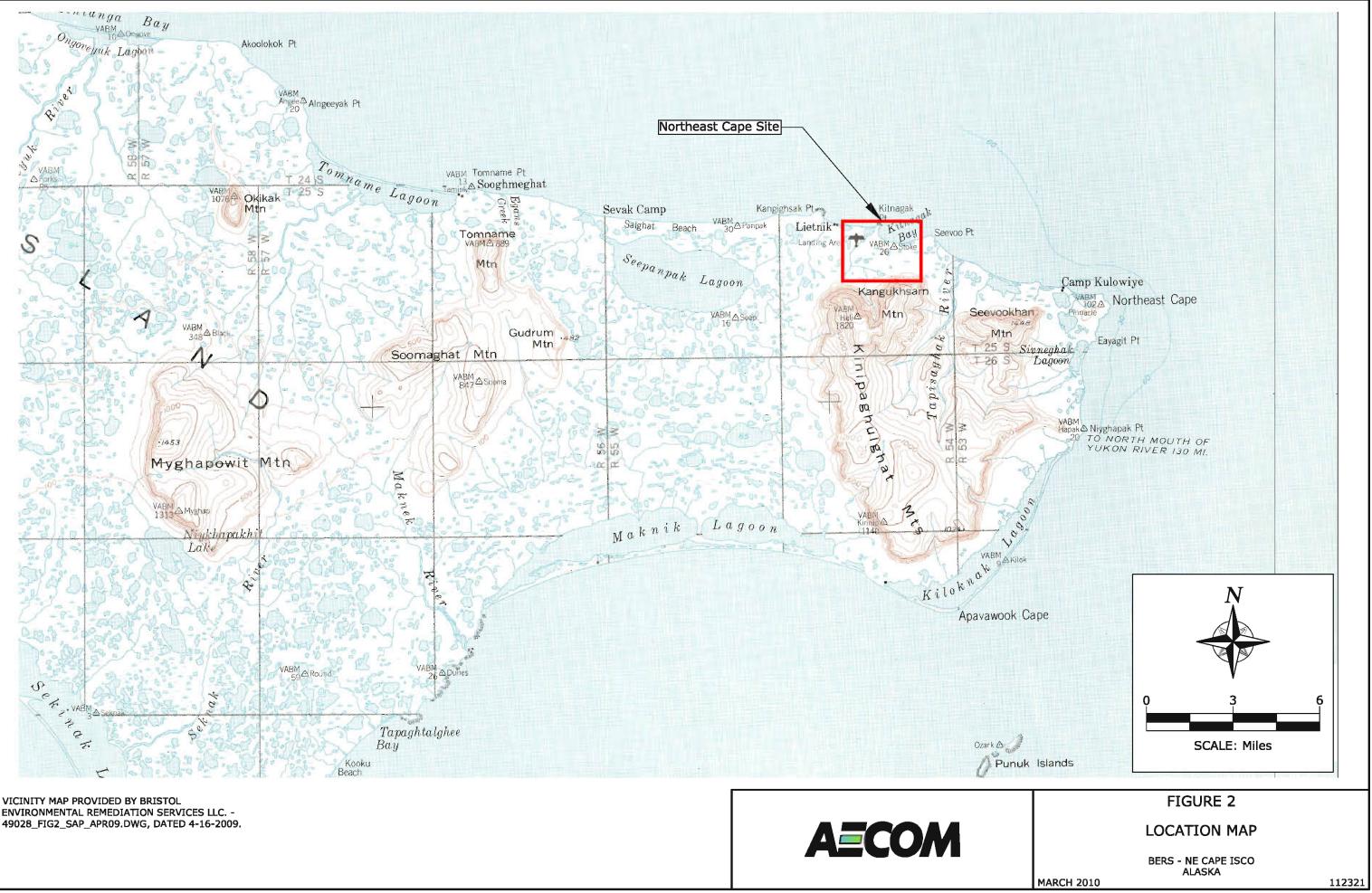
Q-Reporting limit elevated due to sample dilution.

X-Surrogate recovery outside of acceptance limits due to target analyte interference.

µg/kg = micrograms per kilogram	NA = not analyzed
DRO = diesel range organics	ND (value) = Analyte not detected above (reporting limit)
GRO = gasoline range organics	RRO = residual range organics
mg/kg = milligrams per kilogram	TOC = total organic carbon

FIGURES

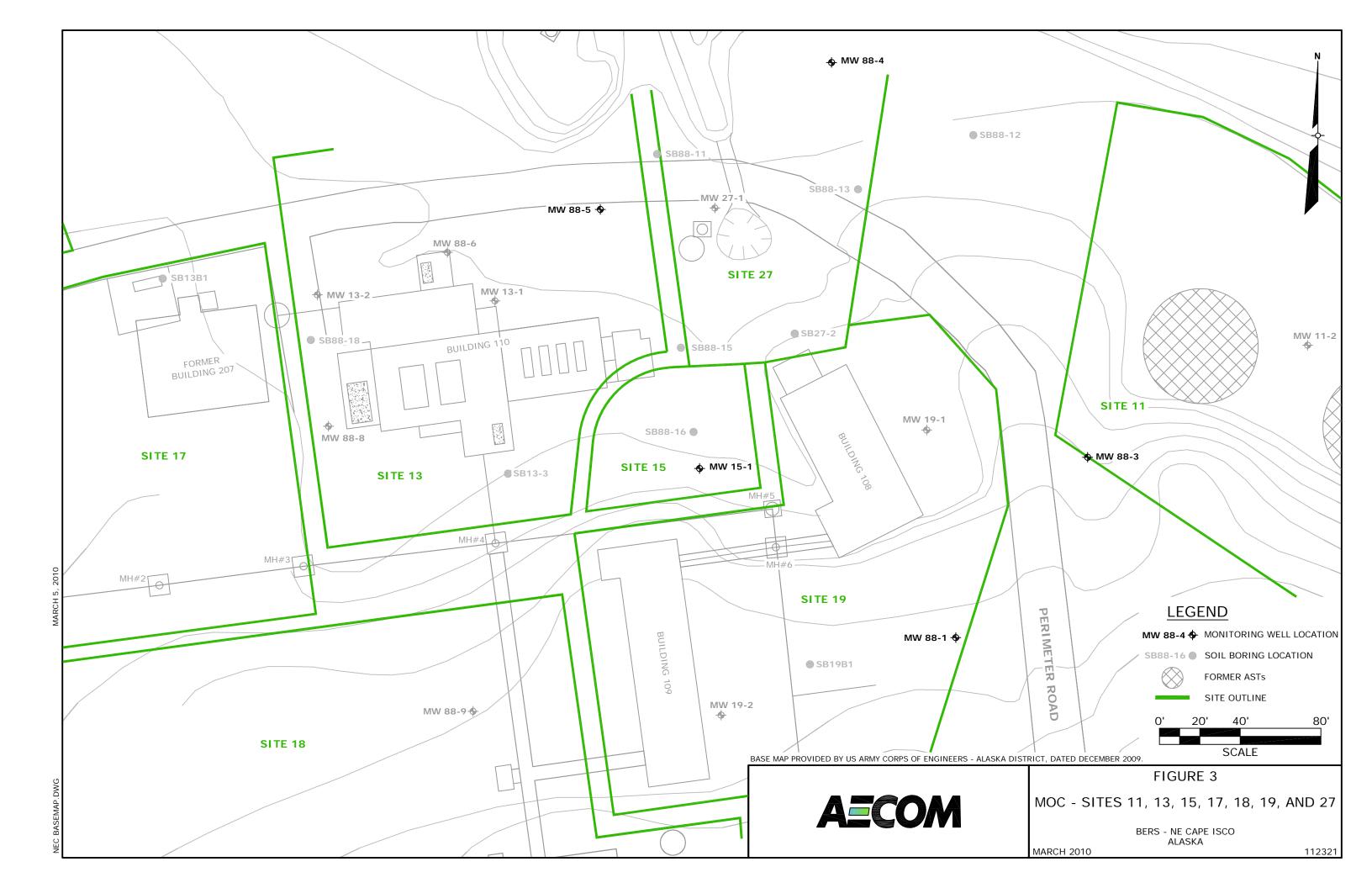


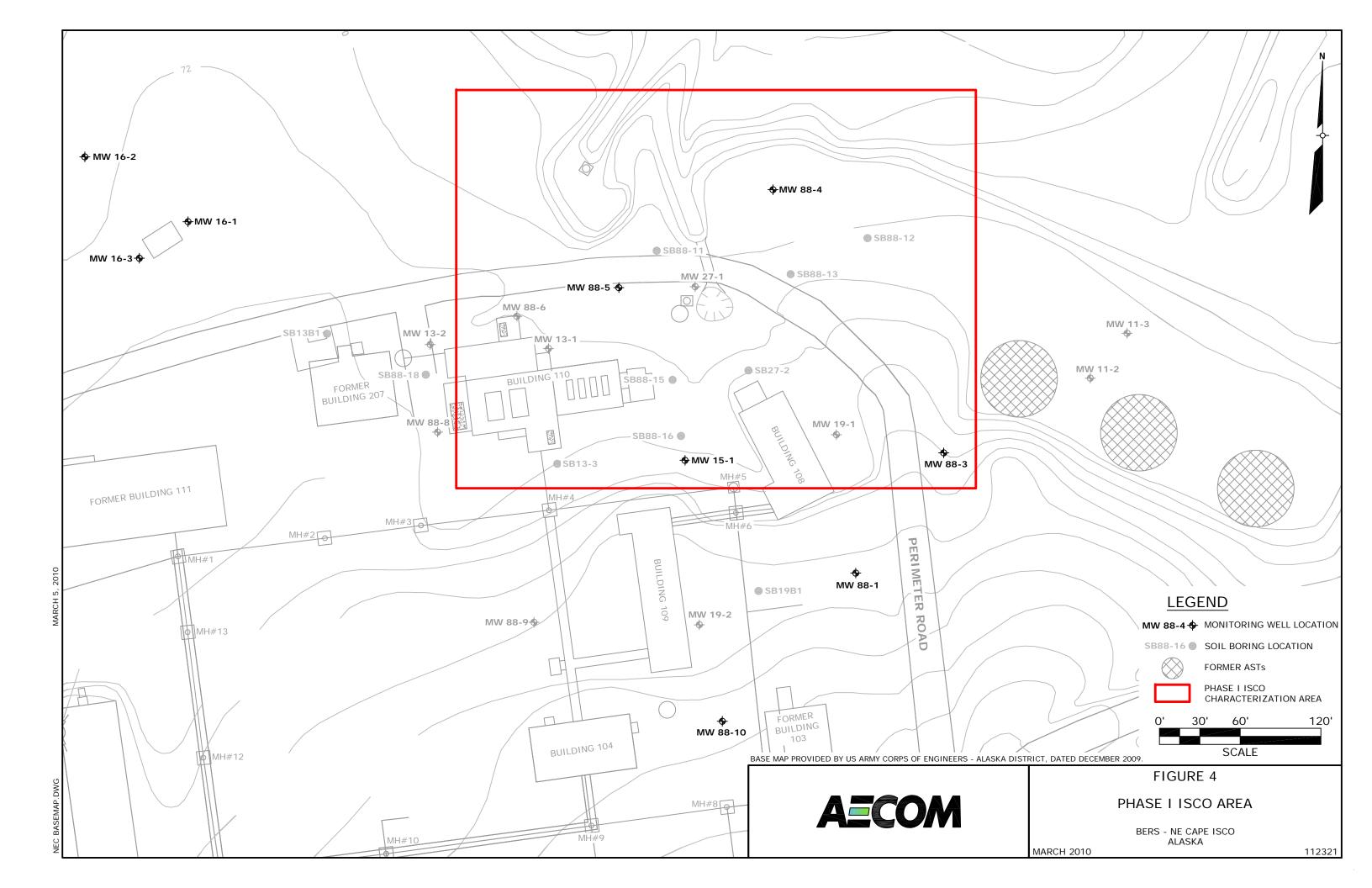


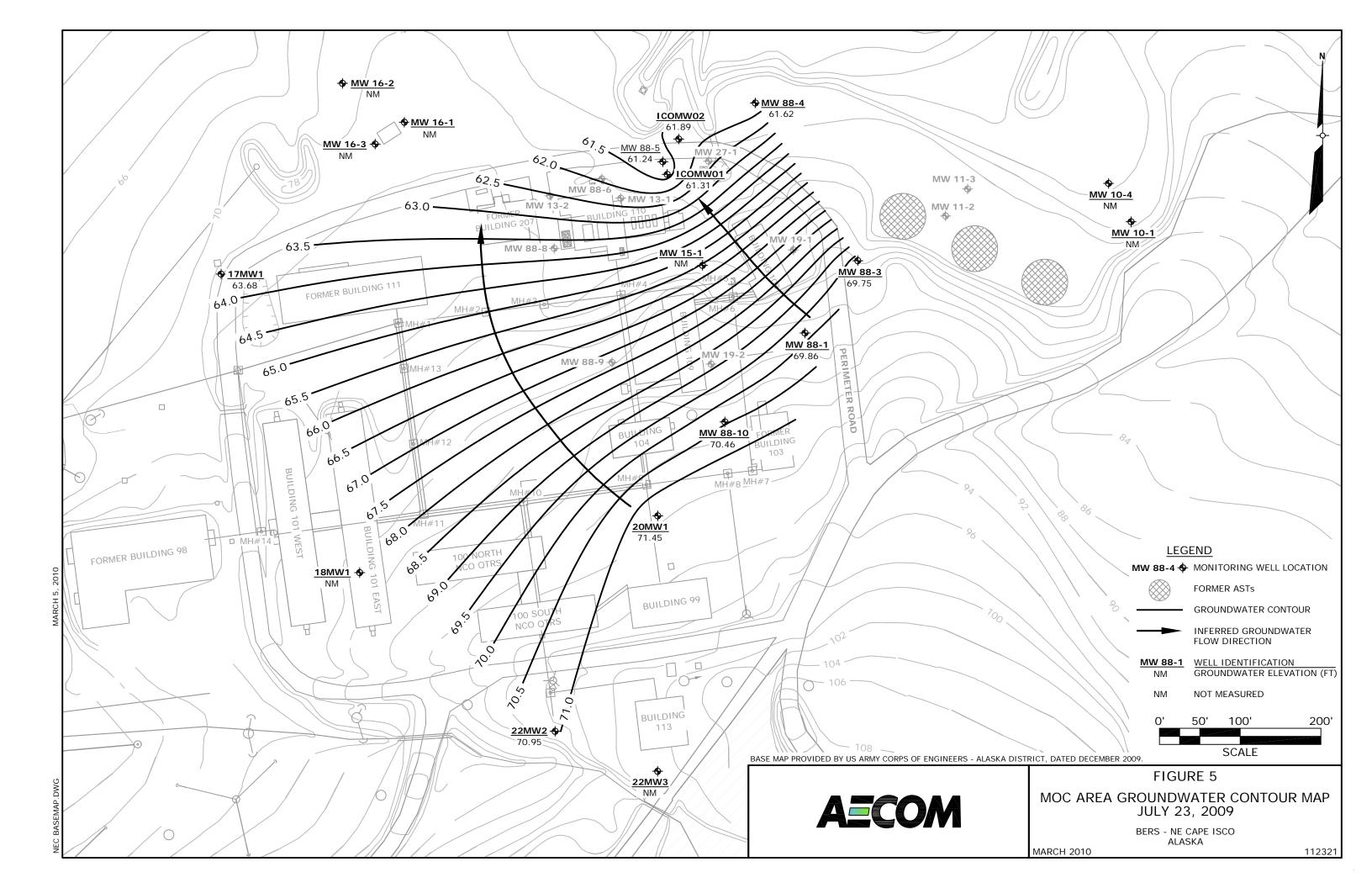
ENVIRONMENTAL REMEDIATION SERVICES LLC. -

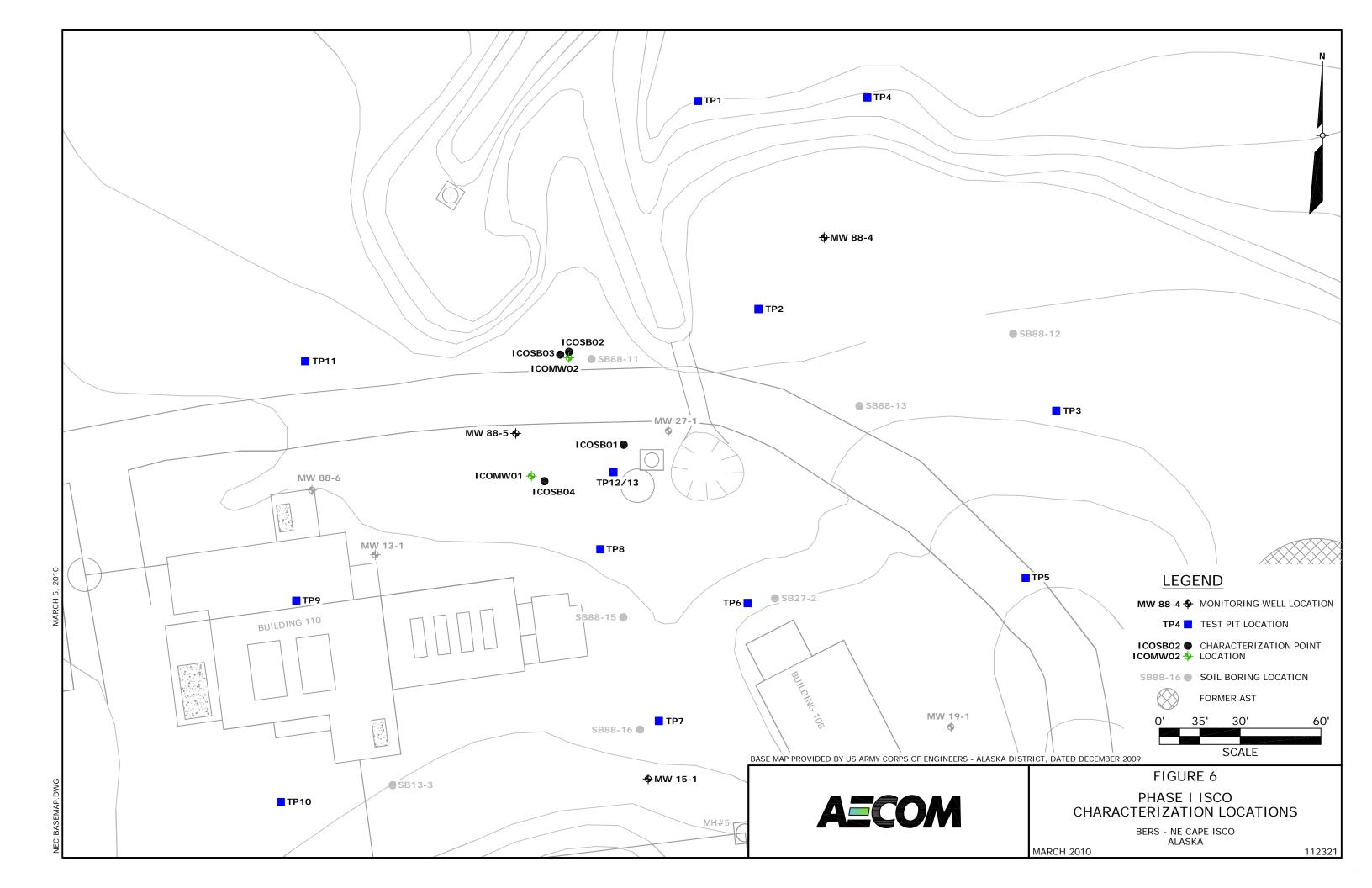


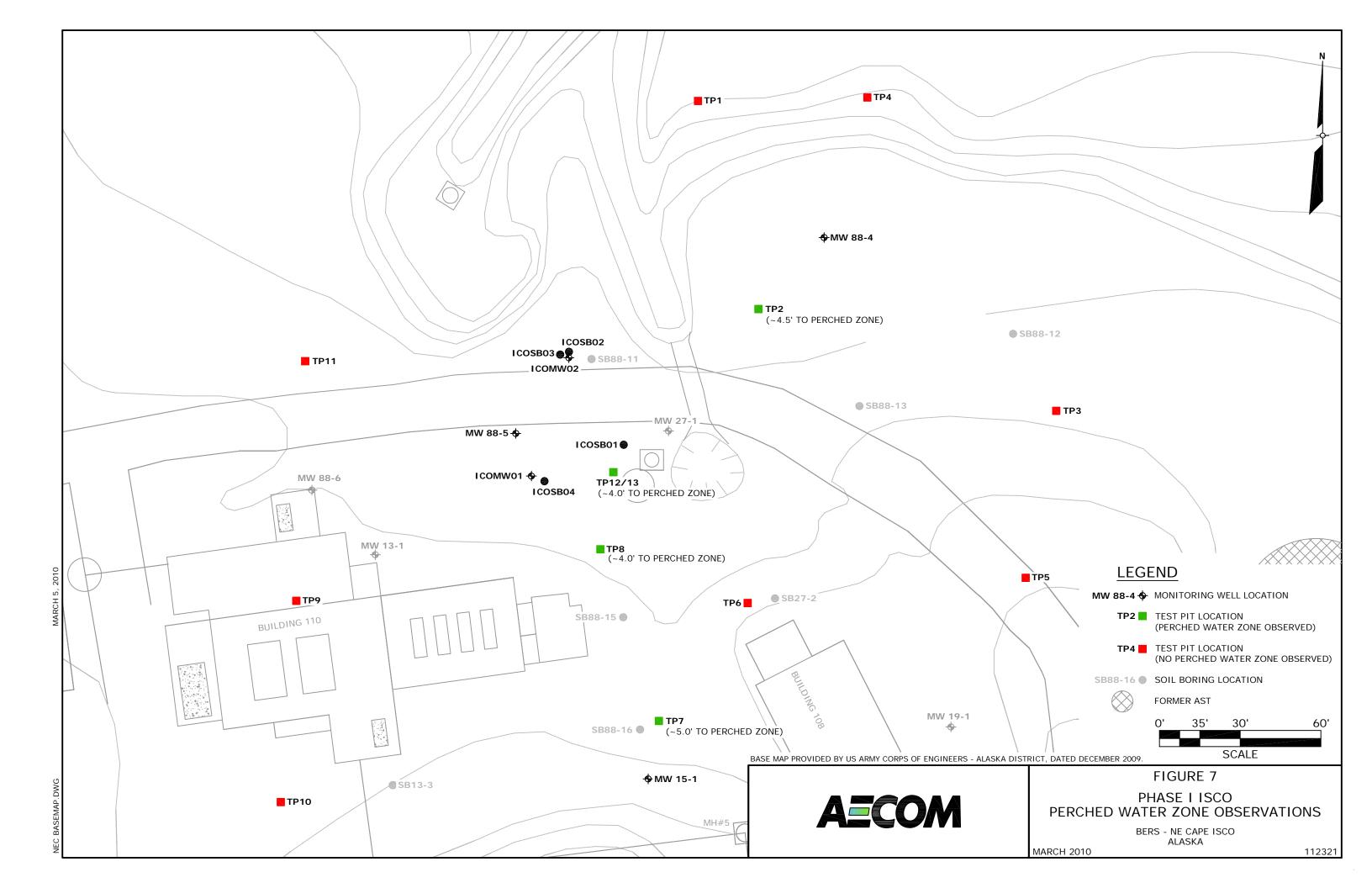
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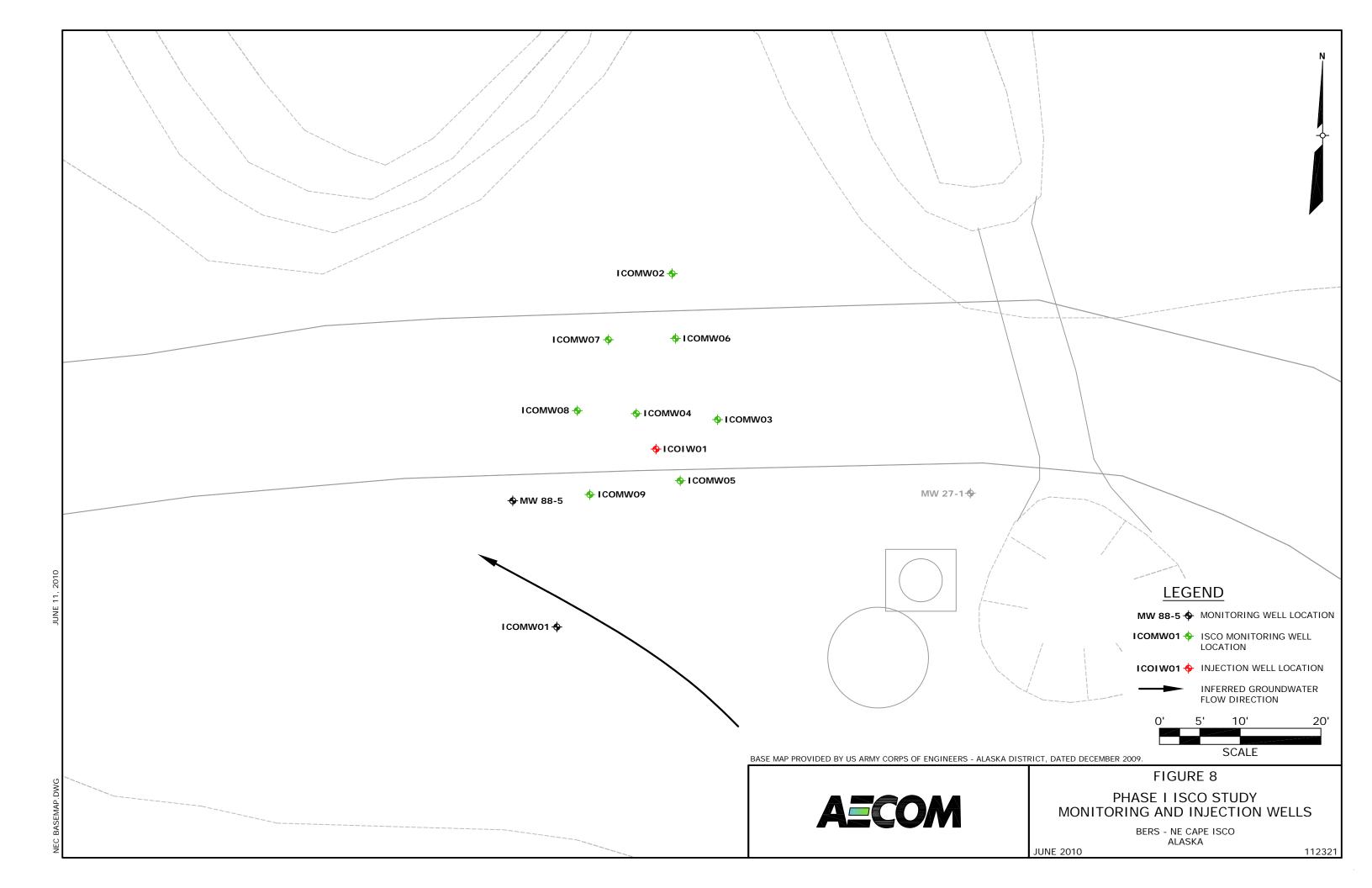


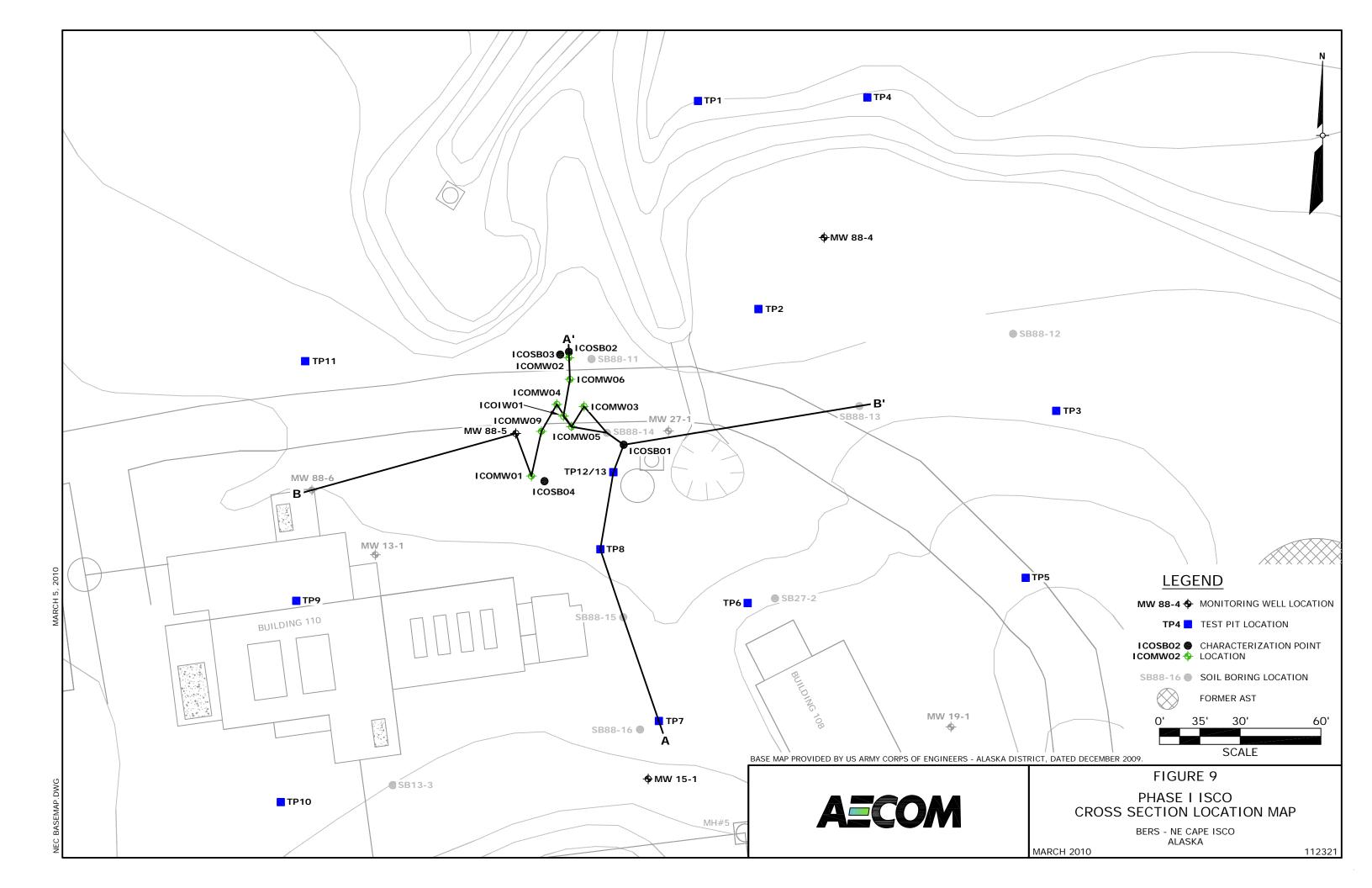


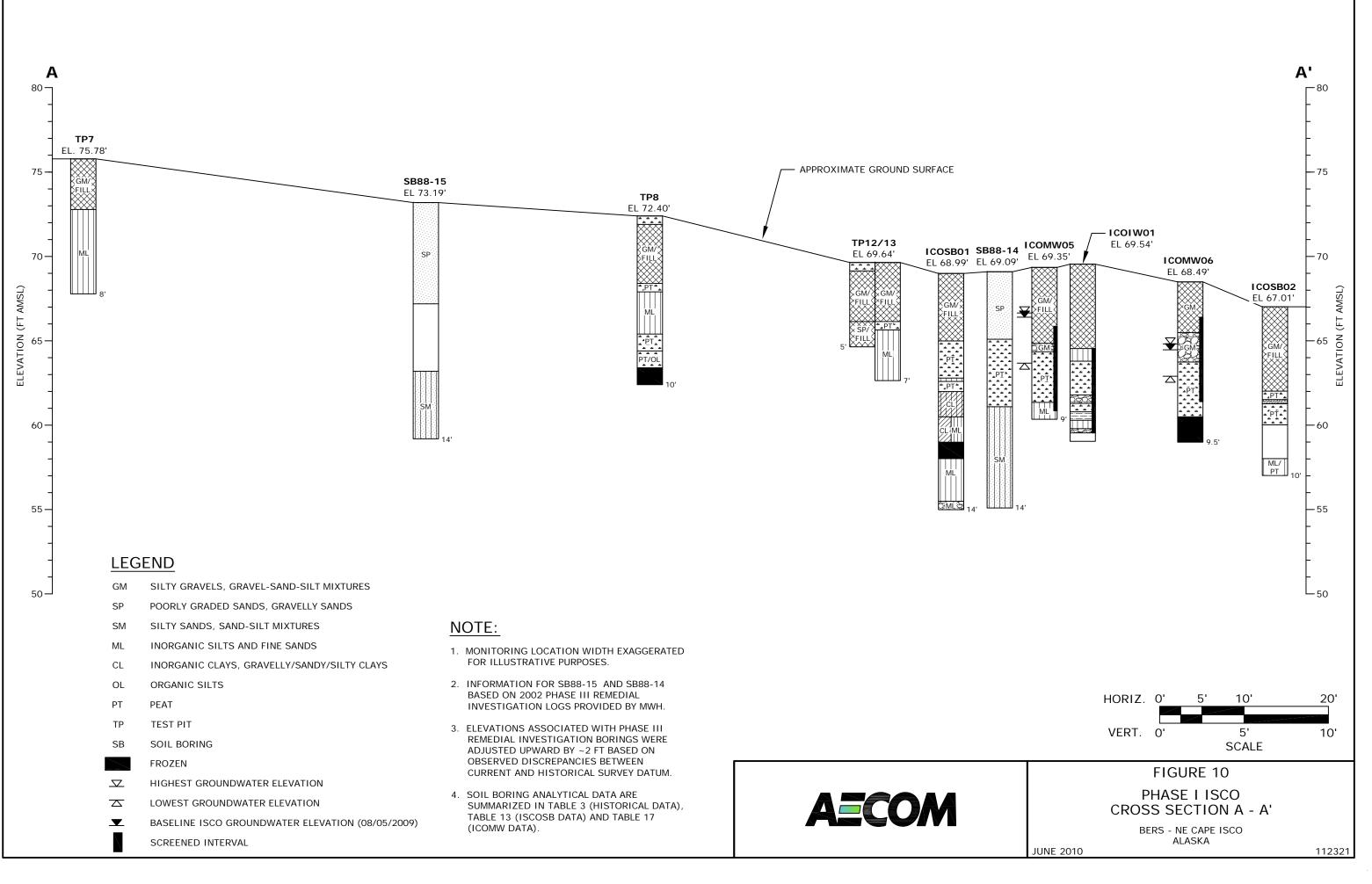


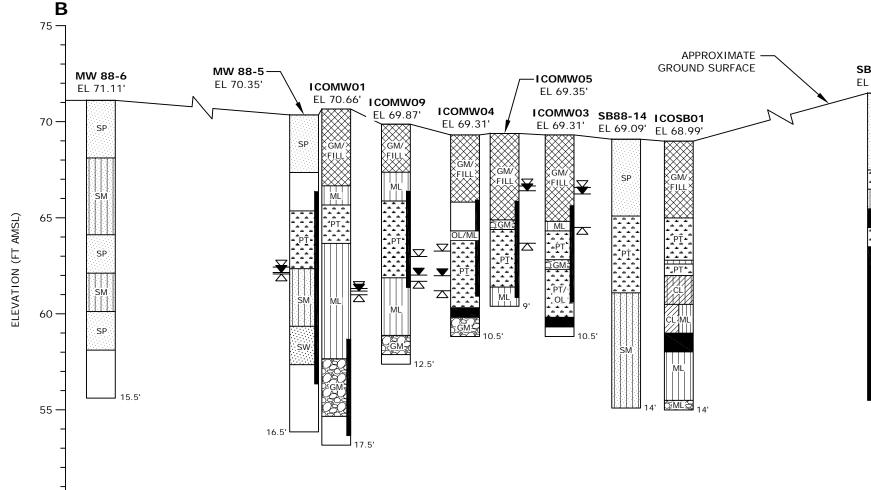












<u>LEGEND</u>

GM SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES

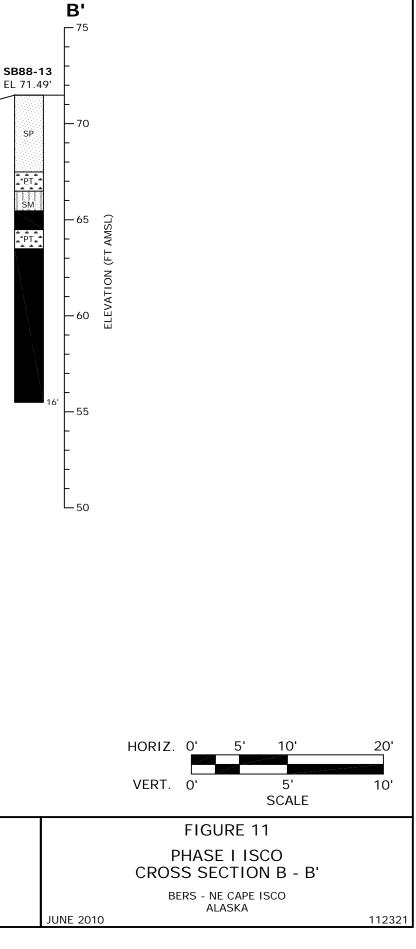
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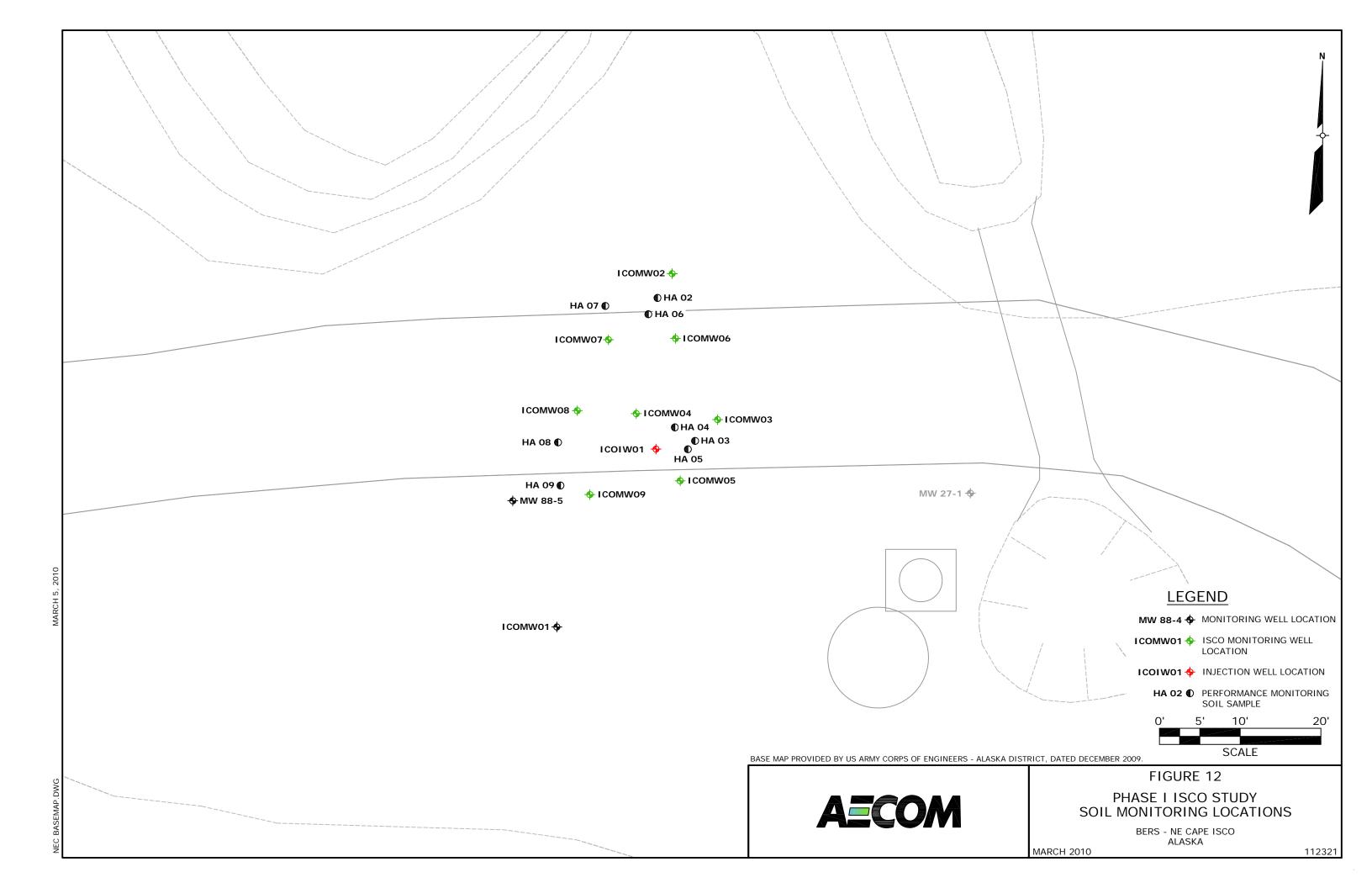
- SW WELL GRADED SANDS, GRAVELLY SANDS
- SP POORLY GRADED SANDS, GRAVELLY SANDS
- SM SILTY SANDS, SAND-SILT MIXTURES
- ML INORGANIC SILTS AND FINE SANDS
- CL INORGANIC CLAYS, GRAVELLY/SANDY/SILTY CLAYS
- OL ORGANIC SILTS
- PT PEAT
- TP TEST PIT
- SB SOIL BORING
 - FROZEN
- ✓ HIGHEST GROUNDWATER ELEVATION
- LOWEST GROUNDWATER ELEVATION
- BASELINE ISCO GROUNDWATER ELEVATION (08/05/2009)
 - SCREENED INTERVAL

NOTE:

- 1. MONITORING LOCATION WIDTH EXAGGERATED FOR ILLUSTRATIVE PURPOSES.
- 2. INFORMATION FOR MW 88-6, MW 88-5, SB88-13 AND SB88-14 BASED ON 2002 PHASE III REMEDIAL INVESTIGATION LOGS PROVIDED BY MWH.
- 3. ELEVATIONS ASSOCIATED WITH PHASE III REMEDIAL INVESTIGATION BORINGS WERE ADJUSTED UPWARD BY ~2 FT BASED ON OBSERVED DISCREPANCIES BETWEEN CURRENT AND HISTORICAL SURVEY DATUM.
- SOIL BORING ANALYTICAL DATA ARE SUMMARIZED IN TABLE 3 (HISTORICAL DATA), TABLE 13 (ISCOSB DATA) AND TABLE 17 (ICOMW DATA).







APPENDIX A

Field Notes

13-July - 2009 High Organ Load TP-1 (3-4) 6/a: 100 g soil ~ 50 ml DI H20 aldert to weather slory Tenp 63.9 "F 0 KP 94 136 (w/ 01 150) pH 5.48 Ald 5 . L 17.59. A H262 pH - 5.27 T 64.3 ORP 363 W 411 S.L 17. 7. AH202 5.20 11 6415 1 04 3.70 All 5, Fe GOTA 5.02 5 tel. line 98 F/3.98 pH T 64.7 T. 74.8 T. 68.1 ORP 412 Add 5 ml 17, 57. 4, 02 110°F 143.5 Ald 3.85 No. 52 % 475 OAP 99.9 °F 1 doll3 Prier T- 1075 No. 12 3 ORP 293 pt 542 ORP 975"F 2.38 pH

2 13- 5417-2009 Ċ TP-4 (2-2.5) clayed sitts in some norts loganes Init Congittury 100 9 500) 50 ml H20 T 64.6 F 14 5.61 OR1 215 Ald 10 - 6 Her ORP 400 mV max pH 5.37 64.1°F T plf Add + 30 see + ROOMIN 5.42 + 6que +3 M/N 64.5 °F 66.2 <u>.</u> 59 64.8% 88.5 74.5 FEEDTA 356 mV 418 m TF 461 401 mV 443 4.34 pt 3.95pH 4.46 plt 3.88 pt Ċ +5 MIN + OMIN +7 min 107.5°F 101 °F 105-6 468 mV 444.0 353 mV 3.93 43.92,14 3.93 + 12:37 my ald Sul 424 + 28 26 w + 20 48 MIN 455 alf ml 506 pm 470 appl 116.2 95.7 °p 100.6°P 4.02 pt 3.61 pH 3.06 14 Ē + 17:36 MIN Add 3.8 Na25.07 + 32500. + 23:25 518 mV 452 4AP mV 476 mV 98.4%F 107.74F 94.4.F) I 3.45 pH 3.79,14 2.87 1915 1915 120

Sulfaric Acril 1 N (P.1. te to SN) budder capacity Lyampile 39:41 29 buy 14 @ 33.95 VWR Add up buret to slow in rovell volumes to such plit chonce 7/18/09 Settyp for TOD 09 30 Peart SKT SAND Qualatative Estimate / Plan (Vilue peart to sayle ja Weigh 50.25 Peat note faire weigh lood. Confully from to to 500 ml angles glass sor with feller love conf. - Observe - 542, pert vicon presel fills is to 3/4 pt. Ald 100mL H2O APT to pear a shake vigorously to I minute Significant pear remains unhydrited & Planting. Add 50 mL H2O DI to pear show. Shake for Immute Top jer & vibrate relevell chargery mortened dawn into Weigh 100 great with 250ml clear glars jan Add 50ml H20 DI - SHANCE 30 staces ps slurry very thin. Could go better slury 6/ 25ml 11,0 Went 100, SILT GALY INTU 250 al clear plan for And 25 ml Hav DI - SILT PARTAR T LATURATED, WITH dry clumps Add 25 m 420 DI - SILTS SATURDATES SUMER. SILANCE 30 Seconos

7/18/09 Select soty matrix 51275/0262445 0262446 1977 - 13 - 13 - 13 - 13 - 13 - 13 - 13 - 13 - 13 - 13 - 13 Nazus 9 Nash & I FE EMPA Nursey+ theself) 43 43 - +3 De WY2K PLAN SCIPE OFLY PROPOSED A SINGLE Sole competition. Will set of the fraction of each contrite to obtain a avera value Princhum Fr EARA actimator rakaleitan FEEDTA 11 13.267. IARON 300 mg/L Fe 2262. 443 mg/L FEEDTA 0.1326 - 2.262 g/L FE EDA E PART Stock - 0,0023 g/mL (dir have resolution - sice) Will red to pre-prop chand dose solution for each sury. For site 1 sitte or and for 1.16 50 al He o Jeous soil 18 versebb de prep a this rite × 50ml = FERITA preps = 50ml × \$6 = 300 ml Na 52 4 05 = 50ml × \$6 = 300 ml 900 ml FLEDTA = 150 mL × 3 = 450 mL Nor Silver on = 150 mL × 3 = 450 mL 2.2625 /L × 5 conve. - 11:31g / L STOCK FORA Fil eng loom Le 300 pp Fe - Fald 20 mL 5x stock + Son (He)

1 M sodium From / Star (Nor 2 43 · 5H20) Sodium Micon (fete Pentahydrote - water x 5 MW= 248.19 70.08 1 m Na2 52 63 158. 11 g twit 1 mol 158.11 g /2 248.19916 Maz 1207 1 5H20 158.11 248.19 1 = 12.825/100ml M Naz 200 - 5420 m 100 m Volumetris Plack. Prepar Use 35 Guttz Or de prepare 17.5% /ut Hale Werl + fore bottley glass, 250 a.L. Add 100 g = H20 Add 100 g 357. 4202 As needed, prepare 8% Hzur wy 17,5% ful Helu hegh 250 ml glass bitte & fare Add (00, 175% fut H202 OKe/rap/ pH chule of grundwater grad single all de nuit bale han BEIMN-4 = 6.00 pH - 67,6F Unilling pld abole of you god sigh collet 7/1/05 w/ back for 88 mlw-5 - 5.58, H ORP 68,0 Time

£ C 18-541, -2019 Ċ C 2100/71-1 (3-4)_pH 625°F 351 2.85 2105/TP-4 (2-5) pH 351 62.4% 2.50 2040 Po, 2 Ca Chile pH PRE-CAL 10.33 10,06 9.98 4.19 7.37 4.00 4.01 7.01 7,00 ¢= Ē 14-July-2009 From UVF doto analysis conducted by Manik an 18-July - 2000; 3 Ample NomENCLATUR ##NCXXX MMZZ 廿日 = Year C. NC = NERTHEAST CAPES ITA (ISCU TARATIMENT XXX : ARAS $\gamma \gamma \chi$ 2 IAMAN TYPE ¢. 5B = 501L au = grandwaite WA = vate 22 2 sayle number ----instantion

to- JULY - 2009 TOD SOILS RECEIVED @ 1345 HRS (9-11 ft bgs) Gravelly SILT - SATURATED ICO 58 03 ILO SB 03 (5-7 Pt bys) from cuttings ORCANE CLAREN SILT ICO 58 03 (7-9 Pt by:) FROZEN WHEN COLLECTED BROWN SICT THAWS - SATURATED PROPUSE USING 5-7- sample as SILT study sotup. Notes' stra petrolean der is attration complete ORGISTIC Dis #/21/04 SILT Nassing done only ies: 1 1) # 100.3 x Soil 2) 100. Pg SOIL 3) tolg soit 160. 2 g soil ORMANIC SILT No2520, + FEEDTH (e 300 pm Fe) 100.3 5 5012 100.1 5 5012 100.05 5012 100 GREAME SILT Na2 520, + 8% /46 H202 1) 100, 3 g soic 2) 400,0 g soic 2) 400,0 g soic 3) (00.02 roic 50 ml Dose / Computed site water (50/50 composigned Gav them added to leach triplante, anget 88 month of 854445, collect 7/ 30 ml added & sur + Pensn lifete & 876140 ΠĒ. 88 mout al 88 14 5, collect 7/11/00 0 a : Allow the equilibrat, and expecting all thread Toy study soil on

20-July-2009 Prepare ICO SB03 ENTROOT FOR DRO FIERD SCRIEEN 5-71 5 g SOIL + POML MeOH $\lambda_{\mathbf{x}}$ 7-91 5g suil + 10ml Meose 2x 9 -11 ' 5g Sail + 10 mL MeOH) 2x ICO 58 04 EXTRACT FOR OPO FIELD SCREEN 4-5 5g soil + 10 ~ C Me OH 5g soil + 20 m L McOH 22 ШJ 5-6' 6-71 4x 5g son + 10 mL Medel 22 5g soil + 10 ml MeOH 10-12' 2 12.5-13/5 3g suc + 10 ml MeOH **1**17 2x Ĩ) Collect to symmetrate alguesto into lond a yrige & fille vin a syrige fibtu (? por) into anot sample vials. HOLD the father analysis or delather landyse ai **a**12 SHIFT focus to Concertin 0F FIXED CAD SOIL CO-PICMATCOL SAUPLES. Soll's SAMALES PREASED: - Peat, high ' Site Lotts DARD yelve. Ico 5001 (5-6) - or, other silt only (gay preffect) (6-7) Ico SB04 21 V ICO SB03 (9-11) - A dean sample - potest. or not- 58-2 9-10 m 8 × 710 30 61 (9-10) - SILT INO DE APPRECIASLED DRU UN SIR LAB **3**11 **SI**

101 20-5467-2019 LOCATION ID / NELON FD SAMPLE ID 13. HG DEATH (M. (SILT) COTH 1445 OGNCMOL SBOI 9-11 MOC-01 ILO 5303 042.54015 (PEAT) 500 09 NC MOC SB02 MOC-01 ICO SB01 5-6 11 pear t c 1510 09NC MOC SBU3 MOC - UI 6-7-ICO SBOZ 3/ 1520 5-6 09 NC MOC SB 04 100 5B04 MOC-01 21-5-6-2009 Check 14, ORS, Temp 4 (5-7) FCOSB03 SILTS; PREDUCE SILTS Teap ("F) ORP 1430 No. 5208 014 1 5.72 pH 52 mV 66.5 25.75 pH 57W 66.9 64 0 664 5.66 6(mV 3 FERDTA 46 mV 657 5.75,4 49 66.9 2 5,72 È. 3 5.72 54 66.0 H20L 5.61 66.7 50 5,64 53 2 NOTE : PLIMIT AMAGLABLE 679 THE R 3 5.61 67,2 58 TO CALACT SULL SAMAFI HES-selider 09 NEMOC SBOI - SBOY AND PECILIER TU TEMAMERICA IN <u>).</u>____ PET SOLL TACOURT, OA. SENP PEAT Nassely dose only 100.29 5012 100 ml comparate By many 2 80 min 5 water 2 100.15 SUIL 100 mL COMPUSITE HLU 3 100ml 160,7, SuiL Cerfort He PGAT 304.4/1 FETERTY + Niz S208 100.49 1 100 mL + Composint H20 100.49 100mL COMO: TE 420 3 100.05 Composite Heo 100ml ÷ PEAR Blotter + Na2S2Ug + .400 ml 100.39 Compositi 420 1 80 LOU ml 100.0 CEMASSITE Hyle + 80 foruml 100.3% Composition H20

11 21-July-2009 Ĩ SILT SOIL PRED / NO ORA SILT Newson dose only EE? 1) 100. pg 100.15 38 mu-4 + 88 mw-5 1/2. 4- 50 ml Comp. ITE 107. c 2) 100.1g ComALITE H20 50ml + 3) 100.0% 50ml Comasine 1420 81 (SILT FEEDAD + Nausily 21 1) 100.0g + 50 ml Composte Hio 2) 100.18 adilla i + 50 mC Course ME 1426 31 (00.2 y 7 50 201 261 Composite 1400 air.i SILT OT. 8% H20 + NA2 5208 30 1) 140,0 + 30 ml COMICISTE HAS + 30 3ml 2) 100.3 Connosine 1+0 30 mC 31 144.2 Common the 6/20 VR 1 BASECINE pht, O.LP, Tem. PEAT PEST Naz S 0, doir only Naz S 0, doir only 11 ORIP(mV Temps (62) 21) 5.08 120 16.5 z 2) 5.13 16.6 1.61 118 3) 5.12 122 (6.7 PERM FEEDTA + N.2.28 5.18 16.5 119 ()5:10 16.5 127 2] 1.00 16.6 127 3) 5.11 <u>51</u> PEAT 8% 4202 + N.25209 124 16.3 5.15 124 16.3 5:13 125 5.12 豹 16.3 127 1571 BALLIER SIAND COURT FORK out AMACHLIN JOIC JANACES terk 69 NC MOLSAGE

21-July-2009 SILT SOLS BASELINE C HE(K SILT ## 2 2 0; dose only 1) 5.87 pH 2) 5.88 pH 3) 5.98 pH 15.7°C 84, 16.0°C 104,V 72 ~ V 16,2 0 SILT FEEDTA + NA2 208 _1) 5.84 pH 16.1 e 20 mV 16.32 2) 5.97 pH 78mV 3) 5.99,11 16.0°C 74mV SILT \$90 H202 + NazSzag 84mV 15.8 2 16,1° 5.95 H 1) -5.82 115mV 163 - 5.88 jH 105 NV 157°C 2) 5.97 - 78 mV 3) Si77 pH 74 n V 15.6 % 22-5447-2009 Add sodium persultate to each soil for Por 205 / by. 2 j person toke 205 10000 long suil 2.4779 Blas 208/100 soil. S_9, 238 5 / ml Nasily 192.15/1 528 Utilize 2.5 g Mazing as Klocur Sidim Resultate from Fine, stock reget da pictured bulk 55 15 bags. Add 50 mt H20 all mother works usig All FRAMA to 1126 SILT, ORLOW MET, PEAT TRIANCOMES LANFIED FEEDILA STIR BY TILTING WRIST ACTION Add 35% H262 to SILT & ORGANICSILTS TRIPLICATES , As calculated below x mh = 358 = 50ml + 8% b<u>e:</u>..... 135x 2 4 x > 11.4 mL Use 11mL of 35%. H202, plus 4 al compositor Strewater. to couplete reaction used actual

22-July - 2009 Observe SILTS ONLY REPORTION IS UN EVENTENC IN PERSONE FATTE COULY PERSULFATE, + FEBORA; However, pur lite + 82 1/202 reaction Vessels preduce stight of good & fee bubbles & surface of surfurter INTERFACE. NO TEMP. EREMANCE INCRESSE OBSERVED IN FIRST MINUTE ON PEACTONS TEMPENSAULE IN SHET ONLY Pen lite + 4205 rice to ma 25°C. has evolution in form of they buildes earlest a size cause FLUTFORG " USSERVED Alt 10mL 356 HLG + 4 mh compasse site wanter SILT ORCOME REACTION VERSENS BEGIN TO ASTRONTE & CATEGE dty. or ans, al seils ZIFT + FOAM. TEMPER ANDE MUN TURINE INDICATES ENCRESSE OVER TIME ICOSTO3 (5-2) Telps, opprovinta 1141 30'C 11 43 All 3 MIDUCITES PHUL SOIL PATERIAL OLT AND 350 1145 41°2 OVER RIM OF RESITION VESTEL, REFULT. Low 1150 65% OF SOIL, AND NEED TO RECONSTRUCT SOIL RENOTUD UENELS. Add 35% to PEAT Reacher Versel 1 al 2 × mL H202 . 35% = 100mL . 8% 35x:8 × 2 22.85 ml Add the volume on 10 ml down a Zul down & stree with sportula to REDUCE SOIL LIFT BY RELEASING TRAVIED DUR. TO DOL LIALID LOCKER 1. ACTUALY 103 ml 42 Rec I demacross SECTION VISTI TENNER OTHER CLAMES TO ESPE in REACTION VESSELS, HOWENER, LANCER RAM UEISER ARBUGATS OVER PLOW OF MAS TACREDIENTS. 500 mL No son man cont. for Construct & NEW shot arconic set Hydrigen Raiside (soque progracities

/		- (
RESECTION	VEJEL TRINUCATE	
_		
1336 WEIGE	100 grams soil [ICO 50 03 (5-7)], ADD 2.5 grams socium MA	BUL EATE
	source and the second file he have	
	SILID TO SOIL MASS. UTILIZE STUCK BTO Hydrogen percessor	254CFASE
	PREPARED ON 18- JULY-2009. AND AND 50 mL TO SOIL PE	
		!
1345	THE BY RAPID INVERSION CYCLING REMOVE CAP TO RELEASE	
	PRAJURE, FROM. LAS BUILLATION.	
	PLACE REACTION JEIJEL I IN REFRICERATEL TO RAN COUD TEND R	
1358	OBSTERVE REACTION. ONLY SLIGHT APPARENT SUNCHTON OF QAS	ues, e
135-717	SUPPEN INCREASE IN JOLLINE OF SOIL WALL, FEMARE ATURE RUF.	
	MAS TEMPERATURE QUICKLY NEACED OF 50'C; HOWEVER	
1425 1421	APPITICINAL 50 mL of GROWNPHINTER APPED TO COCL REACTION.	
	TEMPERATURE DRUPS TO 25°C AND OFF GASSING DEFERSES, ALCOM	116
	LEVEL OF SOL "FLUFF" TO FALL BACK DOWN 500ml were (
	OVER NEXT 15 MINUTES	
1445 1436	CONTINCE TO MONITON TEMPERATURA	
14201441	PREPARE PEAT / Hyperice Pererior / sepina permitate RESETUR	VENTEL
111	3 weather a med Erection to person approximation	
	3 wight & nosification to PERCURE AADITON.	
· · · · · · · · · · · · · · · · · · ·	Pour ver + Futie 24 / 1 -	
	POUR OFF + FILTISA 20 mL of STA WATER NATERNATANT FROM	- 9
	VEDEL 3. APD 20 ml of 82 HYDROKEN PERSKIPE TO ATTAIN 10	
4 V L L/ 1999	FINAL REACTION NESTEL LIGUID WOLLAME.	
ILLIA SA	THUS DILLITING THE PERMAR 1:4.	
14 20 50	TEMPERATURE RIJE OS ONLY ITO 25°C	
14 54 1500	KUNTING & MUNUTOR TEMPERATURES IN ALL REACTON VENE	<i>L</i> _J
·	AND OFFICE AND EVOLUTION, IT NERDED	
1530	TEMPERATURE IN ALL REACTION UCHEUS MASS REACHED STOBLE	Mar PERFORE :
	of 20'c ; HOWEVER, SILT REACHIEN JEIJES TTU EUCLING AA	
1550	LEAME MU REACTUP VEVEN to - COUSELY CAMPER. HYALLAR	Maixing C
	DOJED REACTION JETIELL AND PLACED IN LONGE CARDERY WIFIELD D	READ
	TO CAPTURE OVER PLU, AS NERAER ANY RXN VENERS THAT LOS	- 1974 - 1974 - 1974 - 1974 - 1974 - 1974 - 1974 - 1974 - 1974 - 1974 - 1974 - 1974 - 1974 - 1974 - 1974 - 197
	MAR TO OVER- PRESSUR MAR WILL BE RE-PONE.	E
• • • • • • • • • • • • • • • • • • •		
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22 - They - 2009 1600 PAREEN TO CUTECK Of y grandesta courses prom nouse in marcing MUNTON WELL IN DEEP" LOWER (OR DUTTE , MISIBLY) ARMITER TO CHECK AGAINST ON APPARENT DISCE RESIDET FROM THE FIELD. HIP: pH check @ 5.89. 163 RETTUCK 1220 HOST VOLONIE WATH EVE ACOE DUCUS TED ENERIMENT PUBLICE J E Z DE SIGN, OBJERNATION, RELATION TO FIELD STUDY. DISCUIS CHAMESMEN OR Lieu por sim alterne a capatteri, ADVAMMALIES OF USIAG ANTE Tara ON (DANIS IN COMPINATION WITH MATE FEBRINA 111/2 BE S (LAC 3 61.3 UER -

Ċ 23- July - 2009 C Collect success water comple From. (SAME LOCATION AS THE SPOT WHERE ARISTON IS COLLECTION WATER TO SUMPLY ISCO WIX SYSTEM. Calibration of pH meter HANNA 991003 1 Sto READ INITIAL F CALLA FILM 7.00 7.00 7.01 C 3.86 4.00 4,01 C 10.00 9.93 9,98 C plt + CONDUCTIVITY OF SWRAAR WATER FANATE Monother Fert & my / Ly Haced Fert K. T In - 180 16.2°C Temp C p1+ 6.44 ORP 73 mV C C PEAT SAME C PEAT REN VENEU Stor culy 484 m 0.3% 3.13 pH 1) 2) C 529 ORP 18.1% 2.76,H C 3) 2.70 11 558 ORA 18.0% FEEDING + Sig 1 1.8% 484 n V our 1) 3.27 C 18.1 6 2) 2.52 ,H 559 mV 02 2.54 plt 544 bV oll 18.0 °C 3) C H202 + 5268 C 2.38 2.20 14 5R2 NV 0.4°C () 18.0 % C 221 mV 2) 3) 18.4 °C 48 503 mV 227 ORA SILT - SLOB 1.1°c 1) 2.39,14 487AU 2) 2.24 pH 18-8"6 518 mV 3) 2.21/4 480 mV 18.6% ¢ P

FEENA + Nr. 12 08 O.RG SILT (The 0.8°C 2.40 pH 495 W Ocp 2.39 H 2.43 pH 257 393 . V 0.90 18.6. CC 18,400 399 W 000 PEAT OPEN JLT + H2 0 + Na252 03 1) 2.04 256 ml 1) 2.04 256 ml 2) 2.00 17 282 ml orep 3) 1.96 pl 301 ml 1,1°C 18.70 18.6°C 301 mV (18/ SILT Non of a 1) 2.38 pH 2) 2.28 pH 3) 2.23 pH 585 mV 2,4% 640 NV 18.82 642 mV 18.8€ 1. 低高 SILT FEDATA L NA2 5268 1) 1.95 2) 1.93 pH 3) 1.84 pH 2,1°c 55/mV 482, V 18.82 462mV 18.7°C SKT H202 + W42 1200 584 mV 1) 1.82 pH 2) 2.00 pH 1.2°c 2180 mV 18.7°C 1.71 pH 3) 481 mV 18.8°C 20% Work to Na2 520, solution, from dearty vo with come = 228.19 Klow Par Ut / 4 soli. E Wt% to g/L @ 25 C 800 $y = 0.1049x^2 + 9.1501x + 3.1347$ 700 $R^2 = 0.9999$ 600 **E1** 500 \$ 400 Series1 ()a 300 Poly. (Series1) 200 (72. X 100 0 0 20 40 60 wt%

24-54-2007 She Rold wATER CONFECTED FROM LEAR FRIEAD AS WATER SUPLY FRANCIED FOR WE IN BAACH CHERKAL MEXTER DESTURED CON AND, ONLY THEY, FE pH 6.41 ORP 89 mV 130015°C TEMP Felt Sing/2 by HACH, Form the Terrikit IR-18C 0. 17 mg /L by HACH, Ferro Ver Methul Total Fe CAMBRATION CLOTTCH an pH theke Hanna 991003 SM READ INITION CAL NUME REGINES 7.03 201 4.00 4.02 9,98 10.00 5208 0117 Tomp (1) pH ORP(mV) 0,7 i) 2.97 504 2020 2) 2,58 551 16,5°C 3) 2.41 570 16,6 % SzON + FEEMA 10.4 3,13 503 1) LOLD (ALLIW TV THAN 547 2.27 16.6°C 2) 2.21 587 3) 16,6°C 520, +H202 0.8% 1 2.25 441 Cup 16.7 2) 2.27 211 '}) 2.26 16.8 424 orcome sints - 520, only CRP(~V) Tenp (°C) pH 1) 2.39 541 (alo 1,5 16,6 2) 2.38 441 3) 2.40 16.9 413 SUB + FREDTA 1) 2.37 455 7.5 Caro 2) 2,54 369 17.0 >) 2.58 370 16.7

\$ \$++-5 24-July-2009 UNI. SILTS 5208 + H2 " 9.5% THAN i) <u>1.96</u> 2) 2,12 284 LOLD 7.9°C 283 mV 2,07 17.00 3) 281 Nas Sz Ug daly SILTS 1) pH orp(mV) Terp (°C) 2.52 7.9% **1** 589 C=20 + HAW .635 2.27 2) 3) 16.8 21.2 638 2.27 16.6 Sig + FEEMA 1.94 275-484.V 9.141 144 1) ددد 416 N 2 25 2) 16.6 3) 433mV 2,13 16.5 16 A 526 + H202 448 616 (. 15 TWAL - GAD SUBALES Decumeents 11.2) COLD 2) 2, 22 16.5 SLIGHT For Forther Forther 2 3) 2,12 16.4 426 113 I - 52 520 100

25-5467-2009 MODITORING OF TOP REARTION VENERS PEAT Na2 52 4 only PH ORP(mV) TEMP (°C) 1) 2.98 0.5°C 503 Cap 17,1 " 553 2) 2.54 3) 2.42 17.0% 569 Na Sz Og +FEDID 4. 2 · L 1) 3,21 478 COLA 17.1°C 2.30 537 2) 17.2 3) 2.32 541 1 No2 52 63 r H2U2 2.20 0.6 1) 5/3 6620 585 2) 2.21 173 3) 2.25 576 17.4 OKP(MV) Tranp("C) ORGANIC SILTS pH Nalis 0-14 1) 2.32 17.30.9 449 6447 445 2) 2.36 17.2 3) 2.34 17.2 447 \$X1.2 Fe FA NA Nu2 52 03 1 \mathcal{O} 239 442 0.9 LULD 2) 2.53 17.3 368 3) 2,521 369 17.2 Na2 32 6, 7 Her New York 1) 1:94 286 0.7 Ca-D 17.2 284 2) 2.11 3) 2.06 283 170 ANC: Altras. Tenp (°c) plf onp(M)Teys ("C) pH. orep (nV) 51673 Nes Suly unly Narszey + Hurz Digging a 45653 1.94 2,42 07 620)0.6 iLun Lan 473 172 2.27 2.20 450 17.3 2 See a 2.27 635 17:1 2.12 12.2 432 3) Noz Sz Uy + GERMA 12 12 12 12 12 485 0.6 1) 6.92 ins 426 17.4 2.25 2) 435 17,1 2.12)

26-5664 -2009 CARISADON CHECK pH meter 1121 READ IN IT STD CAL 7.00 7.00 Noris 4.00 3.88 10.06 9.97 NAZ SLOY ONY PEAT 112 Terp (c) ORP (aV) 2790 4,1 377 con 2) 382 17.6 2.75 3) 2.42 511 18.2 Nor Sig + Fe ENNO 1) 2.89 490 4.1 Cin 547 2) 2.21 179 3) 2.18 180 554 (E2) (No. 5208 + H202 (374 1) 2.31 2.7 cino T.T 205 2) 2.25 17.7 3) R. 43 350 18.1 <u>71</u> Naz SO, ONA ORP(NV)7 GRAAM SILTS 1) 2.23 Temp (2) 4.2 D 4.0 2512 403 17.8 2) 2.31 3 89 3) 2.41 17,8 æ Naz Szly + FEEDT4 1) 22.43 428 ورامه 4,3 2) 2.54 176 358 3) 2,57 358 イネチ No2 52 0y + 1-202 565 2.09 1.91 1.8% 290 D CU-0 ()175 270 2) 2.18 ABC O 2.06 17,5 3) 275 27 a la telle

e No2 52 03 012P(m) Ĉ SILT Ċ TErr(%) Ċ 0.9 572 2.33)e-p 2) 2.24 172 621 C 3) 2.29 611 173 Ć Na2 5208 + FEENTA Ê 4.80 1) 2.10 6.3 La-A 2,30 16.9 401 2) 3) 2,37 3 85 172 e Nin S2U H202 Ł C 2.00 608 子1 1 Gup 270 2.17 16.9 C 2 425 2.12 171 3) C <u>Ri</u> Post Read cal chale 5+1 Real. 7.04 2.05 (4.00 1.64 10.06 9.90 Rogers

107 STD CAL READ LOW, CANGE PARCE + MET 7.01 7.01 4.02 4.00 9.98 10.06 RI PEAT Non Sug Only E 9 pH Tey (oc) orp(nV) 535 1) 2,7) 12.6 % 378 R.82 18.6 2) 2.39 2) 19.7 260 Surfra 1the FEDTA Norsig ¥ Gto Only + Milly + FEEDTS 48 10,4 pH 2.8D 531 201 233 454 18.419.1 2.33 598mV ORP 3) 2.27 19.4 Nay 52 63 + He 02 (8%) 2.30 10.0 10.0 256 1) 18.7 18,7 2.29 269 3) 2.48 344 19.5 T pH ORP (5) (mil) Nag 52 "8 Only UKLAPPIC SILAS Nosso 5 16+5 13,4 1) 497 2.38 13.0 598 2.28 0 Z490 2.21 621 ١I 240 295 369 19.5 2) ·2) 2.28 621 190 T C 3) 2,25 2.47 19.6 3) 378 626 18.2 * FE GOTA Nº42 5205 + 415 Nhize + Fotora 1 2.41 129 2 2.58 345 18.8 521 14.12 1) 1.91 2.30 3) 2,62 350 19.2 408 18.2 Z) 396 18.3 3) 2.29 H2% (82) Na 520, 2.00 Navizar + H202 (8%) 304 16.0 12.05 4199 12.2 51**4**13 273 2.14 430 18.2 2 2.25 179 Ś ÷3) 3) 2, 27 18.2 260 18.8 401 2.13 2 2 Ô TRL -END PH 1.1 4.00 4.08 7.03 7.01

8/6/09 Testart Front Scherring BAJELINT diou my /L 22:10 MAGNOMOCMWO7 ZELC ON JAMPUR READ REACTED MAR 73, 30 m /L 10 m2 sample OF FIELD SAMPLE I mL SAMPROLE OF FIERD CANAL quil of DI WATER 32,6 Tops Fren 3.26 05/2 I'ML SAMMUE OF FIELD SAMUEL 53 9 mL DI WAREN Or77 in te = 717 mg/ Ferrow Iren Re-dilyte 1,93 mg/L = 19.3 Ferrous Fresh TE ZERU ON IUN O. OO my /L OPAC MOC MNO2 Delute lox TOTAL IRIN 0.89 m/ 10 x 10 - 8.9 m/ 12 12 Pilute 10m FERREN JRC. U. 45 m/Lello - 4. Smy/L 27.5 ZERE ON SAMPLE 102 PILME 0.00 /6 Og NC MOCOG DILUTE IUL Toron thon 0.95 my /2 x10 : 9.5 mg /2 RIAS 10 Dut 10, SI C Forma, From QOU my 16 x16 - O cy/ 112 A7 (13 Farry In 0,00 7/2 28.3

7/11/09. 0630 HES meeting 0745. Prepratory Please meeting for Test Pit algging. TODO 1) Expose drums on north sides of site? Slightvaking to expose whether they are of concern. * Make copy of tranch pit log for Russell - No entrance in pit if over 4' deep. 0900 Mcbilize to site and go to most southerly pit location and dig trench to 6.5 Contamination (diesel) found at 3' to bottomot hole. Take samples below and E run head space (ppm) Dups taken tovonsite lab -2 -3-4' - FID=52.1ppm PID=18.5ppm TPI 4-5 1F10=556 PID=144 2 5-6 FID= 902 PID=200 1030 Mob to location TPZ take samples below for headspace. See log for details of lithology -TPZ Depth FIDDON. PIDppu Dups taken 740' 3.5-4 160 2 > for onsite 420 1040 6-6-5 labalso 7-7.5 140 720 9.5-10 580 204 1120. Mob to location TP3, appears during trenching that there are several zonos of clayty silt, It gy that are catching cont several peat layers headspace sample taken as well as dups for busite lab analysis for DED/RRO Depth Fippon Pippon TP3 bkg bleg 2-2.5 4.4.5 420 48 320 1 4.0 6-6.5 41.5 (6,8 7.5-8 8.5.9 51.0 4.8 10-5-11 37.5 2.9

Mib to TP4 take samples for headspace and dups for DRO/RRO at onsite lab. 1600 Depth FIDppm PIDppm 2-2.5' 1.2 2.3 TP4. 5-5.5' 138 17 7-7.5' 1280 205 7-7.5 @ capfringe, 1700 Return to office, Un pack gear and post cal instrument. - Finish up logs - Organize shop. 1900 EDD. 2774mSh 17/11/09 Rete in the Rain

C 2/12/09. 2 0630 - He's meeting @ mess hall. - Open Frenches at MOC Ĉ. Watch for frucks. - Hazardous materials in trash. - Trepping hazards in camp area Ston previous camps Ē. È 0700 - Prepare to go out to continue test pits E 104, occpeat tounde 3.5 BgL appears to be contaminated throughout. water at ~ 10° bgs. about 1/2 thick appears very sightly 2 -1015. Dig Test Pri tPT, encounter seep zone @ È 100 to test pet TP8, seep @ 4= TO @ 10= - ground water not encountered -È 1200 - Bettern for lunch. 1300. Review data, work on head space sample from TP and record on logs, E 1700 - Go art to site ang GPS locations of completed test pets! 1900 Finish bookwork and prepare for test pits tomorrow Am. 2 2000 EOP. E JAH SL C 6 E (E-

2/13/09 0630 HE3 meeting wall hands. -0200 Calibrate FID PID for use in = field for continued test petting. 0900 On site @ location for TP10. Upper fill to 4? abundait gravels throughout, TD @ 102, no sign of vater In pit after digging = 0 0 0932 To location of Test Pet TPII Some peat @ 3.5 below filland another larer of pear @ 6-7 - abundant contamination and dressel odor throughout -P entire trench /put. 3 1000 Return to office so I can = vun PIDIFID instrument on soil samples = Callected from Test pits TP10 & TP11. 1200 Lunch > 1230 - Analyze data -1700 - Pit togeather spread sheet to Put with Deo field screening results that Scott & Mark are generaling. 200 EDP -Rete in the Rain

2/14/09. OGBO HES Meeting. 0800 Work on mapor noc, have kissel stom pers use ats to produce hap 0430 60 to Hoc and GPS in boad and remaining monitoring wells of educer-1000 Work on setting up the InSite thanswe and logging package in anticipation of doing slug test. Will try to get Adtesde from home. Continue getting equipment ready 1330 1700 Goto MWBB-3 to do slug tests. WL 10.14 TD 19:45 Set transducere 18.14 = 8' H20 Run 3 Rising \$ 3 Falling head ŝŝ -Need TAPE WEASURS - Stop for slug 1900 Return to office unload aquipment work on download of computer SOD 2000 Atmel

0630 HAS Mitting all hands 0700 fall Bill to arrange Astesour software to ste 2/15/09 0900 To site setup on BBMW-1 For slug tests WL 14.53 Toc 24.05 TD 24.05 TD 22.00 Set Transducer @ 222" 14.53 6.47 WATER TEMP 6,23 Initial DTW (7066) OFF 0.4 BTIM OF SLOG WHICH'S 14×5' @ 20' WELLS FOR SURE TO DO BB-5 \$8,10 Complete 3 Mising & Calling tests initial observations very fast recovery. 1001" Back to camp for tape measure ,083 166 1030 On Loc BOMW-5 WL 2.03 TD 14.8 14.80 148 9,03 9,D Set transducere 5.77 H20 5.0 14.5' Transducer Reads 5.52' H20 14.5 9.0.3 5.47 Set slug btm @ 13.75 Shurs2 Logfor 88 tur 5-R & 88 tur 5-7 labeled Ivansducer moved during insection of slug on 89 mw - 5-3F - Reset immediately offer insection Transducer read 5,565 after reset & well recovered

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volume of slug 1.25 = F. 5625 = 3164 = 59 M2 Hr2h = 3.14 × 13/64 × 60 = 59102 1300 Well WW8310 WL 18.43 1843 25:30 TO 25.30 -453 18.43 6.87 Set Transducer @ 24.5' Btmof Sluge 23.5 3 good falling & vising head tests 1445. TO ZOMWI WL 20.04 1.1.25 TD 28.85. SET TRANSDUCER 28 Set. Bin OF Scule BLOCKC 26ª 3 good falling & vising head tests 17 MWI TO # tomat ~ OBSTRUCTION 1615. WL 10,15 TD. 16.8 Set transducer @ 16' BIMOF SLUGE 15º 145 A KARA M do 3 vising & falling head dets Seem problematic, well problems? 1.45× 10-6 A/sec 0000001.45×10° Ft × 60 = Ft/min × 60 = Ft/hr× Sec 60 24. V= Ka 88-5=K=1.21 # 88-5 K= 14.517 H/day = 39/day K 8.74 - K 8.74 H/day = 235 gradient, 27

7/16/09 -Sample continuous from below fill to WT. - Eric Sample bottles. - 1-5 gallon bucket of hot soil for scott. GRO, RED, VOC 8260B, Decon AREA. - Soil Drums for cuttings? - WATER - GAR ? - SAMPLE ID SCHEME .-4 - GLOVES LOC ID -TERPACORES -GRO BILS 2-4-00 2-4(03) - 25 ml Meoh MWH Phase III Sommary Report + 4-6-02 4-6-04 - FLD/PID - COOLER ONLY ON COC - ICE - BAGGIES - LOGGING FORMS SAmple H SAMPLE LOSS - BUCKETS OPNEMOC HOLE - ALCONOK. GANCMOCSBOI -- IDW IN TOTE HOLEZ 09NCMOCSBOZ-MEETING W/ DUNEVS efc. SAMPLE ID 6 Need VOA'S Fled Dop - 09NEMOCSBO3 New# Sameloc, ID. Mathix Spike - OQNCMOCSB63 MS/MSD SAMPLES GRO/BTEX - 25 ml and MeOH, NPDL # 09-034 - IN comment section OF SAmple #5 Moc-olas - Lups samenumber MS/MSD- GRO-1 bottles DRO/RRO-ELOZ Daphlene/GRO/BTEX in 402

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7/17/09 Kaining 0630 HAS meeting 0800 - Take drill orew to beach to Du drill tig, come back to office to preparel for drilling clove, gather equipment and supplies 200 break for lunch. 1300 - Meet with Bristol people and usce about drilling effort, meet w/ Eric to get Sampling scheme moel - location ID Ist Boring MOCZ - 2nd well etc DATE VY Necope loc Soil OGNIC MOCSBOL Sample #1 FIELD dup same number @s loc ID. Same time. ms/msD ceroviq sample 09NC MOCSBOI O9NC MOCS BOI fieldayo. OQNCMOCSBOINS MSD ms/msp RUN Aqtesolv on slug tests MWBB-3-1R = 9,7518 - A (sec-B,42 Ft/day 1515 × .027 = , 227 Ft/day = Velocity gradient,027 88-10-1R = = \$1,449 f f/sec = 12.51 ft/day x gradient. 027 = ,338 ft/day 88-10-2R = 1.916×10-4 ft/sec = 16.54 ft/day X gradient. 027 = ,446 ft/day 88-10-3R = 1.637×10-4 A/sec = 14.14 Ft/day x 027 = velocity = 382 ft/day

20MWI-IR K= 0.0-1.856×10-4 Ft/Sec =16.03 ft/dag X-027 = ,439 ft/day yo 43.71 20MWI-28 K=1.087 X10" ft/sec = 9.391 ft/day X-,027 = (253-ft/day velocity) 20MWI-3R K=843×10-5 = 7.28 FF/dAy X.027 =, 196 Ft/day velocity. Finish slugtests data reduction for day - Talkabout area for pilot study Field based on gu flow 1900 EOD 5 7/12/09 浩 Atten the Rain

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7/18/09 145° misty-hainy. 0630 thes meeting all hands in Camp 0700 talk to duill crew, will do borng between TP13 and tanget and as below. ITP12 6 TP13 == ICOSBC proposed plotara -C E Set transducer program to every 12 hosin SEMW-5 WL 9.04 @ 0900 0900 -Set up on FCOSBOI -2 heg in Book because of vany conductions - Surface disturbed soil w/ gravel & adolotes 0 v tight donse grave's & cobble w/ silt & C sand mating (FILL), auger tots C Run 2/2 x18' spoon @ 5' Ē 1030 Bow cuts 23.2 5-6.5 PID-25ppm fig 2250 - Bled - ISFis Did - 0 C C 5' silly peak, fives soft, dk ye burn, becoming C Itgy @ to - follow w/ 18" ss @ 65 push toget todepth w/ arrive head bents 6.5-8 1 pid- 20 Eax = 652 e seatto 72 shap contact a velon-33.41 C born clays truck form. Subly to 75 back to C S CE TOP1 m

Bel, augento el For next speon. 8-95 blow course -2,5,5 BZ-BKqd. E 8.5 It qu silty chay pid 140 Fid 1250 sil-mod plastic, und set, uniform, occ sig 9,5-11be 3,4,5 pid 2.5 - fid blog. to. 10' silty sandy clay a/2 becoming pred clayey silt e 10' - vuitorm, sl-mod plastic modert, tight, sl moist, portally frozen CIDE Break for lunch. 1200 back on location 1245 1250 Auger to 11° to take next splitspoon. 11-12.5 SS & 3,6,5 pid Bkg Fid Bod. 11-12.5 ~ partially flozen clayer Self snay IP m dkgy acc scatory throughout, no actor, acc yelbrn-ved brin ox zones, mod plastic, mod stt, st noist to acc partially thosen, doesn't appear sat. Augerto 12.5! Breathing zone while augening to 12.5' Big. 12 5-14 Blow cuts', duill 6,4,9 Appears slightly hander e 135 Avauel - gravel - masure Wi in hole = 7.5' Bar. no water in hole outil we hat H20 Backfill w Cetco medium chips to 1'DE surface. w/ 6 bags. 1200 - Avillers to decon. use brush to knock of excess, skrub w/ Atconox wash, Vinse w/ tepotable & then DI 1530 Spud ICOSBOZ augento \$1 to sample - All appears to end e 4º per duiller. wet cuttings C 4ª Seep? Rete in the Read

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610 PIP dvive spoon - 4-5,5 Blow cuts 1,1,2 22,500 4-5. Silty gravel, und a town, w/org and peat C 5° peat, dk brn silter IP, set, some diesel smell, our sand Blig for PID because of down wind of TP13, TP12, TP8 FID-117ppm. PID-2.58 Auger to follow up w/ sp 5.5-7'-BC, 1, 15.5 Pib 50 - FID 120ppm. 5-6.5 5,5-7,0 2.0-8.5 to No Recovery 6.5-8.0. Bit fell through peator set material to a SP - 9-10,5. LOST 7-9' - Driller will hang center bit to catch up to 10.5' Sample 9-10 Take sample @ 9-10'. Pid 22 Fid 750 Attole appears to be connected all the way down (HzO) Don't want to divag contamination Jownward SO TO hobe @ 102' To hole @ 102 1200 - Drillers to decon area to decon angers and spoons. 1900 EAT Pinnet Work on headspace beadings on samples taken from SBOI \$ 5802 1930 NOU GOD RASL

7/19/09 0630 thes meeting - Cloudy ~ 70% hundrity ~ 50° 0700 meet w/ Scotts Mank about punch listfor the day. 0930 Dusite Por SB03 - ICOSB03 adjacent to sto get saturated Feat for TOD study Auger to 7' for speen sample, lithology B' to east dess Boz which had a perchet zone @ 4º . This boring does not appear to be as saturated as the previous boring (SBOZ), Boring has flowing sitt which came in Strot anger 12 into sampler, pul and clean samper, only show shoe had day silt in it odor TID ICOSBO3 @ 11º - /ithology difference 120. from ICOSBO2 appears considerably different than last. Not as much saturated peat and mostly peat has becoming organic solt (or). - Hole is trozen - partially frozen@ 7 - dviller reports velatively titler zones which could be leng ky zones. - Take photo of nig - Take photo of back filling ICOSBAB with chips Go to conex to get bentonite chips we have -1150. planned. - Boving location for downgradient of site doesn't look good because of uneven ground, maybe put the soil boving just south of -K B8MW-5 Augers after removal are v have stained (diese! and silvy soil) Rete in the Rain

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1200 Break for hunch. 1300 Meet at site-mobilize to location for tcosB04, which is on east side of proposed C pilot study area. Auger to 4' to begin sampling E Sample 4-6 E 6-8 - lost 7-8 E 3-10 no vecovery 2 Water @ ~ 12 where it is most, saturated @ 132 - colled samples in bagging for to D study E E + Water in boring como up to 9,25' E when doilling is completed, appears. E as in SB- IcosBol that there is a head differential between the lower aquiter and seep zones above. -1200 Finish borning Drillers de con, backfull a sile using brustes to knock of Wibertomte excess soill, to drom, tash w/ Alconox chips and water, ninse with vater from C C 2 water source (Creek) that was E brought via water truck to site C in cubic - Return to office ... C C 1900 voturn to lab, vun headspace on E FID/PID. E 2003 Continue in part of log data, E C 2100 BDD - dullason standby for tomorrow E C

7/20/09 0630 H&S meeting all hands 0100 Wating on Corps to decide what they want to do about put ing in a lover completion to look at the lower confined evaluation and begin putting togeater spread sheet depicting lithologies and Seep convelation using test pit and soil borno data. 1500 but the OK to put in a temporany lower completion in a give discussions with mark & Scott decide to put lover

well completion in between 88 mw 5 and ICOSB04

Angento 5° to get through fill run spit spoon sampher in z'intervals From 4-16=

- appears moist @ ~ about 12\$ cap fringe 124-132 - Topon Saturation @ 132

Set. 006 slot screen 5' long. Sump. 172-172 Sereen Int 172-122 - 10/20 Sand. 172.102-3 bags = 3/8" bertomte chips. 102-42 - 4 bags. = H20 after drilling at n 22

- Dutter dec Dutters will leave angers on de compad for night, no Suttare completion as this will be a temporony well for nother

2000 - Return to oggine -

2300. EOD

J.S.M.SL

Rete in the Rain

7/21/09 0630 Has Meeting all bands 0700 het drell crew know we are putting them on standby, going home as we are not going to be doing anymore drelling right now - They will de lon & rig down 0730 Calibrate YSI for well development. 0830 Go to site to begin well development WL = \$COSBOS TEMp well @ 0845. prior to development, pull cap and under pressure - let equilibrite WL @ 138 Bol - Begindevelopment on Well name change to to muo! when installed sand and silt surged into angers up to 14= so the week is pretty dury, surge and pump with BK pump system. Continepinping and surging. 1000 Continue development on the well -1030 Get ok to install upper completion to look at seep zone with install near SB03 & ÷ SBOZ 1100 Well beginning to chear up. Dullevianger to I' to set well in (110 upper seep zone No samples 1200, ICOMWOZ - Set 2",000 prepart -Sump. 99-82 10/20 Silica Said 99. -32 - 5 bags -Soaking and desappearing into sloppy peat 3/0" bevolonite Emps: - 10-3= no surface completion as might be temporary well. BK pump makes very Develope w ittle Waten : Co. co-Al

7/21/09 Cont. 1750. Prepareto sample ICOMWOI FOR DRO/FRS 09 NEMECGWOI - ICOMWOI SAMPLE FOR DRO/ERO @ 1800 Mrs. 1 - 17 Amber glass pres w/ HCL Why gig using ministypeon pump < wall min phi 1900 - Finish sampling, vetunto office and take care of samples, 2000 Work on recording data on XY@ Dite. ALDO, EOD ALS 3 3 Э -D 9 5 = Rets in the Rain

7/22/09 0630 meet for HES meeting and temp well to out to sample semis-5 Paul wist at (YSI) 0800 Sample 88MW5 - FOR DRO/RRO, guick 2 2 2 1100 Sample Icomuoz For DRO/PRO/guck 2 1200 Lunch 2 Level Survey of existing wells, 1300 7 ELEV ELEV , m B STA ELEV EL 2 STA, T MB 67,29 INSTEM 11,69 10,93 W17 78.22 67,29 8.85 8.037.21 75.32 TUST 8811103 77.24 789 67.961 1.25 ,28 -71 8870L4 7.36 6.82 2 TOL 100 Mux 7.80 UNS2 617 12.17 11.17 10,18 88,41 7.29 6-29 68.03 885 Til 815 67.72 8840-1 7.08 6.55 6.11 81.66 2 260 7.04 TOL FCOMW 2 EST 683 ' 10.57 10.05 9.52 65.27 88 millo 250 86,24 C Pape FWST 67 9.07 5.62 8.18 94.86 2-88 73.17 2.15 (.11 C 20 musi 6.32 5.99 5.66 88.87 INSTHT 9.60 380 7.99 81.97 ROUK Inst #1 6.69 5.52 4.37 94.39 6.75 5.79 75.22 C 2.71 ,80 INST 47 287 2.26 1.66 ZanWZ 23.59 71.52 C STAND PLAS 7.49 Angel Inst 232 1146 1862 9439 6.31 5.14 71.17 SLAG E 881 8-37 7.92 121,96 2.27 645 73.44 INST HT 3.09 2244 3 3.05 2.77 253 BM 6.10 4.80 99,19 7.40 67,29 C Closed ENSI 07 1204 1128 1051 190,47 -4.28 324 22 26mw 107.23 C 1500 Return to office, download equipment e C C 1900 - Dinner (930 Returnand work on X-Sies for Corps e C 2030 EDD Barbl -

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7/26/09 0630 HES meeting 8. 0100 - Discuss plan for inpetion or infiltration gallery with Mark ESots Tooli & K falles, Target perch zone & top of peat. 0900 Go to \$8minos and do six drawdown recovery tests _ 2 e. Turtal Wel 9.20 TD 14.52 2 erocuate well let recover. Pun -2 1400 Rungtesole software to figure & values using 20% secony his that Tutel We 9.2, 90% = 10,12 DI - K = 6/11 64 / day DZ - . 555 Hday D3 152 DA 1562 05 1504 DO 1534 1600 Unlove freede prepare spreadsheet with K values, For site 1800 1920 BODRANSL F

7/22/09. 0630 HES Meeting all hands. oro, Talk about what sample intorvels. are to be taken during well custallation and sent out to labs for analysis. 0 800 - abo drum storage to get druns for entings for well installation. 36 - Well Installation. Lower well for injection well be setting into frozen silt @ 10° bg/ other adjacent well will be set a " high 9 for secondary injection of demad necessary. Rete in the Rain

7/28/09 . 0630 - HES meeting all hands 0700 - HAS meeting - AECOM, AEC AND Denali Duk/ Mob to site set upon 1st 0730 E MW in grid (COMW03) t 0800 Duill and sample for GRO Screen take samples for GROC 5-65, 65-75 E 72-85 - 85-95 and 95/09 E 1200 Break for Set well @ 105 E Sump 105-100 t Screen 10º-5º,006 prepack w/10/20 Sand t 10/20 Sand to 45 3bags poursand as we go out of hole w/angers E 30/20 Silica Sand to 35_ Neat Cement to 0.5 E 1400 move to Icomword WE IN FROMWOZ - 7 9 Bgl 7.41 6 Samples taken @ Icomword 6-7.5@ 1445 CIRO 259 Soil W/ 7.5-9= C 1500 90-95 C 1515 / 25 ml methanol in A set well at 10° 402 teflon septa jar. 2 -1600 WL-ICOMWO3 68 Bg1 C 61,03 59.82 WL E 59.82 59.82 MWOZ elev 1.00 6.45 6.45 MW03 1.13 1.01 where F13 5.30 245 60,5 61.03,0.89 + 1.0760.89 62.10 6.45 5.45 5 1.00 5.45 Shoot Toc 6.45 MW02 6.45 - 5.45 1730 5.52 6.45 93 mw03 5.52 - 5.76-5.17 5.17 5-38 MW04 5.38 : 7.00 1.07.

1/29/09 ELEV TOC MWOZ 5902 - 5.48 = 53.54 TOC MW03 6103 60.95 - 7. 4.64 -TOC MWD4 60,89 _ WL 7.41 - 53.48 tine between 324. 7.5' South --Startzomus Kaning all logging & 1030. Sampling done in Teono 5 7.5' 60 truck - will transfer boring log to AECOM Form I comwoz later Auger through Bill 1040 Rig down - shifting problems - needed transmission Aust 1050 Back to drilling 0-42 Fill gravel, #12"-2" croc larger to 4" 485 - splitspoon Blow onto 2222 495 gracel & silting evit - 73-250 gy ~ Fills peat 105-950 5-65 peat albindk bon, strongedor, still moist, fine peat w/silt 65 83 Blowcounts 2,3,34 5 8° 8° - 91 peat a/a - silly IP moist mod dense - rather sharpcontect 8° 8° - 91 th claye of FP may dry - SI moist - fid pid quit because of 5 procesticity ances to 9° for sugges well out tall 1800 Return to office - eat. -1830 Work on logs and tabel samples after Screening 2200 200 Rom 84 Rite in the Rein .

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1/30/29 Windy vaining, miserable netter 0630 HES Meeting. mars 352 9.5(TD must - 7.4! nin 2.5.38 MW5 WL 5.17 4.99 0.830 mob to mas 11-6 ZZIZ IN Fill set @ A? During angeving wert @ 3= to 48 Silt gravel - Sofurated 48 pear under Long Voulty head damp 28 pear under Long Voulty head damp Ľ E 2334, peat as above 6-7 Sat 6-8 Grow up hole 18 moist site y part E @ 8-95 dvill Gpoon 225 Blow courts Sump 92-92 Sump 92-92 Screen 92-42 1020 32-342 bags Stistmet well & 93 34/20-to 25 Plug - Reat ceased 1494 bag 16 gellows-E G. MW3 66.20 - 352=62,68 46.20-- to 05 2 MWS-6620 4.99 = 61.21 MW4-6634-7.41=58,93 muz- 50 6977 65.27-5.38 59.87 400 Use BK pump to begin development of Iconnort. pump 2 gallors to make well purged dry E 1430. Pour 2 gallons clean 1/20 used for decoming into well and surge. 1445. Pump well dry-abundant selt on water, diesel oder. C C 1515 - Spud MW7 Fill 2.3° 25-42 splitspoon Blowents 2546 25-22 Fill Silte gravel 21-36 mil clayey Silt; cold, tight, graino, to @ 38 - peat und birn, coarse to five silty, ou pebblos, _ "nod petodor, ice crystals visible

45-65 Blow cuts 6557 Blow crits display brozen peat, pet ador, silty IP, occ sand & pebbles, oce VEINe graned peat, while peats and silts Silts 55-65-65-85 2.3.41 recovered only le 44 (a<u>a</u>a Frozen to 75 @ 75 / coarse peat modset - sl pet adar. B=-10° Sp @ BS Sloppy peat wet and then m-dkgy silt, w/occ gravel to 11/2 water in augers to 6 after duilling hole. Btmof sump@182 . Sump 105-100 Screen 102 - 5= 10/20 SAND 10= 4= 3Bags. Stop for night will set vest of well tomorrow Am 1800 Keturn to office Prep Samples for Analysis. # OgNEMOCSBOB @ 1000 - GRO - 402 w/septa & Benzene. ICOMWOB 5-6' Peat DRO/RRO / Map. 1-802 clear TOC - 1-402 clean jar HOANCMOCSBORCE 1615 GRO-AKIOI dozw/septa ICOMW07 65-75 Benzene. 11 50 DRO (RRO 1802 Clean jar Nap. Toc - 1 toz clear jar Rete in the Rain

2/31/09 0630 - HES Meeting 0100 - Prepare for field work. Run 30/20 Sand in Icomwoz to 22 Bal, Grout to 02 w/ neat Cement & gallons H20 w/ 1944 bag of 2 portand cenent. WORKONWL Problems below C -62.47 - 59,90 42 3.13 - mw3 3,73 - MWS 61.51 MWZ - 5,37 391 - MW6 65,42 2 63.17 59,60 WL 6.74 - MWH 2 6634 6620 - 3.91 6327 60.20 3.73 61,51 5.37 2 6.74 3.13 63 17 59.60 59.90 E C 5 62,42 2 -4 59,60 e 6217 .7 261.51 59.14. 2 5990 WL MWWY - Shootelev god 65.41 Toc 64.82 5,68 2 WE ELEV 59.14 C 1000 - Dvillers working on sprface completions C do surface completions on Icomwor, Icomwob, C Icomwo3, Icomwos. - Lance developing Mwo3 and mwo4. C 2 1200 Lunch 123.5. P/U drums for soil cuttings

1330-begin anger Icomwoo Auger to 35 through fill to sample to 3 I Fill 37-45 m-dic qy silt. 45-6° Deat, v coarse w/ start stems throughout, 6°-85 Peat/OL org silt, moist C 6° 85-95- mc - makgy silt. Take headspace samples @ 45-5, 55-65 75-95 Finish duilling, TD @ 95 1500 Set well-Sump 10º-95 92-45 Screen, 006 prepack (Z"sch40,006 Serren inside 3' sch 40, 006 screen w/ 10/20 Silica Sand prepark, 10/20 Silica Sand - 105 - 4° - 3 sacks 30/20 Silica Sand - 4° - 3° - 1 sack neat cement 1944 sack of portland w/6 gas hed 1600 Finish well; set surface casing & cemend. 1720 Leave site for office 1740 Run headspace samples on Icomwood Samples. Depth F (D(ppm) 4555 1050 55-65 89 PO(ppm) 190 48 75.95 10 Send Phepane sample to ship to lob. 09 NCMOKSBID@ 1620 55-65 FLORWOS-FOR TRO/PRO - BOT jar Bonzance (SPO - 402 jav w/ 25 ml Toc - 402 jav clean Rets in the hain

8/1/09 0630 - thes neeting all hands 8700 \mathbf{c} WLTOC WL TOC LOC Loc 6.99 MW88-4 33.50 26MW1 30.45 10.74 MW88-3 22MW315.26 MW88-1 26.46 ZZMWZ 10.85 ITMWI 19.20 MW88-10 21.06 20MW-01 0800 WL MWY 7.76 MUOT MUG - 3.91 1103-3,03 C MWB-WRY (5.72) MW2-5,40 435 30 3.15 6 0930 Beginduilling ICOMW09 315 120 Drill and sample to 12º Dry to 112 then gravel which appears to be contining as in 83mw-5-Hold of on completeing well centil E Mark and I can talk about what we C want to do with well. Take FD and MSMSD C 55-65 Ros Lunch. 1230 Put dullers on standby until a desction can be made on what we want to do. Mark and I go over what is happening with qu. Do we have two systems we we have two systems we we have two systems 1600 Go aft drillers have them auger to 21/2 and set well. 125-12° Sump. 12°-7° 2" Puc Screen with 3" outer screen with #50 Sand inside (prepact) 10/20 Sand (3 bags) 129 - 65 30/20 Sand Y2 bag 65 55

02 . 6 Sketchof Well Network 185 85 -20 × 11 5 6 MURE 13 del. 1800, Dullers will finish well (Grout) F tomorrow BACK to deice 1900. Do headspace values from Iconwood. Depth FID PID 56.60 1300 180 450 60 9- -105 120 82 Pack samples for Analysis. PACK DANCADOGSBII FOR DRO/BRO NAD, Benzene GRO, TOL, 1 402 w/ septa MeOtt pues, 1-802, 1402 clear Rete in the Rain

8/2/09 H& S meeting all hands. 0630 Mobilize to site. 0700 Dullers grout I common to 05 of surface, complete surface and set Churst, Box Begin auger FCOIWOI-1000, Auger to 5° though Lel splitspoon samply de -72, 72-92 \$ 90-105 encounter ban gravel @ 72 appears dethology of hole is similar to Icomuos & tcomuos, Icomuos does not have inter mediole gravel 2one .. 1030 Do some slug testing on Icomwos. 1200 - Reach TD on ICOINOI @ 105 Begin setting well, is/ bob wine word 1300 screened. 10/20 Silica Sand 10# Go through logs of new for headspace 1400 readings for input in spread sheet. FD WELL PED DEPTH I PID 45-5e 490 93 ICOMW03 52 -62 307 2010 65 - 25 35 307 72-05 318 32 85-93 440 100. No Readings on log - flameout & norsty ICOMWOS 6-75 250 FCOMW04 1500 75-8-165 950 92.92 1-2-140 24 45-55 ICOMWOB 190 1050 58-65 17 B9 75-95 48 10 145 4-5 ICO MWOG 42 5-6 1630 124 35 6-7 116 55.65 FEDMWOT 650 50 65-75 229 1150 72-85 114 720

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1530 WL 7.08 in 100IW01 9 Dullers setting surface & asing in IcoIulo! & ICOMWOZ. New casing top TOC FOR ILDMWOZ -64.23 FOR ICOINDI-TOC-6658 ICOINOL - GED 66.76 Survey of Wells with elev. Arwes-LOCATION ELEVICE ELEVGED 67.72 88MW-05 ICOMWOI TOG 6803 67.61 67.52 ICO SB04 TPB 68.86 67.84 TPIZ PD ICOSBOI 6673 66.20 FCOMW03 66.52 -66.67 ICOMW05 66.20 64.55 64.23 = ICOMWOZ 66.34 66.64 ICOMW04 nnnn ICOSBOZ 64.56 ICOSB03 64.52 65.41 64.82 Icomwo7 ICOMWOS 66.30 66.57 65.42 65.59 ICOMWOL 66.58 66.76 ICOIWOI 66.45 67.00 ICOMWO9 = 1725 WL ICOMW09-9.28 BGL TO 12.1 2 1 Headspace Samples ICOIWÓI PID FID DEPTH -1450 280 5-70 72-92 = 140 28 1 3 Rits in the Rain"

8/3/09. 0630 Hts Meeting all hands Ores work on getting all samples ready to ship. 0930 Work on updateing spirad sheets for TVA data & For elevations of Bornigs and monitoring wells, 200 lunch 1300 Back @ Isco Site, Conduct drawdown tests on TCOMWOS and Ico MW07 1700 complete drawnown test 1800 - To office 1900 Clean up equipment postcal BNA after taking hadspace readings. Etx 44789

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8/4/22 0630 - HES Meeting all hands 0800 Prepare equipment for field, download photos, 1045, Set upon muor to take another drawndown test. WL- 5.70 5.70 ICOMNO9 appears to have a schedule SO seveen as the BK will not fit down to also is packed with 450 sand, Kuntost Icomwor Test 84 - did not have pump in but of note. Recovery very fast. Run new test ICOMWOTTEst 284 1200 Lunch. WATER SAMPLE & 1545 OGNCMOCCTWO34 Rus 8/4/09 1350. Start Purging Iconwos To 6- 40ml vials w/ UCL for GRO ALLOI, Benz Naph. 2-1 It Amber w/HCL FOR DRO/RRO AKLOZ /AKLO3 1-250ml poly - Sulfates 1-250ml poly w/ HNO3 Por metals 1600 Start Durging Icomword for Sampling Sample # EGNCMOCGWOHOS Rus/8/4/09 C 1730 TAKE dentital sample sweet a/a. 1800. Back to OFFICE 1900 PACK and labetamples for Shypment. Rete in the Rain

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8[5/09 HE'S Meeting all hands 0630 repare equipment for days 0200 repiter Sampling and Sevelopment 0800 - Download camera w/ photos, townload gps date from seto faken yestedaj 0900 - To site, gather bottles for what Sample from TCOMWO7 We in stramp well 245 Toc Furge well, see Water sample data' Records Sample Icomwo7 Sample # OgNCMOCGWOB 1130 * ms/ms to -ognemocarwob ms/msD. each sample containers 6- 40 ml vial Hel pres. For GRONKIOI, Benz, Naph 2-1 It Amber Hel pres Por AKIOZIAKIO3 DRO/REC 1-250 ml poly - Sulfates 1-250 ml poly HNO3 pres for Metals 1200 Lunch 1230. PACK and prepare above sample when ship ment goes out. 1400 At site to sample I thommost & FCOMWOG. 1500 Sample Ico much w/ perstellic (glopump, because of recovery issues. 1-250ml poly for Sulfates 1-250ml poly pres w/ Haloz for metals 2-1 It Amber pres w/ Haloz for DRO/DRO AKIOZ/AKIO3 6-40ml vials pres w/ HCL For GRO, AKLOI, Bewzene Naphtalene 1600 Begin sampling Iconwob, it was Duroid dry (* 1030 Am. Sampledusing ceopung (peristaltic) Sample # OGNCMOCGWOS 1 - 250 mil poly for Sul Catos 1-250ml poly pres, w/AND3 For Metals 2-1.17 Amber prew HCL For 500 A12102/AKIOS. 6-40 we vials w/ HCL for GROAKIOL, Benzeng Napthabene.

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8/6/09 0630 Htts Meeting, - Security to vietion, 0800 GET PACKED to leave, closin up office Meeting - pre-injection w/ Bristol & USACE. - 1+ \$ of Chenicals usage.

Reto in the hain

NECAPE - AEcom/ Britol 9/11/09. Cont. 9/10/09- 41 NECAPE 0800 - Leave Palmer to A FCOMWOY TCOMWOY Anchovage to they to Nome. 1020 WL 7.65 9.70TD 1100 Purge. 09NCMOGW44 MARIA - Sheen on WATER 1200 Meet Anon from indial ABCOM, Evic & Rassell From Temp Cond DOM pH DRP Torb Time The 522 .517 1.05 4.96 47.2 1105 Bristol. Well Dry 1110 569 .584 2.97 5.32 40.2 7.84 1120 surgetital 1300 Contact Derson in Nome 5.51 .610 1.19 5.56 331 6.64 1130 who has equipment left 5.39 ,597 0.79 5.65 34.8 6.25 1/40 behind on last thip toruse in field effort flus round Inventory and then go to Bering Au to please on equipment there. Sample C 1140 purge total Goet eventhing heady for tommo of 2 gallons Took voes e whome I ming had to 1600 EDD wait for vechange, lower purp to 9/11/09 - Go to Bering Awo 080 btmot wellyligto NE Cape, get there sample sultate & we talk @ 1200. about @ 900 - transport supple Bagin DRO/RRD @ 1210 - No water, 29. and equipment to site Aeron and I peurge wells for voter Let recharge and come back Sapuples - Evic soil Sompling

9/11/09 Cont gulog Cont 1220- TO MW03 - FCOMW03 WL 4.38 9.50 1335 - 5.35 WL MW05 8.457D WL 4.38 -Icomwos Temp Cond DOMPH, ORP, Turb Tone Temp, Coud Dore pH ORP Turk Time 2.274 3.88 3.45 322.2 17.6 1845 7.76 1. Hol 3.47 3.75 2783 6.75 1230 Deck 7.66 7.94 1.668 0,94 3.82 283,5 6.09 1240 WL4.8 2.261 2.69 3.46 324.6 16.4 1350 8.27 7.93 1.771 0.87 3.81 284.4 4.05 1245 WL4.9 7.95 1.825 2.81 3.56 313.5 16.1 1355 8.68 1.787 0.47 3.81 287.9 2.99 1250 7.70 1.768 2.89 3.58 306.5 16.1 1400 7.54 1.792 2.81 3.58 301.5 16.0 1405 1230 Jurge C ~ 100 ml / min, water appears color tannic, some diesel ador. clear, st taunic, no odor., st form on water. purge e ~ 100 ml/min surface when going in bucket Sample @ 1405 well du nese vechange Sample @ 1255 Sample for DRO /TZROE field parametes @ 1515'-2-1+ Amber Deopero Helpres 6. voc 40 ml w septa w/ Itcl unable toget all sample 1- 250 ml poly Volume, pump up into tubing pull pump and drawn water 1.250 ml poly w HNO3 1- 500 ml poly into lostiles, for veryaning taugles 5129

apujoa Cont Arvon's taking remaining well water samples as most are low becharge. 600 Help Evic pull soil gampes and prepard pack them. 1200 - Pack up equipment and transport back to airstrip, run purge water through GAC, logal plane and blead back to Nome. ~1800 - Arrive Nome, unload, will come back to mover. and sout equipment, take samples that will be sent to lab as well as volume analysis to Hotel. (900 60D)

9/12/09

and Russell in old bar of Hotel and setup so Apron cannot Pield paramiters of water that we brought back from the cape. Eric and I work on packing samples to be ent to laboratory for analysis.

has all his sample excess ready to ship to bb.

1600 Coo to Bering air and Sent out equipment first needs to go to Anchorage 22 Support Scott IN FL

1000 Arrive on SITE @ 1630 Site town with Mark, Dinner 7/30 review paperwork and geology to date 0800-Au to 1200 PM THUN Arrive Nove ADE GARS HOU WAITING GAME UNTIL 1530. Fly to site with chow /concrete thedic kerin Day 01 WELL DevelopEment ISCOMWO3 + ISCOMWOS-MWO4 7/31 AM WA CAL, NTU, POST CAL FRI SAT Continue WELL Developlement C 8/1 Am/Am CHLIBEATION continued were DEVELOR open t. Brown (Pent) (Gray SILT) WORK THROUGH INFECTION WELL LOCATION WITH MARK POST Durver They bedded Roat + SILT, confined Augure is toug tuff. Re Layout and survey MW, SELECT 1 1 1 Injection well location " continued developenerse Isconwold & Isconwos WELLS req. significant sur 6/BK swab/ ballasting on bouncing bailer /BK out tube, pumping + recarge 8/2 Sun 0630 pm meeting back For Dinner 1800 - 1900 paperworks CALLED THE GILLS 33 Developement @ ISCOMWO4 AM ISCOMWOG, 07, ISCOMWOB has Hole Ancheck. This well was dry at the previous stiften check. 1300+1400 chuck hanging ont LAST WELL ISCOTINOI installed @ 1/ 1500 # 48 hour waiting period. Sprayer broke, firied the low flow controller. wrap-up C1700-1800 Valary stopp stops by twice. Done with Drillers put up rig. / Very Nice day. UUUU POST CALIBRATION Rete in the Rain

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	WELLS	+ Volum	e Remo	UED BY	DATE	<u></u>	
	ISCO MWOI	MWD2	MWO3	MW04	MWOS	MWOG	MWO7
						1.4	
7/31							
2/1	-					S. A.	
01						100	
8/2						1.0	
8/3	-						
						S. Caller	
8/4							
					1.		
					2		
	MWOB		mwog		ISCO.TWO		
	14(14000				4300-1001		
					and the second	I	
							for the second
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8/1	1546 0.	.)] [A. TER	Mar. 10 2 M.	105		17-118
012	WELLS RO	by to an	yole + su	14100 5, 141	103 e		
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5	1.1						ALL N
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States - Section and	and the state of the	2 - 14 - Contraction	the state of the second state of the		and the second se		The second s

8/05/2009 1245 8/45/2007 0905 453 07 2 Done 3.07 63 E 7.78 7,33 04 Done 2,95 2 05 5:25 4.03 66 1 5,68 07 1 8:16 08 3 09 7.86 7.80 FWOI 5.02 2 MW06 5/04/09 PM LEP = 55gal 1300-1900 2 PH Tud/Do Temp Time Vol ORP Cond DTW 2 12,50/22,1 5.26 5.92 0915 In fich 4103 119 6.169 E 21.01/ 8,62 5.28 1.5g 2.0g 5,86 172 6.80 0945 0.161 38,1/9,79 4,53 176 830 6.00 0.170 E 1005 1025 2.5 147.8 53,4/9.60 5,24 8.45 6.15 0-178 2 8.80 Dry. 1030 2 148.1 16 5.94 0.179 13.1/9.65 5.21 1400- 1.0 8.85 2 1500 2 2 B/04/07 pm LPP = 3 gel 1301-1400 Intal 168 7133 5.84 0-236 7199/9.98 4.1 MW04 2 0920 189 9,00 5,71 0.218 1368/12.283.64 Dry252 5,73 = 210 13.70/13.01 4,13 1.0 gal 0948 2 1.5 189.8 1000 2 LOW FLOW Purge Dry = Recours HALT 12,10 19,65 4.14 1:0 187.4 5.79 0.179 1400 -8,45 1500 2 INDI N SWAB 15 Min lange bail Removed 5, Ogel 0920 0985 Recours set pungs 1000 pumped off I gallin the Dark gray. 1000-1200 pumped off 3 gallons w Recovery of 1/- 40 min Diegron E -E 1200-1245 Lunch & Recourse Continued recovery 04804, snige + baile INOI, 09 Esurge 8 1245 1300-1600 surge beiland primped removed 10 gallonse INDQ NWOQ Surged + pailed I gal per hour 1400 to 1200 total 6 C = 3 gallins

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" The second sec - Spenno hig vos ou the bostime + How on "Shal The suppose/ 10081 June 610 used as a verbacement total verrough & le/2000 MWOZ Will be Musn't impound JODO RUMPORT duy 30 golon - Hr Sparm / 009 2,000 to 1, 69; 8 51. L Stb! this wells recharde 4210 LAY 1:10 - 2524 MAP 2081 HW/m \$ 77124 0001 0 Ex/ 4 00/1 - 2051 ·s nollars. LF= Low Flow-7-520 melt may dund 32E1 24 5251 -7 dury 4 times that rear is 1300-1800 Dumbed dey 588 2221 50'01 2251 Dry pumpet i gor. 5.4 640 571N 7:4 27 37 35m הזר רוב לב מיוד ותבות א 1080 Sart Durch LE Typica Bond tasts 0011 sound fores show 100 banw IOME BOMW ,90'5 pmt 85'L. 30 125 80 CL'S 20 265 10 3.10 50 USL he 518 60 55% so my 201 a 1 MIQ STANT ZIFLYM 5101 22 5 2 Survere clush have a truch 2081 mile thits button med additional ou sumple each lothin for Buseling contener your porter plan and and plan an an 0030 In form by adail 0155 1208 0 and sim noise prov 05.70 10 90-9 1830-1930 fost att 451 Papuro la. 1800-1830 Dinner 0031-0091

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8/6/2009 Cow Sampling, over the sampling & mwog will be completel \$17/2004 early am. 2-250 mc plastic metale E TTOL will be collected, & vol's 6-40 me lans -Minion was now thoir purces pry +1- 4-6 times 2 during an avoirty paratines, and How op. 2 Sample collecte 1 MWOZ replaced proposed WP LOCATIONS MWOS * MINOR was developed prior to my appille for carly site characterization + Location selection 2 2 IF purp Aniled to meet NTIL'S, pumped dry Clow Flow proceeded with Surgae 2 collection. Sangles were still the Turped 2 Collected 802 + ALL MW02-09 For Fe Field Kit. C 1800-1845 Dinner 1845-1950 site over view with Money + Ferry (USACE) Ż Clients Clients/Client, z 1845-1950 Collect 2a'dd itim Vol @ EAD/1200 2 8/7/2009 complete samples & Icomwoz - 2 & 250 mc Polys + 6 VON'S GRO/VULS/19KIOI 0830 C 0900-1400 mise down load Winsitu etc 1400 - 1800 WATER LEVELS & Troll Deployment see C back of Book for the Levelst mis Defor C 1800 Fuse publicos, Pre maection festing delayed Ĉ 1800 - 1900 DINNER 1910 - SAMPIS prep for Lab submission E Fixed sprayer, water herel indicator. Ē DOST CHARIBRATION ((2 E

8/08/2009 0630-0700 Am meeting 0700.0000 peck 3 coolers For Lab possible plane to Un R NOGE To day, BOO Cear up LOAD supplies moto to well Fires when levels & troll down Load, check date Storana restart dest. Loc 18x DTW 0840-0318 0 420 events 1, 2, 3 3 4 MW02 43.70 9.48 MW02 4.70 mwo - 3.34 24 2,35 0.5 noo 4 7.55 # 4 A 0.46" MWOS 3.48 mw06 3.80 MW07 5,74 MW08 7,55 11w09 7,36 \$1.00,20 MW88-5 9,27 Tread ability sample well Rockst 8/8/09 1: pm START & MW69 LDTW 7.46 Temp 1.56 DURSSAURE STOPPed 1134 MT #142308 tvall # 3.48 WWOS LDIN 316 Temp 3,18 Pressure STOPRED 1239MT 5708860 1236 #14336 Trall# 1 108595 LOTW 3134 TEMP 3,033 pressure 2.647900 STOPRE WOLMT × stat2 pmint Note down load time 1800+0 1300 = 17 Hog= 22 monutes. Rete in the hain

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0	the alas	EL Luster	DO (mg/L)	off	ORP(WV)	DEPTH	MEASC
	TEMP(C)	TEmp	Do (mg/L)	ORF	20		-
+++++++++++++++++++++++++++++++++++++++					1 5		
MW-067	5.74	89	7. 5.78	6.32	218.2	DTW. 3.85	3.84.1
		127	2.00	7.14	218.5	MIDDLE 6	.7
19, 43	3,55 2.39	120	0,90	7.48	217.4	BOTTOM	8.2
X	15.					DTW 4.71	
NW YU CI	3,50	112	3101	6.62	239	Sits C	5.0)'
O PM	3,19	132	3417 1,00	7.32	202	6.5	
160 PM	1.53	131	0.78	7.51	201	5.1	
A DECEMBER	1	0 0	4.87	-110	1-1	1	TYPE 2
Minofil	0182	2.0	1.08	5.40		6.0	5.72
TO AB	0,93	185	1.20 +0	7.05		7.9	5.10
Ve XO	0.62	103	Into	7,14	106	9,9	
MWOB-		10 10 10 10 10 10 10 10 10 10 10 10 10 1					DTW 7.22
T		163	1.86	699	192	7,45	TD 9.35
1175 8	0.53	158 1	2.20	6.03	193	8,85	
1625 B			Constant and a second			V	
The second second			ry shilog	The second se	A 11		and the second
	Round	#3 rene	dings k	reginit	15 1-	715	
Lochime	Temp	ic m	the Do	PH	ORPINU	DIW	DTRad
1	1 1 1						
MW03	1 11	A2 7			2411	1	
T	6.97	133	612	6.69	273.1	3,22'	4.75
Non M B	4.76	136	1.00	6.64	189,3	+ 11	6.75
(X B	2.884	128	1.36	6.30	188	Troll	\$,75'
mwo.5	1000						
mar	17 211	A110	74 46	c/2	668.0		4.75
9 1	12.04	9110 9456	34,00	5.17 5.47	670.8		5.85'
Xª B	8.12	8540	38.60	5,59	654.3		7.85
	VIII			,,,,	6545		+182
MWO 9	140	5146	9,51	8.16	306 .		
Ť	1.89	1 MSMS	9:50	5.34		\$ 7.60	7.008
M	1.53	142	9.51	8.72	330		4009.0
B	1.30	135	10.88	2.4	285	1	11.00
S. State					B		
1.1			A PALINA			4.1×	1.00
			1				11- 1935

		Buseline.	16	10 12 01	363	1	43
	- AND AND	Ser States	- 1825	69	8/9	2005/	07050
C. P.		\$/5/09 0900	- 1825		0705	1 18	1200
MWOI		9.48	9,46		9.48		9:46
02	9.48	4.20	4.70		1 470	19. 1 2	4.66
63	4.20	3.34	3.24		3.35		3,17
04	3,54	7.55	6.04		6,58		4.16
05	7,85	3.48	3.47		4.39	황감	4.16
06.	3.48	3,80	3,71		3.84	33.1	3.82
07	3.80	5.74	5.68	N. Lan	3.70	5,70	5.67
6B		7.55	7.34	- AND	7,19		7.13
09		7.36	7.40/		7.68		7,70
IWOI			7.40/	55 100	948	8.11	
MW88-5		9,22	9.21	11-04	9,24		
8/9/2	and a	Road	Round	#3 Cont	Aund		
Lochin	e Temp	EL (ms/cm)		PIt	ORP	DTW	DT Reads
MNO4 F	1.83	(35	9.10	7.18	10-10 10-10 10-10 10-10 10-10 10-10 10-10 10-10 10-10 10-10 10-10 10-10 10-10 10-10 10-10 10-10 10-10 10-10 10		140
T	2.88	Insta	10.13	-5-27-	242.1	6.42	6.40
100 14 0	1.80	132	7.98	7.07	244.5		7.00
I B	1.77	157	7.44	7.22	222.9		9.00
1809 M 1809 M B	6,41 3.47 2.17	132 128 119	1.115 0:51 0.66	7.83 8.52 8.82	216.4 202 204	3.72	4.40 8.40 8.2
MWO 247	-						
1825M B MW07	0,96 0,74 0,60	83 83 83	2,48 1.50 1.12	9.32 9.61 9.78	63. Z 64.0	5:68	6.5 8.0 9.3
1835T 1835T B	4182 4,18 1,49		1.47 1.12 0.62	8.86 9.04 9.66	157 154 144	4172	5.0
MWD81	0,58	161	1,96	10,19	135	7,16	8,00
1845	Clean	up site	Molo to	shack	Avon 1	twives	

8	110/2009	Zund	day In	rection			
Loc/Time MWUS 125	Ecmp.	E4 m5/0-) Do myle	<i>PH</i>	ORP (MV)	DTW	DTRd.
Top Form	24.75	22.33	46.51	-6.43	58 1,8 583 580	Troll	3.0 5.0 7.4
Kalus			n	- 1. A			
NW03/1 XTOP B	11.98	0.387	5,55	1,22	4.07,4		4.0' 5.0'
all a second	and the state	3,820	6031	1.55	580.5		8.5
MWO41 TOP	200	0-143	10.71	6.61	185.0	6.50	7.0
B	1,25	0.15+	6.31	6.85	1481		9.0
MWOS	1326	0-225	2,79	7.41	194	7,05'	7,30
Bortov	r. 6.63	6.173		7.31	172.2		8.50
*MWOL	622	4.023	3.43	2.24	585	3.68	4.0
Bottan	3,70	5.912	1:50	2.60	632		686
MWO7	1337 1,62	0.216	2,51 7.51	8.66	4.01	5169	6.75
_m°	090	0.193	2.12	8.43 8162	10.5		7.5
MWOZ	- 1349 Le.15	0,134	1.85	8,56	167	4.61	5.0
mid Bolt	2,40	0.156 6.140	1120 0.94	7,92	120.0		7.0
MW09 J Top	2401	0.154	15.31	6.86		7.40	7,8
M Bott	1.477	0.142	11.30	6.86 A.7.58 7.50	213.6	-	10 815 11.00 24P 10.5
	21						10.5

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Sunday 8/9/2009 2145 Logger Jest stops + reformat For 8/10/2009 injection + baseline. MW09 start time staf s/10 1 An #142308 Water Level 4. temp this Logger thenes limited memory 11 Homezoser < MWOS -il-Water Level _____ temp____ MW03 1240005 Water Level _____ temps _____ de-System settings data collect DTWA, + data points every 20 seconds. ALL Logger notes Co spille Formwos 1300 direct delivery of products T -

	Lemp	mskin	-mabl Do	PH-	ORP	DTW	DTRd_
Loc/tim Mwost	no rea	EC dages da	DO 12-70 (20)	o direct	product a	felove-	
MWO	3/1600					3.25	
TOP	11,96			1.45	541		45.00
mid	4181	10	6 8.40	0,05	581	5 1. 5	Ce.5-1.00
Bot	- 3,69	4.7	3 8.11	-0,49	580		8.59.00
Mwor		2.4				6.49	
Tot	0 2.09	0,138	10.01	5.00	197.2		7
J M	1,41	0.161	8,00	4.98	162		8
Bo	1 1,23	0.167	6,20	5,3%	144,0		9,5
MW	06 1619-	1625				3.62	
	8,40	5.091	3:02	0.91	624_	213142	4
Mic	1 3,82	7.54	3.04	0.77	631.5		6
	+ 3,21		1,32	0.92	6300		8
MWOT	1676-1	636				5.65	
TOP		0.198	3.08	8.54	17:3		6
m.c	d 1014	0 195	2.07		16.6		7.5
Bott	6.1do	6.191	1.60	8,74	18.6		9.0500
MW02	SOAY	sy water v	NASH PH	11.00 /50	witche	ven 11.	00 Phits
				12 12 1 10 M		4.64	
J TOF			2:01	8.40	175		5,00
♥ Mid Bott		and the second se		8:73	and the second se		6.50
pen	1,39	0.140	4.37	4.35	113.0		8.3
PALAM	ETEN MEADUR	ements in s.	KFACE NATER	ports un	EAR 150 IN	DECTION AN	.e.4
TUGAT	TION TIME	TEMP 1	nestan 00	PH	ORP	- 2-102	
POND A	1800	15.78 0	,082 6.70	8.05	250		
PLUP E	3 1805	16.55	6.35 20.6	5 7.37	566	SURFA	1.
forn a	c 1810	16.30 0	0.195 23.	01 8.08	70	W.97.	ce T
POND	0 1820	22.01 2	0.112 18.	19 8.05	75		K
						Å	1 TA
2.4						C	VU
						(10)	J.C.
4						B	& CONEX
					R	-AP	
		1	ALL-ACACHEA	he hain			

Tuesday 8/11/2009 An replace pumps + Test parameters shall next page-Temp EC DO PH ORP PONPB 16.89 6.669 1.4 1528 1.46 402 12.37 0.094 3.54 PONDA 5,28 148,3 1540,18 PONDAB 19101 7.051 0.92 2.21 3.18,3 1622 ADR - POND KB 18:49 6:611 0.96 2.26 312 1636 See previous page for site Map of these ponded water Location. bubbles of oxidant was observed on 8/10/09 @ Location B. Location is is add booken clay tile + sheet material possible culuit exit.

	Temp	EL	700	PH	ORP	DTW	DTR
Loc/Time	- C°	. Mgl.2					
			01				
MW03	1542 /	Logsen				3.46	
-	12.84	3.487	0.70	0.99	598.6		4.00
SYM	4.90	6.040	0,87	0.47	599		6.00
V B	2.96	6.437	0.84	6.22	595		8,50
MWO.9	1520		· · · · · · ·		+	7,38	
MWO.	1.96	0,148	8.65	5,44	163.1	11	7.6'
VA	1.84	0.146		5038			5.0
N M	1.32	0.143	and the second se	5.51	180	(F)	
	MOVE		in downe	1524	./00		20 gri
MWOG	1550			1.5 4 1.		4.10	4.5
10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	5.08	16.53	1.70	-6-11	513		44.5
1 M	3.80	16.11	1.58	-0.05	514		6.5
B	3.54	1815.87		0.08	514		8.5
		1-1-1-	1. A. S.	X			
mwo2	1558					4-71	
T	6.37	0.124	1.61	5,7 50	145.9	1.121	5
Vin	2.14	6.159	0.76	6.11	58,1		7
B	1,79	0.153	0.86	6.23	98.7		18.2
1							
mwo_4	1617					6.35	
	2,57	0.121	11.2,5	5.50	205		6.5
JM		0,140		5,72	152		7.5
B	1.34	0.161	5.14	6.59	120.1		9.0
	Ker-				- C.G.	11.1	
MW05	1630	- 1640			namet ys	23.74	
IT.	21.45			0.43			4
♥ M	12. 44	the second se	28.58	0.78	495,7	33 3kg	- A second se
в	11.423	28:01		0,73	497.0		\$ 7.0
11	200		26.01			e 10	1.1 -
MW67	1700	207	201	1 - 7	100	5,69	60
VT	1.45	0.207	3.26	8.57	10.9		7.50
M	6.65	6.194	1.77	9.76	- 9.1	=	9.07
B	070	0.193	1.69	9,78	- 8.4	100	9.0
MNO 8	1735	C 141				6.92	10
J .	1-50.81	0 181	1.81	8.46	108.3		7.0
ß C	7.63	0.172	2.02	8.42	119,1		1.08

Attenthe Real

88-5 14/5 8/12 Trolls MW05 TA.16, PZ.16, LD 5.068 0817-21017 Down Load new data de 30 sec. MW09 TISZ PI.66 LD 5.201 Download ALL DATA & ZMM. More to \$8MW5 Ê T.1.15 P. 2.50 LDTW 5.78 0839-1039 E E MW03 moved to unot then stopped test @ 0848- 1049. Poun look ALL DATA @ 1.54 min C new teste must 2 MW04 MW04 8122009 Phase 2- 10:53=0853 Temp 1.93 Pressue 1.31 DTW 3.022 2 * Sampled MWORCOAD prov to injection CMWOG 2 2 2 Insita YSI Water Quelity readings coverspond to Supection at the t Converted MW09. INTection T will take place througout the days FILLO Test Kit results are contained. Avons book, when junchs there west wit samples were collected 1 E

Fujectione FCOMW 29 ± 0930 PH ORP Loc/Time temp DTW DO DTR EC MW04 m S/cm 6.27 0 for T 6,25 185 2.54 5.53 7,0 0.147 -1,89 8,4,68 0932 M 5.55 0.160 8.0 181 1.77 4.16 5,53 177 9.0 0.160 -11 MWOS 3,70 370 473 20,58 8.65 4 MV 25.67 8.16 = 18,06 8,90 11.68 23.10 477 6 0189 8 5,37 6,70 25.05 28,10 487,3 8 MWO 1 9,33 5.92 2,10 0=103 7.02 2627 9.5 T 0.079 4.40 11.5 0948 B 1.76 6,97 234.5 0.079 0,79 13,5 1.66 694 211 = \$8 MWO 5 9.03 Louge 18-212 1.06 0955 m 0,99 1000 B 0,99 1000 B 0,94 1000 B 0,94 -47.2 8.08 R. 38 9.5 0.18 7,55 0.177 - 20.0 11.0 13.0 7.42 0.181 -7,7 6115 = MW08 = DRY UM == 41010 B 1 1 INNO T 5.65 0.27 7.52 -48.4 1,57 0.235 1020 1 6000 = 01217 - 30.4 1.30 0,22 7,26 14 8:00 0,213 -21.9 b 019 DIZI 7,10 Revuen I ALL SWITE HEd meterduc to - ORP in was H. bucket MWOT 1.08, 0208, 9.14 7.01 -11.9 AOK ON NOS. 0207.01 -11.9 SP/MH 1034 M 1034 Crally in Ground / steam ISCOMWOI JANN09 1031 - 1120 Review Torolls. Rite in the Rain

		· · · · · · · · · · · · · · · · · · ·					1
1/20						13	
Intra	· · + · · · ·	FC	00	PH	MA	DTW	DTR
LOC/TIM	e temp	CL	00		Cru	0,00	211-
100.6						295	1 10 10 1
	abil	1 27 11-	3 12	1.99	464.9	3.95	110
1125 M	9.64	18:47			463 g		
	6.22	19,24		1.92	+++5:0	AL A	6.0
B	3,01	18,06	2.17	1.89	468.0	2-5 F	8.0
1							1.001
MWO-2	- and			7	1.4	4,40	11-10
T	5.882	0.155	2,90	6.07	14/21		4.75
135 m		0.167	1.44	6.57	80.0	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	5.00
VB	2.03	0.164	1,33	6.67	75.0		8,00
			Ś.,		100	6	1
nwo3	(19.	4.468	1.42	1.90	663	5.74	
T	5	4 2+9			7	2	3.5'
140m	10,88	8, 22415	11.12	1.85	593		5.5
B	5,84	8. 3343	1.09	1.95	565		7.5
1	-	NA -		- <u>M</u>		- Andrew	Sec.
nwo-4	3,07		Sec. Buch	S. 2.		6.15	
INAT MAT	3.07	0.148	11.00		17.7	and the second sec	7
IM	1.76	0.161	5,01	6.30	124.7		89
1º IB	1,50	0,168	74,3.76	6.28	115.0		9
110			(1.88 200
MUOS	8.35				5	2.95	Sea.
153T	21.88	24.20	13.70	(.31	461		4.0
MU	12.07	22.74	19.63	1.34	481		6.0
ISUB	5.33	23.38	34.00	1,19	484		8.0
100 8	-				······	8.25	
1							
1202m	2.16	0,155	3.1	7.10	104.4		9.0
VX					1		1
					+ 1. V.	ASE.	
nwo 5						8.75	
1-	1,29	0.172	28192	7.48	\$4.75		9.5
2 im	0,72	0.157		1 1	77	81-35 C-15 S	11
20,00	0,69		17,53		1 80.2		13
10.	0101		1115	4741	1 493	Jan.	. /
(D)		ar i			1		
(5.5)		Sec.					
10							1

Loc/	Temp	EL	Do	PH.	ORP	DTU	DTR
Fime	0,84	0,163	12.67	7,51	35.5	5,36	6.00
No Top	0.73	+1-90,205	251.71	7120	39.8	5150	8.00
213 Bolt.	0.71	0,204	1.71	7.20	39.4		9.0
10. 10.11.			1-1		2.1	and the second second	1.5
MWOG	14:45		11 .	100	12.19	3.70	4.0
0501	12.75	0.278	8.00	0.85	459.5	3,70	4.0
KS/M	7.45	19.32	2,26	0.70	454	3.70	6.0
B	2,21	17.57	1.40	0.58	469	3.70	85
	10.10	V		1. 185 N	125.22		
MW05	14:40			1. A.			
, T	3040	15. 8	8.5	1.5	483	2.7	3.0
MB	21.52	25.65	13.65	1.05	485	2.7	5.0
	6.30	22.40	34.12	0.78	477	2.7	7.5
MWO.8	15.05		A BELL	N PA	May Street		
JT	1,74	0,2.04	3.25	7.19	89	7.81	8.5
M	NA	NA	NA	NA	NA	2A	NA
Iw-01	14:30						
1T	44.45	63.04	1,39	0,21	693	3,8	4,0
VB	19.50	46.99	3.63	0.27	688	3.8	9.3
M	29.25	52.75	0,53	0.18	691.5	3,8	8.0
MW-07	14:50		ST. Taktan				
17	0.88	0.233	4.80	6.85	11.4	5,50	6.0
VM	0,97	0,220	2:70	6.78	10.7	5,50	7,5
B	0,76	0.211	1.48	6.81	15.9	5.50	9.0
mw-62	15:60		100 200				1
T	6.62	0.132	4.60	6.99	174	4.48	5.0
JM	2.65	D, 170	2.30	6.46	90	4.48	7.0
B	1,86	0.167	1,21	6.45	35	4.48	8,5
8 mld - 05 28	15:08		69.00		3 hes. 2		
, T	0.78	0.149	72.00	6.54	138	9.10	7.65
VM	0.76	0.144	63,00	6.06	1.49	P40	11.0
B	0.73	0.160	56.00	6.02	145.9	9.10	14.0
second not	@ MW-88						
B	1.08	0,162	46.00	5.50	285.2	9.10	14.0
MW-04	15:20			1212			
.17	2.86	6,148	14.75	7,50	138	6.53	7.0
VM	2.05	0.162	9.55	6.55	130	6.53	8.0
В	1.20	0,172	7.20	6.38	116.5	6.53	9.5
		End of the Lar	3 (1985)		the state of the state of the	승규는 눈 옷을	

Reter the Rain

12:29 rH OKP DTRO DTU L SCATION HTME pa EL Temp 2,80 MW-05 15:25 20.5 3.0 5,75 0,91 1,48 T 20,45 606 515 1.23 2. 80 4.61-5.0 M 10,81 11.75 0 0,89 6082 2,80 7.92 0,71 7.0 12.82 B 2.80 9.0 0,90 604.4 12.74 0.77 3, 6.32 MW-01 15:45 95 9.26 0.134 5.20 5.17 140.5 T Z.31 9.26 11.0 2.30 5.82 120.1 14 0,092 1.73 R 9.23 N 0,084 1.79 112 13,5 1.45 6.06 CONCETE MEND & MUSUNMENTS BEGIN CLEAN UP FOR THE DAY 15:51 102 1600 - begin cleanup + shut down DAY 1730 MOB TO OFFICE 3.14- -4 8/13 DAYONE POST INJection. Saturday day 3 Wednesday 7 3 water Soil water Watu Following Wednes 14 water levels / Fiers Lab dest Kits Parameter of pulled voris@ mw.7 1 2 caih-16.36

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	Temp	EC	DO	Ph_	ORP	DIW	DI
Loc/Time	°ے	ms/em					
May 10 1	11:00						-
MWO_		6 40	2 02 1 22	- 2 -		9.46	10.0
1	2-21 2.16		2.04 1.33	- 2.0 -2,4	+60 145.1		10.0
M	1.74	0.078	0.50		136	9.46	12.0
VB	1.68	0.077	0,23	-2.7	101.3	9.46	13.5
MWO_2/	1:15	(dues dory o	rel m wet in a	bear bucket .	La becoming prise)	4,70	-
T	6,99	0.107	0.55	5.15	112	4.70	5.0
VM	3.06	0.160	0,32	- 3,0	125	4.70	6,5
B	2.28	0,167	1.50	-3.0	124.8	4.70	8.0
		5					19.113
MW0.3	11:30					2,85	-3-5
T	18.32	0.056	2.71	- 10.0	227	2.85	3.5
M	13.62	21.38	0.58	-10.0	221	2.85	5.0
VB	9.80	19.5	0.38	-10.0	219.9	2.45	7.0
Br	3.32	16.85	0.39	-10.0	254	2,85	8.5
MW034	11:37		A COLORED OF				
ØT	2.84	0,137	9.55	~ 8	80	7.30	7.5
VM	2,74	0.146	7.20	- 8	83.8	7.30	9.0
B	NA	NO	NA	NA	164	Na	ria
			- stature	di-	a labor l		
MWO 5	11:43						
T	Z5. a	27.64	8. EV	1.0-3.0	296	3.65	4,0
V M	10.49	20,94	25.6	5,01	355.7	3.65	6.0
B	5.38	19.99	35.35	-3.0	368.9	3.65	7.5
AA. 10 C							
MWO G	11:50						2
. / .	12,32	21,93	6.89	8.58	389	4.11	4.5
VM	6.30	22.10	0.54	-6	425	4.11	6.0
B	2.50	14.78	0,25	-9	429.5	4.11	8,5
MWO_7	11:55						
T	1,58	0.260	4.20	-3	242.1	5.69	6.0
VM	1.19	0,244	0.22	-3.0	209	569	7.5
B	0.86	0,114	1.31	-3	225	5.69	9.0
mw-08	12:00						1.0
1-T	1.23	0.171	1.68	-5	194	6.96	7.5
VM	0.93	0.196	1.58	-5	197	6.96	8.5
B	NA	NA	NA	NA-		MA	NA

La CATINA /TIM	Temp	5L	De	PH	ORP	Phi	OTRA
41 - 88							
the second second second	1.42	0,114	58,00	-7		9,21	
M	1.16		57.0		203.7	9.21	11.0
JB	1.10	0 /14	51.0	-7	207	9.21	13.0
[W-01	12:15						STE SIX
T	35.5	43.7	4.4	-10	396	4.25	5.0
VM						4.25-	
ß						1	
	Note IN	JELL VAUL	TUP OF C	AP.			
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	1. State 1	A	×		5. M. C.		
	325	1					77

Day 3 Sampling 8/15 pange 08/04 Both went dry 1300-1400 punge and sample 05, 07, 06 08/04/07/06 1300-1700 g Problem 21 3 / 1300-1800 with Quecking samples discarded 9 V 5 v (6.0) 07,06 2 purget sample 05. 6 2 Gray VOA's are problematic at le 7 1 05,00,07 an zomin to I have to Fill varis 8 / gulen VOA LIDIS #~ 10 mm 8/16 Sample 03/04 punge + sample 03, 02 1000 green vorise oblack NO problem V VOR'S C O2 45 min tol hour C 200 mil /mi 200×60 = 12,000 1/4 /itus pugel. 3 122 = 3 gallons 1402 5/1100 parameter = 1.5 gallons Autal 4,5-5 1645 tempe check 88 muss transducer a 1.5°C up From shale 1.00C 1013 de prior to Infection @ 9 Mank would like to continue monitoring Need to cheen a down Lozd additional Trall data. Mark suggestel purge @ MW08/WW04 at COB day 6 Soil +6W= 3 days scoper / Bristol 2 days Additional purge water loutainen ship sample stralog

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			Reterin	he have			138

8/18/2009 EXCANTE 3 EXCANTIONSTO 1/- 4-45 Pit 1 includes MW02,06,07 Pitz includes MW08, MW09 Pit 3 includes muos, muoy, mavos Pit (- aw entry to Pit Pit 2 - dry Pit 3 - 6w entry Find grang pine cal to 1/ 17' to 2.5' Fill Pound while 5" +1= 6" in to pert bottom backfill w/2 bags bentouide chops + + 30 bags of suice sund. noter continues to foll Pet # 1 set gran pipes for 8/19 samplong. Purge MW08 \$ MW04 5\$ Long day back to offi lamp +/ 2000 See Aaron Dabes For Trench / excavation depthso Follow notes nemoved soil to sample depose @ ? day + 28 Location. Verified + marked sample depth massen down@ ALL LOCATIONS.

8/19/2009 Day 7 Good Groundwater & Soil Sampling Event. Sampling conducted at 1st excavation containing pipes C HA 6, 2, 7, 6W has filled pit to the 1" of below top of 4" gran PVC pipe set 8/18/2009. Samples collected with 3" stainless stee ((55) Hand Auger, 155) bowels + spoons. Sample information Itsted below. Pepth Time (tauget) Sample MOC Mw or 5B ID AECOM HA # BS-S(A) LOCATIONS 11 50-60 1010 OGNCMOCSBIG ICOMW06 HADG PENT Saturated, brown, time surt clays, conesive, non plastic, No fuel odor, tundra peut loog. notes' pipe contained ou, pumped pipe prion bo Sampling "- engal eatine i interval collected nonogen Red Filled 2-402+1802 - method 1-viel @ toz tard Amba par. 6-7.0 1035 3 OGNEMOLSB201 ILOMW02 H402 * PEAT with SILT Saturated brown to grayosh dark brown mostly organiz plantmateric 1, little SILT+CLAY, trace sand fine to medium, cohesire, non pilestic. Turndare part bog. NO FUEL SMELL. note pipe was dry (good bottom seal) Decon HA move sampling + PLywood 1045 Bristol delivers beach sand move several 1.5'/2.0' bouldars From spoil pile. See next paye. Rate in the harm

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prolifer a with 20-25 mond - LIDS. 1320 pe 1 600 (0× 4 Nov. 2 × NON. 2 120 min EDWIN & weiter 100 HOV fresh SOAH Equences 21 Jeron Sommost 12 4520WDNDQ (midium) her gravel, trece siertelay, teint petro HENT, Dry SAME AS ABOVE WILL FRALL FRALL JUNE SIGI Sis-Sit El PONA BAHBOUMOSI BIBSJONDNPO per plan. pit is dry no ew suicht oreanic ordon non plastic, tundue, post bog. Callect samp Tiburg, truck Sand, there is she the word, which HEAT Day, brown, mostly tibevous to plant SHEN S'9-5'S HI = DOWN 60 MWODI 6185 DOWON62 1300 prisso zet de brude Etcommos prem " Strong but odon : roh sample mure enport by sil ! prem " Strong but odon : roh = 3.65 ' Sheen on pit dense, Hand auger could only be advanded Fire sand. The sample interal was very mostly medium Eiberous to Eine granded highly PEAT WITH SILT, Schwerted, Brown to brownish grag. 4181918 3824 SZZI SZSA ZIH FAM/FOUMADE LISISDOWDNGO 1 swit i mode | som ! foumost FOAH CI Jamos 61/8

Sample	boring or	Moc	depth	time 1
ID	mu Loertin		4	
OGNEMOESBIY	FCOMWO4	moc#		L
	1444	9	6-7.0	1700
O INEMOLSB 14		4		
MSIMSD	17A04		SAA	SAA.
Peat	noist to wet, bud	way no.	Shan Fiker	or 3
organic	material, Trace	-511-40	lay, col	esive.
nonplas	tic. Tunduay	Peatbog	- 11	
		d		
		2 3 7 7		
09NCMOCSB15	ICOMWOS HAOS	MOC#10	5.0'-6.0'	1750
	HAOS .			
PEAT, D.	amp to moist,	r: kerous	s, light	brown
to yellow	ish brown, st	rong F	est rolum	-odos-
Tundra	ish brown, st peart bog, De	con of a	ugens p	roduced
Sheen on	- with bucke	×.		1 Libertal
Dinner	10 1 x	- 1	1 - 1	
Donner	1500 to 1340	Return	to sit	<u> </u>
Donner	1500 to 1940	Return	to sit	L
09NCMOCSB13	3 FCOMWO3	moc	to 5:1	
09 NEMOCSBI	3 FCOMWO3 HAO 31	moc # 8	5:0-6,5	1935
PEAT D	3 FCOMWO3 HAO 3r y to Moist, bro	moc # 8	5:0-6.5 Fileron	1935 st Plant
PEAT DA Organic M	3 FCOMWO3 HAO 31 HAO 31 HAO 31 HAO 31 HAO 31 HAO 31	moc # 8	5:0-6.5 Fileron	1935 st Plant
PEAT DA Organic M	3 FCOMWO3 HAO 3r y to Moist, bro	moc # 8	5:0-6.5 Fileron	1935 st Plant
PEAT D Organic n medeuale	3 ICOMWO3 HAO 31 HAO 31 ry to Moist, bro natter, conesin mganic od or.	Moc # 8 wn, All e thick	5:0-6.5 Filedon , modern	1935 st Plant
PEAT D Organic n medeuale	3 ICOMWO3 HAO 31 HAO 31 ry to Moist, bro natter, conesin mganic od or.	Moc # 8 wn, All e thick	5:0-6.5 Filedon , modern	1935 st Plant
PEAT D Organic M moderate C Sampling 8 50 501	3 FCOMWO3 HAO 3V HAO 3V vy to Moist, bro natter, collesiu organic od or. For Soil Compl sampe FILL	Moc # 8 wn, ALI c thick el / cb mL	Fiberon Fiberon , modern , modern , modern	1935 st Plant
PEAT DA Organic M moderate o Sampling # FO Soil # MW 2 G-7	3 FCOMWO3 HAO 3V HAO 3V Vy to Moist, bro natter, conesiu mganic od or. For Soil Compl SAMPE FILL O-4.5	Moc # 8 wn, ALI c thick eh / cb mL	5:0-6.5 Fiberon , modern , Martin , Mar	1935 st Plant
PEAT D Organic M moderate C Sampling # Soil # Min 2 6-2 J. 3 5-6	3 FCOMWO3 HAO 3V HAO 3V ry to Moist, bro natter, collesiu organic od or. For Soil Compl SAMPE FILL 0-4.5 0-4.5	Moc # 8 wn, ALI z Ahrzk ehr/cb ML U 4.5-5	5:0-6.5 Filewon , moder , mode	1935 st Plant
PEAT D OPAT D Organic M moderate C Sampling F Min 2 G-7 N G-7	3 FCOMWO3 HAO 3V HAO 3V Natter, collesille Mganic od or. For Soil Comple SAMPE FILL 0-4.5 0-4.5 0-4.5 0-4.5	Moc # 8' wn, ALI 2 thizk el / cb ML 4.5-5 3.5-5	5:0-6.5 Fiberon , modern PEAT (4.5-7.0 5-6.5 5-7.0	1935 st Plant
PEAT DA OPRAT DA Organic M moderate a Sampling 8 Soit 8 MW 2 6-7 1-3 5-6 1-4 6-7	3 FCOMWO3 HAO 3V HAO 3V Ngho Moist, bro natter, collesitu Mganic Od or. For Soil Compl SAMPE FILL 0-4.5 0-4.5 0-4.5 0-5.0	Moc # 8' wn, ALI 2 thizk el / cb ML 4.5-5 3.5-5	5:0-6.5 Fiberon , modern PEAT (4.5-7.0 5-6.5 5-7.0	1935 st Plant
09 NCMOCSB13 PEAT DA Organic M moderate C Sampling 8 50 2 6-7 MW 2 6-7 1.3 5-6 1.4 6-7 1.5 5-6 1.6 5-6 6.5-7	3 FCOMWO3 HAO 3V HAO 3V Vy to Moist, bro natter, collesitu Mganre od or. For Soil Comple SAMPE FILL S 0-4.5 0-4.5 0-4.5 0-5.0 0-5.0 0-4.8	Moc # 8 wn, ALI c thick ele / cb mL 4.5-5 3.5-5 B b	5:0-6.5 Fileron , modern PEAT 4.5-7.0 5-6.5 5-7.0 5-8 4.8-8.0	1935 st Plant
PEAT DA OPRAT DA Organic M moderate a Sampling 8 Soit 8 MW 2 6-7 1-3 5-6 1-4 6-7	3 FCOMWO3 HAO 3V HAO 3V Nather, collesitu Mganic od ov. For Soil Compl SAMPE FILL 0-4.5 5 0-4.5 0-5.0 0-5.0 0-4.8 0-4.8 0-4.8 0-4.8 0-4.8 0-5.0	Moc # 8' wn, ALI 2 thizk el / cb ML 4.5-5 3.5-5	5:0-6.5 Fiberon modern PEAT 4.5-7.0 5-6.5 5-7.0 5-8 4.8-8.0 3.8/0.0	1935 st Plant

Rete in the hain

8/20/2009 Note checked email 0700 Email From Molly USACE Interested SILT SAmples majority of baseline w Peat Suggest collection now on never C pit bottom " HAS+HAG on pit side well 2 at AAT a Mally confirms collection at 3-4 locations . prep List For nextreday enal (mocht se accouncion part Hous on backfill return + collect. SILTY SAMPLES @ Locations ID ABOVE see Following Sample Frito -MOC Depth Time OGNEMOCSB. MOC FCOSEMW AH moc 14 4.0-4.5 09NCMOCSB22 0900 ICOML109 C SILT Day to morst, gray to gray righ brown 1 mostly site i clay, trace medium to fine sand · cohesine, nonplastic, color, particles, textune suggest non organic particles. Flowich organic/fuel ador 3 260. _ Icomwos Moc \$ 3.7-4.4 0910 OANEMOE SB23 SAME AS ABOVE, He SILT OgNEMOC SB213 ICOMWO17 MOC#12 25'-2,75' 0920 SILT, MOIST brown mostly silt delay trace medium to fine sand, comesive non plastic, particles + textane suggest non ongo hic particles, strong organic / ful odor & notes sam ple side wall of Pit +/ 3" Above present + - 24 hr exervation water Level C2.65 865. See maps negt purge .

1 20 W # WELL 1191 A HADD AUGER PIPE. # RS 0 H3 A HS 08 . H3 w7 H6 17 # 3 26 H6

Roto in the hair

8/25/2000 DAY 14 Groundwater AM Safety meeting Topic Eyes, hands, back 6 Joner & Preuss ACCOM Lance Preass Atan Stringham Accon Tud James Kussell James BERS 0605 meet Brackfist AM SAFety buckfing 0700 LOAD + SHUTTLE TO ATT port 0745 Arrive Berring Air Verify EOPT CAREE 0845 FLIGHT DEPARTS 0.933 Arrive NECAPE UNLOAD / PREP Sumpt adherbard BS BWC SSAW4 - pumper 12 5-13 galless dry, 30 min later topped of the. -Complete sampling 1830 1900 BOARD PLACE 23 1940 Arvive Benny Hr. 14 hrs 2000 Avoive back & Nuggest shage EQPI. 0700 - 2000-13 14125 Boduct show & Broplets identified @ MUNOZ - alternot preduct gange fube + bartles no luck estimated thickness "110 to 3/0 towend detected pump from and point to " helow Mid point, primp is nous I' from bottom vusez'. Low Flow pringe. at this pumping vale eliminate. product or schoor spean of purge bouched after = 15 well screened acress GU mater Free ?

- Locked All WELLS - Sample pour generabel 15-20 gallon page with - 1 down is not used now 2/3 Field both others Ph 2.65 lowert = needs babble wcop bottles - SW 2 Savaex 5 gallons petable water (W454) 2 mare denn buckets w/Libs Neeb(5) / at 5 jit

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Kits - the hain

8/10/09 NE CAPE, AK 1500 injections and mariting. wienther porsonull : Arron Mark Scutt Lanci Brechtist \$600 Group Sutety muting lead by chuch (Greatel) 05-20 Party scope of morke Demosilization River of work Plan, 11-15 plan and MAS , MSBS for churrals. 0634 on site presedues for 100 rijections and mariting Post inliberte 451 meters (see post inlibration sheet) 5003 conjute allo atos (ser calibration start) 0960 of site worth and sately arearter with lance 6920 Go are PPC, anthrong chancels and chanced strange, note , exercised the time high hing equipment and the of proceedings, Don the for round at goverdnache level garging. 0940 Twik (surnex) and all ppet on Degin water hard massermants 1003 TIME ptw LOCATION 10:05 9.45 SLO MW-01 02 10: 07 4.63 3,48 63 10:05 14 10:09 6.47 10:10 4.05 υS 10:11 υĹ 3,62 67 10 213 5.66 0.810:15 6.89 7.35 69 10:17 88 10:19 9.22 complete round of grand where level gauging 10:50 collect parter simple with ballers from MW-02 and Med-07 for cron feeling 10 25 MAN & and not-of un sight allected levining date longer date from yesterday. 1235 Atond she Has meeting (attending Mark, Scott, Lana, Aaron). Assone all ligerili der 1045 trat all as spiller , nucha lizer, net dilation, gencenter, kill son, tones, pull black card 240 V. Report lugo changes is presente values. story across.

8/10/09	NE CAPE	AK					
1058	Complete so	fety meeting .	(potntal la	the gas)			
1100		ing other a			7.		
		h=06 (sh					
		MW-64					
		MW- 65 (r.	d albred an	lar)	1		
	lance .	allerdy there	-og (clur)				
	calledad	MUI-DJ	(yellow have	of water)			
		rollied, Mc					
	MW-	2 has se	diment and	brown at fing	2		
· · ·		67					
1120	complet a s	apple vollend:	u n				
1125	hegin raple						
	Bigen Maly Bis	y Ma-02 +	er irsa un	n, DR/29	6 Coloriante		
	zur 4	tith sample.	O, lute s	sumple 3	12 Cimpl	e : water)	
	m iX	Ferriver	Iron Raugent	with 10	ml of dilv		n vial
	eheel	e zers si n	iter irealing	black as	0		
		sample =					
TOTAL O				·			
familie and a state of the second sec		la a d					
LUCITION	STANDARD (MY)	and a second statement of the second statement and the second statement and the second statement and the second	COMMENT (NOT A CONTRACTOR OF A CONTRACT	ater volume)	TINAI VALUE	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
MW-02	. 03.00 . 		3:12 D.1.			5.45	
PRIV-03	1	D. 7-27 1.13			· · · · ·	7.72	
MW- 04	6,00	0.77	D ; I	vision limit		3.08	
Mu- 05	0.00		2/20 D;			2302	
MW- 06	0.00	1 1	3:9/3:15		10/1:20	49,98	
MW- 67	0.00	3.11	3:15 0:10			18.66	
MW- 18	0.00	0.01/2,00				2.00	
MW-09	0.00	0.18 / 0.90	3:9 dilusion	I ao dilusia	1	0,90	
		- - -					
Ferrous	Fe (as/N	[ms] 1	la ser a se dem	C. J. dur		E in a season	
Ducapen	star start Post of the second start and the second start and the second start and the second start start start and the second start and the second start and the	SAMPLE ("S/L)	nilaiteninaise partanilerka gitti terrenin fengiliterin angebilitati kanan k	(sinde volvon ?	winter volume)	FINAL VALU	
MW-02	6.0	1.36	NO DILUS	•		1.36	· · · · · ·
MW - 03	0.0	0.49	NO DILASI			0.49	
MW-04	d. 60	1.02	NE DILUS		 	1.02	100. s 44 S
MW-65	0.40	1.57	NS MUVSIO			A STREET, STRE	4.08
MW 06	0,00	1	1		sh/110/no dilusion	7.0	7.00
MW - 07	0.00	3.30/3.30/1.50		2/1.5		0.43	
MW - 08 MW - 09	0,00	0,43	NO DILUTION NO DILUTION			0.43	

8/10/07	NE CAPE	AK				 	
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Sodurn	Pusulfate	Brm (m	-45			N 8 4 444 A	а.
lucation	6	•	LOW RANGE	HIGH RAN	6Ē	-	
MW- 02	promitante		Dare lettered	14	na neverinti sindanda (n.g. josa prana se angela na se ang	2020-2020-2040-20-9-5482-6482-1	
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mer - 67				. 14	- ·		
me - 08		5.0	· · ·				
MW 19	· .	3.5			· · ·		
Hipnosen	PEROXINE	TESTING		· .			· · · ·
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nu - y	2.2	1 .	low	··· · · · · · ·		* * *	
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mur- 07	2.4		low	12			
10-58	2,4		1000	12			
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	18 8	62 50.1	jars jar (9 selib		72 40 00	VOIA ILCI	preserved
					Switten .		

"Retirin the Roin"

NE CAPE, AK 8/10/09 complete bootfle investory. 20:30 GW bottles rected scent scepting count Total moded for all weets 1 60 40 or Vert (Hel provid) 2\$3 240 27 20 1 liter Ambers (Her preserved) 27 O853 10 250 ml paty (unpreserved) 40 40 0 10 250 ml poly (Nitric Acid proversed) 39 40 Ì 1 1/13 soil bottles needed each simpling coult 4 cz wide mouth ambers jus (methanol preserved) 7 or 40 40 10 40 22 18 & or with north day just (in preserved) 10 100 mar 9 16 40 24 40 or will much clear jors (unpresend) 10 Ċ. 2:45 Byin wighing with punge repairs W shall pt pumps at eachering shop and first lack to 2140 Rehund comp denots frich. to 2145 10 m conjohnt with the the day. 5500 (i) ···· 1 ġ na S TREESOT 11 11 15 2mg 1. 100 酸物料 19.71 12,221 8/10/19 11 33 2. SH 12.53

8/11/09		APE, AK		Mins + mi	NIT SKING		
	pusonell.	. Aaron c	Jembrisie			·	:
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TLI	IREN		1			4 <i>.</i> .	
Total	1	(m9/.)		Contration -			(My)
Location	standard		The second s	Sumple volume ?	white volvme)	Find value (7.4	n)
PUND A	0.00	0,74	1:18 dilusion)		ana tana ana ana ana ana ana ana ana ana
PEND 13	0,40	3.30 1.65	1310 dilusion /	3700		165	
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Ferrevs	(Reint	(2-4)				. :	Mail
Location	standerd	sample ("1/2)	13	(sumph volum	: under volum)	Ernal Value	<u>C%</u>
POND A	0.00	0.6	no dilusion	: :		0.6	
POND B	0.00	3.30/ 2.40	no dilusion 1:	# dilunian		9.6	
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LUCATION	RANGE HIGH	CONC (Mg/2)	and the second se				
POND A	Low	0			· · ·		
PUND B	HIGH	>70			i .		
1 M Drocht	N PEROXID	E TEST	e name - e ne n				i
DCATEON	CONC (My/L)	RANGE HILLON	# of DROPS				
FEND A	0.8	LOW	4				· .
POND B	14.4	Low	72			· · · · · ·	
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8/11/09	NE CA	PE AK					n managa panaga Addiday	
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GN		1			WEED For 3.7 1	4 ORDER	1	、
Analyte		Bitte	10-200	HAVE ON HAND	NEED For 3,7,1 signpling	(For 3, 7, 14)	NELP	ORDER
6Rei/Berzin/1	Nuph	6, 40 ml VOA	(Ha proseved)	213	180	0	60	72
DRO /RRO		2, 1 lite an	nber (Helprison	(1) 27	60	43	20	20+5
SUIFATE		250 ml poly	(un priserved)	or and a second se	0	0	10	10+5
METALS			(Nitric Acid)	1	Ó	· O	10	10+5
<u>کی ر</u>	antiportomperor a successive provide second					¢		
GRO / Benic	cne/Nuph	402 (rubber siplum	(upreserved)	73	10	20	10	10+5
DRO / RRO		Boz (ja , un,		18	10	0	10	10+5
Toc You Gar Va			9	0	400	10	1015	
TRIP	BLANKS				4 sets	4 50+3	2.54	Zsets
TEMP	BLANKS		1 		14	14	6	6
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11 3 ÷ B.c.	and for lunch	nd naterial monitoring de 1. Sur anniture	and sample	14 sot e	e will pla 28. crhsik up	a order for		· · · · · · · · · · ·
113 - Bre. 1236 M	and for lunch	no naterial	y mailed the mass 3, 7, 1 mand sample into alla	14 sot e	e will pla 28. crhsik up	a order for		
113 - Bre. 1236 M 1245 Q	and for lunch the out to solution on MPE	nd notering de nonitoring de 1. Soc annitorie d'injection	y mailed the mass 3, 7, 1 mand sample into alla	14 sot e	e will pla 28. crhsik up	a order for		
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113 - Bre. 1230 M 1215 Q	and for lunch do at to site and on ME Progen Gus fime	no naterial nonitoring de 1. Sur anniture d'injection discuss H.	y mailed the mass 3, 7, 1 mand sample into alla	14 pot c c collects nate well	e will pla 28. crhsik up	a order for		
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113- Bre. 1230 M 12:15 Q 12:15 Q	nh for lunch do of to solution 2 1 ME 2 2 ME 2 3 ME 12:57 12:58 12:58 12:59 13:00 13:00 13:00	nd noterind nonitoring de 1. Jur and un discuss H gavging Drwging 4.69 3.58 6.49 3.91 3.93	y microed the y and sample into cullo to slight slight pe clear lo brownish e brownish	yellow/cher yellow/cher // sof e rate will pate will volumes ed /chowly ered /cher lorbin/some sed	c will pla 28. Iscation Iscation	a ordes for		
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$\frac{113}{12.15} = 8.2.$ $\frac{12.15}{12.55} = 0.2.$ $\frac{10.04100}{12.55} = 0.2.$ $\frac{10.04100}{10.05}$	-h for lunch do of to side and and and and and and and and	nd noterind nonitering de de ander de agression discuss H gavging <u>DrwG17</u> 4.69 3.58 6.49 3.91 3.93 5.72 6.84	y mil saple y mil saple into cillo to slight slight ge clear lo brownish clear lo	yellow/cher yellow/cher yellow/cher Him/shighty el volunters red / cloudy ted / cloudy ted / cloudy ted / cloudy ted / cloudy	c will pla 28. Iscation Iscation	a ordes for		
113 - Bre. 1230 M 1215 D 1255 D 1000100 MW-02 MW-03 MW-03 MW-03 MW-05 MW-05 MW-06 MW-07 MW-08	nh for Ivneh do of the side and and and and and and and and	nd noteried nonitoring de 1. Jor annitorie Jiscoss H Jiscoss H Jurging DrwGM 4.69 3.58 6.49 3.91 3.93 5.72 6.84 7.28	y and saple y and saple into collo slight slight you clear lo brownish clear los clear los clear los	yellow/cher yellow/cher yellow/cher Him/shighty el volunters red / cloudy ted / cloudy ted / cloudy ted / cloudy ted / cloudy	c will pla 28. Iscation Iscation	a ordes for		
113 - Bre. 1230 M 1215 Q 1255 Q 10004100 MW-02 MW-02 MW-03 MW-04 MW-05 MW-06 MW-05 MW-06 MW-09 MW-09 160MW-01	-h for lunch do of to solution 1 do of to solution 2 of PPE 12:57 12:57 12:58 12:59 13:00 13:00 13:02 13:03 13:04 13:04 12:56	nd noterind nonitring de 1. Jur and m discuss H garging DEW(M) 4.69 3.58 6.49 3.91 3.93 5.72 6.84 7.28 9.52	y mil sayal y mil sayal into cullo slight slight you clear lo brownish a clear los clear los clear los clear los	yello-a/cher yello-a/cher yello-a/cher Hi-a/shightly el volunters red /cloudy red /cherr lorbus /some sed sclass	c will pla 28. Iscation Iscation	a ordes for		

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8/11/07	NE CAPE	.4K	1 1 1 1 1		1 	- x - 1		
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TOTAL IT	zerV					:	nenyemitete antidoriesteretationalaalapinooloo	ar 18 an far 1 ₉ ann far
LICATION	STANDARD	SAMPLE (MS/L)	connert	(scriph volume	i water volvanc)	find value (1/2)	
MW-02	0.00	2.02	3:12			10.1		
MW-03	00 b	2.88	3:12			14.4		
mw-04	0.64	0,26	3:9			1.04		
MW-US	0.00	3.30 / 3.30 / 3.30	1:1000 / 1:2000	1:10000		7 33,003		
nv -06	0.36	3.34 10.23	1:1600 / 1:10000	4		2300		
MW-07	2.00	2.91	1:5	· · · · · ·		17.46		
AW-08	50.0	1.99	no dilusion	-		1.99		0.000
mer - 09	50.0	6.64	nud lision			0.68		
						g		
FERACUS	RUN							
LOCATION	STANDARD	SAMPLE (My/L)	COMMENT	(simple volvare :	unter volume?	ENAL CALCER	my/)	
MW- 62	0.00	3.30/1.31	Au dilusian /2	:3		2,18		
MW- 03	0.00	1.78	no dilusion			1.28		
Mar 64	0.00	0,91	no dilusion			0,91		
MW- 05	0.00	3,30 3.30 3.30	as dilasion/1:4	1:10		36,3		V. Canaditation
MW- 66	6.00	3.30/ 0.83	1:100 1:1000			830		
MW- 67	6.00	3,13	1:5			18.78		
MON- OB	0.00	0.47	na dilusion			0.47		
MW- 09	deviv	0.23	no dilusion			0.23		D. O. A. FURD
Subjun	PERSULFATE			HYDROGEN PER	OXIDE			
100 471010	RANGE HICH Land	CONC My/L		LOCATION	Lanc (mg/L)	RANGE HIGH/ LOND	# OF PI	Rδ
MW- 02	4154	14		Mu - 32	2.2	low	11	eyele Mendela
MW- 03	HIGH	>70		ML3 03	15.2	low	76	
MW- 04	6.31-5	6.3		MW-04	3.4	1500	17	
MW- 35	HIGH	> 70	name of PETER AND Technical Art Andread and an advance for a	MW- 05	5.2	low	26	
MW- CE	H1411	770		MW- 06	6.0	HIGH	6	
MW- UT	HIGH	10		MW- 07	2.2	jour	11	
Aw - 08	1.000	5.0		MW-03	1.4	low	7	
MW- 09	LOW	2.5		MW-09	1.4	low	7	
			an ann ^{ann} a' ^{an} Alba Ann Ann an Ann Ann Ann Ann Ann Ann Ann	a na manana kana kana kana kana kana kan	n an	a na kata na mangka na kata na k		Park Para Pr
17:00 Com	plute senal	e enclisis /	Decan and	put away	ey sipment	fun .		
	p.	9		l' cront	L			
				* • · · ·	· ,			

5/11/09 and feep fortions 17:30 Set up to Jury ~11 LUCATION STAFF HEISHT (FI) CLEVATION MW-06 2.49 (15.42 63,52 POND B 4.39 1.00 58.42 TICHGANNO TEMP WELL 9.49 6.81 61.1 Toc TEMP WELL complete survey, but butter to sample MW-8 17:45 18:00 -p at the site to the right Byin elekn Ů. 1230 detern to unp. 6 8/11/07 line of C

8/12/04 NE CAPE, AK PERSONNEL: AARON J MARK 100000 LANCE SCOTT WEATHER : Mid 40° F (cloudy shows) in the BALAKFAST 06:00 007 BK GROUP INTS MEETING TOPIC ACTUSIVE DRIVING 04:20 201 **1** POST CALIANATE 451 METERS (SEE CALIARATION SHEET) 64.40 CALIBRATE YSI METCRS LIVE CALIBRATION SHEET) PRE COMPLETE LACORATION & METERS, CALIBRATE UK BEGIN MOBILIZATION CUT TO SITE 0745 0880 up at site. Discuss 4+5. 0810 Don ME. collect grandmente levels 1000 ina water color DTW (14) LOCATION TIME -stight y HAD NA 1 0829 9.52 COMM- OI 6831 slight fellow / char mur or 4.69 184 Mw- 03 0832 gillow Velews 3.11 M~ - 64 0832 6.70 slight gellow here / cher 1280 red 1 MW- 65 3.65 0834 MW- 00 3.97 red MW-07 0835 5.71 dur Verlachos Detar / cot div /cdo-las MW-68 0830 7.43 0936 MW-09 8.18 dear colorlys. 30.92 9338 9.27 dur colorhas MW- 88 -Test injection well IW-01 6839 3.64 NA Gruging complete / begin you simple collection with Uniter for field chem analysis. 6841 340 complete sample collection 0915 Peyra analysis of samples for Estal Iras, Formand ingorgen peroxide, 0710 Pessellate testing will not be performed due to low porting supplies. 133 1838

Rite in the Rain"

8/12/09 NE LARE, AK

Total IKIN STANDARD SUMPLE (M/L) COMMENT (SUMPLE VALUE & UNDER VALUE) FINAL VALUE (M/L) MUL- 42 0.0 2.25 1:4 dilusion 11.25 AW- 03 0.0 2.36/1.36/0.09 1:4 dilusion/1:10/1:100 11.25 AW- 03 0.0 5.36/1.36/0.09 1:4 dilusion/1:10/1:100 11.25 AW- 03 0.0 5.36/1.36/0.09 1:4 dilusion/1:10/1:100 11.25 AW- 04 0.0 0.84 1:4 4.2 MW- 65 0.0 1.21 9.5 1:10000 12,101 AW- 61 8.0 0.0/3.30/2.50 1:10000 12,101 29,15 AW- 64 0.0 3.30/2.50 1:10000 12,101 29,15 AW- 64 0.0 3.07 A0 dilvision 3.07 1.9000 3.07 MW- 67 0.0 1.70 n: dilvision 1.90 3.07 1.90 3.07 MW- 68 0.0 3.50/2.81 2.81 n: dilvision 1.90 3.07 MW- 62 0.0 3.50/2.81 2.84 1.10 36.91 5.68 <t< th=""><th>0920</th><th></th><th>•</th><th>· · · · · · · · · · · · · · · · · · ·</th><th></th></t<>	0920		•	· · · · · · · · · · · · · · · · · · ·	
$M_{W} - uz$ 0.0 2.25 1.4 divsion 11.25 $Aw - us$ 0.0 5.56/6.36/0.69 1.4 divsion/100/1100/1100 3.45 $Mw - uy$ 0.0 0.84 1.4 4.2 $Mw - uy$ 0.0 1.21 9.55 1.0000 12.101 $Mw - uy$ 0.0 0.0/3.30/3.30 1.0000 12.101 12.101 $Mw - uy$ 0.0 0.0/3.30/3.30 1.0000 11.0000 12.101 $Mw - uy$ 0.0 0.0/3.30/3.30 1.0000 11.0000 12.101 $Mw - uy$ 0.0 3.0/3.30/3.30 1.00000 11.0000 12.101 $Mw - uy$ 0.0 3.0/3.30/3.30 1.00000 11.0000 11.0000 $Mw - uy$ 0.0 3.07 No 0.1/vs.or/3 3.07 $Mw - 04$ 0.0 1.70 no dilvsion 1.10 30.91 $Feadlass$ 0.0 3.50/2.81 no dilvsion 1.10 30.91 $Fw - uy$ 5.68 11.1 dilvsion 1.10 5.68 10.89 $Mw - $	TOTAL	IKON			
Awr 03 O, 0 x.30/2.30/6.09 1:4 dilusion/fillo/fillo/ 3.45 Awr 04 O. 0 O. 84 1:4 H.2 H.2 Awr 05 O. 0 1.21 Presson 1.0000 12.000 12.000 Awr 06 O. 0 0.0 1.21 Presson 1.0000 12.000 12.000 Awr 06 O. 0 3.30/2.30 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000	LOCATION	STANDARD		COMMENT (SAMPLE VOLVME : water Volume)	FINAL VALUE (M3/2)
mw - u4 0.0 0.84 1.4 4.2 $mw - c5$ 0.0 1.21 9.55 1.10000 12.101 $mw - 61$ 0.0 $0.0[3.30/3.30]$ 1.10000 $716,503$ 733000 $mw - 61$ 0.0 $0.0[3.30/3.30]$ 1.10000 $716,503$ 733000 $mw - 61$ 0.0 $3.20/2.85$ 1.59000 $716,503$ 733000 $mw - 67$ 0.0 3.07 $no dilvs.67$ 3.07 $mw - 07$ 0.0 1.70 $ne dilvsien$ 1.90 $mw - 88$ 0.0 3.50 2.81 $ne dilvsien$ 1.90 $mw - 88$ 0.0 3.50 2.81 $ne dilvsien$ 1.90 $mw - 88$ 0.0 3.50 2.81 $ne dilvsien$ 5.68 $mw - 62$ 0.0 2.84 111 $dilvsien$ 5.68 $Mw - 64$ 0.0 3.361 0.97 $no dilvsin$ 2.66 $mw - 64$ 0.0 2.66 $no dilvsin$ 2.66 2.66 <td>MW- 12</td> <td>0.0</td> <td></td> <td></td> <td>11.25</td>	MW- 12	0.0			11.25
MW = 65 0.0 1.21 0.55 1.10000 12.101 $MW = 61$ 0.0 $0.0[3.30/3.30]$ 1.10000 1.10000 1.5000 $716,505$ $72,101$ $MW = 61$ 0.0 $3.30/3.30$ 1.10000 1.10000 1.10000 $716,505$ 73000 $MW = 67$ 0.0 3.07 No $0.1/155.07$ 3.07 No $0.1/155.07$ 3.07 $MW = 07$ 0.0 1.70 nc $0.1/155.07$ 3.07 No $0.1/155.07$ 3.07 $MW = 08$ 0.0 1.70 nc $0.1/155.07$ 3.07 1.90 $MW = 88$ 0.0 3.50 2.81 nc $0.1/155.07$ 3.07 $MW = 88$ 0.0 3.50 2.81 0.0 0.05 2.84 1.10 0.05 5.68 $MW = 02$ 0.0 2.84 1.11 $0.105.07$ 5.68 10.87 10.87 $MW = 0.4$ 0.0 2.66 nc $0.105.07$ 0.00 0.00 0.00 <	MW- 03	0.0	5.30 6.30 0.69	1:4 dilusion/Fire/1:100	3,45
MW-66 0.0 0.0/3.30/3.30 1.10000/1.1000/1.5000 7/6,503/<83000 MW-67 0.0 3.0/2.65 1.5 1.10 29.15 MW-68 0.0 3.07 No dilvs.07 3.07 MW-68 0.0 1.70 n. dilvs.07 1.90 MW-68 0.0 3.07 n. dilvs.07 1.90 MW-88 0.0 3.0/2.81 n. dilvs.01/1.10 30.91 FERMAN IREM Connext (supple value supple value) FEMAL VALUE(M/L) MW-62 0.0 2.84 111 dilvs.01/10 5.68 MW-63 0.0 3.30/0.97 n.0 dilvs.01/10 5.68 MW-63 0.0 2.66 n.0 3.30/0.97 n.0 dilvs.01/10 MW-64 0.0 2.66 n.0 dilvs.01/10 5.68 10.89 2.66	MW- 84	0.0	0.84		4.2
mw. 67 0.0 3.30/2.65 11.50 29.15 mw. 67 0.0 3.07 no dilvs.67 3.07 mw. 68 0.0 1.70 no dilvs.67 1.90 mw. 68 0.0 3.50/2.81 no dilvs.67 1.90 mw. 68 0.0 3.50/2.81 no dilvs.67 1.90 mw. 88 0.0 3.50/2.81 no dilvs.67 1.10 30.91 Feedeas 1.90 3.50/2.81 no dilvs.67 1.10 30.91 Feedeas 1.90 3.50/2.81 1.10 30.91 30.91 Mw. 88 0.0 3.30/2.81 0.00 3.50/2.81 0.00 5.68 Mw. 62 0.0 3.30/0.97 no dilvs.60/110 10.89 10.89 2.66 Mw. 64 0.0 2.66 no dilvs.60/110 2.66 2.66	MW- 65	0.0			
Aw - 08 D.0 3.07 Ac dilvsion 3.07 Mw - 09 D.0 I.90 n. dilvsion 1.90 Mw - 88 D.0 3.50 2.81 n. dilvsion / 1.10 30.91 Frankans Rom Same (^{my} / _k) connext (surph volume) Final (value (^{my} / _k) Mw - 88 D.0 3.50 2.81 n. dilvsion / 1.10 5.68 Mw - 02 D.0 3.50 0.99 n. dilvsion 5.68 Mw - 04 D.0 3.50 0.99 n. dilvsion 10.87 Mw - 04 D.0 2.66 n. dilvsion 2.66	Mw- 66	0.0			716,503 / < 33000
mw - 04 0.0 1.70 $n = dilvision$ 1.90 $mw - 88$ 0.0 3.50 2.81 $n = dilvision$ 1.10 30.91 Fraction $stars$ $n = dilvision$ 1.10 30.91 Fraction $stars$ $n = dilvision$ 1.10 30.91 Fraction $stars$ $n = dilvision$ 1.10 30.91 $LvcAtion$ $stars$ $stars$ $stars$ $stars$ $stars$ $Mw - 02$ 0.05 2.84 111 $dilvision$ 5.68 $Mw - 03$ 0.0 $3.3010.99$ $n = dilvision$ 10.89 10.89 2.66 $Mw - 04$ 0.0 2.66 $n = dilvision$ 2.66 $n = dilvision$	Mer - 67	0.0	3.30/2.65	15/10	29.15
$MW = 88$ 0.0 3.50 2.81 n_{ed} diffusion / 1.10 30.91 Fraction flow $Identified flow Identified flow$	AW- 08	0.0	3.07	no dilvs.on	3.07
FERRING IRON <u>LUCATION STANDARD SANCE (M/C)</u> <u>COMMENT (Sumple volume Swater volume)</u> <u>FINAL VALUE (M/C)</u> <u>MW-02</u> 0.05 2.84 111 distusion <u>MW-03</u> 0.0 3.30/0.99 no dilusion/110 <u>MW-04</u> 0.0 2.66 <u>Au dilusion</u> 2.66 <u>RUN-04</u> 0.0 2.66	MW- 09	0.0	1.70	no diluzion	1.90
LUCATION STANDARD SAMPLE (1/2) connert (surph volume 3 instructor volume) FINAL VALUE (1/2) MW-02 0.00 2.84 111 diffusion 5.68 MW-03 0.0 3.30/0.99 no diffusion 10.89 MW-04 0.0 2.66 no diffusion 2.66	MW-88	0.0	3.30 2.81	As dilvison / 1:10	30.91
LUCATION STANDARD SAMPLE (1/2) connert (surplusion Final VALUE (1/2) MW-02 0.00 2.84 111 difusion 5.68 MW-03 0.0 3.30/0.99 no difusion 10.89 MW-04 0.0 2.66 no difusion 2.66		t i		4 	
MW-02 0.00 2.84 111 diffusion 5.68 MW-03 0.0 3.30/0.99 no diffusion/110 10.89 MW-04 0.0 2.66 no diffusion 2.66	Fredding 1	Ror			
Mur- 13 0.0 3.30/0.99 no dilusion/110 10.89 Mur- 04 0.0 2.66 no dilusion/110 2.66	LUCATION	STANDARD	Same (M/k)	connert (supple uslane 3 water volume)	FINAL VALUE (My/c)
MW- 04 0.0 2.66 A. dilvion 2.66	MW-02	0.04		111 diffusion	5.68
	Mu- 13	0.0	3.36 0.99	no dilusion/110	10.89
MW- 05 0.0 1.44 3 1.5 1:1000 1441			2.66		2.66
	MW- 05	0.0	1.44	33 j 5 j: 1600	1441
MA-06 6.0 1.33 1.1000 1.331	MG-06	6 0	1		1331
MW- 07 0.0 3.2. 115		0.3	3.2.3		19.82
MW- V8 0.0 0.66 No dilusian 0.66	mw - 18	0.0	0.66	no dilusian	0.66
Mu- 09 0.02 0.72 10 dilusion 0.72		0.0		As delusion	6,72
MW-88 0.0 2.36 Additiona 2.36	mw-85	0.0	2.36	nodilusion	2,36
	1 PAL				
HOR-GEN PEROXIDE	1400.5E~	PEROXIVE		· · · · · · · · · · · ·	· · · · · · · · · · · ·
LOCATION CONC (Mg/D) RANGE HILL to B Drops			RANGE have	# of Drops	
AW-62 1.8 10vs V			1000	Y	,
Mw-03 14.0 high 14	Mw-03		high	19	
Au-19 5.0 hiph . 3			h.,6	3	
AW-05 7.0 MIGH 4	Aw - 05		MIGH		
MU- 66 7.0 HIGH 7	MU - GG	7,0	HIGH	7	
AM-07 4.0 HIGH 4 MIGH 500			村1公井	<i>4</i>	
$mw \cdot 07$ 1.8 low γ	MW- 09		low	9	
MW-88 Z.2 JOW 11	MW- 88	2.2	1300	11	
1245 brat for lunch /supple and so, complete					· · · · · · · · · · · · · · · · · · ·
1330 Reima with with buch and pilling on ME. Begin collecting for anter marginest at mill locations (see Lines 5 Field miles As recorded villes.					arante margunat
at mill locations (see Lines & Field miles As recorded voltes.		at	mil locut	ins (see Lonce & Field rates Ar rec	infel volkes.

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Elizion NE CAPE, AL 15:50 COMPLETE PARAMETER REASINEMENTS of LITLES. BEGIN CLEAN UP AT SITE FOR THE DAY , DE CON AND MUT away all Equipment and supplies. COLPLETI CLEAR OF AT SITE, HEAD MARK TO CARRY 1733 1743 RETURN TO DEABS TRUCK GMAILS NOL PST THE DAT. CANP 1010 K 101001241 STAL. 1941 aning a S. TH STATES. 8/12/09 NIGH-TIN I 2.1768 in the second -----NICES DE 1.575 10000

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8/13/08	NE C	APE , AK	-			· · · · · · · · · · · · · · · · · · ·	
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Totac 1R	UN.	(no ch		<i>r</i> , , , , , , , , , , , , , , , , , , ,			
LICA-TION	STANDAND	sample (ng/L)			me invoter volume)	Final unlige	
MW- 01	0.00	3.30/ 0.98	as delupine / 1:10			10.78	· · ·
MW-02	0.00	3,10	3-12/5:30			+5.5 Z1.	7
Mw - 03	0.0	3.30/3-30/0.0/1	31:50 0.5\$	50/0.1:100/0.	1:50	816.63	
mw-04	0.0	7:121.73				8,65	۵ ۱۹۰۰ میلاد که در میانی این از میلاد میلوند و این میلوند و این میلود این میلود این میلود این میلود این میلود ای ۱۹۰۰ میلود این میلود
AN-65	6.00	0.82	0.012/00	: . ·		8200.82	
Aw 06	0.0.0	0.01 1.85	0,1\$500/0.1	5/00		1851.85	
m~- 07	0.00	3,30 1.53	1:10/1:30	0		47.43	
Mer-08	0.00	3.30 1.15	no dilusiu	5		2.30	
MN-09	n genoemilitarati etti tarintari N 3	7 LULLECTED	CINJECTIC	N Cacani	in)		
MW-88	0,0	0.22	1:10	: :		2,42	
MW-62 (Decp)							
FERROWS 1	CON						
LOCATION	STANDARD	samres (mg/2)	(omnor	y (simple volum	e Swater Volume)	FINAL VAIG	C
Muroi	0.00	3.30 10.98	A. Jilusion / 5		and a second sec	4.9	
MW-OL	0.00	2.12	12,5:12.5			4.24	
MW-03	0,00	1.55	3:30			17.05	
mir - 64	0.20	5.50/ 1.55	na dilusion	15:25	:	9.3	
Mw-05	0.00		0.710,1:100/0.		10,1:25	198.29	
MW -06	0.00	0.00/0.00/1.48				149.48	
Mw. 07	6,00	3,03				18.18	
MW-08		1.73	no dilus,	G :1		1.73	
Aw-09	NU.	7 Gelecie		con Lout	110~)		
MW- 88	0.0	0,71	no dilusion		· · · · ·	0.71	
MW-02(p.c)	0,0	3.29	15:15			6.58	
HYPROGEN				carf na a annana ann an Anna an Anna ann ann		ner (* 1999) 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 199	filmens kalkan da sa da kalkan da kalkan da sa kalkan da s B
LOCATION	conc ("1/2)	RANGE Lind	# OF DIROPS				
MW-01	1.2	10-1	6	l i			
MW-12	5	HIGH	5				
MW-07	18.0	HIGH	18				
MW-04	3.0	141414	3		-		
MW-05	15.0	HISH	15		5		
mov- 06	33.0	HIGH	33			· · ·	
mw-07	4.0	1416,14	4		and a set of a set of a second set of the second set of the second second second second second second second s	1	-
MWr 08	0.0	Low	0				
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MW-09	Supported the second second		IVI VANN				
MW- 09 MW- 88	- 10t (c 018	ilicted cajea	4				

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10.54		TRUNALE GETTIN	rs a vacut	an samples	Kon SITH IN	N KIT N	HEN
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<u>DATE</u> 8/12	Mw- 05	B.00	3,30	d. 01 : 100		and a second	733000
8/12	MW-06	0.04	3.30	0,01:100	t		> 33000
8/13	40-05	0,00	3:30	0.01 -100			> 33000
8/13	MW - 06	0.00	3.30/3.30	0,1100 / 0,01	166		733000
· · / · · · ·		0,00			27 Y		
FERROUS 1	And			-			· · ·
DAIE	CSCATGON	STANDARD	sample (mg)	COMPENT	(singhe volume :	wate volume	T-INAL VALVE
8/12	MW- 05	0,00	¥.32:	0.01:106	168460700-00.0000000000000000000000000000000		13,201.32
8/12	AW-06	0,00	1.44	0.01:100			14,401.44
8/13	MW-05	0,00	0.821.16	01:100			1161
8/13	100-06	0.00	3.30/1.18	1:100/0.05:	50		1181
0/13	1 . 100 0	0	1.10				3.1707.
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8/14/00 NE CAPE, AK Iso wernen and multorink PENjoniec AANN LANCE MARK SISTY NEATHER: COUSY RAINING 40°F MID BRENKFAST 0660 100 HAS MEETING - CHEMICAC DENGES 5500 Gasur 6630 1057 CALIBRATE THE YSI (SEE CALIBRIATION SHEET) 0705 BEGM DEMES, PACKINS I MATERIALS, RANSING SUCKETS KARALL, AM PHER W Sterromy Contanner web For KUCCTIONS Ast. 100 HISTS & GET COMPRESSED GAS CYLINGERS TO BRINTOL SKID AN0 12 BILAGE EN LUNCH 1230 To PACHING UP AND DECON ISTO INTECTION ANDA AND CONVERT RETURN SUPPLIES Bix Arvin PACKAGING ALL pr o 1.47 (21.421 100 CONTA ININY ALL CHEMICAL - Ettem react contain for いぞうで TRIPLE RINSEP CLENAN. 3 DAY Mont Foring, 1530 BGGIN INVENTORYON and Pristing For Tomontow 357710 1.VUENTERT AND SAMPLE ET PER GARIA an. pay, GATHEN ano INCERTAR ALL SUPPLIES. 1720 mon pley For THE PAY MONTIDING. CUNTLETE PACAINY 1560 1114 VP 5 1935 CALCURATION AND 2912 WING OF MARINAMINTA What Louis geo Minious. Q. 1200 for dimer 118 1108 188 1011 .425.8 8/14/09 198 16337

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BRANNEN ANTERNA ANTERNA

8/15/09 ISEO INJELTION AND MINITOGING, CAPE, NE AK PENSONELL AANON J. MARK LANGE SCOTT mid goof NTATITR: mustly doudy 0600 BILLAKFAST GAONA HAS MEETING WITH BRISTOL. 067 0 callengation of yst 556 For 3rd day Gal monitoring event to day. 1645 (see inlibration spect.) complete exhibitation of meter 0730 0735 Levien sale the singlen. Pry the singling 09730 TESTING THIOSUFATE VOLUME NEED TO QUENCH MELD SAMOUS concection For INESERVATION. 1850 UP. MT. SITE PAGALUZ For JAMPEING **M** 21 07 NCMOC GIV13 - TAMPLE SAMPLE NAME: MW-08 02/15/89 LUC 10 MORS EX: ICO MW-08 Moc# 25 8/15/69 (4 (7-112) Cellect cound of her herets 1658 NOTE ICCATION 77.206 DTW JCO MW- 01 9.35 10:59 HAD BALLON in Croll Help To plan ave WILL MEASTAR AGILV AT CARD 4.77 MW-02 11:00 10000 3,42 MW-03 11:01 6.98 11:02 MW.04 11:03 3,84 MW. 05 Mr. 06 4,29 11:04 5.60 MW-07 11: 05 6.65 Mis-03 11: 05 MW - 199 11:06 8,07 O. 1 HIGH (A THAN MELION, ADD COUPLING FOR INSECTION MEADUAINS POINT TOC 9.09 MW-88 11:07 (internet 11:18 IN-01 4.27 Iconw- 01 11.08 7.35 11:11 Competite and acquirents degin DET, of on 14-08 Departay all pumps into surgeling wells. 11:15 11:50 All pumps deployed. Buch to lunch 1200 And sudary Thisselfate to war, and later boths to show exilicative 1132 1.4 ml 140 ml vial 35 AL 1 lito bothe

8/5/04 A. N. sodiene Theorithman of this 350 g to 500 ml theo 12.97 set at and point of mater cultures the simpling A4 punps 13:20 FUMP ADVOINENT Depth to Purpo (Test from Toc) LUMTION MW-02 6.84 6.5 MW-0] 8.31 mw-04 6.15 140-65 6.75 MW-66 7.60 M4. 07 Aur-68 8,6 MARE BERIN PALING AT MW OF (SEE SAMILE SHEETS FOR DECARS.) FTELD FET KIT ANATOS RENTS TITAL INOV samme ("1/2) (WI/NF) (umant LOCATION STANDARD FINGE VALVE 3,30 3.27 2 ML/10 ML IML/10 ML Mw - 07. 0,00 52.7 fme/150 1 0.1 ml/ 100 ml 6.60 3.30 0.71 MW-03 710 1.65 Eni/IdmL Mar - 64 0.00 8.25 0.55 100 mL/200 mL Mr - OS 0,00 1160 2520 Mar- 06 100mL/ 200 mL 0.00 1.20 14- 07 3.30 0.75 45 0.5. mL/10. mL/30. mL 0.00 1-08 0,00 2.86 SAL/10ML 5.72 FERROUS conner -> without SANVIE (m/) STAVOALD LOCATION FINAL VAL US 12.5 ML/12/5 AL 2.63 6.00 5.26 M02/02 3.27 327 MW -03 6.00 I'me / fillal Mar-04 5 ml /25ml 6.00 0.78 0.78 Mer-05 O, W 0.37 100 ml/ 20.1L 740 Mer-Ub 0.93 100 W/ 2007 150.46 0.00 1395 ML-07 SML/SOAL 1.31 0-00 13.1 Mur-08 0.92 no dilusion 0,00 0.92 1000000

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UCATION	KANSE White	ONC (mg/2)	•;	LOCATION	CONC (2/c)	KANGA HIGH	# of DRIPS
mw - 02	Lau	0	SAULLI TILLAN NOT ORANGE	Min- OC	5	H148	5
nw- 03	HIGH	70 ~ (350)	Smillisme	mbr- 03	4	+116,14	4
ner- 44	Low	5.6	÷	AW- 84	3	H(6.4	3
mh- 05	HTEH	14 (400)		5 m - 05	2	Hauth	Ζ.
nw- 06	HIGH	>70/25*	0.25 11 /25 16	500 hin -ol	24.0	H (G1+	24
mw - 67	Low	2.1	:	mar - 07	4.0	H1614	4
mu - 08	Law	4.2	1	MW-08	5.0	HIGH	5
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NE CAPE , AK 08/16/09 ISCO INSCITION AND MUNITORING, PEASONNEL : AANW JAMBAGIE MARN 12077 LANCE WEATHER ? CLOUDY MID 40'S F 06600 BREAKFAST 0620 Group Ht's MEETING WITH BRISTOL. BELIN POST CALIBRATION AND CALIBROTION OF 體で 0645 TURSIDITY STER AND YSI 556 (SEE CALIBRATION SHEET). 350° (05) 0730 METEL CALISKATE OK. 6330 537 ILE FOR LOULAS, EMPTY PURSE WATER SUCKETS INTO OVER MACHER PURIE NATER DR.M. Annie up a MONTTORING COCATION FOR CONTUMPTION OF DAYS GUN MONTTORING EVENT. 0960 A CONTRACTOR 61 over sty, attenieses of concerns. APE, cup STRATS, This Hore anos. where suctince, demote incated, have get in and March 1 6703 D-1 PrE 0945 GW CEVELS MCAJUNE AND ADJUST PUMPS TO MERCENT OF WATER CAUNA OF SAMPLE LICATANS DIW PUMP LOLATING LOCA-110V Time NUTE MW-01 09:65 9.32 NA Ast surplied nov - 62 4,67 6766 6.9 Filblann SHEEN MW-63 0967 3.16 6.35 and the second Am - cy 8.5 6963 7.22 1.10-65 NA 6969 4.05 ACKERPY JAMELO mu- 06 5.63 NP 0910 Qualagy Simples NA 5.61 MW. 07 £911 ALAGANY SAMMED 1992 - Sta 1-68 7.30 8.35 6912 AW- Of 8.11 6913 NA MEAS WRENCE Point Oil highly them sorting car to complete SHECH / NJT SAMPLES Mer- 20 965 6917 NA Ballan . Not same 4,32 Iw-01 N.A NST stantin 6715 100 m 6935 COMPLETE GUN GANGING AND Nop ALACCMENT. Aut is AND Aut of Ger single forms for details) 0940 set of 26 samme -97 J. Manuel No Sign songeling Acr-08 1425 conducte sampling munde Begin Simpling MW-04 1630 Camplete sampling mer-off / begin sat yo at MW-US. 1050 Begin purping mut-23. without depth 3.11 It. Curter is duck red). 1:52 End onlying begin sampling Aw. I. Have trush with Vit, again, but care 1126 make yething and bubble, very difficult

8116/07 Aw - 08 miller and more is and Complete Sempling MW-63. PUll purps at 1200 sungh: labelet and in Beist and put many All isdur. set up an MW-62. 1204 Brank for lunch. 1205 1315 Bigin Purping MW-02 end samply MW-OZ - Byin ilen 145 complete chin op donal down at comp. 1530 by a held kit sumple ingelysis. (SEE TASLE ON 8/15/09 for agults). ISSO complete say the melyis the B/15/07 and B/18/09 (30) dy arriting event) 1232 B/12 and S/13 NOT Begn analysing Sistern PERSULFATE SANDLET FROM inglysed previously because in ran out of supplies for the kit, samples was refridgerable withit made writed. BEBRUM PERSULFATO RANGE (HIGH) CONC (M2/ DATE LACATION MW-02 MW-03 MW-04 8/12/09 MIGH 770 61164 LOW HIGH 5.6 14 * (1400) * 0,25 ml/25 ml M~- 25 101110 + 1.h H. 14 × (1400) * 0.25 ml /25 ml MW-06 HIGH 10 J. 1.2 -07 Low 7.0 T THE 2.1 MW-08 Low 11 MN-09 Luns 1.4 MW - 88 HIGH 10 8/13/09 O 600 Aw- 01 1.1 Min-02 7.0 Low >70" | 14 (1400 5/25-L 025-L/25-L Mw - 03 188 4164 AW-04 5.6 LUN 378 25 "(2500) 0.75 AL/ 25 AL MW-05 4164 5.15.201 30 × (3000) mw-06 4167 0.25 ml/ 25 ml 1.35.41 AN-07 7.0 Low 100-08 1.4 Low 12-aqueon no og CULLET, INSFE ION WELL wst No. of Concession, Name MW-38 2:1 Low MV-02 5. 6.8.8**1**8 7.0 Low 10=ston Sine.455 (830 complete prostant only on den p. Congress make de the die

8/16/09 NE CAPE AK. 12 e đ E/16/01 Ò U U U U

8/17/09 NE CAPE AK Sco INSCETTER & MONTARING PESSONAL! Ammen Janancic MARK 5097 ANG 118 BREARFAST 06-00 GROUP BRISTOL 19TETY MEETING. 0621 CANTIN affle cour is sucher of 1 In of people DOWN AND DEMOBINS morry saonno MARK Fro SCOTT & CAVING SURVEYORS on a reaport 70097 COMBIG IN DIGGINS HOLET FOR SOIL SAMPLING TODAY BOTTOM OF ATTLE, SAMME -contespay. Post CAUBNATILY OF YS1 556 (SEE CAUBRATION AFOET) Pluibidity when 0640 0650 complete post calibration, of meters 757. 556 and terbidity. Begin pucking up trailors 0930 trustering controls of simple conex to chunical conex and clean at Bain 1030 other onex all Alcors mentrical, non a allemical conex. system comex, job bix and find rotes. which survey locations 1100 1365 1200 Luhch. MARK AND SCUTT DEPARTING SITE ON FCIGHT. 1220 1788 1300 PREMAR ALL CAGELI FOR DAY SEVEN SOIL AND GW SAMPLING REVIEW BORING LOG FOR SOLE SAMPLING AND PRE-SAMPLING EXCAVATION 1500 , WCATION FILL FILL me PEAT INTERVAL 11212 6-7 MIN - CZ - 4.5 5-65 0-4.5 MW - 63 3.Þ 6-7.5 0 --- 2 5.0 MW-04 0-3.5 1.1621 5-6 -48 MW-OS 0/ 0-5,0 TUR 5-6 0-4.8 MW-CG 6-2.7 6.5 - 7.5 10-3.7 MW-07 0-2.7 77.58 4.5 -5.5 mw - 08 0-3.7 1.83 5.5-6.5 MW-09 0-72.5 DINMER. Complete of 1 Cen when For Th 1.188 o Tamonnew EXCANATE HULL FOR WOOSDAY SILL SAMPLING GAVGE ALL ATTLES FOR WATER LEVEL INVENTORY JOB BOX 5 MW-4 MW B DRY SO WILL RELAVER FOR NONELOAM PURCIE SAMPLING INGRAVE WELL MOVEMENTS GUTH COTATION NAMES 1.12570 · DUNIH imo grie Romme MEDIL GU 8/17/09

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8/18/09 NE CAPE AK ISCO INDECTION AND MONITURING PERCENVEL ! AANON JAMEROSIC 1 LANCE PHEUSS E) MATHER: PARTLY CLOUDY MO 30'S"F + mid 40'S "F 16:00 BACKERAST 06:23 SAFETY MEETING WITH BRISTEL, EXCANATION SAFETY, PPE, COMMUNICATION EVE CONTACT, AND EXED STACES CONE TO DE COLD AND WINDY DICESS APPRUPATELY. 66:45 PRESS Fin Excavation. CALIGNATE YSI SSE (SEE CALIBRATION SHEET) and Arbility meter 07:59 08:15 meter calibrate ak dow up to site, pick up surving equiparant for exercision of 68:30 suit with the pungt and supplies. Beyn excuration to theme, go our scope and H+S. Beyn excurating toochins to 4 feet (bys) 864 s 1856 (Mu . isi \$ Jim - 01 (mw - 5 Mer 4 18 MW-7 in at Excavation Q but Ger at 3.5 Af end extrantron 09:03 Roya exemption Ca 69:10 End exemption (2) 3.6 test (bys) at north and 3.8 \$4 (bys at with end) 19:22 right at appen contact with Point below the Fill. neve back the excernts of to take a little deeper; still in fill with large 09:25 richs. (xusite to 42 but (big) contact with Peart create O to the feet jup of contact with preat and till execution 09:28 to low then 3 implete nor 69:35 Bigin exerciting (3) but flowing in at 28 feet at water in the fill and silt isstact with sill and pent at 3.45 feet cryphite excavation at 3 to 4 feit bass Eventry Complete 69:45 can an excountion of they product in the performance Grow Fill - greyish brown fine to poilders up to 2.5' \$ angular. Mostly cubble and boulders ML silt grey SILT point - dark broken organics and sitt

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08/18/09	NE CAPE	AK De	1 100 607, 600	AND Mask,	TUNING,		· · · · ·
1		1	a for some of a		•		
LUCATION	TIME	DTW (F#)	Netti			2010-2011-2011-2011-2011-2011-2011-2011	
MW-02	09.18	4.85		1 1 	: · · ·		
MW- 03	69:22	3.21					
MW-04	09:58	7.50					
hw- 05	69:35	4.78					
mw-06	09:19	4.28			1 1 1 1	· · · · · · · ·	• •
M~-07	09:59	5.68			• •	- -	
MW-08	09:25	7.31					
21W-09	69:33	8,75					
m - 28-5	07:58	9.15			5 1		
IW-01	09:56	6.18		· ·			
MW - Oi	09:57	6.42					
39-MW-3	12:07	11.28					
28 - MW - 1	12:12	15,80					
26	12.20	34.44	TD = 42.0	Ste 26 well	not in maps (to written on	well card)
22 MW-03	12:15	31.20				5.25" monumers	
22 WM-02	12:26	27.05	· · · · · · · · · · · · · · · · · · ·				
17 MW-01	12:33	11.71	·		•		
TEMP WELL	1240	2.51					
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12:445	Complete S	w GANSING.	LANCE SE	WS OOMNE ON	9-21-V& THE O	LOLC of mus-	88-5
	AMEN JE	r, op ro p	ancy MUN-8	Ano And-4		1 1 2 4	
14.00					e 0,5' PV	PIPE Dis	INFO
						ACH WELL	
14:10		to runge !					ананананананананананананананананананан
1422				AL DTW- 7.	30 Flow	RATE = 120 m	c/min
TIME	DTW	TEMP °C	LOND "Kin	DO (mg/L)	PH	ORP	Turbidita
14:32	below pourp	4.62	6.175	4.66	5.87		74.01
14:35	below porp	5,19	0,178	6.42	5.95	99.9	124.6
14:58	below porgs	5.43	0,178	5-87	5.92	104.3	NA
14:38	•	ity and pu					
		up an MC					
14:48		jing MW-00			14		
Time		Tomp "C			Ptt .	ORP	TANGATY
14:5B		4.36			5.90		18.17
15:01		4.90			1	113.9	× .
15:04	Belon mus	4,56	0.212	4,96			39.44
		M / Hand, on J of Landson and Market Mark	artas 1. A de la de Alam de l'Art de la des Priside Van de antes de la construit de la de la desante demonstru	*****************			

Mw · is 8/18/08 MW - I CHOAVATION (3) Fill Mi (3~27) 3 10 EAST WEST PEGT (dre brown i. nu- i EXCAVATION 2 1 in in FILL 3 1 NOLTH ģ 50-6724 4 PEAT nw-05 11- 14 15.00 4-03 - 482 EXCANDION - the ĉ. FILL 500 14 PEAT - 1999 5 205 Excavering confecte placed and manual and pove 15130 day 28 pipes to-- 201 hard augo sampling Which I God level measurent, from íC ť 215 to get pravious the 60 to garaje not in site wide Ger guaging existing wills. - 10 M antinue Giv gouging. 150 - 89 - 68 1504 CLEAN JP AT MU-04 WELL RUNS DRY. END PUNGENG. RUSSICE HAVE INSTALLED PVC 1505 LANCE AND PIDES FOR SOIL SAMLES TOMORAUN TCS. 8/19. PVC pipe driven ad ground 0.3' 1 benkenited at base and rand, pump pitchet 22 out water in caving se that band auger water . sample are not when up through sand -48 bentenite - sample Iscotion product lays on each surface. 122 any free 1558 Begn Surveying A THE MW-02 33 6,51 781 and a second -181

"Atein the Rain"

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$\begin{array}{c c c c c c c c c c c c c c c c c c c $	114 - 2	6-7	6.51	9.61	3.3	2.7	10:20	3.69	2,31	1187-555
$\begin{array}{ccccc} HA = 5 & 5 - 6' & 4.50 & 8.73 & 4.23 & 0.77 & 9.09 & 4.59 & 0.41 \\ HA = 6 & 5 - 6' & 5.33 & 9.88 & 4.55 & 0.45 & 10.00 & 4.67 & 8.33 \\ HA = 7 & 6.5 - 7.5 & 5.76 & 10.25 & 4.37 & 2.01 & 10.17 & 4.41 & 2.09 \\ HA = 8 & 4.5 - 5.5' & 4.35 & 7.39 & 3.04 & 1.46 & 7.59 & 3.24 & 1.26 \\ HA = 7 & 5.5 - 6.5' & 3.98 & 7.49 & 3.54 & 1.96 & 7.53 & 5.5' & 1.95 \\ 1630 & complete surveying \\ 1645 & bynn Anage eynerg helds: chose helds the start of depths are side on survey get on the field of the product of the produc$	1+A-3	5-6.5	462	8,68	4.06	0.94	8,9Z			
HA+6 S-6' 5,33 9.88 4.55 0.45 10.00 4.67 6.33 HA+7 6.5-7.5 5.76 10.25 4.37 2.01 10.17 4.41 2.07 HA+8 4.5-5.5' 4.35 7.39 3.04 1.46 7.57 3.24 1.26 HA-9 5.5-6.5 3.98 7.41 3.54 1.96 7.53 3.55 1.95 1630 Complete surveying I.66.1 chase h He sample dopth. Depths are scholon 5.57 1.95 1630 Complete surveying I.66.1 chase h He sample dopth. Depths are scholon 5.57 1.95 1645 Base number fill Construct He manute All Toc accusterenable on surveying I.66 7.1 1647 Teacher fill Base number fill General fill General fill General fill Mark of place number fill General fill G	HA-4	6 - 7.5	4.63	8,85	4.22	1.78				
HA-6 J. 55 J. 85 J. 85 <thj. 85<="" th=""> <thj. 85<="" th=""> <thj.< td=""><td>HA-5</td><td></td><td>4.50</td><td>8,73</td><td>4,23</td><td></td><td>1</td><td></td><td></td><td></td></thj.<></thj.></thj.>	HA-5		4.50	8,73	4,23		1			
$\begin{array}{c cccc} \mu_{A-7} & g, g = -5, g' & g, g = 7, 3g & g, e = 1, 46 & 7, 57 & g, e = 1, 95 \\ \hline \mu_{A-7} & g, g = -6, g' & g, g = 7, 4g & g, g = 7, 4g & g, g = 1, 95 \\ \hline \mu_{A-7} & g, g = -7, g & h, h, g & h & h & h, g & h & h & h & g & h & g = 5, h & e = 5,$	1-14-6		5, 33							
$H_{A} - 7$ $5.5 - 6.5'$ 3.98 7.47 $3.54'$ $1.76'$ $7.533,55'$ $1.95'$ 1630 complete surveying	HA·7		5.76	10.25			1	1	2.09	
1630 complete surveying 1645 kipn Ang egeng heles chese h the single depth. Dyths are site on surveying pale as include the hight of the midmant All Toc newscenards are infected PMY 7 Recences Control That in the first the hight of the midmant All Toc newscenards are infected PMY 7 Recences Control That in the first control to the first prime tace to the are site of the second to the first prime to the first prime to the first prime to the first prime to the second to t	1						ξ I			C
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1645 Bigen hung are of halos chose half sample death. Depths are sited on surveys MH 7 Box include the hight of the midment. All Toe measurements are indeated MH 7 Box inclus That we plot the construct perm control of the construct of the		· · · · ·	· · · · · · ·		.,					
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$HA-5$ 9.50 9.03 4.9 5.4 $HA-6$ 10.33 10.00 4.6 5.05 $HA-7$ 12.26 11.62 6.35 7.0 $HA-8$ 8.255 7.078 5.7 5.9 $HA-9$ 9.48 9.05 6.15 $HA-9$ 9.48 9.05 6.15 $D44$ 28 $Beaning control prophyle control prophyle Location pennel pennel pennel Toc_1 D44 28 Beaning control pennel pennel Toc_2 HA-7 12.51 11.73 6.5 7.28 7.28 HA-3 9.62 9.43 5.5 5.6 5.6 11A-4 10.63 10.13 5.3 5.756.2 $,				、		
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LOCATION TAILOTORINH CARENT DEPTH FROM TOC TWYOF TOC HA-Z 12, 51 11.73 6.5 7.28 HA-3 962 9.43 5.5 5.6 HA-4 10.63 10.13 5.3 5.756.2				. G 1.2						
LOCATION TAILOTORINA COARDIN DEPTH PERTIFIC TOUR TOC HA-Z 12, 51 11.73 6.5 7.28 HA-3 962 9.43 5.5 5.6 HA-4 10.63 10.13 5.3 5.756.2	D44 28	BURINGS				· · · · · .			a a mad shidola	
HA-z 12, 51 11.73 6.5 7.28 HA-3 962 9.43 5.5 5.6 HA-4 10.63 10.13 5.3 $5.756.2$		1	CURRENT DEPTH	DEPAH FROM TOC	Torget Toc	· · · · · ·	:			
HA-3 962 9.43 5.5 5.6 HA-4 10.63 10.13 5.3 $\frac{5.5}{5.75}$ 6.2		יישן פערטייז שליבעראר בעישיין ענולע איי פראפענער בין קרא לאינעראנינער אייר אייראי ביישיין אייראי אייראי אייראי אייראי איינעראי בעישיין אייראי געראיין אייראי איי	A REAL PROPERTY AND A	ANALYSIAN PRODUCT STORE STORE	Contraction of the local division of the loc					
119-4 10.63 10.13 5.3 5.756.2						р <u>.</u>	· · ·			
		1	10.13	5,3	\$756.2					
147-5 9.5 8.75 4.6 5.4		9.5	8.73	4.6	5.4		-			
HA-6 10.33 to.039.89 4.6 5.05 45		10.33	10.03 9.9	4.6	5.05					
HA-7 12.26 11.82 6.5 7.0	HA-7	12.26			7.0					
111-8 8.85 8.34 5.4 5.9	110-8	8.85		5.4	5.9					Testar
HA-7 9.45 9.04 6.2 6.6	HA-9	9.45	9.04	6.2	6.6					
			·		1				· · · · · · · · · · · · · · · · · · ·	
3 tratings that - 3 HA-4 and that 5 are with in 4-5 feet of miching well		3 kullings it	A-3 HA-4	and HAT 5	eve with in	4-5 feet o	mje	they we		
2 bottomp HA-8 and HA-9 are 12-12.5 feet from the injection well				1					- 10 - 1	
3 boldings 49-2, 49-4 and 49-7 are with in 17-21.5 feet at the injustion well.								fiction	well.	
	£1.	,			•					P

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8/18/09 NE CARE AM Brech for Dime 19-50 seture to have argving sample location to just above target 1850 sangel internal complete hand angeing to just abor says target depth at all 7th day and 28th day soil sample locations 2035 2640 mw-or 7.98 orgenal Drive 7.3 MW-08 7.62 orginal 07W 7.50 begin Decon and chief up at site 20045 Onplute decon and chan up head back to 2120 Denos cycipment. End work for the day. UNS 8/18/09

"Retering the Rain"

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8/19/09	· NZ /A	PE, AK	Ford MIFLT	70~ A~0 ,2000	70/21-46			
		PERSONNEL;				• ,		
			LANCE PHE					\$ *
				1 MID 40'	'F		:	
3350 G	BREAKFAST			, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
0620	ALL HAND		ing mint	BRISTOL		-		
0640	POST DALTER			TULBIDITY MET	er lsee cari	BRATION SHE	-75)	
		LATE ME						
0700		SETER C.						
515		samrearing			Fun DECOR	SCALE	TORMS	
		two surrere						
0 83 0	Collect al	1 dotte w	in y al.	site .	 			
		Hts rea				:		
C Cr(v		nd of Gw		1	11 From Man	1-08	· · · · · · · ·	
LUCATION	TIME	prw	TR	PUME DEPTH	pupped nel	from bittom	Roman	
MW-52	0841	4.77	8.94	6,8				
MW-63	6242	4.16	9.50	6.8	2.7			a 1a
MN- 64	08.43	7.61	9,70	8,65	1.05			
Mw-05	0844	5.09	8.45	6.76	1.67			
MW-66	68 45	4,44	9.16	7.75	2,35	4		
MW- 67	0846	5.66	9.60	7.6	2.0			
MW-6's	0247	7.85	9.35	8.6	0,75			
Max-09-	084/8	8.25	NS .	ر ⊻ر		1		
mw of	6549	9.45	N 2	NS		:		No. 1 No. 7
LW-01 MW-88-5	0850	~	/4 S	205				
NW-00 J		9.17 1	AVS	· · · · · · · · ·				
	NS - Aut sa		e	1 m				
		From MUV-6		: 8 G. 1915 1	160-74			
120		MW-08.0		1.		1. 1	1.	
		dry 6 40 echorge und			· · · · · · · · · · · · · · · · · · ·	Grand Caller	7 9	
09 35		ing MU-0			755 52			
1945	Carpleto &	mpling at	AW - U4	Ogwcmee 24 1	@ 09.35 MCC	-19		
	int m	t parkage a	at and both	they us a sthere.				
1000		manage a					•	
		env-os at			- 101			
1050		1500 85 Al		· · ·		ana a a a a a	1	
11 27		Im MW-05			3			
/145		y on Man-0.		4				

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8/19/09 NE CAPE AK sign placing rest of pages in wills at digith set of on Mul-3. 1100 1215 bruch for longh 15 15 built up at site 13:22 lay- pryns Aw-03 13:50 by sumpling New - 03 bagin purging au-contract continues to fill bittles and MW-UR 15:38 begin implying mw-oc 16.10 implied scorpling and - oc set of an april 16:50 2000 B 1 17:08 Begin purging ML-62 17:25 Red porging bagin singering MUS-02 17:55 couplet sugary Mar-c2 18:05 Byin atup on MW-07 Attempt to callent remaining simple art moral after allerin to richarge. 18:10 iltan ~250 ml. 1815 Bruk for dina Band and and site attempt to collect more volume form mer -08. collect 1915 ~125 al. 19:22 Begin purping MW- 67 ALC: KEE begin sumpling MW-07 11:55 complete sapling MW-07 20:12 20:13 attempt to recover additional volvan from moi - 00 70°. 15 manual valance record ~ 40 mL Begin clean yo at the site, dean surges and equipment. 21:16 21:25 Unload equipment of conex boxes. Singoles all in Aridge seter, stoched jus box, equipment patin anexs 22.20 and job box, fuch unloaded. (huch with thick (Bristor land) plan tonerand at Zpra. 188 Tonsnow, puck samples. Run test kil christy a with singles collected today, pack for departure. 116 1.127 8/19/09 1.11 eneraien.

Rete in the Rain

	n an						
08/20/69	NZ CAI	OE AK.		1,000,01,000,000,000,000,000,000,000,00		· · · · · · · · · · · · · · · · · · ·	**************************************
1 1 0	formail	: Auron Junto	sine long f	heuse wen	ther: doub	Howleys mil	5 1 F - A 2 4 V 3 C
0600	Brechfist			Ň	,,		C
		why, ch	ank Secretes	hit to him	all hands	satiti muti	n X lén
0830 1	est caliba	1 FJI 53	TC and the	-bid to mit	e post	librate o	k C
		e culibr					
0706		dypartin					. (
		d chemist				it scrayd	
				/			C
TSTAL 1KG	,~ `						C
LOCATION]	STANDAND	squeri ("1/2)	Connort	DICUSION (VII)	T	FINAL VALU	F
MW-52	U. 00	3.30 3.30	Inc/ pack		and a second	> 330	
MW - 03	0.00	0,40	0,1-1/100-1			400	G
1w-04	0.00	1,23	2 ml/Ione			6.15	
mw-05	0.03	0.75	0.1 mL/200 ml			1500	
mar- 06	0.00	8.60	U. 1 AL / 150 AL			900	C
MW -07	0,00	3.30/0.99	Inclosed 10	1/10.mL		. 99	ſ
MW-08	0.00	3.30 6,52	5-1/10-10	1.1/10AL		52	
FERRON	REN	· · · · · · · · · · · · · · · · · · ·			<u>.</u>	L	
LICATION .	514~0420	SAMPLE (My)) comment	DIRVISION (V	+/vr)	FINGE VA	cere C
Mw-02	0 00 U		1.5 ML/25 ML			6.14	
1-1-03	0.00	2.12	Inc / wome			2/2	
MW- 04	0.00	0.02 0.02	5al/25al	au delusion		0.02	·····
1000-05	0.00	0.26	U.I.M. / ROCAL		× 1 11110	520	
mw-06	0.00	0.37	Olal /isome	,		555	
mw- 07	0.08	1.49	3mil/scal			14.9	
MW- de	0,0	0.14	no blusion			0.14	
PERJULFA		1 200 1	/ur.h				· · · · · C
LOLATION	REANCE HIGH	(ON (21%)	dilinon (VI)	HTONNGEN SUL	and the second se	Alter n S	
MW-02	4144	10.		LOCATION	conc(mg/L)	RANGE (11/414	the of Davips
MW-03	41514	78		Aw-02	0.6 *	4164	<i>0</i>
MW-04	(3~	4.2		Mw-03	3.0	H164	3
BW-05	1416.11	10*(1000)	6,25ml/25ml	hw-04	2.0	H161+	5
MW-06	HUH	10* (500)	0.5 ml / 25 ml	M~ 05	4.0		
MW-07	671414	21.0		nw-06	4.0	tfl.4/f	. 4
1-08	HILIH	14.0		AN- 07	4.0	. HIGH .	4 6
				mor- 08	3,0	1 11/11	3
				× A. 1 . 7 1	I blue when :	sta t	11

change when 45 draps and at sign many. Silvied sample isalfstal still as change with 45 draps added.

8/22/09 NE Cope AK. 11:15 complete field hit during testing by in purking sig sayde Enthese part op plan in the equipment and samples. Singles This on to late. Equipment will be straid on 1200 Alan write ~ II Abra For day 14 events Sust from NE lago to Surcarga to drug of truly sit divid the sa detail then continues on to Norm. Flight flin, or , the trive in None, show and stage equipment, get additional 1800 in the sight proof angel to hipanot. 20:30 EDD NUMB 6 বারণ 08/20/09 - 3146 7 28183 2.993 <u>tan</u> • 1.194 \mathcal{O} - THE - -· · · · . . . 144

A CONTRACT OF

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Rete in the Rain'

intervent in the the way of location and by the produce Andrews 8361 to me light who had bond in 0/21 Rewen bank to work and begin proport deve of 5181 Bruk be lunch sha! complete support new do a locate and by a set as energy 22 71 gome hujdass alig Soul golin budind citing 11-36 set of an man-oc proceed in cult with supple tothe more the move de caill build law p for 11 1 1 1 my " top our The 62.01 buffle due to will fording to not dig so have considered through decur then cull on 451 , will called all purper with in unpreserved complete low level collection set - an MW-DB 356D 5-98-MW SS:60 126 SN 61.2 h5:60 10 -MI SN 12.8 SN 15:60 60 0.6 = C/10.6 20.6 = C/10.6 75:60 HE L 12. DOW 90 SL b 95.5 15:60 21-20W 03% 20 91. c = C/2b. h 02 - 20W DS:60 90 812 01.6 UN -CL-1 = 7/86-6 91-20W 66:60 20.5 50 568 61-29W ch'1 =- e/18' E ph:bo 15.2 60 02% 5818 = 8/01.14 L1 - 20W Lh: Jp os B 08.2 20 7460 12- 79W JOE = C/ED: H 16:4 20 60 8 15.5 51:10 10-14 front adjuthed Just DON nla Loc estrin al c-leit word of but wersurends. 56:60 Arrive at leland. Eggin making court and he site by the to Island 05:80 jord to an proof complete outer colibretion Culibenting when 1020 Buttest / Safety weekery 90 9C to so of Me of the sos year up and the and the yopin 01-0 KUSECC JAMER (BUISED LANCE PHEUS (AECONS Kasimer; AARON Strugeoure (42000) 14 16 buy runitering Event 8/ 52/06 NE CAPE AN 1200 107000 monthering.

8/25/09							
13:53	of field.	Sumple while	Lonce and	Russell con	phile sumplies		
TSTAC 1	lun						
LJCATION	STANDAND	sample (My/c)	(smaterit (VE/VE DIWIN)	FINAL VALUE	
5.0	0100		4	ime/20me/0,		1740	
63	0,00	8.28	D.I. ML/IGML			88	
64	0.00	2.27	Ind / 10 ml			22.7	
(S	0.00	0.35/28	0.1 11 / 200.	36		700	
66	0.00	0.34/0.55	0,1 m / 150	AL CIAL/10	CAL.	550	
57	0.0	3.30/1.57	Dil ML/ 10 mL	10.05.22/10	ml	314	
08	0.0	0.40	O. I.M. / iomi			40	
۰.	n vaaren van een saar genaam aan oorteen saar oorteen saar de see de						
FERROLS IR.	A .		че 1				
Loc.ATION	SIAMOANO	SAMLE (My)	Commun (Dic.	TION VINF		FINAL VALVE	
50	0,40	3.30 / 2,04	HismL/25ml	\$		102	
- 63	0.00	1.40	2.511/25 mL			14	
64	1.00	2.59	No dilusion	-		2.59	
67	04.6	0.23	0.1 m2/20	c.nc	-	460	
06	00 61	6.53/041	0,1 mL / 150	mL O.IML/10	some	410	
67	0.0	3.11	2.5m1/25 ml			31.1	
31	0.0	0,20	no dilution		₽	0.2	
· _ ! .		•					
Sipioni)	PERSVIFATE			HTDAUGHN PER	VXIDE		
LUCATION	Reprise Hisu	(me. (mg/z)	NOTE	Location	CONC (my/L)	RANGE Kon	H OF DRU
MW - 62	1.06-1	2.8	YELLON NOT DE.	ance 62	0 *	Com/HIGH	0
MW- 05	eard	7.0	YOLUNISH URANGE	50	. 4	11:54	
Mw- 64	LEW	7.0	*	64	5	北山谷	
MW- 05	H15H	21.0	YELLOW NOT DANNE	05	۵	11161/100	0
Mw- 66	111617	28.0	HELLO-J NOT UZANGE	06	C.	HIGH/Low	, Ö
14- 17	Hitti Low	4.2	LELISH NOT ORA	wite 17	3	H11-14	3
ma- 08	(لواله ا	1.4	YELLON NOT GLAN	ne 18	1.6	L. V ww	8
No TPS :	ىرىنىيە بىرىنى بىرىمىرىمىرىيە بىرىنىڭ ئىلىكى ئىلىكى تىلىكى تەرىپىتىنىڭ تەرىپىيى بىرىكى بىرىكى بىرىكى بىرىكى بىر تىلىكى بىرىكى		2 4				•
* MW. 0	hydrogen so	The lests, s	uph hence i	the bit show	w change -	when Sodium	- Thousvl
				rupe, triged ser			
t anv-	of reacts s	my as now	5 alm t	iting for by	Ursjeen propi	ac.	
				Mill-6. Simp			5
	•		F	add but			1
	:	this sulfate a	rups add,	mw-s mw-6	and new-	OR sample	ince
		hind at	con and Ulg	Homye ho	hydrigen no	exide axillu	r .
		had a c					

"Actes the Read"

8/25/49 17:25 Conjolute test kit undgess at singoles begin clean up at site Lince and Ressell have completed sungting and are drawing up at the site time is propping out with from will valithe Altergat sough collection and MW , 08 atte allowing to recting - since 1600 1232 and astronad I lite of sugar and will considery use collected perge volume for rest of singell. Down all puge note in downs and over parches, land all supplies 1840 on plane and in job box. Plane laded proper for deputive. 1057 1750 Arow buck in Noone Cim and the second s 10000.07 **1** 13 million - 12 mi Nigo :s

9/11/09 NE CAPE AK DAY 28 Sole + Gov MONITORING PERSONNECC AARO JAMBINON BOB SCHOOSSER, (AECOM) 120 M-ISEN JAMES, ERIC (BRISTOD) WEATHER : MUSTER COULDY 40 F CALIBRATE METERS YSI 556 's (3) and herbidity where 0 630 6760 METERS CALIBRATTE OK. J and sytery merring cours , oxidents low of 6705 SAGAK FAIT D a call stall port of lacetion, 5 6603 VILLOO SUPPLIES TADUEL TO BEANING AIR 08415 DEPART FOR NE CAPE. 0945 Annive we cape EUGENT NAITINS, UNEORO sancies. HEAD of TO SITE. 1000 BEGIN MEASURANS GW CEVELS. Adi 10 long adjumat LUCATION TIME DTW KUMW-01 10.64 9 56 NS 5.38 1.8 MW 62 10:05 8.94 21 . NW- VS 4.29 2.6 10:06 9,50 17 7,65 19 mor 04 1.0 10:07 9,70 Mu- 65 535 245 1.5 10:00 16 nn " . 06 4.20 10:09. 9.10 2.5 26 na - 07 5.49 9.60 10:16 2.05 18 7.24 Mar - OK 9.35 0.3 2 Kingle 10:11 MW 69 8:36 10:12 NS **)** Iw-01 7.59 10:18 NS M~ -88-5 9.29 NS 10:14 <u>الا</u> Complete low GAUGINA Signa set or en me -08 and setting port 16:15 ADJUSTMENTS. Beyn progen & Auros, Collection, all proge water in appressived Listler 18:51 due to low recharge will use it reived. wall some say. ~2.5 lips collected collected additional is liter 11:04 From triding here not through there all allow the achinge and will reathinger Junghe collection. Syla set up on Max-67 41.15 Buyin pulying Mr 07 11:40 END FURGING BEGIN Samming MW-07. MS/MAD and Puplicute 17:18 callented.

9/11/01 NE CAPE AL Complete starting na-57 13:00 13:30 BEGIN PLAGING NOW-OG 14:00 End punging stams sampling me - 66 14:22 annerte simpling moral. BIGIN SET UP on MIN-02 Bellin punging med-02 14:35 15:00 END PURGING BECHN SAMPLING MW-02 complete sample a monthe Bellin clear and 15:13 ADDISTINS WITH SEIL SAMPLING Attempt collect additional astrong for more 02, 0.5 liter 160 5 collected. murde, minut coloren 1640 Robitempt surgely calledour recovered - 40 ml. Terrer a Parking up and Dearstony white waiting the Mart 28 to rectarge. Eric (Brishel) begins Anatomat at purge water through GAC. 1000000 1800 Part of all motion yet all supplies out it job tix, had pline 1830 Depart NE Cape In None Arrive at None, inload plane, organizes syptime, the 1915 samples but to litel figured dont and ind. 1945 stragh in room, coupled work the Man Store 9/11/09 C. Z F A

9/12/09	NE	APE AK.					
	PERSONNEL	· Ann JA	warusic 3	of SCHLOIJ	re CAEL	Con	
		Russecc	MAMER, 6	are (BRI	TILS		
1811 v dav ur 19 19 19 19 19 19 19 19 19 19 19 19 19	wearther	C. CLUNDY	40.E				
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10:36	beyon panta	yeary sungel	, and prop	ing the ship	premet the 1	Le . hill on	1 CUC.s
	Beyin run	ning fest	kit analysis	pi I	4 - E	· · · ·	
	• • • •					· · · ·	·
TOTAL IKO	N	4		, en .	, F	×	
(3C-4710-V	STAMANO	SAUPLE (12/)	Dilusion	1/NF	1	anaan shaqaacaa waxaa waxaa ahaa ahaa ahaa ahaa gaadaa ahaa ahaa	FINAL VAL
02	0.0	3.30 0.45	O.Inclione / a	01 ml/10 ml		1 	450
56	0.0	1.65	6.1 ml / 10m	L		•	165
84	0.0	1.44	O. Lac liom			· · ·	144
05	0.0	1.64	0.1 ml / 10 ml				164
06	0.0	0.12/1.19	0.05 ml/50 ml	0.1 mc/10 mc			119
57	0.0	0.48	0.1 mc / 100 mc	• • • • •			480
08	0.0	0.24	0.1 mL/10 mL				24
FERROSS 12.		consic (mg)	V	I/VF	1 .	1 1	FILSPE VOC
LOCATION	57.91047.0 U.O	3.03			nanimus nanona success I will control of subsections and a success branch and a success of the succes	ni zadomeni japone interiori nina zadan e zadomeni zadan e zado	30.3
02	0.0	3.27	2.5 ml/25 ml				
٥५	0.0	2.83	no dilusion			na kana kana kana kana kana kana kana k	3.27 2.83
05	0.0		2.5 ml /25 m		• • • • • • • • • • • • • • • • • • •		2.03 16.4
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00	0.0	1.5	0.25 nL/25 m			• •	150
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65	RANGE (HIGHON) 4144 LOW HIGH HIGH	14 5.6 35 21		C3-77/11 62 03 64 05	2.6 1.6 2.2 2.6	low low low	3 8 1 3
65 05 06	RANGE (HIGKON) 4164 LOW 4164 HIGH HIGH	19 5.6 35 21 17	7ELLON NOT ORAVGE	C3-77/11 62 03 64 05 06	2.6 1.6 2.2 2.6 3.0	low low low low	13 8 11 13 15
65	RANGE (HIGHON) 4144 LOW HIGH HIGH	14 5.6 35 21	7ELLON NOT ORAVGE	C3-77/11 62 03 64 05	2.6 1.6 2.2 2.6	low low low	3 8 1 3

address

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APPENDIX B

Data Verification Report

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ACRONYMS AND ABBREVIATIONS

% ADEC AK Bristol CoC DQO DRO FD GRO HTRW ID ISCO LCS LCSD MB MDL MB MDL MB MDL mm MS MSD NE Cape NP QC QSM RL RPD RRO SAP SDG	percent Alaska Department of Environmental Conservation Alaska Method Bristol Environmental Remediation Services, LLC chain-of-custody data quality objective diesel range organics field duplicate gasoline range organics hazardous, toxic, and radioactive waste identification in-situ chemical oxidation laboratory control sample laboratory control sample duplicate method blank method detection limit millimeter matrix spike matrix spike duplicate Northeast Cape not preferred quality control Quality Systems Manual reporting limit relative percent difference residual range organics sampling and analysis plan sample delivery group
=	•
SDG	sample delivery group
SW	EPA Solid Waste Method
TestAmerica	TestAmerica Laboratories, Inc.
TOC	total organic carbon
USACE	U.S. Army Corps of Engineers
VOC	volatile organic compound

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1.0 INTRODUCTION

This Data Verification Report has been completed on the submitted data packages in accordance with an agreement between Bristol Environmental Remediation Services, LLC (Bristol), and the U.S. Army Corps of Engineers (USACE). As per this agreement, all laboratory results were generated as part of work on the in-situ chemical oxidation (ISCO) Phase I and Intrusive Drum Removal/Landfill Cap – Northeast Cape (NE Cape), St. Lawrence Island, Alaska. The USACE assigned this project to Bristol under Contract number W911KB-09-C-0013.

Data verification was performed on the data collected as part of the NE Cape ISCO Study and Drum Removal. Data verification is a process for evaluating the completeness, correctness, consistency, compliance with method procedures and quality control (QC) requirements, and identification of anomalous data. The reported project sample values, as well as any method laboratory control samples extracted or prepared with the project samples were reviewed. Specifically, the following items were reviewed in this data verification:

- Sample receipt conditions:
 - Sample preservation
 - Cooler temperatures upon receipt
 - Chain-of-custody (COC) condition/correspondence to submitted sample set
 - Presence/absence of custody seals
- Extraction and analytical procedures:
 - Holding times
 - Method blanks (MBs)
 - Laboratory control samples (LCS)/laboratory control sample duplicates (LCSDs)
 - Matrix spike (MS)/matrix spike duplicate (MSD)
 - Duplicate samples
 - Surrogate recoveries
- Sampling procedures:
 - Field blanks
 - Trip blanks
 - Equipment blanks
 - Field duplicate samples
- Correspondence to method criteria and project data quality objectives (DQOs)

Unless otherwise discussed in this document, the above parameters were within Sampling and Analysis Plan (SAP)/method criteria and were within SAP-specified control limits.

No information on internal standards, calibrations, instrument tunes, chromatograms, quantitation reports, spectra, summaries identifying any analytical irregularities and the subsequent corrective action taken by the laboratories, or results from any other analytical procedures, other than those listed above, were reviewed per SAP requirements and they are not addressed in this report.

Data verification was performed in accordance with:

- The ISCO Phase I and Intrusive Drum Removal/Landfill Cap NE Cape SAP, Revision 1 • (July 2009)
- EM 200-1-6, Chemical Quality Assurance of Hazardous, Toxic, and Radioactive Waste (HTRW) Projects (USACE, 1997)
- U.S. Department of Defense Quality Systems Manual (QSM), Version 3, Final (DoD, 2009)
- ER 1110-1-263, Chemical Data Quality Management for HTRW Remedial Activities (USACE, 1998)
- Alaska Department of Environmental Conservation (ADEC) Technical Memorandum: Environmental Laboratory and Quality Assurance Requirements (Updated March 2009)

Precision and accuracy were assessed by comparing surrogate, MS/MSD and LCS/LCSD recoveries and relative percent differences (RPDs) to the SAP-specified control limits. The frequency of QC samples was compared to the frequency specified in the SAP. MS/MSDs performed on non-project samples are not applicable and were not evaluated.

The reviewed data sets include data collected for the NE Cape ISCO Study and Drum Removal in August 2009 and analyzed by TestAmerica Laboratories, Inc. (TestAmerica). Both the Anchorage, Alaska, and Tacoma, Washington, TestAmerica laboratories were used as presented in Table 1. TestAmerica analyzed the samples for the following compounds:

- The volatile organic compounds (VOCs) benzene and naphthalene by EPA SW-846 method 5035B/8260B
- Gasoline range organics (GRO) by ADEC method Alaska Method (AK)101
- Diesel range organics (DRO) and residual range organics (RRO) by ADEC method Alaska Method AK102/103
- TestAmerica-Tacoma transferred twelve samples from Sample Delivery Group (SDG) 14753 to TestAmerica in West Sacramento for analyses of the following:

Total organic carbon (TOC) by SW-846 9060

The laboratory work order number are presented in Table 1.

Primary Laboratory	Primary Laboratory Work Order No.	Subcontract Laboratory Work Order No.		
TestAmerica-Tacoma	580-14560-1	N/A		
TestAmerica-Tacoma	580-14753-1	G9H060205		
TestAmerica-Tacoma	580-14864-1	N/A		
TestAmerica-Tacoma	580-15053-1	N/A		
TestAmerica-Tacoma	580-15084-1	N/A		
TestAmerica-Tacoma	580-15087-1	N/A		
TestAmerica-Tacoma	580-15185-1	N/A		
TestAmerica-Tacoma	580-15434-1	N/A		
TestAmerica-Tacoma	580-15437-1	N/A		
TestAmerica-Anchorage	ASG0063	N/A		

Table 1: Laboratory Work Order Number

N/A not applicable The following data qualifiers were used to identify data points when data verification determined that results should be qualified because of a potential bias in the result or a deviation from method or SAP QC procedures:

- J The analyte was positively identified; the quantitation is an estimation.
- U The analyte was analyzed for, but not detected at the method detection limit (MDL).
- R The data are unusable because of deficiencies in the ability to analyze the sample and meet QC criteria.
- B The analyte was detected above one-half the reporting limit in an associated blank.
- M A matrix effect was present.
- QH, QL, one or more QC criteria, such as a surrogate or LCS recovery failed with high or low bias.
- NP A second, more technically valid result was reported. NP-qualified results should be disregarded.

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2.0 DATA VERIFICATION

A total of 78 samples which included 26 soil samples (includes three field duplicates), 36 water samples (includes five field duplicates), and 8 trip blanks were collected from July through September 2009 and submitted to TestAmerica for analysis.

Field sample number, corresponding laboratory number, and analyses, are presented in Table 2.

Field Sample Identification	Laboratory Sample Number	Benzene and Naphthalene (8260B)	GRO (AK101)	DRO/RRO (AK102/AK103)	DRO/(AK102)	Total Organic Carbon (9060)	Metals (As, Cr, Pb) by 6020	Sulfate (300)	Remarks
Soil	T								
09NCMOCSB01	580-14560-1				х				
09NCMOCSB02	580-14560-2				х				
09NCMOCSB03	580-14560-3				х				
09NCMOCSB04	580-14560-4				х				
09NCMOCSB05	580-14753-1	х	х	х		х			
09NCMOCSB06	580-14753-2	х	х	х		х			
09NCMOCSB07	580-14753-3	х	х	х		х			
09NCMOCSB08	580-14753-4	х	х	х		х			
09NCMOCSB09	580-14753-5	х	х	х		х			
09NCMOCSB10	580-14753-6	х	х	х		х			
09NCMOCSB11	580-14753-7	x	х	х		x			MS/MSD VOCs, GRO, DRO/RRO, TOC
09NCMOCSB12	580-14753-8	х	х	х		х			FD of 09NCMOCSB11
Trip Blank	580-14753-9	х							
09NCMOCSB13	580-15084-1	х	х	х		х			
09NCMOCSB14	580-15084-2	х	х	x		x			MS/MSD VOCs, GRO, DRO/RRO, TOC
09NCMOCSB15	580-15084-3	х	х	х		х			
09NCMOCSB16	580-15084-4	х	х	х		х			
09NCMOCSB17	580-15084-5	х	х	х		х			
09NCMOCSB18	580-15084-6	х	х	х		х			
09NCMOCSB19	580-15084-7	х	х	х		х			MS/MSD TOC
09NCMOCSB20	580-15084-8	х	х	х		х			
09NCMOCSB21	580-15084-9	х	х	х		х			FD of 09NCMOCSB18
09NCMOCSB22	580-15084-10	х	х	х		х			

Field Sample Identification	Laboratory Sample Number	Benzene and Naphthalene (8260B)	GRO (AK101)	DRO/RRO (AK102/AK103)	DRO/(AK102)	Total Organic Carbon (9060)	Metals (As, Cr, Pb) by 6020	Sulfate (300)	Remarks
09NCMOCSB23	580-15084-11	х	х	х		х			
09NCMOCSB24	580-15084-12	х	х	х		х			
Trip Blank	580-15084-13	х	х						
09NCMOCSB25	580-15434-1	х	х	х		х			
09NCMOCSB26	580-15434-2	х	х	х		х			
09NCMOCSB27	580-15434-3	х	х	х		х			
09NCMOCSB28	580-15434-4	х	х	х		х			
09NCMOCSB31	580-15434-5	х	х	х		х			FD of 09NCMOCSB26 MS/MSD TOC
09NCMOCSB32	580-15434-6	х	х	х		х			MS/MSD VOCs, GRO, DRO/RRO
09NCMOCSB33	580-15434-7	х	х	х		х			
09NCMOCSB34	580-15434-8	х	х	х		х			
09NCMOCSB29	580-15434-9	х	х	х		х			
09NCMOCSB35	580-15434-10								On hold; not reported
Trip Blank	580-15434-11	х	х						
Water				I.					
09NCMOCGW01	ASG00063-01				х				
09NCMOCGW02	ASG00063-02				х				
09NCMOCGW03	ASG00063-03				х				
09NCMOCGW04	580-14864-1	х	х	х			х	х	
09NCMOCGW05	580-14864-2	х	х	х			х	х	
09NCMOCGW06	580-14864-3	х	х	х			х	х	MS/MSD VOCs, GRO, DRO/RRO, Metals, Sulfate
09NCMOCGW07	580-14864-4	х	х	х			х	х	
09NCMOCGW08	580-14864-5	х	х	х			х	х	
09NCMOCGW09	580-14864-6	х	х	х			х	х	
09NCMOCGW10	580-14864-7	х	х	х			х	х	FD of 09NCMOCGW09
09NCMOCGW11	580-14864-8	х	х	х			х	х	
Trip Blank	580-14864-9	х	х						
09NCMOCGW12	580-15053-1	х	х	х					
09NCMOCGW13	580-15053-2	х	х	х					FD of 09NCMOCGW12
09NCMOCGW14	580-15053-3	х	х	х					
09NCMOCGW15	580-15053-4	х	х	х					

Field Sample Identification	Laboratory Sample Number	Benzene and Naphthalene (8260B)	GRO (AK101)	DRO/RRO (AK102/AK103)	DRO/(AK102)	Total Organic Carbon (9060)	Metals (As, Cr, Pb) by 6020	Sulfate (300)	Remarks
09NCMOCGW16	580-15053-5	х	x	х					MS/MSD VOCs, GRO, DRO/RRO
09NCMOCGW17	580-15053-6	х	х	х					
09NCMOCGW18	580-15053-7	х	х	х					
09NCMOCGW19	580-15053-8	х	х	х					
09NCMOCGW20	580-15053-9	х	x	х					
Trip Blank	580-15053-10	х	х						
09NCMOCGW21	580-15087-1	х	х	х					
09NCMOCGW22	580-15087-2	х	x	х					
09NCMOCGW23	580-15087-3	x	х	х					FD of 09NCMOCGW21 MS/MSD VOCs, GRO, DRO/RRO
09NCMOCGW24	580-15087-4	х	х	х					
09NCMOCGW25	580-15087-5	х	х	х					
09NCMOCGW26	580-15087-6	х	х	х					
09NCMOCGW27	580-15087-7	х	х	х					
09NCMOCGW28	580-15087-8	х	х	х					
Trip Blank	580-15087-9	х	х						
09NCMOCGW31	580-15185-1	х	х	х					
09NCMOCGW32	580-15185-2	х	х	х					FD of 09NCMOCGW31
09NCMOCGW33	580-15185-3	x	х	х					MS/MSD VOCs, GRO, DRO/RRO
09NCMOCGW34	580-15185-4	х	x	х					
09NCMOCGW35	580-15185-5	х	x	х					
09NCMOCGW36	580-15185-6	х	x	х					
09NCMOCGW37	580-15185-7	х	x	х					
09NCMOCGW38	580-15185-8	х	x	х					
Trip Blank	580-15185-9	х	х						
09NCMOCGW41	580-15437-1	х	х	х			х	х	
09NCMOCGW42	580-15437-2	х	х	х			х	х	
09NCMOCGW43	580-15437-3	х	х	х			х	х	
09NCMOCGW44	580-15437-4	х	х	х			х	х	
09NCMOCGW45	580-15437-5	х	х	х			х	х	
09NCMOCGW46	580-15437-6	х	x	х			х	х	

Field Sample Identification	Laboratory Sample Number	Benzene and Naphthalene (8260B)	GRO (AK101)	DRO/RRO (AK102/AK103)	DRO/(AK102)	Total Organic Carbon (9060)	Metals (As, Cr, Pb) by 6020	Sulfate (300)	Remarks
09NCMOCGW47	580-15437-7	x	x	x			x	x	FD of 09NCMOCGW41 MS/MSD VOCs, GRO, DRO/RRO, Metals, Sulfate
09NCMOCGW48	580-15437-8	х	х	х			х	х	
Trip Blank	580-15437-9	х	х						

FD field duplicate

2.1 SAMPLE RECEIPT CONDITIONS

All samples were received within 0 to 6 degrees Celsius and in good condition.

The following analysis was requested on the COC form, but not provided:

Work Order	Sample No	Lab No.	Analyses
580-14753-1	Trip Blank	580-14753-9	GRO

Samples shipped with this trip blank contained GRO concentrations well above the reporting limit (RL), and the lack of a trip blank will not affect data usability.

The custody form was not signed by the sampler for sample delivery groups (SDGs) 580-14560, 580-15053, 580-15434, or ASG0063; however, the sampler's name was noted on either the COC form or the shipping airbill, and the coolers were shipped with two custody seals. The missing signatures on the COC forms will not affect data usability.

The custody form did not indicate the sampler relinquish date and time for SDG 580-15437. The date indicated on the custody seal was used as the relinquish date. The missing information will not affect data usability.

Many sample bottles included in SDG 15434-1 did not have sample identifications (IDs) on the containers. The laboratory identified the samples using collection time.

Holding times from collection to analysis were evaluated using the following criteria:

Analyte	Method	Matrix	Holding Time
VOCs	SW8260B	Soil	14 days to analysis
GRO	AK101	Soil	28 days to analysis
DRO/RRO	AK102/103	Soil	14 days to extraction, extracts analyzed 40 days after extraction
TOC	SW9060	Soil	28 days to analysis
VOCs	SW8260B	Water	14 days to analysis
GRO	AK101	Water	28 days to analysis
DRO/RRO	AK102/103	Water	14 days to extraction, extracts analyzed 40 days after extraction
Metals	6020	Water	180 days
Sulfate	300.0	Water	28 days to analysis

2.2 BENZENE AND NAPHTHALENE ANALYSIS

TestAmerica analyzed soil and water samples for benzene and naphthalene by method SW-846 8260B. The analytical batches are summarized in Table 3.

QC Batch	QC Batch Dates
Soil	
580-47755	8-5-09
580-49649	9-3-09
580-50455	9-17-09
Water	
580-48207	8-13-09
580-48286	8-14-09
580-48996	8-25-09
580-49247	8-27-09
580-49349	8-29-09
580-49813	9-8-09
580-50444	9-2-09
580-50043	9-11-09
580-50620	9-21-09
580-50785	9-23-09

Table 3: Benzene and Naphthalene QC Batches

Required QC for an analytical batch of up to 20 samples includes an MB, LCS, and MS/MSD pair. An MB and LCS and MS/MSD pair were performed with each batch, though not all MS/MSDs were from project samples as noted below.

SDG 14864 had project samples initially analyzed in batch 48207, which included most samples from this SDG. All QC, including a project MS/MSD, were within acceptance criteria. Samples 09NCMOCGW09, -10 and -11 required dilutions and reanalysis and were analyzed in batch 48286. The samples were reanalyzed within holding times. No MS was performed on project samples in batch 48286, which is a deviation from QSM guidelines. However, LCS spike recoveries were within limits and the data is usable for its purpose of establishing initial concentrations of contaminants before treatment.

SDG 15053 had project samples initially analyzed in batch 48996, which included most samples from this SDG. All QC, including a project MS/MSD, met acceptance criteria. Samples 09NCMOCGW16, - 18 and -19 required dilutions and reanalysis, and were analyzed in batch 49247. The samples were reanalyzed within holding times. No MS was performed on project samples in batch 49247, which is a deviation from QSM guidelines. However, LCS spike recoveries were within limits and the data is usable for its purpose of determining concentrations of contaminants during treatment.

SDG 15185 had project samples initially analyzed in batch 49813, which included most samples from this SDG. The MS/MSD was performed on sample 09NCMOCGW33, which had naphthalene concentrations greater than 4 times the spike amount. The MSD failed to meet acceptance criteria due to the presence of high target analyte, naphthalene. The benzene recoveries for the MS/MSD met acceptance criteria. All other QC were within method acceptance criteria. No qualification was necessary due to the high concentrations of target analyte in the failed MSD. Samples 09NCMOCGW31 and -32 required dilutions and reanalysis and were analyzed in batch 50043. The samples were reanalyzed outside of holding times as noted below. No matrix spike was performed on project samples in batch 50043, which is a deviation from QSM guidelines. However, LCS and LCSD spike recoveries were within limits and the data is usable for its purpose of determining concentrations of contaminants during treatment.

SDG 15437 had project samples initially analyzed in batch 50620, which included most samples from this SDG. All QC, including a project MS/MSD, met acceptance criteria. Samples 09NCMOCGW42, - 44, -45, -46, -47 and -48 were reanalyzed in batch 50785 due to required dilutions or sample carryover. No matrix spike was performed on project samples in batch 50785, which is a deviation from QSM guidelines. However, LCS recoveries were within limits and the data is usable for its purpose of determining concentrations of contaminants after treatment.

The following items were reviewed and met SAP/method criteria, and were within SAP control limits: MBs, LCS recoveries, and the MS/MSD RPDs.

Headspace was observed in three of the VOC vials for sample 09NCMOCGW08 at sizes ranging from 5 to 14 millimeters (mm). It was assumed that the sample with the smallest air bubble was used for analysis and associated results were qualified as estimated (J). Headspace was also observed in one vial for the following samples:

Sample ID	Air Bubble Size
09NCMOCGW07	14 mm
09NCMOCGW11	6 mm
Trip Blank SDG (580-15053)	4 mm
Trip Blank SDG (580-15185)	7 mm
Trip Blank SDG (580-15437)	6+ mm

It was assumed that vials with no headspace were used for analysis and no further qualifiers were assigned.

Holding times were exceeded for all samples in SDG 580-15084-1 by three to four days due to instrument malfunction. Results were qualified as estimated (QL) and may be associated with a low bias. While there is potential for low bias, the results are still usable for project purposes in determining the presence of naphthalene.

Naphthalene concentrations for the original run for samples 09NCMOCGW21 and 09NCMOCGW22 exceeded the calibration range and were qualified as not preferred (NP) because a reanalysis within the calibration range was available.

Naphthalene results were analyzed six days outside the holding time for samples 09NCMOCGW21, 09NCMOCGW22, 09NCMOCGW25, 09NCMOCGW26, and 09NCMOCGW27. Results reported

outside the holding time were qualified as estimated (QL) to indicate a potential low bias. While holding times were exceeded, the results are still usable as estimates.

Naphthalene results were analyzed three days outside the holding time for samples 09NCMOCGW31 and 09NCMOCGW32. Results reported outside the holding time were qualified as estimated (QL) to indicate potential low bias.

Surrogate recoveries were outside control limits as follows:

Sample No.	Surrogate	Recovery	Acceptance Limits
Soil:			
09NCMOCSB05	Trifluorotoluene	64	75-125
09NCMOCSB06	Trifluorotoluene	38	75-125
09NCMOCSB07	Trifluorotoluene	73	75-125
09NCMOCSB08	Trifluorotoluene	188	75-125
09NCMOCSB08	Toluene-d8	189	85-115
09NCMOCSB10	Trifluorotoluene	184	75-125
09NCMOCSB11	Trifluorotoluene	149	75-125
09NCMOCSB12	Trifluorotoluene	186	75-125
09NCMOCSB13	Trifluorotoluene	149	75-125
09NCMOCSB15	Trifluorotoluene	182	75-125
09NCMOCSB15	Toluene-d8	127	85-115
09NCMOCSB16	Trifluorotoluene	66	75-125
09NCMOCSB18	Trifluorotoluene	72	75-125
09NCMOCSB19	Trifluorotoluene	50	75-125
09NCMOCSB19	Toluene-d8	117	85-115
09NCMOCSB20	Trifluorotoluene	56	75-125
09NCMOCSB21	Trifluorotoluene	56	75-125
09NCMOCSB21	Toluene-d8	123	85-115
09NCMOCSB23	Trifluorotoluene	140	75-125
09NCMOCSB24	Trifluorotoluene	137	75-125
09NCMOCSB24	Toluene-d8	138	85-115
09NCMOCSB25	Toluene-d8	123	85-115
09NCMOCSB26	Trifluorotoluene	161	75-125
09NCMOCSB28	Trifluorotoluene	152	75-125
09NCMOCSB28	Toluene-d8	131	85-115
09NCMOCSB31	Trifluorotoluene	139	75-125
09NCMOCSB31	Toluene-d8	123	85-115
09NCMOCSB32	Trifluorotoluene	162	75-125
09NCMOCSB33	Toluene-d8	123	85-115
09NCMOCSB29	Trifluorotoluene	139	75-125
Motor			
Water: 09NCMOCGW21	Fluerobenzone	66	80-120
09NCMOCGW21	Fluorobenzene Trifluorotoluene	66 818	80-120
09NCMOCGW21	Toluene-d8	830	85-120
09NCMOCGW21	Fluorobenzene	47	80-120
09NCMOCGW22		637	80-120
09NCMOCGW22	Trifluorotoluene Toluene-d8	896	85-120
09NCMOCGW22	Fluorobenzene	500	80-120
09NCMOCGW23	Toluene-d8	167	85-120
09NCMOCGW23	4-Bromofluorobenzene	123	75-120
09NCMOCGW24	Trifluorotoluene	123	80-120
Trip Blank	Trifluorotoluene	79	80-120
пр ванк	rinuoroloidene	13	00-120

Per Table 5-2 of the SAP, results associated with one or more failed QC criteria, such as a surrogate, are QH or QL qualified to indicate a high or low bias, respectively. Only detected results are qualified when a high bias exists while all results associated with a low bias are qualified. If both high and low surrogate recoveries were observed, all associated results were qualified Q with no indication of bias. For dilutions reported without surrogate recoveries, surrogate results for the original run were used for qualification since the same extract was used and the same bias would exist. Recoveries for surrogates not listed in the SAP were reported for some samples. Since these results were not required by the SAP, they were not reviewed.

MS/MSD recoveries were outside control limits as follows:

Sample No.	Analyte	Recovery	Acceptance Limits
09NCMOCSB11 09NCMOCSB11	Benzene Naphthalene	38/42 NE	75-125
09NCMOCSB14	Naphthalene	NE	
09NCMOCGW23 09NCMOCGW33	Naphthalene Naphthalene	175/235 NE	55-140
03110100000033	Naphthalene		

NE – Not evaluated. Sample concentration is >4x spike concentration.

A total of three soil and five water MS/MSDs were collected and analyzed for these parameters. For both matrixes, the majority of spiked samples were in control and qualification was limited to the spiked samples. Benzene results for sample 09NCMOCSB11 and naphthalene results for sample 09NCMOCGW23 were M qualified to indicate a matrix effect was present.

2.3 GRO ANALYSES

TestAmerica analyzed soil and water samples for GRO by ADEC method AK101. The sample analytical batches are summarized in Table 4.

QC Batch	QC Batch Date
Soil	
580-47721	8-5-09
580-49121	8-26-09
580-50596	9-21-09
Water	
580-48257	8-13-09
580-49058	8-25-09
580-49452	8-31-09
580-49163	8-26-09
580-49452	9-1-09
580-50606	9-21-09

Table 4: GRO QC Batches

Required QC for an analytical batch of up to 20 samples includes an MB, LCS, and MS/MSD pair. An MB, LCS, and MS/MSD pair were performed with each batch.

The following items were reviewed and met SAP/method criteria and were within SAP control limits: LCS recoveries, MS/MSD recoveries, and RPDs.

The holding time was exceeded for the following sample:

Sample ID	Lab No.	Days Outside Hold Time
Trip Blank	580-15053	1

Results were qualified as estimated (QL) and may be associated with a low bias.

GRO was detected in the MB at a concentration greater than the MDL, but less than 1/2 the RL as follows:

Batch No.	Units	Concentration	Comments
580-47721	mg/kg	0.64	Associated sample concentrations> RL

Qualification was not required.

Surrogate recoveries were outside SAP control limits as follows:

Sample No.	Surrogate	Recovery	Acceptance Limits
09NCMOCSB06	Trifluorotoluene	45	50-150
09NCMOCSB08	Trifluorotoluene	262	50-150
09NCMOCSB08	4-Bromofluorobenzene	289	50-150
09NCMOCSB10	Trifluorotoluene	344	50-150
09NCMOCSB11	Trifluorotoluene	198	50-150
09NCMOCSB11	4-Bromofluorobenzene	245	50-150
09NCMOCSB12	Trifluorotoluene	233	50-150
09NCMOCSB12	4-Bromofluorobenzene	155	50-150
09NCMOCSB13	Trifluorotoluene	171	50-150
09NCMOCSB13	4-Bromofluorobenzene	271	50-150
09NCMOCSB15	Trifluorotoluene	169	50-150
09NCMOCSB15	4-Bromofluorobenzene	284	50-150
09NCMOCSB16	4-Bromofluorobenzene	297	50-150
09NCMOCSB18	4-Bromofluorobenzene	1090	50-150
09NCMOCSB19	4-Bromofluorobenzene	243	50-150
09NCMOCSB21	Trifluorotoluene	184	50-150
09NCMOCSB21	4-Bromofluorobenzene	471	50-150
09NCMOCSB22	Trifluorotoluene	168	50-150
09NCMOCSB22	4-Bromofluorobenzene	196	50-150
09NCMOCSB23	Trifluorotoluene	189	50-150
09NCMOCSB24	Trifluorotoluene	184	50-150
09NCMOCSB24	4-Bromofluorobenzene	1790	50-150
09NCMOCSB25	Trifluorotoluene	226	50-150
09NCMOCSB25	4-Bromofluorobenzene	384	50-150
09NCMOCSB26	Trifluorotoluene	235	50-150
09NCMOCSB26	4-Bromofluorobenzene	235	50-150
09NCMOCSB28	Trifluorotoluene	225	50-150
09NCMOCSB28	4-Bromofluorobenzene	289	50-150
09NCMOCSB31	Trifluorotoluene	224	50-150
09NCMOCSB31	4-Bromofluorobenzene	256	50-150
09NCMOCSB32	Trifluorotoluene	275	50-150
09NCMOCSB33	Trifluorotoluene	200	50-150
09NCMOCSB33	4-Bromofluorobenzene	222	50-150
09NCMOCSB34	Trifluorotoluene	158	50-150
09NCMOCSB34	4-Bromofluorobenzene	145	50-150
09NCMOCSB29	Trifluorotoluene	193	50-150

09NCMOCSB29	4-Bromofluorobenzene	212	50-150
Water: 09NCMOCGW22 09NCMOCGW32 09NCMOCGW42 09NCMOCGW43	4-Bromofluorobenzene 4-Bromofluorobenzene 4-Bromofluorobenzene 4-Bromofluorobenzene	154 152 165 157	50-150 50-150 50-150 50-150

Detected results associated with high recoveries were qualified QH to indicate that one or more QC criteria failed, with a high bias. All results associated with low recoveries were qualified QL to indicate that one or more QC criteria failed, with a low bias. Only one sample had a low surrogate recovery with the remainder exceeding surrogate recovery limits. Matrix interference is suspected in both cases. Sample results are usable as estimates for ISCO study purposes, though the accuracy of the results is questionable.

MS/MSD GRO recoveries were outside control limits for sample 09NCMOCSB11. The sample GRO concentration was greater than four times the spike concentration, and evaluation of recoveries is not required. No qualifiers were assigned.

2.4 DRO/RRO ANALYSES

TestAmerica analyzed the soil and water samples for DRO/RRO by ADEC method AK102/103. QC batches are summarized in Table 5.

QC Batch	QC Batch Date
Soil	
580-46874 (DRO only)	7-22-09
580-47734	8-5-09
580-49119	8-26-09
580-50657	9-22-09
Water	
9070075	7-26-09
580-48117	8-11-09
580-48999	8-24-09
580-50480	9-18-09
580-49270	8-27-09
580-49666	9-3-09
580-50656	9-22-09

Table 5: DRO/RRO QC Batches

Required QC for a batch of up to 20 samples includes an MB, LCS/LCSD, and MS/MSD pair. An MB and LCS/LCSD were analyzed with each batch. An MS/MSD was included in the majority of batches, and the SAP-required frequency was met.

The following items were reviewed and met SAP/method criteria, and were within SAP control limits: MS/MSD RPDs. MS/MSDs were not analyzed in batches 9070075, 46874, and 50480 due to insufficient sample quantities or because MS/MSD was not specified on the CoC form. The LCS/LCSD recoveries and RPDs met control limits.

Insufficient preservation was used for sample 09NCMOCGW09 (one 1-liter amber). The hydrogen ion concentration was adjusted at the laboratory prior to preparation using hydrochloric acid. A QL qualifier was assigned to the DRO and RRO results to indicate potential low bias.

Several samples in SDG 580-15053 were re-extracted between 19 and 23 days outside the holding time because the LCS for the original sample set was outside control limits. The holding time to extraction was exceeded by >2x the hold time. The LCS control limit exceedance was considered to be less of an impact on data quality, and the original results should be reported. Results for the re-extraction are qualified as NP.

Surrogate recoveries were outside SAP control limits as follows:

Sample No.	Surrogate	Recovery	Acceptance Limits
09NCMOCSB06	n-Triacontane-d62	189	50-150
09NCMOCSB09	n-Triacontane-d62	151	50-150
09NCMOCSB11	n-Triacontane-d62	189	50-150
09NCMOCSB12	n-Triacontane-d62	179	50-150
09NCMOCSB24	n-Triacontane-d62	156	50-150
09NCMOCGW04	n-Triacontane-d62	866	50-150
09NCMOCGW04	o-Terphenyl	821	50-150
09NCMOCGW12	n-Triacontane-d62	159	50-150

Detected results associated with high recoveries were qualified QH to indicate that one or more QC criteria failed, with a high bias. The RRO result for sample 09NCMOCGW12 was also associated with a high LCS/LSCD RPD (discussed below with SDG 580-15053); the final RRO qualifier for this sample, with the combined QC outliers, is a Q with an unknown bias.

Soil:	Dilution Factor	Water:	
09NCMOCSB02	50	09NCMOCGW04	10
09NCMOCSB04	50	09NCMOCGW05	10
09NCMOCSB07	50	09NCMOCGW06	10
09NCMOCSB08	50	09NCMOCGW07	10
09NCMOCSB10	50	09NCMOCGW08	10
09NCMOCSB13	10	09NCMOCGW09	10
09NCMOCSB15	50	09NCMOCGW10	10
09NCMOCSB16	50	09NCMOCGW15	10
09NCMOCSB18	50	09NCMOCGW16	10
09NCMOCSB19	50	09NCMOCGW20	10
09NCMOCSB21	50	09NCMOCGW21	10
09NCMOCSB22	50	09NCMOCGW22	10
09NCMOCSB25	100	09NCMOCGW23	10
09NCMOCSB26	50	09NCMOCGW24	10
09NCMOCSB28	100	09NCMOCGW25	10
09NCMOCSB31	100	09NCMOCGW26	10
09NCMOCSB33	100	09NCMOCGW27	10
09NCMOCSB29	100	09NCMOCGW28	10
		09NCMOCGW31	10
		09NCMOCGW32	10
		09NCMOCGW33	10
		09NCMOCGW34	10
		09NCMOCGW35	10
		09NCMOCGW36	10
		09NCMOCGW37	10
		09NCMOCGW38	10

Surrogates were diluted out in the analysis of the following samples:

Recoveries could not be evaluated. No qualifiers were required.

An alternate surrogate from that specified in the SAP was used for samples analyzed at the TestAmerica-Anchorage laboratory. The surrogate 1-Chlorooctadecane was used. Recoveries were with laboratory control limits of 50 to 150 percent (%), and no data qualifiers were assigned.

DRO/RRO were detected in the MB at a concentration greater than the MDL, but less than 1/2 the RL as follows:

Batch No.	Analyte	Units	Concentration
580-46874 580-50657 580-49666 580-49666	DRO DRO DRO RRO	mg/kg mg/kg mg/L mg/L	4.8 6.17 0.0342 0.0385
000 10000		iiig/ E	0.0000

DRO and RRO concentrations in associated samples were greater than the RL and greater than 10 times the concentration detected in the method blank, thus qualification was not required.

LCS recoveries were outside control limits as follows:

Batch No.	Analyte	Recovery (%)	Acceptance Limits
48117/SDG 14864	RRO	121/132	60-120 (lab limit, none in SAP)
48999/SDG15053	DRO	-/66; RPD 34	75-125; RPD <20
48999/SDG15053	RRO	RPD 45	20
49666/SDG15185	DRO	RPD 38	20
49666/SDG15185	RRO	RPD 27	20

Qualifiers were assigned as follows:

- Batch 48117: All detected RRO results for samples included in this batch were QH qualified due to the high bias.
- Batch 48999: All DRO results for samples included in this batch were detected and QL qualified due to the low bias.
- Batch 48999: All detected RRO results for samples included in this batch were qualified with a Q to indicate one or more QC criteria failed with an unknown bias.
- Batch 49666: All detected DRO/RRO results for samples included in this batch were qualified with a Q to indicate one or more QC criteria failed with an unknown bias.

MS/MSD recoveries were outside control limits as follows:

Sample No.	Analyte	Recovery	Acceptance Limits
09NCMOCSB11	DRO/RRO	NE	
09NCMOCSB14	DRO	-74/1	75-125
09NCMOCSB14	RRO	NE	
09NCMOCSB32	DRO	NE	
09NCMOCSB32	RRO	148/289; RPD 42	60-120; RPD <21
09NCMOCGW06	DRO	NE	
09NCMOCGW06	RRO	190/-	60-120 (lab limit, none in SAP)
09NCMOCGW16	DRO/RRO	NE	
09NCMOCGW23	DRO/RRO	NE	
09NCMOCGW33	DRO	NE	
09NCMOCGW33	RRO	121/46	53-118 (lab limit, none in SAP)
09NCMOCGW47	RRO	119/-	53-118 (lab limit, none in SAP)

NE = Not evaluated. Sample concentration is >4x spike concentration.

- Within control limits

A total of three soil and five water MS/MSDs were collected and analyzed for these parameters.

For soils, the one DRO MS/MSD outside control limits had a sample concentration 3.6 times the spike concentration, and the one RRO MS/MSD outside control limits had a sample concentration 1.5 times the spike concentration. No qualifiers were assigned to the DRO result due to the high analyte concentration. The RRO result for sample 09NCMOCSB32 was M qualified to indicate a matrix effect was present. No other qualifiers were assigned since the majority of MS/MSD results were either in control, or the sample concentration was too high for evaluation.

For waters, the matrix was considered to be changing during the course of the pilot study investigation (day 3, day 7, day 14, etc.), so qualification was limited to the single data sets collected at the same time frame. For samples 09NCMOCGW06 and 09NCMOCGW47, the RRO result for the spiked sample only were M qualified to indicate a matrix effect was present. Other RRO results in the data set were not qualified because the MSD recovery and MS/MSD RPD were within control limits. Both the MS and MSD recoveries for sample 09NCMOCGW33 were outside of control limits and all

RRO results collected with this sample (SDG 580-15185-1) were M qualified to indicate a matrix effect was present. Since both high and low exceedances were observed, bias is unknown.

2.5 METALS ANALYSES (ARSENIC, CHROMIUM, AND LEAD)

TestAmerica analyzed water samples for the metals by SW-846 method 6020. QC batches are summarized in Table 6.

Table 6: Metals QC Batches

QC Batch	QC Batch Date			
Water				
580-49209	8/27/09			
580-50906	9-25-09			

Required QC for a batch of up to 20 samples includes an MB, LCS, and MS/MSD pair. An MB, MS/MSD, and LCS were analyzed per batch.

The following items were reviewed and met SAP criteria, and were within laboratory control limits: MS/MSD recoveries and RPDs, and LCS recoveries.

The laboratory included laboratory duplicate results in the analytical data package. Laboratory duplicates were not required by the SAP with precision being reported through MS/MSD pair RPDs and field duplicate RPDs. Laboratory duplicate results were not reviewed.

Chromium was detected in the MB at a concentration greater than the MDL, but less than the RL as follows:

Batch No.	Analyte	Units	Concentration	MDL	RL
580-49209	Chromium	mg/L	0.0018	0.00037	0.002
580-50906	Arsenic mg/L		0.0013	0.00024	0.002

Associated results were detected at concentrations >RL, but less than ten times the concentration in the method blank; sample results were B flagged with a potential high bias. The results were used as a measurement of treatment effectiveness and are usable for that purpose with qualification. The affected samples are listed in Section 2.9.

2.6 TOTAL ORGANIC CARBON ANALYSES

TestAmerica analyzed soil samples for TOC by SW-846 method 9060. Laboratories used and QC batches are summarized in Table 7.

Lab	QC Batch	QC Batch Date
Soil:		
TestAmerica-West Sacramento	9219575	8-9-09
TestAmerica-Tacoma	580-50534	9-18-09
TestAmerica-Tacoma	580-50639	9-21-09
TestAmerica-Tacoma	580-50865	9-24-09
TestAmerica-Tacoma	580-50999	9-25-09

Required QC for a batch of up to 20 samples includes an MB and a laboratory duplicate. An MB, LCS, and MS/MSD pair were analyzed per batch, with the exception of batch 580-50865. The method QC requirement was met for all other batches. Samples submitted under SDG 580-15434 included an MS/MSD pair, but they were extracted in two separate batches, 580-50865 and 580-50999, on successive days. The MS/MSD submitted with SDG 580-15434 was analyzed in batch 580-50999. The MS/MSD recoveries for batch 580-50999 are further described below. The LCS in batch 580-50865 met acceptance limits. Batch precision could not be evaluated for project samples in batch 580-50865. Sample results from SDG 580-15434 were used to determine the effectiveness of the ISCO treatment and results are usable for that purpose. Sample 09NCMOCSB31 was M qualified due to out-of-control recoveries. Soil matrix heterogeneity at the site may have impacted the accuracy and precision of the sample.

SDG 580-14753 had the TOC analyses of twelve samples subcontracted to TestAmerica-West Sacramento for analyses. All results from this SDG were reported without qualification. All other TOC analyses were performed by TestAmerica-Tacoma.

The following items were reviewed and met SAP criteria and were within laboratory control limits: MB and LCS recoveries.

Holding times were exceeded for all samples analyzed for TOC in SDG 580-15084 by two to five days due to instrument failure. Results were detected and were qualified as estimated (QL). Results may be associated with a low bias.

MS/MSD recoveries were outside control limits as follows:

Sample No.	Analyte	Recovery	Acceptance Limits
09NCMOCSB31	TOC	147/-	76-128
09NCMOCSB31	TOC	RPD 32	<28

A total of four MS/MSD pairs were analyzed, and results for three of the four were in control. Sample 09NCMOCSB31 was M qualified to indicate a matrix effect was present.

2.7 SULFATE

TestAmerica analyzed water samples for sulfate by EPA Method 300.0. QC batches are summarized in Table 8.

Table 8: Sulfate QC Batches

QC Batch	QC Batch Date
Water	
580-48614	8-14-09
580-49693	9-2-09
580-51063	9-28-09

Required QC for a batch of up to 20 samples includes an MB and LCS, an MB and LCS/LCSD, and MS/MSD. Samples from SDG 14864 were initially analyzed on 8-14-09 in QC batch 580-48614. Samples 09NCMOCGW04 and -05 exceeded the calibration range and were diluted and reanalyzed on 9-2-09 in QC batch 49693. Sample 09NCMOCGW06, which was also the MS/MSD sample in batch 580-580-48614, was used as the batch duplicate for 49693 and it met acceptance criteria for duplicate precision. All QC met acceptance criteria in both batches. Sample results are accepted without qualification for QC other than holding times for the out-of-range samples that required reanalysis at a dilution. The diluted sample results are qualified QL due to low potential bias from holding time exceedence.

The following items were reviewed and met SAP criteria, and were within laboratory control limits: MB, and LCS/LCSD recoveries and RPDs.

Sulfate concentrations for samples 09NCMOCGW04 and 09NCMOCGW05 exceeded the calibration range. These results were reanalyzed one day outside hold time. Original results were qualified as NP and the second set of results should be reported. Results analyzed outside the hold time were qualified as estimated (QL) and may be associated with a low bias.

MS/MSD recoveries for sulfate were outside control limits for sample 09NCMOCGW47. The sample concentration was greater than four times the spike concentration, and evaluation of MS/MSD recoveries is not required. No data qualifiers were assigned.

2.8 FIELD QA/QC

Field QC samples included field duplicate pairs and MS/MSD pairs. The same methods used to analyze the investigative samples were used to analyze the field QC samples.

2.8.1 Field Sample Duplicates

Comparison of field sample duplicate results to the associated parent sample results provides precision information for the overall sample collection and analytical process, including possible variability related to sample collection, handling, shipping, storage, preparation, and analysis. The RPD between the primary (parent) sample and field duplicate sample also accounts for the variation of target analyte concentrations within a matrix. This variability is assessed by evaluating the calculated RPDs between the field duplicates and the associated parent samples. In cases where a target analyte was not detected above the RL in both the field duplicate and parent sample, an RPD would not be valid, and therefore was not calculated. The RPD assessment criterion for the MS/MSD RPD provided in the SAP was used to evaluate the field duplicates.

2.8.1.1 FIELD DUPLICATE FREQUENCIES

Field sample duplicate pairs are required by the SAP at a rate of 10%. Field duplicates were collected for each method and matrix at the following frequencies:

- Three field duplicate pairs were collected for the soil matrix and submitted to the laboratory for analysis for benzene, naphthalene, GRO, RRO, and TOC, at a frequency of 12%.
- Three field duplicate pairs were collected for the soil matrix and submitted to the laboratory for analysis for DRO, at a frequency of 10%.
- Five field duplicate pairs were collected for the water matrix and submitted to the laboratory for analysis for benzene, naphthalene, GRO, and RRO, at a frequency of 14%.
- Five field duplicate pairs were collected for the water matrix and submitted to the laboratory for analysis for DRO, at a frequency of 13%.
- Two field duplicate pairs were collected for the water matrix and submitted to the laboratory for analysis for arsenic, chromium, lead, and sulfate, at a frequency of 14%.

2.8.1.2 FIELD DUPLICATE RPDs

Table 9 lists the RPDs calculated between field duplicate and parent sample results for target analytes that were detected above the RL in both the parent and field duplicate sample.

Parent Sample ID (Laboratory Sample ID)	Field Duplicate Sample ID (Laboratory Sample ID)	Compound	Units	Parent Field Sample	Field Duplicate	RPD (%)
Soil:						
09NCMOCSB11	09NCMOCSB12	Benzene	µg/kg	4300	1100	119
(580-14753-7)	(580-14753-8)	Naphthalene	µg/kg	270000	48000	140
		GRO	mg/kg	1600	350	128
		DRO	mg/kg	6500	910	151
		RRO	mg/kg	5300	5300	0
		Total Organic Carbon	mg/kg	261000	238000	9
09NCMOCSB18	09NCMOCSB21	Benzene	µg/kg	490	1300	91
(580-15084-6)	(580-15084-9)	Naphthalene	µg/kg	190000	460000	83
		GRO	mg/kg	1000	5900	142
		DRO	mg/kg	77000	95000	21
		RRO	mg/kg	7600	9900	26
		Total Organic Carbon	mg/kg	150000	150000	0
09NCMOCSB26	09NCMOCSB31	Benzene	µg/kg	1400	2000	35
(580-15434-2)	(580-15434-5)	Naphthalene	µg/kg	270000	280000	4
		GRO	mg/kg	1900	2000	5
		DRO	mg/kg	170000	150000	13
		RRO	mg/kg	7600	8100	6
		Total Organic Carbon	mg/kg	200000	200000	0
Water:						
09NCMOCGW09	09NCMOCGW10	Benzene	µg/L	72	74	3
(580-14864-6)	(580-14864-7)	Naphthalene	µg/L	380	330	14
		GRO	mg/L	2.6	2.4	8
		DRO	mg/L	24	20	18
		RRO	mg/L	2.3	2.0	14
		Arsenic	mg/L	0.0052	0.0036	36
		Chromium	mg/L	0.016	0.012	29
		Lead	mg/L	0.013	0.01	26
		Sulfate	mg/L	25	27	8
09NCMOCGW12	09NCMOCGW13	Benzene	µg/L	69	70	1
(580-15053-1)	(580-15053-2)	Naphthalene	µg/L	120	88	31
		GRO	mg/L	39	29	29
		DRO	mg/L	11	13	17
		RRO	mg/L	1.3	1.0	26
09NCMOCGW21	09NCMOCGW23	Benzene	µg/L	4.8	3.0	46
(580-15087-1)	(580-15087-3)	Naphthalene	µg/L	78	50	44
		GRO	mg/L	0.81	0.70	15
		DRO	mg/L	20	24	18
		RRO	mg/L	1.8	2.7	40
0010000000000	001000000000000000000000000000000000000	Б	//	74	74	•

Table 9: Field Sample Duplicate Pair Results

(580-15185-1)

09NCMOCGW31

09NCMOCGW32

(580-15185-2)

Benzene

Naphthalene

µg/L

µg/L

Parent Sample ID (Laboratory Sample ID)	Field Duplicate Sample ID (Laboratory Sample ID)	Compound	Units	Parent Field Sample	Field Duplicate	RPD (%)
		GRO	mg/L	2.5	2.8	11
		DRO	mg/L	20	28	33
		RRO	mg/L	1.7	1.8	6
09NCMOCGW41	09NCMOCGW47	Benzene	µg/L	32	32	0
(580-15437-1)	(580-15437-7)	Naphthalene	µg/L	2.9	3.7	24
		GRO	mg/L	1.5	1.5	0
		DRO	mg/L	9.8	11	12
		RRO	mg/L	0.92	1.2	26
	Arsenic	mg/L	0.0034	0.0036	6	
		Chromium	mg/L	0.0054	0.0057	5
		Lead	mg/L	0.0003	0.00028	7
		Sulfate	mg/L	3100	4800	43

Note: **Bold** exceeds MS/MSD RPD criteria in SAP; MS/MSD criteria is being used as blind duplicate precision ID = identification

RPDs which exceed SAP criteria are shown in bold font in Table 9.

For soil samples, the RPD exceeds the SAP MS/MSD RPD criteria for benzene for all duplicate pairs. Because of the observed imprecision, all detected benzene results for soil samples were qualified J.

For soil samples, the RPD exceeds the SAP MS/MSD RPD criteria for naphthalene, GRO, and DRO, for two of the three duplicate pairs. These duplicate pairs are representative of pretreatment conditions (09NCMOCSB11) and day 7 conditions (09NCMOCSB18). All detected pretreatment and day 7 samples for naphthalene, GRO, and DRO, were qualified J (SDGs 580-14753 and 580-15084).

For soil samples, the RPD exceeds the SAP MS/MSD RPD criteria for RRO for one of the three duplicate pairs. This duplicate pair is representative of day 7 conditions. Because of the observed imprecision, all detected RRO results for day 7 soil samples were qualified J (SDG 580-15084).

For water samples, the RPD exceeds the SAP MS/MSD RPD criteria for the following sample sets:

Parent Sample	SDG	Description	Analyte
09NCMOCGW09	580-14864	Pre-treatment	Arsenic Chromium Lead
09NCMOCGW12	580-15053	Day 3	Naphthalene
09NCMOCGW21	580-15087	Day 7	Benzene Naphthalene RRO
09NCMOCGW31	580-15185	Day 14	DRO
09NCMOCGW41	580-15437	Day 28	Sulfate

All detected results for the affected analyte were qualified J in the associated SDG, which contains samples collected under the same set of conditions as the duplicate pair.

2.8.2 Matrix Spikes and Matrix Spike Duplicates

The MS/MSD samples are spiked in the laboratory with known concentrations of target analytes. The MS/MSD sample results provide information on possible matrix effects encountered during sample extraction, digestion, and analysis. Analytical results from MS/MSD samples are used to evaluate the sample matrix, method efficiency and applicability, accuracy, and precision. Accuracy was assessed by calculating the percent recovery of the target analytes added to the primary sample; precision was assessed by calculating the RPD for the MS/MSD sample pairs.

MS/MSD sample pairs are required by the SAP at a rate of one MS/MSD pair per 20 samples per matrix. MS/MSD sample pairs were collected at the following frequencies:

- Three MS/MSD pairs from the soil matrix were analyzed by the laboratory for benzene, naphthalene, GRO, and RRO at a frequency of 12%.
- Three MS/MSD pairs from the soil matrix were analyzed by the laboratory for DRO at a frequency of 10%. Four MS/MSD pairs from the soil matrix were analyzed by the laboratory for TOC at a frequency of 15%.
- Five MS/MSD pairs from the water matrix were analyzed by the laboratory for benzene, naphthalene, GRO, and RRO at a frequency of 14%.
- Five MS/MSD pairs were collected for the water matrix and submitted to the laboratory for analysis for DRO, at a frequency of 13%.
- Two MS/MSD pairs from the water matrix were analyzed by the laboratory for sulfate and metals at a frequency of 14%.

MS and MSD recoveries and RPDs are discussed in Sections 2.2 through 2.7. Some extraction batches did not include project MS/MSD samples, which is a deviation from the QSM. The failure to include the MS/MSD in the batches, including the impact to data quality, is also addressed in sections 2.2 through 2.7 under the individual analyses,

2.8.3 Trip Blanks

Aqueous and soil trip blanks are included in shipments containing surface or ground water samples which are submitted to the laboratory for VOC and GRO analyses. Trip blanks are collected to assess the potential for VOC cross-contamination introduced by sample bottles or during sample handling during field operations, shipping, or storage at the laboratory.

GRO was detected in the trip blank at a concentration greater than the MDL, but less than half of the RL with soil samples shipped on 21 August in SDG 15084. GRO was reported at less than ten times the trip blank result in sample 09NCMOCSB23. The sample result is B flagged to indicate trip blank contamination.

Benzene was detected in the trip blank at a concentration greater than the MDL, but less than 1/2 the RL in water samples shipped on 21 August 2009 in SDG 15087. Benzene was analyzed at a 10X dilution due to previous foaming problems. After accounting for the dilution factor, benzene was detected at concentrations < RL in sample 09NCMOCGW26. Benzene results in this sample are UB qualified to indicate they are indistinguishable from the trip blank contamination.

Naphthalene was detected in the trip blank at a concentration greater than the MDL (0.95 µg/L), but less than the RL with water samples shipped on 12 September 2009 in SDG 15437. Naphthalene was detected at concentrations less than ten times the reported trip blank result in samples 09NCMOCGW41, -GW44, and-GW47 Affected samples were B flagged to indicate trip blank contamination.

GRO was detected in the trip blank at a concentration greater than the MDL, but less than the RL with soil samples shipped on 12 September 2009 in SDG 15434. GRO was detected at concentrations greater than the RL in all associated samples, except samples 09NCMOSB27 and – SB32. The GRO results for these samples are UB qualified to indicate they are indistinguishable from the trip blank contamination.

2.9 SAMPLE QUALIFIERS

Sample qualifiers are presented in Table 10.

Table 10: Sample Qualifiers

Field Sample Identification	Laboratory Sample Number	Compounds Affected	Reason	Flag	Bias
09NCMOCSB05	580-14753-1	Benzene	Low surrogate	QL	Low
09NCMOCSB06	580-14753-2	Naphthalene	recovery		
09NCMOCSB07	580-14753-3				
09NCMOCSB16	580-15084-4				
09NCMOCSB18	580-15084-6				
09NCMOCSB20	580-15084-8				
Trip Blank	580-15087-9				
09NCMOCSB08	580-14753-4	Benzene	High surrogate	QH	High
09NCMOCSB10	580-14753-6	Naphthalene	recovery		_
09NCMOCSB11	580-14753-7				
09NCMOCSB12	580-14753-8				
09NCMOCSB13	580-15084-1				
09NCMOCSB15	580-15084-3				
09NCMOCSB23	580-15084-11				
09NCMOCSB24	580-15084-12				
09NCMOCSB25	580-15434-1				
09NCMOCSB26	580-15434-2				
09NCMOCSB28	580-15434-4				
09NCMOCSB31	580-15434-5				
09NCMOCSB32	580-15434-6				
09NCMOCSB33	580-15434-7				
09NCMOCSB29	580-15434-9				
09NCMOCGW23	580-15087-3				
09NCMOCGW24	580-15087-4				
09NCMOCGW26	580-15087-6				
09NCMOCSB19	580-15084-7	Benzene	High and low	Q	Unknown
09NCMOCSB21	580-15084-9	Naphthalene	surrogate		
09NCMOCGW21	580-15087-1		recoveries		
09NCMOCGW22	580-15087-2				

Field Sample Identification	Laboratory Sample Number	Compounds Affected	Reason	Flag	Bias
09NCMOCSB13	580-15084-1	Benzene	Holding time	J/UJ	Low
09NCMOCSB14	580-15084-2	Naphthalene	exceedence		
09NCMOCSB15	580-15084-3				
09NCMOCSB16	580-15084-4				
09NCMOCSB17	580-15084-5				
09NCMOCSB18	580-15084-6				
09NCMOCSB19	580-15084-7				
09NCMOCSB20	580-15084-8				
09NCMOCSB21	580-15084-9				
09NCMOCSB22	580-15084-10				
09NCMOCSB23	580-15084-11				
09NCMOCSB24	580-15084-12				
Trip Blank	580-15084-13				
09NCMOCGW08	580-14864-5	Benzene	Headspace in	J	Low
		Naphthalene	sample vials		
09NCMOCGW21	580-15087-1	Naphthalene	Exceeds	NP	N/A
09NCMOCGW22	580-15087-2		calibration range		
(Batch 49349)					
09NCMOCGW21	580-15087-1	Naphthalene	Holding time	QL	Low
09NCMOCGW22	580-15087-2		exceedence		
09NCMOCGW25	580-15087-5				
09NCMOCGW26	580-15087-6				
09NCMOCGW27	580-15087-7				
(Batch 49813)					
09NCMOCGW31	580-15185-1	Naphthalene	Holding time	QL	Low
09NCMOCGW32	580-15185-2		exceedence	~_	_0
09NCMOCSB11	580-14753-7	Benzene	Low MS/MSD	М	Low
USINCINICCODITI	300-14733-7	Denzene	recovery	IVI	LOW
09NCMOCGW23	580-15087-3	Naphthalene	High MS/MSD	М	High
001101100001120		hapitalono	recovery		. ngn
09NCMOCGW41	58015437	Napthalene	Trip blank	В	High
09NCMOCGW44		-T	contamination		
09NCMOCGW47					
		Benzene	Trip blank	UB	High
09NCMOCSB26	580-15087-6	DONZONO	contamination		riigii
Trip Blank	000 10001 0	CBO		0	Low
пр валк	580-15053-10	GRO	Holding time exceedence	QL	LOW
ONCMOCSPOR		CPO		0	Low
09NCMOCSB06	580-14753-2	GRO	Low surrogate recovery	QL	Low

Field Sample Identification	Laboratory Sample Number	Compounds Affected	Reason	Flag	Bias
09NCMOCSB08	580-14753-4	GRO	High surrogate	QH	High
09NCMOCSB10	580-14753-6		recovery		
09NCMOCSB11	580-14753-7				
09NCMOCSB12	580-14753-8				
09NCMOCSB13	580-15084-1				
09NCMOCSB15	580-15084-3				
09NCMOCSB16	580-15084-4				
09NCMOCSB18	580-15084-6				
09NCMOCSB19	580-15084-7				
09NCMOCSB21	580-15084-9				
09NCMOCSB22	580-15084-10				
09NCMOCSB23	580-15084-11				
09NCMOCSB24	580-15084-12				
09NCMOCSB25	580-15434-1				
09NCMOCSB26	580-15434-2				
09NCMOCSB28	580-15434-4				
09NCMOCSB31	580-15434-5				
09NCMOCSB32	580-15434-6				
09NCMOCSB33	580-15434-7				
09NCMOCSB34	580-15434-8				
09NCMOCSB29	580-15434-9				
09NCMOCGW22	580-15087-2				
09NCMOCGW32	580-15185-2				
09NCMOCGW42	580-15437-2				
09NCMOCGW43	580-15437-3				
09NCMOCSB23	580-15084-11	GRO	Trip blank	UB	High
			contamination		
09NCMOCSB27	580-15434-3				
09NCMOCSB32	580-15434-8				
09NCMOCSB06	580-14753-2	DRO/RRO	High surrogate	QH	High
09NCMOCSB09	580-14753-5		recovery		
09NCMOCSB11	580-14753-7				
09NCMOCSB12	580-14753-8				
09NCMOCSB24	580-15084-12				
09NCMOCGW04	580-14864-8				
09NCMOCGW09	580-14864-6	DRO/RRO	Insufficient preservation	QL	Low
09NCMOCGW12	580-15053-1	DRO	High surrogate recovery; low LCSD recovery	J	Unknown
09NCMOCSB02	580-14560-2	DRO	No surrogate	Х	Unknown
09NCMOCSB04	580-14560-4		reported due to		
09NCMOCSB07	580-14753-3		sample dilution		
09NCMOCSB08	580-14753-4				
09NCMOCSB09	580-14753-5				
09NCMOCSB10	580-14753-6				
09NCMOCSB11	580-14753-7				

Field Sample Identification	Laboratory Sample Number	Compounds Affected	Reason	Flag	Bias
09NCMOCSB01	580-14560-1	DRO	Contamination	В	High
09NCMOCSB02	580-14560-2		reported in the		
09NCMOCSB03	580-14560-3		method blank		
09NCMOCSB04	580-14560-4				
09NCMOCGW12	580-15053-1	RRO	High surrogate recovery; high RPD between LCS and LCSD	Q	Unknown
09NCMOCGW04	580-14864-1	RRO	High LCS/LCSD	QH	High
09NCMOCGW05	580-14864-2		recovery		
09NCMOCGW06	580-14864-3				
09NCMOCGW07	580-14864-4				
09NCMOCGW08	580-14864-5				
09NCMOCGW09	580-14864-6				
09NCMOCGW10	580-14864-7				
09NCMOCGW11	580-14864-8				
09NCMOCGW13	580-15053-2	DRO	Low LCSD	QL	Low
09NCMOCGW14	580-15053-3		recovery		
09NCMOCGW15	580-15053-4				
09NCMOCGW16	580-15053-5				
09NCMOCGW17	580-15053-6				
09NCMOCGW18	580-15053-7				
09NCMOCGW19	580-15053-8				
09NCMOCGW20	580-15053-9				
09NCMOCGW13	580-15053-2	RRO	High RPD between	Q	Unknown
09NCMOCGW14	580-15053-3		LCS and LCSD		
09NCMOCGW15	580-15053-4				
09NCMOCGW16	580-15053-5				
09NCMOCGW17	580-15053-6				
09NCMOCGW18	580-15053-7				
09NCMOCGW19	580-15053-8				
09NCMOCGW20	580-15053-9				
09NCMOCSB32	580-15434-6	RRO	High MS/MSD recoveries	М	High
09NCMOCGW06	580-14864-3	RRO	High MS recovery	М	High
09NCMOCGW47	580-15437-7				
09NCMOCGW31	580-15185-1	RRO	High MS and low	М	Unknown
09NCMOCGW32	580-15185-2		MSD recovery		
09NCMOCGW33	580-15185-3				
09NCMOCGW34	580-15185-4				
09NCMOCGW35	580-15185-5				
09NCMOCGW36	580-15185-6				
09NCMOCGW37	580-15185-7				
09NCMOCGW38	580-15185-8				

Field Sample Identification	Laboratory Sample Number	Compounds Affected	Reason	Flag	Bias
09NCMOCGW31	580-15185-1	DRO/RRO	High RPD between	Q	Unknown
09NCMOCGW32	580-15185-2		LCS and LCSD		
09NCMOCGW33	580-15185-3				
09NCMOCGW34	580-15185-4				
09NCMOCGW35	580-15185-5				
09NCMOCGW36	580-15185-6				
09NCMOCGW37	580-15185-7				
09NCMOCGW38	580-15185-8				
09NCMOCGW13	580-15053-2	DRO/RRO	Hold time	NP	Low
09NCMOCGW14	580-15053-3		exceedence for re-		
09NCMOCGW15	580-15053-4		extraction		
09NCMOCGW16	580-15053-5				
09NCMOCGW17	580-15053-6				
09NCMOCGW18	580-15053-7				
9NCMOCGW19	580-15053-8				
9NCMOCGW20	580-15053-9				
(Batch 508-50480)	300-13033-3				
09NCMOCSB13	580-15084-1	Total organic carbon	Hold time	QL	Low
09NCMOCSB14	580-15084-2		exceedence		
09NCMOCSB15	580-15084-3				
09NCMOCSB16	580-15084-4				
9NCMOCSB17	580-15084-5				
09NCMOCSB18	580-15084-6				
09NCMOCSB19	580-15084-7				
09NCMOCSB20	580-15084-8				
09NCMOCSB21	580-15084-9				
09NCMOCSB22	580-15084-10				
09NCMOCSB23	580-15084-11				
09NCMOCSB24	580-15084-12				
		T (1) 1			
09NCMOCSB31	580-15434-5	Total organic carbon	High MS recovery and high MS/MSD RPD	Μ	High
09NCMOCGW04	580-14864-1	Sulfate	Hold time	J	Low
09NCMOCGW05	580-14864-2		exceedence		
(Batch 49693)					
09NCMOCGW04	580-14864-1	Sulfate	Exceeds	NP; use	Unknown
09NCMOCGW05	580-14864-2	Cullato	calibration range	other	Children
(Batch 48614)				result	
All Soil Samples	SDGs:	Benzene	High field duplicate	J	Unknown
	580-14735	Donzono	RPD	Ũ	Children
	580-15084				
	580-15434				
Soil samples in	SDGs:	Naphthalene	High field duplicate	J	Unknown
affected SDGs	580-14753	GRO	RPD		
	580-15084	DRO			
Soil samples in	SDGs:	RRO	High field duplicate	J	Unknown
affected SDGs	580-15084		RPD		

Field Sample Identification	Laboratory Sample Number	Compounds Affected	Reason	Flag	Bias
Water samples in affected SDG	SDG: 580-14864	Arsenic Chromium Lead	High field duplicate RPD	J	Unknown
09NCMOCGW04 09NCMOCGW05 09NCMOCGW06 09NCMOCGW07 09NCMOCGW08 09NCMOCGW09 09NCMOCGW10 09NCMOCGW11	SDG 580-14864	Chromium	Method Blank Contamination	В	High
09NCMOCGW41 09NCMOCGW42 09NCMOCGW43 09NCMOCGW44 09NCMOCGW46 09NCMOCGW47 09NCMOCGW48	SDG 580-15437	Arsenic	Method Blank Contamination	В	High
Water samples in affected SDG	SDG: 580-15053	Naphthalene	High field duplicate RPD	J	Unknown
Water samples in affected SDG	SDG: 580-15087	Benzene Naphthalene RRO	High field duplicate RPD	J	Unknown
Water samples in affected SDG	SDG: 580-15185	DRO	High field duplicate RPD	J	Unknown
Water samples in affected SDG	SDG: 580-15437	Sulfate	High field duplicate RPD	J	Unknown
B detected in	blook				

- B detected in blank
- H high bias
- J estimated value
- L low bias
- M matrix effect
- N/A not applicable
- NP not preferred
- Q quality control failure
- U not detected

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3.0 SUMMARY

This report evaluates the analytical data generated during the NE Cape ISCO Study and Drum Removal conducted from July through September 2009. This assessment evaluated whether program objectives and DQOs were met. The assessment reviewed sample receipt conditions, extraction and analytical procedures, sampling procedures, and correspondence to method criteria and project DQOs. The following conclusions were drawn based on this assessment of the analytical data:

- Sample receipt conditions were acceptable based on temperatures upon receipt and COC correspondence to submitted sample set. Minor errors and omissions were observed in the sample documentation, but sufficient information was provided and data usability was not affected. Qualification did occur for benzene and naphthalene results in one sample due to the presence of air bubbles in all three sample vials.
- Analyses and extractions were performed within holding times, with the following exceptions:
 - The benzene and naphthalene holding time was exceeded for 13 soil samples.
 - The naphthalene holding time was exceeded for 7 water samples.
 - The holding time for GRO was exceeded for one trip blank.
 - The holding time for TOC was exceeded for 12 soil samples.
 - The holding time for sulfate was exceeded for 2 water samples.
- Extraction and analytical procedures were acceptable based on MBs, LCS/LCSDs, MS/MSDs, and surrogates. However, sample qualification occurred for the following:
 - One or more surrogate recoveries outside control limits for 28 samples analyzed for benzene and naphthalene, 26 samples analyzed for GRO, and 6 samples analyzed for DRO/RRO.
 - MS/MSD recoveries outside control limits, indicating a matrix effect for one benzene soil result, one naphthalene water result, one RRO soil result, 11 RRO water results, and one total organic soil result.
 - High LCS/LCSD recoveries or RPDs for 25 RRO results.
 - High LCS/LCSD recoveries or RPDs for 16 DRO results.
- Three benzene results and one GRO result were qualified due to their presence in the associated trip blank.
- Imprecision was observed in the field duplicate pairs for benzene, naphthalene, GRO, DRO, and RRO in soil samples and for arsenic, chromium, lead, benzene, naphthalene, DRO, RRO, and sulfate in water samples.

Based on this review, the analytical data generated during the NE Cape ISCO Study and Drum Removal are complete, correct, consistent, compliant with method procedures and QC requirements, and are usable as qualified.

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4.0 REFERENCES

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- U.S. Army Corps of Engineers (USACE). 1997. Chemical Quality Assurance of Hazardous, Toxic, and Radioactive Waste (HTRW) Projects. 10 October.

USACE. 1998. Chemical Data Quality Management for Hazardous, Toxic, Radioactive Waste Remedial Activities. ER 1110-1-263. 30 April.

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APPENDIX C

Test Pit Logs

		Δ		CC		M	Project		-	erations Complex Area P st Cape, St. Lawrence Isl			Page 1 of 1 Date: 11 Jul 2009
							Equipn Bris		Contract	tor:			ation Datum: MSL
	Т	ES	ST	PIT	Ľ	.OG	Locatio		Northi Eastin			Тор с	of Test Pit Ition: 64.0 ft
Hole TP	e Number, 1	Field:	I	Perman TP1	ent:		Operat <i>M.</i> 7	tor: Thom	oson		Inspector: <i>R. Schl</i> e		
									ipment: 322B E	xcavator	Test Pit C digging N		tion:
	ket Width: 2.5	1	Fest Pi 14	t Length	ו:	Test Pit Width: 5	Test Pi 6.5 f		oth:	Depth to Groundwater <i>NE</i>	:	Type o Gra	of Samples: <i>b</i>
Depth (ft)	Lithology	FID (ppm)	PID (ppm)	Symbol	Clas AST	ssification FM: D 2487 or D 2488		Depth (ft)	De	escription and Remarks Surface Co	ndition: Gras	s with c	obbles
-				ML/FILL	. SIL	LT / FILL		-	silty lo	am, occasional angular gra	vels and cobb	oles, 3%	gravel, 0% sand, 97% fines.
- 1		_		<u></u>	SīL	. Τ		- 1		pam as above but no grave or odor.	l or cobbles,	exposed	d drum at 2 ft bgs, no visible
- 2 - - 3				-				- 2 - - 3	visible	dark staining (dark yellow	brown [10YR :	3/3 - 3/4	1) in silty loam at 3 ft bos.
- 4		52.1	18.5	-				- 4		rown, soft, dry, low to no pl	-		
- 5		556.0	144.0	OL	Org	ganic SILT		- 5	light b	rown gray to gray brown (10YR 6/2 - 5/2	2) fines	with peat and organics, 30%
- 6		902.0	200.0	-				- 6	drums	and debris, stanning and of and debris, strong petroleu dwater at 6.5 ft bgs.	im odor.	n gray	mottling, appears to be fill,
- 7 -								- - 7	Groun Backfi	n of Exploration 6.5 ft dwater Not Encounted (NE) lled trench in reverse order ntal survey datum: NAD83 /	of excavation AK Zone 9 in I	i as clos U.S. feet	ely as possible.
- 8								- 8 -					
0T 3/3/10	- 9							- 9 -					
ISR_ANC.GI													
008.GPJ EN													
NE_CAPE-TP USACE ISCO LOGS.GPJ ENSR_ANC.GDT 3/3/10 E 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1								12 					
CAPE-TP U								-13	Project:				Hole Number:
NE										Operations Complex Are	ea Phase I IS	600	TP1

		4			M	Project	Project: Main Operations Complex Area Phase I ISCO Page 1 of 1 North East Cape, St. Lawrence Island, Alaska Date: 11 Jul 2						
						Equipm Brist		Contract	or:		Eleva XI	tion Datu	um:] other
		ES	51	PH	LOG	Locatio	n:	Northin Eastin			Top o Eleva	of Test Pi tion: 7	t '0.0 ft
Hole TP:	e Number, 2	Field:	F	Perman TP2	ent:	Operato <i>M. T</i>		oson		Inspector: <i>R. Schl</i>			
						Type of <i>Catij</i>		•	cavator	Test Pit (digging V		ion:	
	ket Width: .5	1	Fest Pit 10	t Length	Test Pit Width:	Test Pit 10.0		th:	Depth to Groundwater		Type c Gra	of Sample b	es:
Depth (ft)	Lithology	FID (ppm)	PID (ppm)	Symbol	Classification ASTM: D 2487 or D 248	38	Depth (ft)	De	scription and Remarks Surface Co	ndition: Gras	s with ro	ocks	
- 1				OL	Organic SILT		- 1 -	materi	rown to dark yellow brown al to 1.5 ft bgs, earthy, occ 0% sand, 95% fines.	(10YR 3/3 - 3 asional smal	8/4) silty II pebble	loam, with s with occ	n abundant organic casional rocks, 5%
- 2 - 3 - 4		740.0	160.0	OL	Organic SILT with Gra	avel	— 2 - — 3 -	light g gravel	ray to gray brown (10YR 5/ s, 3% gravel, 0% sand, 97%	1 - 5/2) staine fines.	ed clayey	∕ silt, abun	ndant large angular
- 5 - 6		-					- - 5 - 6	as abo	ve with low plasticity and s	 oft			
-		1040.0	420.0				-						
- 7- - 8		720.0	140.0	OL	Organic SILT		- 7 - 8	dark b peat, s	rown to dark yellow brown oft, no large fractions, stair	(10YR 3/3 - 3 ned, strong pe	3/4) silty etroleum	loam, 100 odor.	0% fines, abundant
		-					- 9	becom	ing clayey silt at 8.5 ft bgs.				
C.GDT 3		580.0	204.0				- 	Botton	of Exploration 10.0 ft				
NE_CAPE-ITP_USACE ISCO LOGS.GPJ_ENSR_ANC.GDT_3/3/10 11							- 	Seep e trench Backfi	n of Exploration 10.0 ft ncountered at silty clayey /pit. led trench in reverse order ntal survey datum: NAD83 /	of excavatior	n as clos	ely as pos	
NE_CAP								Project: <i>Main</i>	Operations Complex Are	ea Phase I IS	sco	Ho	ble Number: TP2

		Δ			M		Project				nplex Area P Lawrence Isl			Page ⁷ Date:	1 of 1 11 Jul 2009
							Equipm Brist		Contract	tor:			Eleva X N	tion Dat MSL [um:
	Т	ES	ST	PIT	LOG		Locatio	n:	Northin Eastin	•			Top o Eleva	f Test Pi tion: 7	it 7 2.1 ft
	le Number, P3	Field:	[Perman TP3	ent:		Operato <i>M. T</i>	or: homp	son			Inspector: <i>R. Schle</i>	osser		
							Type of <i>Catil</i>		•	kcavator		Test Pit C digging N		ion:	
	cket Width: 4.5	-	Test Pi 6	t Length	:: Test Pit W 4.5	/idth:	Test Pit 11.4		th:	Depth to G	Groundwater 11.0 ft	:	Type o Gra	f Sample b	es:
Depth (ft)	Lithology	FID (ppm)	PID (ppm)	Symbol	Classification ASTM: D 2487 or	⁻ D 2488		Depth (ft)	De	escription and		ndition: Grave	el and gr	ass	
-				ML/FILL	Gravelly SILT /	FILL		_	occasi	ly silt / silty onal cobbles, to gravelly s	, 20% gravel, (4/4), with a 0% sand, 80%	bundant fines, a	50-80 m bundant	nm angular gravel scattered organics
- 1								1 -	Oxidat	ion zone belo	w fill (3.5 ft bg	s).			
- 2	2	bkgd	bkgd					- 2							
- 3	3							— 3							
- 4								- 4	light b low pla	rown gray to asticity, appea	gray brown (M ars partially fro	lunsell 104R (ozen, moist, s	6/2 -5/2) light pet	clayey sil roleum oc	lt, 100% fines, no to dor.
-	5	420.0	48.0					- 5						-	
-		-		PT ML	PEAT Clayey SILT wit Cobbles	th Gravel a	nd	-	light n				•		when smeared, dry
- 6 -	5	32.0	4.0	-	CODDIES			- 6 -	very of	igin periorea					
- 7	7			-				7 -							
— e	3	41.0	17.0	-				- 8							
3/10)	51.0	4.8	PT	PEAT			- 9	dark y	ellow brown to	o very dark gr	ay brown (Mu	nsell 104	IR 3/2 - 3/4	4) peat.
- 40.00 - 10 - 10)							- 							
		-		ML	Clayey SILT wit Cobbles	th Gravel ar	nd	- 11			8/2 - 3/4) claı s, moist, sligh			low pla	sticity, moderately
USACE IS							Bottom of Exploration 11.4 ft Backfilled trench in reverse order of excavation as closely as possible. Horizontal survey datum: NAD83 AK Zone 9 in U.S. feet. bkgd = background						ssible.		
CAPE-TP	3							—13	Project:					He	ole Number:
Ш									Main	Operations	Complex Ar	ea Phase I IS	600		TP3

																	_
			Δ	-	CC		М	Project:		-	rations Comple. at Cape, St. Law				Page Date:	1 of 1 12 Jul 2009	
								Equipm Brist	ent (_			1	tion Da		
		Т	ES	ЪТ	PIT	Ľ	.OG	Location		Northir Easting					of Test		
	Hole TP4	Number, 4	Field:	I	Perman TP4	ent:		Operato <i>M. T</i>			<u>. </u>		Inspector: <i>R. Schle</i>				
								Type of	Equ	ipment:	cavator		Test Pit C digging N	Drientat	ion:		
	Buck 4.	et Width: 5	T	Test Pi 10	t Length	ו:	Test Pit Width: 4.5	Test Pit	Dep		Depth to Grou	ndwater 7.5 ft		Type c Gra		ples:	
	Depth (ft)	Lithology	FID (ppm)	PID (ppm)	Symbol	Clas AST	ssification M: D 2487 or D 2488		Depth (ft)	De	scription and Rem	narks	ndition: Grass				
	-				ML/FILL	Gra	avelly SILT / FILL		_	silt fil throug	(10YR 4/4 - 3/3 hout, 15% gravel,	3), slighti 0% sand,	ly mottled, la 85% fines, mo	arge an oderate	igular c plasticit	obbles and gravels y, soft, moist.	s
	- 1 -							-	- 1 -								
	— 2 -		1.2	2.3	-			-	— 2 _								
	- 3-		-						— 3	becom	ing less clay with	low plast	icity, no visib	le conta	minatio	n or odor.	
	- 4							-	- 4								
	- 5-				ML	Cla	ayey SILT with Gravel a	nd	- 5	arav ti) light gray (10YE	2 5/1 - 7/1) clavev silt	low pla	eticity	occasional organics	_
	- 6		138.0	17.0	_	Co	bbles		- 6	slight	noisture, slight to	moderate	e petroleum o	dor and	light sta	aining.	',
	-		-		ML		ayey SILT with Gravel a	nd	-		ellow brown (10YF oundant peat, stro					ith above ML at 6.5 f	ft
	- 7		1280.0	205.0		0	bbles		- 7 - 1	Botton	of Exploration 7.	5 ft					
	- 8 -							-	— 8 -	Backfi	led trench in reve ntal survey datum	rse order	of excavation AK Zone 9 in I	as clos J.S. feet	ely as p	ossible.	
3/3/10	— 9								— 9								
ANC.GDT	- 10							-	- 10								
PJ ENSR	- 11								- 11								
O LOGS.G	- 12								-								
NE_CAPE-TP_USACE ISCO LOGS.GPJ_ENSR_ANC.GDT_3/3/10									—12 -								
APE-TP	-13	-13														Hole Number:	
NE_C,										Project: <i>Main</i>	Operations Con	nplex Are	ea Phase I IS	600		TP4	

		4		CC	M	Project		-		nplex Area P Lawrence Isl			Page Date:	1 of 1 12 Jul 2009
						Equipm Bris		Contract	or:			Eleva X N	tion Dat /ISL	um: □ other
	Т	ES	ST	PIT	LOG	Locatio	on:	Northi Eastin	•			Top of Elevat	f Test P tion: 7	it 74.2 ft
Hol TI	e Number, ?5	Field:	F	Permane TP5	ent:	Operat <i>M. T</i>	or: 'homp	oson			Inspector: <i>R. Schlo</i>	osser		
								ipment: 322B E	cavator		Test Pit C <i>digging N</i>		on:	
	cket Width: 4.5	-	Test Pit 10	t Length	: Test Pit Width: 4.5	Test Pi 10.4		th:	Depth to (Groundwater 10.0 ft	:	Type o Grai	f Sampl b	es:
Depth (ft)	Lithology	FID (ppm)	PID (ppm)	Symbol	Classification ASTM: D 2487 or D 2488		Depth (ft)	De	scription and		ndition: Grass	5		
- 1				ML/FILL	Gravelly SILT with Sand /	FILL	- 1	occasi	ray gravelly onal sand, nination.	silt (10YR 3/3 20% gravel,	- 3/4), grave trace sand,	els to 13 80% 1	0 mm, o fines, no	occasional cobbles, o odor or visible
- - 2		40.0	hhud				- - 2							
- - 3		40.0	bkgd				- - 3							
-		30.0	bkgd	PT	PEAT		-	dark y	ellow brown	(10YR 3/6) peat				
- 4 - 5 -				ML	Clayey SILT with Gravel a Cobbles	and	— 4 - — 5 -		-	n gray clayey s vn clayey silt w			es toward	ds 6 ft bgs.
— 6 -				ML	SILT with Clay		— 6 -			y silt with gra yey towards ba			ow to n	noderate plasticity,
- 7	,	60.0	3.2				7 -							
-				ML	SILT with Gravel and Cot	obles	- 8	increa	sed percenta	ge of gravel an	d cobbles, 15	% grave	, 85% fin	es.
NC.GDT 3/3/10		30.0	bkgd	ML	Clayey SILT with Gravel a Cobbles	and	— 9 - —1 0	clayey) clayey silt, m moderate plas				s, occasionally very
CAPE-TP USACE ISCO LOGS.GPJ ENSR_ANC.GDT 3/3/10 C1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							- 11	Bottor Backfi Horizo	n of Explorati lled trench in	reverse order atum: NAD83				ssible.
12 - 12 - 13 - 13							—12 - —13							
NE_CAPE		•		·1				Project: <i>Main</i>	Operations	Complex Are	ea Phase IS	SC0	H	ole Number: TP5

		4		CC	M	Project		-	rations Complex Area st Cape, St. Lawrence I			Page 1 of 1 Date: 12 Jul 2009
						Equipm Bris		Contract	or:		Eleva X N	tion Datum: ∕ISL □ other
	I	ES	51	PH	LOG	Locatio	n:	Northin Eastin				f Test Pit tion: 74.1 ft
	le Number, P6	Field:	l	Perman TP6	ent:	Operate <i>M. T</i>	or: hom p	oson		Inspector: <i>R. Schl</i>		
								ipment: 322B Ex	cavator	Test Pit (digging I		on:
	cket Width: 4.5	1	Test Pi 10	t Length	Test Pit Width: 5	Test Pit 8.0 ft	•	th:	Depth to Groundwate 7.4 ft	er:	Type o Grai	f Samples: b
Depth (ft)	Lithology	FID (ppm)	PID (ppm)	Symbol	Classification ASTM: D 2487 or D 2488		Depth (ft)	De	scription and Remarks Surface C	ondition: Gras	S	
-				GM/FILL	Silty GRAVEL / FILL		_	to 130	avel, occasional areas of mm with occasional cob asticity, moderately soft,	bles, 75% grav	el, trace	n, abundant angular gravels sand, 25% fines, no to very r staining.
-	1						- 1 -					
-	2						- 2 -					
	3						— 3 _					
-	4	10.0	3.0	_			- 4					
-	5	-		ML	SILT with Gravel		- 5	grades	to dark gray (10YR 4/1)	silt with grave	I, occasi	onal clay, 10% gravel, trace
	6						- 6	sand, s	90% fines, no plasticity, la	mination beds	partially	frozen, moist.
-	_	30.0	13.0									
-		-		PT ML	PEAT Clayey SILT with Gravel Cobbles	and	/		inch) dark brown peat be silt, 100% fines.	d.		
T 3/3/10	9						- 8 - 9 -	sheen. Water Botton Backfi		uilibrated, shee	n on wat	ely as possible.
R_ANC.GD	0						— 10 _					
NE_CAPE-TP_USACE ISCO LOGS.GPJ_ENSR_ANC.GDT_3/3/10	1						- 11					
	2						- 12					
	3						- 13					
NE_CAPE-								Project: <i>Main</i>	Operations Complex A	rea Phase I I	SCO	Hole Number: TP6

			4		CC		Μ	Project			erations Complex Area P st Cape, St. Lawrence Isi			Page Date:	1 of 1 12 Jul 2009
								Equipm <i>Bris</i>		Contrac	tor:			ation Da MSL	atum: □ other
		Т	ES	ST	PIT		.OG	Locatio	n:	Northi Eastin				of Test ition:	Pit 75.8 ft
	ole N TP7	lumber, l	Field:	F	Perman TP 7	ent:		Operate <i>M. T</i>		oson		Inspector: <i>R. Schlo</i>	osser		
								Type o Cati		•	xcavator	Test Pit C digging N		ion:	
В	ucke 4.5	t Width:	Т	est Pir 12	t Length	ו:	Test Pit Width: 4	Test Pit 8.0 f		oth:	Depth to Groundwater 7.0 ft		Type c <i>Gra</i>		ples:
Denth (ft)		Lithology	FID (ppm)	PID (ppm)	Symbol	Clas AST	ssification IM: D 2487 or D 2488		Depth (ft)	De	escription and Remarks Surface Co	ndition: Grass	6		
-	-				GM/FILL	Sil	ty GRAVEL / FILL		_	grassy	y roots with silty gravel (10Y	′R 3/3), 60% gı	ravel, tra	ace sand	d, 40% fines.
-	1								- 1						
_	2								- 2	very d	ark brown organic rich zone	es.			
_	3—				ML	Cla	ayey SILT		- 3	highly	oxidized silt, dark red brow	wn just below	light gr	ay brov	vn (10YR 4/2) mottled
	4 ML Clayey SILT								- 4	cobble	v brown(10YR 5/4)with al es, 25% gravels, 0% sand, 79	5% fines, no o	dor grav	isible st	ts, abundant angular taining.
-									-						
-	5				ML	Gr	avelly SILT		- 5	light g strong	ray (10YR 4/1) silt with grav petroleum odor, appears to	vels throughou be some per	ut, 40% ched wa	gravels ater at 5	, 0% sand, 60% fines, ft bgs.
-	6								- 6 -						
-	7								- 7	water	at 7 ft bgs.				
	8		325.0	70.0					- 8	Bottor	n of Exploration 8.0 ft				
-									-	Backfi	illed trench in reverse order ontal survey datum: NAD83	of excavation AK Zone 9 in l	as clos J.S. feet	ely as p	ossible.
F 3/3/10	9								- 9 -						
ANC.GD	10								-10						
	1														
LOGS.GF									-						
									-12						
TP USA	13														
NE_CAPE-TP_USACE ISCO LOGS.GPJ_ENSR_ANC.GDT_3/3/10						<u> </u>				Project: <i>Main</i>	Operations Complex Ar	ea Phase I IS	600		Hole Number: TP7

						Project			erations Complex Area F			Page 1	of 1
		A			M		N	orth Ea	st Cape, St. Lawrence Is	land, Alaska		Date:	13 Jul 2009
						Equipm Bris		Contrac	tor:		Elevat	tion Datu ∕ISL □	m:] other
	Т	ES	ST	PIT	LOG	Locatio	n:	Northi Eastin				f Test Pit ion: 72	
Hole TP	e Number, 8	Field:		^D erman TP8	ent:	Operate <i>M. T</i>	or: homp	son		Inspector: <i>R. Schlo</i>	osser		
						Type of <i>Cati</i>		•	xcavator	Test Pit O digging E		on:	
	ket Width: .5	T	Test Pi 12	t Length	n: Test Pit Width:	Test Pit	•	th:	Depth to Groundwater	r:	Type of <i>Grat</i>	f Sample	S:
					Classification			De	escription and Remarks				
Depth (ft)	Lithology	FID (ppm)	PID (ppm)	Symbol	ASTM: D 2487 or D 2488		Depth (ft)		•	ondition: Grass	5		
				0				grass	and roots.				
1		-		GM/FILL	Silty GRAVEL / FILL		- 1	dark y gravel	vellow brown (10YR 3/3 -3, clasts, occasional cobbles	/4) silty grave , 60% gravel, 0	l, silt ma % sand,	atrix with 40% fines	abundant angular , hard digging.
-							-						
- 2							— 2 -						
- 3							— 3 -		ised gravel: 65% gravel, 0%	sand 35% fine			
- 4		728.0	220.0	PT	PEAT		— 4		eat band.	Sanu, 5570 mile			
-		-		ML	SILT with Gravel		-		at ~4 ft bgs on top of ML silt	strong odor			[
- 5							— 5	dark g	ray (10YR 4/1) silt, with occ	asional gravel	•		/
-		1750.0	350.0				-						
- 6							— 6						
-							-						
- 7		-		PT	PEAT		- 7	peat z	one with staining and odor.				
-							-		-				
- 8				PT/OL	PEAT / Organic SILT		- 8 -	peat b	ecoming dark brown to yell	ow brown orga	anic silt.		
_ 9-		-					- 9				-1		
3/3/1				ML	SILT with Clay		_	slight	m to light gray silt, clayey lamination, partially frozen,	in part to very slight odor.	clayey,	dense, cle	an, uniform, tight,
10 10		40.0	4.0				—10		ter in pit when dug.				
SR_AN							_	Groun	n of Exploration 10.0 ft Idwater Not Encounted (NE) Illed trench in reverse order	of execution			sible
≝ ≂—11							—11	Horizo	ontal survey datum: NAD83	AK Zone 9 in L	J.S. feet.	as poss	sible.
GS.GF							_						
9 0 – 12							—12						
ACE IS							_						
NE_CAPE-ITP_USACE ISCO LOGS.GPJ_ENSR_ANC.GDT_3/3/10 1 1													
CAPE.								Project:	:			Ho	le Number:
NE									Operations Complex Ar	rea Phase I IS	CO		TP8

AECOM							Project: Main Operations Complex Area Phase I ISCO Page 1 of 1 North East Cape, St. Lawrence Island, Alaska Date: 13 Jul 2009								
							Equipment Contractor: Bristol					Elevation Datum:			
	Т	ES	ST	PIT	LOG	Locatio	Location: Northing: 3,403,856 Easting: 1,810,639					Top of Test Pit Elevation: 74.6 ft			
	Hole Number, Field: Permanent: TP9 TP9							Operator: In <i>M. Thompson</i>				Inspector: R. Schlosser			
							Type of Equipment: Catipillar 322B Excavator				Test Pit Orientation: digging N-S				
	Bucket Width: T 4.5			t Length	i: Test Pit Widt	h: Test Pit 10.0		th:	Depth to Groundwater <i>NE</i>		Type of Samples: <i>Grab</i>				
Depth (ft)	Depth (ft) Lithology FID (ppm) PID (ppm) Symbol				Classification ASTM: D 2487 or D 2	2488	Description and Rei			narks urface Condition: Large gravel and cobbles ith clayey silt matrix					
	GM/FILL Silty GRAVEL / FILL					_	large rebar.	gravel and cobbles with	clayey silt m	atrix, demo	lition remains, concrete,				
- 1							- 1								
- 2							- - 2								
-						-									
- 3	3					— 3									
- 4							- 4								
-							-								
- 5 -	5 PT PEAT 5.2 2.1 GM Silty, Sandy GRAVEL				/EL	- 5	silty s	at layer andy gravel, highly oxidized	d red brown zo	one to 6 ft b	gs, predominantly 40-100				
- 6	6					- 6	bgs as abo	gular gravel, 75% gravel, tr ove but 20-40 mm angular		-	-				
	7					- 7	abund	ant organics throughout.							
- '							- '								
- 8	8 176.0 69.0					- 8	becom	ing more sandy with depth	; 75% gravel, 5	5% sand, 20	% fines.				
e – 9							- 9								
GDT 3/3		305.0	1605.0				-	70% g	avel, 10% sand, 20% fines.	Less organic	s towards t	otal depth.			
NE_CAPE-TP USACE ISCO LOGS.GPJ ENSR_ANC.GDT 3/3/10 EL 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							—10 - —11	Groun Backfi	n of Exploration 10.0 ft dwater Not Encounted (NE) lled trench in reverse order ntal survey datum: NAD83	of excavation	as closely U.S. feet.	as possible.			
USACE IS							-								
							13	Project:				Hole Number:			
NEC									Operations Complex Ar	ea Phase I IS	SC0	TP9			

AECOM							Project	Project: Main Operations Complex Area Phase I ISCO Page 1 of 1 North East Cape, St. Lawrence Island, Alaska Date: 13 Jul 2009							
								Equipment Contractor: Bristol					Elevation Datum:		
	TEST PIT LOG								Northir Easting			Top of Test Pit Elevation: 76.2 ft			
	Hole Number, Field:Permanent:OTP10TP10							Operator: In <i>M. Thompson</i>			Inspector: <i>R. Schlo</i>	nspector: R. Schlosser			
	T							Type of Equipment: Catipillar 322B Excavator			Test Pit Orientation: digging NW-SE				
Bu	Bucket Width: 4.5				t Length	n: Test Pit Width: 5	Test Pit 10.0	•	th:	Depth to Groundwate <i>NE</i>	Type of Samples: Grab				
Depth (ft)	Depth (ft) Lithology FID (ppm)		PID (ppm)	Symbol	Classification ASTM: D 2487 or D 2488		Depth (ft)	Description and Remarks Surface Condition: Surface soil with grass							
-							_	surfac	e soil with grass.						
-	1 2 3 4 5 6 7 8	Image: Second standy of the second standy					1- - 2 - 3 - 4 - 5 - 4 - 5 - 6 - 7 - 7 - 8	interm gravel, light to gradec 60% gr	ravel with dark yellow ixed, sand predominately 25% sand, 15% fines, den medium gray (10YR 4/2 - l angular gravel clasts and avel, 30% sand, 10% fines.	4/1) sandy gra occasional co	in, scatterd ess silty wit vel, predon bbles, medi	d silt throughout, 60% h depth, moist. inantly 5 mm - 5 cm well um to course grain sand,			
	9	1	605.0	192.0	ML	SILT with Sand		- 9 - 10 - 11 - 11 - 12 - 13	Botton Groun No vis Backfi	ray silt, trace gravel, 10% s n of Exploration 10.0 ft dwater Not Encounted (NE; ble water in hole when pit led trench in reverse order ntal survey datum: NAD83) initially dug. r of excavation	as closely a	as possible.		
										Operations Complex Ar	rea Phase I IS	SCO	TP10		

_																
AECOM							Project:	Project: Main Operations Complex Area Phase I ISCO North East Cape, St. Lawrence Island, Alaska						1 of 1 16 Jul 2009		
								Equipment Contractor:					Elevation Datum:			
	TEST PIT LOG								Bristol Northing: 3,403,945 Location: Facture: 4,240,640					Image: MSL Image: Other Top of Test Pit		
ŀ									Easting: 1,810,643 Elevation: 69.2 ft							
									Operator: Inspector: R. Schl							
									Equipment: Test Pit C Ilar 322B Excavator digging N				Drientation: I W-SE			
E	Bucket Width:Test Pit Length:Test Pit Width:Te4.5105						Test Pit Depth: Depth to Groundwater: 10.0 ft NE					Type of Samples: Grab				
F						Classification ASTM: D 2487 or D 2488			De	scription and Remarks						
į	Depth (ft)	ASTM: D 2487 or D 2488 ASTM: D 2487 or D 2488 ASTM: D 2487 or D 2488			(t) trade O O O O			ndition: Surface soil with gravel								
-			ш		م GM/FILL	Silty GRAVEL / FILL		Δ	surfac	e soil with occasional grave	ls throughout	t.				
F							-	-								
E	• 1						-	- 1								
	- 2	2 ML/FILL Sandy SILT / FILL				_	- 2	yellow	brown (10YR 3/4) sandy silt	t.						
-							-	-								
-	3-	GM/FILL Silty GRAVEL / FILL				- 3	light g	ray silty gravel, 70% gravel,	trace sand, 3	0% fines	i.					
F	F	A TR.0 3.2 PT PEAT Gravelly SILT				-		eat layer. ray silt with scattered grave	ls 10% grave	10% e	and 80%	6 fines areas of dark				
	• 4					- 4	red bro	own slight oxidation.	15, 10 /0 grave	1, 1070 3	anu, 00 /	o mics, aleas of dark				
	- 5							- 5								
-							-	-								
-	6	PT PEAT			- 6	organi	c rich and peat.									
F							-	-								
	• 7–	720.0 3.5 ML Clayey SILT with Gravel and Cobbles				- 7	occasi	o medium gray (10YR 7/1 - (onal zones that have high	clay conten	nt, mode	rate pla					
	- 8							- 8	occasi	onally sticky, partially froze	n, slight to ve	ery slight	odor.			
							-	-								
10	9						-	- 9								
DT 3/3/			1300.0	25.0	-		-	-								
ANC.G	10		1300.0	23.0				-10		n of Exploration 10.0 ft dwater Not Encounted (NE)						
ENSR							-	-	No vis Backfi	ible water in open pit. lled trench in reverse order	of excavation	as clos	ely as po	ossible.		
3S.GPJ	11							-11	Horizo	ntal survey datum: NAD83 A	AK Zone 9 in I	U.S. feet	-			
	12															
ACE IS							F	-								
NE_CAPE-TP_USACE ISCO LOGS.GPJ_ENSR_ANC.GDT_3/3/10	13						F	—13								
CAPE			1	1	1	1	I		Project: Main	Operations Complex Are	a Phasa I IC	800	F	Hole Number: TP11		
۳L									waili	operations complex Are	a r 11830 1 13			11 11		

		Δ			M		Project		-	rations Complex A st Cape, St. Lawrer				Page Date	e 1 of	[:] 1 6 Jul 2009
								nent	Contract	-			Eleva	tion D	atum:	
	Т	ΈS	ST	PIT	LOG		Bris Locatio		Northi Eastin					MSL of Test		other
	e Number, P12	Field:		Perman TP12	ent:		Operat	tor: Thom		j. 1,010,737	lr	nspector: <i>R. Schl</i> e			09.0	n
	- 12			1712			Туре с	of Equ	ipment:			Test Pit C	Drientat	ion:		
	cket Width:	1		t Length		Width:	Test Pi	it Dep		ccavator Depth to Ground		digging S	Туре с		ples:	
	4.5		10		5 Classification		5.0 1	ft	De	scription and Remark	ks		Gra	b		
Depth (ft)	Lithology	FID (ppm)	PID (ppm)	Symbol	ASTM: D 2487	or D 2488		Depth (ft)		-		ition: Gras	s			
									grass		_					
- 1				GM/FILL	Silty GRAVEL	. with Sand /	/ FILL	- 1		ravel fill with yellow 10% sand, 30% fines		lt matrix, a	ıngular (gravels,	scatte	red sand, 60%
- 2								- 2								
-		bkgd	bkgd					-								
- 3	\$ 							- 3 -		ve but dark yellow br						
- 4	Ļ	1058.0	201.0	SP/FILL	Poorly-graded	d Gravelly S	AND /	- 4	perche	gravelly sand, coars d water at 4 ft bgs.	se to ver	y coarse s	and, sta	ained fr	om die	sei, odor, wet,
- 5	;							- 5		pipe, sand as above n of Exploration 5.0 ft		bedding pi	pe		· ·	
-								-	Water Backfi	running in pit from po lled trench in reverse ntal survey datum: N	erched zo e order of	excavation	as clos	ely as p	ossible	9.
- 6 -	5							- 6 -	bkgd =	background				-		
- 7	,							- 7								
- 8	8							- 8								
-								-								
9/3/10								- 9								
ANC.GDT 10								-10								
LOGS.GP								-								
12 12 12	2							12								
NE_CAPE-TP USACE ISCO LOGS.GPJ ENSR_ANC.GDT 3/3/10 E 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	3							-13								
NE_CAPE	<u>.</u>	1	1	<u>.</u>					Project: <i>Main</i>	Operations Compl	lex Area	Phase I IS	SC0		Hole N TP	Number: 12
~								I		•				I		

			A		CC		Μ	Project	٨	lorth Ea	erations Complex Area I st Cape, St. Lawrence Is			Page 1 of 1 Date: 16 Jul 2009
		–		Ŧ				Equipm Bris		Contract	tor:			ation Datum: MSL
		I	ES		PH		OG	Locatio	on:	Northin Eastin			Top o Eleva	f Test Pit tion: 69.6 ft
ŀ	Hole TP1	Number, 3	Field:	ŀ	Perman TP13	ent:		Operat <i>M. T</i>	or: 'hom µ	oson		Inspector: <i>R. Schl</i>		
										ipment: 322B Ex	xcavator	Test Pit (digging E		ion:
E	Buck 4.:	et Width: 5	T	est Pir 10	t Length	ו: ר	Test Pit Width: 5	Test Pi 7.0 f		th:	Depth to Groundwate	r:	Type o Gra	of Samples: b
	Depth (ft)	Lithology	FID (ppm)	PID (ppm)	Symbol	Class ASTN	sification M: D 2487 or D 2488	<u> </u>	Depth (ft)	De	scription and Remarks Surface C	ondition: Silty	gravel	
					GM/FILL	Silty	y GRAVEL with Sand /	FILL	_	silty g moder	gravel, poorly graded g ately dense, slight moistu	ravels to 25 e.	cm, oc	ccasional sand throughout,
-	- 1								- 1					
	- 2								- 2					
╞									-					
-	- 3								- 3					
	- 4				PT	PEA		. 0 d	- 4	-	ellow brown clayey silty pe			had
+			555.0	125.0	ML	Grav	velly, Clayey SILT with	n Sand	-	abund	own slit with scattered c ant water flowing through	but silty peat a	t 4 ft bgs	hed water zone at 4 ft bgs,
-	- 5		555.0	125.0	-				- 5					
	- 6								- 6					
╞			1635.0	238.0	-				-					
	-7-								- 7	Backfi	n of Exploration 7.0 ft lled trench in reverse orde	r of excavatior	n as clos	ely as possible.
-	- 8								- 8	Horizo	ntal survey datum: NAD83	AK Zone 9 in	U.S. feet	
╞									-					
3/3/10	- 9								9					
NC.GDT	-10								-10					
ENSR									-					
NE_CAPE-TP_USACE ISCO LOGS.GPJ_ENSR_ANC.GDT_3/3/10	-11													
ISCO LO	-12								-12					
USACE									-					
APE-TP	-13								-13	Project:				Hole Number:
NE_C/											Operations Complex A	rea Phase I IS	sco	TP13

APPENDIX D

Soil Boring Logs

			Δ			0	M		Project:	-		ns Complex Area P pe, St. Lawrence Isl			Page Date	1 of 1 2 2 Aug 2009
	- \ / I								Drilling Ag	•		Alaska District		Elevat		atum:
E	:XI		_C)RA	4 I	IO	N	LOG	Location:	Northin Easting	g:	3,403,925 1,810,739		Top of Elevati		**
	le Num : 0/W01		Field	: F	[⊃] erma <i>ICOI</i>				Driller: <i>R. Robe</i>	erson			Inspector: <i>R. Schl</i> e			
	pe of H Test F			other <u>I</u> uger Ho	-			Well 🗆 Pi	I ezometer	Depth to G		ndwater: 8 ft WD	Depth Dril 10.5 ft	led:	Т	otal Depth: 10.5 ft
	mmer \ 340 Ibs	-	ht:		Spoon 5 <i>in</i>	I.D:		ize and Type .3 in Hollow St				f Equipment: bile B-61 Auger Rig		Type of Drive		ples: l it Spoon
Depth (ft)	Lithology	Sample	Recovery (%)	Blow Count	FID (ppm)	PID (ppm)	Symbol	Classification ASTM: D 2487	7 or D 2488		Uepth (ft)	Description and	Remarks			
							GM/FILL		GRAVEL / FI	_	· 1 · 2 · 3 · 4	hard packed, trace c	obbles, mois	t from sur	face w	
- e		1	100	2 2 2 2 2 3	1450.0	260.0	ML PT	SILT PEAT		-	· 6	medium brown to ye medium brown, coar				· · · ·
3/3/10		2	100	3 4 5	140.0	28.0	GM PT OL	Silty, Sandy PEAT Organic SIL			8	medium gray and o slight sheen. dark brown, fine pea abundant organics, s	t, increasing	silt with d		dy gravel, saturated,
ANC.GDT		3	100	6 8			ML	SILT				, medium to dark gray			asticity	γ, clayey, wet.
	2			9			GM	Silty, Sandy	GRAVEL	-	-10- -11 -12 -13	Clasts 75-100mm wit Bottom of Exploratio Groundwater Encour Horizontal survey da	h sand and si on 10.5 ft ntered While itum: NAD83	ilt matrix. Drilling (W AK Zone §	/D): at 9 in U.3	fines, angular gravel depth 9.80 ft S. feet. Il log for top of PVC
NE_CAP										Project: <i>Main</i>	Oper	rations Complex Are	ea Phase I IS	500		Hole Number: ICOIW01

			1	Δ			0	M		Project:			ons Complex Area P ape, St. Lawrence Isl			Page Date	e 1 of 1 : 20 Jul 2009
		/-								Drilling Ag] Alaska District		Eleva X N	tion D MSL	atum:
E	<u>-</u> >	۲ŀ	ין	_C	R	A I	IC	N	LOG	Location:	North Eastir	ing:	3,403,903 1,810,726		Top o Eleva		**
		lumb 1 W01	er,	Field	F	Perma ICON	nent: //W01			Driller: <i>R. Robe</i>	erson			Inspector: <i>R. Schl</i> e	osser		
		of Ho st Pit					-	-	nporary) Well □ Pi	_	Depth to		indwater: .2 ft WD	Depth Dril 17.5 ft	led:	Т	otal Depth: 17.5 ft
		er W <i>Ibs</i>			Split S	Spoon 5 <i>in</i>		Si	ze and Type .3 in Hollow S	of Bit:	Т	• •	of Equipment: <i>bile B-61 Auger Rig</i>		Type o <i>Driv</i>		ples: lit Spoon
Depth (ft)	l ithology	(BOIOIDI)	oampie	Recovery (%)	Blow Count	FID (ppm)	PID (ppm)	Symbol	Classification ASTM: D 2487	7 or D 2488		Depth (ft)	Description and	Remarks			
- 2			ň	R	<u> </u>	ш	<u> </u>	SP/GM	Poorly-gradd with Cobble with Sand ar	ed Gravelly S s / Silty GRA\ nd Cobbles	AND /EL	2 2	medium to course occasional large cot	sand, mode bbles, silty in	rately co part, dry	ompact.	, gravels 20-70 mm,
-			1	100	5 2 4 5	350.0 630.0		PT	SILT PEAT			— 4 -	medium brown to o sand / roots, dry. dark brown peat, un			orm, tig	ht, occasional clay /
- 6					7 6	320.0	81.0					- 6	occasional sand				
			2	100	8 9	620.0	168.0	ML /PT	SILT with CI	ay / PEAT		-	throughout, dry.		-		in part, peat organics
			2	100	2 5	850.0	130.0					- 0	tight, occasional pea				
	,			100	4 5	200.0	37.0	ML/SM	Clayey SILT SAND with C	with Sand / S Gravel	Silty	—10	sand, occasional an	gular gravel o	lasts 5-3	0 mm, ı	
-			4	33	6 8 8 11	480.0	68.0					_	olive gray, slight pla slightly saturated to	asticity, occa moist.	sional pe	ebbles,	occasional organics,
DT 3/3/10	2		5		7 8	200.0	40.0					—12	probable capillary fr	-			
				50	9 11			GM	Silty GRAVE	L			pushed cobble or gr	avel beginnin			d pebbles and sand,
			6	100	8 6 12 10	420.0	90.0					_	wet/saturated at 13.2	? feet.			
												—16 -	Bottom of Exploratio	on 17.5 ft			
	3										Desire		Groundwater Encou Horizontal survey da	ntered While atum: NAD83	AK Zone	9 in U.	
											Project <i>Mair</i>		casing elevation. erations Complex Are				Hole Number: ICOMW01

			A		C	D	M		Project:	North East C	ons Complex Area F ape, St. Lawrence Is		1	Pag Date	
	zv	D			νΤ			LOG	Dinning Aq X Oth				X	MSL	other
	_^				~ I	IU		LUG	Location:	Northing: Easting:	3,403,946 1,810,741		Top o Eleva		**
	le Nui Comw		, Field	: 1	Perma <i>ICOI</i>	nent: //W02			Driller: <i>R. Rob</i>	erson		Inspector: <i>R. Schl</i>			
	pe of Test			other <u>I</u> uger Ho				<i>mporary)</i> ∣Well □ Pi	 ezometer	Depth to Grou	indwater: 5 ft WD	Depth Dril 9.0 ft	led:		Total Depth: 9.0 ft
	mmer 340 lb		ght:		Spoon 5 <i>in</i>	I.D:		ize and Type .3 in Hollow St			of Equipment: <i>bile B-61 Auger Rig</i>		Type o Driv		nples: plit Spoon
Depth (ft)	Lithology	Sample	Recovery (%)	Blow Count	FID (ppm)	PID (ppm)	Symbol	Classification ASTM: D 2487	7 or D 2488	Depth (ft)	Description and	Remarks			
							05				Auger to 9 ft bgs to			OMW02	2.
	1									- 1	Wet at 4 ft bgs, slop			See	ICOSB02 for lithology.
-										-			• • • • • • • • • •		
- 2	2									- 2					
	3									- 3					
-										-					
- 4	1									- 4					
-										5	-				
- 6	6									- 6					
F.															
										- 7					
- 8	3									- 8					
/3/10										-					
C GDT 3	,									9	Bottom of Explorati Groundwater Encou	intered While	Drilling (WD): a	at depth 4.50 ft
ANG ANG HSI - 1(D										Horizontal survey d ** Top of hole elev casing elevation.	atum: NAD83 ation not me	AK Zone asured;	see w	I.S. feet. ell log for top of PVC
GPJ EN										-					
										11					
	2									-12					
ING US										-					
	3									-13					
NE_CA										Project: Main Ope	erations Complex Ar	rea Phase I I	sco		Hole Number: ICOMW02

		л	_					Project:			ons Complex Area P			Page 1	of 1
		A				N				ast Ca	ape, St. Lawrence Is	land, Alaska	[Date:	28 Jul 2009
	YP			١T		N	LOG	Drilling Ag	ner Den	ali Dr	∃ Alaska District <i>illing</i>		X MS		m:] other
	_//1		/ 1/				LOU	Location:	North Eastir		3,403,928 1,810,746		Top of I Elevation		
	le Number COMW03	, Field	: F	^D erma ICON	nent: //W03			Driller: <i>R. Rob</i>	person			Inspector: <i>R. Schl</i> e	osser		
	pe of Hole Test Pit		other _/				Well 🗆 Pi	_ ezometer	Depth to		indwater: 0 ft WD	Depth Dril 10.5 ft	led:		l Depth: 0.5 ft
	mmer Wei 340 Ibs	ght:		Spoon 5 <i>in</i>	I.D:		ize and Type .3 in Hollow Si		T	• •	of Equipment: <i>bile B-61 Auger Rig</i>		Type of S Drive	Samples n Split S	
Depth (ft)	Lithology Sample	Recovery (%)	Blow Count	FID (ppm)	PID (ppm)	Symbol	Classification ASTM: D 2487	7 or D 2488		Depth (ft)	Description and	Remarks			
		100	1 2 3 2 2	490.0 2010.0 309.0	93.0 307.0	GM/FILL PT GM	Silty, Sandy		iLL	- 1 - 2 - 3 - 4 - 5 - 5 - 6	sandy silty gravel w dark brown silt, few medium dark brow hydrocarbon odor.	pebbles, occa	asional org		s, moist, strong
2 3/3/10		100	2 4 5 2 9	318.0 940.0	32.0	PT- OL	PEAT with C	rganic Silt		- 7 - 8 - 9	dark brown silty pea	it, saturated.			
LANC.GD1	<u>₩</u> ₽ , 3	100	6	40.0	5.0	GM	Silty GRAVE	L		-	medium to dark gra silt, partially frozen.	y silty gravel,	occasiona	l sand, gr	ades to light gray
	2										Bottom of Exploratio Groundwater Encou Horizontal survey da ** Top of hole elev casing elevation.	ntered While atum: NAD83	AK Zone 9	in U.S. fe	et.
									Project <i>Maii</i>		erations Complex Ar	ea Phase I IS	SC0		e Number: COMW03

		Л		~				Project:	-		ons Complex Area P ape, St. Lawrence Isl			ge 1 of 1
		A						Drilling Ag				anu, Alaska		
╎┍	- VD		רם א	۱ –		N I		I Othe		ali Dr] Alaska District <i>illing</i>		Elevation	other
	:XP	LC	JKł	\	IÜ	VIN	LOG	Location:	North Easti		3,403,929 1,810,736		Top of Ho Elevation:	
	e Numbe <i>OMW04</i>	r, Field	: F	^D erma	nent: //W04			Driller: <i>R. Rob</i> e	erson			Inspector: <i>R. Schl</i> e	osser	
	e of Hole Test Pit		other _/				y Well 🛛 Pi	ezometer	Depth to		indwater: 0 ft WD	Depth Drill 10.5 ft	ed:	Total Depth: 10.5 ft
	nmer We 340 Ibs	ight:		Spoon 5 <i>in</i>	I.D:		ize and Type .3 in Hollow St		1	• •	of Equipment: bile B-61 Auger Rig		Type of Sa Driven S	mples: plit Spoon
Depth (ft)	Lithology Sample	Recovery (%)	Blow Count	FID (ppm)	PID (ppm)	Symbol	Classification ASTM: D 2487	7 or D 2488		Depth (ft)	Description and	Remarks		
- 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 0		20	1 4 5 1 1 2 3 6 7 8	250.0	1500.0						gravel with silt and s LOST CORE: Only 0 dark brown. dark brown silty in petroleum odor.	4-ft recovered	d, cobbles in	
01 3/3/ 9	,, 		8	140.0	24.0	ML	Gravelly, Cla	ayey SILT wit	h Sand	- 9		ay silt, mode	rately dense,	frozen (ice crystals in
- - - - - - - - - - - - - - - - - - -		<u>\$</u>			2.7.0	GM	Silty GRAVE	L		- 10	matrix). Auger to 10.5 ft to se	et well.		
	<u>pM(</u>										Bottom of Exploratio Groundwater Encou Horizontal survey da ** Top of hole eleva casing elevation.	ntered While I atum: NAD83	AK Zone 9 in	at depth 6.00 ft U.S. feet. vell log for top of PVC
		1							Project <i>Mai</i>		erations Complex Ar	ea Phase I IS	SC0	Hole Number: ICOMW04

	л						Project:		-	ons Complex Area P			ge 1 of 1
	A									ape, St. Lawrence Isl	and, Alaska		
			-		NI		Drilling A		□ nali Dr	∃ Alaska District <i>illing</i>		Elevation	Datum:
	2C	JRP	\ 	IO	'IN I	LOG	Location:	Nort East		3,403,921 1,810,742		Top of Ho Elevation:	
Hole Numb		: P	ermar ICON	nent: //W05			Driller: <i>R. Rol</i>	berson			Inspector: <i>R. Schl</i> e		
Type of Ho		other <u>M</u> uger Ho				Well 🗆 Pi	ezometer	Depth to		indwater: 0 ft WD	Depth Drill 9.0 ft	led:	Total Depth: 9.0 ft
Hammer W 340 lbs		Split S	poon		Si	ze and Type .3 in Hollow S			•••	of Equipment: bile B-61 Auger Rig		Type of Sa Driven S	mples: Split Spoon
Lithology	campre Recovery (%)	Blow Count	FID (ppm)	PID (ppm)	Symbol	Classification ASTM: D 2487	7 or D 2488		Depth (ft)	Description and	Remarks		
$ \begin{array}{c} - & 1 \\ - & 2 \\ - & 2 \\ - & 3 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 4 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 \\ - & 5 $	1 100 2 100	2 2 2 2 2 2 2 3	590.0 820.0	240.0		Silty GRAVE	EL			petroleum odor.	, moist, sligh own, stiff, fin	t petroleum o e peat, grade	es to silt, moist, strong
		4	68.0	10.0	ML	Gravelly, Cla	ayey SILT w	ith Sand	ļ	medium gray silt, oc	-	, dense, dry t	o slightly moist.
NE_CAPE_BORING_USACE ISCO LOGS.GPJ_ENSR_ANC.GDT_3/3/10 10 11 12 12 12 12 12 12 12 12 12									9 	Auger to 9 ft to set v Bottom of Exploratio Groundwater Encou Horizontal survey da ** Top of hole eleva casing elevation.	on 9.0 ft ntered While atum: NAD83	AK Zone 9 in	at depth 7.00 ft U.S. feet. well log for top of PVC
CAPE						I		Projec		erations Complex Ar	aa Phaca I II	SC0	Hole Number: ICOMW05
ž								IVIA		auons complex Al	ea F 11838 I R		

		Δ		7	0	М		Project:			ons Complex Area P ape, St. Lawrence Isl			Page 1 of 1 Date: 30 Ju	ıl 2009
								Drilling Ag	•		Alaska District		Elevat	ion Datum:	
E	XP	LC)R/	٩T	IO	N I	_OG	Location:	Northi Eastin	ng:	3,403,938 1,810,741		Top of Elevat	Hole	
	e Number <i>OMW06</i>	, Field	: f	^p erma <i>ICOI</i>	nent: //W06			Driller: <i>R. Rob</i> e	erson			Inspector: <i>R. Schl</i>			
	e of Hole: Test Pit					Vell onitoring	Well 🗆 Pi	ezometer	Depth to (indwater: 0 ft WD	Depth Dril 9.5 ft	lled:	Total Dep 9.5 ft	th:
	nmer Weig 3 40 Ibs	ght:		Spoon 5 <i>in</i>	I.D:		ze and Type 3 in Hollow St		T		of Equipment: <i>bile B-61 Auger Rig</i>	1		f Samples: en Split Spoon	
Depth (ft)	Lithology Sample	Recovery (%)	Blow Count	FID (ppm)	PID (ppm)	Symbol	Classification ASTM: D 2487	7 or D 2488		Depth (ft)	Description and	Remarks			
- - 1 - 2 - 3 - 3						GM GM	Silty GRAVE			- 1 - 2 - 3	silty gravel with occ saturated from surfa				
- 4 - 5 -		100	2 2 1 2	145.0 630.0		. PT	PEAT			- 4 - 5	_ medium to dark brow	wn, very silty	, moist to	damp, strong die	esel odor.
- 6 -	$\frac{1}{\sqrt{2}} \frac{\sqrt{2}}{\sqrt{2}}$		2 3	116.0	35.0					- 6	increasing silt with o	depth, satura	ted.		
- 7	<u></u>	100	3			PT	PEAT			- 7	moist				
.GDT 3/3/10 6 8	<u>~</u> \$	100	2 2 5			ML /SM	SILT with Cl	ay / Silty SAN	ID -	- 8 - 9	medium to dark gray	/ clayey silt,	partially fr	ozen, diesel odor	r.
NE_CAPE_BORING_USACE ISCO LOGS.GPU ENSR_ANC.GDT 3/3/10 E1											Bottom of Exploratio Groundwater Encou Horizontal survey da ** Top of hole eleva casing elevation.	ntered While atum: NAD83	AK Zone	9 in U.S. feet. ee well log for f	top of PVC
									Project: <i>Main</i>	Оре	erations Complex Ar	ea Phase I I	sco	Hole Num ICOM	

				Л	=					Project:	-		ons Complex Area P			ge 1 of 1
				A									ape, St. Lawrence Isl	allu, Alaska		te: 30 Jul 2009
_	- 、					\				Drilling Ag	•	nali Dı	∃ Alaska District <i>illing</i>		Elevation	
E	-/	X	ΡI)KA	\	IÜ	N	LOG	Location:	North Easti		3,403,938 1,810,733		Top of Ho Elevation	
	e N ON			Field	: F	^D erma ICON	nent: //W07			Driller: <i>R. Robe</i>	erson			Inspector: <i>R. Schl</i>		
			Hole: Pit		other _/ uger Ho				g Well 🛛 Pi	ezometer	Depth to		indwater: 0 ft AD	Depth Dril 10.0 ft	led:	Total Depth: 10.0 ft
	mm 340		Weią s	ght:		Spoon 5 <i>in</i>	I.D:		Size and Type of 8.3 in Hollow St		-	• •	of Equipment: <i>bile B-61 Auger Rig</i>		Type of Sa Driven	imples: Split Spoon
Depth (ft)		Litnology	Sample	Recovery (%)	Blow Count	FID (ppm)	PID (ppm)	Symbol	Classification ASTM: D 2487	7 or D 2488		Depth (ft)	Description and	Remarks		
- - 1 - 2				4	1			GM/FIL	L Silty GRAVE	L with Sand /	/ FILL	- - 1 - 2	silty gravel, gravel c	lasts 10-75mr	n with sand a	nd silt matrix.
- - 3 - 4	. <u>``</u>		1	100	2 5 4 6			ML PT	Clayey SILT Cobbles PEAT	with Gravel a	and	- - - 4	medium gray clayey medium to dark br pebbles, ice crystals	own, coarse	to fine grain	n sand, silt, occasional oleum odor.
- 5	<u>\</u>	<u>\\</u>			6 5							- - 5	increasing silt with o	depth, frozen		
- 6	<u>'</u>	<u>\</u>	2	100	5 7	650.0	50.0					- - 6	interbedded peat an	d silt		
- 7	<u>, 1/2</u>	<u>\\</u>	3	50	2 3	1150.0	229.0					- - 7	frozen to 7.5 ft			
- 8	<u>''</u>	<u>1</u> /2			1 1 2	240.0	114.0					- 8 -	wet to saturated			
9/3/ 9/3/	· <u>/</u> _	<u>, v</u>	4	100	1			ML	Gravelly, Cla	yey SILT wit	h Sand	+ 9	medium to dark gray	, occasional	gravel 25-75r	nm.
					3							- - - - - - - - - - - - - - - - - - -	Bottom of Exploratio Groundwater Encou Horizontal survey da ** Top of hole eleva casing elevation.	ntered After E atum: NAD83	AK Zone 9 in	U.S. feet. well log for top of PVC
											Projec <i>Mai</i>		erations Complex Ar	ea Phase I IS	SCO	Hole Number: ICOMW07

			Δ		~		лл		Project:			ons Complex Area P ape, St. Lawrence Isl		1 4	ge 1 of 1 te: 31 Jul 2009
		4						24 - 1	Drilling Ag	ency:] Alaska District		Elevation	Datum:
E	EX	Pl	_C	RA	٩T	10	N	LOG	Location:	North	•	3,403,930		Top of Ho Elevation:	
	e Num		Field:	: 1	Perma				Driller:	Easti	ıg.	1,810,729	Inspector:		
	омwo be of ⊢	-	X	other _I		NW08 ring V			R. Robe		Grou	ndwater:	<i>R. Schl</i> e Depth Drill		Total Depth:
	Test F			uger Ho	ole [Spoon			Well 🗌 Pi	ezometer	T		5 ft WD	10.0 ft	Type of Sa	10.0 ft mples:
	340 lbs	-			5 in			.3 in Hollow St			• •	bile B-61 Auger Rig		• •	plit Spoon
Depth (ft)	Lithology	Sample	Recovery (%)	Blow Count	FID (ppm)	PID (ppm)	Symbol	Classification ASTM: D 2487	7 or D 2488		Depth (ft)	Description and	Remarks		
- - 1 - 2 - 3 - 3 - 4		1	100	2 4 5 4 7 6	1050.0		GM/FILI ML PT		GRAVEL / FI		- 1 - 2 - 3 - 4 - 5 - 5 - 6	3.0 ft bgs. medium to dark grap plasticity, strong pei dark brown to dark very coarse stems, s	y silt, some o roleum odor. yellow brown ilty, cold, mo	rganics, trace I peat, coarse ist.	tes material is "soft" at sand and pebbles, low soft, organics include
- - 7 - 8		2	100	5 7 3 3							- - 7 - 8	trace sand, increasin			
GDT 3/3/10		3	100	3 5	48.0	10.0	ML	Gravelly, Cla	ayey SILT with	h Sand	- 9		yellow brown	n oxide lense	dense, low to medium s and very thin lenses en.
UC ANC											- 10	Auger to 10 ft to set			
											- 	Bottom of Exploratio Groundwater Encou Horizontal survey da ** Top of hole eleva casing elevation.	ntered While	AK Zone 9 in	U.S. feet. well log for top of PVC
NE_CA										Project <i>Maii</i>		rations Complex Are	ea Phase I IS	SC0	Hole Number: ICOMW08

				Δ		C	0	Μ		Project:			ons Complex Area P ape, St. Lawrence Isl			Page Date:	
		-								Drilling Ag		ali Dr] Alaska District		Eleva X N	tion Da MSL	atum:
	E	X	P	LC)R/	Α Τ	IC	N	LOG	Location:	North Eastir	ing:	3,403,919 1,810,731		Top o Eleva	f Hole	**
	le N COM			, Field:	: 1	^D erma	nent: //W09			Driller: <i>R. Robe</i>	erson	<u> </u>		Inspector: <i>R. Schl</i>			
			Hole: Pit		other _/		-		ı Well 🗆 Pi		Depth to		ndwater: 5 ft WD	Depth Dril 12.5 ft	led:	Т	otal Depth: 12.5 ft
На		er	Wei		Split	Spoon 5 in		S	ize and Type .3 in Hollow Si	of Bit:	T	•••	of Equipment: bile B-61 Auger Rig		Type o Driv		oles: <i>it Spoon</i>
Depth (ft)	ithology	LILLIOUOGY	Sample	Recovery (%)	Blow Count	FID (ppm)	PID (ppm)	Symbol	Classification ASTM: D 2487	7 or D 2488		Depth (ft)	Description and	Remarks			
			<u>N</u>	<u> </u>	<u> </u>			GM/FILI	Silty, Sandy	GRAVEL / FI	LL	- - 1 - 2	medium to dark brov	wn.			
			1	100	2 4 5			ML		ayey SILT wit	h Sand	- 3 - 4	cold, dry.		-		organics, little sand,
-	+ <u>\</u>	<u>.</u>			4 5	-		PT/ML PT	PEAT / SILT PEAT			-	lenses of silt (as des medium to dark yell	cribed above	e).		lant fragments, thin ents.
! -	5 ½ <u>×</u>		2	100	4 4							— 5 -					
-	5 <u>†</u>	<u>\</u>			5	1300.0	180.0					— 6 -	fine grained peat, t stems, moist, strong			les, sca	attered large organic
- :		<u>, , ,</u>	3	100	3 6	450.0	60.0					— 7 -					
	3				8 7			ML	SILT			- 8	medium to dark gray organics, dry, slight			city, wa	xy surface, scattered
ANC.GDT 3			4	50	7 7	82.0	12.0					— 9 	<u>_</u>				
HSNE LISP) 				6 2	-		ML	SILT with Sa	and and Grave	el	—10 -	clayey silt with san graded sand, trace y				, fine grained poorly t 11 ft bgs
			5	0	22 15			GM	Silty GRAVE	L		—11 - —12	No recovery				
	3											- 13	Bottom of Exploratic Groundwater Encou Horizontal survey da ** Top of hole eleva	ntered While atum: NAD83	AK Zone	9 in U.S	
NE_CA											Project <i>Maii</i>		casing elevation. rations Complex Are				Holĕ Number: ICOMW09

				Δ		C (2	M		Project:			ns Complex Area Pl pe, St. Lawrence Isl		-	Page Date	
										Drilling Ag	•		Alaska District		Elevat	ion D	
	E	Х	P	LC)R/	٩T	10	N	LOG	Location:	Northing:		3,403,914 1,810,761		Top of Elevat	Hole)
	ole ICO			, Field	:	Permai <i>ICOS</i>				Driller: <i>R. Rob</i> e			.,	Inspector: <i>R. Schl</i>			
Г	уре	e of	Hole t Pit		other uger He			nitoring			Depth to Gro		ndwater: 5 ft WD	Depth Dril 14.0 ft		-	Total Depth: 14.0 ft
	am		r Wei		Split	Spoon 5 <i>in</i>		S	ize and Type	of Bit:	Туре	e o	f Equipment: ile B-61 Auger Rig	140 1	Type of Drive		
(#) - 11 C		Lithology		Recovery (%)	Blow Count	FID (ppm)	PID (ppm)	Symbol	Classification ASTM: D 2487	7 or D 2488	Depth (ft)		Description and F	Surface Co and cobble	ondition: [es	Distur	bed soil with gravel
	1 2 3		****					gm/fill	Silty GRAVE	L / FILL	-	1 2 3	dark yellow brown (75% gravel, trace sa	10YR 3/3 - 3/ nd, 25% fines	4) silty g	ravel,	very tight and dense,
	<u>,</u>			100	2 3	6200.0 5400.0		PT	PEAT		_	4 – 5 6	dark brown silty pea	t, soft, strong	ı odor froi	m 5-7	ft bgs.
-	- /	<u> </u>			2 3	7500.0	42.0		=====		====		light gray silt layer fr	rom 6.2-6.4 ft	bgs.		/
-			2	100	3 4	650.0	29.0	CL	Silty CLAY		_		dark yellow brown t odor. Sharp contact			part,	soft, uniform, strong
-	8		3	100	2 5	4230.0	41.0	CL/ML	SILT / lean C	LAY		8	light gray silty clay plasticity, moderatel			in pa	rt, slight to moderate
-	g				5 3	750.0	37.0				-	9	protiony, moderater	y oon, union			
GDT 3/3/1	10-		4	100	4 5	4260.0	58.0	ML	Clayey SILT	with Sand	1	0-	light gray to medium	gray clayey	silt, froze	n, san	dy in part.
ENSR_ANC	11-		5	100	3 6	14.5	2.5	ML	Clayey SILT	with Sand		1-					occasional yellowish saturated, strong odor
OGS.GPJ E	12				5 6	3700.0	24.0				-1						
	13		б	100	4	5600.0	21 0			-	1	3 ¥		1			
NE_CAPE_BORING_USACE ISCO LOGS.GPJ_ENSR_ANC.GDT_3/3/10	14 14	IX	o o		9		21.0	ML	Gravelly SIL	1		4-	gravelly silt, gravel c Bottom of Exploratio Groundwater Encour Hole backfilled with Horizontal survey da bgs = below ground	on 14.0 ft ntered While medium bent tum: NAD83	Drilling (V onite chip	VD): a os to 1	ft bgs.
NE_CAPE			1			1	!	1			Project: <i>Main O</i>	per	ations Complex Are		sco		Hole Number: ICOSB01

			٨		~		~		Project:	-		ons Complex Area P ape, St. Lawrence Is				1 of 1
									Drilling Ag	jency:		Alaska District			Date: tion Da	
E	EX	P	LC)R/	٩T	IO	N	LOG	Location:	North Easti	ing:	3,403,949 1,810,741		Top of Elevat	f Hole	67.0 ft
	e Nu OSB		Field	: f	Permai				Driller: <i>R. Rob</i> e	erson			Inspector: <i>R. Schl</i> e	osser		
1			□ X A	other uger Ho	ole [] Mo	nitoring	g Well 🛛 Pi	ezometer	Depth to	Grou	indwater: <i>WD</i>	Depth Drill 10.0 ft	ed:	T	otal Depth: 10.0 ft
	nmei 340 Ik	· Weią os	ght:		Spoon 5 <i>in</i>	I.D:		ize and Type .3 in Hollow Si		٦	• •	of Equipment: <i>bile B-61 Auger Rig</i>		Type o Driv		bles: i t Spoon
Depth (ft)	Lithology	Sample	Recovery (%)	Blow Count	FID (ppm)	PID (ppm)	Symbol	Classification ASTM: D 2487	7 or D 2488		Depth (ft)	Description and	Remarks Surface Co	ndition:	Bare so	11
- 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8			100	1 1 2 1 5 5	2600.0 -2400.0 4750.0	140.0	GM/ML 	PEAT with S	E / Gravelly S	SILT	- 1 - 2 - 3 - 3 - 4 - 5 - 6 - 7 - 7 - 8	water at 4 ft bgs. dark brown peat, sil	vel (Native? F ty in part, san aded sand (Si	ill?) as a dy in par 2) at 5.5 f	t, soft, s t bgs a	trong odor, perched some odor. nd then grades back
ANC.GDT 3/3/10		4	100	1	3800.0	29.0	ML/PT	SILT / PEAT			- - 9 -	dark brown silt and hole when extracted		sheen or	ı sampl	e, saturated from up
		<u>paddili</u>										Bottom of Explorati Groundwater Encou Hole backfilled with Horizontal survey da bgs = below ground	ntered While bentonite chi atum: NAD83	ps to 1 ft	bgs.	5. feet.
										Project <i>Mai</i>		erations Complex Ar	ea Phase I IS	600	ŀ	Hole Number: ICOSB02

			A		C	D	M		Project:	North	East Ca	ons Complex Area F ape, St. Lawrence Is		1	Page Date	e: 19 Jul 2009
╎┍	$\overline{\mathbf{v}}$	וח	\sim	חי	۸T				Drilling A		enali Dr] Alaska District <i>illing</i>			ation L MSL	Datum:
	-^	ΓI	_C)T(/	1	IU	ואוי	LOG	Location		thing: sting:	3,403,948 1,810,737			of Hole ation:	
	e Nur OSBO		Field	: 1	Perma ICOS				Driller: <i>R. Rol</i>	berson			Inspector: <i>R. Schl</i>			
1	be of Test			other _	nle r		nitoring		_ ezometer	Depth	to Grou	indwater: NE	Depth Dril 11.0 ft	lled:	-	Total Depth: 11.0 ft
Har	nmer 340 Ib	Weig		Split	Spoon 5 in		Si	ze and Type	of Bit:			of Equipment: bile B-61 Auger Rig		Type o Driv		
Depth (ft)	Lithology	Sample	Recovery (%)	Blow Count	FID (ppm)	PID (ppm)	Symbol	Classification ASTM: D 2487	-		Depth (ft)	Description and				·
		S	~	8			ഗ GM/FILL	Silty GRAVE	L / FILL			auger to 5 ft, drill th	rough gravell	y silt fill.		
- 1 - 2 - 3 - 4 - 5 - 6 - 7				3	1305.0	258.0	OL	Organic SIL	T			very dark brown or odor.	ganic silt, slig	ght to m	oderate	e platicity, soft, strong
8		1	100	3 3 2	520.0	130.0	ML	Clayey SILT Cobbles	with Gravel	l and	- 8	ice crystals, no odo 7-9 ft split spoon: d	r. Irive spoon, d	riller rep	orts ha	ally frozen with visible ad to push 1.3 ft to get ean and run to bottom
				2			ML	Gravelly Sar	ndy SILT		9	medium gray sandy	gravelly silt,	saturate	d, froze	en.
S.GPJ ENSR_AN		2	50	2 2 2	375.0	150.0					—10 -					
NE_CAPE_BORING_USACE ISCO LOGS.GPJ ENSR_ANC.GDT 3/3/10												Bottom of Explorati Groundwater Not Er Plug entire boring v Horizontal survey d bgs = below ground	ncounted (NE) vith medium b atum: NAD83	entonite	e chips e 9 in U	to 1 ft bgs. .S. feet.
										Proje <i>M</i>		rations Complex Ai	rea Phase I I	sco		Hole Number: ICOSB03

				Δ		C (0	M		Project:			ons Complex Area Pl ppe, St. Lawrence Isl		.	Page Date:	
		.								Drilling Ag		ali Dr] Alaska District		Elevati	ion Da	
E	Ξ>	KF	ין	_C)R/	٩T	IO	N	LOG	Location:	North Eastir	ing:	3,403,901 1,810,732		Top of Elevati	Hole	70.0 ft
		lumb B04	er,	Field:	F	Perma ICOS				Driller: <i>R. Robe</i>		-		Inspector: <i>R. Schl</i>			
1		of Ho st Pit			other uger Ho	ole 🗆] Mo	onitoring	Well 🖂 Pi	I ezometer	Depth to		ndwater: 7 ft WD	Depth Dril 14.5 ft	led:	Т	otal Depth: 14.5 ft
		er W <i>Ibs</i>	'eigl	nt:		Spoon 5 <i>in</i>	I.D:		ize and Type .3 in Hollow St		Т	• •	of Equipment: bile B-61 Auger Rig		Type of Drive		oles: <i>it Spoon</i>
Depth (ft)			oampie	Recovery (%)	Blow Count	FID (ppm)	PID (ppm)	Symbol	Classification ASTM: D 2487	7 or D 2488		Depth (ft)	Description and I	Remarks			
-	GM/FILL Silty FILL									L with Cobbl	es /	_	auger to 4 ft throug sand, 30% fines, low	gh silty grave plasticity, m	el with co oderate m	bbles oisture	(fill), 65% gravel, 5% e.
- 2	/ FILL							SP/FILL		led SAND with Gravel 2 hit poorly graded sand and gr west, 5% gravel, 90% sand, 5%					el from pip nes, slight	line tro moist	ench, running east to ure.
_ 2	4 1050.0 240.0							Clayey SILT			- 4		10% gravel, t	race sand		sionally sandy, some fines, low to medium	
-	1 100 5 PT PEAT ½ 5 530.0 200.0					PEAT			brown peat,	trace sa		10% fines, uniform, odor.					
			2	50	8 15 12 4	2150.0	850.0	ML	Gravelly SIL	T		- 6	dark yellow brown strong odor, pushed LOST: no recovery, a	cobble dowr	n at 6.5 ft b	ogs.	t, 10-40 mm gravels,
- E	3		3	0	1 5 6 7	_		SP	Poorly-grade	ed SAND		- 8	poorly gradded sand	I, damp at 10	ft during a	augerin	ng, no recovery.
-10 			4	100	6 6 5 6	810.0	370.0	ML ML/ML	SILT Gravelly SIL	T / Clayey SII	LT	- 10		um gray silty avel, trace sa	gravel to and, 90% f		lly silt and clayey silt partially frozen, soft,
			5	100	8 18 21	610.0	150.0		0 11 01			- 12	<u></u>				(
					18			CL	Gravelly, Sil	ty CLAY with	Sand	-14	dark gray gravelly s 70% fines, medium p Bottom of Exploratio	plasticity, stiff			6 gravel, trace sand, nse, wet.
	6											- 16	Groundwater Encourd Water in auger at 9.2 Plug entire boring w Horizontal survey da bgs = below ground	ntered While 25 ft bgs after ith medium b atum: NAD83	penetration entonite c	on of g hips to	ravel at 13.7 ft bgs. o 1 ft bgs.
								·	1		Project <i>Mair</i>		rations Complex Are	ea Phase I IS	sco		Hole Number: ICOSB04

APPENDIX E

Well Completion Logs

Bio Non 6122505		-			Project:	Main	Operations Comp	lex Area P	hase I ISCO		Page	e 1 of 1
MONITORING WELLLOG Dilling Agency: Alaska District Elevation Datum: Northing: 3.483.25 ft Top of Hole Hole Number, Field: Permanent: COWN R. Roberson // Collection R. Roberson R. Sobasser Type of Hole Dillie: R. Roberson R. Sobasser // Collection Bother Inglection Will Depth to Groundwater Depth Tollection // Test Pht SD Ager Hole Monitoing Well Perzometer 9.80 ft WD // Test Pht SD Ager Hole Monitoing Well Perzometer 9.80 ft WD // Test Pht SD Ager Hole Monitoing Well Perzometer 9.80 ft WD // Test Pht SD Ager Hole Monitoing Well Perzometer 9.80 ft WD // Test Pht SD Ager Hole Monitoing Well Perzometer 9.80 ft WD // Test Pht SD Ager Hole Monitoing Well Perzometer 9.00 ft Coccessing Elevation: 65.572 // Test Pht SD Ager Hole Native Material Note: 9.00 ft Coccessing Elevation: 65.572 // Test Pht SD Ager Hole SD Ager Hole 9.00 ft Coccessing Elevation: 65.572 // Test Pht SD Ager Hole SD Ager Hole 9.00 ft Coccessing Elevation: 65.572 // Test Pht		Α	ECO	Μ		North	East Cape, St. La	wrence Isl	and, Alaska	۱	Date	e: 2 Aug 2009
Control Easting: 1,840.739 ft Elevation: ** Hole Number, Field: Permanent: (COWOI Driller: Imspector: R. Robarson R. Schlossar Type of Hole: K3 other Injection Well Depth to Groundwater: R. Schlossar Depth Dillect: 10.5 ft Total Depth: 10.5 ft Test Prit K3 Auger Hole: Monitoring Well Perzometer A 00 WO Depth to Hole: Total Depth: 10.5 ft Hammer Velgati 340 lbs Split Spoon D: Size and Type of Sit: 3.3 in Hollow Stem Auger Type of Caument Mobile B-61 Auger Hig Type of Samples: Driven Split Spoon Image: Split Spoon NoTE: 1.1 To D Of December Hight To D of December Hight To D of December Hight Image: Split Spoon Image: Split Spoon NoTE: 1.1 To D of December Hight NoTE: 1.1 To D of December Hight Image: Split Spoon Image: Split Spoon NoTE: 1.1 To D of December Hight NoTE: 1.1 To D of December Hight Image: Split Spoon Image: Split S					-			District				
ICOMV01 ICOMV01 R. Roberson R. Schlosser Type of Hole: IX other Injection Well Depth Office: Depth Dified: Total Depth: 11: Tast PH: 30 Auger Hole Split Spoon ID: Size and Type of Bit: Type of Equipment: Type of Samples: 30 Ibs Split Spoon ID: Size and Type of Bit: Type of Casing Elevation: Driven Split Spoon 30 Ibs Split Spoon ID: Size and Type of Bit: Type of PCC Casing Elevation: Driven Split Spoon 10: Top of PCC Casing Elevation: 0.05372 Hummourt (8" dia, Christy box Native Material 11: Top of PCC Casing Elevation: 0.05372 Hummourt with Greenet agern Better Stresses to pol PVC 11: Top of PCC Casing Elevation: 0.05372 Hummourt with Greenet agern Better Stresses to pol PVC 12: SumMARTY OF MATERIALS USEID Summary of Matterial Statistice Steel Type Stee Floar casing Statistice Steel Type Stee Floar casing 12: Statistic Steel Type Stee Floar casing Statistice Steel Type Stee Floar casing Statistice Steel Type Stee Floar casing 12: Statistic Steel Type Stee Floar casing Statistice Steel Type Stee Floar casing Statistice Steel Type Stee Floar casing 12: Statistic Steel Type Stee Floar casing Statistice Steel Type Stee Floar casing Statistice Steel Type Stee Floar casing 12: Statistexteel Type Ste		MONITC	RING W	ELL LOG	Location							
Test Pit 280 Auger Hole Montoring Well Plezometer 9.80 ft WO 10.5 ft 10.5 ft Hammer Weight Split Spoon I.D: Size and Type of Bit: Type of Equipment: Type of Samples: 340 Ibs 2.5 in 8.3 in Holow Stem Auger Mobile B-61 Auger Rig Type of Samples: 1 Top of PVC Casing Elevator: 60.5372* 9 metal flushmourt (8° dia, Christy box) NCTE: 1 Top of PVC Casing Elevator: 60.5372* 9 Native Material SumMARTY OF MATERIALS USED 9 SumMARTY OF MATERIALS USED 9 SumMARTY OF MATERIALS USED 9 Statistics Stati Type 304, 2-in 9 Statistics						berson						
340 lbs 2.5 in 8.3 in Hollow Stem Auger Mobile B-61 Auger Rig Driven Split Spoon Note: In the split spoon Intermount (8" dia, Christy box) Image: Split spoon Note: Image: Split spoon Image: Split split spoon Note: Image: Split spli					iezometer					led:	1	•
Image: State	F	-				1						
Pilasimour value commensues; see top of PVC casing elevation. Bit C - Below Top of Inter Casing SUMMARY OF MATERIALS USED Stanless Steel Type 304.01 in storwer was screet Stanless Steel Type 304.21 in dameter, flushthread Bottom of Exploration 10.5 fl Groundwater Encountered While Dnilling (WD): at depth 3.9 01 ton 822005				I				NOTE:				
Image: Static					metal flushr	mount (8"	dia, Christy box)	Flushmo ** Top of casing el	unt with cem hole elevatio evation.	ent aproi	n. easure	
Submitter Submi					Native Mate	srial						
vater Stainless Steel Type 304, 2-in diameter, flushthread 30/70 Silica Sand 5 6 6 7 7 8 8 9 10/20 Silica Sand 10/20 Silica Sand Stainless Steel Type 304, 2" ID 10-slot screen Bottom of Exploration 10.5 ft Groundwater Encountered While Drilling (WD): at depth 9.80 tron 8/2/2009 Project: Hole Number:	-	1	e (Vo					5 feet - 2-i 5 feet - 2-i	n stainless ste n stainless ste	el Type 3 el Type 3	04 riser 04 0.01	-in slot wire wrap screen
diameter, flushthread 4 5 6 6 7 7 7 10/20 Silica Sand 5 stainless Steel Type 304, 2" ID 10-slot screen 8 9 9 10 Bottom of Exploration 10.5 ft Groundwater Encountered While Drilling (WD): at depth 9 slot to 8/2/2009 Note: Project: Hole Number:		2				pe II cem	ent with 6 gallons					
- - 5 - - 6 - - 7 - - 10/20 Silica Sand Stainless Steel Type 304, 2" ID 10-slot screen - 8 - - - 10 - - - 8 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -		3			Stainless St diameter, fli	teel Type ushthread	304, 2-in d					
10/20 Silica Sand Stainless Steel Type 304, 2" ID 10-slot screen Bottom of Exploration 10.5 ft Groundwater Encountered While Drilling (WD): at depth 9.80 ft on 8/2/2009		4			30/70 Silica	Sand						
10/20 Silica Sand Stainless Steel Type 304, 2" ID 10-slot screen 10/20 Silica Sand Stainless Steel Type 304, 2" ID 10-slot screen Bottom of Exploration 10.5 ft Groundwater Encountered While Drilling (WD): at depth 9.80 ft on 8/2/2009 Hole Number:	_	5										
Bio Non 6122505	01/2	6										
Bio Non 6122505	1 3/2	7			10/20 Silica	Sand						
Bio Non 6122505		8		<u></u> ; 	Stainless St		304, 2" ID 10-slot					
Bio Non 6122505		9										
Bio Non 6122505		10										
		11	<u>1. (7. 10. 6</u>		Bottom Cap)		Groundwa	ter Encounte	10.5 ft ered Whi	le Drill	ling (WD): at depth
								omplex Are	ea Phase I IS	sco		

AECOM	Project: Main Operations Complex Area Phase I ISCO Page 1 of 1 North East Cape, St. Lawrence Island, Alaska Date: 20 Ju					
	Drilling Agency	: 🗌 Alaska Denali Drilling	District		Elevation	n Datum:
MONITORING WELL LOG	Location: N	orthing: 3,403,903 asting: 1,810,726			Top of Ho Elevation	ole
Hole Number, Field: Permanent: ICOMW01 ICOMW01	Driller: <i>R. Roberson</i>		In	nspector: <i>R. Schlos</i>	sser	
Type of Hole: X other Monitoring Well (Temporary) Image: Test Pit XX Auger Hole Image: Monitoring Well Pit	Depti iezometer	n to Groundwater: 13.20 ft WD	D	epth Drille 17.5 ft	ed:	Total Depth: 17.5 ft
Hammer Weight:Split Spoon I.D:Size and Type340 lbs2.5 in8.3 in Hollow S		Type of Equipm Mobile B-61		Т	Type of Sa Driven	amples: Split Spoon
		•	NOTE:	·		
	No protective casin	g (temporary well)	1) Top of P\ Temporary \ ** Top of ho casing eleva BTIC - Belo	well; No sur ble elevation ation.	face comp i not measi	oletion ured; see top of PVC
ال ا						
			SUMMARY 12 feet - 2-inc			
	Native Material		5 feet - 2-inch 3 cubic feet - 4 cubic feet -	10/20 Sand F	Filter Pack N	
	SCH 40 PVC 2" ID 3/8" Bentonite Chip					
		~				
	10/20 Silica Sand					
	SCH 40 PVC 2" ID	6 Slot Screen				
	Native Material					
	Bottom Cap		Bottom of Ex Groundwater 13.20 ft on 7/	r Encountere	7.5 ft ed While D	Drilling (WD): at depth
L CAPE		ject: Main Operations C	omplex Area	Phase I ISC	0	Hole Number: ICOMW01

AECOM		Operations Comp East Cape, St. La			Page 1 of 1 Date: 21 Jul 2009
ALCOM	Drilling Agency:	□ Alaska		Eleva	ition Datum:
MONITORING WELL LOG	No	enali Drilling rthing: 3,403,946	ft	Top o	MSL ighthary other f Hole
	Location: Eas	sting: 1,810,741	ft	Eleva	tion: **
Hole Number, Field:Permanent:ICOMW02ICOMW02	Driller: <i>R. Roberson</i>			pector: R. Schlosser	
Type of Hole: X other Monitoring Well (Temporary) Test Pit X Auger Hole Monitoring Well P	Depth iezometer	to Groundwater: 4.50 ft WD		pth Drilled: 9.0 ft	Total Depth: 9.0 ft
Hammer Weight:Split Spoon I.D:Size and Type340 lbs2.5 in8.3 in Hollow S		Type of Equipm Mobile B-61			of Samples: /en Split Spoon
	.	<i>4</i> III	NOTE:		
	No protective casing	(temporary well)	Temporary we ** Top of hole casing elevation		ompletion easured; see top of PVC
	Native Material		4.5 feet - 2-inch	OF MATERIALS	er Casing
			Slots and 10/20 5 cubic feet - 10) Silica Sand 0/20 Sand Filter Pa	
	3/8" Bentonite Chips		2 cubic feet - 3/8	'8-inch Bentonite C	hips
	SCH 40 PVC 2" ID V	VELL RISER			
- 4					
	10/20 Silica Sand				
<u>"</u> - 7 (영양)=[영양]	SCH 40 PVC 2" ID 6	Slot Screen			
	Bottom Cap		Bottom of Explo	oration 9.0 ft	
			Groundwater Ei 4.50 ft on 7/21/2	Incountered Whi	ile Drilling (WD): at depth
	Proje M	ect: Iain Operations C e	omplex Area Ph	hase I ISCO	Hole Number: ICOMW02

		-	Project: Main Operations Complex Area Phas						Page 1 of 1
	ΞϹΟΛ	1			East Cape, St. La	wrence Isl	and, Alaska	1	Date: 28 Jul 2009
			Drilling A		☐ Alaska enali Drilling	District		Eleva X N	tion Datum: ISL □ other
MONITO	RING WEL	L LOG	Location		thing: 3,403,928 sting: 1,810,746			Top of Elevat	
Hole Number, Field: ICOMW03	Permanent: ICOMW03		Driller: <i>R. Rol</i>	berson			Inspector: <i>R. Schl</i>		
Type of Hole: X oth ☐ Test Pit X Aug	her <u>Monitoring Well</u> jer Hole	ring Well 🛛 Pi	 ezometer	Depth	to Groundwater: 6.00 ft WD		Depth Dril 10.5 ft	led:	Total Depth: 10.5 ft
Hammer Weight: 340 Ibs	Split Spoon I.D: 2.5 in	Size and Type		1	Type of Equipm Mobile B-61			• •	f Samples: en Split Spoon
			-			NOTE:			
		r	metal flushr	nount (8"	dia, Christy box)	Flushmo ** Top of casing el		ent aproi on not me	n. easured; see top of PVC
Depth (ft)									
-			Native Mate	erial					
- 1						5 feet - 2-i	in SCH 40 PV(in SCH 40 PV(et - 10/20 San	C 0.006-in	slot screen
- 2			Neat Cemer	nt (1.5 ba	gs)				
-		/s	SCH 40 PV	C 2" ID V	/ell Riser				
- 3 -									
- 4		200 	30/70 Silica	Sand					
- 5									
-									
- 6 2-		문화 국가 전자 국왕							
8			10/20 Silica SCH 40 PV		-slot screen				
9 00 01 01									
		<u></u>	Bottom Cap			Bottom of Groundwa 6.00 ft on	Exploration ter Encounte 7/28/2009	10.5 ft ered Whi	e Drilling (WD): at depth
				Proje <i>M</i>	ect: ain Operations C			sco	Hole Number: ICOMW03
Z									100111100

Bottom of Exploration 10.5 ft Groundwater Encountered While Drilling (WD): at depth 6.00 ft on 7/28/2009 Bottom of Exploration 10.5 ft Groundwater Encountered While Drilling (WD): at depth 6.00 ft on 7/28/2009		-				Project:		Operations Comp				Pag	e 1 of 1
MONITORING WELLLOG Xi Other Denth Dullarg Top of Null Other Hole Number, Field: Pormanent: Differ: Inspector: Top of Null Elevation: ** COMING Kohning: Jate 20 ft Differ: Inspector: * Top of Null Elevation: * Type of Hole: X Auger Field: Monitoring Well Piezceneter Depth to Groundwater: Depth Drilled: Total Depth: 10.5 ft Hammer Vieight: Split Spoon ID: Size and Yore of Bitt Sol the Work Counter and Sol the Sol the Piezceneter Depth to Groundwater: Depth Drilled: Total Depth: 10.5 ft Hammer Vieight: Split Spoon ID: Size and Yore of Bitt Note the Monitoring Well Piezceneter Depth to Groundwater: Depth Drilled: Total Depth: 10.5 ft Hammer Vieight: Split Spoon ID: Size and Hole St Auger Rig Total Piez Counter and Sol the Piezceneter Depth to Groundwater: Depth to Groundwater: Total Piez Counter and Sol the Piezceneter 1 Interview Neato Comment Sol the Piezceneter Sol the Piezceneter Sol the Pie		Α	ECO	M						and, Alaska	1	Date	e: 28 Jul 2009
Image: Construction Easting: 1.810.735 ft Elevation: ** Hole Number, Field: Permanent: (COMWOW Differ: Imspector: R. Robarson R. Schlossar Type of Hole: X ober Monitoring Well Depth to Groundwater: 0.600 ft WO 10.5 ft Test Prit XX Auger Hole: Monitoring Well Depth to Groundwater: 10.5 ft 10.5 ft Hammer Weight: Split Spoon D: Size and Type of Bit: 3.8 in Hollow Stem Auger Type of Equipment: Mobile 8-61 Auger Rig Type of Samples: Driven Split Spoon Monte: 2.5 in 3.3 in Hollow Stem Auger Type of Put Cosmit Elevation: et ausois: The Schloss and Type of Dit: 3.0 in Holew Stem Auger Not Te ************************************						-			District				
ICOMWOA ICOMWOA R. Roberson R. Schlasser Type of Hole: SX other Monitoring Well Depth Office: Depth Office: Depth Office: Total Depth: 1 Type of Hole: SX other Monitoring Well Examples: Depth Office: 10.5 ft Total Depth: 340 lbs Split Spoon ID: Size and Type of Bit: Type of Equipment: Type of Samples: Driven Split Spoon 340 lbs Split Spoon Examples: Intellow Stem Auger Mosile B-81 Auger Rig Type of Samples: 1 Type of PVC Casing Elevation: 06.3055 Intellow Stem Auger Intellow Stem Auger Intellow Stem Auger 1 Type of PVC Casing Elevation: 06.3055 Intellow Stem Auger Intellow Stem Auger Intellow Stem Auger 1 Type of PVC Casing Elevation: 06.3055 Intellow Stem Auger Intellow Stem Auger Intellow Stem Auger 1 Type of PVC Casing Elevation: 06.3055 Intellow Stem Auger Intellow Stem Auger Intellow Stem Auger 1 Intellow Stem Auger Native Material Intellow Stem Auger Intellow Stem Auger 2 Intellow Stem Auger Native Material Intellow Stem Auger Intellow Stem Auger 2 Intellow Stem Auger Native Material Intellow Stem Auger Intellow Stem Auger 2	M	IONITO	RING W	ELL	LOG	Location							
I Test Pit ØX Auger Hole Monitoring Well Plezometer 6.00 ft WD 10.5 ft 10.5 ft Hammer Weight Split Spoon I.D: Size and Type of Bit: Type of Samples: Driven Split Spoon 340 lbs 2.5 in 8.3 in Hollow Stem Auger Mobile B-61 Auger Rig Type of Samples: 1 Top of PVC Casing Elevation: 63.065' 9 metal flushmount (8' dia. Christy box) NOTE: 1 Top of PVC Casing Elevation: 63.065' 9 Mole B-61 Auger Rig Note: 9 Mole B-61 Auger Rig Note: 9 Top of PVC Casing Elevation: 63.065' 9 Native Material Native Material 1 Native Material SUMMARY OF MATERIALS USED 9 Sch 40 PVC 2' ID Well Reer Stem - 2 = NG140 PVC dier casing 9 Sch 40 PVC 2' ID Well Reer Sch 40 PVC 2' ID B-slot screen 9 Sch 40 PVC 2' ID B-slot screen Sch 40 PVC 2' ID B-slot screen 9 Sch 40 PVC 2' ID B-slot screen Sch 40 PVC 2' ID B-slot screen 9 Botom of Exploration 10.5 1 Casing dier Pres Weile Drilling (WD); at deelf on the screen of the							berson						
240 lbs 2.5 in 8.3 in Hollow Stem Auger Mobile B-61 Auger Rig Driven Split Spoon NTT:					Nell 🗆 Pi	 iezometer	Depth				led:		
Image: Second		-					<u> </u>						•
Plusitionarity terminations To go hole elevation to measured; see top of PVC caling elevation. BTC - Below Top of Inter Casing SUMMARY OF MATERIALS USED 5 fort - 2 in SOH 40 PVC processing 5 fort - 2 in SOH 40 PVC processing 6 fort - 2 in SOH 40 PVC processing 5 fort - 2 in SOH 40 PVC processing 6 fort - 2 in SOH 40 PVC processing 6 fort - 2 in SOH 40 PVC processing 5						<u> </u>							•
1 Image: Section of Exploration 10.5 ft Groundwater Encountered While Drilling (WD): at depth for the rest of the Project:					ı	metal flushn	nount (8"	dia, Christy box)	Flushmo ** Top of casing el	unt with cem hole elevation evation.	ent apro on not m	n. easure	
Solument Project:	Depth (ft)												
1 1 5 feet - 2-in SCH 40 PVC 0.008-in slot acceen - 3 - 4 cubic feet - 10/20 Sand Filter Pack Material - 3 - - - - 4 - - - - 5 - - - - 6 - - - - 7 - - - - 8 - - 10/20 silica sand - 5 - - - - 8 - - - - 7 - - - - 8 - - - - 10/20 silica sand - - - - 8 - - - - - 8 - - - - - - - - - - - - - - - - - - - - - - -			e () o.	•	I	Native Mate	erial						
SCH 40 PVC 2" ID Well Riser 4 5 6 6 7 7 8 8 8 9 10 10 10 10 10 20 silica sand SCH 40 PVC 2" ID Well Riser 6 6 9 10 20 silica sand SCH 40 PVC 2" ID 6-slot screen 8 8 8 10 10 10 20 silica sand SCH 40 PVC 2" ID 6-slot screen 8 8 10 10 10 10 10 10 10 10 10 10	- 1								5 feet - 2-i	in SCH 40 PV	C 0.006-in	slot so	
A 30/70 silica sand 5 6 6 10/20 silica sand 7 7 10/20 silica sand 5 5 10/20 silica sand 5 6 10/20 silica sand 5 7 10/20 silica sand	- 2				I	Neat Cemer	nt						
- - 5 - - 6 - - 7 - - 10/20 silica sand SCH 40 PVC 2" ID 6-slot screen SCH 40 PVC 2" ID 6-slot screen	- 3				;	SCH 40 PV	C 2" ID V	Vell Riser					
Bottom of Exploration 10.5 ft Groundwater Encountered While Drilling (WD): at depth 6.00 ft on 7/28/2009 Project: Hole Number:	- 4				:	30/70 silica	sand						
Bottom of Exploration 10.5 ft Groundwater Encountered While Drilling (WD): at depth 6.00 ft on 7/28/2009 Hole Number:	- 5												
Bottom of Exploration 10.5 ft Groundwater Encountered While Drilling (WD): at depth 6.00 ft on 7/28/2009 Bottom of Exploration 10.5 ft Groundwater Encountered While Drilling (WD): at depth 6.00 ft on 7/28/2009	- 6												
Bottom of Exploration 10.5 ft Groundwater Encountered While Drilling (WD): at depth 6.00 ft on 7/28/2009 Bottom of Exploration 10.5 ft Groundwater Encountered While Drilling (WD): at depth 6.00 ft on 7/28/2009	7 7 - 7 - 7 - 7												
Bottom of Exploration 10.5 ft Groundwater Encountered While Drilling (WD): at depth 6.00 ft on 7/28/2009 Bottom of Exploration 10.5 ft Groundwater Encountered While Drilling (WD): at depth 6.00 ft on 7/28/2009	8							-slot screen					
Bottom of Exploration 10.5 ft Groundwater Encountered While Drilling (WD): at depth 6.00 ft on 7/28/2009 Bottom of Exploration 10.5 ft Groundwater Encountered While Drilling (WD): at depth 6.00 ft on 7/28/2009	9 - 9												
Bottom of Exploration 10.5 ft Groundwater Encountered While Drilling (WD): at depth 6.00 ft on 7/28/2009 Bottom of Exploration 10.5 ft Groundwater Encountered While Drilling (WD): at depth 6.00 ft on 7/28/2009													
Project: Hole Number:	-11				I	Bottom Cap			Groundwa	ater Encounte	10.5 ft ered Whi	ile Dril	ling (WD): at depth
											sco		

	Project: Main Operations Complex Area Ph North East Cape, St. Lawrence Isla						Page 1 of 1
AECOM	Drilling A		□ Alaska			,	Date: 29 Jul 2009
	X Ot	her D	enali Drilling			X MS	SL 🗌 other
MONITORING WELL LOG	Location		thing: 3,403,921 sting: 1,810,742			Top of I Elevatio	
Hole Number, Field: Permanent: ICOMW05 ICOMW05	Driller: <i>R. Ro</i>	berson			Inspector: <i>R. Schl</i> e	osser	
Type of Hole: X other Monitoring Well Image: Test Pit X Auger Hole Image: Monitoring Well Image: Piter Pit	 iezometer	Depth	to Groundwater: 7.00 ft WD		Depth Drill 9.0 ft	ed:	Total Depth: 9.0 ft
Hammer Weight: Split Spoon I.D: Size and Type	of Bit:		Type of Equipm			• •	Samples:
340 lbs 2.5 in 8.3 in Hollow S	tem Auger		Mobile B-61			Drive	n Split Spoon
	metal flushr	nount (8"	dia, Christy box)	Flushmore ** Top of casing el		ent apron. In not mea	asured; see top of PVC
	Native Mate	rial		SLIMMA	TY OF MATE		SED
	Neat Ceme	ot		4 feet - 2-i 5 feet - 2-i	n SCH 40 PVC n SCH 40 PVC feet - 10/20 Sa	c riser casin c 0.006-in s	g lot screen
	SCH 40 PV		/ell Riser				
	30/70 silica	sand					
	(2 / 2 2						
	10/20 silica SCH 40 PV		-slot screen				
	Bottom Cap	1		Bottom of Groundwa 7.00 ft on		9.0 ft ered While	Drilling (WD): at depth
2 y - 10							
		Proje <i>M</i>	ect: ain Operations Co	omplex Are	ea Phase I IS	600	Hole Number: ICOMW05

	Project:		Operations Comp				Page 1 of 1
AECOM			East Cape, St. La		and, Alaska		Date: 30 Jul 2009
	Drilling A		Alaska enali Drilling	District		Eleva	tion Datum: ∕ISL
MONITORING WELL LOG	Location		thing: 3,403,938 sting: 1,810,741			Top o Eleva	f Hole tion: **
Hole Number, Field: Permanent: ICOMW06 ICOMW06	Driller: <i>R. Rol</i>	berson			Inspector: <i>R. Schl</i> e	osser	
Type of Hole: X other Monitoring Well Test Pit X Auger Hole Monitoring Well Pie	_ ezometer	Depth	to Groundwater: 5.00 ft WD		Depth Drill 9.5 ft	ed:	Total Depth: 9.5 ft
Hammer Weight: Split Spoon I.D: Size and Type of 340 lbs 2.5 in 8.3 in Hollow St	of Bit:		Type of Equipm Mobile B-61			• •	f Samples: ren Split Spoon
2.5 11 0.5 11 10100 30	enn Auger		mobile B-017	NOTE:		DIIV	
	netal flushn	nount (8"	dia, Christy box)	1) Top of ** Top of casing el	hole elevation	on not m	on: 68.4904' easured; see top of PVC sing
	Native Mate	rial			RY OF MATE		
	Neat Cemer	nt		5 feet - 2-i	n SCH 40 PVC et - 10/20 Sanc	0.006-in	slot screen
	SCH 40 PV	C 2" ID W	Vell Riser				
- 3	30/70 silica	sand					
- 6							
	10/20 silica SCH 40 PV		-slot screen				
	Bottom Cap			Bottom of Groundwa 5.00 ft on		9.5 ft ered Whi	le Drilling (WD): at depth
		Proje <i>M</i>	ect: ain Operations Co	omplex Are	ea Phase I IS	SC0	Hole Number: ICOMW06

		-	Project:		Operations Comp			L	Page 1 of 1
	<u>=CO/</u>	Ν		North	East Cape, St. La	wrence Isl	land, Alaska		Date: 30 Jul 2009
			Drilling A		☐ Alaska enali Drilling	District		Elevat	ion Datum: ISL 🔲 other
MONITC	ORING WE	LL LOG	Location		thing: 3,403,938 sting: 1,810,733			Top of Elevat	
Hole Number, Field: ICOMW07	Permanent: ICOMW07		Driller: <i>R. Ro</i>	berson			Inspector: <i>R. Schl</i>		
	other <u>Monitoring Wel</u> uger Hole 🛛 Monit		 iezometer	Depth	to Groundwater: 6.00 ft AD		Depth Dril 10.0 ft	led:	Total Depth: 10.0 ft
Hammer Weight: 340 Ibs	Split Spoon I.D: 2.5 in	Size and Type 8.3 in Hollow S			Type of Equipm Mobile B-61			•••	Samples: En Split Spoon
						NOTE:			
		r	metal flushr	nount (8"	dia, Christy box)	Flushmo ** Top of casing el	f PVC Casing unt with cem hole elevatio levation. elow Top of I	ent apror on not me	asured; see top of PVC
Depth (ft)		J-11							
-			Native Mate	erial			RY OF MATE		
- 1						5 feet - 2-	in SCH 40 PV(in SCH 40 PV(et - 10/20 Sand	C 0.006-in	slot screen
- 2			Neat Ceme	nt			et - 10/20 San		
-			SCH 40 PV	C 2" ID V	Vell Riser				
- 3									
- 4			30/70 silica	sand					
- 5									
-									
- 6									
0/2/0									
			10/20 silica	sand					
8					-slot screen				
01- 22 굇 — 10									
			Bottom Cap)		Groundwa	Exploration ater Encounte 7/30/2009	10.0 ft ered After	Drilling (AD): at depth
						0.00 11 011			
				Proje M	ect: ain Operations C	omplex Ar	ea Phaso I I	500	Hole Number: ICOMW07
Z									

	Project: Main Operations Complex Area Phase I ISCO						
AECOM		North	East Cape, St. La	wrence Isl	and, Alaska		Date: 31 Jul 2009
	Drilling Agency: Alaska District Other Denali Drilling				Elevation Datum:		
MONITORING WELL LOG	Location:		thing: 3,403,930 sting: 1,810,729				
Hole Number, Field: Permanent: ICOMW08 ICOMW08	Driller: <i>R. Rol</i>	Driller: <i>R. Roberson</i>			Inspector: <i>R. Schlosser</i>		
Type of Hole: X other Monitoring Well Test Pit X Auger Hole Monitoring Well Pit	 iezometer	Depth	to Groundwater: 5.50 ft WD		Depth Drill 10.0 ft	ed:	Total Depth: 10.0 ft
Hammer Weight:Split Spoon I.D:Size and Type340 lbs2.5 in8.3 in Hollow State			Type of Equipm Mobile B-61			• •	Samples: n Split Spoon
				NOTE:	I		
	metal flushn	nount (8"	dia, Christy box)	Flushmore ** Top of casing el	PVC Casing unt with cem hole elevatic evation. elow Top of I	ent apron. on not mea	asured; see top of PVC
	Native Mate	rial					
	Nalive Male	IIdi			2-in SCH 40 P		
				5 feet - 2-i	n SCH 40 PV0 et - 10/20 Sand	C 0.006-in s	lot screen
	Neat Cemer	nt					
	SCH 40 PV	C 2" ID W	/ell Riser				
- 3							
	30/70 silica :	sand					
	10/20 silica : SCH 40 PV(-slot screen				
	Bottom Cap			Bottom of	Exploration ⁻	10.0 ft	
				Groundwa 5.50 ft on	ter Encounte	ered While	e Drilling (WD): at depth
		Proje	ect: ain Operations Co		a Phasa I IS	SC0	Hole Number: ICOMW08
2							

	_			Project:	Main	Operations Comp	olex Area P	hase I ISCO		Page 1 of 1
	Α	<u>=CO</u>	M		North	East Cape, St. La	awrence Isl	and, Alaska	1	Date: 1 Aug 2009
				-	Drilling Agency: Alaska District Other Denali Drilling			Elevation Datum:		
N	<i>I</i> ONITC	RING W	ELL LOG	Location	Location: Northing: 3,403,919 ft Easting: 1,810,731 ft			Top of Hole Elevation: **		
	Number, Field: MW09	Permanent: ICOMW09		Driller: <i>R. Ro</i>	Driller: <i>R. Roberson</i>			Inspector: R. Schlosser		
		other <u>Monitoring N</u> uger Hole 🔲 Mo		Piezometer		to Groundwater: 9.50 ft WD		Depth Drilled: 12.5 ft		Total Depth: 12.5 ft
	mer Weight: 10 lbs	Split Spoon I.D: 2.5 in	Size and Typ 8.3 in Hollow	be of Bit: A Stem Auger	1	Type of Equipm <i>Mobile B-61</i>			• •	f Samples: en Split Spoon
							NOTE:			
				— metal flushr	nount (8"	dia, Christy box)	Flushmo ** Top of casing el	FPVC Casing unt with cem hole elevatio evation. elow Top of I	ent apror on not me	n. easured; see top of PVC
Depth (ft)			<u> </u>							
				 Native Mate 	erial			RY OF MATE		
- - 2				Neet Come	-		5 feet - 2-	in SCH 40 PV(in SCH 40 PV(et - 10/20 Sand	C 0.006-in	slot screen
				- Neat Ceme						
- 4				— SCH 40 PV	C 2" ID V	Vell Riser				
- - 6 -				— 30/70 silica	sand					
GPJ ACE ANC.GDT 3/3/10 0 0 0 8 8				— 10/20 silica — SCH 40 PV	sand C 2" ID 6	-slot screen				
NE_CAPE_WELL USACE ISCO LOGS GPJ ACE_ANC.GDT 3/3/10				— Bottom Cap)		Bottom of Groundwa 9.50 ft on	Exploration ter Encounte 8/1/2009	12.5 ft ered Whil	e Drilling (WD): at depth
E_CAPE					Proje M	ect: ain Operations C			sco	Hole Number: ICOMW09
zL										

APPENDIX F

Groundwater Sampling Forms

BASELINE AND PRE-ISCO

CLIENT: BRISTOL LOCATION: NOCAPE ISCO PILOT PROJECT #: (12642-20

ENTER WELL LOCATION:

ICOMWE

INSPECTION									
Label on well?			YES	NO Isc	ap locked?			YES (NO
Is reference mar	k visible?		YES	(NO) Sta	nding water presen	it?		YES	NO
Condition of well	:	NEW		Any	indication of surfa	ce runoff in v	vell?	YES	NO I
Weather:		Chardy			Temperature:			~45	
Notes: TEA	TOPARY	VELLI	installed	7/20/09	Developed	rizilog	and a	samp ler	I immediately
STATIC WATER	LEVEL JUS	ST PRIOR TO	D PURGING					1	
Date: 17/2	1/09		Time:	AM/PM					
1	1								
Depth to Water.	•	935	_	Mea	esured with: (ELECTRONIC		CHALK & STEEL	TAPE
Length of Well:		5-00		Dec	contamination:	PRE STEAM	CLEANED	DIWATER	OTHER
WELL PURGING	S ,								1 1 11
Date:2	-1/09	Begir	Time:	AM	PM Purging E	quipment 🟒	Amily	poon w	Constroller
V	1	End T	lime:	AM	/PM Decontam	ination: P	RE STEAM CL		
CALCULATION OF 3	CASING VOLL	MES						-	
	ft Le	ength of well			Yield:		HIGH (LOW)	
$\int (a)$		depth to wate		rge start)	If low, rece	overy time:			
Relow	ft =	length of wat	ter column						
¥*	X	conversion fa	actor (2° well) 0.49	Actual vol	ume purged:	80	gallor	าร
Gallo	ns =	3 casing volu	umes		Actual pur	ge flow rate:	5250	2 sul/sumol/mi	пог
Notes:								۲/min	
Time	Volume	Depth to	pН	Conductivity	Turbidity	D.O.	Temp	ORP	Ferrous
	(gallons)	Water	(SU)	(umhos/cm)	(NTU),	(mg/L)	(°C)		Iron
		(feet)			Saluity				(mg/L)
	1	<0.33'	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 5°	+/- 10 mV	
Start: 1755		* 1C.C	10,83	0.148	0.07	0,88	5,61	-55.3	N/A
1802		 	10,15	0147	0.07	0.47	6.08	- 57.9	N/A
1805	1	<u> </u>	9.54	0-149	0.07	051	5.19	· 57.2	N/A
1810			9.20	0,149	0.07	0.39	5,15	-55,1	N/A
1815	V		8.84	0.149	0.09'	035	5.16	-56.0	N/A
	-		8-62	0,149	0.07	0.36	5.08	-55,4	N/A
	E	11.6	do	at a minart		Late 1	-7	1-	<u>N/A</u>
	Dany	ec att	excer	clopment	- purjed	total	- 35 90	2.65	N/A
	ſ								N/A
									N/A
Final:									N/A
SAMPLE COLLE			Time: /Ê	AM/PM	Method:	Lon Fla	$\omega \omega / M_{i}$	ini Typor	n
Appearance of S	ample:	Cla	iv		Actual sample	e flow rate:	~ 1.00	m	N/min or
SAMPLE BOTTL			1000	<u>1-11ta</u> 0	hober, for	R DRO	RROJ	AKIO2/	L/min AKID3
SAMPLING PER Name: Z-	SCHID	ssev			Company:	AECO	m		

CLIENT: B	rista	TSOP	ilt					TD	
CLIENT: B LOCATION: PROJECT #:	NECap			ENTED	WELL LOCAT	30381.	True	10.10.77	1
PROJECT #:	11264/	10		ENJER	WELL LUCA		<u>Icc</u> ,	MILOL	
INSPECTION									
Label on well?		(YES	NO Iscar	b locked?			YES	NO
Is reference mar	k visible?		NES		ling water prese	nt?		YES	NO
Condition of well)esus			ndication of surfa		vell?	YES	NO
Weather:		Jews Floudy	,	·	emperature:				F
Notes:	 				•	1.0			
werr	makes a	bout 27	5 ml [m	un, Tempso	orany we	ll			
STATIC WATER)			<u></u>	·				
Date: 7/22	109		Time:	AMIPM					
	<u> </u>	72.1*	1615						
Depth to Water:		5.21			ured with:	ELECTRONIC		CHALK & STEEL	. =
Length of Well:	<u>_</u>	د		Deco	ntamination:	PRE STEAM	CLEANED	DIWATER	OTHER
	3								
	د 22.02	Ronin	ı Time: /	6 <u>7</u> 4 AM/P		Equipment	MES-70	ello N	
	22.0 \	End 1		73.5 AM/P	-				
CALCULATION OF 3	3 CASING VOU				Decondar	nnouva. P	RE STEAM CL		ATER OTHER
7.8		ength of well			Yield:		HIGH	Low	
5-21		depth to wate	er (before pu	rge start)		covery time:		wed or K	106ks in
4.59		iength of wat				2	<u></u>		1
~2:25	x	conversion fa	actor (2° wel	I) 0.49	Actual vo	lume purged:	7	gallo	ns
Gallo	ons =	3 casing volu	umes			irge flow rate:	<1001	 √∠ ml/m	In or
Notes:	6	Enport	riy we	((_	L/mir	n l
				1					
Time	Volume	Depth to	Hq	Conductivity	Turbidity	D.O.	Temp	ORP	Ferrous
Time		Depth to Water	pH (SU)	Conductivity (umhos/cm)	Turbidity (NTU)	D.O. (mg/L)	Temp (°C)	ORP	Ferrous
Time	Volume (gallons)	· ·		-	1.1	D.O. (mg/L)	Temp (°C)	ORP	
Time		Water		-	1.1		-	ORP +/- 10 mV	Iron
Time Start: 162.4		Water (feet)	(SU)	(umhos/cm)		(mg/L) +/- 10%	(°C)		Iron
		Water (feet) <0.33	(SU)	(umhos/cm)		(mg/L)	(°C) +/- 5° 		Iron (mg/L)
Start: 1624		Water (feet) <0.33' <i>5.</i> 2 ((SU) +/- 0.1	(umhos/cm) +/- 3%	{NTU} +/- 10%	(mg/L) +/- 10%	(°C) +/-5° 	+/- 10 mV	Iron (mg/L) N/A
Start: 1624 1645 1655 1702		Water (feet) <0.33' 5.2 (5.78 5.75 5.75	(SU) +/- 0.1	(umhos/cm) +/- 3%	(NTU) +/- 10%	(mg/L) +/- 10%	(°C) +1-5° 4.53 4.75 4.75	+/- 10 mV 1/43 178.72 134.7	Iron (mg/L) N/A N/A N/A N/A
Start: 1624 1645 1655 1702 1702		Water (feet) <0.33' 5.72 (5.75 5.75 5.75 5.74 5.80	(SU) +/- 0.1 <u>5: 3.5</u> <u>5: 36</u> 5. <u>3</u> 6 5. <u>3</u> 9 5. 42	(umhos/cm) +/- 3% 0.719 0.270 0.771 0.771 0.725	(NTU) +/- 10% 0,10 0,10 0,10 0,10	(mg/L) +/- 10% 	(°C) +/- 5° 4. 53 4. 75 4. 71 -1. 71	+/- 10 mV 114_3 128.7 134.2 137.3	Iron (mg/L) N/A N/A
Start: 1624 1645 1655 1702 1702 1715		Water (feet) <0.33' 5.2 (5.78 5.75 5.75	(SU) +/- 0.1 5.35 5.36 5.39 5.42 5.42 5.42	(umhos/cm) +/- 3% 0. 719 0. 270 0. 771 0. 775 0. 775	(NTU) +/- 10% 0,10 0,10 0,10 0,10 0,11	(mg/L) +/- 10% 	(°C) +1-5° 4. <u>53</u> 4 .75 4.51 4.71 4.71	+/- 10 mV 1/4_3 1/28,7 134,7 134,7 137,3 14/.4	Iron (mg/L)
Start: 1624 1645 1655 1702 1702 1702 1715 1725		Water (feet) <0.33' 5.72 { 5.75 5.75 5.76 5.40 5.60 5.81	(SU) +/- 0.1 <u>5: 35</u> <u>5: 36</u> <u>5: 36</u> <u>5: 42</u> <u>5: 42</u> <u>5: 42</u> <u>5: 42</u>	(umhos/cm) +/- 3% 0.719 0.270 0.271 0.225 0.725 0.725 0.735	(NTU) +/- 10% 0,10 0,10 0,10 0,10 0,11 0,1/ 0,1/	(mg/L) +/- 10% 1.77 1.53 1.40 1.53 1.40 1.07 0.95	(°C) +/- 5° 	+/- 10 mV 1/43 1/28.72 134.7 137.3 141.0	Iron (mg/L) - N/A N/A N/A N/A N/A N/A
Start: 1624 1645 1655 1702 1702 1715		Water (feet) <0.33' 5.72 [5.75 5.75 5.76 5.90 5.60	(SU) +/- 0.1 5.35 5.36 5.39 5.42 5.42 5.42	(umhos/cm) +/- 3% 0. 719 0. 270 0. 771 0. 775 0. 775	(NTU) +/- 10% 0,10 0,10 0,10 0,10 0,11	(mg/L) +/- 10% 	(°C) +1-5° 4. <u>53</u> 4 .75 4.51 4.71 4.71	+/- 10 mV 1/4_3 1/28,7 134,7 134,7 137,3 14/.4	Iron (mg/L) - N/A N/A N/A N/A N/A N/A N/A N/A
Start: 1624 1645 1655 1702 1702 1702 1715 1725		Water (feet) <0.33' 5.72 { 5.75 5.75 5.76 5.40 5.60 5.81	(SU) +/- 0.1 <u>5: 35</u> <u>5: 36</u> <u>5: 36</u> <u>5: 42</u> <u>5: 42</u> <u>5: 42</u> <u>5: 42</u>	(umhos/cm) +/- 3% 0.719 0.270 0.271 0.225 0.725 0.725 0.735	(NTU) +/- 10% 0,10 0,10 0,10 0,10 0,11 0,1/ 0,1/	(mg/L) +/- 10% 1.77 1.53 1.40 1.53 1.40 1.07 0.95	(°C) +/- 5° 	+/- 10 mV 1/43 1/28.72 134.7 137.3 141.0	Iron (mg/L) - N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 1624 1645 1655 1702 1702 1702 1715 1725		Water (feet) <0.33' 5.72 { 5.75 5.75 5.76 5.60 5.60 5.81	(SU) +/- 0.1 <u>5: 35</u> <u>5: 36</u> <u>5: 36</u> <u>5: 42</u> <u>5: 42</u> <u>5: 42</u> <u>5: 42</u>	(umhos/cm) +/- 3% 0.719 0.270 0.271 0.225 0.725 0.725 0.735	(NTU) +/- 10% 0,10 0,10 0,10 0,10 0,11 0,1/ 0,1/	(mg/L) +/- 10% 1.77 1.53 1.40 1.53 1.40 1.07 0.95	(°C) +/- 5° 	+/- 10 mV 1/43 1/28.72 134.7 137.3 141.0	Iron (mg/L) - N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 1624 1645 1655 1702 1702 1702 1715 1725		Water (feet) <0.33' 5.72 { 5.75 5.75 5.76 5.60 5.60 5.81	(SU) +/- 0.1 <u>5: 35</u> <u>5: 36</u> <u>5: 36</u> <u>5: 42</u> <u>5: 42</u> <u>5: 42</u> <u>5: 42</u>	(umhos/cm) +/- 3% 0.719 0.270 0.271 0.225 0.725 0.725 0.735	(NTU) +/- 10% 0,10 0,10 0,10 0,10 0,11 0,1/ 0,1/	(mg/L) +/- 10% 1.77 1.53 1.40 1.53 1.40 1.07 0.95	(°C) +/- 5° 	+/- 10 mV 1/43 1/28.72 134.7 137.3 141.0	Iron (mg/L) - N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 1624 1645 1655 1702 1702 1702 1715 1725 1725	(gallons)	Water (feet) <0.33' 5.72 [5.78 5.75 5.76 5.80 5.60 5.60 5.60	(SU) +/- 0.1 5, 35 5, 36 5, 39 5, 42 5, 42 5, 42 5, 42 5, 42	(umhos/cm) +/- 3% 0. 719 0. 270 0. 771 0. 775 0. 775 0. 775 0. 775	(NTU) +/- 10% 0,10 0,10 0,10 0,10 0,11 0,11 0,11	(mg/L) +/- 10% 1.77 1.53 1.40 (.26 1.07 0.95 1.28	(°C) +1-5° 4.53 4.75 4.75 4.75 4.75 4.71 4.96 4.50 4.21	+/- 10 mV 1/43 1/28.72 134.7 137.3 141.0	Iron (mg/L) - N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 1624 1645 1645 1702 1702 1715 1725 1725 1735 Final: SAMPLE COLLE	(gallons)	Water (feet) <0.33' 5.72 5.78 5.75 5.75 5.76 5.60 5.60 5.60 5.60	(SU) +/- 0.1 5.35 5.36 5.39 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42	(umhos/cm) +/-3% 0.219 0.270 0.270 0.271 0.225 0.225 0.225 0.225 0.235 0.235 0.235	<pre> {NTU} +/- 10% 0,10 0,10 0,10 0,10 0,11 0,11 0,11 Method: // / Actual samp</pre>	(mg/L) +/- 10% 1.77 1.53 1.40 1.72 1.53 1.40 1.26 1.07 0.95 1.28 1.28	(°C) +1-5° 4.53 4.53 4.57 4.51 4.96 4.96 4.96 4.21	+/- 10 mV 114-3 128.7 134.2 137.3 141.0 138.9	Iron (mg/L)
Start: 1624 1645 1655 1702 1702 1702 1715 1725 1725 1735 Final: SAMPLE COLLE Date: 7/22/	(gallons)	Water (feet) <0.33' 5.72 5.78 5.75 5.75 5.76 5.60 5.60 5.60 5.60	(SU) +/- 0.1 5.35 5.36 5.39 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42	(umhos/cm) +/- 3% 0. 719 0. 270 0. 771 0. 775 0. 775 0. 775 0. 775	<pre> {NTU} +/- 10% 0,10 0,10 0,10 0,10 0,11 0,11 0,11 Method: // / Actual samp</pre>	(mg/L) +/- 10% 1.77 1.53 1.40 1.72 1.53 1.40 1.26 1.07 0.95 1.28 1.28	(°C) +1-5° 4.53 4.53 4.57 4.51 4.96 4.96 4.96 4.21	+/- 10 mV 114-3 128.7 134.2 137.3 141.0 138.9	Iron (mg/L)
Start: 1624 1645 1702 1702 1702 1702 1702 1703 1715 1725 1735 1735 1725 1735 1725 1725 1735 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725	(gallons)	Water (feet) <0.33' 5.21 5.78 5.75 5.75 5.40 5.60 5.60 5.60 5.60 5.60 5.60 5.60 5.6	(SU) +/- 0.1 5:35 5:36 5:36 5:36 5:39 5:42 5:42 5:42 5:42 5:42 5:42 5:42 5:42	(umhos/cm) +/-3% 0.219 0.270 0.270 0.271 0.225 0.225 0.225 0.225 0.235 0.235 0.235	(NTU) +/- 10% 0,10 0,10 0,10 0,10 0,11 0,11 0,11 0	(mg/L) +/- 10% 1.77 1.53 1.40 1.72 1.53 1.40 1.26 1.07 0.95 1.28 1.28	(°C) +1-5° 4.53 4.53 4.57 4.51 4.96 4.96 4.96 4.21	+/- 10 mV 114-3 128.7 134.2 137.3 141.0 138.9	Iron (mg/L)

\mathcal{O}	` (el = 9.32.
CLIENT: D LOCATION: PROJECT #:	NE Car 1 1262	petsce 12.20	Pilt	ENTER	WELL LOCATI	ON:		8MW-5	1
	reating	, v		NO Stan Any Air T ated Cro	p locked? ding water presen indication of surfa emperature: bo m temp	ce runoff in v		YES YES	NO NO
STATIC WATER Date: 7/2/2	,) PURGING Time:	AM/PM					
Depth to Water: Length of Weil:	ł	1.08 /		Mea	sured with: ontamination:	PRE STEAM		CHALK & STEEL	TAPE OTHER
WELL PURGING Date:/2	3 2/09	Begin End T	Time:	<u>/.3 % </u>		quipment <u>Ar</u>	INI TY		ATER OTHER
CALCULATION OF	CASING VOLU					Filler Fi			
15.1		ength of well			Yield:	_	HIGH	LOW	
9,9.08		depth to wate		rge start)	If low, rec	overy time:			
2		length of wat conversion fa		0 4 9	Actual vol	ume purged;	1	gallor	
Gallo Notes:		3 casing volu		1/0.10		rge flow rate:			n or
Time	Volume (gallons)	Depth to Water (feet)	pH (SU)	Conductivity (umhos/cm)	T urbidity (NTU) Salundy	D.O. (mg/L)	Temp (°C)	ORP	Ferrous Iron (mg/L)
	(gallons)	Water (feet) <0.33'	(SU) 2 6.02 +/- 0.1	(umhos/cm) +/- 3%	(NTU) Sochwoly +/- 10%	(mg/L) +/- 10%	(°C) +/- 5°	+/- 10 mV	Iron (mg/L)
Start: 1415	(gallons) ろ	Water (feet) <0.33' 9 16	(SU) 	(umhos/cm) +/- 3%	(NTU) Soutinity +/- 10% 0.16	(mg/L) +/- 10% 0,55	(°C) +/-5° /-68	+/- 10 mV	Iron (mg/L)
Start: <u>1415</u> <u>1425</u>	(gallons)	Water (feet) <0.33' 9.16 9.29	(SU) +/- 0.1 11-20 11-17	(umhos/cm) +/- 3%	(NTU) Southandy +/- 10% 6.18 0.17	(mg/L) +/- 10% 0.55 た.51	(°C) +/-5° /-68	+/- 10 mV -6612 -71.2	Iron (mg/L) N/A N/A
Start: 1415 1425 1433	(gallons) 3 3 7 7	Water (feet) <0.33' 9 16	(SU) +/- 0.1 11-21= 11-21= 11-05	(umhos/cm) +/- 3%	(NTU) Soutinity +/- 10% 0.16	(mg/L) +/- 10% 0.55 0.51 0.37	(°C) +/-5° /.68 /.67 /.57	+/- 10 mV -6612 -71.2 -662	Iron (mg/L)
Start: <u>1415</u> 1425	(gallons)	Water (feet) <0.33' 9.16 9.29	(SU) +/- 0.1 11-20 11-17	(umhos/cm) +/- 3% 0, 374 0, 374 0, 364 0, 387	(NTU) Salundy +/- 10% C.18 C.17 0.18	(mg/L) +/- 10% 0.55 た.51	(°C) +/-5° /-68	+/- 10 mV -6612 -71.2	Iron (mg/L)
Start: 1415 1425 1433 1439	(gallons) 3 7 7 7.2 7.3	Water (feet) <0.33' ? 16 ? 29' ? 29' ? 49	(SU) +/- 0.1 11-26 11-26 11-26 11-25 10-97	(umhos/cm) +/- 3% 0, 374 0, 364 0 387 0.355	(NTU) Soulinaty +/- 10% C.16 C.17 U.18 D.17	(mg/L) +/- 10% 0.55 0.55 0.51 0.37 0.44 0.44 0.44	(°C) +/-5° /.68 /.67 /.87 /.87	+/- 10 mV -6612 - 71.2 - 662 - 73.9	Iron (mg/L) N/A N/A N/A N/A
Start: (415 1425 1433 1439 1442	(gallons) 3 3 7 7 7.2	Water (feet) <0.33' 9 18 9 18 9 18 9 18 9 18 9 18 9 18 9 18	(SU) ² +/-0.1 11-26 11-17 11-05 10-97 10-77 10-77 10-77 10-77	(umhos/cm) +/- 3% 0, 374 0, 364 0, 364 0, 367 0, 355 0, 363 0, 363 0, 363 0, 363	(NTU) Salundy +1-10% C.18 C.17 0.18 D.17 0.17 C.17	(mg/L) +/- 10% 0.55 0.51 0.37 0.37 0.44 0.44 0.44 0.38	(°C) +/-5° /.68 1.67 1.87 1.95 1.95 1.85 2.00	+/- 10 mV -6612 - 71.2 - 662 - 73.9 - 70.7 - 70.1 - \$0.3	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A
Start: 1415 1425 1433 1439 1442 1442 1442 1446 1453 1501	(gallons) 3 7 7 7.2 7.3	Water (feet) <0.33' 9.18 9.29' 9.49 9.49 9.49 4.43	(SU) ² +/-0.1 11-26 11-26 11-26 11-26 11-27 10-97 10-97 10-79 10-79 10-79 10-79	(umhos/cm) +/- 3% 0.374 0.364 0.364 0.355 0.355 0.355 0.363 0.356 0.359 0.355	(NTU) Salundy +/- 10% C.16 C.17 0.18 D.17 0.17 C.17 C.17 C.17	(mg/L) +1-10% 0.55 0.55 0.37 0.37 0.44 0.44 0.38 0.38 0.38 0.38	(°C) +/-5° /.68 /.67 1.87 1.95 (.85 1.85 2.00 1.90	+/- 10 mV - 6612 - 71.2 - 66.2 - 73.9 - 70.7 - 70.1 - \$6.3 - \$5.6	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A
Start: 1415 1425 1433 1439 1442 1442 1442 1445 1445 1450 1501 1500	(gallons) 3 7 7 7.2 7.3	Water (feet) <0.33' 9 18 9 18 9 18 9 18 9 18 9 18 9 18 9 18	(SU) +/-0.1 11.26 11.17 11.05 10.97 10.79 10.79 70.78 10.79 70.78 70.70 9.81 9.60	(umhos/cm) +/- 3% 0, 374 0, 364 0, 355 0, 363 0, 363 0, 363 0, 363 0, 363 0, 363 0, 355 0, 363 0, 355 0, 355	(NTU) Salundy +1-10% C.18 C.17 0.18 D.17 C.17 C.17 C.17 C.17 C.17	(mg/L) +/- 10% 0.55 0.51 0.37 0.37 0.44 0.44 0.38 0.38 0.38 0.38 0.37 0.32	(°C) +/-5° /-68 /-67 /-87 1.87 1.87 1.85 1.85 1.85 2.00 1.90 1.90 1.90	+/- 10 mV -6612 -71.2 -662 -73.9 -70.7 -70.7 -70.1 -80.3 -85.6 -87.1	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A
Start: 1415 1425 1433 1439 1442 1442 1442 1442 1442 1445 1453 1501 1505	(gallons)	Water (feet) <0.33' 9 18 9 18 9 18 9 18 9 18 9 18 9 18 9 18	(SU) +/-0.1 11-26 11-26 11-26 11-26 11-26 11-27 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77 10-77	(umhos/cm) +/- 3% 0, 374 0, 364 0, 355 0, 363 0, 363 0, 363 0, 363 0, 363 0, 359 0, 359 0, 355 0, 362 0, 355 0, 365	(NTU) Salundy +1-10% 0.18 0.18 0.17 0.17 0.17 0.17 0.17 0.17 0.17 0.17	(mg/L) +1-10% 0.55 0.55 0.37 0.37 0.44 0.44 0.38 0.38 0.38 0.38	(°C) +/-5° /.68 /.67 1.87 1.95 (.85 1.85 2.00 1.90	+/- 10 mV - 6612 - 71.2 - 66.2 - 73.9 - 70.7 - 70.1 - \$6.3 - \$5.6	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 1415 1425 1433 1439 1447 1447 1447 1447 1447 1447 1447 144	(gallons) 3 3 7 7 7 7 7 7 7 7 7 7 7 7 7	Water (feet) <0.33' 9 18 9 18 9 18 9 18 9 18 9 18 9 18 9 18	(SU) ² +/-0.1 11-26 11-26 11-26 11-26 11-26 10-97 10-97 10-79 10-79 10-79 70-78 10-79 70-78 10-79 70-78 10-79 7.81 9.60 7.39	(umhos/cm) +/- 3% 0, 374 0, 364 0, 364 0, 367 0, 363 0, 363 0, 363 0, 363 0, 363 0, 363 0, 363 0, 363 0, 365 0, 375 0, 365 0, 375 0, 365 0, 375 0, 365 0, 375 0, 365 0, 375 0, 37	(NTU) Salundy +1-10% 0.18 0.18 0.17 0.17 0.17 0.17 0.17 0.17 0.17 0.17	(mg/L) +/- 10% 0.55 0.51 0.37 0.37 0.44 0.44 0.38 0.38 0.38 0.38 0.37 0.32	(°C) +/-5° /-68 /-67 /-87 1.87 1.87 1.85 1.85 1.85 2.00 1.90 1.90 1.90	+/- 10 mV -6612 -71.2 -662 -73.9 -70.7 -70.7 -70.1 -80.3 -85.6 -87.1	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A
Start: 1415 1425 1433 1439 1442 1442 1442 1442 1442 1445 1453 1501 1505	(gallons) 3 3 7 7 7 7 7 7 7 7 7 7 7 7 7	Water (feet) <0.33' 9 18 9 18 9 18 9 18 9 18 9 18 9 18 9 18	(SU) +/-0.1 11-26 11-17 11-05 10-97 10-79 10-79 10-79 10-79 7.81 9.60 9.81 9.60 9.39 10-70 9.81 9.60 9.39	(umhos/cm) +/-3% 0,374 0,374 0,355 0,363 0,363 0,363 0,363 0,363 0,363 0,363 0,363 0,363 0,363 0,365 0,365 FINALAS Pack AM/PM	(NTU) Salundy +1-10% C.18 C.17 0.18 D.17 C.17 C.17 C.17 C.17 C.17 C.17 C.17 C.17 C.17 Method:	(mg/L) +1-10% 0.55 0.51 0.51 0.37 0.37 0.37 0.38 0.38 0.38 0.38 0.38 0.38 0.38 0.38	(°C) +/-5° /-68 /-68 /-67 /-87 /-87 /-87 /-85 /-85 /-85 /-85 /-87 /-87 /-87	+/- 10 mV -6612 -71.2 -71.2 -667 -73.7 -70.7 -70.7 -70.1 - \$43 -\$5.6 -\$7.1 - \$7.2	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 1415 1425 1425 1433 1439 1442 1442 1446 1442 1446 1442 1501 1501 1501 1525 Final: SAMPLE COLLE Date: Appearance of S	(gallons) 3 7 7.2 7.3 4 Se∉ Ba ECTION Sample:	Water (feet) <0.33' 9 18 9 18 9 18 9 18 9 18 9 18 9 18 9 18	(SU) +/-0.1 11-26 11-17 11-05 10-97 10-79 10-79 10-79 10-79 7.81 9.60 9.81 9.60 9.39 10-70 9.81 9.60 9.39	(umhos/cm) +/-3% 0,374 0,374 0,355 0,363 0,363 0,363 0,363 0,363 0,363 0,363 0,363 0,363 0,363 0,365 0,365 FINALAS Pack AM/PM	(NTU) Salundy +1-10% C.18 C.17 0.18 D.17 C.17 C.17 C.17 C.17 C.17 C.17 C.17 C.17 C.17 Method:	(mg/L) +1-10% 0.55 0.51 0.51 0.37 0.37 0.37 0.38 0.38 0.38 0.38 0.38 0.38 0.38 0.38	(°C) +/-5° /-68 /-68 /-67 /-87 /-87 /-87 /-85 /-85 /-85 /-85 /-87 /-87 /-87	+/- 10 mV -6612 -71.2 -71.2 -667 -73.7 -70.7 -70.7 -70.1 - \$43 -\$5.6 -\$7.1 - \$7.2	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 1415 1425 1433 1439 1442 1499 1442 1493 1442 1493 1442 1591 1501 1501 1525 Final: SAMPLE COLLE Date: 1442	(gallons) 3 7 7.2 7.3 7.3 4 Ser Ba ECTION Sample: LE COLLECT	Water (feet) <0.33' 9 18 9 18 9 18 9 18 9 18 9 18 9 18 9 18	(SU) +/-0.1 11-26 11-17 11-05 10-97 10-79 10-79 10-79 10-79 7.81 9.60 9.81 9.60 9.39 10-70 9.81 9.60 9.39	(umhos/cm) +/-3% 0,374 0,374 0,355 0,363 0,363 0,363 0,363 0,363 0,363 0,363 0,363 0,363 0,363 0,365 0,365 FINALAS Pack AM/PM	(NTU) Salundy +1-10% C.18 C.17 0.18 D.17 C.17 C.17 C.17 C.17 C.17 C.17 C.17 C.17 C.17 Method:	(mg/L) +1-10% 0.55 0.51 0.51 0.37 0.37 0.37 0.38 0.38 0.38 0.38 0.38 0.38 0.38 0.38	(°C) +/-5° /-68 /-68 /-67 /-87 /-87 /-87 /-85 /-85 /-85 /-85 /-87 /-87 /-87	+/- 10 mV -6612 -71.2 -71.2 -667 -73.7 -70.7 -70.7 -70.1 - \$43 -\$5.6 -\$7.1 - \$7.2	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A

Τ

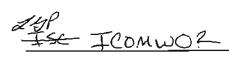
•

CLIENT: Bea LOCATION: A PROJECT #:	LE COPÉ			ENTER	WELL LOCAT	ION:	TCO	MWO9	•
INSPECTION Label on well? Is reference mark Condition of well Weather: Notes: Samp Am. Sile	: <u>Cle</u> ling be x/2009 3	Good ar ho fai juin pos- jiker Am	tly clo t Recove barsfilled	NO Star Any Air T	op locked? Inding water preser Indication of sunta Temperature: 2 on 8/06/ 2 eccare-y 2	ice លោកពី ហៃ W		40.450	NO NO NO S/6/09 7 Am:
STATIC WATER Date: 8/6/200 8/7 /20 Depth to Water: Length of Well:	09 09 .755		Time: 1030	A~~ Mea	sured with: ontamination:	ELECTRONIC PRE STEAM		CHALK & STEEL	TAPE OTHER
WELL PURGING Date: $8/6/2$ CALCULATION OF 3 11, 90 7, 58 4, 32	CASING VOLL ft Le ft <u>- c</u>	End 7	Time: <u>Of</u> Ø/	22 8/6/2001 AM 330 AM 7/2429 rge start)	PM Decontan Yield:	equipment nination: pr covery time:	HIGH	LOW	ATER OTHER
<u>, , , , , ,</u> Gallo Notes:	ns = W		mes	@Low Ho				gello ml/m L/mir 2000 %	in or
Time	Volume (gallons)	Depth to Water (fest)	рН (SU)	Conductivity (umhos/cm)	Turbidity (NTU)	D.O. (mg/L)	Temp (°C)	ORP +/~ 10 mV	Ferrous Iron (mg/L)
1040 21	i	\$0.33'	(, s+/- 0.1	+1-3%	÷/- 10%	+/- 10%	÷/- 5°	129	NÍA
Start: 1105	0.5	12910.5			81,2	12.95_	6.50	114	N/A
1118	0,70	10.83	5.10	6,254	73,2	7.08	6.61	106	
1130	1.0		5.68	0,258	50.1	1.00	11.0	100	N/A
1240	1.05	11,51	55	A . 5-1.		7 4 7	5.84	106	N/A N/A
1340		In a ad	5.62	0.256 Low Fie	40.1	7.02	5.01		N/A
			proje				1		N/A
					<u> </u>				N/A
						<u> </u>			N/A
									N/A
Final:								1	N/A
SAMPLE COLLE Date: 8/7/2	2009	Clear	Time: 0830	ANTEM	Method: <u>\</u> Actual sampl				nl/mln or
SAMPLE BOTTL		ED:			2-250 ML				Límio
SAMPLING PER	SONNEL Av le	bli	rent		Company	ACLOW	M.		;
							1		1

Т

CLIENT: BRESTOL LOCATION: NE CASE PROJECT #: 1126 2412

ENTER WELL LOCATION:



1

INSPECTION			~					\sim	:	
Label on well? (YES) NO Is cap locked? (YES) NO										
ls reference mar		6	(ES)		ding water prese				NO	
Condition of well	t	Good			Îndîcation of sum	ace runoff in w	vell?	YES (NO	
Weather.	_50	inny 50	-60°		emperature:			500-60		
Notes: WEL	-L JLOM	WOZ Wa	is male	bed due	to lack of 1	120 4/- 91	'e ta	000000	,4	
	poor p	roduct ro	n well	who very	turbid 1	- Failed	to chee	uup.	,	
STATIC WATER	LEVEL JUS	T PRIOR TO	PURGING	\sim	J				5	
Date: 0108	306	-	Time:	AMPM						
	د اس					<u> </u>			1	
Depth to Water	_4.(<u>,00</u>			sured with:	ELECTRONIC	TAPE	CHALK & STEEL	TAPE	
Length of Well:		4U		Deco	ontamination:	PRESTEAM	CLEANED	DIWATER	OTHER	
WELL PURGING	08/06	Rogio	Time:	1550 AMA		Equipment 🗍	TYAND DI	mo tim	Acris	
	UST 6,20			U AMA	Punging a PM Decontar	nination. a	RE STEAM CL			
CALCULATION OF	BCASING VOLL	$\sim ($								
BAO		angth of well			Yield:		HIGH (LOW		
4.60		lepth to wate	r (before ou	irde start)		overy time:	12 H	· .		
4.30		length of wat				and a second	<u> </u>			
2.107		conversion fa		0.49	Actual vo	lume purged:	4/ <	Fact mallo		
Gallo		3 casing volu		<u></u>		irge flow rate:	<u>.,,</u>	<u>qal</u> gallo <u>min</u> min	in or	
Notes:	1113					ngo non rucc	<u></u>			
							- Igal	= 10 min		
Тіте	Volume	Depth to	pН	Conducativity	Turbidity	D.O.	Temp	ORP	Ferrous	
	(gailons)	Water	(SU)	(umhos/cm)	(NTU)	(mg/L)	(°C)		Iron	
		(feet)						and the second se	(mg/L)	
l		<0,33	+/- 0.1	+1-3%	÷/- 10%	+/- 10%	+/- 5º	+/- 10 mV	<u> </u>	
Start: 1550	0.1	4.75	6.07	10.245	600	8,54	6.81	127	N/A	
602	1.0	5.00	5.21	D.253	225	6-41	640	125	N/A	
1613	2.0	5.25	5.19	0.258	225	3.01	5.21	119	N/A	
1624	3.5	5.50	5.17	6.258	124	3.03	5.17	117	N/A	
637	`1 .0	6.02	5.16	0.260	104	2,99	5.15	116	N/A	
l				ļ			_		N/A	
		 •								
		<u>}</u>			-		<u> </u>		<u>N/A</u>	
			• -			1			NVA NVA	
							1	ļ	N/A	
SAMPLE COLLE					L]			
	9/06	-	Times 1/_4	42 4445347	معه المراجع المغرو ال	Ti n	Pun	2	-	
Date: 07/0	U_{1}			(AMPM		Typoor	, un	-	<u> </u>	
Appearance of S	Sample	turbi	4		Armai camo	le flow rate:	JADA	h/m.m.	ni/min or	
, production of c					/	- 110W 1215.		······································		
SAMPLE BOTTL	FCONEC		Joc's 11.	250ML POLY	1/3-1 Lite	1 Amber	-X2		L'min	
		<u> </u>	1		1					
SAMPLING PER	SONNEL /	\wedge	Л. I						<u>.</u>	
Name:		Phens	K		Company:	Heco	M		:	
	v~or.ny	1,000,0			Compony.	11.200	•	·	<u>;</u>	
<u>~</u>										
							I		:	

CLIENT: Bristol LOCATION: NE Cape Isco Pilot PROJECT #: 112642.20

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ENTER WELL LOCATION:

ICOMW03

INSPECTION						_					
Label on well?		7			s cap locked				(YES	NO	
Is reference mar		(YES		Standing wat	-				NO	
Condition of well		<u>6000</u>			Any indication of surface runoff in well? YES						
Weather:	\underline{C}	ouery		/	Air Temperat	lle:			46		
Notes:		(
STATIC WATER	R LEVEL JUS										
Date:			Time:	(AM/PM							
8/4/09	2 0		9950	_							
Depth to Water.	3.0				Vieasured wit		ELECTRONIC	IAPE	CHALK & STEEL		
Length of Well:	9,5	O TOC		l	Decontamina	ion:	PRE STEAM C	LEANED	OI WATER	OTHER	
	-	- ·	- 10	~ ~			A	j	1	AP	
Date: 84	09	·			AM/PM P	urging E	Equipment <u>M</u>			control	
		End ĩ	ime:	/	AM/PM D	econtar		E STEAM CL			
CALCULATION OF 3						تماما	しん		d premf	-	
9.50 3.08		ength of well	- / h = \$ = = = = = = = =			ield:		HIGH	LOW		
	· · · · · ·	lepth to wate		rge start)	11	iow, red	covery time:			1	
6.42		length of wat		0.40				6.0	<u>ა</u>		
5.9.7		conversion fe		0.49			lume purged:	_			
Gallo	ns =	3 casing volu	Imes		Ļ	caual pl	irge flow rate:	< 10			
Notes:									L/mir		
								_			
Time	Volume	Depth to	рН	Conductiv	-	-	D.O.	Тетр	ORP	Ferrous	
	(gallons)	Water	(SU)	(umhos/cr	n) (N1	0)	(mg/L)	(°C)		Iròn	
	Running	(feet)						. ((mg/L)	
Start: (600	Totai ,5	<0.33	+/- 0.1	+1-3%	+/-1		+/- 10%	+/- 5°	+/- 10 mV	NITA	
		4.25	5.29				1.16	6.06	214	N/A	
1670	2	4.52	<u>5.32</u> 5.33	0.276			0.58	7.13 7.64	207.5	N/A N/A	
1640	<u> </u>	4.64		0.22		<u>,5</u> ,02	0.18 D.61	7.53	202.0	N/A	
1710	6.0		5.34	0,22		.04	2.49	1.5	204.0	N/A	
/ [10	6.0	4.62	5,30	0100		.09	6.71	1/0	207.0	N/A	
				· · · · · · · · · · · · · · · · · · ·						N/A	
										N/A	
										N/A	
										N/A	
Final:										N/A	
SAMPLE COLLE		1					1				
Date: SJU		-	Time: /73	D AM/PM	Meth	od: 7	yphoon	mini	w/cont	rolev	
		N A	t o	9NCMOC	- CrW04 7	2173	D RNS GIL	hocau	17: 20 C	30	
Appearance of S	Sample:	<u>('lear</u>			Actu	al samp	le flow rate:		n	ni/min or	
			6-404	el Vial	WHCL	(GR	2) [17 Au	Benz, K	laph.	L/miņ	
SAMPLE BOTTL	E COLLECT	TED: _	1-250	nie pay	~ Sultar	=5 {-	2) 1 HAN ACLOZ	loer pl	eo/Reo		
			1-250	rul w/HI	103 - Met	<u>ગ્ર</u> ારડ	- AK102	AK(03			
SAMPLING PER							Λ				
Name: R.S	chlos	ser			Com	pany:	HECON	<u> </u>			
1										t i	

0	511								L38
CLIENT: B LOCATION: PROJECT #:	risto	T							-59
LOCATION:	NECay	se isce	>				-		1 1248
PROJECT #:	11264	2.20		ENTER	WELL LOCATI	ON:	IC	OMWO	4 5520
	and a second la						leg and the		· 67, 61
INSPECTION									
Label on well?		3			ap locked?			(YES	NO
ls reference mai		10.0			nding water preser			YES	NO'
Condition of wel	l:	1ew- 150	DOD		indication of surfa	ce runoff in w	ell?	YES	NO
Weather:	u	undy, a	loudy	Air	Femperature:			402	
Notes:									
STATIC WATER				~					
Date: 815	109		Time: 905	AMIPM					
	7	22					_		
Depth to Water:		.33			isured with	ELECTRONIC		CHALK & STEEL	1
Length of Well:	7	.11		Dec	ontamination:	PRE STEAM C	LEANED	DIWATER	OTHER
WELL PURGING	3			~			2 /	11.	
Date: 8/5	109	Begin	Time: 🗾 💋	2915 (AM		quipment 🏒	erestal	Itic, 12	Jolt
		End T	ime: <u>/</u>	000 AM	PM Decontam		E STEAM CL	EANED DIW	ATER OTHER
CALCULATION OF	3 CASING VOLU	MES				Newfi	using	~	1
9.71		angth of well			Yield:		HIGH	LOW	
7.33		lepth to water		rge start)	If low, rec	overy time:	runged	dryCl	
1.38		ength of wate					e e 15	00 7.5	5
.67		conversion fa) 0.49		ume purged:		5 gallo	
Gailo		3 casing volu		lan have		rge flow rate:	.<		1
Notes: 🌈	ell vac	1 drug;	- Andrew Contractor of the second sec	the second s	very and		x.	L/mir	b
·	((0	the second second	South and the second se	cmoc ow			000	
Time	Volume	Depth to	pH	Conductivity	Turbidity	D.O.	Temp	ORP	Ferrous
	(gailons)	Water	(SU)	(umhos/cm)	(NTU)	(mg/L)	(°C)		lron
		(feet) <0.33'	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/~ 5°	+/- 10 mV	(mg/L)
Start: 0915	Inchal		5.84	0.236	+)- {0%	9,98	4.1	168	N/A
0948	1.0	9.00	5.71	0.21B		12.28	3.64	189	N/A
1000	1.5	Dry	5.13	0,210		13.01	4.13	189.8	N/A
the second s	one ha				overy to	Sampl		10 60	N/A
1500	1.0	1.55	5.94	0.179	15.6	9.65	and the second se	187.4	N/A
									N/A
-		<u> </u>						· ·	N/A
L						·			N/A
									N/A
									N/A
Final:									N/A
SAMPLE COLL	ECTION	b				0			
Date: 8151		7	ime:/500	AM/PM	Method: <u>/</u> Actual sample Switter t	evistalt	lic. se	lowor	2
			•		<u>.</u>	flow	,~50	rel/mi	in
Appearance of S	Sample:	yello	wish		Actual sample	e flow rate:	and a	្រ	nl/min or
			2-11th	were pre	sw/ thee t	or DRO	REDA	K102/AC	(QBin
SAMPLE BOTTI	LE COLLECT	ED:	1-250	al poly	As Sulfat	es lab 1	2=		and the second se
						meial	13		
SAMPLING PER	RSONNEL		0-41	out vial	spresw/a	KL VOV	- 0120	ALLOL, S	many to be
Name: K.	schlos	ser			Company:	BLOM	<u> </u>	0	aporder
- C									i

¥.

CLIENT: B LOCATION: PROJECT #:	NE Cal NE Cal 12642	pe Fsc 20	- P.lot	ENTER	WELL LOCAT	10N:	Icom	wos	
INSPECTION Label on well? Is reference mar Condition of well Weather: Notes:	1	en (YES YES	NO Star Any	ap locked? Iding water prese Indication of surfa Temperature:		vell?	YES YES YES	(2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2)(S) (2
STATIC WATER Date: <u>3</u> [4 Depth to Water:	<u>(09</u> <u>3.0</u>	>B) PURGING Time: ひてい	<u> </u>	sured with:	ELECTRONIC	TAPE	CHALK & STEEL	TAPE
Length of Well: 9;50					ontamination:	PRE STEAM (CLEANED	DI WATER	OTHER
WELL PURGINO	0 B/4(0	End 1	Time: <u>(</u> [:] ĩme:	350 AM		Equipment <u>Ju</u> nination: Pr	ILL' TY		ATER OTHER
9.5D		ength of well			Yield:		HIGH	LOW)	- Comp
3.80		lepth to wate	er (before pu	rge start)	If low, red	covery time:			
570	ft =	length of wat	er column				~		
2.79		conversion fa				lume purged:			ns
Gallo		3 casing volu		Runs 18/4	o a Actual pu	irge flow rate:	~100	<u>oul</u> mVm	in or
Notes:	A. SAN	uple = (BANCANE	affected 6	DINCMO	$C C \omega \psi \gamma$		L/mir)
		r				0.0		000	
Time	Volume	Depth to	рН	Conductivity	Turbidity	D.O.	Temp	ORP	Ferrous
	(gallons)	Water (feət)	(SU)	(umhos/cm)	(NTU)	(mg/L)	(°C)		(mg/l)
1350	(Running)	<0.33'	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/~ 5°	+/- 10 mV	(mģ/L)
ALL LILLING	55	3,03	5.15	0,196	3(7.1	0.64	B.(7	201.4	N/A
1410 1350	1	299	5.15	0.194	182.6	0.75	241	127.3	N/A
1440 1410	2.5	3.50	5.12	0,192	25.9	1.76	9.50	201.0	N/A
+: 1500	6.0	4.00	5:14	0.(41	14.9	3.05	10.28	203.5	N/A
1525	6.2-	4.00	5.16	0192	12.9	\$3.07	11.04	206,3	N/A
1535	7,1	74.00	5.15	0,192	17.1	4.15	9.72	210.5	N/A
									N/A
									N/A
									N/A
									N/A
Final:									N/A
SAMPLE COLLE	109		Time: 1545	AMIPM	Method: <u>A</u>	Mini Typ	shoon	w/const	Loo 1
Appearance of S	Sample:	Clear			Actual sample	le flow rate:	\$100	г	nl/min oʻr
			6-40110	vial 5 Wil	tcl for co		_		1/min
SAMPLE BOTTL	E COLLECI	ED:	2 - 11 + A1	Mor w/ H	CL FOR Dire	PRO AK	102/AK	103 401-11-0 L	1.
			- 2001	m run y te	~ JUL 411407	1-20000	VIIII ML	i v me ra	سے د ر
SAMPLING PER Name: R-Sch	SONNEL Scheh	~ Price	ş.ç		Company	Arcon			I I
								·	

PROJECT #:	112624.	E ST.LA 20 IS	Wence LAND	ENTER	WELL LOCAT	ION:	Icom	wob.	
INSPECTION									
Label on well?		<	YES	NO Is ca	ap locked?			YEŚ Ź	NO
Is reference mar	k visible?	2	YES		nding water prese	n t?		YES	NO
Condition of well		ood n	To usle P		indication of surfa		e112		NO
Weather:	. U	a de	conge		Temperature:		ÇII ;	400	
	we	necy			emperature.			60	— I
Notes:									
STATIC WATER Date: 8/5			Time: 0900	1					
Depth to Water.	4.0	03		Mea	sured with:	ELECTRONIC		CHALK & STEEL	7405
Length of Welt	9.3				ontamination:	PRE STEAM C		DIWATER	OTHER
Lenger or weet						PRESTEAM	LEAINED C	HUVATER	UNRER
					· ·				
WELL PURGING	0	Deele	Time: 🕻	0915 AM		quipment R	evictal	tic	
Date: <u>8/5</u>	107	Begin End]		AM/					!
				AW/	PM Decontan		Lew T		ATER OTHER
CALCULATION OF 3		imes ength of well			Yield:			~	
9.20		lepth to wate	ar /hefore nu	rae start)		overy time:	HIGH	LOW	
4.03		length of wat		ige statt)	11 10 10, 120	overy une.			1
5.17		conversion fa		0.00	Actual up	lume purged:			
. 2.6 gals Gallo		3 casing volu		() 0.49		rge flow rate:		gallor	
Notes:		an of	HE OU	ANCMOC	And DS	ige now late.		ml/mi L/min	1
Notes.		myn		INCINC	Ghro		_	LIB	
Time	Volume	Depth to	PHq	Conductivity	Turbidity	D.O.	Tomp	ORP	Ferrous
1 10116	voluitie		pri	Conductivity	Including	D.O.	Temp		
	(gollopo)		(011)	(upphag/app)		(mall)	(00)		
	(gallons)	Water	(SU)	(umhos/cm)	(NTU)	(mg/L)	(°C)		Iron
	(gallons)	Water (feet)							
		Water (feet) <0.33'	+1-0.1	+/- 3%	+/- 10%	+/- 10%	+/- 5°	+/- 10 mV	Iron (mg/L)
Start: 0915	Instal	Water (feet) <0.33'	+1-0.1	+/- 3%		+/- 10%	+/- 5°	+/- 10 mV	Iron (mg/L) N/A
Start: 0915 0945	Instial	Water (feet) <0.33'	+/-0.1 5.92 5.86	+/- 3% D.169 D.161	+/- 10%	+/- 10%	+/- 5° 5.26 5.28	+/- 10 mV 119 172	Iron (mg/L) N/A N/A
Start: 0915 0945 1005	Instead	Water (feet) <0.33'	+1-01 5.92 5.86 6.00	+1-3% D.169 D.161 D.170	+/- 10%	+/- 10% 22.1 8.6 9.79	+/- 5° 5-26 5.28 4.53	+/- 10 mV 119 172 176	Iron (mg/L) N/A N/A N/A
Start: 0915 0945 1005 1025	Instel 1.5 2.0 2.5 DR	Water (feet) <0.33'	+/-0.1 5.92 5.86	+/- 3% D.169 D.161	+/- 10%	+/- 10%	+/- 5° 5.26 5.28	+/- 10 mV 119 172	Iron (mg/L) N/A N/A N/A N/A
Start: 0915 0945 1005 1025 1030	Instead 1.5 2.0 2.5 Dites Dry	Water (feet) <0.33'	+1-0.1 5.92 5.86 6.00 6.15	+/- 3% D.169 D.161 O.170 D.170	+/- 10%	+/- 10% 22.1 8.6 9-79 9-60	+/-5° 5.26 5.28 4.53 5.24	+/- 10 mV 119 172 176	Iron (mg/L) N/A N/A N/A N/A N/A
Start: 0915 0945 1005 1025 1030	Instel 1.5 2.0 2.5 DR	Water (feet) <0.33'	+1-0.1 5.92 5.86 6.00 6.15	+/- 3% D.169 D.161 O.170 D.170	+/- 10%	+/- 10% 22.1 8.6 9.79	+/-5° 5.26 5.28 4.53 5.24	+/- 10 mV 119 172 176	Iron (mg/L) N/A N/A N/A N/A N/A
Start: 0915 0945 1005 1025 1030	Ins 1.5 2.0 2.5 Dery Del(pu	Water (feet) <0.33'	+1-01 5.92 5.86 6.00 6.15	+1-3% D.169 D.161 D.170 D.170 D.178 Sample	+1-10% NT	+1-10% 221 8.6 9.79 9.60 Vecou	+1-5° 5.26 5.28 4.53 5.24 emy	+/- 10 mV 119 172 175 147.8	Iron (mg/L) N/A N/A N/A N/A N/A N/A
Start: 0915 0945 1005 1025 1030	Instead 1.5 2.0 2.5 Dites Dry	Water (feet) <0.33'	+1-0.1 5.92 5.86 6.00 6.15	+/- 3% D.169 D.161 O.170 D.170	+/- 10%	+/- 10% 22.1 8.6 9-79 9-60	+/-5° 5.26 5.28 4.53 5.24	+/- 10 mV 119 172 176	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A
Start: 0915 0945 1005 1025 1030	Ins 1.5 2.0 2.5 Dery Del(pu	Water (feet) <0.33'	+1-01 5.92 5.86 6.00 6.15	+1-3% D.169 D.161 D.170 D.170 D.178 Sample	+1-10% NT	+1-10% 221 8.6 9.79 9.60 Vecou	+1-5° 5.26 5.28 4.53 5.24 emy	+/- 10 mV 119 172 175 147.8	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 0915 0945 1005 1025 1030 W 1600	Ins 1.5 2.0 2.5 Dery Del(pu	Water (feet) <0.33'	+1-01 5.92 5.86 6.00 6.15	+1-3% D.169 D.161 D.170 D.170 D.178 Sample	+1-10% NT	+1-10% 221 8.6 9.79 9.60 Vecou	+1-5° 5.26 5.28 4.53 5.24 emy	+/- 10 mV 119 172 175 147.8	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A
Start: 0915 0945 1005 1025 1030 UV 1600 Final:	Instead 1.5 2.0 2.5 Die Dary Nellpu 1.0	Water (feet) <0.33'	+1-01 5.92 5.86 6.00 6.15	+1-3% D.169 D.161 D.170 D.170 D.178 Sample	+1-10% NT	+1-10% 221 8.6 9.79 9.60 Vecou	+1-5° 5.26 5.28 4.53 5.24 emy	+/- 10 mV 119 172 175 147.8	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 0915 0945 1005 1025 1030 1600 Final: SAMPLE COLLE	Instration 1.5 2.0 2.5 Dies Dary Nell/pu 1.0	Water (feet) <0.33'	+1-0.1 5.92 5.86 6.00 6.15	+1-3% D.169 D.161 D.170 D.170 D.178 D.179	+/- 10% NT J datter [3.5	+1-10% 221 8.6 9.79 9.60 Vecou	+1-5° 5.26 5.28 4.53 5.24 emy	+/- 10 mV 119 172 175 147.8	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A
Start: 0915 0945 1005 1025 1030 1600 Final: SAMPLE COLLE	Instead 1.5 2.0 2.5 Die Dary Nellpu 1.0	Water (feet) <0.33'	+1-01 5.92 5.86 6.00 6.15	+1-3% D.169 D.161 D.170 D.170 D.178 D.179	+1-10% NT	+1-10% 221 8.6 9.79 9.60 Vecou	+1-5° 5.26 5.28 4.53 5.24 emy	+/- 10 mV 119 172 175 147.8	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A
Start: 0915 0945 1005 1025 1030 1600 Final: SAMPLE COLLE Date: 815	I.D I.S 2.0 2.S Die Day Nell/pu I.D	Water (feet) <0.33'	+1-0.1 5.92 5.86 6.00 6.15	+1-3% D.169 D.161 D.170 D.170 D.178 D.179	+/- 10% 	+1-10% 221 8.6 9.79 9.60 1200 9.65	+1-5° 5.26 5.28 4.53 5.24 emy	+/- 10 mV 119 172 176 148.1 148.1	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 0915 0945 1005 1025 1030 1600 Final: SAMPLE COLLE	I.D I.S 2.0 2.S Die Day Nell/pu I.D	Water (feet) <0.33'	+1-0.1 5.92 5.86 6.00 6.50 6.55 124 - 5.94 Time: !60	+1-3% D.169 D.161 D.170 D.170 D.170 D.170 D.170 D.170 D.179	+/- 10% NT J daffer 13.5 Method: B Actual sample	+/- 10% 22.1 8.6 9.79 9.60 9.65 eo pump e flow rate:	+1-5° 5.26 5.28 4.53 5.24 eng 5.24 5.24	+/- 10 mV 119 172 175 148.1 148.1	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 0915 0945 1005 1025 1030 1030 1600 Final: SAMPLE COLLE Date: 8/5 Appearance of S	I.D I.S I.S Dry Nel(/pu I.D I.D Sample:	Water (feet) <0.33' NT L L L L L L L L L L L L L L L L L L	+1-0.1 5.92 5.86 6.00 6.15 124 5.94 Time: 160 pellow = 1-25	+1-3% D.169 D.161 D.170 D.170 D.170 D.170 D.179 D.179 D.179	+/- 10% NT	+/- 10% 22.1 8.6 9.79 9.60 9.65 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	+1-5° 5.26 5.28 4.53 5.24 eny 5.24 5.24 - Den - Den - Den	+/- 10 mV 119 172 176 148.1 148.1 148.1 148.1	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 0915 0945 1005 1025 1030 1600 Final: SAMPLE COLLE Date: 815	I.D I.S I.S Dry Nel(/pu I.D I.D Sample:	Water (feet) <0.33' NT L L L L L L L L L L L L L L L L L L	+1-0.1 5.92 5.86 6.00 6.00 6.00 6.00 6.00 6.00 6.00 6	+1-3% 0.169 0.161 0.170 0.170 0.178 Sample 0.179 0.179	+/- 10% NT J datter [3.3 Method: B Actual sample sulfaces [w/ttcc - GR	+/- 10% 22.1 8.6 9.29 9.60 <i>Vecon</i> 9.65 eo puny e flow rate: - 250ml of products	+1-5° 5.26 5.28 4.53 5.24 eny 5.24 5.24 5.24 5.24 5.24	+1- 10 mV 119 172 176 148.1 148.1 148.1 148.1 148.1 148.1	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 0915 0945 1005 1025 1030 1030 1030 1030 1000 Final: SAMPLE COLLE Date: 815 Appearance of S SAMPLE BOTTL	I.U. I.S 2.0 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S. Dev 2.S.	Water (feet) <0.33' NT L L L L L L L L L L L L L L L L L L	+1-0.1 5.92 5.86 6.00 6.15 124 5.94 Time: 160 pellow = 1-25	+1-3% 0.169 0.161 0.170 0.170 0.178 Sample 0.179 0.179	+/- 10% NT	+/- 10% 22.1 8.6 9.29 9.60 <i>Vecon</i> 9.65 eo puny e flow rate: - 250ml of products	+1-5° 5.26 5.28 4.53 5.24 eny 5.24 5.24 5.24 5.24 5.24	+1- 10 mV 119 172 176 148.1 148.1 148.1 148.1 148.1 148.1	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 0915 0945 1005 1025 1030 1030 1600 Final: SAMPLE COLLE Date: 8/5 Appearance of S	Instruction I.S 2.0 2.5 Day Left/pur 1.0 1.0 ECTION D9 Sample: E COLLECT RSONNEL	Water (feet) <0.33' NT L L L L L L L L L L L L L L L L L L	+1-0.1 5.92 5.86 6.00 6.00 6.00 6.00 6.00 6.00 6.00 6	+1-3% 0.169 0.161 0.170 0.170 0.178 Sample 0.179 0.179	+/- 10% NT J datter [3.3 Method: B Actual sample sulfaces [w/ttcc - GR	+/- 10% 22.1 8.6 9.29 9.60 <i>Vecon</i> 9.65 eo puny e flow rate: - 250ml of products	+1-5° 5.26 5.28 4.53 5.24 eny 5.24 eny 5.24 5.24 - Den 5.24 - Den 5.24 - Den 5.24 - Den 5.24 - Den 5.24 - Den 5.24 - Den 5.26 - Den 5.28 - Den 5.24 - Den	+1- 10 mV 119 172 176 148.1 148.1 148.1 148.1 148.1 148.1	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A

CLIENT: B LOCATION: PROJECT #:	NECA NECA 112642	PE .20		ENTER	WELL LOCAT	NON:	IC	omue)7
INSPECTION Label on well? Is reference mar Condition of well Weather. Notes:		bood	$ \rightarrow $	NO Stan Алу	p locked? ding water prese indication of surf emperature:		veli?	YES YES YES 400	20 20 20 20 20 20 20 20 20 20 20 20 20 2
STATIC WATER LEVEL JUST PRIOR TO PURGING Date: 450 Depth to Water: 568 Length of Well: 7.68 MEDIANE Decontamination: PRE STEAM CLEANED DI WATER OTHER 01 WATER									
WELL PURGING Date: B/ CALCULATION OF 3 9.60 5.68 9.92 Mailo Notes:	$\frac{5(09)}{\text{ft}}$ $\frac{5(09)}{\text{ft}}$ $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$	ngth of well lepth to wate ength of wat conversion fa 3 casing volu	ime:) 0.49	PM Decontai Yield: If low, re Actual vo	mination: Pr covery time: blume purged: urge flow rate;	<u>аја ј Ту</u> е steam die нідн (<u>- 9.1</u> имед	LOW	ATER OTHER
Time	Volume (gallons)	Depth to Water (feet)	pH (SU)	Conductivity (umhos/cm)	Turbidity (NTU)	D.O. (mg/L)	Temp (°C)	ORP	Ferrous Iron (mg/L)
	Total	<0.33'	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 5°	+/- 10 mV	:
Start: 1000	.5	5,18	5.68	0.257	380	1.01	2.96	156.6	NŻA
1035		5.91	5.65	1.257	31.1	DIL	290	108	N/A
1045	2.5	5.82	5.62	0.263	10.6	1:3/	2.55	95.0	N/A
1055	5.5	5.92	5.10	0.266	1.1	0.19	3-19	83.4	N/A
1105	6.5	5.92	5-72	0.267	4.8	0.41	4.23	76-0	N/A
1115	2.5	5.92	5.73	0.2.68	14.3	0.27	4.52	71.5	N/A
1/25	8.5	5.92	5.73	0.250	3.6	0.31	4.33	68.8	N/A
									N/A
									N/A N/A
Final:								x	N/A
SAMPLE COLLE	CTION	3 11	and the second second			-			(¥A
	ample:	yellow For	le \$		Method: (Actual samp me vice w Ander w Ander w So me poly	Her-C	~/00 RO, Ben AK102/	AK 103 -	Nation of
SAMPLING PER Name: R	Scho	sser	120			AECON		Long.	

DAY 3 SAMPLING FORMS

									19
									32
CLIENT: S LOCATION: PROJECT #:	N.E. C	APE		ENTER	WELL LOCAT	ION:	ICON	1002	
	11204	2.2.2							·
INSPECTION								\sim	
Label on well?		ζ	YES?		ap locked?			(TES)	NO
Is reference mark			YES		nding water presen				NÒ
Condition of well	: <u>(</u>	1000d		Any	indication of surfa	ce runoff in w	rell?	YES	NO
Weather:		edir, Sun	nny: C	Her Ar	Temperature:	Lip alin		55-63	
Notes:	Sam	ple el oc	inc moc	2 GW 19.24	Temperature: $400^{\circ} \pm 3/2$	parge	rale ^e e	5 mL a m 1-14 5	WE.
STATIC WATER					·····	······································			4
Date: 8	12009		Time: <u>130</u>	SAMPIT					
	, ,	, i		U		$\sim -$			
Depth to Water.		Ce Cra			sured with:	ELECTRONIC		CHALK & STEEL	TAPE
Length of Well:		8.46		Dec	ontamination:	PRE STEAM (CLEANED	DIWATER	OTHER
WELL PURGING	2			- Éla	<u></u>			· · · · ·	
	2009	Beain	Time	1315 0		automent M	in. The	CON & LOW	Flow Pant
		End 7		1350 AM			RE STEAM CLI		
CALCULATION OF 3	CASING VOLU	MES							
8.44	ft Le	ength of well			Yield:		HIGH	LOW	Î
4.67	ft (lepth to wate	r (before pu	rge start)	If low, rec.	overy time:		, ,	é .
	ft =	length of wat	er column						
		conversion fa		1) 0.49		ume purged:		gallo	15
Gallo		3 casing volu				rge flow rate:	112		· · ·
Notes:	<u></u>	may VOR		1410 6014	in Septur			nich pu	
Time	Volume	Depth to	pH	Conductivity	Turbidity	D.O.		ORP	Ferrous
-	(galions)	Water	(SU)	(umhos/cm)	(NTU)	(mg/L)	Temp (°C)	UKF	Iron
	(genera)	(feet)	(00)		((())))	(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			(mg/L)
		<0.33	+/- 0.1	+1-3%	+/- 10%	+/- 10%	+/- 5°	+/- 10 mV	
Start: 1315		1/4 81	1607						N/A
327		45.94	3.85	1.237	31.70	3.20	9.33	193	N/A
1332		4.48	<u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>	1.100	32.78	2,29	9.11	157	N/A
1337		4.95	4,50	0,987	33.61	1:0	9,22	127	N/A
1340		4,95	4.60	0.927	33,80 32,60	1.55	9,03	113 120	<u> </u>
1344				101019	22,60	1 1 1 2 1	716 7	96.9	N/A
1 1 1 1		4.45	4.97	DIVSCI			414	607	
1750		4.48	4,97	01880	34,70	1.50	9,24	93.7 91.6	
1350		4.48	4,97 5,02	01880			9,24 9,43	93.7 91.6	N/A N/A N/A
<u> 13</u> 50					34,70	1.50			N/A
」ろうひ Final:					34,70	1.50			N/A N/A
Final: SAMPLE COLLE		4,18	5,02	0,876	34,70	1,50	9:43	91.6	N/A N/A N/A N/A
Final: SAMPLE COLLE	CTION 206 ^C 1	4,18	5,02		34,70	1,50	9:43	91.6	N/A N/A N/A N/A
Final: SAMPLE COLLE Date: \$ 16	2069		5,02	0,876	34,70	1,50	9:43	91.6	N/A N/A N/A N/A
Final: SAMPLE COLLE	2069	4,18	5,02	0,876	34,70	1,50	9:43	91.6	N/A N/A N/A N/A
Final: SAMPLE COLLE Date: 8 16 Appearance of S	emple:	chez	5,02 Time: 13:	O, 876	34,70 34,70	1,50 1,49 1. M. Type Flow rate:	120	91.6	N/A N/A N/A N/A
Final: SAMPLE COLLE Date: \$ 16	emple:	chez	5,02 Time: 13:	O, 876	34,70 34,70	1,50 1,49 1. M. Type Flow rate:	120	91.6	
Final: SAMPLE COLLE Date: \$ 16 Appearance of S SAMPLE BOTTL	emple: E COLLECT	chez	5,02 Time: 13:	O, 876	34,70	1,50 1,49 1. M. Type Flow rate:	120	91.6	
Final: SAMPLE COLLE Date: 8 16 Appearance of S	emple: E COLLECT		5,02 Time: 13: 1-1 Liker 1-1 Liker	O, 876	34,70 34,70	1,50 1,49 1,49 1,49 1,49 1,50 1,50 1,50 1,50 1,50 1,50 1,50 1,50	120	91.6	

INSPECTION VES NO Is cap locked? VES NO Is reference mark visible? VES NO Standing water present? YES NO Condition of well: $\bigcirc \bigcirc $						
Date: 8 / 15 / 2009 Time: 105 / AM/PM Depth to Water: 3.12 Measured with: ELECTRONIC TAPE CHALK & STEEL TAPE Length of Well: 9:577 Decontamination: PRE STEAM CLEANED DI WATER OTHER						
Depth to Water: <u>3.12</u> Measured with: <u>Electronic Tape</u> Chalk & steel tape Length of Welt <u>9.57</u> Decontamination: PRE STEAM CLEANED DI WATER OTHER						
Depth to Water: 3.12 Measured with: ELECTRONIC TAPE CHALK & STEEL TAPE						
Date: 8/10/2009 Begin Time: 1052 (MPM Purging Equipment Mini Typon & Low Flow Cont						
CALCULATION OF 3 CASING VOLUMES Yield: HIGH 9.50 ft Length of well Yield: 3.12 ft - depth to water (before purge start) If low, recovery time:						
ft ≈ length of water column x conversion factor (2" well) 0.49 Actual volume purged: gallons						
Gallons = 3 casing volumes Actual purge flow rate: (60 Notes: Umin						
TimeVolume (gations)Depth to WaterpH (SU)Conductivity (umhos/cm)Turbidity (NTU)D.O. (mg/L)Temp 						
<0.33' +/-01/40 +/-3% +/-10% +/-10% +/-10 mV						
104 1,360 4.03 1.68 14.46 12.77 1.78 17.57 393.6 N/A 101 1696 4.03 1.69 14.48 10.07 1.57 1762 3424 N/A						
110 2816 4.03 1.23 1447 9.86 1.52 12.83 391.1 NA						
1113 4.03 1.73 14.46 4.96 1.34 12.93 391.7 NA						
1111 4.07 1.73 14.44 10.63 1.28 1808 392.6 NA						
1119 4.03 1.70 14.51 10.02 1127 18.06 394.4 NA						
N/A						
N/A N/A Image: Im						
Image: Note of Sample: Image: Clear, red N/A						
N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A <						
Image: Solution of Sample:						

.

CLIENT: R LOCATION: PROJECT #:	N.E. C 11264	APE 2.20		ENTER	WELL LOCAT	ion:	ICON	uw 04	
INSPECTION Label on well? Is reference mark Condition of well Weather: Notes:		Ge Ge udy Wi WCMOG	nd s-10m	NO Star Алу	ap locked? ading water presen indication of sunfa femperature: = 26		ell?	YES YES YES 46- 48 ²⁰	NO (D) NO
STATIC WATER	LEVEL JUS / 2009		DURGING	(MAN)					
Depth to Water. Length of Well:		98 9.71		Mea	sured with: ontemination:	PRE STEAM C		GHALK & STEEL DI WATER	TAPE OTHER
WELL PURGING Date: <u>8/15</u>		Begin End 1	Time:	1354 AM	PM Purging E	iguloment <u>M</u> hination: Pr	ini Typ		Flow Cont
CALCULATION OF 3	ft Le	ngth of well		Parged Dri			HIGH	Low	
6.98		lepth to wate length of wai		rge start)	If low, rec	overy time:			-
		conversion fa		0.40	Actual	ume nurged-			
Gallo		3 casing volu		10.49		ume purged: rge flow rate:	1 00	gallo: [: //mi/mi/mi/mi/mi/mi/mi/mi/mi/mi/mi/mi/mi	
Notes:	·{	oumpe	9.31 (F	· ~ +u/(2)	. Auta pu				
Time	Volume (gallons) Mr.c.	Depth to Water (feet)	рН (SU)	Conductivity (umhos/cm)	Turbidity (NTU)	D.O. (mg/L)	Temp (°C)	ORP	Ferrous Iron (mg/L)
પ્ર		<0.33'	+/-0.1	+/- 3%	+/- 10%	+/- 10%	+/- 5°	+/- 10 mV	
Stari: 350	Intick		-5-167-	0.201		11			N/A
1404 175T	ZOZUL	77,10	5.62	0,204	23,51	4,87	5,23	90,8	N/A
<u>(409</u>	2500	77.10	5.67	0,208	24,59	4.02	5:45	85.8	N/A
1413	2300	77.10	5.01	5,210	22,91	3,58	5.26	85,6	N/A N/A
1421	3700	77.10	5166	0,212	21,89	3,50	6.00	90,9	N/A
	Przp	to Sump	Photo and Photo	well dige		VOA FILL		iver m	NVA
1436	4200	477.10							N/A
1625		-							Ń/A
j050	•								N/A
Final:									N/A
SAMPLE COLLE							1.	<i>C</i> .	1 1
Date: BIS	2009		Time: 1050	ANTPM	Method: 👖	ini ypl	1000/10	w flow (c	ntar
Appearance of S	ample:	clear			Method: 🗾 🔊	e flow rate:	100	^ў (п	aymin or
SAMPLE BOTTL		ED:)-1 Liter	Amber HC VOA'S HCL	L Pre-				L'min
SAMPLING PER				_		A .			
Name: Lanc	£6.1	REUS	>5		Company: #	AEcon			i
									1

CLIENT- Q		ł			P	میکی از در اور مشکل کشور	JLP 8	117 69 117 69 117 109 117 109 117 109	170 180 180 180 180
CLIENT: Q LOCATION: PROJECT #:	N.E. (11264	2.20		ENTER	WELL LOCA	TION:	ICON	<u>4.WO</u>	5
INSPECTION Label on well? Is reference man Condition of well Weather: Notes:	<u>د م</u> داەر			NO Star Any Air T 	ap locked? Inding water prese Indication of surf Temperature:	face runoff in w		YES YES YES Hot	NO NO NO NO NO NO NO NO NO NO NO NO NO N
	2009		Time 8	AMPM)					-
Depth to Water: Length of Well:		<u>3.87</u> 5.45			sured with ontamination:	PRE STEAM		CHALK & STEEL	OTHER
WELL PURGING Date: 8/15	12009	Begin	Time:	<u>1924</u> амл амл		Equipment <u>M</u> mination: Pr	E STEAM CLE		Flow Cont
CALCULATION OF 3	ft Le	imes ength of well lepth to wate	er (before pu	rge start)	Yīeld: If low, re	covery time:	HIGH	LOW	
Gallo Notes:	X	length of wat conversion fa 3 casing volu	actor (2° wel	1) 0.49		olume purged: urge flow rate:	/ U ⁽²⁾	gallo milim Dinin	jiz or
Tîme	Volume (gallons)	Depth to Water (feet)	pH (SU)	Conductivity (umhos/cm)	Turbidity (NTU)	D.O. (mg/L)	Temp (°C)	ORP	Ferrous Iron (mg/L)
. 0 . 7	~	<0.33'	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 5°	+/- 10 mV	:
Start: 1974 1934	Indich	4.41	«.3 is	18,92	66,65	10.50	14.41	410.6	N/A N/A
1937	4	7.6	1.32	19.29	21.36	16.39	14.88	417.3	N/A
1940		>5.6	1.10	17.17	18.79	14.16	1508		N/A
[14]		75.6	1.30	19.08	15,76	14.38	14.89	410.9	N/A
1946		75.6	1.29	1706	18.57	14.65	14.82	411 5	N/A N/A
2020	10 215	5 Ellin	6 1/ DA '51	12) had Ch					N/A
			J		<u> </u>				N/A
									N/A
Final:				5					N/A
SAMPLE COLLE Date: 8/15	12009		Time 2150	AMITEM	Method:	Aini-Typo	on & Lon	· Flow C	onhola.
Appearance of S	ample:	purk re	d		Actual samp	le flow rate:			nd/mun or Limin
SAMPLE BOTTL				Amber 40 VOA'S HEL					
SAMPLING PER Name: Lanc		PREUS	5		Company:	AEcon			

LOCATION: PROJECT #:	N.E. C 11264	APE 2.20		ENTER	WELL LOCAT	ion:	TCOM	uw o G	· ·
INSPECTION Label on well? Is reference man Condition of well Weather: Notes:	: Curr	Goud nd Fogu of Pum		NO Star Any N Air T	ap locked? nding water prese Indication of sum remperature:	ลิce การอรี มา พ		YES YES YES 40 -42 40 -42 40 -42 40 -42 40 -42	
STATIC WATER	LEVELJUS		PURGING			Û	gNLMOU	CGWIDL	
Depth to Water: <u>4.20 4.01</u> Measured with: <u>ELECTRONIC TAPE</u> CHALK & STEEL TAPE Length of Well: <u>7.20</u> Decontamination: PRE STEAM CLEANED DI WATER OTHER WELL PURGING								, 1	
	12009	Beain	Time	15-40_ AMA		Equipment M	ini Tro	The street	Flow, Cont
CALCULATION OF 3		End T		AM/	-		RESTEAMCL		ATER OTHER
9,20		ngth of well	- 05		Yield:		HIGH	LOW	
<u>4.0)</u> <u>5,19</u>		epth to wate		rge start)	IT IOW, TEC	covery time:		i	
1.60		conversion fa		1) 0.49	Actual vo	iume purged:		gallo	ns
Gallo		3 casing volu		<u></u>		irge flow rate:	160		· · · ·
Notes:		clear,~	1 SULID	5 hut rai	mel Colore	. J.		 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	1 1
				/	1				
Time	Volume (gallons)	Depth to Water	pH (SU)	Conductivity (umbos/cm)	Turbidity (NTU)	D.O. (mg/L)	Temp (°C)	ORP	Ferrous
	(genone)	(feet)	(00)	(ennesion)	(((10))	(mgn=)	()		(mg/L)
		<0.33'	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 5°	+/- 10 mV	
Start: 1540	her-2			mr. Slave					NA
1550	1000mL	75.50	1,24	20,87	63.96	2.51	1,60	419.7	NÏA
1555	1570	75150	1,17	2111	6 8 ; DI	2,45	9,93	917,8	N/A
1200	2000	75.50	1.12	21.23	80:30	1 2.52	9.65	420.1	N/A
	2500	75.50	1.07	70 62	79,2	2.65	8,24	423.9	N/A
1605									
1605	3000	75,50	(,))	20.60	76.0	2.47	8.27	423	N/A
	3000	75,50	(, 0)	20:60	76.0			42-3	N/A N/A
	3000	75,50	(, 0 \	20.66	76.0			423	N/A N/A N/A
	3000	75150	(, 0)	70.60	76.0			423	N/A N/A N/A N/A
/ (L) C						2.47	8.27	423	N/A N/A N/A N/A N/A
1610 Final: 161715		76.50	1,00	7.0.61	76.U 73.O			425	N/A N/A N/A N/A
Final: 161715		76.50	1.00 D JA	J. 0. 61	7'3. O	2.47	8.24	425	N/A N/A N/A N/A N/A
Final: 161715		76.50	1,00	7.0.61		2.47	8.27	425	N/A N/A N/A N/A N/A
Final: 161715 SAMPLE COLLE Date: 5	CTION 118/09	76.50		J. B. BI AMMM J. J. P.	7'3. 🗸 Method: 👔	2.47 2.47 2.49	8.24	425 425 2/Low	N/A N/A N/A N/A N/A Flow
Final: 161715	CTION 118/09	76.50		J. B. BI AMMM J. J. P.	7'3. O	2.47 2.47 2.49	8.24	425 425 2/Low	N/A N/A N/A N/A N/A Flow Ve (a
Final: 161715 SAMPLE COLLE Date: 5/	ECTION 18/83 Fample:	76.50 201 Clew, b.	Time: 10 Time: 10 Towish v	AMPM AMPM El.	ی . 7 [.] 3 Method: ۲ Actual sampl	2.47 2.47 2.49	8.24	425 425 2/Low	N/A N/A N/A N/A N/A Flow
Final: 161715 SAMPLE COLLE Date: 5	ECTION 18/83 Fample:	76.50 2011 Clew, h.	Time: 10 Time: 10 rowsish v	J. B. 61 AMPM S. J. P ed. Amber 40	7'3. ن Method: ٢ Actual sampl	2.47 2.47 2.49	8.24	425 425 2/Low	N/A N/A N/A N/A N/A Flow Ve (a
Final: 161715 SAMPLE COLLE Date: 57 Appearance of S SAMPLE BOTTL	ECTION 118/02 Fample: E COLLECT	76.50 2011 Clew, h.	Time: 10 Time: 10 rowsish v	AMPM AMPM El.	7'3. ن Method: ٢ Actual sampl	2.47 2.47 2.49	8.24	425 425 2/Low	N/A N/A N/A N/A N/A Flow Ve (a
Final: 161715 SAMPLE COLLE Date: 5/	ECTION 18/8 ² 7 Eample: E COLLECT SONNEL	76.50 201 Clew, h. ED:	Time: 10 Time:	J. B. 61 AMPM S. J. P ed. Amber 40	7'3. ن Method: ٢ Actual sampl	2.47 2.49 2.49	8.24	425 425 2/Low	N/A N/A N/A N/A N/A Flow Ve (a

کر (

CLIENT: B. LOCATION: N PROJECT #:	1, 2, 6 1 (2, 64	APE 2.20		ENTER	R WELL LOCAT	ion:	ICON	4.W07	7
INSPECTION Label on well? Is reference mark Condition of well: Weather. Notes:	(Souly 4 OGNCY	YES) V - '5V ^V	NO Sta Any	ap locked? nding water present Indication of surfa Temperature:		elî?	YES YES YES LIT SOU	
STATIC WATER L Date: 8/15	EVELJUS 2009		PURGING	AM/EM					
Depth to Water. Length of Well:	5.60 9.60			sured with; ontamination:	ELECTRONIC PRE STEAM C		CHALK & STEEL	TAPE	
WELL PURGING Date: 8/15/		End 7		1451 ANI/ 1540 AMI	PM Purging E PM Decontan	Equipment M nination: PR	E STEAM CL		Flow Cont
$ \begin{array}{c} \text{CALCULATION OF 3 C} \\ \begin{array}{c} \text{A} & \text{B} \\ \end{array} \\ \end{array} \begin{array}{c} \text{A} & \text{B} \\ \end{array} \\ \end{array} \begin{array}{c} \text{A} & \text{B} \\ \end{array} \\ \begin{array}{c} \text{A} & \text{B} \\ \end{array} \\ \end{array} \end{array} \begin{array}{c} \text{A} & \text{B} \\ \end{array} \\ \end{array} \begin{array}{c} \text{A} & \text{B} \\ \end{array} \\ \end{array} \end{array} \begin{array}{c} \text{A} & \text{B} \\ \end{array} \\ \end{array} \begin{array}{c} \text{A} & \text{B} \\ \end{array} \\ \end{array} \end{array} \begin{array}{c} \text{A} & \text{B} \\ \end{array} \\ \end{array} \end{array} \begin{array}{c} \text{A} & \text{B} \\ \end{array} \\ \end{array} \end{array} $ \begin{array}{c} \text{A} & \text{B} \\ \end{array} \end{array} \end{array}	t Le t <u>~d</u> t =1	MES ngth of well epth to wate ength of wat conversion fa	er column			covery time: lume purged;	HIGH	LOW	
Gallons Notes:	s =:		imes	<u>170.49</u>		rge flow rate:		gallo <u>m:1/m</u> :mil/m mic for Umi	in or
Time	Volume (gallons)	Depth to Water (feet)	pH (SU)	Conductivity (umhos/cm)	Turbidity (NTU)	D.O. (mg/L)	Тетр (°С)	ORP	Ferrous Iron (mg/L)
Start: 12351	Juliel.	<0.33	+/- 0.1	+1-3%	+/- 10%	+/- 10%	+/- <u>5</u> °	+/- 10 mV	N/A
1456	50000	5,70	6.55	01387	139	1.72	4203	- 56	N/A
1501	1000mL	5.72	6.36	C 138E	136	2173	3,6%	-6.7	N/A
1500	1 SOOM &	5.75	6158	0,410	59.34	1.16	1,39	-65	N/A
1511	2000mi	5.76	6.62	01415	33.64	1.52	4.17	-604	N/A
1515	2 400pel	2.76	6.64	6.415	131	1:43	21.12-	-65.0	N/A
									N/A
		·mg_ (6		1					N/A
1800					SAMPLES N.			read	N/A
	o notil	en wit	n Que	ching-	+ Hell, Rece	licit.or	e		N/A
Final: 2200									/ N/A
SAMPLE COLLEC				Las					
Date: K/15/0	3		Time: 15	CAM/FM	Method: 😥	on Type	281.00	write w	- -
Appearance of Sa	mple:	C. (2)	12	Amber He	Actual sampl	e flow rate:	100,-	it frim.	יס תנחו/נא הס רנחו/נא
SAMPLE BOTTLE	COLLECT		+ MAM	VOA'S HEL	Re-				E .
CAMPLING DED		<u>.</u>							
SAMPLING PERS		REUS	>5		Company: a	AEcon			

PROJECT #:	1(2009								
NSPECTION Label on well? Is reference ma Condition of we Weather: Notes:	rk visible? 11: උ(උ	Coned Fundy, L:	YES	NO Star	ap locked? nding water prese indication of sun Temperature:		veli?	YES YES YES 45-50 ⁷⁰	NO NO NO
STATIC WATE	R LEVEL JUE 5 / 2009			(AM/PM		·		÷	
Depth to Weter: Length of Well:	6	,65	11:05		asured with: contamination:	ELECTRONIC PRE STEAM (CHALK & STEEL DI WATER	TAPE OTHER
WELL PURGIN Date: <u>8/15</u>	g 1 2009		n Time:	AM/ AM/		Equipment M	E STEAM CL		Flan Corr
CALCULATION OF	3 CASING VOLU								
9.35		ength of well			Yield:		HIGH	(LOW)	
6165		depth to wate		rge start)	-	covery time:			
2.70	ft =	length of wat	ter column						
<u>2.70</u> 1.30		•	-			olume purged:		alleo	ns
1,30	<u>х</u> Элс =	conversion fa	actor (2° well) 0.49	Actual v	olume purged: urge flow rate:	1 126 (1)	gallo gallo	
	<u>х</u> Элс =	conversion fa	actor (2° well) 0.49	Actual v	olume purged: urge flow rate:	1 126 ML 2 20ML		în or
<u> , 30</u> Gall	<u>х</u> Элс =	conversion fa	actor (2° well		Actual v		1 1JC ML Z Yome	/m m mum	în or
<u> , 30</u> Gall	<u>х</u> Элс =	conversion fa	actor (2° well) 0.49	Actual v		1 /JC ML 2 20 ML	/m m mum	în or
<u> ,30</u> Galle Notes:	опs =	conversion fa 3 casing volu GNC MCC	actor (2° well umes ,GW/3	<u>)0.49</u> ∻ MUC# Z	Actual v Actual p	urge flow rate:	`	/11 71 ml/m /1 71 L/mls	ີຄຸດr າ
<u> ,30</u> Galle Notes:	ons =	conversion fa 3 casing volu $\frac{\partial NCMCC}{\partial Depth to}$	actor (2° well umes / 3 pH	<u>) 0.49</u>	Actual v Actual p 	Urge flow rate:	Temp	/11 71 ml/m /1 71 L/mls	ο οτ η Γεπουσ
<u> ,30</u> Galle Notes:	Volume (gallens)	conversion fa 3 casing volt <i>JNC M(C)</i> Depth to Water (feet) <0.33'	actor (2° well umes <u>らい/ 3</u> pH (SU) +/- 0.1) 0.49 → MUC # 2 Conductivity (umhos/cm) +/- 3%	Actual v Actual p - S Turbidity (NTU) +/- 10%	Urge flow rate: D.O. (mg/L) +/- 10%	Temp (°C) +/- 5°	/11 70 · mb/m /m · L/mb ORP +/- 10 mV	n Perfous Iron (mg/L)
<u>// 30</u> Gall Notes: Time Start: 1365	Volume	conversion fr 3 casing volu <u>JNCMCC</u> Depth to Water (feet) <0.33'	actor (2° well umes <i>らいバ 3</i> pH (SU)) 0.49 ☆ MUC [#] 2 Conductivity (umhos/cm)	Actual y Actual p - S Turbidity (NTU)	D.O. (mg/L)	Temp (°C)	ORP	n Ferrous Iron (mg/L)
<u>/, 30</u> Gall Notes: Time Start: <u>1365</u> 	Volume (galleris) M - 5 40	conversion fa 3 casing volu $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}$	ector (2° well umes <i>JG W/ 3</i> pH (SU) +/- 0.1 5. <i>b</i> 7) 0.49 implies implies the first of the fir	Actual v Actual p - S Turbidity (NTU) +/- 10%	Urge flow rate: D.O. (mg/L) +/- 10%	Temp (°C) +/- 5°	/11 70 · mb/m /m · L/mb ORP +/- 10 mV	fsnor Ferrous Iron (mg/L) N/A N/A
<u>/, 30</u> Gall Notes: Time Start: <u>1365</u> <u>1315</u> Start: <u>735</u>	Volume (galleris) M- 540	conversion fa 3 casing volu JNCMCC Depth to Water (feet) <0.33' G.75 Co.75 Co.75	ector (2° well umes <u>5 W / 3</u> pH (SU) +/-0.1 5.69 Le 80) 0.49 → MUC # 2 Conductivity (umhos/cm) +/- 3%	Actual v Actual p Turbidity (NTU) +/- 10%	Urge flow rate: D.O. (mg/L) +/- 10% J 9.0/	Temp (°C) +/- 5° 3 ,76	/11 Th · mbm /m · L/mbm ORP +/- 10 mV 89.9	in or Ferrous Iron (mg/L) N/A N/A N/A
$\frac{1}{30}$ Galli Notes: Time Start: 1365 1315 5277 1320	$\frac{x}{=}$ $\frac{y}{0}$	conversion for 3 casing volu $\frac{1}{1000} \frac{M_{C}}{M_{C}}$ Depth to Water (feet) <0.33' $\frac{1}{1000}$ $\frac{1}{1000}$ $\frac{1}{1000}$ $\frac{1}{1000}$	ector (2° well umes <u>5 W/3</u> pH (SU) +/-0.1 5.69 (Le 80 5.6/	$\frac{0.49}{1000} = 1000$	Actual v Actual p - S Turbidity (NTU) +/~ 10% 9 5 	Urge flow rate: D.O. (mg/L) +/- 10% J f.Oi 4,/0	Temp (°C) +/-5° 3,76 4.45	/11 Th · ml/m /11 Th · L/ml/ ORP +/- 10 mV 89.9	in or Ferrous Iron (mg/L) N/A N/A N/A N/A
<u>1, 30</u> Gall Notes: Time Start: <u>1365</u> 1315 5277 <u>1325</u> 1325	$\begin{array}{r} x \\ = \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	conversion for 3 casing volt $7 \times C M_{C}$ Depth to Water (feet) < 0.33' $9 \times 5^{\circ}$ (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0	ector (2° well umes 50/3 pH (SU) +/-0.1 509 (Le 80 5.6/ 5.70) 0.49 → MUC # 2 Conductivity (umhos/cm) +/- 3% 2 , 191 in L Min · 0 , 191 0 , 194	Actual v Actual p Actual p Turbidity (NTU) +/~ 10% 9 5 9 90, 91 85,61	Urge flow rate: D.O. (mg/L) +/- 10% J f . 0 j 4 . / 0 4 / 0	Temp (°C) +/-5° 3,76 4/245 5(/11 Th · ml/m /11 Th · L/ml/m ORP +/- 10 mV 89.9 88.6 28.6 28.5	in or Ferrous Iron (mg/L) N/A N/A N/A N/A N/A
<u>1,30</u> Gall Notes: Time Start: <u>1365</u> <u>1315</u> SeTT 1320	$\frac{x}{=}$ $\frac{y}{0}$	conversion for 3 casing volu $\int \int C M(C)$ Depth to Water (feet) <0.33' g_{1} δ_{1} δ_{2} δ_{2} δ_{2} δ_{3} δ_{2} δ_{2} δ_{3} δ_{3} δ_{2} δ_{3} δ_{2} δ_{3} δ_{2} δ_{3} δ_{3} δ_{3} δ_{2} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3	ector (2° well umes GW/3 pH (SU) +/-0.1 5.69 Le 80 5.61 5.70 5.71	$\frac{0.49}{10.00} = 1000 \pm 2000 \pm 20000 \pm 200000000$	Actual v Actual p Actual p Turbidity (NTU) +1-10% 95^{-} 95^{-} 90, 91 90, 72	Urge flow rate: D.O. (mg/L) +/- 10% J 9.0/ 4.70 4.70 4.71 Lin 8.7.7	Temp (°C) +1-5° 3,76 4243 5.11 5.11 5.10	/11 Th' ml/m Th' L/mls ORP +/- 10 mV 89.9 89.9 	Ferrous Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A
<u>1, 30</u> Gall Notes: Time Start: <u>1365</u> 1315 5277 <u>1325</u> 1325	$\begin{array}{r} x \\ = \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	conversion for 3 casing volt $7 \times C M_{C}$ Depth to Water (feet) < 0.33' $9 \times 5^{\circ}$ (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0.175) (0	ector (2° well umes 50/3 pH (SU) +/-0.1 509 (Le 80 5.6/ 5.70	$\frac{0.49}{10.00} = 1000 \pm 2000 \pm 20000 \pm 200000000$	Actual v Actual p Actual p Turbidity (NTU) +/~ 10% 9 5 9 90, 91 85,61	Urge flow rate: D.O. (mg/L) +/- 10% J 9.0/ 4.70 4.70 4.71 Lin 8.7.7	Temp (°C) +1-5° 3,76 4243 5.11 5.11 5.10	/11 Th' ml/m Th' L/mls ORP +/- 10 mV 89.9 89.9 	in or Ferrous Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A
<u>1, 30</u> Gall Notes: Time Start: <u>1365</u> 1315 Set 7 1325 1325 1325	$\begin{array}{r} x \\ = \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	conversion for 3 casing volu $\int \int C M(C)$ Depth to Water (feet) <0.33' g_{1} δ_{1} δ_{2} δ_{2} δ_{2} δ_{3} δ_{2} δ_{2} δ_{3} δ_{3} δ_{2} δ_{3} δ_{2} δ_{3} δ_{2} δ_{3} δ_{3} δ_{3} δ_{2} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3	ector (2° well umes GW/3 pH (SU) +/-0.1 5.69 Le 80 5.61 5.70 5.71	$\frac{0.49}{10.00} = 1000 \pm 2000 \pm 20000 \pm 200000000$	Actual v Actual p Actual p Turbidity (NTU) +1-10% 95^{-} 95^{-} 90, 91 90, 72	Urge flow rate: D.O. (mg/L) +/- 10% J 9.0/ 4.70 4.70 4.71 Lin 8.7.7	Temp (°C) +1-5° 3,76 4243 5.11 5.11 5.10	/11 Th' ml/m Th' L/mls ORP +/- 10 mV 89.9 89.9 	in or Ferrous Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A
<u>1, 30</u> Gall Notes: Time Start: <u>1365</u> 1315 5277 <u>1325</u> 1325 1325 1325 1325	$\begin{array}{r} x \\ = \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	conversion for 3 casing volu $\int \int C M(C)$ Depth to Water (feet) <0.33' g_{1} δ_{1} δ_{2} δ_{2} δ_{2} δ_{3} δ_{2} δ_{2} δ_{3} δ_{3} δ_{2} δ_{3} δ_{2} δ_{3} δ_{2} δ_{3} δ_{3} δ_{3} δ_{2} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3	ector (2° well umes GW/3 pH (SU) +/-0.1 5.69 Le 80 5.61 5.70 5.71	$\frac{0.49}{10.00} = 1000 \pm 2000 \pm 20000 \pm 200000000$	Actual v Actual p Actual p Turbidity (NTU) +1-10% 95^{-} 95^{-} 90, 91 90, 72	Urge flow rate: D.O. (mg/L) +/- 10% J 9.0/ 4.70 4.70 4.71 Lin 8.7.7	Temp (°C) +1-5° 3,76 4243 5.11 5.11 5.10	/11 Th' ml/m Th' L/mls ORP +/- 10 mV 89.9 89.9 	in or Ferrous Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
$\frac{1}{130}$ Gall Notes: Time Start: 1365 1315 SET 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 1255 125	$\begin{array}{r} x \\ = \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	conversion for 3 casing volu $\int \int C M(C)$ Depth to Water (feet) <0.33' g_{1} δ_{1} δ_{2} δ_{2} δ_{2} δ_{3} δ_{2} δ_{2} δ_{3} δ_{2} δ_{3} δ_{2} δ_{3} δ_{2} δ_{3} δ_{3} δ_{2} δ_{3} δ_{2} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3} δ_{3	ector (2° well umes GW/3 pH (SU) +/-0.1 5.69 Le 80 5.61 5.70 5.71	$\frac{0.49}{10.00} = 1000 \pm 2000 \pm 20000 \pm 200000000$	Actual v Actual p Actual p Turbidity (NTU) +1-10% 95^{-} 95^{-} 90, 91 90, 72	Urge flow rate: D.O. (mg/L) +/- 10% J 9.0/ 4.70 4.70 4.71 Lin 8.7.7	Temp (°C) +1-5° 3,76 4243 5.11 5.11 5.10	/11 Th' ml/m Th' L/mls ORP +/- 10 mV 89.9 89.9 	in or Ferrous Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A
$\frac{1}{130}$ Galli Notes: Time Start: 1365 1315 5277 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 135 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 1355 15	$\begin{array}{c} x \\ = \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	conversion fit 3 casing volt $\int \int C M(C)$ Depth to Water (feet) <0.33' g_{1} , g_{2} f_{2} , f_{3} f_{1} , f_{3} f_{2} , f_{3} f_{1} , f_{3} f_{2} , f_{3} f_{1} , f_{3} f_{2} , f_{3} f_{3} , f_{3} , f_{3} , f_{3} f_{3} , f_{3} , f_{3	ector (2° well umes SW13 pH (SU) +/-0.1 5.69 (Le 80 5.61 5.70 5.70 5.70 5.70) 0.49 Thuc # 2 Conductivity (umhos/cm) +1-3% 2, 191 in L Min · 0.194 0.194 0.196 0.196 0.196	Actual v Actual p Actual p Turbidity (NTU) +1~10% 9 5 9 5 9 0.92 9 0.92 9 0.72 9 0.72	Urge flow rate: D.O. (mg/L) +1-10% J 7.01 4.10 4.10 4.21 J3-8 7.2) j.5: h	Temp (°C) +1-5° 3,76 47.495 5.11 5.60 MpPT	/11 Th' milm The CRP + 10 mV 89.9 88.6 88.6 88.6 10. 10.	Ferrous Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
<u>1, 30</u> Gall Notes: Time Start: 1365 1315 5277 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1325 1226 1325 1226 1226 1226 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 1225 125 1	$ \begin{array}{c} $	conversion fit 3 casing volt $\frac{3 \text{ casing volt}}{2 \text{ casing volt}}$ $\frac{3 \text{ casing volt}}{2 \text{ cond}}$ $\frac{3 \text{ casing volt}}{2 $	actor (2° well umes GW/3 pH (SU) +/-0.1 5.69 Le 80 5.61 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5) 0.49 c in UC # 2 Conductivity (umhos/cm) +1-3% 7.191 in L Min · 0.191 0.194 0.194 0.196 drig (? E) c AM/PM	Actual v Actual p Actual p Turbidity (NTU) +1~10% 9 5 9 5 9 0.92 9 0.92 9 0.72 9 0.72	urge flow rate: D.O. (mg/L) +/- 10% J $\hat{7}$. Oi 4i, $IO4i$, IO	Temp (°C) +1-5° 3,76 7,295 5.11 5,60 MpET	/11 Th' milm The CRP + 10 mV 89.9 88.6 88.6 88.6 10. 10.	Ferrous Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A

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CLIENT: 🖁	Istatel
LOCATION:	N.E. CAPE
PROJECT #	112642.20

ENTER WELL LOCATION:

ZLOP

ICOMW089

INSPECTION Label on well? NO is cap locked? NO Is reference mark visible? NO Standing water present? NÒ) ES Good NO Condition of well: Any indication of surface runoff in well? YES P.C 45-600 Weather. Clear to Air Temperature: 45-600 Notes: STATIC WATER LEVEL JUST PRIOR TO PURGING 8/15/2009 AMPM Date: Time: 6.89 Depth to Water. Measured with: ELECTRONIC TAPE CHALK & STEEL TAPE Length of Well: Decontamination: PRE STEAM CLEANED DIWATER OTHER WELL PURGING Purging Equipment Mini Typown Claw Flow Cont Decontamination: PRE STEAM CLEANED DIWATER (OTHER Date: 8/15/2009 Begin Time: AM/PM End Time: AM/PM OTHER CALCULATION OF 3 CASING VOLUMES 9.35 ft Length of well Yield: HIGH (LOW) 6,89 ft - depth to water (before purge start) If low, recovery time: 2.49 ft = length of water column 1.2415 x conversion factor (2° well) 0.49 Actual volume purged: gallons Actual purge flow rate: 225 Gallons = 3 casing volumes WELL HAS POOR Recovery, Durged Duy ELOW Flow Notes: Umin Time Volume Depth to Conductivity Temp ORP Ferrous pH Turbidity D.O. Water (umhos/cm) (gallens) (SU) (NTU) (mg/L) (°C) Iron (feet) (mg/L)ML +/- 3% +/- 10% +/- 10% +/- 5° +/- 10 mV <0.33' +/- 0.1 start: 1955 5.76 6,118 450 1,92 2.7 239 0,500 6.99 N/A 0.111 440 3.20 227.2 N/A 7,46 5,69 2000 1625 1.45 1850 5.62 0.112 250 198 N/A 8.01 5.82 4.13 2005 206 686.5 9.50 57 0.118 0.62 30.0 3,475 5 4.06 NIA 181.6 4,00 6,190 169 0.56 4.58 2015 5,100 ŃA N/A Foron All WELL Dungled SAMPLES CALEYT Je CT N/A N/A ŃA N/A Final: N/A SAMPLE COLLECTION Method: Mini Typoon+Lin Flow Control Actual sample flow rate: 225 mc (And mulmin or AMPM Date: Time: SLIGHTLY TUFBID. Appearance of Sample: ປະເກທີ 2-1 Liker Amber Her Pic SAMPLE BOTTLE COLLECTED: 6- YOML VOA'S HEL PLAD SAMPLING PERSONNEL Name: LÜNCE G. PREUSS Company: AECON

DAY 7 SAMPLING FORMS

CLIENT: NACE /BUNTOL LOCATION: NE LAPE AL PROJECT #:

ENTER	WELL	LOC	ATION
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N: TECMINOZ

INSPECTION					A				0000
Label on well?		~	YES	NO I	s cap looked?			YES	(NO)
)s reference mar		<	YES>		Standing water prese			(YES_)	NO
Condition of well	:	- - 			Any indication of sur	ace runoff in w	/ell?	YES	NO
Weather:	الدم	clard, mil	1 40 : 7 2	inly 1	Air Temperature:			-: 1 4 V ·5	- 1
Notes:		1.4 1.1.1.1.1.1.	C. 10 J	12 0	ACO # - VA	2 [·	
	041	ie moce		150 . 10					
STATIC WATER	LEVEL JUS	T PRIOR TO	D PURGING	92567	Any indication of surface Air Temperature: $1 \leftrightarrow \frac{4}{\sqrt{4}} - \frac{1}{\sqrt{4}} + \frac{1}{\sqrt{8}} + \frac{1}{$	103-			
Date: 8/12	12009)	Tīme: 17:05	AM/PM	01				
	,								
Depth to Water.		<u>4.73</u> 5.94		٩	fleasured with:	ELECTRONIC	TAPE	CHALK & STEEL	TAPE
Length of Well:		2.94		E	Decontamination:	PRE STEAM	CLEANED (DI WATER (OTHER
WELL PURGING	6.								
Date: <u>8/1</u>		9 Веділ	Tîme:	17.08 A	M/PM Purging I	Equipment	Mini	Typhion	100 FL
		End	Nime:	17.08 A 17:55 A			E STEAM CL		ATER OTHER
CALCULATION OF 3	CASING VOLU	MES							
	ft Le	ength of well			Yield:		CHIGH	LOW	
	ft (lepth to wate	er (before pu	rge start)	if low, re	covery time:			{
	ft =	length of wat	ter column						:
	X	conversion fa	actor (2" well	I) 0.49	Actual vo	olume purged:		gallo	กร
Gallo	ns ≃:	3 casing volu	imes		Actual p	urge flow rate:	100	(ml/m	in) or
Notes:		_						L/mi	
									:
Time	Volume	Depth to	pН	Conductivi	ty Turbidity	D.O.	Temp	ORP	Ferrous
	(gallons)	Water	(ຮບ)	(umhostan	ίντυ) (κτυ)	(mg/L)	(°C)		Irón
		(feet)		~S/cm					(mg/L)
		<0.33'	<i>+/</i> - 0.1	+/- 3%	+/~ 10%	+/- 10%	+/- 5°	+/- 10 mV	
Start: 17: 00									N/A
17.18		4. 95	3.70	Z. YZ7	14.74	1.48	8.94	184.1	N/A
17:21		5.00	3.82	Z. 875	16.76	1.32	5. 23	167.5	NŻA
17.24		5.10	3.81	7.849		1.05	8.54	170.9	N/A
11:27		5.05	3.02	2.246	9.25	1.05	809	167.7	N/A
17:30		5.05	3, 85	7.639	8.53	0.96	8,17	167.1	N/A
									N/A
									N/A
									N/A
									N/A
Fínal:									N/A
SAMPLE COLLE	CTION								
Date: 8/14	7/2009		Time: 17:3	5 AM/PM	Method:	min. typhis	1 -/ 1-	Alex ende	disc .
	-				_				
Appearance of S	ample: ሓ	hid gelland	burn , sh	224	Actual samp	le flow rate:	100	(r	n1/min pr
Appearance of S	، (ب	wing with	prory my						Umin
SAMPLE BOTTL	E COLLECT	ED:	6 YOML	VOA HEL					:
			2 11:1	VOA HCL	~_				
SAMPLING PER	SONNEL								
		MURCON			Company:	AFCOM			
		,	π						:
L									

CLIENT: ABAGE /U-ohi LOCATION: NC CAPE AK PROJECT #:

ENTER WELL LOCATION:

ICOMWO3

-

INSPECTION									
Label on well?		\langle	YES	NO Is ca	ap locked?			YES <	NO
Is reference mar	k visible?	<	YES	NO Star	nding water prese	ent?		YES	NO
Condition of well		000			indication of surf	ace runoff in w	vell?	YES	NO .
Weather:	a. 1/2	sing al	46.14 h.	In wind, Air 7	Femperature:			mil qu's	F.
Notes:					o the int				
	091	IC MOCI		3 MO		_			
STATIC WATER			D PURGING						
Date: 8/19	12009	}	Time://:/8	AM/PM					ľ
	-,								
Depth to Water.	3	5 :59 9.50		Mea	sured with: $<$	ELECTRONIC	TAPE	CHALK & STEEL	TAPE
Length of Well:		9.50		Dece	ontamination:	PRE STEAM	CLEANED		OTHER
Ŭ									~
WELL PURGING	<u> </u>								,
Date: <u>8</u>	19/200	9 Begir	n Time:	/ J: ZC АМЛ	PM Purging I	Equipment	Mini T	Jphson,	LOWFL
			Time: i	5:56 AMA				EANED DIWA	
CALCULATION OF 3	B CASING VOLU	IMES						·····	
	ft Le	ength of well			Yield:		HIGH	LOW	
	ft - 0	depth to wate	er (before pu	rge start)	∦f low, re	covery time:	\sim		
		length of wal				-			4
		conversion fa		1) 0.49	Actual vo	olume purged:		gallor	, S
Galto	ns =	3 casing volu	umes		- Actual o	urge flow rate:	150	mi/mi	
Notes:		VLD D	1) DIECO +	= collectu	LO muio			Umin	
		Time	Mais Se	- OK ID -	OANC	GWZ1			
Time	Volume	Depth to	рН	Conductivity	Turbidity	D.O.	Temp	ORP	Ferrous
	(gallons)	Water	(ຣບ)	(umhos/cm)	(NTU)	(mg/L)	(°C)		Iron
	(ganono)	(feet)	(00)	(dimined only)	(((mg/L)
		< 0.33'	+/ 0, 1	+/- 3%	+/- 10%	+/- 10%	+/- 5º	≁/- 10 mV	(
Start: 13.20									N/A
13:30		4. 81	1.62	9.940	7,70	1.25	14.60	347.4	N/A
13:33	1	4.91	162	9.984	6.82	1.25	14.72	356.5	N/A
13:36	-	5.06	1.67	7. 989	5.90	1.17	15.11	347.3	N/A
13 34		5 67	1.66	7.995	5,74	1.22	15.26	351,4	N/A
13.42		5,13	1.68	9.966	5.90	1.28	15.14	553.3	N/A
17.45			1.62	9964	5,83	1.24	15.19	35°0.Z	N/A
	-					- <u> </u>			N/A
									N/A
				i i					N/A
Final:			-			1			N/A
SAMPLE COLLE		1	I			1	I		
Date: 8///	9/2009		Time: 133	5C ANATONA	Methodic	n.n: Izrah		luce M	
Date. 8/1	110001			POULLIN		7. 1. 1) 100	and wigh		- (170170)
Anneerence of C	amnle:		in Int		Actual camp	le flow rate:	150	/-	Vmin pr
Appearance of S		eillish v	,					("	~ .
		74	£ 40	201 1111	and in in	Restel			Límin
SAMPLE BOTTL			<u>2 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2</u>	A. L.	Lille a				-
				- Hon ler-	1-11/200 (4	witte.			
	1 4				0				
Name: Aur	1 Junto	6116		and the second second	Company:	AECOM			
						,			

CLIENT: USACE (Brink) LOCATION: NE CAPE, AK PROJECT #:

ENTER WELL LOCATION:

Tecmwo4

INSPECTION									
Label on well	?	\leq	YES	NO ls ca	ap locked?			(YES)	NO
Is reference r	nark visible?	(VEB	NO Star	nding water pres	ent?		YES	NO
Condition of v	vell:			Any	indication of sur	face runoff in w	vell?	YES	NO
Weather:				Air 1	Femperature:			~4 * F	
Notes:			- 10 /	/	•				
	090	ve moed	51022	MO	C#				
	ER LEVEL JU		PURGING	3					
Date: 8/	18/2000	7	Time: 14: 4.	5 AM/PM					
	•						-		
Depth to Wate	er:	7.5		Mea	sured with:	ELECTRONIC	TAPE	CHALK & STEEL	TAPE
Length of We	l:	9.70		Dece	ontamination:	PRE STEAM C	LEANED (DIWATER (QTHER
WELL PURG				_					(
Date:	118 / 200	リ Begin	Time:	14:48 AM/	PM Purging	Equipment	Mini-	Typhom	/LONI FL
/		End T	īme:	19:45 AM/	PM Deconta	mination: pa	RE STEAM CL	EANED DIW	ATER OTHER
CALCULATION C	F 3 CASING VOL	UMES		08/19/09					
	ft L	ength of well			Yield:		HIGH	Javo	-
	ft	depth to wate	r (before pi	urge start)	If low, re	covery time:			
	ft =	length of wat	er column						ŀ
	_x	conversion fa	otor (2" we	ll) 0.49	Actual v	olume purged:		gallo	ns
Ga	illons =	3 casing volu	imes		Actual p	urge flow rate:	120	(1)/III	in or
Notes:	کا	:04 million	15 -11	when to rector	1) over night	and cellent	Co-de	1/ml	n [!]
		ih man				20:40 D'(0		9844.	i
Time	Volume	Depth to	pН	Conductivity	Turbidity	D.O.	Temp	ORP	Ferrous
	(gailons)	Water	(SU)	(umhos/cm)	(NTU)	(mg/L)	(°C)		Ιτόπ
		(feet)		(ms/cm)		-			(mg/L)
Ī.		<0.33	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 5°	+/- 10 mV	
Start: 14:4	8								N/A
े । ५: ४	8	Jule ~ perg	5.90	0.18	18.27	5.35	4.35	107 2	N/A
15:01		going noted	5.88	0.25	35.83	5.35	4.94	113.9	N/A
15.04	4	below prap	5.94	0.212	39.44	4.96	4.54	115.6	N/A
		• •							NVA _
						_			N/A
									N/A
									N/A
							L		N/A
									N/A
Final:									N/A
SAMPLE COL	LECTION							······································	
Date: 8/	19/2009		fime: 09:3	S AM/PM	Method: ,	am. typham	+4	on the ca	to the
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		-			1				~
Appearance o	f Sample:	+, 6) /	~ 1.4	51m.~~	Actual samp	ole flow rate:	17	<u>ب</u> در	nVmin or
••									ر ۱۱٬۳۱٬۱
SAMPLE BOT	TLE COLLEC	TED:	6 YOML	VOA HEL					1
			2 11;	Vois Her Les Honter					
SAMPLING P	ERSONNEL								
	way Junky		Pice P	· • • • •	Company:	AECOM			
					/		•		÷

# CLIENT: USACE / Besty LOCATION: NE CASE AF PROJECT #:

ENTER WELL LOCATION: TCOMLOOS

INSPECTION Label on well? Is reference mer Condition of well Weather: Notes:	1: 	gox E y Sinin Dill IC MUCC	SiJ 2 5	NO Sta Any 	ap locked? Inding water press indication of surf remperature: $t^{\frac{1}{2}}$		/e)  ?	YES YES YES Mil 40 4	
STATIC WATER	≀LEVEL JUS ・ / <i>Э.009</i>								
Date: 8/17	1001		Time: 1632						
Depth to Water.	۲	5.02		Mea	sured with:	ELECTRONIC	TAPE	CHALK & STEEL	TAPE
Length of Well:	6	.45		Dec	ontamination:	PRE STEAM C	CLEANED C	DIWATER	OTHER ;
WELL PURGING	3 19 / 200	(3 Deni-	Time	1034 AMI		Equipmont	40 7		linisci
Date: <u></u>	14 / 200	<u>-/</u> Begin End ]		11:27 AM		Equipment mination: pr	E STEAM CL		· · · · ·
CALCULATION OF 3	3 CASING VOLU			<u>.                                    </u>					
)	ft Le	ength of well			Yield:		(HIGH	LOW	•
		lepth to wate		irge start)	if low, re	covery time:			;
		length of wal							i
		conversion fa		1) 0.49		olume purged:		Oalto	
Gallo Notes:	ons =	3 casing volu	umes		Actual p	urge flow rate:		mVm	
INDICES.								1)ml	l
Time	Volume	Depth to	pH	Conductivity	Turbidity	D.O.	Temp	ORP	Ferrous
	(gallons)	Water	(SU)	(umhos/cm)	(NTU)	(mg/L)	(°C)		Iron
	FZ 1 V FATE	(feet)							(mģ/L)
	me/min	<0.33'	+/- 0.1	+/- 3%	+/~ 10%	+/- 10%	+/- 5°	+/- 10 mV	
Start: /034			( ) <i>i</i> =		11 3 (11)				N/A
<u> </u>	130	5.28	1.47	15.87	<u>43.58</u> 36.37	11 96	11.24 11.18	381.1	N/A
1650	3.	5.79	1.49	15,99	35.95	14.28	11.75	378 0	N/A N/A
1055	45	5.76	).51	16,1	35.61	14.72	11.38	366 3	N/A
1456	83	5.86	1.48	16.40	33.55	14.58	11.75	765.4	N/A
									N/A
									N/A
									N/A
						_			N∕A
Final:				<u> </u>					N/A
SAMPLE COLLE	ECTION					, ,	( P.J		
Date: 8 / / 2	7/2009		Time: /] ( 00	AM/PM	Method:	Mini typhin	10-4 11	c- cintrel	er
Appearance of S	Sample:	reldinh or	unite release	-	Actual samp		85		Winin or
			/ 11	Vod ila		man draw d		-	Umin
SAMPLE BOTTL		ED	<u>אייטו ס</u> - ר-	Voia Her La Ambra	-	mping as to	השיקן היניה	JLL PATE	
SAMPLING PER			· · · ·	ITM UM	-1	w pringo.			· · ·
	Jupprivie				_Company: ,	NZC M			
INGINE. TWOA	VIN PTUIC					TC CGM			

## CLIENT: USACE (Brith) LOCATION: NE CARC, ALC PROJECT #:

ENTER	WELL	LOCAT	ION:
-------	------	-------	------

Techloois

INSPECTION					· · · · · · · · · · · · · · · · · · ·				
Label on well?		C	YES)	NO Is c	ap locked?			YES	(NO)
ls reference mar	k visible?	Ċ	YES		nding water prese	∋nt?		YES	NO
Condition of well	<b>:</b>	6000		Алу	Indication of surf	face runoff in v	vell?	YES	(NO)
Weather:	~t/s	Joing and the	St & hill	wind; Air	Temperature:			mid 40'	
Notes:		VC MOCO	,		C# 20			i	
	091				<u> </u>				
STATIC WATER			) PURGING						
Date: 8/19	12000	1	Time: (5:35	AM/PM					
Depth to Water:		<u>4,41</u> 9.10		Mea	isured with:	ELECTRONIC	TAPE	CHIALK & STEEL	ТАРЕ
Length of Well:		9.10		Dec	ontamination:	PRE STEAM	Cleaned <	DIWATER C	OTHER
WELL PURGING		<i>a</i>	_						1
Date: <u>8</u> /[	7/200	<u>9</u> Begin	Time:	15:36 AM/		Equipment _			
			îime: [	6:55 AM	PM Decontar	mination: Pi	RE STEAM CL	EANED DIW	ATER OTHER
CALCULATION OF 3					N: - Let				3
		ength of well	r (hofers nu	inter attacts	Yield:	an constinues	HIGH	> low	
		depth to wate length of wat		ige start)	n low, rea	covery time:			1
		conversion fa		N G 40	( etus) us				
Gałlo		3 casing volu		1 0.49		plume purged: urge flow rate:		gallo:	1
Notes:									
NOTES.	14.	XIMPA DAG	~ ~~~ ~~ ~~	Care 1 9 1 1	np.ny cy sim	ris perioble ~	The pump	L/mir	
Time	Volume	Depth to	nЫ	Conductivity	Turbidity		Tama	020	Eoriour
iune	(gallons)	Water	pH (SU)	(umhos/cm)	(NTU)	D.O.	Temp	ORP	Ferrous
	(gailons)	(feet)	(30)	(แมนออาจาก)		(mg/L)	(°C)		sron
		<0.33'	+/- 0.1	+/- 3%	+/- 10%	+/ 10%	+/- 5º	+/- 10 mV	(mġ/L)
Start: 15: 18							.,- 0		 N/A
15:48		belowging	1.24	13.22	54.70	3.23	15.51	358.5	N/A
15:51		below pune	i.74	13.70	72.02	2.94	12.43	356,2	N/A
15:54		5. tempap	1.29	13.20	71.52	2,69	12.56	356.9	NIA
15:57		hilm p. ps	1-22	13.01	58 74	3.41	11.75	366.8	N/A
16 00		Vicking 1.190	1.15	11.72	44.07	3.20	10.81	366.1	N/A
18:02		believer	1.14	12.56	56.72	3.08	10.64	366.]	N/A
16.04		h.l jing	1.13	12.67	47.46	ંડે . લો	11.04	360 6	NÌ/A
		, ,							N/A
									N/A
Final:									N/A
SAMPLE COLLE	CTION								
Date: 8/14	7/2009	י ד	Fime: 16-1		Method:	n. typhicin	いるしい	fine contra	te-
,,					_	- JI-			
Appearance of S	ample	reddish or	inge leter		Actual samp	le flow rate:	150	(m	il/min pr
			•					`	Límin
SAMPLE BOTTL	E COLLECT	ED: _	6 YEML	VOA HEL					
			2 11:6	VO.A HCL					
SAMPLING PER	SONNEL								,
Name: Ava	n Jinto	Sic.			Company: /	AECOM			
									,

## CLIENT: USALE /BRISTIL LOCATION: NE CARE AK PROJECT #:

TecMW07

Label on well? Is reference mar Condition of well Weather:	l:	Genop Hy closely	YES YES	NO Star Any	ap locked? nding water prese Indication of surf Femperature:			YES <u>YES</u> YES MONT	NO NO NO
Notes:	091	IC MOCO	5iJ2_	7 MO	x # 18	_			
STATIC WATER									
Date: 8/19	12009	/	Time: 13:05	AM/PM					
Depth to Water:		5.65		Mea	sured with:	CELECTRON	C TAPE	CHALK & STEEL	, 1968
Length of Well:		9.60		-	ontamination:	PRE STEAM	and a second second	_	
5									
WELL PURGING		~		£7					, .
Date: <u></u> <i>§</i>	19/200		Time:	19:22 AM/				Typhion	
		End 1	lime:	20:12 AM	PM Decontar	nination: P	RE STEAM CI	EANED DIW	ATER OT
CALCULATION OF 3		imes ength of well			Yield:		(HIGH)	LOW	;
		lepth to wate	r/before ou	iroe start)		overy time:	HUGH	LOW	
		length of wat		Ngo clarty		overy ante.			1
		conversion fa		1) 0.49	Actual vo	lume purged:		allsp	ns .
Gallo		3 casing volu				irge flow rate:	-		:
Notes:		-				-		L/mh	
							_		
Tíme	Volume	Depth to	pH	Conductivity	Turbidity	D.O,	Temp	ORP	Ferrou
	(galions)	Water	(SU)	(umhos/om)	(NTU)	(mg/L)	(°C)		Iron
		(feet)		ms/im					(mģ/L)
		< 0.33'	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 5°	+/- 10 mV	,
start: 1922			1		~~~~				N/A
1432		5.77	626	0.944	7,53	2.13	5.5L	- 49.4	N/A
1935		5-3	6.33	0.871	3.42	1.96	3.98	-50.7	N/A
	 	5,ëi	<u>t</u> , <u>3</u> j	6.933	2,76	1.67	3,19	-61.1	<u>N/A</u>
1941		5,22	6.19	0.828	<u> </u>	1.45	3.17	-68.9 -71 z	<u> </u>
1947		5.81	6.35	0, 809	Z. 01	1,20	3.98	- 73.8	N/A
1950		5.83	6.37	8,799	1.81	1.15	4.71	-77.6	N/A
1953		5.87	6.75	0.740	1,81	1.13	4.20	.79.0	N/A
	<u>├</u>								N/A
inal:					· ·, ····		+		N/A
SAMPLE COLLE	CTION	I				4		.	
)ate: 8/14	7/2009		Time: 17:5	55 AM/PM	یر :Method	in fighter	n + low	flow comp	other
	-free				1	<u> </u>	<u>\</u>		
ppearance of S	ample	Jurbid tel	hainh bra	~	Actual sampl	e flow rate:	160	(1	
	-	Jurbid yell cleans of v	- /	•				\	L'min
SAMPLE BOTTL	E COLLECT	ED: _	6 YEML	VO:4 HEL					
			2 11:1	Vo: 4 itch					
									N
AMPLING PER	SONNEL ~ Prwss	,				-			1

#### CLIENT: LOCATION: PROJECT #:

#### ENTER WELL LOCATION:

TEOMWOS

INSPECTION									
Label on well?		C	TES	NO Is ca	p locked?			(YES)	NO
Is reference mar	k visible?	24			ding water prese	ent?		(YES)	NO
Condition of well:		yood			indication of sur		vell <b>?</b>	YES	
Weather:		-9	· · · ·		emperature:			~ 40' F	
Notes:					•				
Notes,	091	VE MOCE	31.12 -	MOX	<u>, # 24</u>				
STATIC WATER	LEVEL JUS	ST PRIOR TO	PURGING						
Date: 8/18	12000		Fime: 14:2	<am pm<="" td=""><td></td><td></td><td></td><td></td><td></td></am>					
	<i>{</i>								I.
Depth to Water:		7.30		Mea	sured with:	ELECTRONIC	TAPE	CHALK & STEEL	TAPE
Length of Well:		2.35		Deco	ontamination:		CLEANED <	DI WATER	-OIHER>
		• •							
WELL PURGING	;								
Date: 8/1	€ / 200	9 Begin	Time: /	4;22 AM/	M Purging	Equipment	Mimi	Typhion	/LOW FL
	,	End T	ime: 2.0	15 AM/F	PM Decontar	•	RE STEAM CL		ATER OTHER
Date: <u><u></u><u></u><u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u></u>	CASING VOL	JMES		08/19/07					
		ength of well			Yield:		HIGH	LOW	
		depth to wate	r (before pur	rge start)	If low, re	covery time:	212		
		length of wate		· · · · ·	-	-			:
		conversion fa		0.49	Actual vo	olume purged:		gallo	NS
Gallor		3 casing volu				irge flow rate:		•	
Notes:				allow		•		Umli Umli	
110100.	<u> </u>	undly	t con	in the a	t - cotinger	18/19/00	, ´`@ Z.	2.43 DTW :	
Time	Volume	Depth to	pH	Conductivity	Turbidity	D.O.	Temp	ORP	Ferrous
rune	(gallons)	Water	(SU)	(umbos/cm)	(NTU)	(mg/L)	(°C)	OR	Iron
	(ganons)	(feet)	(30)	(m5/cm)	(1010)	(ingre)	(0)		(mg/L)
		<0.33'	+/~ 0.1	+1-3%	+/- 10%	+/- 10%	+/- 5⁰	+/- 10 mV	(mg/c)
Start: 14:22		-0.55		-1-378		17-1075			N/A
				0.175	74.41	4.66	4.62	104.4	N/A
14:32		buto mono		0.178	24.6	4.42	5 19	99.7	N/A
14.38	·	Julinpung		0.178		5.87	5.43	104.3	N/A
		Idanpung			Dry	3.07		101.3	N/A
<b></b>			_			-	-		N/A N/A
					·				N/A
									N/A
					·				N/A
		<u> </u>				+			
						-	1		N/A
Final:							I		N/A
SAMPLE COLLE	CTION	5						1 1	1
Date: 8/19	1/2009		ime: 09:15	AM/PM	Method:	noi typho	es with	lo-1 Min (	show and
				,		•			~~
Appearance of Sa	ample:	1.14 brons	Jug to	bid	Actual samp	le flow rate:	120	· (	nt/min pr
		•							Ūmin
SAMPLE BOTTL	E COLLEC	TED: _	5 YOML	L'OA HEL in Anstern					:
			2 11:1	4 Ambro					
SAMPLING PER		,							
Name: Auro	- Jeal	mis /4	min by	- zwsj	Company:	AECIM			
1		(	•						

# DAY 14 SAMPLING FORMS

	11262	4 7 13		ENTER	TSLAND RWELLLOCA	TION:	OANCI	MOLGU	هـ 3 ں
		(		· · · ·				DUP	
INSPECTION							OGNEN	NICGW.	
Label on well?		5	YES		ap locked?			(YES)	NO
Is reference mar			YES'		nding water pres			YES	NO
Condition of well		2000			indication of sur	tace runofit in v	vell?		(NO)
Weather:		CLOUDY			Temperature:			40	
Notes:	$\omega$	ND	_ MPH	4			-		
STATIC WATER				-				•••••	
Date: 8/2	5/2009	[	Time: 150.	SAMPM)					
Depth to Water.		4,95		Mea	sured with:	ELECTRONIK	CTAPE	CHALK & STEEL	TAPE
Length of Well:		8,94		Dec	ontemination:	PRESTEAM		DIWATER	OTHER
WELL PURGING						-			
Date: 8/2	5 12009	Regin	Time	15805 AM	PM Puraina	Equipment 🛓	n'hi -		
	5/2017	End 7		1537- AM	<u> </u>		RESTEAMOL	/ ·	ATER O
CALCULATION OF 3	CASING VOLU								IRTER U
8 F14		ength of well			Yield:		HIGH	LOW	
4.95		tepth to wate	r (before ou	roe starf)		covery time:	Children	2000	
		length of wat		3					
		conversion fa		0.49	Actual v	olume purged;		gallo	MS.
				<u></u>	,	r g++-		gane	
Gallo	ns =	3 casing volu	mes		Actual	ume flow rate:	180		and an
Gallo	ns =	3 casing volu	mes		Actual p	urge flow rate:	180		nin or
Gallo Notes:	ns =	3 casing volu	mes		Actual p	urge flow rate:	180	۵) L/min	_
	ns ≃ Volume		pH	Conductivity	Actual pr	urge flow rate:	- 180		n 
Notes:		3 casing volu Depth to Water		Conductivity (umhos/cm)			_	L/mi	n Ferrou
Notes:	Volume	Depth to	рH	} -	Turbidity	D.O.	Temp	L/mi	n Ferrau Iron
Notes:	Volume	Depth to Water	рH	} -	Turbidity	D.O.	Temp	L/mi	n Ferrau Iron
Notes:	Volume	Depth to Water (feet)	pH (SU) +/- 0.1	(umhos/cm) +/- 3%	Turbidity (NTU) +/- 10%	D.O. (mg/L) +/- 10%	Temp (°C) +/- 5°	U/mi ORP +/- 10 mV	n Ferrau Iron
Notes: Time	Volume	Depth to Water (feet) <0.33'	рН (SU) +/-0.1 <u>Iaih</u> 1,39	(umhos/cm) +/-3% 12 pringe 13786 14.34	Turbidity (NTU) +1-10% <u>Avduct drs</u> 9.6	D.O. (mg/L) +/- 10%	Temp (°C) +/- 5°	U/mi ORP +/- 10 mV	n Ferral Iron (mg/L
Notes: Time Start: 1505 1515	Volume	Depth to Water (feet) <0.33' 4, 4 5	рН (SU) +/-0.1 <u>Iaih</u> 1,39	(umhos/cm) +/-3% 12 pringe 13786 14.34	Turbidity (NTU) +1-10% <u>Avduct drs</u> 9.6	D.O. (mg/L) +/-10% plc/s Lav	Temp (°C) +/-5°	レ/mi ORP +/- 10 mV	n Ferrau Iron (mg/L N/A
Notes: Time Start: 1505	Volume	Depth to Water (feet) <0.33' 4,45 5,61	рН (SU) +/-0.1 7 ₁ :1. 1.:39 4.:39	(umhos/cm) +/-3%	Turbidity (NTU) +1-10% <i>Ariduct drs</i> 9.6 <b>4</b> ,6	D.O. (mg/L) +/~10% p/c/~ Lav 0 ,82	Temp (°С) +/-5° 4-5° 9,31	レ/mi ORP +/- 10 mV 1 ' ブロデ - て 今.	n Ferral Iron (mg/L N/A N/A
Notes: Time Start: 1505 1515 1520	Volume	Depth to Water (feet) <0.33' 4,45 5,61 5,45 5,37 5,29	pH (SU) +/- 0.1 <u>Ja: h</u> 4:39 4:39 4:39 <b>4</b> :43	(umhos/cm) +/-3% 13786 /4.34 13786 /4.34 13786 /4.36 13786 /4.36 13786 /4.36 13786 /4.36	Turbidity (NTU) +1-10% <i>Avduct dro</i> 9.6 <b>9.6</b> 5.75	D.O. (mg/L) +/- 10% D/2 / / 5 / Dav 0 .82 0 .82	Temp (°C) +/- 5° 	レ/mi ORP +/- 10 mV レイアのデ - て 今. こ 多. シ	n Ferral Iron (mg/L N/A N/A
Notes: Time Start: 1505 1515 1520 1524	Volume	Depth to Water (feet) <0.33' 4,45 5,61 5,45 5,37	pH (SU) +/- 0.1 <u>Ja: h</u> 4:39 4:39 4:39 <b>4</b> :43	(umhos/cm) +/-3% 2 pringe 13786 19.34 13786 19.36 13175/95	Turbidity (NTU) +1-10% <i>Avduct dro</i> 9.6 <b>9.6</b> 5.75	D.O. (mg/L) +/~10% pkks Lav 0.82 0.82 0.82 0.82	Temp (°C) +1-5° +1-5° 	Umi ORP +1-10 mV 1 ' TDF -Z 3. 2 8'. 1 [9.1]	n Ferrau Iron (mg/L N/A N/A N/A N/A
Notes: Time <u>Start: 1505</u> <u>1515</u> <u>1520</u> <u>1528</u>	Volume	Depth to Water (feet) <0.33' 4,45 5,61 5,45 5,37 5,29	pH (SU) +/- 0.1 <u>Ja: h</u> 4:39 4:39 4:39 <b>4</b> :43	(umhos/cm) +/-3% 13786 /4.34 13786 /4.34 13786 /4.36 13786 /4.36 13786 /4.36 13786 /4.36	Turbidity (NTU) +1-10% Avduct drs 9.6 9.6 5.75 5.80	D.O. (mg/L) +/~10% 0/2 K Lav 0/82 0/82 0/82 0/62 0:62	Тетр (°С) +/-5° 4-5° 9,31 8,32 8,18 8,18 8,11	L/mi ORP +/- 10 mV 1 ' TDF -Z &- 2 & 1 (9 . 1 15, 3	n Ferrau Iron (mg/L N/A N/A N/A N/A
Notes: Time <u>Start: 1505</u> <u>1515</u> <u>1520</u> <u>1528</u>	Volume	Depth to Water (feet) <0.33' 4,45 5,61 5,45 5,37 5,29	pH (SU) +/- 0.1 <u>Ja: h</u> 4:39 4:39 4:39 <b>4</b> :43	(umhos/cm) +/-3% 13786 /4.34 13786 /4.34 13786 /4.36 13786 /4.36 13786 /4.36 13786 /4.36	Turbidity (NTU) +1-10% Avduct drs 9.6 9.6 5.75 5.80	D.O. (mg/L) +/~10% 0/2 K Lav 0/82 0/82 0/82 0/62 0:62	Тетр (°С) +/-5° 4-5° 9,31 8,32 8,18 8,18 8,11	L/mi ORP +/- 10 mV 1 ' TDF -Z &- 2 & 1 (9 . 1 15, 3	n Ferral Iron (rng/L N/A N/A N/A N/A N/A
Notes: Time <u>Start: 1505</u> <u>1515</u> <u>1520</u> <u>1528</u>	Volume	Depth to Water (feet) <0.33' 4,45 5,61 5,45 5,37 5,29	pH (SU) +/- 0.1 <u>Ja: h</u> 4:39 4:39 4:39 <b>4</b> :43	(umhos/cm) +/-3% 13786 /4.34 13786 /4.34 13786 /4.36 13786 /4.36 13786 /4.36 13786 /4.36	Turbidity (NTU) +1-10% Avduct drs 9.6 9.6 5.75 5.80	D.O. (mg/L) +/~10% 0/2 K Lav 0/82 0/82 0/82 0/62 0:62	Тетр (°С) +/-5° 4-5° 9,31 8,32 8,18 8,18 8,11	L/mi ORP +/- 10 mV 1 ' TDF -Z &- 2 & 1 (9 . 1 15, 3	n Ferrol Iron (mg/L N/A N/A N/A N/A N/A
Notes: Time <u>Start: 1505</u> <u>1515</u> <u>1520</u> <u>1528</u>	Volume	Depth to Water (feet) <0.33' 4,45 5,61 5,45 5,37 5,29	pH (SU) +/- 0.1 <u>Ja: h</u> 4:39 4:39 4:39 <b>4</b> :43	(umhos/cm) +/-3% 13786 /4.34 13786 /4.34 13786 /4.36 13786 /4.36 13786 /4.36 13786 /4.36	Turbidity (NTU) +1-10% Avduct drs 9.6 9.6 5.75 5.80	D.O. (mg/L) +/~10% 0/2 K Lav 0/82 0/82 0/82 0/62 0:62	Тетр (°С) +/-5° 4-5° 9,31 8,32 8,18 8,18 8,11	L/mi ORP +/- 10 mV 1 ' TDF -Z &- 2 & 1 (9 . 1 15, 3	n Ferrau Iron (mg/L N/A N/A N/A N/A N/A N/A N/A N/A
Notes: Time Start: 1505 1515 1520 1520 1528 1532 Final:	Volume (gailons)	Depth to Water (feet) <0.33' 4,45 5,61 5,45 5,37 5,29	рН (SU) +/-0.1 <u>Iaih</u> <u>Iaih</u> <u>I</u> :39 <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u>	(umhos/cm) +/-3% 2 privy 2 13786 19.34 13786 19.36 1375/9.5 13959/9.5	Turbidity (NTU) +1-10% Avduct drs 9.6 9.6 5.75 5.80	D.O. (mg/L) +/~10% 0/2 K Lav 0/82 0/82 0/82 0/62 0:62	Тетр (°С) +/-5° 4-5° 9,31 8,32 8,18 8,18 8,11	L/mi ORP +/- 10 mV 1 ' TDF -Z &- 2 & 1 (9 . 1 15, 3	n Ferral Iron (rng/L N/A N/A N/A N/A N/A N/A N/A
Notes: Time Start: 1545 1515 1520 1520 1520 1532 Final: SAMPLE COLLE	Volume (gailons)	Depth to Water (feet) <0.33' 4,45 5,61 5,45 5,37 5,29 5,29 5,24	pH (SU) +/- 0.1 <u>Jaik</u> 4:39 4:39 4:39 4:43 4:44 4:45	(umhos/cm) +1-3% 2 pring 2 13786 19.36 13786 19.36 13756 19.36 13959 9.5 13959 9.5	Turbidity (NTU) +1-10% ANGULT drs 9,6 9,6 9,6 5,75 5,80 4,65	D.O. (mg/L) +/-10% D&K5 Law 0.82 0.82 0.82 0.58 0.62 0.58 0.50	Temp (°C) +1-5° 2,31 8,31 8,32 8,48 8,91 8,71	Umi ORP +1-10 mV 1 ' TDF -Z 9. 2 8. 0 [9.1 15.3 2 2,8	n Ferrol Iron (mg/L N/A N/A N/A N/A N/A N/A N/A N/A N/A
Notes: Time Start: 1545 1515 1520 1520 1520 1532 Final: SAMPLE COLLE	Volume (gailons)	Depth to Water (feet) <0.33' 4,45 5,61 5,45 5,37 5,29 5,29 5,24	pH (SU) +/- 0.1 <u>Jaik</u> 4:39 4:39 4:39 4:43 4:44 4:45	(umhos/cm) +1-3% 2 pring 2 13786 19.36 13786 19.36 13756 19.36 13959 9.5 13959 9.5	Turbidity (NTU) +1-10% ANGULT drs 9,6 9,6 9,6 5,75 5,80 4,65	D.O. (mg/L) +/-10% D&K5 Law 0.82 0.82 0.82 0.58 0.62 0.58 0.50	Temp (°C) +1-5° 2,31 8,31 8,32 8,48 8,91 8,71	Umi ORP +1-10 mV 1 ' TDF -Z 9. 2 8. 0 [9.1 15.3 2 2,8	n Ferrau Iron (mg/L N/A N/A N/A N/A N/A N/A N/A N/A N/A
Notes: TIme Start: 1505 1515 1520 1520 1520 1532 1532 Final: SAMPLE COLLE Date: 8 [2]	Volume (gailons)	Depth to Water (feet) < 0.33' 3'.45 5'.45 5'.57 5'.29 5'.24	pH (SU) +/- 0.1 <u>Jaik</u> 4.39 4.39 4.39 4.39 4.39 4.43 4.44 4.44	(umhos/cm) +/-3% 2 privy 2 13786 19.34 13786 19.36 1375/9.5 13959/9.5	Turbidity (NTU) +1-10% Avduct dro 9.6 9.6 9.6 9.6 5.75 5.80 4.65 Method:	D.O. (mg/L) +/-10% D&K Law 0.82 0.82 0.82 0.82 0.50 0.62 0.59 0.50	Тетр (°С) +1-5° 9,31 8,32 8,48 8,91 8,71	Umi ORP +1-10 mV 1 'TOF -2 9. 28.0 (9.1 19.3 27.8 27.8	n Ferrau Iron (mg/L N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Notes: Time Start: 1545 1515 1520 1520 1520 1532 Final: SAMPLE COLLE	Volume (gailons)	Depth to Water (feet) <0.33' 4,45 5,61 5,45 5,37 5,29 5,29 5,24	pH (SU) +/- 0.1 <u>Jaik</u> 4.39 4.39 4.39 4.39 4.39 4.43 4.44 4.44	(umhos/cm) +1-3% 2 pring 2 13786 19.36 13786 19.36 13756 19.36 13959 9.5 13959 9.5	Turbidity (NTU) +1-10% Avduct dro 9.6 9.6 9.6 9.6 5.75 5.80 4.65 Method:	D.O. (mg/L) +/- 10% D/2 / / 5 / 2 / 2 / 5 / 2 / 5 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 5 / 2 / 2	Temp (°C) +1-5° 2,31 8,31 8,32 8,48 8,91 8,71	Umi ORP +1-10 mV 1 'TOF -2 9. 28.0 (9.1 19.3 27.8 27.8	n Ferrau Iron (mg/L N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Notes: Time Start: 1505 1515 1520 1520 1522 1532 Final: SAMPLE COLLE Date: 8125 Appearance of S	Volume (gailons)	Depth to Water (feet) <0.33' 4,45 5,61 5,45 5,37 5,29 5.24 2 2	pH (SU) +/- 0.1 7 a: h 4 : 39 4 : 39 4 : 39 4 : 39 4 : 39 4 : 39 4 : 43 4 : 44 4 : 45 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	(umhos/cm) +1-3% 2 pring 2 13786 19.36 13786 19.36 13786 19.36 1375/9.5 13959/9.5 13959/9.5 20 pril P 352101PM 05 ENO	Turbidity (NTU) +1-10% And usf des 9,6 9,6 9,6 9,6 9,6 5,75 5,80 4,65 Method: 1 Actual samp	D.O. (mg/L) +/-10% pk/5 Law 0.82 0.82 0.82 0.59 0.62 0.59 0.59 0.59 0.50	Тетр (°С) +1-5° 2,31 8,32 8,48 8,91 8,71 8,71	Umi ORP +1-10 mV 1'TDF Z 9. Z 8. V [9.1] 15.3 22.8 23.8	n Ferrol Iron (mg/L N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Notes: TIme Start: 1505 1515 1520 1520 1520 1532 1532 Final: SAMPLE COLLE Date: 8 [2]	Volume (gailons)	Depth to Water (feet) <0.33' 4,45 5,61 5,45 5,37 5,29 5.24 2 2	pH (SU) +/- 0.1 7 a: h 4 : 39 4 : 39 4 : 39 4 : 39 4 : 39 4 : 39 4 : 43 4 : 44 4 : 45 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	(umhos/cm) +1-3% 2 pring 2 13786 19.36 13786 19.36 13786 19.36 1375/9.5 13959/9.5 13959/9.5 20 pril P 352101PM 05 ENO	Turbidity (NTU) +1-10% Avduct dro 9.6 9.6 9.6 9.6 5.75 5.80 4.65 Method:	D.O. (mg/L) +/-10% pk/5 Law 0.82 0.82 0.82 0.59 0.62 0.59 0.59 0.59 0.50	Тетр (°С) +1-5° 2,31 8,32 8,48 8,91 8,71 8,71	Umi ORP +1-10 mV 1'TDF Z 9. Z 8. V [9.1] 15.3 22.8 23.8	n Ferral Iron (mg/L N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A

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CLIENT: B LOCATION: PROJECT #: INSPECTION Label on well? Is reference mar Condition of well Weather:	N.E. CA 11262 k visible? :	PE MO 4.20 2000 CLOUDY	VES	NO Is ca NO Star Any	T SLAND WELL LOCAT plocked? ding water prese indication of surfa	nt?	<u>O9NCr</u> MSIM	MW NOCGU SDCOIL YES YES YES	<u>133</u>
Notes:		ND 0-1	e mpi-	1 10257	anpoidade				
STATIC WATER Date: 8/25	5/2009		PURGING Time:	AM/PM	sured with:	ELECTRONIC	TAFE	CHALK & STEEL	TAPÉ
Length of Welt		1,50		Deco	ontamination:	PRESTEAM		DIWATER	OTHER
WELL PURGING Date: <u>8/2</u> CALCULATION OF 3 <u>9,50</u> <u>4.50</u> Gallon	$\frac{5}{2009}$ CASING VOLU ft Le ft <u>-0</u> ft =1 <u>x 0</u>	End T	r (before pu er column ctor (2° wel	-	M Decontan Yield: If low, rec Actual vo	Equipment Mination: Print of the second seco	HIGH	LOW gallo	ATER OTHER
Notes:				,				L/mir	
Time	Volume (gallons) ベレ	Depth to Water (feet) <0.33'	pH (SU) +/- 0.1	Conductivity (umhos/cm) M5 ^{LM} /M5/m +/-3%	Turbidity (NTU) +/- 10%	D.O. (mg/L) ÷/- 10%	Temp (°C) +/- 5°	ORP +/- 10 mV	Ferrous Iron (mg/L)
Start: 1330	Intial	4.58	3,29	3659/2.2	6-69	3,34	13,81	3131	N/A
1335		4.85	3,31	3626 2.77	6.73	3,33	1773	306.2	N/A
1340	1200	4,95	3,29	3699/2.86	4.95	2.66	13,19		N/A
1345	1800	5.05	3,31	3793/2,87	J.95	2,59		303.7	N/A
350	2400	5.11	3,24	3862/2,91	4,2/	2.47	12,76	305.5	N/A
						1			
						<u>р</u>			N/A N/A
}						}			N/A
									N/A
Final:									N/A
SAMPLE COLLE		2 <u>7</u>	īme: 135	S AN/PM	Method: 👔	nini Tyi	phosni e	(Lovi Fli	/
Appearance of St	ample:	Clean	(		Actual sample	e flow rate:	120	<u>m</u> (	l/m²
SAMPLE BOTTL	E COLLECT	ED: <u>(</u>	<u>40M</u> 2-12:	L VOA's ter Ame	Her Gree	/Dec al	CION BA	enzenel O AK ³	, ,
SAMPLING PER: Name: Lanc	SONNEL 2 Pro		~					,	

CLIENT: B LOCATION: PROJECT #:	NIE CA NIE CA	PE M 4.20	oc [#] 5	ST. LAW. ENTER	TSLAND RWELLLOCA	TION:	ICO Ognei	MWQ MOCGU	4
INSPECTION Label on well? Is reference man Condition of well Weather: Notes:	n: <u> </u>	2000 <u>CLOUDY</u> NDQ-44		NO Sta Any Air	ap locked? nding water prese r indication of sum Temperature:		well?	YES YES YES (	≥ 2 2 2
STATIC WATER Date: 8/2 Depth to Water.	5/2009		D PURGING Time: [1]:54	5 AMJPM	asured with:	ELECTRON	IC TAPE	CHALK& STEEL	TAPE
Length of Well:	9	.70		Dec	contamination:	PRESTEAM	CLEANED	DIWATER	OTHER
WELL PURGING Date: $8/2$ calculation of: 9.70 7.45 2.25	5/2009 3 casing voll ft Le ft0	End	er (before pu	AM/	PM Deconta Yield:		Min: Ty RESTEAM CL HIGH	Jahoomit L Eaned Diwa LOVV	1
1.769		conversion f		II) 0.49		olume purged		gallor	rs
U Gallo Notes:	ons =	3 casing vol	umes		Actual p	urge flow rate			
Time	Volume (gellons) Flu.v Rutî	Depth to Water (feet) <0.33'	pH (SU) +/- 0,1	Conductivity (umhos/cm) +/- 3%	Turbidity (NTU) +/- 10%	D.O. (mg/L) +/- 10%	Temp (°C) +/- 5°	ORP   +/- 10 mV	Ferrous Iron (mg/L)
Start									N/A
1107	lodiul/min	8.11	5.51	-508	12.0	12.1	6.06	25.2	N/A
1112	100 Malan	8.22	5.52	517	11.9	1/31	4.01	27.9	N/A
	100ml/aus	9:39	5.54	525	17.5	11:8	7.20	33.7	N/A
				1		· ·	1	<u> </u>	N/A
				(	[	1			N/A
					1			<u> </u>	N/A
					1			<u> </u>	N/A
							-		N/A
								<u> </u>	<u>N/A</u>
Final:					L				N/A
SAMPLE COLLE	5 /2.004	1	Time://25	<b>BRITPH</b>	Method:	Mini Ty	phoon	Low Fli	w
Appearance of S	ample: (	leg			Actual samp	le flow rete:	100		1/minor
SAMPLE BOTTL	E COLLECT	'ED:	6 40M	L VOA'S	Her Grad	- for	KIOI B. Geolar	enerne/ 20 Ario	Umin Napth. 2.1103
SAMPLING PER Name: Lavid	SONNEL	,		~ .		4			· ·
		~~~~ ( )	VPLK CA		- company.				

CLIENT: B LOCATION: PROJECT #:	nistol Nie. Cf 11262	4.20	oc# ≤	ST. LAW, 7 ENTER	TSLAND	NON:	TCO. Ogner	Mw <u>0</u> Moc Gu	5
INSPECTION Label on well? Is reference man Condition of wel Weather: Notes:	l: 	2000 CLOUDY ND 5-18	YES) YES)	NO Stan Any Air T	ap locked? ading water press indication of surf emperature:		vell?	YES YES YES 46~50	
STATIC WATER Date: 8/2	8 LEVEL JUS 5 / 2 004		PURGING	-					
Depth to Water. Length of Well:	S,	93			sured with: ontamination:	ELECTRONIC PRE STEAM		CHALK & STEEL DIWATER	TAPE OTHER
WELL PURGING Date: <u>\$/</u> 2	5/2009	Begin End T		Z:0:2 AM/ AM/			hin: Tr Resteand CL		TL/FLOW
CALCULATION OF 3 8.45 5.03 3.42	ft Le	JMES Singth of well depth to wate length of wat		rge start)	Yield: If low, rea	covery time:	HIGH	(OVV)	
5.42 	x	conversion fa 3 casing volu	ictor (2" wel	i) 0 <u>.49</u>		olume purged: Irge flow rate:	3/4 i3	gallo i (mưm i //mir	. 10 mi
						·		~··	
Time	Volume	Depth to	рН	Conductivity	Turbidity	D.O,	Temp	ORP	Ferrous
YSI	(gallons)	Water	(SU)	(umhos/cm)	(NTU)	(mg/L)	(°C)		lron
TING	ML ML	(feet)		M.Sc.w					(mg/L)
0		<0.33'	+/- 0.1	+/- 3%	+/- 10% `	+/- 10%	+/- 5°	+/- 10 mV	
Start 120%		5.35	3.0.2	JT 8,074	65.8	7,32	9,20	306,1	N/A
1205	680	< Amp	<u> 7,94</u>	8,0,5	59,5	7,81	9,49	3,2,6	N/A
1210	1360	2 Pamp		1.883	39.7	7.28	9,56	278.1	N/A
220	3400	< pump	7.92	7,976	41,2 33.4	6,98	9.56	1 59,4	N/A
	39 -	< Pump	<u></u>	8,073			1,50		N/A N/A
			· · · · · · · · · · · · · · · · · · ·						N/A
									N/A
	}							1	N/A
					1. W.				N/A
Final:									N/A
SAMPLE COLLE	CTION		<u> </u>	L					1
	5/200	9 7	Time: 1225	AM/PM	Method: (<u>nini Ty</u> le flow rate: [:]	phoon	Con Fl	oul
						r		introle.	
				. 1			4 M X M X M X M X M X M X M X M X M X M		
Appearance of S	ample:	<u>Cléer</u> ,	511645te	tint	Actual sampl	e flow rate:	<u> </u>	36 6	ni/mineor
Appearance of S	ample:	Cléer						•	/min
Appearance of S		4						•	/min
		ED: _(6 40 M	L VOA'S ter Ame	HCL GRO Der-winc	L FOR (kioi B. Gro/RR	•	/min
SAMPLE BOTTL		ED: _(6 40 M	L VOA'S ter Ame	HCL GRO Der-winc	L FOR (kioi B. Gro/RR	•	/min

CLIENT: B LOCATION: PROJECT #:	N.E. CI N.E. CI	APE M 14.20	0C# <	ST. LAW. ST. LAW.	TSLAND WELL LOCA	TION:	ICO Ogne	MN J MOCGU	2 <u>6</u> 13 <u>6</u>
INSPECTION Label on well? Is reference may Condition of well Weather: Notes:	n:	Zood CLOUDY		NO Star Any Atr	ap locked? nding water prese Indication of sur Femperature:		wall?	YES YES YES	
STATIC WATER Date: 8/2	s Level Ju 5 / 2 004		DPURGING						
Depth to Water. Length of Welt:	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	<u>5.5</u> २-7-7 १।			sured with: onternination:	ELECTRONIC PRE STEAM		CHALK & STEEL	Yape Other
WELL PURGINO Date: <u>\$/2</u>	5/2004	End 7		11:30 AM/ 17:23 AM/		Equipment <u>Y</u> mination: Pi		YPHOON+	
9.10	ft L	ength of well			Yield:		સાહા	LOW	į
5.59		depth to wate		irge start)	If low, re	covery time:			
		length of wat		0.0.40	۸ ماریم ا	a to sea a su summa a da			
Galło		conversion fa 3 casing volu		1) 0.49		olume purged: urge flow rate:	1/0	gallo: ml/m	. č
Notes:	wis –	o casing volu	20085		Acutation	niĝe now tate.		Umin	-
				· • • •				Divin	
Time	Volume	Depth to	рН	Conductivity	Turbidity	D.O.	Temp	ORP	Ferrous
	(gallons)	Water	(SU)	(umnos/cm)	(NTU)	(mg/L)	(°C)		Iron
		(feet)							(mg/L)
		<0.33	*/- 0.1	+/~ 3%	+/- 10%	+/- 10%	*/- 5°	<u>+/- 10 mV</u>	
Start: 11.30			2.		0.00		1.25		N/A
11:46			1.86	3.651	90.85	2.94	9.35	326.8	N/A
11 49	1-9-9-9-9-9-9-9-9-9-9-9-9-9-9-9-9-9-9-9	5.59	1.81	3.686	122.7	3.52	9.28	317.8	N/A
11:52		biles prop	1.73	3.778	158.4	3.74	9.40	333.4	N/A
<u>11:55</u> Л:58		With pingo 1	1.73	3.725	135.6	3.31	935	333.2	N/A
/2.01		bde parp	1.69	3.769	133.0	3.37	2.23	334.6	N/A N/A
/2.01		below pays		3.670	1177.0		LITE	227.0	N/A
		1		}		1	1		N/A
									N/A
Final:		¦		i i				<u> </u>	N/A
SAMPLE COLLE	CTION	de <u>aans</u> waaran ahaa ahaa ah					1	1 1	
	5/200	9 1	rime: 12.0	5 AM/PM	Method: N	mini Ty	ohoon	& Low Fle	sul l
					_	1	ζ.	OVITUDLES	
Appearance of S	ample:	yulanthe toring	A will furb.	d	Actual samp	le flow rate:	110	(m	il/mineor
		1							Umin
SAMPLE BOTTL	E COLLECT	red: _(,	0 40M	L VOA'S ter Amb	HEL GRO	/DEO AI	LION B	enzenel	Wapth.
			2 - 1 2:	ter Amb	er-wilkc	- FOR C	SRO / RA	0 AK-10	2/103
SAMPLING PER	SONNEL			- 1				2461247783	
Alexander 1 and 1		1 1 (1	N	1 Lu X			5 A		
Name LUNC	2 178	455/0	GIECN	Jamorosic	Company:	AECO	, V \ _		

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CLIENT: CLIENT: CLIENT: CLIENT: CLIENT: PROJECT #	NIE. CA	4PE M 4.20	oc# '	ST. LAW. ENTE	すらしろいう R WELL LOCAT	7)011:		MN -	
INSPECTION Label of well? Is reference ma Condion of we Wether. Nots:	11: <u> </u>	CLOUDY	YES YES	NO Sta Any Air	ap locked? anding water prese y indication of surfa Temperature:		well?	YES YES YES YO	
ratic water	5/2004	}	D PURGING						
Depth to Water. Length of Well:		5.57 <u>9.</u> 60			asured with: contamination;	ELECTRON PRE STEAM		CHALK& STEEL	TAPE OTHER
WELL PURGIN Date: <u>8/2</u> CALCULATION OF	5/2009 3 CASING VOLL	End T INVES	Time:		/PM Decontarr		RE STEAM CL	HPHON 41 EANED DIW.	
5.57.	ft (ength of well depth to wate	er (before pu	urge start)	Yield: If low, rec	overy time:	HIGH	LOW	
1.9		length of wat conversion fa		II) 0.49	Actual vol	lume purged:		gallo	ns
Galic Notes:	ons =	3 casing volu	lmes		Actual pu	rge flov/ rate:		↑ ml/mi L/min	· 1
Time	Volume (gallons)	Depth to Water (feat)	pH (SU)	Conductivity (umhos/cm)	Turbidity (NTU)	D.G. (mg/L)	Temp (°C)	ORP	Ferrous Iron (mg/L.)
Stat: 13:15		<d'33,< td=""><td>+/- 0.1</td><td>÷/- 3%</td><td>-+/- 10%</td><td>+/- 10%</td><td>+1-5°</td><td>+/- 10 mV</td><td> N/A</td></d'33,<>	+/- 0.1	÷/- 3%	-+/- 10%	+/- 10%	+1-5°	+/- 10 mV	 N/A
13:15		5.66	5.64	1.972	11.13	1.81	4.85	-12.8	N/A
13:28		5.65	5.68	1.979	8.41	0.87	4.45	-17.2	N/A
3.31		5.65	5.65	1.977	A 14.78 7.86	6.78	47.6	-10.6	N/A
13:39	1	5.65	5.60	1,990	8.07	0.81	457	-56	N/A
13:57		5.65	5.63	2.405	7.09	0.79	4.75	-9.5	N/A
							1		N/A
		-						{	N/A
new Management -	The state of the second second						N		N/A
									N/A
Final:									N/A
SAMPLE COLLE			annosent in					1 (7)	
Date: 812:	5/2004		Time: 13:4	DAMPM	Method: <u>N</u>	nini Ty	phoons	Courtle	sul 1
Appearance of S SAMPLE BOTTL	,	<u>pillowich bros</u> with purgent	- end for	<u>i. J. chr. up</u>	Actual sample	e flow rate:			l/min or
		<u> </u>	2 - 1 2 2	ter Am	ber willer	- £n12 1	GROTAR	O Arin	- 1103
SAMPLING PER	SONNEL				HEL GREE, bgr-wiker L_Company:			0 AK.10	2/103

CLIENT: B LOCATION: PROJECT #:	NE C	APE M	oc # S	ST. LAW.	すいるいつ	TION:	TCO OANC	MNU _COM	28 13 <u>8</u>
INSPECTION Label on well? Is reference man Condition of wel Weather: Notes:	l:P	2000 2000 . <u>(1000</u> 		NO Sta Any Air	ap locked? nding water press indication of sur Temperature:		vell?	YES YES YES	NO NO NO
STATIC WATER Date: 8/2	1 LEVEL JU 5 / 2 004		O PURGING Time: ₡१:ऽ						
Depth to Water. Length of Well:		<u>9.34</u>			sured with: ontamination;	PRE STEAM C		CHALK & STEEL	TAPE OTHER
WELL PURGING Date: §/2 CALCULATION OF 3	$\frac{5}{2004}$ CASING VOL ft L	End UMES angth of well	Time:	<u>}0.(0</u> AM/ <u> & . 00</u> AM/	PM Decontai Yield:		E STEAM CI	LEANED DIW	
· · ·		depth to wate length of wat		rge start)	if low, re	covery time:	710	hoves	
		conversion fa		11) () 49	Actual	olume purged:		gallo	
Gallo		3 casing volu				urge flow rate:	10		1
Notes:		-		- for mothing	y	-			-
Time	Volume (gallons)	Depth to Water (feet)	рН (SU)	Conductivity (umhos/cm)	Turbidity (NTU)	D.O. (mg/L)	Temp (°C)	ORP	Ferrous Iron (mg/L)
Start: 10:10		<0.33'	+/- 0,1	+/- 3%	+/- 10%	+/- 10%	+/- 5°	+/- 10 mV	
Start: 10:10			4.72	1.1.24	42.85	4.1744.6	4.07	1747	N/A
10:23		pelan sung	4.75	0.134	44.80			124.3	N/A
10:25		bism pop		0.135	37.60	5.07	4.27	122.7	N/A
10.00	L	belon peop	7.11	0.75	37.00	P.07	4.11	100.1	N/A
		1		1					N/A
	<u></u>				v				N/A
									N/A
		1		1				1	NA
									N/A
Final:									N/A
SAMPLE COLLE	CTION	L.							
		9.	Time: 10 3	O AMIPM	Method: 6	mini Typ	hoon	& Low Fle	SW.
Appearance of Sa					Actual samp		10		l/minor
SAMPLE BOTTL		red: _(6 40M	L VOA'S	HEL GRO	- FOR G	Ro la	enzanel 20 Azip	Umin iv2.prt4. 2/103
Name: Lave	SONNEL 2 Pro					20			

CLIENT: D LOCATION: PROJECT #:	RISTOL NECA 11262	IPE ST	5. L. A.L	KENCE	TSLAND R WELL LOCA	TION:		NW <u>O</u> MOCGU	
INSPECTION Label on well? Is reference ma Condition of we Weather: Notes:	8: <u> </u>	ood (YES YES	NO Stan Any	ap locked? nding water prese indication of sur Temperature:		vəll?	YES YES YES 45 =	≥0
STATIC WATER Date: 9 ///	RLEVEL JUS	T PRIOR TO	D PURGING Time:	AM/PM					
Depth to Water: Length of Well:	<u>4</u> 9	,38 .50	1 10 10 10		isured with: ontemination:	ELECTRONIC PRE STEAM		CHALK & STEEL DI WATER	TAPE OTHER
WELL PURGING Date: 91	1/ 1200	End				Equipment <u>M</u> mination: Pr		PITONT	
CALCULATION OF: 9.50 4.38 5.12 2.5	ft Le ft <u>- c</u> ft =	MES angth of well depth to wate length of wat conversion fr	er (before pu ter column		·	covery time: blume purged:	HIGH N <u>ot</u> pi 2	LOW <u> <u> </u> </u>	
Gallo Notes:	ons ≃ 	3 casing vol	umes		Actual p	urge flow rate:	<u>-~ 16</u>	0 mVm/ L/min	
Time	Volume	Depth to	pН	Conductivity	Turbidity	D.O.	Temp (°C)	ORP	Ferrous
Time	(gallons)	Water (řest)	(SU)	(umhos/cm)	(NTU)	(mg/L)		+/- 10 m\/	íron (mg/L)
	(gallons)	Water (řest) <0.33'	+/- 0.1	+/- 3%	<i>+1</i> - 10%	+/- 10%	+/- 5°	+/- 10 mV	(mg/L)
Stari: <u>/230</u>	(gallons)	Water (řest) <0.33' 4.38	+/-0.1	+/- 3%	+1-10%	+1- 10%	+1-5° 7.76	278,3	(mg/L) N/A
Stari: 1230 1240	(gallons) Intral .75	Water (feet) <0.33' 4.38 4.68	+/-0.1 3.75 3.82	+1-3% 1, 661 1, 668	+1-10% 6-75 6-09	+1-10% 3,47 0,74	+1-5° 7.76 7.94	278,3 283.5	(mg/l) N/A N/A
Stari: <u> 230</u> <u> 240</u> 245	(gallons) <i>Inific(</i> .75 1,25	Water (feet) <0.33' 4.38 4.68 4.68 4.68	+/-0.1 3.75 3.82. 3.81	+1-3% 1.661 1.668	+1-10% 6-75 6-09 4-05	+1-10% 3,47 0,74 0.87	+1-5° 7.76 7.94 7.93	278,3 283.5 284.4	(mg/L) N/A N/A N/A
Stari: <u>1230</u> <u>1240</u>	(gallons) Intral .75	Water (feet) <0.33' 4.38 4.68	+/-0.1 3.75 3.82	+1-3% 1, 661 1, 668	+1-10% 6-75 6-09	+1-10% 3,47 0,74	+1-5° 7.76 7.94	278,3 283.5	(mg/L)
Stari: <u> 230</u> <u> 240</u> 245	(gallons) <i>Inific(</i> .75 1,25	Water (feet) <0.33' 4.38 4.68 4.68 4.68	+/-0.1 3.75 3.82. 3.81	+1-3% 1.661 1.668	+1-10% 6-75 6-09 4-05	+1-10% 3,47 0,74 0.87	+1-5° 7.76 7.94 7.93	278,3 283.5 284.4	(mg/L) N/A N/A N/A N/A N/A
Start: <u> 230</u> <u> 240</u> 245	(gallons) <i>Inific(</i> .75 1,25	Water (feet) <0.33' 4.38 4.68 4.68 4.68	+/-0.1 3.75 3.82. 3.81	+1-3% 1.661 1.668	+1-10% 6-75 6-09 4-05	+1-10% 3,47 0,74 0.87	+1-5° 7.76 7.94 7.93	278,3 283.5 284.4	(mg/L) N/A N/A N/A N/A N/A N/A
Start: <u> 230</u> <u> 240</u> 245	(gallons) <i>Inific(</i> .75 1,25	Water (feet) <0.33' 4.38 4.68 4.68 4.68	+/-0.1 3.75 3.82. 3.81	+1-3% 1.661 1.668	+1-10% 6-75 6-09 4-05	+1-10% 3,47 0,74 0.87	+1-5° 7.76 7.94 7.93	278,3 283.5 284.4	(mg/L) N/A N/A N/A N/A N/A N/A N/A
Start: <u> 230</u> <u> 240</u> 245	(gallons) <i>Inific(</i> .75 1,25	Water (feet) <0.33' 4.38 4.68 4.68 4.68	+/-0.1 3.75 3.82. 3.81	+1-3% 1.661 1.668	+1-10% 6-75 6-09 4-05	+1-10% 3,47 0,74 0.87	+1-5° 7.76 7.94 7.93	278,3 283.5 284.4	(mg/L) N/A N/A N/A N/A N/A N/A N/A
Stari: <u> 230</u> <u> 240</u> 245	(gallons) <i>Inific(</i> .75 1,25	Water (feet) <0.33' 4.38 4.68 4.68 4.68	+/-0.1 3.75 3.82. 3.81	+1-3% 1.661 1.668	+1-10% 6-75 6-09 4-05	+1-10% 3,47 0,74 0.87	+1-5° 7.76 7.94 7.93	278,3 283.5 284.4	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A
Start: 1230 1240 1245 1250	(gallons) <i>Inific(</i> .75 1,25	Water (feet) <0.33' 4.38 4.68 4.68 4.68	+/-0.1 3.75 3.82. 3.81	+1-3% 1.661 1.668	+1-10% 6-75 6-09 4-05	+1-10% 3,47 0,74 0.87	+1-5° 7.76 7.94 7.93	278,3 283.5 284.4	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: /230 1240 1245 /250	(gallons) IIIIFIL(.75 1.25 Z.00	Water (feet) <0.33' 4.38 4.68 4.68 4.68 4.83	+/- 0.1 3.75 3.82- 3.81 3.81	+1-3% 1. 66. 1 1. 66 B 1. 771 1. 78 7	+1-10% 6-75 6-09 4-05 2-99	+1-10% 3,47 0,94 0.87 0,47	+/-5° 7.7& 7.94 7.93 7.93	278,3 283.5 284.4 287.9	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Stari: 1230 1240 1245 1250	(gallons) <i>If</i> (Water (feet) <0.33' 4.38 4.68 4.68 4.68 4.68 4.83 4.83 	+1-0.1 3.75 3.82 3.81 3.81 3.81 Time: 125 Toa,m, 2.50 m. 6 40 m. VO	+1-3% 1. 66 1. 66 1. 771 1. 187 1. 187 	+1-10% 6-75 6-09 4-05 2-99	+1-10% 3.47 0.74 0.74 0.77 0.77 0.77	+1-5° 7.76 7.76 7.94 7.93 7.93 7.93 7.93 7.93 7.93 7.93 7.93	278,3 283.5 284.4 287.9 JLF () 200 (m 2 falls 2, NApth	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A

CLIENT: B LOCATION: PROJECT #:	N.E Cr	PE SI	T. LAW	ベビルし C こ ENTER	TSLAND I WELL LOCA	TION:	TCOM CANC	nw <u>o</u> Mocgi	<u> </u>
INSPECTION Label on well? Is reference ma Condition of we Weather: Notes:	s: 🤄	eood ourly	YED	NO Star Any	ap locked? Iding water prese Indication of surf Femperature:		vall?	YES YES YES 4/5 ⁻⁵	≥0 (S) (S) (S) (S) (S) (S) (S) (S) (S) (S)
STATIC WATER Date: 9/1	RLEVEL JUE	T PRIOR TO	D PURGING Time:	AM/PM				<u></u>	
Depth to Water. Length of Well:	<u> </u>	6 <u>5</u> 70		-	sured with: onternination:	ELECTRONIC PRE STEAM Ded	- And a state of the	CHALK & STEEL DIWATER	TAPE OTHER -45.00
WELL PURGING Date: 91	3 11 1200	9 Begir End T		1100 (AM) 140. AM	5 5			ENED DIW	FContra
CALCULATION OF $\frac{9.70}{7.65}$	ft Le ft - 0 ft = 0 ft = 0 ons = 0	ength of well lepth to wate length of wat conversion fa 3 casing volu	ter column actor (2° well umes		Actual vo	covery lime: blume purged; Irge flow rate: حارات مراد	нібн <u>2 ћ</u> 40	gallo	intor
	· <u> </u>	DROL	RRO Sa	inples.					
Τῖmə	Volume (gallons)	Depth to Water (îeet) <0.33'	рН (SU) +/- 0.1	Conductivity (umhos/cm) +/- 3%	Turbidity (NTU) +/- 10%	D.O. (mg/L) +/- 10%	Temp (°C) +/- 5°	ORP +/- 10 mV	Ferrous Iron (mg/L)
Starl: 1/05	Initial	7.67	5.32	,517	8.45	1.05	5.2Z	47.2	N/A
1.(20	0,6	8,20	5,32	.584	7.84	1,97	5.68	40.2	N/A
1130	0.8	8.26	5,56	.610	6.64	1.19	5.51	33.1	N/A
1140	0.9	8.29	5,65	. 608	6:25	1.08	5.39	34,8	N/A
í			<u> </u>				<u> </u>	ļ	N/A
									N/A
									N/A
								I	N/A N/A
								┝╼╼─╼╇	N/A N/A
Final:		1							N/A
SAMPLE COLLE Date: 9	TZ00	{	1īme: 1140	AMIEM	Method: 🔥	AINI TY	iphoN	JLF C	
Appearance of S	ample:	Clear	- 250 ML P	6LY - SUI- F.A.	Actual sampl	ie flow rate:	-24	10 m	Winin or
SAMPLE BOTTL	E COLLECT	ED: 6-0	IL+ A	A VIALS IS I	Her GRO	AKIOI TE	20 AK	WAPH	iteur oz
SAMPLING PER	·	}	_			AELON	^		l
Name: AaroN	1000	la main	a		^	ハレノのし	•		1
	0600	04020			Company:	ALCON	`		

DAY 28 SAMPLING FORMS

CLIENT: U LOCATION: PROJECT #:	RISTOL N.E CI 11262	ape 2	T.LAL	ENTE	R WELL LOCA	TION:	TCO CANC	MW <u>O</u> MOCG	<u>2</u> W <u>42</u>
INSPECTION Label on well? Is reference ma Condition of we Weather: Notes:	lt: 🥝	500d		NO Sta Any	ap locked? nding water pres i Indication of sur Temperature:		ve (?	YES YES YES ~40 F	20 20 20 20 20 20 20
STATIC WATER Date: 9	1		O PURGING						
Depth to Water. Length of Welt:		5.1 8.94		. – –	isured with: ontemination:	ELECTRONIC PRE STEAM		CHALK & STEEL	TAPE OTHER
WELL PURGING Date: 91	3 11 1200	•	n Time: Time:	14:35 AM/ 5 15 AM/				LEANED OW	LF Contr.
	ft Le	ength of well depth to wate	er (before pi	urge start)	Yield: If low, re	covery time:	HIGH	LOW	
Gallo	X	length of wa conversion f 3 casing vol	actor (2° wei umes	N) 0.49		blume purged: arge flow rate:	/2.0	gallo) (n/m) (/ma	intor
	,	Depth to	рH	Conductivity	Turbidity	D.O.	Temp	ORP	Ferrous
Time	Volume (gallons)	Water (feet)	(ເບິອັ	(umhos/cm)	(NTU)	(mg/L)	(°C)		Iron (mg/L)
		Water	1 1	(umhos/cm) +/- 3%	(NTU) + <u>+- 10%</u>	(mg/L) +√- 10%	(℃) +/-5°	+/- 10 mV	Iron (mg/L)
Start: 14:35		Water (feet) <0.33'	(SU) +/- 0.1	+/- 3%	+/- 10%	+/- 10%	÷∕-5°		Iron (mg/L) N/A
Start 14:35 14:45		Vvater (feet) <0.33' 5. 60	(SU) +/-0.1 57 ຊ.Z	+1-3%	+1.10%	-+/- 10%	+ ⊢5 ° 7.49	-78 9	Iron (mg/L)
Start: 14:35 14:45 14:45		Water (feet) <0.33'	(SU) +/-0.1 5.92 5.86	+1-3% 3.436 3.420	+1- 10% 41.7î 17.97	+/- 10%	÷∕-5°		Iron (mg/L) N/A N/A N/A
Start 14:35 14:45 14:45 14:51 14:51		Water (feet) <0.33' 5.60 5.60 5.70 5.70	(SU) +/-0.1 57 ຊ.Z	+1-3%	+1.10%	++- 10% 0 22 0 15	+/- 5° 7 49 7.46	-78 5 -58.3	Iron (mg/L) N/A N/A
Start: 14:35 14:45 14:48 14:51		Water (feet) <0.33' 5.60 5.60 5.70 5.70 5.70 5.71	(SU) +/-0.1 5.2Z 5.82 5.82 5.90 5.87	+1-3% 3.436 3.420 3.432 3.378 3.367	+1- 10% 	++- 10% 0 22 0 15 0:15 0:13 0.14	+-5° 749 7.46 7.47	-78 5 -57.3 - 2.28 -79.7 -75.4	Iron (mg/L) N/A N/A N/A N/A
Start 14:35 14:45 14:48 14:51 14:51		Water (feet) <0.33' 5.60 5.60 5.70 5.70	(SU) +/-0.1 5.22 5.82 5.82 5.70	+1-3% 3.436 3.420 3.432 3.378	+1-10% 41.71 17.57 10.13 7.84	++- 10% 0 22 0 15 0 : 15 0 : 13	+1-5° 749 7.46 7.47 7.12	-78 5 -57.3 - 22.8 -79.7	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A
Start: 14:35 14:45 14:45 14:51 14:51 14:57		Water (feet) <0.33' 5.60 5.60 5.70 5.70 5.70 5.71	(SU) +/-0.1 5.2Z 5.82 5.82 5.90 5.87	+1-3% 3.436 3.420 3.432 3.378 3.367	+1-10% 4/1.7? 17.97 10.33 7.86 7.12	++- 10% 0 22 0 15 0:15 0:13 0.14	+1-5° 749 7.4(, 7.47 7.72 7.72 7.72	-78 5 -57.3 - 2.28 -79.7 -75.4	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A
Start: 14:35 14:45 14:45 14:51 14:51 14:57		Water (feet) <0.33' 5.60 5.60 5.70 5.70 5.70 5.71	(SU) +/-0.1 5.2Z 5.82 5.82 5.90 5.87	+1-3% 3.436 3.420 3.432 3.378 3.367	+1-10% 4/1.7? 17.97 10.33 7.86 7.12	++- 10% 0 22 0 15 0:15 0:13 0.14	+1-5° 749 7.4(, 7.47 7.72 7.72 7.72	-78 5 -57.3 - 2.28 -79.7 -75.4	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 14:35 14:45 14:45 14:51 14:51 14:57 14:57 15:20		Water (feet) <0.33' 5.60 5.60 5.70 5.70 5.70 5.71	(SU) +/-0.1 5.2Z 5.82 5.82 5.90 5.87	+1-3% 3.436 3.420 3.432 3.378 3.367	+1-10% 4/1.7? 17.97 10.33 7.86 7.12	++- 10% 0 22 0 15 0:15 0:13 0.14	+1-5° 749 7.4(, 7.47 7.72 7.72 7.72	-78 5 -57.3 - 2.28 -79.7 -75.4	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 14:35 14:45 14:45 14:51 14:57 14:57 15:50 Fmal:	(gallons)	Water (feet) <0.33' 5.60 5.66 5.70 5.70 5.70 5.71 5.75	(SU) +/-0.1 5.2Z 5.82 5.82 5.90 5.87	+1-3% 3.436 3.420 3.432 3.378 3.367	+1-10% 4/1.7? 17.97 10.33 7.86 7.12	++- 10% 0 22 0 15 0:15 0:13 0.14	+1-5° 749 7.4(, 7.47 7.72 7.72 7.72	-78 5 -57.3 - 2.28 -79.7 -75.4	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 14:35 14:45 14:45 14:51 14:51 14:57 14:57 15:20	(gallons)	Water (feet) <0.33' 5.60 5.66 5.70 5.70 5.70 5.71 5.75	(SU) +/-0.1 5.2Z 5.82 5.82 5.90 5.87	+1-3% 3.436 3.420 3.432 3.367 5.356	+1-10%	++- 10% 0 22 0 15 0:15 0:13 0.14	+1-5° 749 7.46 7.47 7.72 7.72 7.76 7.51	-78 9 -59.3 -92.8 -79.7 -75.4 -79.2	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 14:35 14:45 14:45 14:57 14:57 14:57 15:55 Final: SAMPLE COLLE Date: 9 1		Water (feet) <0.33' 5.60 5.70 5.70 5.70 5.71 5.75	(SU) +/- 0.1 5. 2Z 5. 26 5. 26 5. 26 5. 70 5. 75 5. 75	+1-3% 3.436 3.420 3.432 3.367 3.367 5.354	+1-10%	++- 10% 0 22 0 15 0:15 0:15 0:13 0.14 0.14 0.13	+-5° 749 7.46 7.47 7.72 7.72 7.72 7.75	$-78 \ 9$ -58.3 -82.8 -79.7 -75.4 -79.8 -79.8	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 14:35 14:45 14:45 14:51 14:57 14:57 15:50 Fmal:		Water (feet) <0.33' 5.60 5.66 5.70 5.70 5.71 5.75	(SU) +1-0.1 5.22 5.26 5.26 5.26 5.27 5.95 5.95 5.95	+1-3% 3.436 3.420 3.432 3.367 5.356	+1-10% $41.7\hat{1}$ $17.9\hat{7}$ $10.3\hat{3}$ $7.8\hat{6}$ $7.1\hat{2}$ 5.10 Method: <u>W</u> Actual sample 42.50 million	-+- 10% 0 22 0 15 0.15 0.13 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.13 0.14 0.14 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.	+-5° 749 749 7.46 7.72 7.72 7.76 7.51 Phon izo for menzen	-78 9 -58.3 -82.8 -79.7 -75.4 -79.2 -79.2 -79.2 -79.2 -79.2 -79.2 -79.2 -79.2 -79.2 -79.2 -79.2 -79.7 -75.4 -79.7 -75.4 -79.7 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 14:35 14:45 14:45 14:51 14:51 14:57 14:57 14:57 15:50 Final: SAMPLE COLLE Date: 11:1	(gallons)	Water (feet) <0.33' 5.60 5.66 5.70 5.70 5.71 5.75	(SU) +1-0.1 5.22 5.26 5.26 5.26 5.27 5.95 5.95 5.95	+1-3% 3.436 3.430 3.432 3.367 3.367 3.367 5.354 AM/PM	+1-10% $41.7\hat{1}$ $17.9\hat{7}$ $10.3\hat{3}$ $7.8\hat{6}$ $7.1\hat{2}$ 5.10 Method: <u>W</u> Actual sample 42.50 million	++- 10% 0 22 0 15 0.15 0.13 0.14 0.13 0.14 0.14 0.13 0.14 0.13 0.14 0.13 0.14 0.13 0.14 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.1	+-5° 749 7.46 7.47 7.72 7.72 7.72 7.72 7.72 7.72 7.72	-78 9 -58.3 -82.8 -79.7 -75.4 -79.2 -79.2 -79.2 -79.2 -79.2 -79.2 -79.2 -79.2 -79.2 -79.2 -79.2 -79.7 -75.4 -79.7 -75.4 -79.7 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4 -75.4	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A

CLIENT: D LOCATION: PROJECT #:	RISTOL N.E CA 11262	APE ST	T. L.AW	ĸ E い C と EN TEF	TSLANID R Well Loca	TION:		nw <u>o</u> Mocgl	
INSPECTION Label on well? Is reference may Condition of well Weather: Notes:	11: C	ood	VES VES	NO Star Алу	ap locked? nding water prese indication of surf Femperature:		vəll?	VES VES VES 45 =	SO (S) (S) (S) (S) (S) (S) (S) (S) (S) (S)
STATIC WATER Date: 9	R LEVEL JUE 2009	ST PRIOR TO	D PURGING Time:	AM/PM	\$0************************************				
Depth to Water. Length of Well:	4 4	,38 -50			sured with: onternination:	ELECTRONIC FRE STEAM O		CHALK & STEEL DI WATER	TAPE OTHER
WELL PURGING Date: 9/	1200	End		2 <i>22)</i> AMA 2.5,5 AMA				PI-to N 2-1 EANED DIW	F Contra
CALCULATION OF 3 <u>9.50</u> <u>4.38</u> <u>5.12</u> <u>2.5</u> Gallo Notes:	$\begin{array}{ccc} \mathbf{ft} & \mathbf{Le} \\ \mathbf{ft} & -\mathbf{c} \\ \mathbf{ft} & -\mathbf{c} \\ \mathbf{ft} & = \\ \mathbf{xe} \end{array}$	IMES angth of well depth to wate length of wa conversion fa 3 casing volu	er (before pu ter column actor (2° wel		Actual vo	covery time: plume purged: urge flow rate:	нідн <u>истр</u> <u>2</u> -2/С		ns Mor
Notes.								7740M	' (
Time	Volume	Depth to	Hq	Conductivity	Turbidity	D.O.	Temp	ORP	Ferrous
0110	(gallons)	Water (feet)	(SU)	(umhos/cm)	(NTU)	(mg/L)	(°C)		ìran (mg/L)
		(feet) <0.33'	+/- 0.1	+/- 3%	-⊧/- 10%	+/- 10%	+/- 5°	+/- 10 mV	(mg/L)
Start: 1230	Inter!	(feet) <0.33' 4.38	+-01	+1-3% 1. Ľ(; 1	+1-10%	+1-10%	+1-5° 7.76	278,3	(mg/L)
Start: 1230 1240	Intra.1	(feet) <0.33 4.38 4.68	+/-0.1 3.75 3.82	+1-3% 1, 661 1, 66 B	+1-10%	+1-10% 3.47 0,74	+1-5° 7.76 7.94	278,3	(mg/L) N/A N/A
Start: 1230 1240 1245	Intral .75 1,25	(feet) <0.33' 4.38 4.68 4.68	+1-0.1 3.75 <u>3.82</u> 3.81	+1-3% 1. <u>b(;</u> 1 1. <u>i. 6</u> B 1. 771	+1-10% 6.75 6.09 4.05	+1-10% 3.47 0.74 0.87	+1-5° 7.76 7.94 7.93	278,3 2835 2844	(mg/L) N/A N/A N/A
Start: 1230 1240	Intra.1	(feet) <0.33 4.38 4.68	+/-0.1 3.75 3.82	+1-3% 1, 661 1, 66 B	+1-10%	+1-10% 3.47 0,74	+1-5° 7.76 7.94	278,3	(mg/L) N/A N/A
Start: 1230 1240 1245	Intral .75 1,25	(feet) <0.33' 4.38 4.68 4.68	+1-0.1 3.75 <u>3.82</u> 3.81	+1-3% 1. <u>b(;</u> 1 1. <u>i. 6</u> B 1. 771	+1-10% 6.75 6.09 4.05	+1-10% 3.47 0.74 0.87	+1-5° 7.76 7.94 7.93	278,3 2835 2844	(mg/L) N/A N/A N/A N/A
Start: 1230 1240 1245	Intral .75 1,25	(feet) <0.33' 4.38 4.68 4.68	+1-0.1 3.75 <u>3.82</u> 3.81	+1-3% 1. <u>b(;</u> 1 1. <u>i. 6</u> B 1. 771	+1-10% 6.75 6.09 4.05	+1-10% 3.47 0.74 0.87	+1-5° 7.76 7.94 7.93	278,3 2835 2844	(mg/L) N/A N/A N/A N/A N/A
Start: 1230 1240 1245	Intral .75 1,25	(feet) <0.33' 4.38 4.68 4.68	+1-0.1 3.75 <u>3.82</u> 3.81	+1-3% 1. <u>b(;</u> 1 1. <u>i. 6</u> B 1. 771	+1-10% 6.75 6.09 4.05	+1-10% 3.47 0.74 0.87	+1-5° 7.76 7.94 7.93	278,3 2835 2844	(mg/L) N/A N/A N/A N/A N/A N/A
Start: 1230 1240 1245	Intral .75 1,25	(feet) <0.33' 4.38 4.68 4.68	+1-0.1 3.75 <u>3.82</u> 3.81	+1-3% 1. <u>b(;</u> 1 1. <u>i. 6</u> B 1. 771	+1-10% 6.75 6.09 4.05	+1-10% 3.47 0.74 0.87	+1-5° 7.76 7.94 7.93	278,3 2835 2844	(mg/L) N/A N/A N/A N/A N/A N/A N/A
Start: 1230 1240 1245	Intral .75 1,25	(feet) <0.33' 4.38 4.68 4.68	+1-0.1 3.75 <u>3.82</u> 3.81	+1-3% 1. <u>b(;</u> 1 1. <u>i. 6</u> B 1. 771	+1-10% 6.75 6.09 4.05	+1-10% 3.47 0.74 0.87	+1-5° 7.76 7.94 7.93	278,3 2835 2844	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A
Start: 1230 1240 1245 1250	Intral .75 1,25	(feet) <0.33' 4.38 4.68 4.68	+1-0.1 3.75 <u>3.82</u> 3.81	+1-3% 1. <u>b(;</u> 1 1. <u>i. 6</u> B 1. 771	+1-10% 6.75 6.09 4.05	+1-10% 3.47 0.74 0.87	+1-5° 7.76 7.94 7.93	278,3 2835 2844	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: /230 /240 /245 /250 Final:	75 1,25 2,20 2,20 72,20 72,00	(feet) <0.33' 4.38 4.68 4.62 4.82 4.82 4.83 4.83 5.7 -/auture ED: 6-	+1-0.1 3.75 3.82 3.81 3.81 3.81 5.81 7.02,101 2.50 mL P 40 mL VO	+1-3% 1. 66 B 1. 771 1. 787 1. 787 1. 787 	+1-10% 6.75 6.09 4.05 2.19 	+1-10% 3.47 0.94 0.87 0.47 0.47 0.47 1 1 1 1 1 1 1 1 1 1 1 1 1	+1-5° 7.76 7.94 7.93 7.93 7.93 7.93 7.93	278,3 2835 284.4 287.9 + L F (0 etals , NAph	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: /230 /240 /245 /250 Final: SAMPLE COLLE Date: 9///	ECTION 1200 200 200 200 1200 1200 ECTION 1200 ECTION 1200 ECTION	(feet) <0.33' 4.38 4.68 4.62 4.82 4.82 4.83 4.83 5.7 -/auture ED: 6-	+1-0.1 3.75 3.82 3.81 3.81 3.81 5.81 7.02,101 2.50 mL P 40 mL VO	+1-3% 1. 66 B 1. 771 1. 787 1. 787 1. 787 	+1-10% 6.75 6.09 4.05 2.19 Method: ₩	+1-10% 3.47 0.94 0.87 0.47 0.47 0.47 1 1 1 1 1 1 1 1 1 1 1 1 1	+1-5° 7.76 7.94 7.93 7.93 7.93 7.93 7.93	278,3 2835 284.4 287.9 + L F (0 etals , NAph	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A

CLIENT: B LOCATION: PROJECT #:	N.E CA	PESI	- LAW	ベビルく C こ ENTEF	TSLAN: TS Well Locat	110N: (TCON CANC	nw <u>q</u> Mocgi	<u> </u>
INSPECTION Label on well? Is reference ma Condition of we Weather: Notes:	II: <u>6</u>	100d 00d	YE	NO Star Any	ap locked? nding water prese îndîcation of surf Femperature:		vell?	YES YES YES 4/5	NO (2) (2) (2) (2)
STATIC WATER Date: 9_11	. /	ST PRIOR TO	D PURGING Time:	АМРМ					
Depth to Water. Length of Well:	<u>7.</u> _9.	15 70			sured with: ontamination;	FRE STEAM O		CHALK & STEEL OI WATER DU, MD & 4	OTHER OTHER
WELL PURGING Date: 91	G 1200	9 Begir End		1100 (AM) 140. AM				PILC N 4-1 EANED DIW	FContr.
CALCULATION OF 9.70 7.65 2.05 0.90	ft Le ft - c ft = 1	ength of well lepth to wate length of war	er (before pu			covery time: Nume purged:	нісн <u>2 і́н</u> 1	LOW	ns
Gallo Notes:	את = :	3 casing volu	umes	echance on imples:	Actual pu	rge flow rate:	~ 41		lotor
Time	Volume (gallons)	Depth to Water (feet)	рН (SU)	Conductivity (umhos/cm)	Turbidity (NTປ)	D.Q. (mg/L)	Temp (°C)	ORP	Ferrous Iron (mg/L)
Stari: 1/05	Initial	<0.33' 7.67	+1-0.1 5-32	+1-396	+1-10% B-45	+1-10%	+1-5° 5,22	+1-10 mV	N/A
Stari: , 105 1(20	0,6	8,20	5,32	.584	7,84	1,97	5,68	40:2	N/A
/130	0.8	8.26	5,56	,610	6.64	1.19	5,51	33.1	N/A
1140	0.9	8.29	5.65	608	6.25	1.08	5.39	34,8	N/A
									N/A
									N/A
			_	ļļ					N/A
									N/A
									N/A
									N/A N/A
Final:								L.	
SAMPLE COLLE Date: 9	12004	ł .	Time: 1140	AMIEM	Method: <u>N</u>	MINI TY	PHON	JLF (ontro les
Appearance of S	Sample:	Clear	~		Actual sampl	e flow rate:	-24	10 6	
SAMPLE BOTTL	E COLLECT	ED: 6-	250 mL P 40 mL VO	bly-salfa- A VIALS UI MDBM W	HELL For	AKIOS P	3 for m	etals, NAph	L/min r leyre
SAMPLING PER		6-1	0		Composit	AECO,V	1		
Name: Aaron	Uam	01051	(m-		Company:	MULUN	`		

visible?	(YES		ap locked? nding water prese	an#2		YES YES	NO
$\langle \mathcal{Q} \rangle$	bood `			/ indication of sur			, YES	NO NO
	lovdy			Temperature:		د. د	15%	
	-ueucoq							
LEVEL JUS 2009								
5	35		Mea	asured with:	ELECTRONIC	TAPE	CHALK & STEEL	TAPE
B	45		Dec	contamination:	PRE STEAM O	LEANED	DIWATER	OTHER
	0			<u> </u>				
1200	•		(
CASING VOLU			Ally	Ew. Deconia	ninauon. pr	E STEAM CL	EANED DIW	ATER OTH
ft Le	ngth of well			Yield:		HIGH (LOW	
			irge start)	lf low, re	covery time:	15 M	nin	
	•					_		
			1) 0.49			2		
<i>i i</i>	ry - ha	d to		<u> </u>				
			1	Turbidity	DO	Temp	ORP	Ferrous
	Water	(SU)	-	-				Iron
ů /	(feet)					· /		(mg/L)
	<0.33'	+/- 0.1	+1-3%	÷/- 10%	+/~ 10%	+/- 5°	+/- 10 mV	
Intial	5,40	3,45	2,274				322.2	N/A
.75	5.62				- 1	1		N/A
1.1								N/A
1.1.1	- Kan and the second second							N/A
1				16.0	,			N/A
2.0	1.81	3,58	1,113	10.0	2.87	1,59	102.L	N/A
								N/A
								N/A
								N/A
	1							N/A
Į	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~							N/A
mple: 51	1 <u>fanhic</u> 1.1 ED: 6-4	COLOR,	Slodor. OLY-SOU.FA	Actual sampl にミ, 1-250 N HCL 6720	e flow rate: ·· ··/HNO: AKICI B	euzena	etals L, NApH	Umin Umin
	2-	IL+ A	mber w	1 HCL for	GEO/RE	AK	oi laki	02
	$\frac{5}{2009}$ $\frac{5}{8}$ $\frac{1}{200}$ $\frac{5}{8}$ $\frac{1}{200}$ $\frac{1}{200}$ $\frac{1}{1200}$	$\frac{5,35}{B,45}$ $\frac{5,35}{B,45}$ $\frac{12009}{End 7}$	$ \begin{array}{c c} 12009 \\ \hline \text{Time: } 843 \\ \hline 5,35 \\ \hline 8,45 \\ \hline 8,45 \\ \hline 12009 \\ \hline \text{Begin Time: } 1 \\ \hline \text{End Time: } 1 \\ \hline \text{End Time: } 1 \\ \hline \text{CASING VOLUMES} \\ \hline \text{ft} & \text{Length of well} \\ \hline \text{ft} & -\text{depth to water (before put ft)} \\ \hline \text{ft} & -\text{depth to water column} \\ \hline \text{x conversion factor (2" well} \\ \text{s} & = 3 \text{ casing volumes} \\ \hline 0 \text{ ed } \frac{\text{dv} \text{y} - \text{wad to}}{1 & \text{Volume}} \\ \hline \text{gallons} & \text{Volume} \\ \hline \text{Volume} & \text{Depth to } \\ \hline \text{gallons} & \text{Vater} \\ \hline \text{(sU)} \\ \hline \text{(feet)} \\ \hline -75 & 5.62 & 3.46 \\ \hline 1.4 & 6.755 & 3.58 \\ \hline 1.4 & 6.755 & 3.58 \\ \hline 1.7 & 7.24 & 3.58 \\ \hline 1.7 & 7.24 & 3.58 \\ \hline 2.0 & 7.81 & 3.58 \\ \hline 2.0 & 7.81 & 3.58 \\ \hline 1.7 & 7.24 & 3.58 \\ \hline 2.0 & 7.81 & 3.58 \\ \hline 1.7 & 7.24 & 3.58 \\ \hline 2.0 & 7.81 & 3.58 \\ \hline 1.7 & 7.24 & 3.58 \\ \hline 2.0 & 7.81 & 3.58 \\ \hline 1.2 & 7.81 & 3.58 \\ \hline 1.2 & 5.62 & 1.46 \\ \hline 1.2 & 5.64 & 1.46 \\ \hline$	$\frac{5.35}{B.45}$ Mean $\frac{5.35}{B.45}$ Dec $\frac{12009}{End Time:}$ $\frac{1345}{1405}$ AM End Time: $\frac{1405}{1405}$ AM CASING VOLUMES ft Length of well ft	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $

CLIENT: B	RISTOI	- AC 6-	TIA.	INENCE	TSIANIN		TCO	Μω <u>φ</u>	(i)
LOCATION: PROJECT #:		APE 3 24.20		ENTE	R WELL LOCA	TION:	OANC	MOCG	W <u>46</u>
INSPECTION Label on well? Is reference ma Condition of we Weather: Notes:	n: 🤇	Good		NO Is c NO Sta Any	ap locked? noting water pres y Indication of sur Temperature:		əəli?	YES YES YES	83 83 93 93
STATIC WATER Date: 9 /11 Depth to Water.	12000		O PURGINO	/ амлрм	asured with:	ELECTRONIC	TAPE	CHALK & STEEL	TAPE
Length of Well;		9.10		Dec	contamination:	PRESTEAM		DIWATER	OTHER
WELL PURGING Date: <u>9</u>	1 2 0 3 CASING VOLU 3 6 ft L 1 1 ft - - - ft = - - ft = - - ons = - -	End T UMES Length of well depth to wate length of wat conversion fa 3 casing volu	er (before pr ter column actor (2" we umes	14:11 AM/ urge start)	IPM Decontai Yīeld: אל נסיא, re Actual vo Actual pu			EANED DIW	ns Igior
					·····				
Time	Volume (gallons)	Depth to Water (feet) <0.33'	pH (SU) +/- 0.1	Conductivity (umhos/cm) +/- 3%	Turbidīty (NTU) +/- 10%	b.O. (mg/L) +/~ 10%	Тетр (°С) +/-5°	ORP	Ferrous Iron (mg/L.)
Start: 13.30	-	10,00				1)- (0)0	– 0		N/A
13:45			7						
		5.30	3.79	1.402	42.31	0.49	9.20	242.1	N/A
13:48		5.50	3.49	1. 402	54.34	0.44	9 23	250 4	N/A N/A
13:51		5.50 holompinp	3.49 3.29	1. 341 1. 272	54.34 44,36	0.44	9 23 9.12	250 4	
13:51		5.50 holomponp holomponp	3.49 3.29 3.16	1.341 1.272 1.268	54.34 44,36 62.81	0.44 0.45 0.41	973 918 890	250 4 261.5 265 7	N/A N/A N/A
13:51 13:54 13:57		5.50 holompinp	3.49 3.29 3.16 3.12	1.341 1.272 1.268 1.267	54.34 44,36 62.81 73.94	0.44 0.45 0.45 0.40	9 23 9 12 9 90 8 59	250 4 261.5 265 7 265,1	N/A N/A N/A N/A
13:51		5.50 holomponp holomponp	3.49 3.29 3.16	1.341 1.272 1.268	54.34 44,36 62.81	0.44 0.45 0.41	973 918 890	250 4 261.5 265 7	N/A N/A N/A N/A N/A
13:51 13:54 13:57		5.50 holompinp belongingi	3.49 3.29 3.16 3.12	1.341 1.272 1.268 1.267	54.34 44,36 62.81 73.94	0.44 0.45 0.45 0.40	9 23 9 12 9 90 8 59	250 4 261.5 265 7 265,1	N/A N/A N/A N/A N/A
13:51 13:54 13:57		5.50 holompinp belongingi	3.49 3.29 3.16 3.12	1.341 1.272 1.268 1.267	54.34 44,36 62.81 73.94	0.44 0.45 0.45 0.40	9 23 9 12 9 90 8 59	250 4 261.5 265 7 265,1	N/A N/A N/A N/A N/A N/A N/A
13:51 13:54 13:57 14:00		5.50 holompinp belongingi	3.49 3.29 3.16 3.12	1.341 1.272 1.268 1.267	54.34 44,36 62.81 73.94	0.44 0.45 0.45 0.40	9 23 9 12 9 90 8 59	250 4 261.5 265 7 265,1	N/A N/A N/A N/A N/A N/A N/A N/A
13:51 13:54 13:57 14:00 Final: SAMPLE COLLE	CTION	5.50 holompinp bolompinp bolompinp	3.49 3.29 3.16 3.12	1.341 1.272 1.268 1.267	54.34 44,36 62.81 73.94	0.44 0.45 0.45 0.40	9 23 9 12 9 90 8 59	250 4 261.5 265 7 265,1	N/A N/A N/A N/A N/A N/A N/A
13:51 13:54 13:57 14:00 Final: SAMPLE COLLE	IZOO ample: ECOLLECT	5.50 holompimp bolompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimp holompimpimp holompimp holompimp holompimp holompimpimp holompimpimpimp holompimpimpimpimpimp holompimpimpimpimpimpimpimpimpimpimpimpimpim	3.49 3.29 3.16 3.12 5.09 5.09 5.09 5.09 5.09 5.09 5.09 5.09	1. 341 1. 272 1.268 1. 267 1. 267 1. 243 0 AM/PM	54.34 44,36 62.81 73.94 73.90 Method: N	0.44 0.45 0.45 0.45 0.40 0.40 0.44	9 23 9 12 8 90 8 59 8 42 9 42 9 42 130 130 130 130 130 130 130 130 130 130	260 4 261.5 268.7 268.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1 269.1	N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A

PROJECT #:	RISTOL N.E CI 11262	APE S	r. LAn	トベビハく CL ENTE	TSLAND R WELL LOCA MOC - 18	ATION:	TCO Ogno	MUCCGI	7 N <u>47</u>			
INSPECTION Label on well? Is reference ma Condition of wel Weather: Notes:	1: <u> </u>	1.44/27		NO Sta An	cap locked? anding water pres y indication of sur Temperature:		weìl?	YES YES YES	29 (S) (S) (S) (S) (S) (S) (S) (S) (S) (S)			
STATIC WATER Date: 9 11	2009		O PURGING	AM/PM		<u> </u>						
Length of Well:	Depth to Water: 5.92 Measured with: Electronic tape CHALK & STEEL TAPE Length of Well: 9.60 Decontamination: FRE STEAM CLEANED DIWATER OTHER											
Date: <u>911</u>	WELL PURGING Date: <u>9/11/2009</u> Begin Time: <u>11.46</u> AM/PM Purging Equipment: <u>MINITYPIHON+LFContra</u> End Time: <u>73:66</u> AM/PM Decontamination: PRE STEAM CLEANED DIWATER OTHER CALCULATION OF 3 CASING VOLUMES IT Length of well Yield: <u>HIGH</u> LOW											
	-	tepth to wate length of wa		urge start)	If low, re	covery time:						
Gallo Notes:	ns =	conversion fi 3 casing vol	actor (2" we	41 112		olume purged: urge flow rate: 16 c /c c		gallo mirmi L/mir	Tor			
Time	Volume (gallons)	Depth to Water	pH (SU)	Conductivity (umhos/em)	Turbiđity (NTU)	D.O. (mg/L) +/- 10%	Temp (°C)	ORP	Ferrous Iron (mg/L)			
		(feet) <0,33'	+/-0.1	+/- 3%	+/- 10%	T T 1070	+/- 5°	+/- 10 mV [
Start: 11.40		- /	+/- 0.1	+/- 3%	+/- 10%	<u> </u>) +/- 5°	+/- 10 mV				
Start: 11.40 11:50		- /	+1-0.1	+/- 3%	21, 29		5 05	+/- 10 mV	 			
11:50		<0.33			21,25	_		-75,5				
11:50 11:51		<0.33 [°] 5.57 5.57	6.28	5.403	<u>21.25</u> <u>18.28</u> 15.70	0 6 8 0 53	5 05	-75.5 -15.3	N/A			
11:50 11:51 11:56		<0.33 [°] 5.57 5.57 5.52	6.28 6.25 6.24	5.403 3.424 3.492	<u>21.25</u> <u>18.28</u> 15.70	0.68	5 05 5.09 5.18	-75,5	N/A N/A			
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LOCATION:	RISTOL	APE 5	T. LAW	RENCE	TSLAND		TCO	MW <u>Q</u>	2
PROJECT #	11262			ENTE	R WELL LOCA		OANC	MOCG	N <u>48</u>
INSPECTION Label on well? Is reference ma Condition of we Weather: Notes:		500d	Уа – р ²	NO Star Any	ap locked? nding water press indication of sur Temperature:	ent?	well?	YES YES YES 467	(S) (S) (S) (S) (S) (S) (S) (S) (S) (S)
STATIC WATER Date: 9 11 Depth to Water:	12009	26.29	O PURGING	AMPM	sured with:	ELECTRON	CTAPE	CHALK & STEEL	TADE
Length of Well:		<u>7 11</u> 9.35		Dec	ontemination:	PRESTEAN		DIWATER ,	OTHER
WELL PURGING Date: 911112009 Begin Time: 10:51 AM/PM Purging Equipment MINITYPHONHLES HIGH NELLE Contact End Time: 10:54 AM/PM Decontamination: PRE STEAM CLEANED Diwater Onler calculation of 3 casing volumes ft Length of well Yield: HIGH LOW 2 74 ft - depth to water (before purge start) If low, recovery time:									
		-			-				
Time	Volume	Depth to	pH (SU)	Conductivity (umhos/cm)	Turbidity ∙ (NTU)	D.O. (mg/L)	Temp (°C)	ORP	Ferrous Iron
	(gallons)	Water (feet) ⊲0.33'		+1 3%		+1- 20%	+/- 50	+/- 10 m)/	(mg/L)
	(gallons)		++-0.1	+/- 3%	+/- 10%	+1- 10%	+/- 5°	+/- 10 mV	
	(gallons)	(feet)		+1-3%		+1- 10%	+/- 5°	+/- 10 mV	(mg/L)
Start: 10:51	(gallons)	(feet)	++-0.1		+/- 10%				(mg/L) N/A
<u>Start:</u> [0:5] []. ≤1	(gallons)	(feet)	+L Q.1	0.176	+/- 10%	0.66	3.65	132.4	(mg/L) N/A N/A
<u>Start: (0:5)</u> .≤1	(gallons)	(feet)	+L Q.1	0.176	+/- 10%	0.66	3.65	132.4	(mg/L) N/A N/A N/A N/A N/A
<u>Start: (0:5)</u> .≤1	(gallons)	(feet)	+L Q.1	0.176	+/- 10%	0.66	3.65	132.4	(mg/L) N/A N/A N/A N/A N/A N/A
<u>Start: (0:5)</u> .≤1	(gallons)	(feet)	+L Q.1	0.176	+/- 10%	0.66	3.65	132.4	(mg/L) N/A N/A N/A N/A N/A N/A N/A
<u>Start: (0:5)</u> .≤1	(gallons)	(feet)	+L Q.1	0.176	+/- 10%	0.66	3.65	132.4	(mg/L) N/A N/A N/A N/A N/A N/A N/A
<u>Start: (0:5)</u> .≤1	(gallons)	(feet)	+L Q.1	0.176	+/- 10%	0.66	3.65	132.4	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A
Start: (0:5) 11:41 (1:44 (1:44)	(gallons)	(feet)	+L Q.1	0.176	+/- 10%	0.66	3.65	132.4	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A
<u>Start: (0:5)</u> .≤1		(feet) <0.33'	+L Q.1	0.176	+/- 10%	C. 66 C. 66 C. 67	3.65	132.4	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 10:51 11:41 11:47 Final: SAMPLE COLLE		(feet) <0.33'	++- Q.1 57.36 57.37 Fime: 10155 Elicity 101 250 ML P 40 ML VO	AM/PM AM/PM CLY - SULFAT AVIALS 11	+/- 10%	1. Ni Ty e flow rate: A K LOS B	3.65 3.64 	+ L F (0 efals	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A

APPENDIX G

Bench Study

Table G-1:	Soil Oxidant	Demand Test	Results (g/Kg)
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Test Condition	Peat Soils (OL/OH)	Organic Silts (OL/ML)	Silts (ML)
Sodium Persulfate Only	13.4	15.7	14.4
Sodium Persulfate + Iron EDTA	14.4	15.3	7.5
Sodium Persulfate + Hydrogen Peroxide	11.4	15.9	14.9

Table G-2: Bench Scale Treatability Study Laboratory Analyses

Analysis	Groundwater	Soil
DRO/RRO	AK 102/103	AK 102/103
GRO	AK 101	AK 101
BTEX & Naphthalene	EPA 8260b	EPA 8260b
Metals: As, Cr, Pb	EPA 6010b Metals	EPA 6010b Metals
Total Iron	SM 6010B	SM 6010B
Ferrous Iron	HACH Method 8146	N/A
Hexavalent Chromium	SM 218.6 Cr(VI)	7196a Cr(VI)
Sulfate	SM 4500	N/A
Alkalinty (as CaCO ₃)	EPA 310.1	N/A
ТОС	EPA 415.1	N/A

NOTE:

- 1. N/A not applicable
- 3. RRO residual range organics
- 5. BTEX benzene, toluene, ethylbenzene, xylene
- 7. AK Alaska
- 9. EPA Environmental Protection Agency
- 11. CaCO₃ calcium carbonate

- 2. DRO diesel range organics.
- 4. GRO gasoline range organics
- 6. TOC total organic carbon
- 8. SIM Selected Ion Mode
- 10. As arsenic, Cr chromium, Pb lead

Table G-3: Experimental Setup – Activated Sodium Persulfate

Sample Type	2% S ₂ O	₈ - Low	10% S ₂ O	Control	
Activators	300 ppm Fe	8% H ₂ O ₂	300 ppm Fe	8% H ₂ O ₂	NS
Ground Water Volume (mL)	1000	840	1000	840	1000
Soil Mass (g)	500.38	503.61	501.94	500.33	505.25
FMC Klozur Sodium Persulfate (g)	24.75	24.7	123.94	123.98	NS
FeEDTA Mass (g)	6.02	NS	30.18	NS	NS
8% H ₂ O ₂ Solution Volume (mL)	NS	160	NS	160	NS

NOTE:

1. S_2O_8 – persulfate

2. g - grams

3. 8% H_2O_2 solution was made by diluting a 50% H_2O_2 stock solution with site groundwater.

4. NS - Not Sampled

Table G-4: Catalyzed hydrogen peroxide Reaction - Experimental Setup

Sample Type		5%	H ₂ O ₂				Control		
Study Period (hours)	1	3	5	7	1	3	5	7	NS
Groundwater Volume (mL)	900	900	900	900	800	800	800	800	1000
H ₂ O ₂ Solution Volume (mL)	100	100	100	100	200	200	200	200	NS
Soil Mass (grams)	500.29	501.34	503.6	500.09	500.24	503.81	504.01	502.48	500.37
FeEDTA Mass in given Groundwater Vol (grams)	0.2271	0.2268	0.228	0.2274	0.454	0.4587	0.4576	0.4535	NS

NOTE:

1. H2O2 solutions were made by diluting a 50% H2O2 stock solution with site groundwater.

2. Fe concentrations in given FeEDTA mass; 30ppm for the 5% H₂O₂ and 60ppm for the 10% H₂O₂.

2. NS - Not Sampled

Table G-5: Groudwater Analytical Results, Treatability Bench Study

Compound	Sample Dates	Sampling Event (Week)	Benzene (ug/L)	Naphthalene (ug/L)	GRO (C6-C10)	DRO (nC10- <nc25)< th=""><th>RRO (nC25-nC36)</th><th>Hexavalent chromium</th><th>Arsenic</th><th>Lead</th><th>Chromium</th><th>Total Iron</th><th>Ferrous Iron</th><th>Sulfate</th><th>Alkalinity</th><th>Total Organic Carbon</th></nc25)<>	RRO (nC25-nC36)	Hexavalent chromium	Arsenic	Lead	Chromium	Total Iron	Ferrous Iron	Sulfate	Alkalinity	Total Organic Carbon
Untreated Control	8/21/2009	Login Baseline	0.51 J	0.064 U	0.14	11	2.1	0.007 HJ	0.0074 J	0.0077 J	0.012 J	24	35	N/A	80	65
	9/14/2009	0	0.057 U	0.064 U	ND	0.9 B	0.21 *B	0.0037 UH	0.012 J	0.0017 U	0.0033 U	N/A	30	1.5	67	21 H
	9/23/2009	1	0.057 U	5	0.42	28 *B	11 *B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/8/2009	3	0.057 U	0.064 U	6.1	46	9.9	0.091 H	1 J	2	2.5	N/A	20	13	23	160
	10/22/2009	5	N/A	N/A	N/A	10 B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/10/2009	7	0.057 U	15	11	16 B	4	0.046 JH	0.7	1.2	1.4	N/A	16	1.3	180	150
EDTA + 2% S208	9/23/2009	1	0.41 J	5.4	0.24	17 *B	5.6 *B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/8/2009	3	0.14 J	4.1 J	0.58	2	7.7	0.084 JH	0.15	0.11	0.18	N/A	31	39000	N/A	8200
	10/22/2009	5	N/A	N/A	N/A	27 B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/10/2009	1	0.31 J	14	2.6	7.5 B	2.2	0.035 JH	0.42 J	0.76	1.0	N/A	30	28000	N/A	1600
EDTA + 10% S208	9/23/2009	1	0.38	4.6	0.35	98 *B	37 *B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
EDTA + 10% 3200	10/8/2009	3	0.38 0.057 U	4.6	0.68	140	37 B	0.19 JH	0.66	0.79	1.7	N/A	23	160000	N/A	9900
	10/22/2009	5	0.037 U N/A	N/A	N/A	200 B	32 N/A	0.19 JH N/A	0.00 N/A	0.79 N/A	N/A	N/A	23 N/A	N/A	N/A	9900 N/A
	11/10/2009	7	0.44 J	14	5.2	200 B	4.6	0.036 JH	0.92	1.3	1.5	N/A	18	180000	N/A	7300
	11/10/2009	1	0.44 J	14	5.2	20 D	4.0	0.030 311	0.92	1.5	1.5	IN/A	10	100000	19/7	7300
8% H202 + 2% S208	9/23/2009	1	0.33	5.5	0.19	22 *B	9.7 *B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/8/2009	3	0.057 U	7.5	0.43	170	42	0.13 JH	0.94 J	1.6	2.4	N/A	28	53000	N/A	1300
	10/22/2009	5	N/A	N/A	N/A	55 B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/10/2009	7	0.72 J	11	3.3	7.7 B	2.3	0.043 JH	0.48 J	0.97	1.3	N/A	20	65000	N/A	660
-																
8% H202 + 10% S208	9/23/2009	1	0.37	5.5	0.98	150 *B	61 *B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/8/2009	3	0.057 U	0.064 U	0.67	250	69	0.23 JH	0.93	0.69	1.9	N/A	10	220000	N/A	1600
	10/22/2009	5	N/A	N/A	N/A	230 B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/10/2009	7	0.83 J	3.4	0.84	14 B	2.8	0.048 JH	1.1	0.83	1.7	N/A	5	220000	N/A	1600
Catalyzed Hydrogen P		l.					1	TT		1	1			1	1	
CHP Control	11/19/2009	0 hr	0.11 UH	0.13 UH	0.03 U	7.1	1.9	0.0046 JH	0.017 J	0.042	0.05	N/A	32	N/A	48	32
F0/ 11000 + 00 # F	44/40/0000	4 hr	0.44.181	0.40.101	0.040 /	44	05	0.4011	0.47	4.0	4.0	N1/A	474	N1/A	NIA	2000
5% H2O2 + 30 mg/L Fe		1 hr	0.11 UH	0.13 UH	0.042 J	41	35	0.10 H	0.47 J	1.2 N/A	1.6 N/A	N/A N/A	174 N/A	N/A N/A	NA N/A	3600 N/A
	11/19/2009	3 hr	0.11 UH	0.13 UH	0.03 U	13	6.2 17	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A
	11/19/2009 11/19/2009	5 hr 7 hr	0.11 UH 0.11 UH	0.13 UH 0.13 UH	0.055 J 0.03 U	21 32	23	N/A 0.24 H	0.39 J	1.0	1.3	N/A N/A	N/A 169	N/A N/A	N/A NA	3800
	11/19/2009	/ 111	U.IIUH	0.13 UH	0.03 0	32	23	U.24 FI	0.39 J	1.0	1.0	IN/A	109	IN/A	INA	3000
10% H2O2 + 60 mg/L Fe	11/19/2009	1 hr	0.11 UH	0.13 UH	0.032 J	230	160	0.20 H	0.57 J	1.9	2.3	N/A	301	N/A	NA	4700
107011202 + 00111g/E1	11/19/2009	3 hr	0.11 UH	0.13 UH	0.052 J	630	360	0.2011 N/A	N/A	N/A	2.3 N/A	N/A	N/A	N/A	N/A	4700 N/A
	11/19/2009	5 hr	0.11 UH	0.13 UH	0.035 J 0.040 J	340	240	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/19/2009	7 hr	0.11 UH	0.13 UH	0.040 J	87	63	0.14 H	0.34 J	1.3	1.3	N/A	287	N/A	NA	3000
	11/13/2009	/ 10	5.11 011	0.10 011	0.000 0	07		0.1411	3.040	1.0	1.0	19/1	201	19/1		5000

Notes:

1. Units are mg/L unless specified otherwise

2. Laboratory unable to perform alkalinity analysis - sample pHs exceed limit

3. N/A = Not Analyzed

Flags:

B - Compound was found in both blanks and samples

J - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

* - LCS or LCSD exceeds the control limits

H - Sample was prepped or analyzed beyond the specified holding time

ND or U - Result is less than the MDL. Where U, MDL listed in table

Table G-6: Soil Analytical Results, Treatability Bench Study

						DRO	RRO					
			Benzene	Naphthalene	GRO	(nC10-	(nC25-					Hexavalent
Compound	Sample Date	Sampling Event - week	(ug/Kg)	(ug/Kg)	(C6-C10)	<nc25)< th=""><th>nC36)</th><th>Arsenic</th><th>Chromium</th><th>Total Iron</th><th>Lead</th><th>chromium</th></nc25)<>	nC36)	Arsenic	Chromium	Total Iron	Lead	chromium
Untreated Control	8/26/2009	Login Baseline	7 U	3900	730	15000	2900	6.5	23	15000	27	0.72
	9/14/2009	0	64 U	150 U	260	12000 B	3000	5.9	19 B	12000 B	11	0.3 JB
	9/23/2009	1			33	15000 B	4300 B	N/A	N/A	N/A	N/A	N/A
	10/8/2009	3	9.7 U	620	410	17000 B	4700 B	N/A	N/A	N/A	N/A	N/A
	10/22/2009	5				17000	N/A	N/A	N/A	N/A	N/A	N/A
	11/10/2009	7	10 U	610	36 B	15000	5300	3.9 J	12	8200	9.0	0.74 J
EDTA + 2% S208	9/23/2009	1			59	14000 B	5200 B	N/A	N/A	N/A	N/A	N/A
LDTA + 2/0 3200	10/8/2009	3	7.9 U	530	98	16000 B	6200 B	N/A	N/A	N/A	N/A	N/A
	10/22/2009	5	7.50	550	30	8900	N/A	N/A	N/A	N/A	N/A	N/A
	11/10/2009	7	12 U	1400	36 B	16000	7600	5.6 J	17	12000	13	0.67 J
EDTA + 10% S208	9/23/2009	1			27	6600 B	1900 B	N/A	N/A	N/A	N/A	N/A
	10/8/2009	3	8.2 U	1000	170	7100 B	2600 B	N/A	N/A	N/A	N/A	N/A
	10/22/2009	5				5800	N/A	N/A	N/A	N/A	N/A	N/A
	11/10/2009	7	9 U	900	20 B	12000	4900	3.1 J	10	12000	10	0.74
8% H202 + 2% S208	9/23/2009	1			61	15000 B	4700 B	N/A	N/A	N/A	N/A	N/A
07011202 1 270 0200	10/8/2009	3	9 U	1300	320	13000 B	4700 B	N/A	N/A	N/A	N/A	N/A
	10/22/2009	5	50	1000	520	9700	N/A	N/A	N/A	N/A	N/A	N/A
	11/10/2009	7	12 U	1300	45 B	15000	7000	4.7 J	16	11000	12	0.51 J
8% H202 + 10% S208	9/23/2009	1			73	8800 B	2500 B	N/A	N/A	N/A	N/A	N/A
	10/8/2009	3	44 U	4200	1700	12000 B	5000 B	N/A	N/A	N/A	N/A	N/A
	10/22/2009	5				8500	N/A	N/A	N/A	N/A	N/A	N/A
	11/10/2009	7	8.6 U	430	25 B	15000	6700	2.6 J	11	7300	8.9	1
Catalyzed Hydrogen P	lorovido											
CHP Control	11/19/2009	0 hr	8.3 U	750	57	14000 B	6800 *	5.3 J	19 B	13000 B	15	0.42 J
	11/19/2009	UTII	0.3 0	750	57	14000 B	0000	J.J J	19.0	13000 B	10	0.42 J
5% H2O2 + 30 mg/L F	11/19/2009	1 hr	12 U	30 U	77	170 B	220 *	N/A	N/A	N/A	N/A	N/A
	11/19/2009	3 hr	12 U	520	54	7900 B	7600 *	N/A	N/A	N/A	N/A	N/A
	11/19/2009	5 hr	51 U	2400	950	1200 B	870 *	N/A	N/A	N/A	N/A	N/A
	11/19/2009	7 hr	7.8 U	89 J	24	530 B	560 *	N/A	N/A	N/A	N/A	N/A
10% H2O2 + 60 mg/L	11/19/2009	1 hr	25 U	140 J	430	4700 B	5400 *	2.7 J	13 B	9600 B	11	N/A
10 % H2O2 + 60 ING/L	11/19/2009	3 hr	25 U 27 U	140 J 120 J	430	7400 B	5400 * 7700 *	2.7 J N/A	N/A	9600 B N/A	N/A	N/A N/A
	11/19/2009	3 hr	27 U 19 U	410	460	9500 B	9700 *	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A
	11/19/2009	5 hr 7 hr	19 U 22 U	360	460	9500 B 5600 B	9700 * 5900 *	N/A 6.8 J	N/A 26 B	N/A 21000 B	N/A 27	N/A N/A
	11/19/2009	/ 10	22.0	300	420	3000 B	3300	0.0 0	20 0	21000 B	21	IN/A

NOTES:

2. N/A = Not Analyzed

1. Units are mg/Kg unless specified otherwise

Flags:

B - Compound was found in both blanks and samples

J - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

* - LCS or LCSD exceeds the control limits

H - Sample was prepped or analyzed beyond the specified holding time ND or U - Result is less than the MDL. Where U, MDL listed in table



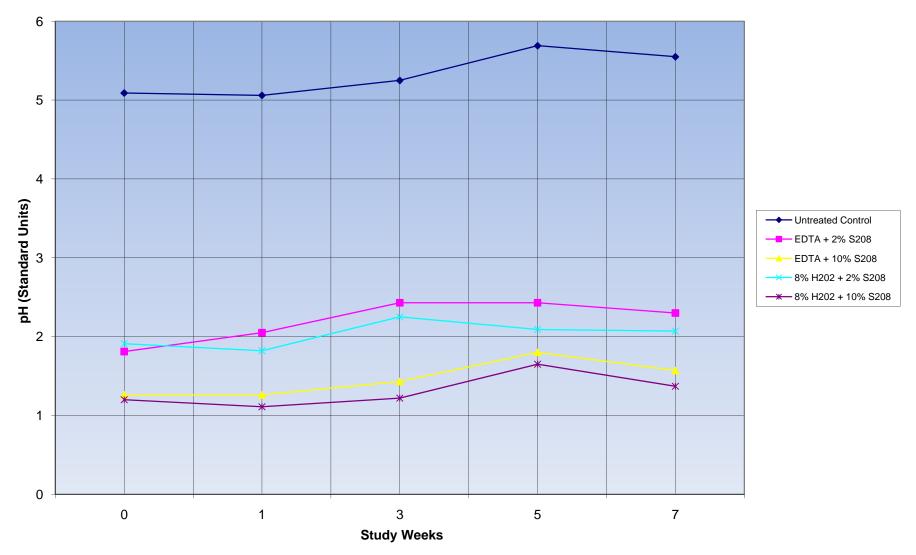
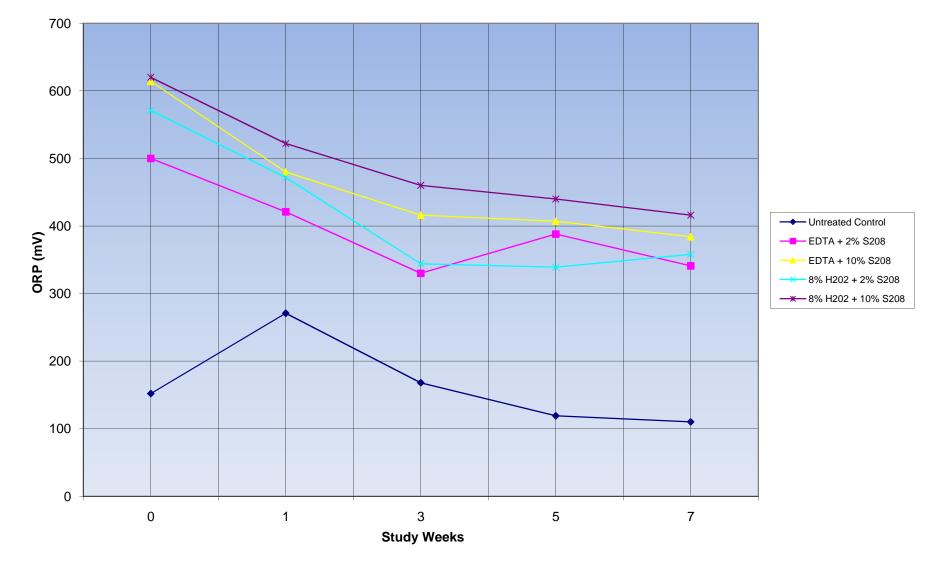
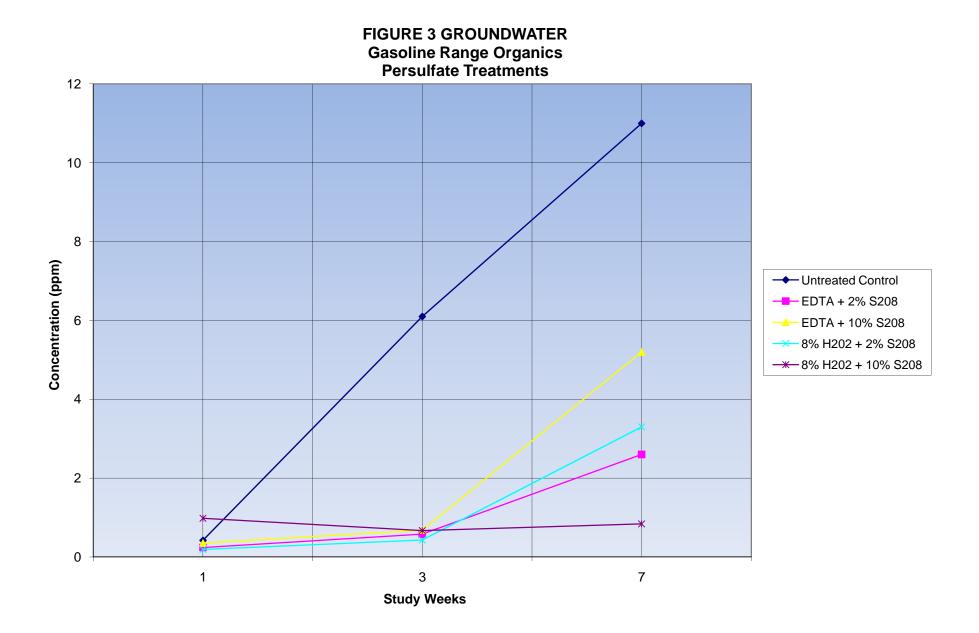
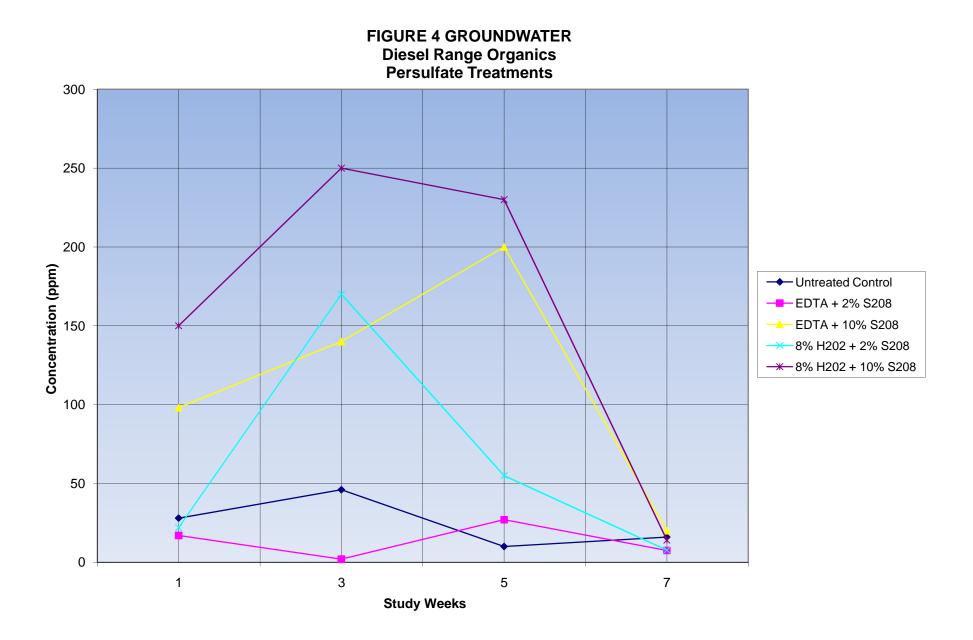
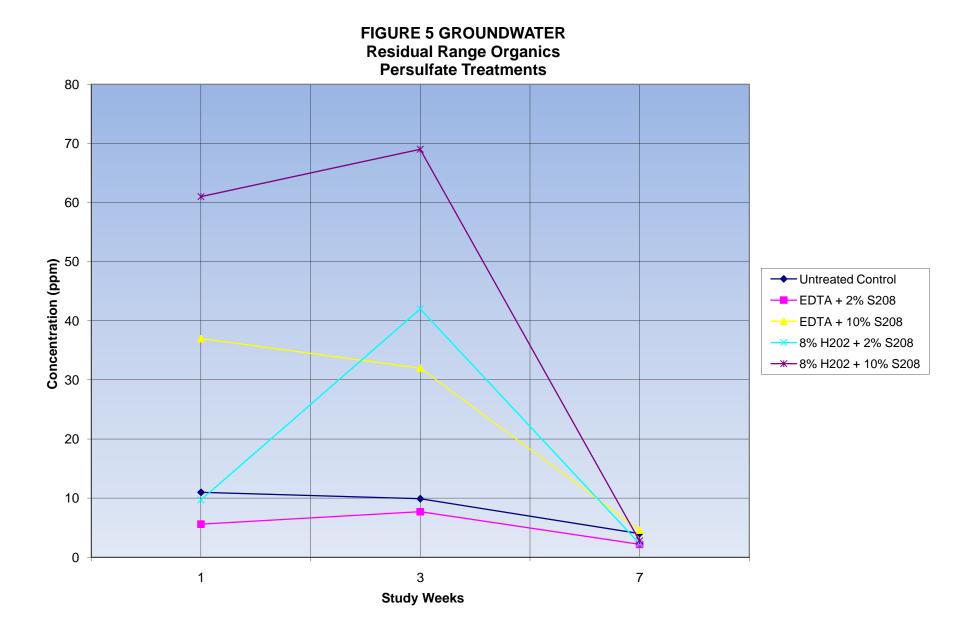


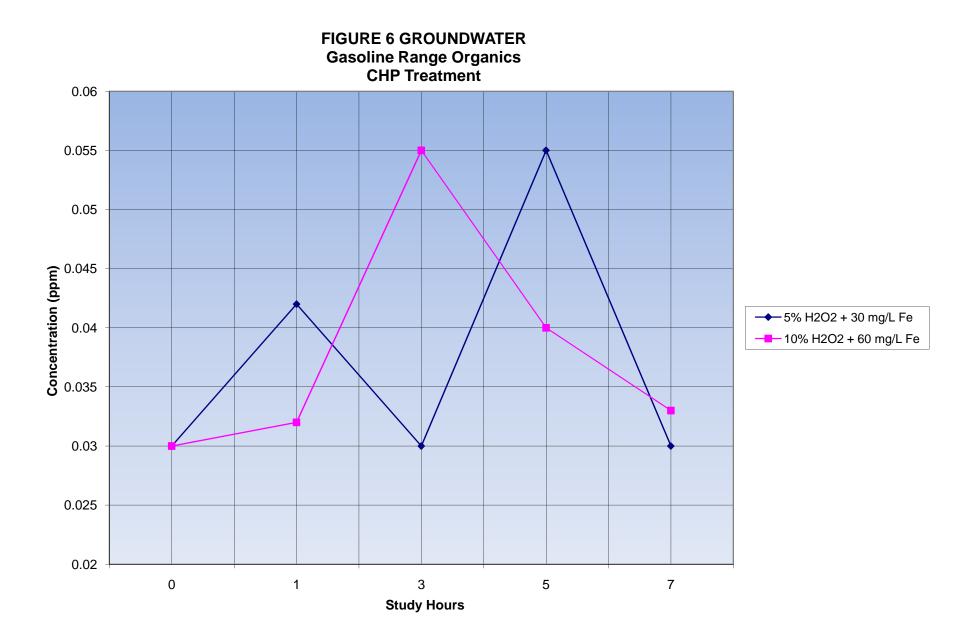
FIGURE 2 ORP TREND Persulfate Treatments

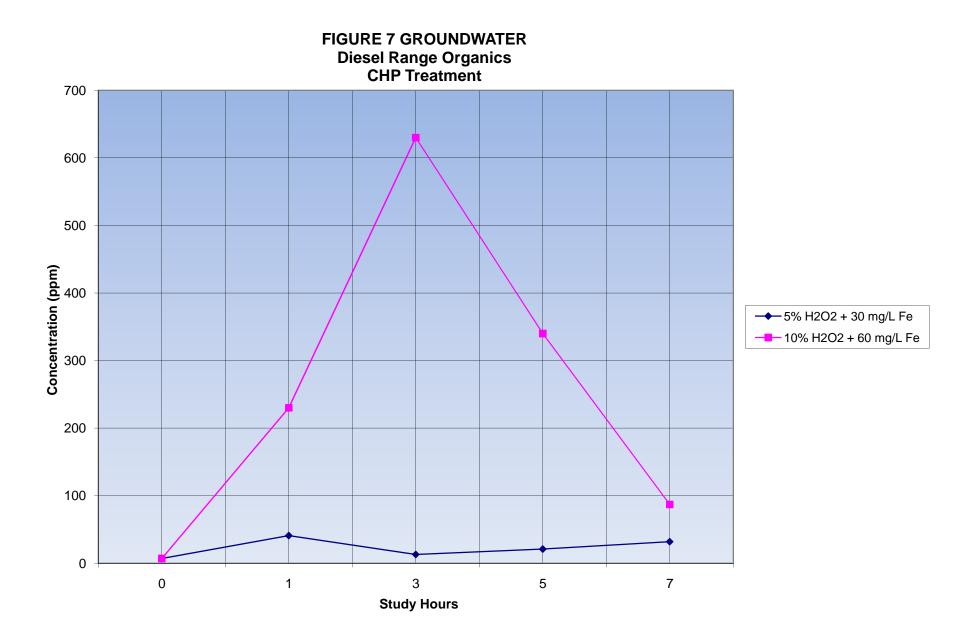


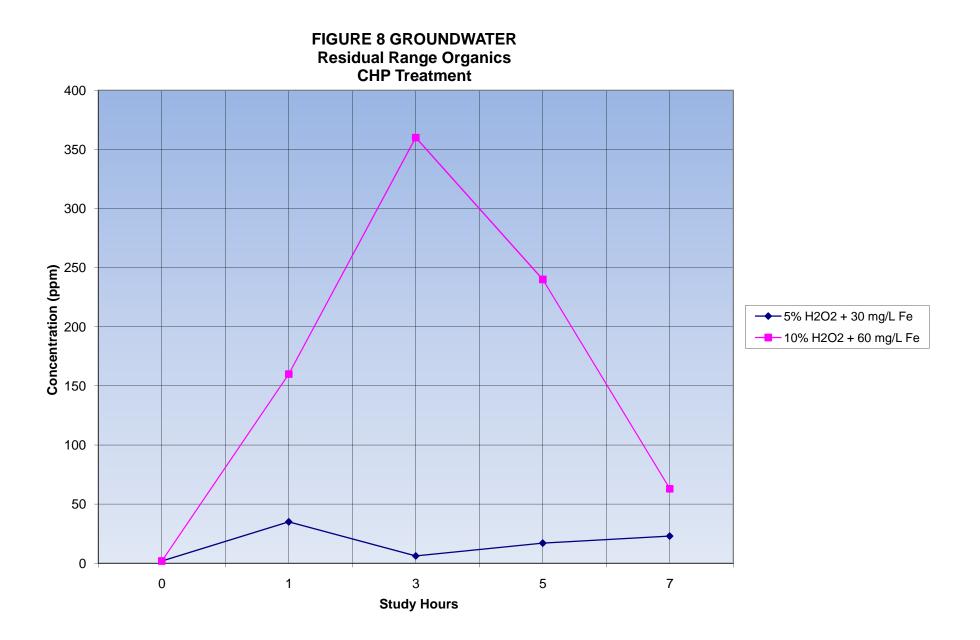


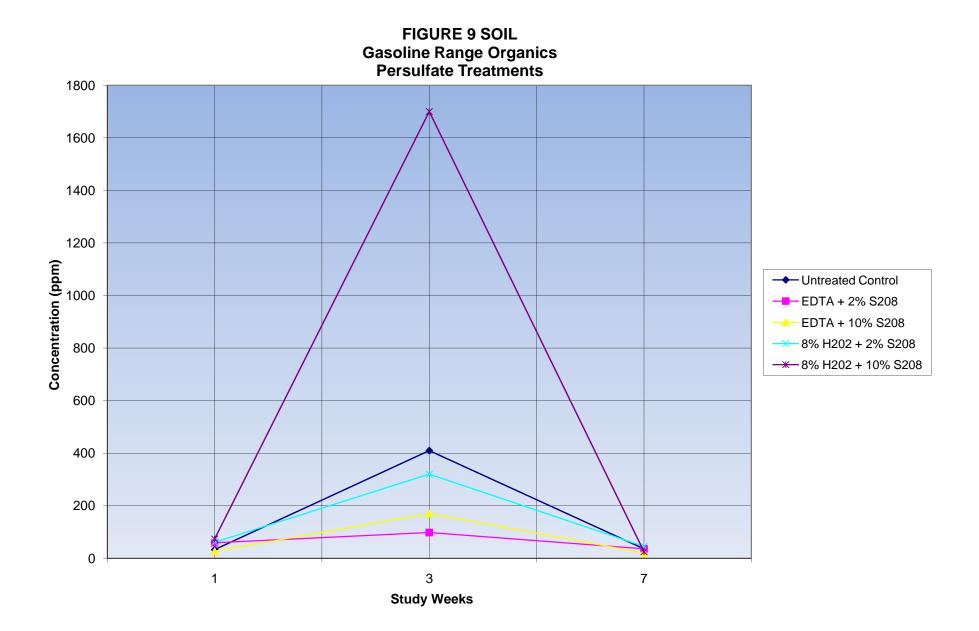


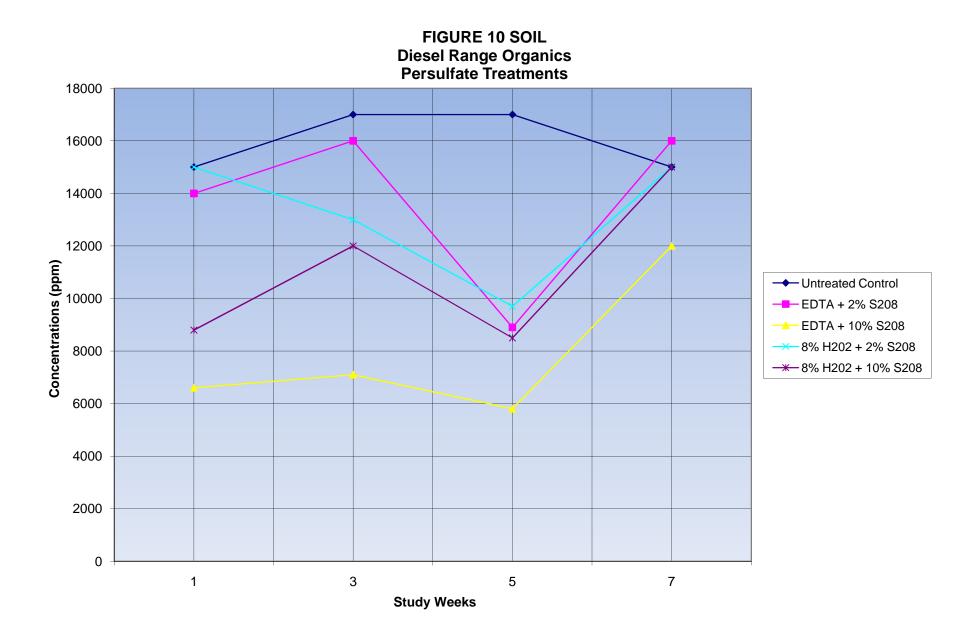












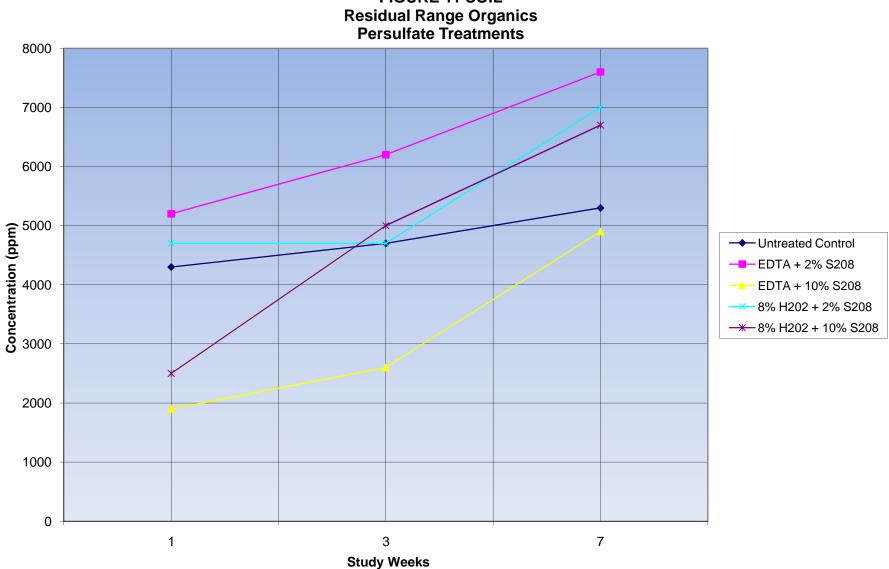
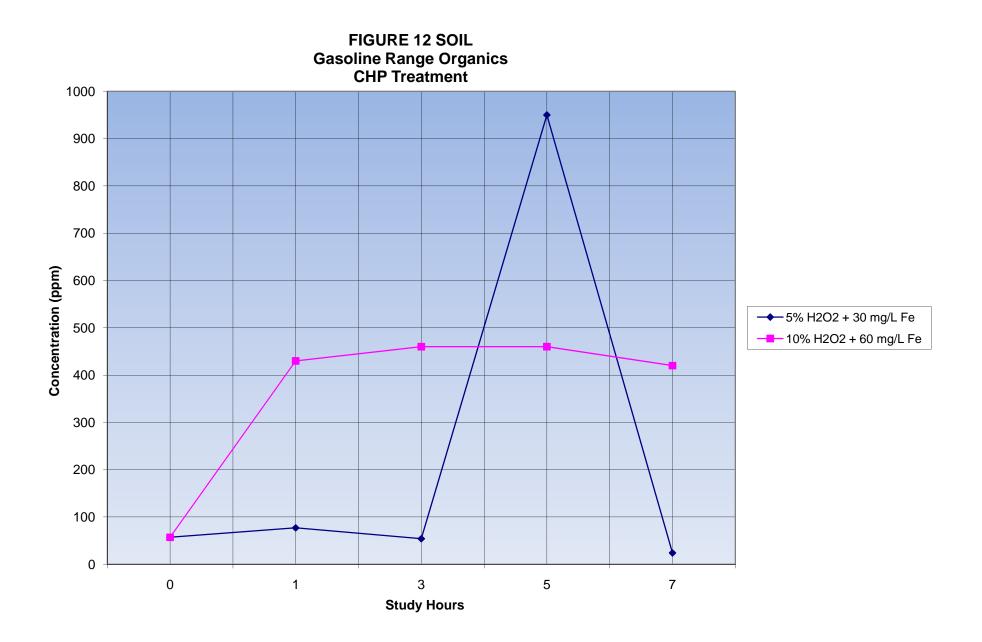
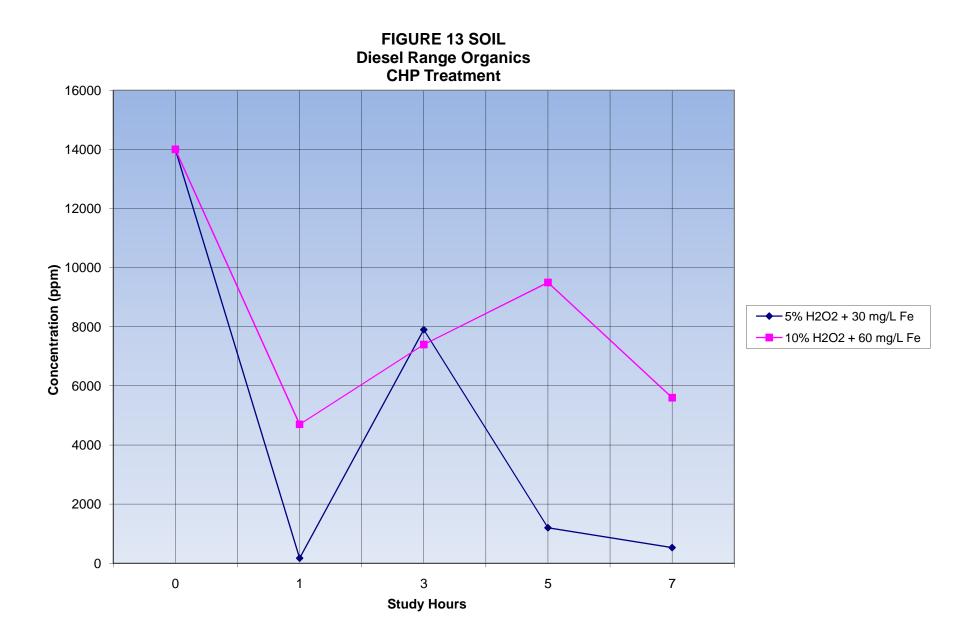
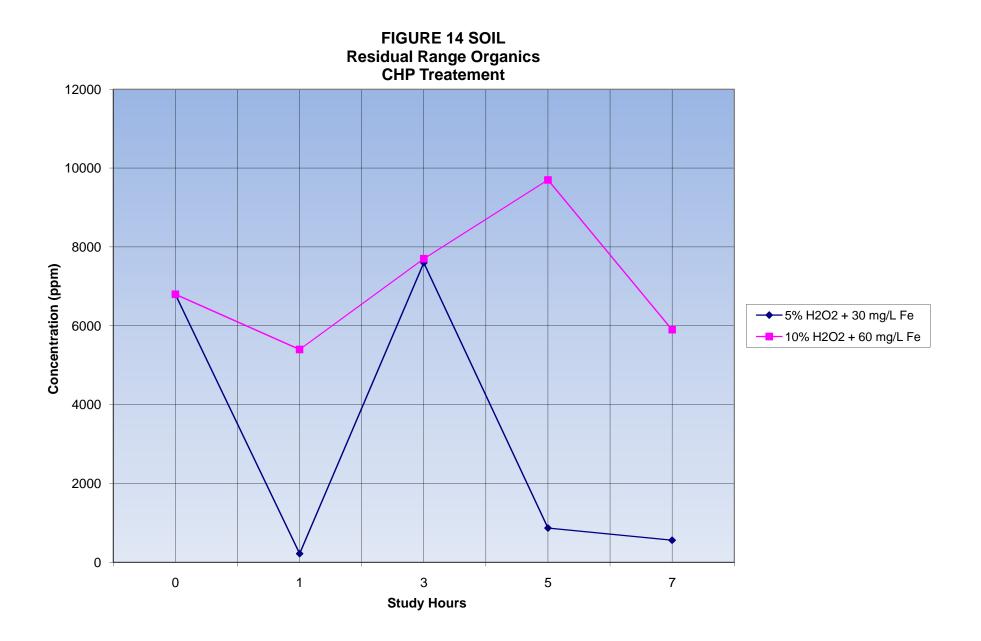


FIGURE 11 SOIL







APPENDIX H

Phase I ISCO Study (Provided on CD)

APPENDIX I

Contaminant Mass Calculations

Contaminant Mass Estimate (DRO)

Containinant Mas		- /					Ма	ss
Representative Well	Zone (feet)	Strata Thickness (m)	Radius (m)	Soil DRO Conc. (mg/kg)	Soil Volume (cu. M.)	Soil Mass (kg)	(kg)	(lb)
ICOMW03	4 - 10	1.5	1.5	170000	10.5975	10597.5	1801.575	3765.29175
ICOMW04	4 - 10	1.5	1.5	17000	10.5975	10597.5	180.1575	376.529175
ICOMW05	4 - 10	1.5	1.5	130000	10.5975	10597.5	1377.675	2879.34075
ICOMW06	4 - 10	1.5	1.5	110000	10.5975	10597.5	1165.725	2436.36525
ICOMW07	4 - 10	1.5	1.5	13000	10.5975	10597.5	137.7675	287.934075
ICOMW08	4 - 10	1.5	1.5	240000	10.5975	10597.5	2543.4	5315.706
ICOMW09	4 - 10	1.5	1.5	6500	10.5975	10597.5	68.88375	143.9670375
ICOMW02	4 - 10	1.5	1.5	13000	10.5975	10597.5	137.7675	287.934075
Totals:					84.78	84780	7412.95125	15493.06811

Contaminant Mass Estimate (DRO)

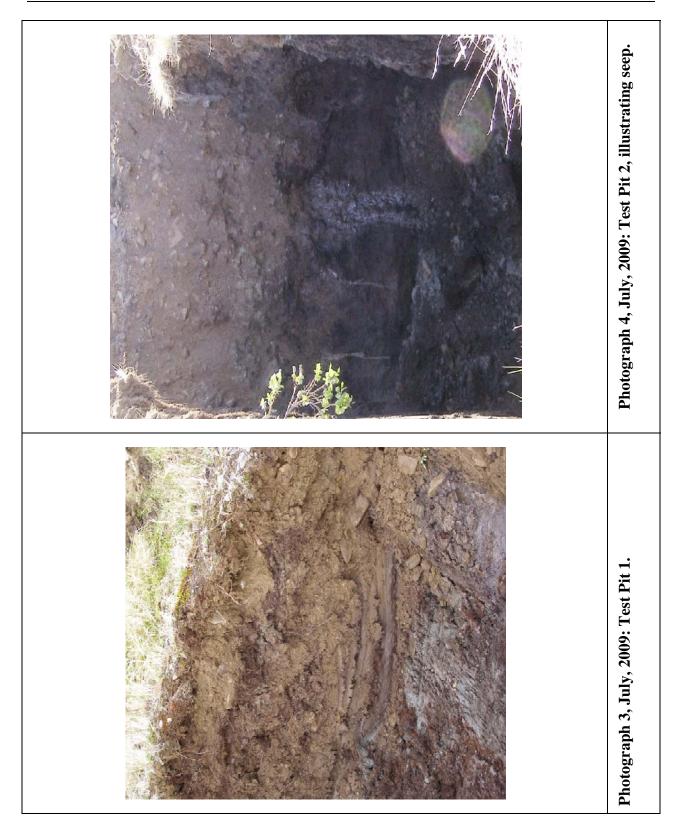
Containinant Mas.	(_	,					Ма	ss
Representative Well	Zone (feet)	Strata Thickness (m)	Radius (m)	Soil DRO Conc. (mg/kg)	Soil Volume (cu. M.)	Soil Mass (kg)	(kg)	(lb)
ICOMW03	4 - 10	1.5	1.5	360000	10.5975	10597.5	3815.1	7973.559
ICOMW04	4 - 10	1.5	1.5	6400	10.5975	10597.5	67.824	141.75216
ICOMW05	4 - 10	1.5	1.5	390000	10.5975	10597.5	4133.025	8638.02225
ICOMW06	4 - 10	1.5	1.5	170000	10.5975	10597.5	1801.575	3765.29175
ICOMW07	4 - 10	1.5	1.5	370	10.5975	10597.5	3.921075	8.19504675
ICOMW08	4 - 10	1.5	1.5	360000	10.5975	10597.5	3815.1	7973.559
ICOMW09	4 - 10	1.5	1.5	150000	10.5975	10597.5	1589.625	3322.31625
ICOMW02	4 - 10	1.5	1.5	17000	10.5975	10597.5	180.1575	376.529175
Totals:					84.78	84780	15406.32758	32199.22463

APPENDIX J

Site Photographs

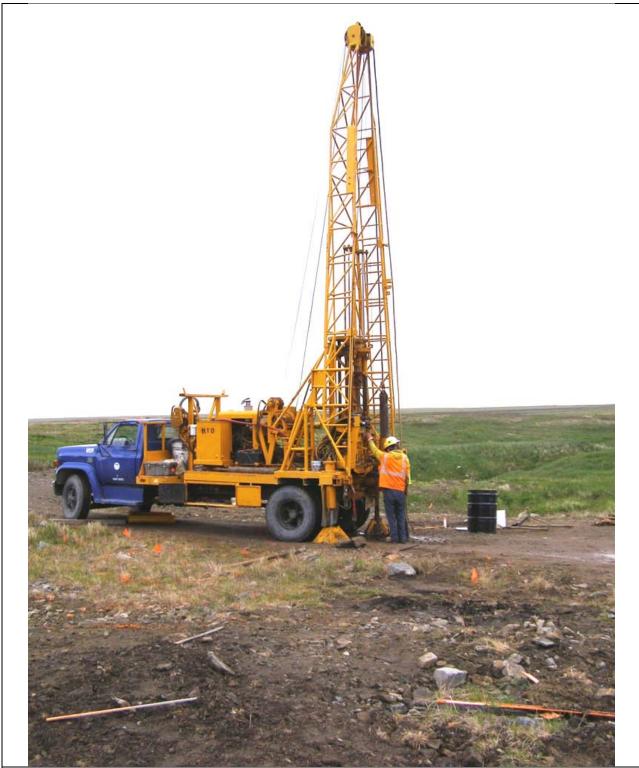


Photograph 2, July, 2009, southwest: Test Pit Excavation, CAT 322b.

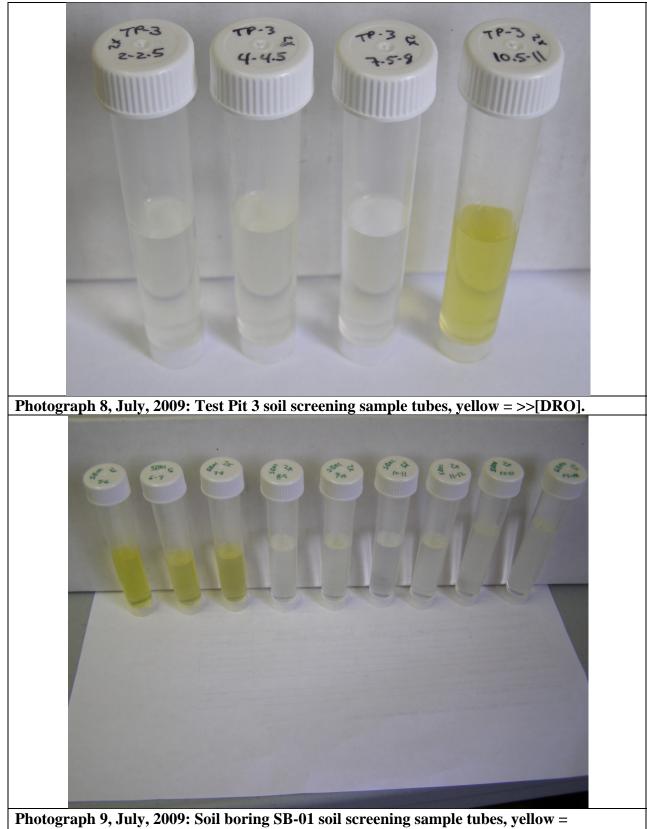




Photograph 6, July, 2009: Test Pit 4.



Photograph 7, July, 2009, northwest: Soil boring installation via hollow stem auger.



>>[DRO].



Photograph 11, July, 2009: ICOOSB01 (10 – 11 ft bgs), TOD reaction vessel, organic silts.







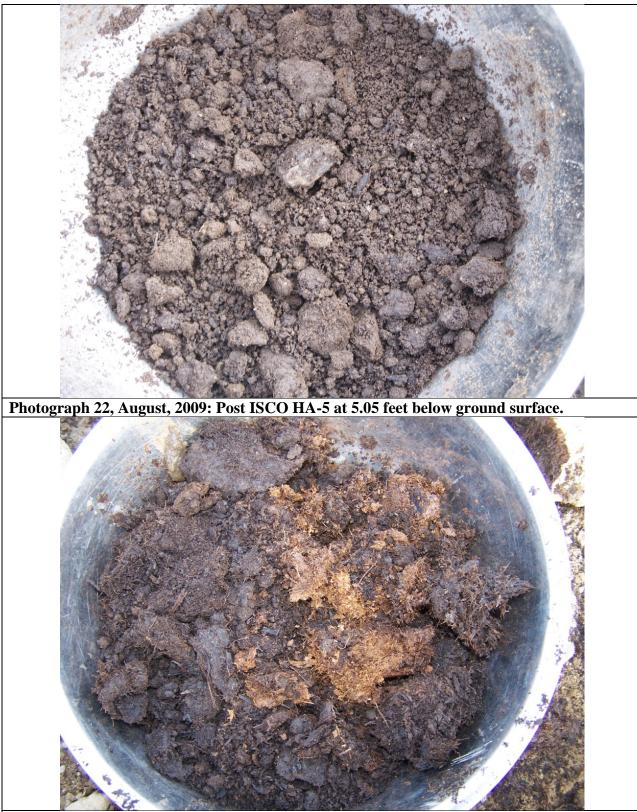
Photograph 17, 8/12/2009: Field scientist conducting performance monitoring.



Photograph 19, 8/10/2009, southwest: From injection fluid breakout point, back towards injection point.



Photograph 21, August, 2009: Post-ISCO HA-3 soils at 5.6 feet below ground surface.



Photograph 23, August, 2009: Post ISCO HA-5 at 5.4 feet below ground surface.

APPENDIX K

Technical Memorandum (Provided on CD) U.S. Army Corps of Engineers, Alaska District

In-Situ Chemical Oxidation (Phase I) and Intrusive Drum Removal/Landfill Cap

Northeast Cape, St. Lawrence Island, Alaska

Contract No. W911KB-09-C-0013

FUDS Property No. F10AK0969-03

MAIN OPERATION COMPLEX AREA Phase I *In Situ* Chemical Oxidation

TECHNICAL MEMORANDUM

DRAFT MARCH 2010





AECOM

Draft TECHNICAL MEMORANDUM MAIN OPERATIONS COMPLEX AREA PHASE I *IN SITU* CHEMICAL OXIDATION NORTHEAST CAPE

St. Lawrence Island, Alaska

Prepared for:

Bristol Environmental Remediation Services, LLC 111 W. 16th Avenue, Third Floor Anchorage Alaska 99501 USACE Project No. F10AK0969-03

Prepared by:

AECOM Technical Services, Inc. 1835 S. Bragaw Street, Suite 490 Anchorage, AK 99508-3439

March 2010

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ATTACHMENTS

- A Deviations from the Work Plan
- B Test Pit Logs
- C Soil Boring and Well Completion Logs
- D Groundwater Sampling Forms

ACRONYMS AND ABBREVIATIONS

%	percent
ATS	AECOM Technical Services, Inc.
bgs	below ground surface
COC	chemical of concern
DI	deionized
DRO	diesel range organics
FeEDTA ft	iron ethylenediaminetetraacetic acid feet or foot
GRO	gasoline range organics
ISCO	in-situ chemical oxidation
MOC	Main Operations Complex
ORP	oxidation-reduction potential
OVA	organic vapor analyzer
ROI	radius of influence

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1.0 INTRODUCTION

This Technical Memorandum presents results of the Phase I In-Situ Chemical Oxidation (ISCO) testing conducted between 7 July and 11 September 2009 at the Main Operations Complex (MOC) Area of the Northeast Cape Site located on St. Lawrence Island, Alaska.

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2.0 OBJECTIVES

The primary objectives of the Phase I ISCO effort were to evaluate the feasibility of ISCO technology for application in an isolated location, and to evaluate the ability of ISCO to achieve remediation goals for the chemicals of concern (COCs) and corresponding media of concern. Table 1, in the Tables Section at the back of this document, summarizes the remediation goals for the COCs and corresponding media of concern.

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3.0 PHASE I ISCO EVALUATION

Phase I ISCO evaluation activities performed included the following work components:

- Evaluate site hydrogeologic conditions
- Test pit based site characterization
- Bench scale soil oxidant demand testing
- Bench scale treatability testing
- Pilot study design and construction
- Inject chemical oxidant
- Monitor performance

The Phase I ISCO test results are discussed in the following sections.

3.1 HYDROGEOLOGIC EVALUATION

To evaluate hydrogeologic conditions at the site, existing monitoring wells at the Main Operations Area (MOC) were gauged for depth to water. Wells included in the gauging effort were MW88-1, MW88-3, MW88-4, MW88-5, MW88-10, MW16-1, MW16-2, MW16-3, 18MW1, 17MW1, 22MW2, 22MW3, 20MW1, and 26MW1. Based on the data collected, a groundwater elevation contour map was generated in the field to evaluate regional groundwater flow direction and gradient. Figure 1 displays the groundwater elevation contour map generated from water level data collected on 23 July 2009. Based on the groundwater contours, the groundwater flow direction is approximately northwest across the MOC area. In addition to water level gauging, slug tests were conducted at a subset of the existing monitoring wells to evaluate conductivity and permeability. Wells where slug testing was performed include 20MW1, MW88-5, ICOMW01, and ICOMW02. Table 2 summarizes the conductivity values obtained from slug testing activities at the site.

3.2 TEST PIT SITE CHARACTERIZATION

To rapidly evaluate the lithology and characterize soil conditions within the Phase I ISCO area, AECOM Technical Services. Inc. (ATS) conducted test pit excavations within a localized area of the MOC. Twelve test pits were excavated to evaluate lithologic and pre-ISCO soil contaminant conditions. An excavator was used to dig each test pit to an approximate depth of 10 feet (ft) below land surface, or to the water table, whichever was encountered first. Figure 2 shows the approximate bounds of the Phase I ISCO area. The locations of the test pits installed during the characterization effort are illustrated on Figure 3. Soil excavated from the test pits was visually evaluated, logged, screened with an organic vapor analyzer (OVA) equipped with a flame ionization detector and photoionization detector, and the sidewalls of the test pits were photographed. Table 3 summarizes the OVA readings collected during the test pitting effort. Soil samples were collected to characterize soil contamination at locations where OVA readings and/or visual inspection suggested the presence of petroleum impacts. Selected soil samples underwent field-screening analysis for diesel range organics (DRO) using a siteLAB field test kit; however, it was determined that screening kit results were biased significantly low. This determination was made by submitting split soil samples to the offsite contract analytical laboratory and comparing field test kit results to lab analytical results. A spike test comparison was also made by adding identical volumes of neat diesel to a deionized (DI) water saturated sample of clean drillers sand and to a DI water saturated native peat (field screened as DRO-free) sample, and demonstrating that the signal was surpressed in the peat sample as indicated by a 50 percent (%) reduction in measured DRO.

During the test pitting efforts, a thin, shallow water bearing zone was observed at TP2, TP7, TP8, and TP12 at an approximate depth of 4.5 ft below ground surface (bgs). Observation of this shallow water-bearing zone during the test pitting efforts provided an initial indication that multiple aquifers

were likely present within the Phase I ISCO area. After test pit characterization activities were completed, the test pits were backfilled with excavated material in reverse order of excavation.

3.3 PRE-ISCO SOIL BORING AND MONITORING WELL INSTALLATION

Upon completion of the test pitting efforts, four soil borings and two monitoring wells were installed in the vicinity of the proposed Phase I ISCO demonstration site. Figure 3 shows the location of the four soil borings and two monitoring wells installed as a part of the characterization effort. The soil borings were designated as ICOSB01, ICOSB02, ICOSB03, and ICOSB04, and the monitoring wells were designated as ICOMW01 and ICOMW02. Screening samples for soil were collected from ICOSB01, ICOSB03, ICOSB04. Screening samples from these locations were submitted for offsite analysis to confirm the appropriateness of the proposed Phase I ISCO site. Data obtained from these screening samples are summarized in Table 4.

During the installation of ICOSB01, saturated soils were initially encountered at a depth of approximately 13.5 ft bgs; however, groundwater levels were observed to rise to a depth of approximately 7 ft bgs within the augers. A similar observation was also noted during the installation of ICOSB04, providing an indication of confined aquifer, conditions. The indication of a deeper (approximately 13 to 14 ft bgs) confined aguifer coupled with the observation of a previously unreported thin, shallow/perched water-bearing zone, prompted a closer look at the potential for multiple aquifers within the Phase I ISCO study area. To evaluate the potential for multiple waterbearing zones, two monitoring wells were installed. ICOMW01 was constructed as a deeper monitoring well with a screened interval corresponding to approximately 12 to 17 ft bgs. This well was intended to isolate the confined aquifer observed during the installation of ICOSB01 and ICOSB04. ICOMW02 was constructed as a shallow monitoring well with a screened interval corresponding to approximately 3.5 to 8.5 ft bgs, and was intended to isolate the shallow/perched water-bearing zone noted in the area during test pitting activities. Existing monitoring well MW88-5 is screened from 6.5 to 16.5 ft bgs, with a sand pack from 4.5 to 16.5 ft bgs, and has the potential to be screened across multiple water bearing zones. Screening samples of groundwater were collected from ICOMW01, ICOMW02, and MW88-5. Screening samples from these locations were submitted for offsite analysis to confirm the appropriateness of the proposed Phase I ISCO site. Data obtained from these screening samples are summarized in Table 4. Analytical results for DRO in groundwater collected from ICOMW01, ICOMW02, and MW88-5 suggested that the bulk of groundwater contamination resides within the shallow/perched water interval (ICOMW02). Based on these screening data, the decision was made to evaluate ISCO in the upper portion of the lithology where the greatest impacts to both soil and groundwater were observed.

3.4 PHASE I ISCO SOIL BORING, INJECTION, AND MONITORING WELL INSTALLATION

Based on the characterization information obtained during the test pitting and pre-ISCO soil and groundwater screening efforts noted above, the Phase I ISCO study was constructed to target the shallow soil and groundwater impacts identified. Figure 4 shows the installed configuration of the Phase I ISCO study monitor and injection wells. The primary injection well was identified as ICOIW01. The Phase I ISCO study monitoring wells were sequentially identified as ICOMW02 through ICOMW09. During well installation, soil borings were continuously screened using an OVA, and samples from the interval displaying the highest OVA readings were submitted for offsite laboratory analysis. Table 5 summarizes the OVA readings from the borings associated with the Phase I ISCO monitoring wells. Offsite analytical data associated with soil samples submitted to the offsite laboratory are presented in the performance-monitoring section below.

3.5 OXIDANT DEMAND TESTING

Prior to performing oxidant injections at the site, bench scale testing to evaluate the natural oxidant demand of site soils was conducted. This testing was conducted on site using soil and groundwater media obtained during the test pit characterization efforts described above. Table 6 summarizes the results of the oxidant demand testing.

3.6 OXIDANT INJECTIONS

3.6.1 Injectate Solution Composition and Volume

Individual solutions of hydrogen peroxide, sodium persulfate, and iron activator, (iron ethylenediaminetetraacetic acid [FeEDTA]) were prepared for injection in a sequential pulse fashion. Oxidant injections were conducted as an alternating pulse sequence where small batches of hydrogen peroxide solution were staggered between small batches of a combined sodium persulfate and FeEDTA activator solution. Injection volumes totaled approximately 1,090 gallons of oxidant/activator solution at ICOIW01 and 646 gallons of oxidant/activator solution at ICOIW09. The concentration of hydrogen peroxide injected at ICOIW01 was approximately 1,320 pounds, and the approximate total mass of hydrogen peroxide injected at ICOIW01 was 944 pounds. The concentration of sodium persulfate in the injectate ranged between 13% and 18%, and the total mass of sodium persulfate injected was approximately 660 pounds at ICOIW01 and 932 pounds at ICOIW09. The maximum concentration of iron delivered via injection was 1,640 parts per million. Approximately 51 pounds of FeEDTA was injected in ICOIW01, and approximately 43 pounds of FeEDTA was delivered to ICOMW09.

Injection activities were halted before target volumes were achieved due to the observation of oxidant short circuiting through the side wall in a low-lying area immediately adjacent to the Phase I ISCO study area. Short circuiting of injection fluids was originally noted while injecting into ICOIW01. Following this observation, injection activities were transitioned to ICOMW09 in an effort to achieve the target volumes and mass of oxidants estimated for the Phase I ISCO study area. Unfortunately, short circuiting of injected fluids was once again observed through the side wall in the same low-lying area immediately adjacent to the Phase I ISCO study area. As a result, no further injection activities were attempted.

Literature values for peat total porosity range upwards of 80%. An estimated 50% reduction in total porosity was anticipated due to silts, sands, and frozen zones in the injection interval. An estimated mobile porosity range was extracted from the United States Environmental Protection Agency guidance document, *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, September 1998, by selecting from the 30 to 50% mobile porosity range for peat as an upper bound and a value from the 1% to 30% mobile porosity range for silt as a lower bound value. Based on the 1,090-gallon volume of injectate applied to the subsurface at ICOIW01 across a 5-ft screen interval, the theoretical radius of influence (ROI) of the injection was expected to range between 4.8 and 9.6 ft based on a total porosity of 40%, and a mobile porosity in the range of one-half to one-eighth of the total porosity. Similarly, based on the 646-gallon volume of injectate applied to the subsurface at ICOIW09, the theoretical ROI was calculated to be between 3.7 and 7.4 ft.

3.7 **PERFORMANCE MONITORING**

The monitoring plan for the pilot study consisted of three discrete sampling periods:

- Baseline monitoring
- Injection performance monitoring
- Post-Injection performance monitoring

Each component of the monitoring plan is described further below.

3.7.1 Baseline Monitoring

Baseline sampling of soil and groundwater media was conducted prior to the initiation of ISCO injection activities. Baseline soil samples were collected from the smear zone soils during monitoring well installation. Following well installation and development activities, and prior to injection activities,

baseline groundwater samples were collected from all monitoring wells. Results obtained during baseline monitoring are presented in conjunction with post injection monitoring results below.

3.7.2 Injection Monitoring

Groundwater data from the monitoring wells within the target injection ROI and immediately downgradient, were collected while oxidant/activator solution was being injected. Field parameters, including electrical conductivity, oxidation-reduction potential (ORP), dissolved oxygen, hydrogen ion concentration, and temperature were used as a qualitative means to evaluate injection ROI during injection activities. Table 7 contains the vertically discrete down-hole water quality field parameters collected during the injection event. Based on the field parameter data collected during the injection event. Based on the field parameter data collected during the injection event, the injected oxidant combination was evident at monitoring wells ICOMW03, ICOMW05, and ICOMW06. Electrical conductivity data at these locations displayed a greater than tenfold increase, and ORP levels at these locations were observed to exceed 400 millivolts during the injection process. These locations also displayed the greatest concentrations of total iron, ferrous iron, sodium persulfate, and hydrogen peroxide, based on field test kit results for these parameters. These data suggest that the ROI achieved by the injection was approximately 10 ft, which agrees well with the calculated theoretical ROI derived from the injected volumes.

3.7.3 Post-Injection Monitoring

Post injection performance monitoring of groundwater was conducted on a schedule corresponding to 3, 7, 14, and 28 days following the completion of oxidant injections. In addition to groundwater samples, soil samples were also collected in conjunction with the day 7 and day 28 post injection sampling event, to evaluate the gross efficacy of the applied ISCO process on soils located within the pilot study area. Baseline soils were collected at depths ranging from 5.5 to 7.5 ft below surface, and subsequent samples were collected from the same depth interval for each sampling event. Table 8 contains the groundwater baseline and performance monitoring data, and Table 9 contains the soil baseline and performance monitoring data. Performance monitoring soil sample locations are shown on Figure 4.

Groundwater analytical results at day 3 indicated an immediate significant increase in concentrations of DRO, gasoline range organics (GRO), residual range organics, and benzene for most sampling locations. This response may be due to desorption of fuels from the highly organic soils. However, it was noted that concentrations of the groundwater COCs were decreasing by day 7, potentially due to aqueous phase oxidation of desorbed COCs. By day 28, concentrations were at or slightly below baseline levels, and the oxidants were mostly consumed. This response is attributed to a continual shift of petroleum hydrocarbons from the highly organic soil matrix into the aqueous phase, with the concomitant oxidation of a portion of this petroleum hydrocarbon mass in the presence of the injected oxidants. The significant source mass sorbed to the highly organic soils may have led to an apparent equilibrium between aqueous phase oxidation and desorption from the soil matrix, and thus the static groundwater concentrations. Additionally, the aquifer system was under dosed with oxidants, given the apparent preferential path and release to the surface described in previous sections, thus reducing the system's capacity for aqueous phase oxidative treatment. Target cleanup goals were met by day 28 for GRO at ICOMW08. Target cleanup goals for groundwater were not met at the locations sampled for the remaining COCs.

Analytical results for soil suggest a significant decreasing trend for benzene and naphthalene from baseline to day 7, which may be a function of aggressive initial oxidation effects. However, benzene results are variable through day 28, and DRO and naphthalene apparently increased through day 28. These results may be attributed to variation in the soil types over short lateral distances (e.g., horizontal horizon). These variations are problematic because pre-injection baseline soil samples may have had lower starting concentrations than the soils sampled post ISCO. Thus, the same relative reduction would not seem to be as effective in the soils with higher starting concentrations. Target cleanup goals were met by day 28 for DRO at ICOMW07 and ICOMW04; however, these results may be attributable to soil sample heterogeneity. Target cleanup goals for soil were not met at the locations sampled for the remaining COCs.

3.8 BENCH SCALE TREATABILITY TESTING

In addition to the field demonstration effort, a bench scale treatability study was also conducted. A treatability study would normally be conducted prior to the formulation of a field study work plan; however, project schedule and limitations (frozen ground versus manual sampling versus cost) on the ability to collect representative samples prior to the summer field season committed this phase to be performed while ISCO-related site characterization and performance sampling was underway.

The objective of the bench scale treatability study was to supplement the *in-situ* approach by varying oxidant dosages and examining catalyzed hydrogen peroxide, iron-activated persulfate, and hydrogen-peroxide-activated sodium persulfate, as independent treatability scenarios. Evaluation of oxidant effectiveness and oxidant efficiencies in the bench scale tests typically help refine the design of the pilot study work plan.

The bench scale treatability test was conducted at an offsite laboratory and completed in parallel with field ISCO testing. This testing was conducted using site soil and groundwater media obtained during the test pit characterization, ISCO soil boring, and well installation efforts discussed above. Bulk samples of soil were collected in plastic-bag-lined, 5-gallon pails, and bulk groundwater samples were collected in 15-gallon poly containers. Soil and groundwater samples were packed in coolers and shipped to ATS's treatability lab facility in Orlando, Florida. Table 10 and Table 11 contain the results of the bench scale treatability testing efforts.

Visual observations of the soil matrix in the reaction vessels with significant peat soil indicated that, over time, bulk organic matter was reduced in volume, and fiber size appeared to decrease. Total organic carbon analytical results for groundwater were significantly greater compared to baseline, supporting the concept of oxidation of the soil matrix and its conversion to soluble organic carbon compounds. Desorption of COCs is likely continuous as the soil organic matter degrades and releases sorbed petroleum hydrocarbon. Increasing contaminant concentrations in groundwater for multiple COCs is similar in response to the post-ISCO monitoring results from the field effort. Higher concentrations of oxidants appear to result in greater concentrations of COCs for both activated persulfate and catalyzed hydrogen peroxide systems. This result may be due to either desorption of contaminants from organic matter as it is degraded, or creation of matrix interference due to the reaction between higher oxidant concentrations and the soil organic matter.

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4.0 CONCLUSIONS AND RECOMMENDATIONS

Characterization efforts associated with the Phase I ISCO unveiled a number of key items related to the MOC area's site conceptual model. These items included the observation of locally extensive peat and organic silt layers within the shallow site lithology, the presence of a shallow perched waterbearing zone, the observation of locally confined aquifer conditions at greater depths, and the presence of, at least locally, higher than expected DRO concentrations in soils. The greatest concentrations of DRO observed in the Phase I ISCO area of the site appear to correspond well with the peat layers and the shallow perched water aquifer identified in the area of study.

The primary objectives of the Phase I ISCO effort was to evaluate the feasibility of ISCO technology for application in an isolated location, and to evaluate the ability of ISCO to achieve remediation goals for the COCs and corresponding media of concern. The results of the treatability study did not suggest that the tested oxidant scenarios were more effective than the approach selected for the field application. The response observed in the treatability study appears to confirm the observed field response to chemical oxidation of highly organic silts and peat. The application of ISCO at this isolated location proved to be challenging due to a number of unforeseen conditions in the field. Some of the conditions include the presence of high organic soils (peats and organic silts), the presence of permafrost and or semi-permafrost zones, and the observation of preferential flow zones. Despite these challenges, the overall process was demonstrated to be manageable and implementable. With regard to ISCO's ability to achieve remediation goals for the COCs and corresponding media of concern, it appears that it will be difficult to reach cleanup goals using ISCO in areas where peat or organic silts predominate the lithology because these layers have been demonstrated to retain high concentrations of contamination (especially DRO), and the natural organics that comprise these materials exhibit significant competition for the oxidants. Based on the results obtained during the Phase I ISCO testing, it does not appear that ISCO is well suited to achieve remediation goals for the COCs and corresponding media of concern in areas where peat or organic silts predominates the lithology.

Targeting soils that are not predominantly peat for further evaluation is recommended for Phase II ISCO, and could result in greater reductions of COCs by elimination of competing organic demand. Implementation of Phase II ISCO in the southern and/or eastern portion of the MOC area, for example, around SB13B1 and upgradient near MW88-10, could potentially be addressed using ISCO. Implementing ISCO in a portion of the MOC that is further away from the wetland boundaries also mitigates the potential for oxidant breakthrough via a sidewall seep.

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5.0 REFERENCES

Environmental Protection Agency, United States (EPA). 1998. *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water*. EPA/600/R-98/128. Office of Research and Development. September.

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TABLES

Table 1: Phase I ISCO Remediation Goals

Table 1: Phase I ISCO Remediation Goals

	Soil Cleanup	Groundwater Cleanup Level
Contaminant of Concern	Level (mg/Kg)	(mg/L)
Diesel Range Organics (DRO)	9,200	1.5
Gasoline Range Organics (GRO)	N/A	1.3
Residual Range Organics (RRO)	N/A	1.1
Naphthalene	120	N/A
Benzene	2	0.005

Notes: N/A – Not Applicable

Table 2: Main Operations Complex Area Slug Testing Results

Well	Test #	K (ft/day)	
	1	8.96	
20MW1	2	8.96	
20101001	3	7.24	
	Average	8.39	
	1	0.556	
	2	0.611	
	3	0.561	
MW 88-5	4	0.51	
	5	0.51	
	6	0.533	
	Average	0.547	
MW 88-3	MW 88-3 Unable to create enough dra		
MW 88-10	Unable to create enough drawdown for test		
	1	1.368	
ICOMW01	2	1.625	
	3	1.872	
	Average	1.62	
	1	1.45	
	2	1.76	
	3	1.77	
ICOMW02	4	3.64	
	5	1.66	
	6	1.87	
	Average	2.03	

Table 2: Main Operations Complex Area Slug Testing Results

Table 3: Test Pit Soil Headspace Screening Readings

Test Pit	Depth	FID Reading	PID Reading
Location	(ft bgs)	(ppm)	(ppm)
TP1	3.0-4.0	52.1	18.5
	4.0-5.0	556	144
	5.0-6.0	902	200
TP2	3.5-4.0	740	160
	6.0-6.5	1,040	420
	7.0-7.5	720	140
	9.5-10.0	580	204
TP3	2.0-2.5	bkg	bkg
	4.0-4.5	42	48
	6.0-6.5	3.2	4
	7.5-8.0	41.5	16.8
	8.5-9.0	51	4.8
	10.5-11.0	37.5	2.9
TP4	2.0-2.5	1.2	2.3
	5.0-5.5	138	17
	7.0-7.5	1,280	205
TP5	2.0-2.5	40	bkg
	3.5-4.0	30	bkg
	6.5-7.0	60	3.2
	9.0-9.5	30	bkg
TP6	3.5-4.0	10	3
	6.5-7.0	30	15
TP7	3.5-4.0	11	1.4
	7.5-8.0	327	70
TP8	3.5-4.0	1,925	380
	7.5-8.0	1,750	350
	9.5-10	40	4
TP9	5.5-6.0	3.2	2.1
	8.0-8.5	17.6	69
	9.5-10	305	94
TP10	4.0-4.5	19	34
	6.5-7.0	742	151
	9.5-10	305	192
TP11	3.5-4.0	78	3.2
	7.0-7.5	720	3.5
	9.5-10	1,300	2.5
TP12/13	2.0-2.5	bkg	bkg
	3.5-4.0	1058	201
	4.5-5.0	555	125
	6.5-7.0	1,635	238

Table 3: Test Pit Soil Headspace Screening Readings

Notes:

ft bgs - feet below ground surface

ppm - parts per million

bkg - reading was less than or equal to background

FID - flame ionization detector

PID - photoionization detector

Table 4: Screening Sample Analytical Data

Table 4: Screening Sample Analytical Data

Sample	Depth Interval	DRO
Location	(ft bgs)	(mg/Kg)
ICOSB01	5-6	98 B
ICOSB02	5-6	130,000 B, X
ICOSB03	9-11	13,000 B
ICOSB04	5-6	260,000 B,X
Sample	Screen Interval	DRO
Location	(ft bgs)	(mg/L)
ICOMW01	12-17	1.18
ICOMW02	3.5-8.5	32.8
MW88-5	6.5-16.5	7.53

Notes:

B - Compound was found in blank and sample.

X - Surrogate not quantitated due to high dilution

Table 5: Soil Boring Headspace Screening Readings

Table 5: Soil Boring Headspace Screening Readings

Location	Depth (ft bgs)	FID Reading (ppm)	PID Reading (ppm)
ICOSB01	4.0-5.0	6,200	58
	5.0-6.0	5,400	48
	6.0-7.0	7,500	42
	7.0-8.0	650	29
	8.0-9.0	4,230	41
	9.0-10.0	750	37
	10.0-11.0	4,260	58
	11.0-12.0	25	2.5
	12.0-13.0	3,700	24
	13.0-14.0	5,600	21
ICOSB02	4.0-5.0	2,600	22
	5.0-6.0	24,000	140
	6.0-7.0	4,750	46
	9.0-10	3,800	29
ICOSB03	5.0-7.0	1,305	258
	7.0-9.0	530	130
	9.0-11.0	375	150
ICOSB04	4.0-5.0	1,050	240
	5.0-6.0	530	200
	6.0-7.0	2,150	850
	10.0-12.0	810	370
	12.5-14.5	610	150
ICOMW01	4.0-5.0	350	95
	5.0-6.0	630	150
	6.0-7.0	320	81
	7.0-8.0	620	168
	8.0-9.0	850	130
		200	37
	9.0-10.0		
	10.0-12.0	480	68
	12.0-13.0	200	40
	14.0-16.0	420	90
ICOMW02 ICOMW03	4550	See ICOSB02	02
	4.5-5.0	490	93
	5-6.5	2,010	3.7
	6.5-7.0	309	35
	7.0-8.5	318	32
	8.5-9.5	740	100
	9.5-10	40	5
ICOMW04	6-7.5	250	1500
	7.5-9.0	950	165
	9-9.5	140	24
ICOMW05	5.0-6.0	590	240
	6.5-8.0	820	140
	8-8.5	68	10
ICOMW06	4.0-5.0	145	42
	5.0-6.0	630	124
	6.0-7.0	116	35
ICOMW07	5.5-6.5	650	50
	6.5-7.5	1,150	229
	7.5-8.5	240	114
ICOMW08	4.5-5.5	1,050	190
	5.5-6.5	89	17
	7.5-9.5	48	10
ICOMW09	5-5-6.5	1,300	180
	6.5-8.0	450	60
	9.0-10.0	82	12

Notes:

ft bgs-feet below ground surface

ppm-parts per million

Table 6: Soil Oxidant Demand Test Results (g/kg)

Table 6: Soil Oxidant Demand Test Results (g/Kg)

Test Condition	Peat Soils (OL/OH)	Organic Silts (OL/ML)	Silts (ML)
Sodium Persulfate Only	13.4	15.7	14.4
Sodium Persulfate + Iron EDTA	14.4	15.3	7.5
Sodium Persulfate + Hydrogen Peroxide	11.4	15.9	14.9

Location	Interval (ft btc)	DATE	TIME	DTW (ft)	TEMP (°C)	EC (mS/cm)	DO (mg/L)	pH (su)	ORP (mV)	Total Iron Conc. (mg/L)	Ferrous Iron Conc. (mg/L)	Hydrogen Peroxide Conc. (mg/L)	Sodium Persulfate Conc. (mg/L)
ICOMW02	5.1	8/9/2009	13:13	4.75	5.5	0.112	1.03	5.82	224.6				
	6.3	8/9/2009	13:13	4.75	4.82	0.109	0.97	6.20	212.0				
	8.3	8/9/2009	13:13	4.75	5.05	1.99	3.01	6.60	176.0				
	5.0	8/9/2009	16:00	4.71	5.5	0.112	3.01	6.62	239.0				
	6.5	8/9/2009	16:00	4.71	3.19	0.132	1.00	7.32	202.0				
	8.1	8/9/2009	16:00	4.71	1.53	0.131	1.00	7.51	201.0				
	5.0	8/9/2009	18:35	4.72	4.82	0.117	1.47	8.86	157.0				
	6.5	8/9/2009	18:35	4.72	4.18	0.122	1.12	9.04	154.0				
	8.0	8/9/2009	18:35	4.72	1.49	0.132	0.62	9.66	144.0				
	5.0	8/10/2009	13:49	4.61	6.15	0.134	1.85	8.56	167.0				
	7.0	8/10/2009	13:49	4.61	2.4	0.156	1.20	7.92	120.0	5.45	1.36	2.8	14
	8.0	8/10/2009	13:49	4.61	1.72	0.14	0.94	7.94	127.2				
	5.0	8/10/2009	16:32	4.64	5.88	0.115	2.01	8.40	125.0				
	6.5	8/10/2009	16:32	4.64	2.23	0.147	1.33	8.73	96.1				
	8.3	8/10/2009	16:32	4.64	1.39	0.14	4.37	4.35	113.0				
	5.0	8/11/2009	15:58	4.71	6.37	0.124	1.61	5.5	145.9				
	7.0	8/11/2009	15:58	4.71	2.14	0.159	0.76	6.11	98.1	5.45	1.36	2.8	14
	8.2	8/11/2009	15:58	4.71	1.79	0.153	0.86	6.23	98.7				
	5.0	8/12/2009	11:35	3.95	5.88	0.155	2.90	6.07	121				
	7.0	8/12/2009	11:35	3.95	2.5	0.167	1.49	6.57	80	11.25	5.68	1.8	14
	8.2	8/12/2009	11:35	3.95	2.03	0.164	1.33	6.67	75				
	5.0	8/12/2009	15:30	4.48	6.62	0.132	4.60	6.99	174				
	7.0	8/12/2009	15:30	4.48	2.65	0.17	2.30	6.46	90				
	8.5	8/12/2009	15:30	4.48	1.86	0.167	1.21	6.45	85.0				
	5.0	8/13/2009	11:15	4.70	6.99	0.107	0.55	5.15	112.00				
	7.0	8/13/2009	11:15	4.70	3.06	0.16	0.32	-3.00	125.00	21.7	4.24	5	7
	8.5	8/13/2009	11:15	4.70	2.88	0.167	1.50	-3.00	124.8				

Notes:

ft btc - feet below top of casing DTW - depth to water in feet TEMP (c) - temperature degrees Celsius

EC (mS/cm) - electrical conductivity in milliSiemens per centimeter DO (mg/L) - dissolved oxygen in milligrams per liter pH (su) - pH in standard units

Location	Interval (ft btc)	DATE	TIME	DTW (ft)	TEMP (°C)	EC (mS/cm)	DO (mg/L)	pH (su)	ORP (mV)	Total Iron Conc. (mg/L)	Ferrous Iron Conc. (mg/L)	Hydrogen Peroxide Conc. (mg/L)	Sodium Persulfate Conc. (mg/L)
ICOMW03	4.5	8/9/2009	12:33	3.34	7.14	0.128	2.3	5.58	200.0	(iiig/L)	(iiig/L)	(iiig/L)	(iiig/L)
100111103	6.5	8/9/2009	12:33	3.34	6.58	0.120	1.14	5.66	200.0				
	8.5	8/9/2009	12:33	3.34	3.44	0.134	1.14	5.70	203.0				
	0.0	0/9/2009	12.55	3.34	3.44	0.151	1.25	5.70	241.0				
	5.0	8/9/2009	15:06	troll	5.92	0.128	1.14	5.89	190.9				
	7.2	8/9/2009	15:06	troll	4.35	0.132	1.23	5.70	183.6				
	9.2	8/9/2009	15:06	troll	2.78	0.135	1.5	5.77	184.0				
	0.2	0/0/2000	10.00	tron	2.10	0.100	1.0	0.11	10-1.0				
	4.8	8/9/2009	17:19	3.22	6.92	0.133	1.12	6.69	243.1				
	6.8	8/9/2009	17:19	3.22	4.76	0.136	1	6.64	189.3				
	8.8	8/9/2009	17:19	3.22	2.84	0.128	1.36	6.3	188				
	4.0	8/10/2009	13:12	3.15	11.98	0.387	5.55	4.01	407.4				
	6.0	8/10/2009	13:12	3.15	4.93	3.599	7.88	1.22	584.7	7.72	0.49	1.8	21
	8.5	8/10/2009	13:12	3.15	3.37	3.82	6.81	1.55	580.5				
	4.5	8/10/2009	16:00	3.25	11.96	1.097	8.602	1.45	541.0				
	6.5	8/10/2009	16:00	3.25	4.81	4.086	8.4	0.05	581.0				
	8.5	8/10/2009	16:00	3.25	3.69	4.73	8.11	-0.49	580.0				
	4.0	8/11/2009	15:42	3.46	12.84	3.487	0.7	0.99	598.6				
	6.0	8/11/2009	15:42	3.46	4.9	6.04	0.87	0.47	599.0	14.4	1.28	15.2	>70
	8.5	8/11/2009	15:42	3.46	2.96	6.437	0.84	0.22	595				
	3.5	8/12/2009	11:40	2.74	19	4.468	1.42	1.90	603.0				
	5.5	8/12/2009	11:40	2.74	10.88	8.259	1.12	1.85	593.0	690.69	10.89	14	>70
	7.5	8/12/2009	11:40	2.74	5.84	8.461	1.09	1.95	565				
		a/1 a/aac -	1		00.15								
	3.0	8/12/2009	15:25	2.80	20.45	5.75	0.91	1.48	606.0				
	5.0	8/12/2009	15:25	2.80	10.81	11.75	0.61	1.23	595.0				
	7.0	8/12/2009	15:25	2.80	7.92	12.82	0.71	0.89	608.2				
	9.0	8/12/2009	15:25	2.80	6.32	12.74	0.8	0.77	604.4				
	3.5	8/13/2009	11:30	2.85	18.32	0.056	2.71	-10.00	227.0		+		
	3.5 5.0	8/13/2009	11:30	2.85	18.32	21.38	0.58	-10.00	227.0	816.63	17.05	18	1400
	7.0	8/13/2009	11:30	2.85	9.8	19.5	0.38	-10.00	221.0	010.00	17.05	10	1400
	8.5	8/13/2009	11:30	2.85	3.32	19.5	0.38	-10.00	219.9				
	0.0	0/13/2009	11.50	2.03	0.02	10.05	0.59	-10.00	204.0		I		

Notes:

ft btc - feet below top of casing DTW - depth to water in feet TEMP (c) - temperature degrees Celsius EC (mS/cm) - electrical conductivity in milliSiemens per centimeter DO (mg/L) - dissolved oxygen in milligrams per liter pH (su) - pH in standard units

										Total Iron	Ferrous Iron	Hydrogen Peroxide	Sodium Persulfate
	Interval			DTW	TEMP	EC	DO	рН	ORP	Conc.	Conc.	Conc.	Conc.
Location	(ft btc)	DATE	TIME	(ft)	(°C)	(mS/cm)	(mg/L)	(su)	(mV)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
ICOMW04	6.8	8/9/2009	12:19	6.51	1.69	0.141	8.77	5.67	235.2				
	8.0	8/9/2009	12:19	6.51	1.84	0.133	9.04	5.49	247.0				
	9.2	8/9/2009	12:19	6.51	1.26	0.146	8.7	5.63	249.3				
	6.6	8/9/2009	15:28	6.40	2.08	0.122	10.33	6.23	383.0				
	7.8	8/9/2009	15:28	6.40	1.52	0.133	8.11	6.23 7.74	336.0				
	9.1	8/9/2009	15:28	6.40	1.32	0.142	7.89	7.83	304.0				
	9.1	6/9/2009	13.20	0.40	1.34	0.145	7.09	1.03	304.0				
	6.4	8/9/2009	18:00	6.42	1.83	0.135	9.1	7.18	242.1				
	7.0	8/9/2009	18:00	6.42	1.8	0.133	7.98	7.07	244.5				
	9.0	8/9/2009	18:00	6.42	1.77	0.152	7.44	7.22	222.9				
	0.0	0,0,2000	10.00	0.42	1.11	0.101	7.44	1.22	222.5				
	7.0	8/10/2009	13:18	6.50	2	0.143	10.71	6.61	185.0				
	8.0	8/10/2009	13:18	6.50	1.46	0.157	7.23	6.54	157.0	3.08	1.02	2.2	7
	9.1	8/10/2009	13:18	6.50	1.25	0.165	6.31	6.85	148.1				
	-												
	7.0	8/11/2009	16:11	6.49	2.09	0.138	10.01	5.00	197.2				
	8.0	8/11/2009	16:11	6.49	1.41	0.161	8	4.98	162.0				
	9.5	8/11/2009	16:11	6.49	1.23	0.167	6.2	5.36	144.0				
	6.5	8/11/2009	16:17	6.35	2.57	0.121	11.25	5.50	205.0				
	7.5	8/11/2009	16:17	6.35	1.78	0.14	8.25	5.72	152.0	1.04	0.91	3.4	6.3
	9.0	8/11/2009	16:17	6.35	1.34	0.161	5.14	6.59	120.1				
	7.0	8/12/2009	9:32	6.27	2.54	0.147	6.25	5.53	185.0				
	8.0	8/12/2009	9:32	6.27	1.89	1.66	4.68	5.55	181.0				
	9.0	8/12/2009	9:32	6.27	1.77	0.168	4.16	5.53	177.0				
	7.0	8/12/2009	11:47	6.15	3.07	0.148	11	6.43	177.7				
	8.0	8/12/2009	11:47	6.15	1.76	0.161	5.01	6.30	124.7				
	9.0	8/12/2009	11:47	6.15	1.5	0.168	3.76	6.28	115.0				
	7.0	8/12/2009	15:20	6.53	2.86	0.148	14.75	7.50	138.0	4.2	2.66	3	5.6
	8.0	8/12/2009	15:20	6.53	2.05	0.162	9.55	6.55	130.0	4.2	2.00	3	0.0
	9.5	8/12/2009	15:20	6.53	1.8	0.172	7.2	6.38	116.5				
	7.5	8/13/2009	11:37	7.30	2.84	0.137	9.55	-8.00	80.0				
	7.5 8.0	8/13/2009	15:20	7.30 NA	2.84 NA	0.137 NA	9.55 NA	-8.00 NA	80.0 NA	8.65	9.3	3	5.6
	8.0 9.5	8/13/2009	15:20	7.30	NA 2.74	0.146	NA 7.2	-8.00	NA 83.8	0.00	5.5	5	5.0
	9.0	0/13/2009	13.20	1.30	2.14	0.140	1.2	-0.00	03.0		1		<u> </u>

Notes:

ft btc - feet below top of casing DTW - depth to water in feet TEMP (c) - temperature degrees Celsius EC (mS/cm) - electrical conductivity in milliSiemens per centimeter DO (mg/L) - dissolved oxygen in milligrams per liter pH (su) - pH in standard units

Location	Interval (ft btc)	DATE	TIME	DTW (ft)	TEMP (°C)	EC (mS/cm)	DO (mg/L)	pH (su)	ORP (mV)	Total Iron Conc. (mg/L)	Ferrous Iron Conc. (mg/L)	Hydrogen Peroxide Conc. (mg/L)	Sodium Persulfate Conc. (mg/L)
ICOMW05	4.0	8/9/2009	12:41	3.48	6.84	0.115	6.8	4.57	477.1				
	6.0	8/9/2009	12:41	3.48	5.38	0.108	2.15	4.68	440.0				
	8.0	8/9/2009	12:41	3.48	4.08	0.105	1.25	4.90	370.0				
	5.5	8/9/2009	15:16	4.16	11.05	1.866	37.58	3.32	582.0				
	6.5	8/9/2009	15:16	4.16	7.7	1.46	35.01	3.27	575.0				
	7.7	8/9/2009	15:16	4.16	7.13	1.289	40.3	2.98	582.0				
	4.8	8/9/2009	17:29	troll	12.04	9.11	34.00	5.17	668.0				
	5.9	8/9/2009	17:29	troll	10.01	9.456	38.6	5.47	670				
	7.9	8/9/2009	17:29	troll	8.12	8.59	46.84	5.59	654.3				
	3.0	8/10/2009	12:56	troll	24.89	22.51	44.98	-0.25	581.8				
	5.0	8/10/2009	12:56	troll	24.78	22.33	46.57	-0.43	583.0	2302	1.57	3	>70
	7.0	8/10/2009	12:56	troll	24.61	22.57	45.36	-0.40	582.0				
	4.0	0/14/00000	10.00	0.44	04.45	00.05	45.0	0.40	405.0				
	4.0	8/11/2009	16:30	3.44	21.45	32.05	15.3	0.43	495.2	>33000	36.3	5.2	>70
	6.0 8.0	8/11/2009 8/11/2009	16:30 16:30	3.44 3.44	12.44 11.23	28.72	28.58 26.01	0.78	495.7 497.0	>33000	30.3	5.2	>70
	8.0	8/11/2009	16:30	3.44	11.23	28.01	26.01	0.73	497.0				
	4.0	8/12/2009	9:39	3.70	20.58	25.67	8.65	8.16	473.0				
	4.0 6.0	8/12/2009	9:39	3.70	20.56	23.07	18.06	8.90	473.0				
	8.0	8/12/2009	9:39	3.70	5.37	25.05	28.1	6.70	487.3				
	0.0	0/12/2009	9.39	5.70	5.57	23.03	20.1	0.70	407.5				
	4.0	8/12/2009	11:53	2.95	21.88	24.2	13.7	1.31	461.0				
	6.0	8/12/2009	11:53	2.95	13.07	22.74	19.63	1.34	481.0				
	8.0	8/12/2009	11:53	2.95	5.33	23.38	34	1.19	484.0				
							÷.						
	3.0	8/12/2009	14:40	2.70	30.4	15.8	8.5	1.50	483.0				
	5.0	8/12/2009	14:40	2.70	21.52	25.65	13.65	1.05	485.0	>33000	13200	9	1400
	7.0	8/12/2009	14:40	2.70	6.3	22.4	34.12	0.78	477.0				
	4.0	8/13/2009	11:43	3.65	25	27.04	2	296.00	483.0				
	6.0	8/13/2009	11:43	3.65	10.49	20.94	5.01	255.70	485.0	>33000	1160	15	2500
	7.5	8/13/2009	11:43	3.65	5.38	19.99	-3	368.90	477.0				

Notes:

ft btc - feet below top of casing DTW - depth to water in feet TEMP (c) - temperature degrees Celsius EC (mS/cm) - electrical conductivity in milliSiemens per centimeter DO (mg/L) - dissolved oxygen in milligrams per liter pH (su) - pH in standard units

	Interval			DTW	TEMP	EC	DO	рН	ORP	Total Iron Conc.	Ferrous Iron Conc.	Hydrogen Peroxide Conc.	Sodium Persulfate Conc.
Location ICOMW06	(ft btc) 5.0	DATE 8/9/2009	13:06	(ft) 3.84	(°C) 5.38	(mS/cm) 0.126	(mg/L)	(su) 6.22	(mV) 188.0	(mg/L)	(mg/L)	(mg/L)	(mg/L)
	7.1	8/9/2009	13:06	3.84	2.7	0.126	1.91 0.77	6.51	156.0				
	9.1	8/9/2009	13:06	3.84	2.45	0.122	1.01	6.58	146.0				
	9.1	0/9/2009	13.00	3.04	2.40	0.121	1.01	0.56	140.0				
	4.7	8/9/2009	15:50	3.85	5.74	0.089	8.78	6.32	218.2				
	6.7	8/9/2009	15:50	3.85	3.55	0.127	2	7.14	218.5				
	8.2	8/9/2009	15:50	3.85	2.39	0.12	0.9	7.48	217.4				
	4.4	8/9/2009	18:09	3.72	6.41	0.132	1.48	7.83	216.4				
	6.4	8/9/2009	18:09	3.72	3.47	0.128	0.51	8.52	202.0				
	8.2	8/9/2009	18:09	3.72	2.17	0.119	0.66	8.82	204.0				
	4.0	8/10/2009	13:30	3.68	6.22	4.023	3.43	2.24	585.0				
	6.0	8/10/2009	13:30	3.68	3.7	5.871	1.5	2.22	623.0				
	8.0	8/10/2009	13:30	3.68	3.1	5.912	1.21	2.60	632.0				
	4.0	8/10/2009	16:19	3.62	8.4	5.091	3.02	0.91	624.0				
	4.0 6.0	8/10/2009	16:19	3.62	8.4 3.82	7.54	3.02	0.91	624.0 631.5	49.98	4.08	3.8	28
	6.0 8.0	8/10/2009	16:19	3.62	3.82	7.54	3.04	0.77	630.0	49.90	4.00	3.0	20
	0.0	0/10/2003	10.19	3.02	5.21	1.310	1.52	0.92	030.0				
	4.5	8/11/2009	15:50	4.10	5.08	16.53	1.7	-0.11	513.0				
	6.5	8/11/2009	15:50	4.10	3.8	16.11	1.58	-0.05	514.0	2300	831	6	>70
	8.5	8/11/2009	15:50	4.10	3.54	15.87	1.52	0.08	514.0				
	4.0	8/12/2009	11:25	3.95	9.64	18.47	3.53	1.99	464.9				
	6.0	8/12/2009	11:25	3.95	6.22	19.24	2.56	1.92	463.9				
	8.0	8/12/2009	11:25	3.95	3.01	18.06	2.13	1.89	470.0				
	4.0	8/12/2009	14:45	3.70	12.75	0.278	8	0.85	459.5			_	
	6.0	8/12/2009	14:45	3.70	7.45	19.32	2.86	0.70	454.0	>33000	14400	7	1400
	8.5	8/12/2009	14:45	3.70	2.21	17.57	1.4	0.58	469.0				
	4.5	0/40/0000	44.50		10.00	01.00	0.00	0.50	000.00				
	4.5	8/13/2009	11:50	4.11	12.32	21.93	6.89	8.58	389.00	>33000	1180	33	3000
	6.0 8.5	8/13/2009	11:50	4.11	6.3	22.1	0.54	-8	425.00	>33000	1160	33	3000
	ö.5	8/13/2009	11:50	4.11	2.5	19.78	0.25	-4	429.00				

Notes:

ft btc - feet below top of casing DTW - depth to water in feet TEMP (c) - temperature degrees Celsius EC (mS/cm) - electrical conductivity in milliSiemens per centimeter DO (mg/L) - dissolved oxygen in milligrams per liter pH (su) - pH in standard units $\label{eq:order} \begin{array}{l} \text{ORP} \mbox{ (mV)} \mbox{-} \mbox{oxidation-reduction potential in millivolts} \\ \text{mg/L} \mbox{-} \mbox{milligrams per liter} \end{array}$

					TEMP					Total Iron	Ferrous Iron	Hydrogen Peroxide	Sodium Persulfate
Location	Interval (ft btc)	DATE	TIME	DTW (ft)	TEMP (°C)	EC (mS/cm)	DO (mg/L)	pH (su)	ORP (mV)	Conc. (mg/L)	Conc. (mg/L)	Conc. (mg/L)	Conc. (mg/L)
ICOMW07	6.5	8/9/2009	12:58	5.70	0.83	0.188	2.27	7.01	77.0	(9/=/	(9/=/	(9, =)	(9, =)
	7.6	8/9/2009	12:58	5.70	0.86	0.184	1.48	6.97	73.0				
	9.6	8/9/2009	12:58	5.70	0.61	0.18	9.9	6.82	133.0				
	6.0	8/9/2009	16:09	5.72	0.82	0.2	4.87	5.40	151.0				
	7.9	8/9/2009	16:09	5.72	0.93	0.184	1.08	7.05	77.0				
	9.9	8/9/2009	16:09	5.72	0.62	0.185	1.2	7.14	106.0				
	6.5	8/9/2009	18:25	5.68	0.96	0.183	2.48	9.32	60.1				
	8.0	8/9/2009	18:25	5.68	0.74	0.183	1.5	9.61	63.2				
	9.3	8/9/2009	18:25	5.68	0.60	0.183	1.12	9.78	64.00				
	6.5	8/10/2009	13:37	5.69	1.62	0.216	2.51	8.66	4.0				
	7.5	8/10/2009	13:37	5.69	0.98	0.193	2.12	8.43	10.5				
	9.3	8/10/2009	13:37	5.69	0.59	0.189	1.55	8.62	11.1				
									17.0				
	6.5	8/10/2009	16:32	5.65	1.4	0.198	3.08	8.54	17.3	18.66	9	2.4	14
	7.5 9.0	8/10/2009 8/10/2009	16:32 16:32	5.65 5.65	1.14 0.66	0.195 0.191	2.07	8.54 8.74	16.6 18.6	10.00	9	2.4	14
	9.0	6/10/2009	10.32	5.65	0.00	0.191	1.0	0.74	10.0				
	6.5	8/11/2009	17:00	5.69	1.45	0.207	3.26	8.57	10.9				
	7.5	8/11/2009	17:00	5.69	0.65	0.207	1.77	9.76	-9.1	17.46	18.78	2.2	10
	9.0	8/11/2009	17:00	5.69	0.03	0.194	1.69	9.78	-8.4	11.40	10.70	2.2	10
	0.0	0/11/2000	11.00	0.00	0.7	0.100	1.00	0.10	0.4				
	6.0	8/12/2009	10:20	5.65	1.57	0.235	0.27	7.52	-48.4				
	6.0	8/12/2009	10:20	5.65	1.08	0.208	9.14	7.01	-11.9				
	8.0	8/12/2009	10:20	5.65	1.3	0.217	0.22	7.26	-30.4				
	9.0	8/12/2009	10:20	5.65	0.9	0.213	0.21	7.1	-21.9				
	6.0	8/12/2009	12:13	5.36	0.84	0.163	12.67	7.51	35.5				
	8.0	8/12/2009	12:13	5.36	0.73	0.205	1.71	7.2	39.8				
	9.0	8/12/2009	12:13	5.36	0.71	0.204	1.71	7.2	39.4				
	6.0	8/12/2009	14:50	5.50	0.88	0.233	4.8	6.85	11.4				_
	7.5	8/12/2009	14:50	5.50	0.97	0.22	2.7	6.78	10.7	29.15	19.62	4	7
	9.0	8/12/2009	14:50	5.50	0.76	0.211	1.48	6.81	15.9				
		0/10/005-											
	6.0	8/13/2009	11:55	5.69	1.58	0.26	4.2	-3	242.0	17.10	10.10		-
	7.5	8/13/2009	11:55	5.69	1.19	0.246	0.22	-3	209.0	47.43	18.18	4	7
	9.0	8/13/2009	11:55	5.69	0.86	0.214	1.31	-3	225.0				

Notes:

ft btc - feet below top of casing DTW - depth to water in feet TEMP (c) - temperature degrees Celsius

EC (mS/cm) - electrical conductivity in milliSiemens per centimeter DO (mg/L) - dissolved oxygen in milligrams per liter pH (su) - pH in standard units

Location	Interval (ft btc)	DATE	TIME	DTW (ft)	TEMP (°C)	EC (mS/cm)	DO (mg/L)	pH (su)	ORP (mV)	Total Iron Conc. (mg/L)	Ferrous Iron Conc. (mg/L)	Hydrogen Peroxide Conc. (mg/L)	Sodium Persulfate Conc. (mg/L)
ICOMW08	8.0	8/9/2009	13:54	7.19	0.69	1.54	2.29	6.49	194.7				
	7.5	8/9/2009	16:25	7.22	6.51	0.163	1.86	5.99	192.0				
	8.9	8/9/2009	16:25	7.22	0.53	0.158	2.2	6.03	193.0				
	8.0	8/9/2009	18:45	7.16	0.58	0.161	1.96	10.19	135.0				
	7.3	8/10/2009	13:26	7.05	1.56	0.225	2.79	7.41	194.0	2	0.43	2.4	5
	8.5	8/10/2009	13:26	7.05	0.63	0.173	3.29	7.31	172.2				
	7.1	8/11/2009	17:35	6.92	0.87	0.181	1.81	8.46	108.3				
	8.8	8/11/2009	17:35	6.92	0.63	0.172	2.02	8.42	119.9				
	Well Sampling	8/11/2009	20:15	6.89	4.58	0.19	0.56	5.57	181.60	1.99	0.47	1.4	5
	NA	8/12/2009	10:10	DRY	NA	NA	NA	NA	NA				
	INA	0/12/2009	10.10	DKT	INA	INA	INA	INA	NA.				
	9.0	8/12/2009	12:02	8.25	2.16	0.255	3.1	7.10	104.4				
	0.0	0/12/2000	12.02	0.20	2.10	0.200	0.1	7.10	104.4				
	9.0	8/12/2009	15:05	7.81	1.74	0.204	3.25	7.19	89.0	3.07	0.66	>100	2.1
	7.5	8/13/2009	12:00	6.96	1.23	0.171	1.68	-5.00	194.0				
	8.5	8/13/2009	12:00	6.96	0.93	0.196	1.58	-5.00	197.0	2.3	1.73	0	1.4

Notes:

ft btc - feet below top of casing DTW - depth to water in feet TEMP (c) - temperature degrees Celsius EC (mS/cm) - electrical conductivity in milliSiemens per centimeter DO (mg/L) - dissolved oxygen in milligrams per liter pH (su) - pH in standard units

Table 8: Phase I ISCO Study Groundwater Results

Table 8: Phase I ISCO Study Groundwater Results

	Sampling	Benzene	Naphthalene	GRO	DRO	RRO
Well ID	Event	(ug/L)	(ug/L)	(mg/L)	(mg/L)	(mg/L)
Groundwater c	leanup levels	5	NA	1.3	1.5	1.1
	Baseline	0.74 J	29	0.37	21	1.7
ICOMW03	Day 3	1.3	49	14	2.7 L	1.6 L
ž	Day 7	3 J,X	50 X	0.70	24 D	2.7 D
<u> </u>	Day 14	2.4	87	0.81	18 X	1.5 X
-	Day 28	2.5	110	0.8	14	1.2
	Baseline	63	74	0.92	11	2
ICOMW04	Day 3	86	34	21	20 L	0.76 L
ž	Day 7	56 X	7.4 X	0.54	7.9 D	1.2 D
S	Day 14	53	4.6	0.54	5.7 X	1.7 X
<u>-</u>	Day 28	70	7	0.66	9.5	1.7
	Baseline	1.1	31	0.29	13	1.9
ICOMW05	Day 3	4.6	81	23	22 L	1.8 L
ž	Day 7	6.1 J	83 H	0.93	18 D	2.4 D
S	Day 14	11	100	0.85	9.9 X	1.5 X
-	Day 28	34	68	1.1	14	2.1
	Baseline	4.9	100	0.97	19	2.3
80 A	Day 3	1.7	57	11	18 L,X,D	2.4 L,X,D
ICOMW06	Day 7	1.7 J	58 H,X	0.62	19 D	2.8 D
8	Day 14	1.7	56	0.56	17 X	2.3 X
-	Day 28	2.1	51	0.37	18	2.2
•	Baseline	45	4	1.4	8.5	1.2
ICOMW07	Day 3	34	4.6	32	12 L,X,D	2.0 L,X,D
ě	Day 7	36	6.7 J,H	1.8	10 D	1.4 D
8	Day 14	40	4.9	1.4	9.1 X	1.4 X
-	Day 28	32	3.7	1.5	11	1.2
~	Baseline	69	120	39	11 L	1.3 L,I,X
ICOMW08	Day 3	70	88	29	13 L	1.0 L
ě	Day 7	76	90	1.5	10 D	2.0 D
S	Day 14	43	ND (1.0)	0.63	8.6 X	1.6 X
-	Day 28	32	16	0.91	9.5	1.4
~	Baseline	72	380	2.6	24 X	2.3 L,X
Ň	Day 3	86	300	54	21 L	1.3 L
É.	Day 7	46 X	340 H,X	2.8 X	18 D,X	1.6 D,X
ICOMW02	Day 14	71	290 H	2.8	28 X	1.8 X
	Day 28	97	260	3.1	110	4.5
~	Baseline	57	33	0.88	5.7 X	0.78 L,X
ŠOV						
Ň						
ICOMW09						
-						

Notes:

B-Compound was found in the blank and sample

D-Samples were diluted due to presence of target analytes. The dilution made quantitition of surrogate recoveries impractical

H-Sample analyzed past recommended 14 day holding time.

I-Indicates the presence of an interference, recovery is not calculated.

J-Result is an estimate. The reported concentration is between the method MDL and PQL.

L-Result is an estimate due to the LCS/LCSD exceeding the method RPD limit.

X-Surrogate recovery outside of acceptance limits due to target analyte interference.

ND (value)-Analyte not detected above (reporting limit)

NA-Not analyzed

Table 9: Phase I ISCO Study Soil Results

Table 9: Phase I ISCO Study Soil Results

	Sampling	Benzene	Naphthalene	DRO	RRO	GRO	TOC
Well ID	Event	(ug/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
Soil Cleanu	p Criteria	2,000	NA	9,200	NA	NA	NA
	Baseline	1,000	120	170,000	7,200	1000 B,X	213,000 Q
ICOMW03	Day 7	520 H	610 H,X	330,000 D	13,000 D	9000 X	400,000 H
	Day 28	230	310	360,000 X	16,000 X	3100 X	410,000
	Baseline	930	81	17,000	4,400	470 B	185,000 Q
ICOMW04	Day 7	95 H	15 H	4,600	5,400	170	200,000 H
	Day 28	240	9	6,400	2,500	98 X	180,000
	Baseline	1,000	93	130,000	7,700	680 B	199,000 Q
ICOMW05	Day 7	240 H	600 H,X	250,000 D	17,000 D	7,500 X	290,000 H
	Day 28	260	440	390,000 X	24,000 X	3,800 X	260,000
	Baseline	580	240	110,000	8,400	2,100 B	215,000 Q
ICOMW06	Day 7	1,000 H	64	77,000	6,800	490 X	150,000 H
	Day 28	1,400	270	170,000 X	7,600	1900 X	200,000
	Baseline	270	25	13,000	2,800	480 B	190,000 Q
ICOMW07	Day 7	ND (69) H	ND (0.17) H	540	6,300	6.7 J	240,000 H
	Day 28	ND (110)	ND (0.26)	370	3,000	12 J	150,000
	Baseline	3,600	300	240,000	5,300	4,400 B	453,000 Q
ICOMW08	Day 7	490 H	190 H,X	77,000 D	7,600 D	1,000 X	150,000 H
	Day 28	3,700	460	360,000 X	20,000 X	3,200 X	250,000
	Baseline	4,300	270	6,500	5,300	1,900 B	261,000 Q
ICOMW09	Day 7	220 H	65 H,X	44,000 D	11,000 D	270 X	260,000 H
	Day 28	2,000	280	150,000 X	8,100 J,X,Q	2,000 X	200,000
	Baseline	NA	NA	13,000	NA	NA	NA
ICOMW02	Day 7	280 H,X	3,100 H,X	2,700	11,000	73	300,000 H
	Day 28	750	760	17,000	3,000	26 X	320,000

Notes:

X-Surrogate recovery outside of acceptance limits due to target analyte interference.

H-Sample analyzed past recommended 14 day holding time.

J-Result is an esimate. The reported concentration is between the method MDL and PQL.

D-Samples were diluted due to presence of target analytes. The dilution made quantitition of surrogate recoveries impractical B-Compound was found in blank and sample.

Q-Reporting limit elevated due to sample dilution.

ND (value)-Analyte not detected above (reporting limit)

NA-Not analyzed

Table 10: Groundwater Analytical Results, Treatability Bench Study

Table 10 - Groudwater Analytical Results, Treatability Bench Study

Compound	Sample Dates	Sampling Event (Week)	Benzene (ug/L)	Naphthalene (ug/L)	GRO (C6-C10)	DRO (nC10- <nc25)< th=""><th>RRO (nC25-nC36)</th><th>Hexavalent chromium</th><th>Arsenic</th><th>Lead</th><th>Chromium</th><th>Total Iron</th><th>Ferrous Iron</th><th>Sulfate</th><th>Alkalinity</th><th>Total Organic Carbon</th></nc25)<>	RRO (nC25-nC36)	Hexavalent chromium	Arsenic	Lead	Chromium	Total Iron	Ferrous Iron	Sulfate	Alkalinity	Total Organic Carbon
			(3)		<u></u>		ated Sodium F									
Untreated Control	8/21/2009	Login Baseline	0.51 J	0.064 U	0.14	11	2.1	0.007 HJ	0.0074 J	0.0077 J	0.012 J	24	35	N/A	80	65
	9/14/2009	0	0.057 U	0.064 U	ND	0.9 B	0.21 *B	0.0037 UH	0.012 J	0.0017 U	0.0033 U	N/A	30	1.5	67	21 H
	9/23/2009	1	0.057 U	5	0.42	28 *B	11 *B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/8/2009	3	0.057 U	0.064 U	6.1	46	9.9	0.091 H	1 J	2	2.5	N/A	20	13	23	160
	10/22/2009	5	N/A	N/A	N/A	10 B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/10/2009	7	0.057 U	15	11	16 B	4	0.046 JH	0.7	1.2	1.4	N/A	16	1.3	180	150
EDTA + 2% S208	9/23/2009	1	0.41 J	5.4	0.24	17 *B	5.6 *B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/8/2009	3	0.14 J	4.1 J	0.58	2	7.7	0.084 JH	0.15	0.11	0.18	N/A	31	39000	N/A	8200
	10/22/2009	5	N/A	N/A	N/A	27 B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/10/2009	7	0.31 J	14	2.6	7.5 B	2.2	0.035 JH	0.42 J	0.76	1.0	N/A	30	28000	N/A	1600
EDTA + 10% S208	9/23/2009	1	0.38	4.6	0.35	98 *B	37 *B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/8/2009	3	0.057 U	11	0.68	140	32	0.19 JH	0.66	0.79	1.7	N/A	23	160000	N/A	9900
	10/22/2009	5	N/A	N/A	N/A	200 B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/10/2009	7	0.44 J	14	5.2	20 B	4.6	0.036 JH	0.92	1.3	1.5	N/A	18	180000	N/A	7300
8% H202 + 2% S208	9/23/2009	1	0.33	5.5	0.19	22 *B	9.7 *B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
07011202 1 270 0200	10/8/2009	3	0.057 U	7.5	0.43	170	42	0.13 JH	0.94 J	1.6	2.4	N/A	28	53000	N/A	1300
	10/22/2009	5	N/A	N/A	N/A	55 B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/10/2009	7	0.72 J	11	3.3	7.7 B	2.3	0.043 JH	0.48 J	0.97	1.3	N/A	20	65000	N/A	660
8% H202 + 10% S208	9/23/2009	1	0.37	5.5	0.98	150 *B	61 *B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/8/2009	3	0.057 U	0.064 U	0.67	250	69	0.23 JH	0.93	0.69	1.9	N/A	10	220000	N/A	1600
	10/22/2009	5	N/A	N/A	N/A	230 B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/10/2009	7	0.83 J	3.4	0.84	14 B	2.8	0.048 JH	1.1	0.83	1.7	N/A	5	220000	N/A	1600
						Ostak		Demonstate								
CHP Control	11/19/2009	0 hr	0.11 UH	0.13 UH	0.03 U	7.1	yzed Hydroger 1.9	0.0046 JH	0.017 J	0.042	0.05	N/A	32	N/A	48	32
	11/19/2009	0111	0.1108	0.13 UH	0.03 0	7.1	1.9	0.0040 JH	0.017 J	0.042	0.05	IN/A	32	IN/A	40	32
5% H2O2 + 30 mg/L Fe	11/19/2009	1 hr	0.11 UH	0.13 UH	0.042 J	41	35	0.10 H	0.47 J	1.2	1.6	N/A	174	N/A	NA	3600
5,51.202 1 00 mg/E10	11/19/2009	3 hr	0.11 UH	0.13 UH	0.042 0	13	6.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/19/2009	5 hr	0.11 UH	0.13 UH	0.055 J	21	17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/19/2009	7 hr	0.11 UH	0.13 UH	0.03 U	32	23	0.24 H	0.39 J	1.0	1.3	N/A	169	N/A	NA	3800
							-				-					
0% H2O2 + 60 mg/L Fe	11/19/2009	1 hr	0.11 UH	0.13 UH	0.032 J	230	160	0.20 H	0.57 J	1.9	2.3	N/A	301	N/A	NA	4700
<u> </u>	11/19/2009	3 hr	0.11 UH	0.13 UH	0.055 J	630	360	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/19/2009	5 hr	0.11 UH	0.13 UH	0.040 J	340	240	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/19/2009	7 hr	0.11 UH	0.13 UH	0.033 J	87	63	0.14 H	0.34 J	1.3	1.3	N/A	287	N/A	NA	3000

Notes:

1. Units are mg/L unless specified otherwise

2. Laboratory unable to perform alkalinity analysis - sample pHs exceed limit

3. N/A = Not Analyzed

Flags:

B - Compound was found in both blanks and samples

J - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

* - LCS or LCSD exceeds the control limits

H - Sample was prepped or analyzed beyond the specified holding time

ND or U - Result is less than the MDL. Where U, MDL listed in table

Table 11: ISCO Treatability Study Soil Results Summary

Table 11: ISCO Treatability Study Soil Results Summary

Compound	Sample Date	Sampling Event (Week)	Benzene (ug/Kg)	Naphthalene (ug/Kg)	GRO (C6-C10)	DRO (nC10- <nc25)< th=""><th>RRO (nC25- nC36)</th><th>Arsenic</th><th>Chromium</th><th>Total Iron</th><th>Lead</th><th>Hexavalent chromium</th></nc25)<>	RRO (nC25- nC36)	Arsenic	Chromium	Total Iron	Lead	Hexavalent chromium
				Activated	d Sodium Pe	rsulfate						
Untreated Control	8/26/2009	Login Baseline	7 U	3900	730	15000	2900	6.5	23	15000	27	0.72
	9/14/2009	0	64 U	150 U	260	12000 B	3000	5.9	19 B	12000 B	11	0.3 JB
	9/23/2009	1			33	15000 B	4300 B	N/A	N/A	N/A	N/A	N/A
	10/8/2009	3	9.7 U	620	410	17000 B	4700 B	N/A	N/A	N/A	N/A	N/A
	10/22/2009	5	N/A	N/A	N/A	17000	N/A	N/A	N/A	N/A	N/A	N/A
	11/10/2009	7	10 U	610	36 B	15000	5300	3.9 J	12	8200	9.0	0.74 J
EDTA + 2% S208	9/23/2009	1	N/A	N/A	59	14000 B	5200 B	N/A	N/A	N/A	N/A	N/A
	10/8/2009	3	7.9 U	530	98	16000 B	6200 B	N/A	N/A	N/A	N/A	N/A
	10/22/2009	5	N/A	N/A	N/A	8900	N/A	N/A	N/A	N/A	N/A	N/A
	11/10/2009	7	12 U	1400	36 B	16000	7600	5.6 J	17	12000	13	0.67 J
EDTA + 10% S208	9/23/2009	1	N/A	N/A	27	6600 B	1900 B	N/A	N/A	N/A	N/A	N/A
	10/8/2009	3	8.2 U	1000	170	7100 B	2600 B	N/A	N/A	N/A	N/A	N/A
	10/22/2009	5	N/A	N/A	N/A	5800	N/A	N/A	N/A	N/A	N/A	N/A
	11/10/2009	7	9 U	900	20 B	12000	4900	3.1 J	10	12000	10	0.74
						_	-					
8% H202 + 2% S208	9/23/2009	1	N/A	N/A	61	15000 B	4700 B	N/A	N/A	N/A	N/A	N/A
	10/8/2009	3	9 U	1300	320	13000 B	4700 B	N/A	N/A	N/A	N/A	N/A
	10/22/2009	5	N/A	N/A	N/A	9700	N/A	N/A	N/A	N/A	N/A	N/A
	11/10/2009	7	12 U	1300	45 B	15000	7000	4.7 J	16	11000	12	0.51 J
8% H202 + 10% S208	9/23/2009	1	N/A	N/A	73	8800 B	2500 B	N/A	N/A	N/A	N/A	N/A
	10/8/2009	3	44 U	4200	1700	12000 B	5000 B	N/A	N/A	N/A	N/A	N/A
	10/22/2009	5	N/A	N/A	N/A	8500	N/A	N/A	N/A	N/A	N/A	N/A
	11/10/2009	7	8.6 U	430	25 B	15000	6700	2.6 J	11	7300	8.9	1
				Catalyzed	l Hydrogen F	Peroxide						
CHP Control	11/19/2009	0 hr	8.3 U	750	57	14000 B	6800 *	5.3 J	19 B	13000 B	15	0.42 J
5% H2O2 + 30 mg/L Fe	11/19/2009	1 hr	12 U	30 U	77	170 B	220 *	N/A	N/A	N/A	N/A	N/A
Ŭ	11/19/2009	3 hr	12 U	520	54	7900 B	7600 *	N/A	N/A	N/A	N/A	N/A
	11/19/2009	5 hr	51 U	2400	950	1200 B	870 *	N/A	N/A	N/A	N/A	N/A
	11/19/2009	7 hr	7.8 U	89 J	24	530 B	560 *	N/A	N/A	N/A	N/A	N/A
0% H2O2 + 60 mg/L F	11/19/2009	1 hr	25 U	140 J	430	4700 B	5400 *	2.7 J	13 B	9600 B	11	N/A
0.1202 + 00 mg/21	11/19/2009	3 hr	20 U	120 J	460	7400 B	7700 *	N/A	N/A	N/A	N/A	N/A
	11/19/2009	5 hr	19 U	410	460	9500 B	9700 *	N/A	N/A	N/A	N/A	N/A
	11/19/2009	7 hr	22 U	360	420	5600 B	5900 *	6.8 J	26 B	21000 B	27	N/A

NOTES:

1. Units are mg/Kg unless specified otherwise

2. N/A = Not Analyzed

Flags:

B - Compound was found in both blanks and samples

J - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

* - LCS or LCSD exceeds the control limits

H - Sample was prepped or analyzed beyond the specified holding time

ND or U - Result is less than the MDL. Where U, MDL listed in table

FIGURES

Figure 1: MOC Area Groundwater Contour Map July 23, 2009

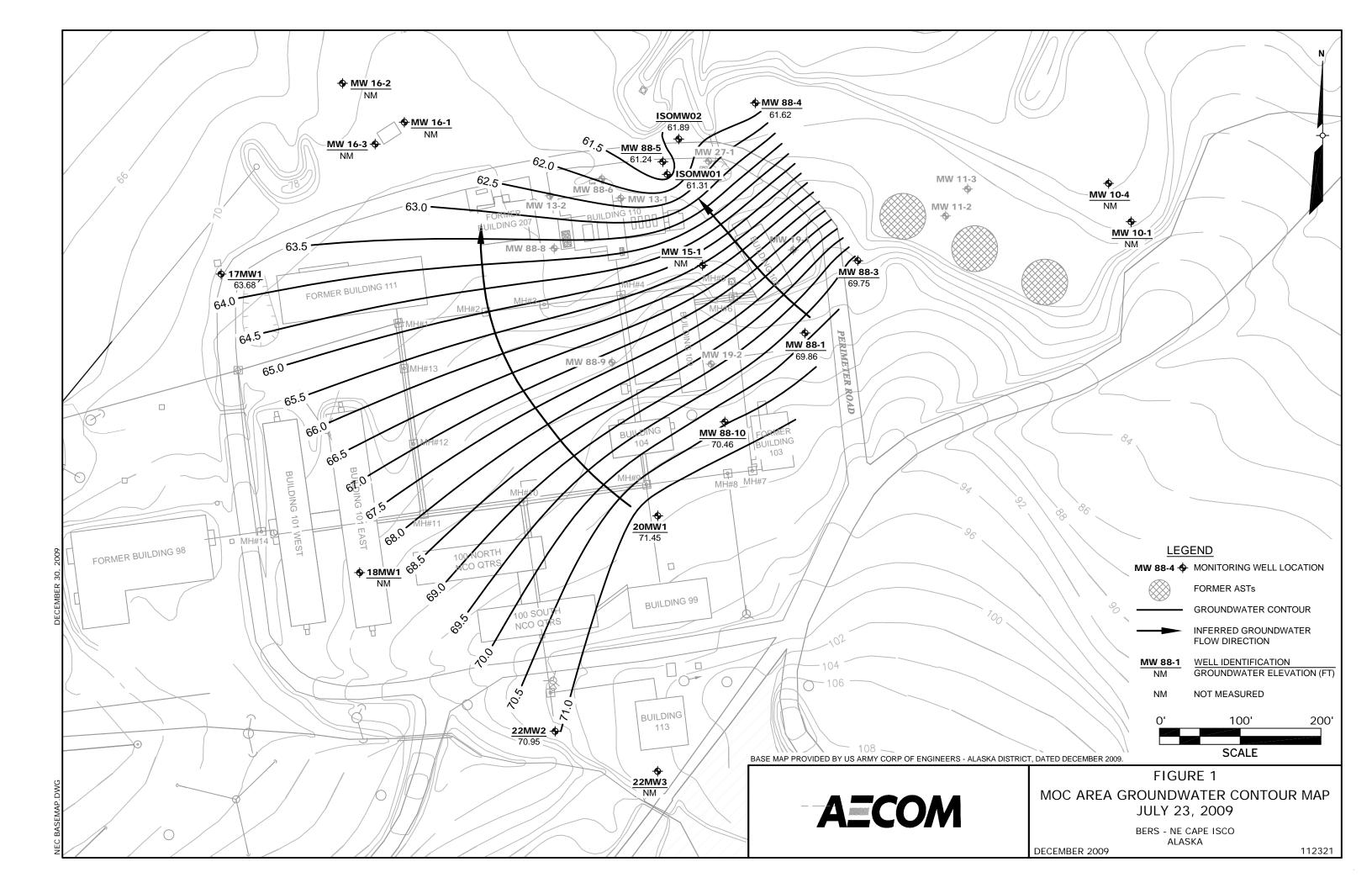


Figure 2: Phase I ISCO Area

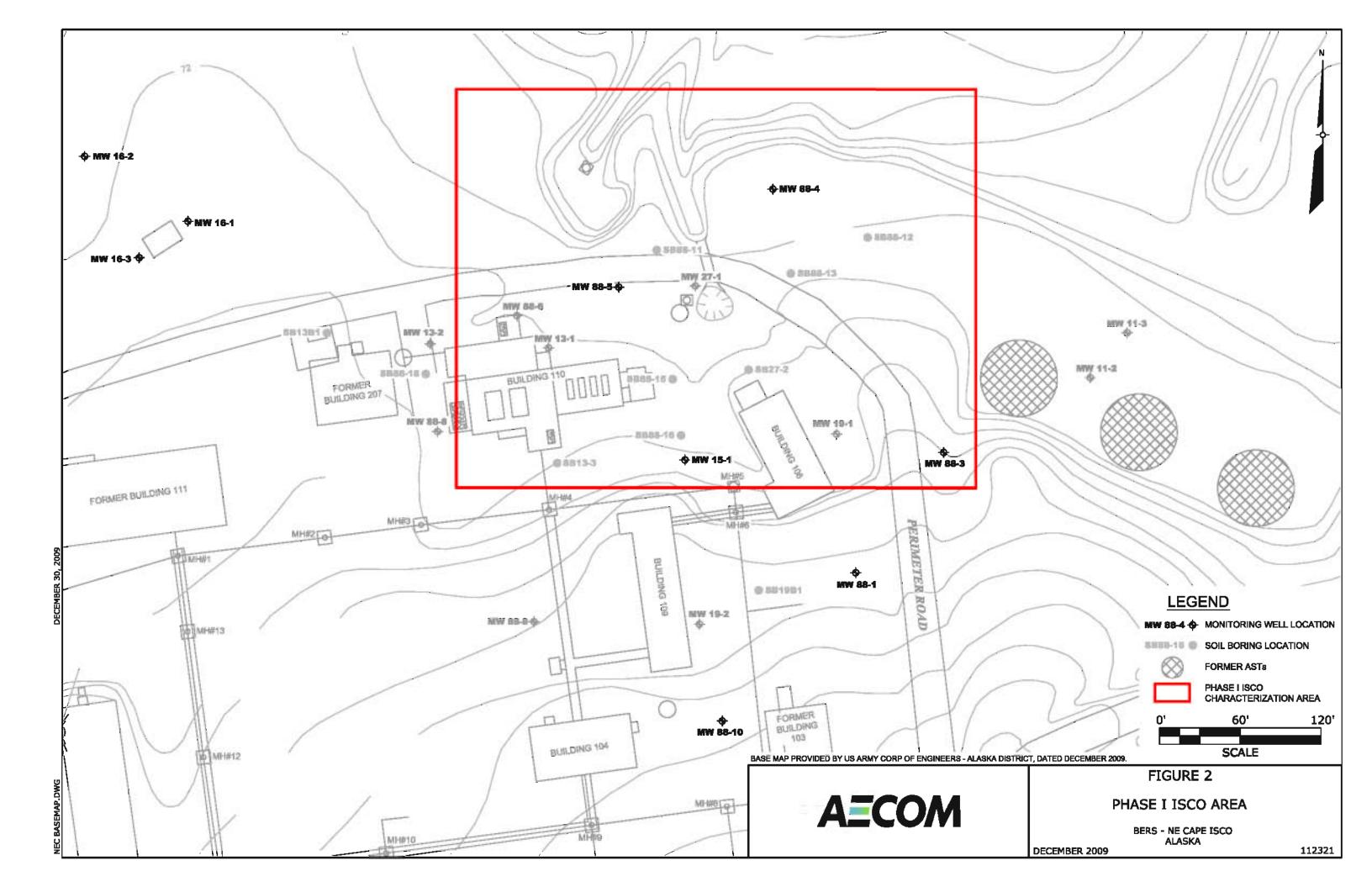


Figure 3: Phase I ISCO Characterization Locations

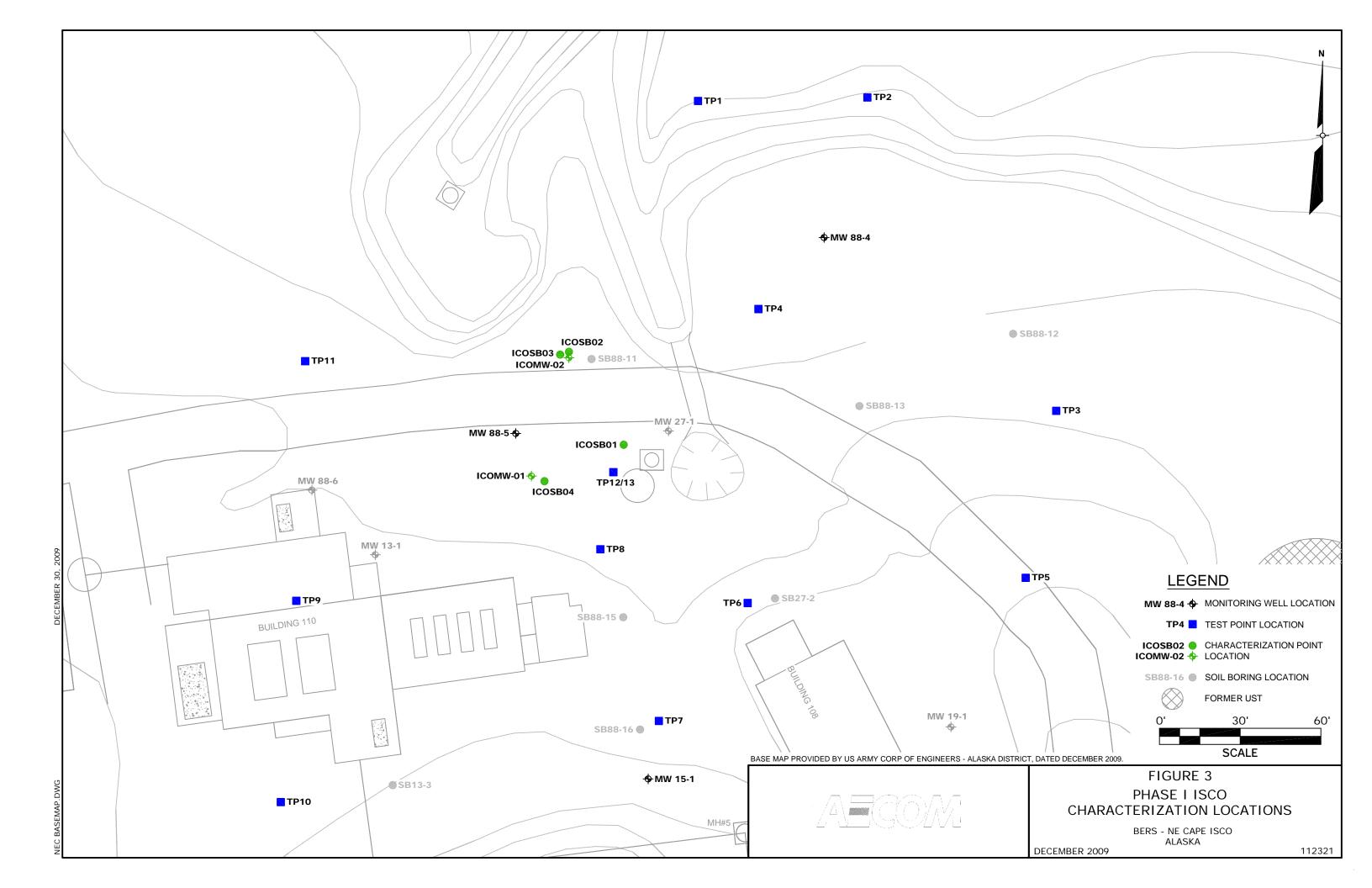


Figure 4: Phase I ISCO Study Monitoring and Injection Wells

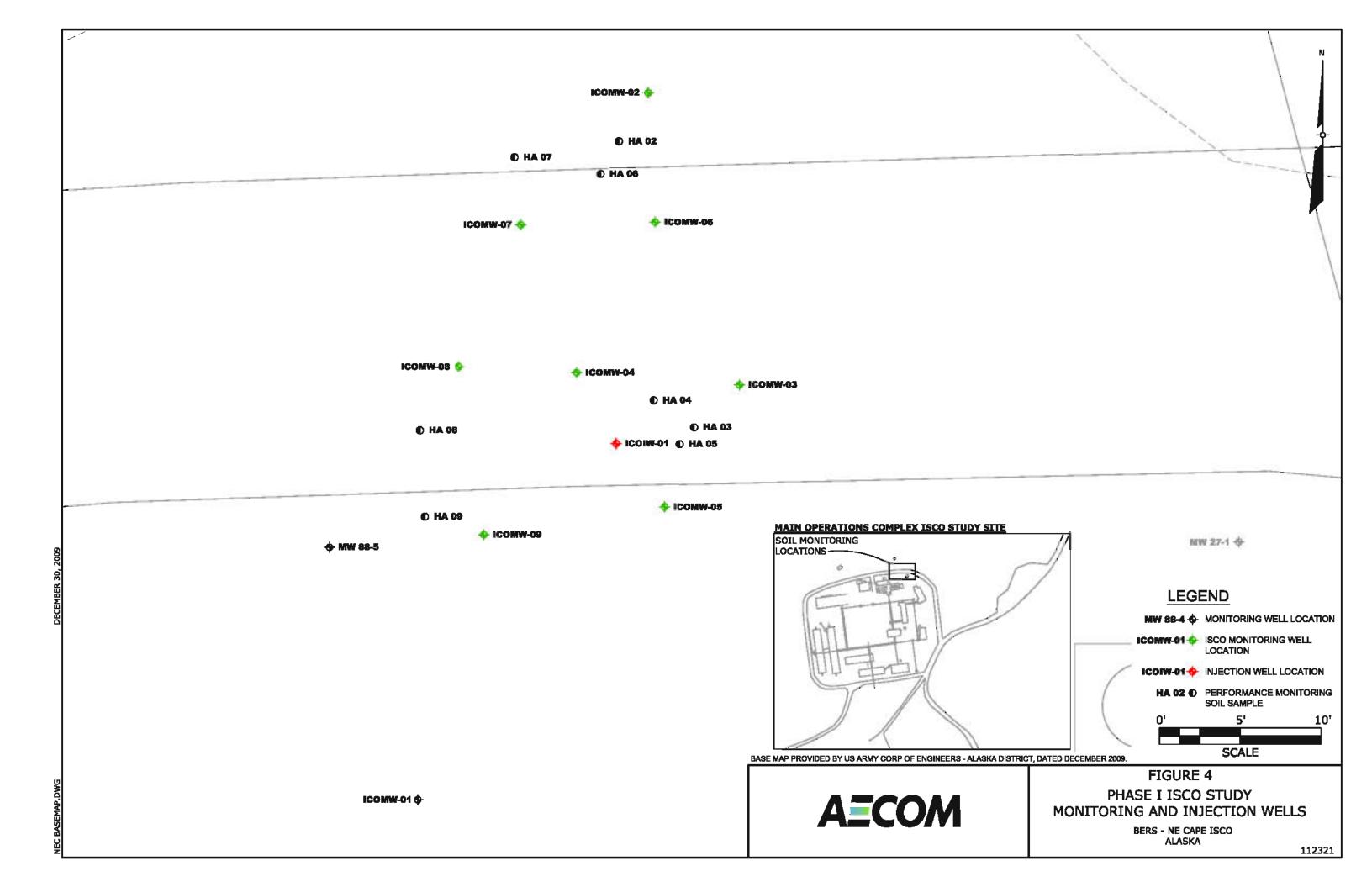


Figure 5: Phase I ISCO Study Soil Monitoring Locations

Attachment A Deviations from the Work Plan

The following summarizes deviations and additions to the Work Plan. Where appropriate, the original Work Plan detail is provided first in *italics* and is followed by an explanation of the deviation (a.).

Deviations from the Work Plan (Field)

Section 3.5: The detailed well layout for the pilot study will include an adjacent pair of injection wells and up to seven monitoring wells.

- a. Following a teleconference between AECOM Technical Services, Inc. (ATS), Bristol Environmental Remediation Services, LLC., and the United States Army Corps of Engineers, a single injection well was installed in the upper aquifer system identified during test pit and soil boring activities. Please see Section 3.4 of the Technical Memorandum for further discussion of injection well installation activities.
- b. During the injection event, the short circuiting of oxidants solutions into the adjacent wetland area via a sidewall seep mandated a cessation of injection at the established injection well ICOIW01. Another attempt at injection was made via the conversion of monitor well ICOMW09 to an injection location.

Section 3.5.1: Injection wells will be installed as a vertical pair with the shallow well screened from approximately 1 foot above the groundwater table to 4 feet below the groundwater table and the deeper well screened from approximately 4 to 9 feet below the groundwater table. Injection wells will be completed with 5 feet of 2-inch diameter stainless steel wire wrapped screen, 2-inch diameter stainless steel well casing, and will be grouted in place with neat cement.

a. Based on observations of contaminant distribution, a shallow injection well screened from 5 feet (ft) to 10 ft below ground surface (bgs) was installed. The injection well was completed with 5 ft of 2-inch diameter stainless steel wire wrapped screen, 2-inch diameter stainless steel well casing, and was grouted in place with neat cement.

Section 3.5.2: Monitoring wells for the pilot study will be screened from approximately one foot above to 9 feet below the groundwater surface interface.

a. Monitor wells for the pilot study were screened from approximately 5 ft to approximately 10 ft bgs.

Deviations from the Work Plan (Treatability Study)

Section 2.0, Page A2: Sampling points for sodium persulfate reaction vessels are set at 1, 2, 3, and 4 weeks to monitor the reaction of the oxidants with the chemicals of concern at both 2X and 5X concentrations.

a. Sampling points for sodium persulfate reaction vessels were at 1, 3, 5, and 7 weeks to monitor the reaction of the oxidants with the chemicals of concern at both 2X and 5X concentrations. The submitted Attachment 1, Analytical Matrix indicated a 1, 3, 5, 7 week sampling interval while the submitted text had not been updated to indicate the proposed interval.

Additions to the Work Plan

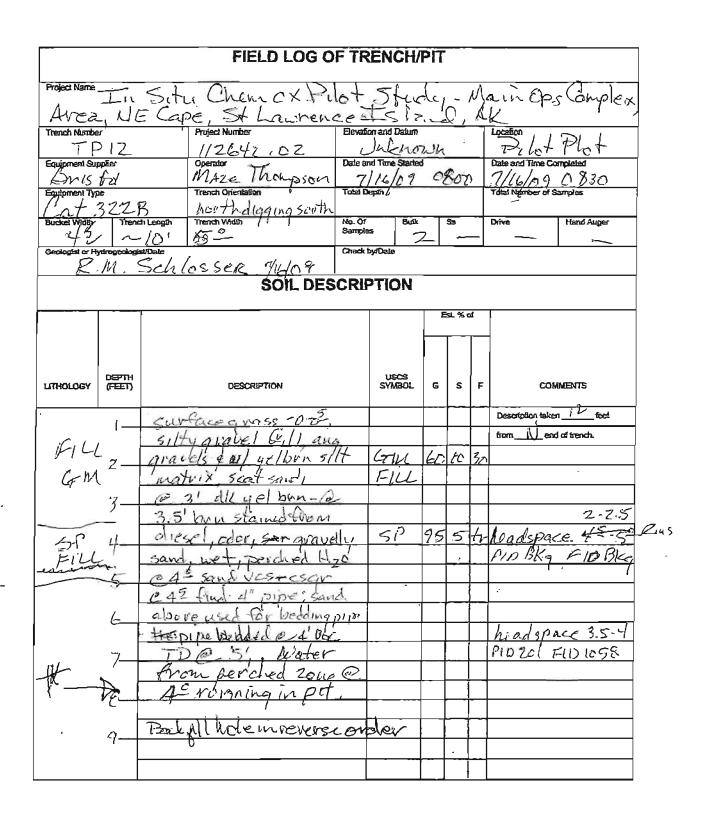
Based on observations of soil and groundwater during the test pit excavation activities, ATS installed four soil borings (ICOSB01 through ICOSB04) and two monitor wells (ICOMW01 and ICOMW02) in the in-situ chemical oxidation study area that were not proposed as part of the Work Plan but were necessary to confirm field conditions. The four soil screening samples split with the off-ite laboratory to confirm the Site-Lab soil screening results were an addition to the Work Plan. Groundwater samples collected from the two newly installed monitor wells and from existing monitor well MW88-5, and submitted for offsite laboratory analysis, were also an addition to the Work Plan.

Attachment B Test Pit Logs

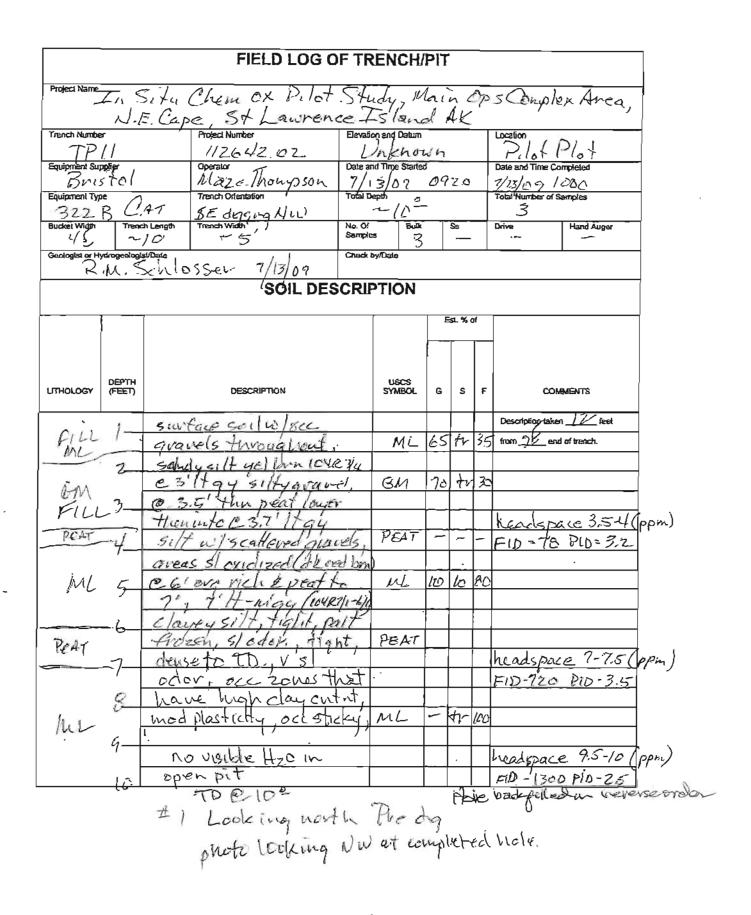
Burlis Act Marce Thompson 7/14/09 0930 7/14/09 Equipment Type Trench Orientation Total Depth Total Depth Total Number of San Marce Threads Marce Threads Total Depth Total Depth Total Number of San Marce Threads Marce Threads Total Depth Total Depth Total Number of San Budket Wildin Trench Length Trench Wildith No. Of Bulk Ss - Drive H B I B B B B Ss - Drive Z - Geologist or Hydrogeologist/Date B SS - Drive - - Geologist or Hydrogeologist/Date Check by/Date Check by/Date - - InthoLogy DEPTH DESCRIPTION USCS 6 S F comMin InthoLogy OEPTH DESCRIPTION Symbol 6 S F comMin				FIELD LOG	OF TR	ENC	:H/P	IT			
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3 Public Silt dk yel (FILI 4.5.5 ben, tight, dry, PiD 125 SiltyPeaty @ 41 is perched water <u>Zeme</u> , almt How throughout ML 5 <u>Peaty Silt Watabove at</u> ML 5 <u>41</u> , Silt a Jourt SILY 6 <u>Clay & gravels to TD</u> <u>Indendspace</u> <u>Judy 6 PiD 238</u> 2 <u>Judy 6 PiD 238</u> 2 <u>Judy 6 PiD 238</u> 2 <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u> <u>Indendspace</u>	Fill	-2-	1	sand throughou	≠,	<u> </u>		-			
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ML 5 <u>Platy silt i vistabove lat</u> ML 5 <u>41</u> , <u>Silt a Jourt</u> SILY E <u>clay & gravels to TD</u> <u>lundspace</u> 7 <u>Test isit Mack offes</u> <u>ununed ortely after</u>	5iHyPea	til	(3.4	Tis nevelyed we	stor						
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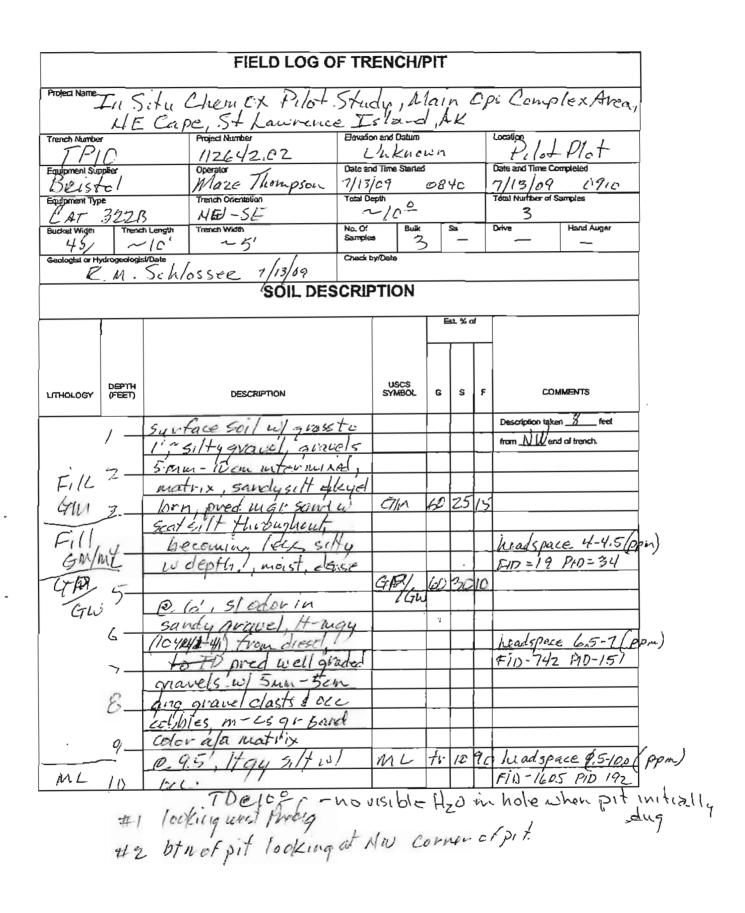
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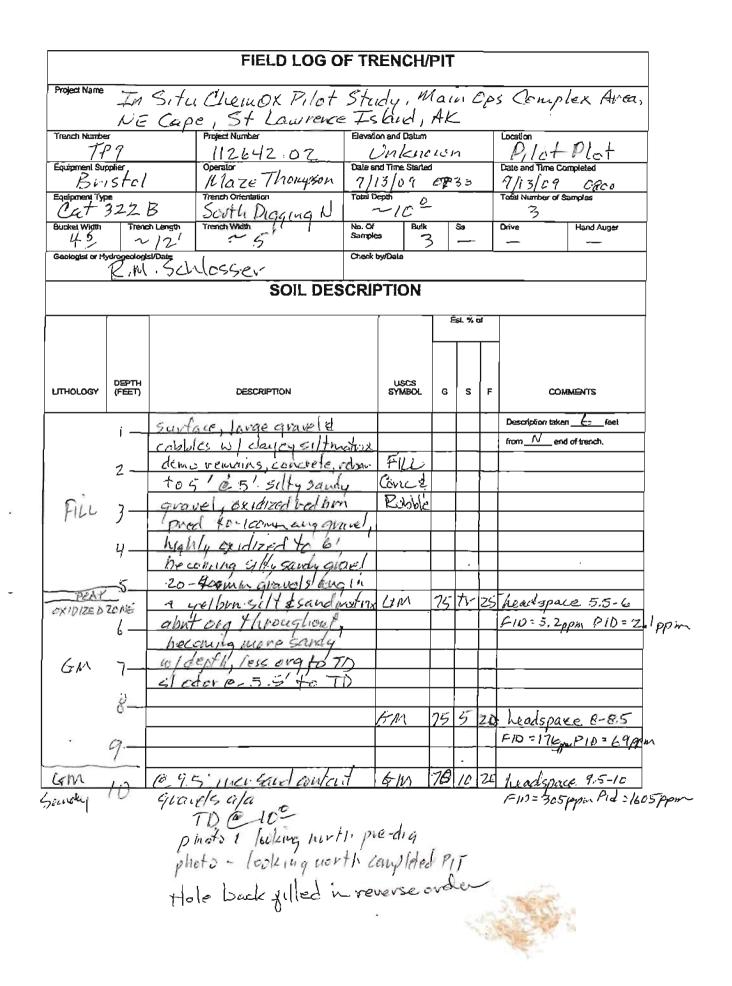
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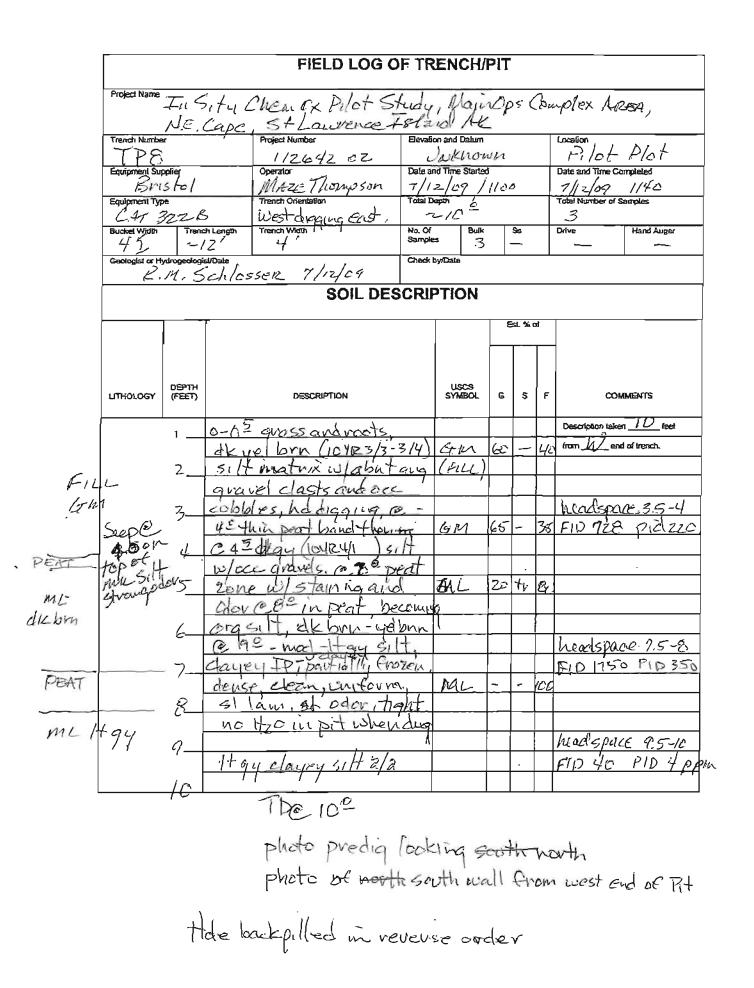
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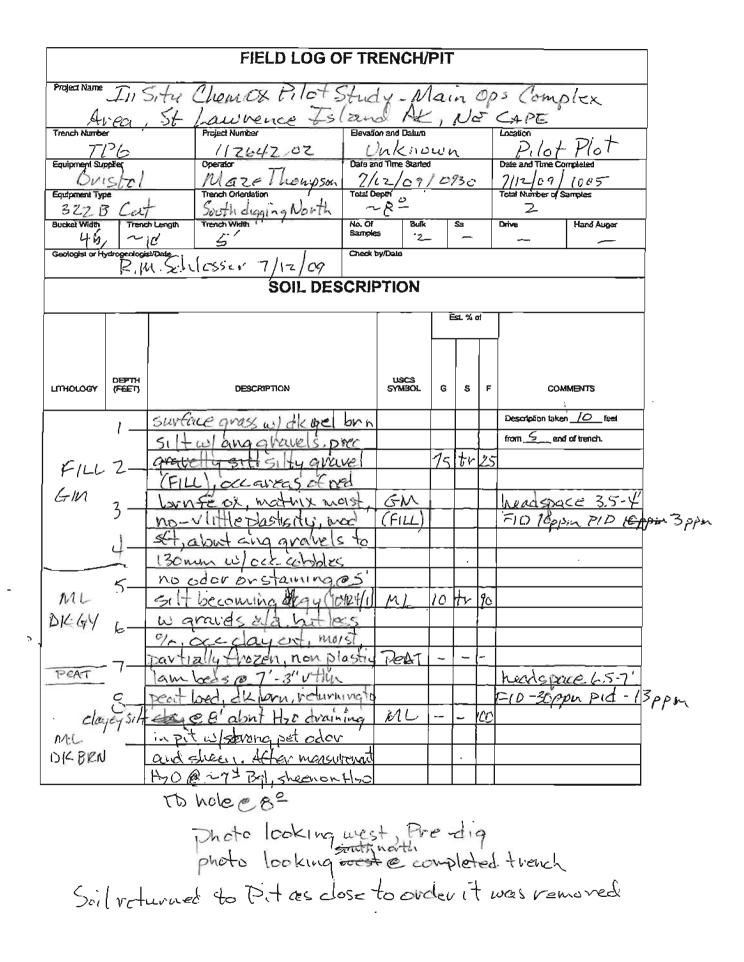


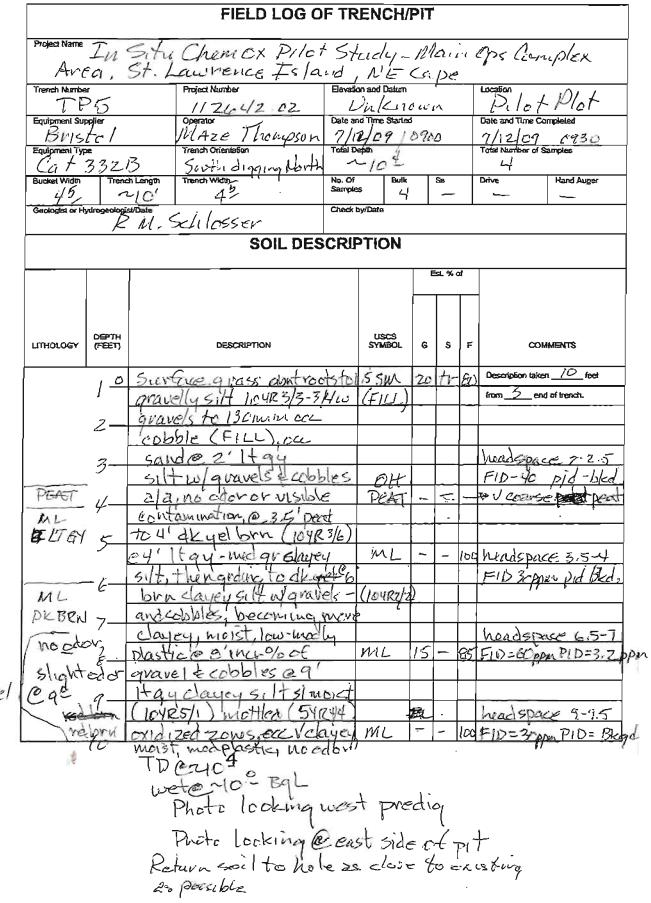
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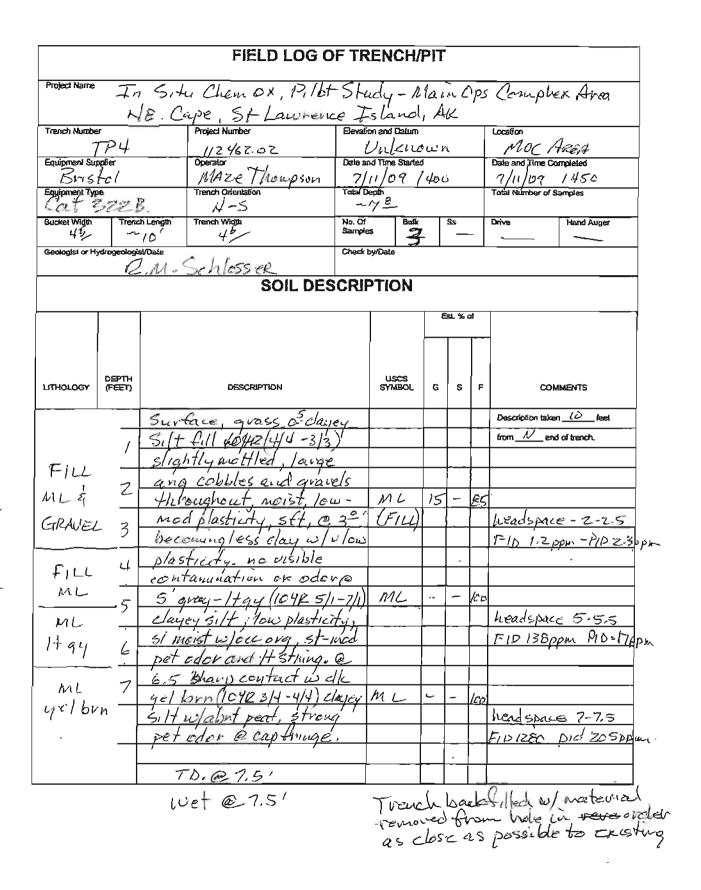
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Trench Number	wrence foldi	ion and Date	<u>k</u>	2	_			4	
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Bucket Wildti Trench Length Trench Wildti	h / No. Of Sampl		utik 2	Se		Drive	Hand Auger]	
Bealogist or Hydrogeologist/Data R.M. Schlessev	Alizlain Check	by/Dale							
K.M. Jeruesser	SOIL DESCRI	PTION	1					-	
				Est. %					
			Î						
DEPTH LITHOLOGY (FEET) DE	SCRIPTION	USCS SYMBO	LG	s	F		MENTS		
		31820			Ľ				
1_ surface to 1	05 grass, racts					Description taken		-	
~ w/silling	varel (104R3/3-				<u> </u>	from <u>A</u> end	of trench.	_	
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	3 highly ox		<u>160</u>	t.	140			1	
	d brh, tast below	۱ <u> </u>						-	
111 target It gy byn					~	headspace		-	
	125/4) w zbut	ML	25	-	\sim	FID	PID	-	
Itgy-debra no ator or	ts, angthroughou	<u></u>		<u></u> _−			•	-	
	>1º angular @	ML	40	-	60			-	
miltate 5' sill becomes		10,000		+				· _	
NIC 19 Lanuary	Liveralan t					Wadam	сс 7.5-β [′]	(Cap Coringe	<u>ا</u> د.
	dor, water 0.7	0		<u> </u>		FID 325		1 corp rollinge	
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- appearst	0 be some perched								
wafer C-2	-5 [°] '								
🗃 Ba	ckfilled with	soil	fra	n l	hd	e in re	revse or ot	QV	

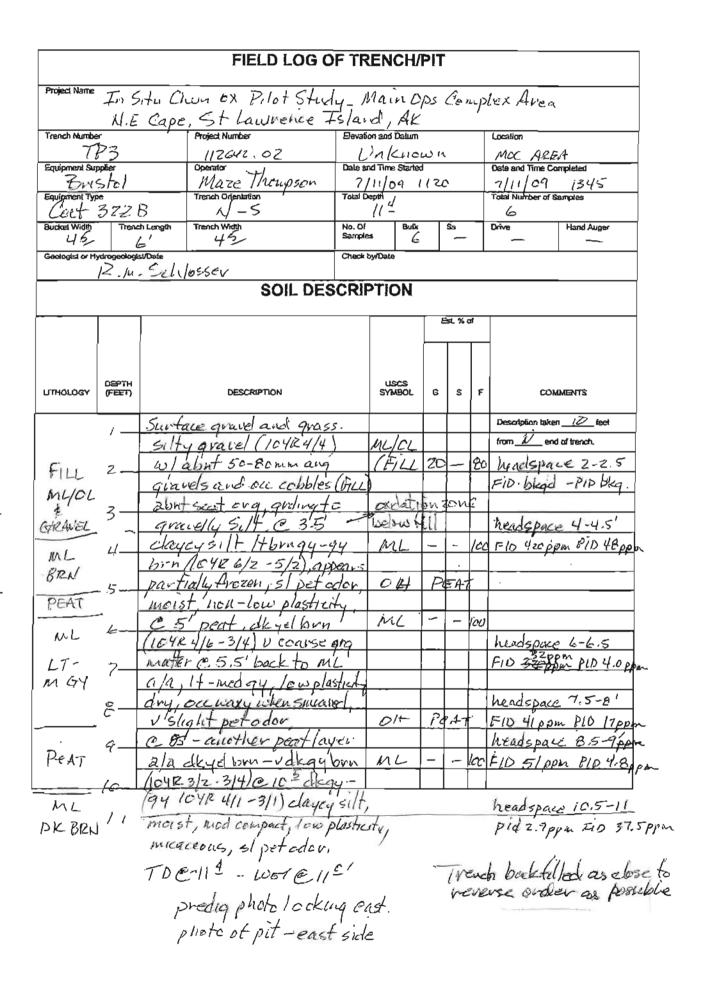
photo looking west Phedia photo of exercitor looking south JP6 enght photo of completed pit looking cout

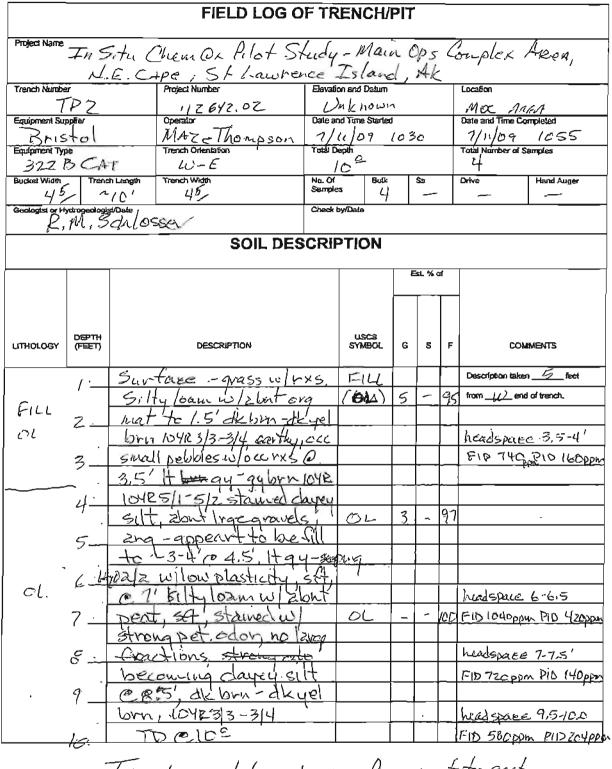




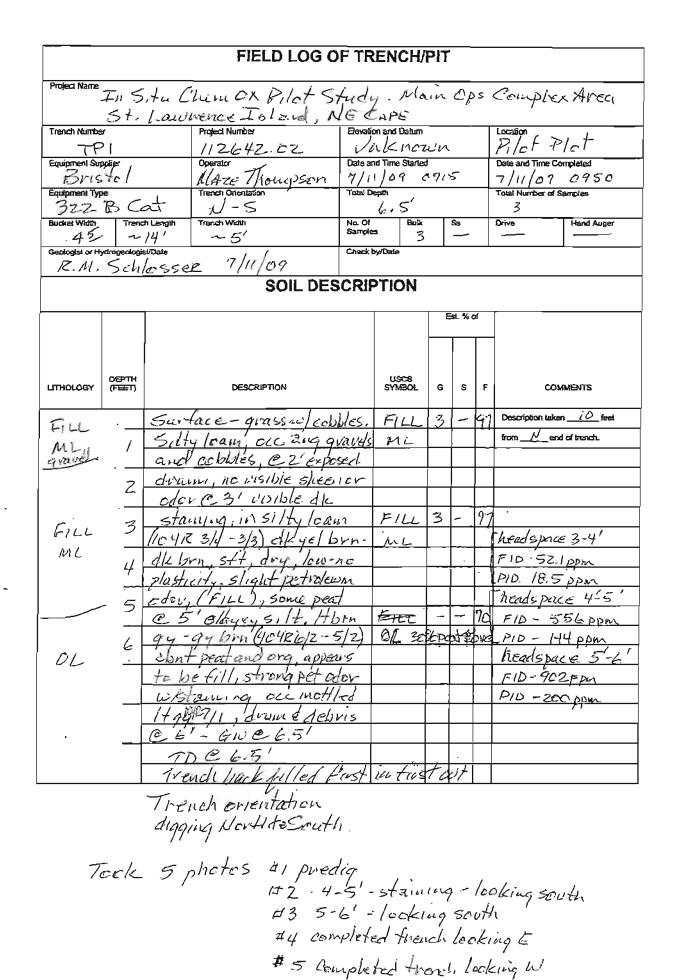
WL w/ gravel







Trench orientation digging from west to east. * Nore - Seeps @ Sulty dayey zone @ 4.5'and l'after completion of thench/pit. Pit backfilled w/ material from hole as closely to reverse order as possible Take 3 photos 1- prethench looking st



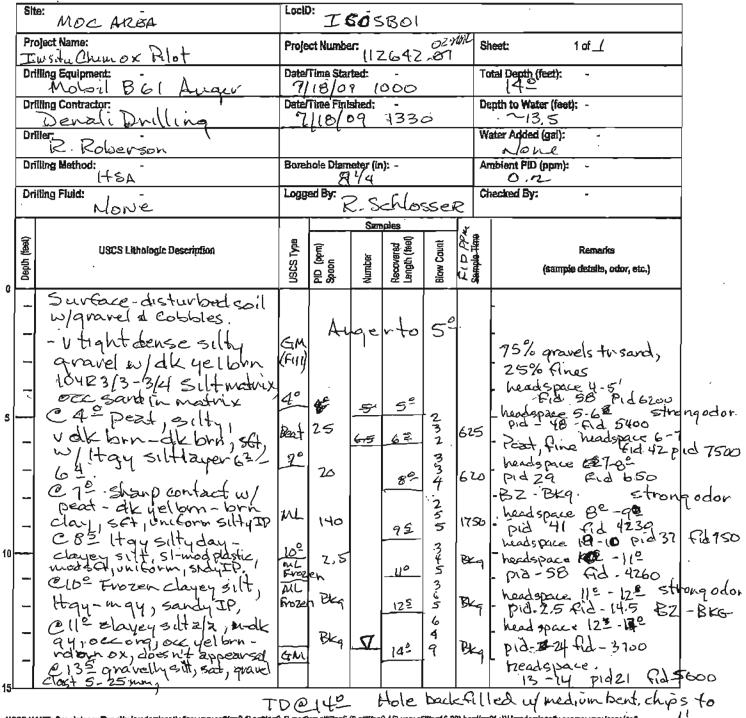
6 A B T H 😭 T E C 8 **Borehole Log (Shallow)**

Site: ISCO MOC AREA	Locit	من ک					OC AREA TECHNIOT		
Project Name: NE GAPE ISCO	stor 7	ct Numbe	- " (] ;	2647	.07	2. Si	rest: 1 of K		
NE CAPE ISCO Drilling Equipment: Mokor BEI	Lare	Time Star 7/3c/	(<u>6</u> 1)	-		īc	Total Depth (feet):		
Drilling Contractor.	Date	1000 File 30/0	shed:			De	epth to Water (fest): -		
Denali Duilling	1	12010				W	ater Added (gal):		
E Roberson Drilling Method: -	Barel	bole Diam	star (br): -	_	A	nbleni PID (ppn): -		
HSA Drilling Fluid: -	ووحا	ed By:	<u>14</u>	, -		Ci	O, C		
Non		<u> </u>	1-1-2	ules Intes	ER				
USCS Lithologic Description	LIBCS Type	PID (nqa) CIN Spoon	Number	Racovorcu Longlh (feot)	Dlovi Colink	Srimple Timo	Remarks (sample detsits, ador, etc.)		
 Fill GM, Silty gravel, gravel clasts, 12"-3" w/ sand & silt metnix, 21 St clayey silt, mgy, cold tight. 38 - peat, m-dk brn, ccarse to fine loc., silty, ecc peibbles, mod pet ador, ice crystals visible in matrix, iblow cuts 4-62 show frozen peat, becommon more silty widepth, to inited peats and silts from 5-65 firezon to 75 @ 05 wet saturated peat, C 95 silt mL m-dkgy, water in augers to 6' after dvilling hole, Set well - Brin of sump lc5 	Fill GM Read Read ML	.27_ 3 <u>5</u>		2 32 4 62 2 50 50 20	55723	5525 1600 65.75 1615 75-85 1620	65-75 /150 229- - 75-85 240 114 -		

Plasticity/Cohoetveness foredomicanily fice complesediment-none).signily pasticit=1/4/18, low plasticity(=1/8/1/16), minimu pasticity(=1/8/2), high plasticity(=1/8/2), high plas antesive, collectoriessi, Stratification/Structure (blocky, massive, lensed, etc.) (contacts, sterp, gradulonal (bedding, burantel, incined); Cementation (mae, week, moderate, strong); Other Dasarigitiva Elementis, Geologis Drigin Sti = Senya Number, St = Spoon Driven, SD = Senya Deptir, ST = Senga Time; A = Analysis

BZ = Brestilling Zona; BG = Background; BH = Borahola; CB = Cuttings Bla

Attachment C Soil Boring and Well Completion Logs



USCB NAME: Consistency/Density (predominantly fine: very soft(r=0-1),soft(r=2-4), medium stif(r=5-8),stif(r=16-30), hard(r=31+)/ (predominantly coarse: very loose(r=0-4), loose(r=5-10), medium dense(r=11-30), dense(r=31-50), very dense(r=31+); Molecture (div, most, ver); Color, Gradation (relative percentages of coll components-ro modifiers); Plesticity/Cohestiveness (predominantly fine: nonclassic (transformed), eligibility basis(r=1/4-1/8), love plesticity(r=1/8-1/16), most, ver); Color, Gradation (relative percentages of coll components-ro modifiers); Plesticity/Cohestiveness (predominantly fine: nonclassic (transformed), eligibility basis(r=1/4-1/8), love plesticity(r=1/8-1/16), most, ver); color, Gradation (relative percentages of coll components-ro modifiers); plesticity/Cohestiveness (predominantly fine: nonclassic (transformed), eligibility basis(r=1/4-1/8), love plesticity(r=1/8-1/16), most, ver); color, Gradation (relative percentages of coll components-ro modifiers); plesticity/Cohestiveness (basis); stratification/Structure (blocky, massive, lensed, etc.)(contacts; sharp, gradeBone); (bedding: instrantia, bacined); Cementagion (none, weak, moderate, strang); Other Descriptive Elements; Geologic Origin

S# = Sample Number; SP = Spoon Driven; SD = Sample Depth; ST = Sample Time; A = Analysis B2 = Breathing Zone; BC = Sackground; BN = Sorebole; CB = Cuttings Sin C [3.5 wet, whin angers C ~ 7.5' B6L Form F-1009 57/03

BOREHOLE LOG (BHALLOW) PPT

E A B T E 🕤 T E G R

Borehole Log (Shallow)

	-	•	F A							
	Si	MOC AREA	Loci		051	302				
	Pn	Ject Name: Jusifu Chen ox Pilot	Proje	ect Numbe	ų.	Z64 2	027	SI SI	heet: 1 of <u>/</u>	
	Dri	illing Equipment: -		Time Star	ted:	-	•=•		otal Depth (feet): -	
		Mobil BAI		18 0		530			7/10/09 10 -	
	ויי	Ming Contractor: Denali Dnilling	Date	Time Finis 7/18		1700	•	De	24 ⁹ - PEPCHED	
		R. Roberson	 					W	ater Added (gal): -	
	Dri	illing Method: I-ISA	Bore	hole Diam	ieter (lu	n): - B ¹ /4j.		A	mbient PID (ppm): -	
		Ming Fluid: , -	Logg	ed By:	/2	<u>es (4)</u>		G	0,0 hecked By: -	
	Ĺ	NONE		ed By: R . S	sch	losse	r .			
	Deplh (feet)	USCS Lithologic Description	USCS Type	PiD (ppm) Speon	Number Number	Recovered Sec Length (feel)		F/D Served Lines	Remarks (sampto distatle, odor, etc.)	
٥	-	Surface, bane soil, Penduiller, quavely silt - Silty quavel endse 49	Gebr	Ast	9 E 4	to e	40_ L		-	
5		CA ² -5 ^e silt, quarel 2/2, native ? Fill		22		40	1	525	headspace 4-5 Pid 22 Fid 2600 strong - Denched H20@4-	ado
J	_	C 5° Pezt, dkbm, silty TP, sft some odon, sdy IP, gradning to SPC 5.5- 5.8' back to pezt to	Pest SP	50	at it is	√€ 7°	2155	1200	- headspace 5°-6.9 put 140 Qid 24%	
	-	72	Repart NR			NR.			pid 46 Rid 4750	
	-	LOST 7=9° duiller dropped Inner bit and fell from 7=9°	ML	9º	k	42	1	1.~	pro 70 310 4130	
10		T=q0	Peat	22	B	· .	ł	(30	headspace 9=10-	
	-	9=-10= silt & peat dk	10° 1			/0-			Pid 29 fid 3800	
	_	lorn, st sheen on sample							-	
	-	when extractedsaturated From uptione TDC10							-	
	-	Hole back-filled w/ bent.							-	
15		unps 101								

USCE NAME: Consistency/Density (predominantly fing: very soft(n=0-1).soft(n=2-4).medium stif(n=3-6),stif(n=0-16),very stif(n=16-30),herd(pr=31+3) (predominantly coarse: very iscee(n=0-4).forse(n=3-16),medium dense(n=1-30),dense(n=31-60),very donse(n=31+3); Makture (dry, mokit, wel); Celer; Gradetion (wistive percentages of self components-no modifiers); Plasticity/Cohesiveness (predominantly fine: nonplastic/tiread=none).sightly plasticity-(14-1/8),kery plasticity/(=1/8-1/16),medium plasticity(=1/32),high plasticity(1=1/84))/predominantly coarse: cohesive.cohesionlassi; Straffication/Structure (blocky, massive, lensed, etc.)(contacts: sharp, gradational/bedding: horizontal, inclined); Cementation (none, weak, moderate, strong); Other Dosartiptiva Elementas, Geologic Origin Saf = Sample Namber, 8P = Spoon Oriver, 90 = Sample Depitr, ST = Sample Teme; A = Aratysis 92 = Breathing Zone; BG = Background, 8H = Bacebole; CB = Cottings Bin

10										RING LOG		
CLIENT _	RI					I.s.		ROJEC	TAL	SHEET MOLE NO. ICO KAWO! SHEET		
BORING			SA			IB	61				1.11	1
	1/20	109	тіме	150	0	TO	TAL D	EPTH	7	5_ ENGINEER/GEOLOGIST R.M. Schlosser		
CONSISTENCY/DENSITY/ Hardness	Z GRAVEL	GEOLO ONVS 24	GIC ST	RUCTUF	MOISTURE	DEPTH SCALE	D TUTA - ANG	CAMPHIC UTHOLOGY LOG .	USCS CODE	122 122 122 122 122 122 122 122	SAMPLE DEPTH	BLOW COUNTS
5,64 5,54 5,54 5,54	8000	0 +	100		duy				SP FILL	Augento 4° SP Sand Mics av in availes 20-70 mm, acc lange cobbiles, dry, moleconpact, silty IP. Headspace Samples Depth Fickpon PiDppn 9.5 130 150 1.5 630 150 1.5 630 150 1.5 630 150 1.5 630 150 1.6	SPANIC SPANI	52457
sH	.0-	5+7	100	L-111.	M				SAL	Clayer silt. olivery - nuckay, occ-v dayer loc, mod photledy, occ 5-30 mm gravel chests, and, occ sdy, most.	2'	4 5 9 8 8
- Get- derve			65 10	M	ni W			इन्हे ।	mc Can Cam 3-14	Pid 12-14 65 FID 65 @132 City avel > sity gravel, pushed cobole or gravel	12 RIR 14 Rez 2' 06	78911 036210

JOB NO .: 112642 61 WELL NO. ICOMWOI HYDROGEOLOGIST: R.M. Schlosser R. ROBERSON CLIENT: DRILLER: BRISTOL WELL LOCATION: Chemex - AREA DATE/TIME: 1800 7120109 61 Well Head Elevation Ground Surface Elev. INK NO GROUND SURFACE Well Head Completion Method NONE - TEMPORY WELL Drilling Method/Rig Type HSA / Mobil B-61 DETAILS OF CONSTRUCTION 70Cf Date hole ICNE Surface Casing: Туре 7/20/09 Completed Diameter Borehole Diameter (in.) 20 Length Type and Size of Casing (in.) + NATIVE Type and Size NUC. A' OCE Slat of Screen (in.) Screen Perforation MATERIALS Diameter (in.) Cement (sks.) NONE Screen Length (ft.) Filter Pack Material $\frac{3 \text{ ft}^3}{12}$ $\frac{12}{4 \text{ ft}^3}$ (ft.³) Centralizer Depths (ft.) Completion Technique Casing Material (ft.) 1. Type of Filter Pack and Bentonite (ft.³) Placement Method = 10/20 SAND 14- - 10-10/20 Silica Sand Duver > NATINE PACIE 125-14E 2. Type of Bentonite and -120 Placement Method 7/8" Top of Bentonite fł. CLUDS - POUVER Seal 3. Type of Grout Mixture and lee Top of Filter Pack ft. Placement Method Top of Screen 129 ft. None 179 .ร่ก Description of Potential Problems SUND With Well: Klone. NOTE: ALL DEPTHS ARE REFERENCED **Bottom of Screen** TO GROUND SURFACE Bottom of Hole Development Technique Surge & Pu GROUT BENTONITE Temporary well no surface completion FILTER PACK

EARTH TECH AECOM

;										RING LOG		
CLIENT	P,	nist	-01				P	ROJEC	T-PI	LOT HOLE NO. JCO MWOZ SHEET.	LOF	_/
BORING	METHO	<u>H</u>	sA	- N	106					DRILLER/COMPANY & Paberson / DEnc	$\dot{\boldsymbol{\zeta}}$	Dr
~ DATE	7/2[109	TIME	180	5C		TAL D	Ертн	99	ENGINEER/GEOLOGIST_P.M.Schloscer.		
		GEOLO	ଜାର ସା	RUCTU	RE	-	ឋ	THOLO	IGY			
Consistency/density/ Hardness	% GRAVEL	gnnas %	% FINES	PLASTICITY	MOISTURE	DEPTH SCALE	structure type- infilit	BRAPHIC LITHOLDGY LOO	USCS CODE	ROCK OR SOIL DESCRIPTION	SAMPLE DEPTH	SAMPLE TYPE
										Auger to 9' to Set temporary well Wet @ 4 \$ sloppy peat, saturated. Unable to log restot hile because of mut See ICO SBOZ tor lithiclogy TD@ q! - Set 2" well Sump & 2 q2 .cc6 Slot scircen 2" q2-65 (Prepack) io/zo Silica sand. 92-32 3/6" chips (bentonite to 1') 32-12		

WELL NO. ICOMUCZ HYDROGEOLOGIST: P.M. Schlosser JOB NO .: 112642.0 R. Roberson DRILLER: CLIENT: PUNIS o^+ WELL LOCATION: P/ DATE/TIME: K JANDA 109 0200 8/3/pms * TEmporary well Well Head Elevation Ground Surface Elev. THE 2 L GROUND SURFACE Well Head Completion Method None - TEMBORARY LLOZE Drilling Method/Rig Type HSA INtobil BK (DETAILS OF CONSTRUCTION Date Туре Surface Casing: Completed Diameter Borehole Diameter (in.) Length Type and Size of Casing (in.) Type and Size . C.C. & Slot PVC of Screen (in.) Screen Perforation MATERIALS Diameter (in.) Cement (sks.) Screen Length (ft.) Filter Pack Material Centralizer Depths (ft.) (ft,³) Completion Technique Casing Material (ft.) 1. Type of Filter Pack and Bentonite (fL³) Placement Method oured. 10/22 Silico 2. Type of Bentonite and Placement Method Top of Bentonite ft. 3/E" Bertent 5 Seal 3. Type of Grout Mixture and 20 Top of Filter Pack ft Placement Method Top of Screen 112 ft. NOLF Description of Potential Problems With Well: actess pleted difficult to develop. NOTE: ALL DEPTHS ARE REFERENCED Bottom of Screen fL TO GROUND SURFACE ft. Bottom of Hole **Development Technique** GROUT BENTONITE A Prepack screen w/10/25 Silica Sand FILTER PACK

EARTH TECH AECOM

е А В Т Я **() Т Е С** Н **Borehole Log (Shallow)**

_								
[Site: ISCO MOC AREA	Loci		-o'h	NWO:	3		
1	NELAPE MCCISCO	Proje	ct Numbe	7. 26-4	2.02		S ł	1 of <u>1</u>
1	MCGC E-61		Time Star シング	ted:	0730		To	ntal Deptin (feet): バリ・ジョ
	Prilling Contractor:	Date	Time Finis	shed:			De	epth to Water (feet):
	Denzli Dulg Driller:	7/	1 <u>28:/0</u>	1	1430		W	ater Added (gal): -
	R Robersori	Barel	hole Diam	untar fiz	<u>.</u>		Δr	ん) 01(L) mblent PD (ppm): -
	HSA		13 4		y			Q. /
	Drilling Fluid: No rue	Logg	ed By:	chl	- 6-5,0	R	Cł	necked By: -
12				San	voles			
March (Keel)	USCS Lithologic Description	JSCS Type	PID (ppm) Speen	Number	Recovered Length (leel)	Blaw Count	Sample Time	(sample details, order, etc.)
0		1	E ው 	Ź	23	ä	<u>م</u>	headspace.
	- Auger Hurough Fill, savdy silty gravel is/ large - coldets. 43' Fill							12-59 93 490 2-5.10
·	- coldies. 45' Fill	Fill	B				2 <u>4</u> 3	5-65 307 2010 - 40 Fi
·	- Brive speene 43-65	Let/						5-65 307 2010 - P 40 Fi 65-75 35 309 501 78-95 100 100 501 501 01140 50000 4-65
.	- 45 selt dk born, al seat	ML	-	1197	42	1	56.5	h vy sy is a list
5 -	C 5° peat not de lorn, al/seat visitly moist, fine				Rec 2º	2	6840	pide Ad BZ-0.5ppm
.	- into silt lenses. strong	Pea			65	3.2	0830	-128 1750 E.V. CE 15
.	- pet odor, p pull 62 - 62 Top 62-72	GIM	62 20			2	29.00	drive spoon 62-01
	- very wet some and silty	ML			200	2 75	85.95 1000	pidfid log = ~ 3ppm
	- very wet so under silty peak - 22.82 silty peak - org silt udie brine 62.	- Rec	ſ		<u></u>	5		Picture we = spon
10 -	Saturaterial C. 79 - 82.	GM	95 102	10	100	9 5	9-10-	pie 37 fiel 107@ 182 drivespean 82-
	silty peat - V silty tight simoust e 92 mod gy - akgy							drivespean and
	sign and i second 4 fis, avading to				Ĩ			
	MAU UITRES DONTO FINDER							piel 58 Fiel ZZO
	- augento 10 2 to set well gravels to z/z* in spoon.							Fpid-Fid BZ. 0.5ppm
.	- Sump 102-100 10/20 Sand around prepact up to							-
15L	· · · · · · · · · · · ·						Ļ	

USCS NAME: Consistency/Density (predominantly line: very soft(n=0-1), soft(n=2-4), medium stiff(n=5-8), stiff(n=9-15), very stiff(n=16-30), hard(n=31-4)) (predominantly coase: very loose(n=0-4), loose(n=5-10), medium dense(n=1-30), dense(n=31-50), very dense(n=51+4); Notstura (dry, moist, wet); Color, Gradation (relative percentages of soil concomentis-no modifiers); Plasticity/Cohesiveness (predominantly line: nonplasticitized=none), sightly plasticit=1/4-1/8), low plasticity(l=1/8-1/16), medium plasticity(l=1/32), high plasticity(l=1/64))/(predominantly coase: cohesive, cohesive, cohesive, cohesive, cohesive, storage, etc.) (contacts: sharp, gradational)(bedding: horizonta), inclined); Comentation (none, weak, moderate, strong); Other Descriptive Elements; Geologic Origin S# - Sample Number; SP = Spoon Driver; SD = Semple Dapit; ST = Sample Time; A = Analysis

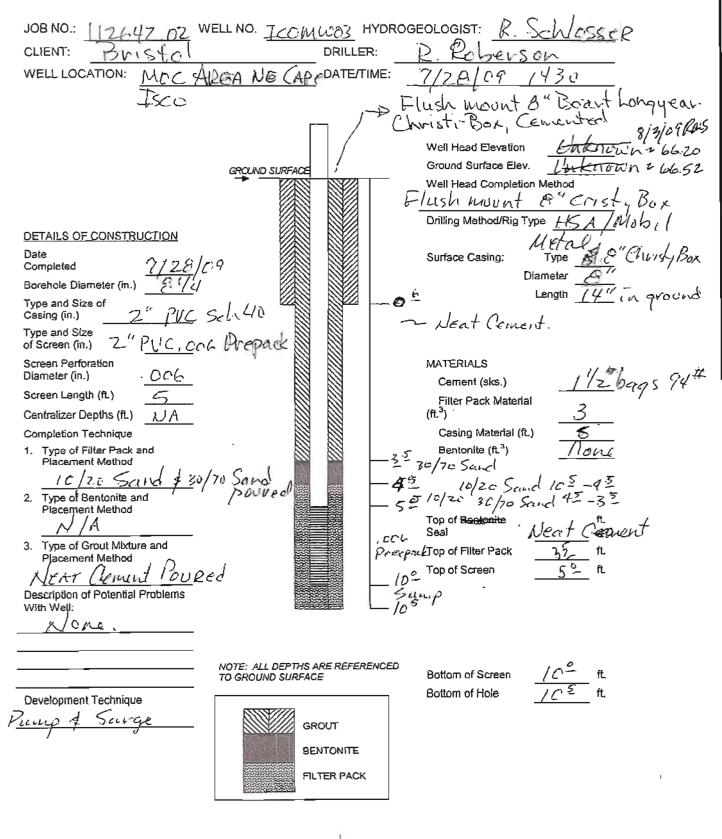
BZ = Breathing Zone, BG = Background, BH = Borehole; CB = Cuttings Bin

BOREHOLE LOG (SHALLOW), PPT

the white

Form F-1009 5/7/03

151 Sample 75



EARTH TECH ACCOM

	Site	ASC AREA TICO	Loci); <u> </u>	- MU	ġ.		-	
	Pro	Ject Name: NE CAPE MCC ISC	Рго]е	ct Numbe	r [[2	642-0	22		neet: 1 of <u>1</u>
	Dri	ling Equipment: Mcbil B-61		Time Star	ted:	400		Ĩc	tal Depth (feet):
	Dril	ling Contractor.	Date	Time Fini: /z.E./L	shed:	170	·i~		eptin to Water (feet); -
	Dri	ler:		12070		1.0		W	ater Added (gal); -
	Dril	E-Roberson	Borel	hale Djam): -		Ā	nblent PID (ppm): -
	6.4	lts A		<u>8'/</u>	4				C.C ppro
		Ing Fluid:	Logg	ed By:	M . Se	chilos	SER	G	necked By:
	æ		-		Sam	ples ~ 7		e e	
	Depth (loat)	USCS Lithologic Description	ISCS Type	PID (ppm) Spoon	ber	Recovered Lenglh (feel)	Blow Count	Sample Time	Remarks
0	Dep		nsc	PID Spoq3	Number	Rec	Blow	Sam	(sample detzijs, odor, etc.)
	-	Auger through fill, grand, silt and sand matrix to 35, mod hd in cld perimeter rd 35-55 cobbles in shoe only becovered of pidilipp	Fill	UL 3		35 Rec	<u>।</u> न		- split sporn 37-55 rec 01 FidpidBZ -0.0ppan
5	-	Fid to ppm - augertes? to they and get cobbles cleared, peat in very btm of shoe. 52.5? mu-ou dib 57.72 silly pead, vdk brn, Stonoist, v silly loc, strong	Piller	a		04 55 862 25 75	- リリー - ~ ~	6-7.5 1445	splitspoon 5=-7= Hopid 650 fid of
	_	becoming eity viced antil		9 <u>0</u> 45		ве.с ^{2'} q5	J 7 V J	7.5- 9.0 1505 9-92	- pill e pett silt cartact 20ppm piel 75 f.d
10	_	frozen i strang pet odor, E 12 ML-Sui widk gysilt, mod druge partially frozen mod odor, mostocc,	Gin	45		5th		1915	- augento 102-toset well in silt.
	-	erystals in matrix, afterfurt Augerto 105 toset well	në v ë ji	.2MINA	пыл				headspace samples Fil - 45-5 E-75 E-250 5-65 75-9= 950
15	-	Set Sump 102-102 Topof Screan \$ 50- 10/20 Sand - Fo 45 30/10 to 32							- 6 5 7 - 9-95 140

PID 1500 165

24

30/10 10 32

USCS NAME; Consistancy/Density (predominantly line: very soft(n=0-1), soft(n=0-4), medium stif(n=5-6), stif(n=0-15), very stif(n=0-16-30), herd(n=31-4)/ (predominantly obassa: very isose(n=0-4), hose(n=5-10), medium dense(n=11-30), dense(n=31-50), very dense(n=51+7); Malsture (dv, rockt, weit; Cokar, Gradation (relative percentages of soit components-no modifies); Plasticity/Cohealvaness (predominantly tine: nanplastic/(hread=none), sightly plasticity(=1/4-1/8), low plasticity(=1/8-116), medium plasticity(=1/82), high plasticity(=1/84)// predominantly obassa: messive.cohealoness; Stratification/Structure (biodxy, massive, lenced, etc.)(contacts: sharp, gradational)(bedding: horizontal, inclined); Cementation (none, weak, moderate, strong); Other Descriptive Elements; Geologic Origin

S# = Sample Number, 8P = Spoon Oniver; SD = Sample Depth; ST = Sample Time; A = Analysis

82 = Breathing Zone; BG = Background; BH = Borehole; CB = Cuttings Bin

Form F-1009 5/7/03

JOB NO .: 112642.02 WELL NO. ICOMODOL HYDROGEOLOGIST: R. S. WOSSER R. Roberson 7/28/09 1700 DRILLER: CLIENT: WELL LOCATION: ISCO MOC-AREA DATE/TIME: Flush mount 8" Boarthongyeau Chursti Box, Cover Well Head Elevation 8/3/09 Ems 66,34 Ground Surface Elev. 66.64 GROUND SURFACE Well Head Completion Method Z" plug w/ Ei " (risti Box, Drilling Method/Rig Type HSA / 11 lobi / B-61 DETAILS OF CONSTRUCTION Type Metal Flush Date Surface Casing: Completed Diameter 8 4 Borehole Diaméter (in.) Length 14"ruground -0.5 Type and Size of PUC Casing (In.) Type and Size screen Perforation w 3" over jock Neat Coment MATERIALS <u>- 9</u>4[#] Diameter (in.) Cernent (sks.) Screen Length (ft.) Filler Pack Material Centralizer Depths (fL) (ft 3) **Completion Technique** Casing Material (ft.) Non Bentonite (ft.⁹) 1. Type of Filter Pack and 35 Placement Method 30/10 Sand 10/20 Silica Saud \$ 30/70 -10/20 Same 2. Type of Bentonite and Placement Method Top of Bentonite Hone Seal one 3. Type of Grout Mixture and Top of Filter Pack fL. Placement Method Top of Screen ft. Neat Comen-10° Description of Potential Problems 105 With Well: lone NOTE: ALL DEPTHS ARE REFERENCED <u>/()-</u> ft. /()シー ft. Bottom of Screen TO GROUND SURFACE Bottom of Hale Development Technique Surge GROUT BENTONITE FILTER PACK

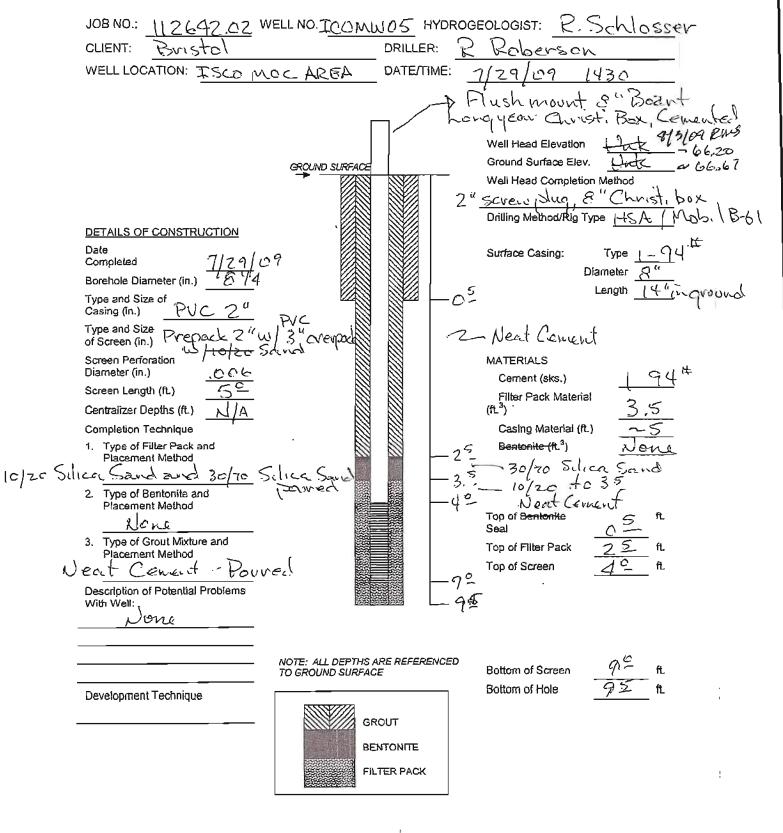
EARTH TECH AFCOM

									-
	Site	FSCO MOC AREA	Locie); []	tċo	AU	105		
	Pro	DJect Name: NE CAPE MOC ISCO	Proje	et Numb	иег: //2	642	. 0 Z-	St	reet (fof_C
	Drī	Magic B-61	Date	Time Sta 7/2-		-0	130	To	tal Depth (feet): -
	Dri	Iling Contractor: Denalis DN/g	Date	Time Fin	fished:	14	_	De	epth to Water (feet): • ~7 9
	DrI	Iller: R. Roberson		<u>ų -</u>				W	ater Added (gai):
	Dri	ling Method: USA	Borah	nole Dian	næter (in 44	}: -	_	Ar	nblent PID (ppm): -
	Ori	Iling Fluid: None	Logge	10		hlos	58eR	- Ch	ecked By: -
Ì					Sam	ples			
	Depth (feet)	USCS Lithologic Description	JSCS Type	PID (ppm) Bpcon	Number	Recovered Length (faet)	alow Count	Sample Time	Remarks (sample details, odor, etc.)
	Dei		nec	5 g	NIN	Rec Len	Blo	San	(sample details, one, end)
5 · 10 ·		Auger 412 Through Fill provel SILE & Sand w/occ Cobbles. 45-5° silfy gravel may, sl petodon, dense, mod moist 5-8° peat m-debry, strong petodor, still moist @ 6°, fine post becoming siltienw/ depth @ 8° sharp contact 8°-85 silt, clayey IP, med gy, dry-simoist dense. Auger to 9° to set well See well completion do		B 8-	5-47 1000 6.5- 1100 8-85 1115	4 22 01 5% 29% 5%	22222334		4.5-5° pid 73 Fid 250 spiltspoon 45-65 peat 5°-65 pid 105 - 750 Fid Splitspoon 65-85 VNO pid Veading -65-85 FiD Hame out Avoninicisture and vain Headspace Samples Depth FID PID 5-6 590 240 6.5-8 820 140 8-8.5 10 68

USCE NAME: Consistency/Density [predominantly fine: very soft(n=0-1),soft(n=2-4),inedium stiff(n=5-5),stiff(n=9-15),very stiff(n=16-30),hard(n=31-51), // (predominantly coarse: very bose(n=0-4),bose(n=5-10),medium dense(n=11-30),dense(n=31-50),very dense(n=51+)); Noisture (dry, moist, ver); Color, Gradation (relative percentages of soil components-no modifiers); Pristicity/(Chastyneets [predominantly line: nonplasticit/inacemon.).stightly pasticit=1/4-1/8),bow pasticity(=1/8-1/16),medium plasticity(=1/82),high plasticity(=1/64)}/(predominantly coarse: constructions; Stratifications; Stratificat

S# = Sample Number; SP = Spoon Oriver; SD = Sample Depth; ST = Semple Time; A = Analysis

82 = Breathing Zone; BG = Background; BH = Barahole; CB = Cuttings Bin



EARTH TECH ACCOM

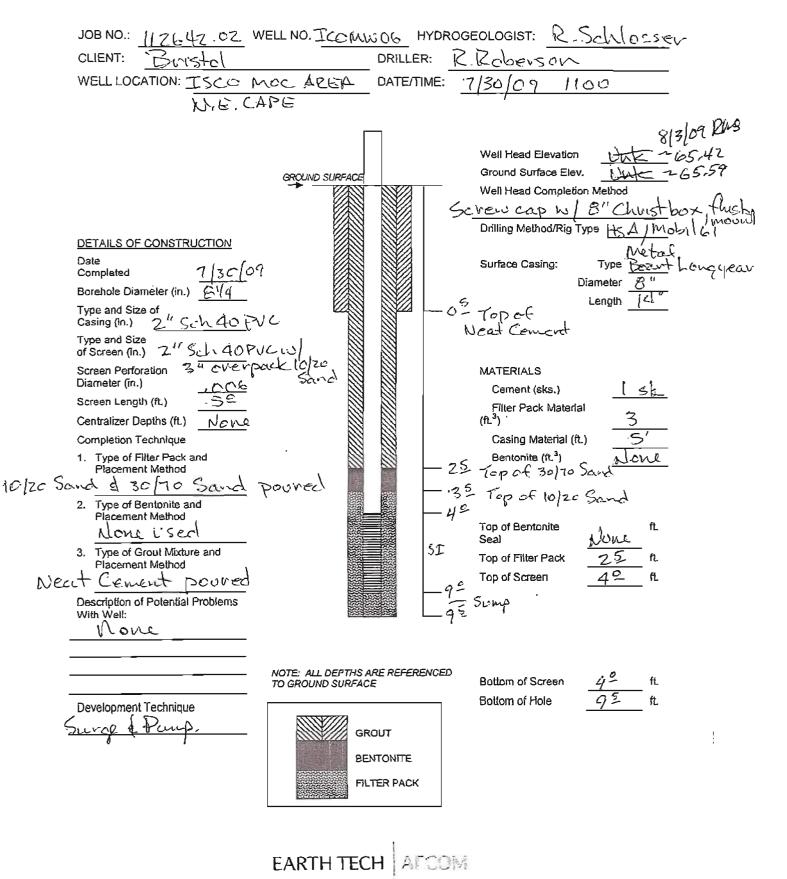
е А R T H 😂 Т Е С Н **Borehole Log (Shallow)**

				-				
Sit	"Isco moc Area	Locie); TCO	> n	106			
Pro	Dect Name: ELAPE ILSCO MOL AREA	Proje	ct Numbe	l Ize	42.2	20	Sł	teet 1 of
Dri	Illng Equipment: MOBもL B-61		Time Star 30/0	ted:	1083		To	vial Depth (feet):
Dri	Denati Dulling	Date	Time Finit Zo/O	shed:	•	_	De	epth to Water (feet); -
Drī	ller: RERoberson	- 4	20/5				W	ater Added (gal): -
Drì	lling Method:	Borel	hole Diam	ieter (In) : -		Ā	nblent P(D (ppm): -
Dri	Iling Fluid:	Logg	ع مربعه:/	<u>- 11</u>	, -		G	C 2-
	None				LOSSA	eiz		· · · · · · · · · · · · · · · · · · ·
Depth (feal)	USCS Lithologic Description	Type	(End		Recovered Lenglh (feel)	Count	Sample Time	Remarks
Dept	、	USCS Type	PIO (ppm) Rpcon	Number	Kecov Kecov	Blow Count	Sampl	(sample details, odor, etc.)
- - - - - - - - - - - - - - - - - - -	Silty Gravel, exoca Say Fill, gravels to A" dense, moist, wet @ 3° & 4° Saturated From sorface runo & C 3° native silty gravel 1-3" gravel dist in magy sandy silt 48-Deat m-dkbrn, v sity, moist damp union v Strong diesel odor. @ 6° 7° Saturated, becom silty w/depth (moist 7-8) C 8° Clayey Silt, mdk 94 jang contaction peat, partially Grozen TD C 9° Saturel @ 9° 50 500	Gh. Reat TD	3 48 8 2 4 4 5 9	4 -5	A y of a y of a y of a y of	22-22334225	₹-5 930 5-6 100 6-7 1030	4.5 145 42 - 5-6 630 124 . 6-7 116 35 - duesel odor

USC3 NAME: Consistency/Density (predominantly ins: vary soft(r=0-1), soft(r=2-4), medium staff(r=3-5), staff(r=2-1), very staff(r=16-30), hard(r=31+1)/ [predominantly coarse: very bose(r=0-A), loss (in-5-10), ned tum denside=11-30), denses (n=31-50), very dense (n=51+3); Malshure (dry, malst vec); Color; Gradellon (relative percentages of color components-to instructions; Plasticity/Cohesiveness [predominantly fine: nonplasticity(t=1/64)), very dense (n=51+3); Malshure (dry, malst vec); Color; Gradellon (relative percentages of color components-to instructions; Plasticity/Cohesiveness [predominantly fine: nonplasticity(t=1/64)), (predominantly coarse: cohesive, cohes Descriptive Elements; Geologio Origin S# = Sample Number; SP = Spoon Driver, SD = Sample Depth; ST = Sample Time; A = Analysis

EZ = Breathing Zone; BG = Background; BH = Borahole; CB = Cuttings Bin

1 4 B



Site: -	Locic).		3			
ISCO MOC AREA			s W	, <u>e</u> C	APG	, r	LOC ARETA SECAMWOT
Project Name: NE CAPE ISCO	Ргоје	ct Numbe	۲۱۳ ^م	2642	.07	2 5	Sheet: 1 of
Drilling Equipment: Mobil Bel		Time Star アノ3c)	ted:	1.5			Total Depth (feet): 3 10 - RRus
Drilling Contractor:	Date	Time Finis	shed:	, -		1	Depth to Water (feet): -
Denali Drilling		/30/	<u>07</u> /	1173	50		Kater Added (gal): -
R. Koberson	Devel	ala Di a	- 1 - 1 -	1.			Nouce
Drilling Method:		hole Diam	11	ı): -		'	Amblent PiD (ppm): - Ø, C
Drilling Fluid:	Logg	ed By:	S-L	Jass.	ER	– (Checked By: -
			-	ples			
(រត្ន ag) USCS Lithologic Description	JSCS Type	(mqc	ক	ered ((sel)	Count	Sample Time	Remarks
	nscs	PlD (ppm) Spcon	Митрег	Recovered Longth (feel)	Błow Count	Sampl	(sampte details, odor, etc.)
 Fill GM, Siltygravel, gravel clasts, 1/2"-3"w/ sand & Silt mednix, 223 clayey silt, mgy, cold tight. 28 - peat, m-dk bm, ccarse to fineloc., Silty, occ pebbles, mod potador, ice crystals visible in natricx, iblow cuts 42-62 show Arozen peat, becoming move siltyw/dopth, to intbd peats and silts from 55-65 firezon to 75 @ 05 met saturated peat. C 95 silt mL m.dkgy, water in augers to 6' after drilling hole, Set well - Brin of sung ics 	Fill GM ALL Part NL	27 3 <u>8</u>		25 Rd 2 47 Red 25 10 27 55 10	5 7 2 3	554 1600 65.7 1615 75.8	5-75-85 240 114 5-75-85 240 114

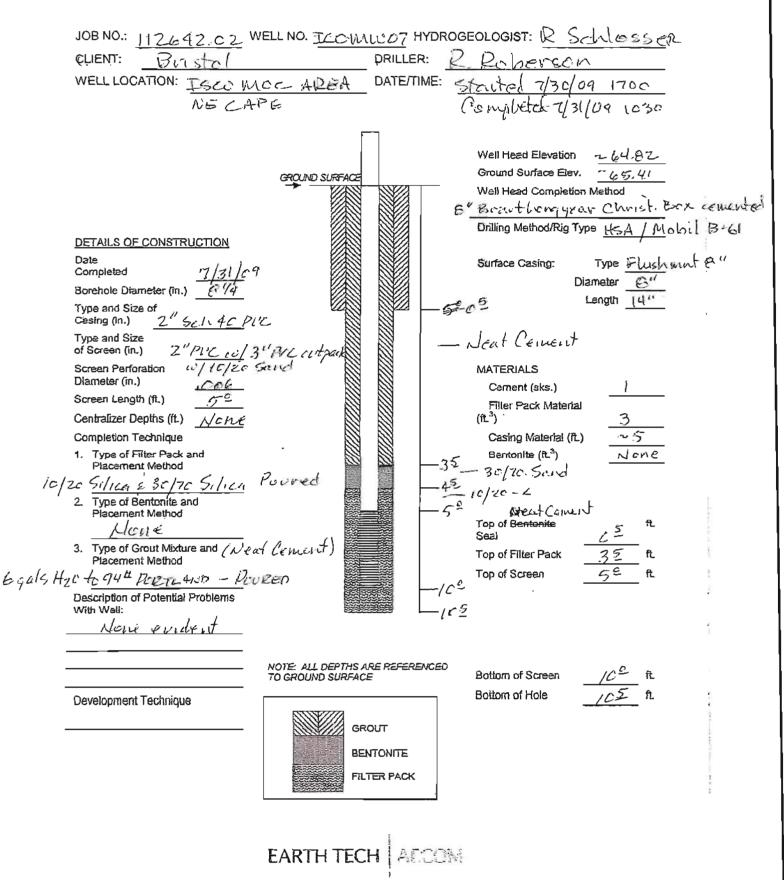
USC3 NAME: Consistency/Density (predominanily line: very soft(n=0-1),soft(n=2-4), medium sülf(n=5-6),stif(r=9-15), very sülf(n=16-30), hard(n=31+))/ [predominanity coarse; very loose(n=0-4),loose(n=5-10), medium dansa(n=11-30), danse(n=31-50), very danse(n=51+)]; Molsture (dry, molst, veri); Color, Gradation (relative personages of soil components-no modifiera); Plasticity/Cohestivaness (predominanily line: nonplestic/thread=none), sägifuly plasticit(=1/4-1/8), low plasticity(=1/8-1/16), medium plasticity(=1/32), high plasticity(=1/54))/(predominanity coarse; very loose(n=0cohestive, cohestioness); Stratification/Structure (blocky, messive, lensed, etc.)(contacts: shap, gradational)(bedding: horizonital, inclineo); Cementation (none, week, moderate, strong); Othar Descriptive Elements; Geologic Origin

S# = Sample Number: SP = Spoon Driven; SD = Sample Depth; ST = Sample Time; A = Analysis

BZ = Breathing Zone; BG = Sectoground; BH = Borehole; CB = Cuttings Bin

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Е А R T H 🐑 T E C H **Borehole Log (Shallow)**

Sh	MOC ISCO PILOT AREA	Loci		<u>S</u> M	wor	7	_	
Pro	JE. CAPE Isco Pilot	Pro]e	ct Numbe	، []	262	4.02	SI	heet: 1 of
Dri	Moby B-61		Time Star 31/09	ted:	330			otal Depth (feet):
Dri	Ming Contractor: Drlg	Date	Time Finis		(65)		De	epth to Water (feet):
Dri	ller:	-	5170	- [(2.)	_	W	fater Added (gal):
Dri	K. Koberson	Borel	nole Diam	eter (in): -		Ā	mblent PID (ppm): -
ปก	H.S.A. Iling Fluid: 1 -	Logg	로 A ed By:				Ci	C,C hecked By: -
-	None		<u>R</u>	Sam	1055	Er-		-
(leal)	USCS Lithologic Description	9dKj	(mc			punt	Time	Remarks
Depth (feal)		USCS Type	PID (ppm) Bpoon	Number	Recovered Length (feet)	Blow Count	Sample Time	(sample details, odor, etc.)
5 5 10 15	Augento to to 3.5° twoph fill, duiller reports gettine sent at 30 - Fill GW 165600 splitspoon 37 - 5 3863 end 32 - 42 midlegy sit, some org and sect ang i to send and perposes, strong per odor e contact, min plasticity C 45 peat, dk bow - elkyelbon, ceause, set, silm IP-strong odor, V coarse stehes/plaut) to peoples. cold, moist ele- C 6° valcown, si moist, dense, C der, the ilen-mod plasticity widepth. E 85 m-alk gy 1 sft-mod dense, 1-m plastic, seat yel bour ox v, cold, possiblic freque, Set cold Scale of 45 v, cold to 35 e Meat const to 55 v, cold to 35 e	aultice (1/1/ Best 1/1/	4 Colorate		35 Rec 5 5 Rec 2 5 Rec	245476573335		Fid 1440 140, e contract Fid 1440 140, e contract Shamp contract Fid 25 pid & sporn Q contract co/OL Fid 39, pid 7° Shamp contract col/OL Fid 39, pid 7° Fid 30, p

USCS NAME: Consistency/Density (predominanily fine: very solit/re-0-1).soft/re-2-4),medium stiff(re-5-6),stiff(re-9-15),very stiff(re-3-16,50),hard(re-31-17) (predominanily coase: very loose(re-0-4),loose(re-5-10),medium densetre=11-30),dense(re-31-50),very dense(re-51+17), Molshure (dry, molst, wei); Color, Gredation (relative percentages of soil components-no modifiers); Plasticity/Cohestiveness (predominanily fine: nonplastic/tireat=none),stightly plastic/t=1/4-1/8),low plasticity(t=1/8-1/16),medium plasticity(t=1/32),bigh plasticity(t=1/36))/predominantly coase: cohestive.cohestive.cohestine.ss; Stratification/Structure (blocky, massive, lensed, sto.);conlacts: sharp, gradational(bedding: hotzontal, inclined); Camentation (none, weak, moderate, strong); Other Our content for some for a content of the structure (blocky, massive, lensed, sto.);conlacts: sharp, gradational(bedding: hotzontal, inclined); Camentation (none, weak, moderate, strong); Other Descriptive Elements; Geologic Origin S# = Sample Number; SP = Spoon Driver; SD = Sample Deptr; ST = Sample Time; A = Ansiysia BZ = Braailing Zone; BG = Background; BH = Borehole; CB = Cuttings Bin

HYDROGEOLOGIST: R. Shlesser JOB NO .: 12642 02 WELL NO. ICOMMOR DRILLER: CLIENT: Roberson WELL LOCATION: FSCO MCC PILOT 1630 DATE/TIME: AREA Well Head Elevation Ground Surface Elev. GROUND SURFACE Well Head Completion Method 8' Elugh mount Bas A Longereau Drilling Method/Rig Type _HSA / Mlobi / B.61 DETAILS OF CONSTRUCTION Date Type Metal Surface Casing: Completed Diameter Borehole Diameter (in.) 05 Լեսցե Type and Size of Casing (in.) 2" Seh 40 Purc Type and Size 2" Set 40 PVC w/ 3" of Screen (in.) Sch 40 cutsicle w/10/20 Neat Conent MATERIALS Screen Perforation (prepack) Diameter (in.) DDG Coment (sks.) Screen Length (ft.) 5 Filter Pack Material (fL^3) HENE Centralizer Depths (fL) Completion Technique Casing Material (fL) 1. Type of Filter Pack and Placement Method 10/22 Silica Sand 5 30/10 Silica Sand Jonui Bentonite (fL3) 30/10 Sand 10/20 Sand 2. Type of Bentonite and Placement Method Ad 10/2= St/rea Sward - 30 ftc 3. Type of Grout Mixture and Placement Method Vone. Next Cenen Top of Bentonite ft. 30 file Silved Sand Seal Top of Filter Pack ft fL Top of Screen Neat Convent legal Hze of 94 "partiand 5 Description of Potential Problem 9 Sump 100 With Well: None Ericken NOTE: ALL DEPTHS ARE REFERENCED Bottom of Screen TO GROUND SURFACE Bottom of Hole Development Technique GROUT BENTONITE FILTER PACK EARTH TECH AFCOM

Sit		Locit): T	-		a		
Рто	Dect Name:	Proje	ے۔ ct Numbe		1100		, Sh	reet: 1 of
Dri	T LAWBRES TSLAND MOLISCO		Time Star	ted:	262	4102		tal Depth (feet):
Del	Illing Equipment: Mobil B61 Illing Contractor:		S/[]oC Timé Fini		60/			pth to Water (feet): -
	Denali Drig		1109		00			295
Dri	R. Roberson		[Wa	ater Added (gal):
Drì	lling Method: - UFSA	Bore	hole Dian 3 1/2		- 4		Ar	nblent PiD (ppm): -
Dri	ling Fluid: None	Logg	ed By:		lose.	e, fr	Ch	ecked By:
		+			iples			
Depth (feel)	USCS Lithologic Description	JSCS Type	PID (ppm) Bpoos	Number	Recovered Length (leel)	Skow Count	Sample Tima	Remarks (sample details, odor, etc.)
	Fill Sandy Silty Gravel M-dk bun Grue Fill C M-dk gel bin i duy, cold protocol, non plastic sed org. mi 3.14, buttle sound Peat M-dk yel bin, coase plant Grags, sharp contact infact self above 4-43 Hin bans self afa. Moist E 62 cold, time Grand peat, to sand & pebbles Seat Wg steves. strong pet adov get duy, I pladic it y mill form, seat org, silpet cdor, clayer at C 102 Navel Seat org, silpet inclayer y self alla mast, sold, small SP Sand Gia grave avoind above clast, to yel bornox Eu doore spoor hit gravel Se US	ML Lle GM	4 <u>.</u>		25 Rec 5 Rec 52 Rec 52 Rec 10 R. 20	2454 544513687776 225		262810 izo Pio BZ DIZ ppm Pio I.9 ppm Fio Fid - BS Fid - 748 Fid - BS Fid - 748 Fid & Contact BIZ Fid , 47 BZ D.3 ppm Pio Pid & Fid 10.5 - TD @ 12 - Headspace Samphs Depth Pio Fid ppu 55-65 180 1300 65-8 60 450

USCS NAME: Consistency/Density (predominanily line: vary soft(n=0-1),soft(n=2-4),medium skif(n=5-6),stiff(n=9-15),very soft(n=16-30),kerd(n=31+)) (predominanily coarse: vary bose(n=0-4),bose(n=5-10),medium dense(n=11-30),dense(n=31-50),very dense(n=51+)); biostore (dry, moist, well; Color; Gradation (relative percentages of soft components-no modifiers); Prasticity/Cohestveness (predominantly line: nonplastic (hread=mone),stightly plastic (=1/4-1/6),low plasticity(=1/8-1/16),medium plasticity(=1/32),herd(n=31+)); (predominantly coarse: cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,cohestve,c

S\$ = Sample Number; 8P = Spoon Driven; 8D = Sample Depth; ST = Sample Tune; A = Analysis BZ = Breathing Zone; BG = Background; BH = Borzhole; CB = Cuttings Bin

BOREHOLE LOG (SHALLOW) PFT

Set Screen CVZ^e Sump 125-122 12²-72 2" puc w/ 3" puc pob slot screen prepacked w/ 50 silica sand. 10/20 SAND to

Form F~1009 5/7/03

DB NO.: 112624,02 WELL NO. JCOMWA? HYDROGEOLOGIST: 25chlosser CLIENT: BRISTOL DRILLER: R. Roberson WELL LOCATION: NE, CAPE ISCOMOC DATENTIME: Start 8/1/09 AREA Well Head Elevation -- 66.45 Ground Surface Elev. -- 62.04 Well Head Completion Method GROUND SURFACE 8" Flush nount, metal w/ cementapron Drilling Method/Rig Type 1+5A - B-61 Mobil DETAILS OF CONSTRUCTION Date Type Metal Surface Casing: Completed Diameter 8" Borehole Diameter (in.) Length 14M Type and Size of 00 Casing (in.) Type and Size 324.40 FUL 2" w/ 3" UNTER of Screen (in.) w/ #50 Sand pade (Propa 3 OUTER Neat MATERIALS Screen Perforation Diameter (in.) Cement, Coment (sks.) 006 Screen Length (fL) Filler Pack Material (ft.3) Centralizer Depths (fL) Completion Technique Casing Material (fL) 1. Type of Filter Pack and Placement Method Bentonite (ft.³) - 30/76 Silica Sand - 10/20 Silica Sand 10/20 Silica & 30/20 Silica Sand, Poured 5 2. Type of Bentonite and Placement Method 72 Top of Bentonite Grout 5 Seal 0-5 ft. alone. 3. Type of Grout Mixture and Placement Method Top of Filter Pack ft, 72 94# porland to logal H20, Poured Top of Screen ft. 120 Description of Potential Problems With Well: 120 None prident NOTE: ALL DEPTHS ARE REFERENCED Bottom of Screen TO GROUND SURFACE fL. Bottom of Hole Development Technique Surce and punping GROUT BENTONITE FILTER PACK

EARTH TECH AFCOM

	Sit	e: 1500 PILOT AREA	Locid: ICOIWOI							
	Pro	ADDA PILDT	Project Number: 112624.0 2					Sh	est: 1 of _ ('	
	Drí	lling Equipment: Mobil: B-61	Date/Time Started: 8/2/09 (800) Date/Time Finished: 8/2/09 (430) Borehole Diameter (In): - $8^{1}/4$. To	tal Depth (feet): - 1つ 5_	
	Dri	Iling Contractor: Denali Duilling						De	pth to Water (feet): - ~ 9.8	
	Drí	Ner. R. Roberson						Wa	ater Added (gal):	
	Dri	lling Method: - HSA						An An	nbient PID (ppra): -	
	Dri	Iling Fluid: -	R.Schlosser					Ch	ecked By: -	
			g	<u>~</u>	Sam	ples G	ut I	Ш Ш		
	Depth (feet)	USCS Lithologic Description	LISCS Type	PID (ppm) Bpoon	Number	Recovered Length (feet)	Blow Court	Sample Time	Remarks . (sample details, odor, etc.)	
0	-	1 1 - 115	FILL (SM)						-	
5	. — —	Netpyr - yel bin, dry, togethe l plasticity, set ML @ 5ª peat hibron, course peat 1 @ 63 biccoming y.	,Dent	5 <u>5</u> 5 <u>8</u>		5° Red 2 ? ? ?	2222		- pid 90 FID 435 - BZ: - PID/EID - BKE strong petador	
	-	sity, ment, cold C7? inquited yel born sitty save gravel, sat C si sheen, shar contact w/ dk born bolg to:	Envi Reat	7 ² B ²		2055 2012 972	mmy so		pid 18 FD De Generation BZ- PID/FID BKG	
10		to 8ª becoming v sity at to 9ª becoming v sity at toget about ong secat peal	GME	99 Mu 98 Mu 70	-	Rec. 15 109	6) 67		- pick 12 Fin 48 - Set ever wraped type 304	
	_	C94 madkayy'sitt, I'm plasticity wet, clayer, ordinate	2	· · ·	GI	Q10 ⁵			55 500000.102-50 - Sump 102-10-	
0	-	3/4-1"ava quandelast's w/sand and silt untrix, 65% quarels 25% cs-for sand 10% Pins, wet							Headspace sample 5°-7° pid 200 - Rd 1450	
15		(Gm)							7= -9" pid 28 Fide 82140	

<u>UBCS NAME</u>; Consistency/Density [predominantly fine: very soft(r=0-1),soft(r=2-4),medium stif(r=5-6),stiff(r=9-16),very stiff(r=16-30),hard(o=31-+)? [predominantly coarse: very loose(r=0-4),loose(r=5-10),medium dense(r=11-30),dense(r=31-50), very dense(r=51+)? Hotstone (dry, moist, well: Color, GradeBon (miaitve personiages of soil componants-no modifiers); Plasticity/Cohestveness [predominantly fine: nonplastic(hread=none),stighty plastic(=1/4-1/6),low plasticity(t=1/8-1/16),medium plasticity(t=1/32),high plasticity(t=1/34))[predominantly coarse: cohestve,cohestveness; [predominantly fine: nonplastic(hread=none),stighty plastic(=1/4-1/6),low plasticity(t=1/8-1/16),medium plasticity(t=1/32),high plasticity(t=1/34)][predominantly coarse: cohestve,cohestveness; [predominantly fine: nonplastic(hread=none),stighty plastic(=1/4-1/6),low plasticity(t=1/6-1/16),medium plasticity(t=1/32),high plasticity(t=1/34)][predominantly coarse: cohestve,cohestveness; [predominantly fine: nonplastic(hread=none),stighty plastic(=1/4-1/6),low plasticity(t=1/32),high plasticity(t=1/34)][predominantly coarse: cohestve,cohestveness; [predominantly fine: nonplastic(hread=none),stighty plastic(=1/4-1/6),low plasticity(t=1/32),high plasticity(t=1/34)][predominantly coarse: cohestve,cohestveness; [predominantly fine: nonplastic(hread=none), storng); Other Descriptive Elementar; Geologic Origin

S# = Sample Number, SP = Spoon Driven; SD = Sample Depth; ST = Sample Time; A = Analysis

BZ = Breathing Zone; BG = Beckground; BH = Borehale; CB = Cuttings Bin

JOB NO.: 112642.20 WELL NOICOLWOI HYDROGEOLOGIST: P. Schlosser R. ROBERSON CLIENT: DRILLER: BRISTOL WELLLOCATION: ISCO PILOT MOC DATE/TIME: 1330 8/2/09 AREA ST. LAWRENCE IS. NO CARE Well Head Elevation ~66.45 Ground Surface Elev. ~67,00 GROUND SURFACE Well Head Completion Melhod Salevele apron ~ 18" ORig Type USA [Mobil B=61 Fligh mount, Drilling Method/Rig Type DETAILS OF CONSTRUCTION Type <u>Steel</u> Boenthough Date Surface Casing: 8/2/09 Completed Diameter $B^{\prime\prime}$ Borehole Diameter (in.) 81/4 Length /4" 5 Type and Size of 0 Casing (In.) 55 54 p = 304 Type and Size of Screen (In.) 010 55 Type 3042" Screen Perforation MATERIALS .010 Wive wray Dlameter (in.) Cement (sks.) Screen Length (fL) Filter Pack Material (fL3) -Centralizer Depths (ft.) lone Completion Technique Casing Material (R.) 1. Type of Filter Pack and Bentonite (ft.3) 35 Placement Method 10/20 Siley Sand & 20/20 Silica Sand 4⁵ 2. Type of Bentonite and 5°-Placement Method Top of Bentonite fi IONE USEB Seal .010 3. Type of Grout Mixture and Scheck Top of Filter Pack fŁ Placement Method **5**5 44# portand TypeII w 6 gal H20 mix Top of Screen £. 10-- Sump Description of Potential Problems 105 With Well: none eridge NOTE: ALL DEPTHS ARE REFERENCED TO GROUND SURFACE Bottom of Screen Bottom of Hole Development Technique GROUT BENTONITE FILTER PACK EARTH TECH AFCOM

Attachment D Groundwater Sampling Forms Baseline and Pre-ISCO Groundwater Sampling Forms

CLIENT: DRUSTOL LOCATION: NOCAPETISCO PILOT PROJECT #: (12642-20

ENTER WELL LOCATION:

Iconwell

INSPECTION														
Label on well?			YES	NO	Is cap locked? YES NO									
Is reference mar	k visible?		YES	NO)	Standing water present? YES NO									
Condition of well	:	NEW				Any indication of surface runoff in well? YES								
Weather: Cloudy						Air Temperature: ~45° F								
Notes: TEA	CPORARY	WELLI	installed	7/20/0	19 - Developed 7/21/09 and sompted understel									
STATIC WATER			r		<u>cv</u> ,	- and a		- 2004						
Date: 7/2/109 Time: AM/PM														
Depth to Water: <u>9.35</u> Measured with: ELECTRONIC TAPE CHALK & STEEL TAPE														
Length of Well: Decontamination; PRE STEAM CLEANED DIWATER OTHER														
WELL PURGING														
Date: 7/2/09 Begin Time: AM/PM Purging Equipment Munity poor w/controller														
End Time: AM/PM Decontamination: PRE STEAM CLEANED DI WATER OTHER														
CALCULATION OF 3 CASING VOLUMES														
	ft Le	ength of well				Yield:		HIGH /	LOW)					
Selas	ft (depth to wate	er (before pu	rge start)		If low, rece	overy time:							
Relow	ft =	length of wat	er column											
41	X	conversion fa	actor (2° well) 0.49		Actual vol	ume purged:		gallor	ns				
Gallo	ns =	3 casing volu	imes			Actual pur	ge flow rate:	_<29	2 ma/zumal/mi	in or				
Notes:									۲/min	i				
Time	Volume	Depth to	рН	Conducti	vity	Turbidity	D.O.	Temp	ORP	Ferrous				
	(gallons)	s) Water	(SU)	(umhos/c	;m)	(NFU)	(mg/L)	(°C)		Iron				
		(feet)				Seducity				(mg/L)				
		<0.33'	+/- 0.1	+/- 3%		+/- 10%	+/- 10%	+/- 5°	+/- 10 mV					
Start: 1755		~ 10.0	10.83	0.148	<u>+</u>	0,07	0,88	5.61	-55.3	N/A.				
1802		[10,15	0.147		0.07	0.47	6.08	- 57.9	N/A				
1805			9.54	0.149		0.07	05	5.19	-51.2	N/A				
1810		·	9.20	0,149		0,07	0.39	5,15	-55,1	N/A				
1815	V .	ļ	8.84	0.149		0.09'	035	5,16	-56.0	N/A				
		8	8-62	0.149		0.07	0-36	5.08	-55,4	N/A				
	P.	1 1 41					1		1	N/A				
	Jam	led at t	exall	Cloping	us-	purged	total	- 3590	als	N/A				
	- 1				3	/				N/A				
										N/A				
Final:										N/A				
SAMPLE COLLE	CTION													
Date: 7/21/	09		Time: 12	AM/PM		Method:	Low Fla	ch'w/U	mi Typao	m				
		0.0												
Appearance of S	ample:	Clei	Ŵ		_	Actual sample	a flow rate:	<u>~ 1.00</u>	I.	nl/min or				
	-				_					L/min				
SAMPLE BOTTL	E COLLECT	TED: の	1000	1-11+	ak	ber, to.	R DRO	(RRO)	AKIO2/	AKIOS				
SAMPLE BOTTLE COLLECTED: CIBOO 1-11+ ababer, FOR DRO/RROJAKIOZ/AKIOS														
Name: R.Schlosser Company: ABCOM														
Name: C. Schubber Company: NBCOM														

CLIENT: B	ristd	TOOP	2,6t					TD	
LOCATION: PROJECT #:	NECap	2 estable		ENTER		10N-	Jeco	11112	1
	112671						<u>+cc</u>	10 <u>0</u> 0	
INSPECTION									0
Label on well?		C	YES	NO Is ca	o locked?			YES (NO
Is reference mai	rk visible?		YES	NO Stand	ding water prese	nt?		YES C	NO
Condition of wel	1: <u>K</u>	is al		Any i	ndication of surfa	ace runoff in w	vell?	YES	NO
Weather:	(loudy			emperature:			-245	F
Notes: Well	makes a	bowl 27	s me/m	in, Temps	orany we	ll			
STATIC WATER	R LEVEL JUS	ST PRIOR TO	D PURGING	~] —				· ··· ·
Date: 7/22	/ 0 7		Time: 1615	AMPM					
Depth to Motor	<u>~~</u>	5.21	1610	14000	used with:	E		• • • • • • • •	
Depth to Water:	<u> </u>				ured with: ntamination:	ELECTRONIC	-	CHALK & STEEL	
Length of Well:		<i></i>		Deco	manauon.	PRE STEAM	CLEANED	DIWATER	OTHER
- WELL PURGING	G								
	P0-55	8eain	Time: /	674 AM/P	M Puroina F	Equipment	Mars-79	8120010	
		20gm End 1		235 AM/P	3 0		RE STEAM CL		
CALCULATION OF	3 CASING VOLU								
2.8	ft Le	ength of well			Yield:		HIGH	LOW	
5-21		depth to wate		irge start)	If low, rec	covery time:	Susta	ined or KI	06helpin
4.59		length of wat							L
~2:25	X	conversion fa	actor (2* wel	I) 0. 4 9	Actual vo	lume purged;	7	gallor	ns
Gallo	วกร =	3 casing volu	umes ,		Actual pu	rge flow rate:	< 1051	√/ ml/ml	nor
Notes:	6	E.Inperiz	2.12, LUE	l(L/min	
		,	/						
Time	Volume	1	/		Turbidity	D.O.	Тетр	ORP	Ferrous
Time	Volume	Depth to Water	/ pH	Conductivity	Turbidity (NTU)	D.O. (mg/L)	Temp (°C)	ORP	Ferrous Iron
Time		Depth to	/			D.O. (mg/L)	Temp (°C)	ORP	
Time	Volume	Depth to Water	/ pH	Conductivity				ORP +/- 10 mV	Iron
Time Start: ॥६२५	Volume	Depth to Water (feet)	/ pH (SU) +/- 0.1	Conductivity (umhos/cm)	~(NTU) ⁵⁷	(mg/L)	(°C)	+/- 10 mV	Iron
	Volume	Depth to Water (feet) <0.33'	/ pH (SU)	Conductivity (umhos/cm)	~(NTU) ⁵⁷	(mg/L)	(°C) +/-5°		(mg/L)
Start: 1624	Volume	Depth to Water (feet) <0.33' <i>S</i> .'2 (/ pH (SU) +/- 0.1	Conductivity (umhos/cm) +/~ 3%	(ŇTU))/ +/- 10%	(mg/L) +/- 10%	(°C) +1-5° 4.83 4.75	+1- 10 mV	Iron (mg/L) N/A
Start: 1624 1645	Volume	Depth to Water (feet) <0.33' 5.2 (5.75	/ pH (SU) +/- 0.1 <u>5, 35</u> <u>5, 36</u> 5, 39	Conductivity (umhos/cm) +/- 3%	(NTU) +/- 10%	(mg/L) +/- 10%	(°C) +1-5° 4.53 4.53 4.75 (1.51	+/- 10 mV 114-3 128, 7- 154-2	Iron (mg/L) - N/A N/A
Start: 1624 1645 1655	Volume	Depth to Water (feet) <0.33' 5.2 [5.78 5:75	/ pH (SU) +/- 0.1 <u>5, 35</u> <u>5, 36</u> <u>5, 36</u> <u>5, 4</u> 2	Conductivity (umhos/cm) +/- 3% 0.719 0.270 0.270 0.771 0.775	(NTU)) +/- 10% 0,10 0,10 0,10 0,10 0,10	(mg/L) +/- 10% 	(°C) +/- 5° 4. §3 4. §3 4. ?5 (1.\$/	+1- 10 mV	Iron (mg/L) N/A N/A N/A
Start: 1624 1645 1655 1702	Volume	Depth to Water (feet) <0.33' 5.2 (5.78 5.78 5.76	/ pH (SU) +/- 0.1 <u>5, 35</u> <u>5, 36</u> <u>5, 39</u> <u>5, 42</u> <u>5, 44</u>	Conductivity (umhos/cm) +/- 3% 0.719 0.270 0.771 0.775 0.775	(NTU) +/- 10% 0,12 0,12 0,13 0,13 0,13 0,13	(mg/L) +/- 10% 	(°C) +1-5° 4.53 4.53 4.75 0.51 0.51 0.51 0.51 0.51	+1-10 mV 114-3 128,7- 139,2 137.3 141.4	Iron (mg/L) N/A N/A N/A N/A
Start: 1624 1645 1655 1702 1702 1703 1715 1725	Volume	Depth to Water (feet) <0.33' 5.78 5.78 5.78 5.78 5.78 5.78 5.78 5.78	/ pH (SU) +/- 0.1 <u>5, 35</u> <u>5, 36</u> <u>5, 36</u> <u>5, 47</u> <u>5, 49</u>	Conductivity (umhos/cm) +/- 3% 0.719 0.270 0.721 0.725 0.725 0.725 0.735	(NTU)) +/- 10% 0,10 0,10 0,10 0,10 0,10 0,10 0,11 0,11 0,11	(mg/L) +/- 10% 1.77 1.53 1.45 1.45 1.95 1.95	(°C) +1-5° 4.53 4.53 4.75 4.75 -1.51 -1.71 -1.76 -1.76 -1.76 -1.76 -1.76	+/- 10 mV 114-3 128, 7- 139-2 137. 3 141.4 141.0	Iron (mg/L) N/A N/A N/A N/A N/A N/A
Start: 1624 1645 1655 1702 1702 1702	Volume	Depth to Water (feet) <0.33' 5.78 5.78 5.78 5.78 5.78 5.78 5.60	/ pH (SU) +/- 0.1 <u>5, 35</u> <u>5, 36</u> <u>5, 39</u> <u>5, 42</u> <u>5, 44</u>	Conductivity (umhos/cm) +/- 3% 0.719 0.270 0.771 0.775 0.775	(NTU) +/- 10% 0,12 0,12 0,13 0,13 0,13 0,13	(mg/L) +/- 10% 	(°C) +1-5° 4.53 4.53 4.75 0.51 0.51 0.51 0.51 0.51	+1-10 mV 114-3 128,7- 139,2 137.3 141.4	Iron (mg/L)
Start: 1624 1645 1655 1702 1702 1702 1715 1725	Volume	Depth to Water (feet) <0.33' 5.78 5.78 5.78 5.78 5.78 5.78 5.78 5.78	/ pH (SU) +/- 0.1 <u>5, 35</u> <u>5, 36</u> <u>5, 36</u> <u>5, 47</u> <u>5, 49</u>	Conductivity (umhos/cm) +/- 3% 0.719 0.270 0.721 0.725 0.725 0.725 0.735	(NTU)) +/- 10% 0,10 0,10 0,10 0,10 0,10 0,10 0,11 0,11 0,11	(mg/L) +/- 10% 1.77 1.53 1.45 1.45 1.95 1.95	(°C) +1-5° 4.53 4.53 4.75 4.75 -1.51 -1.71 -1.76 -1.76 -1.76 -1.76 -1.76	+/- 10 mV 114-3 128, 7- 139-2 137. 3 141.4 141.0	Iron (mg/L) - N/A N/A N/A N/A N/A N/A N/A
Start: 1624 1645 1655 1702 1702 1715 1725	Volume	Depth to Water (feet) <0.33' 5.78 5.78 5.78 5.78 5.78 5.78 5.78 5.78	/ pH (SU) +/- 0.1 <u>5, 35</u> <u>5, 36</u> <u>5, 36</u> <u>5, 47</u> <u>5, 49</u>	Conductivity (umhos/cm) +/- 3% 0.719 0.270 0.721 0.725 0.725 0.725 0.735	(NTU)) +/- 10% 0,10 0,10 0,10 0,10 0,10 0,10 0,11 0,11 0,11	(mg/L) +/- 10% 1.77 1.53 1.45 1.45 1.95 1.95	(°C) +1-5° 4.53 4.53 4.75 4.75 -1.51 -1.71 -1.76 -1.76 -1.76 -1.76 -1.76	+/- 10 mV 114-3 128, 7- 139-2 137. 3 141.4 141.0	Iron (mg/L)
Start: 1624 1645 1655 1702 1702 1702 1715 1725	Volume	Depth to Water (feet) <0.33' 5.78 5.78 5.78 5.78 5.78 5.78 5.78 5.78	/ pH (SU) +/- 0.1 <u>5, 35</u> <u>5, 36</u> <u>5, 36</u> <u>5, 47</u> <u>5, 49</u>	Conductivity (umhos/cm) +/- 3% 0.719 0.270 0.721 0.725 0.725 0.725 0.735	(NTU)) +/- 10% 0,10 0,10 0,10 0,10 0,10 0,10 0,11 0,11 0,11	(mg/L) +/- 10% 1.77 1.53 1.45 1.45 1.95 1.95	(°C) +1-5° 4.53 4.53 4.75 4.75 -1.51 -1.71 -1.76 -1.76 -1.76 -1.76 -1.76	+/- 10 mV 114-3 128, 7- 139-2 137. 3 141.4 141.0	Iron (mg/L) - N/A N/A N/A N/A N/A N/A N/A
Start: 1624 1645 1645 1702 1702 1715 1725 1735 1735 Final: SAMPLE COLL	Volume (gallons)	Depth to Water (feet) <0.33' 5.72 (5.75 5.75 5.75 5.75 5.75 5.60 5.60 5.60	/ pH (SU) +/- 0.1 <u>5, 35</u> <u>5, 36</u> <u>5, 36</u> <u>5, 39</u> <u>5, 42</u> <u>5, 49</u> <u>5, 49</u> <u>5, 49</u>	Conductivity (umhos/cm) +/- 3% 0.719 0.270 0.721 0.725 0.725 0.735 0.735	(NTU) +/- 10% 0,10 0,10 0,10 0,10 0,10 0,10 0,10 0	(mg/L) +/- 10% 1.77 1.73 1.40 1.26 1.07 0.95 1.28	(°C) +1-5° 4.83 4.75 4.75 0.81 0.81 0.81 0.81 0.81 0.81 0.81 0.81	+/- 10 mV 114-3 128, 7- 139-2 137. 3 141.4 141.0	Iron (mg/L) - - N/A N/A N/A N/A N/A N/A N/A N/A
Start: 1624 1645 1855 1702 1715 1715 1725 1735 Final:	Volume (gallons)	Depth to Water (feet) <0.33' 5.72 (5.75 5.75 5.75 5.75 5.75 5.60 5.60 5.60	/ pH (SU) +/- 0.1 <u>5, 35</u> <u>5, 36</u> <u>5, 36</u> <u>5, 39</u> <u>5, 42</u> <u>5, 49</u> <u>5, 49</u> <u>5, 49</u>	Conductivity (umhos/cm) +/- 3% 0.719 0.270 0.721 0.725 0.725 0.725 0.735	(NTU) +/- 10% 0,10 0,10 0,10 0,10 0,10 0,10 0,10 0	(mg/L) +/- 10% 1.77 1.73 1.40 1.26 1.07 0.95 1.28	(°C) +1-5° 4.83 4.75 4.75 0.81 0.81 0.81 0.81 0.81 0.81 0.81 0.81	+/- 10 mV 114-3 128, 7- 139-2 137. 3 141.4 141.0	Iron (mg/L) - - N/A N/A N/A N/A N/A N/A N/A N/A
Start: 1624 1645 1655 1702 1702 1702 1715 1725 1725 1735 Final: SAMPLE COLLI Date: 7/22/	Volume (gallons)	Depth to Water (feet) <0.33' S.72 (S.78 S.75 S.75 S.75 S.75 S.75 S.75 S.75 S.75	7 pH (SU) +/- 0.1 5.35 5.35 5.36 5.39 5.42 5.42 5.49 5.49 5.49 5.49	Conductivity (umhos/cm) +/- 3% 0.719 0.270 0.771 0.775 0.775 0.775 0.775 0.775	(NTU) +/- 10% 0,10 0,10 0,10 0,10 0,10 0,10 0,10 0	(mg/L) +/- 10% 1.77 1.73 1.40 1.26 1.07 0.95 7.28	(°C) +1-5° 4.53 4.53 4.53 4.75 (1.51 (1.51) (1.51) (1.51) (1.51) (1.51) (1.51) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52) (1.52)(+/- 10 mV 114-3 128.7- 139.7 139.7 141.0 1.37.7	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 1624 1645 1645 1702 1702 1715 1725 1735 1735 Final: SAMPLE COLL	Volume (gallons)	Depth to Water (feet) <0.33' 5.78 5.78 5.78 5.78 5.78 5.60 5.60 5.60 5.60	7 pH (SU) +/- 0.1 <u>5.35</u> <u>5.36</u> <u>5.36</u> <u>5.36</u> <u>5.39</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u>	Conductivity (umhos/cm) +/- 3% 0.719 0.270 0.721 0.725 0.725 0.725 0.725 0.735 0.735	(NTU) +/- 10% 0,10 0,10 0,10 0,10 0,10 0,10 0,10 0	(mg/L) +/- 10% 1.77 (.53 1.48 1.26 1.07 0.95 1.28	(°C) +1-5° 4.53 4.53 4.75 4.75 4.75 4.76 4.76 4.76 4.77	+/- 10 mV	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 1624 1645 1701 1701 1701 1701 1701 1705 1705 1705 1715 1725 1735 Final: SAMPLE COLLID Date: 7/22/ Appearance of S	Volume (gallons)	Depth to Water (feet) <0.33' 5.78 5.78 5.78 5.78 5.78 5.60 5.60 5.60 5.60	7 pH (SU) +/- 0.1 <u>5.35</u> <u>5.36</u> <u>5.36</u> <u>5.36</u> <u>5.39</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u>	Conductivity (umhos/cm) +/- 3% 0.719 0.270 0.721 0.725 0.725 0.725 0.725 0.735 0.735	(NTU) +/- 10% 0,10 0,10 0,10 0,10 0,10 0,10 0,10 0	(mg/L) +/- 10% 1.77 (.53 1.48 1.26 1.07 0.95 1.28	(°C) +1-5° 4.53 4.53 4.75 4.75 4.75 4.76 4.76 4.76 4.77	+/- 10 mV	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 1624 1645 1655 1702 1702 1715 1725 1725 1735 Final: SAMPLE COLLI Date: 7/22/	Volume (gallons)	Depth to Water (feet) <0.33' 5.78 5.78 5.78 5.78 5.78 5.60 5.60 5.60 5.60	7 pH (SU) +/- 0.1 <u>5.35</u> <u>5.36</u> <u>5.36</u> <u>5.36</u> <u>5.39</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u>	Conductivity (umhos/cm) +/- 3% 0.719 0.270 0.721 0.725 0.725 0.725 0.725 0.735 0.735	(NTU) +/- 10% 0,10 0,10 0,10 0,10 0,10 0,10 0,10 0	(mg/L) +/- 10% 1.77 (.53 1.48 1.26 1.07 0.95 1.28	(°C) +1-5° 4.53 4.53 4.75 4.75 4.75 4.76 4.76 4.76 4.77	+/- 10 mV	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 1624 1645 1701 1701 1715 1725 1725 1735 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725	Volume (gallons)	Depth to Water (feet) <0.33' 5.78 5.78 5.78 5.78 5.78 5.60 5.60 5.60 5.60	7 pH (SU) +/- 0.1 <u>5.35</u> <u>5.36</u> <u>5.36</u> <u>5.36</u> <u>5.39</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.42</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u> <u>5.44</u>	Conductivity (umhos/cm) +/- 3% 0.719 0.270 0.771 0.775 0.775 0.775 0.775 0.775	(NTU) +/- 10% 0,10 0,10 0,10 0,10 0,10 0,10 0,10 0	(mg/L) +/- 10% 1.77 (.53 1.48 1.26 1.07 0.95 1.28	(°C) +1-5° 4.53 4.53 4.75 4.75 4.75 4.76 4.76 4.76 4.77	+/- 10 mV	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 1624 1645 1855 1702 1705 1705 1705 1705 1705 1705 1715 1725 1735 1735 1735 1725 1735 1725 1735 1735 1735 1735 1735 Appearance of S SAMPLE BOTT SAMPLE BOTT	Volume (gallons)	Depth to Water (feet) <0.33' 5.78 5.78 5.78 5.78 5.78 5.78 5.78 5.78	pH (SU) +/- 0.1 <u>5.35</u> <u>5.36</u> <u>5.36</u> <u>5.36</u> <u>5.36</u> <u>5.36</u> <u>5.42</u> <u>5.42</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u>	Conductivity (umhos/cm) +/- 3% 0.719 0.270 0.721 0.725 0.725 0.725 0.725 0.735 0.735	$\frac{\langle NTU \rangle}{+l-10\%}$ $\frac{0.12}{0.12}$ $\frac{0.13}{0.12}$ $\frac{0.13}{0.11}$ $\frac{0.11}{0.11}$ $\frac{0.11}{0.11}$ $\frac{0.11}{0.11}$ $\frac{0.11}{0.11}$ $\frac{0.11}{0.11}$	(mg/L) +/- 10% 1.77 1.77 1.73 1.48 1.26 1.07 0.95 7.28 1.28 1.28 1.28 1.28 1.28	(°C) +1-5° 4.53 4.53 4.53 4.53 4.57 4.57 4.57 4.76 4.76 4.76 4.76 4.77	+/- 10 mV	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 1624 1645 1701 1701 1715 1725 1735 1725 1735 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725 1725	Volume (gallons)	Depth to Water (feet) <0.33' 5.78 5.78 5.78 5.78 5.78 5.78 5.78 5.78	pH (SU) +/- 0.1 <u>5.35</u> <u>5.36</u> <u>5.36</u> <u>5.36</u> <u>5.36</u> <u>5.36</u> <u>5.42</u> <u>5.42</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u> <u>5.49</u>	Conductivity (umhos/cm) +/- 3% 0.719 0.270 0.721 0.725 0.725 0.725 0.725 0.735 0.735	(NTU) +/- 10% 0,10 0,10 0,10 0,10 0,10 0,10 0,10 0	(mg/L) +/- 10% 1.77 1.77 1.73 1.48 1.26 1.07 0.95 7.28 1.28 1.28 1.28 1.28 1.28	(°C) +1-5° 4.53 4.53 4.53 4.53 4.57 4.57 4.57 4.76 4.76 4.76 4.76 4.77	+/- 10 mV	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A

ALLER D								WL O	ol - 9.32 02 - 5.20
CLIENT: B LOCATION: PROJECT #:	NE Cap 1 1266	etsee 12.20	PILT	ENTER	WELL LOCAT	ION:	8	8MW-5	
INSPECTION Label on well? Is reference mar Condition of well Weather: Notes:		<u>r</u> Condig high,	YES YES cal (br)	NO Star Any Air T	ap locked? Iding water preser Indication of surfa Temperature: Doc not temp	ce runoff in w		YES YES ~-45	20 20 20
STATIC WATER	,								
Date: 7/22	109		Time:	AM/PM)					
Depth to Water. Length of Well:		<u>1 8.08 1</u>	350		sured with: ontamination:	ELECTRONIC PRE STEAM		CHALK & STEEL	TAPE OTHER
WELL PURGING Date:/2	2/09	Begin End T	Time:	<u>/.3 %</u> AM/ AM/		quipment <u>1</u>	INTY		TER
CALCULATION OF	CASING VOLU				Decontain	F			
15.1 19.08		ength of well depth to wate	r (hefore nu	rne start)	Yield:	overy time;	HIGH	LOW	
nfo'	-	length of wat	· ·		1100,100				
2,	_X	conversion fa	actor (2" wel) 0.49	Actual vol	ume purged;	1	gallor	ns
Gallo Notes:	ons =	3 casing volu	imes		Actual pu	rge flow rate;	<u> </u>	mVmi L/min	
Time	Volume (gallons)	Depth to Water (feet)	pH (SU) 2 6102	Conductivity (umhos/cm)	T urbidity (NTU) Souli mot-1	D.O. (mg/L)	Temp (°C)	ORP	Ferrous Iron (mg/L)
		< 0.33	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 5°	+/- 10 mV	N17.4
Start: 1415 1425	3	9.18	1126	0.374	0.16	0,55	1.68	- 71-2	N/A N/A
1433	7	9.48	11.05	0.387	0.18	0.51	1.67	- 66.2	N/A
1439	7.2		10.97	0.355	0.17	0.44	1.95	-73.9	N/A
1442	7.3		10.79	0,363	0.17	0.40	1.85	- 70,7	N/A
1446			10.118	0,361	0.17	6.38	185	-70.1	N/A
1453	- ^{ch}	9.93	10,10	0.359	0.17	0,39	2.00	- \$0.3	N/A
1501		9.43	9.82	0,355	0.17	0.37	1.90	- 85,6	N/A
1510		9.43	9.60	0.362	0.17	0,14	1.81	-87.1	N/A
1525	1 0	9,43	9.39	0.366	<u>C 17</u>		1.87	·82.0	N/A
Final:		et for	L -	FINAL AB	ave				N/A
SAMPLE COLLE	ECTION		& See Time:	AM/PM	Method: M	lini Typh	ØUU		
Appearance of S	Sample:	nesidue	on Hac	ganic suitere (pu				ul_n	l/min or L/min
SAMPLE BOTTI		red:	OPHEN	06-61002	Actual sample rg water -11 + ambe pres w/E	ter tor 1	DRO/PR	0/AK102	ALCIO3,
SAMPLING PER Name: M. He	rsonnel asten, R				Company:				

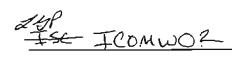
Ι

CLIENT: Bar LOCATION: A PROJECT #:	recore			ENTER	WELL LOCAT	ION:	TCO	MW09	
INSPECTION Label on well? Is reference mark Condition of well Weather: Notes: Samp Dr. S(c	ling bes	Good ar ho Ar. jun pos- juker Am	vES vH y Clo t Recove bersfille	NO Star Any	ap locked? ading water present indication of surfact remperature: a on 8/06/ b lccccery, 2	ស ៧ កិ ០ ឈា ទ ាន		(YES YES YES 40°-45° 40°-45° 40°-45° 40°-45°	NO NO NO S/6/09 7 Am
STATIC WATER Date: 3/6/200 8/7 /20 Depth to Water: Length of Well:	09 09 		Time: 1030 Time: 7,61	i A~ Mea Dec	າຣມred with ontamination:	PRE STEAM		CHALK & STEEL	TAPE OTHER
WELL PURGING Date: <u>8/6/2</u> CALCULATION OF 3 <u>11, 90</u> 7,58	CASEVG VOLU ft Le ft <u>- c</u>	End T mes ength of well lepth to wate	ोत्ताल: ट्रि/ er (before put	00 9/6/2001 AM 7/2009 T/2009	PM Decontan Yield:	Equipment nination: pr covery time:	RE STEAM CL HIGH	LOW	
<u>4 (32</u> <u>2,12</u> Gallo Notes:	ns = 	length of wat conversion fa 3 casing volu ELL Pure LLのいてく	inter (2° well intes	@ Low Ho.	Actual pu	lume purged: Irge flow rate: <u>CECCVEV y</u> Lows C		gallo سار 	inor
Tīme	Volume (gallons)	Depth to Water (feet)	pH (SU)	Conductivity (umhos/cm)	Turbidity (NTU)	D.O. (mg/L)	Temp (°C)	ORP	Ferrous Iron (mg/L)
1040 21	i	\$0.33'	<u>, s</u> +/- 0.1	+/- 3%	÷/- 10%	+/- 10%	÷/- 5°	+/- 10 mV	
Start: 1105	0.5	12910.5	10-5568		81,2	12.95	650	124	N/A
1118	0,10	10.83	5.10	6,254	73.2	7.08	6.61	106	N/A N/A
1130	1.0	11.11	5.60	0,258	50.1	1.00	11.5	100	N/A
1340	1.05	~y@ 11 11.51	5.62	0.256	40.1	7.02	5.84	106	N/A
1310	<u> </u>				1011	602			N/A
	<u> </u>	mped.	Drye				1		N/A
									N/A
1						1		1	N/A
	1								N/A
Final:									NZA
SAMPLE COLLE	CTION			· · · · · · · · · · · · · · · · · · ·				•	
Date: 8/7/2			Time: 0,830	ANYPM	Method: 🚺	TYPOON +			
Appearance of S		<u>Clear</u>	3-11.)	Anhor	Actual sampl		100 ML		ni/min or Límin
SAMPLE BOTTL					n - 127 - 17 1 1997				
Name:	orve	bl	NUM		Company:	ACLON	M·	-	1
							1		

Т

CLIENT: BATSITOL LOCATION: NE CAPE PROJECT #: 1126 2412

ENTER WELL LOCATION:



T

Label on wall? (ES) NO is cop locide? (EE) NO Starderson and visible? Cool: NO And indig water present? YES NO Condition of well: Cool: NO And indig water present? YES NO Meather: Summ, SD-L60° At Temperature: At Temperature: NO Standing water present? YES NO Note: WELL TEON WOL was nucle ket of the black of the 0 +1, q1° & TEON WOS, 1 + Decontamination: YES NO Startic WATER LEVEL JUST PRIOR TO PURGING Decontamination: PRESENCE OF COULD WAS THE INPECTATE CHUK & STEEL INPE Landth of Wate: 8.QO Begin Time: ISSO Attribution of suffice outputs CHUK & STEEL INPE Dete: All (bl.) Geo and time: IL(d) AMP(D) Decontamination: PRESENALEARED Outputs Onwater Calculation of suffice outputs Begin Time: IL(d) AMP(D) Decontamination: PRESENALEARED Outputs Onwater Onwater Calculation of suffice outputs Begin Time: IL(d) AMP(D) Decontamination: PRESENALEARED Outputs Onwater Onwater <tr< th=""><th>INSPECTION</th><th></th><th></th><th>~</th><th></th><th></th><th></th><th></th><th>\frown</th><th></th></tr<>	INSPECTION			~					\frown	
Condition of well: \underline{Cond} Any indication of surface number in weil? VES \underline{CO}^{H} \underline			6	YES		-				\sim
Weather: Summer SD-60° Ait Temperature: SC ^{2-60°} Notes: UGLL Transference Transferen			, i	(ES)						
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		t	Gaie	0			ace runoff in v	rell?		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		_50	inny 50	-60						
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Notes: WEL	L ILOM POOV P	reduction	is inclu	bed due	to lacket	Hzo +/- q'	le IC	muog	,4
Depth to Water: 4.60 Langth of Wett: 9.90 Decontamination: $9.85000000000000000000000000000000000000$	STATIC WATER	LEVEL JUS	T PRIOR TO	PURGING		J				F
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Date: 0908	306	-	iīme:	AM(PM)					1
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		_			<u> </u>					d a
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Depth to Water.	4.(<u>,0</u>		Mea	sured with:	ELECTRONIC	CTAPE	CHALK & STEEL	TAPE
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Length of Welt	&	,90		Deco	ontamination:	PRE STEAM	CLEANED	DI WATER	OTHER
$\begin{array}{c c} A_{a,b_{10}} & T_{b,200} & End Time: 143 & AMARY Decontermination: PRE STEAM CLEANED OWNER CONVERSE CALCULATION OF 3 CASING VOLUMES VIEW CALCULATION OF 3 CASING VOLUMES VIEW CALCULATION OF 3 CASING VOLUMES VIEW CALCULATION OF 12 H25 VIEW (1990) THE CONVERSE VIEW CALCULATION OF 12 H25 VIEW (1990) VIEW (1990$					(_ ~	~		·	t	4
$\begin{array}{c c} A_{u_{1}u_{3}} & L_{1} & 200\% \ \mbox{End} \ \mb$							Equipment 🗌	YPOU P	mp low	now
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Aug	nst 6,20	\sim (me:	GHO AMA	M) Decontar	nination: P	RE STEAM CL	EANED OIW	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $						25.04				
$\begin{array}{c c c c c c c c c c c c c c c c c c c $			-	- (1						
$\begin{array}{c c c c c c c c c c c c c c c c c c c $					ାଧିକ ହାସାଏ)		⊔overy ⊒me:	124	ES.	1
Notes: $\frac{1}{3e^{L} = 0 \text{ mm}}$ Time Volume Depth to pH (SU) (umhos/cm) Turbidity D.O. Temp ORP Ferrous from (mg/L) (C) (C) (C) (mg/L) (C) (C) (mg/L) (C) (C) (C) (mg/L) (C) (C) (C) (C) (C) (C) (C) (C) (C) (C			•		N G 40	Actual		<i>L1</i> <	Tool -	
Notes: $\frac{1}{3e^{L} = (0 \text{ mm})}$ $\frac{1}{3e^{L} = (0 $					1 <u>1</u> 1.49		-	<u> </u>	gallo	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	8	nis ~	a casing tom			Actual br	arge now rate.	100		an or
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	140103							— Igal	= (0 min	i i
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Тіте	Volume	Depth to	pH	Conductivity		D.O.			
$\frac{\langle 0,33' +l-0.1 +l-3\% +l-10\% +l-10\% +l-3\% +l-10mV}{\langle 1,000 +l-5\% +l-10mV}$ $\frac{\langle 0,33' +l-0.1 +l-3\% +l-10\% +l-10\% +l-5\% +l-10mV}{\langle 1,000 +l-5\% +l-10mV}$ $\frac{\langle 0,33' +l-0.1 +l-3\% +l-10\% +l-10\% +l-5\% +l-10mV}{\langle 1,000 +l-5\% +l-10mV}$ $\frac{\langle 0,33' +l-0.1 +l-3\% +l-10\% +l-10\% +l-10\% +l-10mV}{\langle 1,000 +l-5\% +l-10mV}$ $\frac{\langle 0,31' +l-0.1 +l-3\% +l-10\% +l-10\% +l-10\% +l-10\% +l-10mV}{\langle 1,000 +l-5\% +l-10mV}$ $\langle 0,31' +l-0.1 +l-3\% +l-10\% +l-$		(gailons)		-		-	(mg/L)	(°C)	ţ	Iron
State: 1550 0.1 4.75 6.07 0.245 600 8.54 6.81 127 N/A 1617 1.0 5.60 5.21 0.253 225 3.01 5.21 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 <			(feet)						and the second se	(mg/L)
1602 1.0 5.00 5.21 0.253 225 6.41 6.40 125 N/A 1613 2.0 5.25 5.14 0.258 225 3.01 5.21 119 N/A 1624 3.5 5.50 5.17 0.258 124 3.03 5.17 1/7 N/A 1637 4.0 6.62 5.16 0.268 124 3.03 5.15 1/6 N/A 1637 4.0 6.62 5.16 0.260 104 2.99 5.15 1/6 N/A 1637 4.0 6.62 5.16 0.260 104 2.99 5.15 1/6 N/A 1637 4.0 6.62 5.16 0.260 104 2.99 5.15 1/6 N/A 1637 0.0 0.1260 104 2.99 5.15 1/6 N/A 10 0.10 10 10.260 104 10.260 104 N/A SAMPLE COLLECTION 10 Time: 1640 AMEM Method: Typow Punp 10.260 104			<0,33'			÷ <i>I</i> - 10%		+		
1618 2.0 5.25 5.14 0.258 225 3.01 5.21 119 N/A 1624 3.5 5.50 5.17 6.258 124 3.03 5.17 117 N/A 1637 4.0 6.62 5.16 0.260 104 2,99 5.15 116 N/A 1637 4.0 6.62 5.16 0.260 104 2,99 5.15 116 N/A 1637 1.0 6.62 5.16 0.260 104 2,99 5.15 116 N/A 1637 1.0 6.62 5.16 0.260 104 2,99 5.15 116 N/A 1637 1.0 6.62 5.16 0.260 104 2,99 5.15 116 N/A N/A N/A N/A N/A N/A N/A SAMPLE COLLECTION Time: 1640 AM/PM Method: Type on Pump Actual sample flow rate: 200 mil/(million or SAMPLE BOTTLE COLLECTED: 6.100'S/2-250 ML/My / 3-1 Lin Mu bert X 2 Limin SAMPLE NG PERSONNEL/(N) 10	i			6.07	1			-	- 1	,
1624 3.5 5.50 5.17 0.258 124 3.03 5.17 $1/7$ N/A 1637 4.0 6.02 5.16 0.260 104 $2,99$ 5.15 $1/6$ N/A 1637 4.0 6.02 5.16 0.260 104 $2,99$ 5.15 $1/6$ N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A SAMPLE COLLECTION Time: 1640 AM(FM) Method: Type on Pump N/A Appearance of Sample: Turbid Actual sample flow rate: 200 m.iL/m.m.mlmin or SAMPLE BOTTLE COLLECTED: 6 voc's/ 2 -250mL (M-Y/3-1 Lin Amber X 2 Limin SAMPLING PERSONNEL/() M 0 0 0	[+							4 .	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$					1 I		~~~~		<u> </u>	
N/A SAMPLE COLLECTION Date: OP/OS/D6 Time: 1640 AMPM Method: Type on Prop Appearance of Sample: turbid Actual sample flow rate: 2conil/min or SAMPLE BOTTLE COLLECTED: 6 voc's/2-250ml/Proy/3-1 Libut Amber X 2 SAMPLING PERSONNEL/ M III accond										
N/A N/A SAMPLE COLLECTION Time: 1640 AMPM Date: 09/09/06 Time: 1640 AMPM Method: Type our Pump Appearance of Sample: turbid Appearance of Sample: turbid Actual sample flow rate: 200 mil/min or SAMPLE BOTTLE COLLECTED: 6 Vol'5/2-250ml Pmy/3-1 Liber X 2 SAMPLING PERSONNEL/ M	634	4.0	6.02	5.16	0.260	104	2,49	5.15	1/6	· · · · · · · · · · · · · · · · · · ·
Appearance of Sample: 10400000000000000000000000000000000000	L		 				+	1	├ ─── │	· ·
Final: N/A Final: N/A SAMPLE COLLECTION N/A Date: OR/OD/D6 Time: 1640 AMPM Method: Typoor Pump Appearance of Sample: Appearance of Sample: Appearance of Sample: SAMPLE BOTTLE COLLECTED: 6 VOC'S / 2-250ML PUNY / 3-1 Libue Hamber X 2 (A stort A)		l			1			1		,
Finel: SAMPLE COLLECTION Date: 09/09/06 TIME: 1640 AMPM Method: Typoon Punp Appearance of Sample: <u>turbid</u> Actual sample flow rate: <u>200 mil/min</u> or SAMPLE BOTTLE COLLECTED: <u>6 VOC'S / 2-250 ml Puny</u> / 3-1 Litur Ambeir X 2		-							1	
Final: N/A SAMPLE COLLECTION Date: 09/09/06 Time: 1640 AMPM Method: Typoon Punp Appearance of Sample: turbid Actual sample flow rate: 200 mil/min or SAMPLE BOTTLE COLLECTED: 6 voc's/2-250 ml Puny/3-1 Liber X 2 Limin							1			
SAMPLE COLLECTION Date: 09/09/06 Time: 1640 AMPM Method: Typoon Punp Appearance of Sample: <u>turbid</u> Actual sample flow rate: <u>Joonik/min</u> milmin or SAMPLE BOTTLE COLLECTED: <u>6 Voc's/2-250ml</u> Pony/3-1 Limin her X 2	Final:									
Date: 02/09/06 Time: 1640 AMPM Method: Typow Pump Appearance of Sample: <u>twbid</u> Actual sample flow rate: <u>Joonik / minim</u> SAMPLE BOTTLE COLLECTED: <u>6 Voc's/2-250ml Poly</u> /3-1 Liber X 2		ECTION			··					
Appearance of Sample: <u>turbid</u> Actual sample flow rate: <u>Job mit/min</u> or SAMPLE BOTTLE COLLECTED: <u>6 VOC'S/2-250ML</u> POLY/3-1 Limin SAMPLING PERSONNEL/ /			-	īme: 164	(DAMPM)	Method:	TUDOIN	Punk	0	:
SAMPLE BOTTLE COLLECTED: 6 VOC'S/2-250ML POLY/3-1 Liber X2		•		1	<u>`</u>					
SAMPLE BOTTLE COLLECTED: 6 VOC'S/2-250ML POLY/3-1 Liber X2	Appearance of S	Sample:	turb	む		Actual samp	le flow rate:	Joon	L/m.n.	៧/គារ់រា លុវ
SAMPLING PERSONNEL			_	. /	0		ا _{ال} م	Vo	•	
SAMPLING PERSONNEL	SAMPLE BOTTL	E COLLECT	red: 6	NOC'5/2	-250ML (UL)	1/ 3-1 Lite	1 Ambeir	- X 2		
				1		1				- ,
Name: Joina My Mullion Company. HELUNC			$\left(\right) \dots $	V -			iA aco			-
	Name:	ma.M	presso			Company	HELO		<u>.</u>	·
		Ý								
										i .

CLIENT: Bristol LOCATION: NE Cape Isco Pilot PROJECT #: 112642.20

ENTER WELL LOCATION:

ICOMW03

INSPECTION									
Label on well?		2	YES		s cap locked?			(YES	NO
Is reference mar			YES		tanding water preser				NQ
Condition of wel	l:	GOOD		A	ny indication of surfa	ce runoff in w	ell?		NO .
Weather:	<u> </u>	oudy		A	ùr Temperature:			<u>48</u>	
Notes:		(
STATIC WATER	R LEVEL JUS		PURGING						
Date:			Time:	(AMUPM					
\$1,4/09	• -		9950						
Depth to Water.	3.0			N	leasured with:	ELECTRONIC	IAPE	CHALK & STEEL	TAPE
Length of Well:	9,5	OTOC		D	econtamination:	PRE STEAM C	LEANED	DIWATER	OTHER
WELL PURGING	3							,	
Date: \$14	109	Begin	Time: [6	00 A	M/PM Purging E	quipment M	in. Tu	deon ul	control
		End 1			M/PM Decontam		E STEAM CU	- /	ATER OTHER
CALCULATION OF \$								2 punt	
9.50		ength of well			Yield:		HIGH	LOW	
3,08		lepth to wate	r (hefore ou	rae start)		overy time:			
6,42		length of wate		- go own ()		ovory unio.			
		v		0.40	Antivalium		6.0	·>	
5.37		conversion fa		0.49		ume purged:			
Gallo	ns =	3 casing volu	imes		Actual pul	rge flow rate:	< (0)		
Notes:								L/mit	n
					- <u>-</u>	1			1
Time	Volume	Depth to	pН	Conductivit	y Turbidity	D.O.	Temp	ORP	Ferrous
	(gallons)	Water	(SU)	(umhos/cm	i) (NTU)	(mg/L)	(°C)		Iron
	Running	(feet)							(mg/L)
	Total	<0,33'	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 5°	+/- 10 mV	
Start: (600	,5	4.25	5.29	0.718	15.5	1.16	6.06	214	N/A
1620	2	4.52-	5.32	0.226	15.4	0,58	7.13	207.5	N/A
1640	3.5	4.64	5.33	0.225		0.18	7.64	202.0	N/A
1055	4.s	4,00	5.34	D.22		D.61	7.53	200.4	N/A
17:0	6.0	4.62	5,30	0,222		2.49	2-5	2040	N/A
									N/A
									N/A
									N/A
<u> </u>									N/A
<u> </u>								<u> </u>	N/A
Final:									N/A
SAMPLE COLLE Date: Sjul (Time: /73	D AM/PM	Method: 7 GWO4CM3	yphoon	mini	w/cont	rolev
		$\cap \circ$	t A	ancum.	Catal 4 B. MZ	1 Raus 8/4	MOCAL	105 @ 17	30
Appearance of S	Sample:	(lear			Actual sample	e flow rate:		(ni/min or
		_	6-404	ulvial i	WHEL (GRO	AKLOI.	BENZ, N	aph.	L/min
SAMPLE BOTT		ED;	1-250	nie poly -	-Gultates	21 1 HAI	ber hi	PO/RRO	
			1-250	rul w/HN	Actual sample Actual sample wither (Erro - Sultates 103 - Metails	2) 1 HAN AKIOZ	AK (03	(*	1
SAMPLING PER	SONNEL		· -···						
Name: 2.5		SKV			Company:	ASCON	<u> </u>		
		•			Company.				
	-								

CLIENT: B	vistol								138
CLIENT: B LOCATION: PROJECT #:	NE Cap 1264	2.20	D	ENTER	WELL LOCAT	ON:	70	OMWO	4 5520
INSPECTION Label on well? Is reference mar Condition of well Weather: Notes:	-)ew- 6		NO Star Any	ap locked? nding water preser indication of surfa Femperature:		rell?	YES YES	
STATIC WATER Date: 815	•		PURGING	AMIPM					
	~								
Depth to Water: Length of Well:		.33			isured with: ontamination:	ELECTRONIC PRE STEAM C		CHALK & STEEL	OTHER
WELL PURGING Date: 8/5	109	End T		0915 AM			E STEAM CL	Hic, 12 EANED DIW	
9.71		ngth of well			Yield:		HIGH	LOW	
7.33		lepth to wate		rge start)	If low, rec	overy time:	Purged	dryCl	
1.38		ength of wat					e e 15	190	
<u>.67</u> Gailo		conversion fa 3 casing volu		0.49		ume purged: rge flow rate:	•<	2 gallor 00 ml/ml	
	ell vai			for necos	very and	1757		L/min	
	Cui Val	any,		the second s	chocow			L71101	
Time	Volume	Depth to	pH	Conductivity	Turbidity	D.O.	Temp	ORP	Ferrous
	(galions)	Water	(SU)	(umhos/cm)	(NTU)	(mg/L)	(°C)		Iron
		(feet)							(mg/L)
		<0.33'	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 5º	+/- 10 mV	
Start: 0915	Inchal			0.236	NT	9.98	4.1	168	N/A
0948	1.0	9.00	5.71	0.UB		12.28	3.64	189	
1000	1.5	ck to	5.23	0,210	and to	13.01	4.13	189.8	N/A
1500	1.0	1.55	<u>vella</u> 594	0.179	overy to	Sampl 9.65		187.4	NÝA . NVA
,	1.00		0-14		10.0	(143	0,61	60 Co7	N/A N/A
-	<u> </u>	•••							N/A
·						<u> </u>			N/A
									N/A
									N/A
Final:									N∕A
SAMPLE COLLE Date: 8[5]			Time:/500	AM/PM	Method: 🦻	evistali	Lic, sc	low of	
Appearance of S	Sample:	yello	wish 2-11th	were pre	Method: <u>P</u> Actual sample Switter t	flow rate:	3 IRLO A	KIOZ/AC	n/min or (QBain
SAMPLE BOTTI		ED:	1-250	me poly	1 BANOZ to	netal	ls.		
SAMPLING PER	SONNEL		0-4	out vial	spresw/a	KL 800	- allo	ALLOL, B	many to have
Nome: K.	schlos	ser	_		Company:	15con	-		gorden

:

CLIENT: B LOCATION: PROJECT #:	NE Cap 112642	pe f sc 20	_ P.lot	ENTER	WELL LOCAT	ION:	<u>Acow</u>	Wos	
INSPECTION Label on well? Is reference mar Condition of well Weather: Notes:	: <u>A</u>	ew (YES YES	NO Star Any	ap locked? Iding water prese Indication of surfa Temperature:		vell?	YES YES YES	2(2) E)
STATIC WATER	LEVEL JUS) PURGING Time: つうべ						
Length to Water:	3,0				sured with: ontemination:	ELECTRONIC PRE STEAM		CHALK & STEEL DI WATER	TAPE OTHER
WELL PURGING	0 8/4/0	End T		355 AM(AM/	-		RE STEAM CL	\sim) (ATER OTHER
CALCULATION OF 3		mes ength of well			Yield:		HIGH	LOW)	opping
3.80		lepth to wate		rge start)	if low, red	covery time:			
570		length of wat		0.0.40	8 atu - 1		\sim	, 3 gallo	
2 <u>,79</u> Gallo		conversion fa				lume purged: Irge flow rate:		, フ gallor ひいし ml/m	1
Notes: Very (ow	Abw - YS	viple # 1	BANCME Hurough	acted to	on Actual pl のタルCMの >y sun	C GW04		L/mir	
Time	Volume	Depth to	pН	Conductivity	Turbidity	D.O.	Temp	ORP	Ferrous
	(gallons)	Water	(SU)	(umhos/cm)	(NTU)	(mg/L)	(°C)		Iron
	TOTAL	(feet)							(៣g/Լ)
1350	(Running)	<0.33'	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/~ 5°	+/- 10 mV	<u> </u>
Start: 1410	5.5	7.03	5.(5	0,196	3(7.1	0.64	B.(7	201.4	N/A
1410 13.50	2.5	299	5.15	0.194	182,6	0.75	9.50	197.3	N/A N/A
1440 +++++>	1	3.50	<u>5.12</u> 5:14	0.192	14.9	3.05	10.28	201.0	N/A N/A
1525	6.2-	4.00	5.16	0.192	12.9	\$3.07	11.04	206,3	N/A
(535	7,1	74,00	5.15	D,192	LT.,	4.415	9,72	Z10.5-	N/A
						,	1.1.		N/A
							-		N/A
									N/A
									N/A
Final:									N/A
SAMPLE COLLE Date: 814			Time: 1545	AMIPM	Method: <u>A</u>	Vini Ly	shoon	w/cont	4001
Appearance of S	ample:	Clear				le flow rate:		× ·	nl/min oʻr
				• • • • •					J. Mar
SAMPLE BOTTL	E COLLECT	ED: _	6 - 40 m2 <u>2 - 11 + 1</u> 1 1 - 250 i	viais w/t <u>mov w</u> /H ne pory fo	tel for Car el for Dire or Sulfastes	20 MC101, 1 D/RRO AK 1-250 ml	Sensehe SOZ/AK WINITric	Naphane 103 tor meta	۱/۳۱۵ (
SAMPLE BOTTL SAMPLING PER Name: R.S.L		ĒD:	2-11+ AI 1 - 2501	what's w/t miser w/ H wh pory fo	+CL for Car CL for Dire or Sulfartes Company:	1-250 MK	Senzene 102/AK winitic	Napheone 103 tor meta	L'min

CLIENT: 82 LOCATION: 1 PROJECT #:	NECAP	E ST.LA 20 IS	Wence LAND	ENTER	WELL LOCAT	ION:	Icon	WBB	
INSPECTION Label on well? Is reference mar Condition of well Weather: Notes:		ood n ndy	TES TES Lewly C	NO Stan	p locked? ding water preser indication of surfa emperature:		ell?	(YES)	NO NO NO
STATIC WATER Date: 8/5	-	-	PURGING						
Depth to Water. Length of Well:	4.0				sured with: ontamination:	ELECTRONIC PRE STEAM C		CHALK & STEEL	ape Other
WELL PURGING Date: 8/5		Begin End 1		0915 AM			E STEAM CLI	EANED DIWA	JER OTHER
CALCULATION OF 3		MES Ength of well			Yīeld:	^	Lew Yo HIGH	low	-
4.03		lepth to wate	er (before pu	rge start)		overy time:	24	HES	
5.17	ft =	length of wat	er column			-		,	
2.6 gals	<u>X</u>	conversion fa	actor (2" well) 0,49	Actual vol	lume purged:		gallor	is I
Gallo	ns =	3 casing volu	mes		Actual pu	rge flow rate:		ml/mi	nor
Notes:	_	Ample	tt. Ol	Anchoc	GWD8		_	L/min	ł
		•		,			,	,,	
Time	Volume	Depth to	pН	Conductivity	Turbidity	D.O.	Temp	ORP	Ferrous
	(gallons)	Water	(SU)	(umhos/cm)	(NTU)	(mg/L)	(°C)		Iron
		(feet)							(mg/L)
		< 0.33'	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 5°	+/- 10 mV	
Start: 0915	Intial	AST .	5.92	0.169	NT	221	5.26	119	N/A
0945			5.86	0.161	1	8.6	5.78	172	N/A
1005	2.0	-1	6.00	0.170		7-60	4.53	176	N/A N/A
	SDR		6.0	0.178			5.24	1740	N/A N/A
1030	et(pu	imedo	Ant	Sample	datter	Vecon	0 10 1		N/A
- u	eripu	rga a	reg -	erange	all all 100	VELUU			N/A
1600	1.0	6.98	5.94	0,179	13.5	9.65	5.24	148.1	N/A
	1.0					1000			N/A
									N/A
Final:									N/A
SAMPLE COLLE				I					
Date: 63/5		÷	Time: 160	DAMPM	Method:	OD DUMAN	Dest	stall	2
Cale. C/C	1-1		Tighte, et	2 7 6401 141	Mediod.	co purity	-		
Appearance of S	ample.	Shot.	11 lows	funt	Actual sample	e flow rate:	15	0	Vmin or
			1-2	50 ml poly.	sulfates 1		of H-Nos	For metal	
SAMPLE BOTTL	E COLLECT	ED:	6-4	10 me vials	w/HCL - GR	O PROAK	al, Der	rzene, Ng	Aplan
		_	2-	1 1t Ambre	- eniliter	Loy GRO/1	RRO LK	102/4Kic	50
									1 Mar 1
SAMPLING PER	SONNEL					٨			2
Name:	1 8 8	sev			Company:	ABRON			

CLIENT: B LOCATION: PROJECT #:	NECA NECA 112642	PE 1.20		ENTER	WELL LOCAT	TION:	_IC	OMUE)7
INSPECTION Label on well? Is reference man Condition of well Weather: Notes:		bood	$ \rightarrow $	NO Stan Any	p locked? ding water prese indication of surf emperature:		vell?	YES YES YES 140°	202
STATIC WATER Date: 4 Depth to Water: Length of Well:	5 09) PURGING Time:		sured with:	ELECTRONIC PRE STEAM (CHALK & STEEL D! WATER	TAPE
WELL PURGING Date:	5 (09) Casing volu	End T		<u>020</u> амл <u>130</u> амл			RE STEAM OLE		Control ATER OTHER
5.68 3.92 ~2.5gd/1	ftd ft = 1 7NGx	lepth to wate length of wat conversion fa	er column actor (2° well		If low, re Actual ve	covery time: olume purged:	нісн (
Gallo Notes:	Sample	acasing volu	MOC.GU	v06 \$ 09	NCMOCG	urge flow rate: WOL MS		<u>(0</u> −0 m)/m L/mir	4
Time	Volume (gallons) Running Total	Depth to Water (feet)	рН (SU)	Conductivity (umhos/cm)	Turbidīty (NTU)	D.O. (mg/L)	Temp (°C)	ORP	Ferrous Iron (mg/L)
Start: 1000	.5	<0.33' 5,78	+1-0.1	+1-3% 0.257	+1-10%	+1-10%	+1-5° Z96	+/-10 mV 156.6	N/A
1035	1	5.91	5.65	1.257	31.1	0.71	290	108	N/A
1045	2.5	5.82	5.6%	0.763	10.6	131	2-55	95.0	N/A
1055	5.5	5.92	5.10	0.266	7.1	0.19	3-19	83.4	N/A
1105	6.5	57.92	5-72	0.267	4.8	0.41	4.23	76.0	N/A
1115	7.5	5,92	5.73	0.2.68	14.3	0.27	4.52	71.5	N/A
1125	8.5	5.92	5.73	0.263	3.6	0.31	4.33	68.8	N/A
									N/A
									N/A
						-			N/A
Final:			37	22301					NA
SAMPLE COLLE Date: \$14	CTION	194	Time: /[3		Method:	Mine Typ	ove w	control	ller.
Appearance of S	- alle	For	w tint	0	mericele	le flow rate:	RO. Boy	17. Nach	
SAMPLE BOTTL	E COLLECT	ED: 2000	ve 7			10 10 1	mew 21	102 -	majane
		MS/W	SD	1=29	t Amber is to all poly	w/HND?	For Ne	stals	

1

Day 3 Post-ISCO Sampling Forms

									19
CLIENT: S LOCATION: PROJECT #:	N, E. C N, E. C 1 (264	APE 2.20		ENTER	WELL LOCAT	ion:	TCON	1W02	
INSPECTION Label on well? Is reference mark Condition of well Weather: Notes:	() Sam		the second se	NO Star Any <u>Him</u> Air 7 Gui 19. + 1	ap locked? doing water preser indication of surfa remperature: $4 \cap C$ \oplus $3 -2$	ce nuclific w	rell? rache @ E	YES YES 55-63	NO NO NO
STATIC WATER Date: 8 / 6	. /		Time 130	S AMPIN Mea	sured with: ontamination:	ELECTRONIC PRE STEAM		CHALK & STEEL	
WELL PURGING Date: 816	12009	End 7	Time:	1315 1350 AM	and the second se		ini Typ Resteam CLI		Flan Cant
CALCULATION OF 3 8.44 4.67	ft Le ft(ft =	ength of well lepth to wate length of wat	er column			overy time:	HIGH	LOW	and the second second
Gallo	ns = 	11ing 6	imes Vizl Vorts	14.0 60 14	Actual put in Septer 45 + - 7 g	r. 110mscf		Limit	indr I Wyse
Time	Volume (gallons)	Depth to Water (feet) <0.33	рН (SU) +/- 0.1	Conductivity (umhos/cm) +/- 3%	Turbidity (NTU) +/- 10%	D.O. (mg/L) +/- 10%	Temp (°C) +/- ວົ°	ORP +/- 10 mV	Ferrous Iron (mg/L)
Start: 1315 1327 1337 1337		448 81 49.54 4.48 4.48 4.48	3 ¥5 4 14 4 50	1.237 1.100 0.987	34.70 32.78 33.61	3.20	9.33 9.11 9.22	193 157 127	<u>N/A</u> N/A N/A N/A
1340 1344 1347 1387 1380		4,95	4.60 4.86 4.97 5,02	0.927 0.899 0.880 0.876	33,80 52,60 34,70 34,41	(.55 1.50 1,42	9:00 9:23 9:23 9:23 9:43	45 120 96.9 93.7 91.6	N/A N/A N/A
Finel:									N/A N/A
Date: 8/16 Appearance of S	ample:	chea	~		Method: <u>M</u>			iont	Umín pr Limín
SAMPLE BOTTL SAMPLING PER Name: Lanc	SONNEL			<u>Aurlaen</u> Hei Vo, <u>as</u> Hei	Company:				
	20.1		<u> </u>		company: 1				

LOCATION:	N.E. C 11264	APE		ENTER	WELLLOCAT	ion:	TCON	w03	
INSPECTION Label on well? Is reference mark Condition of well: Weather: Notes:	r	60000 200, 51	ES WWW 11	NO Star Any , () A L A Air 7	ap locked? Iding water presen Indication of surfa Temperature: 3 j AAP 8/	ម ល កិចពារ។ ១ ០ន	වේ?	YES YES 50°-6	NO NO NO NO
STATIC WATER		T PRIOR TO		-					
Depth to Water. Length of Well		3.12 9.50			sured with: ontamination:	PRE STEAM		CHALK & STEEL	
WELL PURGING Date: <u>8</u> 10		Begin End T		052 (iii) AM		Equipment <u>M</u> nination: Pr	E STEAM CLE		Flow Cont
CALCULATION OF 3 9.50 3.12	ft Le ft <u>-d</u> ft ≃l	MES ngth of well lepth to wate ength of wate conversion fa	er column		Actual vo	overy time: Nume purged;	HIGH	LOW galjor	<u></u>
Gallor Notes:	ns =:	3 casing volu	mes 		. Actua) pu	irge flow rate:			
Time	Volume (gations) Mith	Depth to Water (feet) <0.33'	pH (SU) +/-0_1 / 0	Conductivity (umhos/cm)	Turbidity (NTU) +/- 10%	D.O. (mg/L) +/- 10%	Temp (°C) +/- 5°	ORP +/- 10 mV	Ferrous Iron (mg/L)
Start: 1052	Setti	my Flow	N 200	13t a m		is the	mi		N/A
(1041	1,360	4.03	1.680	14-4L	12.77	1.79	17.57	393.L	NIA
1(07	1696	4.03	1.69	41.48	10.07	1.57	1762	392.9	N/A
1110	2816	4.03	1.27	14.47	7.84	1.52	12.87	391.1	N/A
1173		4.07	1.73	14 46	4,94	1,34	17.93	341.7	N/A
1/12		4.0 7	1.73	14.44	10.03	1.25	14:06	312.6	N/A
1119		4.03	1.70	14.51	10.02	1,27	18.06	394.4	N/A
									NVA.
							ļ		N/A
									N/A
Final:									N/A
SAMPLE COLLE Date: 8/16/	CTION 39	7	Tme: 112.0	AMPM	Method: 👖	nmi Ty	phor	~~·	
Appearance of S	ample:	clear		A . <i>i</i>	_	le flow rate;	160	······································	Winip br L'mip
SAMPLE BOTTL		ED:	-1 Liter 40 mz	Harlaen HC	Rus AM	8/11/2004	1555 Er	ing lop 5 P	stree
SAMPLING PER	SONNEL_	REUS	5		Company:	AECOM			_ /

CLIENT: 8 LOCATION: PROJECT #:	N.E. (11264	2.20		ENTER	WELL LOCAT	ion:	ICON	uw04	
INSPECTION Label on well? Is reference mark Condition of well Weather: Notes:	C(0	Ge Ge udy tri NCMOG	nd 5-10m	NO Stan Any	p locked? ding water presen indication of sunfa iemperature:		ell?	(TES) YES YES 46 482	NO SO NO
STATIC WATER Date: 8/15 Depth to Water: Length of Well:	2009		D PURGING Time: मेर्टे 13पप्	Mea	sured with:			CHALK & STEEL	
WELL PURGING	$\frac{1}{2} \frac{2}{2} \frac{2}$	Begin End T IMES Ength of well length of wate conversion fa 3 casing volu	Time:	1354 ANG 1436 ANG Parged Drugestart) 10.49	Purging E Decontant Yield: If low, rec Actual vol	PRE STEAM C Equipment: <u>M</u> nination: PR covery time: covery time: lume purged: rge flow rate:	HIGH	COW Galio galio	ATER OTHER
Notes: Time	l Volume	Depth to	9,31 (F	Conductivity	Turbidīty	D.O.	- 12¢ Temp	ORP	Ferrous
يربا	(gallons) Mr L	Water (feet) <0.33'	(SU) +/-0.1	(umhos/am) +/- 3%	(NTU) +/- 10%	(mg/L) +/- 10%	(°C) +/- 5⁰	+/- 10 mV	Iron (mg/L)
Start: 1350 1464 1254	Intick	77,10	5.62	0.201	23,51	4,87	5,25	90,8	N/A N/A
1409	2500 2900	77.10	5,67	0.208	24,59	4.02	5.45	8518 89.6	N/A N/A
1417	2300	01,77 01.17	5.65	N.210 0:212	22,91	3,58	5,97	90.1 90.9	N/A N/A
1436	Pr:10 4200	to Sum,0	ie	well dry@	1435 1-	VUN FILL		iver m	N/A N/A
1625									N/A N/A
Final:									N/A
SAMPLE COLLE Date: 8	CTION 2009		Time: 1050	O ANTPM	Method: 🙌	ini Trob	100 / 10	w flow co	ande
Appearance of S	ample	clear		Amber Her VO.A's Her	Method: <u>M</u> Actual sample Pre R	e flow rate:	<i>j 00</i>	, (T	ນີ້ min or L'miń
SAMPLING PER Name: Lanc		REUS	5		Company: 1	AEcon			

CLIENT- Q		Ì			P	میں انسانیں میں میں	JLP &	117 697	120
CLIENT: R LOCATION: PROJECT #:	N.E. (2.20		ENTER	WELL LOCA		ICON	wo_	5
INSPECTION Label on well? Is reference man Condition of well Weather: Notes:	: <u>ک</u> : داه،	cod / Ner	VES ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	NO Star Any Air 	ap locked? nding water prese Indication of surf Cemperature:			YES YES VES VIC	NO NO NO NO NO NO NO NO NO NO NO NO NO N
Date: 8/15	- 2009 - 2009		Time: 8 19	AMPM)					
Depth to Water: Length of Well:		<u>3.87</u> 5.45			sured with: ontamination:	PRE STEAM		CHALK & STEEL	OTHER
WELL PURGING Date: $8/15$ CALCULATION OF 3	<u> ·ZCO9</u> B CASING VOLL	End 7		1 <u>ダンリ</u> AMA AMA		Equipment <u>M</u> mination: Pr	in: Typ RESTEAM CLI HIGH		Flow Coult
3.81	ft <u>- (</u> ft =	length to wate	er column		If low, re	covery time:		1	
Gallo Notes:		conversion fa 3 casing volu		1) U.49		olume purged: urge flow rate:	100	gallo: milim Umir	ja or
Time	Volume (gallons)	Depth to Water (feet) <0.33'	pH (SU) +/- 0.1	Conductivity (Umhos/cm) MSJ c.M +/- 3%	Turbidity (NTU) +/- 10%	D.O. (mg/L) +/- 10%	Теттр (°С) +/- 5°	ORP +/- 10 mV	Ferrous Iron (mg/L)
Start: 1974	Indich								N/A
1934	1000	4.41	1.76	18,92	66,65	10.50	14.41	4/1.6	N/A
1937		75.6	1.32	19.27	21.36	16.39	14.88	417.3 413.6	N/A N/A
1/47		75.6	1.30	19.08	15,76	14.38	14.89	410.9	NIA
1946		75.6	1.29	1706	12.57	14.65	14.82	411 5	
2020	- 710	5 Eillin	1. 406 41	12) had Ch	1 5				N/A N/A
			y von st	(C) Inter (N	<u> </u>				N/A
									NVA
Final:				1					N/A
SAMPLE COLLE Date: 8/15	ECTION 2009		Time 2157	AMATIN	Metho d:	ASN'TYPE	on & Los	· flow C	on frola
Appearance of S	semple:	Durk re	d			le flow rate:	80-1	<u></u> (1	nilmin or Limin
SAMPLE BOTTL				Nota's HEL		·			
SAMPLING PER <u>Name: ໄດ້ທ</u>	•	PREUS	>5		Company:	AEcon			

CLIENT: S LOCATION: PROJECT #:	N,E. C 11264	APE 2.20		ENTER	WELL LOCAT	ĩon:	ICON	1w06	, ,
INSPECTION Label on well? Is reference mark Condition of well: Weather: Notes:	(crew	Goud nd Fog W of Pum		NO Star Any Air T	ap locked? ading water prese Indication of sum remperature:	ace របរា០រិកី ថា v		YES YES 40-420	
STATIC WATER						Ď	gnemoc	Givia	
Date: Y/IS	12009	-	Time: 154	VAM/PM					
Depth to Water. Length of Well:		9.20 9.20	4.01	-	sured with: ontamination:	PRE STEAM		CHALK & STEEL OI WATER	TAPE OTHER
WELL PURGING	5							,	
Date: 8/15	12009	Begin	∏ිහාළ	1540 AM	M Purging E	Equipment <u>M</u>	in Typ	CON ELCON	Flow Cont
		End T	īme:	AM			RE STEAM CLI		ATER (OTHER)
CALCULATION OF 3	CASING VOLU	Mes							
9.20	ተ Le	ngth of well			Yield		HIGH	LOW	
<u> 4.C) </u>	ft <u>- d</u>	epth to wate	r (befora pu	rge start)	If low, red	covery time:			-
5,19	ft = 1	ength of wat	er column						
1.60	_X (conversion fa	ctor (2° wel	1) 0,49	Actual vo	iume purged:		gallo	ns:
Gallo		3 casing volu				nge flow rate:	,60	សាវ័កា	inor
Notes:		Clear,N	SUL DE	5 hat las	mel (olore	: ₂ ł.		បញ្ចារ	1
				· · · · ·	1			1	
Tîme	Volume	Depth to	pН	Conductivity	Turbidity	D.O.	Temp	ORP	Ferrous
	(galions)	Water	(SU)	(umhos/cm)	(NTU)	(mg/L)	(°C)		
		(feet)	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 5°	+/~ 10 mV	(mg/L)
	h	<0.33'			47- 1070	+/- 10%	7)- 3*	<i>∽r</i> ~ 10 mtv	N/A
Start: 1540 155°6	by v	5800	1 2 1	n: 5/614	In Oila	2 51	1.66	1116-	N/A N/A
155	1000.12	75.50	1,24	20,57	63.016	2.51	9,93	419.7	N/A N/A
1200	2200	75.50	1.12_	21.23	80:30	2,45	9.65	420.1	N/A
1405	2500	75.50	1.07	20.68	74,2	2.65	6, 24	423.9	N/A
1610	3000	75,50	[.01	20:60	76.0	3.47	8.23	423	N/A
								·	N/A
									N/A
									NVA
									N/A
Final: 161715		76.50	100	20,61	0-57	2.49	र्थ.२५	425	N/A
SAMPLE COLLE		202	O the	1000		_		I.	C
Date: 5/	18/09		īme:	AMPM	Method: 🏠	nini T	712 4 00	Ullow,	tion
	/) .	التل.	5,250			2	Cont	20 (2)
Appearance of S	ample:	Clean hu	wish v	· 22.	Actual sample	le flow rate:	100	ń	ານແຫຼນ ອາ
		,		4	2				៤រ៣ក្នែ
SAMPLE BOTTL	E COLLECT	ED:	-liter	Amber He	L Pac				
		6	TOME	VO,A'S HEL	Kes		_		
SAMPLING PER	-	`				Λ			
Name: Lano	26.	-REUS	<u>خ</u>		Company:	AECOM			
									1

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CLIENT: Bristol LOCATION: N.E. CAP PROJECT # 112642	РЕ .20	ENTER	R WELL LOCAT	ion:	ICON	NWO-]
Notes	A 40-55 A 40-55 ANCIMWGW	NO Stau Any Air	ap locked? nding water preser indication of sunfa Temperature: C .27		ell?	YES YES YES C) r · 5 0 th	20 20 20
STATIC WATER LEVEL JUGT P Date: 8/15/2009	RIOR TO PURGING Time:	AMIEM					-
Depth to Water. 57 Length of Well: <u> </u>	60 .60		isured with: contamination:	ELECTRONIC PRE STEAM C		CHALK & STEEL DI WATER	TAPE OTHER
WELL PURGING Date: <u>8/15/2009</u>	_ Begin Time: End Time:	145/ AM/ 1540 AM/	PM Purging E PM Decontarr		E STEAM CL		Flar Cont
$\frac{5 \cdot b \mathcal{O}}{4 \cdot \mathcal{O}} \text{ft} \frac{-\text{dept}}{\text{ft}} = \text{leng}$	h of well h to water (before pu th of water column			overy time:	HIGH		
Gallons = 3 ca	version factor (2 wel Ising volumes イローフィレン	Ŋ <u>0.49</u>		lume purged: rge flow rate:		gallo <u> m:1/m</u> :mlm mic for L/mir	inor
(galions)	epth to pH Nater (SU) (fest) <0.33' +/-0.1	Conductivity (umhos/cm) +/- 3%	Turbidity (NTU) +/- 10%	D.O. (mg/L) +/- 10%	Тетр (°С) ÷/- 5°	ORP +/- 10 mV	Ferrous Iron (mg/L)
Starte 12451 Jutich			1070	-7-1076	<u>+-</u> <u></u>	+- 10 IIIV	N/A
	5,70 6,55	01387	139	1.72	1:03	-56	N/A
1501 1000m2	5.72 6.36	0 1386	136	2173	3,60	-27	N/A
	5.75 6.53	0,410	59.34	1.66	1,39	-65	N∕∕A.
	.76 6.62	01415	33.64	1,52	4.17	-604	<u>N/A</u>
1515 2400mL 3	176 6.64	6.415	2131	1.43	11,12	-65.0	N/A
		 					N/A
1540 Sanplin 1800 Jaile	5 M. Hears	200 15110	Semalar M		. 1	Idasl	N/A N/A
due to position					<u>c alsca</u>	San	N/A
	(With Queen	icri, ug	r man nece	neer is a			/ N/A
		LGA		· _			
SAMPLE COLLECTION	Trace 144		N 1	2	Aini	Ficur	- '
Date: <u><u>k</u>/15/07</u>	Time: 1 52	TAMATINA -	Memod: W	INT TYPO	and La	N11000	
Appearance of Sample:	Class 1		Method: <u>M</u> Actual sample	e flow rate:	100-	it / min	
SAMPLE BOTTLE COLLECTED:	2-1 Liter 6- 70 mL	Amber He VOA'S HEL	- Price				L'min
SAMPLING PERSONNEL Name: LUNCEG.PR							

CLIENT: R LOCATION: PROJECT #:	N.E. C 11264	APE 2.20		ENTER	WELL LOCA	TON:	TCON	4008	
INSPECTION Label on well? Is reference man Condition of well Weather: Notes:	k visible? :	Exited (YES	NO Star	ap locked? Inding water prese Indication of surf Cemperature:		vell?	YES YES YES 45-52 th	NO NO
STATIC WATER	LEVEL JUS			AM/PM					
Depth to Water:	-;	,65 35		Mea	sured with: ontamination:	PRE STEAM		CHALK & STEEL	IAPE OTHER
WELL PURGING Date: <u><u>B</u>[15]</u>		Begir End	n Time:	AM/			RESTEAM CL	TOIN COIS	No. No.
CALCULATION OF 3 9.35 6.65 2.70	ft Le ft (mes angth of well lepth to wate length of wa		rge start)	Yield: If low, re	covery time:	HIGH	LOW	
<u>i, 30</u> Gallo Notes:		conversion fr	actor (2° well umes	<u>1) 0.49</u> ∽ MDC # Z	Actual of	blume purged; urge flow rate;		gallor <u>//n in ml/mi</u> in L/min	n or
Time -	Volume (galleris)	Depth to Water (fest)	рН (SU)	Conductivity (umhos/cm)	Turbidíty (NTU)	D.O. (mg/L)	qməT (°C)	ORP	Ferrous Iron (mg/L)
Start: 1365	540	<0.33'	+1-0.1 5.69	+1-3%	+1-10%	+1-10%	+1-5°	+/- 10 mV 89.9	N/A
1315		6,75	-5101			,,,,,	<u></u>	5	N/A
sett	Louis D	wear in	Le 80	mr mm.			_	1	N/A
1320	580	7.05	5.61	0_15_1	90,91	4,10	4.45	88.6	NHA
1325	980	7,20	5:70	01194	95.61	4121	5.11	E. 3	N/A
12:10	1350	9,20	5,71	0-196	90.10	17-8-71.2)	5,60	54.1	N/A
		WELL	berame		PmL/mm	with pu		D.	N/A
				a					N/A
1000									N/A
1025			ļ					<u> </u>	N/A
Final:									N/A
SAMPLE COLLE Date: 7/16 Appearance of S	2009	clea			M e thod: Actual samp	M, M; T;		think on	low to chan Dmin or
SAMPLE BOTTL		TED:)-111km	Ambaen HC VO.A'S HCL	C Prev 2M	f 8/16/200	9		L'min
SAMPLING PER		PREUS			Company	۸			

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CLIENT:	1075701
LOCATION:	N.E. CAPE
PROJECT #	112642.20

ENTER WELL LOCATION:

260

ICOMWOR

INSPECTION Label on well? NO is cap locked? NO is reference mark visible? NO Standing water present? NÒ) Givid NO Condition of well: Any indication of surface renoff in well? YES P.C. 45- 600 Weather. Clear to Air Temperature: 45-600 Notes: STATIC WATER LEVEL JUST PRIOR TO PURGING 8/15/2009 AMPM Date: Time: <u>6.89</u> 4.35 Depth to Water. Measured with: ELECTRONIC TAPE CHALK & STEEL TAPE Length of Well: Decontamination: PRE STEAM CLEANED DI WATER OTHER WELL PURGING Purging Equipment Mini Typern & Low Flow Date: 8/15/2009 Begin Time: AM/PM End Time: AM/PM Decontamination: OTHER PRE STEAM CLEANED CALCULATION OF 3 CASING VOLUMES 9.35 ft Length of well Yield: HIGH (LOW) 6,89 ft - depth to water (before purge start) If low, recovery time: 2.49 ft = length of water column 1,25 gallons 1,245 x conversion factor (2° well) 0.49 Actual volume purged: 225 Actual purge flow rate: Gallons = 3 casing volumes WELL HAS POOR RELOVERY, Durget Dry CLOW Flow Մարս Notes: Time Volume Depth to pН Conductivity Turbidity D.O. ORP Ferrous Temp Water (gallens) (SU) (umhos/cm) (NTU) (mg/L)(°C) Iron (feet) (mg/L)ML +/- 3% +/- 10% +/- 10% +/- 5° +/- 10 mV <0.33' +/-0.1 450 Start: 1955 5.76 6,118 1,92 2.7 239 0,500 6.99 N/A 0.111 440 3.20 777,2 N/A 7,46 5,69 2000 1625 1.45 1850 5.62 0.117 198. 8.01 250 6.82 4.13 N/A 2005 57 0.118 206 0.62 3010 3,475 9.50 5 186.5 NİA 4.06 69 181.6 4,00 190 0.56 4.5% 2015 5,100 **N/A** N/A WELL Durin FOLLOWIN ALL SAMPLE S LALELT -bay N/A N/A ŃA **N**VA Final: N/A SAMPLE COLLECTION Method: <u>Mini Typoont Low</u> Flow Control AMIPM Date: Time: SLIGHTLY TURBID. Appearance of Sample: Lmin 2-1 Liber Ander Her Pic SAMPLE BOTTLE COLLECTED; TOME VOA'S HEL RAS SAMPLING PERSONNEL . Name: LANCE G. PREUSS Company: AECON

Day 7 Post-ISCO Sampling Forms

CLIENT: NACE /BUSICOL LOCATION: NE LAPE AL PROJECT #:

TECMWOZ

INSPECTION									
Label on well?		~	YES	NO ls	s cap locked?				(NO_)
is reference mar		Ś	YES>		tanding water pres			(YES)	NO
Condition of wel	ا: <u>د</u>	, uu ii		A	ny indication of sur	face runoff in w	/ell?	YES	NO
Weather:	1.1.	cludy mit	140:40	Anta A	Ir Temperature:			c: 44 5	- 1
Notes:		1 1 1 1 - 12	c. 12 3		anthe A	21			
	091	ie moei		1. 1. I. I. I.		<u>//</u> (
STATIC WATER	LEVEL JUS	T PRIOR TO	D PURGING	92667	in indication of surface in the sur	103.			
Date: 8/14	12009	>	Time: 17:05	AM/PM	01-0				
	-1								
Depth to Water.		<u>4.73</u> 2.94		M	leasured with:	ELECTRONIC	TAPE	CHALK & STEEL	TAPE
Length of Well:		2.94		D	econtamination;	PRE STEAM			OTHER
						2000			
WELL PURGING	3								1.0000000
Date: 8/1		ා Benin	1 Time:	17.08 A	M/PM Purging	Equipment	mmin	haber	LOWFL
Date			Time:				E STEAM CL		ATER OTHER
CALCULATION OF	B CASING VOLU								A)ER OIHER
CALCOLATION OF		ength of well			Yield:		< HIGH	LOW	÷.
		0	er (before pu	irae start)		covery time:	(njjern	044	- 30
		length of wal		ige start	1104,10	covery line.			1
		•	actor (2" wel	1.0.40	Actual	olume purged:		!!-	
Qalia				1) 0.49			100	gallo	
Gallo	ins ≃.	3 casing volu	ames		Actual p	urge flow rate:		(ml/m	
Notes:								L/mh	ו
							1	,	
Time	Volume	Depth to	PH PH	Conductivity	-	D.O.	Тетр	ORP	Ferrous
	(gallons)	Water	(SU)	(umhos/cm) (NTU)	(mg/L)	(°C)		۱rọn
		(feet)		~S/cm					(mģ/Ľ)
		<0.33'	+/- 0.1	+/- 3%	+/~ 10%	+/- 10%	+1-50	+/- 10 mV	
Start: 17:00				1					N/A
17.18		4.95	3.70	2.927	14.74	1.48	8.74	184.1	N/A
17 21		5.00	3.82	2.675	16.76	1.32	2. 23	167.5	N/A
17.24		5.10	3.81	7. 569	11.15	1.05	8.54	170.9	N/A
11:27		5.05	3.02	2.246	9.25	1. 05	809	167.7	N/A
17:30		5.05	3, 85	2.83ÿ	8.53	0.96	6.17	1621	N/A
									N/A
									N/A
		с <i>и</i> 1							N/A
									N/A
Final:						_			N/A
SAMPLE COLLE	ECTION			•		1	•		
Date: 8/14	7/2009		Time: 17:3	S AM/PM	Method:	Min, typlas	s w/ Kw	Alex call	dian
<u> </u>	102 .				-	7f*		- IV- N - A	
Annearance of S	iample: 4.,	hid willing	brown ele	(())	Actual same	le flow rate:	100	1.	
Appearance of S	().	Here an end	por pray		, even damp			(Limin
SAMPLE BOTTL									
			-7) 1.1	L'OA HEL	-				
			~ / / . (- I-TUNEZ-	~				
SAMPLING PER									
					A	1 1 1 1 1			
Name: -},		NURWIL			Company:	AFCONT			

CLIENT: 2040E /6-024/ LOCATION: NE LAPE AK PROJECT #:

ENTER WELL LOCATION:

TCCMW03

INSPECTION			\sim						
Label on well?		\langle	YES	NO Is ca	p locked?				NO
Is reference mar	rk visible?	\leq	YES	NO Stan	iding water prese	nt?		YES	NO
Condition of well		000			Indication of surfa	ace runoff in v	vell?	YES <	NO
Weather:	~. t/2	1. 117 A.1	40.14 hy	In wind, Air T	emperature:			m.8 4 . ,	۲¢
Notes:		11 2010	a. 12	3 000	»# <u>17</u>				
	041	CINCLI		/ MCA		_			
STATIC WATER			D PURGING			· · · · · · ·	• • • • • • • •		
Date: 8/19	12000	}	Tíme://:/?	AM/PM					
									,
Depth to Water.	3	१. <i>५</i> ७		Mea	sured with: 🛛 <	ELECTRONIC	TAPE	CHALK & STEEL	TAPE
Length of Well:		9.50		Deco	ontamination;	PRE STEAM	CLEANED	DIWATER	OTHER >
									(
WELL PURGING	3								
Date: 8/	19/200	4 Begir	n Time:	/1: 20 AM	PM Purging E	Equipment	MiniT	4 phron	LOW FL
			Time: i	SISG AMA	•••			EANED DIW	Particular Colorest
CALCULATION OF 3	B GASING VOLL	IMES							- Jonist
	ft Le	ength of well			Yield:		CHIGH	LOW	
		Ç	er (before pu	rae start)	If low, red	overy time:			1
	-	length of wa		<u> </u>		···· , ·····			1
		-	actor (2" well	0.49	Actual vo	lume purged:		gallor	19
Gallo		3 casing vol				rge flow rate:	150		
Notes:	,ne Ş		11311/ t	5 Collection	le nuo	3		 1/min	
Notes.		Time		TD -	CANCINE	(L)7 \		Citat	1
Time	Volume	Depth to	pH	Conductivity	Turbidity	D.O.	Temp	ORP	Ferrous
1 mile	(gallons)	Water	(ຣບ)	(umhos/cm)	(NTU)	(mg/L)	(°C)	ORF	Iron
	(gaions)	(feet)	(00)	(unnoscin)	(1110)	(((())))			(mg/L)
		<0.33'	·+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 5°	+/- 10 mV	(ing/c)
Start: 13.20		-0.00			.,- 10,78				N/A
15 Jo	1	4. 81	1.62	9.940	7,90	1.25	14.60	347.4	N/A
13:33	}	4 91	162	9984	6.52	1.25	14.92	356.5	N/A
13:36		5.06	1.67	7.989	5,90	1.17	15.11	347.3	N/A
13 34		5,67	1.66	9.995	5,74	1,22	15.26	-351.4	N/A N/A
		5,13	1.68	9.166	5. 40	1.28	15.14	353.3	N/A
1342		7,15	1.62	7964	<u>, 70</u> 5. 83	1.24	15.19	35°0.2	N/A
			7.50	,,,,,,		1.61	12.11	55 - 2	N/A
,						-			N/A
						1			N/A
Pin-la			-					r	
Final:		J							N/A
SAMPLE COLLE Date: 8//	=CTION 9/3009		Time: 135	AMIPM	Method: _/	n.n. hach		h low fic	- inteles
Appearance of S	ample:	- ellsta i	emplele	~	Actual sampl	e flow rate:	150	(***	Umin pr
			·						Limite
SAMPLE BOTTI			to YUML	VOA NCL	Whenle id	lete!			Umin
Sample Bottl			<u>Е чём</u> 2 11:1	VOIA HEL	aninje ed Milane ed	lestel			Unin
SAMPLE BOTTL	E COLLECT		£ Yüm_ д) 1:1	VO: A HCL	estina con	ktel uchd			
SAMPLING PER	E COLLECT	TED; 24	£ Уймг д) 1:1	VO:4 HCL 4 Ambro					
SAMPLING PER	E COLLECT	TED; 24	£ ЧОм_ д) 1:1	Vois Her in Ambro	Dente col 145/200 col				

.

CLIENT: USACE (Bridge) LOCATION: NE CAPE, AK PROJECT #:

ENTER WELL LOCATION:

Teomwo4

INSPECTION									ī
Label on well?		C	YES	NO Isca	ap locked?			(YES)	NO
Is reference mar	k visible?	7	VE8		iding water prese	ent7		(YES)	NO
Condition of well	:			Any	indication of sur	ace runoff in w	valí?	YES	NO
Weather:				Air T	emperature:			~4 * F	(
Notes:		VE MOCO	- 1 - U						
	OGA	IC MOLL	= i U Z _		1 # 19	_			
STATIC WATER	LEVEL JUS	ST PRIOR TO	PURGING	i					
Date: 8/18	12000	· · ·	Time: 14: 43	5 AM/PM					
	·••						<u> </u>		
Depth to Water:		7.5		Mea	sured with;	ELECTRONIC	TAPE	CHALK & STEEL	TAPE
Length of Well:		9.70		Dec	ontamination:	PRE STEAM	CLEANED (DUWATER (QTHER>
								,	· ·
WELL PURGING		· · · · · · · · · · · · · · · · · · ·							,
Date: <u>8/1</u>	3/200	<u> </u>	Time:	14:48 AM	PM Purging I	Equipment	M.Tri -	Typharm	LOW FL
		End T	īme: (17:45 AM/	PM Decontar				ATER OTHER
CALCULATION OF 3	CASING VOL	MES		08/14/09					
	ft L	ength of well			Yield:		HIGH	COND	
	ft	depth to wate	r (before pu	rge start)	If low, re-	covery time:			,
	ft =	length of wat	er column						
	_x	conversion fa	ictor (2" wel	1) 0.49		olume purged:		gallo	ns _.
Gallo		3 casing volu				urge flow rate:	120		in or
Notes:	12	104 will (14			pour night.	and celle of-	Co-de-	Umir	n [:]
		in mor	ing of	08/19/09.	۵	20:40 D-10	v = 7	9844.	
Time	Volume	Depth to	́рН	Conductivity	Turbidity	D.O.	Тетр	ORP	Ferrous
	(gailons)	Water	(SU)	(umhos/cm)	(NTU)	(mg/L)	(°C)		Ιτοπ
		(feet)		(ms/cm)					(mg/L)
·		<0.33'	+/- 0.1	+/- 3%	+/- <u>10%</u>	+/- 10%	+/- 5°	<u>+/- 10 mV</u>	
Start: 14:48									N/A
14:58				0.18	18.27	5.35	4.35	107 2	N/A
17:01	<u> </u>	buton pourp		0.25	35 33	5.35	4.94	113.9	N/A
15 04		peros brund	5.9 <u>4</u>	0.212	39.44	4.96	4.54	115.6	N/A
								4	N/A
						-			<u>N/A</u>
									N/A
	-								N/A
									N/A
									N/A
Final:	<u> </u>			<u>.</u>			L		N/A
SAMPLE COLLE	CTION			C		1 .		λ /	, (
Date: 8 / 12	9/2009		Fime: 09:3	7 AM/PM	Method: <u>P</u>	in typhom	~·+4 (w 4/2 cm	trilic.
					b				
Appearance of S	ample:	+,	<u>~ 1.,4</u>		Actual samp	ie now rate:	[2		nVmin pr
		rr.m.	1 se	110. 1 11.1					nun n
SAMPLE BOTTL	E COLLEC	IED: <u>(</u>	5 YUML	VOA HEL					
			μ / <u>Π</u>	Li Hun an					
SAMPLING PER		1,			0	All XA-			
Name: Aw	on Under	»»» / Le	min Pi	enn	Company:	AECOM			
		(· · ·

CLIENT: USACE / Bristy LOCATION: NE CATE AF PROJECT #:

ENTER WELL LOCATION:

Tecnwoos

Label on walf? YES NO is cap locked? YES NO is reference mark visible? YES NO Standing water present? YES NO Condition of walt: g_{acd} NO Air Temperature: NO YES NO Westher: g_{acd} g_{acd} Air Temperature: NO YES NO STATIC WATER LEVEL. JUST PRIOR TO PURGING Date: g_{acd} MCR # 16 Static States month in well? YES NO Date: g_{acd} 2.007 Time: 13.12. MAIPM Measured with: Experiment: Air/ 2.007 Guard K a steel Tape Length of Welt: g_{acd} MAIPM Purging Equipment: Air/ 2.007 Guard K a steel Tape UPLL PURGING Date: g_{acd} AM/PM Purging Equipment: Air/ 2.007 Type I.000 Here: Type I.000 Here: <	INSPECTION											
Condition of well: $g_{01} + \frac{1}{2}$ Any indication of surface runoff in well? YES (NO) Westher: $M = M = M = M = M = M = M = M = M = M =$			\langle	YES	NO is ca	ap locked?			YES	NÔ		
Any indication of surface runoff in well? YES (NQ) Weather: Any indication of surface runoff in well? YES (NQ) Only Concerned and the presentation of surface runoff in well? YES (NQ) STATIC WARTER LEVEL. JUST PRIOR TO PURSING Date: $$//4/$ ONLE REVEL. JUST PRIOR TO PURSING Date: $$//4/$ ONLE REVEL. JUST PRIOR TO PURSING Date: $$//4/$ ONLE REVEL. JUST PRIOR TO PURSING Depth to Water: $$/252$ Measured with: Electrowic Tage Onlack & streme trape Depth to Water: $$/252$ Measured with: Electrowic Tage Onlack & streme trape Depth to Water: $$/252$ Measure onlack & streme trape Onlack & streme trape Depth to water (before purgo start) If flow, recovery time: If low, re	Is reference mar	rk visible?	\subset	YES	NO Star	Ming water pres	ent?	C	YES	NO		
GANC (MOLE IN 2 3	Condition of well	l;	Gast		Any	indication of sur	face runoff in w	/ell?	and a second of the second of	(NO)		
GANC (MOLE IN 2 3		Mr. H	y (1.1. 1.1	423 F 415	Air T	emperature:			mil 40 4			
STATIC WATER LEVEL JUST PRIOR TO PURGING Dept: 5/12 Measured with: Electronic Twee Chark's street Twee Dept: 10 Water: 5/62 Chark's street Twee Length of Well: 9/45 Chark's street Twee Dept: 10 Water: 10/27 AMMPM WELL PURGING Chark's street Twee Dept: 10 Water Chark's street Twee Measured with: Electronic Twee Chark's street Twee WELL PURGING Dept: 10 Water Colspan="2">Chark's street Twee MULL PURGING The Length of well Measured with: Electronic Twee Chark's street Twee The Length of well files/ repurpostart) File on the Water Column The Longth of well (before purgo start) If fow, recovery time: If 10w, recovery time: If 10w	1		······································	~		att- 16						
Date: $\$/19/2.009$ Time: 1932 AM/PM Depth to Water: 5.62 Measured with: Electronic Twest Chalk & street Twest Length of Welt: 9.45 Decontamination: FRE STEAM CLEANED Diverted Other K & street Twest WELL PURGING 9.45 Begin Time: $1/37$ AM/PM Purging Equipment: $A1.7h$ $T_{IP, h, construction} FRE FRE CALCULATION OF 3 CASING VICLUMES End Time: 1/12.7 AM/PM Decontamination: PRE STEAM CLEANED Diverted FRE CALCULATION OF 3 CASING VICLUMES End Time: 1/12.7 AM/PM Decontamination: PRE STEAM CLEANED Diverter FRE CALCULATION OF 3 CASING VICLUMES End Time: 1/12.7 AM/PM Decontamination: PRE STEAM CLEANED Diverter FRE CALCULATION OF 3 CASING VICLUMES End Time: 1/12.7 AM/PM Decontamination: PRE STEAM CLEANED Diverter FRE CALCULATION OF 3 CASING VICLUMES K If Now recovery time: minimit of the vice for $		OGA	ic moce		MO		_					
Depth to Water: 5.62 Measured with: Electronic Tag Chauk & STEEL TAPE Length of Welt 2.45 Decontamination: PRE STEAM CLEANED CHAUK & STEEL TAPE WELL PURGING Date: 5.42 AM/PM Purging Equipment $4n/7n$ $T_{S,p,h}$ $bc.r.FL$ WELL PURGING End Time: $11.2.7$ AM/PM Decontamination: PRE STEAM CLEANED Diverted $cl.r.FL$ CALCULATION OF 3 CASING VOLUMES End Time: $11.2.7$ AM/PM Decontamination: PRE STEAM CLEANED Diverted $cl.r.FL$ CALCULATION OF 3 CASING VOLUMES End Time: $11.2.7$ AM/PM Decontamination: PRE STEAM CLEANED Diverted $cl.r.FL$ CALCULATION OF 3 CASING VOLUMES End Time: $11.2.7$ AM/PM Decontamination: PRE STEAM CLEANED Diverted $cl.r.FL$ CALCULATION OF 3 CASING VOLUMES Conductivity Yield: $vii:Gh cl.r.FL cl.r.FL R = length of welf Pre outputs Actual volume purged: galons minin or vii:Gh vi:Gh vi:Gh vi:Gh vi:Gh vi:Gh $) PURGING))							
Length of Welt 9.45 Decontamination: PRESTRANCIENCE Diverter OTHER WELL PURGING Date: 9.19.3009 Begin Time: 1/37 AM/PM Purging Equipment M37.71 Top h construction FL WELL PURGING Date: 9.19.409 Begin Time: 1/100 AM/PM Decontamination: PRE STRANCIENCE Diverter FL Calculation of 3 Casing Volumes ft Length of well Vield: Yield: Yield: Yield: gatons ft Length of well Vield: Yield: Yield: gatons gatons Gallons = 3 casing volumes Actual volume purged: gatons gatons Notes:	Date: 8/19	12009)	Time: 1632	L AM/PM							
Length of Welt 9.45 Decontamination: PRESTRANCIENCE Diverter OTHER WELL PURGING Date: 9.19.3009 Begin Time: 1/37 AM/PM Purging Equipment M37.71 Top h construction FL WELL PURGING Date: 9.19.409 Begin Time: 1/100 AM/PM Decontamination: PRE STRANCIENCE Diverter FL Calculation of 3 Casing Volumes ft Length of well Vield: Yield: Yield: Yield: gatons ft Length of well Vield: Yield: Yield: gatons gatons Gallons = 3 casing volumes Actual volume purged: gatons gatons Notes:		- (
WELL PURGING Date: S/19 J.2009 Begin Time: 1/34 AM/PM AM/PM Purging Equipment: M.7.7: Tip h son Low FL Calculation of 3 CASING Volumes End Time: 1/124 AM/PM Docontamination: Press TRAN CLEANED Diverse Ones: Diverse Ones: Diverse Ones: Diverse Ones: Diverse Ones: gatons min - depth to water (before purgo start) ft - depth to water (before purgo start) If low, recovery time: gatons min x conversion factor (2" well) 0.49 Actual purge flow rate: gatons minin or Notes: Umin Dopin to pH Conductivity Turbidity D.0. Temp ORP Ferious file yournes Weter (SU) (umhos/cm) (NTU) (mgl.) (*C) If my MA 11:me Volume* Depth to pH Conductivity Turbidity D.0. Temp ORP Ferious fron (mgl.) (*G) If my If my If my If my If my If my If my <td< td=""><td>Depth to Water.</td><td>5</td><td>5.02</td><td></td><td>Mea</td><td>sured with:</td><td>ELECTRONK</td><td>TAPE</td><td>CHALK & STEEL</td><td>TAPE</td></td<>	Depth to Water.	5	5.02		Mea	sured with:	ELECTRONK	TAPE	CHALK & STEEL	TAPE		
Date: $\frac{9}{19}/19/2009$ Begin Time: $\frac{1934}{11.27}$ AM/PM Purging Equipment: $An:7ni T_{3} ph core Low FL Calculation or 3 casine volumes ft Length of well Time: 11.27 AM/PM Decontamination: PRE stream cleaned Division FL Low FL ft Length of well Yield: Yield: Yield: Yield: gallons gallons = 3 casing volumes Actual volume purged: gallons gallons gallons Notes: $	Length of Well:	5	.45		Deca	ontamination:	PRE STEAM	CLEANED	DIWATER	OTHER :		
Date: $\frac{9}{19}/19/2009$ Begin Time: $\frac{1034}{11.27}$ AM/PM Purging Equipment: $\frac{M_17ni}{17}$ $\frac{7}{19}$ $1000000000000000000000000000000000000$					<u>.</u>							
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	WELL PURGING	Э,								1		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Date: <u> </u>	1 <u>9 / 200</u>	<u>් B</u> egin	Time:	1034 AM/		Equipment _	m.ni -	Typhion	ILUN FL		
ftLength of wellYield: μ_{IIGH}^{-1} LOWft- depth to water (before purge start)if low, recovery time:ft= length of water columnx conversion factor (2' well) 0.49Actual volume purged: Actual purge flow rate:gallonsGallons= 3 casing volumesActual purge flow rate:milmin or UminNotes:		-	End 1	lime:	<u>1/127</u> АМЛ	PM Deconta	mination: Pr	RE SYEAM CL	EANED DIW	ATER OTHER		
\vec{t} - depth to water (before purge start)If low, recovery time: \vec{t} = length of water columnx conversion factor (2" well) 0.49Actual volume purged:gatonsGaltons= 3 casing volumesActual purge flow rate:multimin orNotes:UminDepth to (gatters)pH (Gst)Conductivity (umhos/cm)Turbidity 	CALCULATION OF S											
R= length of water column x conversion factor (2" well) 0.49Actual volume purged: milmin or JuminGallons= 3 casing volumesActual volume purged: milmin or JuminTimeVolumepettonsTimeVolumeORPFerrous Irion (mgl.)TimeVolumeORPFerrous Irion (mgl.)TimeVolumeORPFerrous Irion (mgl.)TimeVolumeORPFerrous Irion (mgl.)VolumeUmmin or JuminVolumeORPFerrous Irion (mgl.)VolumeORPFerrous Irion (mgl.)VolumeORPFerrous Irion (mgl.)VolumeORPFerrous Irion (mgl.)VolumeVolumeJuminVolumeORPFerrous Irion (mgl.)VolumeVolumeVolumeVolumeVolumeVolumeActual volume purged: Actual sampleActual volume purged: Actual sampleVolumeActual volume <th <="" colspan="2" td=""><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td>ભાલમ</td><td>LOW</td><td></td></th>	<td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td>ભાલમ</td> <td>LOW</td> <td></td>				-					ભાલમ	LOW	
Actual volume purged:galonsGalonsactual volume purged:galonsMotes:milmin orUnitsMotes:galonsTimeDepth topHConductivityTurbidityD.O.TempORPFeriousTimeMeter(SU)(umhos/cm)(NUU)(mg/L)Time(feet)Notes:UmilianTimeMeter(SU)ConductivityTurbidityD.O.TempORPFeriousImilianNotes:UmilianORPFeriousImilianORPFeriousImilianORPFeriousImilianN/AImilianORPFeriousImilianORPFeriousImilianORPFeriousImilianORPrintImilianORORImilianOROR <th col<="" td=""><td></td><td></td><td></td><td></td><td>urge start)</td><td>if low, re</td><td>covery time:</td><td></td><td></td><td>1</td></th>	<td></td> <td></td> <td></td> <td></td> <td>urge start)</td> <td>if low, re</td> <td>covery time:</td> <td></td> <td></td> <td>1</td>					urge start)	if low, re	covery time:			1	
Gallons= 3 casing volumesActual purge flow rate:Notes:Imitim orTimeVolumeDepth to (gallens)pH (SU)Conductivity (umhos/cm)Turbidity (NTU)D.O. (mg/L)Temp (°C)ORP (°C)Ferrous fron (mg/L)Start://2//2(feet) (feet)-/-01+/-04+/-10% (NTU)+/-50+/-10 mVStart://2 //2//2//2//2//2//2N/A//2//2//2//2//2//2N/A//2//2//2//2//2//2N/A//2//2//2//2//2//2N/A//2//2//2//2//2//2N/A//2//2//2//2//2//2N/A//2//2//2//2//2//2N/A//2//2//2//2//2//2N/A//2//2//2//2//2//2//2N/A//2//2//2//2//2//2//2N/A//2//2//2//2//2//2//2//2//2//2//2 <th 2<="" th="">//2<</th>	//2<			-							e T	
Notes:JminTimeVolumitsDepth to (gallens)pH (SU)Conductivity (umhos/cm)Turbidity 					11) 0.49				¥			
TimeVolume (gallens) $L^{+}(c)$ Depth to (SU)pH (SU)Conductivity (umhos/cm)Turbidity (NTU)D.O. (mgL)Temp (°C)ORPFerrous Iron (mg/L)start: /63Y(feet) $L^{+}(c)$ (GU)(umhos/cm)(NTU)(mg/L)(°C)N/Astart: /63Y(GU)(Umhos/cm)(NTU)(mg/L)(°C)N/A/c/4713*5.031/-0.11/-3%1/-10%+/-5%+/-10mV/c/4713*5.031/-4715.872/-35%1/-961/-2838).1N/A/c/4713*5.731/-4%15.9736.371/-2611.1%7/26.0N/A/c5%855.771/-4%15.9736.371/-2611.1%7/26.0N/A/c5%855.761.5116.1135.6111/1.7231.3%3/-66N/A/c5%855.761.9416.4033.551/4.5%11.7570.5%N/A/c5%855.661.9416.4033.551/4.5%11.7570.5%N/A/c5%865.661.9416.4033.551/4.5%11.7570.5%N/A/c5%1.941.00AM/PMMethod:1/2.5%1.5%1.5%N/A/c5%1.941.00AM/PMMethod:1/2.5%1.5%1.5%1.5%/c5%1.941.961.9%1.5%1.5%1.5%1.5%1.5%		ons =	3 casing volu	umes		Actual p	urge flow rate:			19		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Notes:						·		17uli			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $												
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Time	-		-	-	-			ORP			
$L_{1/2}$ (reel) $+/-0.1$ $+/-3\%$ $+/-10\%$ $+/-5\%$ $+/-10W$ $+/-5\%$ $+/-10W$ Start: $/0.33$ -0.33 1.47 $15.\%7$ $4/3.5\%$ $1/.96$ $1/.24$ 3% $1/.24$ 3% $1/.24$ 3% $1/.90$ $1/.24$ 3% $1/.90$ $1/.24$ 3% $1/.90$ $1/.24$ 3% $1/.90$ $1/.24$ 3% $1/.90$ $1/.24$ 3% $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$ $1/.90$				(50)	(umnos/cm)	(1110)	(mg/L)	(*C)		ŗ		
Start: $/(3)^{1}$ N/A N/A $/(47)$ 13^{1} $5, 0^{1}_{1}$ 1.47 15.87 $4/3.5^{1}_{1}$ $1/96$ $1/.24$ 3^{1}_{2} 1.19 $7/3^{1}_{2}$ 1.47 15.87 $4/3.5^{1}_{2}$ $1/96$ $1/.24$ 3^{1}_{2} 1.19 $7/3^{1}_{2}$ 1.19 $7/3^{1}_{2}$ 1.47 15.87 $4/3.5^{1}_{2}$ 1.19 $7/3^{1}_{2}$ 1.19 $7/3^{1}_{2}$ 1.19 $7/3^{1}_{2}$ 1.19 $7/3^{1}_{2}$ 1.19 $7/3^{1}_{2}$ 1.19 $7/3^{1}_{2}$ 1.19 $7/3^{1}_{2}$ 1.19 $7/3^{1}_{2}$ 1.19 $7/3^{1}_{2}$ 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2} 1.19^{1}_{2}		FA16		J/ 01	T/ 304	41. 100%	+/ 17194	J (50	+(10 m)/	(mg/L)		
$/ \sqrt{4Y}$ 32° $5.\sqrt{8}$ 1.47 $15.\sqrt{87}$ $4/3.58^{\circ}$ 11.96° 11.28° 281.1 N/A 1647 13° 5.73 1.48° 15.97 36.37 12.96° 11.18° 778.0° N/A 165° 85° 5.77° 1.49° 15.97° 35.97° 14.28° 11.23° 370.6° N/A 145° 85° 5.76° 1.51° 16.10° 35.61° 14.28° 11.73° 370.6° N/A 145° 85° 5.76° 1.51° 16.10° 35.61° 14.58° 11.73° 36.5° N/A 145° 85° 5.66° 1.49° 33.55° 14.58° 11.73° 365° N/A 145° 85° 5.66° 1.49° 16.45° 11.73° 365° N/A 145° 85° 5.66° 1.49° 17.5° N/A N/A SAMPLE COLLEC	Start IAiy	mc/m/n	~0.00	·/- u ·		(7- 1070	11-1070	./- 0	17- 101110	ΝίζΑ		
$i \downarrow 47$ 13 5.73 1.42 15.97 56.37 17.96 11.19 778.0 N/A $i \downarrow 550$ 85 5.77 1.449 15.99 35.97 14.28 11.25 370.6 N/A $i \downarrow 550$ 85 5.76 1.51 16.11 35.61 11.77 36.37 N/A $i \downarrow 56$ 85 5.76 1.51 16.11 35.61 11.77 76.57 N/A $i \downarrow 56$ 85 5.76 1.48 16.79 33.55 14.56 11.75 76.57 N/A $i \downarrow 56$ 85 5.76 1.48 16.79 33.55 14.56 11.75 76.57 N/A $i \downarrow 56$ 85 5.76 1.48 16.79 33.55 14.56 11.75 76.57 N/A $i \Lambda i = 0.900$ 1.900 AM/PM $Method:$ $fa; i j j phi 1.3$ 1.800 $Flow$ $i N/A$ SAMPLE COLLECTION $Date:$ $f 2.197/200.97$ $Time: 11.00$ AM/PM	r	130	51.4	1.47	15.87	4258	11.96	11.28	3411			
1856 85 5.77 1.49 15.79 5.95 14.28 11.25 370.6 N/A 1653 85 5.76 1.51 16.11 35.67 14.28 11.25 370.6 N/A 1456 85 5.76 1.51 16.11 35.67 14.72 13.38 36.53 N/A 1456 85 5.60 1.48 16.90 33.55 14.58 11.73 765.97 N/A 1456 85 5.60 1.48 16.90 33.55 14.58 11.73 765.97 N/A SAMPLE COLLECTION $Date: 5/19/2009$ $Time: 1/100$ AM/PM $Method: frain lyphicit low Flow controller M/A Appearance of Sample: 5/19/2009 Time: 1/100 AM/PM Method: frain lyphicit low Flow controller M/A SAMPLE BOTTLE COLLECTED: 6/2000 6/2000$		13.							······			
1053 25 5.76 1.51 16.11 35.61 141.72 11.38 346.3 N/A 1056 85 5.60 1.48 16.40 33.55 14.58 11.75 765.47 N/A 1056 85 5.60 1.48 16.40 33.55 14.58 11.75 765.47 N/A 1056 1.48 16.40 33.55 14.58 11.75 765.47 N/A 1056 1.48 16.40 14.58 11.75 765.47 N/A 1056 1.48 16.40 14.58 11.75 765.47 N/A 1066 1.49 16.40 14.58 11.75 765.47 N/A 1066 1.49 16.40 14.58 11.75 765.47 N/A 1066 1.49 16.40 14.58 11.75 765.47 N/A 1066 1.49 16.40 14.58 11.75 11.57 11.64 1066 1.49 1.49 1.49 10.40 11.64 11.64 1066 1.41 1.41 1.56 11.64 11.64 11.64 1066 11.64 11.64 11.64 11.64 11.64 11.64 1066 11.64 11.64 11.64 11.64 11.64 11.64 1066 11.64 11.64 11.64 11.64 11.64 11.64 1066 11.64 11.64 11.64 11.64 11.64 11.64 1	1250	8.5	5.79	1.49	15,94							
1366 135 14.5% 11.75 765.4% N/A N/A N/A N/A N/A N/A N/A N/A SAMPLE COLLECTION Time: 11:00 AM/PM Method: 19.16 10.45% M/A Appearance of Sample: reldish crange relear Actual sample flow rate: 85 minin pr SAMPLE BOTTLE COLLECTED: 6 40 mL Vod Hett Actual sample flow rate: 85 minin pr SAMPLE BOTTLE COLLECTED: 6 40 mL Vod Hett 11.100 Am/pm Actual sample flow rate: 85 SAMPLING PERSONNEL SAMPLING PERSONNEL Sample flow rate: 85 90.000 mL Vod Hett	1053	25				35.61			366 3	N/A		
Appearance of Sample: reldish crushe / clear SAMPLE BOTTLE COLLECTED: 6 YO ML VOA HICK A runna draw do - a cyccided Limin SAMPLING PERSONNEL SAMPLING PERSONNEL	1356	έs.	5.66	1.48	16,40			11.75				
Final: N/A SAMPLE COLLECTION N/A Date: 8/19/2009 Time: 100 AM/PM Method: 100 Flor Appearance of Sample: reldish cruatic felor Actual sample flow rate: 05 SAMPLE BOTTLE COLLECTED: 6 YO ML VOA HCL 2 11 Lu Aon bu SAMPLING PERSONNEL				·		· · · · · · · · · · · · · · · · · · ·				N/A		
Final: N/A SAMPLE COLLECTION N/A Date: 8 / 19 / 2009 Time: 11:00 AM/PM Method: faini fyphici, low flow contreler Appearance of Sample: reldish crustic feller Actual sample flow rate: B5 Actual sample flow rate: B5 Actual sample flow rate: B5 Mulmin pr Actual sample flow rate: Appearance of Sample: 6 YO ME VOA HEL SAMPLE BOTTLE COLLECTED: 6 YO ME VOA HEL SAMPLING PERSONNEL Find prompting as lower provided with rate										N/A		
Final: N/A SAMPLE COLLECTION Date: 8/19/2009 Time: 11:00 AM/PM Method: 19/10 Isw Flow contreler Appearance of Sample: reldish crunge fellow Actual sample flow rate: 05 Appearance of Sample: reldish crunge fellow Actual sample flow rate: 05 SAMPLE BOTTLE COLLECTED: 6 YO ME VOA HEL Ind propping as lower provided rate SAMPLING PERSONNEL SAMPLING PERSONNEL										N/A		
SAMPLE COLLECTION Date: 8/19/2009 Time: 11:00 AM/PM Method: <u>Ani typhica</u> low Flow contrelien Appearance of Sample: <u>reddish cruage felter</u> SAMPLE BOTTLE COLLECTED: <u>6 YO ME VOA HECE</u> 2 1 1: Lu Aun ben for pressille rate SAMPLING PERSONNEL								ļ		Ņ/A		
Date: 8/19/2009 Time: 11:00 AM/PM Method: Ani typhica Iow Flor contreler Appearance of Sample: reldith crustic felter Actual sample flow rate: 05 mulmin pr SAMPLE BOTTLE COLLECTED: 6 YO ME VOA Hete Int proping as lewing provided rate 2 11: Lu Ander for provide SAMPLING PERSONNEL	Final:									N/A		
Appearance of Sample: <u>reddish crunge felter</u> SAMPLE BOTTLE COLLECTED: <u>6 YO ME VOA HEE</u> 2 1 1: Lu Aunber SAMPLING PERSONNEL												
Appearance of Sample: <u>reddish crucky felter</u> SAMPLE BOTTLE COLLECTED: <u>6 YO ML VOA HECL</u> 2 1 1: Lu Aunbur SAMPLING PERSONNEL	Date: & / / *	7/2004		Time: //:00	AM/PM	Method:	Maini typhi-1	Jow \$1	ca contrel	er .		
SAMPLE BOTTLE COLLECTED: <u>6 YO ME VOA HEE</u> het remping as lowing provided Limin 2 1 1: Lu Aunter for provide to rete		,		,			-,	_		~ ` `		
SAMPLE BOTTLE COLLECTED: <u>6 YO ME VOA HEE</u> het remping as lowing provided Limin 2 1 1: Lu Aunter for provide to rete	Appearance of S	Sample:	reddish or	vage idea	r					1/min or		
SAMPLING PERSONNEL										Umiņ		
SAMPLING PERSONNEL	SAMPLE BOTTL	E COLLECT	ED:	6 YO ML	VOA HEL	find pr	mpiny as is	and pres	sj.L. rate			
		_,		2 11;	Lu Aunter		for prisingo.			<u> </u>		
Name: Han Junbrinic. Company: ACCOM		-										
	Name: 4www	Junbrinic.				Company: ,	AECOM					

CLIENT: USALE (Brich) LOCATION: NE CARG, Aic PROJECT #:

ENTER WELL LOCATION:

TECMLUOS

INSPECTION									
Label on well?		<	YES)	NO Is c	ap locked?			YES	(NO)
Is reference man	k visible?	0	YES	NO Sta	nding water press	∋nt?		< YES>	NO
Condition of well	E	6000		Алу	indication of sur	face runoff in v	vell?	YES	NO .
Weather:	~#s	Jung 1 410	sir + hil	with Air	Temperature:			mid 40	, ⁷ F
Notes:		ve moe			v #_ 20			·	·
	041		SIO Z J			_			
STATIC WATER) PURGING	\$					
Date: 8/19	12000	1	Time: 15:35	AM/PM					
	•	.t. 1					- William Charles		1
Depth to Water:		<u>4,41</u> 9.10		Mea	sured with:	ELECTRONIC	STAPE	CHALK & STEEL	ТАРЕ
Length of Well:		9.10		Dec	ontamination:	PRE STEAM	cleaned <	DI WATER	OTHER
								THE SECOND REPORT	
WELL PURGING	5								
Date: <u>8/1</u>	9/200	9 Begin	Time:	/MA 5:30 AM		Equipment	Mihi	Typhoon	LOW FL
· ·		End 1	îme:	16:55 AM	PM Decontar	mînation: Pl	RE STEAM CL	EANED DIW	ATER OTHER
CALCULATION OF 3									
ļ		ength of well		,	Yield:		HIGH	> low	
		depth to wate		irge start)	If low, re	covery time:			1
		length of wat			A 4				-41 80
		conversion fa		1) 0.49		olume purged:		gallo	1
Gallo		3 casing volu				urge flow rate:			
Notes:	h.	XIMUM OTAU	n clows the	cic c 5. 1	apan shin ,	as puilt ~	11 pap	L/mir	
		7				1		·	
Time	Volume	Depth to	pН	Conductivity	Turbidily	D.O.	Temp	ORP	Ferrous
	(gallons)	Water	(SU)	(umhos/cm)	(NTU)	(mg/L)	(°°)		Iron
	(gallons)	(feet)							}rọn (mģ/L) ,
	(gallons)		(SU) +/- 0.1	(umhos/cm) +/- 3%	(NTU) +/- 10%	(mg/L) +/- 10%	(°C) +/- 5º	+/- 10 mV	(mg/L)
Start: 15:12	(gallons)	(feet) <0.33'	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 50		(mģ/L.)
Start: 15: 18 15:44	(gallons)	(feet) <0.33' b.1	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+1-50	358.5	(mģ/L.) N/A N/A
Start: 15: 18 15:44 15:51	(gallons)	(feet) <0.33' b.10 y - 20 b.10 y - 20	+/-0.1 1.2.1 1.2.4	+1-3% (3.22 (3.70	+1-10% 54.70 72.02	+/- 10%	+1-50 52.21 12.43	358.5 356.2	(mġ/L) N/A N/A N/A
Start: 15: 18 15:44 15:51 15:54	(gallons)	(feet) <0.33' b.10 v p-27 b.10 v p-27 b.10 v p-27 b.10 v p-27	+/-0.1 1.2.1 1.2.4 1.2.4	+1-3% (3.22 (3.70 (3.80	+1-10% 54.70 72.02 71.52	+/- 10% 3. 23 2.94 2.69	+/- 50 12.21 12.43 12.56	358.5 756.2 356.9	(mg/L) N/A N/A N/A N/A
Start: 15: 18 15:44 15:51 15:54 15:54	(gallons)	(feet) <0.33' b.10 v p.2p b.10 v p.2p b.10 v p.2p b.10 v p.2p b.10 v p.2p	+/-0.1 1.2.1 1.2.4 1.2.4 1.2.4 1.2.9 1.2.9 1.2.2	+1-3% (3.22 (3.70	+1-10% 54.70 72.02 71.52 58.14	+/- 10%	+1-50	358.5 356.2 356.9 366.8	(mg/L) N/A N/A N/A N/A N/A
Start: 15: 18 15: 44 15: 51 15: 54 15: 57 16: 6:	(gallons)	(feet) <0.33' b.10 v p p b.10 v p p	+/- 0.1 1.2.4 1.2.4 1.2.4 1.2.4 1.2.4 1.2.4 1.2.4 1.2.4 1.2.4 1.2.5	+1-3% (3.22 (3.22 (3.30 (3.30) (3.30) (3.30) (13.61 ((.72)	+1-10% 54.70 72.02 71.52 58.14 44.07	+/- 10% 3. 23 2.94 2.69 3.41 3.20	+1-50 52.21 12.43 12.56 11.75 10.81	358.5 356.2 356.9 366.8 366.1	(mg/L) N/A N/A N/A N/A N/A N/A
Start: 15: 18 15:48 15:51 15:54 15:57 15:00 16:00	(gallons)	(feet) <0.33' b.10 p. p. b.10 p. p.	+/-0.1 1.2.1 1.2.4 1.2.4 1.2.4 1.2.9 1.2.9 1.2.2	+1-3% (3.22 13.30 13.30 13.61 ((.72 12.56	+1-10% 54.70 72.02 71.52 56.14 44.07 56.72	+/- 10% 3. 23 2.94 2.69 3.01 3.20 3.65	+/-50 57.21 12.43 17.56 11.75 10.81 10.49	358.5 356.2 356.9 366.8 366.1 366.1	(mg/L) N/A N/A N/A N/A N/A N/A N/A
Start: 15: 18 15: 44 15: 51 15: 54 15: 57 16: 6:	(gallons)	(feet) <0.33' b.10 v p p b.10 v p p	+/-0.1 1.2.(1.2.(1.2.) 1.2.9 1.2.9 1.2.2 1.15 1.15	+1-3% (3.22 (3.22 (3.30 (3.30) (3.30) (3.30) (13.61 ((.72)	+1-10% 54.70 72.02 71.52 58.14 44.07	+/- 10% 3. 23 2.94 2.69 3.41 3.20	+1-50 52.21 12.43 12.56 11.75 10.81	358.5 356.2 356.9 366.8 366.1	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A
Start: 15: 18 15:48 15:51 15:54 15:57 15:00 16:00	(gallons)	(feet) <0.33' b.10 p. p. b.10 p. p.	+/-0.1 1.2.(1.2.(1.2.) 1.2.9 1.2.9 1.2.2 1.15 1.15	+1-3% (3.22 13.30 13.30 13.61 ((.72 12.56	+1-10% 54.70 72.02 71.52 56.14 44.07 56.72	+/- 10% 3. 23 2.94 2.69 3.01 3.20 3.65	+/-50 57.21 12.43 17.56 11.75 10.81 10.49	358.5 356.2 356.9 366.8 366.1 366.1	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A
Start: 15: 18 15: 44 15: 51 15: 54 15: 54 15: 57 16: 00 15: 00 16: 00	(gallons)	(feet) <0.33' b.10 p. p. b.10 p. p.	+/-0.1 1.2.(1.2.(1.2.) 1.2.9 1.2.9 1.2.2 1.15 1.15	+1-3% (3.22 13.30 13.30 13.61 ((.72 12.56	+1-10% 54.70 72.02 71.52 56.14 44.07 56.72	+/- 10% 3. 23 2.94 2.69 3.01 3.20 3.65	+/-50 57.21 12.43 17.56 11.75 10.81 10.49	358.5 356.2 356.9 366.8 366.1 366.1	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A
Start: 15: 18 15: 44 15: 51 15: 54 15: 54 15: 57 16: 05 16: 05 16: 05 16: 05 Final:		(feet) <0.33' b.10 p. p. b.10 p. p.	+/-0.1 1.2.(1.2.(1.2.) 1.2.9 1.2.9 1.2.2 1.15 1.15	+1-3% (3.22 13.30 13.30 13.61 ((.72 12.56	+1-10% 54.70 72.02 71.52 56.14 44.07 56.72	+/- 10% 3. 23 2.94 2.69 3.01 3.20 3.65	+/-50 57.21 12.43 17.56 11.75 10.81 10.49	358.5 356.2 356.9 366.8 366.1 366.1	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A
Start: 15° 15° 15° 4° 15° 5° 15° 15° 15° 15° 15° 15° 1		(feet) <0.33' b. 10 v p. 20 b.	+/- 0.1 1.2.(1.2.2 1.2.2 1.2.2 1.15 1.15 1.10 1.13	+1-3% (3.22 13.20 13.20 13.20 13.01 ((.72) 12.56 12.67	+1-10% 54.70 72.02 71.52 5% 14 44.07 5% 12 47.46	+/- 10% 3. 23 2. 94 2. 69 3. 1 3. 20 3. 65 5. 41	+1-50 57.21 12.43 12.56 11.75 10.61 10.49 11.04	358.5 356.7 356.9 366.8 366.1 366.1 366.1	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 15° 15° 15° 4° 15° 5° 15° 15° 15° 15° 15° 15° 1		(feet) <0.33' b. 10 v p. 20 b.	+/-0.1 1.2.(1.2.(1.2.) 1.2.9 1.2.9 1.2.2 1.15 1.15	+1-3% (3.22 13.20 13.20 13.20 13.01 ((.72) 12.56 12.67	+1-10% 54.70 72.02 71.52 5% 14 44.07 5% 12 47.46	+/- 10% 3. 23 2.94 2.69 3.01 3.20 3.65	+1-50 57.21 12.43 12.56 11.75 10.61 10.49 11.04	358.5 356.7 356.9 366.8 366.1 366.1 366.1	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: $15: 12$ 15: 44 15: 51 15: 54 15: 57 16: 02 16: 02 16: 02 Tb. 02 Final: SAMPLE COLLE Date: $g / 16$	CTION 7/3009	(feet) <0.33' b.lov p.sp b.lov p.sp b.lov p.sp b.lov p.sp b.lov p.sp b.lov p.sp b.lov p.sp b.lov p.sp	+/- 0.1 1.2.4 1.2.4 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15	+1-3% (3.22 13.20 13.20 13.20 13.01 ((.72) 12.56 12.67	+1- 10% 54. 70 72. 02 71. 52 5% 14 44 07 50. 12 47.46 Method: <u>1</u>	+/- 10% 3.23 2.94 2.69 3.01 3.20 3.08 3.01 3.08 3.01	+1-50 52.21 12.43 12.56 11.25 10.61 10.69 11.04	358.5 756.7 356.9 366.1 366.1 366.1 366.1	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 15° 15° 15° 4° 15° 5° 15° 15° 15° 15° 15° 15° 1	CTION 7/3009	(feet) <0.33' b. 10 v p. 20 b.	+/- 0.1 1.2.4 1.2.4 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.2.9 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.15	+1-3% (3.22 13.20 13.20 13.20 13.01 ((.72) 12.56 12.67	+1-10% 54.70 72.02 71.52 5% 14 44.07 5% 12 47.46	+/- 10% 3.23 2.94 2.69 3.01 3.20 3.08 3.01 3.08 3.01	+1-50 57.21 12.43 12.56 11.75 10.61 10.49 11.04	358.5 756.7 356.9 366.1 366.1 366.1 366.1	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: $15: 12$ 15: 44 15: 51 15: 54 15: 57 16: 02 16: 02 16: 02 Tb. 02 Final: SAMPLE COLLE Date: $g / 16$	CTION 7/2009 ample:	(feet) <0.33' b. 10 v p p b. 10 v	+/- 0.1 1.2.4 1.2.4 1.2.9 1.2.9 1.2.9 1.2.2 1.15 1.15 1.16 1.13 Fime: 16:1	+1-3% (3.22 13.30 13.30 13.30 13.61 ((.72 12.56 12.67	+1- 10% 54. 70 72. 02 71. 52 5% 14 44 07 50. 12 47.46 Method: <u>1</u>	+/- 10% 3.23 2.94 2.69 3.01 3.20 3.08 3.01 3.08 3.01	+1-50 52.21 12.43 12.56 11.25 10.61 10.69 11.04	358.5 756.7 356.9 366.1 366.1 366.1 366.1	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 15° 16° 15° 4° 15° 5° 15° 15°	CTION 7/2009 ample:	(feet) <0.33' b. 10 v p p b. 10 v	+/- 0.1 1.2.4 1.2.4 1.2.9 1.2.9 1.2.9 1.2.2 1.15 1.15 1.16 1.13 Fime: 16:1	+1-3% (3.22 13.30 13.30 13.30 13.61 ((.72 12.56 12.67	+1- 10% 54. 70 72. 02 71. 52 5% 14 44 07 50. 12 47.46 Method: <u>1</u>	+/- 10% 3.23 2.94 2.69 3.01 3.20 3.08 3.01 3.08 3.01	+1-50 52.21 12.43 12.56 11.25 10.61 10.69 11.04	358.5 756.7 356.9 366.1 366.1 366.1 366.1	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 15° 12° 15° 4° 15° 5° Final: SAMPLE COLLE Date: $g / 16^{\circ}$ Appearance of S SAMPLE BOTTL	CTION 7/2009 ample: E COLLECT	(feet) <0.33' b. 10 v p p b. 10 v	+/- 0.1 1.2.4 1.2.4 1.2.9 1.2.9 1.2.9 1.2.2 1.15 1.15 1.16 1.13 Fime: 16:1	+1-3% (3.22 13.20 13.20 13.20 13.01 ((.72) 12.56 12.67	+1- 10% 54. 70 72. 02 71. 52 5% 14 44 07 50. 12 47.46 Method: <u>1</u>	+/- 10% 3.23 2.94 2.69 3.01 3.20 3.08 3.01 3.08 3.01	+1-50 52.21 12.43 12.56 11.25 10.61 10.69 11.04	358.5 756.7 356.9 366.1 366.1 366.1 366.1	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 15 : 12 15: 4415 : 5115 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : 5415 : $5415615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615615$	CTION 7/2009 ample: E COLLECT	(feet) <0.33' 10.10 - p-20 bulan page bulan page	+/- 0.1 1.2.4 1.2.4 1.2.9 1.2.9 1.2.9 1.2.2 1.15 1.15 1.16 1.13 Fime: 16:1	+1-3% (3.22 13.30 13.30 13.30 13.61 ((.72 12.56 12.67	+1- 10% 54. 70 72. 02 71. 52 5% 14 44 07 50. 12 47.46 Method: <u>1</u>	+/- 10% 3. 23 2. 94 2. 69 3. 0 3. 0 5. 01 3. 0 5. 01 	+1-50 52.21 12.43 12.56 11.25 10.61 10.69 11.04	358.5 756.7 356.9 366.1 366.1 366.1 366.1	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A

CLIENT: USALE /BRISTEL LOCATION: NE CARE AK PROJECT #:

EN	TER	WELL	LOCA	TION:

Tecmino7

INSPECTION		, ,	VEC	NO 15 -	on tools do				<i>tio</i>	
Label on well?	de de llet - O	~	1EQ /		ap locked?			YES	NQ_>	
ls reference mar		,	AF8-		nding water prese			YES	NO	
Condition of wel		(5 cm)		Any	indication of surface runoff in well? YES (NO)					
Weather:	12 47	ly closely	2,8 40.5		Temperature:			Mil 40's	1	
Notes:	091	10 moe	5iJ2_	7 MC	×=====================================					
STATIC WATER Date: 8/19	* LEVEL JUS - / シンロイ		DPURGING							
Depth to Water:		5.65		Mea	sured with:	CELECTRON	C TAPE	CHALK & STEEL	TAPE	
Length of Well:		9.60		Dec	ontamination:	PRE STEAM	1000		OTHER	
WELL PURGING				A 127					/ 1	
Date: <u> </u>	19/200	<u>ソ</u> Begin End 1		19:22 AM/ 20:12 AM/		_		EANED DIW	5	
CALCULATION OF								1. pp-10		
		ength of well	- /h ofere	iner and	Yield:		HIGHD	LOW	1	
		lepth to wate		nge start)	IT IOW, TH	covery time:			i	
		length of wat		0.0.40	Ashistor					
Gallo		conversion fa 3 casing volu		0.49		olume purged: orge flow rate:		d gallo		
Votes:			1(165					L/mir		
Time	Volume	Depth to	рH	Conductivity	Turbidity	D.O,	Temp	ORP	Ferrous	
	(gallons)	Water	(SU)	(umhostom)	(NTU)	(mg/L)	(°C)		Iron	
		(feet)		ms/cm					(mģ/L)	
		<0.33'	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 5°	+/- 10 mV		
Start: 1922 1932		C 33							<u>N/A</u>	
		5.77 इ.81	626	0.944	7,53	2.13	5.5L	- 49.4	N/A	
1935		5.43	6.33	0.871	3.47.	1.96	3.78	-52.7	N/A	
1933		5,81	6,39	6.933	2,76	1.67	3,19	-61.1	<u>N/A</u>	
<u> </u>		5, 22	6.40	0.828	Z.45 3.60	1.45	3.77	-68.9	<u>N/A</u>	
		5.81	6.18	0,809	Z.01	1,20	4.11	-712	N/A	
1947 1956			6.31	8,799			3.98	·· 73.8	N/A	
1953	4	5.83	6.15	0,740	1.81	1.15	4.71	-77.6	N/A	
		5.87	<i>φ</i> , , , ,	-,,,,	1,0[1,13	4.20	- 79.0	N/A N/A	
Final:									N/A	
Final: GAMPLE COLLE Date: 8/14	CTION 9/2009		Time: 17:5	55 AM/PM	یر :Method	in typher	n t low	flow cont		
Appearance of S		Twebil fell				le flow rate:	160		u/min or L'avin	
SAMPLE BOTTL	E COLLECT	ED:;	6 40 ML 2 11:1	Voia Her Les Ambra					-	

CLIENT: LOCATION: PROJECT #:

ENTER WELL LOCATION:

TECMWOS

INSPECTION									
Label on well?		~	VER	NO ls ca	ip locked?			(YES)	NO
Is reference mar	k vleible?	C, C	VEC		iding water pres	nnt?			NO
		yood	4E9					(YES)	
Condition of well		3300			indication of sur	race runon in v	NOIL5	YES ~ 40' F	
Weather:				Air I	emperature:			~ 40 1	
Notes:	041	ve moee	SiJ 2 5	MOX	2#_24				
STATIC WATER			PURGING			_			
Date: 8/19	2000	}	Time: (4'.2	ZAM/PM					
Depth to Water:		7.30		Ndeau	sured with:	ELECTRON	CTARE	CHALK & STEEL	, TADC
Length of Well:		9.35			ontamination;		CLEANED <		OTHER
Cengar of wear		1.75				FRE STEWN	CLEANED <		
WELL PURGING						8.85 C 1 C 1			-
Date: 8/1	8 / 200	6 Benin	Time	141-27 ANAT		Fauloment	mini-	The m h more	/LOW FL
Date	1000	_/ Degiji End T			DA Decorte		RE STEAM CL		
Date: <u><u>8</u>/1 CALCULATION OF 3</u>	CASIMONOL			<u>08/19/09</u>			RC STEAM CL	EANED DIW	ATER OTHER
CALCULATION OF 3				0-[[7]0]	Yield:			1010	
<u> </u>		ength of well denth to wate	r /hafara av	raa chart)		covery time:			
		depth to wate length of wat		ige sidir)	n tow, te	covery unite.	212	NOALT	
i		~			A .4	- 7			
~		conversion fa		0.49		olume purged:		olleg	
Gallo		3 casing volu			•	urge flow rate:	-		
Notes:	19	1 per 11 per 20	Jry ~ 11	allow -11	it restrict	0-2- x. x.	<u>t_</u> _,/	Umin	
*								2:43 OTW -	
Time	Volume	Depth to	рH	Conductivity	Turbidity	D.O.	Temp	ORP	Ferrous
	(gallons)	Water	(SV)	(umbos/cm)	(NTU)	(mg/L)	(°C)		Irón
		(feet)		(ms/em)					(mg/L)
		<0.33'	+/- 0.1	+/- 3%	+ <i>I</i> - 1D%	+/- 10%	+/ - 5⁰	+/- 10 mV	
Start: 14:22									N/A
14:32		buto-prop		0.175	74.41	4.66	4.62	104.4	N/A
14.55		Jula v purp		0.178	124.6	6.42	5 19	79.9	N/A
14:38		Idan pung		0.178	Dry	5.87	5.43	104.3	N/A
									<u>N/A</u>
									N/A
									N/A
									N/A
									N/A
									N/A
Final:									N/A
SAMPLE COLLE	CTION								<u> </u>
Date: 8/19	9/2009		Time: 07:12	5 AM/PM	Method:	nii typho	is with	low there a	un-holler
Appearance of S	ample:	light bran	sug to	rbid	Actual samp	ole flow rate:	- 120	·	numin pr
SAMPLE BOTTL	E COLLEC		6 YOML	L'OIA HEL					ພາກເດ :
		 د	2 11:1	in Ambra					
SAMPLING PER									
Name: A	a leal	mis / C	min by	(ener	Company:	AECIM			
		(<u> </u>				

Day 14 Post-ISCO Sampling Forms

INSPECTION Label on well? Is reference man Condition of well Weather: Notes:	1: <u>C</u>	4.20 2000 CLOUDY ND	YES YES	NO is c NO Sta Any Air	R WELL LOCA ap locked? nding water press indication of sur Temperature:	ent?	OGNES	- Dup	NO NO
STATIC WATER Date: 8/2	RLEVEL JUS) PURGING Time: 1 <i>50</i>	-					
Depth to Water. Length of Well:		4,95			esured with: conternination:	ELECTRONIA PRE STEAM		CHALK & STEEL DIWATER	L TAFE OTHER
CALCULATION OF 3 SA44 9.95 Gallo	ft Le ft $-c$ ft $=$ x =	MES ength of well tepth to wate length of wat conversion fa 3 casing volu	er column actor (2° wel		Yīeld: If low, re Actual ve	covery time: olume purged; urge flow rate:		£OW gallo	UATER OTHER
Notes:								L/mi	in
Notes: Time	Volume (gallons)	Depth to Water	рН (SU)	Conductivity (umhos/cm)	Turbidity (NTU)	D.O. (mg/L)	Temp (°C)	L/mi	Ferraus Iron
		12-357	-	-	-				Ferrous
		Water (feat)	(SU) +/- 0.1 In: h	(umhos/cm) +/- 396	(NTU) +/- 10%	(mg/L)	(°C) +/- 5°	ORP +/- 10 mV	Ferrous Iron
Time		Water (feet) <0.33' 41.95 5,61	(SU) +/- 0.1 <u>Jaik</u> 4,39	(umhos/cm) +/- 396 12 privyz 13786 14.34	(NTU) +1-10% Aroduct dro 9,6	(mg/L) +/- 10% p/c/s Lav 0,82	(°C) +1-5° her pimp 8,31	ORP +1-10 mV 1 ' TDP -2 9-	Ferrous Iron (mg/L)
Time Start: 1505 1515 1520		Water (feet) <0.33' 41.95 5.61 5.45	(SU) +/- 0.1 <u>Inik</u> 4.39 4.39	(umhos/cm) +1-396 13786 19.34 13786 19.34	(NTU) +1-10% Histurt drs 9.6 9.6	(mg/L) +/- 10% 0/2/5 Lav 0.82 0.82	(°C) +/-5° 12.5 9.31 3.32	ORP +/- 10 mV 1 ' TOF -Z 9- 2 8'. V	Ferrous Iron (mg/L) N/A N/A N/A
Time Start: 1505 1515 1520 1524		Water (feet) <0.33' 4,95 5,61 5,45 5,37	(SU) +/-0.1 <u>Iaik</u> 4.39 4.39 4.39 9-43	(umhos/cm) +/- 336 13786 14.34 13786 14.34 13786 14.34 13786 14.34	(NTU) +1-10% Hidult dro 9.6 9.6 5.75	(mg/L) +/- 10% 0.82 0.82 0.82 0.62	(°C) +1-5° 427 pump 9,31 \$.32 8,18	ORP +1-10 mV 1'TDF -2 9- 28.0 19.1	Ferraus Iron (mg/L) N/A N/A N/A
Time Start: 1505 1515 1520 1524 1528		Water (feet) <0.33' 4,95 5,61 5,61 5,45 5,37 5,29	(SU) +/- 0.1 <u>Jaik</u> 4.39 4.39 <u>4.43</u> 4.44	(umhos/cm) +1-336 13786 19.34 13786 19.34 13786 19.36 13975 95 13959/9.6	(NTU) +1-10% Histurt drs 9.6 9.6 5.75 5.80	(mg/L) +/- 10% 0.82 0.82 0.62 0.62 0.58	(°C) +1-5° 8,31 8,31 8,18 8,18 8,18	ORP +1-10 mV 1'TDF 72 9- 28.0 (9.1 19.3	Ferrous Iron (mg/L) N/A N/A N/A N/A
Time Start: 1505 1515 1520 1524		Water (feet) <0.33' 4,95 5,61 5,45 5,37	(SU) +/- 0.1 <u>Jaik</u> 4.39 4.39 <u>4.43</u> 4.44	(umhos/cm) +/- 336 13786 14.34 13786 14.34 13786 14.34 13786 14.34	(NTU) +1-10% Histurt drs 9.6 9.6 5.75 5.80	(mg/L) +/- 10% 0.82 0.82 0.82 0.62	(°C) +1-5° 427 pump 9,31 \$.32 8,18	ORP +1-10 mV 1'TDF -2 9- 28.0 19.1	Ferrous Iron (mg/L) N/A N/A N/A N/A N/A
Time Start: 1565 1515 1520 1524 1528		Water (feet) <0.33' 4,95 5,61 5,61 5,45 5,37 5,29	(SU) +/- 0.1 <u>Jaik</u> 4.39 4.39 <u>4.43</u> 4.44	(umhos/cm) +1-336 13786 19.34 13786 19.34 13786 19.36 13975 95 13959/9.6	(NTU) +1-10% Histurt drs 9.6 9.6 5.75 5.80	(mg/L) +/- 10% 0.82 0.82 0.62 0.62 0.58	(°C) +1-5° 8,31 8,31 8,18 8,18 8,18	ORP +1-10 mV 1'TDF 72 9- 28.0 (9.1 19.3	Ferraus Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A
Time Start: 1565 1515 1520 1524 1528		Water (feet) <0.33' 4,95 5,61 5,61 5,45 5,37 5,29	(SU) +/- 0.1 <u>Jaik</u> 4.39 4.39 <u>4.43</u> 4.44	(umhos/cm) +1-336 13786 19.34 13786 19.34 13786 19.36 13975 95 13959/9.6	(NTU) +1-10% Histurt drs 9.6 9.6 5.75 5.80	(mg/L) +/- 10% 0.82 0.82 0.62 0.62 0.58	(°C) +1-5° 8,31 8,31 8,18 8,18 8,18	ORP +1-10 mV 1'TDF 72 9- 28.0 (9.1 19.3	Ferraus Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A
Time Start: 1565 1515 1520 1524 1528		Water (feet) <0.33' 4,95 5,61 5,61 5,45 5,37 5,29	(SU) +/- 0.1 <u>Jaik</u> 4.39 4.39 <u>4.43</u> 4.44	(umhos/cm) +1-336 13786 19.34 13786 19.34 13786 19.36 13975 95 13959/9.6	(NTU) +1-10% Histurt drs 9.6 9.6 5.75 5.80	(mg/L) +/- 10% 0.82 0.82 0.62 0.62 0.58	(°C) +1-5° 8,31 8,31 8,18 8,18 8,18	ORP +1-10 mV 1'TDF 72 9- 28.0 (9.1 19.3	Ferrous Iron (mg/L) NVA NVA NVA N/A N/A N/A N/A
Time Start: 1505 1515 1520 1520 1524 1532		Water (feet) <0.33' 4,95 5,61 5,61 5,45 5,37 5,29	(SU) +/- 0.1 <u>Jaik</u> 4.39 4.39 <u>4.43</u> 4.44	(umhos/cm) +1-336 13786 19.34 13786 19.34 13786 19.36 13975 95 13959/9.6	(NTU) +1-10% Histurt drs 9.6 9.6 5.75 5.80	(mg/L) +/- 10% 0.82 0.82 0.62 0.62 0.58	(°C) +1-5° 8,31 8,31 8,48 8,48 8,48	ORP +1-10 mV 1'TDF 72 9- 28.0 (9.1 19.3	Ferraus Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A
Time Start: 1565 1515 1520 1524 1528	(gallons)	Water (feet) <0.33' 4,95 5,61 5,61 5,45 5,37 5,29	(SU) +/- 0.1 <u>Jaik</u> 4 : <u>39</u> 4 : <u>39</u> 4 : <u>39</u> 4 : <u>43</u> 4 : <u>44</u> 4 : <u>44</u>	(umhos/cm) +1-336 13786 19.34 13786 19.34 13786 19.36 13975 95 13959/9.6	(NTU) +1-10% Histurt drs 9.6 9.6 5.75 5.80	(mg/L) +/- 10% 0.82 0.82 0.62 0.62 0.58	(°C) +1-5° 8,31 8,31 8,48 8,48 8,48	ORP +1-10 mV 1'TDF 72 9- 28.0 (9.1 19.3	Ferrous Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A

No.

CLIENT: B LOCATION: PROJECT #:	nistol N.E. CA 11262	PE MO 4.20	ع د * عد	ST. LAW. S	TSLAND	fion:	CANCI	MW D NOCGU SD COIL	133
INSPECTION Label on well? Is reference man Condition of well Weather: Notes:	: <u> </u>	2000 CLOUDY	YES YES <u>P</u> Mp+	NO Star Any	ap locked? nding water prese indication of surf remperature:		vell?	VES VES VES HO	NO NO
	5/2009	L .) PURGING Time:	AM/PM		,			
Depth to Water: Length of Welt		4.5°B 7.50			sured with: ontamination:	PRE STEAM		CHALK & STEEL DI WATER	TAPE
WELL PURGING Date: <u>8/2</u> CALCULATION OF 3 <u>9,50</u> <u>4,50</u> <u>50</u> Gallo	$\frac{5}{2009}$ $\frac{5}{12009}$ $\frac{1}{1000}$ $\frac{1}{1000}$ $\frac{1}{1000}$ $\frac{1}{1000}$ $\frac{1}{1000}$ $\frac{1}{1000}$ $\frac{1}{1000}$ $\frac{1}{1000}$ $\frac{1}{1000}$	End 1	er (before pu er column actor (2° wel		M Decontar Yield: If low, red Actual vo	Equipment <u>Mi</u> nination: Fi covery time: plume purged: urge flow rate:	M; Typh æsteamele (HIGH) 136	EANED DIW	ATER OTHER
Notes:				x					/
Time	Volume (gallons) ベレ	Depth to Water (feet) <0.33'	pH (SU) +/- 0.1	Conductivity (umhos/cm) US 4 M/MS/ +/- 3%	Turbidity (NTU) +1- 10%	D.O. (mg/L) +/- 10%	Temp (°C) +/- 5°	ORP +/- 10 mV	Ferrous Iron (mg/L)
Start: 1330	Intial	4.58		3659/2.2	6.69	3.34	13,81	3131	N/A
1335	<u></u>	4,85	3.31	3626 2.7		3:33		306.2	N/A
1340	1200	4,95	274	3699 / 2.86	4.95	2.66	13,19	308.1	N/A
1345	1800	5.05	3,31	3793/2,87	4.95	2,59	12.47	303.7	N/A
350	2400	5.11	3,24	3797/2.87	4,21	2.47	12.76		N/A
									N/A
									N/A
				 		1		,	N/A
									N/AJ
P - 1									N/A
Final: SAMPLE COLLE	OTION .								<u>N/A</u>
Date: 8 12 9 Appearance of S SAMPLE BOTTL	E COLLECT	(₹∂) ED:	- 40M 2-12:		Actual sampl /HCL Grzc)ev-w HC		120 2101 B. 500 [RR		
Name: Lanc	e Pre	455/8	AKON	dambrosic	Соптралу:	AECO	<u>ب</u> ۲۷		

CLIENT: B LOCATION: PROJECT #:	NIE CA NIE CA 11262	PE M 4.20	oc # 5	ST. LAW. ENTE	TSLAND RWELLLOCA	TION:	TCO Ognei	MNS Q MOCGU	4
INSPECTION Label on well? Is reference ma Condition of wel Weather: Notes:	11: <u> </u>	2000 CLOUDY NDD-44		NO Sta 	ap locked? nding water prese indication: of sur Temperature:		well?	YES YES YES YO	
STATIC WATE Date: 8/2 Depth to Water.	5/2009		D PURGING Time: [1]:59	5 ANUPM	asured with:	ELECTRON	NT TACE)	CHALK& STEEL	TADE
Length of Well:	9	:70			ontamination:	PRE STEAM		DIWATER	OTHER
WELL PURGING Date: <u>8/2</u> calculation of: 9.70	5 2009 3 CASING VOLU	End	Time:	1:00 AM		–	Mini Ty Resteamou	Phoone + L Eaned Give LOW	
7,45	ft <u>- c</u>	lepth to wate	er (before pu	irge start)	If low, re	covery time:			
2,25		length of wa conversion f			Actual	olume purged	-	gallog	~
Galic Notes:		3 casing vol	•			urge flow rate			n)or
Time	Volume (gallons)	Depth to Water	pH (SU)	Conductivity (umhos/cm)	Turbidity (NTU)	D.O. (mg/L)	Temp (°C)	ORP	Ferrous Iron
	Rute	(feet) <0.33'	+/- 0.1	÷/- 3%	+/- 10%	+/- 10%	÷/- 5°	+/- 10 mV	(mg/L)
Start					_				N/A
1107	Win 1/Min		5.51	-508	12.0	12.1	6.06	38.2	N/A
1112	100 Million	Sido	5.57	517	11:9	11:1	4.01	77.9	N/A
_413	100ml/aun	7.57	5:54	525	17.5	11.8	7.20	3307	N/A
							1		<u>N/A</u>
			}			1		1	N/A
-					<u> </u>				N/A N/A
	<u> </u>								N/A
				_			-		N/A
Final:									N/A
SAMPLE COLLS	CTION		<u> </u>					<u> </u>	
Date: 812	5 2004	2	Tma-1175	- GRIPM	Mathada	Mini To	who are	King Flo	
Data C) [C		ł	10110 ([4)		W60100.		() ()	& Lon- Fli	-
Appearance of S	amnler /	*lour			Actual samp	le flow rete	100		Vmin or
Appearance of c	жатирі с . (teu(nuvai sailiµ		100	v	
SAMPLE BOTTI	E COLLECT	ED:	6 40 M	L VDA'S	Hack GRE	/DEO A	KIONB	enz - mail	
			1-1L:	ter Am	ber wilke	- FOR	Geolan	O ALIO	2/103
SAMPLING PER	SONNE		-	·	Her Gaze	~		ALIO	2/103

CLIENT: CLIENT: CLIENT: LOCATION: PROJECT #:	N.E. CF N.E. CF	PE MO 4.20	oc [#] ≤	T. LAW. ; ENTER	TSLAND	TON:	TCO. Ognei	MW <u>0</u> MOCGU	5	
INSPECTION Label on well? Label on well? Is reference mark visible? YES NO Is reference mark visible? YES NO Standing water present? YES NO Standing water present? YES NO Any indication of surface runoff in well? YES Notes: WIND 5-18 WIND 5-18 STATIC WATER LEVEL JUST PRIOR TO PURGING										
	$\frac{1}{5} / \frac{1}{2} $		DPURGING							
Depth to Water. S, 0'S Measured with: Electronic Tape Ghalk & STEEL TAPE Length of Well: S, 45 Decontantination: PRE STEAM CLEANED Diwater OTHER										
WELL PURGING Date: <u>8/25/2009</u> Begin Time: 12:02 AMIR Purging Equipment Mini Typhoon+L/Flont										
End Time: AM/PM Decontamination: PRE STEAM CLEANED DIWATER OTHER CALCULATION OF 3 CASING VOLUMES ft Length of well Yield: HIGH OW 5.0.3 ft - depth to water (before purge start) If low, recovery time:										
<u>3.42.</u> <u></u>	x	conversion fa 3 casing volu	actor (2" wel	1) 0.49		lume purged: Irge flow rate:	3/4 13	galko ג' (הולידה ג'רוזוני	ro ni	
Notes: L/min										
	Malumo	Dansh in 1		ا بختر خاند به مر م	Truck alient	00	1 7		E-	
Time	Volume	Depth to	pH (SU)	Conductivity		D.O.	Temp	ORP	Ferrous	
VSI	Volume (gallons) ∧∟	Water	pH (SU)	(umhos/cm)	Turbidity (NTU)	D.O. (mg/L)	Temp (°C)	ORP	Iron	
	(gallons)	Water (feat)	(SU)	(umhasicm) M.Sc.~	(UTU)	(mg/L)	(°C)			
YSI TIME O	(gallons) ML	Water (feat) <0.33'	(SU) +/- 0.1	(umhas/cm) M.Sc.~ +/- 3%	(NTU) +/- 10% `	(mg/L) +/- 10%	(°C) +/- 5°	+ <i>I</i> - 10 mV	Iron (mg/L)	
VSI TIME 0 Start: 120\$	(gallons) ML Iniful	Water (feat) <0.33' 5.35	(SU) +/- 0.1 32	(umhas/cm) M.Sc.~ +/-3%	(NTU) +/- 10%	(mg/L) +6 10% 7, 32	(°C) +/-5° 9, 20	+/- 10 mV 306,1	Iron (mg/L) N/A	
VSI Time 0 Start: 1205 1205	(gallons) ML Iniful E 80	Water (feat) <0.33' 5.35 < Aump	(SU) +/- 0.1 <u>3.か 2</u> み <i>/</i> 14	(umhas/cm) M.Sc.~ +/- 3%	(NTU) +1- 10% [65. 8 59,5	(mg/L) +/- 10%	(°C) +/- 5°	+/- 10 mV 306,1 312,6	Iron (mg/L)	
VSI Time 8 Start: 1205 1205 1210	(gallons) ML Iniful	Water (feat) <0.33' 5.35 < Aump 2 Pump	(SU) +/-0.1 3.v 2 3.A14 3.f13	(umhas/cm) M.Sc.~ +/-3% -HT 8,274 8,035 - 7,883	(NTU) +/- 10%	(mg/L) ++ 10% 7,32 7,81	(°C) +/- 5° 9, 20 9,49	+1-10 mV 306,1 312,6 278.1 290.1	Iron (mg/L) N/A N/A	
VSI Time 8 Start: 1205 1205 1210	(gallons) ML Iniful L & O 1360	Water (feat) <0.33' 5.35 < Aump 2 Pump < Pump	(SU) +/- 0.1 <u>3.か 2</u> み <i>/</i> 14	(umhas/cm) M.S.c.~ +/-3% H 8,014 8,015	(NTU) +1- 10% 65. 8 59, 5 39, 7	(mg/L) ++- 10% 7,32 7,81 7,28	(°C) +1-5° 9,20 9,49 9,56	+/- 10 mV 306,1 312,6 278.1	Iron (mg/L) N/A N/A N/A	
V/SI Time 8 5 1205 1210 1215	(gallons) ML Iniful 60 1360 2040	Water (feat) <0.33' 5.35 < Aump 2 Pump	(SU) +/-0.1 3.02 3.14 3.14 3.13 3.32	(umhas/cm) M.Sc.~ +/-3% H 8,274 8,0,5 7,883 7,883	(NTU) +1-10% 1.55.8 59,5 39.7 41.2	(mg/L) ++ 10% 7,32 7,81 7,28 6,98	(°C) +1-5° 9,20 9,49 9,56 9,56	+1-10 mV 306,1 312,6 278.1 290.1	Iron (mg/L) N/A N/A N/A N/A	
V/SI Time 8 5 1205 1210 1215	(gallons) ML Iniful 60 1360 2040	Water (feat) <0.33' 5.35 < Aump 2 Pump < Pump	(SU) +/-0.1 3.02 3.14 3.14 3.13 3.32	(umhas/cm) M.Sc.~ +/-3% H 8,274 8,0,5 7,883 7,883	(NTU) +1-10% 1.55.8 59,5 39.7 41.2	(mg/L) ++ 10% 7,32 7,81 7,28 6,98	(°C) +1-5° 9,20 9,49 9,56 9,56	+1-10 mV 306,1 312,6 278.1 290.1	Iron (mg/L) N/A N/A N/A N/A N/A	
V/SI Time 8 5 1205 1210 1215	(gallons) ML Iniful 60 1360 2040	Water (feat) <0.33' 5.35 < Aump 2 Pump < Pump	(SU) +/-0.1 3.02 3.14 3.14 3.13 3.32	(umhas/cm) M.Sc.~ +/-3% H 8,274 8,0,5 7,883 7,883	(NTU) +1-10% 1.55.8 59,5 39.7 41.2	(mg/L) ++ 10% 7,32 7,81 7,28 6,98	(°C) +1-5° 9,20 9,49 9,56 9,56	+1-10 mV 306,1 312,6 278.1 290.1	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A	
V/SI Time 8 5 1205 1210 1215	(gallons) ML Iniful 60 1360 2040	Water (feat) <0.33' 5.35 < Aump 2 Pump < Pump	(SU) +/-0.1 3.02 3.14 3.14 3.13 3.32	(umhas/cm) M.Sc.~ +/-3% H 8,274 8,0,5 7,883 7,883	(NTU) +1-10% 65.8 59,5 39,7 41,2 83.4	(mg/L) ++ 10% 7,32 7,81 7,28 6,98	(°C) +1-5° 9,20 9,49 9,56 9,56	+1-10 mV 306,1 312,6 278.1 290.1	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A	
VSI Time 8 8 1205 1210 1215 1220	(gallons) ML Iniful 60 1360 2040	Water (feat) <0.33' 5.35 < Aump 2 Pump < Pump	(SU) +/-0.1 3.02 3.14 3.14 3.13 3.32	(umhas/cm) M.Sc.~ +/-3% H 8,274 8,0,5 7,883 7,883	(NTU) +1-10% 1.55.8 59,5 39.7 41.2	(mg/L) ++ 10% 7,32 7,81 7,28 6,98	(°C) +1-5° 9,20 9,49 9,56 9,56	+1-10 mV 306,1 312,6 278.1 290.1	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A	
V/SI Time 8 8 1205 1210 1215 1220 1220 1220	(gallons) mL Iniful b 80 1360 2040 3100	Water (feat) <0.33' 5.35 < Aump 2 Pump < Pump	(SU) +/-0.1 3.02 3.14 3.14 3.13 3.32	(umhas/cm) M.Sc.~ +/-3% H 8,274 8,0,5 7,883 7,883	(NTU) +1-10% 65.8 59,5 39,7 41,2 83.4	(mg/L) ++ 10% 7,32 7,81 7,28 6,98	(°C) +1-5° 9,20 9,49 9,56 9,56	+1-10 mV 306,1 312,6 278.1 290.1	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A	
V/SI Time 8 8 1205 1210 1215 1220 1220 1220 1220 1220	(gallons) mL Iniful b 80 1360 2040 3100	Water (feat) <0.33' 5.35 < Aump 2 Pump < Pump < Pump	(SU) +/- 0.1 3.0 2 AA4 3.13 3.12 7.94	(umhas/cm) M.Sc.~ +/-3% H 8,274 8,0,5 7,883 7,883	(NTU) +1-10% 1.5.8 59.5 39.7 41.2 \$3.4	(mg/L) ++ 10% 7,32 7,81 7,28 6,98 7,43	(°C) +/-5° 9;20 9;49 9;56 9:56 9:52	+1-10 mV 306,1 312,6 278.1 390.1 2, 59,9	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A	
V/SI Time 8 8 1205 1210 1215 1220 1220 1220 1220 1220	(gallons) ML Iniful E 80 1360 2040 3400 3400	Water (feet) <0.33' 5.35 2 Pump 2 Pump 2 Pump 2 Pump 2 Pump	(SU) +/-0.1 3.02 3.193 3.19 7.94 Time: 1215	(umhas/cm) M.Sc.~ +1-3% AT 8,014 8,015 7,883 7,976 8,073 8,073 AM/PM	(NTU) +/- 10% 	(mg/L) + $+10\%$ 7,32 7,81 7,28 -1,28 -1,28 -1,28 -1,3 7,3 7,3 7,3 7,3 7,3 7,3 7,5 7,5 7,5 7,5 7,5 7,5 7,5 7,5 7,5 7,5	(°C) +1-5° 9,20 9,49 9,56 9,56 9,56 9,52	+1-10 mV 306,1 312,6 278.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 290.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1 200.1	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A	
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CLIENT: B LOCATION: PROJECT #:	N.E CI N.E CI	APE M	۵C # ۲	ST. LAW.	TSL A へ D R WELL LOCA	TION:	ICO Ogne	MNU J MOCGU	<u>26.</u> <u>J 3 6.</u>
INSPECTION Label on well? Is reference may Condition of wel Weather: Notes:	l:P	2000 CLOUDY		NO Sta Any Air	ap locked? nding water prese ndication of sun Temperature:		well?	YES YES YES HO	
STATIC WATER Date: 8/2	s 12004	7							
Depth to Water. Length of Welt:	AN C	5.5 8.74 <u>9.1</u>			sured with: ontamination:	ELECTRONIN PRE STEAM		CHALK & STEEL DIWATER)	(ape Other
WELL PURGING Date: <u>\$/2</u>	5/2004	End		<u>':::3</u> c AM/ 17:7c AM/				yphoon+	LF Cont. ATER OTHER
9.10	ft L ft	ength of well depth to wate		irge start)	Yield: If low, re	covery time:	(G))	LOW	
Galło	_ <u>x</u>	length of wat conversion fa 3 casing volu	actor (2" wel	I) 0.49		olume purged: urge flow rate;	the distance of the second sec	gallo m/m L/mir	jo or
Timo	Volume (gallons)	Depth to Water (feet)	pH (SU)	Conductivity (umhos/cm)	Turbidity (NTU)	D.O. (mg/L)	Temp (°C)	ORP	Ferrous Iron (mg/L)
Start: 11.30		<0.33	÷/- 0.1	+/- 3%	<u>≁/- 10%</u>	+/- 10%	*/- 5"	<u>+/- 10 mV</u>	N/A
Start: 11:50			1.86	3.651	96.85	2.94	9 35	776.8	N/A
11 49		\$ 59	1.8/	3.686	112.7	3.52	9.28	317.8	N/A
11:52		bilorgano	1.73	3.718	158.4	3.74	9.40	333.4	N/A
11:55		indu p. yo	1.73	3.725	135.6	3.31	935	373.2	N/A
л: 58		Idensit	1.70	3.709	160.8	3.37	9.23	334.6	NVA
12.01		below pays	169	3.696	133.0	3.27	8.92	337.8	N/A
		1-1-1-1				1			N/A
2									N/A
									N/A
Final:									N/A
	5 /2.00			5 АМ/РМ			C	& Low Flo	~
Appearance of Sa	E COLLECI	<u>yullonish kiron</u> TED: <u>(</u>			Actual sampi /HCL GRO) <u>eu</u>		110 2101 B	. `	Umin Umin 11/2: prth. 2/10/3
SAMPLING PER	SONNEL								
Name: Lavic	e Fre	435/8	LARON	Jambrosic	Company:	RECO	<u> </u>		i
									1

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CLIENT: CLIENT: CLIENT: CLIENT: CLIENT: PROJECT #	NiE. CF	4.20	0C# 9	ST. LAW. ENTE	すいへつ R WELL LOCAT	1014:		MOLGU	
INSPECTION Label of well? Is reference ma Condion of we Weither: Nots:	11: <u> </u>	2000 CLOUDY		NO Sta Any Air	ap locked? Inding water prese indication of surfa Temperature:		well?	YES YES YES YO	
	5/2009	}	D PURGING	у амлрм		/			
Depth to Water: Length of Well:		5.57 9.60			asured with: contemination;	PRE STEAM		CHALK & STEEL	TAPE OTHER
WELL PURGING Date: <u>\$/2</u>	5/2009	End			IPM Purging E IPM Decontarr			HEANED COLW	
9.60 5.57. 4.03	ft Le ft <u>- c</u>	ength of well lepth to wate length of wal		urge start)	Yield: If low, rec	overy time:	HIGH	LOW	
Gallo	x	conversion fa 3 casing volu	actor (<u>2°</u> wel	II) 0.49		ันme purged: rge flow rate:	14	gallo d ml/m	1
Notes:								L/mir	י ן נ
Time	Volume (gallons)	Depth to Water (feet) <0.33	pH (SU) ∻/- 0,1	Conductivity (umhos/cm) +/- 3%	Turbidity (NTU) +/- 10%	D.O. (mg/L) +/- 10%	Temp (°C)	ORP +/- 10 mV	Ferrous Iron (mg/L)
Start: 13:15		-0.00				-461	44-42	1	N/A
13 · L5		5.66	5.64	1.912	11.13	1.01	4.85	-12.8	N/A
17:28		5.65	5.68	1.979	£.49	0.87	4.45	-17.2	NIA
13.31		5.65	5.65	1.117	14.98 7.86	6.78	426	-10.6	N/A
13:39		5.65	5.60	1,790	9.67	081	4.57	-56 1	N/A
13:37		5.65	5.63	2.005	7.09	0.77	4.75	-9.5	N/A
									N/A
									N/A
							-		N/A
								<u> </u>	N/A
Final:	Low and	a marent were the state of the		<u> </u>					N/A
SAMPLE COLLE Date: 812		î	Finne: 13:4	U AM/PM	Mełhod: <u>N</u>	nini Ty	phoon (& Low Fle	100
Appearance of S	ample:	March hos	- and have	i. J. elie. up	Actual sample	e flow rate:	140	(77	1/mirtor
	· · · · · · · · · · · · · · · · · · ·	with purgan)	. J die up					L/min
SAMPLE BOTTL	E COLLECT	ED: (0 40 M	L VOA'S	HEL GRO,	- FOR (CION B.	enzenel	Wapth
SAMPLING PER	SONNEL					A			
Name: Lanc	e Pre	in 55 / J	taxou	Vanabrosi	Company:	AECO	<i>≫</i> 1 -		
and the second data was a fear of the second data was a fear of the second data was a fear of the second data w									

CLIENT: B LOCATION: PROJECT #:	N.E CI	APE M 4.20	oc# '	ST. LAW. ENTE	すいへつ R WELL LOCA	ATION:	TCC <u>OJNC</u>	MNU _ MOCGU	08 U 3 8
INSPECTION Label on well? Is reference man Conditton of wel Weather: Notes:	l:	2000 2000 2000 y	VES VES	NO Sta Any Air	ap locked? nding water pres v indication of sur Temperature:		veli?	YES YES YES	
STATIC WATER Date: 8/2	ELEVEL JUS		DPURGING					_	
Depth to Water. Length of Well:		07,34 9.75		_	asured with: contamination:	PRE STEAM C		CHALK & STEEL	TAPE OTHER
WELL PURGING Date: <u>§ / 2</u> CALCULATION OF 3	$\frac{5}{2000}$ ft L ft ft = x ns =	End T umes ength of well depth to wate length of wat conversion fa 3 casing volu	fime: er (before pu ler column actor (2° we umes	II) 0.49	PM Deconta Yield: If low, re Actual v	ecovery time: olume purged: urge flow rate:	HIGH 712	LEANED QIW LOW hava gailo 0 Milm	ATER OTHER
Time	Volume (gallons)	Depth to Water (fest)	рН (SU)	Conductivity (umhos/cm)	Turbidity (NTU)	D.O. (mg/L)	Temp (°C)	ORP	Ferrous Iron (mg/L)
Start: 10:10		<0.33'	+/- 0,1	+/- 3%	+/- 10%	+/- 10%	+/- 5°	+/- 10 mV	
and the second s		1	4.72	1 134	42.85	4.134 4.6/	4.07	17117	N/A
10:20		pelon punt	and the start of the start and	0.134	the second se		the second s	124.3	N/A
13: 23		betwee pope	4.75	0.135	44.80	5.07	4. 27 4. 11	122.7	N/A
10.00		Helongong	4.75	0.135	37.60	P.0.	<u>7.11</u>	100.1	N/A
				1					N/A
							*****		N/A N/A
						1			N/A
				-					
Einel.				-					N/A
Final: SAMPLE COLLE									N/A
Date: 8 12 9 Appearance of S SAMPLE BOTTL	ample: E COLLECT			L VOA'S	Method: _ Actual samp /HCL BRC Dev— w (NC		10	<u>, </u>	utimin or
SAMPLING PER Name: Lave	SONNEL E Pre	455/8	LARON	Janbrosic	Company:	AECO	W1 -		

CLIENT: B LOCATION: PROJECT #:	N.E CA	APE ST	T. LAW	KENCE Entei	TSLAND R WELL LOCAT	fion: (NW <u>Q</u> MOCG6		
INSPECTION Label on well? Is reference man Condition of wel Weather: Notes:	: 6	000d	VES VES 15 2	NO Sta Anj	ap locked? nding water prese / indication of surf Temperature:		vall?	YES YES 45 [±]	0 (2) (2) (2) (2) (2) (2) (2) (2) (2) (2)	
STATIC WATER Date: 9 ///	LEVEL JUS	ST PRIOR TO	D PURGING Time:	, AM/PM						
Depth to Water. Length of Well:	<u>4</u> 	.38 .50			asured with: contamination;	ELECTRONIC PRE STEAM C		CHALK & STEEL DIWATER	TAPE	
WELL PURGING Date: <u>9/1/ 12009</u> Begin Time: <u>1220</u> AM/EM) Purging Equipment MINI TYPHON+LFCOMT End Time: <u>1255</u> AM/EM) Decontamination: PRE STEAM CLEANED (DIWATER) OTHER										
Notes:								L/min		
Time	Volume (gallons)	Depth to Water (řeet)	рН (U3)	Conductivity (umhos/cm)	Turbidity (NTU)	D.O. (mg/L)	Temp (°C)	ORP	Ferrous Iron (mg/L)	
	- 1. 1	< 0.33'	+/-0.1	+/-3%	*/- 10%	+/- 10%	+/- 50	+/- 10 mV		
Start: 12-30 12-40	Intral .75	<u>4,38</u> 4,68	3.75 3.82	1.661	6.75	3.47	7.76	278,3	N/A N/A	
1245	1,25	4-82	3.81	1,000	4.05	0.87	7.93	284.4	N/A	
1250	7.00	1.33	3.81	1,187	2.99	0:17	7.93	2.87.9	N/A	
									N/A	
				<u>,</u>					N/A	
									N/A	
									N/A	
									N/A	
									N/A	
Final:									N/A	
SAMPLE COLLE Date: 9///	IZ004	2	Fime: 125	5 AMPM	Method: <u>W</u>	NINI TY	phon	JLF Co	ntroler	
Appearance of S	ample: 5/	<u>-Ганисс</u> 1.4 ЕD: 6-4	<u>apprava</u> 250 mL P 10 mL VO	NCE- WLY-SUMFA A VIALS II	Actual sample TE, 1-250 M HCL GRO / HCL For	e flow rate: L W/HNO: AKIGI P:	-/1 z flum zuzzana	00 (m efiles L, NApth	Umin pr L/min Ley-e	
0.1110		<u>ک</u>			/ race i cr	e Kwije	~ AK			
SAMPLING PER Name: Aaron		brosi	0		Company:	AECO,U	١			

CLIENT: B LOCATION: PROJECT #:	NECK	APE SO	-LAW		TSLAND R WELL LOCA	TION:		nw <u>o</u> Mocgi		
INSPECTION Label on well? Is reference ma Condition of wel Weather. Notes:	N: 🤄	ood (YED	NO Sta	cap locked? Inding water prese y indication of sur Temperature:		vell?	YES YES YES 4/5 ⁻²	S (S) (S) (S) (S) (S) (S) (S) (S) (S) (S	
STATIC WATER Date: 9 11	LEVEL JUE	ST PRIOR TO	D PURGING Time:	AMPM						
Depth to Water. 7.65 Measured with: ELECTRONIC TAPE CHALK & STEEL TAPE Length of Well: 9.70 Decontamination: PRE STEAM GLEANED DIWATER OTHER Decision Tech Dury & Tubing										
WELL PURGING	3 11 1200		_	1100 (
End Time: <u>140</u> AM/PM Decontamination: PRE STEAM CLEANED DIWATER OTHER CALCULATION OF 3 CASING VOLUMES <u>9.70</u> ft Length of well Yield: HIGH LOW <u>7.65</u> ft - depth to water (before purge start) If low, recovery time: <u>2 h v 5</u> <u>2.05</u> ft = length of water column <u>2.05</u> ft = length of water column <u>Callons</u> = 3 casing volumes Actual volume purged: <u>40</u> mVm/mor Notes: Had to wait for reducing of well to col/ect Limin										
			RRO Sa							
Time	Volume (gallons)	Depth to Water (feet)	рН (SU)	Conductivity (umhos/cm)	Turbidity (NTU)	D.O. (mg/L)	Temp (°C)	ORP	Ferrous Iron (mg/L)	
Start: 1/05	Initial	<0.33° 7.67	+1-0.1 5-32	+1-3%	+1-10%	+- 10%	+/-5° 5,22	+1-10 mV	N/A	
Stan: / (20	0,6	8,20	5.32	.584	7.84	1,97	5.68	40.2	N/A	
1130	0.8	8.26	5,56	,610	6.64	1.19	5.51	33,1	N/A	
1140	0,9	8.29	5,65	.608	6.2.5	1.08	5.34	34.8	N/A	
· · · · · · · · · · · · · · · · · · ·					 				N/A	
									N/A	
									N/A	
	ļ								N/A	
									N/A	
						-			N/A	
Final:		}		L					N/A	
SAMPLE COLLE	ZOOC	?	17me:1140	AMIPM	Method: <u>N</u>	AINI TY	phon	+LF (intro her	
Appearance of S	ample:	Clear	r Nach an D	ALV - 511: CA	Actual samp TiE, 1-250 K	le flow rate:	-24		10mlitior	
SAMPLE BOTTL	E COLLECT	ED: 6-0	tome vo	A VIALS IL	Here and	AKIOI B	2 12 12 12 12 12 12 12	, NApH	Umin Leize UZ	
SAMPLING PER	SONNEL					λ .				
Name: AaroN	Jam	brosi	<u>c</u>		Company:	AECO,V	<i>۱</i>]	

Day 28 Post-ISCO Sampling Forms

CLIENT: B	RISTOL	APE 5	T.L.AL	RENCE	TSLAND			MW.O	
PROJECT #:	11262			ENTER	R WELL LOCA	TION:	09 N (MOCGI	N <u>42</u>
INSPECTION Label on well? Is reference ma Condition of we Weather: Notes:		ant, da	rity.	NO Star Any	ap locked? nding water pres indication of sur Temperature:		vali?	YES YES YES ~40 F	29€9
	12.009		O PURGING Time: 14.2	/ AM/PM	\ <i></i>	<u> </u>			
Depth to Water. Length of Well:		5.1 8.94			sured with: ontamination.	PRESTEAM		CHALK & STEEL DIWATER	OTHER
WELL PURGING Date: 91 CALCULATION OF 3	200 3 CASING VOLU ft Le	End		15 15 AMA	PM Deconta Yield:	Equipment: <u>M</u> mination: pr covery time:		LOW	
	ft =	length of wa	ter column			E .			
 Gallo		conversion for 3 casing vol		1) 0.49		olume purged: urge flow rate:	120	ورابع سالاس	~
	sin of <u>fin</u>						/20	Limir	-
Time	Volume (gallons)	Depth to Water (feet)	{	Conductivity (umhos/cm)	Turbidity (NTU) +6 10%	D.O. (mg/L)	Temp (℃)	ORP	Ferrous Iron (mg/L)
Time		Water			-		· ·	ORP +/- 10 mV	lron (mg/L)
Тіте		Water (feet)	(SU)	(umhos/cm)	(NTU)	(mg/L)	(°C)		Iron
Time		Water (feet) <0.33	(SU) +/- 0.1 5.22 5.86	(umhos/cm) +/- 3% 3.436 3.420	• (NTU) +/- 10%	(mg/L) +/- 10%	(°C) +⊱5°	+/- 10 mV	Iron (mg/L) N/A
Time Start: 14:35 14:45 14:45 14:48 14:51		Water (feet) <0.33' 5.60 5.66 5.76	(SU) +/- 0.1 5. 82 5. 82	(umhos/cm) +1-3% 3-43(0 3.420 3.432	(NTU) +1- 10% 	(mg/L) +/- 10% 0.22 0.15 0.15	(°C) +1-5° 7.49 1.49 7.49	+/- 10 mV	Iron (mg/L) N/A N/A
Time Start: 14:35 14:45 14:45 14:51 14:51 14:54		Water (feet) <0.33' 5.60 5.66 5.76 5.70	(SU) +/- 0.1 5. 82 5. 82 5. 90	(umhos/cm) +/- 3% 3.43(2) 3.432 3.432 3.378	(NTU) +1- 10% 	(mg/L) +/- 10% 0.22 0.15 0.15 0.13	(°C) +1-5° 7.47 1.47 7.47 7.47 7.12	+1-10 mV -78 5 -58.3 - 82.8 79.7	Iron (mg/L) N/A N/A N/A
Time Start: 14:35 14:45 14:45 14:57 14:57		Water (feet) <0.33' 5.60 5.66 5.76 5.70 5.70	(SU) +/- 0.1 5.22 5.86 5.86 5.90 5.87	(umhos/cm) +/- 3% 3.436 3.430 3.432 3.378 3.367	(NTU) +1-10% 	(mg/L) +/- 10% 0.22 0.15 0.15 0.13 0.14	(°C) +1-5° 7.47 7.47 7.47 7.12 7.75	+1-10 mV -78 5 -58.3 -82.8 -77.7 -75.4	Iron (mg/L) N/A N/A N/A N/A N/A N/A
Time Start: 14:35 14:45 14:45 14:51 14:51 14:54		Water (feet) <0.33' 5.60 5.66 5.76 5.70	(SU) +/- 0.1 5. 82 5. 82 5. 90	(umhos/cm) +/- 3% 3.43(2) 3.432 3.432 3.378	(NTU) +1- 10% 	(mg/L) +/- 10% 0.22 0.15 0.15 0.13	(°C) +1-5° 7.47 1.47 7.47 7.47 7.12	+1-10 mV -78 5 -58.3 - 82.8 79.7	Iron (mg/L) N/A N/A N/A N/A N/A N/A
Time Start: 14:35 14:45 14:45 14:57 14:57		Water (feet) <0.33' 5.60 5.66 5.76 5.70 5.70	(SU) +/- 0.1 5.22 5.86 5.86 5.90 5.87	(umhos/cm) +/- 3% 3.436 3.430 3.432 3.378 3.367	(NTU) +1-10% 	(mg/L) +/- 10% 0.22 0.15 0.15 0.13 0.14	(°C) +1-5° 7.47 7.47 7.47 7.12 7.75	+1-10 mV -78 5 -58.3 -82.8 -77.7 -75.4	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A
Time Start: 14:35 14:45 14:45 14:57 14:57		Water (feet) <0.33' 5.60 5.66 5.76 5.70 5.70	(SU) +/- 0.1 5.22 5.86 5.86 5.90 5.87	(umhos/cm) +/- 3% 3.436 3.430 3.432 3.378 3.367	(NTU) +1-10% 	(mg/L) +/- 10% 0.22 0.15 0.15 0.13 0.14	(°C) +1-5° 7.47 7.47 7.47 7.12 7.75	+1-10 mV -78 5 -58.3 -82.8 -77.7 -75.4	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A
Time Start: 14:35 14:45 14:45 14:57 14:57 14:57 14:57		Water (feet) <0.33' 5.60 5.66 5.76 5.70 5.70	(SU) +/- 0.1 5.22 5.86 5.86 5.90 5.87	(umhos/cm) +/- 3% 3.436 3.430 3.432 3.378 3.367	(NTU) +1-10% 	(mg/L) +/- 10% 0.22 0.15 0.15 0.13 0.14	(°C) +1-5° 7.47 7.47 7.47 7.12 7.75	+1-10 mV -78 5 -58.3 -82.8 -77.7 -75.4	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A
Time Start: 14:35 14:45 14:45 14:42 14:57 14:57 14:57 14:57 14:57 14:57	(gallons)	Water (feet) <0.33' 5.60 5.66 5.76 5.70 5.70	(SU) +/- 0.1 5.22 5.86 5.86 5.90 5.87	(umhos/cm) +/- 3% 3.436 3.430 3.432 3.378 3.367	(NTU) +1-10% 	(mg/L) +/- 10% 0.22 0.15 0.15 0.13 0.14	(°C) +1-5° 7.47 7.47 7.47 7.12 7.75	+1-10 mV -78 5 -58.3 -82.8 -77.7 -75.4	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A
Time Start: 14:35 14:45 14:42 14:57 14:57 14:57 14:57 14:57 14:57 14:57 14:57	(gallons)	Water (feet) <0.33' 5.66 5.76 5.70 5.71 5.71 5.71	(SU) +/- 0.1 5.22 5.86 5.86 5.90 5.87	(umhos/cm) +/- 3% 3.43(c 3.432 3.378 3.3(c7) 3.3(c7) 5.152	(NTU) +1-10% 41.71 17.57 10.33 7.86 7.12 5.10	(mg/L) +/- 10% 0.22 0.15 0.15 0.13 0.14 0.44	(°C) +1-5° 7.47 7.47 7.47 7.75 7.75 7.75	+1-10 mV -78 5 -58.3 - 82.8 -79.7 -75.4 -79.8	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Time Start: 14:35 14:45 14:42 14:57 14:57 14:57 14:57 14:57 14:57 14:57 14:57	(gallons)	Water (feet) <0.33' 5.60 5.66 5.76 5.70 5.71 5.70 5.71 5.75	(SU) +1-0.1 5.22 5.22 5.26 5.28 5.28 5.25 5.25 5.25 5.25 5.25	(umhos/cm) +/- 3% 3.43(c 3.432 3.378 3.3(c7) 3.3(c7) 5.152	(NTU) + -10% $-4/1.7\tilde{1}$ 17.5% 10.33 7.5% 7.12 5.10 Method: M Actual sample = 1.1250 m -250 m	(mg/L) +/- 10% 0.22 0.15 0.15 0.13 0.14 0.44 0.43 0.44 0.43	(°C) +-5° <u>747</u> <u>747</u> <u>747</u> <u>747</u> <u>747</u> <u>747</u> <u>747</u> <u>747</u> <u>757</u> <u>757</u> <u>757</u>	+1-10 mV -78 5 -58.3 -82.8 -79.7 -79.7 -75.4 -79.8 -79.8 -24 -79.8 -79.8 -79.8 -79.8 -79.8 -79.8 -79.8 -79.8 -79.8 -79.8 -79.8 -79.8 -79.8 -79.8 -79.8 -79.8 -79.8 -79.8 -79.8 -79.8 -79.8 -79.8 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.8 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.8 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -79.7 -	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A

LOCATION: PROJECT #:	eistoi N.E CA 11262	APE ST	T.LAW	& EVIC C こ ENTER	TSLANID Well Loca	TION:		nw <u>o</u> Mocgi	
INSPECTION Label on well? Is reference may Condition of wel Weather: Notes:	1: C	ood	VES VES	NO Star Алу	ap locked? Iding water prese Indication of sur Femperature:		vəll?	VES VES VES 45 =	20 (2) (2)
STATIC WATER Date: 9	RLEVEL JUE	ST PRIOR TO	D PURGING Time:	AM/PM					
Depth to Water. Length of Welt	4 4	,38 -50			sured with: onternination:	ELECTRONIC PRE STEAM O		CHALK & STEEL DI WATER	TAPE OTHER
WELL PURGING Date: 91	1200	End		<u>226)</u> AMA 2 <u>55</u> AMA		Equipment: <u>M</u> mination: Pf		PI-to N 2-1 EANED DIW	
CALCULATION OF 3 <u>9.50</u> <u>4.38</u> <u>5.12</u> <u>2.5</u> Gallo Notes:	$\begin{array}{ccc} \mathbf{ft} & \mathbf{Le} \\ \mathbf{ft} & -\mathbf{c} \\ \mathbf{ft} & -\mathbf{c} \\ \mathbf{ft} & = \\ \mathbf{xe} \end{array}$	imes angth of well depth to wate length of wa conversion fa 3 casing volu	er (before pu ter column actor (2° wel		Actual vo	covery time: plume purged: urge flow rate:	нібн <u>истр</u> і <u>-~</u> 16		ns Mor
10065.								274104	' j
		The second se		1					
Tīme	Volume (gallons)	Depth to Water (feet)	pH (SU)	Conductivity (umhos/cm)	Turbidity (NTU)	D.O. (mg/L)	Temp (°C)	ORP	Ferrous Iron (mg/L)
	(gallons)	Water (feet) <0.33'	(SU) +/- 0.1	(umhos/cm) +/- 3%	(NTU) -+/- 10%	(mg/L) +/- 10%	(°C) +/- 5°	+/- 10 mV	ìran (mg/∟)
Start: 1230	(gallons) Tuifici(Water (feet) <0.33' <u>4.38</u>	(SU) +/-0.1 3.75	(umhos/cm) +/- 3% / . <u>b(-</u> /	(NTU) +/- 10%	(mg/L) +/- 10%	(°C) +1-5° 7.76	+/- 10 mV	ìran (mg/L) N∕A
Start: /230 /240	(gallons) Intra.(.75	Water (feet) <0.33 4.38 4.68	(SU) +/-0.1 3.75 3.82	(umhos/cm) +/- 3% /. Ľ(: / /. &: B	(NTU) +1-10% 6.75 6.09	(mg/L) +/- 10% <u>3.47</u> 0.74	(°C) +1-5° 7.76 7.94	+/- 10 mV 278,3 2835	iran (mg/L) N/A N/A
Start: /230 1240 1245	(gallons) <u>Luifici(</u> .75 <u>1</u> ,25	Water (feet) <0.33' 4.38 4.68 4.68 4.68	(SU) +/-0.1 3.75 3.82 3.81	(umhos/cm) +/- 3% /. <u>b(-</u> / /. <u>c.6</u> /. 77/	(NTU) +1-10% 6.75 6.09 4.05	(mg/L) +/- 10% 3.47 0.74 0.87	(°C) +1-5° 7.76 7.94 7.93	+/- 10 mV 278,3 2835 284.4	∂ron (mg/L) N/A N/A
Start: 1230 1240	(gallons) Intra.(.75	Water (feet) <0.33 4.38 4.68	(SU) +/-0.1 3.75 3.82	(umhos/cm) +/- 3% /. Ľ(: / /. &: B	(NTU) +1-10% 6.75 6.09	(mg/L) +/- 10% <u>3.47</u> 0.74	(°C) +1-5° 7.76 7.94	+/- 10 mV 278,3 2835	iran (mg/L) N/A N/A
Start: 1230 1240 1245	(gallons) <u>Luifici(</u> .75 <u>1</u> ,25	Water (feet) <0.33' 4.38 4.68 4.68 4.68	(SU) +/-0.1 3.75 3.82 3.81	(umhos/cm) +/- 3% /. <u>b(-</u> / /. <u>c.6</u> /. 77/	(NTU) +1-10% 6.75 6.09 4.05	(mg/L) +/- 10% 3.47 0.74 0.87	(°C) +1-5° 7.76 7.94 7.93	+/- 10 mV 278,3 2835 284.4	iron (mg/L) N/A N/A N/A N/A
Start: 1230 1240 1245	(gallons) <u>Luifici(</u> .75 <u>1</u> ,25	Water (feet) <0.33' 4.38 4.68 4.68 4.68	(SU) +/-0.1 3.75 3.82 3.81	(umhos/cm) +/- 3% /. <u>b(-</u> / /. <u>c.6</u> /. 77/	(NTU) +1-10% 6.75 6.09 4.05	(mg/L) +/- 10% 3.47 0.74 0.87	(°C) +1-5° 7.76 7.94 7.93	+/- 10 mV 278,3 2835 284.4	<pre></pre>
Start: 1230 1240 1245	(gallons) <u>Luifici(</u> .75 <u>1</u> ,25	Water (feet) <0.33' 4.38 4.68 4.68 4.68	(SU) +/-0.1 3.75 3.82 3.81	(umhos/cm) +/- 3% /. <u>b(-</u> / /. <u>c.6</u> /. 77/	(NTU) +1-10% 6.75 6.09 4.05	(mg/L) +/- 10% 3.47 0.74 0.87	(°C) +1-5° 7.76 7.94 7.93	+/- 10 mV 278,3 2835 284.4	<pre></pre>
Start: 1230 1240 1245	(gallons) <u>Luifici(</u> .75 <u>1</u> ,25	Water (feet) <0.33' 4.38 4.68 4.68 4.68	(SU) +/-0.1 3.75 3.82 3.81	(umhos/cm) +/- 3% /. <u>b(-</u> / /. <u>c.6</u> /. 77/	(NTU) +1-10% 6.75 6.09 4.05	(mg/L) +/- 10% 3.47 0.74 0.87	(°C) +1-5° 7.76 7.94 7.93	+/- 10 mV 278,3 2835 284.4	iron (mg/L) N/A N/A N/A N/A N/A N/A N/A
Start: 1230 1240 1245	(gallons) <u>Luifici(</u> .75 <u>1</u> ,25	Water (feet) <0.33' 4.38 4.68 4.68 4.68	(SU) +/-0.1 3.75 3.82 3.81	(umhos/cm) +/- 3% /. <u>b(-</u> / /. <u>c.6</u> /. 77/	(NTU) +1-10% 6.75 6.09 4.05	(mg/L) +/- 10% 3.47 0.74 0.87	(°C) +1-5° 7.76 7.94 7.93	+/- 10 mV 278,3 2835 284.4	<pre> ron (mg/L) NVA NVA NVA NVA NVA NVA NVA NVA NVA NVA</pre>
Start: 1230 1240 1245 1250	(gallons) <u>Luifici(</u> .75 <u>1</u> ,25	Water (feet) <0.33' 4.38 4.68 4.68 4.68	(SU) +/-0.1 3.75 3.82 3.81	(umhos/cm) +/- 3% /. <u>b(-</u> / /. <u>c.6</u> /. 77/	(NTU) +1-10% 6.75 6.09 4.05	(mg/L) +/- 10% 3.47 0.74 0.87	(°C) +1-5° 7.76 7.94 7.93	+/- 10 mV 278,3 2835 284.4	<pre></pre>
Start: /230 /240 /245 /250 Final:	(gallons) <i>Inific.</i> (.75 <i>i</i> .25 <i>Z</i> .20 <i>i</i> .25 <i>Z</i> .20 <i>Z</i> .20	Water (feet) <0.33' 4.38 4.68 4.68 4.82 4.82 4.83 4.83 1.1 1.2 1.2 ED: 6-	(SU) +1-0.1 3.75 3.82 3.81 3.81 3.81 5.81 7.02 7.02 7.02 7.02 7.02 7.02 7.02 7.02	(umhoslom) +1-3% 1.668 1.668 1.771 1.787 1.787 5 AMPM CCC 01y - Solo FAT A VIALS 1	(NTU) →1-10% <u>4.75</u> <u>6.09</u> <u>4.05</u> 2.99 <u>4.05</u> 2.99 <u>4.05</u> 2.99 <u>4.05</u> 2.99 <u>4.05</u> 2.99 <u>4.05</u> 2.99 <u>4.05</u> 2.99 <u>4.05</u> 2.99	(mg/L) +/- 10% 3.47 0.94 0.87 0.97 0.97 0.97	(°C) +1-5° 7.76 7.76 7.93 7.93 7.93 7.93 7.93 7.93 7.93	+1-10 mV 278,3 283,5 284.4 287.9 J-LF (0 00 (m efa(5) 1, NA, p.44	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: /230 /245 /245 /250 Final: SAMPLE COLLE Date: 9///	(gallons) Zui, f.c. (.75 <u>1,25</u> Z.00 CTION 1200 ample: S/ E COLLECT	Water (feet) <0.33' 4.38 4.68 4.68 4.82 4.82 4.83 4.83 1.1 1.2 1.2 ED: 6-	(SU) +1-0.1 3.75 3.82 3.81 3.81 3.81 5.81 7.02 7.02 7.02 7.02 7.02 7.02 7.02 7.02	(umhoslom) +1-3% 1.668 1.668 1.771 1.787 1.787 5 AMPM CCC 01y - Solo FAT A VIALS 1	(NTU) →1-10% 6.75 6.09 4.05 2.99 	(mg/L) +/- 10% 3.47 0.94 0.87 0.97 0.97 0.97	(°C) +1-5° 7.76 7.76 7.93 7.93 7.93 7.93 7.93 7.93 7.93	+1-10 mV 278,3 283,5 284.4 287.9 J-LF (0 00 (m efa(5) 1, NA, p.44	Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A

CLIENT: B LOCATION: PROJECT #:	N.E CA	APE ST	T.LAW	< ビスノ ENTE	TSLAND RWELLLOCA	TION:	TCON CANC	nu <u>o</u> Mocgi	4 <u>4</u>
INSPECTION Label on well? Is reference ma Condfilon of we Weather: Notes:	II: 🥝	ood oucly	YES	NO Sta Any	ap locked? nding water press / îndîcation of sur Temperature:		well?	YES YES YES 4/5	NO (0) (0) (0) (0) (0) (0) (0) (0) (0) (0)
STATIC WATER Date: 9 10 Depth to Water:	1/2009	65 7D	D PURGING Time:	АМ/РМ	asured with:	ELECTRONIC	CTAPE	CHALK & STEEL	TAPE
Length of Well:		10		Dec	contamination:	Decli	CLEANED	OIWATER DUIMP & -	OTHER) Tubing
WELL PURGINI Date: 91	G 1200	Ŧ		1100 (AM)			RE STEAM CL		LFContra
CALCULATION OF 9.70 7.65 2.05	ជ Le ជ ប	ength of well	er (before pu	rge start)	Yield: If low, re	covery lime:	нісн <u>2 h</u> 4	LOW	
<u>0.90</u> Gallo Notes:	אר (3 casing volu	forte	echance or	Actual p	blume purged: urge flow rate:	- 41	gallo 2 mil/m L/mil	lintor
		DRO/	RRO Sa	inples:	,				
Time	Volume (gallons)	Depth to Water	рН (SU)	Conductivity (umhos/cm)	Turbidity (งาวป)	D.O. (mg/L)	Temp (°C)	ORP	Ferrous Iron
		(ĭeet) <0.33'	+ <i>I</i> - 0.1	+1- 3%	+/- 10%	+/- 10%	+/- 5°	÷/-10 m.∨	(mg/L)
Start: 1/05	Initial	7.67	5.32	,517	8.45	1.05	5.22	47.2	N/A
1120	0,6	8,20	5,32	.584	7,84	1,97	5,68	40:2	N/A
/130	0.8	8.26	5,56	.610	6.64	1.19	5,51	33.1	N/A
1140	0.9	8,29	5,65	. 408	6.25	1.09	5.39		N/A
<i>L</i>									N/A
				1		<u>i</u> —			N/A
					· · · · ·	-			N/A
									N/A
									N/A
									N/A
Final:									N/A
SAMPLE COLLE Date: 9/	12004	? -	Гіте://40	AMIEM	Method: <u>N</u>	MINI TY	phon	JLF C	intro ler
Appearance of S	-	<u>(lear</u> ED: 6-	250 mL P 40 mL VO	OLY-SALFA	Actual samp TE, 1-250 x Hen ERO / Hen For-	le flow rate: いいんれいの みないのです	-24 3 For m. 22422:42	b etals Naptu	Winnor Umin Lane
SAMPLING PER	SONNEL								
Name: AaroN		brosi	<u> </u>		Company:	AECO.V	١		

CLIENT: B LOCATION: PROJECT #	N.E CI	APE S	T.L.AW	ĸ E へく C ENTE	TSLAND R WELL LOCA	TION: (TCOM CANC	NW.Q MOCGI	<u>5</u> N <u>45</u>
INSPECTION Label on well? Is reference ma Condition of we Weather: Notes:		cood Cloudy	YES	NO Sta	cap locked? anding water prese y indication of surf Temperature:		ell?	VES VES VES	×9 (2) (2)
STATIC WATER Date: 9 11	LEVEL JUS	ST PRIOR T	O PURGING Time: 84^{-2}						
Depth to Water. Length of Well:		5,35 3.45			asured with: contamination:	ELECTRONIC PRE STEAM C		CHALK & STEEL DI WATER	TAPE
WELL PURGING Date: 91	11 1200	End			PM Purging I PM Decontar	Equipment <u>M</u> mination: pr		PHONE	
CALCULATION OF 3 <u>B.45</u> <u>5.35</u> <u>3.10</u>	ft Le	ength of well	er (before pu	rge start)	Yield: If low, rea	covery time:	нідн (/ <i>5 м</i>	LOW	
<u>1.75</u> Gallo		3 casing vol	actor (2° wall umes 22 to Dizo I R	let red	Actual pu	olume purged: arge flow rate:	2 /e tes	gallo C mVm L/mir	intor
Time	Volume	Depth to	0,00 (K	Conductivity	Turbidity	D.O.	Temp	ORP	Ferrous
11170	(gallons)	Water	(SU)	(umhos/cm)	(NTU)	(mg/L)	(°C)	URF	tron
		(feet) <0.33'	+/- 0.1	+/- 3%	↔/- 10%	+/~ 10%	+/- 5°	+/- 10 mV	(mg/L)
Start: 1345	Intial	5,40	3,45	2,214	17,6	3.88	7.66	322.2	N/A
1350	,75	5.62	3.46	2,261	16.4	2.69	8.27	324.6	N/A
1355_	1.1	5.96	3.56	1.825	16-1	2.81	7,95	313,5	N/A
1400	1.4	635	3.58	1.768	16,1	2.89	7,70		N/A
1405	1-7	7,24	3.58	1:792	16:0	2.87	7.59	301.5	N/A
1407	2,0	7.81	3,58	1.793	16.0	2.87		302.6	N/A
								-	N/A
									N/A
									N/A
									N/A
Final:)							N/A
SAMPLE COLLE Date: 9/11	IZ00	2	Time: 1409	ANAPM	Method: <u>N</u>	MINE TY	PHON	+LF (ontro her
Appearance of S	ample: 5	1 tannic	Color,	Slodor.	Actual sampl		AL	- <u>-</u> (1	Wmin pr
SAMPLE BOTTL	E COLLECT	ED: 6-	Jome VO I Lt A	A VIALS II	THE, 1-250 M HALL GRO / HALL For-	AKICI B	euzene AKI	NAPH OI LAKI	viene oz
SAMPLING PER	SONNEL	1				A			
Nome: Aaro N	Jam	brosi	<u>C</u>		Company:	AECO,M			

CLIENT: Ĉ	BRISTON		E I AI	SHEWE B	TSLAN'D		TCO	nw <u>o</u>	6
LOCATION: PROJECT #		APE 3 24.20)	ENTE	ACC-20	TION:	OANC	MOCG	W 46
INSPECTION Label on well? Is reference ma Condition of we Weather: Notes:	e0: 🤇	500d		NO Is NO St Ar	cap locked? anoting water pres- ny indication of sur r Temperature;		vell?	YES YES YES	(§)(§) ⊲≤
STATIC WATE Date: 9 11 Depth to Water: Length of Well:	12000		D PURGING	<u>? AM/PM</u> 	contamination:	ELECTRONIC		CHALK & STEEL DI WATER	TAPE
WELL PURGIN Date: 91 CALCULATION OF	11 1200 3 casing vol. ft L	End	fime:	14:11 AN	VPM Decontar Yield:			eaned (Diw	LFContrater) OTHER
Galic Notes:	ft = 	conversion failed water a conversion failed	ter column actor (2° we ames	11) 0.49	Actual vo	olume purged; urge flow rate;		gallo Gallo L/min	hor
Time	Volume (gallons)	Depth to Water (feet)	р Н (SU)	Conductivity (umhos/cm) +/- 3%	Turbidity (NTU)	D.O. (mg/L)	Temp (°C)	ORP	Ferrous Iron (mg/L)
Start: 13.30		<0.33'	+/~ 0.1	+1-370	14-10%	+/- 10%	+/-5°_	+/- 10 mV	N/A
13:45		5.30	3.79	1.402	47.31	0.49	920	24/2.1	N/A
13:48		3.50	3.41	1.341	54.14	0.44	923	250.4	N/A
13:51		6-low prinp	5.29	1.272	44,36	0.45	9.12	261.5	N/A
13:54		Indang. up	3.16	1.268	62.81	041	\$ 90	260 7	N/A
13.5F]	bulmany	3.12	1.267	73.94	0.40	8 59	245,1	N/A
14:00		Information and	5.09	1,243	73. 20	0 44	9.42	269.1	N/A
									N/A
		ļ		-		ļ			N/A
									N/A
Final:					1				N/A
SAMPLE COLLE Date: 9/11 Appearance of S SAMPLE BOTTL	1200	<u>closily ter</u> 1.2 TED: 6-1	10 ML F	BOLY-SULFA	Method: <u>M</u> Actual sampl IE, 1-250 M HLL GRO / HLL For	AINI TY eflow rate: IL W/Nolo: AKICI B G BO/RE	130 Apr mi euzene	etals , NApti	Umin pr L/min
SAMPLING PER Name: Aaro N		brosic	<u>n</u>		Company:	AECOM			

CLIENT: B LOCATION: PROJECT #	N.E CI	APE S	T.LAN	> <i>ペモ</i> へく <i>C</i> ENTE	TSLAND RWELLLOCA MOL-18	TION:	TCO Ogno	MULO MOCGI	7 w <u>47</u>
INSPECTION Label on well? Is reference ma Condition of we Weather: Notes:	u: 🤇	Low		NO Sta An	cap locked? anding water pres y indication of sur Temperature:		well?	YES YES YES 46°F	28
STATIC WATER: LEVEL JUST PRIOR TO PURGING Date: 9 11 2009 Time: 11:36 AM/PM Depth to Water: 5 42 Measured with: ELECTRONIC TAPE CHALK & STEEL TAPE Length of Well: 9.60 Decontamination: PRE STEAM CLEANED DIWATER OTHER									
Date: <u>911</u>	WELL PURGING								
Gallo	ft = ms =	length of wa conversion f 3 casing vol	ter column actor (2° we	11) 0.49 141 and	Actual ve Actual p	olume purged: urge flow rate:		gallo mim L/min	Por
		Dup	CANCON BO	(41 @ H	00				
Тіте	Vołume (gallons)	Depth to Water (feet) <0.33	04 NC-M 60 pH {SU} +/- 0.1	(umbos/cm) (umbos/cm) (umbos/cm) +/- 3%	یدے Turbidity (NTU) +/- 10%	D.O. (mg/L) +/- 10%	Temp (°C) +/- 5°	ORP +/- 10 mV	Ferrous Iron (mg/L)
		Depth to Water (feet)	pH (SU)	Conductivity (umbos/em)	Turbidity (NTU)	(mg/L)	(°C)		Ferrous Iron (mg/L)
Start: 11.40		Depth to Water (feet) <0.33'	pH {SU} +/- 0.1	Conductivity (umhos/em) ^3 / Cm +/- 3%	Turbidity (NTU) +/- 10%	(mg/L) +/ 10%	(°C) +/- 5°	+/- 10 mV	Ferrous Iron (mg/L) N/A
Start: 11'90 11:50		Depth to Water (feet) <0.33'	pH (SU) +/- 0.1	Conductivity (umhos/em) ~ 3/cm +/- 3%	Turbidity (NTU) +/- 10%	(mg/L) +/- 10%	(°C) +/- 5°	+1- 10 mV	Ferrous Iron (mg/L) N/A N/A
Start: 11.90 11:50 11:53		Depth to Water (feet) <0.33'	pH (SU) +/-0.1 6.25	Conductivity (umbos/em) ~ '/(m +/- 3% 5 . 4 0 3 3 . 4 7.4	Turbidity (NTU) +/- 10%	(mg/L) +/- 10%	(°C) +/- 5° 5_05 5_05	+10 mV	Ferrous Iron (mg/L) N/A N/A N/A
Start: 11 40 11:50 11:50 11:56		Depth to Water (feet) <0.33' 5.57 5.57 5.52	pH {SU} +/-0.1 6.25 6.25 6.24	Conductivity (umbos/em) ~ 1/cn +1-3% 5.403 3.424 3.424 3.492	Turbidity (NTU) +/- 10% Z1. 25 [2.28 [2.28 [5.70	(mg/L) +/- 10% 0 53 0,40	(°C) +/- 5° 5 05 5.05 5.18	+10 mV -75.5 -75.3 -74.9	Ferrous Iron (mg/L) N/A N/A N/A N/A
Start: 11 40 11 : 50 11 : 50 11 : 50 11 : 51		Depth to Water (feet) <0.33' 5.57 5.57 5.57 5.52 5.52 5.52	pH (SU) +/-0.1 6.25 6.25 6.24 6.24	Conductivity (umhos/em) ~ 1/cm +/- 3% 5 . 403 3 . 474 3 . 474 5 . 472	Turbidity (NTU) +/- 10% 24. 55 18. 28 15. 10 11. 39	(mg/L) +/- 10% 0 53 0.40 6.5 Z	(°C) +1-5° 5-05 5-05 5-05 5-05 5-05 5-05 5-05 5	+10 mV -75.5 -75.3 -74.9 -87.3	Ferrous Iron (mg/L) N/A N/A N/A N/A N/A
Start: 11 90 11:50 11:50 11:50 11:50 11:51 11:51 11:51 11:02		Depth to Water (feet) <0.33' 5.57 5.57 5.57 5.52 5.52 5.52	pH (SU) +/-0.1 6.25 6.25 6.24 6.28 6.27	Conductivity (urnhos/ern) ~ 3/cm +/- 3% 5 . 403 3 . 4 74 3 . 472 5 . 472 5 . 472	Turbidity (NTU) +/- 10% 24.85 18.28 15.70 11.39 09.16	(mg/L) +/- 10% 0 53 0 53 0.40 6.52 0 30	(°C) +/-5° 5_05 5_05 5_05 5_05 5_15 5_15 5_30 5_30	+1- 10 mV -75.5 -75.3 -74.9 -87.3 -86.0	Ferrous Iron (mg/L) N/A N/A N/A N/A N/A N/A
Start: 11 40 11:50 11:50 11:56 11:56 11:56 11:56 11:57 12:02 12:05		Depth to Water (feet) <0.33' 5.57 5.57 5.57 5.57 5.57 5.57 5.57 5.5	pH (SU) +/-0.1 6.25 6.25 6.24 6.25 6.24 6.25 6.27 6.27 6.36	Conductivity (umbos/cm) ~ 1/cm +/- 3% 3 . 4 03 3 . 4 74 3 . 4 72 3 . 4 72 3 . 4 72 3 . 4 72 3 . 4 72	Turbidity (NTU) +/- 10% 24.85 18.28 15.70 11.39 09.16 08.34	(mg/L) +/- 10% 0 53 0 53 0.40 6.52 0 30 0.24	(°C) +/-5° 5_05 5_05 5_05 5_18 5_18 5_30 5_30 5_30 5_30 5_32	+10 mV -75.5 -75.3 -74.8 -87.3 -86.0 -186.1	Ferrous Iron (mg/L) N/A N/A N/A N/A N/A N/A
Start: 11.40 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 10		Depth to Water (feet) <0.33' 5.53 5.53 5.52 5.52 5.53 5.53 5.53	pH (SU) +/-0.1 6.25 6.25 6.24 6.25 6.24 6.25 6.27 6.36 6.35	Conductivity (umbos/em) ~ '/cm +/- 3% 3 . 4 03 3 . 4 74 3 . 4 74 3 . 4 72 3 . 4 72	Turbidity (NTU) +/- 10% 24. 85 18. 28 15. 70 11. 39 09.16 08.34 08.34	(mg/L) +/- 10% 0 53 0 53 0 40 0 52 0 30 0 24 6 23	(°C) +1-5° 5 05 5.07 5.18 5.18 5.30 5.30 5.30 5.32 5.33	+1-10 mV -75.5 -75.3 -74.9 -87.3 -86.0 -106.1 -104.6	Ferrous Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A
Start: 11 40 11:50 11:50 11:56 11:56 11:56 11:56 11:57 12:02 12:05		Depth to Water (feet) <0.33' 5.57 5.57 5.57 5.57 5.57 5.57 5.57 5.5	pH (SU) +/-0.1 6.25 6.25 6.24 6.25 6.24 6.25 6.27 6.27 6.36	Conductivity (umbos/cm) ~ 1/cm +/- 3% 3 . 4 03 3 . 4 74 3 . 4 72 3 . 4 72 3 . 4 72 3 . 4 72 3 . 4 72	Turbidity (NTU) +/- 10% 24.85 18.28 15.70 11.39 09.16 08.34	(mg/L) +/- 10% 0 53 0 53 0.40 6.52 0 30 0.24	(°C) +/-5° 5_05 5_05 5_05 5_18 5_18 5_30 5_30 5_30 5_30 5_32	+10 mV -75.5 -75.3 -74.8 -87.3 -86.0 -186.1	Ferrous Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 11'40 11:50 11:50 11:50 11:50 11:51 11:51 11:51 12:02 12:05 12:05 12:05 12:08		Depth to Water (feet) <0.33' 5.53 5.53 5.52 5.52 5.53 5.53 5.53	pH (SU) +/-0.1 6.25 6.25 6.24 6.25 6.24 6.25 6.27 6.36 6.35	Conductivity (umbos/em) ~ '/cm +/- 3% 3 . 4 03 3 . 4 74 3 . 4 74 3 . 4 72 3 . 4 72	Turbidity (NTU) +/- 10% 24. 85 18. 28 15. 70 11. 39 09.16 08.34 08.34	(mg/L) +/- 10% 0 53 0 53 0 40 0 52 0 30 0 24 6 23	(°C) +1-5° 5 05 5.07 5.18 5.18 5.30 5.30 5.30 5.32 5.33	+1-10 mV -75.5 -75.3 -74.9 -87.3 -86.0 -106.1 -104.6	Ferrous Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 11'40 11:50 11:50 11:50 11:50 11:50 11:50 11:50 12:00 12:00 12:00 12:00 12:00 12:00 12:00 12:00 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11	(gallons)	Depth to Water (feet) <0.33' 5.53 5.53 5.52 5.52 5.53 5.53 5.53	pH (SU) +/-0.1 6.25 6.25 6.24 6.25 6.24 6.25 6.27 6.36 6.35	Conductivity (umbos/em) ~ '/cm +/- 3% 3 . 4 03 3 . 4 74 3 . 4 74 3 . 4 72 3 . 4 72	Turbidity (NTU) +/- 10% 24. 85 18. 28 15. 70 11. 39 09.16 08.34 08.34	(mg/L) +/- 10% 0 53 0 53 0 40 0 52 0 30 0 24 6 23	(°C) +1-5° 5 05 5.07 5.18 5.18 5.30 5.30 5.30 5.32 5.33	+1-10 mV -75.5 -75.3 -74.9 -87.3 -86.0 -106.1 -104.6	Ferrous Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 11'40 11:50 11:50 11:50 11:50 11:51 11:51 12:05 12:05 12:05 12:05 12:05	(gallons)	Depth to Water (feet) <0.33' 5.51 5.51 5.52 5.52 5.52 5.52 5.52 5.52	рн (SU) +/-0.1 6.25 6.25 6.27 6.27 6.27 6.27 6.35 6.35 6.35	Conductivity (umbos/em) ~ '/cm +/- 39% 3 . 4 03 3 . 4 12 3 . 4 70 3 . 4 70 5 . 5 . 4 70 5 . 5 . 5 . 5 . 5 . 5 .	Turbidity (NTU) +/-10% 24.25 [2.28 [5.70 [1.39 09.16 08.48 08.48 09.64 Method: M Method: M TE, 3-280 A HCL For	(mg/L) +1-10% 0 53 0 53 0.40 0.52 0.30 0.24 6.23 0.25	(°C) +1-5° 5-05 5-05 5-18 5-30 5-30 5-30 5-30 5-32 5-31 5-31 100 100 100 100 100 100 20 AK	+ 10 mV -75.5 -75.3 -74.8 -87.3 -86.0 -186.1 -104.6 -107.1	Ferrous Iron (mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A

CLIENT: D LOCATION: PROJECT #:	RISTOL N.E.C.C. 11262	APE S	T.LAN	ENTER ENTER	TSLAND RWELL LOCA Mcc.		TCO Ogno	MUCC	₹ ₩ <u>4₹</u> _
INSPECTION Label on well? Is reference ma Condition of wel Weather: Notes:		<u>,</u>	92 - F	NO Star Any	ap locked? Inding water prese Indication of sur Femperature:		se li?	YES YES YES 967F	28€3
STATIC WATER LEVEL JUST PRIOR TO PURGING Date: 9 11 2.009 Time: 10:45 AMUPIM Depth to Water: 7 11 Measured with: ELECTRONSC TAPE CHALK & STEEL TAPE Length of Well: 7.35 Decontamination: PRE STEAM Q EANED DIVATER OTHER									
Length of Well:		9.35		Dec	ontamination:	PRESTEAM	GLEANED '	DI WATER	OTHER
WELL PURGING Date: 91 CALCULATION OF 3	ti	End	Time: er (before pu	<u>/さら/</u> AM/ (6:45 AM/ urge start)	PM Decontai Yield:	Equipment M mination: P covery time:	RE STEAM CL	LOW	LFCorntr
		conversion fa		1) 0.49	Actual vo	olume purged:		galto	រាន
Gallo		3 casing volu				urge flow rate:		mVm	-
Notes:	112	64 will	er der					L/mit	ו
	Volume	Dooth to	nLJ	Conductivity	Turbidity	D.O.	1	ORP	
		Depth to	pH	Conductivity	TURDIDIKY	D.U.	Temp	OKP	Ferrous
Tīmə		Water	(SU)	(umhos/cm)	(NTU)	$(m\alpha/L)$	(°C)		ויסק
Tîmə	(gallons)	Water (feet)	(SU)	(umhos/cm)	(NTU)	(mg/L)	(")		iron (mg/L)
			(SU) +/-0.1	(umhos/cm) +/- 3%	• (NTU) +/- 10%	(mg/L) +/- 10%	(°C) +/- 5°	+/- 10 mV	(mg/L)
Start: <u>(</u> 3:5)		(feet)	+ <i>i</i> - 0.1	+/- 3%	+/- 10%	+/- 10 <u>%</u>	+/- 5°		(mg/L) N/A
Start: <u>/g:51</u> //: *1		(feet)	+J- Q.1 57,36	+1-396	+/- 10%	+/- 10%	+1-5°	132.4	(mg/L) N/A N/A
Start: <u>(</u> 3:5)		(feet)	+ <i>i</i> - 0.1	+/- 3%	+/- 10%	+/- 10 <u>%</u>	+/- 5°		(mg/L) N/A N/A N/A
Start: <u>/g:51</u> //: *1		(feet)	+J- Q.1 57,36	+1-396	+/- 10%	+/- 10%	+1-5°	132.4	(mg/L) N/A N/A
Start: <u>/g:51</u> //: *1		(feet)	+J- 0.1 57.36	+1-396	+/- 10%	+/- 10%	+1-5°	132.4	(mg/L) N/A N/A N/A
Start: <u>/g:51</u> //: *1		(feet)	+J- 0.1 57.36	+1-396	+/- 10%	+/- 10%	+1-5°	132.4	(mg/L) N/A N/A N/A N/A N/A
Start: <u>/g:51</u> //: *1		(feet)	+J- 0.1 57.36	+1-396	+/- 10%	+/- 10%	+1-5°	132.4	(mg/L) N/A N/A N/A N/A N/A N/A
Start: <u>/g:51</u> //: *1		(feet)	+J- 0.1 57.36	+1-396	+/- 10%	+/- 10%	+1-5°	132.4	(mg/L) N/A N/A N/A N/A N/A N/A N/A
Start: <u>/g:51</u> //: *1		(feet)	+J- 0.1 57.36	+1-396	+/- 10%	+/- 10%	+1-5°	132.4	(mg/L) N/A N/A N/A N/A N/A N/A N/A
Start: 10:51 11:41 11:41 11:41 Final:	(gallons)	(feet) <0.33'	+J- 0.1 57.36	+1-396	+/- 10%	+/- 10%	+1-5°	132.4	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: 19:51 11:41 11:41	(gallons)	(feet) <0.33'	+J- 0.1 57.36	+/- 3%6	+/- 10%	+/- 10%	+/- 5° 3.65 3.64	132.4	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Start: (c: 5) (1) (1) (1) (2) Final: SAMPLE COLLE	(gailons)	(feet) <0.33'	+/- 0.1 57.37 57.37 Fime: 10:15 Club, L. 250 ML P	+/- 3%6	+/- 10% 13. 4/ 	+/- 10% $\frac{1}{2}$ () $\frac{1}{2}$ () $\frac{1}{$	+1-5° 3.65 3.64 	+ L F (1 efals L, NAph	(mg/L) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A

APPENDIX L

ADEC Checklists (Provided on CD)

Laboratory Data Review Checklist

Completed by:	Marty Hannah					
Title:	Project Chemist					
Date:	October 2, 2009					
CS Report Name:	NE Cape St. Lawrence Island					
Report Date:						
Consultant Firm:	Bristol Environmental Remediation Services					
Laboratory Name:	TestAmerica-Tacoma					
Laboratory Report Nu	mber: 580-14560					
ADEC File Number:						
ADEC RecKey Number	er:					
1. Laboratory						
a. Did an ADI • Yes	C CS approved laboratory receive and <u>perform</u> all of the submitted sample analyses? No Comments:					
All samples v	vere analyzed by TestAmerica-Tacoma					
b. If the sample laboratory,	les were transferred to another "network" laboratory or sub-contracted to an alternate was the laboratory performing the analyses ADEC CS approved?					
b. If the sampl laboratory, O Yes	les were transferred to another "network" laboratory or sub-contracted to an alternate was the laboratory performing the analyses ADEC CS approved? No Comments:					
b. If the sample laboratory,	les were transferred to another "network" laboratory or sub-contracted to an alternate was the laboratory performing the analyses ADEC CS approved? No Comments:					
b. If the sampl laboratory, O Yes	les were transferred to another "network" laboratory or sub-contracted to an alternate was the laboratory performing the analyses ADEC CS approved? No Comments: le					
 b. If the sample laboratory, Yes 2. <u>Chain of Custody (</u> a. COC inform 	les were transferred to another "network" laboratory or sub-contracted to an alternate was the laboratory performing the analyses ADEC CS approved? No Comments: le <u>COC</u>) nation completed, signed, and dated (including released/received by)?					
 b. If the sample laboratory, [•] Yes Not Applicab 2. Chain of Custody (les were transferred to another "network" laboratory or sub-contracted to an alternate was the laboratory performing the analyses ADEC CS approved? © No Comments: le <u>COC</u>					
 b. If the sample laboratory, Yes 2. <u>Chain of Custody (</u> a. COC inform 	les were transferred to another "network" laboratory or sub-contracted to an alternate was the laboratory performing the analyses ADEC CS approved? No Comments: le <u>COC</u>) nation completed, signed, and dated (including released/received by)?					
 b. If the sample laboratory, Yes Not Applicab 2. Chain of Custody (a. COC inform • Yes b. Correct ana 	les were transferred to another "network" laboratory or sub-contracted to an alternate was the laboratory performing the analyses ADEC CS approved? No Comments: le <u>COC</u>) nation completed, signed, and dated (including released/received by)? No Comments: lyses requested?					
 b. If the sample laboratory, Yes 2. <u>Chain of Custody (</u> a. COC inform Yes 	les were transferred to another "network" laboratory or sub-contracted to an alternate was the laboratory performing the analyses ADEC CS approved? No Comments: le <u>COC</u>) nation completed, signed, and dated (including released/received by)? No Comments:					

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt $(4^\circ \pm 2^\circ C)$?

	💿 Yes	C No	Comments:
b.		ervation acceptab orinated Solvents	le – acidified waters, Methanol preserved VOC soil (GRO, BTEZ , etc.)?
	• Yes	© No	Comments:
 c.	Sample cond	dition documented	d – broken, leaking (Methanol), zero headspace (VOC vials)?
	Yes	© No	Comments:
1	All samples w	vere received in go	ood condition.
d.		reservation, samp	es, were they documented? For example, incorrect sample le temperature outside of acceptable range, insufficient or missin
	🔿 Yes	🔿 No	Comments:
	NT 1.	eies were noted.	
1	No discrepanc	les were noted.	
[] e.	1		ted? Explain.
	1	or usability affec	ted? Explain. Comments:
e.	Data quality		Comments:
e.	Data quality Data quality is	or usability affec	Comments:
e.	Data quality	or usability affec	Comments:
e.	Data quality Data quality is <u>Narrative</u>	or usability affec	Comments:
e.	Data quality Data quality is <u>Narrative</u>	or usability affec	Comments:
e.	Data quality Data quality is <u>Narrative</u> Present and	or usability affec sufficient for pro understandable?	Comments: ject purposes.
e. [] se 1 a.	Data quality Data quality is <u>Narrative</u> Present and • Yes	or usability affec sufficient for pro- understandable? © No	Comments: ject purposes.
e. [] se 1 a.	Data quality Data quality is <u>Narrative</u> Present and • Yes	or usability affec sufficient for pro- understandable? © No	Comments: ject purposes. Comments:
e. [] se 1 a.	Data quality Data quality is <u>Narrative</u> Present and • Yes Discrepancie	or usability affec s sufficient for pro- understandable? No es, errors or QC fa	Comments: ject purposes. Comments: ailures identified by the lab?
e. [I] a. [] b.	Data quality Data quality is <u>Narrative</u> Present and • Yes Discrepancie • Yes	or usability affec sufficient for pro understandable? No es, errors or QC fa	Comments: ject purposes. Comments: ailures identified by the lab? Comments:
e. [] se 1 a.	Data quality Data quality is <u>Narrative</u> Present and • Yes Discrepancie • Yes	or usability affec s sufficient for pro- understandable? No es, errors or QC fa	Comments: ject purposes. Comments: ailures identified by the lab? Comments:

d. What is the effect on data quality/usability according to the case narrative? Comments:

Sample results are usable for project purposes. The method blank had reportable results between the MDL and PQL, sample results were flagged B. The method blank also had surrogate recoveries above the method acceptance limit, no sample results were impacted. Samples 14560-2 and-4 were diluted due to presence of target analytes, the dilution made quantitation of surrogates impractical.

5. <u>Samples Results</u>

a.	Correct ana	lyses perfori	ned/reported as requested on COC	<u>C</u> ?
	Yes	O No	Comments:	
b.	All applicat	ble holding t	imes met?	
	• Yes	O No	Comments:	
c.	All soils rep	oorted on a d	ry weight basis?	
	Yes	O No	Comments:	
d.	Are the repo project?	orted PQLs l	ess than the Cleanup Level or the	minimum required detection level for the
_	• Yes	🔿 No	Comments:	
e.	Data quality	or usability	affected?	
		-	Comments:	
S	Sample analy	sis and repor	ting was acceptable for project pu	irposes.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

- Yes No Comments:
- ii. All method blank results less than PQL?
- Yes No Comments:

The method blank had positive results reported between the MDL and PQL. Affected sample results are B flagged.

iii. If above PQL, what samples are affected? Comments:

The positive result was below the PQL.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

• Yes • No Comments:

v. Data quality or usability affected? Explain. Comments:

Sample results are usable for project purposes. The sample results were greater than 10 times the concentration reported in the method blank.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

- i. Organics One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
- Yes No Comments:
- ii. Metals/Inorganics one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
- Yes No Comments:

Not applicable

- iii. Accuracy All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)
- Yes No Comments:
- iv. Precision All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
- Yes No Comments:
- - v. If %R or RPD is outside of acceptable limits, what samples are affected? Comments:

Not applicable

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ● No Comments:

No data flags were assigned based on Laboratory sample recoveries.

vii. Data quality or usability affected? (Use comment box to explain) Comments:

Sample results are usable for project purposes without qualification.

- c. Surrogates Organics Only
 - i. Are surrogate recoveries reported for organic analyses field, QC and laboratory samples?
 Yes
 No
 Comments:
 - Accuracy All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

- iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
- Yes No Comments:

Samples 58-14560-2 and -4 were diluted and suitable surrogate results were not obtained. The extraction method blank reported surrogate recoveries exceeding method acceptance limits. Data flags (X)were assigned to sample results indicating surrogate recoveries were outside of acceptance limits.

iv. Data quality or usability affected? (Use the comment box to explain.) Comments:

Sample results are usable for project purposes. The flagged results are considered estimates.

- d. Trip blank Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): <u>Water and</u> <u>Soil</u>
 - i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (if not, enter explanation below.)
 - Yes ⓒ No Comments:

Samples were submitted for DRO analysis only.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

○ Yes ○ No Comments:

Not applicable

iii.	All	results	less	than	PQL?	
------	-----	---------	------	------	------	--

• Yes • No Comments:

Not applicable

iv. If above PQL, what samples are affected? Comments:

Not applicable

v. Data quality or usability affected? Explain.

Comments:

Not applicable

e. Field Duplicate

- i. One field duplicate submitted per matrix, analysis and 10 project samples?
- ♥ Yes ♥ No Comments:

.

- ii. Submitted blind to lab?
- Yes No Comments:

Not applicable

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \ge 100$

Where R_1 = Sample Concentration R_2 = Field Duplicate Concentration

O Yes O No

Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

- f. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below.)

 - i. All results less than PQL?
 - Yes No Comments:

Samples were collected with disposable equipment that was not reused.

ii. If above PQL, what samples are affected?

Comments:

iii. Data quality or usability affected? Explain.

Comments:

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

💿 Yes 🛛 🔿 No

Comments:

Laboratory Data Review Checklist

Completed by:	Marty Hannah
Title:	Project Chemist
Date:	October 5, 2009
CS Report Name:	NE Cape Landfill and ISCO Study
Report Date:	
Consultant Firm:	Bristol Environmental Remediation Services
Laboratory Name:	TestAmerica-Tacoma
Laboratory Report Nu	mber: 580-14753
ADEC File Number:	
ADEC RecKey Number	er:
1. Laboratory	
a. Did an ADH • Yes	C CS approved laboratory receive and <u>perform</u> all of the submitted sample analyses? No Comments:
1	es were transferred to another "network" laboratory or sub-contracted to an alternate was the laboratory performing the analyses ADEC CS approved? No Comments:
TOC samples	were sub-contracted to TestAmerica-West Sacramento for analyses.
2. <u>Chain of Custody (</u>	<u>COC)</u>
a. COC inform	nation completed, signed, and dated (including released/received by)?
• Yes	© No Comments:
b. Correct ana• Yes	lyses requested? © No Comments:

3. <u>Laboratory Sample Receipt Documentation</u>

Sample/cooler temperature documented and within range at receipt $(1^{\circ} + 2^{\circ} C)^{\circ}$

	💿 Yes	🔿 No	Comments:
b.		ervation accepta orinated Solven	able – acidified waters, Methanol preserved VOC soil (GRO, BTEX
	Yes	O No	Comments:
c.	Sample cond	dition document	ted – broken, leaking (Methanol), zero headspace (VOC vials)? Comments:
I	All samples w	rere received in	good condition.
d.		reservation, san	cies, were they documented? For example, incorrect sample nple temperature outside of acceptable range, insufficient or missin
	Yes	🔿 No	Comments:
(Custody seals	were not preser	nt on cooler per the cooler receipt form.
e.	Data quality	or usability aff	Sected? Explain. Comments:
•••			comments.
_	ample results	are usable for p	project purposes.
S	ample results <u>Varrative</u>	are usable for p	
sase 1	Narrative_	are usable for put of the second	project purposes.
sase 1	Narrative_		project purposes.
sase 1	Narrative Present and	understandable	project purposes.
ase 1 a.	Narrative Present and to Yes	understandable ⁴	project purposes.
ase 1 a.	Narrative Present and to Yes	understandable ⁴	project purposes. ? Comments:

c. Were all corrective actions documented?

O Yes O No Comments:

No corrective actions were required.

d. What is the effect on data quality/usability according to the case narrative? Comments:

Sample results are usable for project purposes. Some results are considered estimates due minor QC issues.

5. <u>Samples Results</u>

a. Correct analyses performed/reported as requested on COC?

• Yes • No	Comments:
------------	-----------

b. All applicable holding times met?

• Yes • No Comments:

- c. All soils reported on a dry weight basis?
 Yes No Comments:
- d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

Yes	🔿 No	Comments:

e. Data quality or usability affected?

Comments:

Sample analyses were performed within holding times and reporting limits met project data quality objectives.

6. QC Samples

- a. Method Blank
 - i. One method blank reported per matrix, analysis and 20 samples?
 - Yes No Comments:
 - ii. All method blank results less than PQL?
 - Yes No Comments:

iii. If above PQL, what samples are affected? Comments:

The GRO method blank had positive results between the MDL and PQL. All sample result were more than 1000 times the concentration found in the method blank.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

• Yes • No Comments:

Affected samples are assigned a B.

v. Data quality or usability affected? Explain. Comments:

Sample results are unaffected by the positive method blank result.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

€ Yes ○ No Comments:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

💿 Yes 🛛 🔿 No

Comments:

 iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

• Yes • No Comments:

 iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

• Yes • No Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected? Comments:

Not applicable

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No Comments:

Laboratory control samples met control limits for accuracy and precision.

vii. Data quality or usability affected? (Use comment box to explain) Comments:

Sample results are usable for project purposes.

- c. Surrogates Organics Only
 - i. Are surrogate recoveries reported for organic analyses field, QC and laboratory samples?
 Yes
 No
 Comments:
 - Accuracy All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)
 - Yes ⊙ No Comments:

Some sample surrogate recoveries were outside of method acceptance limits.

- iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
- Yes No Comments:

Samples with surrogate recoveries outside of method acceptance limits are flagged X. 8260 sample results with only one surrogate out of method acceptance limits may not be flagged.

iv. Data quality or usability affected? (Use the comment box to explain.) Comments:

All sample results are usable for project purposes. Some results are considered estimates due to minor QC issues such as surrogate recoveries.

- d. Trip blank Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): <u>Water and</u> <u>Soil</u>
 - i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (if not, enter explanation below.)

• Yes • No Comments:

- ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)
- Yes No Comments:

iii. All results less than PQL?Yes O No Comments:

iv. If above PQL, what samples are affected? Comments:

Not applicable

v. Data quality or usability affected? Explain. Comments:

Data quality objectives were met for trip blanks.

e. Field Duplicate

- i. One field duplicate submitted per matrix, analysis and 10 project samples?
- Yes No Comments:
- ii. Submitted blind to lab?
- Yes No Comments:
- iii. Precision All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \ge 100$

Where R_1 = Sample Concentration R_2 = Field Duplicate Concentration

GRO, DRO, Benzene and Naphthalene results did not meet precision limits.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

Data quality objectives for precision were not met for some analytes. TOC and RRO results were within RPD limits.

- f. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below.)

 - i. All results less than PQL?
 - ⊙ Yes ⊙ No Comments:

Samples were collected with disposable equipment.

ii. If above PQL, what samples are affected?

Comments:

Not applicable

iii. Data quality or usability affected? Explain.

Comments:

Comments:

Not applicable

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

🖲 Yes 🛛 🔿 No

Laboratory Data Review Checklist

Completed by:	Marty Hannah			
Title:	Project Chemist			
Date:	October 7, 2009			
CS Report Name:	NE Cape ISCO Study and Drum Removal			
Report Date:				
Consultant Firm:	Bristol Environmental Remediation Services			
Laboratory Name:	TestAmerica-Tacoma			
Laboratory Report Nur	nber: 580-14864			
ADEC File Number:				
ADEC RecKey Number	er:			
1. <u>Laboratory</u>				
 a. Did an ADEC CS approved laboratory receive and <u>perform</u> all of the submitted sample analyses? • Yes • No Comments: 				
 b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved? C Yes C No C Omments: 				
Not applicabl	Not applicable			
2. <u>Chain of Custody (COC)</u>				
a. COC information completed, signed, and dated (including released/received by)?				
• Yes O No Comments:				
	lyses requested?			
• Yes	© No Comments:			

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt $(4^\circ \pm 2^\circ C)$?

b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

• Yes • No Comments:

Sample 09NCMOCGW09 was received without preservative. The laboratory added sufficient preservative prior to extraction and analysis.

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

01	Yes	🔿 No	Comments:

All samples were received in good condition with minor exceptions. Samples MOCGW07, - GW08 and –GW11 were received with bubbles in one or more VOA vials. Sample containers without bubbles or the smallest bubbles were used for analysis.

- d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
 - 💿 Yes 🛛 🔿 No

Comments:

The sample times on 09NDMOCGW10 bottles were 1640, the CoC had 1650. Data unaffected. Sample 09NCMOCGW09 had 2 preserved polys submitted and 09NCMOCGW10 had 2 unpreserved polys submitted. The samples were field duplicates and the mis-labeling did not affect sample results.

e. Data quality or usability affected? Explain.

Comments:

The minor errors in sample times and identification were resolved prior to analysis. Samples with bubbles greatest than 6 mm were not analyzed. Sample results were unaffected.

4. <u>Case Narrative</u>

a. Present and understandable?

• Yes • No Comments:

b. Discrepancies, errors or QC failures identified by the lab?

• Yes • No Comments:

The 8260 LCS had low TFT (surrogate) recovery. All other surrogates were within limits. No further action required.

c. Were all corrective actions documented?

○ Yes ○ No Comments:

No corrective actions were required.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Sample results are usable for project purposes. Samples analyses past recommended holding times were flagged and are considered estimates.

5. <u>Samples Results</u>

a. Correct analyses performed/reported as requested on COC?

• Yes O No Comments:

b. All applicable holding times met?

○ Yes ⓒ No Comments:

The initial sulfate analysis was within holding time though the result exceeded the upper calibration range. Samples were reanalyzed past holding time with similar results. The affected samples are flagged E and are considered estimates.

c. All soils reported on a dry weight basis?

○ Yes ○ No Comments:

All samples were water samples.

- d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?
 - Yes No Comments:
- e. Data quality or usability affected?

Comments:

Some samples were reanalyzed past holding times (sulfate). Results are considered estimates.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

• Yes • No Comments:

ii. All method blank results less than PQL?

• Yes • No Comments:

Metals analysis had reportable chromium below the PQL. Sample results are flagged B.

iii. If above PQL, what samples are affected? Comments:

The blank chromium result was less than the PQL. Sample results were mostly less than 10 times the method blank result, all chromium results were B flagged.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

• Yes • No Comments:

Affected results are B flagged.

v. Data quality or usability affected? Explain. Comments:

Chromium sample results are usable and considered estimates.

- b. Laboratory Control Sample/Duplicate (LCS/LCSD)
 - i. Organics One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
 - Yes No Comments:
 - ii. Metals/Inorganics one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
 - Yes No Comments:
 - iii. Accuracy All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

 - iv. Precision All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
 - Yes No Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected? Comments:

Not applicable			
	vi. Do the affected sar	nple(s) have data flags? If so, are the data flags clearly defined?	
	🔿 Yes 🔿 No	Comments:	

Not applicable

vii. Data quality or usability affected? (Use comment box to explain) Comments:

Data quality objectives were met for laboratory QC accuracy and precision.

- c. Surrogates Organics Only
 - i. Are surrogate recoveries reported for organic analyses field, QC and laboratory samples?
 Yes
 No
 Comments:
 - Accuracy All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

• Yes • No Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

• Yes • No Comments:

Not applicable

iv. Data quality or usability affected? (Use the comment box to explain.) Comments:

Data quality objectives were met for sample surrogate recoveries.

- d. Trip blank Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): <u>Water and</u> <u>Soil</u>
 - i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (if not, enter explanation below.)
 - Yes No Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

○ Yes ○ No Comments:

iii. All results less than PQL?

• Yes • No Comments:

iv. If above PQL, what samples are affected? Comments:

Not applicable

v. Data quality or usability affected? Explain.

Comments:

Data quality objectives were met for trip blanks.

e. Field Duplicate

- i. One field duplicate submitted per matrix, analysis and 10 project samples?
- Yes No Comments:

ii. Submitted blind to lab?

• Yes • No Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \ge 100$

Where R_1 = Sample Concentration R_2 = Field Duplicate Concentration

• Yes • No Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

Data quality objectives were met for field duplicate analyses.

- f. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below.)
 - ⊙ Yes ⊙ No ⊙ Not Applicable
 - i. All results less than PQL?
 - Yes No Comments:
 - ii. If above PQL, what samples are affected?

Comments:

Not applicable

iii. Data quality or usability affected? Explain.

Comments:

Not applicable

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

🖲 Yes 🛛 🔿 No

Comments:

Laboratory Data Review Checklist

Completed by:	Marty Hannah		
Title:	Project Chemist		
Date:	October 7, 2009		
CS Report Name: NE Cape ISCO Study and Drum Removal			
Report Date:			
Consultant Firm:	Bristol Environmental Remediation Services		
Laboratory Name:	TestAmerica-Tacoma		
Laboratory Report Nur	nber: 580-15053		
ADEC File Number:			
ADEC RecKey Number	er:		
1. <u>Laboratory</u>			
 a. Did an ADEC CS approved laboratory receive and <u>perform</u> all of the submitted sample analyses? • Yes • No Comments: 			
 b. If the samples were transferred to another "network" laboratory or sub-contracted to an altern laboratory, was the laboratory performing the analyses ADEC CS approved? © Yes © No Comments: 			
Not applicable			
2. <u>Chain of Custody (COC)</u>			
a. COC information completed, signed, and dated (including released/received by)?			
© Yes	© No Comments:		
Relinquished	Relinquished by name was typed.		
b. Correct analyses requested?			
Yes	© No Comments:		

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt $(4^\circ \pm 2^\circ C)$?

	💿 Yes	🔿 No	Comments:
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Three coolers were shipped, all were within range.

b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

• Yes • No Comments:

- c. Sample condition documented broken, leaking (Methanol), zero headspace (VOC vials)?
 Yes
 No
 Comments:
- d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
 - 🔿 Yes 🔿 No

No discrepancies were noted.

e. Data quality or usability affected? Explain.

Comments:

Comments:

Data quality objectives were met for sample shipment and preservation.

4. Case Narrative

a. Present and understandable?

💿 Yes 🛛 🔿 No

Comments:

b. Discrepancies, errors or QC failures identified by the lab?

🖲 Yes	🔿 No	Comments:

The DRO and RRO LCS/LCSD failed RPD limits. Samples were re-extracted past holding time with passing QC but marginal comparison on sample results.

c. Were all corrective actions documented?

• Yes • No Comments:

d. What is the effect on data quality/usability according to the case narrative? Comments:

DRO/RRO sample results are considered estimates. They are still usable for project purposes.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

• Yes • No Comments:

b. All applicable holding times met?

○ Yes ⊙ No Comments:

The trip blank was analyzed 14 days past holding time. DRO/RRO samples were re-extracted past holding time.

c. All soils reported on a dry weight basis?

○ Yes ○ No Comments:

All samples were water samples.

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

• Yes • No Comments:

All samples were water samples.

e. Data quality or usability affected?

Comments:

Data quality objectives were met with noted exceptions.

6. QC Samples

- a. Method Blank
 - i. One method blank reported per matrix, analysis and 20 samples?
 - Yes No Comments:
 - ii. All method blank results less than PQL?
 - Yes No Comments:

iii. If above PQL, what samples are affected? Comments:

Not applicable

- iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
- Yes No Comments:

Not applicable

v. Data quality or usability affected? Explain.

Comments:

Data quality objectives were met for method blanks.

- b. Laboratory Control Sample/Duplicate (LCS/LCSD)
 - i. Organics One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
 - Yes No Comments:
 - ii. Metals/Inorganics one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
 - Yes No Comments:

Not applicable

 iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

• Yes • No Comments:

- iv. Precision All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
- Yes No Comments:

The DRO/RRO LCS/LCSD failed to meet RPD limits but all were within acceptance limits.

v. If %R or RPD is outside of acceptable limits, what samples are affected? Comments:

All DRO/RRO samples were affected. Samples were re-extracted past holding time with passing QC but marginal comparison of sample results.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes O No Comments:

vii. Data quality or usability affected? (Use comment box to explain) Comments:

Overall data quality for laboratory QC accuracy and precision was met with noted exceptions.

- c. Surrogates Organics Only
 - i. Are surrogate recoveries reported for organic analyses field, QC and laboratory samples?
 Yes
 No
 Comments:
 - Accuracy All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)
 - Yes ⊙ No Comments:

DRO/RRO samples had surrogate recoveries outside of acceptance limits due to target analytes or high dilutions.

- iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
- Yes No Comments:

Samples with surrogate recoveries outside of method acceptance limits are flagged X and are considered estimates.

iv. Data quality or usability affected? (Use the comment box to explain.) Comments:

Samples with failed surrogate recoveries are still usable for project purposes, their results are considered estimates.

- d. Trip blank Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): <u>Water and</u> <u>Soil</u>
 - i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (if not, enter explanation below.)
 - Yes No Comments:
 - ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

○ Yes ○ No Comments:

iii. All results less than PQL?

- Yes No Comments:
- iv. If above PQL, what samples are affected? Comments:

Not applicable

v. Data quality or usability affected? Explain.

Comments:

The trip blank was analyzed 14 days past holding time. The result was non-detect and is considered an estimate.

e. Field Duplicate

- i. One field duplicate submitted per matrix, analysis and 10 project samples?
- Yes No Comments:
- ii. Submitted blind to lab?
- Yes No Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: (R_1-R_2) $x \ 100$

 $((R_1+R_2)/2)$

Where R_1 = Sample Concentration R_2 = Field Duplicate Concentration

• Yes • No Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

Data quality objectives were met for field duplicate precision.

f. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below.)

🔿 Yes	🔿 No	🖲 Not Applicable
-------	------	------------------

- i. All results less than PQL?
- Yes No Comments:

Not applicable

ii. If above PQL, what samples are affected?

Comments:

Not applicable

iii. Data quality or usability affected? Explain.

Comments:

Not applicable

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

🖲 Yes 🛛 🔿 No

Comments:

Laboratory Data Review Checklist

Completed by:	Marty Hannah			
Title:	Project Chemist			
Date:	October 12, 2009			
CS Report Name:	NE Cape ISCO Study and Drum Removal			
Report Date:				
Consultant Firm:	Bristol Environmental Remediation Services			
Laboratory Name:	TestAmerica-Tcoma			
Laboratory Report Nur	mber: 580-15084			
ADEC File Number:				
ADEC RecKey Number	er:			
1. Laboratory				
a. Did an ADH • Yes	EC CS approved laboratory receive and perform all of the submitted sample analyses?O NoComments:			
1	les were transferred to another "network" laboratory or sub-contracted to an alternate was the laboratory performing the analyses ADEC CS approved?			
Not applicabl	e			
2. <u>Chain of Custody (</u>	<u>COC)</u>			
a. COC inform	nation completed, signed, and dated (including released/received by)?			
• Yes	© No Comments:			
b. Correct ana• Yes	lyses requested? © No Comments:			

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt $(4^\circ \pm 2^\circ C)$?

The cooler temperature blank measured 0.6 degrees upon receipt at the laboratory.

b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

• Yes • No Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

 • Yes
 • No
 Comments:

Some samples were not shipped in inner plastic bags.

- d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
 - 🔿 Yes 🛛 🔿 No

No discrepancies were noted.

e. Data quality or usability affected? Explain.

Comments:

Comments:

Data quality objectives were met for sample shipment and documentation.

4. Case Narrative

a. Present and understandable?

💿 Yes 🛛 🔿 No

Comments:

b. Discrepancies, errors or QC failures identified by the lab?

• Yes • No Comments:

c. Were all corrective actions documented?

○ Yes ○ No Comments:

Some samples were reanalyzed at a dilution due to high target analytes.

d. What is the effect on data quality/usability according to the case narrative? Comments:

Overall project data quality objectives were met with some minor QC issues.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

• Yes • No Comments:

b. All applicable holding times met?

○ Yes ⊙ No Comments:

Benzene and naphthalene by 8260 and TOC samples were analyzed past holding time.

c. All soils reported on a dry weight basis?

- Yes No Comments:
- d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

💿 Yes	🔿 No	Comments:

e. Data quality or usability affected?

Comments:

Project data quality objectives were met for timely analyses and reporting levels.

6. QC Samples

- a. Method Blank
 - i. One method blank reported per matrix, analysis and 20 samples?
 - Yes No Comments:

ii. All method blank results less than PQL?

• Yes • No Comments:

iii. If above PQL, what samples are affected? Comments:

Not applicable

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

O Yes O No Comments:

Not applicable

v. Data quality or usability affected? Explain. Comments:

Data quality objectives were met for method blanks.

- b. Laboratory Control Sample/Duplicate (LCS/LCSD)
 - i. Organics One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
 - O No • Yes Comments:
 - ii. Metals/Inorganics one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
 - Yes O No Comments:
 - iii. Accuracy All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)
 - No O Yes Comments:

The naphthalene and DRO/RRO MS/MSD failed to meet recovery limits.

- iv. Precision All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
- Yes No Comments:
- v. If %R or RPD is outside of acceptable limits, what samples are affected? Comments:

Sample MOCSB14 (15084-2) did not meet 8260 and AK102/103 recovery limits.

- vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined? No
- O Yes Comments[.]

The results are flagged for failed surrogate recoveries and analyses outside of holding times.

vii. Data quality or usability affected? (Use comment box to explain) Comments:

Overall data quality for laboratory accuracy and precision was met. The sample matrix and presence of high concentrations of target analytes makes the MS/MSD recoveries difficult to evaluate. The concentrations of target analytes were greater than 4 times the spike concentration.

c. Surrogates – Organics Only

- i. Are surrogate recoveries reported for organic analyses field, QC and laboratory samples?
- Yes No Comments:
- Accuracy All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)
- Yes ⊙ No Comments:
- iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
- Yes No Comments:

Samples with failed or non-reported surrogate recoveries are flagged X and are considered estimates. Samples were diluted due to presence of high concentrations of target analytes.

iv. Data quality or usability affected? (Use the comment box to explain.) Comments:

Overall data quality objectives were met for surrogate recoveries.

- d. Trip blank Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): <u>Water and</u> <u>Soil</u>
 - i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (if not, enter explanation below.)
 - Yes No Comments:
 - ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

○ Yes ○ No Comments:

iii. All results less than PQL?Yes O No Comments:

iv. If above PQL, what samples are affected? Comments:

Not applicable

v. Data quality or usability affected? Explain. Comments:

Data quality objectives were met for trip blanks.

e. Field Duplicate

- i. One field duplicate submitted per matrix, analysis and 10 project samples?
- Yes No Comments:
- ii. Submitted blind to lab?
- Yes No Comments:
- iii. Precision All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \ge 100$

Where R_1 = Sample Concentration R_2 = Field Duplicate Concentration

⊙ Yes ⊙ No Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

The field duplicates failed to meet 50% RPD limits for (waiting to hear from mark Heaston)

f. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below.)

🔿 Yes	🔿 No	🖲 Not Applicable
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- i. All results less than PQL?
- Yes No Comments:

Not applicable

ii. If above PQL, what samples are affected?

Comments:

Not applicable

iii. Data quality or usability affected? Explain.

Comments:

Comments:

Not applicable

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

🖲 Yes 🛛 🔿 No

Laboratory Data Review Checklist

Completed by:	Marty Hannah			
Title:	Project Chemist			
Date:	October 12, 2009			
CS Report Name:	NE Cape ISCO Study and Drum Removal			
Report Date:				
Consultant Firm:	Bristol Environmental Remediation Services			
Laboratory Name:	TestAmerica-Tacoma			
Laboratory Report Nur	nber: 580-15087			
ADEC File Number:				
ADEC RecKey Number	er:			
1. Laboratory				
a. Did an ADE • Yes	C CS approved laboratory receive and <u>perform</u> all of the submitted sample analyses? No Comments:			
	es were transferred to another "network" laboratory or sub-contracted to an alternate was the laboratory performing the analyses ADEC CS approved?			
Not Applicab	le			
2. Chain of Custody (<u>COC)</u>			
a. COC inform	nation completed, signed, and dated (including released/received by)?			
• Yes	© No Comments:			
	lyses requested?			
• Yes	© No Comments:			

3. <u>Laboratory Sample Receipt Documentation</u>

a. Sample/cooler temperature documented and within range at receipt $(4^\circ \pm 2^\circ C)$?

	💿 Yes	🔿 No	Comments:
b.	1 1	ervation acce	eptable – acidified waters, Methanol preserved VOC soil (GRO, BTE vents, etc.)?
_	Yes	O No	Comments:
c.	1		ented – broken, leaking (Methanol), zero headspace (VOC vials)?
	💿 Yes	O No	Comments:
1	All samples w	vere received	in good condition.
d.	containers/p	reservation, s	ancies, were they documented? For example, incorrect sample sample temperature outside of acceptable range, insufficient or missir
d.	containers/p samples, etc	reservation, s	sample temperature outside of acceptable range, insufficient or missin
	containers/p samples, etc • Yes	reservation, s ? O No	sample temperature outside of acceptable range, insufficient or missin Comments:
¢,	containers/p samples, etc • Yes Some sample	reservation, s ? O No labels were in	sample temperature outside of acceptable range, insufficient or missin Comments: ncomplete. The information was obtained from the chain of custody.
	containers/p samples, etc • Yes Some sample	reservation, s ? O No labels were in	sample temperature outside of acceptable range, insufficient or missin Comments: ncomplete. The information was obtained from the chain of custody. affected? Explain.
e.	containers/p samples, etc • Yes Some sample Data quality	reservation, s ? No labels were in or usability a	sample temperature outside of acceptable range, insufficient or missin Comments: ncomplete. The information was obtained from the chain of custody.
e.	containers/p samples, etc • Yes Some sample Data quality	reservation, s ? No labels were in or usability a	sample temperature outside of acceptable range, insufficient or missin Comments: ncomplete. The information was obtained from the chain of custody. affected? Explain. Comments:
e.	containers/p samples, etc • Yes Some sample Data quality Data quality of Narrative	reservation, s ?? O No labels were in or usability a bjectives wer	sample temperature outside of acceptable range, insufficient or missin Comments: ncomplete. The information was obtained from the chain of custody. affected? Explain. Comments: re met for sample shipment and documentation.
e. I	containers/p samples, etc • Yes Some sample Data quality Data quality ol Narrative	reservation, s ?? O No labels were in or usability a bjectives wer	sample temperature outside of acceptable range, insufficient or missin Comments: ncomplete. The information was obtained from the chain of custody. affected? Explain. Comments: re met for sample shipment and documentation.
e. I	containers/p samples, etc	reservation, s ?? © No labels were in or usability a bjectives wer understandab	sample temperature outside of acceptable range, insufficient or missin Comments: ncomplete. The information was obtained from the chain of custody. affected? Explain. Comments: re met for sample shipment and documentation.
e. I a.	containers/p samples, etc	reservation, s ?? ^C No labels were in or usability a bjectives wer understandab ^C No	sample temperature outside of acceptable range, insufficient or missin Comments: ncomplete. The information was obtained from the chain of custody. affected? Explain. Comments: re met for sample shipment and documentation.

c. Were all corrective actions documented?

⊙ Yes ⊙ No Comments:

No corrective actions were performed.

d. What is the effect on data quality/usability according to the case narrative? Comments:

Sample results are usable for project purposes with some qualifications. Qualified results may be considered estimates.

5. <u>Samples Results</u>

a. Correct analyses performed/reported as requested on COC?

• Yes • No Comments:

b. All applicable holding times met?

○ Yes ⊙ No Comments:

Naphthalene by method 8260 was initially analyzed within holding time but with concentrations that exceeded the instrument calibration range. Samples were reanalyzed at a dilution outside of holding times.

c. All soils reported on a dry weight basis?

○ Yes ○ No Comments:

All samples were water samples.

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

• Yes • No Comments:

e. Data quality or usability affected?

Comments:

Overall data quality objectives were met with some samples analyzed outside of holding times. The sample results from analyses outside of holding times are considered estimates.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

• Yes • No Comments:

ii. All method blank results less than PQL?

• Yes • No Comments:

iii. If above PQL, what samples are affected? Comments:

Not applicable

- iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
- Yes No Comments:

Not applicable

v. Data quality or usability affected? Explain.

Comments:

Data quality objectives were met for method blanks.

- b. Laboratory Control Sample/Duplicate (LCS/LCSD)
 - i. Organics One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
 - Yes No Comments:

A single LCS was analyzed for some 8260 batch analyses along with MS/MSD.

- ii. Metals/Inorganics one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
- Yes No Comments:

Not applicable

- iii. Accuracy All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)
- Yes ⊙ No Comments:

The 8260 MS/MSD failed to meet recovery limits.

- iv. Precision All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
- Yes ⊙ No Comments:

The 8260 MS/MSD failed to meet RPD limits.

v. If %R or RPD is outside of acceptable limits, what samples are affected? Comments:

Sample 15087-3 (MOCGW23) for 8260 is considered an estimate due to its failed MS/MSD. The result has already been flagged for surrogate recoveries outside of acceptance limits.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined? • Yes • No • Comments:

Yes, the results are flagged for failed surrogate recoveries.

vii. Data quality or usability affected? (Use comment box to explain) Comments:

Overall project data quality objectives have been met for laboratory accuracy and precision. LCS recoveries met acceptance limits, MS/MSD recoveries for 8260 and DRO/RRO failed to meet method acceptance limits.

c. Surrogates – Organics Only

- Are surrogate recoveries reported for organic analyses field, QC and laboratory samples?
 Yes
 No
 Comments:
- Accuracy All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)
- ⊙ Yes ⊙ No Comments:
- iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
- Yes No Comments:

Samples with failed surrogate recoveries are flagged X and are considered estimates.

iv. Data quality or usability affected? (Use the comment box to explain.) Comments:

Samples with failed surrogate recoveries are flagged X and are considered estimates.

- d. Trip blank Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): <u>Water and</u> <u>Soil</u>
 - i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (if not, enter explanation below.)
 - Yes No Comments:
 - ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

• Yes • No Comments:

iii. All results less than PQL?

Yes, benzene was reported between the MDL and PQL in the trip blank.

iv. If above PQL, what samples are affected?

Comments:

Not applicable

v. Data quality or usability affected? Explain.

Comments:

Data quality objectives were met for trip blanks.

e. Field Duplicate

- i. One field duplicate submitted per matrix, analysis and 10 project samples?
- Yes No Comments:

ii. Submitted blind to lab?

- Yes No Comments:
- iii. Precision All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: (R_1-R_2) $((R_1+R_2)/2)$ x 100

Where R_1 = Sample Concentration R_2 = Field Duplicate Concentration

○ Yes ⓒ No Comments:

The field duplicate did not met RPD criteria for RRO, benzene and naphthalene.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

The primary and duplicate samples were analyzed at a dilution which may have led to poor precision.

f. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below.)

- i. All results less than PQL?
- Yes No Comments:

Not applicable

ii. If above PQL, what samples are affected?

Comments:

Not applicable

iii. Data quality or usability affected? Explain.

Comments:

Not applicable

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

• Yes • No Comments:

Flags are used to identify sample results with minor QC issues. A key is at the bottom of each reduced data table to clearly identify the QC issue.

Laboratory Data Review Checklist

Completed by:	Marty Hannah		
Title:	Project Chemist		
Date:	October 12, 2009		
CS Report Name:	NE Cape ISCO Study and Drum Removal		
Report Date:			
Consultant Firm:	Bristol Environmental Remediation Services		
Laboratory Name:	TestAmerica-Tacoma		
Laboratory Report Nur	mber: 580-15185		
ADEC File Number:			
ADEC RecKey Number	er:		
1. Laboratory			
a. Did an ADI • Yes	EC CS approved laboratory receive and perform all of the submitted sample analyses?Image: NoComments:		
laboratory,	les were transferred to another "network" laboratory or sub-contracted to an alternate was the laboratory performing the analyses ADEC CS approved?		
Not Applicab	le		
2. Chain of Custody (<u>COC)</u>		
a COC inform	notion completed signed and deted (including released/received her)?		
u. COC mion	nation completed, signed, and dated (including released/received by)?		
© Yes	No Comments:		
Yes			

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt $(4^\circ \pm 2^\circ C)$?

	💿 Yes	🔿 No	Comments:
b.		ervation accelorinated Solv	eptable – acidified waters, Methanol preserved VOC soil (GRO, BTE vents, etc.)?
	• Yes	O No	Comments:
 c.	Sample cond	dition docum	ented – broken, leaking (Methanol), zero headspace (VOC vials)?
	• Yes	O No	Comments:
d.		reservation, s	ancies, were they documented? For example, incorrect sample sample temperature outside of acceptable range, insufficient or missi
	🔿 Yes	🔿 No	Comments:
۲	No discrepanc	eies were note	ed.
	1		
	1	or usability	affected? Explain. Comments:
e.	Data quality		Comments:
e.	Data quality Project data qu		1
e.	Data quality		Comments:
e. F	Data quality Project data qu Narrative	uality objectiv	Comments: ves were met for sample shipment and documentation.
e. F	Data quality Project data qu Narrative	uality objectiv	Comments: ves were met for sample shipment and documentation.
e. F	Data quality Project data qu <u>Narrative</u> Present and	uality objectiv	Comments: ves were met for sample shipment and documentation.
e. F se 1 a.	Data quality Project data qu <u>Narrative</u> Present and • Yes	uality objectiv understandat O No	Comments: ves were met for sample shipment and documentation. ble? Comments:
e. F se 1 a.	Data quality Project data qu <u>Narrative</u> Present and • Yes	uality objectiv understandat O No	Comments: ves were met for sample shipment and documentation.
e. F se 1 a.	Data quality Project data qu Narrative Present and • Yes Discrepancie	understandat	Comments: ves were met for sample shipment and documentation. ble? Comments: QC failures identified by the lab?
e. F <u>se 1</u> a. b.	Data quality Project data qu Narrative Present and • Yes Discrepancie • Yes	understandat No es, errors or (No	Comments: ves were met for sample shipment and documentation. ble? Comments: QC failures identified by the lab? Comments:
e. F se 1 a.	Data quality Project data qu Narrative Present and • Yes Discrepancie • Yes	understandat No es, errors or (No	Comments: ves were met for sample shipment and documentation. ble? Comments: QC failures identified by the lab?

d. What is the effect on data quality/usability according to the case narrative? Comments:

Sample results are usable for project purposes. Some results have been qualified for holding times and DRO/RRO samples were analyzed at a dilution so surrogate recoveries were not reported.

5. <u>Samples Results</u>

a. Correct analyses performed/reported as requested on COC?

b. All applicable holding times met?

○ Yes ⊙ No Comments:

Naphthalene was analyzed within holding time, the results exceeded the calibration range. The samples were reanalyzed at a dilution outside of holding time.

c. All soils reported on a dry weight basis?

○ Yes ○ No Comments:

All samples were water samples.

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

💿 Yes 🛛 🔿 No

Comments:

e. Data quality or usability affected?

Comments:

Overall data quality objectives were met for timely analyses and reporting levels.

6. QC Samples

- a. Method Blank
 - i. One method blank reported per matrix, analysis and 20 samples?
 - Yes No Comments:
 - ii. All method blank results less than PQL?

• Yes • No Comments:

The DRO/RRO method blank had positive results below the PQL. Sample results were greater than 10 times greater than the method blank results. No flags were assigned.

Not applicable

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No Comments:

No data flags were assigned to the data table, the laboratory report had flagged the results.

v. Data quality or usability affected? Explain.

Comments:

Data quality objectives were met for method blanks.

- b. Laboratory Control Sample/Duplicate (LCS/LCSD)
 - i. Organics One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
 - Yes No Comments:
 - ii. Metals/Inorganics one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
 - Yes No Comments:

Not applicable

 iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

• Yes • No Comments:

- iv. Precision All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
- Yes No Comments:

The naphthalene and DRO/MS/MSDs did not meet recovery or RPD limits due to high concentrations of target analytes, which were greater than 4 times the spike amount. All LCS/LCSDs met recovery limits so matrix interference is implied.

v. If %R or RPD is outside of acceptable limits, what samples are affected? Comments:

Samples were not affected by the failed MS/MSD recoveries.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ⊙ No Comments:

No flags were assigned based on failed MS/MSD recoveries.

vii. Data quality or usability affected? (Use comment box to explain) Comments:

Sample results are usable for project purposes.

- c. Surrogates Organics Only
 - i. Are surrogate recoveries reported for organic analyses field, QC and laboratory samples?
 Yes No Comments:
 - Accuracy All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)
 - Yes ⊙ No Comments:

DRO/RRO surrogates were not reported due to sample dilution.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

💿 Yes 🛛 🔿 No

DRO/RRO sample results are flagged X due to surrogates not being reported due to dilution.

iv. Data quality or usability affected? (Use the comment box to explain.) Comments:

Comments:

Sample results are usable for project purposes. Flagged results are considered estimates.

- d. Trip blank Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): <u>Water and</u> <u>Soil</u>
 - i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (if not, enter explanation below.)

• Yes • No Comments:

- ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)
- Yes No Comments:

iii. All results less than PQL?Yes O No Comments:

iv. If above PQL, what samples are affected? Comments:

Not applicable

v. Data quality or usability affected? Explain. Comments:

Data quality objectives were met for trip blanks.

e. Field Duplicate

- i. One field duplicate submitted per matrix, analysis and 10 project samples?
- Yes No Comments:
- ii. Submitted blind to lab?
- Yes No Comments:
- iii. Precision All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \ge 100$

Where R_1 = Sample Concentration R_2 = Field Duplicate Concentration

The DRO RPD was 33%, all other results met RPD limits.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

Project data quality objectives were met for field duplicates.

f. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below.)

- i. All results less than PQL?
- Yes No Comments:

Not applicable

ii. If above PQL, what samples are affected?

Comments:

Not applicable

iii. Data quality or usability affected? Explain.

Comments:

Not applicable

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

• Yes • No Comments:

Data flags have been properly assigned to sample results.

Laboratory Data Review Checklist

Completed by:	Marty Hannah			
Title:	Project Chemist			
Date:	October 13, 2009			
CS Report Name:	NE Cape ISCO Study and Drum Removal			
Report Date:				
Consultant Firm:	Bristol Environmental Remediation Services			
Laboratory Name:	TestAmerica-Tacoma			
Laboratory Report Nur	nber: 580-15434			
ADEC File Number:				
ADEC RecKey Number	er:			
1. Laboratory				
a. Did an ADE • Yes	C CS approved laboratory receive and <u>perform</u> all of the submitted sample analyses? No Comments:			
	es were transferred to another "network" laboratory or sub-contracted to an alternate was the laboratory performing the analyses ADEC CS approved?			
Not applicable	e			
2. <u>Chain of Custody (</u>	<u>COC)</u>			
a. COC inform	nation completed, signed, and dated (including released/received by)?			
• Yes	© No Comments:			
	lyses requested?			
• Yes	© No Comments:			

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt $(4^\circ \pm 2^\circ C)$?

Yes	🔿 No	Comments:	

b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

Additional methanol was added to some samples due to the soil being composed of mostly peat.

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
 • Yes
 • No
 Comments:

All samples were received in good condition.

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

€ Yes ○ No Comments:

Sample labels were incomplete and did not fully match CoC.

e. Data quality or usability affected? Explain.

Comments:

Project data quality objectives were met for sample shipment and documentation.

4. <u>Case Narrative</u>

a. Present and understandable?

• Yes • No Comments:

b. Discrepancies, errors or QC failures identified by the lab?

• Yes O No Comments:

Some surrogates were outside of control limits or not reported due to dilutions and the MS/MSD failed for DRO/RRO. The method blank had positive results below the PQL. Samples not affected.

c. Were all corrective actions documented?

• Yes • No Comments:

No corrective actions were required.

d. What is the effect on data quality/usability according to the case narrative? Comments:

Sample results are usable for project purposes. Some are qualified as estimates due to minor QC issues.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

💿 Yes	🔿 No	Comments:
· · · · ·	- 1,0	Comments.

b. All applicable holding times met?

• Yes • No Comments:

- c. All soils reported on a dry weight basis?
 Yes No Comments:
- d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

• Yes O No Comments:

e. Data quality or usability affected?

Comments:

Project data quality objectives were met for timely analyses and reporting levels.

6. QC Samples

- a. Method Blank
 - i. One method blank reported per matrix, analysis and 20 samples?
 - Yes No Comments:

ii. All method blank results less than PQL?

• Yes • No Comments:

The DRO method blank had positive results between the MDL and PQL. All sample results were greater than 10 times the concentration in the method blank. No flags were assigned based on method blank results.

iii. If above PQL, what samples are affected? Comments:

Not applicable

- iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
- Yes No Comments:

No data flags were assigned.

v. Data quality or usability affected? Explain.

Comments:

Data quality objectives were met for method blanks.

- b. Laboratory Control Sample/Duplicate (LCS/LCSD)
 - i. Organics One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

• Yes • No Comments:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

• Yes • No Comments:

- iii. Accuracy All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)
- Yes No Comments:

The DRO/RRO and TOC MS/MSD failed to meet acceptance limits. Heterogeneous sample matrix is suspected.

- iv. Precision All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
- Yes ⓒ No Comments:

The DRO/RRO and TOC MS/MSD failed to meet soil RPD limits.

v. If %R or RPD is outside of acceptable limits, what samples are affected? Comments:

Sample results were not flagged based on MS/MSD recoveries.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

♥ Yes ● No Comments:

No data flags were assigned based on MS/MSD recoveries.

vii. Data quality or usability affected? (Use comment box to explain) Comments:

Overall project data quality objectives were met for laboratory QC precision and accuracy.

- c. Surrogates Organics Only
 - i. Are surrogate recoveries reported for organic analyses field, QC and laboratory samples?
 Yes
 No
 Comments:
 - Accuracy All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)
 - Yes ⊙ No Comments:

Most GRO samples had high surrogate recoveries (200%+).DRO/RRO samples were diluted due to high concentrations of target analytes thus the surrogates were not reported due to the dilutions.

- iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
- Yes No Comments:

Affected samples are flagged X.

iv. Data quality or usability affected? (Use the comment box to explain.) Comments:

Overall data quality objectives were met for surrogates. Some results will be considered estimates due to their surrogate recoveries.

- d. Trip blank Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): <u>Water and</u> <u>Soil</u>
 - i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (if not, enter explanation below.)
 - Yes No Comments:
 - ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

○ Yes ○ No Comments:

iii. All results less than PQL?

The trip blank had positive GRO results below the PQL.

iv. If above PQL, what samples are affected?

Comments:

Not applicable

v. Data quality or usability affected? Explain.

Comments:

Data quality objectives were met for trip blanks.

e. Field Duplicate

- i. One field duplicate submitted per matrix, analysis and 10 project samples?
- Yes No Comments:

ii. Submitted blind to lab?

- Yes No Comments:
- iii. Precision All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \ge 100$

Where R_1 = Sample Concentration R_2 = Field Duplicate Concentration

🖲 Yes	🔿 No	Comments
💽 Yes	🔘 No	Comments

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

Data quality objectives were met for field duplicate precision.

f. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below.)

🔿 Yes	🔿 No	🖲 Not Applicable
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- i. All results less than PQL?
- Yes No Comments:

Not applicable

ii. If above PQL, what samples are affected?

Comments:

Not applicable

iii. Data quality or usability affected? Explain.

Comments:

Not applicable

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

🖲 Yes 🛛 🔿 No

Comments:

Laboratory Data Review Checklist

Completed by:	Marty Hannah		
Title:	Project Chemist		
Date:	October 12, 2009		
CS Report Name:	NE Cape ISCO Study and Drum Removal		
Report Date:			
Consultant Firm:	Bristol Environmental Remediation Services		
Laboratory Name:	TestAmerica-Tacoma		
Laboratory Report Nur	nber: 580-15437		
ADEC File Number:			
ADEC RecKey Numbe	er:		
1. Laboratory			
a. Did an ADE • Yes	C CS approved laboratory receive and <u>perform</u> all of the submitted sample analyses? No Comments:		
	es were transferred to another "network" laboratory or sub-contracted to an alternate was the laboratory performing the analyses ADEC CS approved?		
Not applicable	e		
2. <u>Chain of Custody (</u>	<u>COC)</u>		
a. COC inform	nation completed, signed, and dated (including released/received by)?		
• Yes	© No Comments:		
	lyses requested?		
Yes	© No Comments:		

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt $(4^\circ \pm 2^\circ C)$?

	Yes	🔿 No	Comments:
b.		ervation accep orinated Solve	otable – acidified waters, Methanol preserved VOC soil (GRO, BTEX ents, etc.)?
	Yes	C No	Comments:
 c.	Sample cond	lition docume	nted – broken, leaking (Methanol), zero headspace (VOC vials)?
	Yes	🔿 No	Comments:
Ι	All samples w	ere received in	n good condition.
d.		reservation, sa	ncies, were they documented? For example, incorrect sample ample temperature outside of acceptable range, insufficient or missin
	🔿 Yes	O No	Comments:
N	No discrepanc	eies were noted	1.
e.	Data quality	or usability a	ffected? Explain.
			Comments:
	ata quality ol	bjectives were	met for sample shipment and documentation.
	<u>Varrative</u>		
se N		undorstandahl	e?
	Present and	unuerstanuaur	
	Present and	© No	Comments:
			Comments:
			Comments:
a.	• Yes	© No	Comments: C failures identified by the lab?
a.	• Yes	© No	

⊙ Yes ⊙ No Comments:

No corrective actions were required.

d. What is the effect on data quality/usability according to the case narrative? Comments:

Sample results are usable for project purposes.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

• Yes • No Comments:

b. All applicable holding times met?

• Yes • No Co	omments:
---------------	----------

c. All soils reported on a dry weight basis?

○ Yes ○ No Comments:

All samples were water samples.

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

• Yes • No Comments:

Sample 15437-3 was analyzed at a 1000 dilution but had results between the MDL and PQL. The sample result is J flagged.

e. Data quality or usability affected?

Comments:

Data quality objectives were met for timely analyses and reporting levels.

6. <u>QC Samples</u>

- a. Method Blank
 - i. One method blank reported per matrix, analysis and 20 samples?
 - Yes O No Comments:

ii. All method blank results less than PQL?

• Yes • No Comments:

The arsenic method blank had positive results below the PQL but some sample results were less than 5 times the blank concentration. Sample results are flagged B.

iii. If above PQL, what samples are affected? Comments:

See note above.

- iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
- Yes No Comments:

Affected samples are flagged B.

v. Data quality or usability affected? Explain.

Comments:

Data quality objectives were met for method blanks with the noted exception.

- b. Laboratory Control Sample/Duplicate (LCS/LCSD)
 - i. Organics One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
 - Yes No Comments:
 - ii. Metals/Inorganics one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

• Yes • No Comments:

- iii. Accuracy All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

The RRO MS/MSD exceeded recovery limits.

- iv. Precision All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
- Yes No Comments:
- v. If %R or RPD is outside of acceptable limits, what samples are affected? Comments:

Sample results were not affected due to high target analyte in the MS/MSD sample.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

♥ Yes ● No Comments:

No data flags were assigned based on QC recoveries.

vii. Data quality or usability affected? (Use comment box to explain) Comments:

Overall data quality objectives were met for laboratory QC accuracy and precision.

- c. Surrogates Organics Only
 - i. Are surrogate recoveries reported for organic analyses field, QC and laboratory samples?
 Yes No Comments:
 - Accuracy All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

• Yes • No Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

🔿 Yes 🔿 No

Not applicable

iv. Data quality or usability affected? (Use the comment box to explain.) Comments:

Comments:

Data quality objectives were met for surrogates.

- d. Trip blank Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): <u>Water and</u> <u>Soil</u>
 - i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (if not, enter explanation below.)

• Yes • No Comments:

- ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)
- Yes No Comments:

iii. All results less than PQL?Yes O No Comments:

iv. If above PQL, what samples are affected? Comments:

Not applicable

v. Data quality or usability affected? Explain. Comments:

A 7 mm bubble was noted in one of the trip blank VOA vials.

e. Field Duplicate

- i. One field duplicate submitted per matrix, analysis and 10 project samples?
- Yes No Comments:
- ii. Submitted blind to lab?
- Yes No Comments:
- iii. Precision All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \ge 100$

Where R_1 = Sample Concentration R_2 = Field Duplicate Concentration

$\odot \Sigma$	Zes 🛛 💽) No	Comments:

The field duplicate met RPD precision limits on all analytes except sulfate.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

Data quality objectives were met for field duplicate precision.

f. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below.)

🔿 Yes	🔿 No	🖲 Not Applicable
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- i. All results less than PQL?
- Yes No Comments:

Not applicable

ii. If above PQL, what samples are affected?

Comments:

Not applicable

iii. Data quality or usability affected? Explain.

Comments:

Not applicable

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

🖲 Yes 🛛 🔿 No

Comments:

Laboratory Data Review Checklist

Completed by:	Marty Hannah		
Title:	Project Chemist		
Date: October 7, 2009			
CS Report Name:	NE Cape ISCO Study and Drum Removal		
Report Date:			
Consultant Firm:	Bristol Environmental Remediation Services		
Laboratory Name:	TestAmerica-Anchorage		
Laboratory Report Num	nber: ASG0063		
ADEC File Number:			
ADEC RecKey Numbe			
1. Laboratory			
a. Did an ADE • Yes	CCCS approved laboratory receive and <u>perform</u> all of the submitted sample analyses? No Comments:		
laboratory,	es were transferred to another "network" laboratory or sub-contracted to an alternate was the laboratory performing the analyses ADEC CS approved? © No Comments:		
laboratory,	was the laboratory performing the analyses ADEC CS approved? • No Comments:		
laboratory,	was the laboratory performing the analyses ADEC CS approved? © No Comments: e		
laboratory, v O Yes Not applicable 2. <u>Chain of Custody (</u>	was the laboratory performing the analyses ADEC CS approved? © No Comments: e		
laboratory, v O Yes Not applicable 2. <u>Chain of Custody (</u>	was the laboratory performing the analyses ADEC CS approved? No Comments: e COC)		
laboratory, v Yes Not applicable 2. <u>Chain of Custody (0</u> a. COC inform • Yes	was the laboratory performing the analyses ADEC CS approved? No Comments: e COC) nation completed, signed, and dated (including released/received by)? 		
laboratory, v Yes Not applicable 2. <u>Chain of Custody (f</u> a. COC inform • Yes <u>Relinquished</u>	was the laboratory performing the analyses ADEC CS approved? No Comments: e COC) nation completed, signed, and dated (including released/received by)? No Comments: 		
laboratory, v Yes Not applicable 2. <u>Chain of Custody (f</u> a. COC inform • Yes <u>Relinquished</u>	was the laboratory performing the analyses ADEC CS approved? No Comments: coc) nation completed, signed, and dated (including released/received by)? No Comments: by was typed, not signed.		

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt $(4^\circ \pm 2^\circ C)$?

Yes	© No	Comments:

b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

🖲 Yes	🔿 No	Comments:
		Commentes.

Samples were for DRO only. Samples were received with some ice in the samples.

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

 • Yes
 • No
 Comments:

Two of the three samples were received partly frozen.

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

🔿 Yes 🛛 🔿 No

Comments:

No discrepancies were noted except for partially frozen samples.

e. Data quality or usability affected? Explain.

Comments:

Data quality was unaffected from being partially frozen. All results are usable for project purposes.

4. Case Narrative

a. Present and understandable?

• Yes • No Comments:

b. Discrepancies, errors or QC failures identified by the lab?

• Yes • No Comments:

No discrepancies were noted.

c. Were all corrective actions documented?

• Yes • No Comments:

No corrective actions were required.

d. What is the effect on data quality/usability according to the case narrative? Comments:

5.	Sampl	es Results

a. Correct analyses performed/reported as requested on COC?

• Yes • No Comments:

- b. All applicable holding times met?
 - Yes No Comments:
- c. All soils reported on a dry weight basis?

🔿 Yes	🔿 No	Comments:
- I UB		Comments.

Water samples only.

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

💿 Yes	🔿 No	

e. Data quality or usability affected?

Comments:

Comments:

Data quality objectives were met for timely analyses and reporting levels.

6. QC Samples

- a. Method Blank
 - i. One method blank reported per matrix, analysis and 20 samples?
 - Yes No Comments:

ii. All method blank results less than PQL?

• Yes • No Comments:

iii. If above PQL, what samples are affected? Comments:

Not applicable

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

O Yes O No Comments	🔿 Yes	les 🔿 No	Comments
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No data flags were assigned.

v. Data quality or usability affected? Explain. Comments:

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

- i. Organics One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
- Yes No Comments:
- ii. Metals/Inorganics one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
- Yes No Comments:

Not applicable

- iii. Accuracy All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)
- Yes No Comments:
- iv. Precision All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
- Yes No Comments:
- v. If %R or RPD is outside of acceptable limits, what samples are affected? Comments:

Not applicable

- vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
- Yes No Comments:

Not applicable

vii. Data quality or usability affected? (Use comment box to explain) Comments:

Data quality objectives were met for laboratory accuracy and precision.

c. Surrogates - Organics Only

- i. Are surrogate recoveries reported for organic analyses field, QC and laboratory samples?
- Yes No Comments:
- Accuracy All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)
- € Yes No Comments:
- iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
- Yes No Comments:

Not applicable

iv. Data quality or usability affected? (Use the comment box to explain.) Comments:

Data quality objectives were met for surrogate recoveries.

- d. Trip blank Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): <u>Water and</u> <u>Soil</u>
 - i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (if not, enter explanation below.)
 - C Yes C No Comments:

Not applicable, samples were submitted for DRO analyses only.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

• Yes • No Comments:

Not applicable

iii. All results less than PQL?

○ Yes ○ No Comments:

Not applicable

iv. If above PQL, what samples are affected? Comments:

Not applicable

v. Data quality or usability affected? Explain.

Comments:

Not applicable

e. Field Duplicate

- i. One field duplicate submitted per matrix, analysis and 10 project samples?
- Yes ⊙ No Comments:

A laboratory duplicate analysis was performed on sample ASG0063-3. It met RPD limits.

ii. Submitted blind to lab?

○ Yes ○ No Comments:

Not applicable

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \ge 100$

Where R_1 = Sample Concentration R_2 = Field Duplicate Concentration

• Yes • No Comments:

The duplicate met precision criteria

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

All results are usable for project purposes without qualification.

f. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below.)

- i. All results less than PQL?
- Yes No Comments:

Not applicable

ii. If above PQL, what samples are affected?

Comments:

Not applicable

iii. Data quality or usability affected? Explain.

Comments:

Not applicable

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

• Yes • No Comments:

No flags were assigned to any data from this SDG.

APPENDIX M

Comments and Response to Comments

Main Operations Complex Area Phase I In Situ Chemical Oxidation Summary Report Draft: March 2010

Contaminated Site:Northeast Cape, St. Lawrence Is., AKADEC File #:475.38.013Reviewer:ADEC – Curtis DunkinDate Submitted:May 24, 2010

1.	Section 2.4.2 page 5	Spelling: "Lead is also elevated [at] various"	This correction was made.
2.	2.4.3 page 5	Please insert Table 1; as well as other tables throughout document.	Tables will be left in the appendix
3.	Section 3.0 page 7	Misspelling: "execution of efforts are provide[d] in"	This correction was made.
4.	Sections 3.3 and 3.4 page 9	The bench scale tests should have been conducted prior to the pilot study, even if this resulted in delaying the pilot study for one year. The soil lithology test pits and soil profile characterization should have also been completed thoroughly prior to the bench scale test in order to collect representative soils to be used in the bench scale for the purpose of determining potential effectiveness of the ISCO.	Comment acknowledged; schedule was outside the control of AECOM
5.	Section 3.7.1 page 12	The report does not have a comprehensive table of all soil and water baseline sampling data - please include.	Comparable analytical data from the field pilot is presented in new tables (Tables 16 and 17). These tables that are analogous to Tables 8 and 9 presented in Appendix K.

6.	Section 3.6.2 page 12 and table H-1	Narrative states that oxidant injections were conducted using an alternating pulse sequence of batch volumes <100 gallons, however table H-1 states totalizer volumes of up to 1,144 gallons. Please clarify in this section. Table H-1 states on the top of page 1 of 4 and 3 of 4 total chemical and total injected volumes that do not correlate with the slug/batch and totalizer volumes. Please clarify/correct.	Table presents the cumulative volumes of chemical solution and / or flush water delivered at that time for each batch and the total volume of liquid delivered for all batches. Please note that Pages 1 and 2 of 4 are data for ICOIW01 (see text just below Location ID column header), while Pages 3 and 4 of 4 are data for ICOMW09. Thus, total chemical and injection volumes are indicated for two different injection locations. Upon review, it was noted that the total injected volume for ICOIW01 was short 30 gallons. The revision is made and a new table is included.
7.	Section 3.11 pages17- 18	For the same reasons in comment #4 above, delineating the soil profile, lithology, and general depth to ground water variations would have allowed for better decision making for pilot study location(s) and would have provided the necessary and much needed information required to conduct an ISCO study successfully.	Comment acknowledged; schedule was outside the control of AECOM
8.	Section 6.2.2 page 32	Misspelling: (last paragraph) "greater than 400 mV in nearly all reaction[s]."	This correction was made.
9.	Section 6.3.2.1	Completion of the bench scale study prior to the pilot study would have confirmed the peat's extensive oxidant demand, which resulted in gross	Comment acknowledged; schedule was outside the control of AECOM

	page 37	increases in COC's in groundwater. The bench scale study would have also determined that the soils at NECape are not well-suited to ISCO due to the fact that oxidants are mainly desorbing the DRO resulting in increased groundwater contamination, while being spent on oxidizing the peat material.	
10	Section 6.3.2.1 page 37 Table H- 2	Stated pH ranges on page 37 do not correlate with pH ranges stated in Table H-2 – also unclear since there is not a table for baseline groundwater data. pH ranges for treated samples range between negative ten (-10) and +9.66. Please clarify. Please explain rationale and justify negative pH ranges. Please explain why N/A is entered in the data cells for ICOMW04 on 8/13/09. pH and DO data for the 8/13/09 sampling event of ICOMW05 appears to be switched – please correct.	Correlations are not expected. Section 6.3.2.1 discusses treatability bench study testing activities conducted in Orlando, Florida. Table H-2 presents data on field monitoring that occurred during injection activities on St. Lawrence Island. The negative pH ranges are recorded as indicated by the meter at the time of monitoring, but it is acknowledged that these values are not of practical use. This is most likely a function of interference across the electrode due to the extreme redox conditions present. Data was not collected at the 8 foot interval on 8/13/09; N/A was entered as a place holder. ORP, DO, and pH for the 8/13/09 sampling event were offset. This was corrected in Table H-2.
11	Tables G-8 and H-2	The treatability study evaluated analytes and water quality criteria that were not included in the pilot study. Please explain.	

			f (a	Comparable analytical data from the field pilot is presented in new tables (Tables 16 and 17). These tables are analogous to Tables 8 and 9 presented in Appendix K.	
12	Section 6.6.2.1 page 44	Misspelling second paragraph "in the upper few fee[t] of the"	ר	This correction was made.	
13	Section 6.6.2.4 page 46	Misspelling: "These result[s] suggest"	1	This correction was made.	
14					
15					
16					
17					
		END			

REVIEWPROJECT:W911KB-09-C-0013 ISCO (Phase I) and Intrusive Drum Removal/Landfill CapCOMMENTSDOCUMENT:Draft ISCO Summary ReportLocation: NE Cape, Alaska

U.S. ARMY CORPS OF ENGINEERS DATE: April 2010 REVIEWER: Aaron Shewman PHONE: 753-5558 Action taken on comment by: Mark Heaston / Scott Pittenger of AECO		ECOM					
Item No.	Drawing Sheet No., Spec. Para.		COMMENTS		REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED/ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)

1.	Page 11, Section 3.5.2	Please state the total number of monitoring wells installed.	The following text was inserted into the front of section 3.5.2: A total of 9 monitoring wells were installed as a part of the Phase I ISCO activities.
2.	Page 17, Section 3.11.1	Please state the total number of monitoring wells installed, and one of the installed monitoring wells was subsequently used as an injection well when short-circuiting occurred via the original injection well.	 The following bullet was added to section 3.11.1 to better quantify the first deviation: A total of nine monitoring wells were installed. Monitoring well ICOMW09 was subsequently used as an injection well after short-circuiting occurred during injection at ICOIW01.
3.	Page 24, Section 5.1.1	Choose and use only one monitoring well labeling scheme for MW16-1 (aka 16MW1), MW16-2 (aka 16MW2), and MW16-3 (aka 16MW3).	This correction was made.
4.	Page 26, Section 5.3	First paragraph, please summarize results shown in Table 13 in the text of this section of the report.	The following text was inserted in the first paragraph of section 5.3:Screening results for DRO in soils measured 98 mg/Kg 130 mg/Kg, 13 mg/Kg, and 260 mg/Kg in samples collected from ICOSB01, 02, 03, and 04 respectively.
5.	Page 27	Last sentence of first paragraph, replace "these" with "this" because this sentence refers to only one monitoring well.	This correction was made.
6.	Page 40, Section 6.4	At a minimum this should refer to other sections of the report that address Work Plan Section 3.5. Another option would be to add a brief summary here.	The following text was inserted into the beginning of Section 6.4:

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Item	Drawing	COMMENTS		REVIEW	CONTRACTOR RESPONSE	USAED/ADEC
No.	Sheet No.,			CONFERENCE		RESPONSE
	Spec. Para.			A - comment accepted		ACCEPTANCE
	1			W - comment		(A-AGREE)
				withdrawn		(D-DISAGREE)
				(if neither, explain)		(D-DISAGREE)

			Details regarding the design and construction of the pilot study injection and monitoring well network are provided in Section 3.5.
7.	Page 42, Section 6.5.1	Describe the dilution method used to go, for example, from an initial concentration of 16%-36% sodium persulfate to 13%-18%. Also describe for iron.	The following text was inserted in section 6.5.1: Dilution of the higher concentration persulfate solutions to delivered concentrations was accomplished by combining liquid volumes of iron solution via an in line mixer, thus achieving the delivery concentration of both reagents via dilution with the other.
8.	Page 51, Section 7.0	Second paragraph, ninth line, add "in" between "resulting" and "excessive"	This correction was made
9.	Page 53, Section 8.0	First paragraph, fifteenth line, I assume "geotechnical" should be replaced with "geophysical".	This correction was made
10.	Figure 8	Please add a general groundwater flow direction arrow as on Figure 5.	This addition was made to Figure 8.
11.	Figures 10 and 11	Please show all well screens and DRO sample results, label or define TP as test pits, SB as soil boring, etc. Also could add inferred peat layer between pits and wells since this is an important feature.	A note was added to Figures 10 & 11 indicating DRO data is summarized in Tables 2, 3, 13, and 15. A definition was added that explains the abbreviations used on the Figures and the screen intervals for the MW will be incorporated into the figures.
12.			
13.			

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14.					
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		END			

U.S. ARMY CORPS OF ENGINEERSDATE: April 2010 REVIEWER: Ronald Scrudato PHONE: 845 598 2413 cellA			Acti	on taken on comme	ent by:	
Item No.	Drawing Sheet No., Spec. Para.	COMMENTS]	REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	SCRUDATO RESPONSE
1.	ISCO Summary	I have previously commented on the ISCO bench a scale assessments conducted at the MOC at the NE and my comments continue to focus on the relative the bench/pilot tests and the selection of the site ch AECOM to conduct the ISCO.	C, SLI e timing of osen by		Comment acknowledged	
2.	summary	The site selected to conduct the pilot is underlain b layers of peat and organic-rich silts and sands. The deposits were evident at the time the trenches and is points were being installed during the pilot scale pl the program. Despite the presence of the high orga of sediments/soils, AECOM decided to conduct the pilot scale demonstration in deposits well known to oxidant sinks (oxidant consumers) and knew, or sh have known, that the bulk of the oxidizing reagent be rapidly consumed due to the reaction with the p organic rich sediments.	se injection hase of unic layers e ISCO o serve as ould is would		The selected area had the highest contaminant concentrations ever measured for the site, suggesting this area is a primary source area. The purpose of the pilot study was to demonstrate the feasibility of ISCO to provide remediation of the target contaminants of concern, and the area of highest contaminant concentrations should be the most appropriate for such a test.	Despite the presence of the extensive peat deposits, the COE and Bristol decided to continue with the pilot demonstration which was destined to fail due to the presence of the peat deposits. Had there been and assessment of the suitability of the ISCO process based on Bench Scale assessmen conducted prior to the field assessments, the efforts an costs of the pilot scale dem would have been avoided. The decisions to continue with the pilot demonstration were made by the COE wi guidance from Bristol without the advice or consultation of the RAB.
3.	Summary	AECOM should have followed NORMAL procedu conducted the bench (lab) scale assessments PRIO attempting to demonstrate the technology in the fie Without benefit of the large oxidant demand of the organic sediments that were evident in the results of	R to eld. peat and		Comment acknowledged. It should be noted by the reviewer that the schedule was not set by AECOM, and the performance timeline made a	The issue was whether ISCO was a viable remedial ternative in the area selected by the COE at the NEC for the 2009

	RMY CORF NEERS	PS OF DATE: April 2010 REVIEWER: Ronald Scrudato PHONE: 845 598 2413 cell	Acti	on taken on comme	nt by:	
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		bench scale assessments, it is likely they would hav selected another section of the MOC to conduct the Within the area of the Pilot, the trenches and drill he to conduct the pilot, encountered 3-5 feet of peat de throughout the ISCO demonstration area.	pilot oles used		NORMAL procedural order impossible.	demonstration. Had the bench scale assessment been conducted prior to the pilot scale, field program, it would have clearly demonstrated that ISCO was not a viable technology for the area of the NEC selected by the COE and Bristol to conduct the ISCO technology assessment due to the presence of extensive peat deposits which are known to be oxidant consumers.
4.	Summary	As noted by AECOM, the peat deposits serve as "sp for the petroleum products and because of the asso and the far greater amount of organic matter associa the peat, little of the associated contaminants of con (COCs) were reduced-the peat overwhelmed the an available oxidant supplied as a part of the pilot.	ociation ated with acern nount of		Comment acknowledged	
5.	Summary	The use of catalyzed oxidation is to use a reagent ar catalyst to create the desired reactions. Depending selected chemicals, the two chemicals may react instantaneously when they come in contact and ther produce the super oxidants desired to break down th organic contaminants. Use of the same injection points in the relatively impermeable sediments also resulted in the reaction between the reagents and catalysts to occur near the injection and therefore did not get far into the down	on the refore ne ss e point of		Comment acknowledged	

U.S. ARMY CORPS OF ENGINEERS DATE: April 2010 Ac REVIEWER: Ronald Scrudato PHONE: 845 598 2413 cell Ac			REVIEWER: Ronald Scrudato			
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6.	Summary	regions before reacting with the contaminants of cor other words, the sought after reactions occurred near injection points thereby limiting the radius of influer the catalyzed .reactions. The use of ISCO within the MOC was ill planned ar destined to failure due to the overwhelming presence natural organic matter including the peat and organic soils and sediments which consumed the oxidizing chemicals and the reaction products.	the nce of de of	The pilot test did not fail, but rather it provided that ISCO is not likely to be a viable technology for treating the most highly impacted portion of the site. The pilot study was successful in demonstrating that chemical oxidation is not an appropriate remedy for the most highly contaminated area currently identified at the MOC. This is a scenario where the success of the pilot study lies in the fact that it demonstrates a trialed technology is not appropriate for treatment of very high contaminant concentrations in highly organic soils.	These decisions resulted ir expenditures of thousands of dollars to conduct the pilot scale on efforts that were clearly destined to fa based on the presence of th peat deposit within the area selected by the COE and Bristol to conduct the ISCO pilot assessment.	

REVI	REVIEW PROJECT: W911KB-09-C-0013 NE Cape						
COM	DMMENTS DOCUMENT: In Situ Chemical Oxidation Summary Report, March 2010 Location: NE Cape, Alaska						
	RMY CORF NEERS	S OF DATE: April 2010 REVIEWER: Ronald Scrudato PHONE: 845 598 2413 cell	Action ta	ction taken on comment by:			
Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	A - 0	REVIEW CONFERENCE comment accepted W - comment withdrawn f neither, explain)	CONTRACTOR RESPONSE	SCRUDATO RESPONSE	
I 							
					source of contamination to groundwater.		
7.	Summary	ISCO remediation would have been far more effective within the southern regions of the MOC as note in the fi AECOM report. A range of monitoring wells drilled wi the southern regions of the MOC identified groundwater associated soils/sediments to be contaminated by petrole oils and lubricants (POLs). The concentration of organi rich soils and sediments increases toward the north with the MOC soils and alluvium The northern regions of the MOC impacted by petroleum products remains a viable to effectively utilize ISCO to effectively degrade the contaminants of concern (COCs) impacting the groundwater. I agree with the conclusions reached by AECOM that th peat/organic rich soils and sediments within the northern regions of the MOC are NOT suitable for the use of advanced oxidation technologies because of the natural organic matter associated with the soils and sediments. also concur with AECOM's deduction that the peat deput and organic rich materials within the northern regions of MOC serve as absorbents of petroleum products and near be remediated since they will serve as long term sources therefore continuing impacts to the MOC and the norther regions of the NEC including to serve as a continuous se of contaminants to the Suqi drainage. Natural attenuation is NOT a viable alternative since the contaminants have been concentrated in the peat and org rich soils for more than fifty years and yet continue to at down gradient regions of the site including the surface a	ithin r and eum, ic- iin e area area n n I osits f the ed to s and ern ource ese ganic ffect		Comment acknowledged		

REVI	EW MENTS	PROJECT: W911KB-09-C-0013 NE Cape DOCUMENT: <i>In Situ</i> Chemical Oxidation Summary Report, March 2010 Location: NE Cape, Alaska							
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Item Drawing COMMENTS No. Sheet No., Spec. Para.			REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	SCRUDATO RESPONSE				
		groundwater of the northern MOC and systems	to the north.						
8.	What is attributed to the reasonable reduction in COCs in select monitoring wells? For instance:MW08-reductions in GRO in 28 days:			Groundwater flow dynamics, advection, dispersion, desorption and oxidation.					
9.		This pilot was pre-destined to fail due to the sel site to conduct the pilot ISCO assessment.	ection of the		Comment acknowledged				

REV. COM	IMENTS DOCUMENT: In-Situ Chemical Oxidation (Phase 1) Summary Report (Draft)							
U.S. ARMY CORPSDATE: 25-May-2010Action takeOF ENGINEERSREVIEWER: Mike UtleyPHONE: 907-753-2691			en on comment by:					
Item No.	Drawing Sht. No., Spec. Para.	COMMENTS	REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)		CONTRACTOR RESPONSE	USAED RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)		
1.		Laboratory analytical data for this report with the Landfill report. The data, inclu- checklists, should be included with this repor- report is a stand-alone product. Please inclu-	uding ADEC ort so that the	Updated report.	ADEC checklists will be included in the final	ОК		

		report is a stand-alone product. Please include all data in Final version.		
2.	Section 3.1	Text indicates water level measured to 1/100 per inch. Forms indicate water level measured to 1/100 per foot. Please revise as necessary.	Texted changed to: Groundwater levels were measured using an electronic water level indicator and measured to the nearest 1/100th of a foot.	

U.S. ARMY CORPS OF ENGINEERS		PS DATE: 25-May-2010 REVIEWER: Mike Utley PHONE: 907-753-2691	SDATE: 25-May-2010Action takeREVIEWER: Mike Utley		cidation (Phase 1) Summary Report (Draft) ken on comment by:			
Item No.	Drawing Sht. No., Spec. Para.	Sht. No.,		REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)		
3.	Section 3.11.1	2 nd deviation: Further detail is needed on the (i.e. what about the distribution of contamin deletion of the deeper injection?) Also, the groundwater depth as a measuring guide; cites depth bgs as a measuring guide – plea two so that the reader has a reference of comp 3 rd deviation: Please include a justification for from 10 foot to 5 foot screen. (After readin document, I know you have a good reason; good to include a basic summary here, completeness.)	ants allowed wp text cited bulleted text use relate the arison. or the change ng the entire it would be	deviation: • Th ind con ori of The follow deviation: • Th site aqu Scr sha imp Ba rel. con we	e observed distribution of contaminants licated that the primary zone of ntamination was more shallow than ginally anticipated allowing for deletion the deeper injection zone. wing bullet was added to further describe the 3rd	OK, thanks. Good response.		
4.	Section 5.1.2	A few more details are needed here. For examperform a rising or falling head test method/software was used to calculate the rate	st? What	Rising a The corr values transduc solve fo	wing text was added to section 5.1.2: and falling head tests were conducted. responding water level and elapsed time were logged using an In-Situ Inc. cer. AqteSolv 3.5 software was used to r hydraulic conductivity values using the -Rice method.			

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U.S. A OF EN	IMENTS RMY COR GINEERS A-EN-ES-M	DOCUMENT: In-Situ Cher PS DATE: 25-May-2010 REVIEWER: Mike Utley PHONE: 907-753-2691		lation (Pha en on commer		Summary Report (Draft)	
Item No.	Drawing Sht. No., Spec. Para.	COMMENTS		REVIEW CONFEREN A - comment ac W - comme withdrawn (if neither, exp	NCE cepted ent n	CONTRACTOR RESPONSE	USAED RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
5.	Table 5	Data indicates naphthalene was analyzed 8270C-SIM, but electronic data indicate tha was analyzed by SW8260B. Please evaluate necessary.	t naphthalene			incorrect. Changed table to show benzene and e by 8260.	ОК
6.	Table 13	Data flags are not consistent with those Appendix B. See comment regarding SB(below. Please evaluate and revise as necessar	02 and SB03	an		vs to section 2.9 for DRO surrogate recoveries contamination. Flags in section 2.9 now match	ОК
7.	Table 15	2009 results are presented without includin data flags. Please update data with appropriate		ex		has been modified to include flags and ns. Flags match section 2.9 of the data n report.	ОК
8.	Appendix B						
9.	TOC discussion	Per the hardcopy data, only one of four TOC sent to Sacremento. Please specify relevant that were sent.		an Te re qu	alyses estAmer sults f alificat	ified to read: SDG 580-14753 had the TOC of twelve samples subcontracted to rica-West Sacramento for analyses. All rom this SDG were reported without ion. All other TOC analyses were d by TestAmerica Tacoma.	ОК
10.	Table 1	Electronic data doesn't indicate that sam 14753 were subbed to TA Sacremento; mentries in this table document the subbed TO detailed in the bullet just above Table 1). O TOC samples subbed to TA Sacremento?	either do the C samples (as		ullet abov • T sa V fo	ated to reflect analysis by TA West Sac we Table 1 now reads: estAmerica-Tacoma transferred twelve amples from SDG 14753 to TestAmerica in Vest Sacramento for analyses of the ollowing: otal organic carbon (TOC) by SW-846 060	ОК

COM	OMINIENTS DOCOMENT: In-Situ Chemical Oxidation (Flase 1) Summary Report (Drait)						
OF EN	RMY CORI GINEERS A-EN-ES-M	PS DATE: 25-May-2010 REVIEWER: Mike Utley PHONE: 907-753-2691	Action take	n on comment by:			
Item No.	Drawing Sht. No., Spec. Para.	COMMENTS		REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)	
11.	Table 2	SB35 has incorrect laboratory sample numb correct. GW13 – SAMPID as reported in electro 09NCMOCGW013 (not consistent with this tar revise as necessary).	nic data is	09NCMC on hold; r	SDG # on Table 2 to correct lab #. OCSB35 logged in as 580-15434-10. Sample was never analyzed. d the lab to change the field ID for GW13 in the	ОК	
12.	Section 2.1	Last paragraph – Please delete 2.1.1 and 2.1. and Holding Time Columns	.2 in Matrix	2.1.1 and	2.1.2 removed from columns	ОК	

OF EN	ARMY COR NGINEERS DA-EN-ES-M	PS DATE: 25-May-2010 REVIEWER: Mike Utley PHONE: 907-753-2691	Action take	n on comment by:		
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13	Section 2.2	Electronic data indicates that an MS/M performed as part of batches 48286, 49247 50785. Please evaluate and revise text as nec Holding time qualifications using J/UJ as tex inappropriate Please revise flags to QL. Please discuss impact of all anomalies to of merely stating that "data is usable" without so insufficient.	7, 50043, and cessary. xt indicates is data usability;	samples ini from this 3 acceptance dilutions ar were re-ana project sam However, L for its purpe treatment. SDG 15053 included m MS/MSD, r required dil samples we performed of QSM guide the data is contaminan SDG 15185 included m sample 09N than 4 time to the pre recoveries f within met the high cc 09NCMOC analyzed in times as no in batch 500 and LCSD s purpose of of SDG 15437 included m MS/MSD n	 2.2 text modified on 7-7 to say: SDG 14864 had project tially analyzed in batch 48207 which included most samples SDG. All QC, including a project MS/MSD, were within criteria. Samples 09NCMOCGW09, -10 and -11 required ad reanalysis and were analyzed in batch 48286.The samples lyzed within holding times. No matrix spike was performed on ples in batch 48286, which is a deviation from QSM guidelines. LCS spike recoveries were within limits and the data is usable ose of establishing initial concentrations of contaminants before B had project samples initially analyzed in batch 48996, which nost samples from this SDG All QC, including a project met acceptance criteria. Samples 09NCMOCGW16, -18 and -19 lutions and reanalysis and were analyzed in batch 49247. The ere re-analyzed within holding times. No matrix spike was on project samples in batch 49247, which is a deviation from elines. However, LCS spike recoveries were within limits and s usable for its purpose of determining concentrations of ts during treatment. 5 had project samples initially analyzed in batch 49813, which ost samples from this SDG. The MS/MSD was performed on NCMOCGW33, which had naphthalene concentrations greater s the spike amount. The MSD failed to acceptance criteria due sence of high target analytes, naphthalene. The benzene for the MS/MSD met acceptance criteria. All other QC were hod acceptance criteria. No qualification was necessary due to oncentrations of target analyte in the failed MSD. Samples GW31 and -32 required dilutions and reanalysis and were batch 50043. The samples were re-analyzed on project samples 043, which is a deviation from QSM guidelines. However, LCS spike recoveries were within limits and the data is usable for its determining concentrations of contaminants during treatment. 7 had project samples initially analyzed on project samples 043, which is a deviation from QSM guidelines. However, LCS spike recoveries were within limits and the data is usable for its determining concent	Understood however, plea note that the QS does not allow t use of a non proje sample f MS/MSD analys MS/MSD must from a proje sample in all case This represents deviation that mu be discussed, a the impact to t data evaluate Also, please note if a sample is n extracted for a reason, t corresponding MS/MSD must all be re-extracte This again is p QSM guidelines.

	REVIEWPROJECT: Northeast Cape Main Operati COMMENTSDOCUMENT: In-Situ Chemical Oxidation						
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Item No.	Drawing Sht. No., Spec. Para.	COMMENTS		REVI CONFEF A - commen W - con withdr (if neither,	RENCE t accepted nment rawn	CONTRACTOR RESPONSE	USAED RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
14.	Section 2.3	Holding time qualifications using J/UJ as ter- inappropriate Please revise flags to QL. Please discuss impact of all anomalies to o merely stating that "data is usable" without s insufficient.	lata usability;		Section 2 high reco more QC associated indicate t bias. Only the remai interferen usable as	changed to QL. .3 now reads: Detected results associated with veries were qualified QH to indicate that one or c criteria failed, with a high bias. All results d with low recoveries were qualified QL to hat one or more QC criteria failed, with a low y one sample had a low surrogate recovery with nder exceeded surrogate recovery limits. Matrix ce is suspected in both cases. Sample results are estimates for ISCO study purposes though the of the results is questionable.	OK

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CEPOA-EN-ES-M	PHONE: 907-753-2691			
Item Drawing No. Sht. No., Spec. Para.	COMMENTS	REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)

	Section 2.4	Table 5 is missing TA Anchorage batch 9070075. Please update. 2 nd para – Note that MS/MSD is required in all lab batches. Deficiencies must be noted and usability impacts assessed. Please revise "MS/MSD was included in the majority of batches and the SAP" accordingly. MS/MSDs were not performed in lab batches 46874, 50480, and TA Alaska batch 9070075. 4 th para – pH not less than 2 requires a flag to indicate potential low bias. Please update and revise accordingly. Please specify dilution of surrogates that were diluted out. Method blanks: Please specify that sample results were greater than 10 times that found in the method blanks, and <i>that's why qualification is not required</i> .		 Batch 9070075, extracted on 7-26-09 added to table 5. 2nd para now reads: The following items were reviewed and met SAP/method criteria and were within SAP control limits: MS/MSD RPDs. MS/MSDs were not analyzed in batches 9070075, 46874 and 50480 due to insufficient sample quantities or because MS/MSD was not specified on the chain-of-custody. The LCS/LCSD recoveries and RPDs met control limits. 4th para; A QL qualifier was assigned to the DRO result to indicate potential low bias due to insufficient preservation. Text changed to: Insufficient preservation was used for sample 09NCMOCGW09 (one 1-Liter amber). The hydrogen ion concentration was adjusted at the laboratory prior to preparation using hydrochloric acid. A QL qualifier was assigned to the DRO results to indicate potential low bias. Dilutions were added to section 2.4 in regards to not reporting surrogates. Method blank contamination wording changed to: DRO and RRO concentrations in associated samples were greater than the RL and greater than 10 times the concentration was not required. 	ОК
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REV	REVIEW PROJECT: Northeast Cape Main Operations Complex Area						
COM	IMENTS	DOCUMENT: In-Situ Cher	mical Oxid	lation (Phase 1)	Summary Report (Draft)		
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	GINEERS	REVIEWER: Mike Utley					
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16.	Section 2.5	Please re-evaluate blank evaluation. Both As detected in method blanks; also, results are associated with a contaminated method blank 10 times the blank concentration <i>regardless</i> or revise accordingly.	e impacted if and less than	in the MI less than t Batch No 1 580-4920 (580-5090 (Associate but less t blank, sar bias. The effectiven	MDL RL 9 Chromium mg/L 0.0018 0.00037 0.002	ОК	

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OF EN	RMY CORF GINEERS A-EN-ES-M	PS DATE: 25-May-2010 REVIEWER: Mike Utley PHONE: 907-753-2691	Action take	n on comment by		
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17.	Section 2.6	TOC analyzed by Sacremento is not preser EDF. Please revise. MS/MSD was not performed for batch 5086 text. Please revise accordingly, and indica data usability. Holding time qualifications using J/UJ as tex inappropriate Please revise flags to QL.	5, contrary to te impact on	Text ch samples LCS, ar exception requirent submittt pair but 50865 ar submittt 580-509 are furtt met acc evaluato results effectivy for that qualifies heterog and pre	wised EDD received for 14753 anged to: Required QC for a batch of up to 20 includes a MB and a laboratory duplicate. A MB, ad MS/MSD pair were analyzed per batch with the on of batch 580-50865. The method QC nent was met for all other batches. Samples ed under SDG 580-15434 included an MS/MSD they were extracted in two separate batches, 580- und 580-50999 on successive days. The MS/MSD ed with SDG 580-15434 was analyzed in batch 099. The MS/MSD recoveries for batch 580-50999 her described below. The LCS in batch 580-50865 ceptance limits. Batch precision could not be ed for project samples in batch 580-50865. Sample from SDG 580-15434 were used to determine the eness of the ISCO treatment and results are usable t purpose. Sample 09NCMOCSB31 was M d due to out of control recoveries. Soil matrix eneity at the site may have impacted the accuracy cision of the sample.	

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OF EN	ARMY CORI NGINEERS A-EN-ES-M	5DATE: 25-May-2010Action takeREVIEWER: Mike UtleyPHONE: 907-753-2691		en on comment by:						
Item No.	Drawing Sht. No., Spec. Para.	COMMENTS		REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)				
18.	Section 2.7	MS/MSD was not performed for batch 4969 text. Please revise accordingly, and indica data usability.		20 samp LCS/LCS were ini 48614. S calibratic 09 in QC was also was used acceptant acceptant accepted times for at a dilut due to low	nged on 7-7 to: Required QC for a batch of up to obles includes a MB and LCS. A MB and SD, and MS/MSD. Samples from SDG 14864 tially analyzed on 8-14-09 in QC batch 580- amples 09NCMOCGW04 and -05 exceeded the on range and were diluted and re-analyzed on 9-2- C batch 49693. Sample 09NCMOCGW06, which the MS/MSD sample in batch 580-580-48614, d as the batch duplicate for 49693 and it met ce criteria for duplicate precision. All QC met ce criteria in both batches Sample results are without qualification for QC other than holding the out of range samples that required re-analysis ion. The diluted sample results are qualified QL w potential bias from holding time exceedences. removed.	Note bolded text – were the samples from 49693 re- extracted? If not, no MS/MSD is required (as long as the MS/MSD were reportable from batch 48614.				
19.	Section 2.8.1	1 st para (RPD not valid when only one result statement is not necessarily true. A com detected value and a detection limit is information. It is noted, though, that criteria be widened for this situation (but this shou covered in the QAPP). Please revise language	parison of a still useful may need to ld have been	cases wh RL in bo would no A result result rep and sign	a-4 th sentence. The statement actually reads: In there a target analyte was not detected above the th the field duplicate and parent sample, an RPD of be valid, and therefore was not calculated. above the RL is considered more accurate than a ported below the RL due to instrument limitations al to noise ratio. The lesser degree of accuracy e RL is why results get J flagged.	ΟΚ				

COM U.S. A OF EN					Operations Complex Area idation (Phase 1) Summary Report (Draft) ken on comment by:			
Item No.	Drawing Sht. No., Spec. Para.	COMMENTS		REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)		
20.	Section 2.8.1.1	Section needs summary text indicating tha 10% duplicate requirement was not met, impact to data quality/usability. Merely sta usable" is not sufficient; please provide a ju text of report.	and discuss ating "data is		2.8.1.1 indicates that the 10% frequency was met. have the correct section?	First bullet – 12% Third bullet – 14% Fourth bullet – 13% Fifth bullet – 14% Percentages listed above are all greater than 10%; therefore ADEC mandated 10% duplicate requirement was not met. Please address comment.		
21.	Table 9	Please delete "2.8.2" in GRO row of first data Why are SB18/SB21 bolded for DRO/RRO ADEC guidance criteria. (Would help in criteria [and source] was detailed here).	? They meet	Table 9 The pro were se precisio	B21 %RPD for DRO/RRO will be unbolded in ject specific acceptance criteria for field duplicates t at 20%, same as the LCS/LCSD and MS/MSD n criteria. Its stated in section 5.2.2.1 of the APP and the 20% value is in Table 5-6 of the QAPP	OK Actually, Section 5.2.2.1 indicates soil duplicate precision is 50%. This criterion is not listed in Table 5-6. Comment still stands (and must be addressed)		

REV COM	IEW IMENTS	PROJECT: Northeast Cape DOCUMENT: In-Situ Cher	-	-		
U.S. A OF EN	ARMY COR IGINEERS A-EN-ES-M			n on comment by:	v i /	
Item No.	Drawing Sht. No., Spec. Para.	COMMENTS		REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
22.	Section 2.8.2	2 nd para – MS/MSD are required by the laboratory batch. Comments were made to during SAP review. Please update text accor- bulleted list should specify those batches whe was not included, instead of listing for occurrence.	to this affect ordingly. The ere MS/MSD	document CoCs ide samples of samples f data quali Text char recoverie 2.7. Som MS/MSD The failu including	re to include MS/MSDs in all lab batches are ed under the individual analyses. Not all SDGs- ntified samples for MS/MSD. In some instances, were re-extracted and re-analyzed without project or MS/MSD, such as TOC. They are noted in the ty summary. ged on 7-8 in section 2.8.2 to read: MS and MSD s and RPDs are discussed in Sections 2.2 through he extraction batches did not include project o samples, which is a deviation from the QSM. Ire to include the MS/MSD in the batches, the impact to data quality, is also addressed in 2.2 through 2.7 under the individual analyses.	Section 2.8.2 is a summary. The bulleted text indicates that the frequency was met, which it was not. Please address comment. If samples from a given batch are re- extracted and re- analyzed, that batch does not count. You can't use it to report MS/MSD if you are not reporting primary data from that batch. It's a field error if MS/MSD is not properly designated on a COC, but fault is not the issue here. The issue is to document data quality issues against a known standard (the QSM). Please address comment.

REVIEW COMMENTS		-	PROJECT: Northeast Cape Main Operations Complex Area DOCUMENT: In-Situ Chemical Oxidation (Phase 1) Summary Report (Draft)							
OF EN	RMY CORI IGINEERS A-EN-ES-M	PS DATE: 25-May-2010 REVIEWER: Mike Utley PHONE: 907-753-2691	Action taken on comment by:							
Item No.	Drawing Sht. No., Spec. Para.	COMMENTS		REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)				
23.	Section 2.8.3	2 nd para – Water samples indicated we 8/19/2009; they could not have been shipped Also, note that trip blank contamin collection/preparation QC sample, not instr- thus is not subject to dilution considerations that, the only sample requiring qualification is a result of 0.0017 mg/L, which is less than blank result of 0.00023 mg/L. Please	ed 8/12/2009. ation is a umental (and s). Based on s GW26, with 10X the trip	Samples	were shipped on 8/21, text changed. -GW23 and -GW25 removed from section 2.8.3 table in section 2.9	ОК				
		accordingly. Please specify SDG that trip blanks are associ 3 rd para - Qualification is not consistent with Samples GW41 and GW44 are potentially trip blank contamination (results are less that	QSM criteria. impacted by	3 rd Para impacted	ded in section 2.8.3 (now 4 th), added GW41, GW44 and GW47 as samples. Also added to section 2.9	OK OK				
		contamination level). Please revise text at accordingly. 4 th para – GRO was detected in the trip b SDGs (15084 and 15434). In 15084, the o sample is SB23, with a result of 4.8 mg/kg, 0.61 mg/kg); In 15434, SB27 and SB32 are samples (results of 12 mg/kg and 26 mg/kg, with a TB result of 3 mg/kg.)	nd data flags lank for two nly impacted TB result of the impacted	detected the MDI shipped o at less t 09NCMO indicate t Added to	(now 2nd para), Text added to say: GRO was in the trip blank at a concentration greater than L but less than half of the RL with soil samples on August 21 in SDG 15084. GRO was reported than ten times the trip blank result in sample OCSB23. The sample result is B flagged to trip blank contamination. D section 2.9 as well. (now 5 th) added -SB32 and also added in section	ОК				
24.						ОК				
24.	Section 2.9	Please update flags as indicated in earlier com	iments.	Added						

COMMENTS DOCUMENT: III-Situ Chemical Oxidation (Flase I) Summary Report (Drait)							
U.S. <i>A</i>	ARMY COR	PS DATE: 25-May-2010	Action take	n on comment by:			
OF ENGINEERS CEPOA-EN-ES-M		REVIEWER: Mike Utley					
		PHONE: 907-753-2691					
Item No.	Drawing Sht. No., Spec. Para.	COMMENTS		REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)	
25	General	eneral ADEC checklists were not provided. Please provide. Per Table 13 in main report, SB02 and SB04 were		ADEC cl	hecklists were sent to Utley for review prior to be	How can ADEC	
	General				l into the final report	checklists be	
		impacted by high surrogate recovery. However,			Samples are listed in section 2.4 (columns indicating surrogates were diluted out of reporting levels) and section 2.9. The surrogates were not reported due to dilution, as noted in table 13 and sections 2.4 and 2.9.		
		no mention of this in Appendix B (14560-2 o listed as flagged samples). Please evaluate and		surrogate 2.9. The	s were diluted out of reporting levels) and section surrogates were not reported due to dilution, as	reviewed if they are provided with the final report?	

REVIEW COMMENTS		PROJECT: Northeast Cape Main Operations Complex Area DOCUMENT: In-Situ Chemical Oxidation (Phase 1) Summary Report (Draft)						
OF EN	ARMY COR IGINEERS A-EN-ES-M		Action taken on comment by:					
Item No.	Drawing Sht. No., Spec. Para.	COMMENTS		REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)		
26	COELT	 NPDL number is incorrectly reported in S. (should be 09-034, not ASG0063). If corrected data. LocIDs are not consistent (should not be SAMPID). Please submit corrected data. SDGs 15053, 15087, and 15185 are reportint Extraction Code for AK102/AK103. If corrected data. Note that all samples require a unique ide Blank" is not unique. Please note for future a PVCCODE is incorrect if you prefer the phold time to the run that exceeded calibra indicated in Section 2.2 of the Data Verifi (SDG 15087, sample GW21 and GW22). and resubmit. EXPECTED is incorrect for naphthalene in for SDG 15053; it's reported as 62.1, but it so (57 + 20.1) per the hardcopy. TOC analyzed by Sacramento (batch 92 present in COELT EDF. Please revise. PVCCODE is incorrect if you prefer the phold time to the run that exceeded calibration (batch 92 present in COELT EDF. Please revise. PVCCODE is incorrect if you prefer the phold time to the run that exceeded calibration (batch 92 present in COELT EDF. Please revise. PVCCODE is incorrect if you prefer the phold time to the run that exceeded calibration (batch 92 present in COELT EDF. Please revise. PVCCODE is incorrect if you prefer the phold time to the run that exceeded calibration and resubmit. 	Please submit e duplicate of g the incorrect Please submit ntifier: "Trip submittals. run outside of ation range as ication Report Please revise the MS/MSD should be 77.1 19575) is not run outside of ation range as ication Report	report. 0 15087. Will in and -1.	1 SEDD and EDF files will be supplied with final Corrected files include 14753, 15053, 15185, 14864, clude in future SDGs-"Trip blank" including date If more than one shipmen t then -2,-3 etc DDE was revised in 14864.	OK, backcheck will be required.		
27	SEDD	Please ensure results reported in TA Sact 9219575 are reported in correct SEDD file.	remento batch	report.	A SEDD and EDF files will be supplied with final 14753, 15053, 15185, 14864, 15087 ed EDDs sent on 7-8-10 via email to Utley.	OK, backcheck will be required.		
28		End –						



January 19, 2010

Programs and Project Management Division Environmental Special Projects

Dr. Ron Scrudato 2790 Teal Court St. James City, FL 33956

Dear Dr. Scrudato:

Please find enclosed, a CD copy of the *DRAFT* Main Operations Complex Area, Phase I In Situ Chemical Oxidation, Technical Memorandum for the Northeast Cape FUDS, St. Lawrence Island, Alaska, dated January 2010. This document is a precursor to the final report. I do not intend to distribute this to the RAB until it is final, but we are certainly interested in any commentary you might have regarding the Draft.

If you have any questions, please contact me at (907) 753-2689, or by e-mail at <u>carey.c.cossaboom@usace.army.mil</u>.

Sincerely,

Carey Cossaboom Project Manager

Enclosure: CD

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October 6, 2010

CEPOA-PM-ESP-FUDS

«Title» «FirstName» «LastName» «Company» «Address1» «City», «State» «PostalCode»

Dear «Title» «LastName»:

Please find enclosed, a copy of the Final Northeast Cape Phase I In-Situ Chemical Oxidation Summary Report, dated August 2010.

Please place these documents with the others that make up the St. Lawrence Island Information Repository. These copies are not to be checked out, but left at the repository for anyone to read. Thank you very much!

If you have any questions, please contact me at (907) 753-2689, or by e-mail at carey.c.cossaboom@usace.army.mil.

Sincerely,

Carey Cossaboom **Project Manager**

Enclosure

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October **8**, 2010

CEPOA-PM-ESP-FUDS

Ms. Vi Waghiyi Alaska Community Action on Toxics (ACAT) 505 W. Northern Lights Blvd., Ste 205 Anchorage, AK 99503

Dear Ms. Waghiyi:

Please find enclosed, a copy of the Final Northeast Cape Phase I In-Situ Chemical Oxidation Summary Report, dated August 2010. This document describes the pilot study efforts to assess whether chemical oxidation technology would be a viable method for treating the fuelcontaminated soils at the Main Operations Complex. Unfortunately, the abundant peat in the subsurface there makes the method unworkable. We will be using an alternative remediation method in 2011.

If you have any questions, please contact me at (907) 753-2689, or by e-mail at carey.c.cossaboom@usace.army.mil.

Sincerely, Carey Cossaboom **Project Manager**

Enclosure

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October 🕃 2010

CEPOA-PM-ESP-FUDS

Ron Scrudato R&M Technologies, Inc. 71 Washington Street Newburyport, MA 01950

Dear Dr. Scrudato:

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If you have any questions, please contact me at (907) 753-2689, or by e-mail at <u>carey.c.cossaboom@usace.army.mil</u>.

Sincerely,

Carey Cossaboom **Project Manager**

Enclosure

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STATE OF ALASKA

SEAN PARNELL, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPILL PREVENTION AND RESPONSE CONTAMINATED SITES PROGRAM 555 Cordova Street Anchorage, AK 99501 PHONE (907) 269-3053 FAX (907) 269-7649 www.dec.state.ak.us

File No: 475.38.013

February 16, 2011

Carey Cossaboom, Project Manager U.S. Army Corps of Engineers Alaska Dist. CEPOA-PM-C-FUDS P.O. Box 6898 JBER, AK 99506-6898

Re: ADEC Approval of the Final August 2010 Northeast Cape Summary Report for the Main Operation Complex Area Phase I In-Situ Chemical Oxidation

Dear Mr. Cossaboom:

Thank you for providing The Alaska Department of Environmental Conservation Contaminated Sites Program (ADEC) with a copy of the Final Northeast Cape Summary Report for the Main Operation Complex Area Phase I In-Situ Chemical Oxidation dated August, 2010, which was received by ADEC on September 21, 2010. ADEC submitted comments and revision requests earlier in 2010 which were made and included in the final summary report. ADEC has approved and is filed this report as the final copy on record.

Please contact me at (907) 269-3053 or <u>curtis.dunkin@alaska.gov</u> if you have any questions regarding this letter.

Sincerely,

Curtis Dunkin Environmental Program Specialist

Cc Molly Welker, Bristol ERS, LLC (via email)