Clark Fork River Operable Unit, Milltown Reservoir / Clark Fork River NPL Site, Powell, Deer Lodge, and Granite Counties, Montana
Part 1, Data Summary Report
Reach A, Phase I

Tetra Tech Project Number 114-560156

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March 2010

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LIST OF ACRONYMS AND ABBREVIATIONS

ABA	Acid Base Accounting
ABP	Acid Base Potential
AP	Acid Potential
As	Arsenic
BMP	Best Management Practice
CFR	Clark Fork River
CFRSSI	Clark Fork River Superfund Site Investigation
COC	Contaminant of Concern
DEQ	Montana Department of Environmental Quality
DI	Deionized
DQOs	Data Quality Objectives
DSR	Data Summary Report
EPA	U.S. Department of the Interior Environmental Protection Agency
FB	Field Blank
ft	foot or feet
GIS	Geographic Information System
IC	Institutional Controls
MDEQ	Montana Department of Environmental Quality
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
µg/L	micrograms per liter
mg	milligrams
mg/L	milligrams per liter
NIST	National Institute of Standards and Technology
NPL	National Priorities List
OU	Operable Unit
ppm	parts per million
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QC	Quality Control
RA	Remedial Action
ROD	Record of Decision
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure
s.u.	standard units
XRF	X-ray Fluorescence

Approval Form

Approved by:

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EXECUTIVE SUMMARY

This data summary report (DSR) summarizes the results of the Reach A, Phase 1 Floodplain Investigation (Part 1). The document governing the Floodplain Investigation is the Draft Final Clark Fork Site Sampling and Analysis Plan (SAP) Addendum, Reach A, Phase 1 (Tetra Tech/ CDM, 2009). This SAP Addendum augmented and modified the comprehensive SAP (*Sampling and Analysis Plan (SAP) Soils and Wastes Chemical Characterization for Remedial Design/Remedial Action, Clark Fork River Operable Unit Milltown Reservoir/Clark Fork River NPL Site, (CDM, 2009)* with sampling objectives, methods and analytical procedures specific to collect data in support of a design for remedial action within Reach A, Phase 1 of the Clark Fork Site. Under this Part 1 of this SAP Addendum, DEQ collected design level data concerning the nature and extent of soil contamination, thickness of contaminated materials, concentrations of contamination within the soil profile and depth to groundwater.

In general, the investigation sampling approach consisted of test pit locations, spaced on a north-south – east-west grid pattern with 125-foot centers. Additional sample locations were identified outside of the 125-foot grid system within historic channels or old oxbows. Samples were collected at 6-inch intervals and screened in the field until one of the following conditions was met:

- Evaluation of field XRF data indicated that the sum of As, Cu, and Zn concentrations (i.e. total COC concentrations) was below 500 mg/kg, or
- Course alluvium having a rock content of 60% or more (visual estimation), or bedrock was encountered. These conditions are believed to provide sufficient protection from erosion.

Sampling areas began with the RipES preliminary polygons (CH2MHill, 2004) including Slickens, Impacted Soils and Vegetative Areas, Miscellaneous Site Types and Slightly Impacted Soils and Vegetation Areas.

Floodplain sampling activities began on August 24, 2009, and were completed on September 30, 2009. This DSR only present a summary of data collected from Part 1 of this SAP Addendum. Information collected under Part 2 of this SAP addendum will be summarized in a separate report. A total of 635 natural samples, 38 field duplicates, and 23 filed blanks were submitted for laboratory analysis from 269 test pits. Additional samples were collected but not submitted to the laboratory for analysis and archived for future analysis, if necessary.

1.0 INTRODUCTION

This data summary report (DSR) summarizes the results of the Reach A, Phase 1 Floodplain Investigation (Part 1). The document governing the Floodplain Investigation is the Draft Final Clark Fork Site Sampling and Analysis Plan (SAP) Addendum, Reach A, Phase 1 (Tetra Tech, 2009). This SAP Addendum augmented and modified the comprehensive SAP (*Sampling and Analysis Plan (SAP) Soils and Wastes Chemical Characterization for Remedial Design/Remedial Action, Clark Fork River Operable Unit Milltown Reservoir/Clark Fork River NPL Site, (CDM, 2009)* with sampling objectives, methods and analytical procedures specific to collect data in support of a design for remedial action within Reach A, Phase 1 of the Clark Fork Site. Under this Part 1 of this SAP Addendum, DEQ collected design level data concerning the nature and extent of soil contamination, thickness of contaminated materials, concentrations of contamination within the soil profile and depth to groundwater.

Floodplain sampling activities began on August 24, 2009, and were completed on September 30, 2009. This DSR only present a summary of data collected from Part 1 of the SAP Addendum. Information collected under Part 2 of the SAP addendum will be summarized in a separate report.

1.1 PURPOSE AND OBJECTIVES

The purpose of the Reach A, Phase 1 investigation was two-fold. The purpose of Part 1 of the investigation was to identify design level data concerning the nature and extent of soil contamination, thickness of contaminated materials, concentrations of contamination within the soil profile and depth to groundwater in order to identify design level data. The investigation also provides data to verify or modify the preliminary CFR Riparian Evaluation System (RipES) (CH2MHill, 2004) identification of removal or treatment polygons and document preliminary polygons where no action, BMPs, or ICs may be appropriate. The purpose of Part 2 of the investigation (which will be summarized as a separate report) was to identify specific design level information concerning the Clark Fork River and streambanks within the Reach A, Phase 1 investigation area.

1.2 DATA QUALITY OBJECTIVES AND ASSESSMENT

Project-specific data quality objectives (DQOs) were outlined in the Sampling and Analysis Plan Soils and Wastes Chemical Characterization for Remedial Design/Remedial Action (CDM, 2009). The DQOs were developed to ensure the project goals and objectives are met. The DQOs are presented in a seven step process as follows:

Step 1: State the Problem

Step 1 of the DQO process is to define or describe the environmental problem to be studied so that the focus of the study will be unambiguous. To accomplish this, the following tasks need to be completed:

- Describe the problem and develop a conceptual model of the environmental hazard to be investigated.
- Identify the planning team members.
- Determine resources, constraints, and deadlines.

Problem Description

The selected remedy for the Clark Fork River OU includes removal of tailings/slickens and in situ treatment of mixed soil/tailings. In order to complete remedial designs to implement Remedial Action(s), several data gaps have been identified. These include the following:

- The horizontal and vertical extent of contaminated materials to be removed from the floodplain;
- COC concentrations in areas identified for treatment to determine the depth of treatment and areas where treatment is impracticable in accordance with the ROD requirements;
- The lime rates for treatment areas;
- COC concentrations in the soil profile in areas preliminary defined as Slightly Impacted in the 2006-2007 application of RipES; and
- Arsenic concentrations to ensure that any Remedial Action(s) will meet human health arsenic action levels.

The RipES investigation completed by EPA in 2006-2007 identifies three types of preliminary polygons: exposed tailings/severely impacted (removal) areas, impacted soils and vegetation (treatment) areas, and slightly impacted soils and vegetation (no action or BMPs or ICs) areas. Some chemical data were also collected as part of the RipES investigations. While these data are sufficient to identify preliminary Remedial Action(s), they are insufficient to complete remedial design.

A conceptual site model is provided in Section 5.1 of the Clark Fork River OU ROD, as follows:

> *The primary source of contaminants of concern in the Clark Fork River floodplain is tailings mixed to various degrees with surface and near surface soil deposits within the historic 100-year floodplain. Secondary sources include contaminated surface water and shallow groundwater from the alluvium within the Clark Fork River OU. Other secondary sources include streambed sediments and some historically contaminated irrigation ditches and fields.*
>
> *The primary pathways by which contaminants move within and between media include tailings and soils, groundwater, surface water, and airborne transmissions. Fate and transport of contaminants by these media are listed below and shown in Exhibit 2-3 [of the ROD], Conceptual Model:*
>
> - *Tailings, Sediments, and Impacted Soils*
> - *Oxidation of tailings produces acid, releases metals into surface and groundwater*
> - *Plants uptake contaminants from soil into roots*
> - *Overbank flow from flooding, rainfall, and streambank erosion transport total and dissolved metals into river; aquatic flora and fauna exposed*
> - *Groundwater*
> - *Infiltration and vadose zone transport*
> - *Vadose zone pore-water and groundwater interaction*

- *Groundwater flow*
- *Groundwater and surface water interaction*
- *Streambank storage*

➢ *Surface Water*

- *Surface water runoff from tailings*
- *Surface water and sediment interaction*
- *Streambank and floodplain erosion by the Clark Fork River*

➢ *Streambed Sediments*

- *Streambed material coated with metal oxides, sulfides, and hydroxides*
- *Potential dissolution into the river water.*

➢ *Historically Irrigated Fields*

- *Soil entrainment by wind, potential inhalation and ingestion by residents*
- *Dermal contact with soil, potential for ingestion by children*
- *Ingestion potential through garden vegetables*

Planning Team Members, Affiliations, and Roles are as follows:

Joel Chavez – DEQ Project Manager
Brian Bartkowiak – DEQ Upper Clark Fork River Operations Manager
Kris Edwards – EPA Remedial Project Manager
Tom Mostad – Environmental Science Specialist, Montana Natural Resource Damage Program, Dept. of Justice (NRDP)
Greg Nottingham – National Park Service, Grant-Kohrs Ranch (NPS)

DEQ, as lead agency, with additional oversight from EPA (and NPS for remedial activities on the Grant-Kohrs Ranch), will oversee, manage, coordinate, and implement the Remedial Design, Remedial Action(s), and Operation and Maintenance for the Clark Fork Site. DEQ will coordinate with the NRDP in the implementation of the Clark Fork Aquatic and Riparian Resources Restoration Plan and in the integration of the Clark Fork Aquatic and Riparian Restoration Plan components into the Work. DEQ will coordinate with NPS to implement the Federal Restoration Plan at the Grant-Kohrs Ranch and, where appropriate, integrate the Federal Restoration Plan components into the work. NRDP and NPS are included in the SAP Planning Team to understand and receive the information to be collected, understand how that information is to be analyzed, provide review and comment, and better coordinate aspects of state and federal restoration with the remedy for the Clark Fork Site.

Additional project area specific planning team members will be identified in the SAP addenda.

Resources, Constraints, and Deadlines

Settlement monies from the Clark Fork River OU Consent Decree will provide DEQ with sufficient funding to complete remedial and restoration activities for the Clark Fork River. DEQ will use best efforts to ensure that remedial and restoration activities will be completed within 10 -12 years after the consent decree has been finalized.

DEQ will identify project areas for remedial design/remedial action (RD/RA). Generally, these will be based upon land ownership and execution of landowner agreements. Sampling under this plan and subsequent addenda will be completed for each project area in one field season. Remedial designs will be completed in the fall and winter, in order to complete bid packages for early spring. Because samples will be submitted in phases (as discussed in **Section 4**), it will be imperative to complete analysis and validate data in time to meet the bid package schedule. The RD/RA schedule is further discussed in the Clark Fork River OU RD/RA Work Plan.

Step 2: Identify the Goals of the Study

This step identifies the principal study questions and defines options for addressing those questions. The outputs for this step include decision statements that link the principal study questions to possible actions that will solve those questions. To accomplish this, the following tasks need to be completed:

- Identify the principal questions.
- Define alternative actions.
- Develop decision statements.
- Organize multiple decisions.

Principal Questions and Alternative Actions

The purpose of the Clark Fork River OU is to address principal and low level threats to human health and the environment for the Clark Fork River. The principal questions concerning the floodplain focus on determining the volume of tailings/slickens removal and how impacted tailings/soils mixtures can be treated in place to successfully grow sustainable vegetation and ensure that human health action levels are met for the current or reasonable anticipated land use (based on the exposure unit).

Decision Statements

Arsenic in soils (whether near the river or on historically irrigated lands) is the primary concern for human exposures at this site. In assessing and managing risks where arsenic is present in soils, EPA developed “risk-based concentrations” or action levels. If an action level is exceeded for a particular land use, removal, treatment, and/or cover, actions may be implemented to address these risks. Preliminary polygons identified during the RipES process will establish the spatial basis for this SAP and the Remedial Action(s) along the Clark Fork River OU floodplain. Sub-polygons may be developed during the design process to address risks observed. When human health action levels are not exceeded in soil, the RipES quantitative evaluation becomes the preliminary basis for assessment of ecological risk.

Phrased as principal study questions, these removal guidelines are summarized in **Table 1-1**.

TABLE 1-1

Principal Study Questions, Decision Statements, and Alternative Actions

Principal Study Questions	Decision Statements and Alternative Actions
1. Are slickens (exposed tailings) present at the surface?	If yes, measure the tailings thickness. Collect soil or mixed soil/tailings samples below the base of the tailings (identification of buried "A" horizon is a helpful marker) in six-inch increments. These data will be used to determine the removal depth of slickens/tailings.
2. If no slickens are present, can impacted soils be treated to meet arsenic action level?	Sample results will be used to calculate post-tillage COC concentrations based on six-inch depth increment sampling and to identify areas where exceptions apply.
3. If the answer to Question 2 is "no", what thickness of soil requires removal?	Sample results will be evaluated with respect to the arsenic action level and COC concentrations.
4. If the answer to Question 2 is "yes", what are the treatment requirements?	Sample results will be evaluated in 6-inch intervals to determine depth of treatment. COC concentrations, pH and rock content results will be evaluated. Once depth of treatment has been selected, archived samples will be submitted for acid-base account (ABA) analysis.
5. For slightly impacted areas not identified by RipES for removal or treatment, does the exposure unit meet human health action levels for the current or reasonable anticipated land use?	Soil sample results for COC concentrations from these areas will be evaluated to determine if removal, treatment, institutional controls and/or BMPs, or No Action is appropriate. For areas where treatment is determined to be the appropriate remedy, sample results in 6-inch intervals will be used to determine depth of treatment. COC concentrations, pH and rock content results will be evaluated. Once depth of treatment has been selected, archived samples will be submitted for acid-base account (ABA) analysis.
6. If the answer to Question 5 is "yes", what, if any ICs and/or BMP should be implemented?	Development of BMPs for these non-remediated areas should be considered only in context with adjacent landscapes subjected to Remedial Action(s)
7. If the answer to Question 2 is "no", what are the treatment requirements to ensure that human health action levels are achieved??	Sample results will be evaluated in 6-inch intervals to determine if treatment or removal is appropriate

Step 3: Identify the Information Inputs

This step identifies the information required to resolve the decision statements. It includes the following components:

- Identify the needed information. This includes a list of environmental characteristics that will be measured to enable the planning team to make the necessary decisions.
- Develop a list of information sources or methods that indicate how each action level will be determined.
- Ensure future data integration by developing a list of information that may be important for future data use. This includes ensuring that the newly collected data/information can be merged into, or is compatible with, an existing database.
- Confirm that sampling and analytical methods exist to meet detection limit criteria and action levels.

Information Needs

Although the RipES decision tool has identified and categorized preliminary polygons (delineated areas of land) based on landscape stability, contamination severity, and plant community attributes within reaches A and B, the existing data are insufficient to address the decision statements identified in Step 2 and to complete remedial designs. Test pits will be excavated or other sampling methods utilized (e.g., Geoprobe®) to determine depths of removal, depth of treatment, and identify data needs to be filled to define appropriate Remedial Action(s) and to satisfy initial remedial design specifications. Initially two pits per acre with a minimum of four pits per slickens area will be used to guide sampling efforts. The frequency of test pit excavations may be increased or decreased as knowledge is gained during Remedial Action(s).

At areas identified for removal, no samples will be collected of visually identifiable slickens/tailings materials. Samples will be collected in six inch intervals below the slickens/tailings and underlying soil contact (e.g., at the soil “A” horizon). This sampling plan may be modified if field XRF measurements indicate absence/presence of elevated contamination. Composite soil samples will be analyzed for COCs concentrations and pH.

Areas designated for treatment will have additional analyses performed such as ABA analysis and rock content. Treatment area samples will be collected in six-inch depth increments throughout the depth of contamination.

For miscellaneous site types within slightly impacted areas, samples will be collected in six-inch depth increments throughout the depth of contamination and submitted for analysis if field observations and measurements indicate the presence of buried tailings.

Grid based sampling will be performed outside of slickens, impacted soils, and miscellaneous site types but within the meander belt plus 100 feet on both sides of the belt. Surficial soil samples will be collected and analyzed for arsenic to determine if human health action levels are achieved.

Information Sources

Numerous sampling and various cleanup studies and demonstration projects have been implemented along the Clark Fork River. Key documents with detailed information about the Clark Fork River OU include:

- Clark Fork River OU Remedial Investigation Report Final Draft—Atlantic Richfield 1998, approved by EPA.
- Clark Fork River OU Feasibility Study, Public Review Draft—Atlantic Richfield 2002. This report contains a detailed list of ARARs.
- Clark Fork River OU Ecological Risk Assessment—prepared by Syracuse Research Corporation for EPA—2001.
- Clark Fork River OU Human Health Risk Assessment— prepared by Roy F. Weston Inc. for EPA— 1998.
- Human Health Risk Assessment Addendum Prepared by Syracuse Research Corporation for EPA—2001.

- Geomorphology, Floodplain Tailings, and Metal Transport in the Upper Clark Fork Valley, Montana—USGS and Atlantic Richfield 1998.

A critical information input for this SAP is the RipES evaluation that provided preliminary streambank polygons, exposed tailings areas, and Impacted and Slightly Impacted soils and vegetation areas. Preliminary polygons have been delineated and classified with Remedial Action(s) proposed for each polygon from which to draw the remedial design. Proposed remedial action codes were designated in the Clark Fork River OU ROD (EPA/DEQ 2004) as follows:

1. **RA Code A**: Remedial Action(s) include no action, BMPs, ICs, or minor actions to enhance vegetation within the buffer corridor. These are shown on RipES evaluation maps as green-colored 50-foot streambank buffer zones.

2. **RA Code B:** Polygons with Class 2 streambanks will receive Remedial Action(s) intended to secure streambank stability through establishment of appropriate deep, binding, woody vegetation. Remedial Action(s) may include reconfiguration of the bank, minor removal/replacement and/or in-situ treatment of contaminated materials, followed by supplemental planting of deep, binding, woody vegetation and revegetation with appropriate herbaceous species and BMPs. These are shown on RipES evaluation maps as yellow-colored areas.

3. **RA Code C:** Class 1 streambanks will receive treatment(s) chosen from a set of Remedial Action(s) depending upon site-specific characteristics. Remedial Action(s) for this class include removal of tailings and impacted materials and revegetation with deep, binding, woody vegetation and an understory of appropriate herbaceous species. These are shown on RipES evaluation maps as red-colored areas.

4. **RA Code D**: Removal areas identified by presence of tailings/slickens. These are shown on RipES evaluation maps as red-colored areas.

5. **RA Code E:** Treatment areas identified by the presence of impacted soils. These are shown on RipES evaluation maps as orange-colored areas.

6. **RA Code F:** Providing these areas meet human health action levels, no action, BMPs, or ICs delineated as slightly impacted soils. These are shown on RipES evaluation maps as green-colored areas.

Future Data Integration

The planning team will ensure that standard practices are employed during this sampling and analysis campaign so that the analytical results will be internally consistent and comparable with other similar studies, to the extent possible.

Action Levels and Sampling and Analytical Methods

Risk-based action levels for solid media for arsenic have been established for the Clark Fork River OU based on land use. These action levels are as follows:

- Residential—150 parts per million (ppm)

- Recreational (non-cancer) - 680 ppm (children at Arrowstone Park and other recreational scenarios) and 1,600 ppm for fishermen, swimmers, and tubers along the river
- Rancher/Farmer—620 ppm

It is anticipated that the Rancher/Farmer action level of 620 mg/kg will be applied for most of the Clark Fork River OU RA.

The media to be sampled, sampling procedures, analytical parameters, expected parameter concentrations, and laboratory methods planned for this investigation are consistent with standard guidelines and practices. The planning team has ensured that detection limits are appropriate for the identified parameter-specific standards and cleanup decisions (see Step 5).

Step 4: Define the Boundaries of the Study

This step defines the spatial areas to which decisions will apply and determines where and when data should be collected. It includes the following components.

- Define the target population of interest.
- Specify the spatial boundaries that clarify what the data must represent.
- Determine the time frame for collecting data and making the decisions.
- Determine the practical constraints on collecting data.
- Define the scale of decision making.

Target Population

For this investigation, the target population of interest is the streambanks and preliminary polygons identified for Remedial Action(s) under the Clark Fork RipES.

Spatial Boundaries

The spatial boundary is the RipES preliminary polygons. Vertically, it is desired to collect subsurface samples from removal areas in six inch intervals below visible tailings until the depth of contamination is identified, and from treatment areas in six inch intervals until the depth of contamination is identified. It is also desired to collect subsurface samples from Miscellaneous Site Types. Slightly Impacted Soils, as defined by EPA in 2006-2007, and vegetation polygons will be sampled to confirm that they meet human health action levels. Vertically, the maximum depth of sampling in test pits will generally be four feet below ground surface. Sampling at depths greater than four feet could be accomplished by sampling from the excavator bucket or by sampling with an alternative methodology, such as a Geoprobe® or mobile drill rig.

Temporal Boundaries

The Clark Fork River floodplain, which was impacted by tailings deposition since the early 20th century and continues to be impacted by re-working of historical tailings deposits during high flow events, is of primary interest in this study.

Constraints on Collecting Data

It may be difficult to bring excavators and/or backhoes into wet areas to excavate test pits. Also, it may be difficult to bring in heavy machinery through densely wooded areas or high quality wetland habitat without disturbing the environment in order to sample isolated contaminated areas near the river. Safety considerations limit the allowable depth of test pits. In sampling wetter areas, it may be necessary to dewater test pits in order to collect soil samples. In some instances, such as working next to stream banks, it may be preferable to use drill rigs to auger test borings to collect samples. Other issues include obtaining landowner access (the Clark Fork River OU has multiple landowners).

Scale of Decision Making

The scale of decision making refers to the way the planning team delineates decision units and identifies the smallest unit of subpopulation, area, depth, volume, or time where data will be collected, aggregated, or interpreted to make a decision and control decision error. For the Clark Fork River OU, the decision units will be the project areas within the OU as defined by DEQ. Factors that will be used in determining the size of the project areas include the amount of work that can be completed in a construction season, land ownership, and priority of the area (a general preference will be made to begin remediation upstream and work downstream, and to address any areas where human health risk is of concern). In accordance with the Clark Fork OU ROD, project areas scheduled for remediation in the same construction season will be selected along discontinuous stretches of the river to minimize the impacts from potential flooding and to accommodate affected landowners. The project areas will be composed of the preliminary RipES polygons, which will be consolidated into remedial areas following completion of remedial design. These areas will comprise the smallest decision units. The depth of the decision units depends on several factors, including the depth of contamination, depth to ground water, rock content of the underlying strata, and in the case of streambanks, the depth of construction required to suitably anchor stabilization materials.

Step 5: Develop the Analytical Approach

This step includes the following:

- Specify the parameters important to making decisions about the target populations and select action levels that set the boundaries between one outcome of the decision process and another outcome.
- Select the measurement and analytical methods capable of performing over the expected range of values and verify that the action levels are greater than the detection limits of the measurement method when practicable.

Parameters and Action Levels

The key parameters for the Clark Fork River remedial design are arsenic, copper, cadmium, lead, and zinc concentrations found in soils and soils/tailings mixtures. The human health action levels for arsenic in solid media were identified in Step 3. Secondary parameters to determine Remedial Action(s) include COC concentrations, depth to groundwater, pH, rock content, and potential removal area size.

Several of these parameters determine the depth and intensity of treatment. These parameters include pH, rock content, organic matter, and ABA. Areas where rock content exceed 60% (by

weight) will require no further action, as the elevated rock content serves two purposes. One, it stabilizes underlying stratigraphy from erosion during high flow events; consequently, COCs that have migrated into the coarser material are less prone to be eroded during these events. Two, rocky soil is difficult to till, and thus constrains the depth of tillage.

As project areas are sampled and Remedial Action(s) are completed, statistical evaluation of the overall data set will also be used to uncover trends. These evaluations will be used to help locate patterns and help determine if sampling frequency needs to be increased or decreased.

Measurement and Analytical Methods

Samples collected during this effort will be analyzed in accordance with standard EPA and/or nationally accepted analytical procedures. These are described in Section 5. The laboratory will adhere to all applicable QC requirements established by the methods.

Data Usability

The usability of all analytical data will be determined based on the data validation and evaluation process specified in this sampling and analysis plan. If the data are determined to be unusable, then re-sampling may be necessary during additional sampling phases.

Step 6: Specify Performance Criteria

Decision makers are interested in knowing the true value of the constituent concentrations. Since analytical data are only estimates of the true values, decisions that are based on measurement data could be in error, which is referred to as decision error.

The following are two reasons why the decision maker may not know the true value of the constituent concentration:

- Concentrations may vary over time and space. Limited sampling may miss some features of this inherent variation because it is usually impossible or impractical to measure every point of a population. Sampling design error occurs when sampling design is unable to capture the complete extent of variability that exists in the true state of the environment.
- Analytical methods and instruments are never absolutely perfect; hence a measurement can only estimate the true value of an environmental sample. Measurement error refers to a combination of random and systematic errors that inevitably arise during the various steps to the measurement process.

The combination of sampling design and measurement error is the total study error. Since it is impossible to completely eliminate total study error, steps to reduce or control sampling and analytical error are to be employed so that decision error is minimized. These errors may lead to either over-estimating or under-estimating the concentration of contaminants in site media. Over-estimating contaminant concentrations could result in the removal of solid media that is not a risk and the wasting of resources. Under-estimating contaminant concentrations may result in leaving contaminated soil in-place or not adequately treating the full extent of contamination. To minimize decision errors, the following steps are anticipated:

- Locating representative locations within a preliminary RipES polygon for soil sampling. Initially two pits per acre with a minimum of four pits per slickens area will be used to

guide sampling efforts. The frequency of test pit excavations may be increased or decreased as knowledge is gained during Remedial Action(s). In accordance with the design of this SAP, site-specific SAP addenda will be prepared by the State of Montana that will identify sampling locations for a Project Area, and will include the rationale for the number and frequency of the sampling locations.

- Careful compositing of subsamples following Clark Fork River Superfund Site Investigation Standard Operating Procedures.
- The use of field quality assurance samples (blanks, duplicates, and, when appropriate, National Institute of Standards and Technology [NIST] standards).
- Rigorous adherence to approved chain-of custody protocols.
- Proper laboratory and XRF sample preparation.
- Analytical determinations are conducted while instrumentation is shown to be in statistical control.
- Acceptable laboratory QA results.
- Data validation that assesses the overall quality of the collected data and information. At a minimum, the data validation protocols established for the CFRSSI will be employed.

All the information and data gathered during this evaluation will be checked by a qualified environmental scientist to ensure they are usable for their intended purposes. For the laboratory analytical data, an evaluation of analytical control limits and of the precision, accuracy, representativeness, completeness, and comparability (PARCC) parameters will be performed. Data results will then be discussed with the planning team members in the context of the risk-based action levels, and it will be determined if the total study error could result in an incorrect decision. Using this approach, the probability of making an incorrect decision (i.e., either a false negative or positive) based on the information collected is considered small. The field QA program has been designed in accordance with EPA's Guidance on Systematic Planning using the Data Quality Objectives Process, Publication No. EPA/240/B-06/001 (EPA 2006).

PARCC goals are established for this project to aid in assessing data quality, as shown:

- **Precision**. Field duplicate samples will be collected to provide a measure of the contribution to overall variability of field-related sources. Contribution of laboratory-related sources to overall variability is measured through various laboratory QC samples, specifically XRF laboratory duplicates and laboratory splits. The acceptable relative percent difference limits for field duplicates are less than 35% for soil. In the event that the relative percent difference limits for field duplicates are greater than 35% for soil, the sampling program will be reviewed and corrective action(s) will be implemented. Chemical analytical data will be validated for precision using field duplicates, and laboratory duplicates and splits. Acceptance windows for XRF precision are functions of the analyte, sample preparation method, and the concentration. These are defined in EPA Method 6200 for Field Portable X-Ray Fluorescence Spectrometry For The Determination Of Elemental Concentrations In Soil And Sediment (EPA 2007).

- **Accuracy.** Accuracy is the degree of agreement of a measurement with an accepted reference or true value and is a measure of the bias in a system. The overall accuracy of this program will be based on the results of NIST or other SRM samples inserted into the sample stream at the rate of 5%. Laboratory accuracy will be based on the results of LCS analysis. With the exception of cadmium, the detection limits for field portable XRF

are expected to be sufficient to meet the needs of this project for each element of interest. See Table 1 in EPA Method 6200 (EPA, 2007).

- **Representativeness.** This parameter will be achieved through (a) careful, informed selection of sampling sites, (b) selection of testing parameters and methods that adequately define and characterize the extent of possible contamination and meet the required parameter reporting limits, (c) proper gathering and handling of samples to avoid interference and prevent contamination and loss, and (d) collection of a sufficient number of samples to allow characterization. Representativeness is a consideration that will be employed during all sample location and collection efforts and will be assessed qualitatively by reviewing field procedures and reviewing actual sampling locations versus planned locations.

- **Completeness.** Completeness is a measure of the amount of usable data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions. Those data that are validated and need no qualification (CFRSSI Enforcement Quality Data), or are qualified as estimated data (CFRSSI Screening Quality Data), are considered usable. Rejected data are not considered usable. Completeness will be calculated following data evaluation. For this work, a completeness goal of 90% is projected for COCs, as well as pH determinations. The goal for XRF COC data is enforcement quality data.

- **Comparability.** Consistency in the acquisition, handling, and analysis of samples is necessary for comparing results. Where appropriate, the results of analyses obtained will be compared with the results obtained in previous studies. Standard U.S. EPA analytical methods and QC, as well as those specified in the CFRSSI documents, will be used to ensure comparability of results with other analyses performed in a similar manner within the Clark Fork River OU.

Step 7: Develop the Design for Obtaining Data

This step identifies a resource-effective data collection design for generating data that are expected to satisfy the DQOs. The data collection design (i.e., sampling program) is described in detail in Section 3 of this SAP.

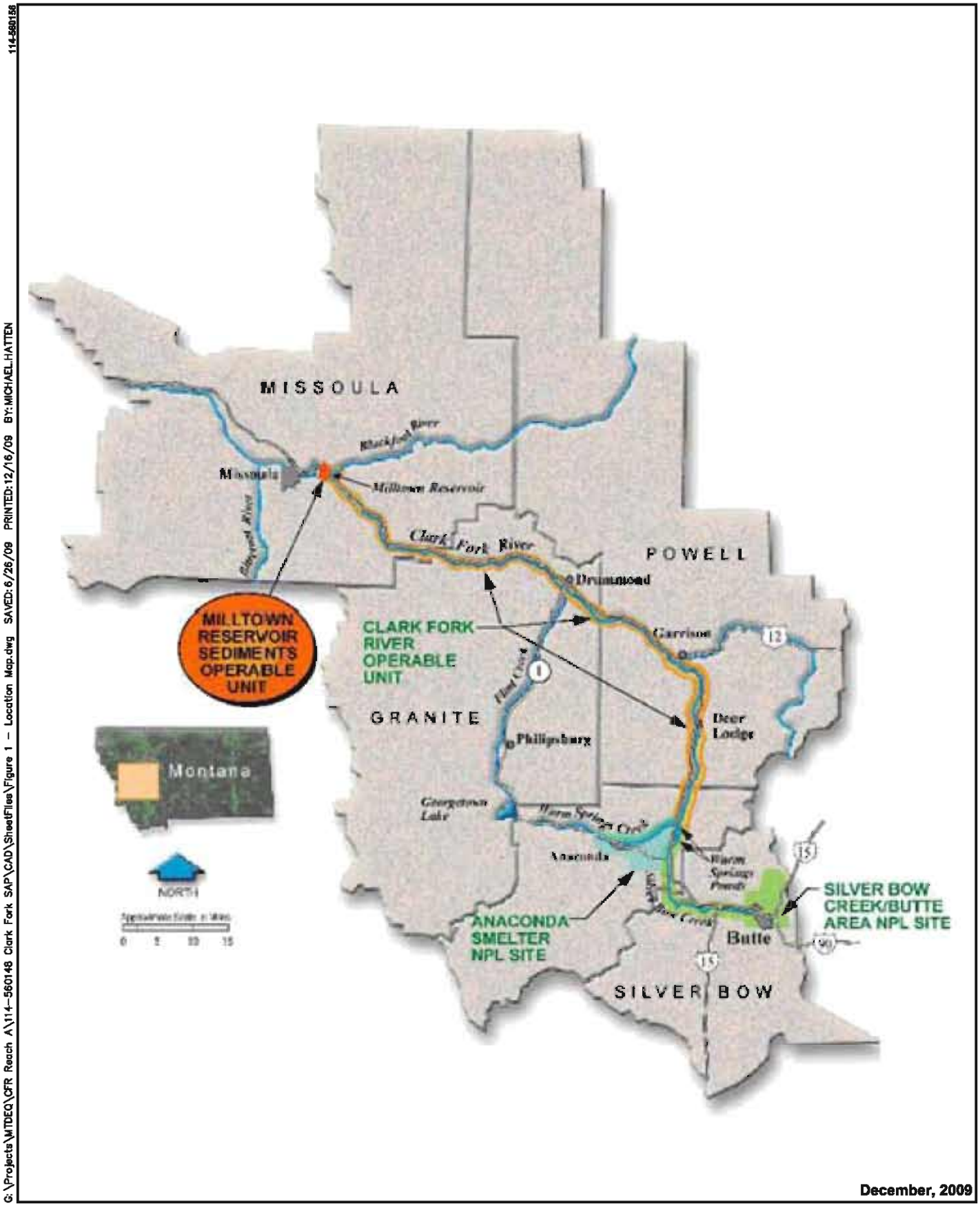
1.3 SITE LOCATION AND DESCRIPTION

The Clark Fork Site is described in the 2004 Record of Decision (ROD) (EPA/DEQ, 2004):

> *The Clark Fork River OU consists of surface water, stream bed sediments, tailings, impacted soils, groundwater, aquatic resources, terrestrial resources, irrigation ditches and related sediment depositions and contaminated property, and air located within and adjacent to the 100-year historic floodplain of the Clark Fork River. The OU extends from the confluence of the old Silver Bow Creek channel with the reconstructed lower Mill-Willow bypass, to the maximum Milltown Reservoir pool.*

The Clark Fork Site has been divided into three reaches, with Reach A stretching from the confluence of the old Silver Bow Creek channel to the town of Garrison, Montana. **Figure 1-1** displays the operable unit with reaches.

The Reach A, Phase 1 Investigation consists of approximately the first 1.7 miles of stream channel and adjacent floodplain within Reach A. **Figure 1-2** displays the Reach A, Phase 1 investigation area.



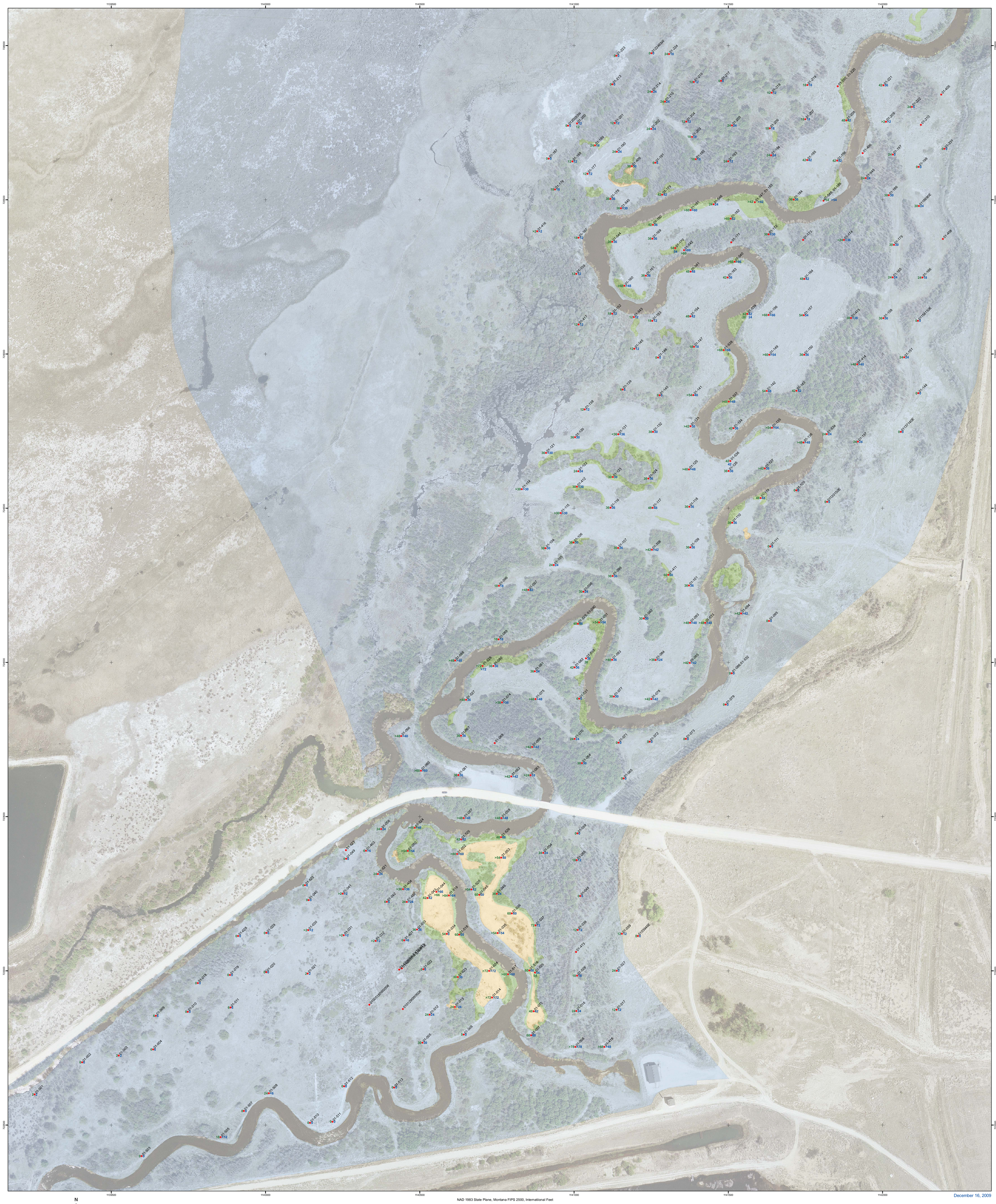
December, 2009

G:\Projects\MTDEQ\CFR Reach A\114-560148 Clark Fork SAP\CAD\SheetFiles\Figure 1 - Location Map.dwg SAVED: 6/26/09 PRINTED: 12/16/09 BY: MICHAEL.HATTEN

114-560156

Clark Fork River Operable Unit
Location Map

FIGURE 1-1



N
W E
S

1:1,200

0 50 100 200 300 400 Feet

Test Pit Location

500mg/Kg Pit Id 800mg/Kg

Soil / Vegetation Classification

- Impacted
- Slicken
- Slightly Impacted

TETRA TECH

Clark Fork Reach A
Test Pit Soil Samples
500 and 800 mg/kg Levels
Warm Springs, Montana

Figure 1-2

2.0 SAMPLING AND DATA ANALYSIS METHODS

The following section describes test pit sampling and analysis procedures used during Part 1 of the CFR Reach A, Phase 1 Investigation. Test pits were generally excavated using a track-mounted excavator except where geographic features or vegetation prohibited access. Hand-dug test pits were utilized in areas where the excavator could not access. The primary activities associated with test pit sampling and analysis included:

- Identify, locate and clearly mark test pit locations according to the numbering system presented in Section 2.2;
- Excavate and (if necessary) dewater test pits;
- Collect samples of soil from the test pit excavations;
- Analyze samples using a field XRF analyzer as a screening tool for submittal to the laboratory;
- If present, document the approximate depth to groundwater in each of the test pits.
- Backfill test pits and seed the disturb area; and
- Archive remaining samples.

Details of sampling techniques are described in the *Clark Fork Site Sampling and Analysis Plan (SAP) Addendum, Reach A, Phase 1* (Tetra Tech/CDM, 2009).

2.1 SAMPLING APPROACH

Figure 1-2 displays the test pit locations for contaminant sampling within the Reach A, Phase 1 investigation area. In general, test pit locations were spaced on a north-south – east-west grid pattern with 125-foot centers. Additional sample locations were identified outside of the 125-foot grid system within historic channels or old oxbows. Samples were collected at 6-inch intervals and screened in the field until one of the following conditions was met:

- Evaluation of field XRF data indicated that the sum of As, Cu, and Zn concentrations (i.e. total COC concentrations) was below 500 mg/kg, or
- Course alluvium having a rock content of 60% or more (visual estimation), or bedrock was encountered. These conditions are believed to provide sufficient protection from erosion.

Sampling areas began with the RipES preliminary polygons (CH2MHill, 2004) including Slickens, Impacted Soils and Vegetative Areas, Miscellaneous Site Types and Slightly Impacted Soils and Vegetation Areas. The sampling strategy followed the subsequent basic criteria:

- **Slickens (RA Code D) –** Confirm presence of tailings through field XRF (high COC) concentrations and field pH (pH<5). Collect soil samples in 6-inch depth increments starting at the tailings/soil interface (“A” horizon). Submit three (3) samples for analysis (one above the “A” horizon, two below) from 18-inch interval based on field XRF to determine depth of removal. If evaluation of field XRF data indicates that in the 0-6 inch depth interval below the “A” horizon the total COC concentrations are below 500 mg/kg, submit base of tailings for analysis.

- **Impacted Soils and Vegetation Areas (RA Code E) –** If evaluation of field XRF data indicates total COC concentration exceeds 500 mg/kg, continue sampling at 6-inch intervals until either (1) field XRF indicates the total COC concentrations are below 500 mg/kg, (2) visual estimation of rock content is greater than 60%, or (3) a maximum safe sampling depth or the depth to the streambed is encountered. Samples will be collected and submitted for analysis for each six inch depth interval until total COC concentrations are below 500 mg/kg.

- **Miscellaneous Site Types (RA Code F) –** These areas include old river channels, oxbows, irrigation ditches, drainage ditches, and canals that may or may not have visible impacts at the surface level. Sample locations will be spaced at approximately 125-foot intervals along the axis of such features. Test pits will be utilized to verify buried tailings. If field measurements indicate buried tailings, sample in accordance with RA Code D. Horizontal extents will be confirmed through the collection of surficial samples.

- **Slightly Impacted Soils and Vegetative Areas –** If evaluation of field XRF data indicates the total COC concentrations exceed 500 mg/kg, continue sampling at 6-inch intervals until either (1) field XRF indicates total COCs are below 500 mg/kg, (2) visual estimation of rock content is greater than 60%, or (3) a maximum safe sampling depth or the depth to the streambed is encountered. If evaluation of field XRF data indicates the total COC concentrations are below 500 mg/kg, a 0 to 2-inch surficial soil sample will be collected and submitted for laboratory analysis. Samples will be collected and submitted for analysis for each 6-inch depth interval until total COC concentrations are below 500 mg/kg.

Staking was performed using a resource grade GPS before sampling commenced in areas suitable for grid sampling as shown in **Figure 1-2**. Pit locations were marked with flagged survey lath, which was placed within one-foot of the proposed test pit locations. The lath was clearly labeled with a unique test pit designation number. Sample identification conformed to the *Clark Fork Site Sampling and Analysis Plan (SAP) Addendum, Reach A, Phase 1* (Tetra Tech/CDM, 2009).

Upon completion of the field sampling, staked test pits were surveyed using survey-grade GPS methods provided by the State Contracted Licensed Surveyor. Survey data collected included test pit designation, northing, easting, and elevation. The accuracy of the survey was within one-foot horizontal and 0.1 foot vertical. Survey data were measured in the Montana State Plane (NAD 83) coordinate system and elevations were based on North American Vertical Datum (NAVD) 1988.

2.2 SAMPLE IDENTIFICATION

The sample identification scheme consisted of a numeric identifier for the specific project area followed by a 3-digit sample location number beginning with 001. The sample locations generally start with the most upstream sampling location and increase numerically as the test pits progress down stream. The sample location number is followed by four digits representing the top and bottom depth of the sampled interval (in inches). Sample location numbers are displayed on **Figure 1-2**.

The following are examples of sample identification codes:

010080612

01	=	Project Area No. 1 – Reach A Phase 1
008	=	Sample Site Location No. 8
0612	=	Subsurface sample collected from a depth interval of 6 to 12 inches below ground surface

For the identification of the horizontal extent of contaminated soils, the test pit and sample identification protocol was modified. These points were located during the investigation and were not staked in advance. The approximate test pit location was determined by the field crew using measurement from the nearest staked test pit, and a field will be added following the nearest test pit identifier. For example, if the horizontal extent is staked 85 feet north of the test pit 01008, the horizontal extent will be identified as 0100885N where the "N" indicates the cardinal direction from the original staked test pit. The surface sample interval of 0 to 2 inches was then appended to this test pit number as with the originally staked pits.

For areas not conducive to grid sampling, the sample crew field located the test pits based on observed conditions as described above. In this case, the sampling crew marked lath according to the scheme described above.

2.3 FIELD SCREENING

Samples were collected from test pit walls at six-inch intervals measuring from the ground surface. In general, the deepest samples were 60-inches below ground surface unless field screening indicated contamination at deeper levels. Some areas exhibited a vertical extent of contamination that was beyond the limits of safe sampling practices.

The XRF instrument used during the investigation was a Niton® Model XLt-700 Bulk Sample Analyzer. This instrument was equipped with a Cadmium^{109} radioactive source, which allowed measurement of arsenic, copper, lead, and zinc among other elements. Since the radioactive source is Cadmium^{109} the instrument cannot successfully detect cadmium; however, cadmium values are not used in the "total COC concentrations" calculation. The instrument has capability of electronically storing over 3,000 tests. Each XRF test was stored electronically and logged on data sheets. Periodically, the test data stored in the XRF were downloaded and stored.

Upon completion of the soil sampling from the test pits, samples were selected and identified for laboratory analysis. For RA Code D polygons, identification of the 6-inch interval samples selected for laboratory analysis were based on a combination of visual observation of the depth of tailings and the results of the XRF field screening. Three 6-inch samples thought to bracket the tailings/soil interface (one above the 6-inch interval where total COC's are greater then 500 mg/kg and two below) were submitted for laboratory analysis. In the event that the maximum depth of the test pit is encountered and field XRF screen values were above the investigation level for the total COC concentrations, the two deepest samples collected were submitted to the laboratory for analysis. For RA Code E and RA Code F, samples were collected and submitted from each six inch depth interval until total COC were less than 500 mg/kg.

Horizontal extents were confirmed through the collection of surficial samples which were comprised of three (3) sub-samples collected within 0.5 meters of the same point. The presence of a minimum thickness of 2 inches was necessary to warrant the collection of a sample.

2.4 LABORATORY ANALYSIS AND DATA ANALYSIS

Laboratory samples were submitted to Pace Analytical Services, Inc. in Billings, Montana for analysis of saturated paste pH, arsenic, cadmium, copper, lead, and zinc (Table 2-1). All remaining samples not analyzed were archived and are available for further laboratory analysis if needed at a later date.

TABLE 2-1

Parameters for Laboratory Analysis
Clark Fork River Operable Unit

Parameter	Test	Method
Total Metals (As, Cu, Cd, Pb, ZN)	ICP-AES	EPA Contract Laboratory Program Statement of Work, Multi-Media, Multi Concentration, Inorganic Analytical Service for Superfund (ILM05.4)
pH	Saturated Paste Extract	USAD Handbook 60, Methods 2, 3a, CFRSSI SOP SS-09 modified[1]

[1] CFRSSI SOP-09 was modified: pH was determined using a minimum of 16-hour equilibration time and vacuum extraction of the saturated paste extract, rather than a 1:1 soil:water dilution

2.5 FIELD QUALITY CONTROL

Field quality control samples were collected as outlined in the *Sampling and Analysis Plan (SAP) Soils and Wastes Chemical Characterization for Remedial Design/Remedial Action* (CDM, 2009).

- Field Blank Samples – analyzed at a frequency of 1 per 20 natural samples.
- Cross Contamination Blank Samples – analyzed at a frequency of 1 per 50 natural samples, or minimum of one per week.
- Field Duplicate Samples – analyzed at a frequency of 1 per 20 natural samples.
- Matrix Spikes – analyzed at a frequency of 1 per 20 natural samples.

2.6 SAP DEVIATIONS

The following deviations to the *Sampling and Analysis Plan (SAP) Addendum* (Tetra Tech/CDM, 2009) are listed below. These deviations are based on unanticipated field conditions encountered during the first week of the Reach A, Phase 1 investigation.

- Test pits were adjusted from the grid pattern based on vegetation, topography, presence of miscellaneous sites types, and/or geomorphology. Test pits were also adjusted to include at least on test pit in a preliminary defined RipES polygon. Deviations from the sampling grid were documented in the field book and were approved by MDEQ.

- Some test pits were excluded from sampling. Reasons for exclusion test pits from sampling included: the horizontal extent of contamination was clearly defined by adjacent pits, topographic features or vegetation prevented access, or utilities prevented

excavation for sampling. These excluded test pits were document in the field book and approved by MDEQ.

- Field pH data were found to be inconsistent and unreliable in assisting with determining the base of tailings. Since pH was run on all laboratory samples, the field pH was only occasionally used as a screening tool.

- Additional test pits were added to the grid based upon field observations and topographic features. These additional test pits were document in the field book and approved by MDEQ. These pits were used to identify additional features not previously slated for sampling such as RipES preliminary polygons without a sample location, additional observed slickens, as well as areas which appeared to require additional sampling in order to properly indentify the horizontal extent of impacted soils. The additional pits followed the previously discussed naming convention as discussed in **Section 2.2** with all pit locations identified by the 3-digit sampling number starting at 400 and increasing sequentially.

- The number of field blank samples obtained was less than the rate of one duplicate sample per 20 natural samples.

During the initial stages of the field sampling event, samples collected from pits in the slightly impacted Polygons, in which XRF analysis indicates contamination of one-foot or less exceeded the 500 mg/kg total COC criteria, a surficial sample (0-2”) was collected and submitted for laboratory analysis. All samples below the surficial sample exceeding the 500 mg/kg COC criteria, as well as the two samples below the 500 mg/kg, were archived. As the investigation progressed and a greater site understanding was ascertained, it was determined that this field adaptation was incompatible with site goals. The field practices were then modified to the following criteria:

- For test pits in which XRF analysis indicates the top 0-6 inches sample exceeds the 500 mg/kg criteria with deeper samples less than the 500 mg/kg total COC criteria, a surficial sample (0-2”) was collected and submitted for laboratory analysis.

- Regardless of Polygon designation, test pits in which the XRF analysis indicates samples from the top 24 inches exceed the 500 mg/kg COC criteria with deeper samples less than 500 mg/kg, all samples above and including the two samples below the 500 mg/kg total COC criteria were submitted to the laboratory for analysis.

- Test pits in which the XRF analysis indicates greater than 24 inches of contamination were sampled to a depth where two samples were below the 500 mg/kg COC criteria. The deepest sample exceeding the 500 mg/kg total COC criteria and the next two samples below the 500 mg/kg total COC criteria were submitted to the laboratory for analysis. All samples above and below the laboratory submitted samples were archived.

Deviations to the SAP did not reduce data quality or affect achievement of the project objectives.

3.0 INVESTIGATION RESULTS

3.1 ANALYTICAL DATA – DEPTH OF CONTAMINATION

The results of the laboratory analysis are contained in a database report presented in **Appendix A**, which lists the sample identification, test pit location and elevation, the saturated pH, and the metal concentrations and laboratory qualifiers. The database report also identifies whether samples passed or failed the COC concentration criteria. In some test pits, (particularly in slickens area) it was not possible to determine the depth of contamination because the test pit could not safely or practically be opened and sampled. In this case, the depth of contamination is preceded by a greater (+) sign. **Appendix B** contains the depth of contamination and elevation as well as the depth and elevation of groundwater observed during the sampling. For those pits where groundwater was not observed, a "NO" entry is made in the groundwater field**.** **Figure 1-2** displays the test pit locations, depth of contamination based on 500mg/kg and 800mg/kg total COC screening criteria, and depth to groundwater**.** **Appendix C** contains copies of the field log book. **Appendix D** contains copies of the test pit excavation logs**.** **Appendix E** contains a technical memorandum addressing the quality assurance and quality control (QA/QC) review of samples analyzed by Pace Analytical Services, Inc. (Pace) for the Clark Fork River, Reach A, Phase 1 investigation.

3.2 QUALITY CONTROL

3.2.1 Field Blank Samples

Field Blank Samples were prepared by filling ziplock bags with an analyte-free media similar in character to the sample media. The media chosen for this investigation was a medium 100% pure silica sand. Field blank identification numbers generally followed the previously discussed naming convention, as discussed in **Section 2.2,** in which a 3-digit number of 700 was used to identify all field blanks followed by a sequential digit of 001 through 023. A total of 23 blank samples were obtained on the total sample set of 635 initial natural samples. The number of field blank samples obtained was less than the rate of one duplicate sample per 20 natural samples, due to miss calculating the total number of natural samples collected while in the field. No COC's above the laboratory PQL were detected in the cross contamination blanks submitted for analysis. Field blank sample results are presented in **Appendix F**.

3.2.2 Cross Contamination Blank Samples

Cross contamination blank samples (Rinsate Blanks) were collected by pouring de-ionized water across decontaminated field sampling equipment (primarily stainless steel sampling spoons). Rinsate water was collected in a 250 ml container provided by the laboratory (sample water was preserved to a pH <2 with dilute nitric acid) and shipped in coolers containing ice sufficient to maintain a temperature of < 5 degrees Celsius. Cross contamination blank samples were collected at a rate of one blank sample per 50 natural samples. A total of 22 duplicate samples were obtained on the total sample set of 635 final natural samples, exceeding the frequency goals outlined in the SAP. No COC's above the laboratory PQL were detected in the cross contamination blanks submitted for analysis. Cross contamination blank sample results are presented in **Appendix F**.

3.2.3 Field Duplicate Samples

Field duplicate samples were collected at a rate of one duplicate sample per 20 natural samples. A total of 38 duplicate samples were obtained on the total sample set of 635 initial natural samples which exceeds SAP requirements for 32 duplicates. Duplicate samples were compared to COC results for their corresponding natural samples and the relative percent difference (RPD) was calculated when both values exceed five-times the PQL, or absolute value difference (AVD) was calculated when one or both values were less than or equal to five–times PQL. This analysis was performed in a Microsoft Access database and the results of the analysis are presented in **Appendix G.** If the RPD was greater than 35 percent or the AVD was greater than the PQL, the duplicate sample value was flagged in the color red. **Table 3-1** presents the number and percentage of duplicate samples that exceeded either the RPD or AVD for each constituent.

TABLE 3-1

Results of Duplicate Sample Comparisons

Constituent	Number of Exceedances	Percent Exceedance[(1)]
Arsenic	12	33%
Cadmium	17	47%
Copper	14	39%
Lead	13	36%
Zinc	7	19%

Note: [(1)] Percent based on 36 duplicate samples in depth of tailings/impacted soils data base.

The relatively large number of exceedence is not unusual for soils sampling although it is probably more severe than in some soil sampling investigations for two reasons:

The materials in the floodplain are very heterogeneous consisting of tailings, natural soils, and mixed soils/tailings. Although duplicate samples were taken at the same depth as the natural samples, their slightly different in positions could produce significantly different metals concentrations due to the heterogeneity of the materials.

The duplicate comparison results indicate that there is some uncertainty associated with the concentrations of a particular constituent at a given sample depth. The remaining question is how much this uncertainty affected the determination of extent of contamination. To ascertain this effect, the values of each duplicate sample and its corresponding natural sample were compared to the pass-fail criteria. This information is presented in **Appendix H**. We then compared how many of the duplicate-natural pairs agreed (both passed or both failed) and how many disagreed (one passed and one failed). This analysis showed that 97 percent of the duplicate-natural sample pairs agreed suggesting that the uncertainty in the actual constituent concentrations had relatively little effect on our ability to determine the extent of contamination.

4.0 SUPPLEMENTAL ANALYSIS – GEOSTATISTICAL ANALYSIS

This section describes the geostatistical analysis for two portions of the sampling program. The first statistical study was conducted on forty-one (41) field XRF and laboratory (lab) analysis pairs from the start of the investigation. The second statistical study was conducted on nearly one thousand samples, which includes all field XRF and lab pairs from the entire investigation. The two statistical studies are outlined below.

4.1 FIRST SAMPLING STATISTICAL STUDY

The following section outlines the statistical comparison of metal concentrations measured by XRF and laboratory analysis. This comparison was directed at evaluating the accuracy and precision of the XRF method at the CFR site. This analysis will direct the future use of XRF for field investigations. The four metals analyzed were zinc, lead, arsenic, and copper using both XRF and laboratory methods from samples collected from sediments within the Reach A, Phase 1 investigation area. This sampling produced data from 40 sample locations with an additional duplicate sample. The data as received is shown in **Table 4-1** and was adjusted in several ways.

1) XRF data with the appended "<" were assumed to be the analytical detection limit. These were given an imputed value of one-half the recorded value. For example, a concentration coded as "<50" became 25 mg/kg in the new sheet. A new column was created with these imputed results with an appended ½. For example, the column "XRF As1/2" indicates that there are ½ values.

2) In the new sheet, NA* values were considered as missing data. It is important to note that because of these missing data, a total of 35 samples out of 41 could be used to compare laboratory to XRF values. NA* values have only been reported for laboratory As and Pb. For this analysis, it is assumed that NA* means below an unspecified laboratory reporting limit. The majority of laboratory NA* data appears to have a corresponding XRF data with a "<" symbol.

3) A new variable ACZ was defined by summing the arsenic, copper, and zinc. No ACZ value was created when arsenic had a NA* value. These six missing values did not enter into any statistical calculation.

4) For each of the concentrations, a new row was calculated using their log-based 10 (log10) value. The new log10 variables used the original names with a prepended L. For example, the transformed "Lab As" values were designated as "L(LabAs)".

5) A new indicator variable was defined such that when the concentration for ACZ lab or XRF values are greater than 500 mg/kg, they were assigned a "1", otherwise a "0". The new variables are called I(XRF_ACZ) and I(LAB_ACZ)

6) The samples highlighted in green represent the duplicated data.

TABLE 4-1

Laboratory and XRF Data Used in First Samplings Study

	Client Project	Clark Fork River												
	Pace Project No	10111134												
NUM	Tetra Tech Sample ID	Pace Lab ID	Collected Date	Percent Moisture	pH, Saturated Paste	Lab Zn (mg/kg)	Lab Cu (mg/kg)	Lab Pb (mg/kg)	Lab As (mg/kg)	XRF Zn	XRF Cu	XRF Pb	XRF As	
1	10010002	10111134014	08/24/2009	31.7	7.9	415	961	99.3	110	236	512	61	71	
2	10020006	10111134015	08/24/2009	29.1	7.6	1430	1150	142	149	790	660	64	78	
3	10020612	10111134018	08/24/2009	34	7.9	55.1	39.3	NA*	21	33	<24	<10	<8	
4	10021218	10111134017	08/24/2009	33.9	7.9	32.7	14.7	NA*	13	16	<21	<9	<7	
5	10030002	10111134012	08/24/2009	35.5	7.8	636	433	97.8	89.4	866	506	120	130	
6	10040006	10111134016	08/24/2009	30.9	8	1500	904	122	133	1252	675	113	118	
7	10040612	10111134002	08/24/2009	35.1	8	51.5	16.6	NA*	17.5	72	40	<8	14	
8	10041218	10111134013	08/24/2009	37.5	8.1	20.4	3	NA*	12.3	<14	<22	<9	<7	
9	10090006	10111134010	08/24/2009	34.1	7.8	2740	1170	189	225	1352	510	104	86	
10	10090612	10111134011	08/24/2009	37.1	8	37.8	12.9	NA*	12.6	16	<23	<9	<7	
11	10091218	10111134001	08/24/2009	37.4	7.9	21.8	4	NA*	14.3	<13	<22	<8	<6	
12	10146066	10111134009	08/24/2009	24.8	7	721	3740	15	NA*	335	1286	<13	18	GW@62
13	10146669	10111134019	08/24/2009	17.4	7.6	163	1040	8.4	NA*	136	995	<12	11	
14	10146972	10111134020	08/24/2009	10.5	7.8	177	1190	16.6	7.5	165	1002	<12	<9	
15	10210002	10111138010	08/25/2009	44	7.8	844	839	182	142	370	331	90	77	
16	10220006	10111138013	08/25/2009	24.8	7.7	2190	2620	772	616	4709	5973	491	489	
17	10220612	10111138003	08/25/2009	37.4	7.8	41	41.8	NA*	15.7	23	36	<10	<8	
18	10221218	10111138004	08/25/2009	41	7.8	15.1	8.6	NA*	9.5	<11	<25	<8	<7	
19	10232430	10111138017	08/25/2009	34.5	7.4	1880	32.2	11	17.6	4199	1040	<12	34	
20	10233036	10111138020	08/25/2009	29.5	7.4	211	24.9	11.7	12.2	177	123	<26	<11	
21	10233642	10111138021	08/25/2009	28.1	7.3	65.5	17.6	14.5	7.1	29	40	<11	<9	
22	10245460	10111134004	08/24/2009	29.3	6.7	644	5310	24.3	6.8	286	1740	<11	<9	
23	10246066	10111134005	08/24/2009	25	6.9	284	1740	12.6	NA*	114	425	<12	<10	
24	10246672	10111134003	08/24/2009	19.6	7.4	198	1590	13.3	NA*	146	1581	<12	<10	
25	10300002	10111138007	08/25/2009	32.4	7.8	1740	1680	304	267	976	1036	195	174	
26	10310002	10111138016	08/25/2009	35.8	7.9	782	693	110	72.3	600	442	66	40	
27	10320002	10111138005	08/25/2009	30.6	7.8	1160	1550	372	156	1114	1278	324	139	
28	10333036	10111138006	08/25/2009	32.2	7.3	6690	12700	1310	1160	2892	4712	585	511	
29	10333642	10111138001	08/25/2009	46.9	7.5	188	46.3	53.7	92.4	28	<24	<9	61	
30	10334248	10111138014	08/25/2009	39.1	7.7	103	37.7	25.8	7.4	63	<23	<11	<9	
31	10346066	10111134007	08/24/2009	45.5	7.4	195	38.6	28	NA*	228	655	24	29	
32	10346672	10111134008	08/24/2009	30.4	7.4	210	61.1	24	5.7	187	<25	210	<8	
33	10347278	10111134006	08/24/2009	24.9	8.2	430	20.7	13.7	NA*	231	<26	<11	<9	
34	10410002	10111138019	08/25/2009	38.2	7.8	1000	1010	253	124	138	189	<11	35	
35	10433642	10111138002	08/24/2009	37	7.7	1010	149	221	130	3107	397	1375	475	
36	10434248	10111138011	08/24/2009	45.2	7.7	123	47.1	28.5	18.3	117	28	20	21	
37	10434854	10111138009	08/24/2009	47.2	7.6	126	38.1	28.7	10.8	42	<25	<11	<8	
38	10444854	10111138018	08/24/2009	32.5	5.2	1310	5600	25.8	15.1	1032	4426	<12	<10	
39	10445460	10111138008	08/24/2009	26.8	5.8	519	2980	15	10.3	132	337	<10	<9	
40	10446066	10111138012	08/24/2009	24	6.6	553	4290	12.5	5.4	347	2070	<10	<9	
41	DUP 1	10111138015	08/25/2009	23.4	7.6	1730	2530	861	666	1169	1460	797	483	

Statistical analysis was performed using Statistica® along with Excel® and other specialized statistical programs. **Table 4-2** shows the statistics for all data from the adjusted data set. Note that there are two sets of XRF data. The first set has a count of 41 which includes all reported XRF data. The second set has a count of 35, which is paired with the laboratory data.

TABLE 4-2

Statistics on the Transformed Data

Variable	Descriptive Stats CFR-XRF Results 20090831-rex				
	Valid N	Mean	Minimum	Maximum	Std.Dev.
Percent Moisture	41	32.54	10.50	47.20	7.98
pH, Saturated Paste	41	7.52	5.20	8.20	0.59
Lab Zn (mg/kg)	41	786.41	15.10	6690.00	1168.62
L(LabZn)	41	2.50	1.18	3.83	0.66
Lab Cu (mg/kg)	41	1374.98	3.00	12700.00	2334.60
L(LabCu)	41	2.38	0.48	4.10	1.01
Lab Pb (mg/kg)	33	164.19	8.40	1310.00	287.91
L(LabPb)	33	1.74	0.92	3.12	0.63
Lab As (mg/kg)	35	124.92	5.40	1160.00	236.28
L(LabAs)	35	1.57	0.73	3.06	0.67
LAB_ACZ	35	2366.54	33.20	20550.00	3732.13
L(LAB_ACZ)	35	2.85	1.52	4.31	0.80
I(LAB_ACZ)	35	0.57	0.00	1.00	0.50
XRF Zn1/2	41	676.68	5.50	4709.00	1113.86
L(XRFZn)	41	2.29	0.74	3.67	0.78
XRF Cu1/2	41	844.76	10.50	5973.00	1327.63
L(XRFCu)	41	2.30	1.02	3.78	0.91
XRF Pb1/2	41	116.52	4.00	1375.00	264.56
L(XRFPb)	41	1.29	0.60	3.14	0.79
XRF As1/2	41	77.54	3.00	511.00	143.83
L(XRFAs)	41	1.27	0.48	2.71	0.74
XRF_ACZ-all	41	1598.98	20.50	11171.00	2319.97
L(XRF_ACZ)-all	41	2.70	1.31	4.05	0.79
I(XRF_ACZ)-all	41	0.56	0.00	1.00	0.50
XRF_ACZ	35	1568.64	20.50	11171.00	2407.44
L(XRF_ACZ)	35	2.64	1.31	4.05	0.83
I(XRF_ACZ)	35	0.51	0.00	1.00	0.51

Figure 4-1 shows the median-quartile box-and-whiskers for laboratory and XRF data side-by-side. The small box is plotted at the median value, the large box brackets range of the second and third quartile, and the lines show the range of the maximum and minimum values.

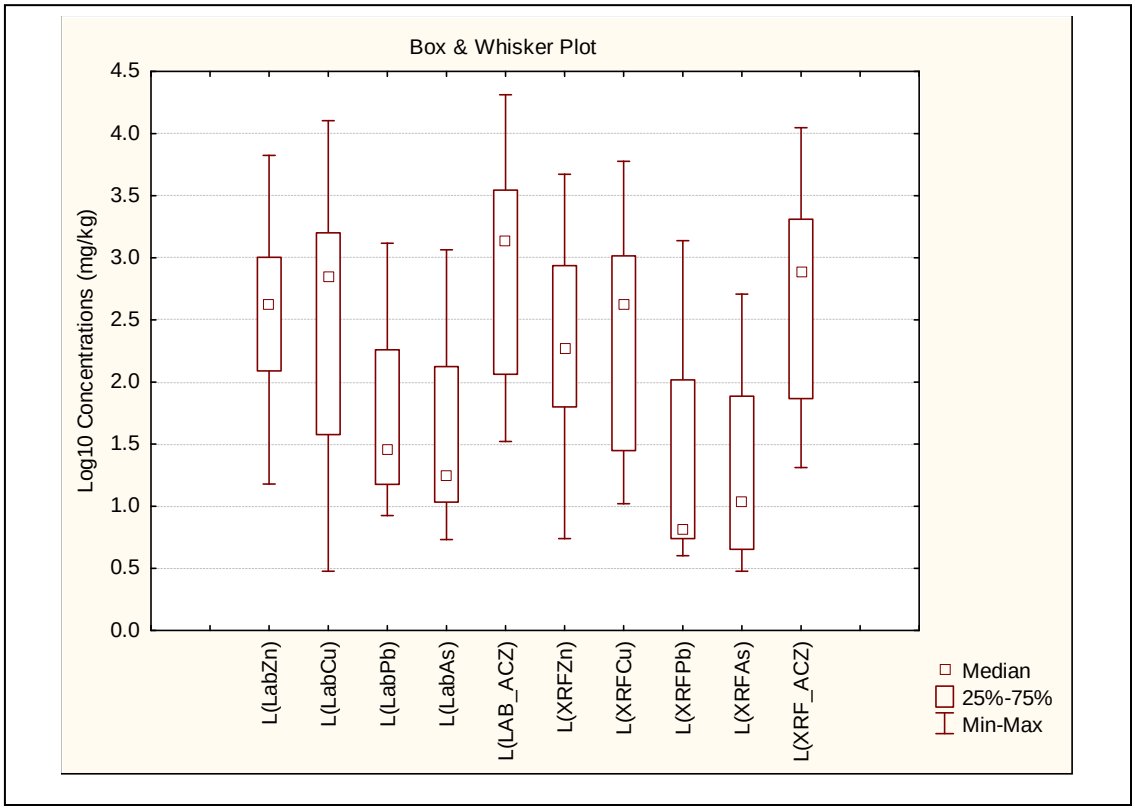


FIGURE 4-1: Box & Whisker Plots Showing Range of log10 Transformed Data

Figures 4-2 and 4-3 show the correlation plots of all metals off the diagonal. The histograms for the metals are plotted on the diagonal. The tables above the plots show the correlation values. The majority of metals with correlation equal or above 0.70 are printed in red. Each plots grid positions on **Figures 4-2 and 4-3** corresponds to the relationships shown on the table (e.g plot in top right corner is for L(LabZn):L(LabAs). All values are in log base 10. Lead and arsenic are almost perfectly correlated, while lead and copper have a correlation of below 50%. Zinc is correlated above 70% with all other metals. Copper has a correlation with arsenic of around 50%

	L(LabZn)	L(LabCu)	L(LabPb)	L(LabAs)
L(LabZn)	1.00	0.79	0.71	0.70
L(LabCu)	0.79	1.00	0.38	0.53
L(LabPb)	0.71	0.38	1.00	0.95
L(LabAs)	0.70	0.53	0.95	1.00

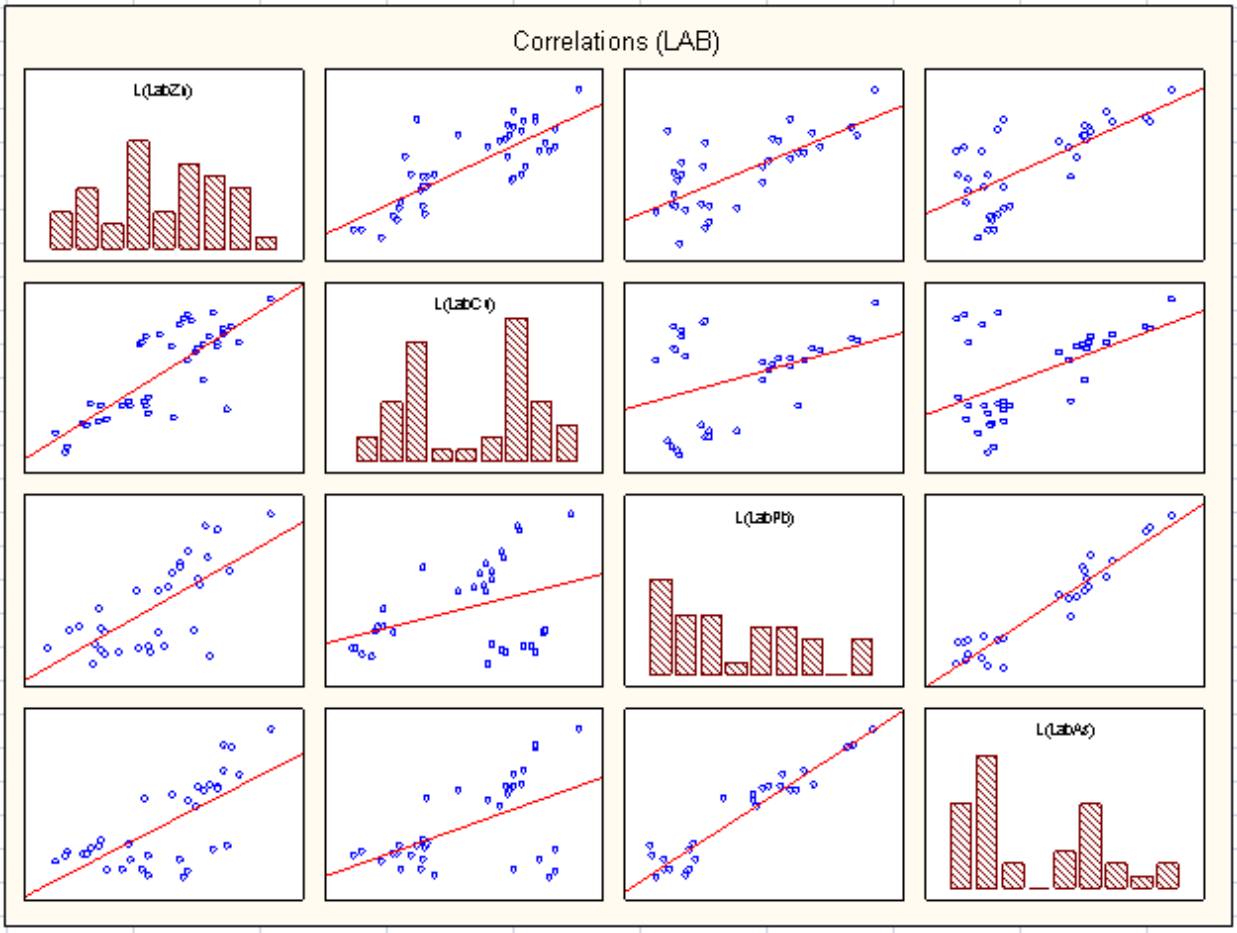


FIGURE 4-2: Correlation Graphs and Values for Laboratory Metals

	L(XRFZn)	L(XRFCu)	L(XRFPb)	L(XRFAs)
L(XRFZn)	1.00	0.81	0.72	0.75
L(XRFCu)	0.81	1.00	0.46	0.55
L(XRFPb)	0.72	0.46	1.00	0.86
L(XRFAs)	0.75	0.55	0.86	1.00

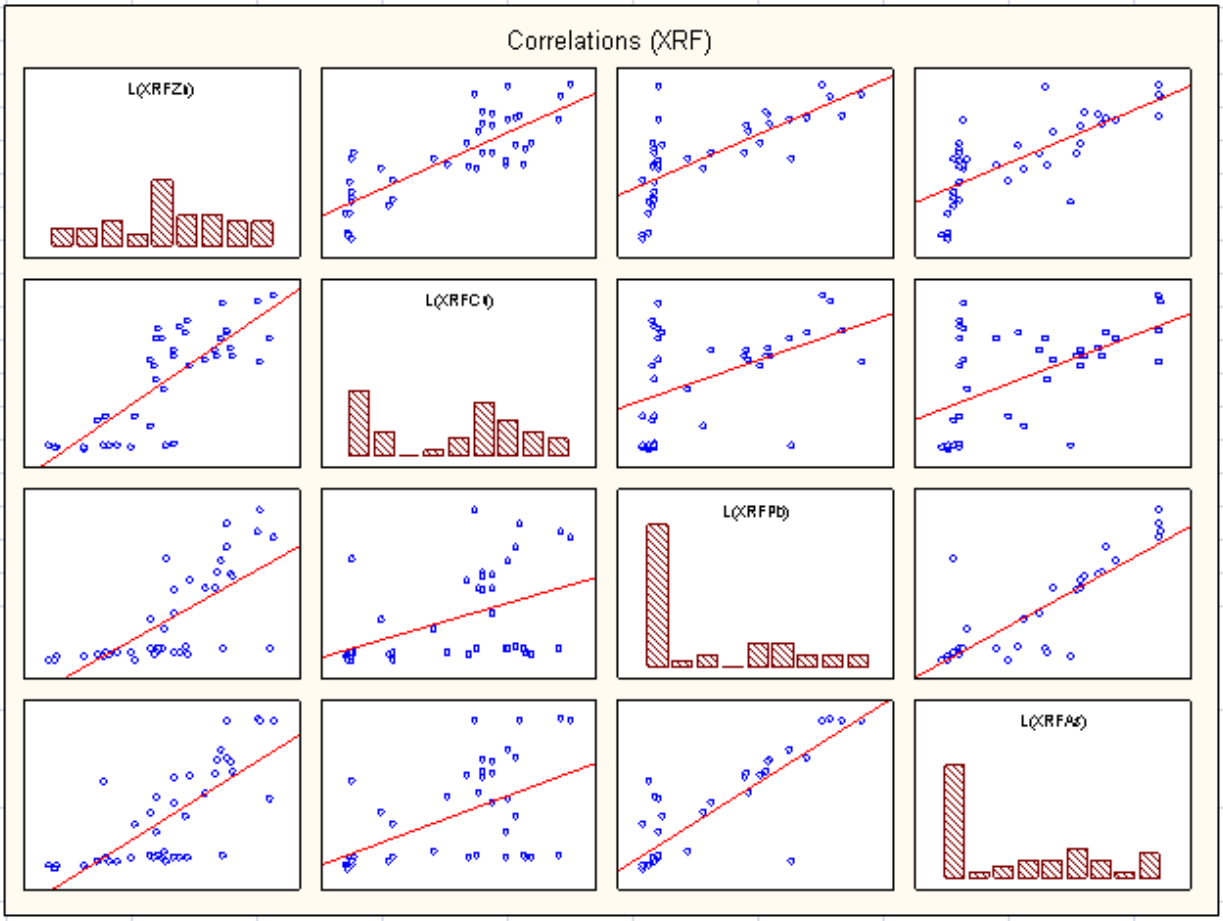


FIGURE 4-3: Correlation Graphs and Values for XRF Metals

Figures 4-4 and **4-5** show the log10 histograms for laboratory and XRF metals respectively. A Shapiro-Wilk test was run on each distribution, testing against the proposed single mode lognormal curve shown in red. This test is designed to accept that the experimental histogram could be from the theoretical distribution if the p value exceeds 0.05. For both Lab and XRF, zinc is the only metal that passes the test.

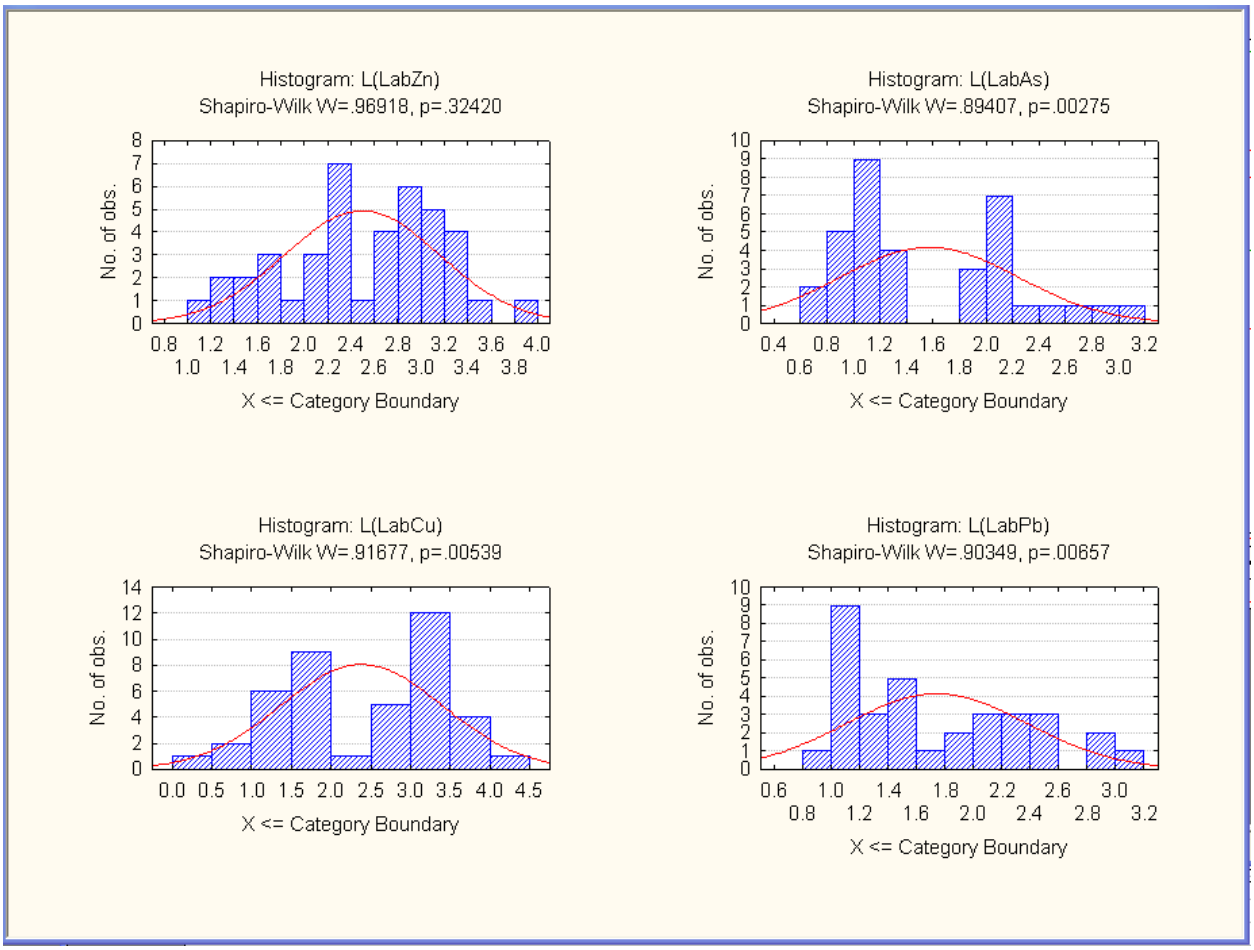


FIGURE 4-4: Histograms of Zn, Cu, As, and Pb for Laboratory

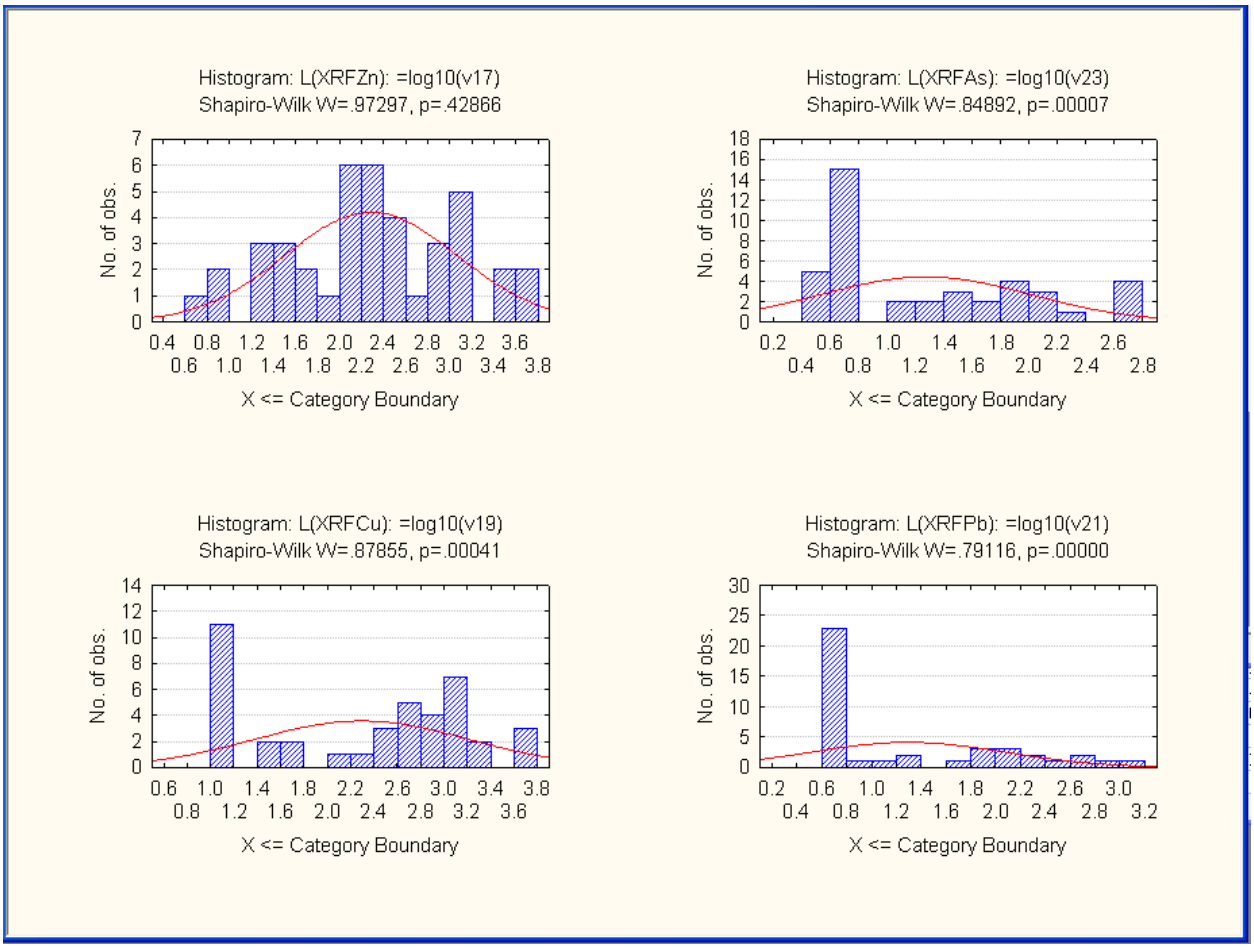


FIGURE 4-5: Histograms of Zn, Cu, As, and Pb for XRF

Figure 4-6 shows the log10 histograms for ACZ Lab and XRF data. For both cases, the Shapiro-Wilk test rejects the hypothesis that the histogram follows a lognormal distribution. The same concentration range for ACZ is plotted on the x-axis. XRF appears to have about the same relative range of concentration, but has a lower average. This difference in means, shown in **Figure 4-7**, is detected by a parametric Dependent Sample T-test and by two nonparametric tests (Sign Test and Wilcoxon Matched Pairs Test). Note the Mean-1.96SE Box-and-Whisker plot in **Figure 4-7**.

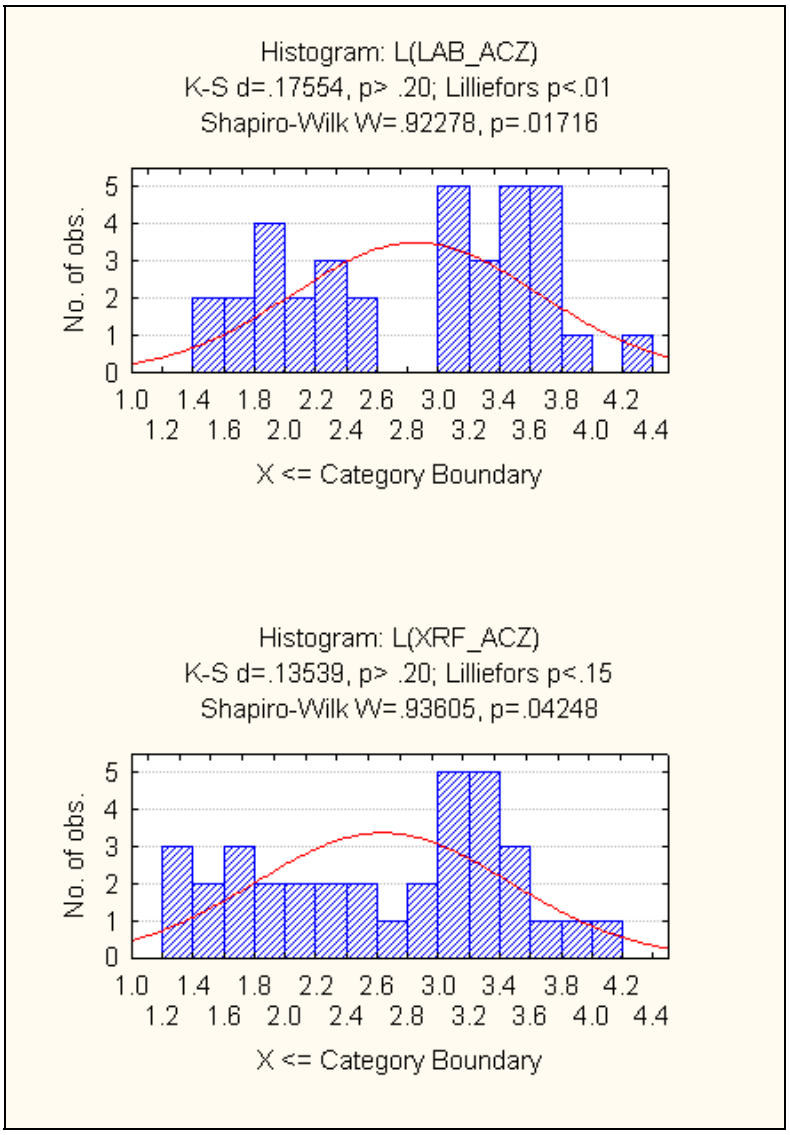
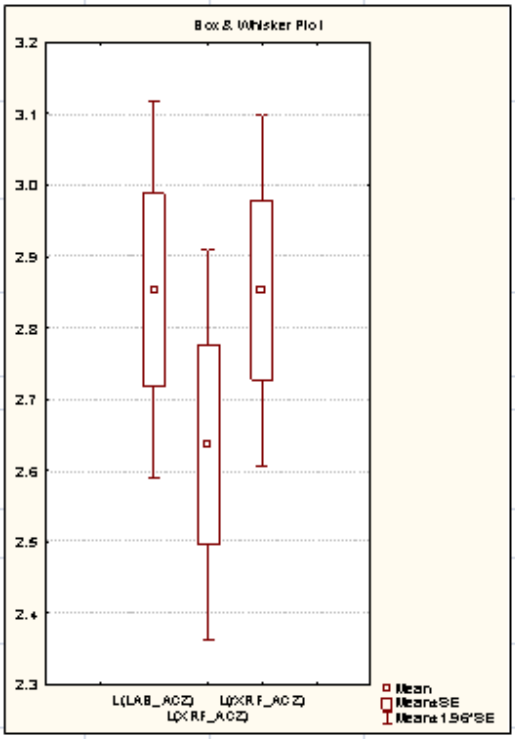


FIGURE 4-6: Histograms of ACZ values for Lab and XRF

The first two box plots show a difference in their means. Statistical tests between these two populations show that they are significantly different (shown in red). The box plotted furthest to the right represents rXRF values, which have been adjusted by a regression equation discussed later. In this case, none of the tests finds any significant difference between Lab and rXRF

	Sign Test Marked tests are significant at p <.05000			
	No. of Non-ties	Percent v < V	Z	p-level
L(LAB_ACZ) & L(XRF_ACZ)	35	17.143	3.719	0.0002
L(LAB_ACZ) & L(rXRF_ACZ)	35	54.286	0.338	0.7353

	Wilcoxon Matched Pairs Test Marked tests are significant at p <.05000			
	Valid N	T	Z	p-level
L(LAB_ACZ) & L(XRF_ACZ)	35	103	3.472	0.001
L(LAB_ACZ) & L(rXRF_ACZ)	35	309	0.098	0.922



	T-test for Dependent Samples Marked differences are significant at p < .05000							
	Mean	Std.Dv.	N	Diff.	Std.Dv. Diff.	t	df	p
L(LAB_ACZ)	2.853	0.798						
L(XRF_ACZ)	2.636	0.826	35	0.217	0.304	4.226	34	0.00017
L(LAB_ACZ)	2.853	0.798						
L(rXRF_ACZ)	2.853	0.743	35	0.000	0.292	-0.002	34	0.99836

FIGURE 4-7: Parametric and Nonparametric Difference of Mean Tests

Figure 4-8 again shows histograms for XRF and laboratory values of ACZ. In this case, a bi-modal lognormal model is proposed. The corresponding lognormal plots are designed to plot a true lognormal as a straight line with the slope being proportional to the distribution variance. In the style of a log-probability plot shown, the x-axis represents the cumulative percent of the probability distribution function and the y-axis indicates what the concentration is in log base 10. Note that the offset "tear" in the linear fit happens at approximately 500 mg/kg ACZ.

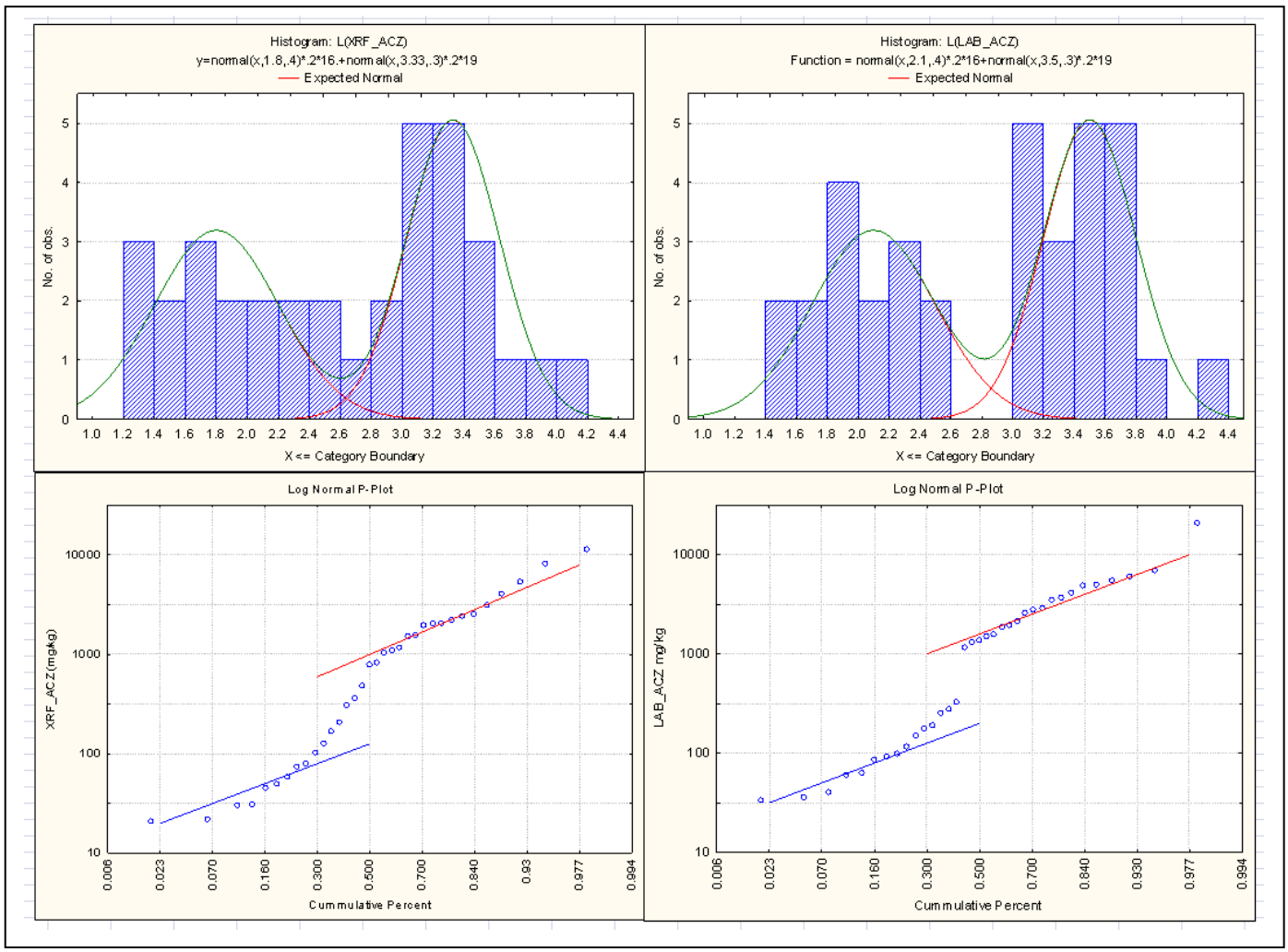


FIGURE 4-8: Bimodal Mixed Lognormal Model Proposed for the Data Set

A generalized Anderson-Darling "goodness-of-fit" test determined that the bimodal mixed lognormal distribution is statistically acceptable for both XRF and laboratory data. The Anderson-Darling can be applied to any distribution. For the bimodal model, a table of critical values for the AD statistic was calculated using 20,000 bootstrap simulation.

Figure 4-9 shows a plot of XRF versus laboratory, with the title "L(XRF_ACZ) vs. L(LAB_ACZ)". On the figure, a regression equation has been plotted as a straight line. The data points appear to be plotted in a fairly tight pattern around this line with a correlation of 0.93. Note the vertical and horizontal lines drawn at 2.69 (log10 of 500 mg/kg). The graph is now broken up into four quadrants. Only two points fall into the quadrant that signifies that the XRF considers the points to be below the 500 mg/kg threshold while the laboratory considers them to be above.

The regression equation is:

L(LAB_ACZ) = 0.48331 + 0.899 * L(XRF_ACZ). Equation 1

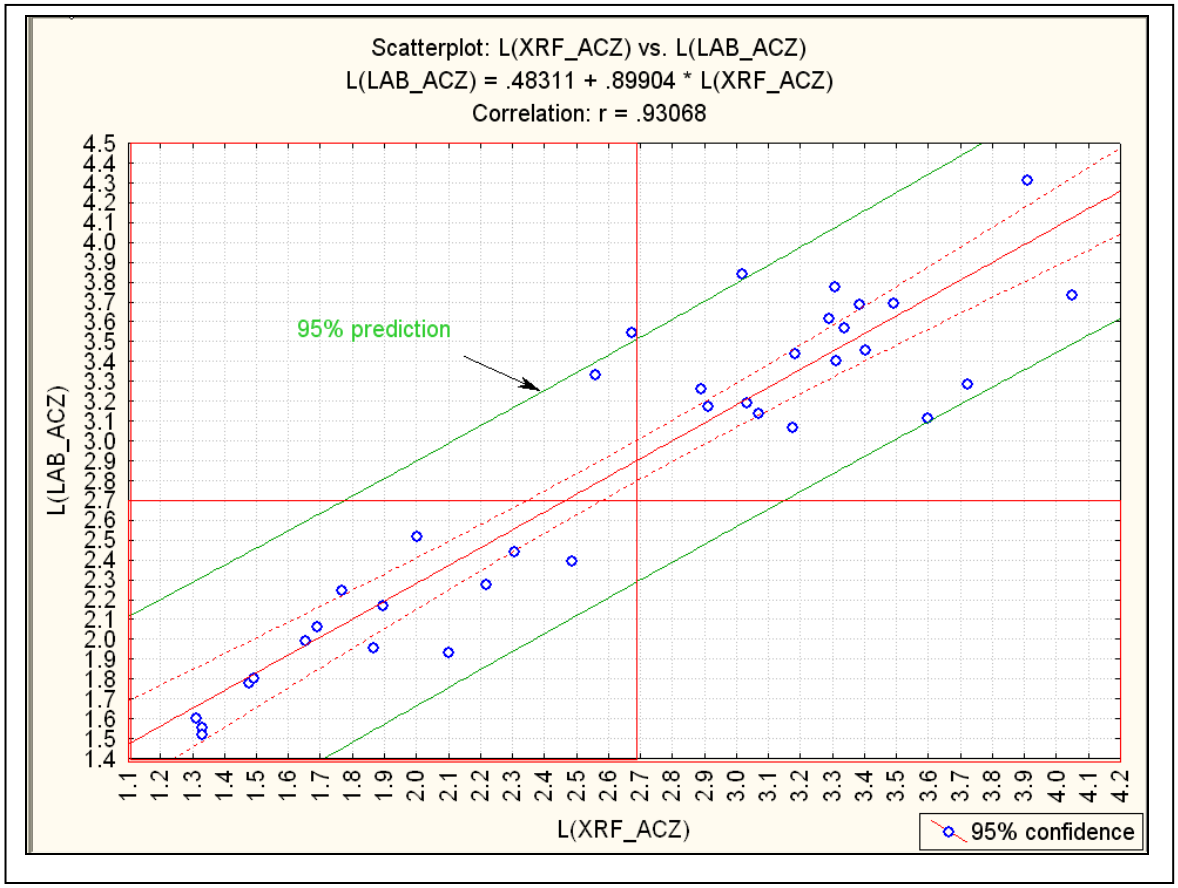


FIGURE 4-9: Scatterplot and Regression Equation of XRF vs. Lab

Figure 4-10 shows the same plot with rXRF used. Note that the two misclassified points are now corrected. The regression slope for the regressed XRF to Lab data is now unity and the intercept is very near zero.

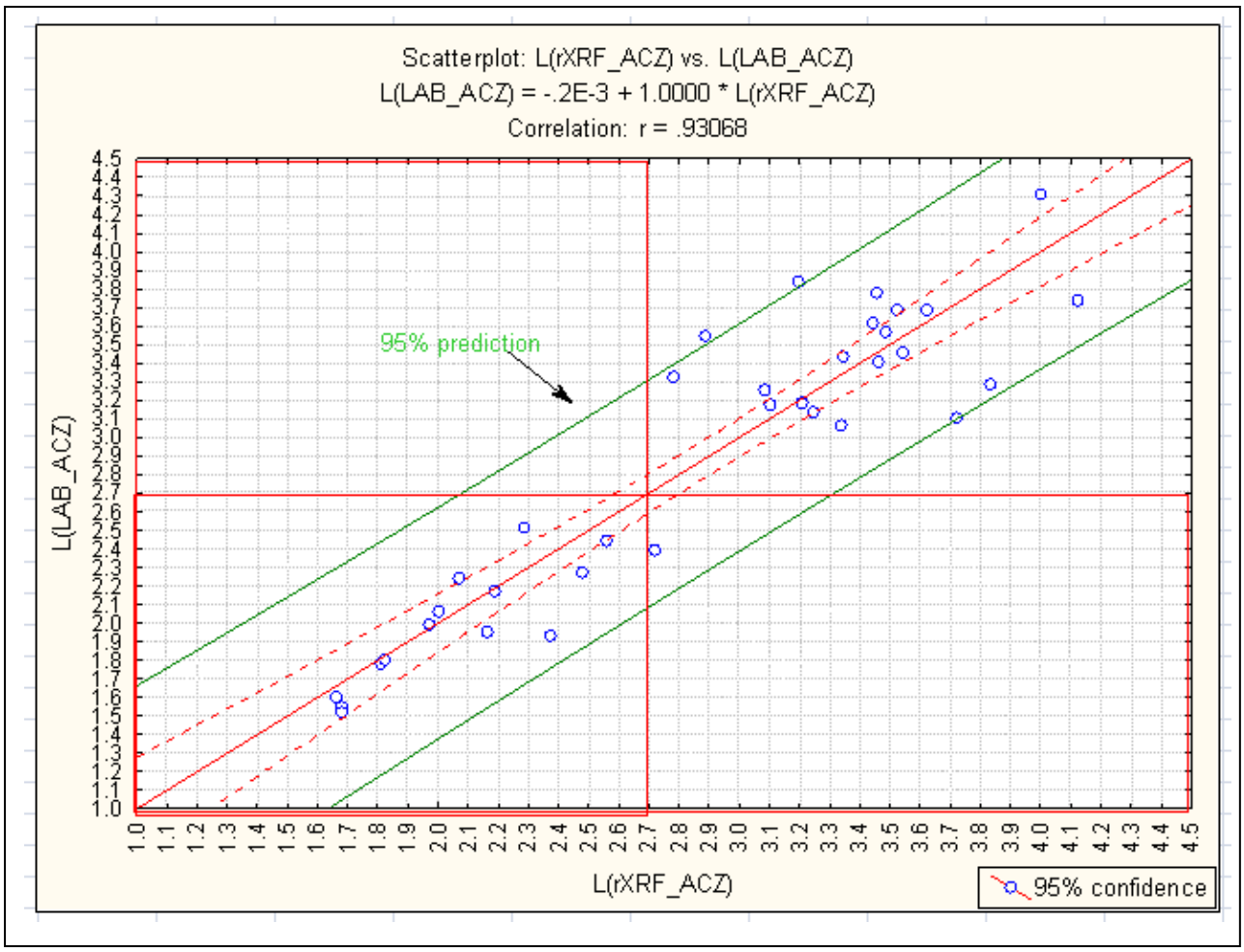


FIGURE 4-10: Scatterplot and Regression Equation of rXRF vs. Lab

In addition to the regression line, Statistica® has plotted both 95% confidence and prediction limits.

a) Confidence limits enclose the data's mean value based on the regression formula 95 times out of 100. With confidence limits it is helpful to think about the average of many measurements.

b) Prediction limits enclose the range that would contain the "next" pair of XRF and laboratory values 95 times out of 100. For prediction limits it is helpful to think about individual measurements.

Conclusion of statistical analysis of first sample data sets.

1) The variable which is the summation of arsenic, copper and zinc appears a good proxy for determining areas of contamination.

2) XRF sampling when adjusted with a regression equation produces a good estimated of sediment contamination measured by lab techniques.

4.2 SECOND SAMPLING STATISTICAL STUDY

The following section outlines the statistical comparison of metal concentrations measured by XRF and laboratory analysis over the complete sample set, rather than a small sample set as discussed in the first sample statistical study.

During the course of this investigation approximately one thousand samples were collected at various depths for analysis. **Table 4-3** shows an abstract of the data. The complete data set is shown in **Appendix A**. The sample IDs highlighted with yellow are the original samples described in the previous section. Again, this data set statistically analyzes the ACZ variable produced by XRF and Lab analysis.

TABLE 4-3

Abstract of Second Round Data
(See Appendix A for listing)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	T	U	W	X	Z	AA	AB	AC
1	Easting	Northing	Elevation	Depth	Site	SampDate	500mgTest	800mgTest	DOC500	DOC800	LabAs	L(LabAs)	LabCu	L(LabCu)	LabZn	L(LabZn)	LabACZ	L(LabACZ)	XRFAs1/2	L(XRFAs)	XRFCu1/2	L(XRFCu)	XRFZn1/2	L(XRFZn)	XRFACZ	L(XRFACZ)
2	1139251.68	722599.54	4801.27	2	10010002	8/24/09	Fail	Fail	2	2	110	2.041	961	2.983	415	2.618	1486	3.172	70.6	1.849	512.19	2.709	236.26	2.373	819.05	2.913
3	1139405.82	722703.71	4799.96	6	10020006	8/24/09	Fail	Fail	6	6	149	2.173	1150	3.061	1430	3.155	2729	3.436	78.39	1.894	659.71	2.819	790.22	2.898	1528.32	3.184
4	1139405.82	722703.71	4799.96	612	10020612	8/24/09	Pass	Pass			21	1.322	39.3	1.594	55.1	1.741	115.4	2.062	1.58	0.199	9.66	0.985	33.27	1.522	44.51	1.649
5	1139405.82	722703.71	4799.96	1218	10021218	8/24/09	Pass	Pass			13	1.114	14.7	1.167	32.7	1.515	60.4	1.781	0.32	-0.495	4.685	0.671	16.38	1.214	21.385	1.330
6	1139524.59	722725.45	4800.32	2	10030002	8/24/09	Fail	Fail	2	2	89.4	1.951	433	2.636	636	2.803	1158.4	3.064	130.37	2.115	506.29	2.704	866.18	2.938	1502.84	3.177
7	1139635.78	722745.59	4799.27	6	10040006	8/24/09	Fail	Fail	6	6	133	2.124	904	2.956	1500	3.176	2537	3.404	117.56	2.070	675.1	2.829	1252.49	3.098	2045.15	3.311
8	1139635.78	722745.59	4799.27	612	10040612	8/24/09	Pass	Pass			17.5	1.243	16.6	1.220	51.5	1.712	85.6	1.932	14.49	1.161	40.11	1.603	71.7	1.856	126.3	2.101
9	1139635.78	722745.59	4799.27	1218	10041218	8/24/09	Pass	Pass			12.3	1.090	3	0.477	20.4	1.310	35.7	1.553	3.29	0.517	0		12.96	1.113	16.25	1.211
10	1140508.87	722767.28	4793.46	1824	10051824	8/26/09	Fail	Fail			900	2.954	20300	4.307	4090	3.612	25290	4.403	484.19	2.685	7346.93	3.866	2034.13	3.308	9865.25	3.994
11	1140508.87	722767.28	4793.46	2430	10052430	8/26/09	Fail	Fail			2170	3.336	26900	4.430	4410	3.644	33480	4.525	130.76	2.116	105.38	2.023	169.33	2.229	405.47	2.608
12	1140508.87	722767.28	4793.46	3036	10053036	8/26/09	Pass	Pass	30	30	32.7	1.515	35.4	1.549	114	2.057	182.1	2.260	0.83	-0.081	0.095	-1.022	0.345	-0.462	1.27	0.104
13	1140642.74	722793.69	4792.94	6	10060006	8/26/09	Pass	Pass	0	0	16.8	1.225	81	1.908	180	2.255	277.8	2.444	14.27	1.154	71.94	1.857	150.28	2.177	236.49	2.374
14	1140851.3	722791.34	4795.38	5460	10075460	9/23/09	Fail	Fail	60	60	2.5	0.398	3060	3.486	497	2.696	3559.5	3.551	0.83	-0.081	1197.97	3.078	201.92	2.305	1400.72	3.146
15	1140851.3	722791.34	4795.38	6066	10076066	9/23/09	Pass	Pass			2.7	0.431	17.1	1.233	272	2.435	291.8	2.465	0.39	-0.409	42.34	1.627	314.47	2.498	357.2	2.553
16	1140851.3	722791.34	4795.38	6672	10076672	9/23/09	Pass	Pass			2.8	0.447	25.4	1.405	348	2.542	376.2	2.575	1.6	0.204	2.5	0.398	135.4	2.132	139.5	2.145
17	1141004.45	722753.97	4795.15	6672	10086672	9/23/09	Fail	Fail			2.9	0.462	3310	3.520	386	2.587	3698.9	3.568	3.66	0.563	1445.03	3.160	301.63	2.479	1750.32	3.243
18	1141004.45	722753.97	4795.15	7278	10087278	9/23/09	Fail	Fail			2.5	0.398	2210	3.344	400	2.602	2612.5	3.417	7.33	0.865	669.09	2.825	177.96	2.250	854.38	2.932
19	1139644.43	722854.83	4798.98	6	10090006	8/24/09	Fail	Fail	6	6	225	2.352	1170	3.068	2740	3.438	4135	3.616	85.75	1.933	509.77	2.707	1352.29	3.131	1947.81	3.290
20	1139644.43	722854.83	4798.98	612	10090612	8/24/09	Pass	Pass			12.6	1.100	12.9	1.111	37.8	1.577	63.3	1.801	3.6	0.556	13.42	1.128	15.69	1.196	32.71	1.515
21	1139644.43	722854.83	4798.98	1218	10091218	8/24/09	Pass	Pass			14.3	1.155	4	0.602	21.8	1.338	40.1	1.603	4.2	0.623	1.46	0.164	9.91	0.996	15.57	1.192
22	1139748.43	722867.65	4798.18	2	10100002	8/27/09	Pass	Pass	0	0	233	2.367					233	2.367	243.87	2.387	1204.25	3.081	2704.87	3.432	4152.99	3.618
23	1139886.72	722881.35	4797.61	6	10110006	8/26/09	Fail	Fail	6	6	120	2.079	867	2.938	566	2.753	1553	3.191	79.37	1.900	517	2.713	378.8	2.578	975.17	2.989
24	1139886.72	722881.35	4797.61	612	10110612	8/26/09	Pass	Pass			15.5	1.190	9.2	0.964	21.5	1.332	46.2	1.665	9.25	0.966	35.53	1.551	19.28	1.285	64.06	1.807
25	1139886.72	722881.35	4797.61	1218	10111218	8/26/09	Pass	Pass			14.3	1.155	3.6	0.556	19.3	1.286	37.2	1.571	3.3	0.519	24.11	1.382	8.44	0.926	35.85	1.554
26	1140532.14	722858.35	4792.8	1824	10121824	8/26/09	Fail	Fail	24	24	2860	3.456	17300	4.238	8470	3.928	28630	4.457	344.82	2.538	1871.46	3.272	1182.44	3.073	3398.72	3.531
27	1140532.14	722858.35	4792.8	2430	10122430	8/26/09	Pass	Pass			13	1.114	18	1.255	36.2	1.559	67.2	1.827	12.2	1.086	4.66	0.668	24.44	1.388	41.3	1.616
28	1140532.14	722858.35	4792.8	3036	10123036	8/26/09	Pass	Pass			12.8	1.107	46.8	1.670	95.8	1.981	155.4	2.191	7.36	0.867	17.63	1.246	50.27	1.701	75.26	1.877
29	1140613.94	722883.59	4793.49	6	10130006	8/26/09	Fail	Fail			392	2.593	768	2.897	755	2.878	1935	3.287	150.86	2.179	601.84	2.779	604.82	2.782	1357.52	3.133
30	1140613.94	722883.59	4793.49	612	10130612	8/26/09	Fail	Fail			1600	3.204	5450	3.736	1430	3.155	8480	3.928	746.46	2.873	5509.84	3.741	1793.71	3.254	8050.01	3.906
31	1140613.94	722883.59	4793.49	1218	10131218	8/26/09	Fail	Fail			2200	3.342	20700	4.316	5300	3.724	28200	4.450	1318.95	3.120	12077.38	4.082	3210.45	3.507	16606.78	4.220
32	1140613.94	722883.59	4793.49	1824	10131824	8/26/09	Fail	Fail	24	24	1370	3.137	44200	4.645	6160	3.790	51730	4.714	1354.4	3.132	13561.85	4.132	4538.96	3.666	19555.21	4.291
33	1140734.76	722913.72	4794.47	6066	10146066	8/24/09	Fail	Fail			3.3	0.519	3740	3.573	721	2.858	4464.3	3.650	17.64	1.246	1286.17	3.109	334.76	2.525	1638.57	3.214
34	1140734.76	722913.72	4794.47	6669	10146669	8/24/09	Fail	Fail			3	0.477	1040	3.017	163	2.212	1206	3.081	11.29	1.053	994.55	2.998	135.61	2.132	1141.45	3.057
35	1140734.76	722913.72	4794.47	6972	10146972	8/24/09	Fail	Fail			7.5	0.875	1190	3.076	177	2.248	1374.5	3.138	0.715	-0.146	1001.87	3.001	164.55	2.216	1167.135	3.067
36	1140869.48	722869.48	4794.55	3642	10153642	9/23/09	Fail	Fail		42	2270	3.356	19300	4.286	10400	4.017	31970	4.505	1284.95	3.109	14126.36	4.150	7610.67	3.881	23021.98	4.362
37	1140869.48	722869.48	4794.55	4248	10154248	9/23/09	Fail	Fass	48		76.3	1.883	164	2.215	551	2.741	791.3	2.898	56.73	1.754	67.43	1.829	276.55	2.442	400.71	2.603
38	1140869.48	722869.48	4794.55	4854	10154854	9/23/09	Pass	Pass			14	1.146	36.8	1.566	98.6	1.994	149.4	2.174	9.48	0.977	34.42	1.537	30.78	1.488	74.68	1.873
39	1141007.92	722870.12	4795.41	6	10160006	9/23/09	Fail	Fail			460	2.663	2270	3.356	1580	3.199	4310	3.634	482.96	2.684	1990.32	3.299	1369.78	3.137	3843.06	3.585
40	1141007.92	722870.12	4795.41	612	10160612	9/23/09	Fail	Fail			620	2.792	1690	3.228	915	2.961	3225	3.509	419.78	2.623	1665.39	3.222	1087.15	3.036	3172.32	3.501
41	1141007.92	722870.12	4795.41	1218	10161218	9/23/09	Fail	Fail			655	2.816	2550	3.407	723	2.859	3928	3.594	608.34	2.784	3593.26	3.555	705.51	2.849	4907.11	3.691

Rows highlighted with red and flagged with the term “Fail” indicate where ACZ values exceed either 500 or 800 mg/kg for the summation of arsenic, copper and zinc. The columns highlighted with light-green are lab results while the brown columns are the XRF columns. **Table 4-4** lists the statistics for the second data set. Note that the negative original data is assumed to be below the reported detection limit. These data have been given a value that one-half the absolute value of the reported data. For example, XRFAs has a minimum negative value of -123.24 mg/kg. This value has been made positive and then divided by 2 to produce a new reported value of 61.62 for the column labeled XRFAs1/2.

TABLE 4-4

Statistics of First and Second Round of Data

Variable	Descriptive Statistics (First & Second Round of Data)				
	Valid N	Mean	Minimum	Maximum	Std.Dev.
LabAs	1039	398.153	2.000	6490.00	707.654
L(LabAs)	1038	1.806	0.301	3.81	0.957
LabCu	1000	2778.501	1.600	64100.00	5572.872
L(LabCu)	1000	2.712	0.204	4.81	0.958
LabZn	1001	1380.301	6.400	10400.00	1566.175
L(LabZn)	1001	2.798	0.806	4.02	0.630
LabACZ	1039	4402.178	11.200	69108.00	6961.003
L(LabACZ)	1039	3.142	1.049	4.84	0.763
XRFAs	1035	274.647	-123.240	3609.97	477.091
XRFAs1/2	1039	273.882	0.000	3609.97	476.295
L(XRFAs)	1035	1.638	-2.301	3.56	1.018
XRFCu	1035	1743.986	-43.820	30293.13	3223.529
XRFCu1/2	1039	1737.386	0.000	30293.13	3219.064
L(XRFCu)	1034	2.541	-1.022	4.48	0.958
XRFZn	1035	862.242	-107.300	7610.67	993.384
XRFZn1/2	1038	859.907	0.000	7610.67	992.887
L(XRFZn)	1035	2.579	-1.523	3.88	0.670
XRFACZ	1039	2870.347	0.000	35343.90	4241.229
L(XRFACZ)	1035	2.989	0.104	4.55	0.747

All metal data is positively correlated as shown in **Figure 4-11**. As with the first sampling program, the data appears to be bi-modally lognormal. **Figure 4-12** echoes the histogram shown in **Figure 4-8**. As before, there is a regression fit between XRF and lab. The current regression equation is shown in **Figure 4-13**:

L(LabACZ) = 0.51559 + 0.87831*L(XRFACZ) Equation 2

Preliminary variography analysis indicates that the sediment data is a candidate for geostatistical estimation techniques such as kriging. **Figure 4-14** shows an experimental correlogram of the regressed XRF data fitted with two nested spherical models with a nugget of 50% of the final sill. The ranges for the two spherical models are 40 and 100 feet.

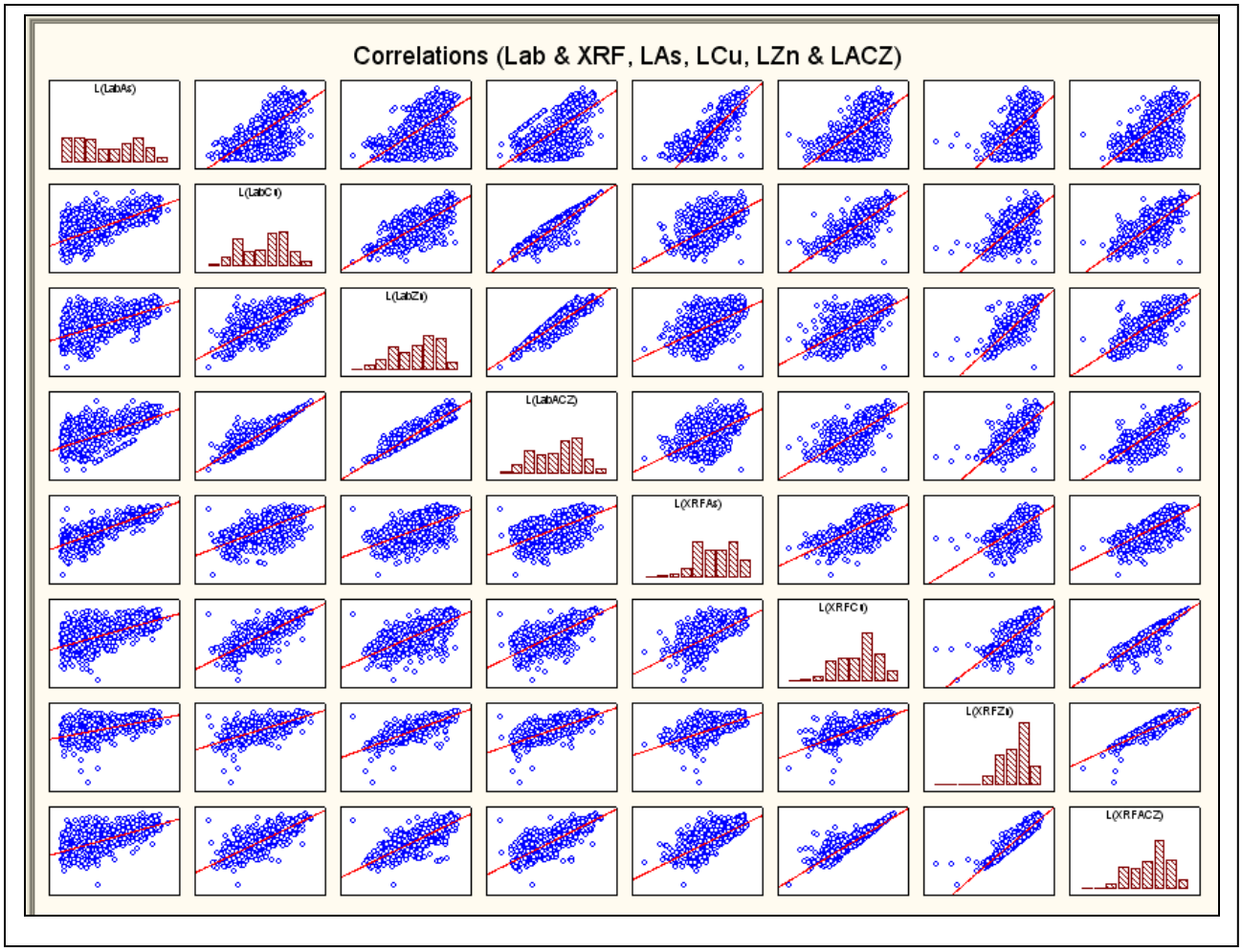


FIGURE 4-11: Correlation Lab versus XRF (First and Second Sampling)

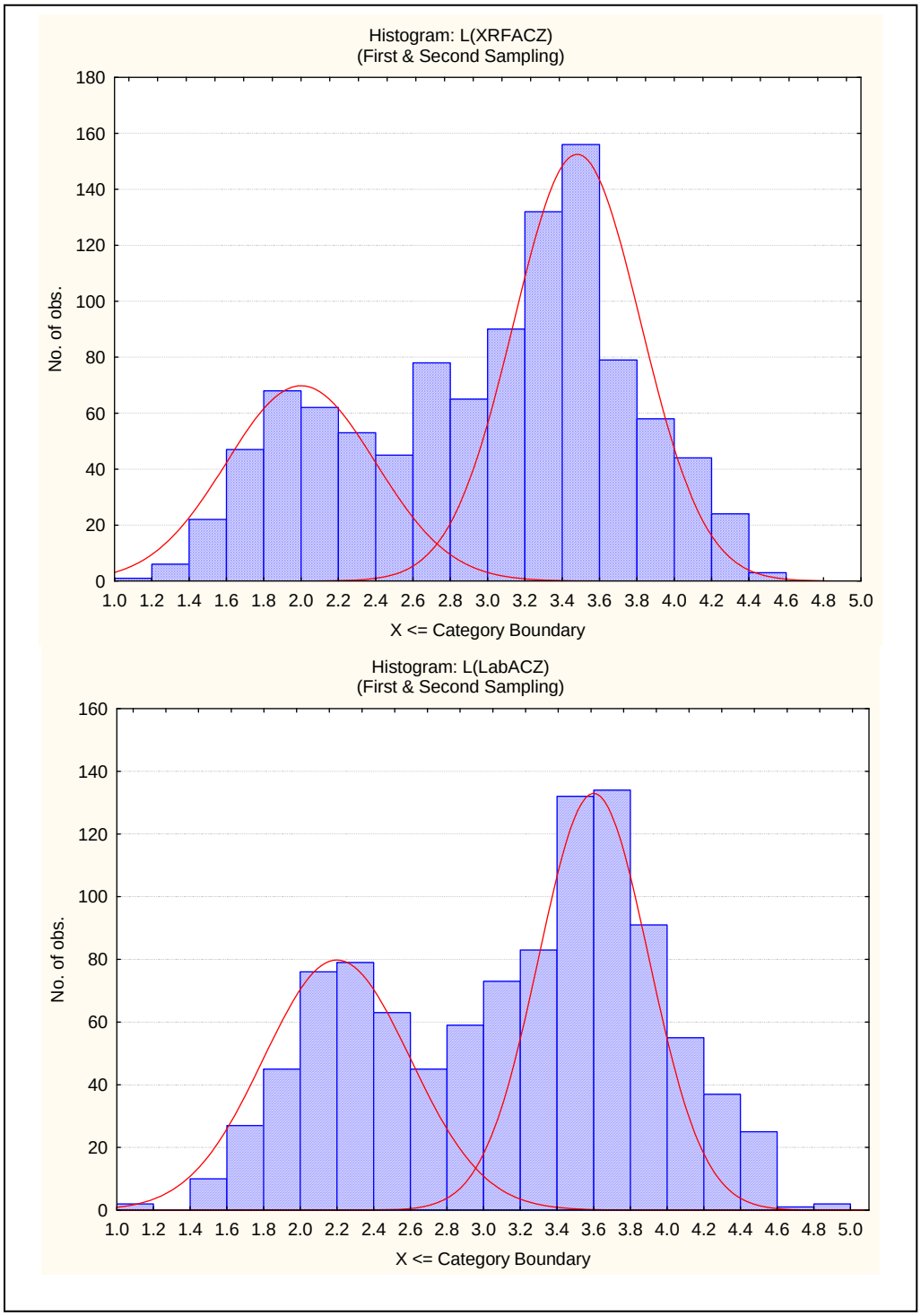


FIGURE 4-12: Bi-modal Lognormal Histograms for ACZ from LAB and XRF Measurements

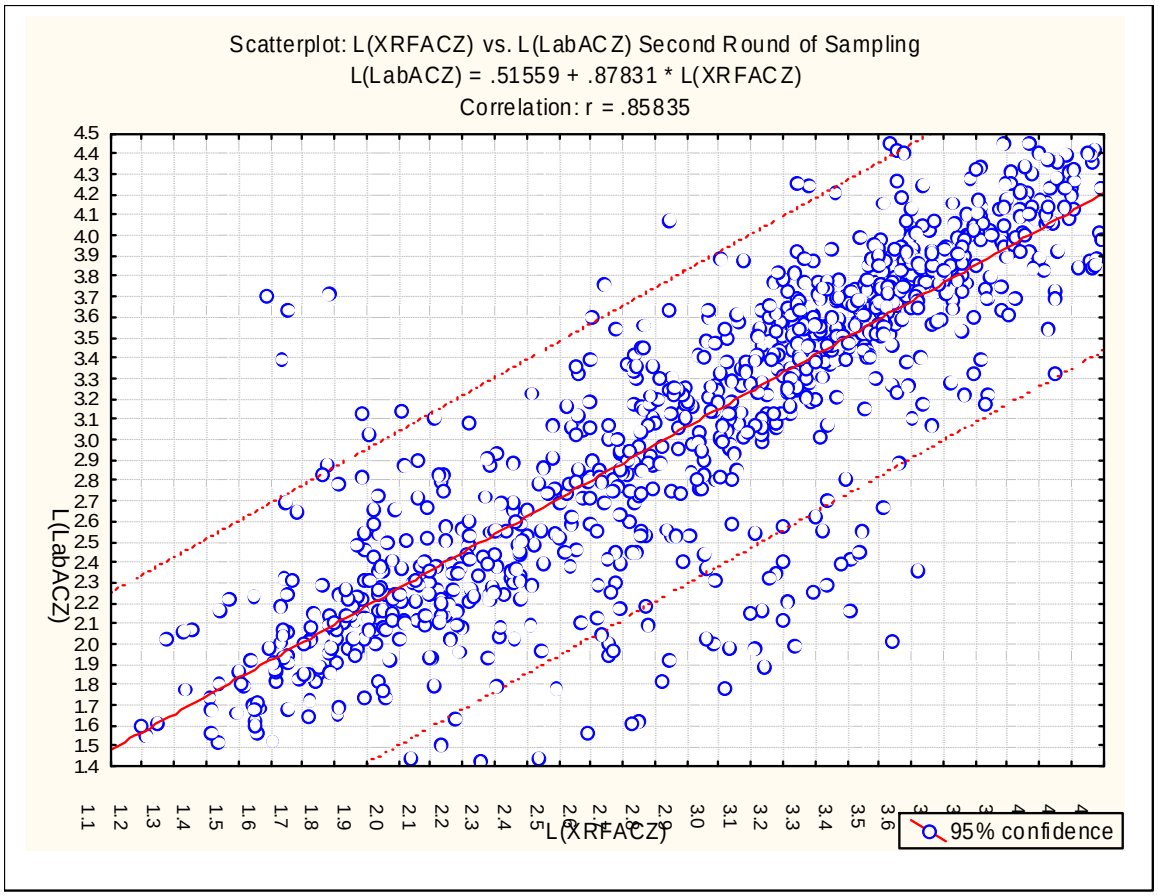


FIGURE 4-13: Scatterplot and Regression Equation of XRF vs. Lab

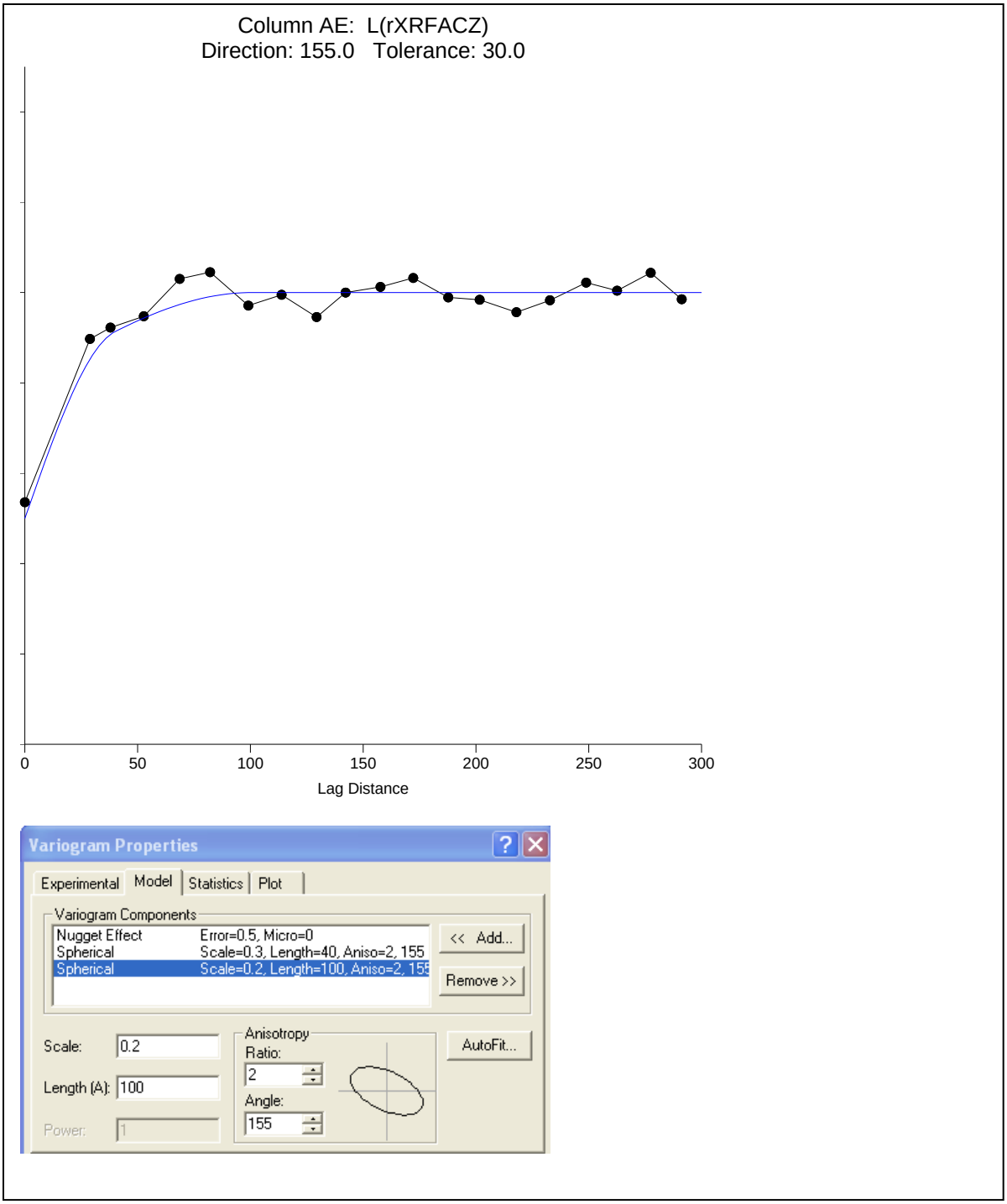


FIGURE 4-14: Variogram of Regressed Lab Value Using XRF and Equation 2

Conclusion of statistical analysis of first and second sample data sets.

1) The new data confirms the conclusions derived from the first study. The variable which is the summation of arsenic, copper and zinc appears a good proxy for determining areas of contamination.
2) XRF sampling when adjusted with a regression equation produces a good estimated of sediment contamination measured by lab techniques.
3) The derivation of a good correlogram supports the idea that geostatistical techniques such as kriging may produce useful results. If so, unsampled locations can be estimated, which allow for the estimation of contamination contours and contaminated sediment volumes.

5.0 REFERENCES

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APPENDIX A

BASE OF TAILINGS/IMPACTED SOIL DATA

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
Pit 01-001														
1139251.68	722599.54	4801.27	8/24/2009	10010002	10111134014	Fail	Fail	00-02	8.1	110	5.3	961	99.3	415
Pit 01-002														
1139405.82	722703.71	4799.96	8/24/2009	10020006	10111134015	Fail	Fail	00-06	8	149	20.2	1150	142	1430
1139405.82	722703.71	4799.96	8/24/2009	10020612	10111134018	Pass	Pass	06-12	8.3	21	0.69	39.3	U2.3	55.1
1139405.82	722703.71	4799.96	8/24/2009	10021218	10111134017	Pass	Pass	12-18	8.3	13	0.34	14.7	U2.3	32.7
Pit 01-003														
1139524.59	722725.45	4800.32	8/24/2009	10030002	10111134012	Fail	Fail	00-02	8.2	89.4	10.9	433	97.8	636
Pit 01-004														
1139635.78	722745.59	4799.27	8/24/2009	10040006	10111134016	Fail	Fail	00-06	8.2	133	21.5	904	122	1500
1139635.78	722745.59	4799.27	8/24/2009	10040612	10111134002	Pass	Pass	06-12	8.3	17.5	0.78	16.6	U2.3	51.5
1139635.78	722745.59	4799.27	8/24/2009	10041218	10111134013	Pass	Pass	12-18	8.4	12.3	0.24	3	U2.4	20.4
Pit 01-005														
1140508.87	722767.28	4793.46	8/26/2009	10051824	10111783010	Fail	Fail	18-24	7.5	900	35.7	20300	1440	4090
1140508.87	722767.28	4793.46	8/26/2009	10052430	10111783011	Fail	Fail	24-30	7.6	2170	60	26900	1650	4410
1140508.87	722767.28	4793.46	8/26/2009	10053036	10111783012	Pass	Pass	30-36	7.7	32.7	0.79	35.4	27.2	114
Pit 01-006														
1140642.74	722793.69	4792.94	8/26/2009	10060006	10111782004	Pass	Pass	00-06	8.2	16.8	U0.084	81	11.7	180
Pit 01-007														
1140861.30	722791.34	4795.38	9/23/2009	10075460	10113328005	Fail	Fail	54-60	7.5	U2.5	2	3060	24.2	497
1140861.30	722791.34	4795.38	9/23/2009	10076066	10113328006	Pass	Pass	60-66	7.1	U2.7	0.16	17.1	13.5	272
1140861.30	722791.34	4795.38	9/23/2009	10076672	10113328007	Pass	Pass	66-72	5.7	U2.8	1	25.4	7	348
Pit 01-008														
1141004.45	722753.97	4795.15	9/23/2009	10086672	10113326012	Fail	Fail	66-72	6	U2.9	2.3	3310	15.1	386
1141004.45	722753.97	4795.15	9/23/2009	10087278	10113326013	Fail	Fail	72-78	6.2	U2.5	2.5	2210	13	400
Pit 01-009														
1139644.43	722854.83	4798.98	8/24/2009	10090006	10111134010	Fail	Fail	00-06	8.2	225	28	1170	189	2740

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1139644.43	722854.83	4798.98	8/24/2009	10090612	10111134011	Pass	Pass	06-12	8.3	12.6	0.45	12.9	U2.4	37.8
1139644.43	722854.83	4798.98	8/24/2009	10091218	10111134001	Pass	Pass	12-18	8.4	14.3	0.23	4	U2.4	21.8
Pit 01-010														
1139748.43	722867.65	4798.18	8/27/2009	10100002	10111783003	Pass	Pass	00-02	--	233	--	--	--	--
Pit 01-011														
1139886.72	722881.35	4797.61	8/26/2009	10110006	10111783016	Fail	Fail	00-06	7.7	120	9.1	867	117	566
1139886.72	722881.35	4797.61	8/26/2009	10110612	10111783017	Pass	Pass	06-12	8	15.5	0.35	9.2	U1.9	21.5
1139886.72	722881.35	4797.61	8/26/2009	10111218	10111783018	Pass	Pass	12-18	7.9	14.3	0.24	3.6	U2	19.3
Pit 01-012														
1140532.14	722858.35	4792.80	8/26/2009	10121824	10111782001	Fail	Fail	18-24	7.6	2860	172	17300	1470	8470
1140532.14	722858.35	4792.80	8/26/2009	10122430	10111782002	Pass	Pass	24-30	7.9	13	U0.29	18	U4.4	36.2
1140532.14	722858.35	4792.80	8/26/2009	10123036	10111782003	Pass	Pass	30-36	7.9	12.8	2.2	46.8	20.3	95.8
Pit 01-013														
1140613.94	722883.59	4793.49	8/26/2009	10130006	10111782005	Fail	Fail	00-06	3.8	392	22	788	426	755
1140613.94	722883.59	4793.49	8/26/2009	10130612	10111782006	Fail	Fail	06-12	5.4	1600	83.6	5450	750	1430
1140613.94	722883.59	4793.49	8/26/2009	10131218	10111782007	Fail	Fail	12-18	7.1	2200	124	20700	999	5300
1140613.94	722883.59	4793.49	8/26/2009	10131824	10111782008	Fail	Fail	18-24	7.6	1370	87.6	44200	1730	6160
1140613.94	722883.59	4793.49	8/26/2009	10132430	10117453015	Pass	Pass	24-30	8.1	16.7	0.37	21.5	14.5	446
1140613.94	722883.59	4793.49	8/26/2009	10133036	10117453017	Pass	Pass	30-36	7.9	16.6	0.21	19.9	14.6	65.7
Pit 01-014														
1140734.76	722913.72	4794.47	8/24/2009	10146066	10111134009	Fail	Fail	60-66	7.3	U3.3	13	3740	15	721
1140734.76	722913.72	4794.47	8/24/2009	10146669	10111134019	Fail	Fail	66-69	7.7	U3	0.19	1040	8.4	163
1140734.76	722913.72	4794.47	8/24/2009	10146972	10111134020	Fail	Fail	69-72	7.9	7.5	0.64	1190	16.6	177
Pit 01-015														
1140869.48	722869.48	4794.55	9/23/2009	10153642	10113328008	Fail	Fail	36-42	7.3	2270	76.7	19300	3090	10400
1140869.48	722869.48	4794.55	9/23/2009	10154248	10113328009	Fail	Pass	42-48	7.5	76.3	4.9	164	106	551
1140869.48	722869.48	4794.55	9/23/2009	10154854	10113328010	Pass	Pass	48-54	7.1	14	0.57	36.8	16.3	98.6

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
Pit 01-016														
1141007.92	722870.12	4795.41	9/23/2009	10160006	10113326017	Fail	Fail	00-06	8.1	460	16.9	2270	400	1580
1141007.92	722870.12	4795.41	9/23/2009	10160612	10113326018	Fail	Fail	06-12	8.2	620	15.7	1690	631	915
1141007.92	722870.12	4795.41	9/23/2009	10161218	10113326019	Fail	Fail	12-18	6.7	655	14.5	2550	403	723
1141007.92	722870.12	4795.41	9/23/2009	10161824	10113326014	Fail	Fail	18-24	7.2	34	2.5	1430	22.6	422
1141007.92	722870.12	4795.41	9/23/2009	10162430	10113326015	Pass	Pass	24-30	7.4	3.1	0.18	34.1	11	135
1141007.92	722870.12	4795.41	9/23/2009	10163036	10113326016	Pass	Pass	30-36	7.6	2.5	U0.089	22.5	8.4	36.1
Pit 01-017														
1141138.06	722874.23	4796.04	9/23/2009	10170006	10113326020	Fail	Fail	00-06	8.1	82.8	4.2	502	96.5	435
1141138.06	722874.23	4796.04	9/23/2009	10170612	10113328001	Fail	Fail	06-12	7.9	92.3	3.7	456	57.6	410
1141138.06	722874.23	4796.04	9/23/2009	10171218	10113328002	Pass	Pass	12-18	8.2	35.3	1	192	24.5	111
1141138.06	722874.23	4796.04	9/23/2009	10171824	10113328003	Pass	Pass	18-24	8.3	11.5	0.21	16	6.9	16.9
1141138.06	722874.23	4796.04	9/23/2009	10172430	10113328004	Pass	Pass	24-30	8.3	9.2	0.19	22.2	7.5	21.7
Pit 01-018														
1139781.01	722960.48	4797.48	8/27/2009	10180002	10111783004	Pass	Pass	00-02	--	61.7	--	--	--	--
Pit 01-019														
1139885.10	722986.81	4796.69	8/27/2009	10190002	10111783005	Pass	Pass	00-02	--	263	--	--	--	--
Pit 01-020														
1140002.65	722996.08	4796.32	8/26/2009	10200002	10111783006	Pass	Pass	00-02	--	147	--	--	--	--
Pit 01-021														
1140136.98	722991.42	4795.67	8/25/2009	10210002	10111138010	Fail	Fail	00-02	8.1	142	15.4	839	182	844
Pit 01-022														
1140511.60	723005.45	4793.72	8/25/2009	10220006	10111138013	Fail	Fail	00-06	8	616	35.6	2620	772	2190
1140511.60	723005.45	4793.72	8/25/2009	10220612	10111138003	Pass	Pass	06-12	8	15.7	U0.16	41.8	U2.4	41
1140511.60	723005.45	4793.72	8/25/2009	10221218	10111138004	Pass	Pass	12-18	7.9	9.5	U0.17	8.6	U2.5	15.1
Pit 01-023														
1140623.47	722980.08	4793.59	8/25/2009	10232430	10111138017	Fail	Fail	24-30	8	17.6	0.66	32.2	11	1880

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1140623.47	722980.08	4793.59	8/25/2009	10233036	10111138020	Pass	Pass	30-36	8.1	12.2	0.44	24.9	11.7	211
1140623.47	722980.08	4793.59	8/25/2009	10233642	10111138021	Pass	Pass	36-42	8.1	7.1	0.92	17.6	14.5	65.5
Pit 01-024														
1140725.00	723000.00		8/24/2009	10245460	10111134004	Fail	Fail	54-60	7.3	6.8	1.8	5310	24.3	644
1140725.00	723000.00		8/24/2009	10246066	10111134005	Fail	Fail	60-66	7.4	U3.3	0.36	1740	12.6	284
1140725.00	723000.00		8/24/2009	10246672	10111134003	Fail	Fail	66-72	7.8	U3.1	0.22	1590	13.3	198
Pit 01-025														
1140873.48	722994.56	4794.25	9/23/2009	10254854	10113328011	Fail	Fail	48-54	7.8	3.4	0.59	426	11.1	553
1140873.48	722994.56	4794.25	9/23/2009	10255460	10113328012	Pass	Pass	54-60	7.5	U2.8	0.22	38	16.8	327
1140873.48	722994.56	4794.25	9/23/2009	10256066	10113328013	Pass	Pass	60-66	8	U3.2	1	23	14.4	127
Pit 01-026														
1141009.78	722984.67	4794.98	9/28/2009	10260006	10113935004	Fail	Fail	00-06	8.1	538	32.1	1990	543	930
1141009.78	722984.67	4794.98	9/28/2009	10260612	10113935005	Fail	Fail	06-12	7.5	682	35.7	1530	408	604
1141009.78	722984.67	4794.98	9/28/2009	10261218	10113935006	Fail	Fail	12-18	7.5	411	24.7	2720	216	802
1141009.78	722984.67	4794.98	9/28/2009	10261824	10113935007	Pass	Pass	18-24	7.7	41.6	5.3	84.7	10.2	220
1141009.78	722984.67	4794.98	9/28/2009	10262430	10113935008	Pass	Pass	24-30	7.8	28.5	3.6	27.7	10.9	185
1141009.78	722984.67	4794.98	9/28/2009	10263036	10113935009	Pass	Pass	30-36	8	24.9	2.6	41.1	11.8	157
Pit 01-027														
1141138.44	723000.81	4796.52	9/28/2009	10270006	10113935014	Pass	Pass	00-06	8.4	17.9	2	42.9	12.8	46.3
1141138.44	723000.81	4796.52	9/28/2009	10270612	10113935015	Fail	Pass	06-12	8.3	65.2	6.3	265	73.5	259
1141138.44	723000.81	4796.52	9/28/2009	10271218	10113935016	Pass	Pass	12-18	8.3	67.8	5.7	229	40.8	198
1141138.44	723000.81	4796.52	9/28/2009	10271824	10113935017	Fail	Pass	18-24	8.3	77.7	5.5	332	38.6	173
1141138.44	723000.81	4796.52	9/28/2009	10272430	10113935018	Pass	Pass	24-30	8.4	17.3	1.8	17.9	6.4	19.9
1141138.44	723000.81	4796.52	9/28/2009	10273036	10113935019	Pass	Pass	30-36	8	14.5	1.5	17.4	6.1	17
Pit 01-028														
1139911.42	723113.28	4797.05	8/26/2009	10280002	10111782018	Pass	Pass	00-02	--	128	--	--	--	--
Pit 01-029														

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1140003.10	723123.25	4796.13	8/26/2009	10290002	10111782019	Pass	Pass	00-02	--	222	--	--	--	--
Pit 01-030														
1140138.62	723132.29	4795.43	8/25/2009	10300002	10111138007	Fail	Fail	00-02	8.2	267	32.8	1680	304	1740
Pit 01-031														
1140253.63	723115.65	4794.46	8/25/2009	10310002	10111138016	Fail	Fail	00-02	8.1	72.3	6.4	693	110	782
Pit 01-032														
1140357.11	723097.29	4795.05	8/25/2009	10320002	10111138005	Fail	Fail	00-02	8.2	156	16.4	1550	372	1160
Pit 01-033														
1140491.21	723134.14	4791.49	8/25/2009	10333036	10111138006	Fail	Fail	30-36	7.8	1160	83.4	12700	1310	6690
1140491.21	723134.14	4791.49	8/25/2009	10333642	10111138001	Pass	Pass	36-42	6.5	92.4	6.3	46.3	53.7	188
1140491.21	723134.14	4791.49	8/25/2009	10334248	10111138014	Pass	Pass	42-48	8	7.4	2.1	37.7	25.8	103
Pit 01-034														
1140587.59	723120.18	4794.48	8/24/2009	10344854	10117453018	Fail	Fail	48-54	7.7	15.6	17.2	1200	35.5	3340
1140587.59	723120.18	4794.48	8/24/2009	10345460	10117453019	Pass	Pass	54-60	7.2	4.1	0.41	34.4	11.6	302
1140587.59	723120.18	4794.48	8/24/2009	10346066	10111134007	Pass	Pass	60-66	7.4	U4.6	0.3	38.6	28	195
1140587.59	723120.18	4794.48	8/24/2009	10346672	10111134008	Pass	Pass	66-72	7.5	5.7	0.25	61.1	24	210
1140587.59	723120.18	4794.48	8/24/2009	10347278	10111134006	Pass	Pass	72-78	6.3	U3.3	0.15	20.7	13.7	430
Pit 01-035														
1140752.65	723122.84	4793.34	9/23/2009	10354248	10113328016	Fail	Fail	42-48	7.9	U3.1	6.7	805	16.8	2960
1140752.65	723122.84	4793.34	9/23/2009	10354854	10113328017	Fail	Fail	48-54	7.8	U2.6	43.1	1070	20.7	2150
Pit 01-036														
1140798.65	723186.44	4793.10	9/24/2009	10364854	10113702003	Fail	Fail	48-54	7.6	U2.7	0.56	774	8.2	190
1140798.65	723186.44	4793.10	9/24/2009	10365460	10113702004	Fail	Fail	54-60	7.4	U2.4	0.13	691	8.1	182
1140798.65	723186.44	4793.10	9/24/2009	10366066	10113702005	Pass	Pass	60-66	8	U3.5	0.16	25.5	15.3	67.6
Pit 01-037														
1140875.40	723147.76	4794.03	9/23/2009	10376672	10113328014	Fail	Fail	66-72	7.4	U3.2	2.2	52.7	18.1	1790
1140875.40	723147.76	4794.03	9/23/2009	10377278	10113328015	Pass	Pass	72-78	8.2	U2.5	0.24	10.3	9	298

Notes:

(s.u.) - Standard units
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Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
Pit 01-038														
1141012.25	723132.86	4793.85	9/28/2009	10380006	10113937001	Fail	Fail	00-06	7.7	757	48.8	5060	596	2520
1141012.25	723132.86	4793.85	9/28/2009	10380612	10113937003	Fail	Fail	06-12	8.2	63.8	2.9	523	49.3	778
1141012.25	723132.86	4793.85	9/28/2009	10381218	10113937004	Pass	Pass	12-18	8.1	7.1	0.25	44.3	13.2	58
Pit 01-039														
1141155.48	723120.51	4795.80	9/28/2009	10390006	10113935010	Pass	Pass	00-06	8.5	40.9	4.4	117	29.9	110
1141155.48	723120.51	4795.80	9/28/2009	10390612	10113935011	Fail	Fail	06-12	8.1	244	15.2	936	189	565
1141155.48	723120.51	4795.80	9/28/2009	10391218	10113935012	Pass	Pass	12-18	8.2	15.5	1.7	16	6	23.9
1141155.48	723120.51	4795.80	9/28/2009	10391824	10113935013	Pass	Pass	18-24	8	12.1	1.4	11.1	5.8	13.8
Pit 01-03946E														
1141207.40	723113.30	4796.30	9/28/2009	.03946E0002	10113935020	Pass	Pass	00-02	--	148	--	--	--	--
Pit 01-040														
1140140.11	723229.82	4795.19	8/27/2009	10400002	10111783020	Pass	Pass	00-02	--	84.7	--	--	--	--
Pit 01-041														
1140250.26	723250.44	4794.38	8/25/2009	10410002	10111138019	Fail	Fail	00-02	8.2	124	13.5	1010	253	1000
Pit 01-042														
1140393.64	723224.08	4793.41	8/25/2009	10420006	10111783007	Fail	Fail	00-06	8.4	426	12.8	1820	604	1260
1140393.64	723224.08	4793.41	8/25/2009	10420612	10111783008	Pass	Pass	06-12	8.4	19.3	0.48	32.2	U2.1	51.2
1140393.64	723224.08	4793.41	8/25/2009	10421218	10111783009	Pass	Pass	12-18	8.3	16.8	0.29	6.1	U2	24.9
Pit 01-043														
1140525.31	723236.67	4792.98	8/24/2009	10433642	10111138002	Fail	Fail	36-42	7.9	130	14.2	149	221	1010
1140525.31	723236.67	4792.98	8/24/2009	10434248	10111138011	Pass	Pass	42-48	7.8	18.3	2.9	47.1	28.5	123
1140525.31	723236.67	4792.98	8/24/2009	10434854	10111138009	Pass	Pass	48-54	7.8	10.8	2.6	38.1	28.7	126
Pit 01-044														
1140554.04	723256.62	4793.09	8/24/2009	10444854	10111138018	Fail	Fail	48-54	6	15.1	6.9	5600	25.8	1310
1140554.04	723256.62	4793.09	8/24/2009	10445460	10111138008	Fail	Fail	54-60	6.2	10.3	3.5	2980	15	519
1140554.04	723256.62	4793.09	8/24/2009	10446066	10111138012	Fail	Fail	60-66	7	5.4	2.4	4290	12.5	553

Notes:

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Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
Pit 01-045														
1140693.10	723247.11	4792.79	9/24/2009	10455460	10113702001	Fail	Fail	54-60	7.6	U2.9	15.7	185	13.1	855
1140693.10	723247.11	4792.79	9/24/2009	10456066	10113702002	Pass	Pass	60-66	7	U2.3	U0.092	2.5	4.8	38
Pit 01-046														
1140750.00	723250.00		9/24/2009	10460006	10113702006	Fail	Fail	00-06	5	296	7.4	566	345	637
1140750.00	723250.00		9/24/2009	10460612	10113702007	Fail	Fail	06-12	6.7	1440	41.2	2280	659	1730
1140750.00	723250.00		9/24/2009	10461218	10113702008	Pass	Pass	12-18	7.2	1010	39.5	--	1420	6050
1140750.00	723250.00		9/24/2009	10461824	10113702009	Fail	Fail	18-24	8.1	3.7	17.8	5440	20.2	3030
1140750.00	723250.00		9/24/2009	10462430	10113702010	Pass	Pass	24-30	8.3	2.8	0.19	34.3	16.1	139
1140750.00	723250.00		9/24/2009	10463036	10113702011	Fail	Pass	30-36	8	U2.6	0.4	34.1	17.1	484
1140750.00	723250.00		9/24/2009	10463642	10117453013	Pass	Pass	36-42	8	4.4	0.37	11.7	10.3	399
1140750.00	723250.00		9/24/2009	10464248	10117453016	Pass	Pass	42-48	7.8	6.6	U0.11	20.5	19.3	122
Pit 01-048														
1141020.60	723242.72	4793.47	9/28/2009	10480002	10113937002	Pass	Pass	00-02	--	473	--	--	--	--
Pit 01-049														
1140261.63	723363.65	4794.79	8/25/2009	10490002	10111783019	Pass	Pass	00-02	--	136	--	--	--	--
Pit 01-050														
1140461.46	723389.24	4793.47	9/28/2009	10504248	10113935002	Fail	Fail	42-48	7.8	26.7	5.5	4210	73.1	781
1140461.46	723389.24	4793.47	9/28/2009	10504854	10113935003	Fail	Fail	48-54	8.2	7.9	1.8	1430	6.7	134
Pit 01-052														
1140621.25	723379.11	4793.56	9/24/2009	10524854	10113702017	Fail	Fail	48-54	7	U2.4	1	1490	9.3	190
1140621.25	723379.11	4793.56	9/24/2009	10525460	10113702018	Fail	Fail	54-60	7.5	U2.6	1	1860	11.9	241
Pit 01-053														
1140764.18	723367.45	4791.78	9/24/2009	10534248	10113702012	Fail	Fail	42-48	7.6	U2.7	4.5	2290	19.1	788
1140764.18	723367.45	4791.78	9/24/2009	10534854	10113702013	Fail	Pass	48-54	7.8	U2.4	12.2	269	7.4	439
Pit 01-054														
1140900.31	723382.94	4792.76	9/28/2009	10540006	10113937006	Fail	Fail	00-06	7.4	346	9.3	626	342	665

Notes:

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Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1140900.31	723382.94	4792.76	9/28/2009	10540612	10113937007	Fail	Fail	06-12	7.2	1200	23.8	917	631	941
1140900.31	723382.94	4792.76	9/28/2009	10541218	10113937008	Fail	Fail	12-18	7.7	176	10.6	8720	141	2750
1140900.31	723382.94	4792.76	9/28/2009	10541824	10113937009	Fail	Fail	18-24	8.1	20.8	3.6	259	16.9	1160
1140900.31	723382.94	4792.76	9/28/2009	10542430	10113937010	Pass	Pass	24-30	8.1	6.8	0.7	110	18.3	239
1140900.31	723382.94	4792.76	9/28/2009	10543036	10113937011	Pass	Pass	30-36	7.9	5	0.47	44.6	12.4	164
Pit 01-055														
1141009.07	723359.48	4792.51	9/29/2009	10550006	10113937012	Fail	Fail	00-06	8.2	544	13.5	910	608	592
1141009.07	723359.48	4792.51	9/29/2009	10550612	10113937013	Fail	Fail	06-12	8	441	16.8	4680	349	2410
1141009.07	723359.48	4792.51	9/29/2009	10551218	10113937014	Fail	Pass	12-18	8.2	53.3	2	208	40.8	391
1141009.07	723359.48	4792.51	9/29/2009	10551824	10113937015	Pass	Pass	18-24	8.2	26.2	0.82	154	30.3	167
1141009.07	723359.48	4792.51	9/29/2009	10552430	10113937016	Pass	Pass	24-30	8.2	7.3	0.21	53.8	14.7	57.7
Pit 01-056														
1140374.82	723460.07	4793.44	8/25/2009	10561218	10111783013	Fail	Fail	12-18	8	2120	57.4	18700	1000	4190
1140374.82	723460.07	4793.44	8/25/2009	10561824	10111783014	Fail	Fail	18-24	8.1	41.3	1.6	250	39.1	881
1140374.82	723460.07	4793.44	8/25/2009	10562430	10111783015	Pass	Pass	24-30	8.1	32	0.48	47.3	U2.4	38.8
Pit 01-057														
1140642.73	723495.69	4792.51	9/29/2009	10573642	10113925003	Fail	Fail	36-42	8.1	384	17	2080	492	2450
1140642.73	723495.69	4792.51	9/29/2009	10574248	10113925004	Fail	Fail	42-48	8.2	154	8.8	1360	180	1590
Pit 01-058														
1140764.87	723495.69	4793.11	9/29/2009	10583642	10113925001	Fail	Fail	36-42	7.5	27.6	2.3	3710	75.1	749
1140764.87	723495.69	4793.11	9/29/2009	10584248	10113925002	Fail	Fail	42-48	8.1	160	7.1	2360	199	1010
Pit 01-059														
1141011.21	723445.92	4792.35	9/28/2009	10590002	10113937005	Pass	Pass	00-02	--	275	--	--	--	--
Pit 01-060														
1140503.96	723649.35	4792.15	9/1/2009	10600006	10112270010	Fail	Fail	00-06	8.2	303	18.2	2220	258	923
1140503.96	723649.35	4792.15	9/1/2009	10600612	10112270011	Fail	Fail	06-12	8	669	39.2	5820	879	2000
1140503.96	723649.35	4792.15	9/1/2009	10601218	10112270012	Fail	Fail	12-18	6.8	754	39.5	2300	708	940

Notes:

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Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1140503.96	723649.35	4792.15	9/1/2009	10601824	10112270013	Fail	Fail	18-24	7.6	2780	142	4760	1050	2120
1140503.96	723649.35	4792.15	9/1/2009	10602430	10112270014	Fail	Fail	24-30	7.8	962	56.5	32200	2600	6230
1140503.96	723649.35	4792.15	9/1/2009	10603036	10112270015	Fail	Fail	30-36	8.2	12.3	19	168	22.9	6210
1140503.96	723649.35	4792.15	9/1/2009	10603642	10112270016	Fail	Fail	36-42	8.4	9	1.2	60.5	15.3	1310
1140503.96	723649.35	4792.15	9/1/2009	10604248	10112270017	Fail	Fail	42-48	8.4	11.8	1.2	167	18.1	1180
1140503.96	723649.35	4792.15	9/1/2009	10604854	10112270018	Fail	Fail	48-54	8.2	15.3	7	671	19.4	1540
1140503.96	723649.35	4792.15	9/1/2009	10605460	10112270019	Fail	Fail	54-60	8.2	60.4	6.5	1010	25.5	1470
Pit 01-061														
1140625.35	723635.06	4791.33	9/1/2009	10610006	10112267018	Fail	Pass	00-06	7.9	90.7	4.1	427	79.6	272
1140625.35	723635.06	4791.33	9/1/2009	10610612	10112267019	Fail	Fail	06-12	7.8	185	9.1	1160	210	841
1140625.35	723635.06	4791.33	9/1/2009	10611218	10112267020	Fail	Fail	12-18	7.6	992	24.6	1860	843	796
1140625.35	723635.06	4791.33	9/1/2009	10611824	10112270001	Fail	Fail	18-24	7.6	2750	136	3700	1160	1640
1140625.35	723635.06	4791.33	9/1/2009	10612430	10112270002	Fail	Fail	24-30	7.9	649	44.2	19800	2980	4690
1140625.35	723635.06	4791.33	9/1/2009	10613036	10112270003	Fail	Fail	30-36	8	7.3	3.7	34.5	15.8	8610
1140625.35	723635.06	4791.33	9/1/2009	10613642	10112270004	Pass	Pass	36-42	7.9	6.6	1.3	15	12.5	50.1
1140625.35	723635.06	4791.33	9/1/2009	10614248	10112270005	Pass	Pass	42-48	8.1	7.5	2.2	61	9.7	288
Pit 01-062														
1140796.79	723630.58	4791.10	9/1/2009	10620612	10112267012	Fail	Fail	06-12	6.9	187	28.3	4750	245	3840
1140796.79	723630.58	4791.10	9/1/2009	10621218	10112267013	Fail	Fail	12-18	5.8	652	15.1	1140	717	324
1140796.79	723630.58	4791.10	9/1/2009	10621824	10112267014	Fail	Fail	18-24	5	2060	48.8	2330	1140	1650
1140796.79	723630.58	4791.10	9/1/2009	10622430	10112267015	Fail	Fail	24-30	6.2	2090	50.4	6280	1940	2290
1140796.79	723630.58	4791.10	9/1/2009	10623036	10112267016	Fail	Fail	30-36	6.7	313	10	10600	656	1470
1140796.79	723630.58	4791.10	9/1/2009	10623642	10112267017	Fail	Fail	36-42	7	3.3	1.6	2130	15	410
Pit 01-063														
1140859.01	723634.63	4789.49	9/1/2009	10630006	10112270006	Fail	Pass	00-06	8.2	41.1	3.2	189	37.3	456
1140859.01	723634.63	4789.49	9/1/2009	10630612	10112270007	Fail	Fail	06-12	8.2	78.8	7	525	84.7	697
1140859.01	723634.63	4789.49	9/1/2009	10631218	10112270008	Fail	Fail	12-18	8.4	81.4	6.7	346	69.9	714

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1140859.01	723634.63	4789.49	9/1/2009	10631824	10112270009	Fail	Pass	18-24	8.2	52.2	7.5	237	45.9	369
Pit 01-064														
1141025.83	723673.76	4790.53	9/29/2009	10642430	10113925005	Fail	Fail	24-30	8.3	U2.2	7	128	13.2	969
1141025.83	723673.76	4790.53	9/29/2009	10643036	10113925006	Pass	Pass	30-36	8.1	U2.1	1.6	77.6	3.6	134
1141025.83	723673.76	4790.53	9/29/2009	10643642	10113925007	Pass	Pass	36-42	8	U2.4	0.85	25.3	3.8	77.9
Pit 01-065														
1141160.96	723624.29	4790.37	9/1/2009	10650002	10112274014	Pass	Pass	00-02	--	94.2	--	--	--	--
Pit 01-066														
1140440.20	723761.46	4791.28	9/1/2009	10660006	10112270020	Fail	Fail	00-06	8.3	438	23.9	3350	435	1190
1140440.20	723761.46	4791.28	9/1/2009	10660612	10112274001	Fail	Fail	06-12	8.1	381	22.7	534	550	435
1140440.20	723761.46	4791.28	9/1/2009	10661218	10112274002	Fail	Fail	12-18	7.9	470	30.2	2760	566	1610
1140440.20	723761.46	4791.28	9/1/2009	10661824	10112274003	Fail	Fail	18-24	6.7	3560	196	3420	1220	1580
1140440.20	723761.46	4791.28	9/1/2009	10662430	10112274004	Fail	Fail	24-30	8	478	42.4	64100	447	4530
1140440.20	723761.46	4791.28	9/1/2009	10663036	10112274005	Fail	Fail	30-36	8.2	10.6	8.3	4250	14.1	2310
1140440.20	723761.46	4791.28	9/1/2009	10663642	10112274006	Pass	Pass	36-42	8.2	9.6	U0.14	23.5	9.5	115
1140440.20	723761.46	4791.28	9/1/2009	10664248	10112274007	Fail	Fail	42-48	7.5	44.1	10	2910	8.7	1630
Pit 01-067														
1140634.18	723762.89	4790.77	9/1/2009	10670006	10112280004	Fail	Fail	00-06	7.9	788	35	2270	595	1220
1140634.18	723762.89	4790.77	9/1/2009	10670612	10112280005	Fail	Fail	06-12	7.6	446	24.6	3300	516	1570
1140634.18	723762.89	4790.77	9/1/2009	10671218	10112280006	Fail	Fail	12-18	6.4	947	38.2	1300	961	558
1140634.18	723762.89	4790.77	9/1/2009	10671824	10112280007	Fail	Fail	18-24	7.6	32	5.5	4210	41.3	439
1140634.18	723762.89	4790.77	9/1/2009	10672430	10112280008	Fail	Fail	24-30	7	16.5	6.4	2720	25.9	722
1140634.18	723762.89	4790.77	9/1/2009	10673036	10112280009	Fail	Fail	30-36	6.9	12	3.9	1910	24.6	386
1140634.18	723762.89	4790.77	9/1/2009	10673642	10112280010	Pass	Pass	36-42	7.7	5.5	1.2	8.4	5.1	238
Pit 01-069														
1140864.67	723726.01	4791.16	9/2/2009	10690006	10112281007	Fail	Fail	00-06	7.9	270	13.3	1750	367	1690
1140864.67	723726.01	4791.16	9/2/2009	10690612	10112281008	Fail	Fail	06-12	7.4	336	9.9	2120	366	1160

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1140864.67	723726.01	4791.16	9/2/2009	10691218	10112281009	Fail	Fail	12-18	7.5	1450	24.7	1010	749	1370
1140864.67	723726.01	4791.16	9/2/2009	10691824	10112281010	Fail	Fail	18-24	7.3	2140	35.8	9680	1490	1800
1140864.67	723726.01	4791.16	9/2/2009	10692430	10112281011	Fail	Fail	24-30	7.6	98	17.2	2940	43.6	2580
1140864.67	723726.01	4791.16	9/2/2009	10693036	10112281012	Fail	Fail	30-36	7.6	26.7	3.5	515	28.1	974
1140864.67	723726.01	4791.16	9/2/2009	10693642	10112281013	Fail	Fail	36-42	7.7	16	2.1	1630	33.9	611
Pit 01-070														
1141002.23	723752.33	4789.16	9/1/2009	10700006	10112274019	Fail	Fail	00-06	7.8	343	28.7	2230	325	1790
1141002.23	723752.33	4789.16	9/1/2009	10700612	10112274020	Fail	Fail	06-12	7.5	947	55.7	5570	747	2060
1141002.23	723752.33	4789.16	9/1/2009	10701218	10112277001	Fail	Fail	12-18	7.6	2820	70.4	22300	2520	4890
1141002.23	723752.33	4789.16	9/1/2009	10701824	10112277002	Fail	Fail	18-24	8.1	206	37.9	2150	1330	6490
1141002.23	723752.33	4789.16	9/1/2009	10702430	10112277003	Pass	Pass	24-30	7.6	7	0.15	63.3	18.9	69.8
1141002.23	723752.33	4789.16	9/1/2009	10703036	10112277004	Pass	Pass	30-36	7.5	U2	0.18	8.5	7.8	58
Pit 01-071														
1141144.57	723740.08	4791.05	9/1/2009	10710002	10112274018	Pass	Pass	00-02	--	66.2	--	--	--	--
Pit 01-072														
1141245.59	723743.26	4791.26	9/1/2009	10720002	10112274015	Pass	Pass	00-02	--	41.9	--	--	--	--
Pit 01-073														
1141362.85	723752.37	4792.31	9/1/2009	10730002	10112274017	Pass	Pass	00-02	--	32.1	--	--	--	--
Pit 01-074														
1140766.74	723870.39	4790.25	9/1/2009	10740006	10112274008	Fail	Fail	00-06	7.2	636	38	1750	540	1160
1140766.74	723870.39	4790.25	9/1/2009	10740612	10112274009	Fail	Fail	06-12	5	489	24.8	489	916	99.1
1140766.74	723870.39	4790.25	9/1/2009	10741218	10112274010	Fail	Fail	12-18	4.9	2330	122	1570	1270	2360
1140766.74	723870.39	4790.25	9/1/2009	10741824	10112274011	Fail	Fail	18-24	6.4	654	40.5	22600	1390	3270
1140766.74	723870.39	4790.25	9/1/2009	10742430	10112274012	Fail	Fail	24-30	8.2	28.8	17.5	805	20.6	6220
1140766.74	723870.39	4790.25	9/1/2009	10743036	10112274013	Fail	Fail	30-36	8.1	134	11.3	3960	75.7	3460
Pit 01-075														
1140875.46	723881.56	4788.88	9/1/2009	10750006	10112277005	Fail	Fail	00-06	7.8	806	20.5	1980	577	1520

Notes:

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Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1140875.46	723881.56	4788.88	9/1/2009	10750612	10112277006	Fail	Fail	06-12	7.6	497	12.2	661	538	702
1140875.46	723881.56	4788.88	9/1/2009	10751218	10112277007	Fail	Fail	12-18	6.5	1580	36.1	2010	1370	2390
1140875.46	723881.56	4788.88	9/1/2009	10751824	10112277008	Fail	Fail	18-24	7.6	1250	31.8	10800	778	1660
1140875.46	723881.56	4788.88	9/1/2009	10752430	10112277009	Fail	Fail	24-30	7.7	1470	50.6	16800	2140	4640
1140875.46	723881.56	4788.88	9/1/2009	10753036	10112277010	Fail	Fail	30-36	8.1	62.8	5.1	335	55	3980
1140875.46	723881.56	4788.88	9/1/2009	10753642	10112277011	Pass	Pass	36-42	6.4	U2.3	U0.093	48.9	15.2	56.9
1140875.46	723881.56	4788.88	9/1/2009	10754248	10112277012	Fail	Fail	42-48	7	6.2	0.26	71.9	27.1	1000
Pit 01-077														
1141129.30	723889.78	4787.86	9/21/2009	10772430	10113184005	Fail	Fail	24-30	6.9	U3	8.1	364	12.5	2860
1141129.30	723889.78	4787.86	9/21/2009	10773036	10113184006	Pass	Pass	30-36	7.4	U3.9	0.29	21.9	10.7	62
1141129.30	723889.78	4787.86	9/21/2009	10773642	10113184007	Pass	Pass	36-42	7	4	U0.079	2.1	6.7	275
Pit 01-078														
1141250.79	723881.32	4787.61	9/21/2009	10783036	10113184008	Fail	Fail	30-36	7.6	2.9	0.75	900	7.8	109
1141250.79	723881.32	4787.61	9/21/2009	10783642	10113184009	Fail	Fail	36-42	7.7	23.4	1.3	1480	24	137
Pit 01-079														
1141491.77	723863.59	4791.72	9/1/2009	10790002	10112274016	Pass	Pass	00-02	--	28	--	--	--	--
Pit 01-080														
1140738.88	723988.75	4789.91	9/1/2009	10800006	10112280011	Fail	Fail	00-06	8.1	500	21.4	1260	463	777
1140738.88	723988.75	4789.91	9/1/2009	10800612	10112280012	Fail	Fail	06-12	4.2	1930	77.2	1930	944	2170
1140738.88	723988.75	4789.91	9/1/2009	10801218	10112280013	Fail	Fail	12-18	5.5	2310	89.6	2360	1500	2030
1140738.88	723988.75	4789.91	9/1/2009	10801824	10112280014	Fail	Fail	18-24	7.1	585	26	9040	1820	1470
1140738.88	723988.75	4789.91	9/1/2009	10802430	10112280015	Fail	Fail	24-30	7.7	49.1	9.9	24100	539	2250
1140738.88	723988.75	4789.91	9/1/2009	10803036	10112280016	Fail	Fail	30-36	7.9	25.1	2.8	109	56.9	3440
1140738.88	723988.75	4789.91	9/1/2009	10803642	10112280017	Pass	Pass	36-42	8	11.6	2	24.1	17.8	86.7
1140738.88	723988.75	4789.91	9/1/2009	10804248	10112280018	Pass	Pass	42-48	8.2	5.3	1.2	20.3	13.2	53
Pit 01-081														
1140873.35	723971.41	4789.65	9/1/2009	10810006	10112277013	Fail	Fail	00-06	7.7	924	20.5	705	631	1480

Notes:

(s.u.) - Standard units
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Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1140873.35	723971.41	4789.65	9/1/2009	10810612	10112277014	Fail	Fail	06-12	7.5	278	12.4	16400	410	3800
1140873.35	723971.41	4789.65	9/1/2009	10811218	10112277015	Fail	Pass	12-18	7.9	14.2	0.55	146	16.2	496
1140873.35	723971.41	4789.65	9/1/2009	10811824	10112277016	Fail	Fail	18-24	8	118	3.8	695	93.9	434
1140873.35	723971.41	4789.65	9/1/2009	10812430	10112277017	Fail	Pass	24-30	8	75.4	2.4	337	79.3	339
1140873.35	723971.41	4789.65	9/1/2009	10813036	10112277018	Fail	Pass	30-36	8.1	44.1	1.3	246	37.9	386
1140873.35	723971.41	4789.65	9/1/2009	10813642	10112277019	Pass	Pass	36-42	8.1	40.9	1.2	160	44.9	187
1140873.35	723971.41	4789.65	9/1/2009	10814248	10112277020	Pass	Pass	42-48	8.1	20.5	0.5	70.6	23.8	111
Pit 01-082														
1141002.26	723984.24	4788.71	9/2/2009	10820006	10112440009	Fail	Fail	00-06	8	647	27	1870	599	1300
1141002.26	723984.24	4788.71	9/2/2009	10820612	10112440010	Fail	Fail	06-12	7.4	1650	65.2	4220	1040	2150
1141002.26	723984.24	4788.71	9/2/2009	10821218	10112440011	Fail	Fail	12-18	6.8	2930	103	2290	1040	1480
1141002.26	723984.24	4788.71	9/2/2009	10821824	10112440012	Fail	Fail	18-24	7.2	1950	73.6	20000	2100	3440
1141002.26	723984.24	4788.71	9/2/2009	10822430	10112440013	Fail	Fail	24-30	7.8	306	31.9	27400	795	4660
1141002.26	723984.24	4788.71	9/2/2009	10823036	10112440014	Fail	Fail	30-36	7.8	14.7	3.2	66.7	18.9	3730
1141002.26	723984.24	4788.71	9/2/2009	10823642	10112440015	Fail	Pass	36-42	7.8	15.5	2	40.6	18.1	713
1141002.26	723984.24	4788.71	9/2/2009	10824248	10112440016	Pass	Pass	42-48	7.8	4.4	1.4	4.1	4.6	179
Pit 01-083														
1141123.40	724008.78	4788.97	9/21/2009	10833036	10113184001	Fail	Fail	30-36	7.3	19.8	15.4	1160	19.8	3330
1141123.40	724008.78	4788.97	9/21/2009	10833642	10113184002	Fail	Pass	36-42	8.1	4.4	1.1	30.8	9.6	724
1141123.40	724008.78	4788.97	9/21/2009	10834248	10113184003	Fail	Pass	42-48	7.8	3.8	1.1	70.8	11.6	637
Pit 01-084														
1141265.04	724008.42	4788.16	9/21/2009	10841824	10117453012	Fail	Pass	18-24	7.9	8.5	2.1	1210	22.9	560
1141265.04	724008.42	4788.16	9/21/2009	10842430	10113184010	Fail	Pass	24-30	8	U2	1.5	162	13.6	473
1141265.04	724008.42	4788.16	9/21/2009	10843036	10113184011	Fail	Pass	30-36	7.9	5.7	1.4	135	13.5	425
Pit 01-085														
1141375.40	723998.87	4787.73	9/21/2009	10853036	10113184012	Fail	Fail	30-36	7.7	452	12.9	2100	403	4930
1141375.40	723998.87	4787.73	9/21/2009	10853642	10113184013	Fail	Fail	36-42	7.6	371	14.4	2330	437	3300

Notes:

(s.u.) - Standard units
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-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
Pit 01-088														
1140615.11	724006.38	4790.38	9/30/2009	10883642	10113929016	Fail	Fail	36-42	8.2	43.3	11.3	1290	53.3	1170
1140615.11	724006.38	4790.38	9/30/2009	10884248	10113929017	Fail	Fail	42-48	8.1	23.5	4.2	396	24.8	483
Pit 01-089														
1140755.89	724075.22	4790.60	9/30/2009	10890006	10113930012	Fail	Fail	00-06	7.9	253	22.6	1500	292	1600
1140755.89	724075.22	4790.60	9/30/2009	10890612	10113930013	Fail	Fail	06-12	7.4	1160	56.2	1460	670	939
1140755.89	724075.22	4790.60	9/30/2009	10891218	10113930014	Fail	Fail	12-18	7.8	18	0.99	256	10.6	578
1140755.89	724075.22	4790.60	9/30/2009	10891824	10113930015	Pass	Pass	18-24	8.2	20.1	0.99	87.1	15.8	105
1140755.89	724075.22	4790.60	9/30/2009	10892430	10113930016	Pass	Pass	24-30	8.1	13.6	0.93	84.7	17.4	104
1140755.89	724075.22	4790.60	9/30/2009	10893036	10113930017	Pass	Pass	30-36	8.1	19.6	1.3	101	18.9	86.6
Pit 01-091														
1141081.42	724130.07	4789.01	9/2/2009	10910006	10112285012	Fail	Fail	00-06	4.6	519	26.5	4940	471	2230
1141081.42	724130.07	4789.01	9/2/2009	10910612	10112285013	Fail	Fail	06-12	3.9	840	31.8	1060	912	479
1141081.42	724130.07	4789.01	9/2/2009	10911218	10112285014	Fail	Fail	12-18	4.9	3430	123	5720	2480	1990
1141081.42	724130.07	4789.01	9/2/2009	10911824	10112285015	Fail	Fail	18-24	5	308	16	14000	785	1990
1141081.42	724130.07	4789.01	9/2/2009	10912430	10112285016	Fail	Fail	24-30	5.5	14	8.1	21100	48.7	2190
1141081.42	724130.07	4789.01	9/2/2009	10913036	10112285017	Fail	Fail	30-36	5.6	7.5	2.8	5550	15.5	524
1141081.42	724130.07	4789.01	9/2/2009	10913642	10112285018	Fail	Fail	36-42	5.9	9.1	4.9	7440	25.4	1180
1141081.42	724130.07	4789.01	9/2/2009	10914248	10112285019	Fail	Fail	42-48	6.5	6.4	3	2930	10.6	481
1141081.42	724130.07	4789.01	9/2/2009	10914854	10112285020	Fail	Fail	48-54	7.1	17.5	2.8	790	18.5	357
Pit 01-092														
1141226.12	724142.73	4788.92	9/21/2009	10922430	10113183018	Fail	Fail	24-30	7.4	9	45.6	874	14.4	7650
1141226.12	724142.73	4788.92	9/21/2009	10923036	10113183019	Pass	Pass	30-36	8.1	6.3	1.6	303	6	189
1141226.12	724142.73	4788.92	9/21/2009	10923642	10113183020	Pass	Pass	36-42	8.1	5.9	1.8	28.9	7.7	420
Pit 01-093														
1141376.41	724128.66	4787.35	9/21/2009	10933642	10113183013	Fail	Fail	36-42	7.9	308	22.9	2050	298	2410
1141376.41	724128.66	4787.35	9/21/2009	10934248	10113183014	Fail	Fail	42-48	8.1	385	26.5	1680	247	2900

Notes:

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Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
Pit 01-094														
1141541.88	724159.16	4785.72	9/2/2009	10940006	10112440018	Fail	Fail	00-06	8	126	9.2	819	113	646
1141541.88	724159.16	4785.72	9/2/2009	10940612	10112440019	Fail	Fail	06-12	8	230	24.1	1670	282	2120
1141541.88	724159.16	4785.72	9/2/2009	10941218	10112440020	Fail	Fail	12-18	8	343	27.8	2260	398	2420
1141541.88	724159.16	4785.72	9/2/2009	10941824	10112441001	Fail	Fail	18-24	7.8	186	18.2	1920	204	1510
1141541.88	724159.16	4785.72	9/2/2009	10942430	10112441002	Fail	Fail	24-30	8.1	196	21.1	3370	243	1450
1141541.88	724159.16	4785.72	9/2/2009	10943036	10112441003	Fail	Fail	30-36	7.8	107	28	1060	106	2000
1141541.88	724159.16	4785.72	9/2/2009	10943642	10112441004	Fail	Fail	36-42	6.1	113	17.4	1440	184	2340
Pit 01-095														
1141632.18	724134.87	4789.54	9/2/2009	10950002	10112441005	Pass	Pass	00-02	--	--102	--	--	--	--
Pit 01-096														
1140756.58	724248.60	4788.19	9/22/2009	10960006	10113322009	Fail	Fail	00-06	5.9	627	41.1	4430	457	1840
1140756.58	724248.60	4788.19	9/22/2009	10960612	10113322010	Fail	Fail	06-12	8	203	22.2	2360	234	2440
1140756.58	724248.60	4788.19	9/22/2009	10961218	10113322011	Fail	Fail	12-18	8.1	167	16.7	3210	141	1470
1140756.58	724248.60	4788.19	9/22/2009	10961824	10113322012	Pass	Pass	18-24	8.1	18.3	1.4	59.4	17.3	98.5
1140756.58	724248.60	4788.19	9/22/2009	10962430	10113322013	Pass	Pass	24-30	8.1	7.8	1.1	13.1	9.4	42.6
Pit 01-097														
1140852.41	724235.43	4788.30	9/22/2009	10973642	10113322007	Fail	Fail	36-42	7.9	18.8	2.5	1510	6.7	228
1140852.41	724235.43	4788.30	9/22/2009	10974248	10113322008	Fail	Pass	42-48	8.1	5.7	0.78	441	4.3	137
Pit 01-098														
1141030.89	724229.64	4789.61	9/30/2009	10980006	10113930018	Fail	Fail	00-06	7.2	214	13.2	537	252	449
1141030.89	724229.64	4789.61	9/30/2009	10980612	10113930019	Fail	Fail	06-12	7.6	345	20.5	1920	337	1020
1141030.89	724229.64	4789.61	9/30/2009	10981218	10113930020	Fail	Fail	12-18	8	1140	57.2	12700	1590	2480
1141030.89	724229.64	4789.61	9/30/2009	10981824	10113931001	Fail	Fail	18-24	8	32.6	4.5	312	23.6	1940
1141030.89	724229.64	4789.61	9/30/2009	10982430	10113931002	Fail	Pass	24-30	7.9	10.7	1.4	285	12.7	322
1141030.89	724229.64	4789.61	9/30/2009	10983036	10113931003	Pass	Pass	30-36	8.3	6.5	0.58	36.1	12.6	263
Pit 01-099														

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141125.22	724280.63	4788.42	9/21/2009	10992430	10113322001	Fail	Fail	24-30	7.8	68.1	5.4	596	141	997
1141125.22	724280.63	4788.42	9/21/2009	10993036	10113322002	Fail	Fail	30-36	8.1	32.6	6.1	259	104	1190
1141125.22	724280.63	4788.42	9/21/2009	10993642	10113322003	Pass	Pass	36-42	8	U2.3	0.31	27.3	12.7	171
Pit 01-101														
1141372.85	724249.55	4786.58	9/21/2009	11012430	10113184014	Fail	Fail	24-30	7.9	9.1	0.68	2200	13.6	210
1141372.85	724249.55	4786.58	9/21/2009	11013036	10113184015	Fail	Fail	30-36	8.1	4	1.2	1230	16.8	403
1141372.85	724249.55	4786.58	9/21/2009	11013642	10113184016	Pass	Pass	36-42	8	U2.8	0.37	84	7	306
Pit 01-104														
1140907.82	724370.67	4786.78	9/22/2009	11042430	10113322004	Fail	Fail	24-30	7.7	908	25.7	13700	708	2450
1140907.82	724370.67	4786.78	9/22/2009	11043036	10113322005	Pass	Pass	30-36	7.3	48.2	4.6	56.2	23.7	140
1140907.82	724370.67	4786.78	9/22/2009	11043642	10113322006	Pass	Pass	36-42	7.5	14.5	2.4	85.5	23	157
Pit 01-105														
1140934.37	724316.16	4786.96	9/17/2009	11051824	10112920004	Fail	Fail	18-24	8.1	1700	44.8	11600	853	3280
1140934.37	724316.16	4786.96	9/17/2009	11052430	10112920005	Pass	Pass	24-30	8	17.2	0.71	34.2	21	287
1140934.37	724316.16	4786.96	9/17/2009	11053036	10112920006	Pass	Pass	30-36	7.7	U3.3	0.39	25	14.9	102
Pit 01-106														
1140998.70	724389.41	4786.99	9/17/2009	11062430	10112920001	Fail	Fail	24-30	7.5	40	30.1	836	78	3460
1140998.70	724389.41	4786.99	9/17/2009	11063036	10112920002	Fail	Pass	30-36	7.8	11.7	0.95	29.7	12.6	571
1140998.70	724389.41	4786.99	9/17/2009	11063642	10112920003	Pass	Pass	36-42	7.9	4.2	0.43	27.5	18.8	109
Pit 01-107														
1141143.27	724371.65	4787.64	9/21/2009	11073036	10113183006	Fail	Fail	30-36	7.5	410	37.2	3010	2570	4260
1141143.27	724371.65	4787.64	9/21/2009	11073642	10113183007	Pass	Pass	36-42	7.6	9.8	1.7	29.9	16.8	80.9
1141143.27	724371.65	4787.64	9/21/2009	11074248	10113183008	Pass	Pass	42-48	7.9	9.5	1.9	29.4	17.2	106
Pit 01-108														
1141252.81	724365.66	4786.21	9/21/2009	11083036	10113183004	Fail	Fail	30-36	7.7	46.2	4.7	160	19	1010
1141252.81	724365.66	4786.21	9/21/2009	11083642	10113183005	Fail	Fail	36-42	7.4	4.5	4.8	1630	5.9	260
Pit 01-109														

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141377.23	724373.42	4786.46	9/21/2009	11093036	10113183009	Fail	Fail	30-36	8	104	11.2	1660	196	2710
1141377.23	724373.42	4786.46	9/21/2009	11093642	10113183010	Pass	Pass	36-42	7.5	8	1	13.2	9.5	44.7
1141377.23	724373.42	4786.46	9/21/2009	11094248	10113183011	Pass	Pass	42-48	7.6	7.1	1.2	13.7	10.6	61.2
Pit 01-110														
1141513.14	724453.28	4786.85	9/2/2009	11100006	10112441007	Fail	Fail	00-06	7.4	574	25.2	1570	671	769
1141513.14	724453.28	4786.85	9/2/2009	11100612	10112441008	Fail	Fail	06-12	4.3	1090	41.9	1130	1030	1080
1141513.14	724453.28	4786.85	9/2/2009	11101218	10112441009	Fail	Fail	12-18	4.3	2810	102	1980	1110	1980
1141513.14	724453.28	4786.85	9/2/2009	11101824	10112441010	Fail	Fail	18-24	5.5	3520	126	4530	1910	2100
1141513.14	724453.28	4786.85	9/2/2009	11102430	10112441011	Fail	Fail	24-30	7.4	32.8	9.9	13000	196	1800
1141513.14	724453.28	4786.85	9/2/2009	11103036	10112441012	Fail	Fail	30-36	8	11.8	5.2	1480	17.5	824
1141513.14	724453.28	4786.85	9/2/2009	11103642	10112441013	Pass	Pass	36-42	8	10.4	2.2	26.8	17.8	80.5
Pit 01-111														
1141636.32	724376.52	4789.69	9/3/2009	11110002	10112281014	Pass	Pass	00-02	--	41.2	--	--	--	--
Pit 01-114														
1140831.05	724561.93	4785.97	9/16/2009	11141824	10112916013	Fail	Fail	18-24	8	261	12.7	2820	196	2470
1140831.05	724561.93	4785.97	9/16/2009	11142430	10112916012	Fail	Fail	24-30	8.1	U2.7	2.6	268	19.3	916
Pit 01-115														
1140957.13	724484.44	4786.60	9/17/2009	11151824	10112920007	Fail	Fail	18-24	7.5	6.2	4.5	5630	18.7	1630
1140957.13	724484.44	4786.60	9/17/2009	11152430	10112920008	Fail	Fail	24-30	7.6	U2.7	0.46	800	6.3	119
Pit 01-116														
1141118.48	724502.05	4786.96	9/16/2009	11162430	10112916005	Fail	Fail	24-30	7.9	14.1	22	6540	20.1	3510
1141118.48	724502.05	4786.96	9/16/2009	11163036	10112916003	Fail	Fail	30-36	8	7.9	3.4	627	23.2	724
1141118.48	724502.05	4786.96	9/16/2009	11163642	10112916004	Pass	Pass	36-42	7.7	U3.1	0.7	28.3	15	318
Pit 01-117														
1141255.12	724501.61	4786.41	9/16/2009	11174248	10112919008	Fail	Fail	42-48	7.3	3480	176	28000	1330	6420
1141255.12	724501.61	4786.41	9/16/2009	11174854	10112921012	Pass	Pass	48-54	7.8	65.4	4.7	101	135	261
1141255.12	724501.61	4786.41	9/16/2009	11175460	10112921011	Pass	Pass	54-60	7.9	30.9	2.6	41.1	66.8	138

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
Pit 01-118														
1141373.94	724505.20	4786.12	9/16/2009	11183036	10112921008	Fail	Fail	30-36	8	11.9	6.5	224	15.1	1810
1141373.94	724505.20	4786.12	9/16/2009	11183642	10112921009	Pass	Pass	36-42	7.2	6.6	1.3	16.5	10.6	61.9
1141373.94	724505.20	4786.12	9/16/2009	11184248	10112921010	Pass	Pass	42-48	7.4	5.9	1.4	18.4	11.3	80
Pit 01-119														
1141604.81	724533.27	4786.80	9/2/2009	11190006	10112441014	Fail	Fail	00-06	7.7	872	44	6210	887	2380
1141604.81	724533.27	4786.80	9/2/2009	11190612	10112441015	Fail	Fail	06-12	7	673	44.8	6010	810	2970
1141604.81	724533.27	4786.80	9/2/2009	11191218	10112441016	Fail	Fail	12-18	5.8	1060	15.1	2350	919	543
1141604.81	724533.27	4786.80	9/2/2009	11191824	10112441017	Fail	Fail	18-24	5.9	678	10.3	1650	687	550
1141604.81	724533.27	4786.80	9/2/2009	11192430	10112441018	Fail	Fail	24-30	6.1	1490	20.9	1880	1120	647
1141604.81	724533.27	4786.80	9/2/2009	11193036	10112441019	Fail	Fail	30-36	6.3	3670	53.1	8090	2090	2110
1141604.81	724533.27	4786.80	9/2/2009	11193642	10112441020	Fail	Fail	36-42	7.7	262	20	16100	880	3780
1141604.81	724533.27	4786.80	9/2/2009	11194248	10112442001	Fail	Fail	42-48	7.9	15.5	4.7	517	48.8	682
1141604.81	724533.27	4786.80	9/2/2009	11194854	10112442002	Pass	Pass	48-54	7.9	21.9	1.1	132	45.8	237
Pit 01-120														
1141720.63	724558.16	4787.96	9/3/2009	11200002	10112442003	Pass	Pass	00-02	--	36.9	--	--	--	--
Pit 01-120150E														
1141820.79	724521.07	4790.53	9/10/2009	120150E000	10112879004	Pass	Pass	00-02	--	20.5	--	--	--	--
Pit 01-121														
1140909.67	724679.45	4785.74	9/22/2009	11213036	10113326001	Fail	Pass	30-36	7.3	15.3	3.4	53.3	27.4	510
1140909.67	724679.45	4785.74	9/22/2009	11213642	10113326002	Pass	Pass	36-42	7.2	10.3	2.4	39.7	20.7	179
1140909.67	724679.45	4785.74	9/22/2009	11214248	10113326003	Pass	Pass	42-48	7.5	9.3	1.9	25.2	17.3	428
Pit 01-122														
1141013.93	724620.18	4785.62	9/16/2009	11221218	10112916010	Fail	Fail	12-18	7.4	3870	96.1	24400	2990	4800
1141013.93	724620.18	4785.62	9/16/2009	11221824	10112916009	Fail	Fail	18-24	7.8	235	7.2	1300	321	946
1141013.93	724620.18	4785.62	9/16/2009	11222430	10112916011	Pass	Pass	24-30	8	7.5	0.53	43.3	30.5	146
Pit 01-123														

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141125.67	724601.37	4786.59	9/16/2009	11232430	10112916008	Fail	Fail	24-30	8	17.3	1.4	343	20.2	3230
1141125.67	724601.37	4786.59	9/16/2009	11233036	10112916007	Pass	Pass	30-36	8.1	9.7	0.35	21.9	15.9	260
1141125.67	724601.37	4786.59	9/16/2009	11233642	10112916006	Pass	Pass	36-42	8	U3.8	0.38	21.5	14.7	81.8
Pit 01-124														
1141241.26	724596.50	4786.19	9/21/2009	11243036	10113183001	Fail	Fail	30-36	7.4	10.2	42.5	6540	22.1	3830
1141241.26	724596.50	4786.19	9/21/2009	11243642	10113183002	Pass	Pass	36-42	7.8	16.9	2.4	27.7	19.3	103
1141241.26	724596.50	4786.19	9/21/2009	11244248	10113183003	Pass	Pass	42-48	8	7.4	0.96	12.4	10.2	46.4
Pit 01-125														
1141372.52	724626.11	4785.75	9/16/2009	11253036	10112921003	Fail	Fail	30-36	8	45.3	6	4910	38.2	803
1141372.52	724626.11	4785.75	9/16/2009	11253642	10112921002	Fail	Fail	36-42	7.2	11.5	6.3	182	13.5	2180
1141372.52	724626.11	4785.75	9/16/2009	11254248	10112921001	Fail	Fail	42-48	7.4	65.5	5.2	659	35.1	574
Pit 01-126														
1141501.23	724621.04	4785.88	9/16/2009	11263036	10112921004	Fail	Fail	30-36	8	4.8	8	1080	8.9	1200
1141501.23	724621.04	4785.88	9/16/2009	11263642	10112921005	Pass	Pass	36-42	7.5	13.4	2.3	23.6	15.6	165
1141501.23	724621.04	4785.88	9/16/2009	11264248	10112921006	Pass	Pass	42-48	7.4	11.4	2.1	31.7	21	134
Pit 01-127														
1141618.41	724629.22	4786.87	9/17/2009	11273036	10112916018	Fail	Fail	30-36	7.4	U2.4	2.1	2790	16.7	517
1141618.41	724629.22	4786.87	9/17/2009	11273642	10112916017	Fail	Pass	36-42	8	2.2	0.48	452	15.1	80.7
Pit 01-130														
1141003.53	724730.38	4785.63	9/16/2009	11302430	10112919010	Fail	Fail	24-30	7.9	24.8	9.7	2030	21.3	1100
1141003.53	724730.38	4785.63	9/16/2009	11303036	10112919009	Fail	Pass	30-36	7.8	31.6	3.2	441	21.4	157
1141003.53	724730.38	4785.63	9/16/2009	11303642	10112919011	Pass	Pass	36-42	8	5.5	1.4	22.5	12	53.8
Pit 01-131														
1141143.53	724740.12	4785.73	9/16/2009	11313642	10112919006	Pass	Pass	36-42	7.6	8.9	1.6	19.3	14.6	63.1
1141143.53	724740.12	4785.73	9/16/2009	11314248	10112919005	Pass	Pass	42-48	7.9	8.9	1.8	22.7	16.6	72.9
Pit 01-132														
1141256.32	724747.89	4785.05	9/16/2009	11320006	10112919004	Fail	Fail	00-06	8.2	864	42.8	2780	672	1410

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141256.32	724747.89	4785.05	9/16/2009	11320612	10112919003	Fail	Fail	06-12	8.1	957	47.6	2640	670	1860
1141256.32	724747.89	4785.05	9/16/2009	11321218	10112919002	Fail	Fail	12-18	8	608	31.7	5810	904	1210
1141256.32	724747.89	4785.05	9/16/2009	11321824	10112919001	Fail	Fail	18-24	7.6	40	3.2	1130	31.2	336
1141256.32	724747.89	4785.05	9/16/2009	11322430	10112916020	Fail	Fail	24-30	7.8	U3.1	0.58	687	9.1	208
1141256.32	724747.89	4785.05	9/16/2009	11323036	10112916019	Pass	Pass	30-36	7.7	U2.5	0.11	10.2	9.6	163
Pit 01-133														
1141377.66	724765.99	4784.87	9/16/2009	11332430	10112916001	Fail	Fail	24-30	6.9	6.2	1.8	1290	16.2	422
1141377.66	724765.99	4784.87	9/16/2009	11333036	10112915020	Pass	Pass	30-36	7.4	4.6	1.4	352	5.6	137
1141377.66	724765.99	4784.87	9/16/2009	11333642	10112915019	Fail	Pass	36-42	7.4	3.4	1.4	501	6.1	136
Pit 01-134														
1141517.35	724759.52	4785.86	9/29/2009	11343036	10113929006	Fail	Fail	30-36	8	12.8	5.9	110	15.6	854
1141517.35	724759.52	4785.86	9/29/2009	11343642	10113929007	Fail	Pass	36-42	8.5	13.5	3.6	102	20.3	545
1141517.35	724759.52	4785.86	9/29/2009	11344248	10113929008	Pass	Pass	42-48	8	7.1	1.4	16.2	14.2	64.1
Pit 01-135														
1141641.91	724761.17	4786.08	9/17/2009	11354248	10112920020	Fail	Fail	42-48	7.9	93.4	54.9	2600	65.1	4540
1141641.91	724761.17	4786.08	9/17/2009	11354854	10112920019	Fail	Fail	48-54	7.4	154	4.6	2020	142	1390
Pit 01-136														
1141744.24	724713.39	4785.90	9/17/2009	11363642	10112916014	Fail	Fail	36-42	8.1	266	7.9	1240	245	1920
1141744.24	724713.39	4785.90	9/17/2009	11364248	10112916015	Fail	Fail	42-48	7.9	241	6.6	986	205	1040
Pit 01-137														
1141920.30	724716.02	4788.02	9/3/2009	11371824	10112442010	Fail	Fail	18-24	7.9	263	7.2	2030	243	984
1141920.30	724716.02	4788.02	9/3/2009	11372430	10112442011	Pass	Pass	24-30	8	21.1	1.1	140	16.8	148
1141920.30	724716.02	4788.02	9/3/2009	11373036	10112442012	Pass	Pass	30-36	7.9	8.3	0.24	33.2	19.7	92.8
Pit 01-137140E														
1142059.27	724747.68	4787.68	9/10/2009	137140E000	10112881004	Pass	Pass	00-02	--	47.7	--	--	--	--
Pit 01-138														
1141035.06	724820.39	4785.40	9/22/2009	11380006	10113326004	Fail	Fail	00-06	8.4	769	52.3	4760	562	2130

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141035.06	724820.39	4785.40	9/22/2009	11380612	10113326005	Fail	Fail	06-12	8.3	21.9	3.3	87.8	13.5	1070
1141035.06	724820.39	4785.40	9/22/2009	11381218	10113326006	Pass	Pass	12-18	8.3	7.8	0.45	54.8	18.1	102
1141035.06	724820.39	4785.40	9/22/2009	11381824	10113326007	Pass	Pass	18-24	8.3	5	0.45	54.4	18.3	85.7
Pit 01-139														
1141157.92	724885.06	4785.82	9/16/2009	11390006	10112919015	Fail	Fail	00-06	8	1810	102	11900	1150	5340
1141157.92	724885.06	4785.82	9/16/2009	11390612	10112919014	Pass	Pass	06-12	8.3	18.2	1.7	72.4	15.6	90.5
1141157.92	724885.06	4785.82	9/16/2009	11391218	10112919013	Pass	Pass	12-18	8.2	8.8	0.84	8.8	5.1	24
1141157.92	724885.06	4785.82	9/16/2009	11391824	10112919012	Pass	Pass	18-24	8.1	8.3	0.91	15.8	6.1	26.5
Pit 01-140														
1141277.47	724866.59	4785.72	9/16/2009	11400002	10112919020	Pass	Pass	00-02	--	508	--	--	--	--
Pit 01-141														
1141386.60	724867.07	4784.72	9/16/2009	11414248	10112915018	Fail	Fail	42-48	7.1	3.1	2.5	395	6.4	410
1141386.60	724867.07	4784.72	9/16/2009	11414854	10112915017	Fail	Pass	48-54	7.7	U2.9	0.44	726	5.6	56.4
Pit 01-142														
1141624.89	724880.51	4785.74	9/8/2009	11420006	10112765014	Fail	Fail	00-06	7.9	398	9.7	1580	341	967
1141624.89	724880.51	4785.74	9/8/2009	11420612	10112765015	Fail	Fail	06-12	8	377	7.9	2380	498	805
1141624.89	724880.51	4785.74	9/8/2009	11421218	10112765016	Fail	Fail	12-18	6.4	781	15.6	802	669	1870
1141624.89	724880.51	4785.74	9/8/2009	11421824	10112765017	Fail	Fail	18-24	4.5	2010	34.1	1210	877	1380
1141624.89	724880.51	4785.74	9/8/2009	11422430	10112765018	Fail	Fail	24-30	6	774	15	12800	1250	1680
1141624.89	724880.51	4785.74	9/8/2009	11423036	10112765019	Fail	Fail	30-36	5.4	63.1	16.4	19400	699	2980
1141624.89	724880.51	4785.74	9/8/2009	11423642	10112765020	Fail	Fail	36-42	7.7	5.2	20.8	2220	15.1	2660
1141624.89	724880.51	4785.74	9/8/2009	11424248	10112766001	Fail	Fail	42-48	6.9	10.1	10.6	469	16.1	1360
1141624.89	724880.51	4785.74	9/8/2009	11424854	10112766002	Fail	Pass	48-54	6.8	5.8	2	459	7.5	227
1141624.89	724880.51	4785.74	9/8/2009	11425460	10112766003	Pass	Pass	54-60	6.8	5.4	1.1	14.4	9.7	66.4
1141624.89	724880.51	4785.74	9/8/2009	11426066	10112766004	Pass	Pass	60-66	6.8	9.7	1.3	21.9	9.9	63.3
Pit 01-143														
1141721.38	724881.13	4785.37	9/3/2009	11430006	10112442019	Fail	Fail	00-06	5.7	382	11.2	3890	389	1630

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141721.38	724881.13	4785.37	9/3/2009	11430612	10112442020	Fail	Fail	06-12	5.9	387	9.7	1560	357	850
1141721.38	724881.13	4785.37	9/3/2009	11431218	10112443001	Fail	Fail	12-18	4.3	619	15.2	745	548	1530
1141721.38	724881.13	4785.37	9/3/2009	11431824	10112443002	Fail	Fail	18-24	5	656	14.7	658	445	1330
1141721.38	724881.13	4785.37	9/3/2009	11432430	10112443003	Fail	Fail	24-30	6.8	1620	35.5	2100	902	2120
1141721.38	724881.13	4785.37	9/3/2009	11433036	10112443004	Fail	Fail	30-36	8.1	U3.9	27.2	3780	20	5030
1141721.38	724881.13	4785.37	9/3/2009	11433642	10112443005	Fail	Fail	36-42	7.3	U3.3	2.7	77	16	2410
1141721.38	724881.13	4785.37	9/3/2009	11434248	10112443006	Pass	Pass	42-48	7.7	U2.6	U0.1	6.4	7.5	78.5
1141721.38	724881.13	4785.37	9/3/2009	11434854	10112443007	Pass	Pass	48-54	7.4	U3.1	U0.13	8.9	10.3	127
Pit 01-144														
1142116.10	724873.13	4786.35	9/9/2009	11440002	10112885005	Pass	Pass	00-02	--	108	--	--	--	--
Pit 01-145														
1141195.95	725017.25	4784.08	9/16/2009	11450006	10112919016	Fail	Fail	00-06	8	840	47.7	3040	704	2070
1141195.95	725017.25	4784.08	9/16/2009	11450612	10112919017	Fail	Fail	06-12	7.9	55.5	15.1	3000	58.2	3000
1141195.95	725017.25	4784.08	9/16/2009	11451218	10112919018	Pass	Pass	12-18	8.2	10.2	1.7	50.9	13.6	174
Pit 01-146														
1141272.71	724988.62	4784.25	9/16/2009	11460002	10112919019	Pass	Pass	00-02	--	98	--	--	--	--
Pit 01-147														
1141389.25	725023.85	4784.73	9/16/2009	11470006	10112915012	Fail	Fail	00-06	6.5	708	33.6	1600	555	783
1141389.25	725023.85	4784.73	9/16/2009	11470612	10112915013	Fail	Fail	06-12	6.6	2490	112	7430	1540	2120
1141389.25	725023.85	4784.73	9/16/2009	11471218	10112915014	Fail	Fail	12-18	8	25	19.1	7800	35.8	4060
1141389.25	725023.85	4784.73	9/16/2009	11471824	10112915015	Pass	Pass	18-24	8.1	10.4	1.3	50.2	12.9	251
1141389.25	725023.85	4784.73	9/16/2009	11472430	10112915016	Pass	Pass	24-30	8.2	9.7	0.61	32.4	13	88.1
Pit 01-149														
1141632.92	724998.00	4784.66	9/3/2009	11490006	10112443008	Fail	Fail	00-06	7.9	489	12	1200	335	733
1141632.92	724998.00	4784.66	9/3/2009	11490612	10112443009	Fail	Fail	06-12	7.8	752	19.1	1240	431	1560
1141632.92	724998.00	4784.66	9/3/2009	11491218	10112443010	Fail	Fail	12-18	6.2	1500	34	3090	876	1910
1141632.92	724998.00	4784.66	9/3/2009	11491824	10112443011	Fail	Fail	18-24	6	1690	37.9	6460	1790	2420

Notes:

(s.u.) - Standard units
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Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141632.92	724998.00	4784.66	9/3/2009	11492430	10112443012	Fail	Fail	24-30	6.8	14.6	9.2	25500	128	2550
1141632.92	724998.00	4784.66	9/3/2009	11493036	10112444005	Fail	Fail	30-36	7.6	3.8	34.2	3560	16.5	6550
1141632.92	724998.00	4784.66	9/3/2009	11493642	10112444006	Fail	Pass	36-42	7.7	U2.8	0.65	343	5.5	426
1141632.92	724998.00	4784.66	9/3/2009	11494248	10112444007	Pass	Pass	42-48	7.6	U2.2	0.42	197	3.9	137
1141632.92	724998.00	4784.66	9/3/2009	11494854	10112444008	Fail	Fail	48-54	7.7	U2.7	0.14	12.4	11	822
1141632.92	724998.00	4784.66	9/3/2009	11495460	10117453011	Fail	Fail	54-60	6.8	3.6	U0.11	17.5	13.4	893
Pit 01-150														
1141746.08	724997.64	4784.28	9/3/2009	11500006	10112444009	Fail	Fail	00-06	7.8	628	16.1	2240	439	1440
1141746.08	724997.64	4784.28	9/3/2009	11500612	10112444010	Fail	Fail	06-12	7.9	568	13.5	1290	527	922
1141746.08	724997.64	4784.28	9/3/2009	11501218	10112444011	Fail	Fail	12-18	7.9	904	24	1920	495	2380
1141746.08	724997.64	4784.28	9/3/2009	11501824	10112444012	Fail	Fail	18-24	6	2640	55	4590	2180	2250
1141746.08	724997.64	4784.28	9/3/2009	11502430	10112444013	Fail	Fail	24-30	7.1	1800	40.3	13100	2690	3700
1141746.08	724997.64	4784.28	9/3/2009	11503036	10112444014	Fail	Fail	30-36	8	9.2	13	2270	13.2	3130
1141746.08	724997.64	4784.28	9/3/2009	11503642	10112444015	Pass	Pass	36-42	8.1	4.1	0.2	71.7	17.2	206
1141746.08	724997.64	4784.28	9/3/2009	11504248	10112444016	Pass	Pass	42-48	7	6.1	0.23	52	19.5	82.1
1141746.08	724997.64	4784.28	9/3/2009	11504854	10112443013	Pass	Pass	48-54	7.9	U2.7	0.26	34	14.7	82.1
Pit 01-151														
1142070.29	724989.55	4784.83	9/9/2009	11510006	10112881020	Fail	Fail	00-06	8	101	8.3	564	70.9	622
1142070.29	724989.55	4784.83	9/9/2009	11510612	10112883001	Fail	Fail	06-12	7.8	96.9	7.5	511	70.8	563
1142070.29	724989.55	4784.83	9/9/2009	11511218	10112883002	Fail	Fail	12-18	7.7	264	15.8	2060	235	1420
1142070.29	724989.55	4784.83	9/9/2009	11511824	10112883003	Fail	Fail	18-24	7.9	176	15.5	2070	357	1970
1142070.29	724989.55	4784.83	9/9/2009	11512430	10112883004	Pass	Pass	24-30	8.2	11	1.8	33.6	10.9	237
1142070.29	724989.55	4784.83	9/9/2009	11513036	10112883005	Pass	Pass	30-36	8.2	10.2	1.9	29.9	14.5	91.7
Pit 01-152														
1141124.07	725131.19	4783.90	9/15/2009	11520006	10112773006	Fail	Fail	00-06	8	414	9.8	1120	838	589
1141124.07	725131.19	4783.90	9/15/2009	11520612	10112773007	Fail	Fail	06-12	8.1	25.3	7.1	454	25.3	1530
1141124.07	725131.19	4783.90	9/15/2009	11521218	10112773008	Fail	Pass	12-18	7.8	19	1.8	110	28.9	393

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141124.07	725131.19	4783.90	9/15/2009	11521824	10112773009	Pass	Pass	18-24	8	18.8	1.1	132	24.9	238
1141124.07	725131.19	4783.90	9/15/2009	11522430	10112773010	Pass	Pass	24-30	7.9	3.5	0.12	12.6	11.6	49.9
1141124.07	725131.19	4783.90	9/15/2009	11523036	10112773011	Pass	Pass	30-36	8	U2.9	0.14	11	8.4	41
Pit 01-153														
1141254.21	725107.99	4783.52	9/15/2009	11530006	10112915002	Fail	Fail	00-06	8	285	18	1060	243	920
1141254.21	725107.99	4783.52	9/15/2009	11530612	10112915003	Fail	Fail	06-12	7.9	769	59.8	11800	699	4590
1141254.21	725107.99	4783.52	9/15/2009	11531218	10112915004	Fail	Pass	12-18	8.3	16.2	2.5	89.6	19	458
1141254.21	725107.99	4783.52	9/15/2009	11531824	10112915005	Pass	Pass	18-24	8.3	11.5	1.9	46.1	18.1	133
Pit 01-154														
1141377.39	725122.39	4783.93	9/15/2009	11543642	10112915006	Fail	Fail	36-42	7.6	12.2	3.9	2530	24.8	324
1141377.39	725122.39	4783.93	9/15/2009	11544248	10112915007	Fail	Pass	42-48	7.5	3.1	0.75	565	3.5	55
1141377.39	725122.39	4783.93	9/15/2009	11544854	10112915008	Pass	Pass	48-54	7.4	3.5	0.59	377	3	42.6
Pit 01-156														
1141630.65	725126.76	4784.75	9/3/2009	11560006	10112443014	Fail	Fail	00-06	7.8	490	18.6	2520	445	2360
1141630.65	725126.76	4784.75	9/3/2009	11560612	10112443015	Fail	Fail	06-12	7.2	610	23.2	4250	413	2740
1141630.65	725126.76	4784.75	9/3/2009	11561218	10112443016	Fail	Fail	12-18	4.2	559	12.9	1020	463	565
1141630.65	725126.76	4784.75	9/3/2009	11561824	10112443017	Fail	Fail	18-24	6.3	1470	35.2	2980	852	2310
1141630.65	725126.76	4784.75	9/3/2009	11562430	10112443018	Fail	Fail	24-30	4.3	2490	55.5	10400	992	1830
1141630.65	725126.76	4784.75	9/3/2009	11563036	10112443019	Fail	Fail	30-36	4.4	175	9.5	8160	791	2260
1141630.65	725126.76	4784.75	9/3/2009	11563642	10112443020	Fail	Fail	36-42	5.6	22.4	7.5	3610	58	1640
1141630.65	725126.76	4784.75	9/3/2009	11564248	10112444001	Fail	Fail	42-48	7	U3.2	13.2	2400	17.7	3370
1141630.65	725126.76	4784.75	9/3/2009	11564854	10112444002	Fail	Fail	48-54	6.7	54	12.8	3150	64.8	3260
1141630.65	725126.76	4784.75	9/3/2009	11565460	10112444003	Fail	Fail	54-60	6.3	U3.7	0.97	85.5	18.8	3050
1141630.65	725126.76	4784.75	9/3/2009	11566066	10112444004	Fail	Fail	60-66	7.2	U3	7.2	1460	12.7	1160
Pit 01-157														
1141744.90	725125.89	4784.84	9/3/2009	11570006	10112266001	Fail	Fail	00-06	7.7	441	14.1	2500	407	1550
1141744.90	725125.89	4784.84	9/3/2009	11570612	10112266002	Fail	Fail	06-12	7.1	855	22	6660	599	1720

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
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-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141744.90	725125.89	4784.84	9/3/2009	11571218	10112266003	Fail	Fail	12-18	4.8	869	21.1	1470	614	1440
1141744.90	725125.89	4784.84	9/3/2009	11571824	10112266004	Fail	Fail	18-24	6.4	468	11.8	1160	603	788
1141744.90	725125.89	4784.84	9/3/2009	11572430	10112266005	Fail	Fail	24-30	4.2	1890	44.5	1980	1240	2630
1141744.90	725125.89	4784.84	9/3/2009	11573036	10112266006	Pass	Pass	30-36	7.2	U3.2	U0.13	U1.6	U1.9	U6.4
1141744.90	725125.89	4784.84	9/3/2009	11573642	10112266007	Fail	Pass	36-42	7.3	68.3	2.1	108	84.3	596
1141744.90	725125.89	4784.84	9/3/2009	11574248	10112266008	Pass	Pass	42-48	7.9	16.7	1.2	64.8	20.4	298
1141744.90	725125.89	4784.84	9/3/2009	11574854	10112266009	Fail	Fail	48-54	8	U2.6	0.15	14.7	9	783
1141744.90	725125.89	4784.84	9/3/2009	11575460	10112266010	Pass	Pass	54-60	8.1	U2.5	U0.1	8.4	7.2	95.8
Pit 01-158														
1142002.98	725116.33	4783.66	9/9/2009	11580006	10112883006	Fail	Fail	00-06	7.9	333	23.4	1590	283	2380
1142002.98	725116.33	4783.66	9/9/2009	11580612	10112883007	Fail	Fail	06-12	7.7	347	22.8	2330	361	2300
1142002.98	725116.33	4783.66	9/9/2009	11581218	10112883008	Fail	Fail	12-18	8	1610	85.4	11800	1120	5280
1142002.98	725116.33	4783.66	9/9/2009	11581824	10112883009	Fail	Fail	18-24	7.9	3280	149	26100	1400	3530
1142002.98	725116.33	4783.66	9/9/2009	11582430	10112883010	Fail	Fail	24-30	8.2	23.4	3.3	90.8	22.6	1110
1142002.98	725116.33	4783.66	9/9/2009	11583036	10112883011	Fail	Fail	30-36	8	14.6	3.1	47	18.6	881
1142002.98	725116.33	4783.66	9/9/2009	11583642	10112883012	Pass	Pass	36-42	7.8	12.1	1.8	36	16.3	117
1142002.98	725116.33	4783.66	9/9/2009	11584248	10112883013	Pass	Pass	42-48	7.8	16.4	2.6	41.2	27.9	108
Pit 01-158130E														
1142115.02	725107.95	4784.58	9/9/2009	158130E000	10112885006	Pass	Pass	00-02	--	89.2	--	--	--	--
Pit 01-159														
1141007.89	725260.22	4783.26	9/15/2009	11590006	10112773002	Fail	Fail	00-06	7.9	1270	32.4	10300	1100	2100
1141007.89	725260.22	4783.26	9/15/2009	11590612	10112773003	Fail	Fail	06-12	7.8	773	27.8	9090	855	3640
1141007.89	725260.22	4783.26	9/15/2009	11591218	10112773004	Pass	Pass	12-18	8.2	8.5	0.35	25.3	13.9	169
1141007.89	725260.22	4783.26	9/15/2009	11591824	10112773005	Pass	Pass	18-24	8.1	13.2	0.47	98.7	24.9	164
Pit 01-160														
1141163.76	725221.41	4782.56	9/14/2009	11600006	10112760005	Fail	Fail	00-06	5.6	176	3.9	415	221	418
1141163.76	725221.41	4782.56	9/8/2009	11600612	10112760006	Fail	Fail	06-12	7.9	522	14.5	2130	555	2710

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141163.76	725221.41	4782.56	9/8/2009	11601218	10112760007	Fail	Fail	12-18	7.9	474	15.9	2000	370	2350
1141163.76	725221.41	4782.56	9/8/2009	11601824	10112760008	Fail	Fail	18-24	7.8	334	12.6	1690	256	3060
1141163.76	725221.41	4782.56	9/8/2009	11602430	10112760009	Fail	Fail	24-30	7.5	579	12.2	2180	465	6100
1141163.76	725221.41	4782.56	9/8/2009	11603036	10112760010	Fail	Fail	30-36	7.6	618	12.3	1970	444	6170
1141163.76	725221.41	4782.56	9/8/2009	11603642	10112760011	Fail	Fail	36-42	7.6	443	10.4	1670	376	3700
1141163.76	725221.41	4782.56	9/8/2009	11604248	10112760012	Fail	Fail	42-48	8	643	18.1	3990	431	5210
Pit 01-161														
1141233.10	725254.31	4783.25	9/8/2009	11610006	10112760013	Fail	Fail	00-06	7.8	793	21.2	3060	607	2710
1141233.10	725254.31	4783.25	9/8/2009	11610612	10112760014	Fail	Fail	06-12	4.4	1370	23	1340	820	1870
1141233.10	725254.31	4783.25	9/8/2009	11611218	10112760015	Fail	Fail	12-18	5.6	2890	43.7	2880	1540	1780
1141233.10	725254.31	4783.25	9/8/2009	11611824	10112760016	Fail	Fail	18-24	6.9	804	18.5	20000	3000	3450
1141233.10	725254.31	4783.25	9/8/2009	11612430	10112760017	Fail	Fail	24-30	7.9	11.7	44.4	960	16.2	5400
1141233.10	725254.31	4783.25	9/8/2009	11613036	10112760018	Fail	Fail	30-36	7.9	6.4	0.13	12.4	8.6	916
1141233.10	725254.31	4783.25	9/8/2009	11613642	10112760019	Pass	Pass	36-42	8	5.7	0.12	18.1	11.4	68.5
1141233.10	725254.31	4783.25	9/8/2009	11614248	10112760020	Pass	Pass	42-48	7.9	U2.8	0.27	6.5	5.3	24.5
Pit 01-163														
1141498.01	725248.37	4784.15	9/15/2009	11633036	10112915009	Fail	Fail	30-36	7.6	128	8.5	751	97.3	888
1141498.01	725248.37	4784.15	9/15/2009	11633642	10112915010	Fail	Pass	36-42	7.8	8.4	3.6	47.1	11.8	628
1141498.01	725248.37	4784.15	9/15/2009	11634248	10112915011	Pass	Pass	42-48	7.6	7.1	0.77	22.1	5.9	43.7
Pit 01-164														
1141746.91	725243.82	4784.03	9/8/2009	11640006	10112766005	Fail	Fail	00-06	8.1	370	33.2	5510	390	4190
1141746.91	725243.82	4784.03	9/8/2009	11640612	10112766006	Fail	Fail	06-12	5.5	404	17	2380	437	874
1141746.91	725243.82	4784.03	9/8/2009	11641218	10112766007	Fail	Fail	12-18	5.2	270	11.4	252	314	630
1141746.91	725243.82	4784.03	9/8/2009	11641824	10112766008	Fail	Pass	18-24	4.2	166	6.8	145	258	258
1141746.91	725243.82	4784.03	9/8/2009	11642430	10112766009	Fail	Fail	24-30	4.4	627	24	1510	569	409
1141746.91	725243.82	4784.03	9/8/2009	11643036	10112766010	Fail	Fail	30-36	6.5	2210	84.9	11900	1290	4110
1141746.91	725243.82	4784.03	9/8/2009	11643642	10112766011	Fail	Fail	36-42	8	2700	114	24700	2120	8910

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141746.91	725243.82	4784.03	9/8/2009	11644248	10112766012	Fail	Pass	42-48	7.4	88.6	6.9	132	144	550
1141746.91	725243.82	4784.03	9/8/2009	11644854	10112766013	Pass	Pass	48-54	7.4	19.5	2.4	32.9	22.4	115
Pit 01-165														
1142032.94	725248.88	4783.27	9/9/2009	11650006	10112878004	Fail	Fail	00-06	7.8	390	13	1980	339	1710
1142032.94	725248.88	4783.27	9/9/2009	11650612	10112878005	Fail	Fail	06-12	7.7	801	20.1	1600	551	2120
1142032.94	725248.88	4783.27	9/9/2009	11651218	10112878006	Fail	Fail	12-18	7.4	2110	56.9	20300	1270	4850
1142032.94	725248.88	4783.27	9/9/2009	11651824	10112878007	Fail	Fail	18-24	8.1	9.1	7	919	19.4	2010
1142032.94	725248.88	4783.27	9/9/2009	11652430	10112878008	Pass	Pass	24-30	8.2	U2.3	0.51	37.1	14.9	365
1142032.94	725248.88	4783.27	9/9/2009	11653036	10112878009	Pass	Pass	30-36	8	U3.2	U0.13	28.2	17.6	137
1142032.94	725248.88	4783.27	9/9/2009	11653642	10112878010	Pass	Pass	36-42	8.2	20	0.37	24.3	20.9	131
Pit 01-166														
1142129.41	725248.21	4783.09	9/9/2009	11660006	10112883014	Fail	Fail	00-06	7.9	449	26	1630	348	1630
1142129.41	725248.21	4783.09	9/9/2009	11660612	10112883015	Fail	Fail	06-12	7.9	1190	54.4	6750	665	2470
1142129.41	725248.21	4783.09	9/9/2009	11661218	10112883016	Fail	Fail	12-18	8.1	57.1	12.4	1210	35.6	2280
1142129.41	725248.21	4783.09	9/9/2009	11661824	10112883017	Fail	Pass	18-24	8.1	18.5	3.4	131	15	638
1142129.41	725248.21	4783.09	9/9/2009	11662430	10112883018	Pass	Pass	24-30	8.1	10.4	1.5	17.6	10.5	129
1142129.41	725248.21	4783.09	9/9/2009	11663036	10112883019	Pass	Pass	30-36	7.2	32.8	2.3	63	5.8	99.6
Pit 01-167														
1141015.07	725377.16	4783.32	9/15/2009	11670006	10112771018	Fail	Fail	00-06	7.9	358	19	3090	309	2460
1141015.07	725377.16	4783.32	9/15/2009	11670612	10112771019	Fail	Fail	06-12	7.8	373	28.1	3850	310	4580
1141015.07	725377.16	4783.32	9/15/2009	11671218	10112771020	Fail	Pass	12-18	8	31.2	1.9	177	29.1	484
1141015.07	725377.16	4783.32	9/15/2009	11671824	10112773001	Pass	Pass	18-24	8	8.5	0.63	46.9	17.8	164
Pit 01-169														
1141254.30	725374.36	4782.17	9/8/2009	11690006	10112763001	Fail	Fail	00-06	7.7	956	17.5	2010	681	1230
1141254.30	725374.36	4782.17	9/8/2009	11690612	10112763002	Fail	Fail	06-12	7.3	1230	19.2	1500	825	1270
1141254.30	725374.36	4782.17	9/8/2009	11691218	10112763003	Fail	Fail	12-18	7.8	536	16	12200	2450	3740
1141254.30	725374.36	4782.17	9/8/2009	11691824	10112763004	Fail	Fail	18-24	7.8	492	16.3	11600	1490	2880

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
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-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141254.30	725374.36	4782.17	9/8/2009	11692430	10112763005	Fail	Fail	24-30	7.5	30.7	9.6	10300	88.3	2310
1141254.30	725374.36	4782.17	9/8/2009	11693036	10112763006	Fail	Fail	30-36	8.2	6.9	21.2	32.3	22.6	2280
1141254.30	725374.36	4782.17	9/8/2009	11693642	10112763007	Pass	Pass	36-42	8	4.9	0.12	13.8	9.9	55.6
1141254.30	725374.36	4782.17	9/8/2009	11694248	10112763008	Pass	Pass	42-48	7.7	2.8	0.15	14.7	10.1	56.2
Pit 01-170														
1141328.09	725343.85	4783.54	9/8/2009	11700006	10112763019	Fail	Fail	00-06	6.6	518	20.4	3460	463	890
1141328.09	725343.85	4783.54	9/8/2009	11700612	10112763020	Fail	Fail	06-12	4.2	1070	39.3	1140	778	1330
1141328.09	725343.85	4783.54	9/8/2009	11701218	10112764001	Fail	Fail	12-18	4	1950	69.1	1640	1020	1850
1141328.09	725343.85	4783.54	9/8/2009	11701824	10112764002	Fail	Fail	18-24	4.3	1240	44.6	1590	998	1420
1141328.09	725343.85	4783.54	9/8/2009	11702430	10112764003	Fail	Fail	24-30	5.2	1290	46.9	3140	1140	1590
1141328.09	725343.85	4783.54	9/8/2009	11703036	10112764004	Fail	Fail	30-36	6.3	22.3	14.2	2350	29.9	2030
1141328.09	725343.85	4783.54	9/8/2009	11703642	10112764005	Fail	Fail	36-42	7.4	9.9	13.2	27.5	12.8	3630
1141328.09	725343.85	4783.54	9/8/2009	11704248	10112764006	Fail	Fail	42-48	7.8	10.2	1.6	29.2	13.4	824
1141328.09	725343.85	4783.54	9/8/2009	11704854	10112764007	Fail	Fail	48-54	6.9	14.6	7.6	620	16.4	925
1141328.09	725343.85	4783.54	9/8/2009	11705460	10112764008	Pass	Pass	54-60	7.1	3.8	1.5	226	4.8	128
Pit 01-172														
1141630.99	725388.36	4783.25	9/29/2009	11721824	10117444010	Fail	Fail	18-24	7.6	157	15.2	5340	214	1540
1141630.99	725388.36	4783.25	9/29/2009	11722430	10117453003	Fail	Fail	24-30	8.2	11.4	5.2	906	25.2	1220
1141630.99	725388.36	4783.25	9/29/2009	11723036	10113925014	Pass	Pass	30-36	8.4	U2.3	0.52	53.9	17.1	192
1141630.99	725388.36	4783.25	9/29/2009	11723642	10113925015	Pass	Pass	36-42	8.3	U2.4	U0.098	12.5	9.3	28.4
1141630.99	725388.36	4783.25	9/29/2009	11724248	10113925016	Pass	Pass	42-48	8.6	4	0.25	58.9	17.8	53.7
Pit 01-174														
1141875.00	725370.11	4782.40	9/29/2009	11742430	10117444003	Pass	Pass	24-30	8.2	13.7	0.87	302	26.2	275
1141875.00	725370.11	4782.40	9/29/2009	11743036	10117444004	Pass	Pass	30-36	8.1	11.9	0.67	257	27.2	210
1141875.00	725370.11	4782.40	9/29/2009	11743642	10113925012	Pass	Pass	36-42	8.2	5.5	0.71	218	25.7	143
1141875.00	725370.11	4782.40	9/29/2009	11744248	10113925013	Pass	Pass	42-48	8.4	7.7	0.68	187	39.5	198
Pit 01-175														

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
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-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1142037.14	725354.33	4783.00	9/9/2009	11750006	10112878011	Fail	Fail	00-06	6.3	375	16.5	2840	322	2100
1142037.14	725354.33	4783.00	9/9/2009	11750612	10112878012	Fail	Fail	06-12	6.2	831	17.2	4230	562	1770
1142037.14	725354.33	4783.00	9/9/2009	11751218	10112878013	Fail	Fail	12-18	7.5	2840	64	18400	1200	3650
1142037.14	725354.33	4783.00	9/9/2009	11751824	10112878014	Fail	Fail	18-24	8	35.2	17.3	578	19.2	3130
1142037.14	725354.33	4783.00	9/9/2009	11752430	10112878015	Fail	Fail	24-30	8.4	68.7	2.1	372	56.8	630
1142037.14	725354.33	4783.00	9/9/2009	11753036	10112878016	Pass	Pass	30-36	8	6.5	0.15	21	10.7	74.4
Pit 01-176														
1140938.69	725533.78	4783.20	9/29/2009	11760006	10113927014	Fail	Fail	00-06	8.2	323	21.4	2710	407	2480
1140938.69	725533.78	4783.20	9/29/2009	11760612	10113927015	Fail	Fail	06-12	8.3	403	13.2	1730	234	1400
1140938.69	725533.78	4783.20	9/29/2009	11761218	10113927016	Fail	Fail	12-18	8.3	1830	48.5	10500	1490	3140
1140938.69	725533.78	4783.20	9/29/2009	11761824	10113927017	Pass	Pass	18-24	8.5	11.7	1.3	91.1	29.5	152
1140938.69	725533.78	4783.20	9/29/2009	11762430	10113927018	Pass	Pass	24-30	8.3	19.6	0.85	151	33.6	151
1140938.69	725533.78	4783.20	9/29/2009	11763036	10113927019	Pass	Pass	30-36	8.3	17.3	0.6	134	32.7	133
Pit 01-177														
1141044.24	725584.63	4780.50	9/14/2009	11770006	10112770016	Fail	Fail	00-06	8.2	504	12.3	1940	352	917
1141044.24	725584.63	4780.50	9/14/2009	11770612	10112770017	Fail	Fail	06-12	8.1	112	3	578	144	490
1141044.24	725584.63	4780.50	9/14/2009	11771218	10112770018	Pass	Pass	12-18	7.8	U2.8	0.69	10.8	12.5	160
Pit 01-178														
1141118.27	725503.41	4782.23	9/15/2009	11782430	10112771012	Pass	Pass	24-30	8.1	10.1	0.48	67	31.3	203
1141118.27	725503.41	4782.23	9/15/2009	11783036	10112771013	Fail	Fail	30-36	8.3	U3.1	U0.12	16.8	15.2	1380
1141118.27	725503.41	4782.23	9/15/2009	11783642	10112771014	Pass	Pass	36-42	7.3	U2.3	1.9	69.1	3.3	288
Pit 01-179														
1141285.98	725517.02	4782.56	9/29/2009	11793642	10113927012	Fail	Fail	36-42	7.8	U3.5	7	3590	18.9	1070
1141285.98	725517.02	4782.56	9/29/2009	11794248	10113927013	Pass	Pass	42-48	7.8	U2.9	0.26	48.6	15.6	290
Pit 01-180														
1141255.73	725419.25	4782.75	9/8/2009	11800006	10112764009	Fail	Fail	00-06	7.4	505	22.8	4020	416	1400
1141255.73	725419.25	4782.75	9/8/2009	11800612	10112764010	Fail	Fail	06-12	4.4	354	14.7	1610	345	685

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
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-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141255.73	725419.25	4782.75	9/8/2009	11801218	10112764011	Fail	Fail	12-18	4.5	648	22.3	557	1010	334
1141255.73	725419.25	4782.75	9/8/2009	11801824	10112764012	Fail	Fail	18-24	5	3350	114	4130	1950	2310
1141255.73	725419.25	4782.75	9/8/2009	11802430	10112764013	Fail	Fail	24-30	7.6	1880	77.7	27500	2150	3880
1141255.73	725419.25	4782.75	9/8/2009	11803036	10112764014	Fail	Fail	30-36	7	62.3	9.2	2770	196	1930
1141255.73	725419.25	4782.75	9/8/2009	11803642	10112764015	Fail	Pass	36-42	6.9	16.1	2.6	35.7	19.2	498
1141255.73	725419.25	4782.75	9/8/2009	11804248	10112764016	Pass	Pass	42-48	6.9	10	1.5	19	14.6	78.8
Pit 01-181														
1141377.97	725466.70	4782.58	9/8/2009	11810006	10112764017	Fail	Fail	00-06	8	1760	63.2	2490	728	1750
1141377.97	725466.70	4782.58	9/8/2009	11810612	10112764018	Fail	Fail	06-12	7.8	383	32.2	7560	341	3520
1141377.97	725466.70	4782.58	9/8/2009	11811218	10112764019	Fail	Fail	12-18	7.7	884	15.9	1860	776	1020
1141377.97	725466.70	4782.58	9/8/2009	11811824	10112764020	Fail	Fail	18-24	6.7	2030	34.2	3530	984	1800
1141377.97	725466.70	4782.58	9/8/2009	11812430	10112765001	Fail	Fail	24-30	5.8	2840	49.2	9270	3270	3670
1141377.97	725466.70	4782.58	9/8/2009	11813036	10112765002	Fail	Fail	30-36	6.5	32.8	4	7720	184	1930
1141377.97	725466.70	4782.58	9/8/2009	11813642	10112765003	Fail	Fail	36-42	7	U3.7	8.3	9850	24.4	2870
1141377.97	725466.70	4782.58	9/8/2009	11814248	10112765004	Pass	Pass	42-48	7.2	U2.7	U0.11	8.3	7.1	276
1141377.97	725466.70	4782.58	9/8/2009	11814854	10112765005	Pass	Pass	48-54	7.2	U3.4	0.21	15.9	12.5	129
1141377.97	725466.70	4782.58	9/8/2009	11815460	10112765006	Fail	Fail	54-60	7.3	U2.5	4.9	221	9.2	1050
Pit 01-182														
1141508.11	725438.95	4782.51	9/8/2009	11820006	10112767004	Fail	Fail	00-06	7.8	652	34.2	2490	535	1970
1141508.11	725438.95	4782.51	9/8/2009	11820612	10112767005	Fail	Fail	06-12	7.8	579	31.4	2870	381	1830
1141508.11	725438.95	4782.51	9/8/2009	11821218	10112767006	Fail	Fail	12-18	7.4	527	24.2	2690	304	1240
1141508.11	725438.95	4782.51	9/8/2009	11821824	10112767007	Fail	Fail	18-24	7.4	510	28	4410	429	2130
1141508.11	725438.95	4782.51	9/8/2009	11822430	10112767008	Fail	Fail	24-30	7.8	763	39.7	3150	831	2270
1141508.11	725438.95	4782.51	9/8/2009	11823036	10112767009	Fail	Fail	30-36	7.4	30.4	5.5	2290	44	1080
1141508.11	725438.95	4782.51	9/8/2009	11823642	10112767010	Fail	Fail	36-42	7.2	22.1	5.5	6620	56.4	569
1141508.11	725438.95	4782.51	9/8/2009	11824248	10112767011	Fail	Pass	42-48	6.9	12	3.5	366	19.9	297
1141508.11	725438.95	4782.51	9/8/2009	11824854	10112767012	Fail	Pass	48-54	7.6	6.3	1.6	377	8	264

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141508.11	725438.95	4782.51	9/8/2009	11825460	10112767013	Fail	Pass	54-60	7.6	19.4	1.5	39.3	12.8	472
Pit 01-184														
1141712.05	725501.17	4781.07	9/11/2009	11840006	10112885012	Fail	Fail	00-06	4.9	270	16.4	1490	325	1010
1141712.05	725501.17	4781.07	9/11/2009	11840612	10112885013	Fail	Fail	06-12	5	306	17	1360	397	895
1141712.05	725501.17	4781.07	9/11/2009	11841218	10112885014	Fail	Fail	12-18	7.4	540	44.5	3540	605	4010
1141712.05	725501.17	4781.07	9/11/2009	11841824	10112885015	Fail	Fail	18-24	7.7	676	39.3	3290	564	3270
1141712.05	725501.17	4781.07	9/11/2009	11842430	10112885016	Fail	Fail	24-30	7.9	569	35.1	2850	379	2150
1141712.05	725501.17	4781.07	9/11/2009	11843036	10112885017	Fail	Fail	30-36	8.1	571	33.3	4010	490	2280
1141712.05	725501.17	4781.07	9/11/2009	11843642	10112885018	Pass	Pass	36-42	8	11.3	2.1	27.5	17	85.6
1141712.05	725501.17	4781.07	9/11/2009	11844248	10112885019	Pass	Pass	42-48	7.5	6.3	1.5	24.9	16.9	70.5
Pit 01-186														
1142020.54	725514.85	4782.58	9/9/2009	11860006	10112878017	Fail	Fail	00-06	7.6	285	10.6	1230	214	1400
1142020.54	725514.85	4782.58	9/9/2009	11860612	10112878018	Fail	Fail	06-12	7.4	828	16.4	3590	578	1140
1142020.54	725514.85	4782.58	9/9/2009	11861218	10112878019	Fail	Fail	12-18	7.3	474	16.1	2770	369	2130
1142020.54	725514.85	4782.58	9/9/2009	11861824	10112878020	Fail	Fail	18-24	7.7	101	51.7	1180	70.5	1150
1142020.54	725514.85	4782.58	9/9/2009	11862430	10112879001	Fail	Fail	24-30	8	7.7	2.9	55.3	10.9	1160
1142020.54	725514.85	4782.58	9/9/2009	11863036	10112879002	Pass	Pass	30-36	8	U2.9	0.13	25	17.8	91.4
1142020.54	725514.85	4782.58	9/9/2009	11863642	10112879003	Pass	Pass	36-42	7.9	U3.3	U0.13	29.2	18.3	88.4
Pit 01-187														
1140918.14	725633.89	4782.28	9/14/2009	11870002	10112771008	Pass	Pass	00-02	--	468	--	--	--	--
Pit 01-188														
1140994.90	725624.56	4781.98	9/14/2009	11880006	10112770019	Fail	Fail	00-06	8	836	24	7470	660	2920
1140994.90	725624.56	4781.98	9/14/2009	11880612	10112770020	Fail	Fail	06-12	8.2	1650	42.2	12200	974	3470
1140994.90	725624.56	4781.98	9/14/2009	11881218	10112771001	Pass	Pass	12-18	8.1	42.4	1.3	200	35	220
1140994.90	725624.56	4781.98	9/14/2009	11881824	10112771002	Pass	Pass	18-24	8	U2.9	U0.12	17.1	10.8	44.5
Pit 01-189														
1141068.12	725676.70	4781.45	9/14/2009	11890006	10112768002	Fail	Fail	00-06	7.5	705	36.2	3730	761	2120

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141068.12	725676.70	4781.45	9/14/2009	11890612	10112768003	Fail	Fail	06-12	7.7	2200	96.1	21400	1680	4980
1141068.12	725676.70	4781.45	9/14/2009	11891218	10112768004	Fail	Fail	12-18	7.8	142	54.7	2170	351	7370
1141068.12	725676.70	4781.45	9/14/2009	11891824	10112768005	Fail	Pass	18-24	8.1	12.4	1.3	36.7	13.4	568
1141068.12	725676.70	4781.45	9/14/2009	11892430	10112768006	Pass	Pass	24-30	8.1	6.6	1.4	16.5	10.2	52.6
Pit 01-190														
1141139.24	725656.09	4781.49	9/14/2009	11900006	10112770003	Fail	Fail	00-06	8.1	1030	26	4900	662	1950
1141139.24	725656.09	4781.49	9/14/2009	11900612	10112770004	Fail	Fail	06-12	7.9	1020	26.7	8350	930	2130
1141139.24	725656.09	4781.49	9/14/2009	11901218	10112770005	Fail	Fail	12-18	7.9	745	26.7	8070	484	2650
1141139.24	725656.09	4781.49	9/14/2009	11901824	10112770006	Fail	Fail	18-24	7.9	1240	32.8	8810	648	2350
1141139.24	725656.09	4781.49	9/14/2009	11902430	10112770007	Pass	Pass	24-30	7.7	U2.8	0.37	41.4	16.8	290
1141139.24	725656.09	4781.49	9/14/2009	11903036	10112770008	Pass	Pass	30-36	7.5	U2.4	0.11	23.9	15.6	84.9
Pit 01-191														
1141263.58	725620.37	4782.50	9/14/2009	11910006	10112771009	Fail	Fail	00-06	8	459	14.4	3310	349	2120
1141263.58	725620.37	4782.50	9/14/2009	11910612	10112771010	Pass	Pass	06-12	8.1	25.3	0.77	65.5	21.3	132
1141263.58	725620.37	4782.50	9/14/2009	11911218	10112771011	Pass	Pass	12-18	8	9.3	0.47	48.7	24.6	119
Pit 01-192														
1141395.05	725631.79	4780.68	9/14/2009	11920006	10112768013	Fail	Fail	00-06	4.6	368	18.6	1250	486	895
1141395.05	725631.79	4780.68	9/14/2009	11920612	10112768014	Fail	Fail	06-12	6.6	777	44.7	3590	703	4040
1141395.05	725631.79	4780.68	9/14/2009	11921218	10112768015	Fail	Fail	12-18	7.2	2560	107	17400	1650	5010
1141395.05	725631.79	4780.68	9/14/2009	11921824	10112768016	Pass	Pass	18-24	8	9	1.6	30.9	13.2	62.4
1141395.05	725631.79	4780.68	9/14/2009	11922430	10112768017	Pass	Pass	24-30	8	5.2	0.89	11.7	8.7	32.1
Pit 01-193														
1141500.00	725625.00		9/29/2009	11930006	10113927007	Fail	Fail	00-06	7.3	499	16.2	1600	417	1560
1141500.00	725625.00		9/29/2009	11930612	10113927008	Fail	Fail	06-12	8.3	1400	38.8	7120	598	3500
1141500.00	725625.00		9/29/2009	11931218	10113927009	Fail	Pass	12-18	8.4	26.9	2.5	241	23.2	490
1141500.00	725625.00		9/29/2009	11931824	10113927010	Fail	Pass	18-24	8.1	35.3	2.3	232	36.2	457
1141500.00	725625.00		9/29/2009	11932430	10113927011	Pass	Pass	24-30	8.3	7.3	0.52	70.3	27.1	150

Notes:

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-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
Pit 01-194														
1141639.07	725644.71	4782.12	9/11/2009	11940006	10112885020	Fail	Fail	00-06	5.5	333	18.5	887	391	687
1141639.07	725644.71	4782.12	9/11/2009	11940612	10112886001	Fail	Fail	06-12	7.4	844	46.1	20500	776	3590
1141639.07	725644.71	4782.12	9/11/2009	11941218	10112886002	Fail	Fail	12-18	7.5	57.4	33.6	6190	41.2	6810
1141639.07	725644.71	4782.12	9/11/2009	11941824	10112886003	Fail	Fail	18-24	7.8	20.3	5.2	255	16	1080
1141639.07	725644.71	4782.12	9/11/2009	11942430	10112886004	Pass	Pass	24-30	8	10.5	0.73	42.7	14	153
1141639.07	725644.71	4782.12	9/11/2009	11943036	10112886005	Pass	Pass	30-36	7.9	13	2	197	20.5	146
1141639.07	725644.71	4782.12	9/11/2009	11943642	10112886006	Pass	Pass	36-42	7.7	8.2	1.5	37.9	16.5	76.7
1141639.07	725644.71	4782.12	9/11/2009	11944248	10112886007	Pass	Pass	42-48	7.8	4.6	0.68	19.5	6.9	38.2
Pit 01-195														
1141755.78	725629.07	4781.19	9/11/2009	11950006	10112879014	Fail	Fail	00-06	8	715	18.7	2710	471	1660
1141755.78	725629.07	4781.19	9/11/2009	11950612	10112879015	Fail	Fail	06-12	8	509	13.1	1910	408	1280
1141755.78	725629.07	4781.19	9/11/2009	11951218	10112879016	Fail	Fail	12-18	7.9	662	16.8	1950	461	1520
1141755.78	725629.07	4781.19	9/11/2009	11951824	10112879017	Fail	Fail	18-24	7.8	2050	44.6	6670	644	2500
1141755.78	725629.07	4781.19	9/11/2009	11952430	10112879018	Fail	Fail	24-30	7.7	1020	35.1	9370	890	4570
1141755.78	725629.07	4781.19	9/11/2009	11953036	10112879019	Fail	Fail	30-36	7.9	23.4	4.9	204	34.3	2420
1141755.78	725629.07	4781.19	9/11/2009	11953642	10112879020	Fail	Fail	36-42	7.7	15.3	3.2	281	30	1870
1141755.78	725629.07	4781.19	9/11/2009	11954248	10112880001	Pass	Pass	42-48	7	11.5	1.6	17.6	13.4	372
1141755.78	725629.07	4781.19	9/11/2009	11954854	10112880002	Pass	Pass	48-54	6.5	14.3	1.6	14.3	10	95.6
Pit 01-196														
1141852.94	725627.13	4781.84	9/11/2009	11960006	10112877015	Fail	Fail	00-06	7.8	60.6	7.1	641	71.1	844
1141852.94	725627.13	4781.84	9/11/2009	11960612	10112877016	Fail	Fail	06-12	5.5	634	25.3	886	947	260
1141852.94	725627.13	4781.84	9/11/2009	11961218	10112877017	Fail	Fail	12-18	6.9	2930	111	893	853	1210
1141852.94	725627.13	4781.84	9/11/2009	11961824	10112877018	Fail	Fail	18-24	7	2290	93.2	7330	2830	3160
1141852.94	725627.13	4781.84	9/11/2009	11962430	10112877019	Fail	Fail	24-30	7.3	37.4	7.4	19100	209	1970
1141852.94	725627.13	4781.84	9/11/2009	11963036	10112877020	Fail	Fail	30-36	7.9	10.6	22.5	10700	27.1	3080
1141852.94	725627.13	4781.84	9/11/2009	11963642	10112878001	Fail	Fail	36-42	7.9	43	7.2	851	22.5	3290

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141852.94	725627.13	4781.84	9/11/2009	11964248	10112878002	Pass	Pass	42-48	7.9	U4.1	0.58	290	15	156
1141852.94	725627.13	4781.84	9/11/2009	11964854	10112878003	Pass	Pass	48-54	8	U3.4	0.2	21.8	15.7	68.2
Pit 01-197														
1142033.45	725646.82	4782.78	9/9/2009	11970006	10112879008	Pass	Pass	00-06	7.5	21.8	0.89	281	12.8	61
1142033.45	725646.82	4782.78	9/9/2009	11970612	10112879009	Pass	Pass	06-12	7.4	8.2	0.6	150	5.9	39.5
1142033.45	725646.82	4782.78	9/9/2009	11971218	10112879010	Pass	Pass	12-18	7.5	5.2	1.4	27.2	5.5	211
1142033.45	725646.82	4782.78	9/9/2009	11971824	10112879011	Fail	Pass	18-24	7.8	4.8	0.67	34.6	6.8	605
1142033.45	725646.82	4782.78	9/9/2009	11972430	10112879012	Pass	Pass	24-30	8.2	U2.9	0.64	39.5	14.7	296
1142033.45	725646.82	4782.78	9/9/2009	11973036	10112879013	Pass	Pass	30-36	8.2	U3	0.41	41.1	17.6	207
1142033.45	725646.82	4782.78	9/9/2009	11973642	10112881011	Pass	Pass	36-42	8	11.6	2.1	30.9	16.1	82.9
Pit 01-198														
1142117.23	725606.87	4785.47	9/9/2009	11980002	10112767017	Pass	Pass	00-02	--	78.8	--	--	--	--
Pit 01-200														
1141010.12	725747.58	4781.33	9/14/2009	12000006	10112771003	Fail	Fail	00-06	7.8	451	16.4	1370	429	1900
1141010.12	725747.58	4781.33	9/14/2009	12000612	10112771004	Fail	Fail	06-12	8.1	1050	22.8	4860	901	1950
1141010.12	725747.58	4781.33	9/14/2009	12001218	10112771005	Pass	Pass	12-18	8.1	11.8	0.93	56.8	18.7	136
1141010.12	725747.58	4781.33	9/14/2009	12001824	10112771006	Pass	Pass	18-24	8.2	6.3	0.42	59.4	27.8	121
Pit 01-20033W														
1140980.99	725740.54	4781.81	9/14/2009	20033W000	10112771007	Pass	Pass	00-02	--	162	--	--	--	--
Pit 01-201														
1141132.16	725748.97	4781.52	9/29/2009	12010006	10113925019	Fail	Fail	00-06	7.4	910	22	2000	661	900
1141132.16	725748.97	4781.52	9/29/2009	12010612	10113925020	Fail	Fail	06-12	8.2	1090	47.6	11200	776	5690
1141132.16	725748.97	4781.52	9/29/2009	12011218	10113927001	Pass	Pass	12-18	8.4	24.8	0.75	76.7	20.5	161
1141132.16	725748.97	4781.52	9/29/2009	12011824	10113927002	Pass	Pass	18-24	8.2	7.7	0.13	18	10.4	39.1
Pit 01-202														
1141250.21	725730.27	4780.09	9/14/2009	12020006	10112768007	Fail	Fail	00-06	7.8	560	27.3	3130	392	2230
1141250.21	725730.27	4780.09	9/14/2009	12020612	10112768008	Fail	Pass	06-12	7.7	182	7.7	311	284	283

Notes:

(s.u.) - Standard units
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-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141250.21	725730.27	4780.09	9/14/2009	12021218	10112768009	Fail	Fail	12-18	7.5	933	46.3	7020	1440	4080
1141250.21	725730.27	4780.09	9/14/2009	12021824	10112768010	Fail	Fail	18-24	7.3	325	21.8	1050	229	2260
1141250.21	725730.27	4780.09	9/14/2009	12022430	10112768011	Pass	Pass	24-30	7.3	24.7	2.6	41.5	23.3	103
1141250.21	725730.27	4780.09	9/14/2009	12023036	10112768012	Pass	Pass	30-36	7.9	16.9	2.7	39.1	33	116
Pit 01-203														
1141382.50	725704.26	4780.90	9/14/2009	12030006	10112768018	Fail	Fail	00-06	7.9	540	14.8	2440	688	1730
1141382.50	725704.26	4780.90	9/14/2009	12030612	10112768019	Fail	Fail	06-12	7.6	2180	51.1	11100	1050	4760
1141382.50	725704.26	4780.90	9/14/2009	12031218	10112768020	Fail	Fail	12-18	7.8	1520	39.6	15900	737	4210
1141382.50	725704.26	4780.90	9/14/2009	12031824	10112769001	Pass	Pass	18-24	7.6	6.4	0.55	22	12.7	293
1141382.50	725704.26	4780.90	9/14/2009	12032430	10112769002	Pass	Pass	24-30	8	3.3	0.31	59.4	20.9	182
Pit 01-204														
1141364.06	725753.75	4781.42	9/22/2009	12040006	10113326008	Fail	Fail	00-06	6.8	679	14	1180	627	688
1141364.06	725753.75	4781.42	9/22/2009	12040612	10113326009	Fail	Fail	06-12	7.9	45.3	30.6	1030	55.1	5710
1141364.06	725753.75	4781.42	9/22/2009	12041218	10113326010	Pass	Pass	12-18	7.8	2.9	0.24	32.6	18.1	94.1
1141364.06	725753.75	4781.42	9/22/2009	12041824	10113326011	Pass	Pass	18-24	8.1	U3	0.21	26.2	15.5	89.9
Pit 01-205														
1141512.21	725741.45	4780.20	9/29/2009	12050006	10113927020	Fail	Fail	00-06	7.3	328	17	1560	306	2290
1141512.21	725741.45	4780.20	9/29/2009	12050612	10113929001	Fail	Fail	06-12	7	477	24.3	2850	372	2110
1141512.21	725741.45	4780.20	9/29/2009	12051218	10113929002	Fail	Fail	12-18	7.8	917	51.3	4590	463	2140
1141512.21	725741.45	4780.20	9/29/2009	12051824	10113929003	Fail	Fail	18-24	8	974	57.5	14000	3400	4330
1141512.21	725741.45	4780.20	9/29/2009	12052430	10113929004	Pass	Pass	24-30	7.7	12.9	1.9	36.6	12.7	56.7
1141512.21	725741.45	4780.20	9/29/2009	12053036	10113929005	Pass	Pass	30-36	7.6	10	1.7	23.9	15.3	62.8
Pit 01-206														
1141634.94	725731.84	4781.54	9/11/2009	12060006	10112886010	Fail	Fail	00-06	6.5	428	20.8	931	385	1100
1141634.94	725731.84	4781.54	9/11/2009	12060612	10112886011	Fail	Fail	06-12	7	165	19.7	14300	233	2790
1141634.94	725731.84	4781.54	9/11/2009	12061218	10112886012	Fail	Fail	12-18	8	32.2	7.4	352	21.5	1350
1141634.94	725731.84	4781.54	9/11/2009	12061824	10112886013	Pass	Pass	18-24	8	12.7	0.8	54.2	13	167

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141634.94	725731.84	4781.54	9/11/2009	12062430	10112886014	Pass	Pass	24-30	7.9	16.6	2.2	45	20.4	201
Pit 01-207														
1141750.00	725761.43	4780.86	9/11/2009	12070006	10112886017	Fail	Fail	00-06	7	568	25.3	742	691	930
1141750.00	725761.43	4780.86	9/11/2009	12070612	10112886018	Fail	Fail	06-12	7.7	1780	75.2	3590	939	2060
1141750.00	725761.43	4780.86	9/11/2009	12071218	10112886019	Fail	Fail	12-18	8	25.5	8.4	2470	20.8	1940
1141750.00	725761.43	4780.86	9/11/2009	12071824	10112886020	Pass	Pass	18-24	8.1	31.9	2.4	169	31	234
1141750.00	725761.43	4780.86	9/11/2009	12072430	10112888001	Pass	Pass	24-30	8.2	13.6	0.37	126	24.1	113
Pit 01-208														
1141882.57	725757.79	4781.17	9/11/2009	12080006	10112888002	Pass	Pass	00-06	8.1	45.7	1.2	189	38.3	110
1141882.57	725757.79	4781.17	9/11/2009	12080612	10112888003	Fail	Fail	06-12	8	75.5	5.6	702	65.8	681
1141882.57	725757.79	4781.17	9/11/2009	12081218	10112888004	Fail	Fail	12-18	6.7	566	10.2	1070	789	324
1141882.57	725757.79	4781.17	9/11/2009	12081824	10112888005	Fail	Fail	18-24	6.9	1460	26.5	1290	920	810
1141882.57	725757.79	4781.17	9/11/2009	12082430	10112888006	Fail	Fail	24-30	7.7	3520	66.2	2950	1860	2240
1141882.57	725757.79	4781.17	9/11/2009	12083036	10112888007	Fail	Fail	30-36	8.1	35.8	9.4	1770	68.1	1690
1141882.57	725757.79	4781.17	9/11/2009	12083642	10112888008	Fail	Fail	36-42	8.1	34.7	2.9	1200	38.1	1180
1141882.57	725757.79	4781.17	9/11/2009	12084248	10112888009	Fail	Pass	42-48	8.1	4.8	0.75	264	42.4	269
1141882.57	725757.79	4781.17	9/11/2009	12084854	10112888010	Pass	Pass	48-54	6.9	U3.7	0.21	57.1	17.7	94.1
1141882.57	725757.79	4781.17	9/11/2009	12085460	10112888011	Pass	Pass	54-60	7.2	3.8	0.45	47.2	20.8	143
1141882.57	725757.79	4781.17	9/11/2009	12086066	10112888012	Pass	Pass	60-66	7.2	5.5	0.15	9	7.1	31.9
Pit 01-209														
1142011.30	725753.45	4781.50	9/10/2009	12090002	10112879007	Fail	Fail	00-02	8.1	165	4.5	850	150	332
Pit 01-213														
1141124.61	725874.46	4781.14	9/14/2009	12130002	10112769009	Pass	Pass	00-02	--	256	--	--	--	--
Pit 01-214														
1141252.87	725850.65	4780.76	9/14/2009	12140006	10112769003	Fail	Fail	00-06	8.3	287	6.9	437	380	811
1141252.87	725850.65	4780.76	9/14/2009	12140612	10112769004	Fail	Fail	06-12	8.2	2000	45.1	7810	1140	4110
1141252.87	725850.65	4780.76	9/14/2009	12141218	10112769005	Fail	Fail	12-18	8	2230	67.2	18500	962	6030

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
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-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141252.87	725850.65	4780.76	9/14/2009	12141824	10112769006	Fail	Fail	18-24	8.2	10.4	3.4	371	16.9	1130
1141252.87	725850.65	4780.76	9/14/2009	12142430	10112769007	Pass	Pass	24-30	8.3	U2.6	0.16	34.3	22	304
1141252.87	725850.65	4780.76	9/14/2009	12143036	10112769008	Pass	Pass	30-36	8.2	7.7	0.3	46.3	23.5	100
Pit 01-215														
1141294.74	725818.64	4780.62	9/14/2009	12150006	10112769016	Fail	Fail	00-06	8	572	15.2	1570	528	1600
1141294.74	725818.64	4780.62	9/14/2009	12150612	10112769017	Fail	Fail	06-12	8	1300	35.5	10700	517	2490
1141294.74	725818.64	4780.62	9/14/2009	12151218	10112769018	Fail	Fail	12-18	8	489	14	3090	296	1190
1141294.74	725818.64	4780.62	9/14/2009	12151824	10112769019	Fail	Fail	18-24	8	778	17.1	957	38.9	1310
1141294.74	725818.64	4780.62	9/14/2009	12152430	10112769020	Pass	Pass	24-30	7.3	30.7	0.73	29.7	26.4	100
1141294.74	725818.64	4780.62	9/14/2009	12153036	10112770001	Pass	Pass	30-36	4.7	9.4	0.23	36.3	22.8	88
Pit 01-216														
1141388.67	725882.17	4780.89	9/29/2009	12160006	10113927003	Fail	Fail	00-06	8.2	850	28.8	5920	790	3350
1141388.67	725882.17	4780.89	9/29/2009	12160612	10113927004	Fail	Fail	06-12	8.4	107	9	1070	109	2040
1141388.67	725882.17	4780.89	9/29/2009	12161218	10113927005	Pass	Pass	12-18	8.4	18.6	0.65	50.5	20.4	149
1141388.67	725882.17	4780.89	9/29/2009	12161824	10113927006	Pass	Pass	18-24	8.4	7.2	0.24	29.4	21	94.1
Pit 01-217														
1141476.67	725885.78	4780.48	9/14/2009	12170002	10112770002	Pass	Pass	00-02	--	365	--	--	--	--
Pit 01-218														
1141640.90	725847.16	4779.86	9/14/2009	12180006	10112760001	Fail	Fail	00-06	7.8	601	14.5	2110	466	1930
1141640.90	725847.16	4779.86	9/14/2009	12180612	10112760002	Fail	Fail	06-12	7.8	1980	47.5	17500	1300	4470
1141640.90	725847.16	4779.86	9/14/2009	12181218	10112760003	Pass	Pass	12-18	8.2	U2.6	0.18	37.5	21.6	153
1141640.90	725847.16	4779.86	9/8/2009	12181824	10112760004	Pass	Pass	18-24	7.9	U3.1	U0.12	33.2	24.7	112
Pit 01-219														
1141756.55	725872.36	4781.16	9/11/2009	12190006	10112877001	Fail	Fail	00-06	7.9	2250	91.7	2890	1250	2120
1141756.55	725872.36	4781.16	9/11/2009	12190612	10112877002	Fail	Fail	06-12	8	93.2	13.5	5130	119	2660
1141756.55	725872.36	4781.16	9/11/2009	12191218	10112877003	Fail	Fail	12-18	8.3	10.2	2.4	423	13.5	460
1141756.55	725872.36	4781.16	9/11/2009	12191824	10112877004	Pass	Pass	18-24	8.2	7	1.1	116	7.2	118

Notes:

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Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141756.55	725872.36	4781.16	9/11/2009	12192430	10112877005	Pass	Pass	24-30	7.9	7.8	0.63	10.6	7	30.4
Pit 01-221														
1142003.06	725871.49	4780.21	9/10/2009	12210006	10112880015	Fail	Fail	00-06	8	567	33.1	7230	434	2100
1142003.06	725871.49	4780.21	9/10/2009	12210612	10112880016	Fail	Fail	06-12	7.8	1130	56.3	4860	678	2690
1142003.06	725871.49	4780.21	9/10/2009	12211218	10112880017	Fail	Fail	12-18	7.8	1330	73.4	7080	793	3950
1142003.06	725871.49	4780.21	9/10/2009	12211824	10112880018	Fail	Fail	18-24	4.6	3450	153	3110	1250	1580
1142003.06	725871.49	4780.21	9/10/2009	12212430	10112880019	Fail	Fail	24-30	4.8	6490	285	4110	2780	2340
1142003.06	725871.49	4780.21	9/10/2009	12213036	10112880020	Fail	Fail	30-36	7.7	17.6	28.6	16900	57	4330
1142003.06	725871.49	4780.21	9/10/2009	12213642	10112881001	Fail	Pass	36-42	8	17.6	2.7	56.7	18.7	518
1142003.06	725871.49	4780.21	9/10/2009	12214248	10112881002	Pass	Pass	42-48	7.8	18	2	31.5	18.9	179
Pit 01-222														
1142095.50	725801.53	4782.17	9/10/2009	12220006	10112880003	Fail	Fail	00-06	6.4	190	9.7	586	210	342
1142095.50	725801.53	4782.17	9/10/2009	12220612	10112880004	Fail	Pass	06-12	7	16.5	2.2	449	7.7	103
1142095.50	725801.53	4782.17	9/10/2009	12221218	10112880005	Fail	Pass	12-18	7.2	13.3	2.1	414	7	126
1142095.50	725801.53	4782.17	9/10/2009	12221824	10112880006	Fail	Pass	18-24	8	11.2	2.6	53.2	6.6	707
1142095.50	725801.53	4782.17	9/10/2009	12222430	10112880007	Pass	Pass	24-30	7.9	10.4	1.2	15.9	6.3	62.4
1142095.50	725801.53	4782.17	9/10/2009	12223036	10112880008	Pass	Pass	30-36	8.1	12.4	1.8	48	15	147
Pit 01-223														
1141137.79	725967.24	4780.83	9/14/2009	12230002	10112769010	Pass	Pass	00-02	--	208	--	--	--	--
Pit 01-224														
1141308.28	725972.75	4778.56	9/14/2009	12240006	10112769011	Fail	Fail	00-06	8	319	11.1	2880	306	1750
1141308.28	725972.75	4778.56	9/14/2009	12240612	10112769012	Fail	Fail	06-12	7.9	2010	47.9	12500	1410	3310
1141308.28	725972.75	4778.56	9/14/2009	12241218	10112769013	Fail	Fail	12-18	7.7	69.6	7.7	118	86.4	2630
1141308.28	725972.75	4778.56	9/14/2009	12241824	10112769014	Fail	Pass	18-24	7.6	22.2	0.93	213	54.1	266
1141308.28	725972.75	4778.56	9/14/2009	12242430	10112769015	Pass	Pass	24-30	7.7	U2.2	U0.089	12.2	6.2	26
Pit 01-22463W														
1141251.15	725975.44	4780.78	9/14/2009	22463W000	10112768001	Pass	Pass	00-02	--	357	--	--	--	--

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
Pit 01-231														
1142200.84	725665.71	4791.10	9/10/2009	12310002	10112881003	Pass	Pass	00-02	--	95	--	--	--	--
Pit 01-401														
1140449.86	723099.49	4794.15	8/26/2009	14010006	10111782009	Fail	Fail	00-06	8.1	95.5	1.6	714	103	602
1140449.86	723099.49	4794.15	8/26/2009	14010612	10117444006	Pass	Pass	06-12	8.3	18.6	0.23	14.4	U1.7	18.4
1140449.86	723099.49	4794.15	8/26/2009	14011218	10117453010	Pass	Pass	12-18	8.2	17.7	U0.13	4.7	U2	13.3
Pit 01-402														
1140458.03	723223.88	4791.89	8/26/2009	14020006	10111782013	Fail	Fail	00-06	8	296	19.9	2200	384	2400
1140458.03	723223.88	4791.89	8/26/2009	14020612	10111782014	Fail	Fail	06-12	8.1	275	16	1880	254	1060
1140458.03	723223.88	4791.89	8/26/2009	14021218	10111782015	Fail	Fail	12-18	7.6	1920	121	16900	1430	9370
1140458.03	723223.88	4791.89	8/26/2009	14021824	10111782016	Fail	Fail	18-24	7.9	187	9.5	225	86.1	1090
1140458.03	723223.88	4791.89	8/26/2009	14022430	10117453001	Pass	Pass	24-30	8.2	12	0.33	22.3	11.8	68.4
1140458.03	723223.88	4791.89	8/26/2009	14023036	10117444009	Pass	Pass	30-36	8.1	6.7	0.12	23.1	15	66.7
Pit 01-403														
1140325.89	723389.76	4793.16	8/26/2009	14030006	10111782017	Fail	Fail	00-06	8.1	160	15.4	1460	232	2220
1140325.89	723389.76	4793.16	8/26/2009	14030612	10117444007	Pass	Pass	06-12	8.6	25	1.7	98.8	U1.9	137
1140325.89	723389.76	4793.16	8/26/2009	14031218	10117444001	Pass	Pass	12-18	8.2	25	0.69	33.5	U2.3	43
Pit 01-404														
1140445.85	723265.10	4793.21	8/27/2009	14043036	10111783021	Fail	Fail	30-36	7.8	15.7	7.2	718	19.1	2010
Pit 01-409														
1141187.51	725608.98	4781.89	9/14/2009	14090006	10112770009	Fail	Fail	00-06	4.8	609	13.9	2200	447	1110
1141187.51	725608.98	4781.89	9/14/2009	14090612	10112770010	Fail	Fail	06-12	5	907	18.8	1910	555	853
1141187.51	725608.98	4781.89	9/14/2009	14091218	10112770011	Fail	Fail	12-18	7.6	1720	42.5	12400	1520	3150
1141187.51	725608.98	4781.89	9/14/2009	14091824	10112770012	Fail	Fail	18-24	8	36.8	3.9	1370	19.9	1070
1141187.51	725608.98	4781.89	9/14/2009	14092430	10112770013	Fail	Fail	24-30	7.7	4	1.6	182	18	859
1141187.51	725608.98	4781.89	9/14/2009	14093036	10112770014	Pass	Pass	30-36	7.8	U2.5	0.16	10.9	8.9	94.4
1141187.51	725608.98	4781.89	9/14/2009	14093642	10112770015	Pass	Pass	36-42	7.5	U2.6	U0.1	15.5	10.8	53.1

Notes:

(s.u.) - Standard units
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-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
Pit 01-410														
1142118.26	725479.88	4782.59	9/9/2009	14100006	10112881005	Fail	Fail	00-06	8	200	15.6	915	153	1130
1142118.26	725479.88	4782.59	9/9/2009	14100612	10112881006	Fail	Fail	06-12	7.7	357	18.3	619	404	748
1142118.26	725479.88	4782.59	9/9/2009	14101218	10112881007	Fail	Fail	12-18	7.5	569	32	7140	384	1200
1142118.26	725479.88	4782.59	9/9/2009	14101824	10112881008	Fail	Fail	18-24	7.6	57.5	9.7	448	19.5	1210
1142118.26	725479.88	4782.59	9/9/2009	14102430	10112881009	Fail	Pass	24-30	8.1	19.8	3.2	54.2	12.6	600
1142118.26	725479.88	4782.59	9/9/2009	14103036	10112881010	Pass	Pass	30-36	8	14.2	1.1	38	11.8	89.3
Pit 01-411														
1141305.65	724284.17	4787.22	9/22/2009	14115460	10113322015	Fail	Fail	54-60	7.9	2420	158	25700	2290	6040
1141305.65	724284.17	4787.22	9/22/2009	14116066	10113322016	Pass	Pass	60-66	7.7	18.3	2.2	25.7	21.6	97.5
1141305.65	724284.17	4787.22	9/22/2009	14116672	10113322017	Pass	Pass	66-72	7.6	22	2.4	27.9	17.2	78.2
Pit 01-412														
1141009.70	724569.89	4786.24	9/22/2009	14121824	10117453002	Fail	Fail	18-24	7.7	2320	39.3	13200	1510	2140
1141009.70	724569.89	4786.24	9/22/2009	14122430	10117444005	Fail	Fail	24-30	8	58.7	93.6	1860	95.5	6630
1141009.70	724569.89	4786.24	9/22/2009	14123036	10113322018	Pass	Pass	30-36	7.9	4.8	0.67	9.1	5.1	119
1141009.70	724569.89	4786.24	9/22/2009	14123642	10113322019	Pass	Pass	36-42	8.1	9.5	1.9	33.7	16.9	95.6
1141009.70	724569.89	4786.24	9/22/2009	14124248	10113322020	Pass	Pass	42-48	8.1	11.4	1.5	31.5	12.5	74.5
Pit 01-414														
1141918.11	724966.82	4785.07	9/29/2009	14143642	10113925008	Fail	Fail	36-42	8.1	9.8	3	107	22.7	930
1141918.11	724966.82	4785.07	9/29/2009	14144248	10113925009	Fail	Fail	42-48	8.1	35.2	3.3	299	47.2	1170
Pit 01-415														
1141898.21	725116.99	4784.82	9/29/2009	14152430	10117453007	Fail	Fail	24-30	8.2	131	2.8	978	114	692
1141898.21	725116.99	4784.82	9/29/2009	14153036	10117453014	Pass	Pass	30-36	8.1	27	0.62	196	40.5	180
1141898.21	725116.99	4784.82	9/29/2009	14153642	10113925010	Pass	Pass	36-42	7.9	U3.2	U0.13	31.7	22.7	89.2
1141898.21	725116.99	4784.82	9/29/2009	14154248	10113925011	Pass	Pass	42-48	8.4	8.6	0.48	107	38.1	153
Pit 01-416														
1140880.77	725398.10	4782.57	9/30/2009	14160002	10113929015	Fail	Fail	00-02	8.2	585	41.2	4330	533	2910

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
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-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
Pit 01-417														
1141015.06	725095.88	4784.00	9/30/2009	14170006	10113929018	Fail	Fail	00-06	8.1	694	38.7	2570	607	1680
1141015.06	725095.88	4784.00	9/30/2009	14170612	10113929019	Fail	Fail	06-12	8.4	119	27.8	2500	191	3460
1141015.06	725095.88	4784.00	9/30/2009	14171218	10113929020	Pass	Pass	12-18	8.3	15.8	1.9	36.6	16.6	79.8
1141015.06	725095.88	4784.00	9/30/2009	14171824	10113930001	Pass	Pass	18-24	8.2	11.9	1.8	23.1	15	68.7
1141015.06	725095.88	4784.00	9/30/2009	14172430	10113930002	Pass	Pass	24-30	8.4	14.1	1.8	30.2	15.1	67.6
1141015.06	725095.88	4784.00	9/30/2009	14173036	10113930003	Pass	Pass	30-36	8.4	17.5	2.1	64.7	17.9	93.9
Pit 01-418														
1141098.82	722753.91	4797.35	9/30/2009	14180006	10113930004	Fail	Fail	00-06	6.3	234	14.8	849	169	510
1141098.82	722753.91	4797.35	9/30/2009	14180612	10113930005	Fail	Fail	06-12	5.6	198	12.3	864	143	420
1141098.82	722753.91	4797.35	9/30/2009	14181218	10113930006	Fail	Fail	12-18	5.7	113	7.5	621	137	251
1141098.82	722753.91	4797.35	9/30/2009	14181824	10113930007	Fail	Fail	18-24	4.6	742	36.7	1700	791	808
1141098.82	722753.91	4797.35	9/30/2009	14182430	10113930008	Fail	Fail	24-30	5.1	942	44.3	1070	1070	473
1141098.82	722753.91	4797.35	9/30/2009	14183036	10113930009	Fail	Fail	30-36	5.2	68.6	5.2	1600	48.7	176
1141098.82	722753.91	4797.35	9/30/2009	14183642	10113930010	Fail	Fail	36-42	5.8	40.3	4.5	1380	27.5	193
1141098.82	722753.91	4797.35	9/30/2009	14184248	10113930011	Fail	Fail	42-48	7.5	15.3	4.7	2020	13.3	593
Pit 01-503														
1139598.75	722399.62	4801.29	8/31/2009	15030002	10112267009	Pass	Pass	00-02	--	96.9	--	--	--	--
Pit 01-505														
1139854.58	722461.25	4800.72	8/31/2009	15050006	10112267010	Fail	Fail	00-06	8.2	182	12.3	1380	150	858
1139854.58	722461.25	4800.72	8/31/2009	15050612	10112267011	Fail	Fail	06-12	7.9	170	9.3	1280	136	630
1139854.58	722461.25	4800.72	8/31/2009	15051218	10117453006	Fail	Pass	12-18	8	112	4.6	688	80.9	402
1139854.58	722461.25	4800.72	8/31/2009	15051824	10117453008	Pass	Pass	18-24	8.1	40.6	1.8	199	17.6	156
1139854.58	722461.25	4800.72	8/31/2009	15052430	10117453009	Pass	Pass	24-30	8.5	15	0.2	11.4	U1.7	30
Pit 01-507														
1139930.11	722545.91	4799.19	8/31/2009	15070002	10112267008	Pass	Pass	00-02	--	142	--	--	--	--
Pit 01-508														

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1140010.71	722603.31	4799.00	8/31/2009	15080006	10112267004	Fail	Pass	00-06	8	51.3	3.5	298	37.5	200
1140010.71	722603.31	4799.00	8/31/2009	15080612	10112267005	Pass	Pass	06-12	8	15.8	0.57	26.6	U1.5	38.7
1140010.71	722603.31	4799.00	8/31/2009	15081218	10112267006	Pass	Pass	12-18	8.1	18.7	0.33	11.7	U1.5	29.2
1140010.71	722603.31	4799.00	8/31/2009	15081824	10112267007	Fail	Pass	18-24	8.3	63.7	5.4	338	50.5	310
1140010.71	722603.31	4799.00	8/31/2009	15082430	10117444012	Pass	Pass	24-30	8.3	14.2	0.19	4.3	U1.6	22
1140010.71	722603.31	4799.00	8/31/2009	15083036	10117444011	Pass	Pass	30-36	8.3	15.1	0.22	8.8	U1.6	25.5
Pit 01-510														
1140144.51	722507.68	4799.42	8/31/2009	15100002	10112267002	Pass	Pass	00-02	--	26.7	--	--	--	--
Pit 01-511														
1140217.22	722511.33	4798.71	8/31/2009	15110002	10112267003	Pass	Pass	00-02	--	11.9	--	--	--	--
Pit 01-512														
1140254.91	722626.16	4797.01	8/31/2009	15120002	10112267001	Pass	Pass	00-02	--	28	--	--	--	--
Pit 01-513														
1140417.44	722622.23	4794.73	8/31/2009	15130002	10112266020	Pass	Pass	00-02	--	151	--	--	--	--
Pit 01-516														
1140855.30	723001.77	4794.04	9/24/2009	15165460	10113702021	Fail	Fail	54-60	8	5.4	1.4	737	7.2	157
1140855.30	723001.77	4794.04	9/24/2009	15166066	10113702022	Pass	Pass	60-66	8	14.1	1.7	97.9	5	253
Pit 01-517														
1140786.37	722989.11	4792.19	8/27/2009	15174248	10112442013	Fail	Fail	42-48	8	95.6	2.9	601	90	1250
1140786.37	722989.11	4792.19	8/27/2009	15175460	10112442014	Fail	Fail	54-60	7.6	290	7.4	1280	255	3120
Pit 01-518														
1140628.26	723117.68	4795.07	8/27/2009	15185460	10112442015	Fail	Fail	54-60	8	U3.6	1.6	31.3	22.8	4120
1140628.26	723117.68	4795.07	8/27/2009	15186672	10112442016	Pass	Pass	66-72	8.1	5.1	0.43	60.9	23.4	103
Pit 01-519														
1140594.46	723244.73	4794.30	8/27/2009	15195460	10112442017	Fail	Fail	54-60	6	6.2	1.4	1240	17.2	419
1140594.46	723244.73	4794.30	8/27/2009	15197284	10112442018	Fail	Fail	72-84	7	3.9	1.4	531	5.8	291
Pit 01-520														

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1140667.84	723264.26	4794.59	9/28/2009	15203642	10113931017	Fail	Fail	36-42	8.1	2.6	1.4	1010	24.1	285
1140667.84	723264.26	4794.59	9/28/2009	15204248	10113931018	Fail	Pass	42-48	8.2	U2.7	0.68	551	12.7	178
1140667.84	723264.26	4794.59	9/28/2009	15204854	10113931019	Fail	Pass	48-54	8.2	U2.2	1	470	11.1	164
Pit 01-521														
1140364.58	723314.34	4792.34	8/27/2009	15211218	10111782020	Fail	Fail	12-18	8.3	23.9	2.5	126	U2.4	1030
1140364.58	723314.34	4792.34	8/27/2009	15211824	10111783001	Fail	Fail	18-24	7.7	21.2	0.99	58.5	U2.3	731
1140364.58	723314.34	4792.34	8/27/2009	15212430	10111783002	Pass	Pass	24-30	8.2	18.2	1.2	60.6	U2.3	287
Pit 01-522														
1140128.41	723277.78	4795.21	8/26/2009	15220006	10111782010	Fail	Fail	00-06	8.2	128	10	821	120	449
1140128.41	723277.78	4795.21	8/27/2009	15220612	10111782011	Pass	Pass	06-12	8.3	18.8	U0.15	8.2	U2.3	25.5
1140128.41	723277.78	4795.21	8/27/2009	15221218	10111782012	Pass	Pass	12-18	8.4	21.2	U0.14	6.7	U2	20.6
Pit 01-524														
1140484.01	723464.46	4792.51	9/28/2009	15243642	10113931020	Fail	Fail	36-42	8.1	125	4.9	870	162	1330
1140484.01	723464.46	4792.51	9/28/2009	15244248	10113935001	Fail	Fail	42-48	8	426	12.5	2860	331	5060
Pit 01-525														
1140634.28	723426.39	4793.08	9/24/2009	15253642	10113702019	Fail	Fail	36-42	7.6	68	3.9	3410	157	505
1140634.28	723426.39	4793.08	9/24/2009	15254248	10113702020	Pass	Pass	42-48	8.1	U2.5	0.25	184	9	129
Pit 01-526														
1140763.45	723433.63	4792.26	9/24/2009	15264248	10113702014	Fail	Fail	42-48	7.8	U2.9	1.1	2380	15.2	278
1140763.45	723433.63	4792.26	9/24/2009	15264854	10113702015	Pass	Pass	48-54	7.6	U3.2	0.27	24.8	17.6	79.7
1140763.45	723433.63	4792.26	9/24/2009	15265460	10113702016	Pass	Pass	54-60	7.6	U2.7	0.4	54.6	20.6	112
Pit 01-527														
1140650.32	723879.03	4789.66	9/2/2009	15270006	10112280019	Fail	Fail	00-06	8.2	586	25.8	1100	446	1090
1140650.32	723879.03	4789.66	9/2/2009	15270612	10112280020	Fail	Fail	06-12	7.1	1390	53.3	988	829	1170
1140650.32	723879.03	4789.66	9/2/2009	15271218	10112281001	Fail	Fail	12-18	7.3	2450	38.8	1860	1310	1400
1140650.32	723879.03	4789.66	9/2/2009	15271824	10112281002	Fail	Fail	18-24	7.6	96	2.1	3980	106	269
1140650.32	723879.03	4789.66	9/2/2009	15272430	10112281003	Fail	Fail	24-30	7.6	12.2	0.56	3170	19.4	230

Notes:

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Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1140650.32	723879.03	4789.66	9/2/2009	15273036	10112281004	Fail	Fail	30-36	7.5	13	0.56	1650	17.4	174
1140650.32	723879.03	4789.66	9/2/2009	15273642	10112281005	Fail	Pass	36-42	7.5	U3.5	1.6	62.9	13.1	733
1140650.32	723879.03	4789.66	9/2/2009	15274248	10112281006	Fail	Pass	42-48	7.8	3.8	2.5	39.9	8.9	457
Pit 01-528														
1140704.06	723988.94	4790.22	9/2/2009	15280006	10112281015	Fail	Fail	00-06	7.3	168	10.6	1830	219	1420
1140704.06	723988.94	4790.22	9/2/2009	15280612	10112281016	Fail	Fail	06-12	3.8	202	3.7	562	261	419
1140704.06	723988.94	4790.22	9/2/2009	15281218	10112281017	Fail	Fail	12-18	4.3	205	3.7	564	260	422
1140704.06	723988.94	4790.22	9/2/2009	15281824	10112281018	Fail	Fail	18-24	7.1	233	18.9	1830	257	2280
1140704.06	723988.94	4790.22	9/2/2009	15282430	10112281019	Fail	Fail	24-30	7.6	591	14.3	4600	1050	2490
1140704.06	723988.94	4790.22	9/2/2009	15283036	10112281020	Fail	Fail	30-36	7.8	468	10.5	7200	1530	2430
1140704.06	723988.94	4790.22	9/2/2009	15283642	10112285001	Fail	Fail	36-42	7.9	661	30.2	11100	1090	1910
1140704.06	723988.94	4790.22	9/2/2009	15284854	10112285002	Pass	Pass	48-54	7.3	58.1	4.2	56.5	34	169
1140704.06	723988.94	4790.22	9/2/2009	15285460	10112285003	Fail	Fail	54-60	8.1	190	11	1800	399	1010
1140704.06	723988.94	4790.22	9/2/2009	15286672	10112285004	Fail	Fail	66-72	7.7	25.9	2	141	25.7	1420
Pit 01-529														
1141012.83	724125.73	4789.31	9/2/2009	10900006	10112285005	Fail	Fail	00-06	4.3	243	11.4	419	279	373
1141012.83	724125.73	4789.31	9/2/2009	10900612	10112285006	Fail	Fail	06-12	7.3	1310	52.7	2300	1290	2040
1141012.83	724125.73	4789.31	9/2/2009	10901218	10112285007	Fail	Fail	12-18	7.3	27.2	6.4	3770	73.2	1390
1141012.83	724125.73	4789.31	9/2/2009	10903036	10112285008	Pass	Pass	30-36	7.6	8.1	1.9	27.4	8.1	132
1141012.83	724125.73	4789.31	9/2/2009	10903642	10112285009	Fail	Pass	36-42	7.6	6.1	2.8	22.4	15.7	738
1141012.83	724125.73	4789.31	9/2/2009	10904248	10112285010	Fail	Fail	42-48	7.8	8.1	6.5	157	19.6	1170
1141012.83	724125.73	4789.31	9/2/2009	10904854	10112285011	Pass	Pass	48-54	7.7	3.7	0.94	287	7.6	71.7
Pit 01-530														
1141039.02	724013.24	4789.07	9/2/2009	15300006	10112440001	Fail	Fail	00-06	7.6	270	29.7	1730	214	2780
1141039.02	724013.24	4789.07	9/2/2009	15300612	10112440002	Fail	Fail	06-12	7.8	739	46.2	5100	420	3200
1141039.02	724013.24	4789.07	9/2/2009	15301218	10112440003	Fail	Fail	12-18	7.4	488	31.9	17500	369	3210
1141039.02	724013.24	4789.07	9/2/2009	15301824	10112440004	Fail	Fail	18-24	6.3	2600	97.9	4340	2720	3380

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
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-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141039.02	724013.24	4789.07	9/2/2009	15302430	10112440005	Fail	Fail	24-30	7.8	28.3	30	61000	174	7110
1141039.02	724013.24	4789.07	9/2/2009	15303036	10112440006	Fail	Fail	30-36	7.9	26.4	7.2	2350	43	1110
1141039.02	724013.24	4789.07	9/2/2009	15303642	10112440007	Pass	Pass	36-42	7.2	13.4	2.3	28.5	21.2	97.6
1141039.02	724013.24	4789.07	9/2/2009	15304248	10112440008	Pass	Pass	42-48	7.8	9.5	2.2	40.6	22.2	113
Pit 01-531														
1141016.83	723882.67	4789.41	9/1/2009	15310006	10112280001	Fail	Fail	00-06	8.1	913	40.3	2180	593	1350
1141016.83	723882.67	4789.41	9/1/2009	15310612	10112280002	Pass	Pass	06-12	8	15.9	1.9	43.4	12.6	122
1141016.83	723882.67	4789.41	9/1/2009	15311218	10112280003	Pass	Pass	12-18	8.1	15	1.9	63.6	19.6	107
Pit 01-532														
1141511.37	723964.93	4789.92	9/2/2009	15320002	10112440017	Pass	Pass	00-02	--	197	--	--	--	--
Pit 01-533														
1141425.59	724128.61	4787.65	9/21/2009	15333036	10113183015	Fail	Fail	30-36	7.8	27.8	10	110	39.4	1650
1141425.59	724128.61	4787.65	9/21/2009	15333642	10113183016	Fail	Pass	36-42	7.5	18.1	2.8	46.2	24	659
1141425.59	724128.61	4787.65	9/21/2009	15334248	10113183017	Fail	Fail	42-48	7.7	13.1	3.6	154	28.5	931
Pit 01-534														
1141819.50	724740.58	4786.50	9/3/2009	15340006	10112442004	Fail	Fail	00-06	5	249	6.9	997	301	899
1141819.50	724740.58	4786.50	9/3/2009	15340612	10112442005	Fail	Fail	06-12	6.2	445	24.3	3840	425	3020
1141819.50	724740.58	4786.50	9/3/2009	15341218	10112442006	Fail	Fail	12-18	6	1310	33.2	15800	770	4950
1141819.50	724740.58	4786.50	9/3/2009	15341824	10112442007	Fail	Fail	18-24	8.1	13.1	6	482	18	1510
1141819.50	724740.58	4786.50	9/3/2009	15342430	10112442008	Pass	Pass	24-30	8.2	6.9	0.59	50.9	19.3	173
1141819.50	724740.58	4786.50	9/3/2009	15343036	10112442009	Pass	Pass	30-36	8.3	3	0.2	30.8	18.3	93.7
Pit 01-536														
1141506.64	724653.31	4786.03	9/17/2009	15363642	10112920009	Fail	Fail	36-42	7.9	1830	62.5	13900	1750	8540
1141506.64	724653.31	4786.03	9/17/2009	15364854	10112920010	Pass	Pass	48-54	8.1	10.7	0.51	70.9	61.8	157
1141506.64	724653.31	4786.03	9/17/2009	15365460	10112920011	Pass	Pass	54-60	8.1	8.4	0.5	36.2	34.1	134
Pit 01-537														
1141501.71	724846.04	4784.74	9/29/2009	15373642	10113925017	Fail	Fail	36-42	7.9	783	18.1	3460	577	1410

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
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-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141501.71	724846.04	4784.74	9/29/2009	15374248	10113925018	Fail	Fail	42-48	7.7	289	7.7	1510	842	1030
Pit 01-538														
1141485.41	725012.95	4784.67	9/17/2009	15385460	10112920013	Fail	Fail	54-60	7.3	249	22	2740	208	1760
1141485.41	725012.95	4784.67	9/17/2009	15386066	10112920012	Fail	Fail	60-66	7.2	422	18	3750	231	1960
Pit 01-539														
1141561.79	725130.31	4784.53	9/3/2009	15390006	10112266011	Fail	Fail	00-06	4.2	402	10	1980	410	904
1141561.79	725130.31	4784.53	9/3/2009	15390612	10112266012	Fail	Fail	06-12	4.1	1870	43.9	2020	972	2700
1141561.79	725130.31	4784.53	9/3/2009	15391218	10112266013	Fail	Fail	12-18	4.4	2940	64.2	2840	1130	2380
1141561.79	725130.31	4784.53	9/3/2009	15391824	10112266014	Fail	Fail	18-24	5.7	2870	69.4	17800	2880	4710
1141561.79	725130.31	4784.53	9/3/2009	15392430	10112266015	Fail	Fail	24-30	7.7	31.8	22.2	4760	190	3270
1141561.79	725130.31	4784.53	9/3/2009	15393036	10112266016	Fail	Fail	30-36	7.9	16.4	6.6	426	30.2	1580
1141561.79	725130.31	4784.53	9/3/2009	15393642	10112266017	Fail	Fail	36-42	7.5	U2.9	27.8	542	18.5	2430
1141561.79	725130.31	4784.53	9/3/2009	15394248	10112266018	Pass	Pass	42-48	7.6	U2.7	0.32	27.5	13.3	94.6
1141561.79	725130.31	4784.53	9/3/2009	15394854	10112266019	Pass	Pass	48-54	8.3	U2.8	U0.11	6.8	6.7	62.9
Pit 01-540														
1141520.65	725299.55	4783.82	9/17/2009	15405460	10112920017	Fail	Fail	54-60	7.3	1020	41.9	6800	716	6690
1141520.65	725299.55	4783.82	9/17/2009	15406066	10112920018	Fail	Fail	60-66	7.2	236	5.9	2150	622	948
Pit 01-541														
1141378.10	725267.56	4784.13	9/17/2009	15414248	10112920014	Fail	Fail	42-48	8.2	U3.2	3.4	343	9.3	569
1141378.10	725267.56	4784.13	9/17/2009	15414854	10112920015	Pass	Pass	48-54	7.5	U3.1	0.32	22.2	16.4	72
1141378.10	725267.56	4784.13	9/17/2009	15415460	10112920016	Pass	Pass	54-60	7.8	U3.2	0.51	33.9	10.6	454
Pit 01-542														
1141356.61	725336.87	4783.59	9/8/2009	15420006	10112763009	Fail	Fail	00-06	6.3	368	8.3	1660	414	885
1141356.61	725336.87	4783.59	9/8/2009	15420612	10112763010	Fail	Fail	06-12	5.5	835	14.7	560	609	1150
1141356.61	725336.87	4783.59	9/8/2009	15421218	10112763011	Fail	Fail	12-18	5.6	1390	21.9	544	696	1320
1141356.61	725336.87	4783.59	9/8/2009	15421824	10112763012	Fail	Fail	18-24	7.4	2320	37.7	3120	2660	3100
1141356.61	725336.87	4783.59	9/8/2009	15422430	10112763013	Fail	Fail	24-30	7.7	318	6.5	5250	1070	1370

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141356.61	725336.87	4783.59	9/8/2009	15423036	10112763014	Fail	Fail	30-36	7.3	24.7	2.3	1380	49	247
1141356.61	725336.87	4783.59	9/8/2009	15423642	10112763015	Fail	Fail	36-42	7.2	7	2.7	4470	18	551
1141356.61	725336.87	4783.59	9/8/2009	15424248	10112763016	Fail	Fail	42-48	7.1	5.5	15.5	946	17	2020
1141356.61	725336.87	4783.59	9/8/2009	15424854	10112763017	Fail	Pass	48-54	7.6	8.5	2	117	12.5	504
1141356.61	725336.87	4783.59	9/8/2009	15425460	10112763018	Fail	Fail	54-60	7.5	17.9	3.1	58.4	12.4	1590
Pit 01-543														
1141193.93	725119.95	4782.62	9/15/2009	15430006	10112773012	Fail	Fail	00-06	8	36.9	28.7	5900	39.5	7040
1141193.93	725119.95	4782.62	9/15/2009	15430612	10112773013	Fail	Fail	06-12	8.2	17.3	11.7	2080	29	2670
1141193.93	725119.95	4782.62	9/15/2009	15431218	10112773014	Pass	Pass	12-18	8.2	U3.1	0.48	38.9	14.1	164
1141193.93	725119.95	4782.62	9/15/2009	15431824	10112773015	Pass	Pass	18-24	7.9	3	0.37	10.7	8.5	71
Pit 01-544														
1141124.09	725364.11	4782.22	9/9/2009	15440006	10112881012	Fail	Fail	00-06	5.2	315	16.4	938	312	545
1141124.09	725364.11	4782.22	9/9/2009	15440612	10112881013	Fail	Fail	06-12	5.4	645	29.2	605	1160	116
1141124.09	725364.11	4782.22	9/9/2009	15441218	10112881014	Fail	Fail	12-18	5.4	1910	87.5	1440	975	1950
1141124.09	725364.11	4782.22	9/9/2009	15441824	10112881015	Fail	Fail	18-24	6.2	3280	145	2170	1310	1690
1141124.09	725364.11	4782.22	9/9/2009	15442430	10112881016	Fail	Fail	24-30	7.4	216	27.8	10800	777	2790
1141124.09	725364.11	4782.22	9/9/2009	15443036	10112881019	Fail	Fail	30-36	7.7	37.3	7.6	1840	48.9	1790
1141124.09	725364.11	4782.22	9/9/2009	15443642	10112881017	Pass	Pass	36-42	7.4	5.7	0.91	9.9	5.5	44.9
1141124.09	725364.11	4782.22	9/9/2009	15444248	10112881018	Pass	Pass	42-48	7.4	U3.2	0.7	6.4	5.3	168
Pit 01-545														
1141152.37	725472.59	4782.18	9/15/2009	15451824	10117453005	Fail	Fail	18-24	7.9	18	25.9	55900	65.4	4680
1141152.37	725472.59	4782.18	9/15/2009	15452430	10117453004	Fail	Fail	24-30	8.4	3.7	4.6	155	15.7	2880
1141152.37	725472.59	4782.18	9/15/2009	15453036	10112771015	Fail	Pass	30-36	7.7	U3.1	2.7	32.9	12	631
1141152.37	725472.59	4782.18	9/15/2009	15453642	10112771016	Pass	Pass	36-42	7.9	U2.3	2.5	20.7	8.2	382
1141152.37	725472.59	4782.18	9/15/2009	15454248	10112771017	Pass	Pass	42-48	8.3	U3	0.56	33.1	16.8	204
Pit 01-546														
1141452.46	725485.45	4782.29	9/8/2009	15460006	10112765007	Fail	Fail	00-06	7.8	624	23.8	6330	514	3860

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141452.46	725485.45	4782.29	9/8/2009	15460612	10112765008	Fail	Fail	06-12	7.8	645	12.9	2390	637	1070
1141452.46	725485.45	4782.29	9/8/2009	15461218	10112765009	Fail	Fail	12-18	7.7	1590	41.4	9180	902	3130
1141452.46	725485.45	4782.29	9/8/2009	15461824	10112765010	Fail	Fail	18-24	7.7	2530	65.2	22000	3020	6120
1141452.46	725485.45	4782.29	9/8/2009	15462430	10112765011	Pass	Pass	24-30	7.8	32.4	0.85	52.2	107	175
1141452.46	725485.45	4782.29	9/8/2009	15463036	10112765012	Pass	Pass	30-36	8.1	15.2	0.55	44.5	74.7	120
Pit 01-547														
1141614.43	725492.29	4780.78	9/8/2009	15470006	10112766017	Fail	Fail	00-06	6	323	15.6	2640	346	980
1141614.43	725492.29	4780.78	9/8/2009	15470612	10112766018	Fail	Fail	06-12	4.6	232	12.2	510	257	365
1141614.43	725492.29	4780.78	9/8/2009	15471218	10112766019	Fail	Fail	12-18	7.6	188	17.1	5040	207	1390
1141614.43	725492.29	4780.78	9/8/2009	15471824	10112766020	Fail	Fail	18-24	8	111	11.1	908	104	2280
1141614.43	725492.29	4780.78	9/8/2009	15472430	10112767001	Fail	Fail	24-30	7.6	126	12.2	821	149	1570
1141614.43	725492.29	4780.78	9/8/2009	15473036	10112767002	Fail	Fail	30-36	7.9	625	35.6	3230	306	3380
1141614.43	725492.29	4780.78	9/8/2009	15473642	10112767003	Fail	Fail	36-42	7.5	181	16.7	1450	158	2050
Pit 01-548														
1141830.00	725500.00		9/11/2009	15480006	10112877006	Fail	Fail	00-06	7.9	167	14.2	1270	209	1050
1141830.00	725500.00		9/11/2009	15480612	10112877007	Fail	Fail	06-12	7.6	151	20.8	3470	170	1980
1141830.00	725500.00		9/11/2009	15481218	10112877008	Fail	Fail	12-18	7.5	154	25.3	1460	138	2370
1141830.00	725500.00		9/11/2009	15481824	10112877009	Fail	Fail	18-24	7.8	258	18.4	1820	268	2560
1141830.00	725500.00		9/11/2009	15482430	10112877010	Fail	Fail	24-30	8	272	17.9	1850	246	2230
1141830.00	725500.00		9/11/2009	15483036	10112877011	Fail	Fail	30-36	7.9	307	21.1	1840	227	2460
1141830.00	725500.00		9/11/2009	15483642	10112877012	Fail	Fail	36-42	7.8	268	15	1510	163	1730
1141830.00	725500.00		9/11/2009	15484248	10112877013	Fail	Fail	42-48	7.5	319	18.9	1710	209	2840
1141830.00	725500.00		9/11/2009	15484854	10112877014	Fail	Fail	48-54	7.5	533	27.7	2270	385	5490
Pit 01-549														
1141945.67	725570.37	4781.49	9/10/2009	15490006	10112880009	Fail	Fail	00-06	7.7	387	21.8	1440	369	1180
1141945.67	725570.37	4781.49	9/10/2009	15490612	10112880010	Fail	Fail	06-12	7.5	362	26.2	4760	450	1750
1141945.67	725570.37	4781.49	9/10/2009	15491218	10112880011	Fail	Fail	12-18	7.9	34.7	11.5	726	32.9	2130

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

Appendix A
Base of Tailings/Impacted Soil Data

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	Depth (Inches)	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141945.67	725570.37	4781.49	9/10/2009	15491824	10112880012	Fail	Fail	18-24	7.6	22.6	4.6	153	27	681
1141945.67	725570.37	4781.49	9/10/2009	15492430	10112880013	Pass	Pass	24-30	8	22.1	2.9	52.2	22.1	114
1141945.67	725570.37	4781.49	9/10/2009	15493036	10112880014	Pass	Pass	30-36	8	60.8	4.9	28	19.3	85.5
Pit 01-550														
1141561.79	725130.31	4784.53	9/11/2009	15500006	10112888013	Fail	Fail	00-06	6.4	456	10.1	768	261	600
1141561.79	725130.31	4784.53	9/11/2009	15500612	10112888014	Fail	Fail	06-12	5.9	1820	37.3	1170	774	1540
1141561.79	725130.31	4784.53	9/11/2009	15501218	10112888015	Fail	Fail	12-18	5.9	1610	33	8660	635	1690
1141561.79	725130.31	4784.53	9/11/2009	15501824	10112888016	Fail	Fail	18-24	7.8	6.5	23.2	3160	12.7	4490
1141561.79	725130.31	4784.53	9/11/2009	15502430	10112888017	Fail	Pass	24-30	8.1	2.9	0.72	314	13.8	233
1141561.79	725130.31	4784.53	9/11/2009	15503036	10112888018	Fail	Pass	30-36	8.2	U2.5	0.45	364	13.6	162
1141854.94	725868.01	4781.28	9/11/2009	15503642	10117444002	Pass	Pass	36-42	8	3.9	U0.091	21.9	15.1	104
1141854.94	725868.01	4781.28	9/11/2009	15504248	10117444008	Pass	Pass	42-48	8.4	U2.2	0.67	3.6	3.8	158

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

-- - Sample not collected/analyzed

APPENDIX B

ELEVATION OF BASE OF TAILINGS/IMPACTED SOIL AND GROUNDWATER

Appendix B

Elevation of Base of Tailings/Impacted Soil and Groundwater

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Sample Area and Pit	Easting	Northing	Elevation (feet)	500 mg/kg Depth of Impacted Soil (inches)	500 mg/kg Base of Tailings Elevation (feet)	800 mg/kg Depth of Impacted Soil (inches)	800 mg/kg Base of Tailings Elevation (feet)	Water (inches) Depth to	Groundwater Elevation (feet)
01-001	1139251.68	722599.54	4801.27	2	4801.10	2	4801.10	42	4797.77
01-002	1139405.82	722703.71	4799.96	6	4799.46	6	4799.46	42	4796.46
01-003	1139524.59	722725.45	4800.32	2	4800.15	2	4800.15	46	4796.49
01-004	1139635.78	722745.59	4799.27	6	4798.77	6	4798.77	46	4795.44
01-005	1140508.87	722767.28	4793.46	30	4790.96	30	4790.96	42	4789.96
01-005150W	1140336.66	722890.52	4795.31	0	4795.31	0	4795.31	NO	
01-006	1140642.74	722793.69	4792.94	0	4792.94	0	4792.94	36	4789.94
01-007	1140861.30	722791.34	4795.38	60	4790.38	60	4790.38	72	4789.38
01-008	1141004.45	722753.97	4795.15	>78	4788.65	>78	4788.65	NO	
01-009	1139644.43	722854.83	4798.98	6	4798.48	6	4798.48	42	4795.48
01-010	1139748.43	722867.65	4798.18	0	4798.18	0	4798.18	36	4795.18
01-011	1139886.72	722881.35	4797.61	6	4797.11	6	4797.11	NO	
01-012	1140532.14	722858.35	4792.80	24	4790.80	24	4790.80	42	4789.30
01-013	1140613.94	722883.59	4793.49	24	4791.49	24	4791.49	48	4789.49
01-014	1140734.76	722913.72	4794.47	>72	4788.47	>72	4788.47	66	4788.97
01-015	1140869.48	722869.48	4794.55			42	4791.05	60	4789.55
01-015	1140869.48	722869.48	4794.55	48	4790.55			60	4789.55
01-016	1141007.92	722870.12	4795.41	24	4793.41	24	4793.41	NO	
01-017	1141138.06	722874.23	4796.04	12	4795.04	12	4795.04	NO	
01-018	1139781.01	722960.48	4797.48	0	4797.48	0	4797.48	48	4793.48
01-019	1139885.10	722986.81	4796.69	0	4796.69	0	4796.69	48	4792.69
01-020	1140002.65	722996.08	4796.32	0	4796.32	0	4796.32	48	4792.32
01-021	1140136.98	722991.42	4795.67	2	4795.50	2	4795.50	NO	
01-022	1140511.60	723005.45	4793.72	6	4793.22	6	4793.22	52	4789.39
01-023	1140623.47	722980.08	4793.59	30	4791.09	30	4791.09	NO	
01-024	1140725.00	723000.00		>72		>72		72	
01-025	1140873.48	722994.56	4794.25	54	4789.75	54	4789.75	62	4789.08
01-026	1141009.78	722984.67	4794.98	18	4793.48	18	4793.48	NO	
01-027	1141138.44	723000.81	4796.52			0	4796.52	NO	
01-027	1141138.44	723000.81	4796.52	24	4794.52			NO	
01-028	1139911.42	723113.28	4797.05	0	4797.05	0	4797.05	NO	
01-029	1140003.10	723123.25	4796.13	0	4796.13	0	4796.13	42	4792.63
01-030	1140138.62	723132.29	4795.43	>2	4795.26	>2	4795.26	NO	
01-031	1140253.63	723115.65	4794.46	>2	4794.29	>2	4794.29	NO	
01-032	1140357.11	723097.29	4795.05	>2	4794.88	>2	4794.88	NO	
01-033	1140491.21	723134.14	4791.49	36	4788.49	36	4788.49	54	4786.99
01-034	1140587.59	723120.18	4794.48	54	4789.98	54	4789.98	72	4788.48
01-035	1140752.65	723122.84	4793.34	>54	4788.84	>54	4788.84	60	4788.34
01-036	1140798.65	723186.44	4793.10	60	4788.10	60	4788.10	54	4788.60
01-037	1140875.40	723147.76	4794.03	72	4788.03	72	4788.03	72	4788.03
01-038	1141012.25	723132.86	4793.85	12	4792.85	12	4792.85	NO	
01-039	1141155.48	723120.51	4795.80	12	4794.80	12	4794.80	NO	
01-03946E	1141207.40	723113.30	4796.30	0	4796.30	0	4796.30	NO	

mg/kg - Milligrams per kilogram

NO - Not Observed to depth of test pit

Appendix B

Elevation of Base of Tailings/Impacted Soil and Groundwater

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Sample Area and Pit	Easting	Northing	Elevation (feet)	500 mg/kg Depth of Impacted Soil (inches)	500 mg/kg Base of Tailings Elevation (feet)	800 mg/kg Depth of Impacted Soil (inches)	800 mg/kg Base of Tailings Elevation (feet)	Water (inches) Depth to	Groundwater Elevation (feet)
01-040	1140140.11	723229.82	4795.19	0	4795.19	0	4795.19	40	4791.86
01-041	1140250.26	723250.44	4794.38	>2	4794.21	>2	4794.21	NO	
01-042	1140393.64	723224.08	4793.41	6	4792.91	6	4792.91	42	4789.91
01-043	1140525.31	723236.67	4792.98	42	4789.48	42	4789.48	54	4788.48
01-044	1140554.04	723256.62	4793.09	>66	4787.59	>66	4787.59	48	4789.09
01-045	1140693.10	723247.11	4792.79	60	4787.79	60	4787.79	48	4788.79
01-046	1140750.00	723250.00				24		NO	
01-046	1140750.00	723250.00		36				NO	
01-048	1141020.60	723242.72	4793.47	0	4793.47	0	4793.47	NO	
01-049	1140261.63	723363.65	4794.79	0	4794.79	0	4794.79	52	4790.46
01-050	1140461.46	723389.24	4793.47	>54	4788.97	>54	4788.97	48	4789.47
01-052	1140621.25	723379.11	4793.56	>60	4788.56	>60	4788.56	54	4789.06
01-053	1140764.18	723367.45	4791.78			48	4787.78	48	4787.78
01-053	1140764.18	723367.45	4791.78	>54	4787.28			48	4787.78
01-054	1140900.31	723382.94	4792.76	24	4790.76	24	4790.76	NO	
01-055	1141009.07	723359.48	4792.51	18	4791.01			NO	
01-055	1141009.07	723359.48	4792.51			12	4791.51	NO	
01-056	1140374.82	723460.07	4793.44	24	4791.44	24	4791.44	42	4789.94
01-057	1140642.73	723495.69	4792.51	>48	4788.51	>48	4788.51	48	4788.51
01-058	1140764.87	723495.69	4793.11	>48	4789.11	>48	4789.11	NO	
01-059	1141011.21	723445.92	4792.35	0	4792.35	0	4792.35	NO	
01-060	1140503.96	723649.35	4792.15	>60	4787.15	>60	4787.15	48	4788.15
01-061	1140625.35	723635.06	4791.33	36	4788.33	36	4788.33	45	4787.58
01-062	1140796.79	723630.58	4791.10	>42	4787.60	>42	4787.60	42	4787.60
01-063	1140859.01	723634.63	4789.49	>24	4787.49			24	4787.49
01-063	1140859.01	723634.63	4789.49			18	4787.99	24	4787.49
01-064	1141025.83	723673.76	4790.53	30	4788.03	30	4788.03	48	4786.53
01-065	1141160.96	723624.29	4790.37	0	4790.37	0	4790.37	60	4785.37
01-066	1140440.20	723761.46	4791.28	>48	4787.28	>48	4787.28	36	4788.28
01-067	1140634.18	723762.89	4790.77	36	4787.77	36	4787.77	36	4787.77
01-069	1140864.67	723726.01	4791.16	>42	4787.66	>42	4787.66	NO	
01-070	1141002.23	723752.33	4789.16	24	4787.16	24	4787.16	36	4786.16
01-071	1141144.57	723740.08	4791.05	0	4791.05	0	4791.05	NO	
01-072	1141245.59	723743.26	4791.26	0	4791.26	0	4791.26	NO	
01-073	1141362.85	723752.37	4792.31	0	4792.31	0	4792.31	NO	
01-074	1140766.74	723870.39	4790.25	>36	4787.25	>36	4787.25	NO	
01-075	1140875.46	723881.56	4788.88	>48	4784.88	>48	4784.88	36	4785.88
01-077	1141129.30	723889.78	4787.86	30	4785.36	30	4785.36	NO	
01-078	1141250.79	723881.32	4787.61	>42	4784.11	>42	4784.11	NO	
01-079	1141491.77	723863.59	4791.72	0	4791.72	0	4791.72	NO	
01-080	1140738.88	723988.75	4789.91	36	4786.91	36	4786.91	36	4786.91
01-081	1140873.35	723971.41	4789.65			24	4787.65	Missing	
01-081	1140873.35	723971.41	4789.65	36	4786.65			Missing	

mg/kg - Milligrams per kilogram

NO - Not Observed to depth of test pit

Appendix B

Elevation of Base of Tailings/Impacted Soil and Groundwater

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Sample Area and Pit	Easting	Northing	Elevation (feet)	500 mg/kg Depth of Impacted Soil (inches)	500 mg/kg Base of Tailings Elevation (feet)	800 mg/kg Depth of Impacted Soil (inches)	800 mg/kg Base of Tailings Elevation (feet)	Water (inches) Depth to	Groundwater Elevation (feet)
01-082	1141002.26	723984.24	4788.71			36	4785.71	48	4784.71
01-082	1141002.26	723984.24	4788.71	42	4785.21			48	4784.71
01-083	1141123.40	724008.78	4788.97			36	4785.97	NO	
01-083	1141123.40	724008.78	4788.97	>48	4784.97			NO	
01-084	1141265.04	724008.42	4788.16			<18	4786.66	NO	
01-084	1141265.04	724008.42	4788.16	>36	4785.16			NO	
01-085	1141375.40	723998.87	4787.73	>42	4784.23	>42	4784.23	36	4784.73
01-088	1140615.11	724006.38	4790.38	>48	4786.38	>48	4786.38	NO	
01-089	1140755.89	724075.22	4790.60	18	4789.10	18	4789.10	NO	
01-091	1141081.42	724130.07	4789.01	>54	4784.51	>54	4784.51	42	4785.51
01-092	1141226.12	724142.73	4788.92	30	4786.42	30	4786.42	NO	
01-093	1141376.41	724128.66	4787.35	>48	4783.35	>48	4783.35	42	4783.85
01-094	1141541.88	724159.16	4785.72	>42	4782.22	>42	4782.22	32	4783.05
01-095	1141632.18	724134.87	4789.54	0	4789.54	0	4789.54	NO	
01-096	1140756.58	724248.60	4788.19	18	4786.69	18	4786.69	42	4784.69
01-097	1140852.41	724235.43	4788.30			42	4784.80	NO	
01-097	1140852.41	724235.43	4788.30	>48	4784.30			NO	
01-098	1141030.89	724229.64	4789.61			24	4787.61	30	4787.11
01-098	1141030.89	724229.64	4789.61	30	4787.11			30	4787.11
01-099	1141125.22	724280.63	4788.42	36	4785.42	36	4785.42	48	4784.42
01-101	1141372.85	724249.55	4786.58	36	4783.58	36	4783.58	36	4783.58
01-104	1140907.82	724370.67	4786.78	30	4784.28	30	4784.28	30	4784.28
01-105	1140934.37	724316.16	4786.96	24	4784.96	24	4784.96	42	4783.46
01-106	1140998.70	724389.41	4786.99			30	4784.49	36	4783.99
01-106	1140998.70	724389.41	4786.99	36	4783.99			36	4783.99
01-107	1141143.27	724371.65	4787.64	36	4784.64	36	4784.64	NO	
01-108	1141252.81	724365.66	4786.21	>42	4782.71	>42	4782.71	30	4783.71
01-109	1141377.23	724373.42	4786.46	36	4783.46	36	4783.46	NO	
01-110	1141513.14	724453.28	4786.85	36	4783.85	36	4783.85	48	4782.85
01-111	1141636.32	724376.52	4789.69	0	4789.69	0	4789.69	NO	
01-114	1140831.05	724561.93	4785.97	>30	4783.47	>30	4783.47	NO	
01-115	1140957.13	724484.44	4786.60	>30	4784.10	>30	4784.10	30	4784.10
01-116	1141118.48	724502.05	4786.96	36	4783.96	36	4783.96	36	4783.96
01-117	1141255.12	724501.61	4786.41	48	4782.41	48	4782.41	66	4780.91
01-118	1141373.94	724505.20	4786.12	36	4783.12	36	4783.12	NO	
01-119	1141604.81	724533.27	4786.80	48	4782.80	48	4782.80	60	4781.80
01-120	1141720.63	724558.16	4787.96	0	4787.96	0	4787.96	NO	
01-120150E	1141820.79	724521.07	4790.53	0	4790.53	0	4790.53	NO	
01-121	1140909.67	724679.45	4785.74	36	4782.74	<30	4783.24	48	4781.74
01-122	1141013.93	724620.18	4785.62	24	4783.62	24	4783.62	NO	
01-123	1141125.67	724601.37	4786.59	30	4784.09	30	4784.09	42	4783.09
01-124	1141241.26	724596.50	4786.19	36	4783.19	36	4783.19	48	4782.19
01-125	1141372.52	724626.11	4785.75	>48	4781.75	>48	4781.75	51	4781.50

mg/kg - Milligrams per kilogram

NO - Not Observed to depth of test pit

Appendix B

Elevation of Base of Tailings/Impacted Soil and Groundwater

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Sample Area and Pit	Easting	Northing	Elevation (feet)	500 mg/kg Depth of Impacted Soil (inches)	500 mg/kg Base of Tailings Elevation (feet)	800 mg/kg Depth of Impacted Soil (inches)	800 mg/kg Base of Tailings Elevation (feet)	Water (inches) Depth to	Groundwater Elevation (feet)
01-126	1141501.23	724621.04	4785.88	36	4782.88	36	4782.88	48	4781.88
01-127	1141618.41	724629.22	4786.87			36	4783.87	54	4782.37
01-127	1141618.41	724629.22	4786.87	>42	4783.37			54	4782.37
01-130	1141003.53	724730.38	4785.63	36	4782.63			0	4785.63
01-130	1141003.53	724730.38	4785.63			30	4783.13	0	4785.63
01-131	1141143.53	724740.12	4785.73	<36	4782.73	<36	4782.73	NO	
01-132	1141256.32	724747.89	4785.05	30	4782.55	30	4782.55	36	4782.05
01-133	1141377.66	724765.99	4784.87			30	4782.37	NO	
01-133	1141377.66	724765.99	4784.87	>42	4781.37			NO	
01-134	1141517.35	724759.52	4785.86			36	4782.86	NO	
01-134	1141517.35	724759.52	4785.86	42	4782.36			NO	
01-135	1141641.91	724761.17	4786.08	>54	4781.58	>54	4781.58	48	4782.08
01-136	1141744.24	724713.39	4785.90	>48	4781.90	>48	4781.90	NO	
01-137	1141920.30	724716.02	4788.02	24	4786.02	24	4786.02	NO	
01-137140E	1142059.27	724747.68	4787.68	0	4787.68	0	4787.68	NO	
01-138	1141035.06	724820.39	4785.40	12	4784.40	12	4784.40	NO	
01-139	1141157.92	724885.06	4785.82	6	4785.32	6	4785.32	NO	
01-140	1141277.47	724866.59	4785.72	0	4785.72	0	4785.72	NO	
01-141	1141386.60	724867.07	4784.72			48	4780.72	48	4780.72
01-141	1141386.60	724867.07	4784.72	>54	4780.22			48	4780.72
01-142	1141624.89	724880.51	4785.74	54	4781.24			60	4780.74
01-142	1141624.89	724880.51	4785.74			48	4781.74	60	4780.74
01-143	1141721.38	724881.13	4785.37	42	4781.87	42	4781.87	60	4780.37
01-144	1142116.10	724873.13	4786.35	0	4786.35	0	4786.35	NO	
01-145	1141195.95	725017.25	4784.08	12	4783.08	12	4783.08	NO	
01-146	1141272.71	724988.62	4784.25	0	4784.25	0	4784.25	NO	
01-147	1141389.25	725023.85	4784.73	18	4783.23	18	4783.23	NO	
01-149	1141632.92	724998.00	4784.66	>60	4779.66	>60	4779.66	54	4780.16
01-150	1141746.08	724997.64	4784.28	36	4781.28	36	4781.28	48	4780.28
01-151	1142070.29	724989.55	4784.83	24	4782.83	24	4782.83	48	4780.83
01-152	1141124.07	725131.19	4783.90			12	4782.90	NO	
01-152	1141124.07	725131.19	4783.90	18	4782.40			NO	
01-153	1141254.21	725107.99	4783.52	18	4782.02			NO	
01-153	1141254.21	725107.99	4783.52			12	4782.52	NO	
01-154	1141377.39	725122.39	4783.93			42	4780.43	50	4779.76
01-154	1141377.39	725122.39	4783.93	48	4779.93			50	4779.76
01-156	1141630.65	725126.76	4784.75	>66	4779.25	>66	4779.25	54	4780.25
01-157	1141744.90	725125.89	4784.84	54	4780.34	54	4780.34	60	4779.84
01-158	1142002.98	725116.33	4783.66	36	4780.66	36	4780.66	48	4779.66
01-158130E	1142115.02	725107.95	4784.58	0	4784.58	0	4784.58	NO	
01-159	1141007.89	725260.22	4783.26	12	4782.26	12	4782.26	NO	
01-160	1141163.76	725221.41	4782.56	>48	4778.56	>48	4778.56	42	4779.06
01-161	1141233.10	725254.31	4783.25	36	4780.25	36	4780.25	45	4779.50

mg/kg - Milligrams per kilogram

NO - Not Observed to depth of test pit

Appendix B

Elevation of Base of Tailings/Impacted Soil and Groundwater

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Sample Area and Pit	Easting	Northing	Elevation (feet)	500 mg/kg Depth of Impacted Soil (inches)	500 mg/kg Base of Tailings Elevation (feet)	800 mg/kg Depth of Impacted Soil (inches)	800 mg/kg Base of Tailings Elevation (feet)	Water (inches) Depth to	Groundwater Elevation (feet)
01-163	1141498.01	725248.37	4784.15			36	4781.15	NO	
01-163	1141498.01	725248.37	4784.15	42	4780.65			NO	
01-164	1141746.91	725243.82	4784.03			42	4780.53	54	4779.53
01-164	1141746.91	725243.82	4784.03	48	4780.03			54	4779.53
01-165	1142032.94	725248.88	4783.27	24	4781.27	24	4781.27	NO	
01-166	1142129.41	725248.21	4783.09	24	4781.09			NO	
01-166	1142129.41	725248.21	4783.09			18	4781.59	NO	
01-167	1141015.07	725377.16	4783.32			12	4782.32	NO	
01-167	1141015.07	725377.16	4783.32	18	4781.82			NO	
01-169	1141254.30	725374.36	4782.17	36	4779.17	36	4779.17	45	4778.42
01-170	1141328.09	725343.85	4783.54	54	4779.04	54	4779.04	60	4778.54
01-172	1141630.99	725388.36	4783.25	30	4780.75	30	4780.75	NO	
01-174	1141875.00	725370.11	4782.40	<24	4780.40	<24	4780.40	NO	
01-175	1142037.14	725354.33	4783.00	30	4780.50	30	4780.50	NO	
01-176	1140938.69	725533.78	4783.20	18	4781.70	18	4781.70	30	4780.70
01-177	1141044.24	725584.63	4780.50	12	4779.50	12	4779.50	24	4778.50
01-178	1141118.27	725503.41	4782.23	36	4779.23	36	4779.23	48	4778.23
01-179	1141285.98	725517.02	4782.56	42	4779.06	42	4779.06	48	4778.56
01-180	1141255.73	725419.25	4782.75			36	4779.75	48	4778.75
01-180	1141255.73	725419.25	4782.75	42	4779.25			48	4778.75
01-181	1141377.97	725466.70	4782.58	>60	4777.58	>60	4777.58	NO	
01-182	1141508.11	725438.95	4782.51			42	4779.01	48	4778.51
01-182	1141508.11	725438.95	4782.51	>60	4777.51			48	4778.51
01-184	1141712.05	725501.17	4781.07	36	4778.07	36	4778.07	NO	
01-186	1142020.54	725514.85	4782.58	30	4780.08	30	4780.08	NO	
01-187	1140918.14	725633.89	4782.28	0	4782.28	0	4782.28	NO	
01-188	1140994.90	725624.56	4781.98	12	4780.98	12	4780.98	NO	
01-189	1141068.12	725676.70	4781.45	24	4779.45			42	4777.95
01-189	1141068.12	725676.70	4781.45			18	4779.95	42	4777.95
01-190	1141139.24	725656.09	4781.49	24	4779.49	24	4779.49	48	4777.49
01-191	1141263.58	725620.37	4782.50	6	4782.00	6	4782.00	NO	
01-192	1141395.05	725631.79	4780.68	18	4779.18	18	4779.18	NO	
01-193	1141500.00	725625.00				12		48	
01-193	1141500.00	725625.00		24				48	
01-194	1141639.07	725644.71	4782.12	24	4780.12	24	4780.12	NO	
01-195	1141755.78	725629.07	4781.19	42	4777.69	42	4777.69	51	4776.94
01-196	1141852.94	725627.13	4781.84	42	4778.34	42	4778.34	54	4777.34
01-197	1142033.45	725646.82	4782.78			0	4782.78	NO	
01-197	1142033.45	725646.82	4782.78	24	4780.78			NO	
01-198	1142117.23	725606.87	4785.47	0	4785.47	0	4785.47	NO	
01-200	1141010.12	725747.58	4781.33	12	4780.33	12	4780.33	36	4778.33
01-20033W	1140980.99	725740.54	4781.81	0	4781.81	0	4781.81	NO	
01-201	1141132.16	725748.97	4781.52	12	4780.52	12	4780.52	30	4779.02

mg/kg - Milligrams per kilogram

NO - Not Observed to depth of test pit

Appendix B

Elevation of Base of Tailings/Impacted Soil and Groundwater

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Sample Area and Pit	Easting	Northing	Elevation (feet)	500 mg/kg Depth of Impacted Soil (inches)	500 mg/kg Base of Tailings Elevation (feet)	800 mg/kg Depth of Impacted Soil (inches)	800 mg/kg Base of Tailings Elevation (feet)	Water (inches) Depth to	Groundwater Elevation (feet)
01-202	1141250.21	725730.27	4780.09	24	4778.09	24	4778.09	36	4777.09
01-203	1141382.50	725704.26	4780.90	18	4779.40	18	4779.40	42	4777.40
01-204	1141364.06	725753.75	4781.42	12	4780.42	12	4780.42	NO	
01-205	1141512.21	725741.45	4780.20	24	4778.20	24	4778.20	42	4776.70
01-206	1141634.94	725731.84	4781.54	18	4780.04	18	4780.04	NO	
01-207	1141750.00	725761.43	4780.86	18	4779.36	18	4779.36	NO	
01-208	1141882.57	725757.79	4781.17	48	4777.17			60	4776.17
01-208	1141882.57	725757.79	4781.17			42	4777.67	60	4776.17
01-209	1142011.30	725753.45	4781.50	>2	4781.33	>2	4781.33	NO	
01-213	1141124.61	725874.46	4781.14	0	4781.14	0	4781.14	NO	
01-214	1141252.87	725850.65	4780.76	24	4778.76	24	4778.76	42	4777.26
01-215	1141294.74	725818.64	4780.62	24	4778.62	24	4778.62	42	4777.12
01-216	1141388.67	725882.17	4780.89	12	4779.89	12	4779.89	NO	
01-217	1141476.67	725885.78	4780.48	0	4780.48	0	4780.48	42	4776.98
01-218	1141640.90	725847.16	4779.86	12	4778.86	12	4778.86	48	4775.86
01-219	1141756.55	725872.36	4781.16	18	4779.66	18	4779.66	NO	
01-221	1142003.06	725871.49	4780.21			36	4777.21	NO	
01-221	1142003.06	725871.49	4780.21	42	4776.71			NO	
01-222	1142095.50	725801.53	4782.17			6	4781.67	NO	
01-222	1142095.50	725801.53	4782.17	24	4780.17			NO	
01-223	1141137.79	725967.24	4780.83	0	4780.83	0	4780.83	42	4777.33
01-224	1141308.28	725972.75	4778.56			18	4777.06	30	4776.06
01-224	1141308.28	725972.75	4778.56	24	4776.56			30	4776.06
01-22463W	1141251.15	725975.44	4780.78	0	4780.78	0	4780.78	NO	
01-231	1142200.84	725665.71	4791.10	0	4791.10	0	4791.10	NO	
01-401	1140449.86	723099.49	4794.15	6	4793.65	6	4793.65	NO	
01-402	1140458.03	723223.88	4791.89	24	4789.89	24	4789.89	50	4787.72
01-403	1140325.89	723389.76	4793.16	6	4792.66	6	4792.66	42	4789.66
01-404	1140445.85	723265.10	4793.21	>36	4790.21	>36	4790.21	NO	
01-409	1141187.51	725608.98	4781.89	30	4779.39	30	4779.39	42	4778.39
01-410	1142118.26	725479.88	4782.59	30	4780.09			NO	
01-410	1142118.26	725479.88	4782.59			24	4780.59	NO	
01-411	1141305.65	724284.17	4787.22	60	4782.22	60	4782.22	54	4782.72
01-412	1141009.70	724569.89	4786.24	30	4783.74	30	4783.74	42	4782.74
01-414	1141918.11	724966.82	4785.07	>48	4781.07	>48	4781.07	NO	
01-415	1141898.21	725116.99	4784.82	30	4782.32	30	4782.32	NO	
01-416	1140880.77	725398.10	4782.57	>2	4782.40	>2	4782.40	36	4779.57
01-417	1141015.06	725095.88	4784.00	12	4783.00	12	4783.00	18	4782.50
01-418	1141098.82	722753.91	4797.35	>48	4793.35	>48	4793.35	NO	
01-503	1139598.75	722399.62	4801.29	0	4801.29	0	4801.29	63	4796.04
01-505	1139854.58	722461.25	4800.72	18	4799.22			70 (Est.)	4794.89
01-505	1139854.58	722461.25	4800.72			12	4799.72	70 (Est.)	4794.89
01-507	1139930.11	722545.91	4799.19	0	4799.19	0	4799.19	64 (Est.)	4793.86

mg/kg - Milligrams per kilogram

NO - Not Observed to depth of test pit

Appendix B

Elevation of Base of Tailings/Impacted Soil and Groundwater

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Sample Area and Pit	Easting	Northing	Elevation (feet)	500 mg/kg Depth of Impacted Soil (inches)	500 mg/kg Base of Tailings Elevation (feet)	800 mg/kg Depth of Impacted Soil (inches)	800 mg/kg Base of Tailings Elevation (feet)	Water (inches) Depth to	Groundwater Elevation (feet)
01-508	1140010.71	722603.31	4799.00	24	4797.00			60	4794.00
01-508	1140010.71	722603.31	4799.00			<6	4798.50	60	4794.00
01-510	1140144.51	722507.68	4799.42	0	4799.42	0	4799.42	68	4793.75
01-511	1140217.22	722511.33	4798.71	0	4798.71	0	4798.71	60	4793.71
01-512	1140254.91	722626.16	4797.01	0	4797.01	0	4797.01	74	4790.84
01-513	1140417.44	722622.23	4794.73	0	4794.73	0	4794.73	66	4789.23
01-516	1140855.30	723001.77	4794.04	60	4789.04	60	4789.04	54	4789.54
01-517	1140786.37	722989.11	4792.19	>60	4787.19	>60	4787.19	48	4788.19
01-518	1140628.26	723117.68	4795.07	60	4790.07	60	4790.07	54	4790.57
01-519	1140594.46	723244.73	4794.30	>84	4787.30	>84	4787.30	60	4789.30
01-520	1140667.84	723264.26	4794.59	>54	4790.09			60	4789.59
01-520	1140667.84	723264.26	4794.59			42	4791.09	60	4789.59
01-521	1140364.58	723314.34	4792.34	24	4790.34	24	4790.34	48	4788.34
01-522	1140128.41	723277.78	4795.21	6	4794.71	6	4794.71	50	4791.04
01-524	1140484.01	723464.46	4792.51	>48	4788.51	>48	4788.51	48	4788.51
01-525	1140634.28	723426.39	4793.08	42	4789.58	42	4789.58	48	4789.08
01-526	1140763.45	723433.63	4792.26	48	4788.26	48	4788.26	60	4787.26
01-527	1140650.32	723879.03	4789.66	>48	4785.66			43	4786.08
01-527	1140650.32	723879.03	4789.66			36	4786.66	43	4786.08
01-528	1140704.06	723988.94	4790.22	>72	4784.22	>72	4784.22	49	4786.14
01-529	1141012.83	724125.73	4789.31	48	4785.31	48	4785.31	42	4785.81
01-530	1141039.02	724013.24	4789.07	36	4786.07	36	4786.07	60	4784.07
01-531	1141016.83	723882.67	4789.41	6	4788.91	6	4788.91	60	4784.41
01-532	1141511.37	723964.93	4789.92	0	4789.92	0	4789.92	72	4783.92
01-533	1141425.59	724128.61	4787.65	>48	4783.65	>48	4783.65	51	4783.40
01-534	1141819.50	724740.58	4786.50	24	4784.50	24	4784.50	58	4781.67
01-536	1141506.64	724653.31	4786.03	42	4782.53	42	4782.53	54	4781.53
01-537	1141501.71	724846.04	4784.74	>48	4780.74	>48	4780.74	48	4780.74
01-538	1141485.41	725012.95	4784.67	>66	4779.17	>66	4779.17	48	4780.67
01-539	1141561.79	725130.31	4784.53	42	4781.03	42	4781.03	54	4780.03
01-540	1141520.65	725299.55	4783.82	>66	4778.32	>66	4778.32	54	4779.32
01-541	1141378.10	725267.56	4784.13	48	4780.13	48	4780.13	54	4779.63
01-542	1141356.61	725336.87	4783.59	>60	4778.59	>60	4778.59	60	4778.59
01-543	1141193.93	725119.95	4782.62	12	4781.62	12	4781.62	36	4779.62
01-544	1141124.09	725364.11	4782.22	36	4779.22	36	4779.22	48	4778.22
01-545	1141152.37	725472.59	4782.18	36	4779.18			42	4778.68
01-545	1141152.37	725472.59	4782.18			30	4779.68	42	4778.68
01-546	1141452.46	725485.45	4782.29	24	4780.29	24	4780.29	48	4778.29
01-547	1141614.43	725492.29	4780.78	>42	4777.28	>42	4777.28	48	4776.78
01-548	1141830.00	725500.00		>54		>54		45	
01-549	1141945.67	725570.37	4781.49	24	4779.49	24	4779.49	50	4777.32
01-550	1141561.79	725130.31	4784.53	36	4781.53			69	4778.78
01-550	1141561.79	725130.31	4784.53			24	4782.53	69	4778.78

mg/kg - Milligrams per kilogram

NO - Not Observed to depth of test pit

APPENDIX C

FIELD LOG BOOK

"Outdoor [illegible] ...for [illegible] people."

RECYCLABLE

"Rite in the Rain" – A unique [illegible] created to shed water and enhance the [illegible] used [illegible] the [illegible]

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"Rite in the Rain"®
ALL-WEATHER
FIELD
No. 351

CFR Reach A
Phase 1

8/24/2005 → 09/15/09

"Rite in the Rain"®
ALL-WEATHER WRITING PAPER

ATTN: Mike Hatton.

Name Tetra Tech
303 IRENE ST Helena MT

Address

Phone

Project

Clear Vinyl Protective Slipcovers (Item No. 30) are available for this style of notebook
Helps protect your notebook from wear & tear. Contact your dealer or the J. L. Darling Corporation

EACH TEST PIT

- INTERVAL OF SAMPLES COLLECTED
- WHAT SAMPLES WENT TO LAB
- VEG, SURFACE CONDITIONS
- DEPTH OF VISUAL TAILINGS AND LOCATION OF A HORIZON (IF POSSIBLE)
- TOTAL DEPTH OF PIT

8/24/2009 CLEAR CALM WARM X RF D BYTHE
R. ENGLISH
M. HATTEN

- ONSITE, REVIEW HASP WITH DURAN CONTRACTING
- BRIAN W/ DEQ ONSITE, STAND BY TO MOB EXCAVATOR FROM DROP OFF POINT TO SITE.
- CALIBRATE XRF

Test Pit

01001 - XRF Sample >500 total As/Zn/Pb Sample 00-02, At 1 meter from test/sample location, composite sample of 4 sample locations 00-02 Sent to Lab

01002 - XRF Sample 00-06 < 500 total As/Zn/Pb Sent 00-06, 06-12, 12-18 to Lab.

01003 - XRF Sample not < 500 total As/Zn/Pb Sent 00-02, 0.5m from hole location to Lab for analysis. Composite sample of 5 locations

01004 - XRF Sample 00-06 >500 total As/Zn/Pb Sent 00-06, 06-12, 12-18 to Lab

01009 - XRF Sample 00-06 > 500 total As/Zn/Pb Sent 00-06, 06-12, 12-18 to lab.

01014 Visible Slickens. Salts visible on surface little to no vegetation.

16th - 1200: [illegible] from [illegible] [illegible] tailings [illegible] to [illegible] of pipeline by 25'. [illegible] [illegible] to [illegible], [illegible] [illegible] to be [illegible]. I [illegible] [illegible] [illegible] [illegible] than 25' [illegible].

01019 - Visible tailings. Sampled @ 4859 XRF Readings Indicate Zn/Pb/As >500 Did not collect samples from 00-48". As other tailings present. XRF indicated 5960, 6066, 6069 All Failed >500 Criteria. Note: @ 66", MO prevented full sample interval. Also, sampled 69-72 with excavator Bucket Method. Sample was Sandy Gravels. Appears to be old River channel. Sent 60-66, 66-69, 69-72 to Lab.

01024 - Visible tailings. STARTED Sampling @ 4859 5960 High XRF criteria. Sent 5960, 6066 and 6672 to lab.

0139 - Visible tailing @ surface. Started sampling @ 4859. Sent 6066 (Failed XRF), 6672 and 7278 to lab.

01043 visible tailings at surface. Sampled test pit from 00 to 60 for [illegible]. Granular. Final Pit on 00 to 60. Sent 3692, 4248 and 4854 to lab. Note small channel of non-flowing H_2O in 20 west of test pit.

01044 - Visible tailings @ surface. Excavated Pit to 78", H_2O too deep to sample 66-78. Side wall collapsing in at bottom when trying to remove H_2O to sample. Sent 4854, 5460, 6066 to lab.

600 - Parked & collected under [illegible] Parker Cat in trees away from creek [illegible] Section

08/05/2009 Rust/Oos/Tenas Sunny; clear skys
Tailings safety meeting. Talked about all items listed in HASP listed under Daily HAS topics

01033 Test Pit in veg area w/ grasses & trees. Located at edge of Natural depression. Possible old organics. Sampled from 24"-54". Sent 3692, 4248 and 4854. Strong sulfur smell from material @ 36-54, like old organics decomposing

[illegible] XRF & shelled. Recorded in log.

01032 - High veg. [illegible], lots of grass + [illegible]. Sampled from 00 to 30 cm [illegible] collected 00 [illegible] - [illegible] XRF [illegible] high readings.

Tailings to [illegible] test pits located in "clear areas". Amount of [illegible] is visible spring [illegible], [illegible] is XRF [illegible] to collect sample from 00 is only log hole to 36" (all tails)

01021 - Located tailings from 00 to 68 XRF [illegible]
All samples [illegible] collected a 3 point composite sample for lab

- IDENTIFY EDGE OF TAILINGS WEST OF 01022
  VISUAL TAILINGS 0-3" 55' WEST OF 01022, XRF CONFIRMS VISUAL.
  - NO VISUAL TAILINGS 63' WEST OF 01022
  XRF SHOWS 0-3' INTERVAL CLEAN
- DIG TEST PIT @ 0102255W AND SAMPLE 0006, 0612, 1218 FOR DEQ ARCHIVES. STAKE LOCATION
- SURFACE XRF 0102263W, STAKE LOCATION
- COLLECT DUP-1 - DUP OF 0102200006

R. ERBLUS #

8/26/2004 SUNNY, CLEAR, CALM 60°F TRAVIS

- PHONE W/ MR. HATTEN CONCERNING EDGE OF TAILINGS AND ADDITIONAL PITS BETWEEN TWO DIRTY TEST PITS.
  - WHEN 2 DIRTY PITS OCCUR WITH ONE HAVING >24" VISIBLE TAILINGS. ADD 4 PIT BETWEEN THE TWO COLLECT ONE DIRTY AND TWO CLEAN BELOW AND ARCHIVE WITH DEQ LABEL DIRTY (ORIG. NAME AS USUAL) TC1 4(5) ECE.
  - EDGE OF TAILINGS: STEP OUT 25' OR WHERE EVER MAKES MOST SENSE GRAB MINI EX BUCKET. REPEAT UNTIL NO VISIBLE TAILINGS AND SAMPLE C-6 INTERVAL, XRF AND LABEL AS PER WORKPLAN, SEND TO LAB
- SAFETY MEETING WITH TRAVIS, MOB MINIEX AND STAKE 4 LOCATIONS
- CALL EON AS XRF STAND REMAINS UNFUNCTIONAL
- ESTABLISH PROTOCOL FOR FIELD BOOK ENTRY, NEED TO CATCH UP FIELD BOOK FROM YESTERDAYS PITS WHEN XRF SHEETS RETURN FROM HELENA.

8/26/2004

01012 - located in a depression possibly old River channel or oxbow, exact location apx 20' SE to capture depression. Very visible tailings to about 18". Mixed specs of tailings in clay from 18 to 30". GW @ 42". Sent 1824, 2430, 3036 to lab. Note: Alot of vegitation (grasses) in the area. Not able to differentiate old channel >100'. Will not sample along Ans. Will try to catch EOT.

01005 - located in grassy area, lots of trees very clear, visible tailings to about 24" SILTS with high organics to about 36". Clayey material to 48. Some gravels @ 48. Sent 1824, 2430, 3036 to lab. GW AT 42".

EOT - From 01012 apx 62' westerly. Pulled Excavator Bucket of soil. Visible tailings @ 03 to 10". XRF shot 235 - No Sample collected.

EOT. From 01012 apx 90' westerly. No visible tailings to 12". Can't

8/26/2009

get Backhoe % too close to NWE Pipe (10'). USED shovel. Sampled 0006. ~~Sent to Lab.~~

Note: Brian from DEQ arrived @ 1100 Talked about Plan for EOT and Clean/Dirty Holes. On grid pattern. We will sample B/T Holes when have a location >500 total and a location <500 total @ 0006. Then, we will eliminate any pits that Remain on Grid in the Cardinal direction of the dirty/clean Pit line.

0101290W 0006 - Small amount of visible tailings. XRF Readings indicate >500 total. Archived Sample.

01005150W 0006 - EOT Sample @ 00-06 No visible tailings some vegetation; Appears Naturally sparse. @90' WEST OF 01005 10-12" VISIBLE TAILINGS, MOVE WEST ACROSS GAS LINE SAMPLE Sent 0006 to LAB

01006 - XRF Indicates <500 total from 00-92 Send 0006 to Lab to confirm.

8/26/2009

01013 - No grass or veg. Slickrock. Pit location in IP Polygon. Plan Indicates Lab will analysis all material until XRF indicates <500 Total. Talked to Brian (DEQ) about intent of Sample and analysis. Our interpretation of Work Plan is that tailings for 00-29 will be left in place and treated. Lab will need not taking samples <29" to do ABA. So, if we have tailing <29", send all samples collected where XRF shows >500 tot. Sent 0006, 0012, 1218, 1829. All of which XRF shows >500 total. 2430 XRF is <500 total.

Note: Brian and Dan STAKED locations B/T Pit locations for sampling. These "new" Pits will be labeled 019XX, The intention is to give some indication of EOT B/T A >500 Total location and A <500 total.

"01401 0006 SMALL LAYER TAILINGS <1" THICK

8/26/2009

~~01024~~

01902 - New Pit added to determine extent of tailings from sluice area. Pit located on West side of Natural Depression possible "Sluiceway" or old channel. XRF Data indicates 7500 total @ 00 to 24. Sent 0006, 0612, 1218, 1824 to Lab for analysis.

01903 PIT BETWEEN 049 AND 056 APPROX 30' SW OF 056. 1" VISIBLE TAILINGS AT SURFACE 0006 TO LAB FOR ANALYSIS.

RWE 01028 - In area with great vegetation. No visible tailings. Appears to be all Native - undisturbed soil. Sent 00 02

RWE ~~01029~~ - Area with Great vegetation. moved

01028 Sample location EAST Apx. 15' due to large trees & willows. Soil appears all Native, No visible tailings.

01020 -- Area w/Great veg. No visible tailings All Samples <500 total; Sent 00 02 to lab

01011 - Same veg as above - 00 06 7500 Total. Sent 0002 to lab to evaluate

Note: Collected Rinsate Blank transport bag. Labeled as "Rinsate 1". Collected By pouring DI over Ranken spoons. Bottle contains Nitric Acid

0700 - Called to check out. Mike Hatter is going down Emerson to Help with COM Pits

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08/27/2009 - RWE, DB, Travis (Jordan) Tailgate Safety meeting - Talked About High Heat, Slips/Trips/Falls. Hazards associated with ATV, Excavator and Chemicals such as As, Pb, Cu. Bugs & Bites

01019 - HEAVY VEG, NO VISIBLE TAILINGS 0002 & 0006 FAIL XRF SEND 0002 TO LAB ARCHIVE 0006, 0612, 1218, 1824

01018 - HEAVY VEG, NO VISIBLE TAILINGS, 0002 FAILS XRF SEND TO LAB

Talked to Bill Butcher About NEEDS FOR Pits along Creek. IDEA is get Representative Sample of material which is Natural and at the level which the creek is currently @. We can

8/27/2009

Also take samples

-01010 - Located on Highway near No visible Tailings. CCCC 7500 total. SENT CCCC TO LAB

~~-01502~~

01404 - Hand test Pit with stainless steel spoon - Could not retrieve samples > 36". Some cross contamination possible - Rinsed spoon B/t 6" sample grabs. Sent Bottom sample to LAB @ it failed > 500 ttl.

01522 CDM Test Pit. See Field Form. Collected soil samples ~~0606~~, 0612, 1218, Sent 0606, 0612, 1218 to LAB. Collected A sample from Bottom of Test Pit, About same elevation as creek flow. Sample was collected with Bucket of excavator and Filled a large Bag 2/3 full for A Gradation sample. Sample is Representative of material at Toe of Streambank and at Bottom of River flow.

Note: Collected Rinsate Blank. Labeled Rinsate-2

01521 - CDM River test Pit with toe Analysis. Please see field form for description. Area was difficult to get to with Track hoe, made Best effort to disturb as little as possible, Placed Brown Branches

01510 - CDM River Pit. No toe analysis.

08/31/2009 RWS Cm - overcast / Sunny.
ARRIVED AT ARCO Lime Plant - Cm to get initial on-site training. Overall Sure alot of people onsite this week. Most will be up at outlet dam for inspection. Cm signed off on ARCO safety sheet.
Held tailgate safety Briefing at truck, what through entire HASP for Cm. Travis and Brian were in attendance. Cm signed HAS Plan.
MT called about GPS. Need in Helena for Tues/ Wed/ Thurs. Cm and I will have to pre-stake 8 days of holes. will stop Backhoe work early to accomplish this task working on CDM Test pits along River.

01513 - located apx. 5' off of River Channel - Good vegetation, grasses + Trees. No visible Tailings. Total depth. Apx 96" - Bucket collected 2' for Representive sample. Labeled 01513772%
Estimated sample is GP GW @ 66"

01512 - Test Pit located Next to River Fairly good vegetation w/ some spare Areas. Test Pit very deep (low @ 94") STEPPED Back side wall. Estimated Soil from 84 - 108 to be gravely Sands (Bucket method) GP. with Some cobbles up to 4". 0002 - To LAB.

01510 - CDM Test Pit located Next To River (Apx 8') No visible Tailings Total Depth = 72". All Samples collected GW @ 68" Sent 0202 to Lab.

01511 - located Next to River. Area has lots of large cobbles @ Surface. Found Fabric @ 12". Separated Cobbles + gravels to place back on top of excavated pit. No visible Tailings. Lots of Fragments in area of the cobble material

01508 - located apx 8' away from River. Good vegitation. Excavated down to 61" - Hard Concrete like layer of gravels + sands. Noted a layer @ 18-28" which contained

A Black top soil material with lots of old organics. Layer XRF slightly >500 (606). Also 0006 and 0002 XRF >500 total. No visible tailings noted.

01507 - COM Test pit placed apx 12' from River. Pit moved >5' due to Bank stability concerns. No visible tailings Sampled to a total depth of 60". Concrete like gravelly sands @ 60" Appears to be apx 12" Above River STATE H_2O level.

01505 COM Pit placed Apx 12' from River ~~COM~~ Pit moved >5 due to Communication error B/T operator & TetraTech personal (RWE). No Visible Tailings. Very good vegitation in AREA w/ grasses; willows and various weeds. Sampled pit down to 67". @ 67". very Hard Gravely cobbles in concrete like material. Could not collect Toe material due to this. STREAM Bank Appears to be A good Gravely sand mix w/cobbles up to 8".

01503 - COM Pit located on top of sloping Bank Apx 17' from River. Bank too STEEP to walk CAT down and worried ABOUT possibility of EROSION of pit is down BANK. GW @ 63". Visual examination of Bucket from River level to 2' Below is a Gravely sand w/cobbles. Appears to Be poorly graded gravel GP. Toe Sample not collected.

NOTE - operator Knocked Bee hive off of Tree, many, many Bees flying around in AREA. operator Closed windows of Track hoe AND called TetraTech Personal with Cell phone to inform.

MARKED 42 Test pits w/ GPS. Left site @ 7:45, GPS Batteries are dead. Drove Back to hotel to pick up more supplies.

EOD —

09/01/09 – Rue Cm – Sunny Cloudy.
Tailgate safety meeting – Required topics listed in HASP. Talked about being around public and Roads as we will be test pitting in areas close to Road.
~~0900Z~~ Calibrate detector & sensitivity
Time: 5597; Rad: 171.5, Exam 7.2173.

01062 Pit Located @ North End of Quarry but 25' In From River Bank
Total Depth 42" good vegitation
tall Grass and willows – really dirty
All samples sent to lab

01061 Pit located along access Rd ~~[illegible]~~ East To West off of Main Rd, Total Depth 48" All samples sent to lab
Visible Tailings

01063 Located along river Bank 10' S,
Total Depth 2'. water entering very quick, Gravely sands @ Bottom of P.H.

9-1-09. Cm Rue
01060 – Visible Tailings – Pit located in good vegitation, with willows in opening clearing. Total Depth 48" Ground water @ 48" went Deeper to Find clean ch dust Sand – 54-60"
01066 located NW of ~~[illegible]~~ Cm 01060 100' total Depth 48" Groundwater @ 48" visible tailings, good vegitation
01074 – located in Willows, Not accessible with track hoe – Hand dug with SS spoon sampler. Rinsed spoon B/T intervals with TAP H2O. Collected samples to 36". Sent 0000, 0612, 1218, 1824, 2430, 3036. very little to No ground cover vegitation. Visible tailings @ Surface. And Down to Appx 18"
01065 located at edge of willows near Area Entrance Road. Good vegitation including grasses, weeds, brush + willows/dogwood. Visible tailings @ 0003004. Sampled pit all way down to 54"-60" to make sure No visible tailings Below. GW AT 60". Sent 0002 to lab B/C unlikely will disturb 0006 due to great veg.

RE ~~01073~~ - 01072 - test location in Heavy veg
[illegible], No visible tailings present
Pit to 24", logged soil to ~~24"~~ 54"
Sent 0002 to Lab

~~01077~~ - Test Pit located in [illegible] Heavy
01073 or bare ground area Approx
to be sampled soil @ surface. Sampled
pit to 24", log ~~the~~ soil to 24"
No visible tailings other than low
veg @ surface.

01079. Pit located in high veg area.
Sampled pit to 24" log soil
to 48". Sent 0002 to lab
No visible tailings. Slightly less
veg than other areas mostly EAST.

01071 - located next to willows and Dog
rosed up on Beach (water?) No
visible tailings. Sampled soil to
24". Sent 0002 to lab. logged
Soil to 48"

01070 Test location

01075 - located Along Trees in open
area - Visible Tailings, Sampled to 36"
C.W @ 36" - logged total Depth of 36"
sent sample -

01531 - CDM Pit
combined CDM Pit with Tetra Tech
Pit, ~~No~~ Can Impacted area, ~~no~~ Can visual
Tailing Top 3" good vegitation
Tall grass & willows, sampled 5' from
River Bank, Toe sample collected
for gradation - from 72"-96" 01076

01067
located along tree line 30' from river
edge Total Depth 36" Hit water @
36"

9-3-09 - CM - Rusk, Travis

Tailgate safety meeting reviewed all topics in HASP etc. Tarps, Rusk working with operator maintain eye contact, & wheelers safety, proper PPE

2-[illegible] 01527 - COM Test Pit located Apx 5' Away from edge of Road. Pit is New and parking on a Raised area with willows and dogwood But space very under canopy and visible Tailings. Very Away from raised area is very good possibly an area Tilled during earlier reclamation efforts. GW @ 43" (4872-GP) Sent: All samples

2-[illegible] 01528 COM Test Pit located Apx 6' From [illegible] River edge. Area has visible Tailings @ Surface in Trees (willow dogwood) GW @ 49". All samples sent

2-[illegible] 01069 - Area of good vegitation with many trees (willow dogwood) No visible tailings at surface. Pit was Hand excavated with a SS spoon and Rinsed B/T Samples with Tap H2O Some slight X contamination noted during collection. Cross contamination material was Removed from collection.

01090 - Combined with COM 01529. located Apx 10' away from River in area with Trees (willow & dogwood) visible Tailings @ surface. GW @ 42" No Toe Sample collected. Toe material 48-72 was a poorly Graded Gravel (GP) w/cobbles up to 8". All samples Sent

[illegible] 01091 - Test Pit location in willows Near Bend in River. Visible Tailings At Surface. All samples sent

01082 - Test Pit location in open U shape road to [illegible] the River 50' Visible Tailings @ surface G.W @ 49"

01530 - COM Test pit located Apx 7' Away from River. Sampled Pit to 60". Also collected Sample from Bucket @ Apx 60-66". Toe material was a Well Graded Sand (SW). Also found gravels & Cobbles

[illegible] 75" (at [illegible] sample). No [illegible] sample collected. A small (1 [illegible]) composite was created to be [illegible] and is [illegible] 54-75"

2. 01532 - Combined 01086. located hole B/T two, about 10' North of 01532. No visible Tailings. Very great vegetation in area. observed TOE sample @ 72-96 to be a well graded gravel with Apx 50% sands, few very fine sands and some rocks up to 2". Rock content estimated to be <40% called sample A (GW). No sample collected. GW @ 72"

01094 - moved pit from GPS position Apx 50' North EASTERLY Due to inaccessibility of original GPS position. This GPS position is in the middle of an "island" which is somewhat connected to a bigger island with 01102. The thought is that 01102 will be representative of the contents of this island. Moved to edge of OHV side channel where we could get bucket from trackhoe. Excavated down to 92" GW @ 30. All samples exceeded >500 total coliform. Sent all samples to lab

01095 - Test pit located in field of Great Veg. No visible tailings. Sampled to 29" Sent 0002 to lab.

01110 - Test pit located on flat bench near River. Test Pit was moved Apx 30' North to avoid overhead fiber optic line and to capture IP Polygon. Good Veg up to willow line, somewhat sparse in willow area. Placed pit next to willow tree line. Sampled to 48" GW @ 48"

01119 - Test pit moved Apx 35' Westerly to be in a IP Polygon. GW @ 60" Excavated pit to past 72", sampled pit to 60". Sent 00 → 54. Bottom of pit @ 72" Has a gravelly sand with cobbles up to 4".

Note: Went Back to our open Pits; 01075 and 01530 to

wrap additional flagging around 4' lath that surround pits I have exposed to all personnel could that I am unavailable with large pits open.
Tomorrow, Mike Miller, EPA, Virginia DEQ will all be out. Trying to establish some good pits to dig while they are there.
EOD

0830 - RWE Con - Partly cloudy Times From Jordan construction Running production. Health & Safety Tailgate Meeting, weather watch, ~~Con~~ 24 maintain eye contact with min. x operator, Slips Trips, falls, wear proper PPE
Shutter Calibration Done on XRF.

0111 Pit located In willow to the south of fiber optic line 100' Total Depth sample Taken up to 24" sent 0002 To lab.

0120 - Moved from out side the willows to inside willows, Per. Bruce (DEQ) Total Depth 30-36", sent In 0002 to lab.

0534 Pit located 5' from River Bank, clean all the way up to 24"-30", G.W. 72" Total Depth 72" Sent sampler 2 clean and 4 dirty
→ Sent R24, 2930, 2936 & 0018 All clean.

0137 TEST PIT LOCATED NEXT TO TREE LINE, VERY GOOD VEG. WILLOWS, GRASSES AND DOGWOODS, NO VISIBLE DRAINS @ SURFACE. COLLECTED SAMPLES TO 24"; 18-24 WAS NOT SO EXCAVATED DOWN TO 42" - NOTEBOOK CHANGED @ 24" SENT LOCATION 2 / DIRTY SAMPLE - SAME VEST from DEQ, MRD, CH2M HILL AND EPA

0143 - Test Pit located at edge of Tree line in a grassy field. Visible tailings in trees (willow, dogwood), Not overly visible in field but some areas have

Obvious Signs of tailings @ surface.
"A" Horizon noted at 30"
Sent 00 → 54. 4248 + 4854 Clean.

01149 - test pit located in middle of "reclaimed field. Some sign of tailings "A" Horizon difficult to determine. Appears to be 36 - 42 Range. Sent. 00 → 54.

01150 - test pit located in middle of field with good veg. Some visible signs of tailings at surface. Excavated to 66" GW @ 48" Sampled to 48 54. Sent 00 → 54. 4248 + 4854 clean.

01156 - Test Pit located in field w/ good veg. Field appears to be reclaimed. (possibly lime addition area). Some visible tailings @ surface. Obvious tailings in pit to about 30" Test pitted and sampled down to 66". Sample showed XRF values > 500 ppm. Tried to open pit to get deeper sample but too much ground H_2O. Noted gravels @ 60 Range from Bucket of excavator. Classified material as Silty Sand (SM).

66-72

01539 combined with 01155 moved location into an area with less willows & dogwood to minimize disturbance. Pit area has visible signs of tailing at surface. Located apx 8' away from River. Test pitted to 80" inches. Sampled 54". Pulled Bucket material from 60 to 80" inches. Found Sands w/few gravels Classified material @ Silty Sand (SM).

01157 - Test pit located in middle of field. Some visible tailings @ surface. Opened Pit to 60" Sampled to 60" GW @ 60". Good vegetation in area in General. (Reclaimed area).

CM

9-8-04 - CM, DB, TH, BD.
Tailgate safety meeting, maintain eye contact w the equipment and Trimes, open pit, slips, Trips and falls, heat stress, insects water, wear proper PPE, Take breaks, and Drink plenty of "Gatorade"

Weather Clear, Cool Slight wind
Calibrated slamtron on XRF 0830

01164 Total Depth 60" pit located north end of field along willows, good vegetation tall Grasses. G.W. @ 60" visable signs of Tailings

01142 Total Depth 60' Hit G.W @ 60" pit located South end of open field along edge of willows good vegitation Tall Grasses, visable Tailings All sample To lab.

01547 Combined ave pit 01183 with CBM pit 01547 per Brian (DEQ) Pit located along river Bank 5' along in willows, good vegitation. hit water @ 49" hit cobbles @ 38" with sand At 36½ can't go deeper water flowing up hole - with cobbles & sand possible

slurry problems, Duplicate collected Depth 18.24" visable tailings All samples To lab

01182 Pit located south of River along willows, G.W. @ 50", visable tailings good vegitation, tall Grasses, & willows Total Depth 54' moved by Brian South from original Point. All samples

01546 - CBM Pit, Pit located 10' off River Bank, along River, visable Tailings hit G.W. @ 50" good vegitation. Tall Grasses, with willows. Total Depth samples 0036 send to lab

01181 - Pit located along River, good vegitation, Tall Grasses & willows, visable Tailings, Total Depth: 50" Hit G.W. @ 50". 3' North of Pit small Area were no vegitation is growing, Dig deeper to obtain more clean samples, Deepest was dirty 2 above were clean 4.85 & 2.48 -, hit cobbels so no more samples could be taken send all samples to lab 0036"
Hit water @ 72"

01180 Pit located along River Bank Hit G.W. @48", usable tailings, good vegitation Tall grasses and willows, sent in all samples.

01170 Pit located in field 15' North of COM Pit 542, good vegitation, Tall grasses, willows Total Depth 48" water @ 48", usable tailings. sent Dup #2 - 1824"

01542 COM pit: located 5' in from River Bank, good vegitation, Tall Grasses, willow Hit G.W. @ 54", Total Depth water in Pit, ~~sampled Toe~~ Clay All samples sent 1 sample out of Bucket ~~sampled and Arch. Used~~ the To deep Below river Bottom for Toe sample

01169- Pit located in center of open field good vegitation Tall Grasses Total Depth 48" water @ 40", sent all samples

01161 Pit located South end of open Field: Total Depth, 50" good vegitation Tall Grasses, & willows Hit G.W @ 48" - usable Tailings, sent samples All sample 2 clean - rest Dirty 0048

01160 Pit located West end of Open Field good vegitation, with Tall Grasses and willows Total Depth 48". hit G.W @ 36", with sand & gravel at Bottom of Pit sent samples.

7-9-08 DB, CW
Head Tailsite safety meeting went over what was in the HASP started 0.730, Travis is having a mechanic come to fighten a time on the excavator.

TALLY SAMPLES TO LAB FROM 9/8
107 TO LAB 2 DUP COLLECTED
WILL COLLECT EXTRA DUPS TODAY
TO REACH 1/20 RATIO.

01544 CBM Pit located 10' from River In willows + Tall Grasses, good vegitation. Total Depth 78" Hit G.W at 40" Dump #1 - 1218 All samples sent

01158 Pit located in open field Along Access road & willows good Vegitation Tall Grass, willows, No visable signs of Tailings Dump #2 (6-12')

01151 Pit located along Access Rd. & willow good vegitation, tall Grasses willows No visable signs of tailings Dump #3 (6-12') All samples sent in

01144 Pit located in willows in Tall Grass 42" Total Depth Hit G W @ 40" slow trickle good vegitation

CBM

01158130E - Placed pit here Because 01158 was dirty, was looking for EOT. located in open field with good vegitation Tallgrass, and willows visable Tailings 2' depth, No G.W.

01164.
6-12 - Dump #5
~~18-24~~ Dump #4
1218

Pit located in center of Open field, good vegitation, Tall Grass with willows outlined Total depth 42" water @ 42" sent in 0036 To Lab.

01165 - Pit located in open splitted area between the willows Trees, good Vegitation Tall Grasses, & willows No G.W encountered, Total Depth 42" Dump #6 1218
7:0612

01175 Located along edge of willows
in good vegetation grass, willows
visable Tailing in upper 012" layer
Total depth 42" Just into
G.W. Dup #8 - 0612 All samples
0036

01186 - Located in tall Grass, with Willows
in Back ground, good vegitation,
some visable signs of Tailings no
G.W @ 42" Dup #9 1218

01198 Pit located in open field, sparce
vegitation, some visable tailings
with signs sampling depth interval
12 18 root hair Impacted soil
with large cobbles unable to sample

01197 - Pit Located 40' NE from original
location, moved By Brian (DEQ)
some vegitation grass, and willows.
No G.W @ 42". Sent all sample per
Protocol per DEQ.

410 (Cont)

~~01185 90E~~ 01209
located 90' E of 01186, new pit
for contaminate extent, move for
due 1st set. Placed By Dan B.
visable Tailings, no water @ 42"
good vegitation, Tall Grass, willows

9-10-09
Heather's safty meeting. Tailgate, went
over all duties in detail, cleaned up
Paper work DB Comp. Weather
cool - clear.

01210 - Skipped ~~for~~ Per Brian (DEQ)

01222 - Moved from original location
By Brian (DEQ)
0800 - calibrated shutter on XRF
Pit Located in willows some vegitation
grasses no describable Tailings Total Depth
42" no G.W standing samples -

01204 Pit Location: In open field with good vegetation Tall grasses, Total Depth to 42" Top 1' visable Tailings, no general water, Trace staining on bottom of pit sending samples - 0002

01221 Pit located in open field, center Total Depth is 42" no C.W., good vegetation Tall Grasses visable Tailing in Top 1' layer, sent samples - Depth 1218

On test Pit along the Ditch Brian from DEQ said to not to dig but owner talking To Mike he wants us to dig along the Toe of the Ditch in a few places, will GPS new points and Dig one hole inside the ditch To verify clean or dirty - will 2' & sample.

01231 Pit located 35' N of original point for easier access from the R, so was distant from up stream, located in center of ditch, good vegetation Tall Grass & willows, Pit has staining

9-22-03

reddish orange tint to soil will sample down to 24" Top 12" shot flat dug down to 36" shot Bottom side walls with XRF Zinc & copper levels but just over 500 mark, will dig down to 48" and resample pit All samples Archived up to 0006 0002 sent to lab - no visable tailings

01405 - located a central point of the toe of the hill North end of open field along willows in good vegitation grass, shot with XRF showed clean will sample 12".

01549 CDM pit moved North 50' from original point to gain access with minimal, good vegitation, Tall grasses & willows, 5' of river edge visable Tailings C.W. 2
48" Total Depth to sample, will dig extra 2' for Toe classification & sample for Confirmation sent samples
72" To sample

Cm, PB. 9-10-..

01406 located on Island North of cove pit 549. Dug down to 24" good vegitation, thick grass & willows samples Taken 00 24" XRF Bad so sent to lab Archieved. 1824 - no sample To cobbly for sample

01407 Pit Located 65' N. 01221 Dug to 48" sampled and XRF good vegitation Grass, and willows in the background, samples sent. none There are 2 monitoring well to the East 50' missable Tailings Hit Ground water @ 48" Dug to 60" still dirty, water filling up hole Fast re Fine sand unable to sample any deeper than 60" due to sloughing of material

Archieved

~~01475~~

01408 located in open field of Tree to Channel (canal) Dug To 18" sampled & shot with XRF from 18" up no samples sent to lab All Archieved

Confirmation pit shot with XRF Down to 6" 25 NE of 01158 130E hole with To confirm cot. 1111 ZN. 110
CU. 128
AS. 54
Pb -12

01132 140E
Confirmation Pit located 140' E of 01132, Dug down to 12" shot with XRF samples Taken 0006, 0012 XRF shot # 1112 ZN. 0002-lab samples Archieved Pb As no missable Tailings

01120150E
confirmation Pit EOT. dug down to 12" will sample to see face Bottom to old shot & Backfilled, overburden good vegetation Tall Grass, with willows no visable Tailings.

9-11-09 (m, D3, RE) Trees
Weather cool, clear, Sunny
Tailgate safety meeting, reviewed every thing in HASP, Insects, slips, Trips, falls eye contact with operator, working on or near streams, be careful w/ equipment

01208: Moved 10' E from original point due to raised area on River Bank Total depth 60" Just brit Gravel visable Tailings. good Vegetation grasses and willows, All samples went to lab 0060"

01556 Combined 60cm Pit with one pit 01220 Total Depth sampled To 48" Just above ground water Pit 5' from River Bank, good vegitation grasses & willows, will dig down to River Bottom to classify true, There is visable Tailings. All samples sent to lab from 0030"

01196 Pit located along river Bank in open field; visable signs of Tailing Top 2' Total Depth 48" & Gravel, good vegitation grasses & willows, Sample to lab.

01548 60cm Pit combined 01185 located 10' off river edge hit river Bottom @ 36" cobbels & sand, with Gravel good vegitation grasses & willows, Bottom sample clicky, will try to dig deeper. Tryed To get 2 more samples deeper still in cobbels.

01195 - Pit located in open field with good vegitation grass, hit G.W @ 48" with visable tailings Hit cobbles @ 54" with sand. sample sent to lab 0048 HH

01184 - Pit located South end of open field good vegitation willows and grass, strong root system through out hole Total Depth 50", no G.W. sent sample

01206 - located in field with willows & Tall grass, Just N of 01194, good vegitation, visable Tailings, Total Depth To 48" no ground water, samples 0030"

01194 - located in the willows with good vegitation, grasses, and scrubs No G.W Total Depth 48", visable Tailings

9-14-05 Lee, RE, Travis

0900 Tailgate safety meeting, slips, trips & falls, mountain lion contact with the public, heat, Driving, 4-wheeler safety

01218 - Pit located in the willows, with visable Tailing down to 2', good vegitation grasses, willows Total Depth 48" hit ground water @ 48" 1824 T

01217 - located in the willows, with good vegitation grasses, willows. Visable Tailings, down to 1' Hit Ground water @ 48", sent 0002 to lab

01224 - located in possible old channel good vegitation depth To 36" hit G water, will dig a sump to sample

01215 located along row of willow trees with good vegitation, visable tailing down to 2' Total Depth 36", Hit Ground water

01223 located in open field in the grass
Vegitation grasses, no visable signs
of Tailing Total Depth 32" G.W
& 36" sent 0002

01213 Pit located along willows good
Veg. tation, grasses, no visable signs
of Tailings Depth to 18", no G.W
sent

01214 Pit located in the willows with good
Veg. tation, visable signs of Tailings
down to 2' Total Depth 48" no
G.W Dup# 1 Taken 0613

01224 3 W E.O.T : visable Tailing
to 12".
01224 2 W : visable Tailing to 6"
01224 6 3 W no visable Tailing
Depth to 24"

01203 Pit located along willows
in cut out visable Tailings down
to 2' mark, good veg. Total Depth
48" hit G.W. sent samples
01192 located at the end of the
cut in the willows good vegitation
grasses & willows visable Tailing 1"
36" Depth. Barley & Grass Dup# 2 0006

01202 - Dup 1824 Pit located Along
willows with good vegitation
visable Tailing Total Depth 36" hit G.W
sent all samples to lab

01189 Pit located Along willows in
sparse vegitation - hole dug around wetarea
that appear to be a alkaly deposit visable
signs of Tailing Depth to 42" & hit G.W

01190 Pit located in center of corner
field good vegitation grasses, visable
Tailing 06" Total Dep 42" no G.W.

01199 - Pit located in w. Willows 36 of open field E. of 01190 >1. Wind area, visable Tailings Top 1' depth to 1/2" G.W & cobbels

01177 - Pit located in open field S and Dug to 2' hit cobbels and G.W

01188 located in w. Willows W of 01177 in good veg. between grasses, w. Willows visable Tailings Dug to 36' NO G.W

01200 located along the road & willows in large open field some visable Tailing 6" good vegitation grasses & willows no ground water 0-19' Lab.

01200 33W - E.O.T good veg, NO visual Tailings. Depth 24" sampling 18" up 0002 - Lab

01191 Pit located in W. Willow patch - open area good vegitation, some visable Tailings 36"

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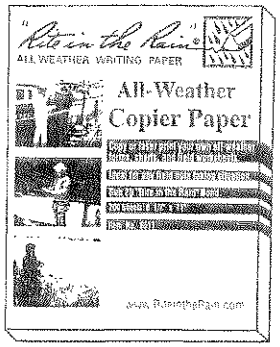

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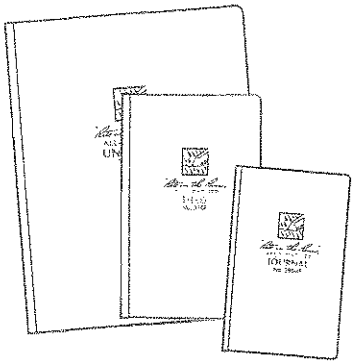
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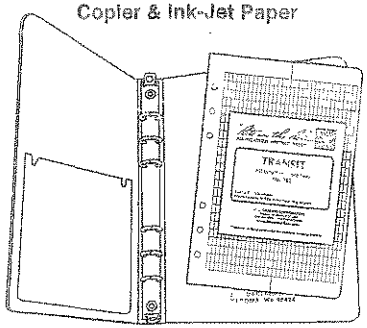
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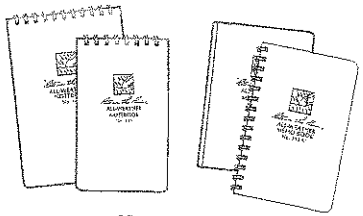
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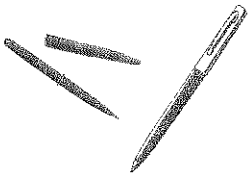
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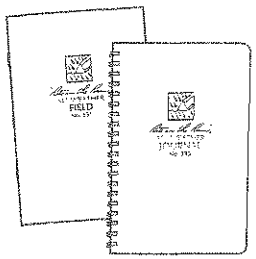
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PAGE

09/15/2009 - RWE/Trans

Arrived onsite @ 0700. Held Tailgate Safety meeting. Talked about slips/trips/falls, lifting heavy objects, insects, Equipment safety, Wildlife.

01178 - located at edge of Tree line next to open meadow Area. Tailings visible @ surface. GW encountered @ apx 48". Good Veg in Area in General.

01545 - 100m Test Pit located next to River. Moved Pit location away from River Bank apx 12' due to mature trees in area as well as concerns about Bank stability. Visible tailings @ surface with some veg (grasses) impacts noted. Excavated pit to 54" + Sampled. Pulled Bucket of material from 54" to apx 78". Visual inspection of Bucket material was fine to med Grey Sands (apx <30% fine). SP.

Brian from DEQ Arrived, Talked about Best Route to Sample Area in middle of West Side of River. RWE + Brian have Previously tried to locate Route to Area from Western side w/o success. Too many cut trees + H_2O/mud to make Route. Brian walked up from South end Near Road, to look for a Better Road in. Decided we will Have to make Road/Trail Down From North (current location). We will Try Keep logging to a min, Stay Away from River as much as possible to limit visual impact of Entry. Walked through to pick Best Route + Flagged for operator.

01167 - located apx 15' west of River Bank. Good veg and Trees in Area. Excavated Pit down to 48". Sample clean Below 12". Sent 00-24 to lab. No Pics

01159 - located in willows next to new Road made to access middle/west side. Test pitting area. Excavated to 36". Some visible tailings noted @ surface. Generally good vegetation in Area. XRF indicates Cu-72 exceed COC total of 500. Sent 00-29 to lab

01152 - located Next to Beaver Slide Next to New Road. Excavated to 36". Good veg in Area (grasses, Brush, willows). Visible tailings 0012, None on surface. 1829 exceeded COC 7500 total. Sent 00-30 to lab.

01543 - COMTOX Pit CTT. Pit located
DUP-1 Apx 5' from River edge. Excavated
0612 to 36" to Sample. Very good veg
in AREA. Dup-1 Taken @ 06-12
Removed with 0612 in Bigger Zip lock
Bag. 0612 was then Re-XRF'ed along
with Dup-1. Sent 00 29 to lab.

01153 - Located Near River in Area w/small
willows + very good grass cover. Excavated
to 42". Sent 00-29 to LAB

01154 - located in open AREA with very good
grass cover. Some visible tailings at
Surface. Area appears to have Been
"Reclaimed" (Tilled + Reseeded). Excavated to
42", 36-42 exceeded 7500 total COC.
Removed additional 12", sampled clean
to 54". GW encountered @ 50". Sent
3642, 4248, 4854 to lab

01163 - located in open AREA with very good
Veg cover (grasses etc.). Area appears
same as described above. Sampled to
48" Sent 3036, 3642, 4248 to LAB

9-26-09 Arrived, Conducted
morning safety meeting, Slips, Trips, Falls
maintained eye contact with the operator
at all times, used caution when driving
on road into site, rolled windows up
Field in mirrors, adjusted seat, Fauna
+ wildlife, Public wear proper PPE
safety vest.

01147 Pit Located along willows
In open field, good vegitation, Depth
To 36" visable Tailings. No ground water
Vegitation is grasses + willows 0030"

01141 - Pit located Along willows in
open cut, good vegitation grasses + willows
Visable signs of tailings, Depth 36"
Dug deeper to find clean went to
54" still hot, sent last 4 samples
To lab

01133 Pit located 10' off river in
good vegitation, grasses + willows, There
is visable signs of Tailings, No Ground
water. Dup#1 2430

01132 Pit located In open field with good vegitation grasses, There are visable signs of Tailings. sent air samples To lab

01131 Pit located in open field with willows on each side, good vegitation, grasses visable signs of Tailings depth 36" no G.W Dep# 2 30-36"

01130 Pit located ~~[illegible]~~ In middle of field Along Cut Tails, in swampy area, good vegitation grasses some visable signs of Tailings Had to dig deeper to find clean 48" Total

01139 Pit located Along willows In open field no visable Tailings sampled to 2' no G.W

01145 Pit located along willows in good vegitation grasses, visable Tailings at surface no G.W

01146 - Sand bar along willows, good vegitation grasses, Pit located In open cut Moved Pit to the East of original location sent 0002 lab

01140 pit located in willow good vegitation, grasses. No visable signs of Tailings no G.W. sent 0002 lab

01125 - Pit located In open field center good vegitation grasses, Pit G.W @ 48" ~~[illegible]~~ visable Tailings. sent samples Hit cobbels @ 54"

01126 Pit located In open field with good vegitation (grasses) visable Tailings 2' down, Depth to 48" ground water @ 48".

01118 - Pit located In open field just North of fiber optic line 42" no G.W good vegitation grasses

01117 - Pit located in open field with good vegitation grasses, visable Tailings. 48" No G.W. had to dig deeper To find Clean

01116 - Pit located Between Row of willows & Field of water & 48" good vegitation grasses water & 48" visable signs of Tailings

01114 - Moved from original location due to a marsh, placed on edge of marsh with good vegitation grasses, willows, cat tails. no visable signs of Tailings

01115 Pit moved from original location due to Fiber optic line moved to the south in willows good vegitation grasses visable Tailings Pit G.W. & Gravels @ 30"

01106 - Pit located in willows with good vegitation grasses, No G.W., visable Tailings Depth To 36"

01105 Pit located in open land along the willows good vegitation grasses visable Tailings.

01536 - Pit located 8' of River edge in good vegitation grasses. There is visable signs of Tailings Dug down to 42", had to go Deeper To find clean dug to 66" Pit filled water - classified Toc Sent Above 2 clean 1 dirty.

01538 - Pit located 5' from river edge on a bend in the river good vegitation grasses with willows visable signs of Tailings. Pit water @ 48" All sample Pit, Toc Material. Sand layer Pit cobbles @ 6' sent bottom 3 samples, all Pit

01540 Pit located 10' off river edge good veg. tation, grasses, willows, visable Tailings Dug to Hit Ground water 54" sent Bottom 3 samples To lab.

01580 Pit located 8' off river edge in what appears to be a small slickens area, with no vegitation growing on it. All sample were Hot, sampled From Bucket of x, hole was filling in with water, so dirty issue settling into the pit

01635 Pit located on Bench above River Bank, good vegitation grasses, willows growing around area, visable Tailing. Hit water @ 54" All sample Hot hit more water @ 54" couldn't sample any deeper, sent 2 Bottom samples

01130 Pit located on bank slope To rivers edge. good veg. tation grass, willows, visable Tailings Dug to Depth of 18" No G.W. yet Dug To 48" For a clean sample To much water to go deeper + Wet sands & gravels, All Samples Hot, sent The Two Bottom samples To lab

01PCF Pit located In the willows along river edge good vegitation grasses, visable signs of Tailings Dug To 42" no G.W. Dup #1 3036 Again All sample Hot dug deeper hit Sands, gravels & cobbles, Two Bottom samples EOD

09/21/09 AME DJS Inclement Stormy weather
ADDRESSED ALL Items listed in ABOVE order
"Items covered" 1st Hr DJS Tailgate. Also
alot of Rain and Frost on ground this
morn, Extra careful of Slips/trips/falls
01124 located in tree area - removed
a small amount of veg to get back
into area - Excavated Pit 54" - alot
of Cov. AREA Has visible Tailings At Surface
Sent 3036, 3642, 4248 to Lab.
01108 - located Bet. two groups of trees
lots of good veg @ Surface including
Small willow, grasses + other Brush.
Excavated Pit to 48", alot of H_2O. And
Gravels @ 36. Sampled to 3642
Sent 3036, 3642 to LAB AS
Berm exceeded >500 COC total
01107 - located At edge of tree line
near "Reclaimed" field. Excavated to
54". Noticed visible tailings among trees
And Slight "Wind-Row" from previous Tailings
01109 - located in middle of field which
Appears to be "Reclaimed". No visible
Tailing @ Surface Dup-1 TAKEN
Excavated to 48 - Sent 3036, 3642, 4248

01101 - located in field w/ Erect veg cover.
AREA Appears "Reclaimed". Excavated to
54" - Gravels + cobbles Sampled to 48
Sent 3036, 3642, 4248 to Lab.
~~01093 - located apx 5' from outside~~
~~River edge.~~ (RIB)
01093 - located in middle of field.
Excavated to 54", Bottom - filled of
Sands + H_2O. Sampled to 48"
Send Bottom two samples
3642, 4248. Dup-2 @ 3642
01533 - COM Test Pit located apx
5' from River edge. Water is very
Fast And apx 18" deep next to Bank.
Pit located in area w/ visible Tailings
At surface, And across "Wind Row" of
tailings near middle area of Pit.
Sample actually collected from
vertical AREA Away from "Wind Row"
And other tilled material Cobbles
And Gravels noted @ 48".
Collected COM TCE Sample. TCE SAMPLE
TAKEN FROM 60-72, POORLY SORTED
SAND, GRAVELS & COBBLES. SURFACE
WATER @ 48"

01092 - located into tree line near edge of field. large "wind row" left over. AT EDGE of tree line. Excavated & sampled to 48". Sent 2432, 3036, 3692.

01083 - located in trees (in wind row) Apx 15' from River. Visible tailings at surface. Wind Row left @ tree line (of tailings). Sent 3036, 3692 then 4248 to lab.

01077 - located in field near tree line Excavated to 36", gravely sand "cobbles" Collected sample to 42". Sent. 2432, 3036, 3692. Some visible @ surface.

01078 - located in field near tree line Some visible tailings @ surface Excavated to 00-42, collected samples to 42, Sent. 3036 and 3692, Both samples exceed the >500 COC total. Too much gravel + cobble w/ little to sample deeper.

01084 - located in middle of field. visible tailings @ surface near sample area. great veg cover @ sample location. Excavated to 36". Very defined layers including "A" Horizon @ apx 18". Sent. 2434, 3036.

01085 - located at edge of field in low lying which appears on surface to be slough. Test pit excavated to 42". Cobbles + H2O in bottom of p.t. Sampled to 42, Sent 3036, 3692 to lab. Both samples >500 COC total.

01099 - located near willows in what appears to be old road or slough or River channel. open area appears to be Reclaimed as there are (wind rows) of tailings near tree edges. Old River silts exposed on both edges of clearing and not likely in or in open areas. Excavated to 48", sent 2434, 3036, 3692 to lab.

01104 - found in visible festoon near cattail/swamp. Apx 1.5 miles away & sample location [illegible]

2423(?) [illegible]
Tailings [illegible] [illegible]
[illegible] of [illegible] [illegible]
[illegible] [illegible], [illegible] [illegible] & [illegible]
[illegible] of [illegible] on ground.

01104 - Reopened Hole. [illegible] in trees
[illegible] 12' away from [illegible]
[illegible] [illegible] by [illegible] & [illegible]
Not a H_2O. Sampled Hole to 54"
Sent 2432, 3036, 3642 to LAB
GW @ 18-24" in morning.

01097 - Located @ edge of Trees in open
AREA. Tailings visible at surface & appear
"wind row'd" from previous Reclamation
efforts. Excavated to 54", Sampled
to 48. could not get 4854 due to
too much H_2O & Sands sliding into
Hole 3642. Exceeded >500 CCC total
Sent 3642, 4248 to lab

01096 - located in middle of Brush in treeline
(clearing left from previous Reclamation). No
visible tailings @ surface in pit location. Tails
are visible @ edges of clearing (wind rows)
from previous plowing. Sent 0000 → 2430.
Pit fills into new <24" >500 CCC Total

01411 - located in [illegible] area. ID'd
on map as Green polygon. Pit is
NE of 01100 on map. Visible tailings
AT surface. No veg or very little veg
Noted @ sample location. Excavated
to 66". Sampled to 72 after
digging deeper. Sent 5962, 6066
AND 6672 to lab. Tailings very dry.

01412 LOCATED IN IMPACTED GREEN
HORSE-SHOE SHAPED POLYGON ON
MAP NO VISIBLE TAILINGS @ SURFACE
HEAVY VEG (GRASSES & WILLOWS)
EXCAVATED TO 48" SAMPLED TO
48" 3036, 3642 & 4248 TO
LAB.

01121 - Moved location out of willows
and cattails. Pit is next to willow
trees in area with H_2O @ surface.
Salts + tailings visible @ surface. Old
Tailings "wind rows" appear @ edge of
treeline. Many cattails and surface
H_2O North Apx 30'. Sampled to 48"
Sent 3036, 4248, 3036 to lab.
No Pics - Camera dead.

01138 - moved location SE approx 40' to avoid swampy area. Pit located in open area near willows and cattails/swamp to North + West. Surface H_2O present to N, W, + S. Excavated to 36" and sampled to 36. Sent 0006, 0612, 1218 and 1824 to LAB.

Moved all equipment out of area. Removed debris and mud from beaver slides on road on way out. Stacked branches and any previously removed willow on road to prevent travel by others. Cleaned up any circus down area.

01204 - located in willow trees. Excavated to approx 48". Sampled to 42" due to rocks. Sent 0006, 0612, 1218, 1824 to lab. Visible tailings @ surface as well as "tailing rock line" @ edge of tree line. Moved excavator + equipment to area E of River, N of Road, South of water source road.

01/23/07 Arc/Travis (SU)/Jim Bj. Tailgate Safety meeting. Addressed issues with noise near gas line, entrance + exit slips/trips/falls, Public, other ARCO contractors in area, New Exit Route + alternative (east side road), Equipment safety, Proper PPE (sleeves, etc).

01008 located in spring w/ source visible taking @ surface. Excavated to 78". Sampled to 78". Sent 0672, 7278 to lab. Left open. For DEQ land owner tour this day.

01017 - located next to two steel cased H2O wells, near old road into area. Vegitation is poor to no trees nearby. Excavated to 54" sampled 42". Sent 0006, 0612, 1218, 1824, 2430, 3036 to lab.

01016 - located off of access road into area and @ edge of treeline, moderate vegitation noted @ location but appears to be caused by sandy loam

material which will not hold moisture very well. Excavated to 36', found that the >500 ppm COC total was found @ 12ft. Excavated to 48". Sent 0006, 0612, 1218, 1829, 2430 to lab.

01007 - located near edge of Slickens and apx 55' from edge of River veg is very impacted and Tailings are ovious @ surface. Excavated to Gravels + cobble + H_2O @ 72". Sampled to 72". SENT 5460, 6066, 6672 to lab

01015 - located in SLICKENS AREA, many visible salts at surface, No veg. Excavated to 72", Sampled to 66" (H_2O) SENT 3642, 4248 + 4854 to Lab.

01025 - located in Small strip of slickens near edge where some grasses are growing. Pit was located at edge of position on map in which Slickens and IP was defined. Excavated Pit. To 72", Sampled to 66 due to GW Sent 4854, 5460, 6066 to lab.

01037 - located Next to slickens on Berm, moved to outside of Berm.

in tree line in area marked as IP on map. Excavated to 78" Sampled to 78". Sent 6672 7278 Rebuilt Berm to prevent salts from leaving area of Slickens.

01038 - Test pit located apx 15 East of Slickens Berm. No Veg. Salts At surface. Excavated to 60' Collected Samples - Re-excavated to 80", pit falling in, could not get sample. Noted gravels + cobbles @ 75-80" Sent

Note. left XRF @ site for JEQ To use during their press show. Also left a Hudson sprayer for people to clean their hands or feet.

C1/24/09 Rec. Dan Clyde, Trans
Targets safety meeting, Reviewed items
listed in Hasp with emphasis on
PPE, Sensitive areas, equipment use
and ATV safety
01045 located next to Slickens but in
A.O. 2nd polygon on map. Appears
to be a split in old channel but
difficult to determine due to previous
activities, Excavated to 72 but pit
filling in due to no more H_2O.
Sampled to 66", Sent 5460, 6066
01036 - located in middle of Slickens next
to old pit location. Excavated to
72", Sampled to 66. Pit filling in
@ Bottom, H_2O + Sands. Sent 4854,
5460, 6066 to lab.
01046 Test Pit located in willow trees
on South of Slickens area. Pit
is EAST of Slickens Berm. Replaced
Berm when pit closed. Excavated
to 48". Sent 0066, 0612, 1218, 1824
2430 and 3036 to Lab.
01053 located EAST of Intersate, South
of Warm Springs Road near Antioch.
Near Riverline information views,
No veg or wildlife usage in Dam

Sent 4248, 4854 to lab
01526 Com Test Pit located A.O.
5' from River EDGE. Willows and
Dogwood present at Rivers EDGE.
Pit is Between Tailings Berm in
Slickens area and H_2O. Surface
Tailings noted. Excavated to 60"
Sampled to 66". GW @ 60". Removed
Toe Sample material. Sent
4248, 4854 and 5460 to Lab
Toe material classified as GW
01052 - located Apx 15' away from
Slickens Berm in area of Trees. Surface
Tailings noted. Excavated to 60", Sampled
To 66". Gravels, Cobbles + Sands
>60" Sent 4854, 5460 to Lab.
01525 - located Apx 5' from River edge.
A LARGE Tree and Bank has slipped
off into River just up from pit location
LARGE Area of Beaver activity AND
OLD Beaver hut on shore, (OLD). Excavated
to 48" - GW @ 48". Excavated further
down to collect Toe material

01516 - COM Test Pit located on Outside Bend of River. Large Berm located in area of Test Pit moved location away from River Apx 12' and dug pit in middle of Berm Excavated to 50" Sampled, Excavated to 66" Sampled to 66. Removed About 1.5' of material and Then pulled a TOC material Sample. All Samples SP. Sent 5460, 6066 to LMS

Questions About a few test Pits. 01524, 01051, and 01051. Not Sure How much Lay we want to Remove to get to trace. Will ASK OCA on Friday

09/28/09 Rick/Travis/DB.
Tailgate Safety meeting. Review items listed in HASP, also address cold weather, Heavy Frost on ground. Heavy Equipment safety.

01520 - COM Test Pit located approx 8" from River edge and Beyond Tailings Berm. Near Sickens area, visible tailings @ surface. Excavated to 54". Sampled to 54, Sent 3642, 4248 4854 to LMS.

01524 COM Test Pit located approx 8' from River Edge. Excavated to 48", Found H_2O & Gravely Cobbles in Bottom. Sampled to 48, No Deeper Sample due to gravels and Cobbles. Sent 3642, 4248.

01050 - Test Pit located b/t 01050 AND 01051. Pit moved to accomodate Trees Hac & vegitation. Excavated to 54", Found Gravels & cobble & H_2O @ 48". Sampled to 54". Sent 4248, 4854 to LMS.

01026 - Excavated to 48, Sampled to 3036. Sent 0006, 0612, 1218, 1829 2430, 3036 to Lab.

01039 - Next to Tree line in area of High veg. Some visible impacts at surface. Excavated to 48 Sampled to 36, Sent 0006, 0612, 1218 1829. to Lab.

01 27 - Next to willows in grassy area. Some impacts @ surface observed in AREA Excavated to 48, Sampled to 36, Sent 0006, 0612, 1218, 1829, 2430 3036 to Lab.

01413. - Extra Test Pit located in Old Irrigation Ditch. Excavated to 36". Ditch is appx 18" lower elevation than surrounding grade. Alot of willows at EDGE of Ditch. Piles of soil on sides of ditch indicate Ditch was Excavated After Tailings deposit on surface No Samples sent to Lab All samples are Archived.

01039-46E - located in grass area with sparse veg @ surface. Sample

Sample location has fine to med sands w/ large cobbles (18"+). Excavated to 36". Sampled to 24". Sent 0002 to Lab.

01038 - located in willows, Alot of dead or poor condition willows near westerly of old irrigation ditch. Excavated to 48", Sampled to 48. Sent 0006 0612, 1218 to Lab visible tailings in 0006 layer and some mixed tailings in 0612. Good veg @ surface.

01048 - located in willows with alot of dead or poor condition willows around Excavated to 48". Sampled to 48. Sent 0002 to lab. good surface veg of grasses + thistle.

01059 - original location in ditch beside road. moved location appx 30' South due to access by excavator. Excavated pit to 48". Came to gray fine sand @ 48" possible ash layer? Sent 0002 to lab. Very good veg cover in area. Also, old test pit located 50' SE. pile of material with a hole next to it, hole has H2O present

01054 - located in willows. location was moved apx 45' east of original location to get access by excavator. Heavy veg and old willows. visible tailings in willow area on surface. Excavated to 54", sampled to 48". Sent 0006, 0612, 1218, 1824, 2931 + 3036 to Lab.

09/29/09 RWE/DB/Mike Hatten Tailgate Safety meeting. review material listed in HASP, emphasis on pinch points, slips trips - falls and weather. DB talked about traffic & working around Rig.

(H) 01055 - LOCATED IN WILLOWS, HAND DIG TO 48" ORIGINAL GPS LOCATIONS HEAVY VEG. Sent 0006, 0612, 1218 18, 24 and 2930 to lab. H= sampled with Hand Auger to 48"

(H) 01058 LOCATED NEAR WILLOWS, HAND DIG IN HEAVY VEG. SAMPLE TO 48" NO CHANGE FROM GPS. Sent 3642 + 4248 to Lab, Both Samples > 500 total COC.

7/27/2009 RWE, MH, DB

(H) 01057 - LOCATED IN WILLOWS, HAND DIG TO 48" NO GPS. Sent 3642, 4248 To LAB.

(H) 01064 - Located in willows. Visual Tailings on surface. Sent 0006, 0612, 2431, 3036, 3642 to lab.

(H) 01414 ADDED IN DIAMOND SHAPED WILLOW INFESTED AREA SAMPLED TO 48". Sent 3642, 4248 to lab

(H) 01415 ADDED IN DIAMOND SHAPED WILLOW INFESTED AREA SAMPLED TO 48" Visible Tailings on surface. Sent 3642, 4248 to lab.

(H) 01172 LOCATED IN WILLOWS SAMPLED TO 48". Visible Tailings on surface but good veg - Sent 3036, 3642 + 4248

01174 LOCATED IN THICK WILLOWS SAMPLED TO 48" Sent 3642, 4248 to lab

(H) 01537 LOCATED IN THICK WILLOWS. Sent 3642, 4248 to lab

(H) 01134 LOCATED IN THICK WILLOWS, LOCATION NOT STAKED. Guessed location

CH
01134 - ([illegible]) [illegible] MAP, [illegible]
[illegible] [illegible] AREA. Sent [illegible]
3642 + 4248 to LAB

CH
01216 Located in willow area, [illegible]
[illegible] surface
willows [illegible] moss.
CH Sent 0006, 0012, 1218, 1824 to lab
01201 In [illegible] tailings [illegible]
[illegible] sampled to 48" with
Hand auger. Sent 0006, 0012, 1218, 1824
01205 - In thick willows some small tailings
& sand at surface in area. Sampled
to 48" w/ hand auger. Sent 0006,
0012, 1218, 1824, 2436, 3642 to lab
01193 - In willows app 50' from river.
Sampled to 48" with hand auger. Sent
0006, 0012, 1218, 1824, 2436 to lab
01179 - Around willows near river. Moved
location to a [illegible], Apx 35'
EAST. Visible tailings & metal sheets
at surface. Sampled to 48" w/ hand
Auger. Sent 3642, 4248 to lab

01176 - Location not [illegible] moved
location apx 8' [illegible]
Sampled to 48" w/ hand auger. Sent
0006, 0012, 1218, 1824, 2436, & 3642
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

01416 LOCATED IN GRASSY OPENING, SAMPLED
TO 48" SOME VISIBLE TAILINGS, NO
GPS

01417 LOCATED IN SWAMPY WILLOWS PIT
ADDED WITH NO GPS, SAMPLED
TO 42" GRAVELS & COBBLES BELOW
42"

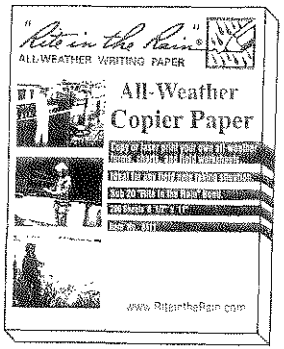
01089 LOCATED 10' FROM STREAM SAMPLED
TO 36" COBBLES & GRAVELS BELOW
36".

01088 - PIT LOCATED 15' FROM CFR, SAMPLED TO 36" GRAVELS & GRAVELS BELOW 36"

01098 - PIT LOCATED 15' FROM CFR SAMPLED TO 48", VISIBLE TAILINGS TO ≈ 18"

Notes -
11-19-2009 - Test #1 01523 & 01090 were combined Data Box showed # 01090
RWB - changed 01090 to 01523 in DB!

"Rite in the Rain"®
ALL-WEATHER WRITING PAPER



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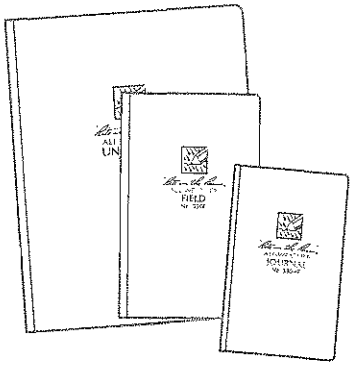
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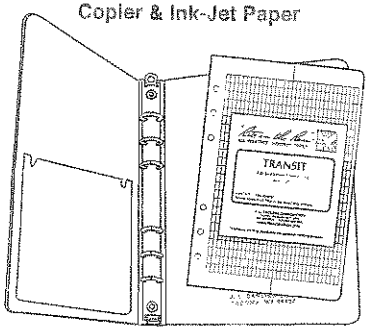
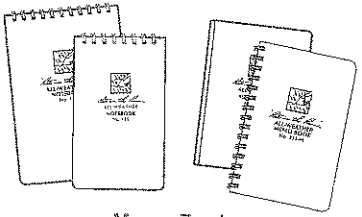


Loose Leaf / Ring Binder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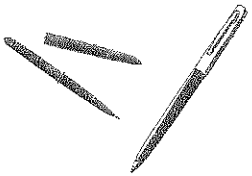
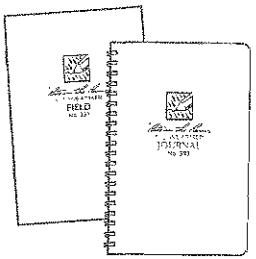

All-Weather Pens



Notebooks

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APPENDIX D

TEST PIT EXCAVATION LOGS

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	8/24/07
Contractor:	Jordan Construction	**Test Pit No:**	001-01
Photo ID:	8/24/07 01	**Excavator:**	Case 303
Logged By:	M Harper	**Weather:**	Sunny - 70°
Change from GPS Position	None		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	Sandy Sand	Dry	Brown	7-8	0%			(P) / F
06-12	↓	↓	↓	↓	↓			(P) / F
12-18	↓	↓	↓	↓	↓			(P) / F
18-24	Potential Floor Zone @ 18"	↓	↓	↓	↓			(P) / F
24-30	↓	↓	↓	↓	↓			(P) / F
30-36	↓	↓	Tan	↓	↓			(P) / F
36-42	↓	Moist	↓	↓	↓			(P) / F
42-48	Sandy Gravel ↓	Wet	Tan	↓	50-60%			(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
								P / F

TD = 48"
End sampling on test pit @ 36"
Collected surface sample within 1 meter of test pit location 01 001 0001 and submitted to CHS

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 8/24/09 002
Logged By: Rule / Mad
Change from GPS Position NONE

Date: 08/29
Test Pit No: 001 002
Excavator: Cat 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	Silty Sand	Dk Brown	Dark	No color 7-8	—	N	Yes	P / (F)
06-12						N	Yes ~~N~~	(P) / F
12-18							Yes	(P) / F
18-24							N	(P) / F
24-30								(P) / F
30-36								(P) / F
36-42	Silty Sand with Gravel	Gray	Moist		<20%			(P) / F
42-48	Sand Cobbles and Gravels		Wet		80%			No Sample P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: TD = 48"
GW @ 42"

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 03
Logged By: D BLYTHE
Change from GPS Position NO

Date: 8/24/2009
Test Pit No: 001 003
Excavator: CAT 303
Weather: SUNNY CLEAR HOT

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	Dark Brown Silty SAND, CRAP-[illegible]	DRY	BRN	7-8	<10	NO	N	(P) / F
06-12		↓	BRN	↓	↓	↓	↓	(P) / F
12-18		↓	BRN	↓	↓	↓	↓	(P) / F
18-24		↓	LT BRN	↓	↓	↓	↓	(P) / F
24-30		DRY	LT GRAY	↓	↓	↓	↓	(P) / F
30-36		MOIST	↓	↓	↓	↓	↓	(P) / F
36-42		SAT.	↓	↓	↓	↓	↓	(P) / F
42-48	Light Gray Sandy Clay Some Inclusions Saturated @ 46" (GW)	Saturated	Light Gray	↓	(Bulk) <10 ~~<10~~	↓	↓	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 04
Logged By: DB / RWE
Change from GPS Position NE

Date: 08/24/2000
Test Pit No: 001 004
Excavator: Cat 303
Weather: Sunny, Hot 75°F

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	HEAVY ORGANICS, SILTY SAND	DRY	BRN	7-8	<10	NO	Y	P / (F)
06-12	SILTY SAND	↓	↓	↓	↓	↓	Y	(P) / F
12-18		↓	LT GRAY	↓	↓	↓	Y	(P) / F
18-24		↓	↓	↓	↓	↓	N	(P) / F
24-30		↓	↓	↓	↓	↓	↓	(P) / F
30-36	↓	MOIST	↓	↓	↓	↓	↓	(P) / F
36-42	LT GRAY SILTY SAND, SOME GRAVELS	MOIST	↓	↓	↓	↓	↓	(P) / F
42-48	Grat 46" Some gravels.	SAT	Light Gray	↓	<10	No.	↓	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	8/24/2009
Contractor:	Jordan Construction	**Test Pit No:**	001 009
Photo ID:	05 8/24/2009	**Excavator:**	CAT 303
Logged By:	RWE / DB	**Weather:**	SUNNY, CLEAR, HOT
Change from GPS Position	MS		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	ORGANIC RICH, SILTY SAND	DRY	BRN	7.5-8	0		Y	P / (F)
06-12				7.5-8	0		Y	P / F
12-18				7.5-8	0		Y	P / F
18-24	SILTY SAND		LT GRAY	—	0		N	P / F
24-30				—	0		N	P / F
30-36		MOIST		—	0		N	P / F
36-42	SILTY SAND SOME ROCK	MOIST		—	<5		N	P / F
42-48		SAT		—	<5		N	P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 8/24/2009 06
Logged By: DB
Change from GPS Position NA

Date: 8/24/2009
Test Pit No: 001 C14
Excavator: CAT 303.5C
Weather: SUNNY, HOT

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	LT BRN/ ORANGE	5.5-6	<10	Y	N	P / F → N/A
06-12								P / F
12-18								P / F
18-24								P / F
24-30								P / F
30-36								P / F
36-42	SILTY SAND	MOIST	DARK GRAY W/ORANGE STRINGERS					P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66		SAT			<10		Y	P / F
66-72	GRAVELS, COBBLES	SAT	LT GRAY		>60	N	Y	P / F

Remarks:

Page 1 of 1

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 7 08/24/2009
Logged By: DB
Change from GPS Position YES 20-25 NORTH

Date: 8/24/2009
Test Pit No: 001 024
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	LT BRN	NOT TAKEN		Y		P / F
06-12								P / F
12-18								P / F
18-24			ORANGE					P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54	SILTY SAND W/ MOTTLING	MOIST	BROWN				N	P / F
54-60	SILTY SAND W/ ORGANICS	MOIST		7.5			Y	P / F
60-66	SILTY SAND W/ ORGANICS	MOIST					Y	P / F
66-72	SAND and GRAVELS	MOIST			<10		Y	P / F

N/A

Remarks: WATER TABLE @ 72', > 72' 80% GRAVELS, COBBLES

72-78 UNABLE TO SAMPLE

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	08/24/2009
Contractor:	Jordan Construction	**Test Pit No:**	001 034
Photo ID:	08/24/2009 Photo #8	**Excavator:**	Cat 303
Logged By:	Rylee	**Weather:**	Sunny
Change from GPS Position	No		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	Fine to MOD SANDS w/some silts.	Dry	GRAYS REDS TANS		<10	Y		P / F
06-12			MIXED LAYERS.					P / F
12-18								P / F
18-24								P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48	Silty SANDS (OLD Root zone) Possible "A" Horizon	slightly moist	BLACK					P / F
48-54	Silty SANDS							P / (F)
54-60								P / (F)
60-66		moist		7.5-8			Y	P / (F)
66-72		Saturated					Y	(P) / F
72-78	SANDS w/some silts	Saturated					Y	(P) / F

Remarks: GW @ 72"

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 8/24/2009 #9
Logged By: RWE
Change from GPS Position No

Date: 08/24/2009
Test Pit No: 001 043
Excavator: Cat 303
Weather: Hot

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	Fine to med Sands	Dry	Red Brown Gray All mixed	5.5	<1	Y	No	P / F
06-12	↓	↓	↓	5.5	↓	↓	↓	P / F
12-18	↓	↓	↓	7	↓	↓	↓	P / F
18-24	Fine Sandy Silt		Dark Gray Fine Sands.	7	↓	Possible	↓	P / (F)
24-30	↓	↓	↓	↓	↓	↓	↓	P / (F)
30-36	Silty Sand	moist	↓	↓	↓	↓	No	P / (F)
36-42	↓	↓	↓	7	↓	↓	YES	P / (F)
42-48	Fine Sands w Silts; decomposing organic Smell	Saturated	Black	↓	↓	↓	YES	(P) / F
48-54	↓	↓	↓	↓	↓	↓	YES	(P) / F
54-60	↓	↓	↓	7	↓	↓	No	P / F
60-66	↓							P / F
66-72								P / F

Remarks: GW @ 54"

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 08/24/2009 #10
Logged By: KWE
Change from GPS Position No

Date: 08/24/2009
Test Pit No: 001044
Excavator: CAT 303
Weather: Sunny, Hot.

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	Fine to med Sands	DRY	Gray Brown Red Tan All Mixed	None Taken	<1	Y	N	P / F
06-12								P / F
12-18								P / F
18-24								P / F
24-30								P / F
30-36	Sandy Silts; Some Organics	moist	Black					P / F
36-42	Sandy Silts: old Root Zone		Dark Gray					P / F
42-48	Silty Sand	Saturated						P / F
48-54			Light Gray. ~~Saturated~~	8.0			Y	P / F
54-60	Fine Sandy Silt		Gray.	7.0	<5		Y	P / F
60-66	Med Sands		Light Gray.	6.5	<5		Y	P / F
66-72								P / F

7.48'

N/A

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 8-25-2009 #1 / #2
Logged By: RWE / DB
Change from GPS Position none

Date: 08-25-2009
Test Pit No: 001 038
Excavator: Cat 303 Track
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND • HEAVY ORGANICS 0-6"	DRY	WHITE YELLOW ORANGE		<5	Y	SAMPLE NOT TAKEN	P / F
06-12		DRY						P / F
12-18		MOIST						P / F
18-24								P / F
24-30				7			N	P / (F)
30-36			DARK GRAY BLACK	7		N	Y	P / (F)
36-42				7			Y	(P) / F
42-48	• 3" ROOT ZONE 42-45"			7			Y	(P) / F
48-54							N	(P) / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	8/25
Contractor:	Jordan Construction	**Test Pit No:**	001 032
Photo ID:	8/25 #3	**Excavator:**	CAT 303.5
Logged By:	DB	**Weather:**	SUNNY CLEAR CALM HOT
Change from GPS Position	NO		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	ORGANIC SILT • HEAVY ORGANICS 0-12"	DRY	LT GRAY	7-8	<5	N	N	(P) / F
06-12				NOT TAKEN				(P) / F
12-18	ORGANIC SILTY SAND							(P) / F
18-24								(P) / F
24-30								(P) / F
30-36							SEE BELOW	P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: 01032 0002 XRF FAIL, LAB SAMPLE

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	8/05/2009
Contractor:	Jordan Construction	**Test Pit No:**	001 021
Photo ID:	#4 8/25	**Excavator:**	303.5
Logged By:	D. BUTTHE	**Weather:**	SUNNY, CALM, HOT
Change from GPS Position	NO		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND • 0-6" ROOTS, ORGANIC RICH	DRY	DARK BROWN		<5	N	No	P / ~~F~~
06-12								P / F
12-18								P / F
18-24			LT GRAY				Not Collected	P / F
24-30								P / F
30-36		MOIST						P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: #8
Logged By: DBUSTHE
Change from GPS Position NO

Date: 8/25/2009
Test Pit No: 001 041
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, CALM HOT

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY CLAY / 0-6" ROOT ZONE HEAVY VEG.	DRY	BROWN	7-8	<5	N	NO	(P) / F
06-12				7-8				(P) / F
12-18			LT GRAY	NONE TAKEN				(P) / F
18-24							Not Collected	P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	8/25/2009
Contractor:	Jordan Construction	**Test Pit No:**	001 ~~027~~ 031 (RWE)
Photo ID:	#7	**Excavator:**	303.5 MINI EX
Logged By:	D BUTTHE	**Weather:**	SUNNY, SLT BREEZE HOT
Change from GPS Position	NO		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY CLAY - 0-6" ROOT ZONE HEAVY VEG	DRY	DARK BRN	7-8	<1	N	N	(P) / ~~F~~ (RE)
06-12				7-8				(P) / F
12-18				7-8				(P) / F
18-24		MOIST		NONE TAKEN			Not collected	P / F
24-30								P / F
30-36								P / F
36-42	SOME GRAVELS <5%		LT GRAY					P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	8/25/2009
Contractor:	Jordan Construction	**Test Pit No:**	001 022
Photo ID:	8/25/2009 # 8	**Excavator:**	Cat 303
Logged By:	RWB	**Weather:**	Sunny Hot
Change from GPS Position	None		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SAND	Dry	Brown TPY 2.5YR	6	< 5	yes	yes	P / (F)
06-12	Silty Sand		Dark Brown	7		No		(P) / F
12-18								(P) / F
18-24								(P) / F
24-30			Dark Gray				No	(P) / F
30-36								(P) / F
36-42	Silty Clay	Moist	Light Gray					(P) / F
42-48								(P) / F
48-54		Saturated						P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 8/25/2003 #9
Logged By: Rust
Change from GPS Position No GPS

Date: 8/25/2003
Test Pit No: 001022.55W
Excavator: CAT 303
Weather: Sunny HOT

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	Silty Sand → 00-02 Sand	Dry	Dark Brown w/some Light Tan Sand	6	<5	yes 00-02	No	P / F
06-12			Gray	7				P / F
12-18								P / F
18-24							Not Collected	P / F
24-30	Silty Clay		Light Gray					P / F
30-36		Moist						P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 08/25/2009 #10
Logged By: RWE
Change from GPS Position yes ~ 15'

Date: 8/25/09
Test Pit No: 001 023
Excavator: CAT 363
Weather: Sunny Hot

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	Fine Sands	Dry	Red Tan Gray	5.5	< 5	yes	No	P / (F)
06-12								P / (F)
12-18				6.0				P / (F)
18-24								P / (F)
24-30	"A" Hori. zon @ 24" Sands/Silts/organics		Dark Brown	7.0		NO	Yes	P / (F)
30-36	Silty Sand							(P) / F
36-42								(P) / F
42-48	Silty Clay	moist					No	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	8 25/2009
Contractor:	Jordan Construction	**Test Pit No:**	001 049 ↓ 01 523 Cumstone
Photo ID:	8/25/2009 # 11	**Excavator:**	Cat 323
Logged By:	RWE	**Weather:**	Sunny; Hot
Change from GPS Position	No		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND W/ORGANICS	Dry	Dark Brown	Side wall 7	<5	No	N	(P) / F
06-12	↓	↓	↓	↓	↓	↓	↓	(P) / F
12-18	↓	↓	↓	↓	↓	↓	↓	(P) / F
18-24	SANDY SILT	↓	Gray	↓	↓	↓	↓	(P) / F
24-30	↓	↓	Light Gray	↓	↓	↓	↓	(P) / F
30-36	↓ SILTY CLAY	moist	↓	↓	↓	↓	NOT Collected	P / F
36-42	↓	↓	↓	↓	↓	↓	↓	P / F
42-48	↓	very moist	↓	↓	↓	↓	↓	P / F
48-54	COBBLES AND GRAVELS with SAND (GP)	WET	Brown		75%			P / F
54-60	↓	↓	↓		↓			P / F
60-66								P / F
66-72								P / F

Remarks: Cut to 52"

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 08/25/2009 # 12
Logged By: RWE
Change from GPS Position No

Date: 8/25/2009
Test Pit No: 001 042
Excavator: CAT 303
Weather: Cloudy Hot

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	Fine sand	Dry.	Red Tan Gray	Kt 7	< 5	yes	yes	P / (F)
06-12	SILTY sand		Dark Brown			No		(P) / F
12-18								(P) / F
18-24	SILTY CLAY w/ some gravels up to 2"		Gray		< 10		No	(P) / F
24-30								(P) / F
30-36	SILTY Clay w/ gravels & Cobbles. Cobbles up to 6"	Very moist			< 40			(P) / F
36-42	H_2O @ 43"		light Gray					(P) / F
42-48		SATURATED						(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	08/25/2000
Contractor:	Jordan Construction	**Test Pit No:**	001 056
Photo ID:	08/25/2000 #13	**Excavator:**	CAT 303
Logged By:	RWB	**Weather:**	Cloudy Hot
Change from GPS Position	No		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	Fine Sands.	Dry	Red Gray Tan.		<5	Yes	No	P / F
06-12	↓	↓	↓		↓	↓	↓	P / F
12-18	↓	↓	↓	Kit 7-8	↓	↓	Yes	P / F
18-24	Sandy Silts. Possible "A" Horizon @ 22"	↓	Dark Brown	7-8	↓	No	Yes	P / F
24-30	Silty Sand.	Moist	Brown	7-8.	↓	↓	Yes	P / F
30-36	↓	Very Moist	Light Gray		↓	↓	No	P / F
36-42	20 Silty Clay.	Saturated	↓		↓	↓	↓	P / F
42-48	Silty Clay	↓	↓		<20	↓	↓	P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 08/25/2009 #14
Logged By: RWS
Change from GPS Position Approx 10' SE From ORIGINAL

Date: 08/25/2009
Test Pit No: 001 040
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY Sand	Dry	Dark Brown	Kit 7	< 5	NO	N	(P) / F
06-12	↓	↓	↓	7	↓	↓	↓	(P) / F
12-18	↓	↓	↓	7	↓	↓	↓	(P) / F
18-24	↓	↓	↓		↓	↓		NS P / F
24-30	↓	↓	gray		↓	↓		NS P / F
30-36	SILTY Clay	very moist	light Gray		↓	↓		NS P / F
36-42	↓	↓	↓		↓	↓		NS P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 8/26/2009 #1
Logged By: RWB
Change from GPS Position APX 73' SE

Date: 08/26/2009
Test Pit No: 001 B12
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	Silty Sand	Dry	Brown/Red		< 5	yes	Not collected	P / F
06-12	SAND						not collected	P / F
12-18	Fine CLAYEY SAND	Very moist	Black				No.	P / (F)
18-24	Very ↑ ORGANICS @ 24"			Kit 7			yes	P / (F)
24-30	SANDY CLAY Possible "A" Horizon @ 26"		Gray	7			yes	(P) / F
30-36			Brown	7		No	yes	(P) / F
36-42		Saturated	Black/Brown		< 10		No	(P) / F
42-48	Sandy Gravels w/ Cobble		—		780		No.	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 8/26/2009 #2
Logged By: RWG
Change from GPS Position No

Date: 08/26/2009
Test Pit No: 001 005
Excavator: CAT 353
Weather: Sunny Hot.

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	Sands	Dry	Brown Red Clay		<5	yes	N	P / (F)
06-12								P / (F)
12-18								P / (F)
18-24							Y	P / (F)
24-30	Silts w/ Heavy organics. Clay	Very moist	Black	Ph 7		No	Y	(P) / F
30-36	lots of organics.			7			Y	(P) / F
36-42		Saturated		7			Y	(P) / F
42-48	Some gravels				<40		N	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: #3 8/26/2009
Logged By: D. BLYTHE
Change from GPS Position NO

Date: 8/26/2009
Test Pit No: 001 006
Excavator: CAT 303.5 MINI EX
Weather: CLEAR, SLT BREEZE, HOT

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY GRAVELS	DRY	BRN	7	<45	N	Y	P / ~~F~~ (B)
06-12	↓	↓	↓	7	↓	↓	N	P / F
12-18	SANDY CLAY	MOIST	DARK GRAY	7	25	↓	↓	P / F
18-24		↓	DARK GRAY	NOT COLLECTED	↓	↓	↓	P / F
24-30	SAND 24-28 RED ORANGE SANDY CLAY DARK GRAY 28-30	MOIST	DARK GRAY RED/ORANGE	↓	↓	Y	↓	P / F
30-36	SANDY CLAY	SAT.	DARK GRAY	↓	↓	N	↓	P / F
36-42	↓	SAT	↓	↓	↓	↓	↓	P / F
42-48	NO SAMPLE GRAVELS				>50			P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 4
Logged By: DBLSTHE
Change from GPS Position

Date: 8/26/2009
Test Pit No: 001 013
Excavator: 3035 CAT MINIEX
Weather: SUNNY BREEZY, HOT

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SAND	DRY	YELLOW ORANGE WHITE	5	<1	Y	Y	P / (F)
06-12				5.5				P / (F)
12-18	SANDY CLAY	MOIST	DARK BROWN/ BLACK	7		N		P / (F)
18-24				7				P / (F)
24-30				NOT COLLECTED			N	(P) / F
30-36	• POSSIBLE REDX ZONE HEAVY ORGANICS							(P) / F
36-42								(P) / F
42-48		SAT						(P) / F
48-54		SAT						(P) / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	8/26/2009
Contractor:	Jordan Construction	**Test Pit No:**	001401
Photo ID:	5	**Excavator:**	303.9 CAT M.W/ EX
Logged By:	D BOTHE	**Weather:**	SUNNY, BREEZY, WARM
Change from GPS Position	N/A		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY CLAY w/ TAILINGS @ 1-2"	DRY	DARK BROWN	7	<1	Y	Y	P / F
06-12				None COLLECTED		N	N	P / F
12-18								P / F
18-24			GRAY/ WHITE					P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	8/26/2009
Contractor:	Jordan Construction	**Test Pit No:**	001 402
Photo ID:	6	**Excavator:**	303.5 CAT MINI EX
Logged By:	D. BLYTHE	**Weather:**	SUNNY, HOT
Change from GPS Position	N/A		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY CLAY	DRY	LT BRN / ORANGE RED	7	<1	Y	Y	P / (F)
06-12	• SOME GRAVELS			NOT COLLECTED	<10	Y		P / (F)
12-18			BLACK		<1	Y / N		P / (F)
18-24	SILTY CLAY	MOIST	DARK GRAY					P / (F)
24-30							N	(P) / F
30-36								(P) / F
36-42								(P) / F
42-48			WHITE					(P) / F
48-~~54~~ 50		SAT.						(P) / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 7/8
Logged By: D BLYTHE
Change from GPS Position N/A

Date: 8/26/2009
Test Pit No: 001 ABS
Excavator: 303.5 MINI EX
Weather: HOT

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY/CLAY / SANDY / 1" LAYER	DRY	DARK BRN	7	≤5	Y	Y	P / (F)
06-12		MOIST		NOT COLLECTED		N	N	(P) / F
12-18								(P) / F
18-24								(P) / F
24-30			LT GRAY					(P) / F
30-36	SOME GRAVEL	MOIST			<30			(P) / F
36-42	SOME COBBLES/GRAVEL	SAT			<20			(P) / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	08/26/2009
Contractor:	Jordan Construction	**Test Pit No:**	001 079
Photo ID:	8/26/2009 #9	**Excavator:**	CAT 307
Logged By:	Rieks	**Weather:**	Sunny Hot
Change from GPS Position	No		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY sand	Dry	Dark Brown	7	< 5	NO	N	P / F
06-12			Brown					P / F
12-18								P / F
18-24			gray					P / F
24-30	Silty Clay		Light gray					P / F
30-36	Clay	moist						P / F
36-42		Very moist	Light gray					P / F
42-48		Saturated			< 10 Some large cobbles >6"			P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

NOT COLLECTED

Remarks: 0002 FAILED XRF, SENT TO LAB PH 7

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	8/26/09
Contractor:	Jordan Construction	**Test Pit No:**	001 028
Photo ID:	8/26/09 # 10	**Excavator:**	CAT 303
Logged By:	RWG	**Weather:**	Sunny
Change from GPS Position	YES APX 15' EAST		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY Sand	Dry	Dark Brown		5	NO	N	P / F
06-12								P / F
12-18								P / F
18-24								P / F
24-30	SILTY Clay		BROWN					P / F
30-36								P / F
36-42	Fine SAND	moist			10			P / F
42-48	SANDY Gravel w/cobbles upto 6"	Very moist			780			P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

NOT COLLECTED

Remarks: 0002 PASSED XRF, SENT TO LAB pH 7

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 8/26/09 #11
Logged By: RWB
Change from GPS Position No

Date: 8/26/09
Test Pit No: 001 70
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	Silty	Dry	Dark Brow	7	< 5	No	N	P / (F)
06-12	SILTY Sand.							(P) / F
12-18								(P) / F
18-24								(P) / F
24-30	SILTY Clay (possible Ash?)	moist	Brown					P / F
30-36	SILTY Clay w/Sand		Gray					P / F
36-42		very moist	light gray		< 10			P / F
42-48	GW @ 47"	Saturated			> 70			P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

NOT COLLECTED

Remarks: 0002 FAILED XRF, SENT TO LAB pH 7

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	8/26/2009
Contractor:	Jordan Construction	**Test Pit No:**	001 011
Photo ID:	8/26/2009 #12	**Excavator:**	Cat 303
Logged By:	RWE	**Weather:**	Sunny Hot
Change from GPS Position	None		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)	
00-06	SILTY SANDY	Dry	DARK BROWN.	7	<5	NO	N	(P) / F	
06-12			BROWN					(P) / F	
12-18								(P) / F	
18-24								(P) / F	
24-30	SILTY CLAY		GRAY					P / F	NOT COLLECT
30-36			Light GRAY					P / F	
36-42	SILTY CLAY W/SAND				<30			P / F	
42-48	CLAY W gravels + cobbles	very moist			>50			P / F	
48-54								P / F	
54-60								P / F	
60-66								P / F	
66-72								P / F	

Remarks: OCH2 PASSED XRF, SENT TO LAB, pH 7

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	8/27/2009
Contractor:	Jordan Construction	**Test Pit No:**	00119
Photo ID:	1	**Excavator:**	303.5 CAT MINI EX
Logged By:	R BLYTHE	**Weather:**	CLEAR, CALM WARM
Change from GPS Position	20' EAST		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)	
00-06	SILTY CLAY w HEAVY ORGANICS & VEG.	DRY	DARK BRN	7	<5	N	NO	P / (F)	
06-12		MOIST	DARK GRAY					(P) / F	
12-18								(P) / F	
18-24								(P) / F	
24-30								P / F	MORE COLLECT
30-36			WHITE					P / F	
36-42								P / F	
42-48		SAT						P / F	
48-54				–	770			P / F	
54-60								P / F	
60-66								P / F	
66-72								P / F	

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 2
Logged By: D BLYTHE
Change from GPS Position 35' WEST

Date: 8/27/2009
Test Pit No: 001 018
Excavator: 303.5 CAT MINI EX
Weather: SUNNY, CALM,

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	Silty Clay ~ Heavy organics	Dry	dark Brown	7	<5	No	No	P / (F)
06-12			Brown	7				(P) / F
12-18				7				(P) / F
18-24								(P) / F
24-30	CLAYEY silt		light Gray					P / F
30-36		moist						P / F
36-42		very moist						P / F
42-48					<20			P / F
48-54	Gravels, pebbles >6"	Saturated			>80			P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	8/27/2009
Contractor:	Jordan Construction	**Test Pit No:**	001010
Photo ID:	3	**Excavator:**	30B5 CAT MINI EX
Logged By:	BWE	**Weather:**	
Change from GPS Position	Made		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY CLAY - ORGANIC RICH	MOIST	DARK BROWN	7		No	No	P / (F)
06-12				7				(P) / F
12-18				7				(P) / F
18-24								(P) / F
24-30			LT GRAY/ WHITE					P / F
30-36								P / F
36-42		SAT						P / F
42-48	GRAVELS COBBLES				<50			P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

NOT TAKEN

Remarks: NO GW ENCOUNTERED

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	8/27/07
Contractor:	Jordan Construction	**Test Pit No:**	001 532
Photo ID:	8/27/05 4 + 5 + 6	**Excavator:**	353.5 CAT
Logged By:	EWE/MPS	**Weather:**	Sunny - Hot
Change from GPS Position	None		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	Silty clay Top soil w/organics	Dry	Dk Brown	7	< 5	No	Y	P / (F)
06-12				7			Y	(P) / F
12-18				7			Y	(P) / F
18-24		Moist	Gray					P / F
24-30	SILTY clayey sands.							P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54	Cobbles and Gravels with Sands (GP)	Wet			70-80%		Geotextile sample	P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GW @ 50"
TD: 66"

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID:
Logged By: MH
Change from GPS Position Added Report

Date: 8/27/07
Test Pit No: 001 401
Excavator: Hanna Anderson
Weather: Sunny - Hot

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SANDS	Dry	RED TAN BROWN		< 1	yes	No	P / F
06-12								P / F
12-18								P / F
18-24								P / F
24-30	SILT w/ organics	moist	Dark Gray			No	X	P / F
30-36	SILTY Clay w/lots of organics		Black				X	P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	8/22/09
Contractor:	Jordan Construction	**Test Pit No:**	001 521
Photo ID:	8/27/09 007	**Excavator:**	303.5 Cat
Logged By:	M. Hatten	**Weather:**	Sunny - Hot
Change from GPS Position	None		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	Silty Sand	Damp	Orange Brown		< 5	yes	No	P / (F)
06-12	↓	↓	↓		↓	↓	↓	P / (F)
12-18			Dk Brown			↓	yes	P / (F)
18-24	↓		↓		↓		yes	(P) / F
24-30	Silty Sand with Cobbles	↓	Gray	30-40% max	30-40%		yes	(P) / F
30-36	↓				↓		No	(P) / F
36-42	↓	Moist					↓	(P) / F
42-48	Silty Clayey Sand with Cobbles	Moist			20-30%			(P) / F
48-54	Sandy Gravels and Cobbles (GP)	Wet			50-60%			(P) / F
54-60	↓	Wet			20-50%			P / F
60-66	↓	Wet			↓			P / F
66-72								P / F

Remarks: TD = ~~[illegible]~~ max 60"
Cobble, ~~[illegible]~~ max 48"

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 8/23/09 009
Logged By: MH
Change from GPS Position None

Date: 8/23/09
Test Pit No: 001 STA
Excavator: 303.5 CAT
Weather: Sunny - Hot

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	Sandy Sand	Damp	Light Brown	5.5	< 5	yes	No	P / (F)
06-12			Light Brown	5.0				P / (F)
12-18				5.5				P / (F)
18-24				4.5				P / (F)
24-30				6.0				P / (F)
30-36	SAND Layer ~~32-36~~ MH			6.5				P / (F)
36-42			Dk Brown	7				P / (F)
42-48				7				P / (F)
48-54	~~Sandy Cl~~ Sandy Silt	moist		7		No		P / (F)
54-60	Sandy Clayey Sand	wet					yes	P / (F)
60-66			Grayish Green					(P) / F
66-72	MED Sands							(P) / F

Remarks: TD = 72"
GW = 54"

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	8/27/2009
Contractor:	Jordan Construction	**Test Pit No:**	001 S19
Photo ID:	10	**Excavator:**	263.5C
Logged By:	D. BLYTHE	**Weather:**	SUNNY CLEAR HOT
Change from GPS Position	NO		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND ORGANIC RICH	DRY	BROWN	8	<5	Y	No	P / F
06-12	SILTY SAND	MOIST	ORANGE BROWN	5.5				P / F
12-18				4.5				P / F
18-24	SAND LAYER			4.5				P / F
24-30				5.0				P / F
30-36	SILTY SAND			5.5				P / F
36-42			BROWN/GRAY	6.0		N		P / F
42-48				6.0				P / F
48-54				6.5				P / F
54-60	SILTY CLAYEY SAND			7.0				P / F
60-66			BLAKISH BROWN				Not Collected	P / F
66-72							Not Collected	P / P

Remarks: 72-84 SP POORLY GRADED SAND XRF SAMPLE COLLECTED

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	8/27/2009
Contractor:	Jordan Construction	**Test Pit No:**	001 5/7
Photo ID:	11	**Excavator:**	303.5 MINI EX
Logged By:	D. BLYTHE	**Weather:**	HOT
Change from GPS Position	NO		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SAND ORGANIC RICH	DRY	BRN		<5	Y	No	P / F
06-12		MOIST	ORANGE					P / F
12-18								P / F
18-24								P / F
24-30	SILTY SAND		BROWN			N		P / F
30-36								P / F
36-42								P / F
42-48		SAT					yes	P / F
48-54	POORLY GRADED SAND POORLY GRADED SAND MIX WITH	SAT	SALT & PEPPER		<10		Not collected	P / F
54-60	BOULDERS (<20%)				<20		yes	P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	8-31-09
Contractor:	Jordan Construction	**Test Pit No:**	001 513
Photo ID:	8/31/09 #1, #2	**Excavator:**	Cat 303 mini x
Logged By:	Chris Murgel	**Weather:**	Partly cloudy warm
Change from GPS Position	no		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	Silt	Dry	Brown		<1	no		P / F
06-12								P / F
12-18								P / F
18-24	Silty clay							P / F
24-30			Light Brown					P / F
30-36								P / F
36-42	clay	Dry	Gray					P / F
42-48		moist						P / F
48-54	silt - heavy organic	moist	Dark Brown		<20			P / F
54-60	silt w. the Gravels & small Gravels up to 3"	Very moist	Black		70			P / F
60-66		saturated						P / F
66-72	Sand clay - visible mica Gray in color				<30			P / F

Remarks: 72-96 - Silty gravels w/sand. <60% gravels gradations Sample taken collected 0002 GP

72 96 96

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 05/37/2009 #3 & #4
Logged By: EWS/CM
Change from GPS Position None

Date: 08/37/2009
Test Pit No: 001 512
Excavator: CAT 303
Weather: Sunny - Partly cloudy

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY Sand Some ORGANICS	Dry	Dark Brown	X	< 5	No		(P) / F
06-12								(P) / F
12-18			BROWN					(P) / F
18-24								(P) / F
24-30								(P) / F
30-36	SILTY clay		light Gray					(P) / F
36-42								(P) / F
42-48		Very moist						(P) / F
48-54	Clay							(P) / F
54-60					< 30			(P) / F
60-66	Fine SANDS & GRAVELS	Saturated	Dark Gray/Brown					(P) / F
66-72					< 40			(P) / F

Remarks: Sent in OU2 lab sample

GW @ 84" 72-78 SANDS W GRAVELS
78-84 - SANDY GRAVELS

< 50%
> 1 in

Page _____ of _____

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	8-31-09
Contractor:	Jordan Construction	**Test Pit No:**	001 511
Photo ID:	8-31-09 778	**Excavator:**	305.5 Cat mini x
Logged By:	Randy Englesh	**Weather:**	Partly cloudy warm
Change from GPS Position	No		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
Fill 00-06	Cobbles & Gravels w/ SANDS. cobbles > 36"	Dry	Brown		>80%	No		P / F
06-12	↓	↓	↓		↓			P / F
12-18	Fabric layer Separation SILTY Sand.		Light gray		< 5			P / F
18-24	↓		↓					P / F
24-30	SILTS w/ Black streaks in line Patterns - old Root zone?		↓					P / F
30-36			Gray					P / F
36-42		↓	↓					P / F
42-48	SANDY GRAVELS	Moist	Dark Gray w/ some orange					P / F
48-54		↓	↓					P / F
Fill 54-60	Gravely Sands; Cobbles up to 5"	Saturated	↓					P / F
60-66								P / F
66-72								P / F

Remarks: large cobbles & gravels & sands. on top of Heavy Black Fabric. Mixed Vegitation w/ lots Knapweed. could sampled for lab.

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	8-31-09
Contractor:	Jordan Construction	**Test Pit No:**	001508C
Photo ID:	8/31/09 #9 + 10	**Excavator:**	325.5 mini X Cat
Logged By:	Randy English	**Weather:**	Partly cloudy - warm, light wind
Change from GPS Position	No		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	Silty Sand.	dry	Dark Brown		<1	No		P / (F)
06-12			Brown					(P) / F
12-18								(P) / F
18-24	SILT - Top soil w/organics & Sand		Black					P / (F)
24-30	SILTY clay.		light Gray.					(P) / F
30-36								(P) / F
36-42	SAND		Grayish Brown		<1			(P) / F
42-48	SANDY Gravels.	Moist	Brown		<30			(P) / F
48-54	Gravely sands				>50			(P) / F
54-60					>60			(P) / F
60-66	@ 60" - Gravel sand mix w/concrete type hardness. Can't punch through w/Excavator.							P / F
~~66-72~~								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	08-31-09
Contractor:	Jordan Construction	**Test Pit No:**	001 507
Photo ID:	8/31/09 #11 #12	**Excavator:**	UAT 303
Logged By:	RWE	**Weather:**	overcast
Change from GPS Position	Moved to 12' away from River.		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY sand.	Dry	Dark Brown	<	< 5	No		P / F
06-12	↓	↓	↓		↓	↓		P / F
12-18	↓	↓	light gray.		↓	↓		P / F
18-24	↓	↓	↓		↓	↓		P / F
24-30	SANDY silt	↓	grayish Tan.		↓	↓		P / F
30-36	↓	↓	↓		↓	↓		P / F
36-42	SANDY gravel.	↓	Brown		< 30	↓		P / F
42-48	↓	↓	↓		< 50	↓		P / F
48-54	GRAVELY sand.	↓	↓		↓	↓		P / F
54-60	↓	↓	↓		> 60	↓		P / F
60-66	@ 60" Hard concrete material of gravely sands.	moist						P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	08/31/09.
Contractor:	Jordan Construction	**Test Pit No:**	001 505
Photo ID:	8/31/09 #13 + 14.	**Excavator:**	CAT 303
Logged By:	RWE	**Weather:**	OVERCAST
Change from GPS Position	NO		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY Sand	Dry	Dark. Brown		< 5	No		P / (F)
06-12								P / (F)
12-18								P / (F)
18-24	SILTS		Brownish TAN					P / (F)
24-30								(P) / F
30-36	SILTY Clay.		light Gray					(P) / F
36-42	SANDY Silt							(P) / F
42-48	SANDY gravels.		Gray		< 40			(P) / F
48-54	Gravely Sands.				< 40			(P) / F
54-60	Gravely SANDS w/(cobbles) up to 8"				> 80			(P) / F
60-66		moist						(P) / F
66-72	@ 67" - Hard concrete like gravely sands w/ Cobbles.							(P) / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	08/31/2009
Contractor:	Jordan Construction	**Test Pit No:**	001 510
Photo ID:	8/31/2009 #5 + #6	**Excavator:**	CAT 303
Logged By:	RWB	**Weather:**	Partly Cloudy
Change from GPS Position	No		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Discernable tailings?	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTS w/organics	Dry.	Dark Brown			No.		P / F
06-12	SILTY sandy		light Gray					(P) / F
12-18								(P) / F
18-24								(P) / F
24-30								(P) / F
30-36	SANDY Grayey		Gray		<40			(P) / F
36-42								(P) / F
42-48	Gravely sands				>60			(P) / F
48-54		moist						(P) / F
54-60	Gravely Sands w/cobbles up to 6"				>80			(P) / F
60-66		Saturated						(P) / F
66-72								(P) / F

Remarks: GW @ 68" Collected 0002 -

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 07/6/09 #10 + 11
Logged By: RWB
Change from GPS Position: No.

Date: 07/6/09
Test Pit No: 001 065
Excavator: CAT 303
Weather: Sunny - Hot.

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY silt.	Dry	Dark Brown	N/A	<10	yes		P / F
06-12	SANDS		light Brown			NO		P / F
12-18								P / F
18-24								P / F
24-30								P / F
30-36								P / F
36-42	SILTY sand.		Dark Brown					P / F
42-48	SILTY Clay.	Moist						P / F
48-54	w/more SAND Lens							P / F
54-60	MED SANDS	Saturated	multi color					P / F
60-66								P / F
66-72								P / F

Remarks: GW @ 60'.

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/01/09 #82 #9
Logged By: RWG
Change from GPS Position: NO

Date: 09/01/09
Test Pit No: 001 006
Excavator: CAT 303
Weather: Sunny.

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY sand.	moist	Dark Brown	N/A	< 5	No		P / F
06-12			TAN.			yes		P / F
12-18			Dark Brown					P / F
18-24		very moist	Dark gray.					P / F
24-30	STRONG Smell of organics decomposing							P / F
30-36	SILTY clay. OLD ROOT zone.							P / F
36-42		Saturated	Black		< 5			P / F
42-48	Gravely sands. - Cobbles up to 6"				> 80			P / F
48-54	Visual ID from Bucket.							P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/01/09 #6 & 7
Logged By: RWB
Change from GPS Position: No

Date: 09/01/09
Test Pit No: 001 090
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Sands & Organics 0003	moist	Brown	N/A.	< 5	No		P / F
06-12						No		P / F
12-18	SILTY sands.		Tan grey Red.			yes		P / F
18-24	SILTY clay		Red Brown					P / F
24-30								P / F
30-36		Saturated						P / F
36-42	SILTY sands. OLD Root Zone		Black.					P / F
42-48	SILTY clay					No		P / F
48-54	OLD ORGANICS mixed IN							P / F
54-60								P / F
60-66	Visual ID: Not Collected → Side wall collapsing; H_2O							P / F
66-72	Visual ID of gravels ≈ 72"		BROWN		>70			P / F

Remarks: GW @ 42"
AREA HAS good vegetation; grasses; trees;

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/01/09 - #1 & #2
Logged By: RWE
Change from GPS Position: Moved Apx 10' East.

Date: 09/01/09
Test Pit No: 001 CW2
Excavator: Cat 363
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDS w/organics CO OZ	moist	BROWN		<5	No		P / F
06-12	~~Brown~~ SILTY sands.		RED TAN Brown					P / F
12-18								P / F
18-24	SILTY clay.		Black					P / F
24-30	SANDY silt							P / F
30-36	OLD Root ZONE w/ some organics							P / F
36-42								P / F
42-48	Visual ID - SANDY silt - No sample collected due to GW & Test Pit Falling in		Brown					P / F
48-54	Visual ID - MED SANDS.		GRAY					P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GW @ 42"

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/01/09 - #1 & #2
Logged By: RWE
Change from GPS Position: MOVED 10' EAST.

Date: 09/01/09
Test Pit No: 001 CO2
Excavator: CAT 363
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDS w/organics CO 02	moist	BROWN		<5	No		P / F
06-12	~~Brown~~ SILTY sands.		RED TAN BROWN					P / F
12-18								P / F
18-24	SILTY clay.		Black					P / F
24-30	SANDY silt							P / F
30-36	OLD Root ZONE w/ some organics							P / F
36-42								P / F
42-48	Visual ID - SANDY silt - No sample collected due to GW + Test Pit Falling in		Brown					P / F
48-54	Visual ID - MED SANDS.		GRAY					P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GW @ 42"

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/01/09 #5
Logged By: RWG
Change from GPS Position: No

Date: 09/01/09
Test Pit No: 001 063
Excavator: CAT 303
Weather: Sunny.

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SAND.	Very moist	Brown	N/A	< 5	NO		P / F
06-12			dark gray					P / F
12-18	Root zone		Brown		< 5			P / F
18-24	Gravely sands (up to 2")	Saturated			760			P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GW @ 22"

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/01/09 #3 & 4
Logged By: RWE
Change from GPS Position: No

Date: 09/01/09
Test Pit No: 001 061
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	Dry	Black	NA	<5	No		P / F
06-12	SAND	↓	TAN BROWN	↓	↓	↓		P / F
12-18	↓	↓	↓	↓	↓	↓		P / F
18-24	SILTY clay w/ SANDS	↓	RED TAN	↓	↓	yes		P / F
24-30	↓	moist	↓	↓	↓	↓		P / F
30-36	SANDS	↓	Gray	↓	↓	↓		P / F
36-42	↓	Saturated	↓	↓	↓	↓		P / F
42-48	↓	↓	↓	↓	↓	?		P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GW @ 45"

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 8/31/2009 #15 & #16
Logged By: Rent
Change from GPS Position: No

Date: 8/31/2009
Test Pit No: 001 503
Excavator: Cat 303
Weather: cloudy

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY sand	Dry	Dark Brown	N/A	<5	No		P / (F)
06-12								(P) / F
12-18								(P) / F
18-24	SILTY clay		light gray		<10			(P) / F
24-30								(P) / F
30-36								(P) / F
36-42	Fine SANDS		Brown					(P) / F
42-48	SILTY sand		Gray		<30			(P) / F
48-54	SANDY Gravel	very moist			<50			(P) / F
54-60		Saturated						(P) / F
60-66	Gravel w/cobbles & sands				780			(P) / F
~~66-72~~ 66-90	Poorly graded gravel (GP) cobbles up to 9" Toe sample not collected.							(P) / F

Remarks: GW @ 63"

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 9-1-09
Logged By: Chris Mungel
Change from GPS Position: No

Date: 9-1-09
Test Pit No: 001-073
Excavator: 303.5 mini X-cat
Weather: Clear, light wind - Hot

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	sandy silt with Top soil with small sand	Dry	Light Brown		—	No		P / F
06-12								P / F
12-18								P / F
18-24		slight moisture						P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks.

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 9-1-05
Logged By: Chris Murgel
Change from GPS Position: NO

Date: 9-1-05
Test Pit No: 001075
Excavator: 303.5 [illegible]
Weather: Hot Clear

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Silty sand - w. th. little clay	Damp	Orange		—	Yes		P / F
06-12								P / F
12-18								P / F
18-24								P / F
24-30	Clay sand silt		Black					P / F
30-36	Clay th. t. c.w	wet	Black	—	—	Yes		P / F
36-42	CLAY	saturated	Black			NO		P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 9-1-09
Logged By: Chris Musser
Change from GPS Position: no

Date: 9-1-09
Test Pit No: 001 090
Excavator: 303.5 mini X
Weather: Hot clear

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Silty sand -	moist	Brown orange		<1	yes		P / F
06-12								P / F
12-18								P / F
18-24	Sand Clay - with silt							P / F
24-30						no		P / F
30-36	Clay with some silt Color @ 36"	saturated	Black			no		P / F
36-42	Sandy clay					no		P / F
42-48	Sandy - silt					no		P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Page _____ of _____

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID:
Logged By: Chris Mangiel
Change from GPS Position: no

Date: 9-1-09
Test Pit No: 001 067
Excavator: 303.5 mini x
Weather: Hot clear

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILT sand	Dry	orange		< 1%	yes		P / F
06-12								P / F
12-18								P / F
18-24	Sandy CLAY	Damp	Dark Brown					P / F
24-30								P / F
30-36	CLAY - some silt G.W @ 36"	Saturated	Black			no		P / F
36-42	Gravely Sand		Gray Black					P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 0910/09
Logged By: RWE
Change from GPS Position: yes. [illegible] 01076 & 01531

Date: 10/01/09
Test Pit No: 001 0776, 01531
Excavator: Cat 303
Weather: Sunny, Hot

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY silt	Dry	Tan		<1	yes		P / F
06-12	SILT w/ some sand.		Dark Brown			No		P / F
12-18	SILTY clay w/ some sand							P / F
18-24		moist						P / F
24-30								P / F
30-36	SAND		Red					P / F
36-42			Brown					P / F
42-48		very moist						P / F
48-54		Saturated	Gray					P / F
54-60	SAND		Gray					P / F
60-66	SILTY Clay		Black					P / F
66-72	Gravelly SAND							P / F

Remarks: 72-96 Poorly graded gravel.

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 9-1-09
Logged By: Chris Mangel
Change from GPS Position: no

Date: 9-1-09
Test Pit No: 001 of 79
Excavator: 303.5 mini x cat
Weather: light wind, Hot clear

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Sandy silt with Topsoil	Dry	Light Brown white		—	no		P / F
06-12	Sandy silt	Dry	Light Brown			No		P / F
12-18						no		P / F
18-24	Sandy							P / F
24-30								P / F
30-36								P / F
36-42			Dark Brown					P / F
42-48	Sandy clay silt	Dry	Dark Brown					P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: no GW good vegetation

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID:
Logged By: Chris Marzol
Change from GPS Position: no

Date: 9-1-09
Test Pit No: 001 171
Excavator: 303.5 mini X Cat
Weather: Hot, clear, slight wind

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	good root system - Top soil with sandy clay	Damp	Dark Brown		—	no		P / F
06-12					—	No		P / F
12-18	root system fading - clay silt	Damp	Dark Brown		—	NO		P / F
18-24	Silty sand with clay	Damp	Light Brown					P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: no G.W

Page _____ of _____

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID:
Logged By: Chris Mangel
Change from GPS Position: no

Date: 9-1-09
Test Pit No: 001 074
Excavator: 303.5 min. E
Weather: Hot, clear, light wind

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Orange charred - silt	moist	Orange		—	yes	1	P / (F)
06-12								P / (F)
12-18								P / (F)
18-24								P / (F)
24-30	Sand silt with clay	moist	Dark Brown		—	no		P / (F)
30-36	Silty sand & clay	moist	Dark Brown			no		P / (F)
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: Sample taken with hand spoons Dissule done By Bags

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 9-1-09 —
Logged By: Chris Mangel
Change from GPS Position No

Date: 9-1-09
Test Pit No: 001 078
Excavator: 303.5 mini x Cat
Weather: Hot - Clear,

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Silty sand light root system	moist	Brownish orange		—	yes		P / F
06-12		moist	Light orange		—	yes		P / F
12-18								P / F
18-24								P / F
24-30			Black					P / F
30-36	clay - silt							P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GW @ 3'

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/01/09 #12 & 13
Logged By: RWE
Change from GPS Position: No

Date: 09/01/09
Test Pit No: 001 072
Excavator: Cat 353
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	dry	Dark Brown	N/A	< 5	No		P / F
06-12	SANDY Silt.							P / F
12-18								P / F
18-24	SILTY SAND							P / F
24-30		moist						P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54		moist						P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/02/09 #1 & 2
Logged By: RWE
Change from GPS Position: No

Date: 09/02/09
Test Pit No: 001 527
Excavator: CAT 303
Weather: SUNNY

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDS	Dry	RED TAN BROWN	<1 (RE)	<1	yes	Y	P / F
06-12	↓	↓	↓	↓	↓	↓	↓	P / F
12-18	↓	MOIST	↓	↓	↓	↓	↓	P / F
18-24	SILTY Sand	↓	BLACK	↓	↓	↓	↓	P / F
24-30	SANDS	↓	Gray	↓	↓	↓	↓	P / F
30-36	MED SANDS	↓	Dark GRAY	↓	↓	↓	↓	P / F
36-42	↓	↓	RED GRAY	↓	↓	↓	↓	P / F
42-48	SANDY gravels	Saturated	↓	<50 (RE)	<50	↓	↓	P / F
48-54	GRAVELY sands Cobbles up to 5"	↓	↓	>80 (RE)	>80	↓	↓	P / F
54-60	Visual ID From Bucket	↓	↓	↓	↓	↓	↓	P / F
60-66	↓	↓	↓	↓	↓	↓	↓	P / F
66-72	↓	↓	↓	↓	↓	↓	↓	P / F

Remarks: GW @ 43" : TOE material was classified from Samples obtained from Bucket and Reviewed by excavator. 48-72 Poorly graded gravel (GP) with cobbles up to 5". TOE SAMPLE NOT collected.

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/02/09 #3 + 4
Logged By: RWB
Change from GPS Position: No

Date: 09/02/09
Test Pit No: 001 528
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDS w/some organics Current Root Zone	moist	Red Brown Gray		< 1	yes	A C	P / F
06-12	↓	↓	↓		↓	↓	↓	P / F
12-18	SANDS.	↓						P / F
18-24	↓	very moist						P / F
24-30	SILTY sands	↓	↓					P / F
30-36	SILTY sands w/some clay lens.	↓	w/ light gray clay					P / F
36-42	SANDS Possible old Root zone. old organics Noted.		Dark gray.		↓	↓		P / F
42-48	Fine Sands w/visible mica.		Black					P / F
48-54	SILTY sands w/some clay.	Saturated						P / F
54-60	Visual ID From Bucket	↓						P / F
60-66	↓							P / F
66-72	SANDS	↓						P / F

Remarks: GW @ 49". Note: Encountered material w/bucket due to excessive H_2O and Hole instability. Measured to Bottom of Hole after a change in material was visually Identified. Sample collected from Bucket @ Pts. 66 72. Feel pos 90% confident of depth. Toe sample not collected.

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/02/09 #5 + 6
Logged By: RWS
Change from GPS Position: NO

Date: 09/02/09
Test Pit No: 001 C09
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Fine Silty sands w/ organics	Dry.	Red Tan Brown		<1	yes	All	P / (F)
06-12	Sands.							P / (F)
12-18								P / (F)
18-24	SILTY sands		22" Black			22"		P / (F)
24/32 ~~24-30~~		moist	Dark Gray					P / (F)
32 36 ~~30-36~~	SILTY clay w/ sands							(P) / F
36-42		very moist						P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: "AND" OG Test pit w/ SS sampling Grown

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/02/09 # 7 + 8
Logged By: RWE
Change from GPS Position: Combined pit w/CPM

Date: 09/02/09
Test Pit No: 001 CPO Combined 01529
Excavator: CAT 303
Weather: Sunny.

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDS.	Slightly Moist	RED		<1	yes	All	P / (F)
06-12		↓	↓		↓	↓	↓	P / (F)
12-18		↓	GRAY		↓	↓	↓	P / (F)
18-24		↓			↓	↓	↓	P / (F)
24-30		↓	TAN.		↓	↓	↓	P / (F)
30-36		very moist			↓	↓	↓	(P) / F
36-42	SANDY silt.	Saturated			↓	↓	↓	(P) / F
42-48	SILTY sand w/organics. OID Root zone @ 46"	↓	Black		↓	↓	↓	(P) / F
48-54	GRAVELLY sands w/cobbles up to 8" GP							P / (F)
54-60	↓							P / F
60-66								P / F
66-72								P / F

Remarks: GW At 42". No Toe sample collected. Toe sample classified as a Poorly Graded Gravel (GP).

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 07/02/09 #9 + #10
Logged By: RWE
Change from GPS Position: No

Date: 07/02/09
Test Pit No: 001 TP1
Excavator: CAT 303
Weather: SUNNY

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Fine SAND	Dry	TAN RED	TAN RED	<1	yes	All	P / F
06-12	SILTY sand w/some clay.		Dark BROWN					P / F
12-18								P / F
18-24								P / F
24-30	SANDY silt some old organics Roles.							P / F
30-36	MED SAND.		Gray.					P / F
36-42	SANDY SILT w/clay.		Dark Brown			NO		P / F
42-48		Saturated						P / F
48-54	SAND		GRAY					P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 9.2.09 #11 + #12
Logged By: Chris Mooyer
Change from GPS Position: No

Date: 9.2.09
Test Pit No: 001-092
Excavator: 303.5 mini X Cat
Weather: Hot Clear

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Fine Sand	Dry	Tan/Red	N/A	<1%	yes	Yes	P / (F)
06-12	Silty Sand with some clay							P / (F)
12-18								P / (F)
18-24								P / (F)
24-30								P / (F)
30-36	Fine silt with some clay							P / (F)
36-42		Moist	Black			No		(P) / F
42-48	OLD Root zone	Saturated						(P) / F
48-54	Fine to med Sands		Gray		<10			P / F
54-60	ID w/ Bucket of Excavator							P / F
60-66								P / F
66-72								P / F

Remarks: GW @ 48". Note: All material > 48" appeared to be a consistent Fine to med Sand.

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/02/03 #13 + 14 + #15
Logged By: Randy English
Change from GPS Position: No

Date: 9-2-03
Test Pit No: 001 530
Excavator: 303.5 mini X
Weather: Hot, clear

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY silt	Slightly moist	Tan/Red		<1	yes	All	P / (F)
06-12								P / (F)
12-18								P / (F)
18-24								P / (F)
24-30	SILTY Sand w/organics - OLD Root zone		Dark Brown			No		P / (F)
30-36	SILTY Sand w/some clay.		Gray					P / (F)
36-42		very moist	Black					P / (F)
42-48	SILTS w/ ~~Heavy old~~ Heavy old organics strong smell of decomposing							(P) / F
48-54								(P) / F
54-60	SANDS (Fine)	SATURATED						(P) / F
60-66	SANDS		GRAY		<10			(P) / F
66-72	Sampled From Bucket.							P / F

Remarks: GW @ 60 Toe sample w/Bucket - To 84" Well graded SAND (SW). NOTE @ Apx 75", Found Gravel w/cobbles up to 8". No Toe sample collected for gradation, Although some was collected for XRF (Quart size)

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 02/02/09 #16-17
Logged By: RWE
Change from GPS Position: 405 - Combined 01532 AND 01086
MOVED - ARE 10' NORTH

Date: 02/02/09
Test Pit No: 001 532 + 01086
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY Sand	DRY	Brown	NA	<1	No	No	P / (F)
06-12								(P) / F
12-18	MED to Coarse SAND.		light Brown					(P) / F
18-24								(P) / F
24-30								P / F
30-36								P / F
36-42	SILTY SAND		Dark Brown					P / F
42-48								P / F
48-54	Fine SAND	moist	Brown					P / F
54-60								P / F
60-66		very mois						P / F
66-72		SATURATED						P / F

GW

Remarks: GW At 72". Visual TOE Sample From 72 - 76. SANDY Gravels: well graded gravel w/cobbles up to 2". (GW)

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/02/09 - #18 & 19
Logged By: RWE
Change from GPS Position: yes 50' North ENTERLY

Date: 09/02/09
Test Pit No: 001 094
Excavator: CAT 303
Weather: SUNNY - HOT

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY Sand.	very moist	dark gray.		< 5	yes		P / (F)
06-12	SANDY SILT		RED TAN					P / (F)
12-18								P / (F)
18-24								P / (F)
24-30								P / (F)
30-36	GRAVELY sand. lots of old organics	Saturated	RED GRY		> 70			P / (F)
36-42	GRAVELY SAND w/ lots silts.		Black		< 40			P / (F)
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GW @ 32"

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/02/09 #20 + 21
Logged By: RWE
Change from GPS Position: No.

Date: 09/02/09
Test Pit No: 001 095
Excavator: CAT 303
Weather: Sunny - Hot

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY sand	Dry	Brown		<1	No		P / F
06-12	SILT	↓	Black		↓	↓		P / F
12-18	↓	↓	↓		↓	↓		P / F
18-24	↓	↓	↓		↓	↓		P / F
24-30	SILTY sand.	moist	Dark Brown		↓	↓		P / F
30-36	↓	↓	↓		↓	↓		P / F
36-42	↓	↓	↓		↓	↓		P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

(609)

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/02/09 #22 & 23
Logged By: RWC
Change from GPS Position: yes. moved 30 N to capture IP Bigpow & noted working under fiber optic line

Date: 09/02/09
Test Pit No: 001 110
Excavator: CAT 303
Weather: SUNNY HOT!!

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY sand	Damp	RED TAN.	N/A	< 1	yes		P / F
06-12								P / F
12-18		Very moist						P / F
18-24	SANDY SILT.		GRAY.					P / F
24-30	SAND. OLD ROOT ZONE							P / F
30-36	OLD ROOT ZONE		Dark Brown					P / F
36-42								P / F
42-48	Fine SAND.	SATURATED						P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GW @ 48".

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/02/09 24 & 25 Rule.
Logged By:
Change from GPS Position: yes - moved ADX 35' westerly, located in IP Polygon

Date: 09/02/09
Test Pit No: 001 119
Excavator: CAT 303.
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND.	Dry.	Tan	N/A	21	yes	yes	P / (F)
06-12	OLD ROOTS	↓	Black.	↓	↓	↓	↓	P / (F)
12-18	↓	Moist	TAN	↓	↓	↓	↓	P / (F)
18-24	SAND	↓	Brown	↓	↓	↓	↓	P / (F)
24-30	SILTY sand.	↓	gray.	↓	↓	↓	↓	P / (F)
30-36	OLD ROOT ZONE.	↓	Dark gray	↓	↓	No	↓	P / (F)
36-42	OLD ROOT ZONE.	↓	↓	↓	↓	↓	↓	P / (F)
42-48	↓	very moist	↓	↓	↓	↓	↓	(P) / F
48-54	↓	↓	Black	↓	↓	↓	↓	(P) / F
54-60	↓	↓	↓	↓	↓	↓	No	(P) / F
60-66	Visual ID From Bucket.	SATURATED	↓	↓				P / F
66-72	↓							P / F

Remarks: GW @ 60" Note: River cobbles & gravels @ 72" +. Bucket samples look like Poorly graded gravel w/ cobbles up to 7" bits of [illegible]

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/03/09 #1 + #2
Logged By: RMC
Change from GPS Position: No

Date: 09/03/09
Test Pit No: 001 111
Excavator: CAT 303
Weather: Overcast.

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Fine Sands w/ very high surface organics and Root Zone	Dry	Tanish Brown		<30	No		P / F
06-12	↓		↓		<5	↓		P / F
12-18	Fine to med Sands		↓		<1	↓		P / F
18-24	Fine Sands		↓		↓	↓		P / F
24-30	SILTY Sands w/ lots of organics. Possible anaic stains (white specs in soil.)		Dark Brown		↓	↓		P / F
30-36	↓	Slightly moist	↓		↓	↓		P / F
36-42	SILTY Sandy clay.	↓	↓		↓	↓		P / F
42-48	↓	↓	↓		↓	↓		P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/03/09 #3 & 4
Logged By: RWB
Change from GPS Position: No.

Date: 09/03/09
Test Pit No: 001 539
Excavator: Cat 353
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY sand w/organics		Red Tan Brown	N/A	<1	yes		P / F
06-12								P / F
12-18								P / F
18-24	SILT	Moist	Dark Brown			No		P / F
24-30								P / F
30-36	SILTY sand							P / F
36-42								P / F
42-48		very moist						P / F
48-54	SAND		Gray Brown					P / F
54-60		lens with H_2O						P / F
60-66	SILTY Sandy CLAY							P / F
66-72			Gray					P / F

Remarks: Note: Cut should be @ 55" (measured down bank to river west to pit). Pulled Bucket sample from 60-66 - Appears to be a Sandy silt.

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 9/3/09 5/4
Logged By: M Hassler
Change from GPS Position: ~~None~~ Moved Appx 50' SE'ly to get out of trees

Date: 9/3/09
Test Pit No: 001 134
Excavator: CAT 303
Weather: Sunny - Hot

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY SILT	DAMP	BROWN	N/A	—	✓		P / F
06-12			WITH DARK			✓		P / F
12-18			LENSES			✓		P / F
18-24						✓		P / (F)
24-30			DK BROWN					(P) / F
30-36								(P) / F
36-42								(P) / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: TD = 42"
GW NOT ENCOUNTERED

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/03/09 7+8
Logged By: RWE
Change from GPS Position: No

Date: 09/03/09
Test Pit No: 001 143
Excavator: Cat 30
Weather: Sunny. Hot

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY silt w/organics 0069 Root zone	Dry	Red Tan Brown	N/A	<1	yes		P / F
06-12	Root zone.							P / F
12-18								P / F
18-24								P / F
24-30								P / F
30-36	SILT		Black		<5	No		P / F
36-42	OID Root zone.							P / F
42-48	SAND OID Root zone END Apx. 43	Moist	Dark Gray					P / F
48-54	SILTY Sand							P / F
54-60	MED SAND.	Saturated	Gray.					P / F
60-66								P / F
66-72								P / F

Remarks: GW @ 60

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 03/03/09 9AM.
Logged By: RWB
Change from GPS Position NO (Brown marker)

Date: 03/03/09
Test Pit No: 001 149
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Sandy Silt w/ Root & Organics 0002	Slightly moist	Red Tan Brown	N/A	<5	yes		P / F
06-12	Root zone.							P / F
12-18								P / F
18-24	SAND.							P / F
24-30	SILTY sand.		Dark Gray		<1			P / F
30-36								P / F
36-42	SILTY sand w/some clay							P / F
42-48	SAND		gray					P / F
48-54		Saturated						P / F
54-60								P / F
60-66	Gravelly Sands w cobbles up to 2"				>80			P / F
66-72								P / F

Remarks: GW @ 54

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/03/09 11 + 12
Logged By: RWE
Change from GPS Position: No

Date: 09/03/09
Test Pit No: 001 / 50
Excavator: CAT 303
Weather: Sunny.

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Sands.	Dry	Red Brown Tan.	N/A	<1	yes		P / F
06-12	↓		↓	↓	↓	↓		P / F
12-18	↓		↓	↓	↓	↓		P / F
18-24	↓		↓	↓	↓	↓		P / F
24-30	SILTY sand		Dark Brown.	↓	↓	No		P / F
30-36	↓		Dark gray.	↓	↓	↓		P / F
36-42	~~Sand~~ OID organics - Silty sand. STRONG sufer smell - decomposing		Black	↓	↓	↓		P / F
42-48	↓		↓	↓	↓	↓		P / F
48-54	SANDY silt		↓	↓	↓	↓		P / F
54-60	↓		↓	↓	↓	↓		P / F
60-66	MED SAND.		Gray	↓	↓	↓		P / F
66-72				↓				P / F

Remarks: GW @ 48"

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/03/09 13:14.
Logged By: RWB
Change from GPS Position: No.

Date: 09/03/09
Test Pit No: 001 | 56
Excavator: CAT 303
Weather: Sunny.

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDS. w/ some silt	Dry	Red Tan Gray.	7.5 ~~N/A~~	<1	yes		P / F
06-12	↓	↓	↓	7.0	↓	↓		P / F
12-18	↓	↓	↓	4.5	↓	↓		P / F
18-24	~~Fine Sands~~ SILTY sand.	↓	↓	4.5	↓	↓		P / F
24-30	↓	↓	Red Brown	5.0	↓	↓		P / F
30-36	↓	↓	Reddish Brown	5.0	↓	no		P / F
36-42	↓	↓	Dark Brown	↓	↓	↓		P / F
42-48	↓	moist	↓	↓	↓	↓		P / F
48-54	↓	Saturated	Black	↓	↓	↓		P / F
54-60	SILT w/ some Sand.	↓	↓	↓	↓	↓		P / F
60-66	SANDY silt.	↓	Gray	↓	<5	↓		P / F
66-72	Gravely Sands w/ cobble up to 6" Noted From Bucket.	↓	↓	↓	~~>~~80	↓	Could not Sample deeper.	P / F

Remarks: @ 72" Gravely sands w/ cobbles up to 6". GW @ 54"

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/03/09 #15 & #16
Logged By: RWB
Change from GPS Position: yes

Date: 09/03/09
Test Pit No: 001 539
Excavator: CAT 303
Weather: Sunny HOT

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY silt	Slightly moist	Red Tan Brown		<1	yes		P / F
06-12	↓	↓	↓		↓	↓		P / F
12-18	↓	↓	↓		↓	↓		P / F
18-24	↓	↓	↓		↓	↓		P / F
24-30	SILTY Sand	moist	Dark Brown		↓	↓		P / F
30-36	↓	↓	↓		↓	↓		P / F
36-42	Sandy silt	moist	Gray		↓	↓		P / F
42-48	↓	very moist	↓		↓	No		P / F
48-54	SAND w/ Few silts.	Saturated	Brownish Gray		↓	↓		P / F
54-60	↓	↓	↓		↓	↓		P / F
60-66	↓	↓	↓		↓	↓		P / F
66-72	↓	↓	↓		↓	↓		P / F

Remarks: GW @ 54". Bucket method of 54 - 78+, Found SANDS w/ Few Silts. Noted Gravel w/ cobbles up + 6" @ 80±" (SM)

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

1447.

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/03/09
Logged By: RWS.
Change from GPS Position: No

Date: 09/03/09
Test Pit No: 001 157
Excavator: CAT 303
Weather: Cloudy.

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY SILT	Dry.	Tan Gray Red.		<1	yes		P / F
06-12	↓	↓	↓		↓	↓		P / F
12-18	↓	↓	↓		↓	↓		P / F
18-24	Fine Sand.	↓	Gray.		↓	↓		P / F
24-30	SANDY SILT	↓	Brown		↓	↓		P / F
30-36	↓	↓	Brownish Red.		↓	↓		P / F
36-42	SILTY SAND	very moist	Gray Dark		↓			P / F
42-48	OLD Root Zone. lots of organic	↓	↓		↓			P / F
48-54	OLD Root Zone lots of organics	↓	Black		↓			P / F
54-60	↓	Saturated	↓		↓			P / F
60-66	↓	↓	↓		↓			P / F
66-72			↓					P / F

Remarks:

Page _____ of _____

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 1
Logged By: D. BLYTHE
Change from GPS Position: NO

Date: 9/8/2009
Test Pit No: 001 /6A
Excavator: 303.5 MINI EX
Weather: CLEAR, BREEZY HOT

Depth (in)	Soil Description	Moisture Content	Color	pH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	BRN ORGANIC RICH SILTY SAND	DRY	BRN	NOT TESTED	< 1	Y	Y	P / (F)
06-12	SILTY SAND		YELLOW					P / (F)
12-18								P / (F)
18-24								P / (F)
24-30	SANDY CLAY	MOIST	LT GRAY			N		P / (F)
30-36	OLD ROOT ZONE 33-36							P / (F)
36-42	OLD ROOT ZONE 36-39		DARK GRAY					P / (F)
42-48								(P) / F
48-54		SAT						(P) / F
54-60							N	(P) / F
60-66								P / F
66-72								P / F

Remarks:

Page 1 of 1

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 2
Logged By: D. BLYTHE
Change from GPS Position NO

Date: 9/8/2009
Test Pit No: 001 142
Excavator: 303.5 MINIEX
Weather: SUNNY, CALM, HOT

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND ORGANIC RICH	DRY	BRN	pH NOT TESTED	<1	Y	Y	P / F
06-12	SILTY SAND							P / F
12-18								P / F
18-24		MOIST	GRAY BRN			N		P / F
24-30	~~Gr~~ SANDY CLAY ROOT ZONE 24-27							P / F
30-36								P / F
36-42			GRAY					P / F
42-48								P / F
48-54		SAT.						P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 3/4
Logged By: D. BLYTHE
Change from GPS Position: NO, COMBINED W/ 01547 - 01185

Date: 9/8/2009
Test Pit No: 001547
Excavator: 3025 MINI EX
Weather: SUNNY, CLEAR, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH Pit	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND ORGANIC RICH	MOIST	BRN	NOT TESTED	<1	N	Y	P / F
06-12			LT BRN/ ORANGE			Y		P / F
12-18	SALT & PEPPER SAND		GRAY			N		P / F
18-24	ROOT ZONE							P / F
24-30			ORANGE					P / F
30-36	SAND POORLY GRADED				<5			P / F
36-42	SAND, SMALL COBBLE MIX POORLY GRADED				45			P / F
42-48	SAND, COBBLE BOULDER MIX WELL GRADED	SAT			60		NO SAMPLE	P / F
48-54	COBBLES & BOULDERS W/ SAND WELL GRADED				75			P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GROUND WATER WITH ORANGE TINT

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 5/6
Logged By: D.BLYTHE
Change from GPS Position YES

Date: 9/8/2009
Test Pit No: 001 182
Excavator: 303.5 MINI EX
Weather: SUNNY, CALM, HOT

Depth (in)	Soil Description	Moisture Content	Color	~~pH~~ Pb	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY VEG	DRY	BRN	NOT TAKEN	<5	N	Y	P / (F)
06-12		MOIST	ORANGE YELLOW			Y		P / (F)
12-18								P / (F)
18-24								P / (F)
24-30								P / (F)
30-36								P / (F)
36-42	SANDY CLAY		GRAY/ BLACK			N		P / (F)
42-48								(P) / F
48-54	SILTY SAND, SOME COBBLES <5%	SAT						P / (F)
54-60		SAT						(P) / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 7/8
Logged By: D. BLYTHE
Change from GPS Position: No

Date: 9/8/2009
Test Pit No: 001 546
Excavator: 303.5 MINI EX
Weather: SUNNY CLEAR CALM

Depth (in)	Soil Description	Moisture Content	Color	pH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY WEEDS	DRY	LT BRN/ YELLOW	NOT TAKEN	21	Y	Y	P / (F)
06-12		MOIST						P / (F)
12-18								P / (F)
18-24			GRAY/ BLACK			N		P / (F)
24-30								(P) / F
30-36								(P) / F
36-42	SANDY CLAY						N	(P) / F
42-48		SAT						(P) / F
48-54	GRAVELY SAND POORLY GRADED 51-54				30		NO SAMPLE	P / F
54-60	~~SS~~ WELL GRADED GRAVEL W/ COBBLE				50			P / F
60-66	GW - 60-72							P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 9/10
Logged By: D. BLYTHE
Change from GPS Position: NO

Date: 9/8/2009
Test Pit No: 001 /8
Excavator: 303.5 WINTEX
Weather: SUNNY, CLEAR, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	LT BRN/ YELLOW	NOT TAKEN	< 1	Y	Y	P / F
06-12		MOIST						P / F
12-18			BRN			N		P / F
18-24			BRN/ GRAY					P / F
24-30								P / F
30-36	ROOT ZONE 30-36							P / F
36-42								P / F
42-48								P / F
48-54							NOT SAMPLE	P / F
54-60	SILTY SAND WITH COBBLES 54-57 COBBLES WITH SAND WELL GRADED				30/40			P / F
60-66								P / F
66-72								P / F

Remarks: GROUNDWATER NOT ENCOUNTERED

PASS

Page 1 of 1

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 11/12
Logged By: D. BLYTHE
Change from GPS Position NO

Date: 9/8/2009
Test Pit No: 001 180
Excavator: 303.5 CAT MINIEX.
Weather: SUNNY, CALM HOT

Depth (in)	Soil Description	Moisture Content	Color	pH Pit	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY VEG.	DRY	LT BRN YELLOW	NOT TAKEN	< 1	Y	Y	P / F
06-12		MOIST				Y		P / F
12-18			BRN			N		P / F
18-24								P / F
24-30			GRAY/ BLACK					P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 13/14
Logged By: D. BLYTHE
Change from GPS Position: NO

Date: 9/8/2009
Test Pit No: 001 170
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, CALM, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH Pit	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY VEG.	DRY	LT BRN YELLOW	NOT TAKEN	<1	Y	Y	P / F
06-12								P / F
12-18								P / F
18-24		MOIST						P / F
24-30	SANDY CLAY		DK BRN GRAY			N		P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54	SILTY SAND SOME GRAVEL				10			P / F
54-60		SAT.						P / F
60-66		SAT.					N	P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 15/16
Logged By: D. BLYTHE
Change from GPS Position: NO

Date: 9/8/2009
Test Pit No: 001 542
Excavator: 303.5 MINI EX
Weather: SUNNY, CALM, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY VEG	DRY	YELLOW/ LT BRN	NOT TAKEN	<5	Y	Y	P / F
06-12		MOIST						P / F
12-18								P / F
18-24								P / F
24-30								P / F
30-36	SANDY CLAY		GRAY/ BLACK			N		P / F
36-42								P / F
42-48								P / F
48-54					<5			P / F
54-60	SAND W/ COBBLES	SAT			30			P / F
60-66		SAT			50		NO SAMPLE	P / F
66-72	COBBLES WITH SAND, WELL GRADED	SAT			60		NO SAMPLE	P / F

Remarks: NO GRADATION SAMPLE TAKEN

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 19/20
Logged By: D. BLYTHE
Change from GPS Position: NO

Date: 9/8/2009
Test Pit No: 001 / 61
Excavator: CAT 303.5 MINI EX
Weather: SUNNY CALM HOT

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Pb~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY VEG. @ SURFACE	DRY	LT BRN YELLOW	NOT TAKEN	<1	Y	Y	P / (F)
06-12		MOIST				Y		P / (F)
12-18						Y		P / (F)
18-24			GRAY			N		P / (F)
24-30								P / (F)
30-36								P / (F)
36-42								(P) / F
42-48		SAT						(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

▽ 45'

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 1/2
Logged By: D. DUTHE
Change from GPS Position YES

Date: 9/9/2009
Test Pit No: 001 544
Excavator: CAT 303.5 MINIEX.
Weather: SUNNY, CALM

Depth (in)	Soil Description	Moisture Content	Color	pH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY VEG	DRY	BRN	NOT TAKEN	<1	Y	Y	P / F
06-12	CLAY (LIME?) 06-10	MOIST	WHITE			N		P / F
12-18	SILTY SAND		LT ORN ORANGE			Y		P / F
18-24						Y		P / F
24-30	SANDY CLAY ROOT ZONE		GRAY/ BLACK			N		P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54	SILTY SAND	SAT					NO SAMPLE	P / F
54-60								P / F
60-66	POORLY GRADED SAND				<5			P / F
66-72					<5			P / F

Remarks: COMBINED WITH 01/68

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 3/4
Logged By: D. BLYTHE
Change from GPS Position NO

Date: 9/9/2009
Test Pit No: 001 158
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, CALM

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Ph~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY VEG.	DRY	BRN	NOT TAKEN	<1	N	Y	P / (F)
06-12		MOIST	BRN/ YELLOW			Y		P / (F)
12-18			YELLOW			Y		P / (F)
18-24			GRAY BLACK			N		P / (F)
24-30								P / (F)
30-36								P / (F)
36-42								(P) / F
42-48								(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 5/6
Logged By: D. BOTHE
Change from GPS Position NO

Date: 9/9/2009
Test Pit No: 001 /91
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, WARM

Depth (in)	Soil Description	Moisture Content	Color	~~Ph~~ pH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	BRN	NOT TAKEN	<1	N	Y	P / (F)
06-12		MOIST						P / (F)
12-18								P / (F)
18-24								P / (F)
24-30			GRAY					(P) / F
30-36								(P) / F
36-42	SANDY CLAY		BLACK				N	(P) / F
42-48							N	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 7/8
Logged By: D. BLYTHE
Change from GPS Position NO

Date: 9/9/2009
Test Pit No: 001 144
Excavator: CAT 303.5C MINI EX
Weather: SUNNY, WINDY

Depth (in)	Soil Description	Moisture Content	Color	pH Pit	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY VEG	DRY	BRN	NOT TAKEN	<1	N	N	P / (F)
06-12								P / (F)
12-18		MOIST						(P) / F
18-24								(P) / F
24-30								(P) / F
30-36			DARK BRN					(P) / F
36-42								(P) / F
42-48								(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: COLLECTED 0002 AND SENT TO LAB

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 9/16
Logged By: D. BLYTHE
Change from GPS Position W/R

Date: 9/9/2009
Test Pit No: 001 158130E
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, WARM

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Ph~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY VEG.	DRY	BRN	NOT TAKEN	<1	N	N	(P) / F
06-12		MOIST						(P) / F
12-18								(P) / F
18-24								(P) / F
24-30			DK BRN					(P) / F
30-36								(P) / F
36-42								(P) / F
42-48								(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: COLLECT COOZ AND SEND TO LAB

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 11 / 12
Logged By: R. BLYTHE
Change from GPS Position: NO

Date: 9/9/2009
Test Pit No: 001 / 66
Excavator: CAT 303.5
Weather: SUNNY, BREEZY

Depth (in)	Soil Description	Moisture Content	Color	pH ~~PH~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	LT BRN	NOT TAKEN	<1	N	Y	P / (F)
06-12		MOIST	YELLOW/ ORANGE			Y		P / (F)
12-18			GRAY			N		P / (F)
18-24								P / (F)
24-30								(P) / F
30-36								(P) / F
36-42	SAND & GRAVELS, SOME COBBLES				60		N	(P) / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: NO GROUNDWATER ENCOUNTERED

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 13/14
Logged By: D. BLYTHE
Change from GPS Position NO

Date: 9/9/2009
Test Pit No: 001/65
Excavator: CAT 303.5 MINI EX
Weather: SUNNY CALM

Depth (in)	Soil Description	Moisture Content	Color	pH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY VEG.	DRY	BRN	NOT TAKEN	<1	N	Y	P / F
06-12		MOIST	YELLOW ORANGE			Y		P / F
12-18			GRAY			N		P / F
18-24	OLD ROOT ZONE							P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 17/18
Logged By: D. BLYTHE
Change from GPS Position: NO

Date: 9/8/2009
Test Pit No: 001 169
Excavator: 303S CAT MINI EX
Weather: SUNNY, CALM, HOT

Depth (in)	Soil Description	Moisture Content	Color	~~PH~~ DH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	LT BRN/ YELLOW	NOT TAKEN	Σ 1	Y		P / (F)
06-12		MOIST				Y		P / (F)
12-18			GRAY			N		P / (F)
18-24	SANDY CLAY		DK GRAY					P / (F)
24-30								P / (F)
30-36								P / (F)
36-42								(P) / F
42-48		SAT						(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

45' ▽

OUT OF ORDER

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 21/22
Logged By: D. BLYTHE
Change from GPS Position

Date: 9/8/2009
Test Pit No: 001 /60
Excavator: CAT 303.5 MINIEX
Weather: SUNNY, CALM, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH Pn	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	LT BRN	NOT TAKEN	<5	N	Y	P / ~~F~~ DB
06-12		MOIST	BRN					P / F
12-18								P / F
18-24								P / F
24-30	SAND							P / F
30-36								P / F
36-42	SAND & GRAVEL				10			P / F
42-48	SAND GRAVEL & COBBLES MIX W/ CLAY	SAT			40-60		~~NO~~ SAMPLE	P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

OUT OF ORDER

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 15/16
Logged By: D. BLITHE
Change from GPS Position NO

Date: 9/9/2009
Test Pit No: 001 ~~175~~
Excavator: CAT 303.5 Mini EX
Weather: SUNNY, HOT

Depth (in)	Soil Description	Moisture Content	Color	~~Ph~~ PH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY VEG	DRY	BRN	NOT TAKEN	<1	N	Y	P / F
06-12		MOIST	YELLOW ORANGE			Y		P / F
12-18			BRN			N		P / F
18-24			GRAY					P / F
24-30								P / F
30-36								P / F
36-42							N	P / F
42-48							N	P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: NO GROUNDWATER ENCOUNTERED

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	9/9/2009
Contractor:	Jordan Construction	**Test Pit No:**	001/86
Photo ID:	17/18	**Excavator:**	CAT 303.5 MINI EX
Logged By:	D. BLITTHE	**Weather:**	SUNNY, HOT
Change from GPS Position	NO		

Depth (in)	Soil Description	Moisture Content	Color	pH Plr	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILT/SAND HEAVY VEG	DRY	LT BRN YELLOW	NOT TAKEN	21	Y	Y	P / F
06-12		MOIST				Y		P / F
12-18						Y		P / F
18-24			BLACK GRAY			N		P / F
24-30								P / F
30-36	ROOT ZONE		GRAY					P / F
36-42								P / F
42-48							N	P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 19/20
Logged By: D. BUTTHE
Change from GPS Position: NO

Date: 9/9/2009
Test Pit No: 001 198
Excavator: CAT 303.5
Weather: SUNNY, CALM

Depth (in)	Soil Description	Moisture Content	Color	~~Ph~~ pH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SAND	DRY	BRN	NOT TAKEN	<1	N	N	P / (F)
06-12	SAND w/ GRAVEL	↓	↓	↓	10	↓	↓	P / (F)
12-18	SAND GRAVEL SOME COBBLES	↓	↓	↓	40	↓	↓	(P) / F
18-24	GRAVEL COBBLES & BOULDERS (NO SAMPLE)	↓	↓	↓	70	↓	NO SAMPLE	~~P / F~~
24-30	SILTY SAND	MOIST	GRAY	↓	<1	↓	N	(P) / F
30-36	SILTY SAND	↓	↓	↓	↓	↓	↓	(P) / F
36-42	↓	↓	↓	↓	↓	↓	↓	(P) / F
42-48	↓	↓	↓	↓	↓	↓	↓	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GROUNDWATER NOT ENCOUNTERED, 0002 COLLECTED AND SENT TO LAB

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 21/22
Logged By: D. BURNE
Change from GPS Position YES ≈40' NE

Date: 9/9/2009
Test Pit No: 001 197
Excavator: CAT 303 5 MINI EX
Weather: SUNNY, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	1" LAYER LIME WHITE 0-1 SILTY SAND	DRY	BRN	NOT TAKEN	<1	N	Y	(P) / F
06-12		MOIST						(P) / F
12-18	SAND POORLY GRADED							(P) / F
18-24								P / (F)
24-30	SILTY SAND							P / (F)
30-36								(P) / F
36-42								(P) / F
42-48							N	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Note: ▷ to 410

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	Date:	9/9/2009
Contractor:	Jordan Construction	Test Pit No:	001/8690E
Photo ID:	23/24	Excavator:	CAT 303.5 MINI EX
Logged By:	D. BOTTHE	Weather:	SUNNY, HOT
Change from GPS Position	n/a		

Depth (in)	Soil Description	Moisture Content	Color	~~Ph~~ pH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY VEG.	DRY	YELLOW ORANGE	NOT TAKEN	<1	Y	Y	P / (F)
06-12								P / (F) *
12-18								P / (F)
18-24		MOIST	GRAY			N		P / (F)
24-30	• ROOT ZONE							(P) / F
30-36							Y	(P) / F
36-42							N	(P) / F
42-48							N	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GROUNDWATER NOT ENCOUNTERED * THIS ID WAS CHANGED TO 01409 ON 9/11

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 1, 2
Logged By: D. BUSTHE
Change from GPS Position YES

Date: 9/10/2009
Test Pit No: 001 222
Excavator: CAT 303.5 MINI EX
Weather: CLEAR COOL

Depth (in)	Soil Description	Moisture Content	Color	~~Ph~~ pH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILT/ SAND LIME 0-4" HEAVY VEG	DRY	WHITE	NOT TESTED	21	N	Y	P / (F)
06-12		MOIST	BRN					(P) / F
12-18								P / (F)
18-24								P / (F)
24-30								(P) / F
30-36								(P) / F
36-42	SANDY CLAY		BLACK BROWN				N	(P) / F
42-48							N	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GROUNDWATER NOT ENCOUNTERED

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 3,4
Logged By: D. BUSTHE
Change from GPS Position: NO

Date: 9/10/2009
Test Pit No: 001 209
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, CALM

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Ph~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY VEG.	DRY	LT BRN		<1	N	N	P / (F)
06-12	SMALL 1" ORANGE BAND	MOIST	BRN					P / (F)
12-18			LT GRAY					(P) / F
18-24	SANDY CLAY		DK GRAY					(P) / F
24-30								(P) / F
30-36								(P) / F
36-42								(P) / F
42-48								(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: NO GROUNDWATER ENCOUNTERED, COLLECTED 0002 SENT TO LAB

Page 1 of 1

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 56
Logged By: D. BLYTHE
Change from GPS Position: NO

Date: 9/10/2009
Test Pit No: 001 221
Excavator: CAT 303.5 MINIEX
Weather: SUNNY, WARM

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Pb~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY VEG	DRY	LT BRN WHITE	NOT TAKEN	<1	Y	Y	P / F
06-12		MOIST	BRN ORANGE			Y		P / F
12-18			BRN ORANGE YELLOW			Y		P / F
18-24			BRN/ ORANGE TINT			N		P / F
24-30								P / F
30-36	SANDY CLAY		GRAY					P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: NO GROUND WATER ENCOUNTERED

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	Date:	9/10/2009
Contractor:	Jordan Construction	Test Pit No:	001 231
Photo ID:	7,8	Excavator:	CAT 303.5 MINIEX
Logged By:	D. BUTNE	Weather:	SUNNY, CALM
Change from GPS Position	NO YES		

Depth (in)	Soil Description	Moisture Content	Color	~~Ph~~ PH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	~~SAND~~ SILTY SAND HEAVY VEG	DRY	BRN	NOT TAKEN	<1	N	N	P / (F)
06-12	SAND POORLY GRADED	MOIST						(P) / F
12-18								(P) / F
18-24								(P) / F
24-30	XRF Zn 504							(P) / F
30-36	Cu 116 SANDY CLAY As 15							(P) / F
36-42	635 COC							P / (F)
42-48								P / (F)
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: SHOOT BASE OF PIT WITH XRF 30" DEPTH, TOOK COC, SENT TO LAB

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 9.10
Logged By: D. BUTTRE
Change from GPS Position: n/A

Date: 9/10/2009
Test Pit No: 001 405
Excavator: CAT 303.5 mini EX
Weather: SUNNY, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH Phs	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	~~SAND~~ SILTY SAND	DRY	BRN	NOT TAKEN	<1	N	N	(P) / F
06-12	↓	↓	↓	↓	↓	↓	↓	(P) / F
12-18								P / F
18-24								P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GROUNDWATER NOT ENCOUNTERED

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 11,12
Logged By: D. BLYTHE
Change from GPS Position: YES

Date: 9/10/2009
Test Pit No: 001 ~~549~~
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, WARM

Depth (in)	Soil Description	Moisture Content	Color	~~Ph~~ PH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)	
00-06	SILTY SAND HEAVY VEG.	DRY	ORANGE/ LT BRN	NOT TAKEN	< 1	Y		P / (F)	
06-12		MOIST	ORANGE YELLOW			Y		P / (F)	
12-18	SILTY CLAY, DENSE - ROOT ZONE		BLACK/ GRAY			N		P / (F)	
18-24								P / (F)	
24-30								(P) / ~~(F)~~	DB
30-36								(P) / ~~(F)~~	DB
36-42								(P) / ~~(F)~~	
42-48	SILTY SAND, MED SAND POORLY GRADED							(P) / F	
48-54	SURFACE WATER ≈ 50" SAND, MEDIUM POORLY GRADED						N/A	P / F	SAMPLE NOT TAKEN
54-60								P / F	
60-66	MEDIUM SAND WITH COBBLES ROUNDED WELL GRADED							P / F	
66-72	TOE SAMPLE 48-72							P / F	

Remarks: GROUNDWATER NOT ENCOUNTERED

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 13,14
Logged By: DBLYTHE
Change from GPS Position n/a

Date: 9/16/2009
Test Pit No: 001 ~~006~~
Excavator: CAT 303.5 MiniEX
Weather: SUNNY, BREEZY

Depth (in)	Soil Description	Moisture Content	Color	~~Ph~~ pH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06		MOIST	DK BRN		<1	N	N	(P) / F
06-12						N		(P) / F
12-18			ORANGE DK BRN			Y		P / (F)
18-24	COBBLES & GRAVELS NO SAMPLE				60			P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	9/15/2009
Contractor:	Jordan Construction	**Test Pit No:**	001 407
Photo ID:	15, 16	**Excavator:**	CAT 303.5 MINI EX
Logged By:	D. Carthe	**Weather:**	Sunny, warm
Change from GPS Position	N/A		

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Ph~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	~~[illegible]~~ SILTY SAND, HEAVY VEG	DRY	LT BRN	NOT TAKEN	<1	N	N	P / F
06-12		MOIST	WHITE YELLOW ORANGE			Y		P / F
12-18						Y		P / F
18-24			GRAY			N		P / F
24-30	SAND							P / F
30-36								P / F
36-42	SILTY SAND							P / F
42-48		SAT	BLACK GRAY					P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

A

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 17 18
Logged By: D. SMITHS
Change from GPS Position N/A

Date: 9/10/2009
Test Pit No: 001 408
Excavator: CAT 303.5 C MINI EX
Weather: SUNNY, WARM

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Pb~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY VEG.	DRY	LT BRN	NOT TAKEN	<1	Y	N	P / (F)
06-12	↓	MOIST	YELLOW WHITE	↓	↓	Y	↓	P / (F)
12-18	↓	↓	BLACK GRAY	↓	↓	N	↓	(P) / F
18-24								P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: NO GROUND WATER ENCOUNTERED

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	9/10/2009
Contractor:	Jordan Construction	**Test Pit No:**	001, 37/40E
Photo ID:	19,20	**Excavator:**	CAT 303.5 w/ EX
Logged By:	D. BUTHE	**Weather:**	SUNNY, WARM
Change from GPS Position	N/A		

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Ph~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY VEG	DRY	LT BRN	NOT TAKEN	<1	N	N	(P) / F
06-12	↓	↓	↓	↓	↓	↓	↓	(P) / F
12-18								P / F
18-24								P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GROUNDWATER NOT ENCOUNTERED, 0002 TAKEN AND SENT TO LAB

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: NONE TAKEN
Logged By: D. BLYTHE
Change from GPS Position N/A

Date: 9/10/2009
Test Pit No: 001 /20190E
Excavator: CAT WHEEL EX 303.5
Weather: SUNNY, CALM, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Ph~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY VEG.	DRY	LT BRN	NOT TAKEN	<1	N	N	(P) / F
06-12	↓	↓	↓	↓	↓	↓	↓	(P) / F
12-18						↓		P / F
18-24								P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GROUNDWATER NOT ENCOUNTERED. 0002 TAKEN & SENT TO LAB

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 1,2
Logged By: D. BLYTHE
Change from GPS Position NO

Date: 9/11/2009
Test Pit No: 001 208
Excavator: CAT 303.5 MINI EX
Weather: SUNNY CLEAR, WARM

Depth (in)	Soil Description	Moisture Content	Color	~~Ph~~ pH	% Rock	Idaho Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY VEG	DRY	LT BRN	NOT TESTED	<1	N	Y	P / F
06-12		MOIST	BRN/ ORANGE			Y		P / F
12-18			YELLOW ORANGE WHITE					P / F
18-24			ORANGE					P / F
24-30	• POTENTIAL OLD ROOT ZONE		BRN GRAY			N		P / F
30-36			DK GRAY					P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66		SAT						P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 3,4
Logged By: D. BOTHE
Change from GPS Position: NO

Date: 9/11/2009
Test Pit No: 001 550
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, HOT

Depth (in)	Soil Description	Moisture Content	Color	~~Ph~~ pH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY VEG.	DRY	LT ~~BRN~~ YELLOW	NOT TAKEN	<1	Y	Y	P / (F)
06-12		MOIST	YELLOW ORANGE					P / (F)
12-18			ORANGE					P / (F)
18-24			LT GRAY			N		P / (F)
24-30			GRAY					(P) / F
30-36	SANDY CLAY							(P) / F
36-42							N	(P) / F
42-48	MEDIUM SAND POORLY GRADED			BLACK GRAY	10		NO	(P) / F
48-54	SAND & GRAVELS WELL GRADED				30		SAMPLE	P / F
54-60	SAND GRAVELS & COBBLES				70			P / F
60-66	CLARK FORK SURFACE @ ≈ 63" TOE							P / F
66-72	TROUBLE GETTING DEEPER THAN 72"	SAT						P / F

69'

Remarks: COMBINED WITH 01220

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 56
Logged By: D. BLYTHE
Change from GPS Position NO

Date: 9/11/2009
Test Pit No: 001196
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Pit~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY VEG.	DRY	LT BRN	NOT TAKEN	<1	Y	Y	(P) / F
06-12		MOIST	ORANGE YELLOW			Y		P / (F)
12-18			ORANGE BRN			N		P / (F)
18-24			BRN GRAY					P / (F)
24-30			GRAY					P / (F)
30-36								P / (F)
36-42								P / (F)
42-48								(P) / F
48-54	FINE TO MEDIUM SAND POORLY GRADED	MOIST						(P) / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GROUND WATER (<1") IN BOTTOM OF PIT

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 38
Logged By: D. BUCKTHE
Change from GPS Position: NO

Date: 9/11/2009
Test Pit No: 001548
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, CLEAR, CALM

Depth (in)	Soil Description	Moisture Content	Color	pH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY VEG	DRY	LT BRN	NOT TAKEN	<1	N	Y	P / (F)
06-12		MOIST	ORANGE			Y		P / (F)
12-18			BRN			N		P / (F)
18-24								P / (F)
24-30								P / (F)
30-36								P / (F)
36-42								P / (F)
42-48	- SAMPLE FROM STRINGER OF SAND IN COBBLES	SAT			60			P / (F)
48-54	MEDIUM SAND POORLY GRADED				20			P / (F)
54-60								P / F
60-66								P / F
66-72								P / F

▽ 45"

Remarks: COMBINED WITH 01185

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	9/11/2009
Contractor:	Jordan Construction	**Test Pit No:**	001 195
Photo ID:	9,10	**Excavator:**	CAT 303.5 MINIEX
Logged By:	D.BUTTLE	**Weather:**	SUNNY, WARM
Change from GPS Position	NO		

Depth (in)	Soil Description	Moisture Content	Color	~~Ph~~ PH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	LT BRN	NOT TAKEN	<1	Y	Y	P / F
06-12	↓	MOIST	YELLOW	↓	↓	Y	↓	P / F
12-18	↓	↓	YELLOW WHITE	↓	↓	Y	↓	P / F
18-24	↓	↓	BRN GRAY	↓	↓	N	↓	P / F
24-30	↓	↓	↓	↓	↓	↓	↓	P / F
30-36	↓	↓	↓	↓	↓	↓	↓	P / F
36-42	SANDY CLAY	↓	GRAY BLACK	↓	↓	↓	↓	P / F
42-48	↓	↓	↓	↓	↓	↓	↓	P / F
48-54	MEDIUM SAND, POORLY GRADED	SAT	↓	↓	↓	↓	↓	P / F
54-60	SAND GRAVEL COBBLES WELL GRADED NO SAMPLE	SAT	↓	↓	60			P / F
60-66								P / F
66-72								P / F

Remarks:

▽ 51"

DUP 3 0612

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	9/11/2009
Contractor:	Jordan Construction	**Test Pit No:**	001 184
Photo ID:	11,12	**Excavator:**	CAT 303.5 mini EX
Logged By:	DuBOTHE / RUE	**Weather:**	SUNNY, CLEAR, HOT
Change from GPS Position	NO		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY sand.	slightly moist	Tan Gray Red	NA	<1	yes		P / F
06-12								P / F
12-18								P / F
18-24	Fine SAND	moist	Tan Red Brown					P / F
24-30								P / F
30-36								P / F
36-42	SILTY Clay.	very moist	Black			NO		(P) / F
42-48		Saturated						(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 13, 14
Logged By: D. BLITHE
Change from GPS Position NO

Date: 9/11/2009
Test Pit No: 001 ZOG
Excavator: CAT 303.5
Weather: SUNNY, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Ph~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY SURFACE VEG.	DRY	YELLOW WHITE	NOT TAKEN	<1	Y	Y	P / (F)
06-12		MOIST	LIGHT YELLOW			Y		P / (F)
12-18	• ROOT ZONE •		GRAY/ BLACK			N		P / (F)
18-24								(P) / F
24-30								(P) / F
30-36							N	(P) / F
36-42	SANDY CLAY		BRN	BRN				(P) / F
42-48								(P) / (F) DR
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GROUNDWATER NOT ENCOUNTERED

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 15,16
Logged By: D. BLYTHE
Change from GPS Position YES

Date: 9/11/2009
Test Pit No: 001 194
Excavator: CAT
Weather: SUNNY, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SAND	Dry.	Brown Red Tan.	8.5	<1	yes	Y	P / (F)
06-12	SANDY Silt	↓	↓	↓	↓	yes	↓	P / (F)
12-18	SILTY Sand	↓	Gray	↓	↓	NO	↓	P / (F)
18-24	↓	↓	Gray	↓	↓	↓	↓	P / (F)
24-30	SILTY Sand.	↓	Black	↓	↓	↓	↓	(P) / F
30-36	↓	↓	↓	↓	↓	↓	↓	P / (F)
36-42	↓	moist	↓	↓	↓	↓	↓	P / (F)
42-48	↓	↓	↓	↓	↓	↓	↓	P / (F)
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 17 & 18
Logged By: RWE
Change from GPS Position: No.

Date: 09/11/09
Test Pit No: 001 219
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY sand.	slightly moist	TAN		<1	yes		P / F
06-12	Root Zone		Brown			NO		P / F
12-18	Root Zone		Dark Brown					P / F
18-24								P / F
24-30	SAND.		Gray		<5			P / F
30-36	SAND w/some silts		Brown.					P / F
36-42		moist	Gray.					P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 19, 20
Logged By: D. DUSTHE
Change from GPS Position: NO

Date: 9/11/2009
Test Pit No: 001 207
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY SURFACE VEG.	DRY	LT BRN YELLOW	NOT TAKEN	<1	Y	Y	P / (F)
06-12		MOIST	ORANGE GRAY			Y / N		P / (F)
12-18								P / (F)
18-24								(P) / F
24-30								(P) / F
30-36							N	(P) / F
36-42	MEDIUM SAND POORLY GRADED							(P) / F
42-48								(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GROUNDWATER NOT ENCOUNTERED

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/14/09 #1 & 2
Logged By: RWB
Change from GPS Position: No

Date: 09/14/09
Test Pit No: 001
Excavator: CAT 313
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY SILT. Top organics (1")		Tan Gray	N/A	<1	yes	yes	~~P~~ (FF) / F
06-12			BROWN					P / F
12-18	SILTY ~~Sandy~~	moist	Black			No		P / F
18-24								P / F
24-30								P / F
30-36	SILTY clay OR ORGANICS						No	P / F
36-42								P / F
42-48								P / F
48-54	SANDY GRAVELS	Saturated			70			P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GW @ 48"

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/14/09 #3-4
Logged By: RWE
Change from GPS Position: No.

Date: 09/14/09
Test Pit No: 001 217
Excavator: Cat 325
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY silt	slightly moist	TAN		<1	yes		P / F
06-12	SILT Root Zone	moist	dark Brown			NO		P / F
12-18			Black.					P / F
18-24								P / F
24-30	Sand w/some silts.	very moist	Brown					P / F
30-36								P / F
36-42	SILTY clay w/some sand		dark Brown.					P / F
42-48	Sand.	Saturated	Brown		<10			P / F
48-54	Gravely Sand		Brownish Red		760			P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GW @ 42".

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/19/09 #5 & #6
Logged By: RWE.
Change from GPS Position ~~No~~ yes - approx 10' east.

Date: 09/19/09
Test Pit No: 001 224
Excavator: Cat 307
Weather: Sunny.

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY Silt w/some clay.	very moist	Tan Red Brown		<20	yes		P / F
06-12								P / F
12-18	SANDS.		Gray.					P / F
18-24	SANDY Silt.		Black					P / F
24-30	SANDS.	Saturated	Gray.		<30			P / F
30-36	GRAVELY sands w/cobble up to 8"		Gray		>80			P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: Note GW @ surface apx 10' away. Appears to be old channel

Tetra Tech, Inc

TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/14/09 7-8
Logged By: RWB
Change from GPS Position No

Date: 09/14/09
Test Pit No: 001 215
Excavator: Cat 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY sand.	Slightly moist	TAN RED BROWN	N/A	< 1	YES		P / F
06-12								P / F
12-18								P / F
18-24	SILTY clay w/some sand.	very moist	Black.			No		P / F
24-30	OLD ORGANICS - STRONG Smell of Decomposing organics.							P / F
30-36		Saturated						P / F
36-42								P / F
42-48	SILTY Sand.		Gray					P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/14/09 9-10.
Logged By: RWE
Change from GPS Position No

Date: 09/14/09
Test Pit No: 001 223
Excavator: Cat 303
Weather: Sunny.

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY sand. Root Zone	Moist	Black					P / F
06-12	Some Mottle stains.	↓						P / F
12-18		Very Moist						P / F
18-24								P / F
24-30								P / F
30-36								P / F
36-42		Sat						P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: Note: Very good veg material!

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 2/14/ @ 11 - 12
Logged By: RWB
Change from GPS Position: No

Date: 09/14/09
Test Pit No: 001 213
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILT - Thin tailings Layer Noted @ 002 - 003 - Some black stains.	Moist	Brown / Black		21	yes / No		P / F
06-12	↓	↓	↓		↓	↓		P / F
12-18	↓	↓	↓		↓	↓		P / F
18-24								P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: Visible @ surface in AREA AROUND

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	09/14/09
Contractor:	Jordan Construction	**Test Pit No:**	001 214
Photo ID:	09/19/09 13-19	**Excavator:**	CAT 303
Logged By:	RWG	**Weather:**	
Change from GPS Position	No.		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SAND	Moist	TAN Brown Red	N/A	<1	yes		P / F
06-12	↓	↓	Gray ↓	↓	↓	yes		P / F
12-18	SILTY SAND. Heavy OM organics. Decomposing.	Very moist	Black	↓	↓	NO		P / F
18-24	SAND? SILT	↓	Dark Brown	↓	↓	↓		P / F
24-30	↓	↓	↓	↓	↓	↓		P / F
30-36	SAND.	↓	Dark Gray	↓	↓	↓		P / F
36-42	↓	Saturate	Gray	↓	↓	↓		P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/14/09 15 & 16
Logged By: RWB.
Change from GPS Position No

Date: 09/14/09
Test Pit No: 001 203
Excavator: Cat 303
Weather: Sunny.

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND.	Moist	Tan Red Brown	N/A	< 1	yes		P / F
06-12	↓	↓	↓	↓	↓	↓		P / F
12-18	Fine Sand - old organics	↓	↓	↓	↓	↓		P / F
18-24	SANDY SILT	Very moist	Brown	↓	↓	No		P / F
24-30	↓	↓	Dark Brown	↓	↓	↓		P / F
30-36	2" SAND lens.	↓	Brown	↓	↓	↓		P / F
36-42	↓	Saturated	Dark Gray.	↓	↓	↓		P / F
42-48	SAND (Fine)	↓	Gray	↓	↓	↓		P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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31 12 22
63

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 17-18
Logged By: RWT
Change from GPS Position —

Date: 09/14/07
Test Pit No: 001 22463W
Excavator: Cat 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Silty Sand. Root Zone	slightly moist	Black	N/A	<1	No		P / F
06-12	↓	↓	↓	↓	↓	↓		P / F
12-18	↓	↓	↓	↓	↓	↓		P / F
18-24	↓	↓	↓	↓	↓	↓		P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GOT GOOD VEG

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/14/09 #19 - 20
Logged By: [illegible]
Change from GPS Position: No

Date: 09/14/09
Test Pit No: 001 192
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY silt.	Slightly moist	RED TAN Brown	N/A	<1	yes		P / F
06-12	↓	↓	↓	↓	↓	↓		P / F
12-18	↓		↓			↓		P / F
18-24	SILTY sand W/ OD ORGANICS Root Zone		Black			NO		P / F
24-30	SANDY silt Root Zone.		Gray			↓		P / F
30-36	SAND	↓	↓	↓	↓	↓		P / F
36-42	Sandy silt	very moist	↓	↓	↓	↓		P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/14/09 21 + 22
Logged By: Rewe
Change from GPS Position No

Date: 09/14/09
Test Pit No: 001 202
Excavator: CAT 303
Weather: Partly Cloudy

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY SILT	Slightly moist	Red Tan Brown	N/A	21	YES		P / F
06-12	↓	↓	↓	↓	↓	↓		P / F
12-18	↓	↓	↓	↓	↓	↓		P / F
18-24	↓	Very moist	Birch Brown	↓	↓	↓		P / F
24-30	SILTY sand. lots of old organics	Very moist	Dark Brown	↓	↓	NO		P / F
30-36	SILTY Clay w/some sands	Saturated	Dark Gray	↓	↓	↓		P / F
36-42	↓	↓	↓	↓	↓	↓		P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 23 + 24
Logged By: RWE
Change from GPS Position No

Date: 09/14/09
Test Pit No: 001 189
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY SILT	Slightly moist	TAN RED BROWN	N/A	21	yes		P / F
06-12		↓	↓					P / F
12-18	SILTY clay.	moist	Dark Gray.			↓		P / F
18-24	Fine SAND OLD organics layer @ 22-24"	Very moist	Brown/ Black			NO		P / F
24-30	SAND.	↓	Gray					P / F
30-36	↓		Dark Gray.					P / F
36-42	SANDY SILT	Saturated	Black	↓	↓	↓		P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GW @ 42" Visible tailings @ Surface

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 25 & 26
Logged By: RWB
Change from GPS Position: No

Date: 09/14/09
Test Pit No: 001 190
Excavator: CAT 303
Weather: Overcast

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY Silts	Slightly moist	Tan Black Brown Red	N/A	<1	yes		P / F
06-12	↓	↓	↓	↓	↓	↓		P / F
12-18	SANDY Silts w/some clay mixed	moist	Dark Brown	↓	↓	↓		P / F
18-24	↓	↓	Dark Gray	↓	↓	↓		P / F
24-30	OLD Root Zone.	Very moist	Dark Brown	↓	↓	NO		P / F
30-36	↓	↓	Dark Gray	↓	↓	↓		P / F
36-42	SANDY SILT	↓	↓	↓	↓	↓		P / F
42-48	MED SANDS	Saturated	Gray	↓	<10	↓		P / F
48-54	Gravelly Sands w/cobbles up to 6"	↓	↓	↓	>80	↓		P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 27 + 28.
Logged By: RWE
Change from GPS Position New P.P

Date: 09/14/09
Test Pit No: 001 409
Excavator: CAT 303
Weather: Partly cloudy

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY Silt.	Slightly moist	Red Tan Brown	N/A	21	yes		P / F
06-12	↓	↓	↓	↓	↓	↓		P / F
12-18	↓	↓	↓	↓	↓	↓		P / F
18-24	SILTY sand. OLD ORGANICS Larger	Moist	Black Gray	↓	↓	NO		P / F
24-30	↓	Very moist	Dark Brown	↓	↓	↓		P / F
30-36	SANDY Silt.	↓	Dark Gray	↓	↓	↓		P / F
36-42	SANDS	Saturated	Gray	↓	<10	↓		P / F
42-48	Gravely Sands w/cobble up to 6"	↓		↓	>80	↓		P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 29830
Logged By: RWJ
Change from GPS Position: yes - 15' westerly

Date: 09/14/09
Test Pit No: 001 177
Excavator: CAT 303
Weather: Partly Cloudy

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY SILT	moist	Brown Tan Red	N/A	<1	yes		P / F
06-12	SILTY SAND. c/o organics	↓	Black Brown	↓	↓	yes		P / F
12-18		very moist	Dark Gray	↓	↓	no		P / F
18-24	SAND.	Saturated	↓	↓	↓	↓		P / F
24-30	↓	↓	Gray	↓	<10	↓		P / F
30-36	Gravelly Sand w/ some cobbles	↓	↓	↓	>50	↓		P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: # 31 & 32
Logged By: RWB
Change from GPS Position: No.

Date: 09/14/09
Test Pit No: 001 188
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY Silt.	Slightly moist	Tan.	N/A	<1	yes		P / F
06-12	SILT	↓	Gray	↓	↓	yes		P / F
12-18	SILTY Sand. 010 ORGANICS CAMER	↓	Dark Brown.	↓	↓	No		P / F
18-24	SAND.	↓	Gray	↓	↓	↓		P / F
24-30	↓	Moist	↓	↓	↓	↓		P / F
30-36	SANDY Silt.	↓	↓	↓	↓	↓		P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 33+34
Logged By: RWS
Change from GPS Position: No.

Date: 09/14/09
Test Pit No: 001 200
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Sandy silt	Slightly moist	Light Brown	N/A	<1	yes		P / F
06-12		↓	↓			yes		P / F
12-18	Silty Sand.	moist	Dark Brown			No		P / F
18-24		very moist	↓					P / F
24-30	Sandy Silt w/some clay		Dark Gray.					P / F
30-36	↓	↓	↓		↓			P / F
36-42	Gravel sands w/cobbles up to 5"	Saturated	↓	↓	>80	↓		P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: Pit @ Edge of tree line.

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: # 35 + 36
Logged By: RWB
Change from GPS Position New.

Date: 09/14/09
Test Pit No: 001 20033W
Excavator: Cat 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY Sand.	Dry	Dark Gray.	N/A	<1	No		P / F
06-12	↓	↓	↓	↓	↓	↓		P / F
12-18	↓	↓	↓	↓	↓	↓		P / F
18-24	↓	Slightly moist	↓	↓	↓	↓		P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project:	Clark Fork OU - Reach A, Phase 1	**Date:**	09/14/09
Contractor:	Jordan Construction	**Test Pit No:**	001 187
Photo ID:	37 + 38	**Excavator:**	CAT 303
Logged By:	RWE	**Weather:**	Overcast
Change from GPS Position	yes - ~ 75' East of location		

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Sandy silt - ½" layer of tailing @ 2"	Dry	Brown	N/A	21	yes / No		P / F
06-12	Silty sand.	↓	↓	↓	↓	↓		P / F
12-18	↓	↓	↓	↓	↓	↓		P / F
18-24	↓	↓	↓	↓	↓	↓		P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 39 & 40
Logged By: Bwt
Change from GPS Position: No

Date: 09/14/09
Test Pit No: 001 191
Excavator: Cat 303
Weather: Partly cloudy.

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Sandy Silt. Root Zone.	Slightly moist	Tan Red Brown	N/A	<1	yes		P / F
06-12	Silty Sand.		Brown			NO		P / F
12-18								P / F
18-24								P / F
24-30	Sandy Silt	moist						P / F
30-36								P / F
36-42	Sandy Silt	very moist						P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/15/09 # 1 & 2
Logged By: RWE
Change from GPS Position: No

Date: 09/15/09
Test Pit No: 001 178
Excavator: Cat 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY silt	Slightly moist	Red Tan Brown		<1	yes	N	P / (F)
06-12	↓	↓	↓		↓	↓	↓	P / (F)
12-18	↓	moist	Brown		↓	↓	↓	P / (F)
18-24	SILTY sand	very moist	Black		↓	No	↓	P / (F)
24-30	OID ORGANICS	↓	Dark Gray		↓	↓	Y	P / (F)
30-36	↓	↓	↓		↓	↓	Y	(P) / F
36-42	SAND	SAT	Gray		<10	↓	Y	(P) / F
42-48	SANDY Gravel	↓	↓		<30	↓	No Sample	P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Page 1 of 1

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID:
Logged By:
Change from GPS Position

Date: 09/15/09
Test Pit No: 001 595
Excavator:
Weather:

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY silt	Slightly moist	Red Tan Brown	N/A	<1	Yes	N	P / F
06-12	↓	↓	↓	↓	↓	↓	↓	P / F
12-18	↓	↓	↓	↓	↓	↓	↓	P / F
18-24	SILTY sand no organics	moist	Dark Brown	↓	↓	No	↓	P / F
24-30	SAND w/ some silts	↓	Brown	↓	↓	↓	↓	P / F
30-36	↓	↓	Gray	↓	↓	↓	Y	P / F
36-42	↓	Very moist	↓	↓	↓	↓	Y	P / F
42-48	SAND	Sat.	↓	↓	↓	↓	Y	P / F
48-54	SAND w/ few gravels.		↓	↓	<30	↓	N	P / F
54-~~60~~ +2'	Fine to MED SANDS (APX < 30% Fines) SP							P / F
60-66	↓ BUCKET VISUAL Inspection NO TOB Sample Collected							P / F
66-72	↓							P / F

Remarks: GW @ 42"

Page _____ of _____

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: No photo
Logged By: RWB
Change from GPS Position: No

Date: 09/15/09
Test Pit No: 001 167
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY silt	Slightly moist	TAN BROWN		<1	yes	yes	P / (F)
06-12	↓		↓			yes		P / (F)
12-18	SILTY sand		Gray/ Brown			NO		(P) / F
18-24	SANDY SILT						↓	(P) / F
24-30							No	(P) / F
30-36								(P) / F
36-42		↓						(P) / F
42-48		moist	↓		↓	↓	↓	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Page _____ of _____

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/15/09 6-7
Logged By: Eric
Change from GPS Position: No

Date: 09/15/09
Test Pit No: 001 159
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY silt	Slightly moist	Tan Red Brown		< 1	yes	yes	P / (F)
06-12	↓	↓	↓			yes		P / (F)
12-18	SILTY SAND. Root Zone.	moist	Black			NO		(P) / F
18-24	Strong organic smell.		Gray					(P) / F
24-30	~~Silt w/ some sands.~~ SANDY SILT						No	(P) / F
30-36		very moist					No.	(P) / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Page _____ of _____

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/15/00 849
Logged By: RWE
Change from GPS Position: 10'

Date: 09/15/00
Test Pit No: 001 152
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY SILT	Slightly Moist	Tan Red Brown	N/A	21	yes	yes	P / (F)
06-12	OIL OR ORGANIC Layer		↓			yes		P / (F)
12-18	SAND	moist	Gray			NO		(P) / F
18-24	SANDY SILT	↓	Dark Gray					P / (P)
24-30	↓	Very moist						(P) / F
30-36	SILTY sand.	Very moist	↓	↓	↓	↓	↓	(P) / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Page ____ of ____

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/15/09 10 & 11
Logged By: RWE / MH
Change from GPS Position: No

Date: 09/15/09
Test Pit No: 001 543
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	moist	Dark Brown		<1	yes	yes	P / F
06-12	↓		Black		↓	yes	↓	P / F
12-18	SANDY silt	very moist	Dark Gray			No		P / F
18-24	SAND		↓			↓	↓	P / F
24-30	SANDY ~~Silt~~						No	P / F
30-36	SAND w/some silts.	SATURED	↓				No	P / F
36-42	SAND w/some gravels up to 1" Fines < 10%		Gray					P / F
42-48	↓		↓					P / F
48-54					↓			P / F
54-60					<15			P / F
60-66	GRAVELY SAND w cobbles up to 5"				>80	↓		P / F
66-72	GP Toe @ 68-72		↓					P / F

Remarks: GW @ 36

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 4/15/09 Roll 3
Logged By: M. Hartman
Change from GPS Position: None

Date: 09/15/09
Test Pit No: 001 153
Excavator: Cat 303
Weather: Sunny Hot.

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY SOIL	DAMP	TAN		<1	YES	YES	P / F
06-12							YES	P / F
12-18			DK BROWN			NO	YES	P / F
18-24	SILTY SAND	MOIST					YES	P / F
24-30							NO	P / F
30-36							NO	P / F
36-42							NO	P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: TD = 42"
GW NOT ENCOUNTERED

Page _____ of _____

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 9/15/09 14+15
Logged By: M. Hassan
Change from GPS Position: None

Date: 9/15/09
Test Pit No: 001 154
Excavator: CAT 303
Weather: Sunny - Hot

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY SILT	DRY	TAN		<1	YES	N	P / (F)
06-12						YES	N	P / (F)
12-18			ORANGE BROWN			Y	N	P / (F)
18-24	SILTY SAND					Y	N	P / (F)
24-30		MOIST				Y	N	P / (F)
30-36			DK BROWN			N	N	P / (F)
36-42						N	Y	P / (F)
42-48	SAND - COARSE TO MED. GRAINED		BROWN			N	Y	(P) / F
48-54	SAND - COARSE TO MED GRAINED	WET	BROWN			N	Y	(P) / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: TD - 54"
GW @ 50"

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 9/15/07 1617
Logged By: M. [illegible]
Change from GPS Position: None

Date: 9/15/09
Test Pit No: 001 1613
Excavator: CAT 303
Weather: Sunny - Hot

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Sandy Sand	Damp	Tan		<1	Y		P / F
06-12			Grey with orange			Y		P / F
12-18						Y		P / F
18-24						Y		P / F
24-30	Sandy Soil	Moist	Dk Brown			N		P / F
30-36						N	Y	P / F
36-42						N	Y	P / F
42-48	Sand - Coarse to Med Gravel	Moist				N	Y	P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: → 4'8"
Could not excavate deeper

Page _____ of _____

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/16/09 #1 & 2
Logged By: RWE
Change from GPS Position: yes 12' EAST

Date: 09/16/09
Test Pit No: 001 147
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY SILT	dry	RED TAN BROWN	N/A	21	yes	Y	P / (F)
06-12	↓	↓	↓	↓	↓	yes	Y	P / (F)
12-18	SILTY SAND. (OLD ORGANIC LAYER 12-14)	↓	Black / BROWN	↓	↓	NO	Y	P / (F)
18-24	↓	↓	GRAY.	↓	↓	↓	Y	(P) / F
24-30	SANDY SILT.	↓	dark Gray.	↓	↓	↓	Y	(P) / F
30-36	↓	↓	↓	↓	↓	↓	N	(P) / F
36-42	SAND.	moist	↓	↓	↓	↓	N	P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Page _____ of _____

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: # 3 & 4.
Logged By: RWJ
Change from GPS Position No

Date: 03/16/09
Test Pit No: 001 141
Excavator: Cat 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Sandy Silt	Dry	Tan Brown Red	N/A	<1	yes	No	P / (F)
06-12	Silty Sand	↓	↓		↓	↓	↓	P / (F)
12-18	↓	↓	↓		↓	↓	↓	P / (F)
18-24	Silty Sand w/ some clay	↓	Gray		↓	yes	↓	P / (F)
24-30	Silty Sand w/ some clay	Moist	Dark Gray		↓	↓	↓	P / (F)
30-36	Silty Sand.	↓	↓		↓	No	yes	P / (F)
36-42	Sand w/ some silts.	very moist	Dark Gray w/ Red		↓	No	yes	(P) / F
42-48	Sand w/ some Silts	Sat	Gray		<5	↓	yes	P / (F)
48-54	Sand	Sat	Gray.		<10	↓	yes	P / (F)
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Page _____ of _____

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: # 5 & 6
Logged By: RWB
Change from GPS Position: No

Date: 09/16/09
Test Pit No: 001 / 33
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY SILT	Dry	RED TAN	N/A	<1	No	No	P / (F)
06-12	SILTY Sand.	↓	RED TAN BROWN	↓	↓	yes	↓	P / (F)
12-18	↓	↓	TAN GRAY	↓	↓	yes	↓	P / (F)
18-24	SILT OID Obsidian layer	↓	Black	↓	↓	No	↓	P / (F)
24-30	SILTY SAND.	↓	Dark Gray	↓	↓	↓	yes	P / (F) Dup-1
30-36	SAND w/some Silts	↓	Gray	↓	↓	↓	yes	(P) / F
36-42	SAND	moist	↓	↓	↓	↓	yes	(P) / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 7 & 8
Logged By: BWE
Change from GPS Position: No

Date: 09/16/09
Test Pit No: 001 132
Excavator: Cat 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND.	Slightly Moist	RED TAN BROWN		<1	yes	yes	P / F
06-12								P / F
12-18								P / F
18-24	SANDY SILT	Moist Very	Dark Gray.			NO		P / F
24-30	SAND.		BROWN					P / F
30-36	SAND.	Sat	Gray		<10			P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Page _____ of _____

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: ~~[illegible]~~ #11 & 12
Logged By: RWS
Change from GPS Position: No

Date: 09/06/09
Test Pit No: 001 1.31
Excavator:
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY Silt	slightly moist	RED Tan Brown	N/A	21	yes		P / F
06-12	↓	↓	↓	↓	↓	↓		P / F
12-18	↓	↓	↓	↓	↓	↓		P / F
18-24	↓	↓	↓	↓	↓	↓		P / F
24-30	SANDY Silt & clay (Some old organics)	moist	Dark Gray	↓	↓	↓		P / F
30-36	SANDY Silt	very moist	↓	↓	↓			P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Page _____ of _____

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: ~~[illegible]~~ 9 & 10
Logged By: RWB
Change from GPS Position: NO.

Date: 09/16/07
Test Pit No: 001 /30
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND.	SATURATED	RED TAN BROWN.	N/A	21	yes	No	P / (F)
06-12		↓	↓	↓	↓	↓	↓	P / (F)
12-18		↓	↓	↓	↓	↓	↓	P / (F)
18-24		very moist	↓	↓	↓	↓	↓	P / (F)
24-30	Silty Sand w/ some clay	↓	Dark Gray	↓	↓	NO	Y	P / (F)
30-36	SAND	↓	Gray	↓	↓	↓	Y	(P) / F
36-42	SAND w/ some clay	↓	↓	↓	↓	↓	Y	(P) / F
42-48	SAND.	↓	↓	↓	↓	↓	N	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: Surface H_2O present @ location. Near cattails.

Page _____ of _____

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: #13 & #14
Logged By: RWE.
Change from GPS Position: No

Date: 09/16/09
Test Pit No: 001 1307
Excavator: Cat 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SAND, silt w/organics.	Dry	Tan Gray.	N/A	<1	ye		P / F
06-12	Silty Sand.	↓	Brown	↓	↓	NO		P / F
12-18	SAND	Moist	↓	↓	↓	↓		P / F
18-24	↓	↓	↓	↓	↓	↓		P / F
24-30	↓	↓	↓	↓	↓	↓		P / F
30-36	↓	↓	↓	↓	↓	↓		P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 15 & 16
Logged By: RWE
Change from GPS Position: Yes - 30' EAST

Date: 09/16/09
Test Pit No: 001 195
Excavator: CAT 303
Weather: Sunny Hot

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Sandy silt	moist	Tan Red Brown		<1	yes		P / F
06-12	Silty sand OID organics layer		Black / Dk Brown			NO		P / F
12-18								P / F
18-24		very moist						P / F
24-30			Dark Gray					P / F
30-36	Sandy silt							P / F
36-42	Gravelly sand w/cobbles up + 4"				780			P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Page _____ of _____

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 17 of 18
Logged By: RWE
Change from GPS Position: yes - moved 20' east in middle of area with little vegitation

Date: 09/16/09
Test Pit No: 001 146
Excavator: Cat 333
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Sandy Silt	Dry	Brown.	N/A	< 10	yes		P / F
06-12	Sand		light Brown			No		P / F
12-18								P / F
18-24								P / F
24-30								P / F
30-36		Moist						P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 19 & 20
Logged By: RWE
Change from GPS Position: NO

Date: 09/16/09
Test Pit No: 001 140
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Silty Sand w/Heavy organics 1/2" Tailings layer 1"-2"	Slightly moist	Dark Brown	N/A	<1	yes		P / F
06-12	Silty Sand					No		P / F
12-18								P / F
18-24								P / F
24-30								P / F
30-36	Sand	moist						P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 21+22
Logged By: Rule
Change from GPS Position: No

Date: 09/16/09
Test Pit No: 001 125
Excavator: Cat 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Sandy Silt	Dry	Tan Red Brown	N/A	21	yes		P / F
06-12	↓	↓	↓	↓	↓	↓		P / F
12-18	↓	↓	↓	↓	↓	↓		P / F
18-24	↓	↓	↓	↓	↓	↓		P / F
24-30	↓	↓	↓	↓	↓	↓		P / F
30-36	Silty Sand w/ some organics.	Very Moist	Dark Brown	↓	↓	No		P / F
36-42	↓	↓	↓	↓	↓	↓		P / F
42-48	Sand	Sat	Gray	↓	↓	↓		P / F
48-54	Sand	↓	↓	↓	<10	↓		P / F
54-60	Gravelly sands w/cobbles up to 8"	↓	↓	↓	>80	↓	No Sample	P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 23 & 24 Only 1 photo
Logged By: Rave
Change from GPS Position No

Date: 09/16/09
Test Pit No: 001 126
Excavator: CAT 303
Weather: Sunny Hot.

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY Silt.	Dry	Tan Brown Red	N/A	<1	yes		P / F
06-12								P / F
12-18								P / F
18-24								P / F
24-30	Silty Sandy.	Moist	Brown Gray					P / F
30-36						No		P / F
36-42	SAND.							P / F
42-48		Very moist	Gray					P / F
48-54		Sat						P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 25 & 26
Logged By: RWG
Change from GPS Position: NO

Date: 09/16/09
Test Pit No: 001 118
Excavator: CAT 303
Weather: Sunny Hot

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY SILT	Dry	RED TAN BROWN	N/A	<1	yes		P / F
06-12								P / F
12-18								P / F
18-24								P / F
24-30								P / F
30-36	SAND (OLD ORGANICS)		Black Gray			NO		P / F
36-42								P / F
42-48		moist						P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 27 + 28 + 29 + 30
Logged By: RWG
Change from GPS Position: NO

Date: 03/16/00
Test Pit No: 001 117
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY SILT	dry	Red Tan Brown	N/A	<1	yes		P / F
06-12								P / F
12-18	SANDY SILT w/ Clay layers.							P / F
18-24								P / F
24-30	Clay w/some SAND.		Black					P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60	Fine SAND	moist	gray					P / F
60-66	SAND	Sat						P / F
66-72	SAND.							P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 31 & 32
Logged By: RWC
Change from GPS Position: No

Date: 09/16/09
Test Pit No: 001 116
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY silt	moist	Tan Red Brown		<1	yes		P / F
06-12								P / F
12-18								P / F
18-24								P / F
24-30	SILTY SAND w/ clay.	very moist	Black			NO		P / F
30-36		SAT						P / F
36-42								P / F
42-48	SAND		gray					P / F
48-54	SAND.							P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 33 & 34
Logged By: RWG
Change from GPS Position: No

Date: 09/16/09
Test Pit No: 001 123
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY SILT.	moist	Red Tan Brown	N/A	21	yes		P / F
06-12	↓	↓	↓	↓	↓	↓		P / F
12-18	SILTY SAND w/ clay	very moist	↓	↓	↓	↓		P / F
18-24	↓ OLD Organics layer.	↓	Brown	↓	↓	↓		P / F
24-30	SILTY Sand	↓	Gray	↓	↓	↓		P / F
30-36	SANDY SILT	↓	Dark Gray	↓	↓	NO		P / F
36-42	↓	SAT	Black	↓	↓	No.		P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 35 + 36
Logged By: RWB
Change from GPS Position: No

Date: 09/16/09
Test Pit No: 001 127
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY silt	Slightly moist	TAN RED BROWN		<1	yes		P / F
06-12		↓	↓		↓	↓		P / F
12-18	Some clay lingering mixed in.	↓	↓		↓	↓		P / F
18-24	SILTY sand	moist	Gray Brown		↓	↓		P / F
24-30	SANDY Silty/old organics	↓	Dark Gray.		↓	NO		P / F
30-36	↓	very moist	↓		↓	↓		P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 37, 38
Logged By: RWG
Change from GPS Position: yes - 39' North to avoid Fiber optic & Swamp

Date: 09/16/09
Test Pit No: 001 114
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY silt	Slightly moist	Tan Red Brown	N/A	<1	yes		P / F
06-12	↓	↓	↓	↓	↓	↓		P / F
12-18	↓	moist	↓	↓	↓	↓		P / F
18-24	SILTY sand. (lots of old organics)	↓	Black	↓	↓	No		P / F
24-30	↓	↓	Dark Gray	↓	↓	↓		P / F
30-36	SAND	↓	↓	↓	↓	↓		P / F
36-42	↓	very moist	Gray	↓	↓	↓		P / F
42-48	↓	↓	↓	↓	↓	↓		P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

0814

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 09/17/09 #1 - 2
Logged By: RWB
Change from GPS Position: yes - moved 30' southerly to avoid phone line.

Date: 09/17/09
Test Pit No: 001 115
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Sandy Silt	Moist	Tan Red Gray	N/A	<1	yes		P / F
06-12	↓	Very moist	↓	↓	↓	↓		P / F
12-18	↓	↓	↓	↓	↓	↓		P / F
18-24	SILTY SAND (010 organics) "A" Horizon	↓	Black gray	↓	↓	↓		P / F
24-30	Gravely Sands	Sat	dark Brown	↓	<50	No		P / F
30-36	Gravely Sands w/cobbles up to 6"	↓	Brown	↓	>80	No.		P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GW @ 30; moved position to avoid fiber optic

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: ~~#2 & #3~~ No Pics (Camera malfunction)
Logged By: RWE
Change from GPS Position: No

Date: 09/17/09
Test Pit No: 001 106
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Organics 00-02. Sandy Silt	Slightly moist	Tan Red Brown	N/A	<1	yes		P / F
06-12	↓	moist	↓	↓	↓	↓		P / F
12-18	↓	↓	Red	↓	↓	↓		P / F
18-24	Old "A" Horizon (organics) SILTY Sand	↓	Black / Dark gray	↓	↓	No		P / F
24-30	↓	↓	↓	↓	↓	↓		P / F
30-36	SILTY Sand w/some clay	very moist	Black	↓	↓	↓		P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: #2 & #3
Logged By: RWE
Change from GPS Position: No.

Date: 07/17/09
Test Pit No: 001 105
Excavator: CAT 303
Weather: Sunny.

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY Silt (organics 00-01)	moist	Brown	N/A	<1	yes		P / F
06-12	↓	↓	↓	↓	↓	↓		P / F
12-18	Silty sand w/some Clay.	↓	Tan	↓	↓	↓		P / F
18-24	Silty (no organics)	↓	Gray/Black	↓	↓	↓		P / F
24-30	SANDY Silt	very moist	Black	↓	↓	No		P / F
30-36	↓	↓	Gray	↓	↓	↓		P / F
36-42	SAND	SAT	Gray.	↓	↓	↓		P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: # 4 & 5
Logged By: RWE
Change from GPS Position: No

Date: 09/17/09
Test Pit No: 001 536
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY SILT 00 - 03 organics	Slightly moist	Red Brown Tan	N/A	<1	yes	NO	P / (F)
06-12	↓	↓	↓	↓	↓	↓	↓	P / (F)
12-18	↓	↓	↓	↓	↓	↓	↓	P / (F)
18-24	SAND	moist	↓	↓	↓	↓	↓	P / (F)
24-30	SANDY SILT	↓	↓	↓	↓	↓	↓	P / (F)
30-36	↓	very moist	Gray	↓	↓	↓	↓	P / (F)
36-42	SILTY SAND	↓	↓	↓	↓	No.	↓	P / (F)
42-48	↓	↓	Dark Gray	↓	↓	↓	yes	P / (F)
48-54	↓	SAT	↓	↓	↓	↓	yes	(P) / F
54-60	SANDY SILT	↓	↓	↓	↓	↓	yes	(P) / F
60-66	↓	↓	↓	↓	↓	↓	No	(P) / F
66-72	Gravely Sands.							P / F

Remarks: Pit located ADJ 8' From River EDGE. TOE sample observed. Gravely Sands w/cobbles up to 8"
DSC @ 3" (Bill) - GP-

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 647, 48
Logged By: RWE
Change from GPS Position: No

Date: 09/17/09
Test Pit No: 001 01538
Excavator: CAT 303
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY Silts. (00-02 organics)	Slightly moist	Red Tan Brown,	N/A	<1	yes		P / F
06-12								P / F
12-18								P / F
18-24		moist						P / F
24-30			Gray Red Brown					P / F
30-36	SAND	moist						P / F
36-42	SAND w/some silts		Gray.					P / F
42-48		SAT						P / F
48-54								P / F
54-60	SAND w/ Fines		Dark Gray					P / F
60-66	OID organics layer							P / F
66-72	Not sampled Sands w/Fines to 72" (visual)							P / F

Remarks: TOE MATERIAL IS Poorly Graded SAND. Gravelly Sands w/cobbles @ Apx 30-34" Cobbles up to 8".

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 9 & 10
Logged By: RWG
Change from GPS Position: located approx. 10' away from crack cobbs

Date: 09/17/09
Test Pit No: 001 541
Excavator: CAT 303
Weather: SUNNY

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY silt	Dry	RED TAN Brown	N/A	<1	yes		P / F
06-12	↓	↓	↓	↓	↓	↓		P / F
12-18	↓	Slightly moist	↓	↓	↓	↓		P / F
18-24	↓	↓	↓	↓	↓	↓		P / F
24-30	↓	moist	↓	↓	↓	↓		P / F
30-36	↓	↓	↓	↓	↓	No		P / F
36-42	Silty SAND	↓	Dark Brown	↓	↓	↓		P / F
42-48	↓	↓	↓	↓	↓	↓		P / F
48-54	SAND	SAT	GRAY BROWN	↓	↓	↓		P / F
54-60	Silty SAND	↓	Black	↓	↓	↓		P / F
60-66	SANDS							P / F
66-72	↓							P / F

Remarks: Note Excavated to 74" (All Sands) @ ABX 74" - Found Gravely Sands w/Few cobbles

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 11 + 12
Logged By: RWG
Change from GPS Position: No

Date: 09/17/09
Test Pit No: 001 540
Excavator: Cat 303
Weather: Hot Sunny.

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY Silt.	Slightly moist	Red Brown TAN	N/A	<1	yes		P / F
06-12		moist						P / F
12-18								P / F
18-24								P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48	SILTY sand.	very moist						P / F
48-54	SAND (010 ORGANICS layer) Possible "A" Horizon.	SAT	light Gray.					P / F
54-60								P / F
60-66	SANDS w/ old organics Bucket IN						Bucket Sample	P / F
66-72								P / F

Remarks: SANDS noted TO 84", Gravely Sands Below.

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 13 & 14
Logged By: RWB
Change from GPS Position: No

Date: 09/17/09
Test Pit No: 001 135
Excavator: CAT 303
Weather: Sunny w Few clouds

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND.	Dry	RED TAN BROWN	N/A	<1	yes		P / F
06-12	↓	↓	↓	↓	↓	↓		P / F
12-18	↓	Moist	GRAY TAN.	↓	↓	↓		P / F
18-24	SANDY Silt	↓	↓	↓	↓	↓		P / F
24-30	↓	↓	↓	↓	↓	↓		P / F
30-36	↓	very moist	RED BROWN	↓	↓	↓		P / F
36-42	↓	↓	↓	↓	↓	↓		P / F
42-48	SANDS.	Sat	RED GRAY	↓	↓	↓		P / F
48-54	Gravely Sands	↓	RED	↓	750			P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 15 + 16
Logged By: RWB
Change from GPS Position: No

Date: 09/17/09
Test Pit No: 001 1136
Excavator: CAT 303
Weather: Sunny - Hot.

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Fine SAND	Dry	Brown	N/A	<1	yes		P / F
06-12	SAND w/ some silts.		Orange Brown					P / F
12-18	SAND w/ some silts.							P / F
18-24								P / F
24-30			Gray					P / F
30-36			Red Gray		<30			P / F
36-42	~~Gravely Sands~~ (No Cobbles) SANDY Gravel.	moist	RED		<40			P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID:
Logged By: BWB
Change from GPS Position: No

Date: 09/17/09
Test Pit No: 001 127
Excavator: CAT 303
Weather: Sunny w/ large clouds

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY SILTS.	Dry	RED TAN BROWN		<1	yes	No	P / F
06-12	Silty Sands.	Slightly moist	↓		↓	↓	↓	P / F
12-18	↓	↑	↓		↓	↓	↓	P / F
18-24	SANDS	↓	↓		↓	↓	↓	P / F
24-30	↓	↓	Gray		↓	NO	↓	P / F
30-36	SANDS w/some silts	↓	Brown		↓	↓	yes	P / F
36-42	Gravely Sands	↓	gray		~~<1~~ <40	↓	yes	P / F
42-48	Gravely Sands w/ cobble up to 4"	moist	↓		780	↓	No Sample	P / F
48-54	↓	Sat						P / F
54-60								P / F
60-66								P / F
66-72								P / F

D-p 1

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 1,2
Logged By: D. BLYTHE
Change from GPS Position NO

Date: 9/21/2004
Test Pit No: 001124
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, CALM, COOL

Depth (in)	Soil Description	Moisture Content	Color	pH Pn	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	MOIST	LT BRN	NOT TAKEN	<1	N		P / (F)
06-12			ORANGE			Y		P / (F)
12-18						Y		P / (F)
18-24						Y		P / (F)
24-30			GRAY BLACK					P / (F)
30-36	SANDY CLAY						Y	P / (F)
36-42								(P) / F
42-48	SILTY SAND W/ SOME MEDIUM SAND							(P) / F
48-54		SAT					N	(P) / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Page 2 of 1

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 3,4
Logged By: D. BLETTHE
Change from GPS Position NO

Date: 9/21/2009
Test Pit No: 001 108
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, CALM, COOL

Depth (in)	Soil Description	Moisture Content	Color	~~Ph~~ OH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	BRN	NOT TAKEN	<1	N	N	P / F
06-12		MOIST	LT BRN ORANGE			Y		P / F
12-18						Y		P / F
18-24	SANDY CLAY		BLACK GRAY			N		P / F
24-30		SAT						P / F
30-36	SANDY CLAY HEAVY ORGANICS OLD ROOT ZONE	SAT					Y	P / F
36-42	GRAVELS & COBBLES				<40		Y	P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 96
Logged By: D. PETTIE
Change from GPS Position: NO

Date: 9/21/09
Test Pit No: 001 107
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, CALM, COOL

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Pit~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	LT BRN	NOT TAKEN	<1	N	N	P / (F)
06-12		MOIST	YELLOW			Y		P / (F)
12-18						Y		P / (F)
18-24			GRAY			N		P / (F)
24-30	SANDY CLAY						N	P / (F)
30-36							Y	(P) / (F)
36-42							Y	(P) / F
42-48							Y	(P) / F
48-54							N	(P) / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GROUNDWATER NOT ENCOUNTERED

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 7,8
Logged By: D. BLITHE
Change from GPS Position: NO

Date: 9/21/2009
Test Pit No: 001 109
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, BREEZY, WARM

Depth (in)	Soil Description	Moisture Content	Color	pH *Ph*	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	MOIST	LT GRN YELLOW		<1	Y	N	P / (F)
06-12			ORANGE/ YELLOW			Y		P / (F)
12-18			↓			Y		P / (F)
18-24			GRAY			N		P / (F)
24-30			BLACK				↓	P / (F)
30-36							Y	P / (F)
36-42								(P) / F
42-48	↓	↓	↓	↓	↓	↓	↓	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GROUND WATER NOT ENCOUNTERED

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 9,10
Logged By: D. BLYTHE
Change from GPS Position NO

Date: 9/21/2009
Test Pit No: 001 /01
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, CLEAR, WARM

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Pit~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	LT BRN	NOT TAKEN	<1	N	No	P / (F)
06-12		MOIST	ORANGE WHITE			Y		P / (F)
12-18						N		P / (F)
18-24			GRAY					P / (F)
24-30							No	P / (F)
30-36	COARSE SAND w/ SILT						Yes	P / (F)
36-42	SAND, PEBBLE, COBBLE MIX	SAT			<40		Yes	(P) / F
42-48					<50		Yes	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: M 12
Logged By: D. BLYTHE
Change from GPS Position: NO

Date: 9/21/2009
Test Pit No: 001093
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, CALM,

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Ph~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILT/ SAND	DRY	LT BRN	NOT TAKEN	<1	N	N	P / (F)
06-12		MOIST	ORANGE/ LT BRN			Y		P / (F)
12-18			LT BRN			Y		P / (F)
18-24			BRN/ RED			N		P / (F)
24-30								P / (F)
30-36								P / (F)
36-42	FINE ~ COARSE SAND						Y	P / (F)
42-48		SAT			<40		Y	P / (F)
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 13,14
Logged By: D. BLYTHE
Change from GPS Position: no

Date: 9/21/2009
Test Pit No: 001 533
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, CALM, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH Pit	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND HEAVY VEG	DRY	LT BRN ORANGE	NOT TAKEN	<1	Y	N	P / (F)
06-12		MOIST	ORANGE			Y		P / (F)
12-18						Y		P / (F)
18-24			LT BRN			N		P / (F)
24-30			GRAY					P / (F)
30-36								P / (F)
36-42	METALLIC FLAKES						Y	(P) / F
42-48	SAND AND GRAVELS SURFACE WATER @ 48"				<20		Y	P / (F)
48-54	NO SAMPLE TAKEN! SAND GRAVELS, COBBLES, POORLY SORTED	SAT			<60		NA	P / F
54-60					<80			P / F
60-66	TOE SAMPLE							P / F
66-72								P / F

51"

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 15,16
Logged By: D. BLYTHE
Change from GPS Position NO

Date: 9/21/2009
Test Pit No: 001 C92
Excavator: CAT MINI EX 303.5
Weather: SUNNY, CALM, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	ORANGE	none TAKEN	<1	Y	No	P / (F)
06-12		MOIST				Y		P / (F)
12-18			LT BRN			N		P / (F)
18-24			BRN					P / (F)
24-30			GRAY				Y	P / (F)
30-36							Y	(P) / F
36-42	COARSE GRAVEL WELL SORTED						Y	(P) / F
42-48	FINE SAND WELL SORTED						No	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GROUNDWATER NOT ENCOUNTERED

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 17, 18
Logged By: DBLYTHE
Change from GPS Position NO

Date: 9/21/2009
Test Pit No: 001083
Excavator: CAT 303.5 MINI EX
Weather: SUNNY CLEAR HOT

Depth (in)	Soil Description	Moisture Content	Color	~~Ph~~ pH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	LT GRY		<1	N	N	P / F
06-12		MOIST	YELLOW ORANGE			Y		P / F
12-18			BRN			N		P / F
18-24								P / F
24-30								P / F
30-36			GRAY				Y	P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 9.20
Logged By: D. BUTTHE
Change from GPS Position NO

Date: 9/21/2009
Test Pit No: 001 078
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, CALM, CLEAR

Depth (in)	Soil Description	Moisture Content	Color	pH Pb	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND		BRN	NOT TAKEN	<1	N	No	P / (F)
06-12			ORANGE WHITE			Y		P / (F)
12-18			BRN			N		P / (F)
18-24			GRAY					P / (F)
24-30							No	P / (F)
30-36							yes	P / (F)
36-42					2/0		yes	P / (F)
42-48	COBBLES & BOULDERS W/ SAND NO SAMPLE				>60		No Sample	P / (F)
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 21, 22, 23 DELETE 22!!
Logged By: D. BLYTHE
Change from GPS Position NO

Date: 9/21/2009
Test Pit No: 001 C-7
Excavator: CAT 303.5 MINIEX
Weather: CALM, SUNNY CLEAR

Depth (in)	Soil Description	Moisture Content	Color	pH Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	LT BRN	NOT TAKEN	< 1	N	NO	P / (F)
06-12		MOIST	BRN					P / (F)
12-18			GRAY					P / (F)
18-24							No	P / (F)
24-30							yes	P / (F)
30-36							yes	(P) / F
36-42	COBBLES & SAND				<50		yes	P / (F)
42-48					>60			P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 24 25
Logged By: D. BLYTHE
Change from GPS Position NO

Date: 9/21/2009
Test Pit No: 001 084
Excavator: CAT 303.5 MINI EX
Weather: SUNNY

Depth (in)	Soil Description	Moisture Content	Color	pH Ptr	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	BRN	NOT TAKEN	<1	N	No	P / F
06-12	↓	↓	YELLOW	↓	↓	Y	↓	P / F
12-18	↓	MOIST	BLACK	↓	↓	N	↓	P / F
18-24	SAND & PEBBLES. POORLY SORTED	↓	GRAY	↓	↓	↓	No	P / F
24-30	SILTY SAND	↓	BRN	↓	↓	↓	yes	P / F
30-36	↓	↓	↓	↓	↓	↓	yes	P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GROUNDWATER NOT ENCOUNTERED

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 26,27
Logged By: D. BUTTNE
Change from GPS Position: NO

Date: 9/21/2009
Test Pit No: 001 085
Excavator: 303 CAT
Weather: SUNNY

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	LT BRN	NOT TAKEN	<1	N	No	P / F
06-12		MOIST	ORANGE BRN			Y		P / F
12-18			BRN			N		P / F
18-24								P / F
24-30							No	P / F
30-36							yes	P / F
36-42	SANDY CLAY	SAT	LT GRAY				yes	P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 28 + 29
Logged By: RWF
Change from GPS Position: No

Date: 09/21/09
Test Pit No: 001 099
Excavator: CAT 303 Trans
Weather: Sunny ≈ 68°

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY SILT.	moist	RED TAN Brown		<1	yes.	No	P / (F)
06-12		moist very						P / (F)
12-18								P / (F)
18-24								P / (F)
24-30			gray				Y	P / (F)
30-36	~~SANDY S~~ SILTY sand w/ clay.		Black/Gray			No	Y	(P) / F
36-42	SAND		Gray				Y	(P) / F
42-48		SAT					No	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 1, 2
Logged By: D. BLYTHE
Change from GPS Position NO

Date: 9/22/2009
Test Pit No: 001 104
Excavator: CAT 303 MINI EX
Weather: SUNNY, CLEAR, COOL

Depth (in)	Soil Description	Moisture Content	Color	pH Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	BRN	NOT TAKEN	< 1	N	N	P / (F)
06-12		MOIST	ORANGE			Y		P / (F)
12-18			GRAY			N		P / (F)
18-24			BLACK DK GRAY					P / (F)
24-30	OLD ORGANIC LAYER						Y	P / (F)
30-36		SAT					Y	(P) / F
36-42		SAT					Y	(P) / F
42-48		SAT					N	(P) / F
48-54		~~MOIST~~ SAT					N	(P) / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 3,4
Logged By: R. BLYTHE
Change from GPS Position NO

Date: 9/22/2009
Test Pit No: 001 097
Excavator: CAT 303.5C MINI EX
Weather: SUNNY, CLEAR, CALM

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND		LT BRN WHITE/ YELLOW	NOT TAKEN	<1	Y	N	P / F
06-12			↓			Y		P / F
12-18			ORANGE			Y		P / F
18-24			BLACK			N		P / F
24-30								P / F
30-36								P / F
36-42	FINE - MEDIUM SAND - WELL SORTED		GRAY				Y	P / F
42-48							Y	P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 5,6
Logged By: D. BUTTHE
Change from GPS Position NO

Date: 9/22/2009
Test Pit No: 001 076
Excavator: CAT 303.5C MINI EX
Weather: CLEAR, CALM WARM

Depth (in)	Soil Description	Moisture Content	Color	pH Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DK BRN	MOIST		<1	N	Y	P / (F)
06-12								P / (F)
12-18								P / (F)
18-24								(P) / F
24-30		DK BRN GRAY					N	(P) / F
30-36	SANDY CLAY							(P) / F
36-42								(P) / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 7,8
Logged By: D. BUTTHE
Change from GPS Position: n/A

Date: 9/22/2009
Test Pit No: 001-41
Excavator: CAT 303.5C
Weather: SUNNY, CALM HOT!!

Depth (in)	Soil Description	Moisture Content	Color	~~Ph~~ pH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	DK BRN ORANGE	NOT TAKEN	21	Y	N	P / F
06-12		MOIST	YELLOW WHITE					P / F
12-18								P / F
18-24								P / F
24-30								P / F
30-36								P / F
36-42			LT GRAY			N		P / F
42-48			GRAY					P / F
48-54			BLACK					P / F
54-60	OLD ROOT ZONE	SAT					Y	P / F
60-66							Y	P / F
66-72	FINE-COARSE SAND POORLY SORTED						Y	P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 9,10
Logged By: D. BUTTHE
Change from GPS Position N/A

Date: 09/22 / 2009
Test Pit No: 001 412
Excavator: CAT 303.5C MINI EX
Weather: SUNNY, CLEAR CALM, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH Ptr	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	BRN	NOT TAKEN	<1	N	N	P / (F)
06-12		MOIST	WHITE/ ORANGE			Y		P / (F)
12-18			ORANGE			Y		P / (F)
18-24			BRN			N		P / (F)
24-30			GRAY				N	P / (F)
30-36							Y	P / (F)
36-42							Y	(P) / F
42-48		SAT					Y	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: ~~1-12~~ NONE
Logged By: D. BLYTHE
Change from GPS Position YES

Date: 9/22/2009
Test Pit No: 001 121
Excavator: CAT 303.5 MINI EX
Weather: CALM, SUNNY, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Ptr~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	MOIST	LT BRN	NOT TAKEN	<1	N	NO	P / (F)
06-12			ORANGE			Y		P / (F)
12-18			GRAY/ BLACK			N		P / (F)
18-24								P / (F)
24-30								P / (F)
30-36							Y	P / (F)
36-42							Y	(P) / F
42-48							Y	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks. VERY LITTLE GROUNDWATER @ BASE OF EXCAVATION

1 of 1

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 11, 12
Logged By: D. BLYTHE
Change from GPS Position YES

Date: 9/22/2009
Test Pit No: 001 138
Excavator: CAT 303.5C MINI EX
Weather: SUNNY, CLEAR, CALM

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Rh~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND ORGANIC RICH	MOIST	BLACK	NOT TAKEN	<1	N	Y	P / (F)
06-12							Y	P / (F)
12-18							Y	(P) / F
18-24							Y	(P) / F
24-30							No	(P) / F
30-36							No	(P) / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 13,14
Logged By: D. BLYTHE
Change from GPS Position: NO

Date: 9/22/2009
Test Pit No: 001 204
Excavator: CAT 303C MINI EX
Weather: SUNNY, CLEAR, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Pb~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	LT BRN	NOT TAKEN	<1	N	~~Y~~ N	P / (F)
06-12		MOIST	ORANGE YELLOW			Y	Y	~~P~~ / (F)
12-18			GRAY			N	Y	(P) / F
18-24	*ROOT ZONE OLD HEAVY ORGANICS		GRAY/ BLACK				Y	(P) / F
24-30							Y	(P) / F
30-36							N	(P) / F
36-42							N	(P) / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: #1 & #2
Logged By: DB/RWE
Change from GPS Position: No

Date: 09/23/09
Test Pit No: 001 008
Excavator: CAT 303 - Trami
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	pH Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND VEG: GRASSES	DRY	LT BRN ORANGE	NOT TAKEN	<1	Y	N	P / F
06-12		MOIST	WHITE			Y		P / F
12-18			LT BRN ORANGE			Y		P / F
18-24						Y		P / F
24-30						Y		P / F
30-36	SMALL MED SAND STRINGER, S&P WELL SORTED					Y		P / F
36-42						Y		P / F
42-48			DK GRAY			N		P / F
48-54								P / F
54-60								P / F
60-66							Y	P / F
66-72	OLD RUST ZONE						Y	P / F

Remarks:

72-78 COBBLES & GRAVELS @ 78" NO SAMPLE

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 34
Logged By: D. BRITTHE
Change from GPS Position NO

Date: 9/23/2009
Test Pit No: 001 016
Excavator: 303.5C CAT MINI EX
Weather: SUNNY, CLEAR, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH Ph.	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND VEG; GRASSES	DRY	LT BRN		<1	N	Y	P / (F)
06-12	WHITE STRINGER 3-4" THICK	DRY / MOIST						P / (F)
12-18								P / (F)
18-24								P / (F)
24-30								(P) / F
30-36	SMALL POCKETS OF RED TINTED SND							(P) / F
36-42							N	(P) / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 56
Logged By: D. BLYTHE
Change from GPS Position: NO

Date: 9/23/2009
Test Pit No: 001 017
Excavator: CAT 303.5C MINI EX
Weather: SUNNY, CALM, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND VEG; HEAVY GRASSES - ROOTS	DRY	LT BRN	NOT TAKEN	< 1	N	yes	P / (F)
06-12	↓	↓	↓	↓	↓	↓	yes	P / (F)
12-18	↓	↓	↓	↓	↓	↓	yes	P / (F)
18-24	↓	MOIST	↓	↓	↓	↓	yes	(P) / F
24-30	↓	↓	↓	↓	↓	↓	yes	(P) / F
30-36	↓	↓	↓	↓	↓	↓	NO	(P) / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: INITIALLY SAMPLED TO 18", THEN TO 36"

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 7,8
Logged By: D. BLYTHE
Change from GPS Position: NO

Date: 9/23/2009
Test Pit No: 001 ~~004~~
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, CALM, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Ph~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND VEG; LIGHT GRASSES, WILLOWS	DRY	LT BRN	NOT TAKEN	<1	N / Y	NO	P / (F)
06-12		MOIST	ORANGE					P / (F)
12-18	ROOT ZONE							P / (F)
18-24								P / (F)
24-30	* WHITE SAND STRINGER							P / (F)
30-36			DARK BRN					P / (F)
36-42						N		P / (F)
42-48								P / (F)
48-54							NO	P / (F)
54-60							yes	P / (F)
60-66			GRAY BRN				yes	(P) / F
66-72							yes	(P) / F

Remarks: COBBLES & GRAVELS BELOW 72" NO FURTHER SAMPLES TAKEN

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 9,10
Logged By: DB
Change from GPS Position: NO

Date: 9/23/2009
Test Pit No: 001 015
Excavator: CAT 303.5C MINIEX
Weather: SUNNY, CLEAR, CALM, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	LT BRN	NOT TAKEN	<1	Y	No	P / F
06-12	•SMALL WHITE STRINGER 1-2"	MOIST	ORANGE					P / F
12-18			LT YELLOW					P / F
18-24								P / F
24-30	•OLD ROOT ZONE							P / F
30-36							No	P / F
36-42			BRN			N	yes	P / F
42-48			GRAY				Yes	P / F
48-54							yes	P / F
54-60							No	P / F
60-66		SAT					No	P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

23 (RE)

Project:	Clark Fork OU - Reach A, Phase 1	Date:	9/22/2009
Contractor:	Jordan Construction	Test Pit No: 001	025
Photo ID:	412	Excavator:	CAT 303.5 MINI EX
Logged By:	D. BLYTHE	Weather:	SUNNY, HOT
Change from GPS Position	NO		

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Ph~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND VEG. SPARSE GRASSES / BARREN	DRY	LT BRN ORANGE	NOT TAKEN	<1	Y		P / F
06-12		MOIST	YELLOW					P / F
12-18								P / F
18-24								P / F
24-30	DENSE							P / F
30-36	BLACK DENSE STRINGER ORGANIC RICH DENSE		LT BRN			N		P / F
36-42			BRN					P / F
42-48			GRAY					P / F
48-54								P / F
54-60								P / F
60-66		SAT						P / F
66-72								P / F

▽ 62"

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 13, 14
Logged By: D. BLYTHE
Change from GPS Position: YES, EAST ≈10'

Date: 9/~~22~~ 23 (RB) / 2009
Test Pit No: 001 037
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, CLEAR, HOT

Depth (in)	Soil Description	Moisture Content	Color	~~Ph~~ pH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	LT BRN ORANGE	NOT TAKEN	<1	Y	N	P / F
06-12		MOIST						P / F
12-18								P / F
18-24								P / F
24-30			DK GRAY			N		P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72							Y	P / F
72 78	MEDIUM-COARSE SAND W/ SILT						Y	P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 15/16
Logged By: D.BLYTHE
Change from GPS Position NO

Date: 9/23/2009
Test Pit No: 001 035
Excavator: CAT 303 MINI EX
Weather: SUNNY, CALM, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Ph~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND VEG; NONE	DRY	LT BRN / ORANGE	NOT TAKEN	< 1	Y		P / F
06-12	• WHITE STRINGER @ 6-8"	MOIST						P / F
12-18								P / F
18-24								P / F
24-30								P / F
30-36			GRAY			N		P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GRAVELS & COBBLES @ 30"; SLUFFING AND CAVING NO SAMPLES FROM 54' DOWN

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 1, 2
Logged By: D. BOTHE
Change from GPS Position: NO

Date: 9/24/2009
Test Pit No: 001 036
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH *PH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND VEG; NONE - BARREN	DRY	YELLOW	NOT TAKEN	<1	Y		P / F
06-12		MOIST	ORANGE					P / F
12-18								P / F
18-24								P / F
24-30	• DENSE, ORGANICS							P / F
30-36								P / F
36-42			DK BRN			N		P / F
42-48								P / F
48-54								P / F
54-60		SAT						P / F
60-66		SAT						P / F
66-72								P / F

Remarks: NO SAMPLES BELOW 66" DUE TO FREQUENT SLUFFING - CAVE-IN

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 3,4
Logged By: D. BLYTHE
Change from GPS Position: NO

Date: 9/29/2009
Test Pit No: 001 C4S
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, HOT

Depth (in)	Soil Description	Moisture Content	Color	PH Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND VEG; NONE-LT GRASSES	DRY	LT BRN ORANGE	NOT TAKEN	<1	Y		P / F
06-12		MOIST	YELLOW					P / F
12-18								P / F
18-24								P / F
24-30			GRAY			N		P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54		SAT						P / F
54-60								P / F
60-66	- FINE- MEDIUM SAND							P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 56
Logged By: P. DUSTHE
Change from GPS Position: NO

Date: 9/24/2009
Test Pit No: 001 046
Excavator: CAT 303.5C MINI EX
Weather: SUNNY, CLEAR, CALM

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Ph~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND VEG; WILLOWS/GRASSES	DRY	LT BRN ORANGE	NOT TAKEN	<1	Y		P / F
06-12								P / F
12-18								P / F
18-24			BRN			N		P / F
24-30			GRAY					(P) / F
30-36								(P) / F
36-42								(P) / F
42-48								(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GROUNDWATER NOT ENCOUNTERED

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 78
Logged By: D. BOTTHE
Change from GPS Position: NO

Date: 9/28/2009
Test Pit No: 001 053
Excavator: CAT 308 SC
Weather: SUNNY, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND VERY FINE - BARREN	DRY	BRN YELLOW	NOT TAKEN	<1	Y		P / F
06-12		MOIST	ORANGE			Y		P / F
12-18						Y		P / F
18-24			GRAY/ BLACK			N		P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54		SAT						P / F
54-60	GRAVELS & COBBLES, NO SAMPLE				>60			P / F
60-66								P / F
66-72								P / F

Remarks: RANDY'S MAMA 459 4168

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 9,10
Logged By: D. BLYTHE
Change from GPS Position: NO

Date: 9/24/2009
Test Pit No: 001 526
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH Pit	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND VEG; GRASSES	DRY	BRN ORANGE	NOT TAKEN	<1	Y		P / F
06-12		MOIST				Y		P / F
12-18	• WHITE STONGER					Y		P / F
18-24	• ROOT ZONE		GRAY BLACK			N		P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66	FINE-COARSE SAND WELL GRADED	SAT			<1			P / F
66-72	COBBLES, GRAVEL & BOULDERS WELL GRADED				>60			P / F

Remarks: SURFACE WATER LEVEL @ ≈ 50"

TOE SAMPLE

66" ↓ ~~72~~-90"

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 11,12
Logged By: D. BLYTHE
Change from GPS Position: NO

Date: 9/24/2009
Test Pit No: 001 052
Excavator: CAT MINI EX 303.5C
Weather: SUNNY, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH "Pit"	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	LT BRN ORANGE	NOT TAKEN	<1	Y		P / F
06-12		MOIST				Y		P / F
12-18						Y		P / F
18-24						Y		P / F
24-30			BRN			N		P / F
30-36			GRAY					P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60		SAT						P / F
60-66	COBBLES & GRAVELS NO SAMPLE TAKEN							P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 13,14
Logged By: D. BIXTHE
Change from GPS Position NO

Date: 9/24/2009
Test Pit No: 001 S25
Excavator: CAT 303.5C mini EX
Weather: Sunny, Hot

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Pt~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	LT BRN ORANGE	NOT TAKEN	< 1	Y		P / F
06-12	- WHITE CLAY-LIKE STRINGERS	MOIST				Y		P / F
12-18						Y		P / F
18-24						Y		P / F
24-30			GRAY			N		P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54	MEDIUM - COARSE SAND POORLY GRADED	SAT						P / F
54-60								P / F
60-66	toe sample material SP							P / F
66-72								P / F

Remarks: SURFACE WATER @ 48"

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: No photo.
Logged By: Rust
Change from GPS Position: Moved Apx 10' Back from Stream Bank

Date: 09/24/09
Test Pit No: 001 Site
Excavator: CAT 303 - Travis
Weather: Sunny HOT

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SAND	Dry	Red Tan Brown	N/A	<1	yes		P / F
06-12	↓	↓	↓	↓	↓	↓		P / F
12-18	SANDY SILT	Slightly moist	↓	↓	↓	↓		P / F
18-24	↓	↓	↓	↓	↓	↓		P / F
24-30	↓	moist	↓	↓	↓	↓		P / F
30-36	↓	↓	↓	↓	↓	↓		P / F
36-42	SILTY SAND.	↓	Black	↓	↓	↓		P / F
42-48	↓	↓	Dark Brown	↓	↓	NO		P / F
48-54	SILTY SAND	SAT	Brown	↓	↓	↓		P / F
54-60	SAND	↓	Gray	↓	↓	↓		P / F
60-66	↓	↓	↓	↓	↓	↓		P / F
66-72	↓	↓	↓	↓	↓	↓		P / F

Remarks: TOE Sample is SANDS; No gravels. SP.
72-

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 1, 2 7,8
Logged By: D. BLYTHE
Change from GPS Position: no

Date: 9/28/2009
Test Pit No: 001 S26
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, CLEAR, COOL

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Ph~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND • ROOT ZONE THROUGHOUT	DRY	LT BRN ORANGE	NOT TAKEN	<1	Y		P / F
06-12		DRY				Y		P / F
12-18		MOIST				Y		P / F
18-24			DK BRN			N		P / F
24-30			GRAY					P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54					30			P / F
54-60	SAND/GRAVELS W/ COBBLES TO 2" TO 90" GW	NO	SAMPLE		60	NO SAMPLE		P / F
60-66					70			P / F
66-72								P / F

Remarks: ~~GROUND WATER NOT ENCOUNTERED~~ GROUND WATER ENCOUNTERED WHILE DIGGING TOE, @ 60"

SURFACE WATER MATCHES GROUND WATER (60")

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 3,4
Logged By: D. BLOTHE
Change from GPS Position YES

Date: 9/28/2009
Test Pit No: 001 524
Excavator: CAT 3035 MINI EX
Weather: SUNNY, COOL

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Rb~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	LT BRN GRAVEL	NOT TAKEN	<1	Y		P / F
06-12		MOIST				Y		P / F
12-18						Y		P / F
18-24						Y		P / F
24-30			LT BRN			N		P / F
30-36			GRAY					P / F
36-42								P / F
42-48	SILTY SAND W/ SOME PEBBLE & COBBLES				10			P / F
48-54	GRAVELS & SAND WELL GRADED	SAT	REDDISH BROWN		50			P / F
54-60	GRAVELS COBBLES & SAND WELL GRADED				80			P / F
60-66		GRAY						P / F
66-72								P / F

Remarks: SURFACE WATER @ 48"

Page _____ of _____

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 9,6
Logged By: D. BUTTRE
Change from GPS Position: YES, COMBINED WITH

Date: 9/28/2009
Test Pit No: 001 050
Excavator: CAT 303.5 MINI EX
Weather: SUNNY, COOL

Depth (in)	Soil Description	Moisture Content	Color	NOT TAKEN Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	LT BRN ORANGE		<1	Y		P / F
06-12		MOIST	YELLOW			Y		P / F
12-18						Y		P / F
18-24	• WHITE STRINGER, CLAY, 3" THICK					Y		P / F
24-30	• BLACK DENSE ORGANICS, 2" THICK		BRN/ GRAY			N		P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54	GRAVELS & COBBLES W/ SAND				55	N		P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Page _____ of _____

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 9,10
Logged By: D. BLYTHE
Change from GPS Position NO

Date: 9/28/2009
Test Pit No: 001026
Excavator: CAT 303.5C MINI-EX
Weather: SUNNY, WARM

Depth (in)	Soil Description	Moisture Content	Color	pH Pb	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND - WHITE CLAY LAYER ≈ 2" THICK	DRY	LT BRN	NOT TAKEN	<1			P / F
06-12								P / F
12-18								P / F
18-24	SMALL RED LAYER <1" THICK							P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GROUNDWATER NOT ENCOUNTERED

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 11,12
Logged By: D. BLITHE
Change from GPS Position: NO

Date: 9/28/2009
Test Pit No: 001 029
Excavator: CAT 323 SC MINI EX
Weather: SUNNY, WARM

Depth (in)	Soil Description	Moisture Content	Color	~~Ph~~ pH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	BRN	NOT TAKEN	<1	N		P / F
06-12								P / F
12-18								P / F
18-24								P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GROUNDWATER NOT ENCOUNTERED

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 13,14
Logged By: D. BUTHE
Change from GPS Position NO

Date: 9/28/2009
Test Pit No: 001027
Excavator: CAT 303.5C Mini EX
Weather: SUNNY, CLEAR, WARM

Depth (in)	Soil Description	Moisture Content	Color	pH Pb	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	BRN		<1	N		P / F
06-12								P / F
12-18	-DENSE ORGANIC RICH							P / F
18-24								P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GROUNDWATER NOT ENCOUNTERED

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 15,16
Logged By: D. BUTTHE
Change from GPS Position: n/a

Date: 9/28/2009
Test Pit No: 001 4,3
Excavator: CAT 303.5 MINI-EX
Weather: SUNNY, BREEZY, HOT

Depth (in)	Soil Description	Moisture Content	Color	~~Ph~~ OH	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	DK BRN	NOT TAKEN	21	N		P / F
06-12	↓	MOIST	↓	↓	↓	↓		P / F
12-18	↓	↓	↓	↓	↓	↓		P / F
18-24	↓	↓	↓	↓	↓	↓		P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: GROUNDWATER NOT ENCOUNTERED

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 17/18
Logged By: D. DUTKE
Change from GPS Position: N/A

Date: 9/28/2009
Test Pit No: 001S3946E
Excavator: CAT 303.5C MINI EX
Weather: SUNNY, BREEZY, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH *Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	LT BRN		<1	N		P / F
06-12	MIX WITH BOULDERS SUB ANGULAR	MOIST			30			P / F
12-18					<1			P / F
18-24								P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 19,20
Logged By: D. BLYTHE
Change from GPS Position: NO

Date: 9/28/2009
Test Pit No: 001 038
Excavator: CAT 303.5C MINI EX
Weather: SUNNY, CLEAR, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Pb~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	BRN	NOT TAKEN	<1	N		P / F
06-12		MOIST						P / F
12-18								P / F
18-24								P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 21, 22
Logged By: D. BLYTHE
Change from GPS Position: NO

Date: 9/28/2009
Test Pit No: 001 ~~048~~
Excavator: CAT303.5C, MINI EX
Weather: SUNNY, CLEAR, HOT

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Ph~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	DRY	BRN	NOT TAKEN	<1	N		P / F
06-12	- SMALL WHITE, CLAY STRINGER <2" THICK	MOIST						P / F
12-18								P / F
18-24								P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 23, 24
Logged By: RWB
Change from GPS Position: yes apx 40' South, off of Road.

Date: 09/28/05
Test Pit No: 001 059
Excavator: CAT 303 JCI, Travis
Weather: overcast

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Sandy Silt	dry	Brown	N/A	<1	yes		P / F
06-12	Silty sand.		Dark Brown			yes		P / F
12-18						NO		P / F
18-24								P / F
24-30								P / F
30-36								P / F
36-42								P / F
42-48	Silty Sand w/ 3" white Fine sand lens.	Moist	Gray					P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 25 & 26
Logged By: RWE
Change from GPS Position: yes - Apx 40' EAST

Date: 09/28/2009
Test Pit No: 001 054
Excavator: CAT 303 SCI, Travis
Weather: overcast.

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Sandy Silt.	Dry	Tan Brown	N/A	<1	yes		P / F
06-12	↓	↓	Gray	↓	↓	yes		P / F
12-18	Silty Sand. OID "A" Horizon @ 16"	↓	light Brown	↓	↓	yes		P / F
18-24	↓	moist	light Brown Gray.	↓	↓	No		P / F
24-30	↓	↓	Dark Brown	↓	↓	↓		P / F
30-36	Sandy Silt	↓	Brown	↓	↓	↓		P / F
36-42	↓	↓		↓	↓	↓		P / F
42-48	Silty Sand	very moist	Dark Brown	↓	↓	↓		P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 1
Logged By: D. BLITHE
Change from GPS Position: NO

Date: 9/29/2009
Test Pit No: 001 055
Excavator: N/A ~ HAND DIG
Weather: CLOUDY, COOL

Depth (in)	Soil Description	Moisture Content	Color	pH ~~Ptr~~	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY sand w/ organics.	Dry	TAN BROWN	NOT TAKEN	<1	yes	yes	P / (F)
06-12	SANDY Silt	↓	↓		↓	yes	↓	P / (F)
12-18	↓	↓	Brown		↓	NO	↓	P / (F)
18-24	SILTY SAND	moist	↓		↓	↓	↓	(P) / F
24-30	SANDY Silt	↓	Dark Gray		↓	↓	↓	(P) / F
30-36	SAND	↓	Gray.		↓	↓	NO	(P) / F
36-42	↓	↓	Brown.		↓	↓	↓	(P) / F
42-48	SILTY Sand	very moist	Dark Brown		↓	↓	↓	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 2
Logged By: RWE - From Bags
Change from GPS Position: No

Date: 09/29/09
Test Pit No: 001 058
Excavator: HAND DIG 4'SS SPOON,
Weather: SUNNY / OVERCAST

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND	Dry	TAN BROWN	N/A	<1	yes	NO	P / F
06-12	SAND.	↓	RED	↓	↓	↓	↓	P / F
12-18	↓	↓	RED BROWN	↓	↓	↓	↓	P / F
18-24	↓	Moist	BROWN RED	↓	↓	↓	↓	P / F
24-30	↓	↓	↓	↓	↓	↓	↓	P / F
30-36	↓	↓	GRAY.	↓	↓	No	↓	P / F
36-42	↓	Very Moist	DARK BROWN	↓	↓	No	yes	P / F
42-48	SANDY SILT	↓	↓	↓	↓	No.	yes	P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: ~~Z~~ None
Logged By: RWE - From Bass.
Change from GPS Position No

Date: 09/29/09
Test Pit No: 001 057
Excavator: HAND DUG SS SPOON.
Weather: Sunny.

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY SILT	Dry	Tan Red Brown		<1	yes	No	P / F
06-12		↓	Red Brown.					P / F
12-18		moist						P / F
18-24	SILTY SAND	↓						P / F
24-30		moist Very						P / F
30-36			↓				↓	P / F
36-42		↓	Brown		↓	↓	yes	P / F
42-48	SANDY Silt	Sat	↓		<10	No.	yes	P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: None.
Logged By: RWC - From Bags
Change from GPS Position: No

Date: 09/29/09
Test Pit No: 001 0004
Excavator: Hand Dig - SS Spoon.
Weather: Smog.

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY SILT	Dry	Red	None	<1	yes	No	P / (F)
06-12			↓			yes		P / (F)
12-18	SILTY sand	moist	Dark Brown			yes		P / (F)
18-24		Very moist				yes		P / (F)
24-30						yes	yes	P / (F)
30-36	Course SAND		Gray		<5	No	yes	(P) / F
36-42							yes	(P) / F
42-48	SILTY SAND -	SAT	Black		<1		NO	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 4
Logged By: Rive - From Soil Sample Bags
Change from GPS Position: No GPS Position Idel.

Date: 09/29/09
Test Pit No: 001 414
Excavator: HAND DUG - SS SPOON
Weather: Sunny

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY Silt	Dry	TAN RED	None	<1	yes	NO ~~yes~~	P / F
06-12	↓	↓	↓	↓	↓	↓	No	P / F
12-18	SAND	Slightly moist	RED Brown	↓	↓	↓	No	P / F
18-24	↓	↓	↓	↓	↓	↓	No	P / F
24-30	SANDY Silt	moist	RED TAN Brown	↓	↓	↓	No	P / F
30-36	SILTY SAND.	↓		↓	↓	↓	No	P / F
36-42	SILTY SAND w/ CLAY.	very moist	Dark Brown	↓	↓	↓	yes	P / F
42-48	↓ ↓	↓	↓	↓	↓	No.	yes	P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 5
Logged By: RWE - From Soil Bags
Change from GPS Position: No GPS Position

Date: 09/29/09
Test Pit No: 001 415
Excavator: Hand Excavated w/ SS Spoons
Weather: Sunny - Windy

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY silt	Dry	RED TAN	None	<1	yes	No	P / F
06-12	↓	↓	TAN RED	↓	↓	yes	↓	P / (F)
12-18	↓	↓	RED Brown	↓	↓	yes	↓	P / (F)
18-24	SILTY SAND	Slightly moist	Dark Brown	↓	↓	No	↓	P / (F)
24-30	↓	↓	↓	↓	↓	↓	↓	P / (F)
30-36	↓	↓	↓	↓	↓	↓	↓	P / (F)
36-42	SILTY SAND w/ clay	moist	↓	↓	↓	↓	yes	P / (F)
42-48	↓ ↓	Moist	Dark Gray	↓	↓	↓	yes	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: ~~#~~ None.
Logged By: RLC
Change from GPS Position: No

Date: 05/29/09
Test Pit No: 001 172
Excavator: Hand Dug w/ SS spoon.
Weather: Sunny - Windy

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY silt	Dry	Tan Red Brown	None	<1	Yes		P / F
06-12		Slightly moist	↓	↓	↓	↓		P / F
12-18	Silty sand	Very moist	Brown	↓	↓	↓		P / F
18-24	↓	↓	Dark Brown	↓	↓	↓		P / F
24-30	↓	↓	↓	↓	↓	No		P / F
30-36	↓	SAT	↓	↓	↓	↓		P / F
36-42	SAND w/ silts	↓	↓	↓	↓	↓		P / F
42-48	↓	↓	↓	↓	↓	↓		P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 7
Logged By: RWE
Change from GPS Position: No

Date: 09/29/09
Test Pit No: 001 174
Excavator: HAND Excavated w/ SS Spoon
Weather: Cloudy windy

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY Silt	Dry	RED Brown	None	< 1	yes	No	P / F
06-12	SILTY sand.		Dark Brown			NO		P / F
12-18								P / F
18-24								P / F
24-30								P / F
30-36								P / F
36-42	SILTY Sand w/ Clay		Black				yes	P / F
42-48		moist					yes	P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 8
Logged By: RWE- From Bagged Samples
Change from GPS Position No

Date: 09/29/09
Test Pit No: 001 537
Excavator: HAND Dig w/ SS Spoon
Weather: Overcast - windy

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY Sand	Dry	RED Brown	None	<1	yes	No	P / (F)
06-12	SANDY silt	↓	RED TAN	↓	↓	↓	↓	(P) / F
12-18	↓	moist	↓	↓	↓	↓	↓	P / (F)
18-24	↓	↓	Brown RED	↓	↓	↓	↓	P / (F)
24-30	↓	very moist	↓	↓	↓	↓	↓	P / (F)
30-36	SILTY Sand	↓	↓	↓	↓	↓	↓	P / (F)
36-42	SANDY Silt	↓	↓	↓	↓	↓	yes	P / (F)
42-48	SANDY silt w/ mica.	SAT	Dark Gray	↓	↓	No	yes	P / (F)
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

2

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 9
Logged By: RWE
Change from GPS Position: No

Date: 09/29/09
Test Pit No: 001 134
Excavator: Hand Dug - SS Spoon
Weather: Cloudy - Windy

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY Silt	Dry	Tan Red	None	<1	yes	No	P / F
06-12	↓		Red	↓	↓	yes	↓	P / F
12-18	↓	Slightly moist	Brown	↓	↓	yes	↓	P / F
18-24	↓	↓	Dark Gray	↓	↓	No	↓	P / F
24-30	↓	↓	↓	↓	↓	↓	↓	P / F
30-36	SAND	moist	↓	↓	↓	↓	yes	P / F
36-42	SILTY Sand	↓	Dark Gray	↓	↓	↓	↓	P / F
42-48	↓	Very moist	Dark Gray	↓	↓	↓	↓	P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 10
Logged By: RWB From Samples Collected
Change from GPS Position No

Date: 09/29/09
Test Pit No: 001 216
Excavator: Hand Digging
Weather: overcast - windy

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND w/organics	Dry	Tan Dark Brown	None	<1	yes		P / F
06-12	SILTY sand	moist	Dark Brown			No		P / F
12-18								P / F
18-24								P / F
24-30								P / F
30-36	SANDY Silt w/clay							P / F
36-42	SANDY Silt w/clay	very moist						P / F
42-48		very moist						P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 11
Logged By: RWE - From Soil Bags.
Change from GPS Position: No.

Date: 09/29/09
Test Pit No: 001 201
Excavator: Hand Auger
Weather: overcast - windy

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Silty sand w/ organics	Dry.	Tan Red Brow	None	<1	yes	yes	P / F
06-12	↓	moist	Tan Brow	↓	↓	yes	yes	P / F
12-18	SAND w/some silts	very moist	Gray	↓	↓	No	yes	P / F
18-24	↓	↓	↓	↓	↓	↓	yes	P / F
24-30	SAND	SAT	↓	↓	↓	↓	No	P / F
30-36	SAND	↓	↓	↓	↓	↓	↓	P / F
36-42	SANDY Gravel.	↓	↓	↓	< 30	↓	↓	P / F
42-48	SANDY Gravel	↓	↓	↓	< 40	↓	↓	P / F
48-54						↓		P / F
54-60						↓		P / F
60-66						↓		P / F
66-72								P / F

Remarks:

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Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 12
Logged By: RWE From Soil Sample collected.
Change from GPS Position: No

Date: 09/23/09
Test Pit No: 001 205
Excavator: Hand Auger
Weather: Overcast - windy

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY SILT	Dry	Red Tan Brow	NONE	< 1	yes	yes	P / (F)
06-12	↓	↓	Tan Brown	↓	↓	↓	↓	P / (F)
12-18	SAND	moist	Brown Red Tan	↓	↓	↓	↓	P / (F)
18-24	SANDY SILT w/ old organics	↓	Black	↓	↓	↓	↓	P / (F)
24-30		very moist	Dark Gray	↓	↓	No	↓	(P) / F
30-36	SANDY SILT	↓	↓	↓	↓	↓	↓	(P) / F
36-42	SAND w/ some silts.	SAT	Gray.	↓	↓	↓	No	(P) / F
42-48	SAND	SAT	Gray	↓	↓	↓	No.	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 13
Logged By: RWE From Sample Bags.
Change from GPS Position: No

Date: 09/29/09
Test Pit No: 001 | 93
Excavator: HAND AUGER
Weather: OVERCAST WINDY

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SILTY SAND W/ORGANICS	Dry	RED BROWN	None	<1	yes	yes	P / (F)
06-12	↓	↓	↓	↓	↓	↓	↓	P / (F)
12-18	SILTY SAND	↓		↓	↓	No	↓	P / (F)
18-24	↓	moist		↓	↓	↓	↓	(P) / F
24-30	↓	↓		↓	↓	↓	↓	(P) / F
30-36	SILTY Sand	↓		↓	↓	↓	No	(P) / F
36-42	SANDY silt	moist		↓	↓	↓	↓	(P) / F
42-48	SANDS	SAT	GRAY.	↓	↓	↓	↓	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 14
Logged By: RWT - Using Soil collected.
Change from GPS Position No

Date: 09/29/09
Test Pit No: 001 179
Excavator: HAND AUGER
Weather: Overcast windy

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY silt	Dry	RED TAN BROWN	None	<1	yes	No	P / F
06-12	↓	↓	↓	↓	↓	↓	↓	P / F
12-18	↓	moist	↓	↓	↓	↓	↓	P / F
18-24	↓	↓	↓	↓	↓	↓	↓	P / F
24-30	SILTY sand	Very moist	Dark BROWN TAN	↓	↓	No	↓	P / F
30-36	SILTY sand w/ some clay	↓	Dark Gray	↓	↓	↓	↓	P / F
36-42	↓	↓	↓	↓	↓	↓	yes	P / F
42-48	↓	SAT	↓	↓	↓	↓	yes	P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: 15
Logged By: Rwe From Soil Bags
Change from GPS Position: yes - unknown

Date: 09/29/09
Test Pit No: 001 176
Excavator: Hand Auger
Weather: Overcast - windy

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY Silt w/ organics	Dry	Tan Brown	None	<1	yes	yes	P / (F)
06-12	SAND	↓						P / (F)
12-18	SANDY SILT	very moist	Dark Brown			↓		P / (F)
18-24	SILTY SAND	↓	Black.			No		P / (F)
24-30	SILTY SAND w/ clay	SAT	Gray					(P) / F
30-36	~~SAND~~ (RF) ↓				↓		↓	(P) / F
36-42	SAND	↓	↓		<30		No	(P) / F
42-48	SANDY GRAVEL	↓	↓	↓	<30	↓	No	(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: None
Logged By: Rice From Soil Samples
Change from GPS Position: UNKNOWN

Date: 09/30/09
Test Pit No: 001 416
Excavator: Hand Auger
Weather: Overcast/Rain/Snow

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Silty Sand w/organics	Moist	Dark Gray	None	21	yes		P / (F)
06-12	↓	↓	↓	↓	↓	NO		(P) / F
12-18	Silty Sand.	↓	↓	↓	↓	↓		(P) / F
18-24	Gravely Sand / Silty Sand (mixed material)	Very Moist	↓	↓	<20	↓		(P) / F
24-30	Gravely Sand / Silty Sand. (mixed material)	↓	↓	↓	<30	↓		(P) / F
30-36	SAND w/Few Silts	SAT	↓	↓	<5	↓		(P) / F
36-42	↓	↓	Gray	↓	↓	↓		(P) / F
42-48	↓	↓	↓	↓	↓	↓		(P) / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID: None.
Logged By: Rice From Soil Samples
Change from GPS Position: Not established

Date: 09/30/09
Test Pit No: 001 417
Excavator: HAND AUGER
Weather: Cloudy / Rain - Snow

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06		very moist	Brown	None	21	yes	Y	P / (F)
06-12		↓				No	Y	P / (F)
12-18	SILTY Sand.	SAT	Dark Gray				Y	(P) / F
18-24							Y	P / (F)
24-30							Y	(P) / F
30-36							Y	(P) / F
36-42							No	(P) / F
42-48	Sample Not Collected - Gravels - Cobbles - Sands				780		No.	P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID:
Logged By: RWE From Bags
Change from GPS Position

Date: 09/30/09
Test Pit No: 001 088
Excavator: HAND Auger
Weather: Cloudy

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY Silt	Slightly moist	RED TAN BROWN	None	<1	Yes	No	P / F
06-12	↓	↓	↓	↓	↓	↓	↓	P / F
12-18	↓	↓	↓	↓	↓	↓	↓	P / F
18-24	↓	↓	↓	↓	↓	↓	↓	P / F
24-30	SILTY SAND	↓	RED Gray	↓	↓	↓	↓	P / F
30-36	SANDY Silt	moist	Dark Gray	↓	↓	No	↓	P / F
36-42	SILTY SAND	↓	↓	↓	↓	↓	yes	P / F
42-48	SAND w/some silt	very moist	Brown	↓	↓	↓	yes	P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks:

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID:
Logged By: RWE From Soil Bags
Change from GPS Position Unknown - Not MARKED

Date: 09/30/09
Test Pit No: 001 008
Excavator: HAND AUGER
Weather: Cloudy - Rain

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	SANDY SILT	Damp	Brown	N/A	<5%	Yes	Yes	P / (F)
06-12			Reddish Brown			Yes	Yes	P / (F)
12-18			Gray			Yes	Yes	P / (F)
18-24		Moist				No	Yes	P / (F)
24-30	Clayey Silt	Saturated					Yes	(P) / F
30-36							Yes	(P) / F
36-42	Hard Pan Gravels - No Sample							P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: TD - 30"
Dup #3 18-24"

Page _____ of _____

Tetra Tech, Inc
TEST PIT EXCAVATION LOG

Project: Clark Fork OU - Reach A, Phase 1
Contractor: Jordan Construction
Photo ID:
Logged By: M Thorson
Change from GPS Position: None

Date: 9/3/05
Test Pit No: 001 087
Excavator: Hand Auger
Weather: Cloudy, Cool

Depth (in)	Soil Description	Moisture Content	Color	Ph	% Rock	Idabel Tailings	Laboratory Sample	XRF (Pass/Fail)
00-06	Sandy Silt	Damp	Reddish Brown	N/A	<5%	Yes	Y	P / (F)
06-12			Tan			Yes	Y	P / (F)
12-18			Gray			No	Y	P / (F)
18-24		Moist				No	Y	P / (F)
24-30						No	Y	(P) / F
30-36	Sandy Sand					No	Y	(P) / F
36-42	Hard Pan Gravels - No Sample							P / F
42-48								P / F
48-54								P / F
54-60								P / F
60-66								P / F
66-72								P / F

Remarks: TD: 36"
Dup #4 24-30

APPENDIX E

QUALITY ASSURANCE/QUALITY CONTROL TECHNICAL MEMORANDUM

TETRA TECH, INC.

TECHNICAL MEMORANDUM

DATE: January 7, 2010

TO: Mr. Brian Bartkowiak- Remediation Division/Mine Waste Cleanup Bureau
Department of Environmental Quality

FROM: Michael Hatten, P.E. – Tetra Tech

RE: Clark Fork River, Reach A, Phase 1 Investigation Data Quality

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1.0 Introduction

The purpose of this technical memorandum is to address the quality assurance and quality control (QA/QC) review of samples analyzed by Pace Analytical Services, Inc. (Pace) for the Clark Fork River, Reach A, Phase 1 investigation. Investigation and quality control objectives are described in the *Clark Fork Site Sampling and Analysis Plan (SAP) Addendum, Reach A, Phase 1* (Tetra Tech/CDM, 2009).

1.1 Field Screening

Samples were collected from test pit walls at six-inch intervals measuring from the ground surface. In general, the deepest samples were 60-inches below ground surface unless field screening indicated contamination at deeper levels. Some areas exhibited a vertical extent of contamination that was beyond the limits of safe sampling practices.

Upon completion of the soil sampling from the test pits, samples were selected and identified for laboratory analysis. For RA Code D polygons, identification of the 6-inch interval samples selected for laboratory analysis were based on a combination of visual observation of the depth of tailings and the results of the XRF field screening. Three 6-inch samples thought to bracket the tailings/soil interface (one above the 6-inch interval where total COC's are greater then 500 mg/kg and two below) were submitted for laboratory analysis. In the event that the maximum depth of the test pit is encountered and field XRF screen values were above the investigation level for the total COC concentrations, the two deepest samples collected were submitted to the laboratory for analysis. For RA Code E and RA Code F, samples were collected and submitted from each six inch depth interval until total COC were less than 500 mg/kg.

Following laboratory analysis, all laboratory data was received electronically and imported into the project database developed by Tetra Tech. Hard copy data and laboratory reports are also on file and available upon request.

1.3 Holding Times and Preservation

Investigation samples were stored in custody-sealed coolers and submitted to the laboratory on a

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weekly basis. Chemical preservation was not required for the soil samples; however, water samples were preserved with nitric acid. All laboratory analysis was conducted between August 26, 2009 and November 19, 2009. Adequate sample preservation techniques were used and all holding times were met.

1.4 Laboratory Quality Control

Laboratory quality control was conducted in accordance with the Quality Assurance Project Plan (Tetra Tech/CDM, 2009).

1.5 Field Blank Samples

Field Blank Samples were prepared by filling ziplock bags with an analyte-free media similar in character to the sample media. The media chosen for this investigation was a medium 100% pure silica sand. A total of 23 blank samples were obtained on the total sample set of 635 initial natural samples. The number of field blank samples obtained was less than the rate of one duplicate sample per 20 natural samples, due to a communication break-down between field personnel. No COC's above the laboratory PQL were detected in the field blanks submitted for analysis.

1.6 Cross Contamination Blank Samples

Cross contamination blank samples (Rinsate Blanks) were collected by pouring de-ionized water across decontaminated field sampling equipment (primarily stainless steel sampling spoons). Rinsate water was collected in a 250 ml container provided by the laboratory (sample water was preserved to a pH <2 with dilute nitric acid) and shipped in coolers containing ice sufficient to maintain a temperature of < 5 degrees Celsius. Cross contamination blank samples were collected at a rate of one blank sample per 50 natural samples. A total of 22 cross contamination blanks were obtained on the total sample set of 635 final natural samples, exceeding the frequency goals outlined in the SAP. No COC's above the laboratory PQL were detected in the cross contamination blanks submitted for analysis.

1.7 Field Duplicate Samples

Field duplicate samples were collected at a rate of one duplicate sample per 20 natural samples. A total of 38 duplicate samples were obtained on the total sample set of 635 initial natural samples which exceeds SAP requirements for 32 duplicates. Duplicate samples were compared to COC results for their corresponding natural samples and the relative percent difference (RPD) was calculated when both values exceed five-times the PQL, or absolute value difference (AVD) was calculated when one or both values were less than or equal to five–times PQL. This analysis was performed in a Microsoft Access database**.** If the RPD was greater than 35 percent or the AVD was greater than the PQL, the duplicate sample value was flagged. **Table 1-1** presents the number and percentage of duplicate samples that exceeded either the RPD or AVD for each constituent.

TABLE 1-1: Results of Duplicate Sample Comparisons

Constituent	Number of Exceedances	Percent Exceedance(1)
Arsenic	12	33%
Cadmium	17	47%
Copper	14	39%
Lead	13	36%
Zinc	7	19%

Note: (1) Percent based on 38 duplicate samples in depth of tailings/impacted soils data base.

The relatively large number of exceedence is not unusual for soils sampling although it is probably more severe than in some soil sampling investigations for two reasons:

The materials in the floodplain are very heterogeneous consisting of tailings, natural soils, and ore. Although duplicate samples were taken at the same depth as the natural samples, their slightly different horizontal positions could produce significantly different metals concentrations.

The duplicate comparison results indicate that there is some uncertainty associated with the concentrations of a particular constituent at a given sample depth. The remaining question is how much this uncertainty affected the determination of the base of tailings/impacted soil. To ascertain this effect, the values of each duplicate sample and its corresponding natural sample were compared to the pass-fail criteria. We then compared how many of the duplicate-natural pairs agreed (both passed or both failed) and how many disagreed (one passed and one failed). This analysis showed that 97 percent of the duplicate-natural sample pairs agreed suggesting that the uncertainty in the actual constituent concentrations had relatively little effect on our ability to determine a precise base of tailings/impacted soil.

1.8 Method Blank Evaluation

To evaluate the presence and degree of contamination that may be introduced to samples as part of laboratory preparation and analysis procedures, the laboratory analyzed one method blank in conjunction with each Sample Delivery Groups (SDG). All method blank results came back less than or equal to the contract required quantitation limit (CRQL) (1 mg/kg for soil, 0.01 mg/L for water).

1.9 Matrix Spike (MS) Sample Analysis

At least one matrix spike (MS) sample was analyzed in correspondence with each SDG. Percent recovery values were calculated for each matrix spike by comparing the concentration of a spiked sample to the original concentration of the sample before the spike was added. To perform this calculation, the following formula was used:

$$\%R_S = \left| \frac{(SC - OC)}{TV} \right| \times 100\%$$

where:
$\%R_S$ = percent recovery of spike
SC = spiked sample concentration
OC = original concentration
TV = true value of the added spike

No samples were qualified as a result of MS sample analysis.

1.10 Laboratory Duplicate Sample Analysis

At least one field sample/laboratory duplicate pair and one MS/MSD pair were analyzed in correspondence with each SDG. A relative percent difference (RPD) was calculated for each duplicate pair by comparing a spiked sample or a laboratory duplicate to its corresponding original sample using the following formula. Samples were qualified as a result of duplicate sample analysis.

$$RPD = \left| \frac{(C_1 - C_2)}{\left(\frac{(C_1 + C_2)}{2} \right)} \right| \times 100\%$$

where: RPD = relative percent difference
C_1 = concentration of QA/QC sample
C_2 = concentration of associated original

1.11 Overall Assessment

All analytical data collected throughout the Reach A, Phase 1 project adhered to the sampling and analysis protocols described in the *Work for Laboratory Services, Appendix B, Clark Fork Site Sampling and Analysis Plan (SAP) Addendum, Reach A, Phase 1* (Tetra Tech/CDM, 2009).

APPENDIX F

RINSATE/FIELD BLANK RESULTS

Appendix F
Rinsate / Field Blank Results

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Sample Date	Sample ID	Laboratory Number	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
Field Blank								
9/9/2009	17000001	10112285022	7.6	U2	U0.079	U0.98	U1.2	U3.9
9/9/2009	17000002	10112285023	7.7	U1.7	U0.07	U0.87	U1	U3.5
9/9/2009	17000003	10112285025	7.4	U2.1	U0.083	U1	U1.2	U4.1
9/9/2009	17000004	10112285021	7.8	U1.8	U0.071	U0.89	U1.1	U3.5
9/9/2009	17000005	10112285024	7.6	U1.7	U0.069	U0.86	U1	U3.4
9/9/2009	17000006	10112886016	7.7	U2	U0.079	U0.98	U1.2	U3.9
9/9/2009	17000007	10112886015	8	U1.8	U0.073	U0.91	U1.1	U3.6
9/9/2009	17000008	10112885007	8.1	U1.8	U0.074	U0.92	U1.1	U3.7
9/9/2009	17000009	10112885009	8.3	U2	U0.079	U0.99	U1.2	U3.9
9/9/2009	17000010	10112885008	8.5	U2	U0.079	U0.98	U1.2	U3.9
9/16/2009	17000011	10113931004	7.5	U2	U0.081	U1	U1.2	U4
9/17/2009	17000012	10113931005	7.4	U1.7	U0.069	U0.86	U1	U3.4
9/14/2009	17000013	10113931006	7.5	U2.3	U0.093	U1.2	U1.4	U4.6
9/15/2009	17000014	10113931007	7.5	U2.4	U0.095	U1.2	U1.4	U4.8
9/10/2009	17000015	10113931008	7.6	U2	U0.082	U1	U1.2	U4.1
9/21/2009	17000016	10113931009	7.7	U2.2	U0.086	U1.1	U1.3	U4.3
9/11/2009	17000017	10113931010	7.5	U2.1	U0.085	U1.1	U1.3	U4.3
9/9/2009	17000018	10113931011	7.5	U1.8	U0.072	U0.9	U1.1	U3.6
9/8/2009	17000019	10113931012	7.2	U2.3	U0.092	U1.1	U1.4	U4.6
9/22/2009	17000020	10113931013	8.3	U1.7	U0.068	U0.84	U1	U3.4
9/28/2009	17000021	10113931014	7.9	U2.3	U0.093	U1.2	U1.4	U4.7
9/29/2009	17000022	10113931015	7.8	U1.9	U0.078	U0.97	U1.2	U3.9
9/30/2009	17000023	10113931016	7.8	U2.1	U0.083	U1	U1.2	U4.1
Rinsate Blank								
8/26/2009	RINSATE 1	10113897001	--	U10	U1	U10	U3	U20
8/27/2009	RINSATE 2	10113897002	--	U10	U1	U10	U3	U20
9/11/2009	RINSATE 3	10113897003	--	U10	U1	U10	U3	U20
9/8/2009	RINSATE 4	10113897004	--	U10	U1	U10	U3	U20
9/8/2009	RINSATE 5	10113897005	--	U10	U1	U10	U3	U20
9/9/2009	RINSATE 6	10113897006	--	U10	U1	U10	U3	U20
9/10/2009	RINSATE 7	10113897007	--	U10	U1	U10	U3	U20
9/11/2009	RINSATE 8	10113897008	--	U10	U1	U10	U3	U20
9/11/2009	RINSATE 9	10113897009	--	U10	U1	U10	U3	U20
9/14/2009	RINSATE 10	10113897010	--	U10	U1	U10	U3	U20
9/14/2009	RINSATE 11	10113897011	--	U10	U1	U10	U3	U20
9/15/2009	RINSATE 12	10113897012	--	U10	U1	U10	U3	U20
9/16/2009	RINSATE 13	10113897013	--	U10	U1	U10	U3	U20
9/17/2009	RINSATE 14	10113897014	--	U10	U1	U10	U3	U20
9/21/2009	RINSATE 15	10113897015	--	U10	U1	U10	U3	U20
9/22/2009	RINSATE 16	10113897016	--	U10	U1	U10	U3	U20
9/23/2009	RINSATE 17	10113897017	--	U10	U1	U10	U3	U20
9/24/2009	RINSATE 18	10113897018	--	U10	U1	U10	U3	U20
9/28/2009	RINSATE 19	10113897019	--	U10	U1	U10	U3	U20

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level
-- - Sample not collected/analyzed

Appendix F
Rinsate / Field Blank Results

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Sample Date	Sample ID	Laboratory Number	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
9/29/2009	RINSATE 20	10113897020	--	U10	U1	U10	U3	U20
9/29/2009	RINSATE 21	10113897021	--	U10	U1	U10	U3	U20
9/30/2009	RINSATE 22	10113897022	--	U10	U1	U10	U3	U20

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level
-- - Sample not collected/analyzed

APPENDIX G

NATURAL/DUPLICATE SAMPLE STATISTICS

Appendix G
Natural / Duplicate Sample Statistics
Clark Fork River Reach A, Phase 1
Warm Springs, Montana

PitID	Site	QC	SampDate	LabNum	Arsenic mg/kg		Cadmium mg/kg		Copper mg/kg		Lead mg/kg		Zinc mg/kg	
				PQL:	10		1		10		3		20	
Pit 01-022	10220006	N	8/25/2009	10111138013	616	7.80	35.6	4.66	2620	3.50	772	10.90	2190	23.47
Pit 01-022	10220006	D	8/25/2009	10111138015	666		37.3		2530		861		1730	
Pit 01-042	10420006	N	8/25/2009	10111783007	426	11.15	12.8	9.67	1820	16.16	604	41.12	1260	32.00
Pit 01-042	10420006	D	8/25/2009	10111783022	381		14.1		2140		398		1740	
Pit 01-088	10884248	N	9/30/2009	10113929017	23.5	1.50	4.2	1.90	396	81.85	24.8	37.89	483	6.80
Pit 01-088	10884248	D	9/30/2009	10113929009	22		6.1		166		16.9		517	
Pit 01-089	10892430	N	9/30/2009	10113930016	13.6	40.70	0.93	1.67	84.7	4.47	17.4	16.84	104	19.91
Pit 01-089	10892430	D	9/30/2009	10113929012	54.3		2.6		81		20.6		127	
Pit 01-093	10933642	N	9/21/2009	10113183013	308	6.02	22.9	62.46	2050	2.88	298	21.97	2410	28.47
Pit 01-093	10933642	D	9/21/2009	10113184004	290		12		2110		239		3210	
Pit 01-095	10950002	N	9/2/2009	10112441005	102	0.00	--		--		--		--	
Pit 01-095	10950002	D	9/2/2009	10112441006	102		--		--		--		--	
Pit 01-096	10960612	N	9/22/2009	10113322010	203	29.38	22.2	74.92	2360	104.42	234	92.68	2440	103.20
Pit 01-096	10960612	D	9/22/2009	10113322014	151		10.1		741		85.8		779	
Pit 01-098	10981824	N	9/30/2009	10113931001	32.6	18.30	4.5	2.30	312	3.59	23.6	10.50	1940	34.44
Pit 01-098	10981824	D	9/30/2009	10113929011	14.3		2.2		301		13.1		1370	
Pit 01-109	11093036	N	9/21/2009	10113183009	104	15.11	11.2	3.51	1660	48.69	196	8.51	2710	17.20
Pit 01-109	11093036	D	9/21/2009	10113183012	121		11.6		1010		180		3220	
Pit 01-126	11263036	N	9/16/2009	10112921004	4.8	41.10	8	93.69	1080	129.27	8.9	37.00	1200	82.06
Pit 01-126	11263036	D	9/16/2009	10112921007	45.9		22.1		232		45.9		2870	
Pit 01-127	11273036	N	9/17/2009	10112916018	2.4	0.40	2.1	0.50	2790	26.83	16.7	3.80	517	44.44
Pit 01-127	11273036	D	9/17/2009	10112916016	2.8		1.6		2130		12.9		329	
Pit 01-133	11332430	N	9/16/2009	10112916001	6.2	0.30	1.8	1.50	1290	88.79	16.2	53.72	422	41.65
Pit 01-133	11332430	D	9/16/2009	10112916002	6.5		3.3		3350		28.1		644	
Pit 01-151	11510612	N	9/9/2009	10112883001	96.9	7.07	7.5	5.19	511	8.79	70.8	11.95	563	8.50
Pit 01-151	11510612	D	9/9/2009	10112885002	104		7.9		558		79.8		613	
Pit 01-158	11581218	N	9/9/2009	10112883008	1610	138.06	85.4	121.66	11800	146.55	1120	120.00	5280	77.17
Pit 01-158	11581218	D	9/9/2009	10112885001	295		20.8		1820		280		2340	
Pit 01-165	11650612	N	9/9/2009	10112878005	801	47.50	20.1	91.79	1600	94.04	551	40.98	2120	30.40
Pit 01-165	11650612	D	9/8/2009	10112766016	1300		54.2		4440		835		2880	
Pit 01-165	11651218	N	9/9/2009	10112878006	2110	176.11	56.9	6.13	20300	42.39	1270	142.78	4850	30.27
Pit 01-165	11651218	D	9/8/2009	10112766015	134		60.5		13200		212		6580	
Pit 01-166	11660612	N	9/9/2009	10112883015	1190	26.91	54.4	30.13	6750	56.76	665	19.54	2470	15.33
Pit 01-166	11660612	D	9/9/2009	10112885004	1560		73.7		12100		809		2880	
Pit 01-166	11661218	N	9/9/2009	10112883016	57.1	15.30	12.4	31.78	1210	33.82	35.6	14.14	2280	11.11
Pit 01-166	11661218	D	9/9/2009	10112885003	41.8		9		860		30.9		2040	
Pit 01-170	11701824	N	9/8/2009	10112764002	1240	31.86	44.6	42.06	1590	3.19	998	23.52	1420	9.59
Pit 01-170	11701824	D	9/8/2009	10112765013	1710		29.1		1540		788		1290	
Pit 01-175	11750612	N	9/9/2009	10112878012	831	36.34	17.2	99.85	4230	7.51	562	23.96	1770	18.46
Pit 01-175	11750612	D	9/9/2009	10112767014	1200		51.5		4560		715		2130	
Pit 01-184	11840006	N	9/11/2009	10112885012	270	6.45	16.4	1.81	1490	17.18	325	12.68	1010	2.91
Pit 01-184	11840006	D	9/11/2009	10112885010	288		16.7		1770		369		981	
Pit 01-186	11861218	N	9/9/2009	10112878019	474	79.54	16.1	99.06	2770	57.03	369	81.06	2130	29.03

Appendix G
Natural / Duplicate Sample Statistics
Clark Fork River Reach A, Phase 1
Warm Springs, Montana

PitID	Site	QC	SampDate	LabNum	Arsenic mg/kg		Cadmium mg/kg		Copper mg/kg		Lead mg/kg		Zinc mg/kg	
				PQL:	10		1		10		3		20	
Pit 01-186	11861218	D	9/9/2009	10112767015	1100		47.7		4980		872		1590	
Pit 01-192	11920006	N	9/14/2009	10112768013	368	10.29	18.6	6.09	1250	21.43	486	17.69	895	3.51
Pit 01-192	11920006	D	9/14/2009	10112767019	332		17.5		1550		407		927	
Pit 01-194	11940612	N	9/11/2009	10112886001	844	13.27	46.1	20.62	20500	51.53	776	18.75	3590	23.15
Pit 01-194	11940612	D	9/11/2009	10112885011	964		56.7		12100		643		4530	
Pit 01-195	11950612	N	9/11/2009	10112879015	509	47.26	13.1	48.55	1910	51.07	408	1.22	1280	19.72
Pit 01-195	11950612	D	9/11/2009	10112879005	824		21.5		3220		413		1560	
Pit 01-202	12020006	N	9/14/2009	10112768007	560	10.97	27.3	32.77	3130	26.11	392	68.01	2230	32.65
Pit 01-202	12020006	D	9/14/2009	10112767020	625		38		4070		796		3100	
Pit 01-208	12080612	N	9/11/2009	10112888003	75.5	158.49	5.6	132.33	702	17.31	65.8	172.23	681	105.38
Pit 01-208	12080612	D	9/11/2009	10112886008	652		27.5		835		882		211	
Pit 01-214	12140612	N	9/14/2009	10112769004	2000	4.60	45.1	52.49	7810	56.76	1140	4.48	4110	10.16
Pit 01-214	12140612	D	9/14/2009	10112767018	1910		77.2		14000		1090		4550	
Pit 01-221	12211218	N	9/10/2009	10112880017	1330	20.88	73.4	48.81	7080	17.64	793	9.23	3950	30.99
Pit 01-221	12211218	D	9/10/2009	10112879006	1640		44.6		8450		723		2890	
Pit 01-410	14100612	N	9/9/2009	10112881006	357	23.27	18.3	11.34	619	15.64	404	24.73	748	10.27
Pit 01-410	14100612	D	9/9/2009	10112767016	451		20.5		724		518		829	
Pit 01-416	14160002	N	9/30/2009	10113929015	585	25.76	41.2	18.70	4330	47.08	533	13.96	2910	7.49
Pit 01-416	14160002	D	9/30/2009	10113929010	758		49.7		2680		613		2700	
Pit 01-418	14180006	N	9/30/2009	10113930004	234	10.91	14.8	6.54	849	2.75	169	34.72	510	1.98
Pit 01-418	14180006	D	9/30/2009	10113929013	261		15.8		826		240		500	
Pit 01-418	14180612	N	9/30/2009	10113930005	198	25.17	12.3	10.04	864	3.06	143	29.76	420	19.90
Pit 01-418	14180612	D	9/30/2009	10113929014	255		13.6		838		193		344	
Pit 01-543	15430612	N	9/15/2009	10112773013	17.3	15.40	11.7	18.60	2080	2.84	29	26.09	2670	9.96
Pit 01-543	15430612	D	9/15/2009	10112915001	32.7		14.1		2140		37.7		2950	
Pit 01-544	15441218	N	9/9/2009	10112881014	1910	11.82	87.5	0.23	1440	0.70	975	12.05	1950	7.88
Pit 01-544	15441218	D	9/9/2009	10112883020	2150		87.7		1430		1100		2110	
Pit 01-547	15471824	N	9/8/2009	10112766020	111	5.26	11.1	37.36	908	27.70	104	8.29	2280	0.44
Pit 01-547	15471824	D	9/8/2009	10112766014	117		16.2		1200		113		2270	

- Absolute Value Difference (one or both values less than 5x PQL)
- Relative Percent Difference (both values greater than 5x PQL)

Red - Exceedance of PQL for AVD or 35% for RPD
mg/kg - millgrams per kilogram
-- - Sample not collected / analyzed

APPENDIX H

NATURAL/DUPLICATE SAMPLE COMPARISON

Appendix H
Natural/Duplicate Sample Comparison

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	QC	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
Pit 01-022														
1140511.60	**723005.45**	**4793.72**	**8/25/2009**	**10220006**	**N**	**10111138013**	Fail	Fail	8	616	35.6	2620	772	2190
1140511.60	723005.45	4793.72	8/25/2009	10220006	D	10111138015	Fail	Fail	8	666	37.3	2530	861	1730
Pit 01-042														
1140393.64	**723224.08**	**4793.41**	**8/25/2009**	**10420006**	**N**	**10111783007**	Fail	Fail	8.4	426	12.8	1820	604	1260
1140393.64	723224.08	4793.41	8/25/2009	10420006	D	10111783022	Fail	Fail	8	381	14.1	2140	398	1740
Pit 01-088														
1140615.11	**724006.38**	**4790.38**	**9/30/2009**	**10884248**	**N**	**10113929017**	Fail	Fail	8.1	23.5	4.2	396	24.8	483
1140615.11	724006.38	4790.38	9/30/2009	10884248	D	10113929009	Fail	Pass	8.1	22	6.1	166	16.9	517
Pit 01-089														
1140755.89	**724075.22**	**4790.60**	**9/30/2009**	**10892430**	**N**	**10113930016**	Pass	Pass	8.1	13.6	0.93	84.7	17.4	104
1140755.89	724075.22	4790.60	9/30/2009	10892430	D	10113929012	Pass	Pass	8.4	54.3	2.6	81	20.6	127
Pit 01-093														
1141376.41	**724128.66**	**4787.35**	**9/21/2009**	**10933642**	**N**	**10113183013**	Fail	Fail	7.9	308	22.9	2050	298	2410
1141376.41	724128.66	4787.35	9/21/2009	10933642	D	10113184004	Fail	Fail	7.8	290	12	2110	239	3210
Pit 01-095														
1141632.18	**724134.87**	**4789.54**	**9/2/2009**	**10950002**	**N**	**10112441005**	Pass	Pass	--	--102	--	--	--	--
1141632.18	724134.87	4789.54	9/2/2009	10950002	D	10112441006	Fail	Fail	8.4	102	9.4	799	146	485
Pit 01-096														
1140756.58	**724248.60**	**4788.19**	**9/22/2009**	**10960612**	**N**	**10113322010**	Fail	Fail	8	203	22.2	2360	234	2440
1140756.58	724248.60	4788.19	9/22/2009	10960612	D	10113322014	Fail	Fail	8.1	151	10.1	741	85.8	779
Pit 01-098														
1141030.89	**724229.64**	**4789.61**	**9/30/2009**	**10981824**	**N**	**10113931001**	Fail	Fail	8	32.6	4.5	312	23.6	1940
1141030.89	724229.64	4789.61	9/30/2009	10981824	D	10113929011	Fail	Fail	8.1	14.3	2.2	301	13.1	1370
Pit 01-109														
1141377.23	**724373.42**	**4786.46**	**9/21/2009**	**11093036**	**N**	**10113183009**	Fail	Fail	8	104	11.2	1660	196	2710

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

N - Natural sample
D - Duplicate sample

Appendix H
Natural/Duplicate Sample Comparison

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	QC	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141377.23	724373.42	4786.46	9/21/2009	11093036	D	10113183012	Fail	Fail	8.1	121	11.6	1010	180	3220
Pit 01-126														
1141501.23	**724621.04**	**4785.88**	**9/16/2009**	**11263036**	**N**	**10112921004**	Fail	Fail	8	4.8	8	1080	8.9	1200
1141501.23	724621.04	4785.88	9/16/2009	11263036	D	10112921007	Fail	Fail	8.1	45.9	22.1	232	45.9	2870
Pit 01-127														
1141618.41	**724629.22**	**4786.87**	**9/17/2009**	**11273036**	**N**	**10112916018**	Fail	Fail	7.4	U2.4	2.1	2790	16.7	517
1141618.41	724629.22	4786.87	9/17/2009	11273036	D	10112916016	Fail	Fail	7.8	U2.8	1.6	2130	12.9	329
Pit 01-133														
1141377.66	**724765.99**	**4784.87**	**9/16/2009**	**11332430**	**N**	**10112916001**	Fail	Fail	6.9	6.2	1.8	1290	16.2	422
1141377.66	724765.99	4784.87	9/16/2009	11332430	D	10112916002	Fail	Fail	7.4	6.5	3.3	3350	28.1	644
Pit 01-151														
1142070.29	**724989.55**	**4784.83**	**9/9/2009**	**11510612**	**N**	**10112883001**	Fail	Fail	7.8	96.9	7.5	511	70.8	563
1142070.29	724989.55	4784.83	9/9/2009	11510612	D	10112885002	Fail	Fail	8	104	7.9	558	79.8	613
Pit 01-158														
1142002.98	**725116.33**	**4783.66**	**9/9/2009**	**11581218**	**N**	**10112883008**	Fail	Fail	8	1610	85.4	11800	1120	5280
1142002.98	725116.33	4783.66	9/9/2009	11581218	D	10112885001	Fail	Fail	7.7	295	20.8	1820	280	2340
Pit 01-165														
1142032.94	**725248.88**	**4783.27**	**9/9/2009**	**11650612**	**N**	**10112878005**	Fail	Fail	7.7	801	20.1	1600	551	2120
1142032.94	725248.88	4783.27	9/8/2009	11650612	D	10112766016	Fail	Fail	7.9	1300	54.2	4440	835	2880
1142032.94	**725248.88**	**4783.27**	**9/9/2009**	**11651218**	**N**	**10112878006**	Fail	Fail	7.4	2110	56.9	20300	1270	4850
1142032.94	725248.88	4783.27	9/8/2009	11651218	D	10112766015	Fail	Fail	8	134	60.5	13200	212	6580
Pit 01-166														
1142129.41	**725248.21**	**4783.09**	**9/9/2009**	**11660612**	**N**	**10112883015**	Fail	Fail	7.9	1190	54.4	6750	665	2470
1142129.41	725248.21	4783.09	9/9/2009	11660612	D	10112885004	Fail	Fail	7.4	1560	73.7	12100	809	2880
1142129.41	**725248.21**	**4783.09**	**9/9/2009**	**11661218**	**N**	**10112883016**	Fail	Fail	8.1	57.1	12.4	1210	35.6	2280
1142129.41	725248.21	4783.09	9/9/2009	11661218	D	10112885003	Fail	Fail	8	41.8	9	860	30.9	2040

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

N - Natural sample
D - Duplicate sample

Appendix H
Natural/Duplicate Sample Comparison

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	QC	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
Pit 01-170														
1141328.09	**725343.85**	**4783.54**	**9/8/2009**	**11701824**	**N**	**10112764002**	Fail	Fail	4.3	1240	44.6	1590	998	1420
1141328.09	725343.85	4783.54	9/8/2009	11701824	D	10112765013	Fail	Fail	5.3	1710	29.1	1540	788	1290
Pit 01-175														
1142037.14	**725354.33**	**4783.00**	**9/9/2009**	**11750612**	**N**	**10112878012**	Fail	Fail	6.2	831	17.2	4230	562	1770
1142037.14	725354.33	4783.00	9/9/2009	11750612	D	10112767014	Fail	Fail	6.4	1200	51.5	4560	715	2130
Pit 01-184														
1141712.05	**725501.17**	**4781.07**	**9/11/2009**	**11840006**	**N**	**10112885012**	Fail	Fail	4.9	270	16.4	1490	325	1010
1141712.05	725501.17	4781.07	9/11/2009	11840006	D	10112885010	Fail	Fail	5	288	16.7	1770	369	981
Pit 01-186														
1142020.54	**725514.85**	**4782.58**	**9/9/2009**	**11861218**	**N**	**10112878019**	Fail	Fail	7.3	474	16.1	2770	369	2130
1142020.54	725514.85	4782.58	9/9/2009	11861218	D	10112767015	Fail	Fail	7.7	1100	47.7	4980	872	1590
Pit 01-192														
1141395.05	**725631.79**	**4780.68**	**9/14/2009**	**11920006**	**N**	**10112768013**	Fail	Fail	4.6	368	18.6	1250	486	895
1141395.05	725631.79	4780.68	9/14/2009	11920006	D	10112767019	Fail	Fail	4.7	332	17.5	1550	407	927
Pit 01-194														
1141639.07	**725644.71**	**4782.12**	**9/11/2009**	**11940612**	**N**	**10112886001**	Fail	Fail	7.4	844	46.1	20500	776	3590
1141639.07	725644.71	4782.12	9/11/2009	11940612	D	10112885011	Fail	Fail	7	964	56.7	12100	643	4530
Pit 01-195														
1141755.78	**725629.07**	**4781.19**	**9/11/2009**	**11950612**	**N**	**10112879015**	Fail	Fail	8	509	13.1	1910	408	1280
1141755.78	725629.07	4781.19	9/11/2009	11950612	D	10112879005	Fail	Fail	8	824	21.5	3220	413	1560
Pit 01-202														
1141250.21	**725730.27**	**4780.09**	**9/14/2009**	**12020006**	**N**	**10112768007**	Fail	Fail	7.8	560	27.3	3130	392	2230
1141250.21	725730.27	4780.09	9/14/2009	12020006	D	10112767020	Fail	Fail	7.6	625	38	4070	796	3100
Pit 01-208														
1141882.57	**725757.79**	**4781.17**	**9/11/2009**	**12080612**	**N**	**10112888003**	Fail	Fail	8	75.5	5.6	702	65.8	681

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

N - Natural sample
D - Duplicate sample

Appendix H
Natural/Duplicate Sample Comparison

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	QC	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141882.57	725757.79	4781.17	9/11/2009	12080612	D	10112886008	Fail	Fail	8	652	27.5	835	882	211
Pit 01-214														
1141252.87	**725850.65**	**4780.76**	**9/14/2009**	**12140612**	**N**	**10112769004**	Fail	Fail	8.2	2000	45.1	7810	1140	4110
1141252.87	725850.65	4780.76	9/14/2009	12140612	D	10112767018	Fail	Fail	8	1910	77.2	14000	1090	4550
Pit 01-221														
1142003.06	**725871.49**	**4780.21**	**9/10/2009**	**12211218**	**N**	**10112880017**	Fail	Fail	7.8	1330	73.4	7080	793	3950
1142003.06	725871.49	4780.21	9/10/2009	12211218	D	10112879006	Fail	Fail	8	1640	44.6	8450	723	2890
Pit 01-410														
1142118.26	**725479.88**	**4782.59**	**9/9/2009**	**14100612**	**N**	**10112881006**	Fail	Fail	7.7	357	18.3	619	404	748
1141187.51	725608.98	4781.89	9/9/2009	14100612	D	10112767016	Fail	Fail	7.6	451	20.5	724	518	829
Pit 01-416														
1140880.77	**725398.10**	**4782.57**	**9/30/2009**	**14160002**	**N**	**10113929015**	Fail	Fail	8.2	585	41.2	4330	533	2910
1140880.77	725398.10	4782.57	9/30/2009	14160002	D	10113929010	Fail	Fail	8.2	758	49.7	2680	613	2700
Pit 01-418														
1141098.82	**722753.91**	**4797.35**	**9/30/2009**	**14180006**	**N**	**10113930004**	Fail	Fail	6.3	234	14.8	849	169	510
1141098.82	722753.91	4797.35	9/30/2009	14180006	D	10113929013	Fail	Fail	6.2	261	15.8	826	240	500
1141098.82	**722753.91**	**4797.35**	**9/30/2009**	**14180612**	**N**	**10113930005**	Fail	Fail	5.6	198	12.3	864	143	420
1141098.82	722753.91	4797.35	9/30/2009	14180612	D	10113929014	Fail	Fail	5.4	255	13.6	838	193	344
Pit 01-543														
1141193.93	**725119.95**	**4782.62**	**9/15/2009**	**15430612**	**N**	**10112773013**	Fail	Fail	8.2	17.3	11.7	2080	29	2670
1141193.93	725119.95	4782.62	9/15/2009	15430612	D	10112915001	Fail	Fail	8.2	32.7	14.1	2140	37.7	2950
Pit 01-544														
1141124.09	**725364.11**	**4782.22**	**9/9/2009**	**15441218**	**N**	**10112881014**	Fail	Fail	5.4	1910	87.5	1440	975	1950
1141124.09	725364.11	4782.22	9/9/2009	15441218	D	10112883020	Fail	Fail	5.1	2150	87.7	1430	1100	2110
Pit 01-547														
1141614.43	**725492.29**	**4780.78**	**9/8/2009**	**15471824**	**N**	**10112766020**	Fail	Fail	8	111	11.1	908	104	2280

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

N - Natural sample
D - Duplicate sample

Appendix H
Natural/Duplicate Sample Comparison

Clark Fork River Reach A, Phase 1
Warm Springs, Montana

Easting	Northing	Elev.	Sample Date	Sample ID	QC	Laboratory Number	Pass / Fail 500 mg/kg	Pass / Fail 800 mg/kg	pH (s.u.)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
1141614.43	725492.29	4780.78	9/8/2009	15471824	D	10112766014	Fail	Fail	7.9	117	16.2	1200	113	2270

Notes:

(s.u.) - Standard units
(mg/kg) - Millgrams per kilogram
U - Below laboratory practical quantitation level

N - Natural sample
D - Duplicate sample