DATA MANAGEMENT PLAN FOR
ENVIRONMENTAL DATA COLLECTION ACTIVITIES
PHASE II RCRA FACILITY INVESTIGATION
EAST HELENA FACILITY

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1.0 INTRODUCTION

This document represents the data management plan (DMP) for environmental data collection activities at the former Asarco lead smelter in East Helena, Montana, (the East Helena Facility or the Facility). The DMP has been prepared at the request of the Montana Trust Group, LLC, as Trustee for the Montana Environmental Custodial Trust (the Custodial Trust), in accordance with U.S. Environmental Protection Agency (EPA) guidance (EPA, 1994). The DMP is intended to be used in conjunction with other East Helena Facility project documents, including, but not limited to Field Sampling and Analysis Plans (FSAPs), Quality Assurance Project Plans (QAPP), Groundwater/Surface Water Monitoring Plans and/or other Work Plans (WPs) and documents that have been or will be prepared to address ongoing environmental work at the Facility under the Resource Conservation and Recovery Act (RCRA). The procedures outlined in this DMP will apply to work conducted under the Phase II RCRA Facility Investigation (RFI) Site Characterization Work Plan (Hydrometrics, 2010a) and other Phase II RFI activities, including the Baseline Ecological Risk Assessment (BERA) and the Human Health Risk Assessment (HHRA) and the associated Quality Assurance Project Plan (Hydrometrics, 2010b) and Field Sampling and Analysis Plan (Hydrometrics, 2010c). The DMP will also be used in connection with other data collection activities, studies and investigations at the Facility pursuant to the terms and conditions of the US Federal District Court RCRA Consent Decree (Re: Case No. CV98-3-H-CCL US District of Montana, dated May 5, 1998), subject to modifications currently being finalized by the Custodial Trust and the United States Department of Justice (DOJ) and the US Environmental Protection Agency (EPA), who are also beneficiaries of the Custodial Trust (the US Beneficiaries).

The DMP is a critical component of the overall quality assurance system for data collection and management activities for the East Helena Facility. The purpose of the DMP is to ensure that all data collected in support of the RCRA corrective action process is properly documented, recorded, and distributed. As outlined in EPA guidance (EPA, 1994), the DMP consists of a plan to document and track investigation data and results; therefore, this DMP contains guidance regarding:

- Data documentation;
- Project file requirements;

- Progress reporting (as required by the Consent Decree); and
- Presentation of raw data and conclusions.

1.1 DATA MANAGEMENT PLAN SCOPE AND OBJECTIVES

This DMP sets forth a description of how data collection, data management, data reporting activities, and communication of information to EPA and other regulatory agencies during the RCRA corrective action process for the East Helena Facility will be conducted. As noted previously, the DMP is applicable to data collected and analyzed during the Phase II RFI planned for 2010, ongoing long-term Post-RI/FS groundwater and surface water monitoring, and any subsequent data collection efforts associated with the corrective measures phase of the project.

Specific objectives of this DMP include:

1. Describe methods for documenting field data and sample collection activities;
2. Present procedures for management of sampling and analytical data, including establishment and maintenance of a project database; and
3. Describe progress reporting requirements (as required by the Consent Decree) and the general approach for presenting both raw data and the results of field investigations.

The DMP is an addendum to the Phase II RFI Site Characterization Work Plan (Hydrometrics, 2010a) (the Phase II RFI Work Plan), with additional addenda including the East Helena Facility data collection QAPP (Hydrometrics, 2010b), a Community Relations Plan (Montana Environmental Trust Group, 2010), a Borehole Abandonment Plan (Hydrometrics, 2010c), a Project Management Plan (Hydrometrics, 2010d), and a Health and Safety Plan (Brox, 2010). The remainder of Section 1 provides a brief overview of the project background and setting (additional project detail is available in the Phase II Work Plan). Section 2 of the DMP presents data documentation procedures. Section 3 describes data management, including data review and the establishment and maintenance of the project database. Section 4 briefly reviews project reporting requirements, and report references are in Section 5.

1.2 SITE DESCRIPTION AND BACKGROUND

The East Helena Facility is a former custom lead smelter located on approximately 142 acres. The Facility is located primarily on the Prickly Pear Creek alluvial plain, and is bounded to the south by Upper Lake and Lower Lake, to the east and northeast by Prickly Pear Creek, and on the west and southwest by uplands or foothills comprised of tertiary-age sediments. State Highway 12 and the American Chemet Facility (a manufacturer and marketer of metals-based chemicals) borders the Facility on the north, with the Town of East Helena located a short distance north of the Facility. Plant operations were suspended in April 2001 due to a downturn in economic conditions. Ownership of the Facility was transferred from ASARCO, LLC to the Montana Environmental Trust Group, LLC, Trustee for the Montana Environmental Custodial Trust in December 2009.

Previous investigations of the Facility have shown that surface and subsurface soils contain elevated concentrations of metals including, but not limited to, cadmium, copper, lead and zinc, as well as arsenic. In September 1984, the U.S. Environmental Protection Agency (EPA) listed the East Helena Facility on the National Priorities List (NPL) pursuant to Section 105 of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). From 1984 through 1997, remedial actions conducted at the Facility by Asarco consisted of either voluntary actions or actions implemented as part of certain settlement agreements between EPA and Asarco under CERCLA. In 1997, EPA initiated a transfer of responsibility for on-going remedial activities at the Facility from its CERCLA program to its "corrective action" program under RCRA. A Consent Decree effective May 5, 1998 between EPA and Asarco (U.S. District Court, 1998) initiated the corrective action process in accordance with the RCRA program. An RFI was required by EPA for the Facility, with the RFI to be conducted in two phases. Objectives of the Phase I RFI included characterization and investigation of portions and aspects of the Facility not addressed as part of interim measures or other prior studies (ACI, 2005). Phase II of the RFI is intended to address site characterization issues not addressed in the Phase I RFI or other previous investigations, and to assess risks posed by current conditions at the Facility through preparation of human health and ecological risk assessments. Information obtained through the Phase I and Phase II RFI will be used to prepare a RCRA Corrective Measures Study (CMS) for the East Helena Facility.

Post-RI/FS (long-term) groundwater and surface water monitoring has also been conducted at the Facility from 1991 to the present. This monitoring program consists of monitoring groundwater and surface water sample collection semiannually (typically in May and November) within and adjacent to the East Helena Facility. The data generated through this long-term monitoring program is used to evaluate long-term trends in groundwater and surface water quality and to characterize the status and evolution of groundwater contaminant plumes beneath and downgradient of the facility, with an emphasis on arsenic and (more recently) selenium migration.

In addition to the ongoing site characterization and remediation efforts, as part of the 1998 CD with EPA and separate February 2005 and October 2007 consent decrees with the Montana Department of Environmental Quality (MDEQ), Asarco began demolishing structures and disposing of demolition waste in two Corrective Action Management Units (CAMUs) constructed on site. Groundwater detection monitoring activities related to operation of the CAMUs are conducted quarterly at a suite of wells adjacent to the Phase I and Phase II CAMU cells.

1.3 DATA MANAGEMENT ORGANIZATION AND RESPONSIBILITY

Figure 1-1 is an organization chart illustrating the relationships between the Custodial Trust, data generators, and data users. In general, environmental data will be collected and documented by field personnel, under the supervision of the Custodial Trust, task-specific project managers, and the Quality Assurance (QA) manager. Data management and validation personnel will ensure that field and laboratory data are properly documented,

FIGURE 1-1. EAST HELENA FACILITY ENVIRONMENTAL DATA MANAGEMENT ORGANIZATION CHART

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reviewed, and entered into the project database in a timely manner. Data users, including EPA, state regulators, and other stakeholders, will have access to the project database for analysis and decision-making.

2.0 DATA DOCUMENTATION PROCEDURES

This section describes how data collected, analyzed and validated as part of the Phase II RFI and other Facility data collection activities will be recorded and documented. Complete and accurate documentation is essential for all aspects of the Phase II RFI, including: field sampling and data collection; laboratory analysis; independent data validation; and technical and corrective measure studies. Data documentation and recordation requirements, standards and procedures set forth in this DMP are required to ensure overall project quality as well as compliance with the Facility QAPP and project-specific FSAPs or other work plans.

Environmental data obtained during the Phase II RFI and other site investigation activities will be thoroughly documented in the field using the procedures outlined in Sections 2.6 and 3.3 of the East Helena Facility QAPP (Hydrometrics, 2010b). Overall data flow, from field sample collection and documentation, through laboratory analysis, data review and validation, and entry into the permanent project database, is described in Figure 2-1. The general steps in the generation and documentation of environmental data include:

1. Obtaining unique sample identification codes, along with field forms, field notebooks, and information from project planning documents (e.g., FSAPs and QAPPs) regarding sample locations, depth intervals, quality control (QC) sample frequency, analytical parameters and required detection limits, and other pertinent information;
2. Collection of samples and recording of field instrument calibrations, field parameter measurements, and other sampling information;
3. Transmittal of samples to the analytical laboratory under chain-of-custody, with accompanying parameters lists showing required analytical methods and detection limits;
4. Transmittal of field documentation (including chain-of-custody information) to data management personnel;
5. Transmittal of analytical data to data management personnel;
6. Review and validation of field and laboratory analytical data by data management personnel; and
7. Entry of validated data into the project database.

2.1 FIELD DATA DOCUMENTATION

Prior to entering the field to collect data and samples, all appropriate field notebooks, field forms, and unique sample identification codes must be obtained by field personnel from the data management team. Field personnel should reference the project QAPP, FSAPs, and associated Standard Operating Procedures (SOPs) to ensure that the proper equipment and forms are utilized. Field documentation requirements and the project sample numbering scheme are outlined in Section 3.3 of the East Helena Facility QAPP. Appendix C of the QAPP includes the following SOPs relevant to field data collection and documentation:

- HSOP-2: Determination, Identification, and Description of Field Sampling Sites;
- HSOP-4: Chain-of-Custody Procedures, Packing and Shipping Samples;

FIGURE 2-1. EAST HELENA FACILITY DATA DOCUMENTATION AND MANAGEMENT PROCEDURE

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- HSOP-29: Labeling and Documentation of Samples; and
- HSOP-31: Field Notebooks.

Field notebooks and field forms, described in the QAPP, FSAP, and associated SOPs will be used to document events that occur during a particular field activity. Standardized field data sheets, such as soil boring logs, monitoring well construction forms, and water sampling forms will be used in addition to field notebooks. All field measurements and observations will be recorded in field notebooks and on field forms as they are collected. Entries will be legible, recorded in ink, and signed and dated by the person recording the data. The language will be factual, objective, and free of bias or inappropriate terminology. If errors are made, erroneous entries will be legibly crossed out and corrected in a space adjacent to the original entry. Corrections will be initialed by the person making the correction, and if the correction is made on a different date than the original entry, the correction will also be dated.

Raw data documentation will be delivered by field personnel directly to the project Data Management Team and/or to the Data Management and Validation Coordinator (Figure 2-1). Raw field data will typically consist of calibration records, field parameter measurements, sample location and methodology descriptions, field sample identification numbers, dates and times of sample collection, completed field forms, and any other observations recorded during field activities.

2.2 LABORATORY DATA DOCUMENTATION

Each sample on the chain-of-custody will be assigned a unique laboratory sample number when received at the laboratory, which will then be used to cross-reference the unique field sample number and to track analytical results for the sample. All raw analytical data will be recorded in dedicated laboratory notebooks and/or entered (or directly downloaded) into the laboratory's information management system (LIMS). Analytical results recorded in laboratory notebooks or downloaded to the LIMS will be accompanied by other pertinent information, such as the field sample identification number and the laboratory sample number, the analytical method used, name of analyst, the date of analysis, matrix sampled, reagent concentrations, and instrument settings. Each page of the notebooks shall be signed and dated by the laboratory analyst.

Quality control data (e.g., laboratory duplicates, matrix spikes, matrix spike duplicates, and laboratory control standards) will be compared to the method acceptance criteria by the analyst. Reanalysis will be performed if certain QC results exceed acceptance criteria. Data associated with QC criteria exceedances not requiring reanalysis will be qualified according to the laboratory's quality assurance plan (QAP). Acceptable data (with QC summaries) will be sent to the Laboratory QA Manager for review. Case narratives will be prepared by the QA manager which will include information concerning data exceeding QC limits, and any other anomalous conditions encountered during sample analysis. After the Laboratory QA Manager approves these data, a final laboratory report will be prepared.

2.3 DATA TRANSFORMATION AND DATA REDUCTION

Data transformation and reduction includes the conversion of the raw data into an electronic form for efficient and accurate tracking, retrieval, use, and presentation of the information. Before data is subjected to the project-specified data review and validation process, it is considered part of the working data record. Data is transcribed or downloaded into the electronic database managed by the Data Management and Validation Coordinator (see Section 3.0).

2.3.1 Field Data Reduction

Upon receipt of field documentation, the Data Management Team will:

- Make photocopies of field notebooks and field forms;
- Scan field notes and field forms into electronic format (e.g., Adobe Portable Document Format (pdf)) and save scanned files to the project directory on the network;
- Provide the copies to the Data Management and Validation Coordinator; and
- File originals in a project-specific location at the Hydrometrics Helena, Montana office.

Any raw electronic data obtained directly from field equipment, such as data loggers, will be saved to a network computer (with daily backup). Saved files are identified with a unique file description that references the collection date. These electronic data files will be maintained on the terminal server at the Hydrometrics Helena, Montana office. Files will be incorporated into the project database (see Section 3.2.2) and/or will be distributed to data users via regular progress reports and annual reports.

Written field measurement data will be manually entered into electronic format and stored in the project database discussed in Section 3.0. In addition, photocopies and scanned electronic copies of the manually written field records will be maintained as part of the data record.

2.3.2 Laboratory Data Reduction

Laboratory data reduction procedures will follow protocol described in the laboratory's QA manuals, included as Appendix D of the QAPP (Hydrometrics, 2010b). Raw laboratory data will be reduced to electronic data deliverables (EDDs) suitable for transmittal into the project database (e.g., comma-separated variable or similar format), and will also be provided in hard copy format. These deliverables will consist of case narratives, chain-of-custody records, analytical dates, methods, results, detection limits, and specific QC sample results as described in the project QAPP. EDDs and/or hard copies of the data will be delivered directly to the Data Management Team and the Data Management and Validation Coordinator. While raw laboratory data will not be delivered to the Data Management Team, the laboratory will archive raw data in accordance with laboratory QA procedures, and this data will be available and provided for review if necessary during the data review and validation process. A hard copy and electronic (pdf) copy of the laboratory analytical report will also be maintained as part of the data record.

3.0 DATA MANAGEMENT PROCEDURES

Data management procedures for environmental data related to the East Helena Facility are presented in Section 3.10 of the Facility QAPP (Hydrometrics, 2010b). For purposes of the DMP, data management refers to the review, verification, and validation of field and laboratory environmental data, as well as the establishment and maintenance of an electronic project database, accessible by a range of data users and decision makers, including regulatory agencies, risk assessors, groundwater modelers, and other stakeholders and interested parties (Figure 1-1).

3.1 DATA VERIFICATION AND VALIDATION

As discussed in the East Helena Facility QAPP, validation or data quality review is a systematic process for determining the compliance of environmental data with the applicable method requirements and project specifications. Verification of data at transformation will be performed as the first step in the validation process. All data deliverables containing analytical data and quality control information will be reviewed for overall completeness of the data package. Completeness checks will be performed for all data to confirm that the data deliverables have met the requirements of the project planning documents. The number and type of samples collected will be compared with project specifications to ensure conformance with the sampling process design. Review of sample collection and handling procedures will include verification of the following:

- Completeness of submittal packages;
- Completeness of field documentation, including chain-of-custody documentation;
- Field equipment calibration and maintenance and/or quality of field measurements;
- Adherence to proper sample collection procedures;
- Accurate cross-referencing of field sample identification codes with sample site locations; and
- Absence of data entry errors.

The review of laboratory deliverables will include verification of the following:

- Completeness of submittal packages, including chain-of-custody documents, case narrative, sample analyses, and QC sample results;
- Proper field sample identification with cross-references to laboratory sample identification; and
- Absence of data entry errors.

Data validation will include a detailed review of all analytical results, including:

- Reporting limits (RLs) and practical quantitation limits (PQLs) vs. project required detection limits (PRDLs);
- Holding times;
- Analytical methods;

- Field QC sample results; and
- Laboratory QC sample results.

Data validation will be conducted by the project Data Management and Validation Coordinator, with the cooperation of the field sampling and data management personnel associated with site characterization and risk assessment contractors. Specific technical criteria for data validation are outlined in Section 5.2 and 5.3 of the East Helena Facility QAPP (Hydrometrics, 2010b), including data qualifiers to be applied during validation.

The primary outcome of the data verification and validation process will be a determination by the Data Management and Validation Coordinator as to the usability of analytical results. The need for corrective action due to sampling or analytical deficiencies may be identified during data verification and validation. Unusable data identified during the data verification process may necessitate resampling by the field team or reanalysis of samples by the laboratory. If the Data Management and Validation Coordinator determines that data deficiences must be corrected, the QA Manager and Project Manager will be responsible for approving the implementation of corrective action, including potential resampling and/or reanalysis. Corrective actions will be documented by the QA Manager, and this documentation will become part of the data record.

3.2 PERMANENT DATA RECORD

Following data verification/validation procedures, data will be entered into the permanent project data record. The primary storage facility for the RCRA corrective action technical data and project files is currently at the Hydrometrics Helena, Montana office. A chronological project file system has been established to properly organize the hard copies of the data for efficient retrieval and usage. Electronic data records will be stored on the Hydrometrics network, and will also be archived to secondary backup computer media to ensure the integrity of the data in the event of failure of the primary computer storage media. Copies of all project data will also be maintained by the Data Management and Validation Coordinator.

The permanent data record for the East Helena Facility will incorporate (in both hard copy and electronic format) the types of information stipulated in EPA guidance for RCRA corrective action (EPA, 1994), including:

- Unique field sample identification codes;
- Sampling/measurement locations and types;
- Sampling or measurement raw data;
- Unique laboratory sample identification codes;
- Analytical parameter description; and
- Result of the analysis with applicable qualifiers.

3.2.1 Project Files

The project file will consist of, at a minimum:

- Copies of all field documentation, including field notebooks, field forms and sampling logs, and chain-of-custody documentation;
- Copies of all laboratory analytical results, including sample results and associated QC sample results, along with a case narrative;
- Copies of any corrective actions requested and implemented during the data verification and validation process; and
- Copies of data validation reports.

The majority of information maintained in hard copy format in the project files will also be maintained in electronic format to facilitate distribution to data users.

3.2.2 Project Database

The Data Management and Validation Coordinator will maintain a semi-public (available to authorized users) project database and electronic files of all analytical results. Procedures for maintaining, updating, and distributing the project database are included in the Database Maintenance and Distribution SOP for the East Helena Facility (Appendix A). In general, database maintenance and distribution will consist of the following:

1. The Facility primary database will reside with the project Data Management and Validation Coordinator, and will be backed up daily both on-site (external hard drive) and off-site (web-based backup site).
2. The database will be updated and posted to a secure website (available to specific authorized data users) on a monthly basis.
3. The DMVC will notify all data users via email after the database is uploaded onto the website.
4. The DMVC will review database management records at the beginning of each month. Users that have not responded to the email and/or downloaded the latest update will be notified.
5. All requests and questions regarding the Facility database should be routed to the DMVC and/or the project QA Manager.

The SOP in Appendix A includes contact information and current details regarding the Data Management and Validation Coordinator, data users, the database program, storage website, and brief downloading instructions. In addition, the Data Management and Validation Coordinator will provide support as necessary to data users requiring data in specific formats to meet project needs on a case-by-case basis.

4.0 REPORTING PROCEDURES

The Phase II RFI program will culminate in one or more reports detailing the Phase II RFI procedures and results. The report(s) will include a thorough review of data collection activities, analytical results including a detailed assessment of data quality and usability, interpretation of the results in terms of the magnitude and extent of contaminant concentrations, contaminant sources and source areas, contaminant fate and transport, and unacceptable risks posed by the Facility to human health and the environment.

Although specific reporting formats will depend on individual project objectives, all summary reports will contain tabular and graphical summaries of environmental data collected, including the types of data identified in EPA (1994) as applicable. Typical data formats for summary reports include comprehensive tables of results (concentrations) for each constituent in each medium; summary statistics; maps of sampling locations and (where applicable) sampling depths; and concentration maps showing the spatial distribution of constituent concentrations. In addition to these data summaries, electronic or hard copy versions of the raw data (laboratory reports and/or field forms and notes) are normally included as report attachments.

Due to the project schedules and specific task pathways, it is currently envisioned that three separate reports will be prepared for the site characterization, BERA and HHRA portions of the Phase II RFI. If so, a separate summary report or technical memorandum may be necessary to compile and coordinate the results and findings of the individual studies and develop a clear pathway to the corrective measures phase of the RCRA corrective action at the Facility.

Additional Phase II RFI reporting requirements are outlined in Section 4.2 of the East Helena Facility QAPP (Hydrometrics, 2010b), including data validation reports and progress reports, along with the results of any field or laboratory performance audits and any corrective actions.

4.1.1 Validation Reports

Data validation reports will be prepared by the Data Management and Validation Coordinator in accordance with Section 5.0 of the QAPP, and will be distributed to the project manager and QA manager. Typically, separate data validation reports are prepared for different sampling events and/or sample matrices. For example, review and validation of soil sample results would be reported separately from review and validation of water samples, and different water sampling events would also be reported separately.

4.1.2 Progress Reporting

In addition to the final RFI report(s), monthly progress reports will be prepared for agency and stakeholder review. These progress reports are required by Section XI of the Consent Decree, and will include:

- A narrative summary of sampling and testing activities for the previous month;
- Any preliminary findings of these activities;
- Directions for accessing (via the project database) any validated data collected during the reporting period;
- A description of any deviations from applicable work plans or planned activities, along with the reasons for such deviations and measures taken to correct any deviations; and
- Ay changes in key personnel or schedules.

5.0 REFERENCES

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APPENDIX A

STANDARD OPERATING PROCEDURE
EAST HELENA FACILITY DATABASE MAINTENANCE AND DISTRIBUTION