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Region 4 Superfund and Emergency Management Division

STANDARD OPERATING PROCEDURE

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The table below shows changes to this controlled document over time. The most recent version is presented in the top row of the table and replaces the previous version. Previous versions of the document are maintained by the EPA Region 4 Superfund and Emergency Management Division (SEMD) Document Control Coordinator.

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1 General Information

1.1 Purpose

This document describes the methods to be used in submitting environmental data electronically to the United States Environmental Protection Agency (the EPA) Region 4 Superfund and Emergency Management Division (SEMD) personnel and their contractors as well as other EPA personnel working on the EPA Region 4 Superfund Program sites and/or projects. These methods occur during field activities that result in creating, handling, and managing field documentation and resulting in the creation of environmental data to be submitted to the EPA Region 4 data management system. The goal of this SOP for environmental data submission is to guide the EPA Region 4 SEMD personnel and contractors to submit the appropriate required electronic data.

1.2 Scope/Application

The methods described in this document are to be used by all data providers when preparing and submitting environmental data electronically to the EPA Region 4, regardless of the originating program. The enforcement of such methods is supported by the SEMD Director's Memo "Region 4 Data Management and Electronic Data Deliverables" that may be found at:

<http://www2.epa.gov/sites/production/files/2015-09/documents/ddeddmemo.pdf>

This document does not cover the use of DART, EQUIS™ Professional, or creating maps and reports. Extensive documentation on the use of EQUIS Professional and EQUIS Enterprise can be found at: <https://help.earthsoft.com>.

1.3 Documentation/Verification

This procedure was prepared by persons deemed technically competent by the EPA Region 4 SEMD personnel, based on their knowledge, skills and abilities, and has been tested in practice and reviewed in print by a subject matter expert. The official copy of this procedure will be scanned into the EPA's Superfund Enterprise Management System (SEMS) and published on EPA's internet. The Document Control Coordinator (DCC) is responsible for ensuring the most recent version of the procedure is placed in SEMS and for maintaining records of review conducted prior to its issuance.

1.4 Acronyms

CAD – Computer-Aided Drafting

CLP – Contract Laboratory Program

DART – Data Archival and ReTrieval

DCC – Document Control Coordinator

EDD – Electronic Data Deliverable

EDGE – EQUIS Data Gathering Engine

EDP – EQUIS Data Processor
EQUIS™ – Environmental Quality Information System
EPA – United States Environmental Protection Agency
GIS – Geographic Information System
GNIS – Geographic Names Information System
GPS – Global Positioning System
LIMS – Laboratory Information Management System
LSASD – Laboratory Services and Applied Science Division
OSC – EPA’s On Scene Coordinator
NPL – National Priorities List
PRP – Potentially Responsible Party
QAPP – Quality Assurance Project Plan
R4DART – United States Environmental Protection Agency, Region 4 DART
R4LIMS – United States Environmental Protection Agency, Region 4 LIMS
RCRA – Resource Conservation and Recovery Act
RPM – Remedial Project Manager
SEMD – Superfund and Emergency Management Division
SEMS – Superfund Enterprise Management System
SMO – Sample Management Office
URL – Uniform Resource Locator
USGS – United States Geological Survey
XML – Extended Markup Language

1.5 Definitions

Activity Code (task_type) – Descriptive code for the EPA activity (RA - Remedial Action, RI – Remedial Investigation, etc.) for which the event is required. Activity Code values are a controlled vocabulary.

Analytical Data – Data reported by a fixed-base laboratory.

Controlled Vocabulary – See Valid Values.

Data Package – A data package is a software archive (.dat format) containing one or more Electronic Data Deliverables.

Data Provider – The entity responsible for the electronic submission of environmental data to the EPA Region 4. Data providers are identified by a code value that is a controlled vocabulary.

Data Submittal Summary – A summary of the data proposed for submittal by the data provider for the Potentially Responsible Party and fund lead projects not scheduled through R4LIMS.

Electronic Data Deliverable – An archive zip file saved with a “.dat” extension holding one or more tab-delimited text files containing the environmental data to be submitted. An EDD file follows a consistent design meant to organize information in a useful format and typically contains header row(s) that describe what information should be completed in each column.

Element – LIMS system used to report LSASD and CLP analytical data.

EQuIS Collect – A user friendly, mobile field application from EarthSoft, Inc. for collecting environmental and geotechnical data on a smart phone, tablet, or computer. EQuIS Collect uses EDP to verify and enforce data quality in real time.

EQuIS Data Gathering Engine – Software from EarthSoft, Inc. that runs on a tablet or computer to ensure accurate and complete field data collection events. EDGE includes EDP for live, real-time error checking of data submissions.

EQuIS Data Processor – Software from EarthSoft, Inc. used to check the EDDs for data completion, referential integrity, and identify and correct errors prior to submission.

EQuIS Professional – Workstation Software from EarthSoft, Inc. used by data managers that interfaces to the EPA Region 4 database.

Esri – A software development and services company providing Geographic Information System software.

Field Results Data – Field analytical data such as pH, dissolved oxygen, XRF, etc. These data may be generated from EDGE, EQuIS Collect, or Scribe.

Format File – The EDP format file is the essence of data checking with EDP and contains the definitions and restrictions for each individual field in available data tables. The format file controls data checks, formatting, and enumerations.

Geographic Information System Data – GIS data, as they relate to the Superfund program, may include point data (latitude/longitude), lines, and/or polygons representing some site-related area of interest. Computer-aided drafting (CAD), image formatted files, and tabular data are also acceptable data formats so long as they meet the requirements defined in the *EPA Region 4 Geographic Information System Deliverable Guidance*.

Geographic Names Information System – The naming system was developed by the U.S. Geological Survey (USGS) in cooperation with the U.S. Board on Geographic Names (BGN), and contains information about the official names for places, features, and areas in the 50 states, District of Columbia, and territories and outlying areas of the United States, including Antarctica.

Geology Data – Specialized data relating to geology, such as lithology, well construction, etc.

LIMS – Software for managing and reporting laboratory analyses.

Media Code (matrix_code) – A two or more character code designating the sample matrix (i.e., SW is the media code for Surface Water). Media code values are a controlled vocabulary.

Project – A project is defined as the data generated for a report.

Project ID (task_code) – Unique ID associated with a project QAPP or for R4LIMS projects, it is associated with a single sampling event. For R4LIMS, this value is assigned by the Project Tracking System for the dataset being submitted. For all other project types, the R4DART will provide this Project ID.

Project Number (task_code2) – A Project ID may have multiple Project Numbers or be the same as the Project ID. For R4LIMS, this value is assigned by the Project Tracking System for the Chain of Custody being submitted. For all other project types, R4DART will provide this Project Number.

Project Tracking System – The EPA Region 4 LSASD’s project tracking system used for R4LIMS projects.

Quality Assurance Project Plan – The controlling document for proposed field work. There may be multiple Project ID numbers assigned to the QAPP and will be used in EDDs generated for that project to uniquely identify the data to that event.

Reference Value File – The reference value file (RVF) is associated with the EDP format file and is denoted with an .rvf file extension. This file contains the valid values reference tables that EDP uses to populate the drop-down menus that control when a specific type of value is required in an EDD. Example reference values are “mg/kg” (milligrams per kilogram) for a unit code or “GW” (groundwater) for a media code. These fields limit the type of data permitted in certain columns of the EDD, and the most recent valid values are in the RVF file. Therefore, it is extremely important to ensure you are using the most current file. Check the EarthSoft website to see if your version is current before working on your data. The link for this web site is provided below within section 2.3.2.

Scribe – Scribe is a software tool developed by EPA to assist in the process of managing environmental data. Scribe captures soil, water, air, and biota sampling, observational, and monitoring field data. Scribe can import EDDs from analytical laboratories, location data from a global positioning system, and from specific laboratory and exported EQUIS EDDs.

Shapefiles – Map files used by Esri GIS software.

Site (or Waterbody) – The unique site or waterbody in DART for storing project data. Also sometimes referred to as a facility.

Station ID (sys_loc_code) – Unique designation for a sample location.

Valid Value – All allowable values for the field have been pre-determined. The data provider must select one of the available choices, or request a new valid value be added.

.xml File – File format of the electronic chain-of-custody for Scribe, Collect, and EDGE.

1.6 Supporting Reference Documents

EPA Region 4 EDD Format File Guide.

The EPA Region 4 EDD Format File Guide provides detailed information for the creation of the EDD files that are required to be submitted.

EPA Region 4 EQUIS Data Processor Reference Manual.

The EPA Region 4 EQUIS Data Processor Reference Manual provides the information needed to download, install and maintain the EDP software, as well as how to use the software to proof EDDs and create data packages.

EPA Region 4 Geographic Information System Deliverable Guidance.

The EPA Region 4 GIS Deliverable Guidance document provides specific requirements and file delivery formats for all GIS materials developed in support of the program.

2 Introduction

2.1 Data Sources

Data is submitted electronically to the EPA Region 4 from multiple sources. It should be emphasized that the differences between the processes for data submittal arise solely from the inherent efficiencies afforded to EPA lead investigations because the work may be done 'in-house'. There is **no** difference in the types of data submitted, or the format of the files being submitted. Regardless of how EDD files are created (or what organization led the investigation), the files must meet the specifications of the *EPA Region 4 EDD Format File Guide*. All GIS materials developed in support of the program must meet the specific requirements and file delivery formats specified in the *EPA Region 4 Geographic Information System Deliverable Guidance*.

2.2 Overview

The following summary provides a general outline of the process for submitting environmental data to the EPA Region 4.

Create the Site or Waterbody – If the site or waterbody does not exist in DART, it must be created. Creating the site or waterbody is the responsibility of the R4DART coordinator.

Create the Project – For R4LIMS projects, before data can be accepted by LSASD, a receiving project must be created in the R4LIMS System. Creating the project is the responsibility of the EPA Region 4 Sample Coordinator or EPA LSASD project lead.

Data Submittal Summary – For non R4LIMS, a projects summary of the data must be submitted to provide a check that all data is received. The data provider is responsible for this task.

DART Reports – For R4LIMS projects, reports are sent out automatically after the chain-of-custody information is uploaded to the Project Tracking System. The data provider (or EPA LSASD project leader) is responsible for responding to these reports.

Create EDD(s) – Create EDDs to match the Data Submittal Summary. The data provider (or the EPA LSASD project leader) is responsible for this task.

Check EDD(s) with EDP – All EDDs must be checked with EDP prior to submittal to the R4DART coordinator. The data provider (or EPA LSASD project leader) is responsible for this task.

Submit EDD(s) – Submit all EDDs to EPAR4@EQulSonline.com. Attach the EDD(s) to the requesting email. The data provider (or EPA LSASD project leader) is responsible for this task.

Proof and Correct as Needed – Notify [R4DART](#) of any needed corrections or additions arising from the EDDs being rejected. It is the EPA Region 4's responsibility to update or add any information needed and inform back to the data provider completion or denial of request with

alternate action. It is then the responsibility of the data provider (or the EPA LSASD project leader) to proof the data for accuracy and resubmit with any needed corrections.

The system is designed for data to be submitted once (i.e., sample coordinates and screening intervals for a monitoring well are submitted one time).

The details for successfully completing the above steps can be found in Section 3 for EPA fund lead data submittals and Section 4 for Potentially Responsible Party (PRP) lead data submittals.

GIS Data Submittal – GIS data deliverables must accompany the submission of a final report to the EPA Region 4 (see Section 5 for instructions).

2.3 EDP Standalone

If you are a data provider to the EPA Region 4 and do not have access to an EPA workstation, you will need to download and install the EQuIS Data Processor (EDP) Standalone software. There is no charge to the user for this software. If you have access to an EPA workstation and need EDP installed, email R4DART@epa.gov.

2.3.1 Obtaining EDP Standalone

Instructions for obtaining, installing, registering, and maintaining EDP Standalone can be found in the *EPA Region 4 EQuIS Data Processor Reference Manual*.

2.3.2 Using EDP Standalone

EDP Standalone can be used to create smaller EDD files, but its primary function is to check EDDs for errors and create data packages for submittal.

The structure of the EPA Region 4 EDD files is determined by the format file. If the format of any of the EDDs must be changed (rarely), then it will be necessary for users of the standalone version of EDP to obtain the updated format file. Instructions for downloading and installing updated format files can be found in the *EPA Region 4 EQuIS Data Processor Reference Manual*.

Likewise, if the valid values used by EPA Region 4 are updated, it will then be necessary for users of the EDP Standalone to obtain the updated reference value file (.rvf). The current version of the EPA Region 4 .rvf file is at:

<https://www.epa.gov/superfund/region-4-superfund-electronic-data-submission>.

This file is updated periodically when the valid values are updated.

The EPA Region 4 will notify all data providers, currently in the database, when it is necessary to update these files, but it is the responsibility of the data provider to ensure that the most current version is being used.

2.3.3 Valid Values in EDP

The EPA Region 4 valid values can be viewed in EDP by starting EDP, then clicking on the “Reference Values” tab in the lower left corner.

If you need a valid value that is not in the list (rare analyte, new analytical method, etc.), you may request it be added as outlined in the *EPA Region 4 EDD Format File Guide*.

2.3.4 Data Package

A data package is created by EDP when the ‘sign and submit’ function is used to save the EDD. This creates an archive file (.zip) containing all EDDs that were loaded into EDP. The data package must be properly named, including .dat file extension.

2.4 Information Required in EQulS EDDs

An EDD is a tab-delimited text file containing environmental data in the EPA Region 4 format. Detailed information on all EDD formats may be found in the *EPA Region 4 EDD Format File Guide*. Table 2-1 is a check list of which EDD files are required based on the type of field activity. When planning field activities, consider the data requirements to ensure appropriate data collection and reporting to meet project objectives. Verify with your RPM if you should be completing other EDDs in addition to the required EDDs for the field activity. A brief summary of the more commonly used formats can be found below.

Location EDDs – These EDDs provide coordinates for sampling locations, along with a simple indication of the quality of the information. Because all other EDDs rely upon this information, the Location EDD is the first EDD that is submitted.

Field Results EDDs – These EDDs provide the results of field analyses (e.g., XRF, pH, temperature, turbidity, etc.).

Water Level EDDs – These EDDs provide groundwater elevation data. If a water level EDD is submitted, a Location EDD with the ground surface elevation (measured to top of casing for wells) is required. In addition, each Water Level EDD must have a matching Well Datum EDD (EPAR4_WellDatum_v1) to identify the measuring point of the Water Level Depth. The Well Datum EDD is required when submitting water levels for the first time and any time a well is modified.

Geology EDDs – These EDDs provide information about well construction, lithology, etc. If groundwater samples are to be submitted, the screening intervals must have been recorded using the well construction EDD (EPAR4_WellConstruction_v1).

Analytical Data EDDs – Provide the fixed-base laboratory analytical data. The data is in a three-file format.

Table 2-1 Required EDD Files

EDDs/Tables/ Format Sections	Soil (Surface and Subsurface)	Soil Borings/ Cores ¹	Well Installation (New and Existing)	Sediment	Surface Water	Groundwater (Monitoring Well, Piezometer, Temporary Well)	Groundwater (Irrigational Wells, Residential or Potable Wells)	Residential Tap on Public Supply ²	Ambient Air, Soil-Gas ³	Vapor Intrusion (sub slab)	Windrose Air Speed/ Direction ⁴	Land Access ⁵
EPAR4 Location	√	√	√	√	√	√		√	√	√	√	√
EPAR4 Location Parameter	x	x	x	x	x	x	x	x	√	√	√	√
EPAR4 Well	x	x	√	x	x	√	√	x	x	x	x	x
EPAR4 Well Construction	x	x	√ ⁶	x	x	x	x	x	x	x	x	x
EPAR4 Lithology	√	√	√	x	x	x	x	x	x	x	x	x
EPAR4 Well Datum	x	x	x	x	x	√	x ⁷	x	x	x	x	x
EPAR4 Water Levels	x	x	x	x	x	√	x ⁷	x	x	x	x	x
EPAR4 Field Results	√	√ ⁸	√	√	√	√	√	√	√	x	x	x
EPAR4 Fsample	√	√	√	√	√	√	√	√	√	x	x	x
EPAR4 TST	√	√	√	√	√	√	√	√	√	x	x	x
EPAR4 RES	√	√	√	√	√	√	√	√	√	x	x	x
VI Bldg Address	x	x	x	x	x	x	x	x	x	√	x	x
VI Building Inspection	x	x	x	x	x	x	x	x	x	√	x	x
VI Building Parameters	x	x	x	x	x	x	x	x	x	√	x	x
VI Locations	x	x	x	x	x	x	x	x	x	√	x	x
VI Outdoor Locations	x	x	x	x	x	x	x	x	x	√	x	x
VI Samples	x	x	x	x	x	x	x	x	x	√	x	x
VI Test Results QC	x	x	x	x	x	x	x	x	x	√	x	x
VI Batches	x	x	x	x	x	x	x	x	x	√	x	x
Files	When requested, schematics and photos should be submitted. Examples are boring logs, monitoring wells, locations, etc. Historic information may be sent as a PDF file, except for well screen information which must be submitted in an EDD.											

√ = Required; x = Not Required

¹ Cores can include Membrane Interface Probes (MIPs) and Cone Penetration Readouts

² Not private well (municipal or community supplied)

³ Should be measured away from buildings; not for vapor intrusion studies

⁴ Measure for any air sampling

⁵ Attach PDF file of land access agreement

⁶ Well screen information is required, however, back fill and other construction information can be important and should included when available

⁷ While not required, provide whenever possible

⁸ If encountered, add rock core fracture zones as field parameter "FI-Fracture" and denote the start and end depths

2.5 Common Fields in EDDs

With few exceptions, the values described below are the first four columns of all the EPA Region 4 EDDs. See the *EPA Region 4 EDD Format File Guide* for details on your specific EDD format.

2.5.1 Data Provider Codes (sampling_company)

Data Provider codes are used to identify the source of the data within DART.

For R4LIMS projects, the data provider code is selected within the Project Tracking System as the project is created.

For all other projects, the data provider code is determined by R4DART (and is then provided to the data provider). If a data provider code does not exist in the system, R4DART will create one.

2.5.2 Project IDs (task_code)

The Project ID is a unique identifier for all data collected during an investigation. It allows data from a given study to be retrieved by the original report with which it was submitted.

For R4LIMS fund lead projects, the Project ID is generated by the R4LIMS Project System when the project is created. The Project ID is provided to data providers via the LSASD Project Tracking System email reporting system. For non R4LIMS projects, the data provider requests the Project ID from the R4DART. When Collect, EDGE or Scribe are used for the project, the Project ID is entered during the initial setup with the Site Information.

2.5.3 Project Numbers (task_code2)

The Project Number is typically the same as the Project ID. These are unique identifiers for all data collected during an event for the investigation or when multiple laboratories are needed. The Project Number allows data from a given study to be retrieved by the original report with which it was submitted.

For R4LIMS fund lead projects, the Project Numbers are generated by the R4LIMS Project System when the project is created. The Project Numbers are provided to data providers via the LSASD Project Log Summary Report email. For non R4LIMS projects, the Project Number may be the same as the Project ID provided by R4DART. If a unique Project Number is required to track an individual event, request a new Project Number from R4DART.

When Collect, EDGE or Scribe are used for the project, the Project Number is entered during the chain-of-custody setup.

2.5.4 Program/Activity Codes (task_type)

The Program/Activity code identifies the program activity associated with the sampling event to the DART database.

For R4LIMS lead projects, the Program/Activity code is provided by the person entering project data into the R4LIMS Project System.

For non R4LIMS lead projects, the Program/Activity code is determined by the site manager (RPM or OSC) and is then provided to the data provider for entry into the activity_code in the EDD.

When Collect, EDGE or Scribe are used for the project, the Program/Activity Code is entered during the initial setup with the Site Information.

2.5.5 Station IDs (sys_loc_code)

A Station ID is the permanent designation for a sample collection point. Once a sampling point has been established, the Station ID designation will be used for all future sampling events regardless of the entity leading the investigation. Note that the sampling point is established for a location, not a sample type.

A Station ID is not a Sample ID. Sample IDs should be distinct from Station IDs to prevent confusion.

Station ID designations should be simple and easy to remember. Do not use special characters such as the asterisk, quote, or percent symbol. The Station ID should be kept to 8 or fewer characters where possible.

For example, two samples are collected from the same location in Sandy Creek, sample SC-001-SW (a surface water sample) and SC-001-SD (a companion sediment sample). Because they were collected at the same location, both will have the same Station ID, such as SC001.

Additional example, a soil sample is collected as a part of a monitoring well installation. The subsurface soil sample is designated RF-007C-SB. The well being installed is being given the designation MW012. Sample RF-007C-SB (and all other samples collected at that well location) will have the Station ID MW012.

It may help to think of the Station ID as the permanent name for a sampling location, while any number of samples (from any media available) may be collected at that given location. A Station ID is a point on a map, and many samples may be collected from that point during an investigation (or series of investigations).

All environmental samples must have a Station ID (e.g., surface water, groundwater, sediment, surface soil, etc.).

Field blanks (trip blanks, equipment rinse blanks, etc.) do not have coordinates, and therefore, do not have Station IDs. The logic for this is built into EDP—if you try to enter a Station ID for a sample type (media code) that does not allow it, EDP will display an error. Likewise, if a media code requires a Station ID that is missing, EDP will again display an error.

3 EPA Lead Data Submittals

3.1 EPA Lead Projects

Data from all EPA lead projects (LSASD, States and EPA contractor performing organizations) using EPA laboratory resources (CLP and special purchase laboratories) must be permanently archived in DART. It is the responsibility of the EPA manager (RPM or OSC) to ensure that the data provider(s) for the investigation properly prepare and submit all EDDs.

All questions about data submittals for EPA Lead projects should be directed to:

R4DART@epa.gov.

Procedures for projects that are being conducted by PRPs can be found below (Section 4).

3.2 Software Requirements

The software listed below is required for electronic submittal of data from EPA lead projects in the EPA Region 4.

3.2.1 Collect, EDGE, or Scribe

EQUS Collect and EDGE are both EarthSoft developed applications and can create a Scribe like deliverable. Scribe is an EPA developed and distributed software program that is used in the EPA Region 4 to generate EDD files of chain-of-custody information.

EDGE is available for free at the EarthSoft website:

<https://earthsoft.com/products/edp/edp-format-for-epar4/>.

EQUS Collect Mobile app is available for free from the Google Play Store, Apple App Store, or Microsoft Store.

Scribe is available for free at: <https://www.ertsupport.org/Scribe>.

In the EPA Region 4, these programs are used with DART to provide more compatibility between Element and DART, making EDD creation and submittal easier. If using Scribe, the EPA Region 4 samplers should obtain the EPA Region 4 template for the necessary customizations specific for the EPA Region 4 Scribe configuration from:

https://response.epa.gov/site/doc_list.aspx?site_id=ScribeGIS.

Select the Scribe Template from the right-side category listing.

3.2.2 EQUS Data Processor

EDP is used to check EDDs for errors prior to submission and to create the data package for submittal. It can also be used to create smaller EDDs. It is available as a free download, if the data provider does not have access to an EPA workstation. See Section 2.3 for more information on EDP Standalone.

3.3 Create Site or Waterbody

3.3.1 Site Creation

Before data can be submitted, the site must be created in DART.

Proper site\waterbody creation is important to success. DART is intended to be a permanent archive for the data generated by these investigations.

For EPA lead projects conducted by LSASD, the Project Leader has the responsibility for Site or Waterbody creation. For EPA lead projects not conducted by LSASD, the EPA Region 4 program office will submit the required information. Site creation requests must be sent to:

R4DART@epa.gov.

Begin by checking with the R4DART coordinator to see if the site has been created. Internal to the EPA Region 4, anyone with access to the R4LIMS Project Information may check the dropdown for R4LIMS projects. If the site is not within DART, it must be created. To create a site in DART:

- Search for the site at the SEMS website at:
<https://cumulis.epa.gov/supercpad/cursites/srchsites.cfm>
- Verify the search results, identify if there is an EPA ID recorded, and copy the URL (website address) from the search results and paste it into an email to R4DART@epa.gov requesting the site be created.
- If the site is not found on the SEMS website or does not have an EPA ID, go to the EPA EnviroFacts website at: <https://enviro.epa.gov/>.
- This will utilize a Multisystem query retrieval and may return several related sites. Find the site matching the address and if the site is found, select the Facility Report icon. When the page is updated, if there is an EPA Registry ID listed, copy the URL (website address) from the Facility report feature and paste it into an email to R4DART@epa.gov requesting the site be created.
- If the site is not in these databases, send the following information to R4DART@epa.gov:

Site Name
Address,
City, State, Zip Code
County
RPM/OSC
Lat/Long of Site Centroid
NPL Status

3.3.2 Waterbody Creation

First contact the R4DART coordinator to see if the waterbody already exists in DART. If the waterbody does not exist in the EQUS DART database, it must be created.

To create a waterbody in DART, the project leader must provide the USGS GNIS ID number for the Waterbody. The GNIS ID numbers for all waterbodies in the US can be found at this website: <http://geonames.usgs.gov/>.

- At the website, select 'Search Domestic Names'.
- In the dialog box that opens, enter the 'Feature Name'.
- Select your 'Feature Type' and 'State'.
- Click 'Submit Query'.
- In the dialog box that opens, click the Feature Name for details.
- Copy the URL (website address) of the page that opens and paste it into an email to R4DART@epa.gov requesting the waterbody be created.

If the waterbody does not exist in the USGS database, send the best available name to R4DART@epa.gov.

3.3.3 Criminal and Enforcement Confidential

If the field investigation is criminal or enforcement confidential, extra precaution must be taken to keep the project data confidential.

For these investigations, determine if the site is in DART as outlined above. If found, check the Facility Code field. If it does not begin with 'R4SC-', copy the name and Facility Code of the site and forward to R4DART@epa.gov with a request to create the site as criminal or enforcement confidential.

If the site or waterbody does not exist in DART, find the needed information as outlined above (Sections 3.3.1 and 3.3.2) and forward to R4DART@epa.gov. The subject line of the email should state the site is for criminal or enforcement confidential data.

If the site or waterbody cannot be found in the EPA or USGS databases, send the best available information to R4DART@epa.gov. The subject line of the email should state the site is for criminal or enforcement confidential data.

3.4 Project Creation (Project ID)

For R4LIMS fund lead projects, after the project has been created but prior to the field investigation, the data provider will receive an email with the Project Log Summary information required to successfully submit an electronic chain-of-custody to LSASD. Use the information in this report to setup your investigation in Collect, EDGE or Scribe.

When a project for the investigation is logged into the R4LIMS System, a Project ID is assigned and a project is automatically created in the R4LIMS System. The Project ID is then embedded in the EDDs and is used to tie that data to the original study.

For non R4LIMS projects, contact R4DART for the assigned Project ID. As part of the project setup for non R4LIMS projects, information about the types of data that will be collected (and EDDs submitted) should be sent to R4DART using the Data Submittal Summary Template.

3.5 Chain of Custody

All EPA lead projects in the EPA Region 4 must submit an electronic chain-of-custody to LSASD. For all soil and sediment type sampling, a copy of the chain-of-custody XML file must also be sent to R4DART@epa.gov. This file can be generated using Collect, EDGE or Scribe.

This EDD file is different in one major aspect from all other EDDs submitted from EPA lead projects:

These chain-of-custody EDDs must be submitted to R4SampleCustody@epa.gov and cc R4DART@epa.gov.

This submittal does **not** satisfy the requirement for a signed chain-of-custody to accompany the samples at all times.

3.6 DART Reports

After your chain-of-custody data is received and the samples are logged into the R4LIMS (Element) system, you will receive automated reports if additional information or corrections are required. These emails are sent the night samples are logged into the R4LIMS (Element) system and each Monday thereafter.

When all needed corrections have been made to Project Log and Element, the project setup in the Project Tracking System is checked to see what additional EDDs (Location, Field Results, Geology, or Water Level) are required.

The data provider will receive at least one DART report from the Project Tracking System, even if no errors are found and no additional data are required. This is to allow for an opportunity to proof and correct the data in the system.

3.6.1 Sample Information Requests

These email alerts are triggered by missing or incorrect information in Project Log or Element that will prevent the lab analytical data from loading to DART once reported. These corrections **must be made before** the data is reported by the LSASD laboratory. If the corrections are not made before the data is reported, it will be necessary for the lab to re-report the data.

These emails contain a due date in the subject line. Corrections and missing data must be submitted prior to the due date.

3.6.1.1 Corrections to Project Log

For R4LIMS lead projects, if the Project Summary report email shows information missing, forward the email to R4DART@epa.gov and supply the missing information. This portion of the report checks for:

- Valid site or waterbody selected,
- Valid Project ID selected,
- Valid program\activity selected, and
- Valid data provider selected.

3.6.1.2 Corrections to Element

Errors within Element are not easily corrected when system information conflicts with the official hardcopy. Changes to Element must be accompanied by supporting information, such as corrected chain-of-custody, logbook information, and explanation (to attach to official documents in the file). Information presented in this portion of the email shows your sampling information as it currently resides in Element.

Station IDs and Media Codes are checked to ensure compliance with business rules. If you have a missing or incorrect Station ID or Media Code, type the correct value in the appropriate 'Edited' column and forward the email to R4DART@epa.gov and cc R4SampleCustody@epa.gov.

Should an error on the chain-of-custody be found after the samples and electronic chain-of-custody xml file have been sent to R4SampleCustody@epa.gov (cc R4DART@epa.gov), an updated electronic chain-of-custody needs to be recreated and then sent to R4COCCorrections@epa.gov and again cc R4DART@epa.gov. Errors of this type may be a mislabeled sample, the wrong location code used, or a date and time wrongfully entered.

3.6.2 EDD Requests

These emails contain a due date in the subject line. Requested EDDs must be submitted prior to the due date.

- After any errors in Project Log and Element are corrected, a Location EDD is requested for Station IDs that cannot be matched in DART. A weekly reminder to submit the Location EDD will be sent until the data are received.
- Once the Location EDD has been received, requests for any additional EDDs will be sent based upon the information in the project setup.

3.6.3 'Overdue' Reports

If corrections and EDDs are not submitted before the analytical data is reported by the lab for R4LIMS lead projects, 'Overdue' reports will be generated. These reports will be sent each Monday morning until the requested data is received.

3.7 Creating EDDs

EDDs can be created in a number of ways. The best method will depend upon the amount of data to be submitted, and how the chain-of-custody was generated.

It should be noted that for small amounts of data, any of the EDD(s) listed below can be created directly in EDP. Detailed instructions for creating EDDs can be found in the *EPA Region 4 EDD Format File Guide* and the *EPA Region 4 EQUIS Data Processor Reference Manual*.

3.7.1 Location EDDs

Each email request for a Location EDD has the list of missing Station IDs within the email body. Submit the required information via Location EDD as soon as possible and prior to the analytical data being generated.

3.7.2 Field Results EDDs

Field results should be sent to DART as soon as the locations have been submitted. These are typically the direct measurements taken during the field event. In place of a CAS-RN, all field parameters use a FI- prefix for the code. Fields results are not permitted to be entered within the analytical results EDD.

3.7.3 Water Level EDDs

Required for all groundwater elevation measurements and for all surface water elevation measurements tied to groundwater elevation. The measuring from datum must be recorded for the elevation to be calculated using the depth to water.

3.7.4 Geology EDDs

It is recommended that these EDDs be prepared by professionals with experience with this type data. Details for the various formats are specified in the *EPA Region 4 EDD Format File Guide*.

3.7.5 Analytical Data EDDs

Preparation of these files should be performed by individuals with experience in understanding unfiltered laboratory reports. The format is specified in the *EPA Region 4 EDD Format File Guide*.

Element – Analytical data reported by the EPA Region 4 LIMS (Element) are formatted for EQUIS and are automatically loaded upon receipt of a valid Location EDD. This includes any samples that are shipped to the CLP.

Subcontracts/Interagency Agreements – Any non-Element data must be placed in the EQUIS format by the data provider. To help ensure accuracy, the performing laboratory should be requested to report the data in the EPA Region 4 EQUIS format as part of the bid. If the data provider has been tasked to validate the data, then validation qualifiers, interpreted qualifiers, and the validation stage are added to the laboratory deliverable prior to error checking and submittal.

3.8 Error Checking with EQUS Data Processor

For information on obtaining, installing, maintaining and using EDP Standalone, refer to the *EPA Region 4 EQUS Data Processor Reference Manual*. If you are using EDP Standalone, be sure the EPA Region 4 format and reference values are all up to date before using.

If you are using EDP on an EPA workstation, start EDP by logging in to EQUS Professional and selecting your site (facility). Once connected to the database, select the EDP icon in the upper left corner.

Data Providers must use EDP to check all EDDs for errors before submission. EDP contains a help file to assist with error correction. Let the mouse hover over any cell with a non-white background to view a detailed error message. Hover the mouse over any column header to view additional information specific to the field.

Instructions for using EDP can be found in the *EPA Region 4 EQUS Data Processor Reference Manual*.

When you email the EDD to EPAR4@EQUSOnline.com and there are errors, the system will automatically send the data provider an email that the EDD was rejected and an error log will be attached. If you are unable to correct the problem, email the EDD's Error Log along with the file causing the problem to R4DART@epa.gov with your contact information.

3.9 Submitting EDDs

After correcting any errors in your EDD, save the file from EDP using the sign and submit menu option to save the data package. A user name and password is required to successfully create the EDD package and upload the data into DART. If you do not have a valid user name and password for DART, email R4DART@epa.gov and provide the Site, RPM, data provider company, and data provider email address.

After processing with EDP, the submitted file **IS REQUIRED** to be named according to the following convention that includes the following elements connected with underscores:

- Task Code
- Site Name
- Data Provider Company Code
- Date Submitting (YY MM DD)
- Type (Loc-Location/Ch-Chemistry/FR-FieldResults/WL-WaterLevel/GEO-Geology/WC-Well and Well Construction /VI-Vapor Intrusion)
- .FacilityCode.EPAR4.dat

For example:

13-0001_YourSite_YourCompanyCode_19 01 08_Ch.110001224773.EPAR4.dat

NOTE: The EPA electronic mail system will reject files with a .zip format due to security concerns. To match how the EPA Region 4 laboratory submits EDDs, you must rename the EDD file extension from .zip to .dat before emailing the EDD to the EPA Region 4. **Files must be submitted with the “.dat” extension.**

NOTE: The EPA electronic mail system will reject files with more than three (3) periods. Thus, it is important to connect the file naming elements using underscores rather than periods.

If the EDD contains data for a field that will need to update values already in the database, use “EPAR4update.dat” rather than “EPAR4.dat”, which only merges the data. An example is replacing estimated coordinates with surveyed coordinates.

Attach the EDD to the automated email you received requesting the sampling for R4LIMS lead projects and forward to EPAR4@EQulSonline.com. If the file is named improperly or not attached to the requesting email, it will be returned to the data provider.

3.10 Proofing and Corrections

Notify the DART coordinator of any errors you find in the system. Send corrections to R4DART@epa.gov.

After the data has been successfully loaded, an automated email will be sent to the data provider from EPAR4@EQulSonline.com notifying that the file has been accepted and no errors were found. If the data are rejected, an automated email will be sent to the data provider from EPAR4@EQulSonline.com with the error log attached as a .dat file. To open the error log, download the .dat file from the email and rename the file extension from .dat to .zip prior to opening.

Once the errors have been corrected, recreate the EDD package following the same process as the original sign and submit. The one exception will be the file name, which may not be identical to any previous submissions. For each resubmittal, add a capital letter suffix (i.e., “A” then “B”, etc.) to the file name. After the “Type”, insert an underscore followed by the capital letter suffix (i.e., Type_ **A**.FacilityCode).

For example:

13-0001_YourSite_YourCompanyCode_19 01 08_Ch_ **A**.110001224773.EPAR4.dat

The data provider is responsible for the receipt of all automated emails based on the information provided when requesting a user name and password. Should the data provider not receive the automated emails regarding their EDD submission or feel an error was inaccurately returned, notify the EPA Region 4 at R4DART@epa.gov for any errors found.

4 PRP Lead Data Submittals

4.1 PRP Lead Projects

Responsible Parties conducting environmental investigations in the EPA Region 4 for the Superfund program must report their data to the EPA Region 4 electronically. The types of data required to be submitted are outlined in Section 2.4. The responsible party is responsible for the information contained in the files submitted by the data provider.

Address all data submittals questions to R4DART@epa.gov.

Procedures for EPA lead projects can be found in Section 3.

4.2 Software Requirements

All data providers are required to use EDP to check their data files for errors prior to submittal. EDP is software used to check all EDDs for errors prior to submittal and to create properly formatted data packages. EDP can also be used to create smaller EDDs. EDP is available as a free download.

4.3 Site Creation

All National Priorities List sites in the EPA Region 4 have been created in DART. If, however, a site is found to be missing (or a new site is added to the NPL), it must first be created using information from EPA's national database as described in Section 3.3.1.

To create the site, the RPM or OSC must email the URL (website address) from their search results (SEMS or Envirofacts as detailed in Section 3.3.1) to R4DART@epa.gov.

If the site is not in these databases, the RPM or OSC must send the following information to R4DART@epa.gov:

- Site Name
- Address,
- City, State, Zip Code
- County
- RPM/OSC
- Lat/Long of Site Centroid
- NPL Status

4.4 Project Creation (Project ID)

For current and historical data (as defined in the *EPA Region 4 EDD Format File Guide*), the project must be created manually (assuming no past fund lead projects are available in the R4LIMS Project System). The R4DART coordinator will use the DART system to setup the proposed data submittal, and to get the data provider contact information (email address) in the system.

When the project has been successfully established, a report may be sent to the data provider containing any existing Station IDs and their coordinates. The data provider must review the report for existing sampling stations. If samples are to be collected (or were collected) at an existing Station, the established Station ID must be used.

4.5 Data Submittal Summary

After the project is created, the EPA Region 4 will notify the data provider to submit the Data Submittal Summary for non R4LIMS sampling and email to R4DART@epa.gov for tracking. When this information has been received and accepted by the RPM, the R4DART will be prepared to receive the project data. Information on the Data Submittal Summary format can be found in the *EPA Region 4 EDD Format File Guide* and downloaded from the Superfund website at: <http://www2.epa.gov/superfund/region-4-superfund-electronic-data-submission>

4.6 DART Reports

After the information from the Data Submittal Summary is entered into the Project Tracking System and accepted by the RPM, automated reports detailing any errors or additional information needed will be sent to the data provider. These emails are sent the night the Data Submittal Summary is loaded, and each Tuesday thereafter until all data for the given project has been received.

Note the order for the data submittals below. This order is both dictated by a desire to offer data providers with the opportunity to review each step in the data submittal process, and by the database logic of DART.

4.6.1 Location EDD Request

If the Data Submittal Summary contains additional information for an established sampling station, the data provider **MUST** use the Station ID(s) provided.

Because the system will begin requesting the remaining EDDs upon receipt of the first Location EDD file, the data provider may prefer to submit all Station IDs in a single Location EDD file. Multiple Location EDDs may be submitted if needed.

If the Location EDD is found to contain an error not related to the coordinates, the PRP must send a spreadsheet with a list of the incorrect and corrected information.

For coordinates with errors (or if better coordinates become available), the original Location EDD may be edited and re-submitted. Delete the rows in the original Location EDD that do not need to be updated, edit the coordinates for the remaining rows, and re-submit to R4DART@epa.gov. The phrase 'Updated coordinates' should be in the subject line.

4.6.2 Other EDD Requests

Upon receipt of the Location EDD, the Project Tracking System will make weekly requests for the remaining EDDs that were specified in the original Data Submittal Summary and accepted by the PRP. The remaining EDDs will be checked against Station IDs as they are received, and will be rejected if no matching Station ID can be found.

4.7 Creating EDDs

EDDs can be created using spreadsheet software, directly in EDP, or in a word processor such as Notepad. More information about the file format can be found in the *EPA Region 4 EDD Format File Guide*.

The best method for creating EDDs will depend upon the amount of data to be submitted. It should be noted that for small amounts of data, any of the EDD(s) listed below can be created directly in EDP. Detailed instructions for creating EDDs can be found in the *EPA Region 4 EDD Format File Guide* and the *EPA Region 4 EQUS Data Processor Reference Manual*.

4.8 EQUS Data Processor

For information on obtaining, installing, maintaining, and using EDP Standalone, refer to the *EPA Region 4 EQUS Data Processor Reference Manual*, and Section 2.3 of this guidance document.

Use EDP to check all EDDs for errors before submission. EDP contains a help file to assist with error correction. Hover the mouse over any cell with a non-white background to view a detailed error message. Hover the mouse over any column header to view additional information specific to the field.

If you have errors you are unable to correct, email the EDD's Error Log along with the file(s) causing the problem to R4DART@epa.gov with your contact information. Place the site name and the Project ID in the subject line.

If you need to update the EDP Standalone appearance options for 508 compliancy, email R4DART@epa.gov for assistance.

4.9 Submitting EDDs

Remember to submit Location EDDs **before** submitting any other EDDs. The database structure requires locations to be loaded prior to all other environmental data.

While EDP permits the submittal of combined EDDs, this feature is not fully supported in the EPA Region 4 implementation. Submit each EDD separately (**except** for Analytical EDDs, which are **always** submitted as a three file set, and first time water levels will need a well datum EDD together – See the *EPA Region 4 EDD Format File Guide*).

When all errors have been corrected, save the EDD(s) using 'sign and submit' (see *EPA Region 4 EQUIS Data Processor Reference Manual*). Name all files as specified below. Improperly named files will be returned to the data provider. The required names can also be found in the EDD request reports sent to the data provider.

After processing with EDP, the submitted file **IS REQUIRED** to be named according to the following convention that includes the following elements connected with underscores:

- Task Code
- Site Name
- Data Provider Company Code
- Date Submitting (YY MM DD)
- Type (Loc-Location/Ch-Chemistry/FR-FieldResults/WL-WaterLevel/GEO-Geology/WC-Well and Well Construction /VI-Vapor Intrusion)
- .FacilityCode.EPAR4.dat

For example:

P2013-0001_YourSite_YourCompanyCode_19 01 08_Ch.110001224773.EPAR4.dat

NOTE: The EPA electronic mail system will reject files with a .zip format due to security concerns. To match how the EPA Region 4 laboratory submits EDDs, you must rename the EDD file extension from .zip to .dat before emailing the EDD to the EPA Region 4. **Files must be submitted with the “.dat” extension.**

If the EDD contains data for a field that will need to update values already in the database, use “EPAR4update.dat” rather than “EPAR4.dat”, which only merges the data. An example is replacing estimated coordinates with surveyed coordinates.

To submit your prepared data package, attach the data package to the EDD request and forward to EPAR4@EQUISonline.com. Any time there has been a data request sent, data packages must be attached to the requesting report.

4.10 Proofing and Corrections

After the data has been successfully loaded, an automated email will be sent to the data provider from EPAR4@EQUISonline.com notifying that the file has been accepted and no errors were found. If the data is rejected, an automated email will be sent to the data provider from EPAR4@EQUISonline.com with the error log attached as a .dat file. To open the error log, download the .dat file from the email and rename the file extensions from .dat to .zip prior to opening.

Once the errors have been corrected, recreate the EDD package following the same process as the original sign and submit. The one exception will be the file name, which may not be identical to any previous submissions. For each resubmittal, add a capital letter suffix (i.e., “A”

then “B”, etc.) to the file name. After the “Type”, insert an underscore followed by the capital letter suffix (i.e., Type_**A**.FacilityCode).

For example:

P2013-0001_YourSite_YourCompanyCode_19 01 08_Ch_**A**.110001224773.EPAR4.dat

The data provider is responsible for the receipt of all automated emails based on the information provided when requesting a user name and password. Should the data provider not receive the automated emails regarding their EDD submission or feel an error was inaccurately returned, notify the EPA Region 4 at R4DART@epa.gov for any errors found.

5 Information Required in GIS Submittals

Initial draft submittal and final version of spatially enabled files acquired or developed to support mapping, spatial analysis, and/or report generation by a data provider are considered property of the EPA Region 4 SEMD and are required to be submitted to the EPA Region 4. GIS data submittals must meet the project, metadata, organizational, and delivery requirements in acceptable GIS data formats as specified in the *EPA Region 4 Geographic Information System Deliverable Guidance*.

GIS data and map files will be packaged into zip files and submitted electronically. All electronic submissions will require the completion of an online GIS Data Submittal form. This form and zip file(s) should contain all information necessary to understand the data submittal. The EPA Region 4 will not accept any GIS data that does not have this form completed and accompanying the submittal.

To submit your GIS data to the EPA Region 4, please zip all files and use the link below to access the EPA Region 4 online GIS Data Submission form:

<https://arcg.is/1aDXya>



EPA Region 4 EDD Format File Guide

January 2020

EPA Region 4 Superfund and Emergency Management Division

Updated by:

earths**ft**

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Reference herein to any specific commercial products, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government, and shall not be used for advertising or product endorsement purposes.

CONTACTS

For questions and comments, contact:

Your Remedial Project Manager, or

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R4 SEMD Data Manager
404-562-8814
walden.beth@epa.gov

or

R4DART
941-544-5428
R4dart@epa.gov

Acronyms

CAS RN – Chemical Abstracts Service Registry Number
CLP – Contract Laboratory Program
DART – Data Archival and ReTrieval
DNAPL – Dense non-aqueous phase liquids
EDD – Electronic Data Deliverable
EDGE – EQuIS Data Gathering Engine
EDP – EQuIS Data Processor
EPA – United States Environmental Protection Agency
EQuIS – Environmental Quality Information System
GC/MS – Gas Chromatography/Mass Spectrometry
LIMS – Laboratory Information Management System
LNAPL – Light non-aqueous phase liquids
LSASD – Laboratory Services and Applied Science Division
O&M – Operation and Maintenance
RPM – Remedial Project Manager
PCB – Polychlorinated Biphenyl Compounds
PRP – Potentially Responsible Party
QAPP – Quality Assurance Project Plan
QC – Quality Control
SEMD – Superfund and Emergency Management Division
SPLP – Synthetic Precipitation Leaching Procedure
SRS – Substance Registry System
SVI – Soil Vapor Intrusion
SVOA – Semi-Volatile Organic Aromatic Compounds
TCLP – Toxicity Characteristic Leaching Procedure
TIC – Tentatively Identified Compound
VI – Vapor Intrusion
VOA – Volatile Organic Aromatic Compounds
XML – Extended Markup Language

Definitions

Data Provider – “Data Provider” and “Sampling Company” are defined to be interchangeable with regard to EDD submittals. The data provider may be defined as the person or agency that organized, formatted, and submitted the electronic data from a sampling event. This may or may not be the sampling company, particularly when working with historic data. Unless otherwise noted by your RPM, the prime contractor or grantee is always entered as the Sampling Company for the Samples and the Data Provider for the Geology EDDs.

Electronic Data Deliverable – An Electronic Data Deliverable (EDD) is a tabular, flat file format for sharing, manipulating, and using data, and is commonly a text or Microsoft Excel file type. For the EPA Region 4, an EDD is an archive zip file saved with a “.dat” extension holding one or more tab-delimited text files containing the environmental data to be submitted. An EDD file follows a consistent design meant to organize information in a useful format and typically contains header row(s) that describe what information should be completed in each column and in what format that data should be entered.

	Column 1	Column 2	Column 3	Column 4
Header Row 1	#sys_loc_code	x_coord	y_coord	coord_type_code
Header Row 2	#Text (20)	Numeric	Numeric	Text (20)
Data Row 1	MW14	-81.26551	38.80360	LAT LONG
Data Row 2	MW15	-81.60310	38.12871	LAT LONG

EQUS™ Data Processor – The standalone version of the EQUS Data Processor (EDP) is a powerful desktop interface to check for data completion and referential integrity, identify and correct errors, and create compressed files containing multiple related EDDs in a single useable format for upload and storage in a relational data base system.

EDP Format File – The EDP format file is the essence of data checking with EDP. The EDP format file contains the definitions and restrictions for each individual field in available data tables. The format files control data checks, such as range checking, formatting, and enumerations. Format files are used in the field data collection tools EQUS Collect and EQUS Data Gathering Engine (EDGE) as well as EDP. The EPA Region 4 has a custom EDP format file, *EPAR4.zip*. It is extremely important to ensure you are using the most current file. Check the EarthSoft website to see if your version of the EPA R4 format file is current before working on your data.

Scribe – Scribe is a software tool developed by the EPA to assist in the process of managing environmental data. Scribe captures soil, water, air, and biota sampling, observational, and monitoring field data. Scribe can import EDDs from analytical laboratories, location data from a global positioning system (GPS), and from exported EQUS EDDs.

Sampling Company – “Data Provider” and “Sampling Company” are defined to be interchangeable with regard to EDD submittals. The data provider may be defined as the person or agency that organized, formatted, and submitted the electronic data from a sampling event.

This may or may not be the sampling company, particularly when working with historic data. Unless otherwise noted by your RPM, the prime contractor or grantee is always entered as the Sampling Company for the Samples and the Data Provider for the Geology EDDs.

Reference Values File – The reference values file (RVF) is associated with the EDP format file and is denoted with an .rvf file extension. This file contains the valid values reference tables that EDP uses to populate the drop-down menus that control when a specific type of value is required in an EDD. Example reference values are “mg/kg” (milligrams per kilogram) for a unit code or “GW” (groundwater) for a media code. These fields limit the type of data permitted in certain columns of the EDD, and the most recent valid values are in the RVF file. Therefore, it is extremely important to ensure you are using the most current file. Check the EarthSoft website to see if your version is current before working on your data.

ZIP Archival File Format – The ZIP file format is a data compression and archival format that contains one or more files that have been compressed, to reduce their file size, or stored as-is. ZIP archival files typically use the file extensions “.zip” or “.ZIP”.

EDP automatically creates an archival zip file for submittal to the EQulS database, however, the EPA electronic mail system will reject files with a .zip file extension due to security concerns. Therefore, the EDD package created by EDP with the extension “.zip” should be renamed with the extension “.dat”.

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1 Introduction

The EPA Region 4 Format File Guide describes the formats of the various Electronic Data Deliverable (EDD) files necessary for properly preparing, formatting, and electronically submitting environmental data to the EPA Region 4 Superfund and Emergency Management Division (SEMD) using the EQuIS Data Processor (EDP) from EarthSoft, Inc. Instructions for obtaining EDP can be found in Section 2.11 of this document. Instructions for using the EDP are available in the *EPA Region 4 EDP Reference Manual*. You may also obtain instructions from the manufacturer at <https://help.earthsoft.com>.

Every effort has been made to create EDD format files that incorporate as much useful discreet information as possible based on the commonalities of various sites under the EPA Region 4 purview. It should be understood that any one site would rarely require the use of every possible EDD, and that simultaneously, no number of EDD files could completely cover the requirements of every possible site. Thus, a reasonable effort should be made by data providers to prepare data to correctly import into the EQuIS database structure. It is also understood that in some rare cases, historical data may lack key components necessary for complete importation, and subsequently may only be partially input, or in some extremely rare cases, not be capable of input at all. The decision to import or not import this data lies exclusively with the EPA Region 4.

1.1 What You Will Find in This Guide

This document should serve as a reference guide for the individuals who understand the structure of their own data and the process used to format and import electronic data into management systems such as EQuIS. In this guide, you will find a detailed description of all EDD formats currently used by the EPA Region 4 as well as information for handling formatting issues with historic data.

1.2 What You Will NOT Find in This Guide

This guide does not contain detailed instructions on how to manage information nor does it contain directions for importing electronic data into the EPA EQuIS database. This information is contained in the *EPA Region 4 EDP Reference Manual* found on the EPA Region 4 Superfund website at:

<https://www.epa.gov/superfund/region-4-superfund-electronic-data-submission-documents>

You will also not find lessons or instructions on general data management. It is assumed that persons dealing with data of this nature have some experience and understanding of basic data management guidelines and software.

1.3 Projects

Before data can be submitted to the EPA Region 4, the dataset must be defined as a “project” in

the EPA Region 4 data system. For most fund lead projects, the project information will be emailed to the field personnel. For other types of projects, the data provider needs to contact the EPA Region 4 SEMD Data Manager (R4DART) to request the project information. The project information defines the numbers of samples, media sampled, and analyses performed (including lab results, field results, lithology, etc.). Each project will be assigned a unique ID (Project ID) to identify the dataset in the system. Data from a given project can be sent to the EPA Region 4 in multiple submittals, if desired.

When multiple laboratories and/or chain-of-custodies are needed for the unique project ID, then multiple project numbers will be assigned under the project ID. Projects that are not logged through R4LIMS or if you have not received your project ID and project numbers, contact the EPA Region 4 SEMD Data Manager for further instructions.

1.4 Data Provider

The EPA Region 4 data system defines the “data provider” as the entity preparing and sending the EDDs to the R4DART. It is the responsibility of the data provider to ensure completeness of the data submittal, and to correct any errors in the dataset.

1.5 Current and Historical Data

Unless designated as “historical” by the EPA Region 4 SEMD Data Manager, all data are considered to be “current” and must be submitted according to the site-specific legal order, on a regular basis (at least annually, semi-annually), or in accordance with this manual. The determination as to the status of data as either “historical” or “current” is at the sole discretion of the EPA Region 4 SEMD Data Manager, who will assign the Project ID as detailed in Table 1.1. Please contact R4DART if you believe your data is historical and the level of effort to satisfy certain controlled data fields is deemed very high. R4DART will advise on what values may be used when the information may be found in supporting reports.

The intent of developing special requirements for historical information is to decrease the burden and complications associated with reporting in-depth details about data that may have been collected years ago while retaining the value of the information being reported. The EPA Region 4 recognizes that some information about data collected in the past may not be readily available, and by reducing the requirements for electronic historical data, is endeavoring to strike a balance between minimizing the amount of effort involved to input information and maximizing the ability to document remedy progress.

The EPA Region 4 will require all data providers to submit EDDs in accordance with this manual and reference guide. In addition to the routine data checking performed on all data as it loads into the EPA Region 4 data system, current data will undergo an additional electronic EPA Region 4 review prior to being loaded. This may include but is not limited to the plotting of submitted locations to verify the accuracy of the spatial information being submitted.

The data provider is encouraged to become familiar with and submit EDDs in accordance with the standard *EPA Region 4 EDP Reference Manual* located on the EPA Region 4 web site:

<https://www.epa.gov/superfund/region-4-superfund-electronic-data-submission-documents>

Table 1.1 Data Reporting Requirements – Project ID Format

	Source	Project ID Format*
Historical Data	PRP	HPYYYY-####
	Fund Lead (LSASD or CLP data)	HFYYYY-####
	Fund Lead (Not LSASD or CLP data)	HCYYYY-####
	Other	HOYYYY-####
Current Data	PRP	PYYYY-####
	Fund Lead (LSASD or CLP data)	YY-####
	Fund Lead (Not LSASD or CLP data)	RYYYY-####
	Scribe (Not LSASD or CLP data)	SYYYY-####
	Other	OYYYY-####

1.6 Scribe

Samples collected that are analyzed using the EPA Region 4 Laboratory Services and Applied Science Division (LSASD) lab or the Contract Laboratory Program (CLP) will be submitted as *Current Data: Fund Lead* (See Table 1.1). Should data be analyzed using a private lab and loaded into Scribe, contact the EPA Region 4 SEMD Data Manager to determine if the project database may be sent to R4DART. Prior to sending the data to R4DART, the EDD file(s) or Scribe project database should first be loaded into the EDP checker to verify if any additional information needs to be added.

The Project ID is provided by the EPA Region 4 Sample Coordinator or R4DART. If you have not been provided a Project ID, contact R4DART@epa.gov.

2 GENERAL EDD REPORTING REQUIREMENTS

2.1 Defining the Data Submittal

It is important to define what is to be submitted *ahead of the data submittal*. While it is often not possible to know precisely how many rows of data may be submitted, it should be possible to provide a summary of the amounts and types of data that are to be submitted.

The summary is a tabular list of the types of samples being submitted, the analyses performed (see Section 2.7), and the EDD file types (see Section 3). Table 2-1 presents an abbreviated example summary and the template, *Data Submittal Summary Template.XLS*, may be downloaded from:

<http://www.epa.gov/superfund/region-4-superfund-electronic-data-submission>

Fund lead projects going through the R4LIMS system will receive an email with the summary. For any reason you do not receive an email with a Project Log Summary Report, then prepare the data submittal summary according to the data requirements outlined in the project's Quality Assurance Project Plan (QAPP).

See Table 2-2 for an explanation of when this should be submitted, depending on your submittal type. The email containing Project Log Summary Report serves as the Data Submittal Summary. The data provider completes the file, indicating the data that will be submitted when ready, and emails the file to: R4DART@epa.gov.

Table 2-1 Data Submittal Summary Form

Media	SVOA	VOA	PCBA	Etc.
Surface Soil	54	54	27	
Subsurface Soil				
Sediment	12	12	12	
Groundwater	10	10		
Surface Water	12	12	12	
Etc.				
EDD Types				
AlternatePosition	N			
SiteLoc	N			
FieldResults	Y			
Well	Y			
Etc.				

The table is in two sections. The first section (Media) lists the number of samples anticipated to be submitted to the EPA Region 4 by media and analytical method. The second section simply lists the available EDD Types, with the data provider indicating by yes (Y) or no (N) whether or not an EDD of that type will be submitted for that Project ID.

Note: Location EDD is assumed to be present if required. Also, if the media portion of the table is completed, FSsample, TST, and RES are assumed to be present (see Section 3).

Table 2-2 When to Submit Your Data Submittal Summary Form

	Source	When to Submit
Historical Data	PRP	Submit with EDD(s)
	Fund Lead (LSASD or CLP data)	Submit with EDD(s)
	Fund Lead (Not LSASD or CLP data)	Submit with EDD(s)
	Other	Submit with EDD(s)
Current Data	PRP	Submit prior to field event
	Fund Lead (LSASD or CLP data)	Submit prior to field event
	Fund Lead (Not LSASD or CLP data)	Submit prior to field event
	Scribe (Not LSASD or CLP data)	Submit prior to field event
	Other	Submit prior to field event

2.2 File Formats

All data to be reported to the EPA Region 4 must be submitted as signed “.dat” files generated by importing EDD files to EDP (Section. 2.11) and exporting for submission. EDD files can be produced using any software with the capability to create text files, but these files *must be checked* with EDP (Section. 2.11) prior to submittal to the EPA Region 4. These files are especially easy to create using spreadsheet or database software packages. However, if these are unavailable, the files can be created using a word processor or text editor. Table 2-3 provides instructions for creating tab-delimited text files from some commonly used software packages.

Table 2-3 Instructions for Producing Tab-Delimited Text Files

Package	Type	Instructions
EQuIS	Database	Data already existing in an EQuIS Database of any version must still be exported to the various EDD files and checked with EDP. Export individual tables into a spreadsheet format so that they may be reformatted into the correct data structure described in Section 3. Then follow the instructions from “Excel” below for exporting to the text file format.
Access	Database	<p>Create tables using file structures in Section 3.</p> <p>After data are entered, close table.</p> <p>Click on table name (under table tab) and then select “File,” “Save As,” from the top menu. Save to an external file or database. Change “Save as Type” to a text file. Change the file extension from “txt” to “tab.” Press OK. This will start the export wizard.</p> <p>In the export wizard, select “Delimited,” then press the “Next” button. Select “Tab” as the delimiter type and (“”) as the text qualifier. Press the “Next” button. Select a destination and name for the file. Press the “Finish” button.</p>
Excel	Spreadsheet	<p>Select “File,” “Save As,” from the top menu. Change “Save as Type” to a “Text (Tab Delimited)” file. Press the “Save” button.</p> <p>Note: When using Excel, care must be taken to prevent the software from stripping leading and trailing zeroes from your dataset.</p>

2.3 EDD Files

The tables in this guidance identify the various types of data required. Each EDD file should be saved as an individual text file and should be named in accordance with the naming convention rules. Table 2-4 is a check list of which EDD files are required based on the type of field activity. If historical data does not meet the requirements, discuss the data gaps with your RPM to resolve EDD issues. When planning field activities, consider the data requirements to ensure appropriate data collection and reporting to meet project objectives. Verify with your RPM if you should be completing other EDDs in addition to the required EDDs for the field activity.

Table 2-5 provides general information for the EDD files. Detailed instructions for creating all the EDD files are provided in Section 3. Instructions for submitting EDDs to the EPA Region 4 are presented in Section 3.0 and in the *EPA Region 4 EDP Reference Manual*. Figure 2-1 illustrates the EDD creation process conceptually.

Table 2-4 Required EDD Files

EDDs/Tables/ Format Sections	Soil (Surface and Subsurface)	Soil Borings/ Cores ¹	Well Installation (New and Existing)	Sediment	Surface Water	Groundwater (Monitoring Well, Piezometer, Temporary Well)	Groundwater (Irrigational Wells, Residential or Potable Wells)	Residential Tap on Public Supply ²	Ambient Air, Soil-Gas ³	Vapor Intrusion (sub slab)	Windrose Air Speed/ Direction ⁴	Land Access ⁵
EPAR4 Location	√	√	√	√	√	√		√	√	√	√	√
EPAR4 Location Parameter	x	x	x	x	x	x	x	x	√	√	√	√
EPAR4 Well	x	x	√	x	x	√	√	x	x	x	x	x
EPAR4 Well Construction	x	x	√ ⁶	x	x	x	x	x	x	x	x	x
EPAR4 Lithology	√	√	√	x	x	x	x	x	x	x	x	x
EPAR4 Well Datum	x	x	x	x	x	√	x ⁷	x	x	x	x	x
EPAR4 Water Levels	x	x	x	x	x	√	x ⁷	x	x	x	x	x
EPAR4 Field Results	√	√ ⁸	√	√	√	√	√	√	√	x	x	x
EPAR4 Fsample	√	√	√	√	√	√	√	√	√	x	x	x
EPAR4 TST	√	√	√	√	√	√	√	√	√	x	x	x
EPAR4 RES	√	√	√	√	√	√	√	√	√	x	x	x
VI Bldg Address	x	x	x	x	x	x	x	x	x	√	x	x
VI Building Inspection	x	x	x	x	x	x	x	x	x	√	x	x
VI Building Parameters	x	x	x	x	x	x	x	x	x	√	x	x
VI Locations	x	x	x	x	x	x	x	x	x	√	x	x
VI Outdoor Locations	x	x	x	x	x	x	x	x	x	√	x	x
VI Samples	x	x	x	x	x	x	x	x	x	√	x	x
VI Test Results QC	x	x	x	x	x	x	x	x	x	√	x	x
VI Batches	x	x	x	x	x	x	x	x	x	√	x	x
Files	When requested, schematics and photos should be submitted. Examples are boring logs, monitoring wells, locations, etc. Historic information may be sent as a PDF file, except for well screen information which must be submitted in an EDD.											

√ = Required; x = Not Required

¹ Cores can include Membrane Interface Probes (MIPs) and Cone Penetration Readouts

² Not private well (municipal or community supplied)

³ Should be measured away from buildings; not for vapor intrusion studies

⁴ Measure for any air sampling

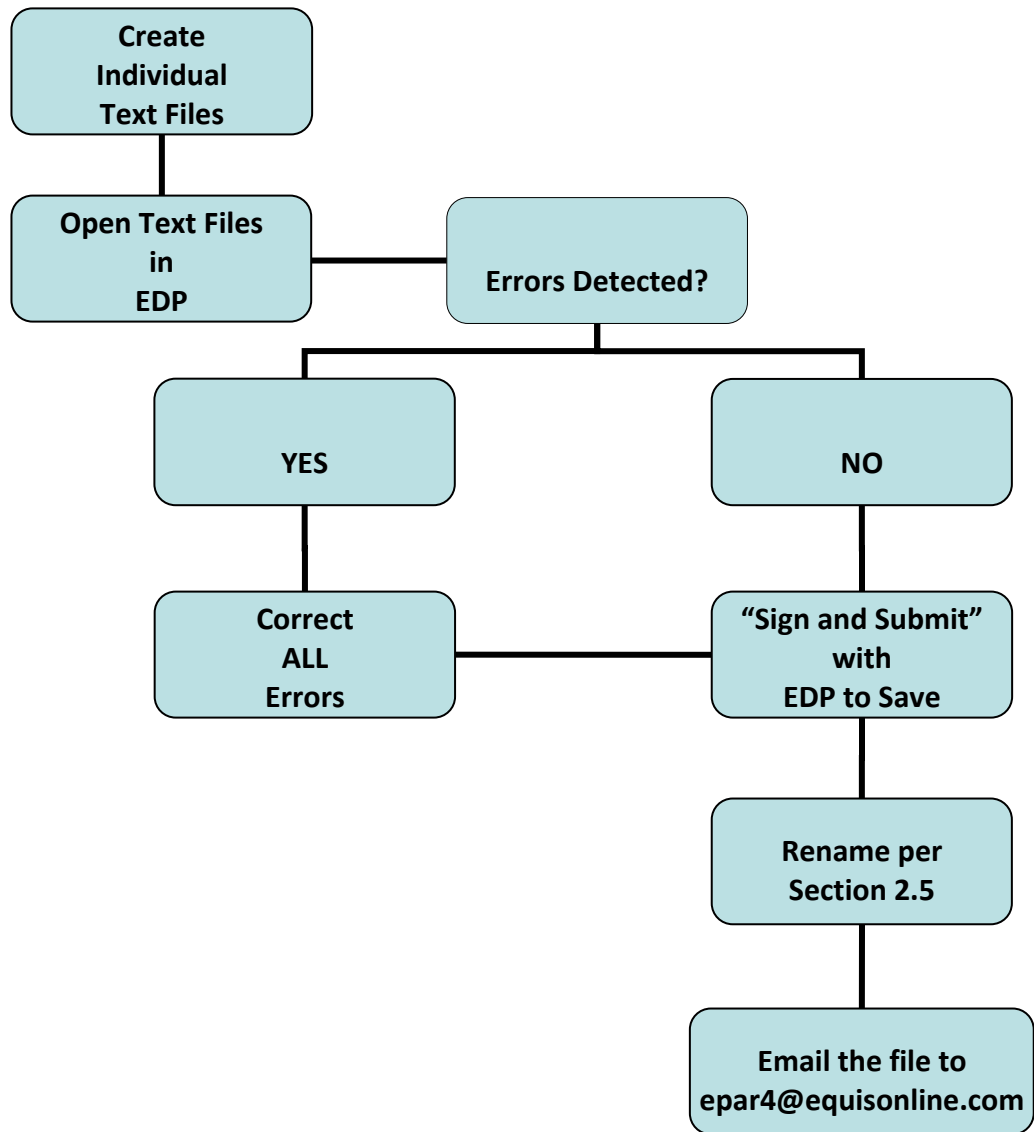
⁵ Attach PDF file of land access agreement

⁶ Well screen information is required, however, back fill and other construction information can be important and should included when available

⁷ While not required, provide whenever possible

⁸ If encountered, add rock core fracture zones as field parameter "FI-Fracture" and denote the start and end depths

Figure 2-1 Conceptual Model of the EDD Submittal Process



It is not possible to prepare a dataset for acceptance into a database without understanding the basics of how databases operate. Row uniqueness and referential integrity are requirements of the EQUIS database. Their requirements impact how the EDD is prepared. Row uniqueness is assured when no two rows in a file contain the same values for all the fields listed under the heading “What makes a row of data unique?” in Table 2-5, also see Section 2.4.

The relationship between rows within the files of the EDD must be assured by enforcing the “referential integrity” rules discussed in Table 2-5 under the column labeled “Dependence of other files on these data”, also see Section 2.4.

Table 2-5 General Information on EDD Files

File Type	File Name	Contents	What makes a row of data unique? (i.e., Primary Key fields)	Dependence of other files on these data
Site (Section 3.1)	EPAR4_Site_v1	One-time definition of any Operational Units or Area of Concerns	site_code	The location file cannot be loaded without properly referenced sites (site_code).
Location (Section 3.2)	EPAR4_Location_v1	One entry for each location on a facility. Contains elevation, coordinate, and general locational data. Data should only be reported once for a location.	sys_loc_code	All except Chemistry Test, and Chemistry Result
Alternate Position (Section 3.3)	EPAR4_Alternate Position_v1	Alternate position/location information for sample locations, if required to submit locations with coordinates not submitted in the Location section.	sys_loc_code coord_type_code identifier	None
Site Location (Section 3.4)	EPAR4_SiteLoc_v1	Information relating sample locations to the site, as on, off, or background.	sys_loc_code site_code	None
Location Parameter (Section 3.5)	EPAR4_Location Parameter_v1	Information relating to the location such as wind speed or wind direction.	sys_loc_code param_code measurement_date	None
Field Results (Section 3.6)	EPAR4_Field Results_v1	Results of field tests for unique locations. Not all locations will have Field Results, but Field Results must have a location.	sys_loc_code sample_name field_parameter result_date	None
Chemistry Field Sample (Section 3.7)	EPAR4_FSsample_v1	One row for each sample submitted to the lab.	sys_sample_code	Chemistry Test and Chemistry Result
Chemistry Sample Parameter (Section 3.8)	EPAR4_Sample Parameter_v1	One row for each parameter associated with a sample sent to a lab. This will include non-numeric results relating to the sample such as the sex of a fish sample.	sys_sample_code param_code measurement_date	None

Table 2-5 General Information on EDD Files

File Type	File Name	Contents	What makes a row of data unique? (i.e., Primary Key fields)	Dependence of other files on these data
Chemistry Test (Section 3.9)	EPAR4_TST_v1	One row for each test run on each sample submitted, including duplicates. Duplicates must have a unique sys_sample_code.	sys_sample_code lab_anl_method_name analysis_date analysis_time total_or_dissolved test_type	Chemistry Result
Chemistry Result (Section 3.10)	EPAR4_RES_v1	One row for each analyte reported for a given sample and test. Additional rows can be added to report total and dissolved results and to report results for re-extracts. Duplicates must have a unique sys_sample_code.	sys_sample_code lab_anl_method_name analysis_date analysis_time total_or_dissolved test_type cas_rn	None
Well (Section 3.11)	EPAR4_Well_v1	Data that relates to any well used for sampling under the project.	sys_loc_code	Well Construction (sys_loc_code)
Well Construction (Section 3.12)	EPAR4_Well Construction_v1	Well construction information including segment type, material type, depths, and diameters.	sys_loc_code segment_type material_type_code start_depth	None
Well Datum (Section 3.13)	EPAR4_Well Datum_v1	Well elevation information for measurements of water level. Includes datum used.	sys_loc_code start_date	Water Level
Water Level (Section 3.14)	EPAR4_WaterLevel_v1	Groundwater level data for monitoring wells.	sys_loc_code measurement_date	Well Datum
Geologic Sample (Section 3.15)	EPAR4_Geologic Sample_v1	Geology data for a borehole.	geo_sample_code	Geologic Sample Parameter Static Properties
Geologic Sample Parameter (Section 3.16)	EPAR4_GeoSample Parameter_v1	Field parameters specifically related to drilling a borehole, (e.g., conductivity, turbidity).	geo_sample_code param_code param_unit	None
Water Table (Section 3.17)	EPAR4_WaterTable_v1	Aquifer information.	sys_loc_code type sequence	None
Lithology (Section 3.18)	EPAR4_Lithology_v1	Lithology information from a borehole.	sys_loc_code start_depth	None

Table 2-5 General Information on EDD Files

File Type	File Name	Contents	What makes a row of data unique? (i.e., Primary Key fields)	Dependence of other files on these data
Drill Activity (Section 3.19)	EPAR4_Drill Activity_v1	Drilling event information including unique location and depths.	sys_loc_code drill_event	DrillParameter
Drill Parameter (Section 3.20)	EPAR4_Drill Parameter_v1	Field parameters specifically related to drilling, e.g. conductivity, turbidity. Relates to Drill Activity.	sys_loc_code drill_event start_depth param_code	None
Downhole Point Parameter (Section 3.21)	EPAR4_Downhole Point_v1	Drilling tip and sleeve stress information.	sys_loc_code depth param	None
Static Properties (Section 3.22)	EPAR4_StaticProps_ v1	Static physical properties such as geologic materials, specific gravity and porosity related to drilling.	geo_sample_code.	None
VI Building Address (Section 3.23)	VI_Bldg_Address_v1	Building address with contact information for the building.	building_code	All VI sections except TestResults and Batches
VI Building Inspection (Section 3.24)	VI_Building_ Inspection_v1	Building information during the building inspection.	building_code inspection_date	None
VI Building Parameters (Section 3.25)	VI_Building_ Parameters_v1	Additional information for the building inspection.	building_code param_code	None
VI Locations (Section 3.26)	VI_Locations_v1	Establishing sampling locations within a building.	sys_loc_code	VI_Samples
VI Outdoor Locations (Section 3.27)	VI_Outdoor_ Locations_v1	Relating outdoor locations to a building	sys_loc_code building_code	None
VI Samples (Section 3.28)	VI_Samples_v1	Information related to the individual sample.	sys_sample_code	VI_TestResults

Table 2-5 General Information on EDD Files

File Type	File Name	Contents	What makes a row of data unique? (i.e., Primary Key fields)	Dependence of other files on these data
VI Test Results QC (Section 3.29)	VI_TestResults_QC_v1	One row for each analyte reported for a given sample and test. Additional rows can be added to report total and dissolved results and to report results for re-extracts. Duplicates must have a unique sys_sample_code.	sys_sample_code lab_anl_method_name analysis_date analysis_time total_or_dissolved test_type cas_rn	VI_Batches_v1
VI Batch (Section 3.30)	VI_Batches_v1	Information relating individual sample methods to a batch.	sys_sample_code lab_anl_method_name analysis_date analysis_time total_or_dissolved test_type test_batch_type	None
Files (Section 3.31)	Files_v1	Loads supplementary information into EQUIS	None	None

2.4 Data Integrity Rules

Data providers are responsible for performing three types of integrity checks on their data prior to submittal: Validity, row uniqueness, and row integrity.

Validity – All codes used in a data set must be valid. Valid values for all coded fields are either provided in the description columns of the tables in Section 3 or in the reference tables of EDP. Data providers must use the most up-to-date reference tables (.rvf files) available from EarthSoft. For example, sample matrix information is input in the sample_matrix_code field of the Field Sample Results table and must be reported using one of the values provided in the reference file associated with EDP. It is essential to obtain the latest version of the formats and reference files before beginning work.

Row Uniqueness – Row uniqueness must be verified using the guidance provided in Table 2-5. In database terminology this is called a primary key. For example, the sys_loc_code is the primary key in the Location EDD table, and therefore, no two rows in the file can have the same sys_loc_code value. EDP will highlight duplicate rows of data to assist in locating these errors.

Row Integrity – The relationship between rows within the tables of the EDD must be assured by enforcing the “referential integrity” rules discussed in Table 2-5 under the column labeled

“Dependence of other files on these data.” For example, the values in the sys_loc_code field in the Field Sample Results table must match with a value previously reported in the sys_loc_code field of the Location table. **EDP will not test for integrity between EDDs and existing data in the database until it is loaded.** The data provider will be responsible for taking care not to submit duplicate data. If the data fails integrity tests, it will NOT be uploaded into the DART system at the EPA Region 4 and you will be notified via automated email that the data was not successfully loaded. You will need to correct any errors and resubmit the data along with the error report email. Instructions are included with the email.

2.5 File Naming Convention

The data submittal is a .zip archive file containing one or more of the individual EDD files (see Section 3).

NOTE: The EPA electronic mail system will reject files with a .zip format due to security concerns. To match how the EPA Region 4 laboratory submits EDDs, you must rename the EDD file extension from .zip to .dat before emailing the EDD to the EPA Region 4. **Files must be submitted with the “.dat” extension.**

After processing with EDP, the submitted file **IS REQUIRED** to be named according to the following convention that includes the following elements connected with underscores:

- Task Code (PRP use PYYYY-nnnn as provided by R4DART; Fund-lead use YY-nnnn as provided by EPA work order)
- Site Name
- Data Provider Company Code
- Date Submitting (YY MM DD)
- Type (Loc-Location/Ch-Chemistry/FR-FieldResults/WL-WaterLevel/WC-Well/GEO-Geology/VI-Vapor Intrusion)
- .FacilityCode.EPAR4.dat

Example EDD Filename

P2015-0001_ChemicalCompanyABC_PL-DataProvider_19 01 08_Ch.110001224773.EPAR4.dat

where,

- Task Code is “P2015-001”
- Site Name is “Chemical Company ABC”
- Company Code is “PL-DataProvider”
- Date Submitting is January 8, 2019 as “190108”

- Type of data submission is “Ch” for Chemistry
- Facility Code is “110001224773”
- Format used is “EPAR4”
- File extension has been changed from “.zip” to “.dat”

This filename is in the email you received when the project was created at EPA Region 4—you can copy and paste to rename your .dat file.

Note: For the EPA Region 4 to properly process the EDDs, the file naming convention must be followed or the EDD will be sent back to the data provider for correction.

2.6 Valid Values

Valid values, also known as reference values or code lists, govern the contents of some fields in the EDD files and create some of the drop-down menus in EDP. In other words, some fields may only be populated with data that *exactly* matches a value listed in the EPA Region 4 list of valid values in EDP. A list of all the data fields that must contain valid values is presented in Table 2-6. This list is also cross-referenced to the EDD file(s) in which the field appears.

If data providers need to enter a value not already in the EPA Region 4 Valid Value List, they can request the proposed addition to the valid value list by sending an email to R4DART@epa.gov. The data provider should explicitly state the valid value that she/he would like added, into what reference table the value needs to be added, provide a description of the value, and explain why the addition is necessary. In the case of requesting a new laboratory code, the data provider should include the full name of the laboratory and its address and contact information.

When requesting an addition of an analyte, the data provider must include the appropriate CAS RN or EPA ID along with a description of the analyte. The EPA SRS (http://iaspub.epa.gov/sor_internet/registry/substreg/home/overview/home.do) should be thoroughly examined for an existing CAS RN before submitting a request for the addition of new analytes. Select the “Search & Retrieve” tab and enter the CAS Number, chemical name or other identifier. Be certain to check for synonyms. This will minimize possible confusion with conflicting numbers and small variations in chemical naming conventions. EQuIS relies on the CAS RN as the primary key, not the chemical name.

Table 2-6 Valid Values and Associated EDD Files

Valid Value Name	EDD Field Name	EDD Table
Analyte	cas_rn, chemical_name, dnapl_cas_rn, Inapl_cas_rn	Result, Water Level, VI Test Results QC
Analytical Method (see Section 2.7 below)	lab_anl_method_name	Test, Result, VI Test Results QC, VI Batches
Basin	loc_major_basin	Location
Building Type	building_type	VI Building Inspection
Building Use Type	building_use_type	VI Building Inspection, VI Task Parameters
Company	data_provider, drilling_subcontractor, engineer_subcontractor, inspect_contractor, estab_company_code, excav_company_code, sampling_company_code, lab_name_code, subcontractor_name_code, construct_contractor, subcontractor_name_code	Location, All tables containing data_provider, Field Sample, Test, VI Test Results QC, Alternate Position
Company Type	Not Currently Used	None
Coordinate Elevation Datum	elev_datum_code	Location, Alternate Position
Coordinate Elevation Method	elev_collect_method_code, datum_collect_method_code	Location, Alternate Position, Well Datum
Coordinate Geometric Type	geometric_type_code	Alternate Position
Coordinate Horizontal Datum	horz_datum_code	Alternate Position, VI Locations
Coordinate Horizontal Method	horz_collect_method_code, verification_code	Alternate Position, VI Locations
Coordinate Type	coord_type_code	Location, Alternate Position
Coordinate Type Verification	verification_code	Location, Alternate Position
County	county, loc_county_code, state, loc_state_code	VI Building Address, VI Locations
Downhole Point Parameter Type	Param	Downhole Point
Field Parameters	field_parameter	Field Results
Foundation Type	foundation_type	VI Building Inspection
Fraction	total_or_dissolved	Test, Result
Geologic Unit	geo_unit_code_1, geo_unit_code_2, geo_unit_code_3, geo_unit_code_4, geo_unit_code_5, geologic_unit_code	Lithology, Static Properties
Lab Parameters (View)	chemical_name	Result
Location Parameter Type	param_code	Location Parameter
Location Type	loc_type	Location, VI Locations

Table 2-6 Valid Values and Associated EDD Files

Valid Value Name	EDD Field Name	EDD Table
Material	material_type, material_name	Lithology, Static Properties
Matrix	matrix_code, sample_matrix_code, lab_matrix_code	Geologic Sample, Field Sample, Result, Field Results, Test, VI Test Results QC
Preparation Method	lab_prep_method_name, prep_method	Test, VI Test Results QC
Preservative	Preservative	Test, VI Test Results QC
Qualifier	interpreted_qualifiers	VI Test Results QC
Result Type	result_type_code	Result, VI Test Results QC
Sample Method	sample_method, sampling_technique, sampling_method	Geologic Sample, Field Sample, VI Samples
Sample Parameter Type	param_code	Geologic Sample Parameter, Drill Parameter, Sample Parameter
Sample Type	sample_type_code	Field Sample, Result, VI Samples
State	loc_state_code, state	Location, Site, VI Building Address, VI Locations
Stream	stream_code	Location
Sample Parameter Type	param_code	Sample Parameters
Subfacility Parameter Type	param_code	VI Building Parameters
Subfacility Type	site_type	Site
Task Parameter Type	param_code	VI Task Parameters
Task Type	activity_code	Occurs in multiple
Test Batch Type	test_batch_type	Result
Test Type	test_type	Test, Result, VI Test Results QC, VI Batches
Unit	various_unit fields throughout all files	All Files
Well Segment Type	segment_type, material_type_code	Well Construction

2.7 Understanding Analytical Methods

Analytical Methods pose a special challenge in dealing with data from multiple sources and time frames within a single database environment and must be handled with care to provide the most accurate information possible. The EPA Region 4 valid value table, included with the reference files, contains analytical methods based on the EPA laboratory nomenclature.

EPA Method Code:Lab Analytical Code (i.e., VOA:EPA 8260B)

In the example above, “VOA” refers to volatile organic compounds while “EPA 8260B” refers to the laboratory analytical method of discovery of volatile organic compounds by gas chromatography/mass spectrometry (GC/MS). When formatting your own data to comply with the standards necessary for input into the EPA Region 4 EQUIS System, it is important to ensure

the methods used in identifying your data fit properly into one of these standard methods. Table 2-7 below provides a list of EPA Method Codes.

For “Historical” data, if the analytical method is not known, the data may be reported using only the appropriate “Method Code” from Table 2-7. For all “Current” data, the Method Code and Lab Analytical Code are required.

Table 2-7 EPA Method Codes

EPA Method Code	Description
ALG	Algal Assay
ASBES	Asbestos
CLP	Contract Laboratory Program
CNA	Classical/Nutrient Analyses
DCNA	Dissolved Classical Nutrients
DIO	Dioxin
DMTL	Dissolved Metals
HERB	Herbicides
MICRO	Microbiology
NITRO	Nitroaromatics
OCP	Organochlorine Pesticides
OMTL	Organometallics
OPP	Organophosphorous Pesticides
PCBA	PCB Aroclors
PCBC	PCB Congeners
PEST	Pesticides
PHYSP	Physical Properties
PSC	Particle Size Characterization
RAD	Alpha and Beta Emitters
SMTL	Speciated Metals
SPLPD	SPLP Dioxin
SPLPM	SPLP Metals
SPLPP	SPLP Pesticides
SPLPS	SPLP Semi Volatiles
SPLPV	SPLP Volatiles
SVOA	Semi Volatile Organics
TCLPA	TCLP Aroclors
TCLPD	TCLP Dioxin
TCLPH	TCLP Herbicides
TCLPM	TCLP Metals
TCLPP	TCLP Pesticides
TCLPS	TCLP Semi Volatiles
TCLPV	TCLP Volatiles
TMTL	Total Metals
VOA	Volatile Organics
Historic Method Codes	

Table 2-7 EPA Method Codes

EPA Method Code	Description
HIST-CNA	Classical/Nutrient Analyses
HIST-DCNA	Dissolved Classical/Nutrients
HIST-DIO	Dioxin
HIST-DMTL	Dissolved Metals
HIST-HERB	Herbicides
HIST-NITRO	Historical Nitroaromatics
HIST-OCF	Organochlorine Pesticides
HIST-OMTL	Organometallics
HIST-OPP	Organophosphorous Pesticides
HIST-PCBA	PCB Aroclors
HIST-PCBC	PCB Congeners
HIST-PESTPCB	Pesticides/PCBs
HIST-PHYSP	Physical Properties
HIST-PSC	Particle Size Characterization
HIST-RAD	Historical Alpha and Beta Emitters
HIST-SMTL	Speciated Metals
HIST-SPLPM	SPLP Metals
HIST-SPLPP	SPLP Pesticides
HIST-SVOA	Semi-Volatiles
HIST-TCLPM	TCLP Metals
HIST-TCLPP	TCLP Pesticides
HIST-TCLPS	TCLP Semi-Volatiles
HIST-TCLPV	TCLP Volatiles
HIST-TMTL	Total Metals
HIST-VOA	Volatile Organics

2.8 Reporting Results

Laboratory results (both detects and non-detects) must be reported as shown in the example below. Each non-detect row must show an “N” in the detect_flag field and must have values entered in the quantitation_limit and detection_limit_unit fields (i.e., these fields cannot be left null). If no quantitation limit is available for historic data, but a result value is available, a qualifier of “X” should be added to the interpreted_qualifiers column and the result value should be added to the quantitation_limit column. Table 2-8 presents an example of how to report detect (1st row) and non-detect (2nd row) data. Results with a text value, such as “NA,” “ND,” or other non-numeric values should not be reported, as noted in the last row of Table 2-8.

Table 2-8 Example of Reporting Non-detects

result_value	detect_flag	quantitation_limit	detection_limit_unit	lab_qualifiers	interpreted_qualifiers
0.15	Y	0.05	ug/ml		
0.005	N	0.005	ug/ml	U	U
8.0	N	8.0	ug/ml	U	UX
5.2	Y	-	ug/ml	J	J
ND	N		ug/ml	U	

2.9 Reporting Duplicate Lab Results

Duplicate laboratory results can occur for a variety of reasons including dilutions, equipment tolerances, sample conditions, and holding time allowances. Results should be validated and only the final result may be submitted to the EPA Region 4. When duplicate results are reported from the lab and determined by your RPM to report BOTH results, the Test Type specified in the EDD needs to identify accurately the type of result and only one may be marked as Reportable Result of Yes. An example of how to report laboratory duplicate laboratory results is presented in Table 2-9.

Table 2-9 Example of Reporting Laboratory Duplicates

sys_sample_code	lab_anl_method_name	Analysis_date	analysis_time	test_type	cas_rn	chemical_name	result_value*	reportable_result
C082402-10	TMTL:EPA 200.7	01/05/2008	12:41	initial	7440-36-0	Antimony	82	No
C082402-10	TMTL:EPA 200.7	01/05/2008	13:05	dilution	7440-36-0	Antimony	8500	Yes

*Additional fields are required but have not been shown here for simplicity. All required fields for a normal result are required here.

2.10 Reporting Tentatively Identified Compounds (TICs)

Tentatively Identified Compounds (TICs) should be reported to the EPA Region 4 EQuIS system when available. TICs present an additional challenge in reporting to a single database as there is no standardized method of reporting from one source to another.

When submitting TICs to EQuIS, the result_type_code in the Result EDD must be set to "TIC". The compound(s) is typically assigned an R4-Number as the cas_rn.

All ancillary information that is associated with reporting target chemical results should also accompany TICs. These include sys_sample_code, analysis_date, analysis_time, lab_analytical_method, lab_anl_method_name, cas_rn, chemical_name, result_type_code, quantitation_limit, result_unit, detection_limit_unit, and test_batch_id.

Table 2-10 provides examples of TICs and valid values assigned to selected database fields.

Table 2-10 Examples of TIC Reporting

cas_rn	chemical_name	result_type_code	result_value	detect_flag	quantitation_limit
R4-6500	Petroleum Product	TIC	5	Y	5
R4-0000	Tentatively Identified Compounds	TIC		N	0.005
R4-8001483	Furfural (TIC)	TIC	30	Y	

2.11 Using the EQUIS Data Processor to Check EDD Formatting

All EDD files must be processed with the EQUIS Data Processor (EDP) prior to submittal to the EPA Region 4. EDP is a no-cost application that performs a series of formatting checks on EDD files and then identifies any records that have errors, along with a description of those errors. This allows the data provider to correct the errors before sending the files to the EPA Region 4. EDD files that pass through EDP error-free should also result in error-free import at the EPA Region 4.

EDP, EPA Region 4 Format File, and EPA Region 4 Reference Values Files (.rvf) are available as no-cost downloads from the EarthSoft website:

<https://earthsoft.com/products/edp/edp-format-for-epar4/>.

Instructions on how to install and use EDP are also provided on the website and in the *EPA Region 4 EDP Reference Manual*. You will need to register the EPA Region 4 Format with EarthSoft to use EDP. Follow the instructions provided with EDP for registering properly. Contact R4DART for the required authorization code to enter during registration. You will not be able to use EDP with the correct EPA Region 4 Format without proper registration.

Once you have installed and licensed EDP, you should use this document as a guideline for formatting your data to conform to the necessary EDD formats. Load the EPA Region 4 Format and reference values into EDP per the instructions in the *EPA Region 4 EDP Reference Manual*. Import your individual EDDs to the correct section (e.g., Geology, Chemistry, or Basic Field Results) and test your data for readiness to import.

3 EDD FILE FORMATS

This section contains detailed information regarding the files that make up the EPA Region 4 EDD Format. As stated in Section 2.2, each EDD file must be saved as individual text files and can be created using any software with the capability to create text files (including EDP). If a field is limited to a specific number of characters, the limit will be given in parenthesis within the “Data Type” column (e.g., “Text (3)” signifies the value cannot exceed 3 characters in length). Fields marked “required” must be reported for each row in the file. Fields marked “when available” should also be reported, if possible.

If required fields are not populated, errors will be identified in the EDD and the EDD will need to be resubmitted. Note that some fields denoted as “required” in this guidance may not be similarly marked in the EPA Region 4 Blank EDD Template or enforced when submitted through EDP. This discrepancy is intentional to allow submittal of historical data that were collected when the Environmental Data Submission procedures were not applicable. For current data submittals, EDDs should be constructed to meet the requirements as stated in this document.

The Location file needs to be submitted as part of the first EDD submittal. This file need only be submitted once, unless information in the file changes or additional information, such as a new sampling location, needs to be added.

For all other EDD files, the EPA Region 4 will send a list of the EDDs expected for the data submittal.

Note: The EPA Region 4 will provide the valid values for data_provider, task_code, and activity_code for each data submittal.

3.1 Site EDD File

The Site EDD file contains general information about any established Areas of Concern, Operable Units, Background, or Sub-site Areas that may be a segregated investigation. The Site EDD file is typically submitted only once for new area groups of locations and the site_code should be used in the Location’s site_code field.

Site EDD files should be named according to the following convention: **EPAR4_Site_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
site_code	Text (20)	Y		Use a unique code that identifies the sub-site (BLDG, OU or AOC, etc.). This is the Primary Key field that controls duplications within the EDD.
site_type	Text (20)	Y		Enter the primary type of the sub-site. Review the Reference table for a proper entry.
site_name	Text(60)	Y		Common name of the BLDG, OU or AOC as identified on maps and figures.
site_task_code	Text(20)	Y		Unique identifier for when the sub-site was first identified. This should be the unique Project Number that was assigned for a specific event under a given Project ID. Contact the R4DART if you do not have your Project Number.
site_desc1	Text(255)	when available		Alternate Name 1.
site_desc2	Text(255)	when available		Alternate Name 2.
contact_name	Text(50)	Y		Contact name of who would provide access to the sub-site.
address1	Text(40)	when available		Location Address of the sub-site if separate from the facility.
address2	Text(40)	when available		Supplemental Address of the sub-site if separate from the facility.
city	Text(40)	when available		City Name of the sub-site if separate from the facility.
state	Text(10)	when available		State of the sub-site if separate from the facility. Review the Reference table for a proper entry.
zipcode	Text(30)	when available		Zip/Postal Code of the sub-site if separate from the facility.

3.2 Location EDD File

The Location file is typically submitted only once and must be part of the first EDD submittal. The location file only needs to be resubmitted if a new sampling location is used, such as a new monitoring well, or to update previously submitted information. When resubmitting the location file, only include data for the new locations and/or for the locations whose information is being updated. The Location EDD file contains general information about sampling station locations and station ID numbers. This table does not need to be resubmitted if information has previously been submitted to the EPA Region 4 as an EDD.

Location EDD files should be named according to the following convention: **EPAR4_Location_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
data_provider	Text(20)	Y		Location data provider. Review the reference table for a proper entry or obtain your company code from the R4DART.
sys_loc_code	Text(20)	Y		Unique Station or Well ID for the location at the unique X and Y coordinates. A depth differential should not create a separate location. This is the Primary Key field that controls duplications within the EDD.
x_coord	Numeric	Y		X coordinate/Easting/Longitude (WGS 1984 decimal degrees only).
y_coord	Numeric	Y		Y coordinate/Northing/Latitude (WGS 1984 decimal degrees only).
coord_type_code	Text(20)	Y		Sampling location coordinate system description. Must be Latitude and Longitude based on World Geodetic System 1984 (WGS84) datum. Reference Value is Lat Long.
verification_code	Text(20)	Y		Verification Code of coordinate accuracy. Review the Reference table for a proper entry.
loc_type	Text(20)	Y		Media Code for the general location. In many cases, multiple sample types (e.g., surface soil, subsurface soil) were collected. Identify the initial media type here as multiple values are not available and only one location should be specified under sys_loc_code. Review the reference table for a proper entry.
surf_elev	Numeric	Y		Elevation of the ground surface, or, if the location is for surface water samples, water surface elevation (Decimal feet).
elev_unit	Text(15)	Y		Surface elevation unit (Decimal feet).

Field Name	Data Type	Required	Parent	Description
elev_datum_code	Text(20)	Y		Code that represents the reference datum used to determine the vertical measure or elevation. Review the reference table for a proper entry.
elev_collect_method_code	Text(20)	Y		Code that represents the method used to collect the vertical measure or elevation of a reference point. Review the reference table for a proper entry.
parcel_code	Text(255)	Y		Assessor's Parcel Number, if available. This is required for all Residential type locations.
loc_desc	Text(255)	Y		Location description. Residential locations shall have the street address entered. Other location types may include a short summary of how to access hard to find locations.
total_depth	Numeric	Y		The total depth associated with this location. For surface water, enter the total depth of the body of water.
depth_to_bedrock	Numeric	when available		Depth to bedrock, if applicable to this location when boring.
units	Text(15)	Y		Depth units of total_depth and/or depth_to_bedrock. Review the Reference table for a proper entry.
bearing	Text(20)	Y		Angle of variance from a given reference point (i.e., North); assumed vertical location if not provided.
plunge	Text(20)	Y		Angle of variance (inclination) from horizontal; assumed vertical location if not provided.
loc_name	Text(40)	Y		Location name. May be used for clarification or better relationship to text (e.g., MW04 was originally MW-04).
loc_type_2	Text(20)	Y		Land use type. Enter residential, industrial, federal, or tribal that best describes the land use at the location.
loc_purpose	Text(20)	Y		Short definition for purpose of location (e.g., Monitoring, Removal, Remedial Design, Creek Monitoring, etc.).
site_code	Text(20)	when available	EPAR4_Site_v1. site_code	Code used to specify an Operational Unit the location falls within.
start_date	Date	when available		Date started at location, if known.
end_date	Date	when available		Date ended at location, if known.
log_date	Date	when available		Date log entry made.
survey_date	Date	Y		Date survey was done.

Field Name	Data Type	Required	Parent	Description
surveyor_name	Text(255)	Y		Name of surveyor
driller	Text(50)	when available		Name of driller (well installation or soil core sample; not for SW or SD).
drilling_subcontractor	Text(20)	when available		Code of drilling subcontractor. Review the Reference table for a proper entry.
drilling_method	Text(40)	when available		Simple description of drilling method.
geologist	Text(50)	when available		Name of geologist.
engineer	Text(50)	when available		Name of engineer.
engineer_subcontractor	Text(20)	when available		Engineering subcontractor. Review the Reference table for a proper entry.
inspector	Text(50)	when available		Name of inspector.
inspect_contractor	Text(20)	when available		Code of inspection subcontractor. Review the Reference table for a proper entry.
drawing_checker	Text(50)	when available		Name of person checking the drawing.
drawing_check_date	Date	when available		Date drawing was checked.
drawing_editor	Text(50)	when available		Name of person editing the drawing.
drawing_edit_date	Date	when available		Date edit was made to drawing.
within_facility_yn	Text(1)	Y		“Facility” is an EQuIS database term. For EPA R4 purposes, this field distinguishes whether the location is “within the Superfund site boundary versus a background sample.” Y/N value indicating: Y, if location is within the Superfund site boundary; N, if included as background or off property sampling location.
loc_county_code	Text(20)	when available		Location county code. Review the Reference table for a proper entry.
loc_district_code	Text(20)	when available		Location district code.
loc_state_code	Text(10)	when available		Location state code. Review the Reference table for a proper entry.
loc_major_basin	Text(20)	when available		Location major basin. Review the Reference table for a proper entry.
loc_minor_basin	Text(20)	when available		Location minor basin.
estab_company_code	Text(20)	when available		Location establishing company code. Review the Reference table for a proper entry.
excav_company_code	Text(20)	when available		Location excavation company code. Review the Reference table for a proper entry.

Field Name	Data Type	Required	Parent	Description
remark	Text(255)	when available		Additional Remark about the location.
remark_2	Text(255)	when available		Additional Remark about the location.
approved	Text(1)	when available		Is the information approved for inclusion to the database? Y or N.
stream_code	Text(30)	when available		Stream code. This may include rivers, creeks, or other types of moving waterways.
stream_mile	Numeric	when available		Stream mile. Required when location is from rivers, creeks, or other types of moving waterways.

3.3 Alternate Position EDD File

When multiple coordinates may exist for an identified location, an Alternate Position EDD may be submitted, ranking the locational information according to preference.

Alternate Position EDD files should be named according to the following convention: **EPAR4_AlternatePosition_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
sys_loc_code	Text (20)	Y	Location EDD, sys_loc_code	Unique Station or Well ID. Required for mapping. Must be a valid code for the facility and must match one of the reported values in the sys_loc_code field of the Location EDD file submitted in the current or previous EDD.
coord_type_code	Text (20)	Y		Unique identifier describing coordinate system in which this location is referenced (WGS 1984). Refer to Valid Values.
identifier	Text (20)	Y		Text identifier that facilitates unique representation of the coordinate system.
observation_date	Date	when available		Date when position observation was made.
alt_x_coord	Text (20)	when available		Alternate X coordinate. WGS 1984 in decimal degrees ONLY.
alt_y_coord	Text (20)	when available		Alternate Y coordinate. WGS 1984 in decimal degrees ONLY.
elev	Text (20)	when available		Alternate elevation.

Field Name	Data Type	Required	Parent	Description
elev_unit	Text (15)	when available		Unit of measurement for the elevation. Refer to Valid Values.
horz_collect_method_code	Text (20)	when available		Code that represents the method used to determine the coordinates for a point on the earth. Refer to Valid Values.
horz_accuracy_value	Text (20)	when available		Measure of the accuracy of the x, y coordinates.
horz_accuracy_unit	Text (15)	when available		Unit of measure used to quantify the measure of horizontal accuracy. Refer to Valid Values.
horz_datum_code	Text (20)	when available		Code that represents the reference datum used in determining x, y coordinates. Refer to Valid Values.
elev_collect_method_code	Text (20)	when available		Code that represents the method used to collect the vertical measure or elevation of a reference point. Refer to Valid Values.
elev_accuracy_value	Text (20)	when available		Measure of accuracy of the elevation.
elev_accuracy_unit	Text (15)	when available		Unit of measure used to quantify the measure of vertical or elevation accuracy. Refer to Valid Values.
elev_datum_code	Text (20)	when available		Code that represents the reference datum used to determine the vertical measure or elevation. Refer to Valid Values.
source_scale	Text (20)	when available		Represents the proportional distance on the ground for one unit of measure on a map or photo.
subcontractor_name_code	Text (20)	when available		Code used to represent the subcontractor or party responsible for providing coordinate information.
verification_code	Text (20)	when available		Code that represents the process used to verify the coordinate information. Refer to Valid Values.
reference_point	Text (50)	when available		Text that identifies the place for which geographic coordinates were established.
geometric_type_code	Text (20)	when available		Code that defines the geometric entity represented. As sys_loc_code typically defines a location (e.g., borehole, well, etc.), this will likely be a "point". Refer to Valid Values.
remark	Text (255)	when available		Remarks.
rank	Numeric	when available		Integer that represents preference where more than one coordinate system exists for a given sys_loc_code.

3.4 Site Location EDD File

The Site Location EDD identifies sampling locations in relation to the site as on site, off site or a background sample. It also ties a group of locations as various sys_loc_code fields directly to a site_code.

Site Location EDD files should be named according to the following convention: **EPAR4_SiteLoc_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
sys_loc_code	Text (20)	Y	Location EDD, sys_loc_code	Unique Well ID. Required for mapping. Must be a valid code for the facility and must match one of the reported values in the sys_loc_code field of the location EDD file submitted in the current or previous EDD.
site_code	Text (20)	Y		Use the BG, OU, or AOC code submitted in the Site section.
site_loc_type_code	Text (10)	when available		Code indicating whether the location is onsite, offsite, or background.
gradient	Text (20)	when available		Gradient at site.

3.5 Location Parameter EDD File

Additional location parameters are related by the Primary Key sys_loc_code. Parameter codes must be added to the rt_location_param_type table first.

Location Parameter EDD files should be named according to the following convention: **EPAR4_LocationParameter_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
sys_loc_code	Text(20)	Y	EPAR4_Location_v1. sys_loc_code	Unique Station ID. Required for mapping. Must match what has been previously submitted for the location or match what is entered in the EPAR4_Location_v1.sys_loc_code field. This is the Primary Key field with the param_code and measurement_date that inhibits duplications within the EDD.
param_code	Text(20)	Y		Code used to identify parameter being measured. Review the Reference table for a proper entry. Valid param_code values are WindSpeed and WindDirection.
param_value	Text(240)	Y		Value of parameter reading. Record the WindDirection as degrees clockwise relative to due North.
param_unit	Text(15)	Y		Unit of the parameter measurement. As appropriate, enter the unit of the speed recorded or for the wind direction, the unit must be based on degrees clockwise relative to due north. Review the Reference table for a proper entry.
measurement_method	Text(20)	Y		Method used to measure the parameter reading.
measurement_date	Date	Y		Date the parameter reading was conducted.
remark	Text(255)	when available		Remarks about parameter.

3.6 Field Results EDD File

Field results may be entered for current and historical sampling events where field information such as temperature, pH, turbidity, salinity, and dissolved oxygen was captured. The field_parameter column should be used to identify what was captured with the

results of that test in the result_value column and the appropriate units in the result_unit column. Field parameters not identified in the valid values table for Field Results should be submitted to EPA with an explanation of the parameter, its units, and result type (numeric, text, etc.) for possible inclusion into the valid values.

Field Results EDD files should be named according to the following convention: **EPAR4_FieldResults_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
data_provider	Text(20)	Y		EDD provider. Review the Reference table for a proper entry or obtain your company code from the R4DART.
project_id	Text(20)	Y		The Project ID is the EPA tracking number for the entire project. Contact the R4DART if you do not have your Project ID.
activity_code	Text(20)	Y		The program activity associated for the well information (e.g., RI, PASI, RA, etc.). Review the Reference table for a proper entry.
sys_loc_code	Text(20)	Y	EPAR4_Location_v1.sys_loc_code	Unique Location ID. Must match what has been previously submitted for the location or match what is entered in the EPAR4_Location_v1.sys_loc_code field. This is the Primary Key field along with the sample_name, field_parameter, and result_date fields that inhibits duplications within the EDD.
sample_name	Text(17)	Y		Sample ID used within creation of the unique sys_sample_code. Task_code, sample_name, and result_date combined cannot exceed 40 characters.
field_parameter	Text(15)	Y		Field parameter. These are controlled with the "FI-" prefix as defined by EPA. Review the Reference table for a proper entry.
start_depth	Numeric	Y		Sample start depth.
end_depth	Numeric	Y		Sample end depth.
depth_unit	Text(2)	Y		Sample depth unit. Review the Reference table for a proper entry.
result_date	DateTime	Y		Result date/time (MM/DD/YYYY hh:mm:ss).
result_value	Numeric	Y (for detects)		Result value.
result_unit	Text(15)	Y		Result unit.
quantitation_limit	Text(20)	Y (for non-detects)		Quantitation limit.
sample_matrix_code	Text(10)	Y		Sample matrix code.

Field Name	Data Type	Required	Parent	Description
qualifier	Text(20)	Y		Qualifier.
sampling_reason	Text(30)	when available		Additional reason for sampling.
sample_method	Text(40)	when available		Sampling technique. Review the Reference table for a proper entry.
reportable_result	Text(3)	Y		Reportable result.
value_type	Text(10)	Y		How value was derived. Acceptable entries include "ACTUAL", "CALCULATED", OR "ESTIMATED".
detect_flag	Text(1)	Y		Y/N. May be either Y for detected analytes or N for non-detects.
remark	Text(225)	when available		Additional information about the parameter reading.

3.7 Chemistry Field Sample EDD File

The Chemistry Field Sample EDD is the crucial file by which all chemistry result data is based. Sys_sample_code uniquely identifies each sample that was returned from a laboratory with a result. This value is unique throughout the database, even for resamples, duplicates, etc. This does not represent the value submitted on the chain of custody when sending samples to the lab for analyses (which should be populated in the sample_name column).

Chemistry Field Sample EDD files should be named according to the following convention: **EPAR4_FSsample_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
sys_sample_code	Text(40)	Y		Sample ID. Each sample must have a unique value, including spikes and duplicates. Laboratory QC samples must also have unique identifiers. Uniqueness throughout the database is the only restriction enforced by EQUIS.
sample_name	Text(30)	Y		Sample ID from COC. Is not required to be unique (i.e., duplicates are OK).
sample_matrix_code	Text(10)	Y		Media Code. Review the Reference table for a proper entry.
sample_type_code	Text(10)	Y		Code to distinguish between field samples (N) and field QA/QC and Laboratory samples. Review the Reference table for a proper entry.
sample_source	Text(10)	Y		This field identifies where the sample came from, either Field or Lab. In this import, this should always be Field.
parent_sample_code	Text(40)	(For Duplicate or Replicate)	EPAR4_FSsample_v1. sys_sample_code	The value of "sys_sample_code" that uniquely identifies the sample that was the source of this sample. For example, the value of this field for a duplicate sample would identify the normal sample of which this sample is a duplicate. Required in the laboratory EDD for all laboratory "clone" samples (e.g., spikes and duplicates). Field duplicates may be submitted blind to the laboratory, so this field is not required in the laboratory EDD for field "clones". Must be blank for samples which have no parent (e.g., normal field samples, LCS samples, method blanks, etc.).

Field Name	Data Type	Required	Parent	Description
project_number	Text(20)	Y		The unique Project Number that is assigned to individual labs or events under a given Project ID. If the project uses multiple labs or is preparing multiple COCs or undergoing multiple events during the course of the project. This will be unique for each lab event/EDD submittal. Unique identifier for the event. Contact the R4DART if you do not have your Project Number.
sample_date	Date	Y		Date sample was collected in the field. Date information must be identical with the date from the AR/COC form.
sample_time	Time	Y		Time sample was collected in the field. Time information must be identical with the date from the AR/COC form.
sys_loc_code	Text(20)	Y		Unique Station or Well ID. Must match what has been previously submitted for the location or match what is entered in the EPAR4_Location_v1.sys_loc_code field. If #R4DART# was used for QC type samples in Scribe or EDGE, this must be removed from the sys loc code before submitting data. QC type of samples are not to have sys_loc_code populated.
start_depth	Numeric	Y (unless there is a well segment provided)		Beginning depth (top) of sample. Required when sample_matrix_code = SF, SB, or SD and SW when taken from a large body of water.
end_depth	Numeric	Y (unless there is a well segment provided)		Ending depth (bottom) of sample. Required when sample_matrix_code = SF, SB, or SD and SW when taken from a large body of water.
depth_unit	Text(15)	Y (when depths are provided)		Unit of measurement for the sample begin and end depths. Review the Reference table for a proper entry.
chain_of_custody	Text(15)	when available		Chain of custody identifier. A single sample may be assigned to only one chain of custody.
sent_to_lab_date	Date	when available		Date sample was sent to lab (in MM/DD/YY format for EDD).
sample_receipt_date	Date	when available		Date that sample was received at laboratory (in MM/DD/YY format for EDD).
sampler	Text(30)	when available		Name or initials of sampler.

Field Name	Data Type	Required	Parent	Description
sampling_company_code	Text(20)	Y		Sampling company code. Review the Reference table for a proper entry.
sampling_reason	Text(30)	when available		Additional reason for sampling.
sampling_technique	Text(40)	Y		Sampling technique. Review the Reference table for a proper entry.
project_id	Text(20)	Y		The Project ID is the EPA tracking number for the entire project. Contact the R4DART if you do not have your Project ID.
activity_code	Text(20)	Y		The program activity associated for the well information (e.g., RI, PASI, RA, etc.).
collection_quarter	Text(5)	Y		Quarter of the year sample was collected (e.g., "17Q1").
composite_yn	Text(1)	Y		Sample collection location. Boolean field used to indicate whether a sample is a composite sample. Not included in the laboratory EDD.
composite_desc	Text(255)	when available		Description of composite sample (Required when composite_yn is Y).
sample_class	Text(10)	when available		Sample class code.
custom_field_1	Text(255)	When needed		Custom sample field.
custom_field_2	Text(255)	When needed		Custom sample field.
custom_field_3	Text(255)	When needed		Custom sample field.
comment	Text(255)	when available		Sample comments as necessary (optional).
sample_receipt_time	Time	when available		Time of lab receipt sample in 24-hr (military) hh:mm format.
sample_delivery_group	Text(10)	when available		Sample delivery group.
cat_sample_code		when available		Do not edit; this code is to match Sample with Field Sample.

3.8 Chemistry Sample Parameter EDD File

The Chemistry Sample Parameter EDD contains associated information about the sample that may not have an analytical method or a true numerical type result. Use the Sample Parameter EDD to record parameter data associated with a sample sent to a lab. This is commonly used for measurements associated with biological data to record information about the species being analyzed.

Chemistry Sample Parameter EDD files should be named according to the following convention: **EPAR4_SampleParameter_v1.csv or**

.txt for tab-delimited files.

Field Name	Data Type	Required	Parent	Description
sys_sample_code	Text (40)	Y		Lab Sample ID. For data generated by R4 and CLP, prefix Lab Sample ID with R4. Each sample must have a unique value, including spikes and duplicates. Laboratory QC samples must also have unique identifiers. Uniqueness throughout the database is the only restriction enforced by EQUIS.
param_code	Text (20)	Y		Unique code for sample parameter type. Refer to Valid Values: must exist in the rt_sample_param_type.param_code table.
measurement_date	DateTime	Y		Date of sample parameter measurement in MM/DD/YYYY hh:mm:ss format.
param_unit	Text (15)	when available		Unit of measurement for subsample amount. Refer to Valid Values.
param_value	Text (255)	when available		Sample parameter value.
measurement_method	Text (20)	when available		Measurement method.
remark	Text (2000)	when available		Parameter measurement specific comment.

3.9 Chemistry Test EDD File

The Test EDD ties the Field EDD to the results by correlating the analytical method used with the sys_sample_code, along with the analysis date and time. It is important to follow the guidelines for the EPA Region 4 sys_sample_code. The R4 prefix is reserved for LSASD /CLP LIMS (Element) data. Regardless of the sample's source, the sys_sample_code must match the Chemistry Field Sample section's sys_sample_code to tie the tests back to the sample. Lab analytical methods should be matched to the valid values. Historical data should be matched as closely as possible or an R4-HIST or HIST method should be chosen that matches. When these assumptions are made, they should be listed in the technical documentation of the conversion. When no suitable analytical method can be found, the method should be submitted to the EPA Region 4 along with a description for review and possible inclusion in the valid values tables.

When preparing data from non- LSASD/CLP labs, as well as historical data, certain required data such as the analysis date and time may be missing. A convention has been created to handle these inconsistencies and enter data successfully into the EPA EQUIS

system. When the analysis date is not present in the lab report, it should be reported in the EDD using the same date as the sample date but with an analysis time of 23:59. This will allow the user to easily identify data with missing analysis dates, and to recognize that information was missing. Data results with an analysis date but no time should be given an analysis time of 23:59. It's important not to use arbitrary times that are similar to other actual data times as these give the appearance that the data set was complete and not simply an estimate.

Any time there is estimated information populated, you must include a comment describing what was added within the comment field.

Chemistry Test EDD files should be named according to the following convention: **EPAR4_TST_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
sys_sample_code	Text(40)	Y	EPAR4_FSAMPLE_v1. sys_sample_code	Sample ID. Each sample must have a unique value, including spikes, duplicates and laboratory QC samples. This is the Primary Key field along with the lab_anl_method_name, analysis_date, total_or_dissolved, analysis_time, and test_type fields that inhibits duplications within the EDD. This must match what is recorded in the EPAR4_RES_v1 sample result's sys_sample_code, lab_anl_method_name, analysis_date, analysis_time, total_or_dissolved, test_type for the information is directly related.
lab_anl_method_name	Text(20)	Y		Laboratory analytic method name or description. Review the Reference table for a proper entry.
analysis_date	Date	Y		Date of sample analysis in MM/DD/YYYY format. May refer to either beginning or end of the analysis as required by EQUIS Chemistry project manager. This field is not always required, but most users will want it.
analysis_time	Time	Y		Time of sample analysis in 24-hr (military) hh:mm format. Time zone and daylight savings must be same as analysis_date.
total_or_dissolved	Text(1)	Y		Must be either "T" for total [metal] concentration, "D" for dissolved or filtered [metal] concentration, or "N" for organic (or other) constituents for which neither "total" nor "dissolved" is applicable.

Field Name	Data Type	Required	Parent	Description
column_number	Text(2)	Y		If required, then it must be either "1C" for first column analyses, "2C" for second column analyses, or "NA" for analyses for which neither "1C" nor "2C" is applicable.
test_type	Text(20)	Y		Type of test in the laboratory. This field is used to distinguish between initial runs, re-extractions, reanalysis and dilutions. Review the Reference table for a proper entry.
lab_matrix_code	Text(10)	Y		Code that describes the matrix as analyzed by the lab. May differ from sample_matrix_code. See matrix valid value table.
analysis_location	Text(2)	Y		Notes where sample was analyzed. FL for mobile Field Laboratory analysis, LB for a fixed Based Laboratory analysis or FI for Field Instrument.
basis	Text(10)	Y		Must be either Wet for wet_weight basis reporting, Dry for dry_weight basis reporting, or NA for tests for which this distinction is not applicable.
container_id	Text(30)	when available		Sample container identifier.
dilution_factor	Numeric	Y		Dilution factor at which the analyte was measured effectively. Enter "1" if not diluted.
lab_prep_method_name	Text(20)	when available		Laboratory sample preparation method code. Review the Reference table for a proper entry.
prep_date	Date	when available		Date sample preparation began in MM/DD/YYYY format.
prep_time	Time	when available		Time sample preparation began in 24-hr (military) format. Time zone and daylight savings must be same as analysis_date.
leachate_method	Text(15)	when available		Laboratory leachate generation method name or description. The method name should be sufficient to reflect operation of the laboratory.
leachate_date	Date	when available		Date of leachate preparation in MM/DD/YYYY format.
leachate_time	Time	when available		Time of leachate preparation in 24-hr (military) format. Time zone and daylight savings must be same as analysis_date.
lab_name_code	Text(20)	Y		Unique identifier of the laboratory as defined by the EPA. Review the Reference table for a proper entry.
qc_level	Text(10)	Y		Quality Control Level. Please enter the Corresponding Label Code from Appendix B of the Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use. https://semsub.epa.gov/work/HQ/176101.pdf

Field Name	Data Type	Required	Parent	Description
lab_sample_id	Text(20)	when available		Laboratory LIMS sample identifier. If necessary, a field sample may have more than one LIMS lab_sample_id (maximum one per each test event).
percent_moisture	Text(5)	when available		Percent moisture of the sample portion used in this test; this value may vary from test to test for any sample. Report 70.1% as 70.1 not as 70.1%.
subsample_amount	Text(14)	when available		Amount of sample used for test.
subsample_amount_unit	Text(15)	when available		Unit of measurement for subsample amount. Review the Reference table for a proper entry.
analyst_name	Text(30)	when available		Name or initials of laboratory analyst.
instrument_id	Text(50)	when available		Instrument identifier.
comment	Text(255)	when available		Comments about the test as necessary.
preservative	Text(20)	Y		Sample preservative used. Review the Reference table for a proper entry.
final_volume	Text(15)	when available		The final volume of the sample after sample preparation. Include all dilution factors.
final_volume_unit	Text(15)	when available		The unit of measure that corresponds to the final_volume. Review the Reference table for a proper entry.

3.10 Chemistry Result EDD File

The Chemistry Sample Result EDD file contains result data for laboratory analyses only. For surface water samples, record the sample depths, start_depth (field 9), and end_depth (field 10), as depth below the water surface elevation. The water surface elevation at the time of the sampling should be recorded in the Water Level file (see Section 3.14).

Chemistry Results EDD files should be named according to the following convention: **EPAR4_RES_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
sys_sample_code	Text(40)	Y	EPAR4_TST_v1. sys_sample_code	Sample ID. Each sample must have a unique value, including spikes, duplicates and laboratory QC samples. This is the Primary Key field with the lab_anl_method_name, analysis_date, analysis_time, total_or_dissolved, test_type and cas_rn fields that inhibits duplications within the EDD. This must match what is recorded in the EPAR4_TST_v1 sample's sys_sample_code, lab_anl_method_name, analysis_date, analysis_time, total_or_dissolved, test_type because the information is directly related.
lab_anl_method_name	Text(20)	Y	EPAR4_TST_v1. lab_anl_method_name	Laboratory analytic method name or description. Review the Reference table for a proper entry.
analysis_date	Date	Y	EPAR4_TST_v1. analysis_date	Date of sample analysis in MM/DD/YY format. May refer to either beginning or end of the analysis as required by EQUIS Chemistry project manager. This field is not always required, but most users will want it.
analysis_time	Time	Y	EPAR4_TST_v1. analysis_time	Time of sample analysis in 24-hr (military) hh:mm format. Time zone and daylight savings must be same as analysis_date.
total_or_dissolved	Text(1)	Y	EPAR4_TST_v1. total_or_dissolved	Must be either "T" for total [metal] concentration, "D" for dissolved or filtered [metal] concentration, or "N" for organic (or other) constituents for which neither "total" nor "dissolved" is applicable.

Field Name	Data Type	Required	Parent	Description
column_number	Text(2)	when available		If required, then it must be either "1C" for first column analyses, "2C" for second column analyses, or "NA" for analyses for which neither "1C" nor "2C" is applicable. Second column data may not be required, depending on the needs identified by the EQuIS Chemistry project manager, in which case all results may be reported as "NA". However, if any "2C" tests are reported, then there must be corresponding "1C" tests present also. Also, laboratories typically can report which of the two columns is to be considered "primary". This distinction is handled by the "reportable_result" field in the result table. This field is not part of the EPA Region 4's test primary key. This field will not create uniqueness for the results. If more than one column needs to be reported, then one of the test primary keys will need to be used for uniqueness.
test_type	Text(20)	when available	EPAR4_TST_v1. test_type	Type of test in the laboratory. This field is used to distinguish between initial runs, re-extractions, reanalysis and dilutions. Review the Reference table for a proper entry.
cas_rn	Text(15)	Y		CAS Number or R4 designation. Review the Reference table for a proper entry.
chemical_name	Text(60)	Y		Chemical or Analyte Name.
result_value	Numeric	Y (for detects)		Result Value.
result_error_delta	Text(20)	when available		Error range applicable to the result value; typically used only for radiochemistry results.
result_type_code	Text(3)	Y		Must be either TRG for a target or regular result, TIC for tentatively identified compounds, SUR for surrogates, IS for internal standards, or SC for spiked compounds.
reportable_result	Text(3)	Y		Yes/No. Must be Yes for results considered to be reportable, or No for other results.
detect_flag	Text(1)	Y		May be either Y for detected analytes or N for non-detects.
lab_qualifiers	Text(20)	when available		Qualifier flags assigned by the lab.
validator_qualifiers	Text(40)	when available		Qualifier flags assigned by the validator.
interpreted_qualifiers	Text(20)	when available		Final qualifier flags. Review the Reference table for a proper entry.

Field Name	Data Type	Required	Parent	Description
organic_yn	Text(1)	when available		Must be either Y for organic constituents or N for inorganic constituents.
method_detection_limit	Text(20)	when available		Method detection limit.
reporting_detection_limit	Numeric	when available		Concentration level above which results can be quantified with 95% confidence limit. Must reflect conditions such as dilution factors and moisture content. Report as the sample specific detection limit.
quantitation_limit	Text(20)	Y (for non-detects)		Concentration level above which results can be quantified with 95% confidence limit. Must reflect conditions such as dilution factors and moisture content. Report as the sample specific quantitation limit.
result_unit	Text(15)	Y (for detects)		Units of measurement for the result unit. Review the Reference table for a proper entry.
detection_limit_unit	Text(15)	Y (for non-detects)		Units of measurement for the detection limit(s). Review the Reference table for a proper entry. This field is required if a reporting_detection_limit is reported.
tic_retention_time	Text(8)	when available		TIC Retention Time.
result_comment	Text(254)	when available		Result specific comments.
qc_original_conc	Text(14)	when available		The concentration of the analyte in the original (unspiked) sample. Might be required for spikes and spike duplicates (depending on user needs). Not necessary for surrogate compounds or LCS samples where the original concentration is assumed to be zero.
qc_spike_added	Text(14)	when available		The concentration of the analyte added to the original sample. Might be required for spikes, surrogate compounds, LCS and any spiked sample (depending on user needs).
qc_spike_measured	Text(14)	when available		The measured concentration of the analyte. Use zero for spiked compounds that were not detected in the sample. Might be required for spikes, spike duplicates, surrogate compounds, LCS and any spiked sample (depending on user needs).
qc_spike_recovery	Text(14)	when available		The percent recovery calculated as specified by the laboratory QC program. Always required for spikes, spike duplicates, surrogate compounds, LCS and any spiked sample. Report as percentage multiplied by 100 (e.g., report 120% as 120).

Field Name	Data Type	Required	Parent	Description
qc_dup_original_conc	Text(14)	when available		The concentration of the analyte in the original (unspiked) sample. May be required for spike or LCS duplicates only (depending on user needs). Not necessary for surrogate compounds or LCS samples (where the original concentration is assumed to be zero).
qc_dup_spike_added	Text(14)	when available		The concentration of the analyte added to the duplicate sample. Might be required for spike or LCS duplicates, surrogate compounds, and any spiked and duplicated sample (depending on user needs).
qc_dup_spike_measured	Text(14)	when available		The measured concentration of the analyte in the duplicate. Use zero for spiked compounds that were not detected in the sample. Might be required for spike and LCS duplicates, surrogate compounds, and any other spiked and duplicated sample.
qc_dup_spike_recovery	Text(14)	when available		The duplicate percent recovery calculated as specified by the laboratory QC program. Always required for spike or LCS duplicates, surrogate compounds, and any other spiked and duplicated sample. Report as percentage multiplied by 100 (e.g., 50% as 50).
qc_rpd	Text(8)	when available		The relative percent difference calculated as specified by the laboratory QC program. Required for duplicate samples as appropriate. Report as percentage multiplied by 100 (e.g., report 30% as 30).
qc_spike_lcl	Text(8)	when available		Lower control limit for spike recovery. Required for spikes, spike duplicates, surrogate compounds, LCS and any spiked sample. Report as percentage multiplied by 100 (e.g., report 60% as 60).
qc_spike_ucl	Text(8)	when available		Upper control limit for spike recovery. Required for spikes, spike duplicates, surrogate compounds, LCS and any spiked sample. Report as percentage multiplied by 100 (e.g., report 120% as 120).
qc_rpd_cl	Text(8)	when available		Relative percent difference control limit. Required for any duplicated sample. Report as percentage multiplied by 100 (e.g., report 25% as 25).

Field Name	Data Type	Required	Parent	Description
qc_spike_status	Text(10)	when available		Used to indicate whether the spike recovery was within control limits. Use the * character to indicate failure, otherwise leave blank. Required for spikes, spike duplicates, surrogate compounds, LCS and any spiked sample.
qc_dup_spike_status	Text(10)	when available		Used to indicate whether the duplicate spike recovery was within control limits. Use the * character to indicate failure, otherwise leave blank. Required for any spiked and duplicated sample.
qc_rpd_status	Text(10)	when available		Used to indicate whether the relative percent difference was within control limits. Use the * character to indicate failure, otherwise leave blank. Required for any duplicated sample.
test_batch_type	Text(10)	when available		Lab Batch type. Review the Reference table for a proper entry.
test_batch_id	Text(20)	when available		Unique identifier for all lab batches.

3.11 Well EDD File

The Well EDD file should be submitted for all sites where extraction and/or injection wells are a part of the remedial work at the site. The purpose of the Well EDD file is to provide the EPA Region 4 with detailed well information that may be correlated with water levels, well construction and geologic information. It also provides pump type, capacity and yield information.

Well EDD files should be named according to the following convention: **EPAR4_Well_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
data_provider	Text(20)	Y		EDD provider. Review the Reference table for a proper entry or obtain your company code from the R4DART.
task_code	Text(20)	Y		Unique identifier for the event. This should be the unique Project Number that was assigned for a specific event under a given Project ID. Contact the R4DART if you do not have your Project Number.
activity_code	Text(20)	Y		The program activity associated for the well information (e.g., RI, PASI, RA, etc.).
sys_loc_code	Text(20)	Y	EPAR4_Location_v1.sys_loc_code	Unique Well ID. Must match what has been previously submitted for the location or match what is entered in the EPAR4_Location_v1.sys_loc_code field. This is the Primary Key field that controls duplications within the EDD.
top_casing_elev	Numeric	Y		Elevation of the top of well casing. This should be survey grade information.
well_id	Text(30)	when available		Non-unique well identifier, name, or alias that may be used for graphical display names.
well_owner	Text(50)	Y		Owner of well for Industry. Use "Resident" for any wells owned by a private citizen.
well_purpose	Text(20)	Y		Brief description of well use (e.g., Monitoring, Injection, Extraction, Water Supply, etc.).
well_status	Text(20)	Y		Current status of well (e.g., damaged, active, abandoned, etc.).
depth_of_well	Numeric	Y		Total depth of the well as measured from the top of casing measuring point. Required for all wells, except for temporary wells.
depth_unit	Text(15)	Y		Unit of measure for depth_of_well and top_of_casing. Review the Reference table for a proper entry.

Field Name	Data Type	Required	Parent	Description
depth_measure_method	Text(20)	Y		Method used to make the well depth measurement.
stickup_height	Text(8)	Y		Total height the well extends above ground surface. Required for all new well installations.
stickup_unit	Text(15)	Y		Unit of measure for stickup height. Review the Reference table for a proper entry. Required for all new well installations.
sump_length	Text(20)	Y		Length of sump at well installation. Required for all new well installations.
sump_unit	Text(15)	Y		Unit of measure for sump length. Review the Reference table for a proper entry. Required for all new well installations.
installation_date	Date	Y		Date well was installed. Required for all new well installations.
construct_start_date	Date	when available		Date well construction began, if different from installation date.
construct_complete_date	Date	when available		Date well construction was completed, if different from installation date.
construct_contractor	Text(20)	Y		Name of company that installed well. Required for all new well installations.
pump_type	Text(20)	when available		Type of pump installed, if applicable.
pump_capacity	Text(6)	when available		Pump capacity.
pump_unit	Text(15)	when available		Unit of measure for pump capacity (e.g., gal/minute). Review the Reference table for a proper entry.
pump_yield	Text(6)	when available		Pump yield.
pump_yield_method	Text(20)	when available		Method of testing pump yield.
weep_hole	Text(1)	when available		Does well have weep hole (Y/N)?
head_configuration	Text(50)	when available		Description of well head configuration.
access_port_yn	Text(1)	when available		Does well have access port (Y/N)?
casing_joint_type	Text(50)	when available		Description of well casing joint type.
perforator_used	Text(50)	when available		Description of well perforator, if applicable.
intake_depth	Numeric	when available		Depth of well intake.
disinfected_yn	Text(1)	when available		Has well been disinfected (Y/N)?
historical_reference_elev	Numeric	when available		Elevation of reference measuring point used when top_of_casing is not available.

Field Name	Data Type	Required	Parent	Description
geologic_unit_code	Text(20)	Y		Geologic unit from which well samples collected. Review the Reference table for a proper entry.
geologist_name	Text(50)	when available		Geologist name.
driller	Text(50)	when available		Driller.
remark	Text(2000)	when available		Remark to further document purpose of Well.

3.12 Well Construction EDD File

The Well Construction EDD allows for the input of information regarding the materials, sizes, and program associated with well installation. Wells should be tied to a location by a valid sys_loc_code populated in the Location EDD (which may have been previously submitted). Record the activity code, task code, and other information related to the specific installation event.

Well Construction EDD files should be named according to the following convention: **EPAR4_WellConstruction_v1.csv or .txt for tab-delimited files.**

Please note: The Well Construction section (EPAR4_WellConstruction_v1) needs to be submitted during the initial Well setup and should at a minimum include the segment type of 'Screen' for any Wells that will have groundwater samples submitted.

Field Name	Data Type	Required	Parent	Description
sys_loc_code	Text(20)	Y	EPAR4_Location_v1. sys_loc_code	Unique Well ID. Required for mapping. Must match what has been previously submitted for the location or match what is entered in the EPAR4_Location_v1.sys_loc_code field. This is the Primary Key field with the segment_type, material_type_code, and start_depth fields that inhibits duplications within the EDD.
segment_type	Text(20)	Y		Type of segment described in this record. "Screen" is required for all GW locations; enter additional rows for other segment types. Review the Reference table for a proper entry.

Field Name	Data Type	Required	Parent	Description
material_type_code	Text(20)	Y		Material used for construction of this well segment. Review the Reference table for a proper entry.
start_depth	Numeric	Y		Start depth of well segment.
depth_unit	Text(15)	Y		Unit of measure for well segment start depth and end depth. Review the Reference table for a proper entry.
inner_diameter	Numeric	Y		Inner diameter of well segment. If unknown, enter -99999 and include an explanation in the remark field.
diameter_unit	Text(15)	Y		Unit of measure for inner and outer diameters. Review the Reference table for a proper entry.
perf_length	Numeric	Y		Total perforated length for Screen segment types.
end_depth	Numeric	Y		End depth of well segment.
outer_diameter	Numeric	Y		Outer diameter of well segment. If unknown, enter -99999 and include an explanation in the remark field.
thickness	Numeric	when available		Enter the thickness of the well segment.
thickness_unit	Text(15)	when available		Unit of measure for thickness. Required when thickness is recorded. Review the Reference table for a proper entry.
slot_type	Text(20)	when available		For screen segments, indicates type of screen slot.
slot_size	Numeric	when available		For screen segments, indicates size of screen slot.
slot_size_unit	Text(15)	when available		Unit of measure for slot size where segment_type is Screen. Required when slot_size is recorded. Review the Reference table for a proper entry.
screen_type	Text(15)	Y		Type of screen. Required when segment type is Screen.
material_quantity	Text(20)	when available		Quantity of fill material where applicable (annulus or grouted annulus segment types).
material_density	Text(20)	when available		Density of fill material where applicable (annulus or grouted annulus segment types).
remark	Text(2000)	when available		Remark.

3.13 Well Datum EDD File

When capturing elevation information for wells and groundwater levels, it is important to specify reference point from which water

level readings were taken, especially if these values change. Figure 3-1 provides a flow chart that illustrates the logic for looking up a measure datum.

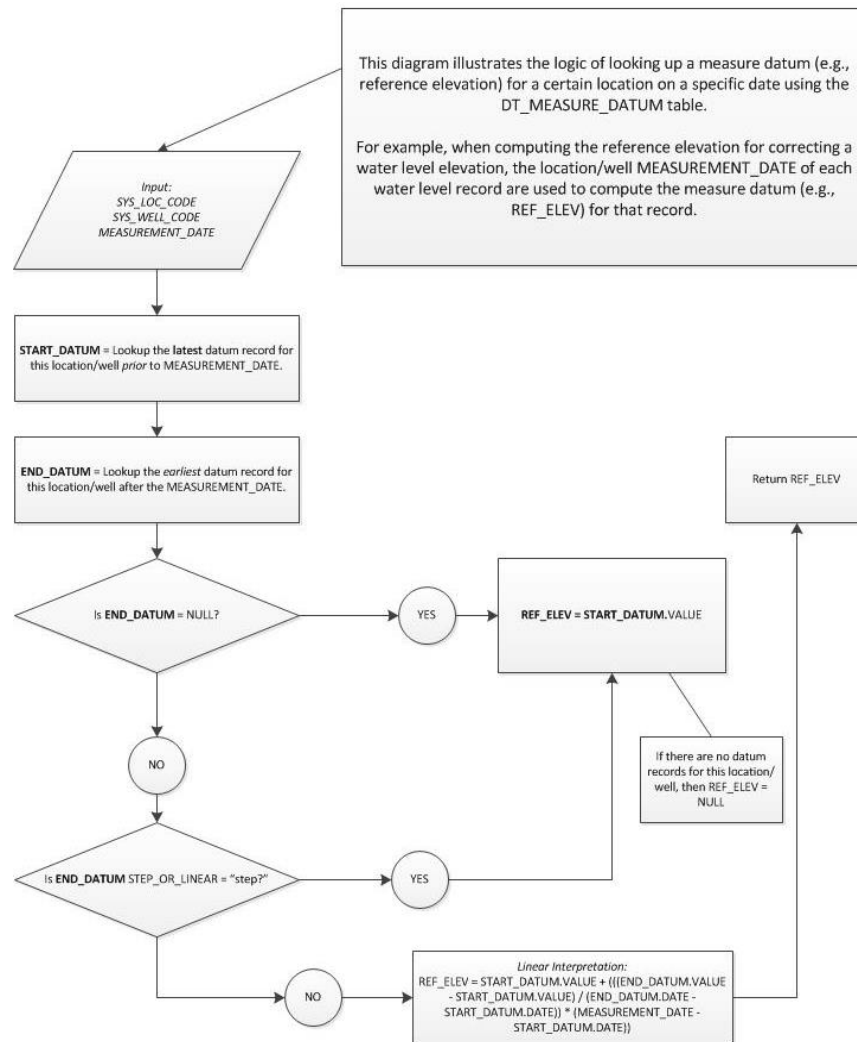
Well Datum EDD files should be named according to the following convention: **EPAR4_WellDatum_v1.csv or .txt for tab-delimited files.**

Please note: The Well Datum section (EPAR4_WellDatum_v1) is required when submitting water levels for the first time and any time a well is modified.

Field Name	Data Type	Required	Parent	Description
data_provider	Text(20)	Y		EDD provider. Review the Reference table for a proper entry or obtain your company code from the R4DART.
task_code	Text(20)	Y		Unique identifier for the event. This should be the unique Project Number that was assigned for a specific event under a given Project ID. Contact the R4DART if you do not have your Project Number.
activity_code	Text(20)	Y		The program activity associated for the well information (e.g., RI, PASI, RA, etc.).
sys_loc_code	Text(20)	Y	EPAR4_Location_v1. sys_loc_code	Unique Well ID. Required for mapping. Must match what has been previously submitted for the location or match what is entered in the EPAR4_Location_v1.sys_loc_code field. This is the Primary Key field with the start_date field that inhibits duplications within the EDD.
start_date	DateTime	Y		Date/time started (MM/DD/YYYY hh:mm:ss). Should be recorded prior to the Water Level Depth recording.
step_or_linear	Text(6)	Y		Indicates whether the change in well datum was step or linear. Use step for any drastic change; use linear for any gradual change.
datum_value	Numeric	Y		Elevation of measuring reference point from which water level readings were taken.
datum_unit	Text(15)	Y		Unit of measure for well datum. Review the Reference table for a proper entry.

Field Name	Data Type	Required	Parent	Description
datum_desc	Text(70)	Y		Description of this well datum reference elevation.
datum_collect_method_code	Text(20)	when available		Code representing method used to measure well datum. Review the Reference table for a proper entry.

Figure 3-1 Measure Datum Calculation



3.14 Water Level EDD File

The Water Level EDD file includes information on water level measurements collected at the site over the years. Depth to water, reference elevations, and groundwater elevation information should be recorded here. Surface water level data may be recorded in this file as well. In these cases, indicate in the remarks column which data represents surface water. All other required fields remain required regardless of groundwater or surface water data. Light non-aqueous phase liquids (LNAPL) and dense non-aqueous phase liquids (DNAPL) occurrences and their depths should be recorded here as well.

Water Level EDD files should be named according to the following convention: **EPAR4_WaterLevel_v1.csv or .txt for tab-delimited files.**

Please note: The Well Datum EDD (EPAR4_WellDatum_v1) needs to be submitted with the Water Level EDD (EPAR4_WaterLevel_v1).

Field Name	Data Type	Required	Parent	Description
data_provider	Text(20)	Y		EDD provider. Review the Reference table for a proper entry or obtain your company code from the R4DART.
task_code	Text(20)	Y		Unique identifier for the event. This should be the unique Project Number that was assigned for a specific event under a given Project ID. Contact the R4DART if you do not have your Project Number.
activity_code	Text(20)	Y		The program activity associated for the well information (e.g., RI, PASI, RA, etc.).
sys_loc_code	Text(20)	Y	EPAR4_Location_v1. sys_loc_code	Unique Well ID. Required for mapping. Must match what has been previously submitted for the location or match what is entered in the EPAR4_Location_v1.sys_loc_code and EPAR4_WellDatum_v1.sys_loc_code fields. This is the Primary Key field with the measurement_date field that inhibits duplications within the EDD.
measurement_date	DateTime	Y		Date/time of measurement (MM/DD/YYYY hh:mm:ss). Recorded after the EPAR4_WellDatum_v1 start time.
water_level_depth	Numeric	Y		Depth of water level. The EPAR4_WellDatum_v1 EDD is required to record the measuring point from elevation.

Field Name	Data Type	Required	Parent	Description
depth_unit	Text(15)	Y		Unit of measure for water level depth, corrected depth, and measured depth of well. Review the Reference table for a proper entry.
water_level_elev	Numeric	when available		Elevation of water level.
measured_depth_of_well	Numeric	Y		Depth of well as measured at the time of this water level measurement. If this depth is different than the depth of well recorded in the EPAR4_Well_v1 table, add a remark to provide why.
corrected_depth	Numeric	when available		Depth of water level, corrected, for example, for free product.
corrected_elevation	Numeric	when available		Elevation of water level, corrected, for example, for free product.
technician	Text(50)	when available		Name of technician taking measurements.
dry_indicator_yn	Text(1)	Y		Is well dry (Y/N)?
measurement_method	Text(20)	when available		Method used to make the well depth measurement.
dip_or_elevation	Text(10)	Y		Enforced vocabulary (dip, elevation).
batch_number	Text(10)	when available		Batch, or grouping number, for water level measurements.
remark	Text(2000)	when available		Record any additional information regarding this water level event.
lnapl_depth	Numeric	when available		LNAPL depth - if found, record it! Depth to where the Light Non-Aqueous Phase Liquid (LNAPL) was encountered in the well.
lnapl_cas_rn	Text(15)	when available		LNAPL CAS number. Review the Reference table for a proper entry. Required when lnapl_depth is populated.
dnapl_depth	Numeric	when available		DNAPL depth - if found, record it! Depth to where Dense Non-Aqueous Phase Liquid (DNAPL) was encountered in the well.
dnapl_cas_rn	Text(15)	when available		DNAPL CAS number. Review the Reference table for a proper entry. Required when dnapl_depth is populated.
equipment_code	Text(60)	when available		Equipment code used to define equipment used during event.

3.15 Geologic Sample EDD File

The variations in geology nomenclature make the submittal of geologic data, particularly historic geologic data, a special challenge. The Geology Sample EDD is the first of several EDDs used to capture as much geologic data in a useable form as possible. The Geologic Sample Parameter and Static Properties EDDs rely on information populated in the Geologic Sample EDD. Other files related to geology are correlated to the Geologic Sample EDD via the `sys_loc_code` for the boring. This EDD links locations with geologic samples, tasks, and activity codes.

Geologic Sample EDD files should be named according to the following convention: **EPAR4_GeologicSample_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
<code>data_provider</code>	Text(20)	Y		EDD provider. Review the Reference table for a proper entry or obtain your company code from the R4DART.
<code>task_code</code>	Text(20)	Y		Unique identifier for the event. This should be the unique Project Number that was assigned for a specific event under a given Project ID. Contact the R4DART if you do not have your Project Number.
<code>activity_code</code>	Text(20)	Y		The program activity associated for the well information (e.g., RI, PASI, RA, etc.).
<code>geo_sample_code</code>	Text(40)	Y		Unique Sample ID. This is the Primary Key field that inhibits duplications within the EDD. This should match the field <code>sample_sys_sample_code</code> when the information is directly related.
<code>sample_name</code>	Text(50)	Y		This may be a non-unique Sample ID.
<code>sys_loc_code</code>	Text(20)	Y	EPAR4_Location_v1. <code>sys_loc_code</code>	Unique Station or Well ID. Must match what has been previously submitted for the location or match what is entered in the <code>EPAR4_Location_v1.sys_loc_code</code> field.
<code>sample_top</code>	Numeric	Y		Top (depth measured in feet) of geologic sample.
<code>sample_bottom</code>	Numeric	Y		Bottom (depth measured in feet) of geologic sample.
<code>sampling_date</code>	DateTime	Y		Date and time of the sampling.
<code>matrix_code</code>	Text(20)	Y		Geologic matrix or sample type (e.g., rock or soil, etc.). Review the Reference table for a proper entry.
<code>sample_method</code>	Text(40)	Y		Method used for sample collection. Review the Reference table for a proper entry.
<code>sample_desc</code>	Text(255)	Y		Provide a brief description of geologic sample.

3.16 Geologic Sample Parameter EDD File

Measurements of conductivity, moisture, pH, and specific gravity for a geologic sample should be recorded here if available. One primary key is the geo_sample_code, which relates information recorded in the Geologic Sample Parameter EDD to the Geologic Sample EDD.

Geologic Sample Parameter EDD files should be named according to the following convention: **EPAR4_GeoSampleParameter_v1.csv** or **.txt** for tab-delimited files.

Field Name	Data Type	Required	Parent	Description
geo_sample_code	Text(40)	Y	EPAR4_GeologicSample_v1. geo_sample_code	Unique Sample ID. This is the Primary Key field with the param_code and that inhibits duplications within the EDD. This must match what is recorded in the EPAR4_GeologicSample_v1.geo_sample_code field and should match the field sample sys_sample_code when the information is directly related.
param_code	Text(20)	Y		Parameter observed during acquisition of this sample (e.g., N1, N2, N3, N4, PID, FID, OVM, Length Advanced, Length Recovered, Tip Stress, etc.). Review the Reference table for a proper entry.
param_value	Text(255)	Y		Value observed or measured for this parameter.
param_unit	Text(15)	Y		Unit of measurement for parameter value, if applicable. Review the Reference table for a proper entry.
measurement_method	Text(20)	when available		Method of measurement/instrument used for this parameter, when applicable.
remark	Text(2000)	when available		Provide additional information regarding the geological measurement.

3.17 Water Table EDD File

Water table depth information, as well as general or specific aquifer information can be populated in the Water Table EDD. As always, it is important to refer to the valid values in the EDP reference tables to be certain information is accurate.

Water Table EDD files should be named according to the following convention: **EPAR4_WaterTable_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
data_provider	Text (20)	Y		Water Table data provider. Refer to Valid Values.
task_code	Text (20)	Y		Unique identifier for sampling event.
activity_code	Text (20)	Y		The program activity associated with the sampling event (e.g., CME, SI, ODMDS, etc.). Refer to Valid Values.
sys_loc_code	Text (20)	Y	EPAR4_Location_v1. sys_loc_code	Unique Station or Well ID. Required for mapping. Must be a valid code for the facility and must match one of the reported values in the sys_loc_code field of the Location EDD file submitted in the current or previous EDD.
type	Text (20)	Y		Designation of aquifer. Can be general (such as UNCONFINED or CONFINED), or a specific aquifer name such as OGALALLA.
sequence	Text (20)	Y		Sequence in which this measurement was taken. Intended to represent 1 of 2 mutually exclusive values (e.g., Unstabilized/Stabilized, or Initial/Final, or 1/2, etc.).
depth	Numeric	Y		Depth of water table (starts at zero).
flowing_yn	Text (1)	when available		Is water flowing from drill hole? Y/N option only.
measurement_method	Text (50)	when available		Method used to obtain water table measurement.
capped_pressure	Numeric	when available		Water pressure when capped.
capped_pressure_unit	Text (15)	when available		Unit of measure for water pressure when capped. Refer to Valid Values.

Field Name	Data Type	Required	Parent	Description
reference_point	Text (50)	when available		Point of reference for water table measurement.
reference_elevation	Numeric	when available		Elevation of reference point for water table measurement.
temperature	Numeric	when available		Water temperature.
temperature_unit	Text (15)	when available		Unit of measure for water temperature. Refer to Valid Values.

3.18 Lithology EDD File

Due to the complexity of the possible lithology in any boring, the Lithology EDD is designed to allow for multiple material types (lithologic layer types) to be assigned by depth to a single location (sys_loc_code) under a single activity code. An example appears below the EDD table.

Lithology EDD files should be named according to the following convention: **EPAR4_Lithology_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
data_provider	Text(20)	Y		EDD provider. Review the Reference table for a proper entry or obtain your company code from the R4DART.
task_code	Text(20)	Y		Unique identifier for the event. This should be the unique Project Number that was assigned to for a specific event under a given Project ID. Contact the R4DART if you do not have your Project Number.
activity_code	Text(20)	Y		The program activity associated for the well information (e.g., RI, PASI, RA, etc.).
sys_loc_code	Text(20)	Y	EPAR4_Location_v1. sys_loc_code	Unique Well ID. Required for mapping. Must match what has been previously submitted for the location or match what is entered in the EPAR4_Location_v1.sys_loc_code field. This is the Primary Key field with the start_depth fields that inhibits duplications within the EDD.
start_depth	Numeric	Y		Start depth of lithology layer.
end_depth	Numeric	Y		End depth of lithology layer.

Field Name	Data Type	Required	Parent	Description
material_type	Text(40)	Y		Code used to specify material type. Review the Reference table for a proper entry.
bearing	Numeric	Y		Bearing, used for non-vertical boreholes; degrees - use 0 (zero) for vertical.
plunge	Numeric	Y		Plunge, used for non-vertical boreholes; degrees - use 0 (zero) for vertical.
geo_unit_code_1	Text(20)	Y		Code used to specify geologic unit. Aquifer layer is within. Review the Reference table for a proper entry.
geo_unit_code_2	Text(20)	when available		Code used to specify geologic unit when a sub aquifer is identified. Review the Reference table for a proper entry.
geo_unit_code_3	Text(20)	when available		Code used to specify when additional geologic units are known.
geo_unit_code_4	Text(20)	when available		Code used to specify when additional geologic units are known.
geo_unit_code_5	Text(20)	when available		Code used to specify when additional geologic units are known.
remark_1	Text(2000)	Y		Provide a description for the lithologic layer.
remark_2	Text(2000)	when available		Lithologic layer remark 2.
moisture	Text(20)	Y		Qualitative description of soil moisture.
permeable	Text(20)	when available		Indicator of permeability.
consolidated_yn	Text(1)	when available		Is layer consolidated (Y or N)?
cementation	Text(20)	when available		Qualitative description of cementation.
color	Text(30)	Y		Layer color.
observation	Text(255)	Y		General layer observation.
consistency	Text(20)	Y		Soil consistency.
sorting	Text(20)	Y		Descriptor of soil particle size sorting.
grainsize	Text(20)	Y		Measure of particle size.
odor	Text(20)	Y		Soil odor.
angularity	Text(20)	when available		Angularity of soil particles.

Example of Required Fields in Lithology EDD

data_provider	task_code	activity_code	sys_loc_code	start_depth	End_depth	material_type
PL-CONT_X1	15-1101	RI	B09	0	0.5	TOPSOIL
PL-CONT_X1	15-1101	RI	B09	0.5	3	SILTY CLAY

PL-CONT_X1	15-1101	RI	B09	3	6	CLAY
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3.19 Drill Activity EDD File

Drilling activity related to any drilling event can be stored in the Drill Activity EDD and coupled with the Drill Parameter EDD to save a solid record of the event, including rig and auger type, viscosity, and pressure as well as other information chronicling the drilling procedure. In most cases, this EDD will be used to document the start and end depths of a drilling event.

Drill Activity EDD files should be named according to the following convention: **EPAR4_DrillActivity_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
data_provider	Text(20)	Y		EDD provider. Review the Reference table for a proper entry or obtain your company code from the R4DART.
task_code	Text(20)	Y		Unique identifier for the event. This should be the unique Project Number that was assigned for a specific event under a given Project ID. Contact the R4DART if you do not have your Project Number.
activity_code	Text(20)	Y		The program activity associated for the well information (e.g., RI, PASI, RA, etc.).
sys_loc_code	Text(20)	Y	EPAR4_Location_v1.sys_loc_code	Unique Station or Well ID. Must match what has been previously submitted for the location or match what is entered in the EPAR4_Location_v1.sys_loc_code field. This is the Primary Key field with the drill event field that inhibits duplications within the EDD.
drill_event	Text(20)	Y		Enter an event code that will uniquely identify a drilling event.
start_depth	Numeric	Y		Start depth of drill activity.
end_depth	Numeric	Y		End depth of drill activity.
start_date	DateTime	Y		Date/time drilling activity started (MM/DD/YYYY hh:mm:ss).
end_date	DateTime	Y		Date/time drilling activity was completed (MM/DD/YYYY hh:mm:ss).
diameter	Text(20)	Y		Diameter of drilled hole.
diameter_unit	Text(15)	Y		Unit of measurement for diameter of drilled hole. Review the Reference table for a proper entry.
drill_method	Text(50)	Y		Method of drilling/advancement.

Field Name	Data Type	Required	Parent	Description
casing_size	Text(50)	Y		Size of casing installed. Note that this is a general text field and non-numeric entries such as "Schedule 40" are permitted.
rig_desc	Text(50)	when available		Description of drilling rig.
rig_make	Text(50)	when available		Drilling rig make.
rig_model	Text(50)	when available		Drilling rig model.
rod_desc	Text(50)	when available		Description of drilling rod.
bit_desc	Text(50)	when available		Description of drilling bit.
hammer_desc	Text(50)	when available		Description of hammer.
auger_desc	Text(50)	when available		Description of auger.
sampler_desc	Text(50)	when available		Description of sampler.
fluid	Text(50)	when available		Drilling fluid used.
viscosity	Text(50)	when available		Viscosity of drilling fluid.
drilling_pressure	Text(50)	when available		Drilling pressure.
hammer_wt	Text(50)	when available		Weight of hammer.
hammer_fall	Text(50)	when available		Fall length of hammer.
lift_mechanism	Text(50)	when available		Mechanism used to lift hammer.
new_yn	Text(1)	Y		Is this a new borehole (Y or N)?

Field Name	Data Type	Required	Parent	Description
repair_yn	Text(1)	Y		Is this drilling activity to repair an existing borehole (Y or N)?
deepen_yn	Text(1)	Y		Is this drilling activity to deepen an existing borehole (Y or N)?
abandon_yn	Text(1)	Y		Is this drilling activity to abandon an existing borehole (Y or N)?
replace_yn	Text(1)	Y		Does this drilling activity replace another borehole (Y or N)?
public_yn	Text(1)	Y		Is this borehole owned or used by a public agency (Y or N)?
purpose	Text(70)	Y		Purpose of drilling activity.
remark	Text(255)	Y		Short description about the drilling activity.

3.20 Drill Parameter EDD File

Drill Parameter may be used to capture specific results for a drilling event listed in the Drill Activity EDD.

Drill Parameter EDD files should be named according to the following convention: **EPAR4_DrillParameter_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
sys_loc_code	Text(20)	Y	EPAR4_Location_v1. sys_loc_code	Unique Station or Well ID. Must match what has been previously submitted for the location or match what is entered in the EPAR4_Location_v1.sys_loc_code field. This is the Primary Key field with along the drill event, start_depth, and param_code fields that inhibits duplications within the EDD. The sys_loc_code and drill_event entries must match what is submitted in the EPAR4_DrillActivity_v1 format.
drill_event	Text(20)	Y		Enter an event code that will uniquely identify a drilling event. Entry match an entry submitted in the EPAR4_DrillActivity_v1 format.
start_depth	Numeric	Y		Start depth of drill activity.
param_code	Text(20)	Y		Parameter observed or measured over this interval. Review the Reference table for a proper entry.
end_depth	Numeric	Y		End depth of drill activity.

Field Name	Data Type	Required	Parent	Description
run_length	Text(20)	Y		Length of drilling run.
param_value	Text(255)	Y		Value observed or measured over this interval for this parameter.
param_unit	Text(15)	Y		Unit of measurement for parameter value. Review the Reference table for a proper entry.
remark	Text(255)	when available		Provide a brief description for this parameter reading.

3.21 Downhole Point Parameter EDD File

The Downhole Point Parameter EDD should be used for recording drilling-specific results, such as tip and sleeve stress, pore pressure, and ratio. All fields are required in this EDD and must relate back to a valid location (sys_loc_code).

Downhole Point Parameter EDD files should be named according to the following convention: **EPAR4_DownholePoint_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
data_provider	Text(20)	Y		EDD provider. Review the Reference table for a proper entry or obtain your company code from the R4DART.
task_code	Text(20)	Y		Unique identifier for the event. This should be the unique Project Number that was assigned for a specific event under a given Project ID. Contact the R4DART if you do not have your Project Number.
activity_code	Text(20)	Y		The program activity associated for the well information (e.g., RI, PASI, RA, etc.).
sys_loc_code	Text(20)	Y	EPAR4_Location_v1.sys_loc_code	Unique Station or Well ID. Must match what has been previously submitted for the location or match what is entered in the EPAR4_Location_v1.sys_loc_code field. This is the Primary Key field with the depth and param fields that inhibits duplications within the EDD.
depth	Numeric	Y		Depth at which parameter was observed or measured.
param	Text(20)	Y		All Parameter(s) observed or measured at this point. Review the Reference table for a proper entry.
param_value	Text(255)	Y		Value observed or measured at this point for this parameter.
param_unit	Text(15)	Y		Unit of measurement for parameter value. All values should have the same unit for a given parameter. Review the Reference table for a proper entry.

3.22 Static Properties EDD File

Additional static information recorded as a part of a drilling activity and related to a geologic sample (e.g., porosity, void ratios,

moisture contents, etc.) that have not been recorded elsewhere may be recorded here.

Static Properties EDD files should be named according to the following convention: **EPAR4_StaticProps_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
geo_sample_code	Text (40)	Y	Geologic Sample EDD, geo_sample_code	Unique Sample ID.
sample_desc	Text (255)	when available		Sample description.
material_name	Text (40)	when available		Material name. Refer to Valid Values.
geologic_unit_code	Text (20)	when available		Geologic unit code. Refer to Valid Values.
e	Numeric	when available		Void ratio.
e_max	Numeric	when available		Maximum void ratio.
e_min	Numeric	when available		Minimum void ratio.
n	Numeric	when available		Porosity.
specific_gravity	Numeric	when available		Specific gravity.
w	Numeric	when available		Moisture content.
opt_w	Numeric	when available		Optimum moisture content.
S	Numeric	when available		Saturation.
K	Numeric	when available		Hydraulic conductivity.
K_unit	Text (15)	Required if K is populated.		Unit of measurement for hydraulic conductivity. Refer to Valid Values. If K is populated, then K_unit is required.
unit_wt	Numeric	when available		Unit weight.
sat_unit_wt	Numeric	when available		Saturated unit weight.
dry_unit_wt	Numeric	when available		Dry unit weight.
dry_unit_wt_max	Numeric	when available		Maximum dry unit weight.
dry_unit_wt_min	Numeric	when available		Minimum dry unit weight.
density_unit	Text (15)	Required if sat_unit_wt or dry_unit_wt is populated.		Unit of measure for density (unit weight). Refer to Valid Values. If sat_unit_wt or dry_unit_wt is populated, then density_unit is required.

Field Name	Data Type	Required	Parent	Description
rel_density	Numeric	when available		Relative density.
rel_compaction	Numeric	when available		Relative compaction.
consistency	Text (20)	when available		Consistency.
organic_carbon	Numeric	when available		Organic carbon content.
organic_carbon_unit	Text (15)	Required if organic_carbon is populated.		Unit of measure for organic carbon. Refer to Valid Values. If organic_carbon is populated, then organic_carbon_unit is required.

3.23 Vapor Intrusion Building Address EDD File

Vapor Intrusion data submittals contain sampling data collected inside of the contaminated sites or buildings. The Vapor Intrusion Building Address EDD file contains address and contact information for the building.

Vapor Intrusion Building Address EDD files must be named according to the following convention: **VI_Bldg_Address_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
building_code	Text(20)	Y		Unique code that identifies the building within the facility (e.g., B001, B002, etc.). This is the Primary Key field that controls duplications within the EDD.
subfacility_code	Text(20)	Y		Code indicating the sub-site operable unit (OU) for which the building resides in. There may be multiple buildings within this parent OU area. Must match a code in the Site EDD file submitted in the current or previous EDDs.
task_code	Text(40)	Y		The Project ID is the EPA tracking number for the entire project, including multiple field events. Contact the R4DART if you do not have your Project ID or need your Project ID added to your selection list.

Field Name	Data Type	Required	Parent	Description
contact_name	Text(50)	when available		Building Contact Name. This should be populated with the EPA RPM name. Occupant or Owner personal information (Name, telephone numbers, and address) are not to be included for SVI Building Information.
address1	Text(40)	when available		Building Street Address Line 1.
address2	Text(40)	when available		Building Street Address Line 2.
city	Text(30)	when available		Building city. Example: Albany.
state	Text(2)	when available		Building state. Review the Reference table for a proper entry.
zip_code	Text(10)	when available		Building zip code.
county	Text(50)	when available		Building county. Review the Reference table for a proper entry.
phone_number	Text(30)	when available		Enter only if public information. Occupant or Owner personal information are not to be included for SVI Building Information.
alt_phone_number	Text(30)	when available		Enter only if public information. Occupant or Owner personal information are not to be included for SVI Building Information.
fax_number	Text(30)	when available		Enter only if public information. Occupant or Owner personal information are not to be included for SVI Building Information.
email_address	Text(100)	when available		Enter only if public information. Occupant or Owner personal information are not to be included for SVI Building Information.
remark	Text(2000)	when available		Add a remark to further describe the building being sample. Use Remark 2 if needed.
remark_2	Text(2000)	when available		Remarks regarding building

3.24 Vapor Intrusion Building Inspection EDD File

The Vapor Intrusion Building Inspection EDD file contains specific data about the building.

Vapor Intrusion Building Inspection EDD files must be named according to the following convention: **VI_Building_Inspection_v1.csv** or **.txt** for tab-delimited files.

Field Name	Data Type	Required	Parent	Description
building_code	Text(20)	Y		Unique code that identifies the building within the facility (e.g., B001, B002, etc.). Must be a valid building_code and match the building_code field in the VI_Bldg_Address_v1 EDD file submitted in the current or previous EDDs. This is the Primary Key field along with the inspection date field that controls duplications within the EDD.
inspection_date	DateTime	Y		Enter the date the building inspection was conducted.
task_code	Text(40)	Y		The Project ID is the EPA tracking number for the entire project, including multiple field events. This must match the code entered in the VI_Bldg_Address_v1 with the same Building code.
building_name	Text(255)	Y		Building name (e.g., Denison Medical Building).
building_type	Text(20)	Y		Type of building. Review the Reference table for a proper entry. Example: Residential, Industrial, etc.
building_use_type	Text(20)	Y		Enter the building's use. Review the Reference table for a proper entry. Example: Dry Cleaner, Day Care if Commercial or Ranch Home if Residential.
building_size	Text(20)	Y		Size of building. Input, "Small", "Medium", or "Large."
num_floors	Numeric	Y		Input number of floors in the building.
construct_year	Numeric	Y		Input year of construction.
foundation_depth	Numeric	Y		Input foundation depth below ground surface. Must be feet.
foundation_depth_unit	Text(15)	Y		Unit of measurement for Foundation depth. Review the Reference table for a proper entry. Input "FT" for feet.
foundation_type	Text(20)	Y		Foundation type. Review the Reference table for a proper entry. Example: Basement, crawlspace, etc.
foundation_wall_material	Text(20)	Y		Foundation wall material. Review the Reference table for a proper entry. Example: Poured Concrete.

Field Name	Data Type	Required	Parent	Description
foundation_floor_material	Text(20)	Y		Foundation floor material. Review the Reference table for a proper entry. Example: Poured Concrete.
foundation_wall_thickness	Numeric	Y		Foundation wall thickness. Must be in feet.
foundation_floor_thickness	Numeric	Y		Foundation floor thickness. Must be in feet.
foundation_thickness_unit	Text(15)	Y		Foundation thickness units. Review the Reference table for a proper entry. Input "FT" for feet.
attached_garage_yn	Text(1)	Y		Existence of an attached garage (Y/N)?
radon_mitigation_yn	Text(1)	Y		Existence of radon mitigation system (Y/N)?
heat_fuel_type	Text(255)	Y		Type of heating fuel. Example: Natural gas, Oil, Gas, Wood, Electric, Other, or None.
heat_system_type	Text(255)	Y		Type of heating system. Example: Forced hot air, Radiant Heating, Hot Water Baseboard, Steam Radiant, Geothermal, Other, or None.
central_air_yn	Text(1)	Y		Existence of central air system (Y/N)?
sump_yn	Text(1)	Y		Existence of sump pump (Y/N)?
voc_mitigation_yn	Text(1)	Y		Existence of VOC mitigation flag (Y/N)?
remark	Text(2000)	Y		Building remarks.

3.25 Vapor Intrusion Building Parameters EDD File

The Vapor Intrusion Building Parameters EDD file contains additional sampling parameters collected in the field and not analyzed in the laboratory.

Vapor Intrusion Building Parameters EDD files must be named according to the following convention:

VI_Building_Parameters_v1.csv or .txt for tab-delimited files.

Field Name	Data Type	Required	Parent	Description
building_code	Text(20)	Y	VI_Bldg_Address_v1. building_code	Unique code that identifies the building within the facility (e.g., B001, B002, etc.). Must be a valid building_code and match the building_code field in the VI_Bldg_Address_v1 EDD file submitted in the current or previous EDDs. This is the Primary Key field along with the param_code field that controls duplications within the EDD.
param_code	Text(20)	Y		Any parameters that are being recorded within the building not captured on the inspection format. Review the Reference table for a proper entry.
task_code	Text(40)	Y		The Project ID is the EPA tracking number for the entire project, including multiple field events. This must match the code entered in the VI_Bldg_Address_v1 with the same Building code.
measurement_date	DateTime	Y		The specific date the measurement was collected. For Soil Vapor Intrusion form data, the date should be the building inspection date.
param_value	Text(255)	Y		The value related to the parameter code used.
param_unit	Text(15)	Y		The corresponding unit that relates to the parameter value used.
remark	Text(2000)	when available		Add a remark to further describe the parameter or specific value.

3.26 Vapor Intrusion Locations EDD File

The Vapor Intrusion Locations EDD file contains information related to the sampling location where the vapor intrusion is being sampled.

Vapor Intrusion Locations EDD files must be named according to the following convention: **VI_Locations_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
data_provider	Text(20)	Y		EDD provider. Review the Reference table for a proper entry or obtain your company code from the R4DART.
sys_loc_code	Text(20)	Y		Location identifier of sample collection. Must be unique ID for the location at the X and Y coordinates. This is the Primary Key field that controls duplications within the EDD.
building_code	Text(20)	Y	VI_Bldg_Address_v1. building_code	Must be the valid code for a building and match the building_code field in the VI_Bldg_Address_v1 EDD file submitted in the current or previous EDD.
x_coord	Numeric	Y		Longitude of sampling location in decimal degrees. Must be negative for western hemisphere (-ddd.xxxxx). Example: -84.38207. Note: Multiple sys_loc_codes can share the same coordinates if a centroid point is used to represent sample locations in a building.
y_coord	Numeric	Y		Latitude of sampling location in decimal degrees (dd.xxxxx). Example: 34.99475. Note: Multiple sys_loc_codes can share the same coordinates if a centroid point is used to represent sample locations in a building.
alt_coord_type_code	Text(20)	when available		Must reference alternate coordinate system type code. SP designates State Plane.
alt_identifier	Text(20)	when available		If providing alternate coordinates in state plane or some other coordinate system, include alt_x_coord and alt_y_coord coordinate fields and use PRIMARY as the alt_identifier code.
horz_collect_method_code	Text(3)	Y		Method used to determine latitude/longitude. Review the Reference table for a proper entry.

Field Name	Data Type	Required	Parent	Description
horz_accuracy_value	Text(20)	Y		Accuracy range (+/-) of the latitude and longitude. Use "0.1" for professional survey, "100" for site centroid, or "10" for all other methods.
horz_accuracy_unit	Text(15)	Y		Unit of the horizontal accuracy. Review the Reference table for a proper entry.
horz_datum_code	Text(3)	Y		This is the reference datum for the original survey coordinates. Review the Reference table for a proper entry.
source_scale	Text(2)	when available		If coordinates were derived from a published map, enter the scale of the map source (e.g., 1 inch = 100 feet).
subcontractor_name_code	Text(20)	Y		Code used to distinguish subcontractor name. Review the Reference table for a proper entry.
verification_code	Text(20)	when available		The verification code should indicate how the survey coordinate/elevation reference point was verified. Review the Reference table for a proper entry.
reference_point	Text(50)	when available		If coordinates and elevations were surveyed using a traditional survey method in the field without a GPS, a description of the reference point used as the survey benchmark. (e.g., NYSDOT bridge footing, or Hydrant at station 00+01 elevation 25).
loc_name	Text(40)	when available		Location name. May be used for clarification or better relationship to text, e.g. BLDG1-Laundry Room was originally BLDG-LR.
loc_desc	Text(255)	when available		Sampling location detailed description. Example: "Laundry room sample collected 4 feet above ground surface to capture breathing zone."
loc_type	Text(20)	Y		Sampling location type. Use codes in loc_type valid values table for Soil Vapor Intrusion. Options include: BASEMENT, CRAWLSPACE, FIRST FLOOR, OUTDOOR, SUBSLAB, and UPPER FLOOR. Review the Reference table for a proper entry.
loc_purpose	Text(20)	Y		Sampling location purpose. Example: "Odors detected in basement," "Visible Floor Penetrations."
within_facility_yn	Text(1)	Y		Indicates whether this sampling location is within facility boundaries, 'Y' for yes or 'N' for no.
loc_county_code	Text(20)	when available		Location county code. Review the Reference table for a proper entry.

Field Name	Data Type	Required	Parent	Description
DEC_region	Text(20)	when available		Location district code; controlled vocabulary using FIPS codes.
loc_state_code	Text(2)	when available		Location state code. Review the Reference table for a proper entry.
remark	Text(255)	when available		Location specific comment.

3.27 Vapor Intrusion Outdoor Locations EDD File

The Vapor Intrusion Outdoor Locations EDD file contains information that relates an outdoor location to the nearest building.

Vapor Intrusion Outdoor Locations EDD files must be named according to the following convention: **VI_Outdoor_Locations_v1.csv** or **.txt** for tab-delimited files.

Field Name	Data Type	Required	Parent	Description
sys_loc_code	Text(40)	Y		Unique Location. Must match what has been previously submitted for the location or match what is entered in the VI_Locations_v1 field. This is the Primary Key field along with the building_code field that controls duplications within the EDD.
building_loc_type_code	Text(20)	Y		The default building_loc_type should be OUTDOOR.
building_code	Text(20)	Y		Must be the valid code for a building and match the building_code field in the VI_Bldg_Address_v1 EDD file submitted in the current or previous EDD.

3.28 Vapor Intrusion Sample EDD File

The Vapor Intrusion Sample EDD file contains information pertaining to the sample(s) collected.

Vapor Intrusion Sample EDD files must be named according to the following convention: **VI_Samples_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
data_provider	Text(20)	Y		EDD provider. Review the Reference table for a proper entry or obtain your company code from the R4DART.
sys_sample_code	Text(40)	Y		Sample ID. Each sample must have a unique value. Uniqueness throughout the database is the only restriction enforced. This is the Primary Key field that controls duplications within the EDD.
sample_name	Text(50)	Y		Additional sample identification information as necessary. Is not required to be unique (i.e., duplicates are OK). Can be the same value as in the sys_sample_code field.
sample_matrix_code	Text(3)	Y		Code that distinguishes between different types of sample matrix. Review the Reference table for a proper entry. SVI Matrix codes include SG for soil vapor, AA for ambient air, or IA for indoor ambient air, CA for crawlspace air.
sample_type_code	Text(20)	Y		Code that distinguishes between different types of samples. Review the Reference table for a proper entry.
sample_source	Text(10)	Y		This field identifies where the sample originated. Samples collected in the Field are entered as "FIELD," samples originating in the Lab are entered as "LAB."
parent_sample_code	Text(40)	when available		If the sample is a duplicate, MS/MSD, blind dup, lab dup, etc., input the parent sample "sys_sample_code."
sample_delivery_group	Text(20)	when available		This is the field or laboratory sample delivery group.
sample_start_date	DateTime	Y		Date and time sample collection was started. Input in MM/DD/YYYY hh:mm:ss format. This is the date that labs should report as the sample date.
sys_loc_code	Text(20)	Y		Location identifier of sample collection. Must be unique ID for the location at the X and Y coordinates. Must match what has been previously submitted for the location or match what is entered in the VI_Locations_v1.

Field Name	Data Type	Required	Parent	Description
chain_of_custody	Text(40)	when available		Chain of custody identifier. Note: A single sample may be assigned to only one chain of custody.
sent_to_lab_date	DateTime	when available		Shipping date sample was sent to lab (in MM/DD/YYYY format).
sample_receipt_date	DateTime	when available		Date that sample was received at laboratory (in MM/DD/YYYY format).
sampler	Text(50)	Y		Person taking sample.
sampling_company_code	Text(20)	Y		Sampling company code. Review the Reference table for a proper entry.
sampling_reason	Text(30)	when available		Additional reason for sampling.
sampling_method	Text(40)	Y		Sampling method. Review the Reference table for a proper entry. Example: Summa Canister.
task_code	Text(40)	Y		The Project ID is the EPA tracking number for the entire project, including multiple field events. Contact the R4DART if you do not have your Project ID.
sample_end_date	DateTime	Y		Date and time sample collection was completed. Input in MM/DD/YYYY hh:mm:ss format.
sample_duration	Text(20)	Y		The sampling duration.
sample_duration_unit	Text(15)	Y		Sample duration units. Review the Reference table for a proper entry.
floor_material	Text(20)	Y		Lowest level floor material at sample location. Review the Reference table for a proper entry.
slab_thickness	Text(20)	when available		Slab thickness at sample location (in inches).
subslab_material	Text(20)	Y		Material found below the foundation floor. Review the Reference table for a proper entry.
subslab_moisture	Text(20)	when available		Moisture content at subslab sample location. Example: Dry, Damp, Saturated, etc.
seal_type	Text(20)	when available		Type of seal used during sampling. Example: Beeswax, Clay, Teflon Tape, etc.
seal_adequate_yn	Text(1)	when available		Did the sample probe seal pass the tracer test (Y/N)?
purge_yn	Text(1)	when available		Was the sample equipment purged in accordance with work plan (Y/N)?
purge_pid	Numeric	when available		Input PID instrument reading.
purge_pid_unit	Text(15)	Y		PID instrument reading units. Review the Reference table for a proper entry.
vac_gauge_initial	Numeric	when available		Vacuum gauge reading immediately after start.
vac_gauge_final	Numeric	when available		Vacuum gauge reading immediately before end.

Field Name	Data Type	Required	Parent	Description
vac_gauge_unit	Text(15)	Y		Vacuum gauge instrument units. Review the Reference table for a proper entry.
vapor_loc_desc	Text(255)	when available		Soil vapor intrusion location description.
remark	Text(2000)	when available		Remark.
tracer_test_pass_yn	Text(1)	when available		Enter a Y to indicate that the helium tracer tests were conducted and passed for any subslab samples.

3.29 Vapor Intrusion Test Result QC EDD File

The Vapor Intrusion Test Result QC EDD file contains data concerning analytical tests performed on samples with quality control data elements.

Vapor Intrusion Test Result QC EDD files must be named according to the following convention: **VI_TestResultsQC_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
sys_sample_code	Text(40)	Y	VI_Samples_v1. sys_sample_code	Sample ID. Each sample must have a unique value, including spikes, duplicates and laboratory QC samples. This is the Primary Key field along with the lab_anl_method_name, analysis_date, fraction, and test_type fields that inhibits duplications within the EDD. This must match what is recorded in the VI_TestResultsQC_v1 format's sys_sample_code, lab_anl_method_name, analysis_date, fraction, column_number, and test_type for the information that is directly related.
lab_anl_method_name	Text(20)	Y		Laboratory analytic method name or description. Review the Reference table for a proper entry.
analysis_date	DateTime	Y		Date of sample analysis in MM/DD/YY format. May refer to either beginning or end of the analysis as required by EQUIS Chemistry project manager. This field is not always required, but most users will want it.

Field Name	Data Type	Required	Parent	Description
fraction	Text(10)	Y		Must be either "T" for total [metal] concentration, "D" for dissolved or filtered [metal] concentration, or "N" for organic (or other) constituents for which neither "total" nor "dissolved" is applicable.
column_number	Text(2)	Y		If required, then it must be either "1C" for first column analyses, "2C" for second column analyses, or "NA" for analyses for which neither "1C" nor "2C" is applicable.
test_type	Text(10)	Y		Type of test in the laboratory. This field is used to distinguish between initial runs, re-extractions, reanalysis and dilutions. Review the Reference table for a proper entry.
lab_matrix_code	Text(10)	Y		Code which describes the matrix as analyzed by the lab. May differ from sample_matrix_code. See matrix valid value table in the appendix.
analysis_location	Text(2)	Y		Must be either 'FI' for field instrument or probe, 'FL' for mobile field laboratory analysis, or 'LB' for fixed_based laboratory analysis.
basis	Text(10)	Y		For SVI samples enter "NA" for not applicable.
container_id	Text(30)	Y		Report the equipment ID in this field for SVI samples.
dilution_factor	Numeric	Y		Effective test dilution factor. If value is less than 1, then put 'concentration factor' in the comment column.
prep_method	Text(20)	when available		Laboratory sample preparation method code. Review the Reference table for a proper entry.
prep_date	DateTime	when available		Date sample preparation began in MM/DD/YYYY hh:mm format.
leachate_method	Text(15)	when available		Laboratory leachate generation method name or description. The method name should be sufficient to reflect operation of the laboratory.
leachate_date	DateTime	when available		Date of leachate preparation in MM/DD/YYYY format.
lab_name_code	Text(20)	Y		Unique identifier of the laboratory as defined by the EPA. Review the Reference table for a proper entry.
qc_level	Text(10)	Y		Quality Control Level. Please enter the Corresponding Label Code from Appendix B of the Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use. https://semspub.epa.gov/work/HQ/176101.pdf

Field Name	Data Type	Required	Parent	Description
lab_sample_id	Text(40)	when available		Laboratory LIMS sample identifier. If necessary, a field sample may have more than one LIMS lab_sample_id (maximum one per each test event).
percent_moisture	Text(5)	when available		Percent moisture of the sample portion used in this test; this value may vary from test to test for any sample. Report 70.1% as 70.1 not as 70.1%.
subsample_amount	Text(14)	when available		Amount of sample used for test.
subsample_amount_unit	Text(15)	when available		Unit of measurement for subsample amount. Review the Reference table for a proper entry.
analyst_name	Text(30)	when available		Name or initials of laboratory analyst.
instrument_id	Text(50)	when available		Instrument identifier.
comment	Text(255)	when available		Comments about the test as necessary.
preservative	Text(20)	when available		Sample preservative used. Review the Reference table for a proper entry.
final_volume	Numeric	when available		The final volume of the sample after sample preparation. Include all dilution factors.
final_volume_unit	Text(15)	when available		The unit of measure that corresponds to the final_volume. Review the Reference table for a proper entry.
cas_rn	Text(15)	Y		CAS Number or R4 designation. Review the Reference table for a proper entry.
chemical_name	Text(255)	Y		Use the name in the analyte valid value table.
result_value	Numeric	Y (for detects)		Result Value.
result_error_delta	Text(20)	when available		Error range applicable to the result value; typically used only for radiochemistry results.
result_type_code	Text(10)	Y		Must be either TRG for a target or regular result, TIC for tentatively identified compounds, SUR for surrogates, IS for internal standards, or SC for spiked compounds.
reportable_result	Text(3)	Y		Yes/No. Must be Yes for results considered to be reportable, or No for other results.
detect_flag	Text(1)	Y		May be either Y for detected analytes or N for non-detects.
lab_qualifiers	Text(10)	when available		Qualifier flags assigned by the lab.

Field Name	Data Type	Required	Parent	Description
validator_qualifiers	Text(10)	when available		Qualifier flags assigned by the validator.
interpreted_qualifiers	Text(10)	Y (for non-detects)		Final qualifier flags. Review the Reference table for a proper entry.
validated_yn	Text(1)	Y		Indicates if the result has been validated. "Y" for validated, "N" for not validated.
method_detection_limit	Text(20)	when available		Method detection limit.
reporting_detection_limit	Numeric	when available		Concentration level above which results can be quantified with 95% confidence limit. Must reflect conditions such as dilution factors and moisture content. Report as the sample specific detection limit.
quantitation_limit	Text(20)	Y (for non-detects)		Concentration level above which results can be quantified with 95% confidence limit. Must reflect conditions such as dilution factors and moisture content. Report as the sample specific quantitation limit.
result_unit	Text(15)	Y (for detects)		Units of measurement for the result unit. Review the Reference table for a proper entry.
detection_limit_unit	Text(15)	Y (for non-detects)		Units of measurement for the detection limit(s). Review the Reference table for a proper entry. This field is required if a reporting_detection_limit is reported.
tic_retention_time	Text(8)	when available		TIC Retention Time.
minimum_detectable_conc	Numeric	when available		Minimum detectable concentration or activity. This value should be in the same units as the result_value.
counting_error	Numeric	when available		Counting error as reported by the laboratory. This value should be in the same units as the result_value.
uncertainty	Text(10)	when available		The uncertainty of the counting error, valid values include "1 sigma" or "2 sigma." This field is required if the counting_error field is populated.
critical_value	Numeric	when available		Critical value as reported by the laboratory.
validation_level	Text(20)	when available		Quality Control Level. Please enter the Corresponding Label Code from Appendix B of the Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use. https://semspub.epa.gov/work/HQ/176101.pdf
result_comment	Text(255)	when available		Result specific comments.

Field Name	Data Type	Required	Parent	Description
qc_original_conc	Numeric	when available		The concentration of the analyte in the original (unspiked) sample. Might be required for spikes and spike duplicates (depending on user needs). Not necessary for surrogate compounds or LCS samples (where the original concentration is assumed to be zero).
qc_spike_added	Numeric	when available		The concentration of the analyte added to the original sample. Might be required for spikes, spike duplicates, surrogate compounds, LCS and any spiked sample (depending on user needs).
qc_spike_measured	Numeric	when available		The measured concentration of the analyte. Use zero for spiked compounds that were not detected in the sample. Might be required for spikes, spike duplicates, surrogate compounds, LCS and any spiked sample (depending on user needs).
qc_spike_recovery	Numeric	when available		The percent recovery calculated as specified by the laboratory QC program. Always required for spikes, spike duplicates, surrogate compounds, LCS and any spiked sample. Report as percentage multiplied by 100 (e.g., report "120%" as "120").
qc_dup_original_conc	Numeric	when available		The concentration of the analyte in the original (unspiked) sample. Might be required for spike or LCS duplicates only (depending on user needs). Not necessary for surrogate compounds or LCS samples (where the original concentration is assumed to be zero).
qc_dup_spike_added	Numeric	when available		The concentration of the analyte added to the original sample. Might be required for spike or LCS duplicates, surrogate compounds, and any spiked and duplicated sample (depending on user needs). Use zero for spiked compounds that were not detected in the sample. Required for spikes, spike duplicates, surrogate compounds, LCS and any spiked sample. Also complete the qc_spike_added field.
qc_dup_spike_measured	Numeric	when available		The measured concentration of the analyte in the duplicate. Use zero for spiked compounds that were not detected in the sample. Might be required for spike and LCS duplicates, surrogate compounds, and any other spiked and duplicated sample (depending on user needs). Also complete the qc_spike_measured field.

Field Name	Data Type	Required	Parent	Description
qc_dup_spike_recovery	Numeric	when available		The duplicate percent recovery calculated as specified by the laboratory QC program. Always required for spike or LCS duplicates, surrogate compounds, and any other spiked and duplicated sample. Also complete the qc_spike_recovery field. Report as percentage multiplied by 100 (e.g., report "120%" as "120").
qc_rpd	Text(8)	when available		The relative percent difference calculated as specified by the laboratory QC program. Required for duplicate samples as appropriate. Report as percentage multiplied by 100 (e.g., report "30%" as "30").
qc_spike_lcl	Text(8)	when available		Lower control limit for spike recovery. Required for spikes, spike duplicates, surrogate compounds, LCS and any spiked sample. Report as percentage multiplied by 100 (e.g., report "60%" as "60").
qc_spike_ucl	Text(8)	when available		Upper control limit for spike recovery. Required for spikes, spike duplicates, surrogate compounds, LCS and any spiked sample. Report as percentage multiplied by 100 (e.g., report "60%" as "60").
qc_rpd_cl	Text(8)	when available		Relative percent difference control limit. Required for any duplicated sample. Report as percentage multiplied by 100 (e.g., report "25%" as "25").
qc_spike_status	Text(10)	when available		Used to indicate whether the spike recovery was within control limits. Use the "*" character to indicate failure, otherwise leave blank. Required for spikes, spike duplicates, surrogate compounds, LCS and any spiked sample.
qc_dup_spike_status	Text(10)	when available		Used to indicate whether the duplicate spike recovery was within control limits. Use the "*" character to indicate failure, otherwise leave blank. Required for any spiked and duplicate sample.
qc_rpd_status	Text(10)	when available		Used to indicate whether the relative percent difference was within control limits. Use the "*" character to indicate failure, otherwise leave blank. Required for any duplicate sample.
lab_SDG	Text(20)	when available		Lab Sample Delivery Group (SDG) identifier. A single sample may be assigned to multiple Sample Delivery Group (SDG) based on different analysis.

3.30 Vapor Intrusion Batch EDD File

The Vapor Intrusion Batch EDD file contains data that relates the individual samples to the batch identifier.

Vapor Intrusion Batch EDD files must be named according to the following convention: **VI_Batches_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
sys_sample_code	Text(40)	Y		Sample ID. Each sample must have a unique value, including spikes, duplicates and laboratory QC samples. This is the Primary Key field along with the lab_anl_method_name, analysis_date, fraction, and test_type fields that inhibits duplications within the EDD. This must match what is recorded in the VI_TestResultsQC_v1 format's sys_sample_code, lab_anl_method_name, analysis_date, fraction, column_number, and test_type for the information is directly related.
lab_anl_method_name	Text(35)	Y		Laboratory analytic method name or description. Review the Reference table for a proper entry.
analysis_date	DateTime	Y		Date of sample analysis in MM/DD/YY format. May refer to either beginning or end of the analysis as required by EQulS Chemistry project manager. This field is not always required, but most users will want it.
fraction	Text(10)	Y		Must be either "T" for total [metal] concentration, "D" for dissolved or filtered [metal] concentration, or "N" for organic (or other) constituents for which neither "total" nor "dissolved" is applicable.
column_number	Text(2)	Y		If required, then it must be either "1C" for first column analyses, "2C" for second column analyses, or "NA" for analyses for which neither "1C" nor "2C" is applicable.
test_type	Text(10)	Y		Type of test in the laboratory. This field is used to distinguish between initial runs, re-extractions, reanalysis and dilutions. Review the Reference table for a proper entry.
test_batch_type	Text(10)	Y		Lab batch type. Valid values include 'PREP', and 'ANALYSIS'. This is a required field for all batches.
test_batch_id	Text(20)	Y		Unique identifier for all lab batches.

3.31 Files EDD Section

The Files_v1 table of the EPA Region 4 Format allows for files (e.g., site photos, boring logs) to be loaded into the EPA Region 4 database. When completing a data submission using EDP Sign and Submit, the files entered into the Files_v1 table’s file name field will be packaged within the EDD.

Files should be named according to the following convention:

TaskCode.SiteName.ContentDescription.FileType

An example file name is **P2015-0001_ChemicalCompanyABC_SitePhoto1.JPG**

- Task Code is P2015-0001, (PRP use PYYYY-nnnn as provided by R4DART; Fund-lead use YY-nnnn as provided by EPA work order),
- Site Name is Chemical Company ABC,
- Content Description is SitePhoto1, and
- JPG is the file type.

The file’s EDD file section should be named according to the following convention: **EPAR4_Files_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Required	Parent	Description
file_name	Text(255)	Y	EPAR4_Location_v1. sys_loc_code	Name of the file.
file_type	Text(20)	Y		Type of the file.
file_date	DateTime	when available		Date of the file.
title	Text(255)	when available		Title of the file.
author	Text(255)	when available		Author of the file.
confidential_yn	Text(1)	when available		Whether or not the file is confidential.
remark	Text(255)	when available		Remark for the file.

Field Name	Data Type	Required	Parent	Description
place_type	Text(50)	when available		Type of place this file is associated with.
place_code	Text(50)	when available		Code/identifier of the place this file is associated with.
place_subcode	Text(50)	when available		Subcode/identifier of the place this file is associated with.
content		when available		Content of the file.

3.32 Working with Data

It must be assumed that persons working with EDDs have a working understanding of databases and some fundamental knowledge of data base structure. Database managers will need to work in conjunction with environmental management to properly process and format this data. It is crucial that the data provided be of the highest standard and that every effort to properly format the data be made prior to submittal to the EPA Region 4.



EQUS Data Processor Reference Manual

January 2020

USEPA Region 4 Superfund and Emergency Management Division

Updated by:

earthsoft

Disclaimer of Endorsement

Reference herein to any specific commercial products, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government and shall not be used for advertising or product endorsement purposes.

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Acronyms

CAS RN – Chemical Abstracts Service Registry Number
CLP – Contract Laboratory Program
DART – Data Archival and ReTrieval
EDD – Electronic Data Deliverable
EDGE – EQUIS Data Gathering Engine
EDP – EQUIS Data Processor
EQUIS – Environmental Quality Information System
EPA – United States Environmental Protection Agency
PRP – Potentially Responsible Party
QC – Quality Control
RPM – Remedial Project Manager
SEMD – Superfund and Emergency Management Division
XML – Extended Markup Language

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1 Introduction

1.1 Purpose

The sole purpose of this document is to assist the EPA Region 4 Superfund and Emergency Management Division (SEMD) data providers with the installation and use of the EQUIS™ Data Processor (EDP) in conjunction with submitting Electronic Data Deliverable (EDD) files to the EPA Region 4. Therefore, this document only provides information pertaining to the specific requirements to validate EDDs for the EPA Region 4 and is not intended to be a comprehensive EDP Manual. For a more detailed discussion of the functionality and technical specifications of EDP, please refer to EarthSoft’s website at: <https://help.earthsoft.com>.

For a more detailed discussion of the EPA Region 4 EDD specifications, please refer to the *EPA Region 4 EDD Format File Guide* found on the EPA Region 4 Superfund website at:

<https://www.epa.gov/superfund/region-4-superfund-electronic-data-submission>

1.2 Scope and Application

The methods described in this document are to be used by all data providers when preparing and submitting environmental data electronically to the EPA Region 4, regardless of the originating program.

Following these procedures will help to reduce errors in data submitted to the EPA Region 4 and will enforce consistency, maintaining the strength and integrity of the EPA Region 4 EQUIS database. This strength of data allows for more informed and cost-effective decision-making.

1.3 Definitions

Data Provider – “Data Provider” and “Sampling Company” are defined to be interchangeable with regard to EDD submittals. The data provider may be defined as the person or agency that organized, formatted, and submitted the electronic data from a sampling event. This may or may not be the sampling company, particularly when working with historic data. Unless otherwise noted by the RPM, the prime contractor or grantee is always entered as the Sampling Company for the Samples and the Data Provider for the Geology EDDs.

Electronic Data Deliverable – An Electronic Data Deliverable (EDD) is a tabular, flat file format for sharing, manipulating, and using data, and is commonly a text or Microsoft Excel file type. For the EPA Region 4, an EDD is an archive zip file saved with a “.dat” extension holding one or more tab-delimited text files containing the environmental data to be submitted. An EDD file follows a consistent design meant to organize information in a useful format and typically contains header row(s) that describe what information should be completed in each column and in what format that data should be entered (see image on next page).

	Column 1	Column 2	Column 3	Column 4
Header Row 1	#sys_loc_code	x_coord	y_coord	coord_type_code
Header Row 2	#Text(20)	Numeric	Numeric	Text(20)
Data Row 1	EPA-1S	-82.317493	28.057509	LAT LONG
Data Row 2	EPA-2I	-82.317659	28.057151	LAT LONG

EQuIS Data Processor – The standalone version of the EQuIS Data Processor (EDP) is a powerful desktop interface to check for data completion and referential integrity, identify and correct errors, and create compressed files containing multiple related EDDs in a single useable format for upload and storage in a relational data base system.

EDP Format File – The EDP format file is the essence of data checking with EDP. The EDP format file set contains the definitions and restrictions for each individual field in available data tables. The format files control data checks, such as range checking, formatting, and enumerations. Format files are used in the field data collection tools EQuIS Collect and EQuIS Data Gathering Engine (EDGE) as well as EDP. The EPA Region 4 has a custom EDP format file, *EPAR4.zip*. It is extremely important to ensure you are using the most current file. Check the EarthSoft website to see if your version of the EPA R4 format file is current before working on your data.

Scribe – Scribe is a software tool developed by the EPA to assist in the process of managing environmental data. Scribe captures soil, water, air, and biota sampling, observational, and monitoring field data. Scribe can import EDDs from analytical laboratories, location data from a global positioning system (GPS), and from exported EQuIS EDDs.

Sampling Company – “Data Provider” and “Sampling Company” are defined to be interchangeable with regard to EDD submittals. The data provider may be defined as the person or agency that organized, formatted, and submitted the electronic data from a sampling event. This may or may not be the sampling company, particularly when working with historic data. Unless otherwise noted by the RPM, the prime contractor or grantee is always entered as the Sampling Company for the Samples and the Data Provider for the Geology EDDs.”

Reference Value File – The reference value file (RVF) is associated with the EDP format file and is denoted with an .rvf file extension. This file contains the valid values reference tables that EDP uses to populate the drop-down menus that control when a specific type of value is required in an EDD. Example reference values are “mg/kg” (milligrams per kilogram) for a unit code or “GW” (groundwater) for a media code. These fields limit the type of data permitted in certain columns of the EDD, and the most recent valid values are in the RVF file. Therefore, it is extremely important to ensure you are using the most current file. Check the EarthSoft website to see if your version is current before working on your data.

ZIP Archival File Format – The ZIP file format is a data compression and archival format that contains one or more files that have been compressed, to reduce their file size, or stored as-is. ZIP archival files typically use the file extensions “.zip” or “.ZIP”.

EDP automatically creates an archival zip file for submittal to the EQUIS database, however, the EPA electronic mail system will reject files with a .zip file extension due to security concerns. Therefore, the EDD package created by EDP with the extension “.zip” should be renamed with the extension “.dat”. Details of this process are discussed in Section 3.8.

2 Getting Started

The standalone version of the EQuIS Data Processor is a product of EarthSoft, Inc. and replaces all previous methods of EDD checking, whether electronic or manual. EDP is a single application that checks all EDD files currently used by the EPA Region 4 and provides an easy-to-use, straight-forward interface for identifying and correcting data errors.

EDP Standalone has been made available to data providers to check their EDD files prior to submittal to the EPA Region 4. EDP is used to ensure EDD files are formatted as described in the EPA Region 4 File Format Guide. If EDP detects errors, the errors can be viewed directly within EDP or via an error log. After the errors are corrected by the data provider, the revised EDD files should be processed by EDP to ensure that no errors remain. The EDD files can then be “signed and submitted,” saved with the appropriate filename, and emailed to the EPA Region 4 DART EQuIS database at EPAR4@EQuISonline.com.

Getting started with EDP Standalone involves three steps:

- 1) Downloading the EDP Standalone application,
- 2) Installing EDP Standalone, and
- 3) Registering EDP Standalone with EarthSoft.

Note: You must be an administrator or user with “Power User” privileges on your computer to install EDP. Check with your IT support before downloading and installing any software and only download EDP directly from EarthSoft or the EPA Region 4.

2.1 Downloading EDP Standalone

The most recent build of the EQuIS Data Processor 7 Standalone application can be downloaded directly from EarthSoft for no cost at:

<https://earthsoft.com/products/edp/edp-format-for-epar4/>.

The EPA Region 4 format file (*EPAR4.zip*) and reference value file (*EPAR4rvfyyyymmdd.zip*, where *yyyymmdd* is the date of the file creation) are also available for download from the EarthSoft website.

Note: The EPA Region 4 ‘EDP 7 Format File’ requires the ‘EDP 7 Version’ application.

Ensure that you have the correct version for the Microsoft .NET Framework installed before installing EDP. The download page will provide the version needed for the most recent version of EDP. Information on checking your .NET version and obtaining the correct version can be found on the Microsoft website at <http://www.microsoft.com/.NET/>, and additional information regarding Microsoft can be found below the installation instructions on the EarthSoft website.

US EPA Region 4 EDP Format

EQuIS Data Processor (EDP) developed for EPA Region 4

Name	Size	Type	Modified
EQuIS Data Processor (EDP) v7 19046 32 bit 64 bit (x64)	51 MB	.zip	February 15, 2019
EPAR4 Format	787 KB	.zip	July 11, 2019
EPA Region 4 Reference Values	302 KB	.zip	Nov 18, 2019
EPAR4 EDGE	210 MB	.zip	Sept 12, 2019
EPA Region 4 Scribe mdb Format	290.0 KB	.zip	July 22, 2016

EPAR4 guidance page:

<http://www.epa.gov/superfund/region-4-superfund-electronic-data-submission>

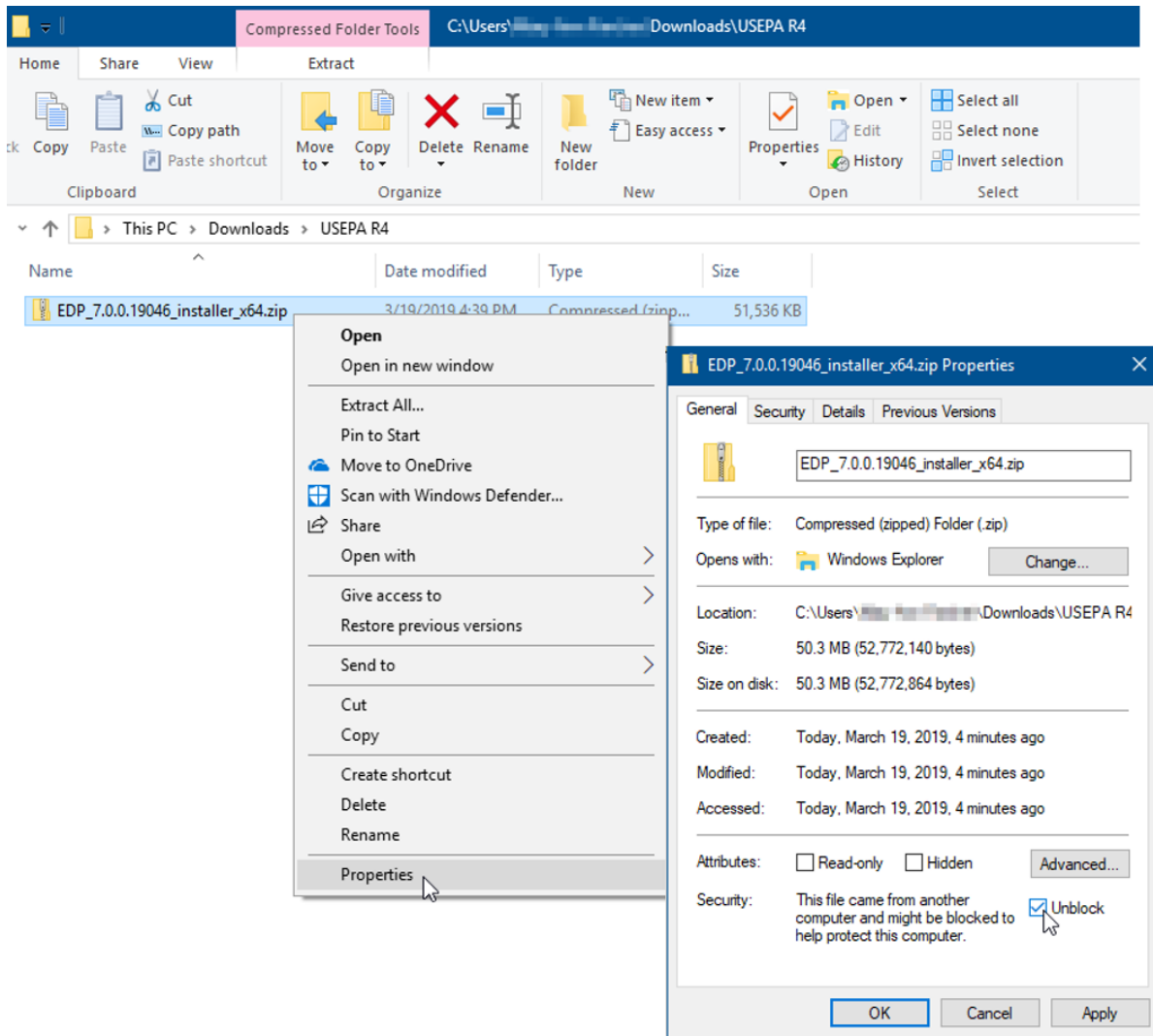
Requires .NET Framework 4.7.2

2.2 Installing EDP

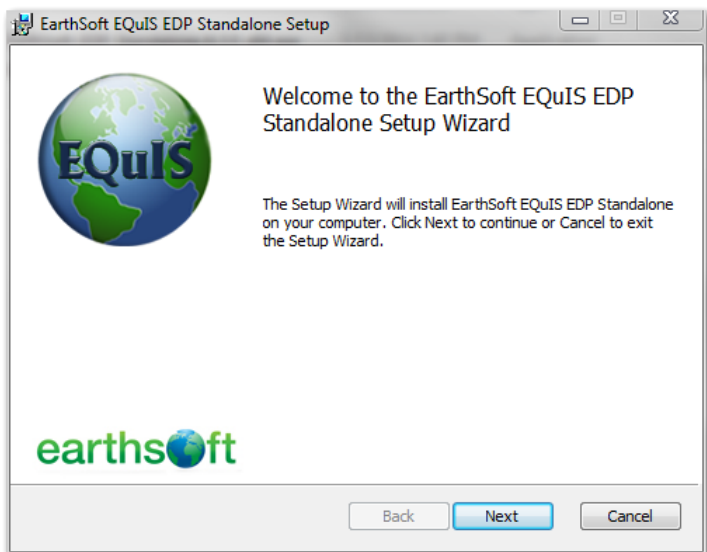
Open the directory where the EDP application was downloaded and unblock the file prior to unzipping the file.

Note: When downloading files from the Internet or other location, Windows may set an attribute on the file to "Blocked." When this happens, the file may not load properly. This behavior is the default for .NET 4 and is designed to help protect your computer from executing malicious files. Whenever you download a file, it is recommended that you check for the blocked attribute, and then "Unblock" the file so it will load properly. It is easier to unblock a .zip file rather than unblocking each of the individual files that are extracted from it.

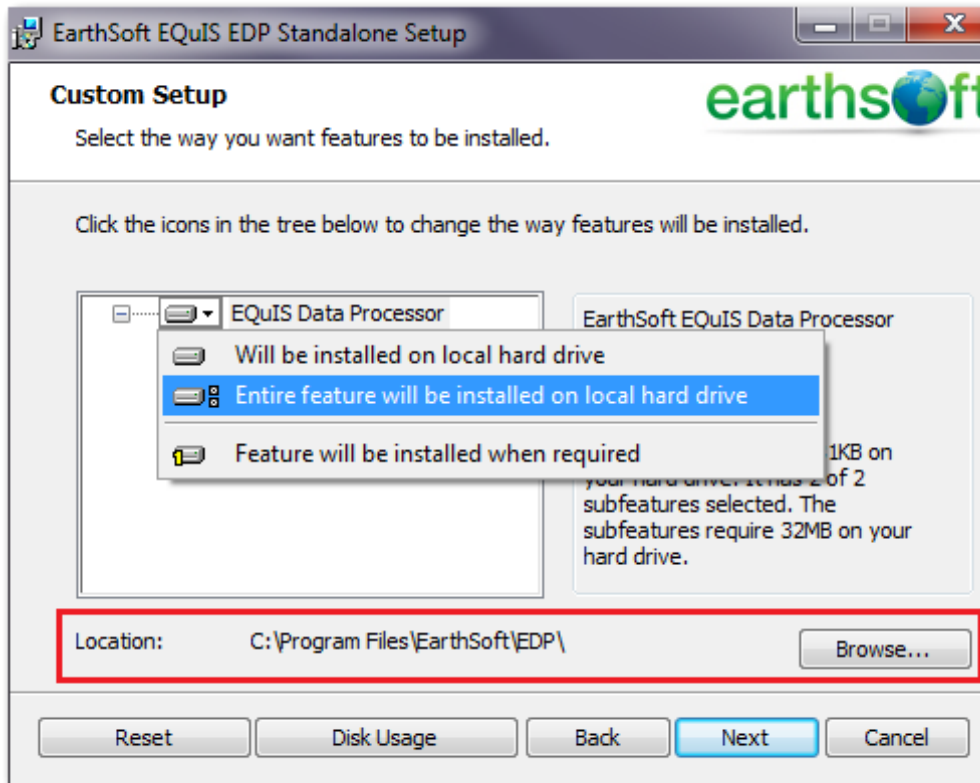
After downloading the file, check to see if it has been blocked by Windows by right-clicking on the downloaded file, and then selecting **Properties** from the drop-down menu. A file properties dialog will be displayed. On the **General** tab, click the **Unblock** checkbox or button and then select the **OK** button to remove this restriction on the file.



After the file has been unblocked, unzip the EDP installation folder. Double-click the EDP application installer to open the Installation Wizard. The install wizard will guide you step-by-step through the installation procedure. It is important to note that during installation you should have no other programs running.



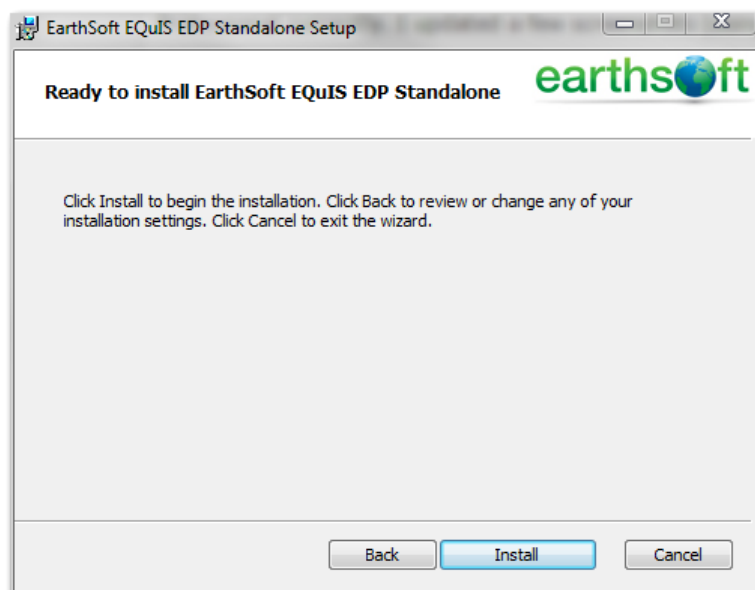
Click the **Next** button. The License Agreement screen will appear. Check the **I accept the terms in the License Agreement** radio button and click the **Next** button to open the Custom Setup screen.



Click the icon next to 'EQUIS Data Processor' and select '**Entire feature will be installed on local hard drive**'. At the bottom of the window, select the destination folder for the application files. Click the **Next** button. The "Ready to install" screen will open.


Click the **Install** button to begin the installation.

When the installation is complete, you will be presented with a window that verifies that EDP Standalone has been successfully installed. Click the **Finish** button to exit the installation.

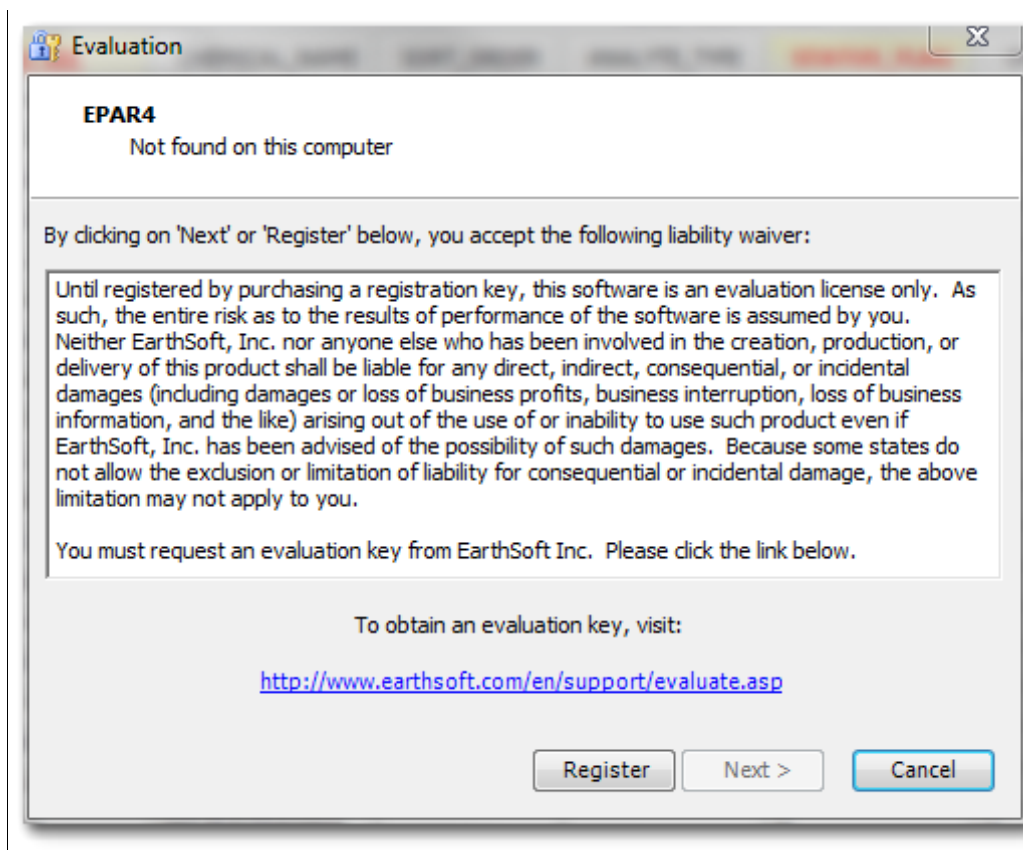


Next, return to the EarthSoft website to download the EPAR4 format file and reference values file. Select the “EPAR4 Format” link and save the *EPAR4.zip* file to the desired folder. Select the “EPA Region 4 Reference Values” link and save the *EPAR4rvfyymmdd.zip* file to the desired folder. We recommend saving the files to the *C:\Program Files\EarthSoft\EDP\Formats* folder. [If you were required to install the 32-bit version of the software, this path will be *C:\Program Files (x86)\EarthSoft\EDP\Formats*. The remaining references within this document will assume the 64-bit version.] Unblock the zipped format file according to the instructions above, but do not unzip this file. Unblock the *EPAR4yyyymmdd.zip* file and extract the *EPAR4.rvf* file from the reference values zip file.

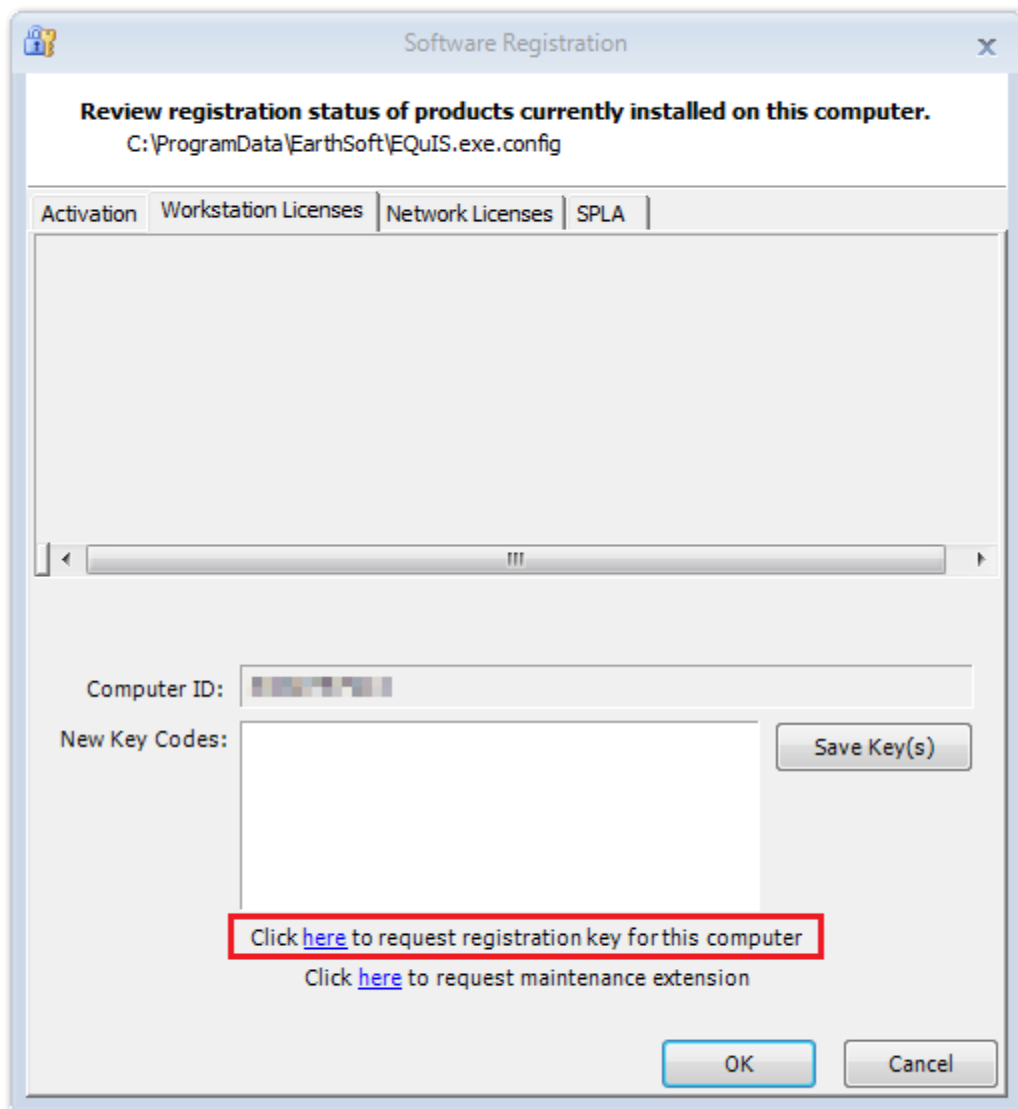
2.3 Registering EDP

Once installed, EDP must be registered. Start the EDP application by selecting **EDP Standalone** from the Windows Start menu. The EDP application will start with a blank workspace. Select **Format**  from the Open group of the EDP Home ribbon.

Browse to select the *EPAR4.zip* format file. If you moved the format file to the suggested folder, the path you select will be the *C:\Program Files\EarthSoft\EDP\Formats* folder. Select the file, and then click the **Open** button. The “Evaluation” screen will appear. Click the **Register** button.



The ‘Software Registration’ screen will appear. Go to the **Workstation Licenses** tab. Click the first link to open the registration request page in your web browser.



Enter the requested information in the “EDP Format for EPA Region 4 – Registration” form (see image on next page). Your computer ID should be automatically populated. If you are working with several RPMs, enter the primary RPM or the RPM who provided your approval code in the appropriate field of the registration form. You will need to request the approval code from either your RPM or email the R4DART@epa.gov. When all information has been entered, click the **Submit** button. With the proper approval code, the software key codes will be automatically emailed to the email address entered in the registration form.

Once the new key codes have been received, register EDP by copying the registration key codes into the **New Key Codes** box on the **Workstation Licenses** tab of the Software Registration window. Click the **Save Key(s)** button. A screen stating that the “Registration succeeded” should appear. Click **OK**. EDP is now registered and ready for use. Registration is unique to a computer. You will need to repeat this process to use EDP on a different computer.



EDP Format for EPA Region 4 - Registration

To request software registration keys, please provide the following information
(fields in red are required):

Quicklinks

[Register Software](#)
[Community Center](#)

Name:

Project Manager (RPM):

Approval Code:

Company:

Address:

City:

State:

Zip Code:

Country:

Phone Number:

Email Address:

Computer ID*:

*Note that this request form is for local workstation Computer IDs only. To purchase the format for network licensing, please contact support@earthsoft.com.

Comment: Please indicate if you are registering a new license, re-registering an existing license, moving a license from an old machine to a new machine, etc.

3 Using EDP

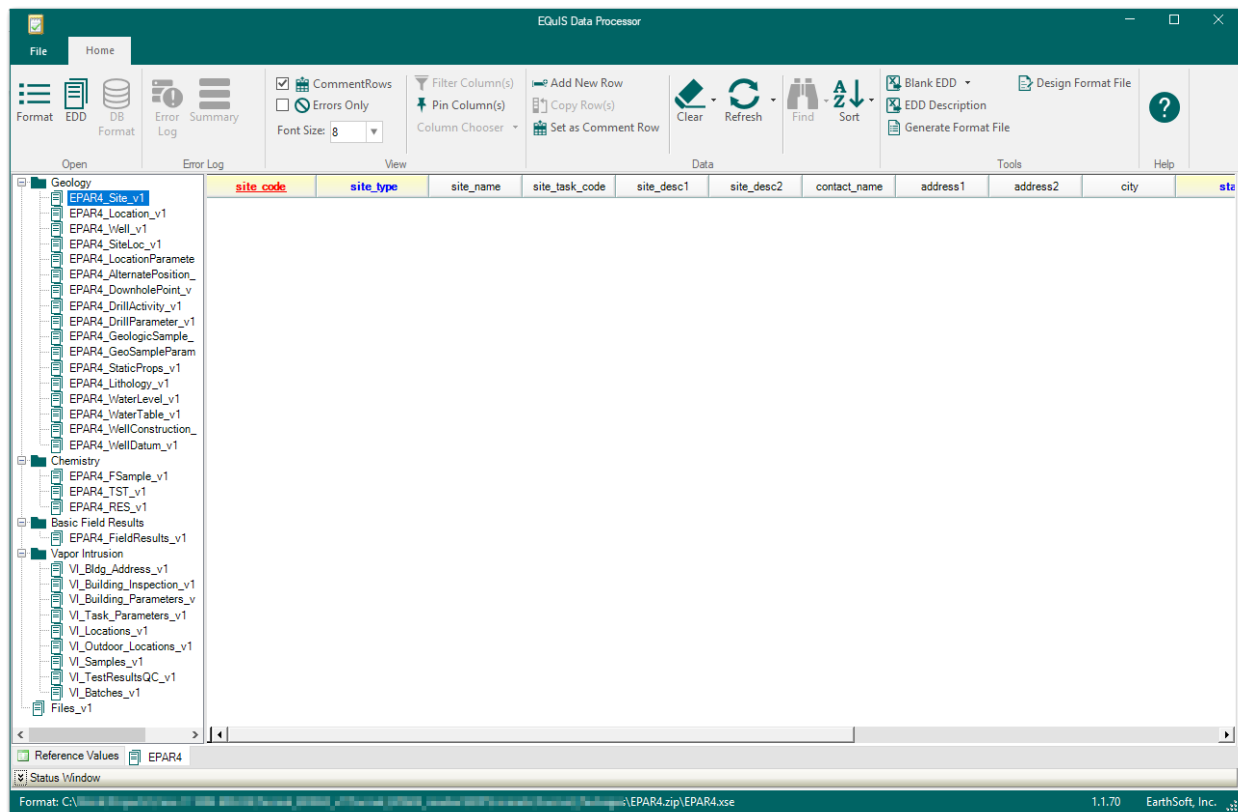
EDP is available as two desktop applications: (1) EDP Standalone, which is available via the download and registration process outlined in Section 2 above; and (2) Professional EDP, which is only available to users who have purchased and licensed EQUIS Professional. This manual only addresses the use of EDP Standalone for the EPA Region 4.

Review of EDDs via EDP is completed via the following workflow:

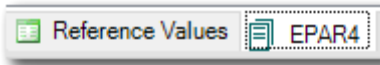
1. Launch EDP and load the EPAR4 Format
2. Load the EDDs
3. Resolve data errors (if any)
4. Sign and Submit the EDD to EPA Region 4

3.1 Start EDP and Load Format

Start the application by selecting **EDP Standalone** from the Windows Start menu. EDP will open. If the Region 4 format file does not load automatically, you will need to load it manually. Select **Format** from the Open group of the EDP Home ribbon. Select the *EPAR4.zip* format file from the *C:\Program Files\EarthSoft\EDP\Formats* folder and click the **Open** button. If requested, also browse to where you extracted the *EPAR4.rvf* file and select this as your reference values file. The lower-left displays the elapsed time while the software is loading the format and respective reference values.

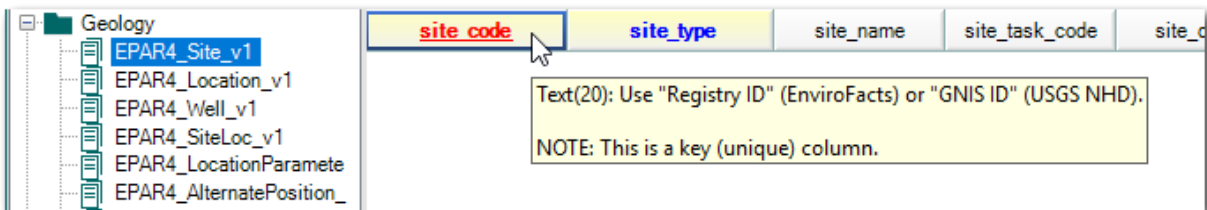


Two tabs are displayed near the bottom of the screen above the Status Window. Select the **EPAR4** tab to view the current EPA Region 4 EDD format specifications you will use to load and check your data.

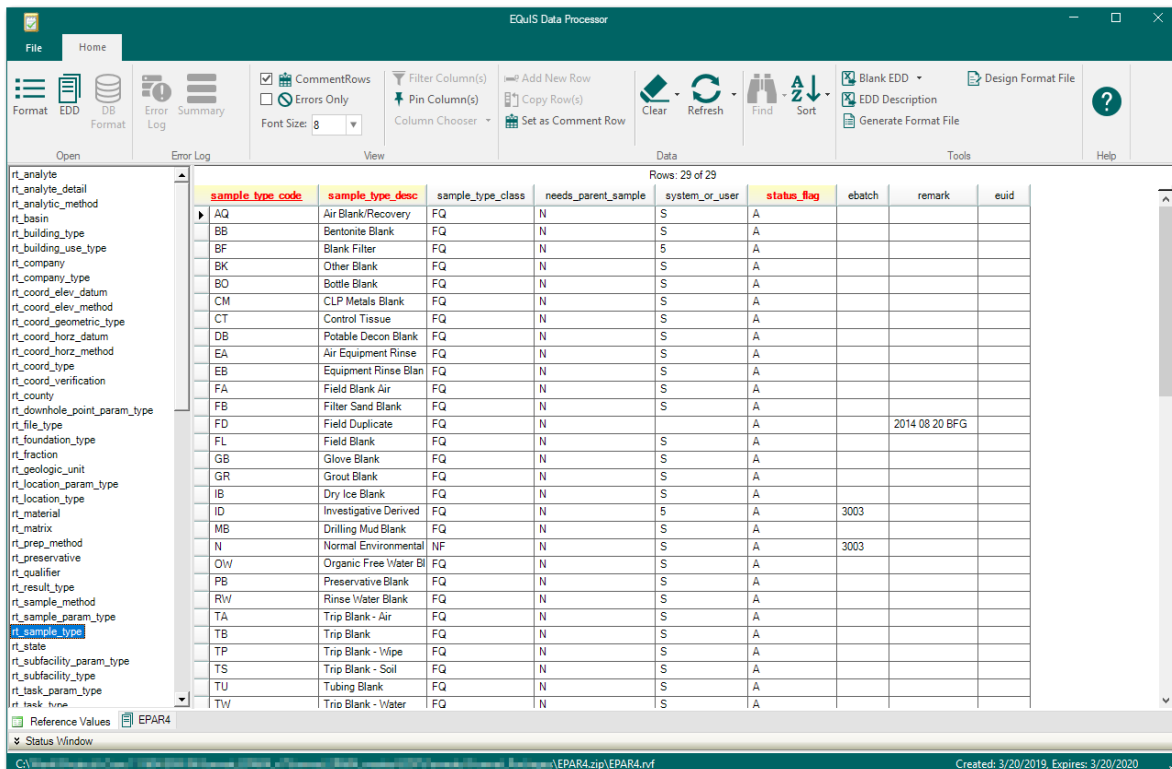


The EPA Region 4 EDD sections are displayed along the left side of the window. Each of the EDD sections listed in EDP corresponds to the EDD files described in the *EPA Region 4 Format File Guide*.

An empty table is displayed in the right pane showing the field names associated with the highlighted section type along the top. Information about each field is provided when the cursor is placed over the column header or field name (as indicated in the example below).



Select the **Reference Values** tab to view the current valid values that are acceptable in the EPA Region 4 database. The valid reference values for the RT_SAMPLE_TYPE table are displayed in the example image below.



3.2 Blank EDDs and EDD Descriptions

The Blank EDD and EDD Description tools within EDP can facilitate data processing. The Blank EDD tool creates an empty Excel template that follows the format file's specific layout for data entry. The EDD Description tool defines the specifications of the format. These tools can be used to help generate EDDs to submit to the EPA Region 4.

To create a blank EDD in the EPAR4 format, select **Blank EDD** from the Tools group of the Home ribbon. Selecting the arrow next to the Blank EDD option will provide the ability to export a blank EDD with either Valid Values or Parent Values (or both). In the Save dialog, name the blank EDD file, choose the desired location, and select **Save**.

A Microsoft Excel file is created with the format columns and field types, along with the color-coding as displayed in EDP to indicate required fields, primary keys, and look-up values. Separate worksheets are named for each section of the format file. The blank EDD file may be loaded into EDP for data checking after data has been entered.

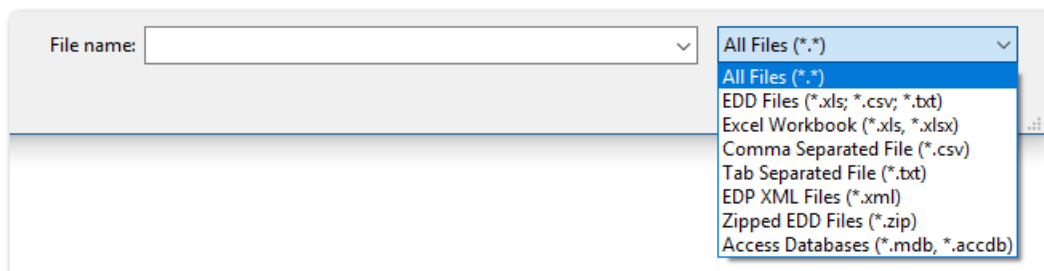
To create an EDD description file of the EPAR4 format, select **EDD Description** from the Tools group of the Home ribbon. In the Save dialog, name the EDD description file, choose the desired location, and select **Save**.

Information about the format file is exported into a Microsoft Excel spreadsheet, including whether a field is a primary key (i.e., required), data type, related look-up tables, and EQuIS Schema mapping. The EDD description file includes a separate worksheet detailing each section of the EDD format file.

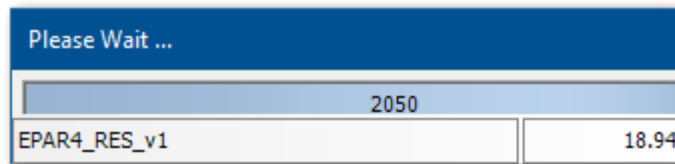
3.3 Loading EDD Files

A variety of EDD file types can be loaded into EDP and checked, including:

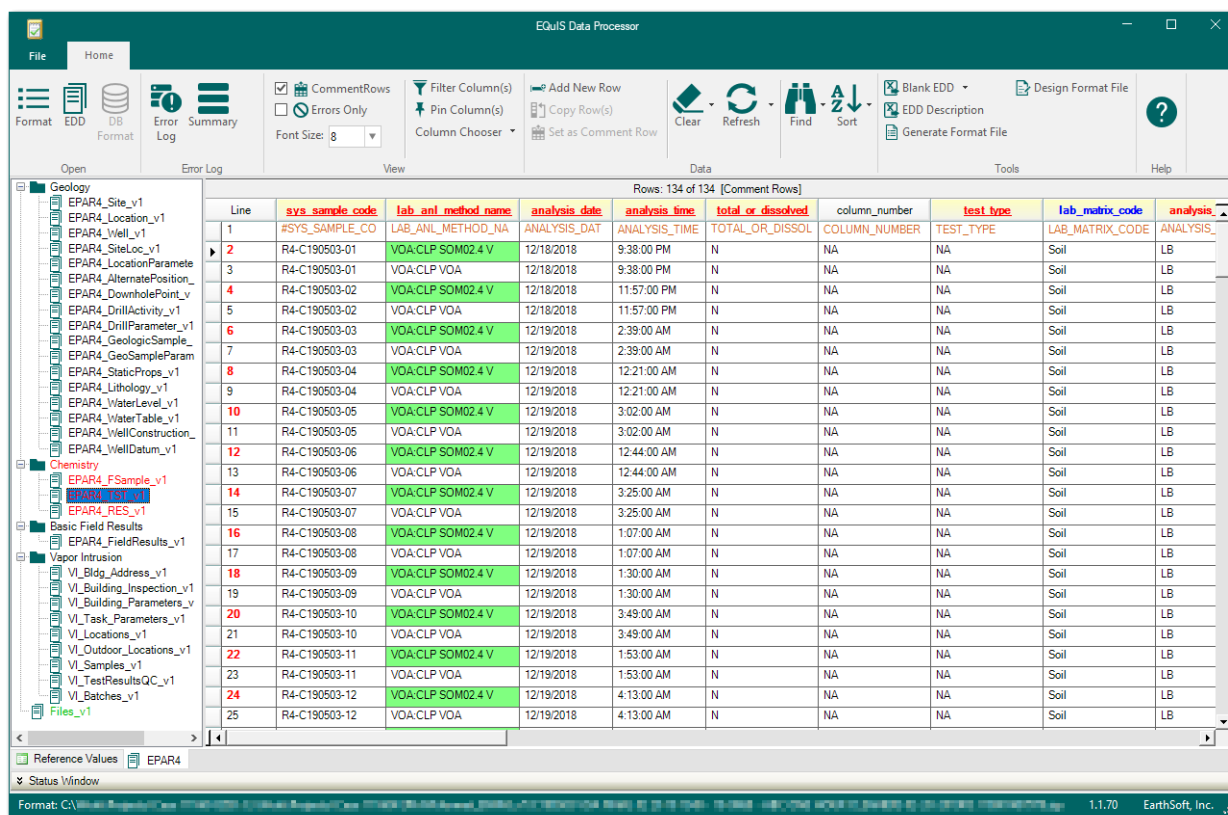
- Individually created EDD files.
- A single Access database created with individual tables named according to the naming conventions.
- An Excel spreadsheet with tabs named according to the naming conventions.
- A zip package of individual EDD files.



To load EDD files, select **EDD** from the Open group of the EDP Home ribbon. Use the Browse window to locate the EDD file and select **Open** or double-click on the file to open it. The data file will load to EDP and be checked for errors during loading. This may take a few minutes depending on the size of the dataset. A loading dialog box will display progress of the EDD.



Data will load into one or more sections of the format, depending on which sections were populated in the EDD file. Populated section names will be **Red** or **Green**, depending on if they contain errors or are error-free, respectively. Empty sections of the format will remain black. Data will be displayed in the tables and any detected errors will be shaded.



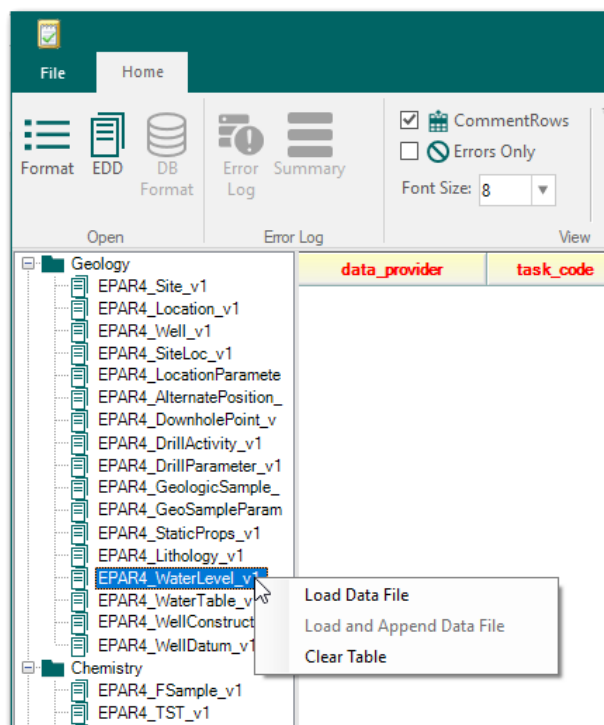
Warning: If the data file contains header rows, EDP will identify fields in the header rows as errors, unless each header row is preceded by the default hash character (#) in the first column.

Note: To be 508 Compliant, add bitmap images for the appearance of errors (see Section 3.3.2 to edit appearance options and view examples).

3.3.1 Load EDD File Directly to Section

A single EDD can be loaded directly to a format section by right-clicking on the desired format table in format list. Select **Load Data File** to open the file browser. Use the Browse window to locate the EDD file and select **Open** or double-click on the file to open it. The selected EDD file will load directly to the format section and be checked for errors during loading. Data will be displayed in the table and any detected errors will be shaded.

If data already exists in the table, the **Load and Append Data File** option will be visible.



3.3.2 Managing EDD Display

A variety of display options are available in the View group of the EDP Home ribbon. These features can assist you with seeing and resolving errors in the EDD.

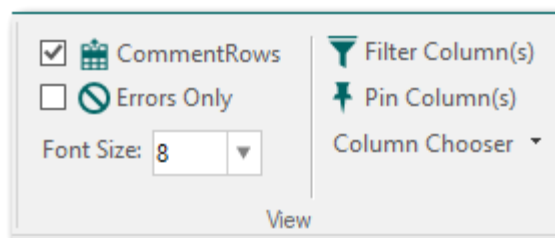
Display of comment rows is controlled by checking and unchecking the **Comment Rows** box.

To view only the data rows with errors, check the **Errors Only** box. To restore all the rows, uncheck the **Errors Only** box. EDDs may contain thousands of records and large EDDs with an exorbitant number of errors may cause EDP to appear as not responding when switching from "Errors Only" to viewing all data.

Some tables have many columns of data. Use the **Pin Column(s)** option to be able to pin any column to the left-hand side of the table's grid view to make viewing data easier.

Filter a column by any value within that column by selecting the **Filter Column(s)** option. A filter search box appears below each column header in the grid view. If the field is numeric, then the filter operator appears as "=". If the field is text, then the filter operator appears as "A".

Tip: The default appearance of the Column Headers, Errors, and Informational messages can be modified to enhance the user experience and/or be 508 compliant. This functionality can be accessed by clicking on the EDP **File** menu, then selecting the **Options** button and expanding the **Appearance** menu.



Changing the appearance to add an image provides the user with multiple means to denote an error or understand the significance of a field, such as being a primary key. Within the Appearance menu, select the column header or error type to change and then select **Image**.

In the examples below, a symbol has been added in the header to denote a required field and symbols have been added to indicate the presence of errors. Hovering the mouse will pop-up the error. The 'Req' text within the sample_matrix_code of the image will not affect the data and will remove itself once the cell error has been corrected.



3.4 EDD Data File Checks

EDP checks for errors both within a single EDD and between related EDD files. EDP highlights errors with different colors to signify the error type, facilitating error correction. Errors may be corrected easily and directly within EDP.

EDD errors often occur because of issues with formatting, logic, or terminology. Along with the EPA Region 4 business rule verifications, EDP checks data for the following potential issues:

- Reference Values
- Field Lengths
- Required Fields
- Data Types
- Valid Dates
- Duplicate Rows
- Parent-Child Relationships

This section describes these errors in more detail. Section 3.6 provides the process to resolve the errors.

3.4.1 Reference Value Not Found

The value in the field does not match the values listed in the reference file downloaded from the EPA. If the field value is correct, research to ensure that the value does not already exist as a valid reference valid written in a different way (e.g., analytes have many synonyms, and analytical methods may be written in similar

code	activity_code	collection_quarter
le	task_desc	collection_quarter
	BV-HIST	
	BV-HIST	
	BV-HIST	
	BV-HIST	

Reference value not found

ways but reference the same method). After careful consideration and research, if the value is correct and not listed as a reference value, follow the guidelines in Section 2.6 of the *EPA Region 4 Format File Guide* to request that the value be added to the EPA Region 4 valid value tables. Send that request along with the necessary accompanying information to R4DART@epa.gov. The DART Coordinator will review the request and forward it, if appropriate, to the correct administrator for review and inclusion in the system.

Do NOT submit your data until the request has been approved and you are notified that the values were added. Doing so may cause your data to be rejected for failing to pass EDP. If a new *EPAR4.rvf* file is not provided, check the website for and download the new one when available. Replace the old *EPAR4.rvf* file with the updated file and recheck your EDD before submitting to R4DART.

3.4.2 Value Exceeds Field Length

The number of characters of the value entered in the field exceeds the maximum allowed number of characters. Place your cursor over the column header to view the description of the field that will include the field length. For further detail of each field, see Section 3 of the *EPA Region 4 Format File Guide*.

sys_sample_code	sample_name	sample_matrix_code
TOP_OF_WELL_48 ON THEBACK OF THE BARN ON THE SOUTH SIDE		
EFF_4Q01	EFF	GW
FD_1202	Value exceeds field length	GW

3.4.3 Missing Required Field

The field *must* be populated with a value. The field cannot be left null (i.e., blank). See Section 3 of the *EPA Region 4 EDD Format File Guide* for information on required fields.

Note that the field name at the top of the column is written in red. This indicates that the field is required and that the EDD will not pass EDP unless all values in this column are populated correctly. Placing your cursor over the column header will also bring up the description that includes the line: "NOTE: This is a required field."

sample_matrix_code	sample_
GW	N
	N
GW	N
GW	N
GW	N

A common problem arises with the CAS RN field during the conversion process from one type of file to another, such as comma separated to Excel. In this process, any CAS RN that may appear as a date may be converted to a date. For example, the CAS RN for Potassium is 7440-09-7 and will be converted to 9/7/7440.

3.4.4 Invalid Data Type

The value is not the appropriate data type. Each field has a specific data type that must be used, such as text, date/time, or numeric. If the appropriate data type for a field is Date/Time, then the value must be a valid date format such as the MM/DD/YYYY HH:MM:SS format. See the Data Type description in Section 3 of the *EPA Region 4 EDD Format File Guide* for the appropriate data type.

5/29/2009	19:47:00
27005	18:56:00
5/29/2009	18:25:00
2/13/200	Invalid data type 00
2/13/2007	15:00:00

Another common problem arises with Date/Time fields during the conversion process from one type of file to another. In this process, Date/Time fields may be incorrectly converted to an integer Julian date. Be sure to check your Date fields to make sure they are appropriately classified to avoid errors.

3.4.5 Duplicate Row

Two or more records have the same values in the primary key fields. The primary key fields are the fields that make each record in the file unique. No two records can have the same values in the primary keys. For example, the EPAR4_Location_v1 file has the sys_loc_code field as the primary keys. Two records that both have 006 in the sys_loc_code fields would be considered duplicate records. To make each record unique, one record would have to be changed so that the sys_loc_code was something other than 006.

data_provider	sys_loc_code	x_coord
PL-CONT_BV	001	-85.404687
PL-CONT_BV	006	-85.403886
PL-CONT_BV	006	-85.404687
PL-CONT_BV	008	-85.404527
PL-CONT_BV	013	-85.403727

Laboratories frequently report data from the same event in multiple packages, sometimes creating duplications of sample records. In these cases, if all data is processed through EDP at the same time, duplicate records will appear in the EPAR4_FSAMPLE_v1 EDD. These duplicate records will need to be deleted prior to submitting the data to EPA Region 4. Data will not pass the EDP checker with duplicate rows.

Refer to Section 2.4 of the *EPA Region 4 EDD Format File Guide* for further discussion of data integrity and duplicate records.

3.4.6 Orphan Row

The record is missing a required parent record. Records that depend on information (i.e., child records) from another record (i.e., parent record) must reference the parent record accurately and the parent record must exist in the corresponding file.

Line	sys_sample_code	lab_a
4	CFDPT-9202_052609	VOA:EP
5	GWSMP-006	VOA:CL
6	CFDPT-202_052609	VOA:EP
7	CFDPT-201_052609	VOA:EP

For example, each row in the EPAR4_TST_v1 table must include a sys_sample_code that corresponds to a sys_sample_code reported in the EPAR4_FSAMPLE_v1 table. If a record in the EPAR4_TST_v1 table has a sys_sample_code of GWSMP-006, then a record must also be included in the EPAR4_FSAMPLE_v1 table with a sys_sample_code of GWSMP-006. If a record in the EPAR4_TST_v1 table has a sys_sample_code that is *not* included in the EPAR4_FSAMPLE_v1 table, an “Orphan Row” error will be identified.

Likewise, each row in the EPAR4_RES_v1 table must have a matching “parent” row in the EPAR4_TST_v1 table. There are six (6) fields that establish the relationship between the results and test records, and they are: sys_sample_code, lab_anl_method_name, analysis_date, analysis_time, total_or_dissolved, and test_type. See Table 2-5 and Section 2.3 of the *EPA Region 4 EDD Format File Guide* for further discussion of child/parent records.

3.4.7 Result_value Is Required When detect_flag = Y

Identifies records that have the detect_flag (EPAR4_RES_v1) value of “Y” yet there is no value reported in the result_value field. This error applies only to records of target analytes (TRG) and tentatively identified compounds (TIC). If a record has a value of “TRG” or “TIC” in the result_type_code (EPAR4_RES_v1) and the detect_flag has a value of “Y”, the result_value field must be populated with the numeric result value (i.e., field cannot be left blank).

reportable_result	detect_flag	lab_qualifiers	validator_qualifiers
Yes	Y	R	R
Yes	Y		X
Yes	N	U	X
Yes	N	U	X

Result_value is required where detect_flag=Y

3.4.8 Quantitation_limit Cannot Be Null When detect_flag = N

Identifies records with a detect_flag (EPAR4_RES_v1) value of “N” and the quantitation_limit field is null. All records that have a value of “N” in the detect_flag field must have the quantitation_limit field populated with the appropriate detection limit value (i.e., field cannot be left null).

reportable_result	detect_flag	lab_qualifiers	validator_qualifiers
Yes	Y		X
Yes	N		X
Yes	N	U	X
Yes	N	U	X

Quantitation_limit cannot be null when detect_flag=N. (5)

3.4.9 Parent_sample_code Is Required Where sample_type_code = FD

Identifies records that have a sample_type_code (EPAR4_FSample_v1) of “FD” but are missing the appropriate parent_sample_code. In the image below, the sample_type_codes signify duplicates, and the sample identifier (i.e., sys_sample_code) of the original sample from which the duplicate was derived must be populated in the parent_sample_code field. The parent_sample_code value must match the sys_sample_code of the original sample and the original sample must also be reported as a separate record in the EPAR4_FSample_v1 file (i.e., there must be a record for the original sample and a separate record for the duplicate sample).

sample_type_code	sample_source	parent_sample_code	project_number	sample_date	sample_time
SAMPLE_TYPE_CODE	SAMPLE_SOURCE	PARENT_SAMPLE_COD	SAMPLE_DELIVER	SAMPLE_DATE	SAMPLE_T
FD	Field		14-0219	6/10/2014	12:03:00
N	Field		14-0219	6/10/2014	11:41:00
N	Field		Parent_sample_code is required where sample_type_code= FD		

3.4.10 Sys_loc_code Is Required When sample_type_code = N

A location identifier (i.e., sys_loc_code) must be provided for all samples that are normal environmental samples. Therefore, all records in the EPAR4_FSample_v1 file that have a sample_type_code of “N” must also have the sys_loc_code field populated (i.e., this field cannot be left blank).

sys_loc_code	start_depth	end_depth
MW04		
MW24		
Sys_loc_code is required where sample_type_code=N. (21)		
MW30		

A matching sys_loc_code with coordinates in the WGS84 (Longitude/Latitude) system must exist in the database or be submitted within the EDD package with the corresponding samples. Data Providers using the Scribe software are required to populate #R4DART# for the station name of various field QC type samples. Before submitting the EDD to R4DART, you must remove this placeholder from your data.

3.4.11 Depths are Required When sample_matrix_code = SF, SB, or SD

Identifies records that have a sample_matrix_code (EPAR4_FSample_v1) of “SF”, “SB”, or “SD” and has null values for start_depth, end_depth and/or depth_unit. If sample_matrix_code = SF, SB, or SD, then start_depth, end_depth and depth_unit are required.

sys_loc_code	start_depth	end_depth	depth_unit	chain_of_custody	sent_to_lab_date	sample_time
SSA6						
SSA9						
SSB6						

If sample_matrix_code='SF', 'SB', or 'SD' then start_depth, end_depth and depth_unit are required.

3.5 Error Logs

It is easy to generate a summary list of data errors and reference value errors to assist in troubleshooting. EDP produces an error log that can be saved as an HTML formatted file.

On the EDP Home ribbon in the Error Log group, select **Error Log** to view and save the error details or **Summary** to view and save a summary of the errors (as indicated by the example below). Use the Browse window to locate the desired location and select **Save**. The error log file will then be saved in the selected folder.

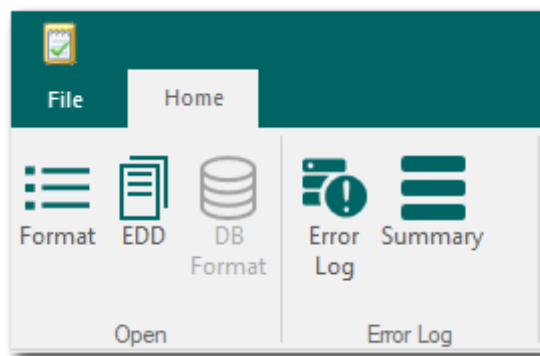


Table	# of Rows	Column	Value	Message	Type
EPAR4_FSAMPLE_v1	1	sample_matrix_code	[NULL]	Missing required field	ERROR
EPAR4_FSAMPLE_v1	1	sys_loc_code	[NULL]	Sys_loc_code is required where sample_type_code='N'.	ERROR
EPAR4_FSAMPLE_v1	1	sample_matrix_code	BadMatrix	Reference value not found	ERROR
EPAR4_FSAMPLE_v1	1	parent_sample_code	[NULL]	Parent_sample_code is required where sample_type_code= FD	ERROR
EPAR4_FSAMPLE_v1	1	~	~	Duplicate row	ERROR
EPAR4_TST_v1	1	sys_sample_code	R4-E142404-01ORPAN	Orphan row	ERROR
EPAR4_RES_v1	1	detect_flag	Y	Result_value is required where detect_flag='Y' and result_type_code='TRG', 'TIC' and CAS_RN <> 'R4-6500'.	ERROR
EPAR4_RES_v1	20	sys_sample_code	R4-E142404-01	Orphan row	ERROR
EPAR4_RES_v1	20	lab_anl_method_name	OCP:EPA 8081	Orphan row	ERROR
EPAR4_RES_v1	20	analysis_date	7/3/2014	Orphan row	ERROR
EPAR4_RES_v1	20	analysis_time	04:10:00	Orphan row	ERROR
EPAR4_RES_v1	20	total_or_dissolved	N	Orphan row	ERROR
EPAR4_RES_v1	20	test_type	NA	Orphan row	ERROR

3.6 Resolve Errors

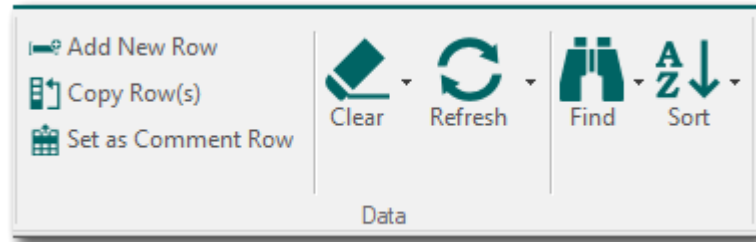
Data are checked for errors by EDP as the EDD files are loading. Populated section names will be **Red** (or display the image added with the Appearances Option) or **Green** (or display no image), depending on if they contain errors or are error-free, respectively. For any sections with errors, troubleshoot and resolve data errors.

Single-click on the top-most **Red** section to view the data in that section. Since data in the various tables are related, it is important to resolve data errors in a top-down manner. The fields with errors will be shaded different colors depending on the type of error. Place the cursor over an error to show a description for the type of error.

Note: Two different cells with the same error type may or may not be resolved the same way.

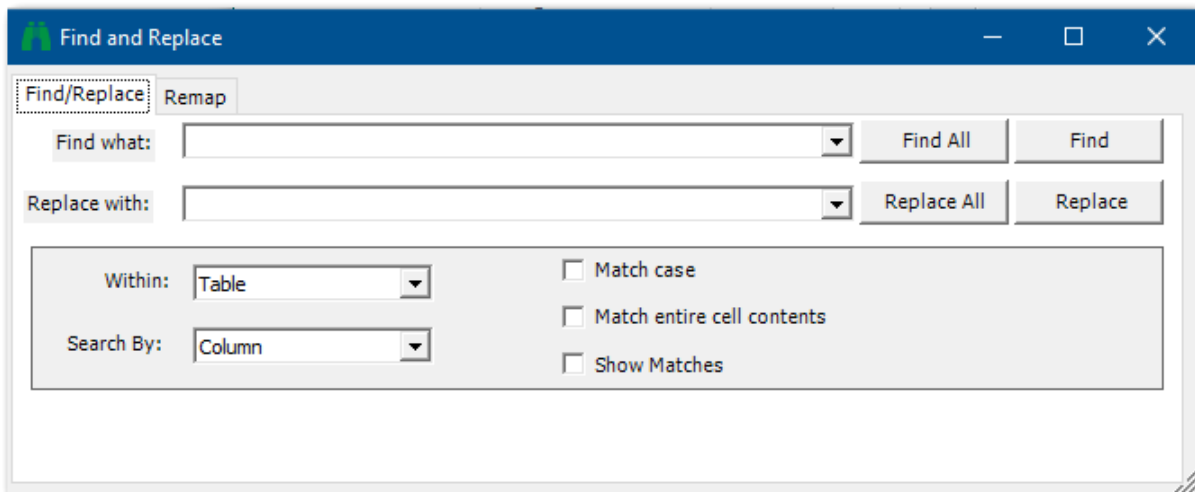
3.6.1 EDP Tools

EDP provides tools in the Data group on the Home ribbon that can assist with resolving data errors.



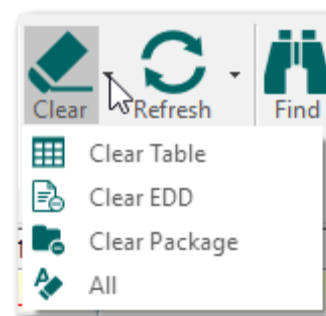
If an intended header row appears as an error, highlight the header row by clicking to the left of the row and then select the **Set as Comment Row** button. This will add hash character (#) in the first column of the row to set as a comment row.

The “Find and Replace” function allows users to search the file for a specified value and then replace it with another value. This function is useful when there are a number of similar values that need to be changed. Select the **Find** button to open the “Find and Replace” dialog box. Type the value to be replaced in the “Find what” field and the new value in the “Replace with” field. Select the desired search options and then click either **Replace** or **Replace All**.



To clear the data from EDP, select the **Clear** drop-down button and then select **Clear EDD**. The EDD file will be cleared from the EDP viewer. Data can also be removed from individual tables.

Note: Clearing data from EDP will not delete the EDP file; the action only removes the data from the viewer.



3.6.2 Methods to Resolve Errors

Two methods can be used to correct errors within EDD files: Edit files outside of EDP or correct errors within EDP.

1. Exit EDP and then open the EDD file using a text editor or spreadsheet application, correct the errors, resave the file, and then re-load the EDD into EDP to ensure no further errors. The detailed error log file is extremely useful for this method.
2. The preferred method is to correct errors directly within EDP. Correct errors by clicking in the field with the error and entering the correct value. If the field is restricted to a list of valid values, the values will be provided from a drop-down list by clicking on the down arrow located on the right-side of the field. Once the error is corrected and the cursor is moved out of the field (i.e., user clicks on another field), the shading signifying an error will disappear. It may be necessary to highlight the row by clicking on the tab at the far left of the row and then selecting **Refresh> Selected Rows** from the Data group on the Home ribbon. This will “reload” the checker for just that row with the new data entered. You may also refresh the entire table. For large data sets, refreshing the entire table may take a long time and may cause EDP to appear as not responding while it processes.

While EDP is a robust data checker, EDDs should also be reviewed for potential errors that might not be flagged as errors by EDP. Examples of these other potential issues are incorrect sampling dates, matrix types being inconsistent with sample type, etc.

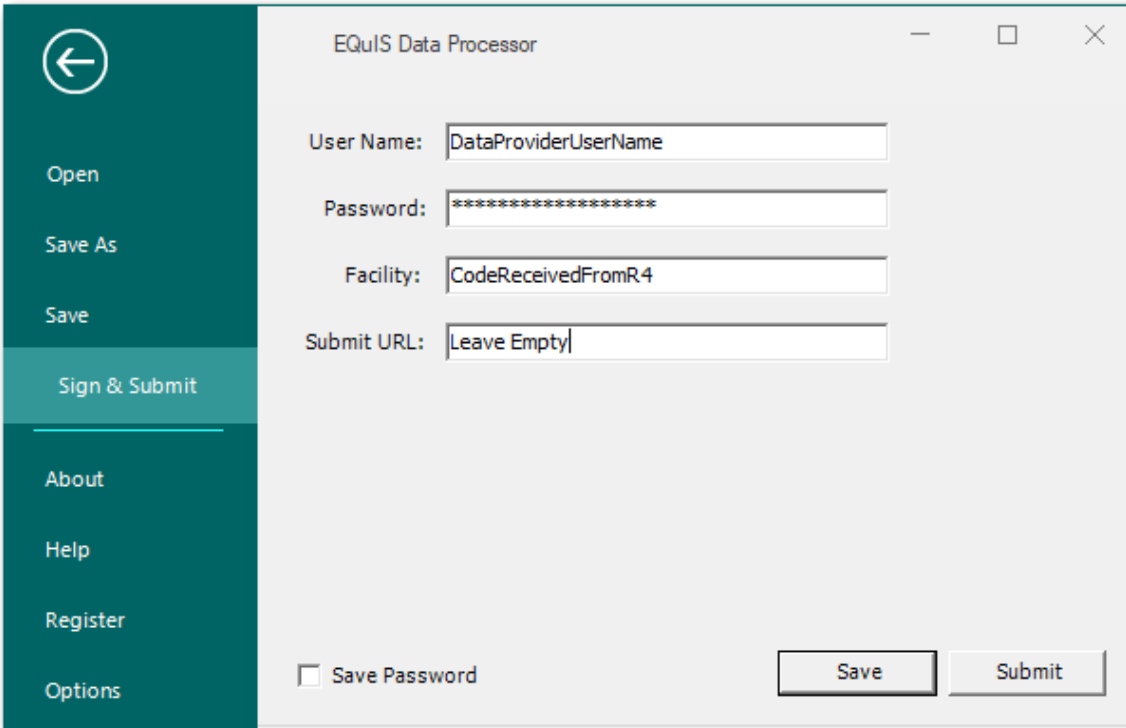
3.7 Saving Changes to the EDD File

To save the changes made to the EDD data file, click the EDP **File** Menu and then select **Save> EDD**. Use the Browse window to locate the folder where the EDD file is to be saved and click **Save**. Any changes made to the EDD will now be saved.

Note: When saving as an individual file type such as .csv or .txt, only the individual EDD table selected in the left-hand format list will be saved. To save all of the EDD tables to one package, change the “Save as Type” to one of the selections that will allow for multiple tables, such as an Excel workbook, Zipped EDD file, or Access database.

3.8 Sign and Submit

The “Sign and Submit” function of EDP allows all files within an EDD to be compiled into the final Data Package, which is subsequently submitted to the EPA Region 4. Click on the EDP **File** Menu and select **Sign & Submit**.



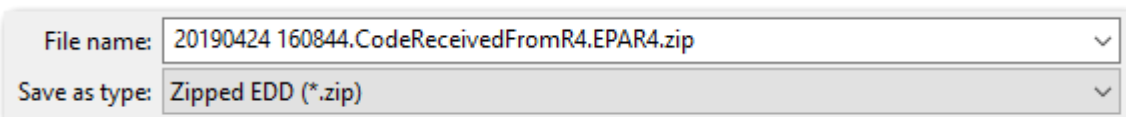
During the “Sign and Submit” process, EDP will export and name all loaded tables according to EDP’s required file naming conventions before compressing them into a single archive zip file. Also included in the .zip file is the Data Provider’s .usr file, referred to as the user certificate.

The user certificate is created automatically using the User Name and Password as entered into the Sign and Submit form. Your user name and password *must* match *exactly* the user name and password assigned in the R4DART EQuIS Enterprise for each Data Provider. If you do not have a valid user name and password for DART, email R4DART@epa.gov and provide the Site, RPM, data provider company, and data provider email address.

You should also have been notified of the facility code for the site you are preparing the EDD submittal. Enter the facility code into the Facility box.

If you have not been assigned this information or received the proper facility code, contact the R4DART coordinator before completing this process to submit your data.

After entering the correct authentication information, click the **Save** button. [Note that the Submit option with the Submit URL is not used by EPA Region 4]. Select the folder location where you would like the zip archive file to be saved.



Data Providers need to update the default filename of the Data Package being created to use the EPA Region 4 required EDD file naming convention. Update the prefix of the filename from the date/time stamp to include the following pieces of information connected with underscores (see example filename below):

- Task Code (PRP use PYYYY-nnnn as provided by R4DART; Fund-lead use YY-nnnn as provided by EPA work order)
- Site Name
- Company Code
- Date Submitting (YY MM DD)
- Type (Loc-Location/Ch-Chemistry/FR-FieldResults/WL-WaterLevel/GEO-Geology/WC-Well and Well Construction /VI-Vapor Intrusion)

Click the **Save** button to save the archive zip file to the selected folder.

Note: The EPA electronic mail system will reject files with a .zip format due to security concerns. To match how the EPA Region 4 laboratory submits EDDs, you must rename the EDD file extension from .zip to .dat before emailing the EDD to the EPA Region 4. **Files must be submitted with the “.dat” extension.**

Note: The EPA electronic mail system will reject files with more than three (3) periods. Thus, it is important to connect the file naming elements using underscores rather than periods.

Example EDD Filename

P2015-0001_ChemicalCompanyABC_PL-DataProvider_19 01 08_Ch.110001224773.EPAR4.dat

where,

- Task Code is “P2015-001”
- Site Name is “Chemical Company ABC”
- Company Code is “PL-DataProvider”
- Date Submitting is January 8, 2019 as “190108”
- Type of data submission is “Ch” for Chemistry
- Facility Code is “110001224773”
- Format used is “EPAR4”
- File extension has been changed from “.zip” to “.dat”

4 Submitting and Resubmitting the EDD Data Package

After the EDD files have been checked by EDP and the “Sign and Submit” process has been completed, the Data Package is ready for submittal to EPA Region 4. Data packages are submitted by attaching the .dat file to the original email requesting the data and forwarding the email to EPAR4@EQulSonline.com. This may either be the Project Log Summary report email or the Request for Data Submittal Summary template email. If the file is named improperly or not attached to the requesting email, it will be returned to the data provider.

Some causes of common data rejections are:

1. When Location EDDs are not submitted prior to submitting environmental chemistry,
2. Geology EDDs are submitted when the station locations do not already exist in the EPA Region 4 database, and
3. If depths are missing for soil and sediment sample types and the Scribe COC XML file was not sent to R4DART.

Another type of request for additional data from your RPM may be due to Water Level EDDs submitted when there is no corresponding Well Datum information to calculate the water level elevations. The Well Datum EDD is required when submitting water levels for the first time and any time a well is modified.

Fund lead projects begin with an automated email being sent to the project leads for projects scheduled through R4LIMS. For these types of projects, there will be a list of existing station IDs and their related coordinates sent to you as they exist for the site in the EPA Region 4 EQulS database.

If you receive an error log with information that your EDD submission was rejected and need to send a corrected EDD, you are to use the initial file name with simply a revision character between the Type and Facility Code file name sections. Acceptable examples of second and third submissions necessary due to errors in the EDD for the same data are provided below:

Initial submitted file:

P2015-0001_ChemicalCompanyABC_PL-DataProvider_190108_Ch.110001224773.EPAR4.dat

Second submitted file of the corrected initial submission:

P2015-0001_ChemicalCompanyABC_PL-DataProvider_190108_Ch_ **A**.110001224773.EPAR4.dat

Third submitted file if the second is also rejected:

P2015-0001_ChemicalCompanyABC_PL-DataProvider_190108_Ch_ **B**.110001224773.EPAR4.dat

5 Updating the Reference Value File

Periodically, the EPA Region 4 will post an updated reference value file (.rvf) on the EarthSoft website. Follow the steps below to update the reference values in the EDP application:

1. Download the most recent reference value file from the EarthSoft website:
<https://earthsoft.com/products/edp/edp-format-for-epar4/>.
2. Create a backup of your existing EPAR4 format files.
3. Replace the existing reference value file, *EPAR4.rvf*, with the recent downloaded file.
 - a. If you maintain the format within a .zip, you may update the .zip file by copying the *EPAR4.rvf* into the zip replacing the existing file.
 - b. If you extracted the files to a folder, replace the *EPAR4.rvf* within the folder.
4. The next time EDP is started, the new reference values will be loaded.

6 Updating the Format File

When the EPA Region 4 makes changes to their EDD format, the EDP application will need to be updated with a new format file. Follow the steps below to update the EPAR4 format file in the EDP application:

1. Download the most recent format file from the EPA Region 4 EarthSoft website:
<https://earthsoft.com/products/edp/edp-format-for-epar4/>.
2. Create a backup of your existing EPAR4 format files.
3. Replace the existing EPAR4 format file(s)
 - a. If you maintain the format within a .zip, replace the .zip file.
 - b. If you extracted the files to a folder, extract and replace all the files into the folder.
4. The next time EDP is started, the new format files will be loaded.

Note: The EPA Region 4 does not expect to make changes very often; however, if changes are made, R4DART will provide notification of the format changes via email to all data providers at the email address you submitted when beginning EQUIS database work on the site.



EPA Region 4 Geographic Information System Deliverable Guidance

January 2020

Prepared By:

**USEPA Region 4
Superfund and Emergency
Management Division**

Contacts

For questions and comments, contact:

Your Remedial Project Manager, or r4dartgeo@epa.gov

To request access to the EPA GeoPlatform, email:

r4dartgeo@epa.gov

In the request include name, company, address, phone, and email address of all users that will need access granted.

To request access for a particular site on the EPA GeoPlatform, email:

r4dartgeo@epa.gov

Acronyms and Definitions

CAD – Computer-Aided Drafting

CSDGM – Content Standard for Digital Geospatial Metadata

DEM – Digital Elevation Model

DXF – Drawing Exchange Format

EPA – United States Environmental Protection Agency

ERDAS – Earth Resource Development Assessment System

Esri – Software development and services company providing GIS software.

FGDC – Federal Geographic Data Committee

GIS – Geographic Information System

GPS – Global Positioning System

MXD – Map Exchange Document

PDF – Portable Document Format

RPM – Remedial Project Manager

SEMD – Superfund and Emergency Management Division

SME – Subject Matter Expert

SOP – Standard Operating Procedure

TIN – Triangular Irregular Networks

WGS84 – World Geodetic System 1984 datum

XML – Extended Markup Language

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1 Introduction

Geospatial data may be used for many purposes, both internal and external to the United States Environmental Protection Agency (the EPA). Externally, they can provide useful community-specific information to the public on EPA activities and the location of key site attributes. Internally, geospatial information can support analyses, such as the health and ecological impacts of cleanups, site characterization, emergency planning and cross-program collaboration.

This document is intended to specify Geographic Information System (GIS) data file delivery formats, requirements, and the steps for submitting data to the EPA Region 4 for all geospatial materials developed in support of GIS related work within the Superfund program. It is the intent of the EPA Region 4 Superfund and Emergency Management Division (SEMD) to acquire, catalog, and manage all GIS files comprehensively across all projects to:

- 1) ensure future use and access to the EPA Region 4 and its stakeholders,
- 2) provide an archive of work accomplished, and
- 3) maintain and serve data that spatially represent features pertinent to on-going EPA efforts.

1.1 Purpose

The purpose of this document is to provide guidance to contractors, grantees, or others who provide GIS deliverables to the EPA Region 4 SEMD program. It is intended to provide specific requirements and file delivery formats for all GIS materials developed in support of the program. GIS data that follows these standards promotes the EPA Region 4's ability to share information with the public and to perform analyses to support program implementation and evaluation in a consistent fashion.

1.2 Scope

This document covers the types of GIS deliverables anticipated in the EPA Region 4 and how the Region would like to receive these deliverables. Additionally, data standards, formats, and best management practices are identified. GIS data, as they relate to the Superfund program, may include point data (latitude/longitude), lines, and/or polygons representing some site-related area of interest. Computer-aided drafting (CAD), image formatted files, and tabular data are also acceptable data formats so long as they meet the requirements defined in this document.

2 GIS Formatted Data Files

All draft and final version, spatially enabled files acquired or developed to support mapping, spatial analysis, and/or report generation by a data provider are considered property of the EPA Region 4 and are required to be submitted to the EPA Region 4. The delivery of these files should accompany the submission of a final report (see Delivery Requirements section below). This includes but is not limited to all GIS, CAD, and image formatted files used to develop maps for any scoping or decision document developed for the EPA Region 4, as well as any spatial file used to inform a decision on site management or development. Only final versions of each layer are required for delivery to the EPA Region 4 and must be in an approved format as specified in this document. In addition, all electronic geospatial data, whether vector or raster, must be projection defined (have a projection defined and embedded in or associated with the data file), and in the case of CAD data must NOT be in page space or a custom site-specific projection. All CAD data must be in known real world coordinate space, ideally conforming to the projection specifications outlined below. Should tabular data be appropriate to connect location information with attribute information, then documentation specifying the primary and foreign keys is required. Should coordinate information be provided in tabular format it should contain at minimum the following fields:

ID – A unique identifier given to each feature.

Latitude – The Y coordinate in decimal degrees, 6 significant digits.

Longitude – The X coordinate in decimal degrees, 6 significant digits.

Horizontal Datum – The datum of the coordinates.

Additionally, all static maps that appear in an EPA Region 4 document should be in an electronic Adobe PDF format with fonts embedded and at a resolution of 300 dots per inch (dpi) or greater and any associated Esri ArcMap documents (.mxd), are required for delivery to the EPA Region 4 with accompanying data in a stand-alone directory structure. Map document formats also need to be configured to use relative paths and not be set to use a printer-specific paper setting. Such documents are recommended to be provided as Esri map packages (.mpk).

3 Requirements

3.1 Projection Requirements

All GIS files submitted to the EPA Region 4 must have spatial reference information that describes the projection, datum, and where applicable the collection methods. The EPA Region 4 requests the following:

- Vector data be submitted in geographic coordinate system, decimal degree units, and WGS84 datum.
- Raster data, such as aerial photographs may be submitted in their native projection, and maps should be in the appropriate projection/coordinate system for the area depicted.

The EPA Region 4 SEMD Data Management Team GIS subject matter experts (SME) will be happy to consult and advise on projection, coordinate, and datum details for submission to the EPA Region 4.

3.2 Metadata Requirements

A metadata record is a file of information, generally presented as an XML document, which captures the basic characteristics of a data or information resource. A metadata record represents the who, what, when, where, why and how of the data. Geospatial metadata commonly document geographic digital data such as GIS files, geospatial databases, and earth imagery but can also be used to document geospatial resources including data catalogs, mapping applications, data models and related websites. All GIS files developed for the EPA Region 4 are required by Executive Order 12906 to have associated metadata. The EPA Region 4 requires FGDC-compliant metadata on all GIS files developed for site support. The EPA Region 4 also requires that all dynamic maps (ArcMap documents) have metadata completed. The Content Standard for Digital Geospatial Metadata can be found at: <https://www.fgdc.gov>.

Metadata, including information about the data's projection, can be developed using one of several built-in or add on tools within a GIS, and typically is associated with the geometry file as an XML file. The EPA has created the EPA Metadata Editor (EME), which can be used to help create FGDC-compliant metadata and is available for free download at:

<https://edg.epa.gov/EME/>.

The EPA Region 4 Data Management Team GIS SME are available to consult and advise on development of required metadata.

3.3 Organizational Requirements

A directory structure and readme text file in the upper level directory that describes the structure is required. Because the EPA Region 4 will be managing data across many projects, it is important to make your submittals as understandable as possible and please remember to provide only the final versions of your files. A recommended directory structure is as follows:

<Project_Name>

- |_ **GIS Data Submittal Form** (see Delivery Requirements section for details)
- |_ **Docs** (reports, SOPs, correspondence, and other such documents)
- |_ **Images** (aerial photos, satellite imagery, logos, DEMs, and other raster type data)
- |_ **Maps** (MXDs and PDFs; map names should use the project name as a prefix)
- |_ **Shapes** (geodatabases, shape files, and other approved vector data formats)
- |_ **Source** (original unmodified data that may have been acquired from external/internal sources)
- |_ **Tables** (Microsoft Access databases, spreadsheets, delimited text files, or other such tabular data not stored in a geodatabase)

Readme Text File

File naming conventions should be logical, consistent, and contain no spaces or special characters. The options below are examples of acceptable standards for naming electronic files including: GIS, CAD, Global Positioning System (GPS) data, tabular data, digital images, reports, and reference materials.

The conventional naming standard shall follow the general rules:

- File name shall be succinct and descriptive. (Note: long file and path names of more than 128 characters may not allow backup onto CD's or external hard drives).
- Use underscores as delimiters instead of blank spaces or periods.
- Do not use special characters in file and folder names (e.g., -% () # @ . , * & [] / \).
- Use the date for document version control. Embed the version date at the end of the file name. Date shall be in yyyyymmdd format at the end of the file name preceded by an underscore (e.g., FileName_YYYYMMDD.pdf).
- For GIS data, if file names of different feature types are identical, use a two-letter abbreviation for point (pt), line (ln), and polygon (py).
- File names must be unique, complete, and interpretable outside of the file structure.

3.4 Delivery Requirements

GIS data deliverables should accompany the submission of a final report to the EPA Region 4. If a final report has maps, CAD drawings, etc., then there should be an accompanying GIS data deliverable. GIS data and map files will be packaged into zip files and submitted electronically.

All electronic submissions of GIS data to the EPA Region 4 will require completion of the online GIS Data Submittal form (see Section 5). This form and zip file(s) should contain all information

necessary to understand the data submittal. The EPA Region 4 will not accept any GIS data that does not have this form completed and accompanying the submittal.

This form should include, but is not limited to the following:

- Description of the project, including all related deliverables and any project codes;
- Version and date of the data;
- Information on sensitive data issues (if any exist or as appropriate);
- Contact information for those responsible for creating the data and who have the responsibility for maintaining the master version of the data;
- A short description of data themes (limited to one to two sentences for each theme);
and
- A checklist to assist in complying with the standards detailed above.

4 EPA Region 4 Acceptable Data Formats

The following file formats are considered acceptable and all maps and data must include an associated metadata document.

DATA
Vector – Projected to geographic, decimal degrees, WGS84
File Geodatabase (.gdb) *Preferred Shape File (.shp, .shx, .dbf, .prj, .sbx, .sbn) Personal Geodatabase (.mdb) Oracle Dump (.dmp) XML Workspace Document with dependencies clearly documented (.xml)
Raster – Native projection acceptable
TIFF image with world reference file or as a GeoTIFF (.tif, .tiff) JPEG image with world reference file (.jpg, .jpw) ERDAS Imagine image with pyramid file (.img, .rrd) MrSid image (.sid) Esri Grid DEM
TINs – Appropriate projection/coordinate system for the area depicted
Esri TIN
CAD – Projected to geographic, decimal degrees, WGS84
DXF layer separates (.dxf)
Tabular – Primary keys should be clearly identified/documented
Microsoft Access database (.mdb) Microsoft Excel spreadsheet (.xlsx) Delimited text file (.txt, .csv)
MAPS
Static
Adobe PDF at 300 dpi or better with embedded fonts (.pdf)
Dynamic
ArcMap document with associated data files in a stand-alone directory structure using relative paths (.mxd) Esri Map Package (.mpk)
FGDC COMPLIANT METADATA
XML (.xml) FGDC CSDGM XML (.xml) FGDC CSDGM SGML (.sgml) FGDC CSDGM TXT (.txt)

5 GIS Data Submittal Form and Checklist

Please complete the forms and checklists below as completely as possible and include these documents with your GIS data submission. The *Data/Maps Checklist* and *GIS Submission Summary* documents should be included in the zip file.

5.1 Submission Instructions

To submit your data to the EPA Region 4, please zip all files and use the link below to access the EPA Region 4 GIS Data Submission form:

<https://arcg.is/1aDXya>

If your GIS data submission is larger than 10 mb after being zipped, you can split the submission into parts or you can reach out to r4dartgeo@epa.gov for an alternative method of transferring the data to the EPA Region 4.

The following information will need to be submitted in fields on the GIS Data Submission form:

Project/Contract Information

Submission Date:	
Project/Report Name:	
Contract Number:	

Contractor/Grantee Contact Information

Name:	
Phone:	
Email:	

EPA Region 4 Project Manager Contact Information

Name:	
Phone:	
Email:	

5.2 Data/Maps Checklist

An example of the checklist is provided here, however, the checklist can be downloaded as a separate file from the EPA Region 4 website.

<https://www.epa.gov/superfund/region-4-superfund-electronic-data-submission>

DATA	Yes	Does Not Apply
Is each vector file, CAD included, in geographic, decimal degrees, WGS84?	<input type="checkbox"/>	<input type="checkbox"/>
Is each raster file in its native projection?	<input type="checkbox"/>	<input type="checkbox"/>
Is each data file one of the EPA Region 4 acceptable formats?	<input type="checkbox"/>	<input type="checkbox"/>
Does each data file have FGDC-compliant metadata in an associated file?	<input type="checkbox"/>	<input type="checkbox"/>
Are the primary and foreign keys documented for tabular data?	<input type="checkbox"/>	<input type="checkbox"/>
Is a README text file included with a directory structure explaining how the structure is organized?	<input type="checkbox"/>	<input type="checkbox"/>
MAPS		
Is each static map provided in an electronic format at a resolution of 300 dpi or higher?	<input type="checkbox"/>	<input type="checkbox"/>
Does each static map have fonts embedded?	<input type="checkbox"/>	<input type="checkbox"/>
Has the page and print setup for map documents been configured to NOT use printer-specific paper settings?	<input type="checkbox"/>	<input type="checkbox"/>
Are map documents set to use relative paths?	<input type="checkbox"/>	<input type="checkbox"/>
Are map names prefixed with the project name?	<input type="checkbox"/>	<input type="checkbox"/>
Are map documents accompanied with their relevant data in a stand-alone directory structure?	<input type="checkbox"/>	<input type="checkbox"/>
Does each map have FGDC-compliant metadata in an associated file?	<input type="checkbox"/>	<input type="checkbox"/>

