Mining Bureau Electronic Data Deliverable Guideline

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Version 1.0

Mining Bureau
Air, Energy, and Mining Division

Table of Contents

ACRONYMS

.xls	Excel Spreadsheet
.zip	Compressed File
DEQ	Montana Department of Environmental Quality
EDD	Electronic Data Deliverable
EDP	EQuIS Data Processor
FTS	File Transfer Service

WEBSITES

Mining Bureau Hydrologic Data Support Website	https://deq.mt.gov/mining/resources
DEQ EQuIS Email ListServ	https://public.govdelivery.com/accounts/MTDEQ/subscriber/new
State of Montana's File Transfer Website	https://transfer.mt.gov/Home/Login
Earthsoft Montana DEQ EDP Mining Format Website	https://earthsoft.com/products/edp/mtdeqmining-edp-format/

1.0 GENERAL INFORMATION

The purpose of this guidance manual is to provide detailed instructions on how to report environmental data electronically to the Montana Department of Environmental Quality (DEQ) Mining Bureau. Data submitted to DEQ will be stored in the Montana EQuIS database, DEQ's main repository for water quality monitoring data.

This manual describes both the procedural and formatting requirements you need to know to submit your Electronic Data Deliverable (EDD) to the Mining Bureau of DEQ. Note that data collected for other bureaus of DEQ may require a different format. Always check with DEQ prior to data submittal. The first section, Initial Set-up, covers the initial steps that need to be taken to get established in our database. The next section, EDD Development, focuses on formatting EDDs. It covers general reporting requirements and includes tables that describe each EDD worksheet in detail. The next section covers EDD validation and focuses on the EQuIS Data Processor (EDP), which each data provider will be required to use prior to submitting an EDD. The final section covers the EDD submittal process. This section introduces the Mining Bureau Hydrologic Data Submittal Form and the data package required for each submittal to DEQ. An overview of the EDD submittal process is shown in **Figure 1**.

All materials referenced in this guidance manual are available from DEQ's **Mining Bureau Hydrologic Data Support Website**.
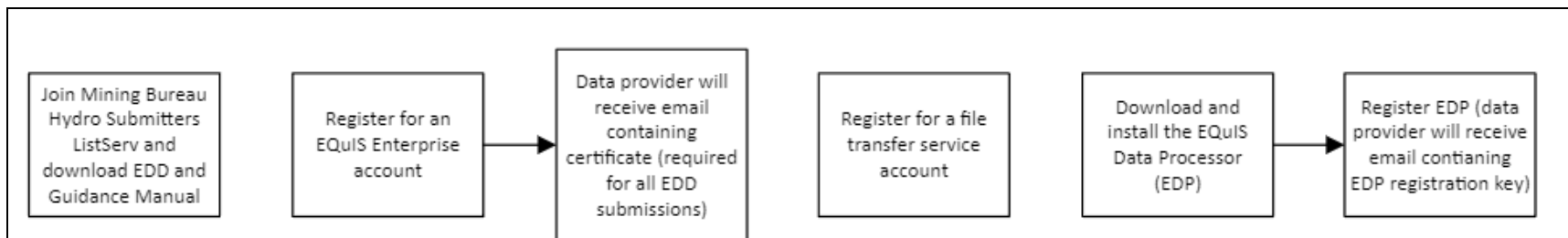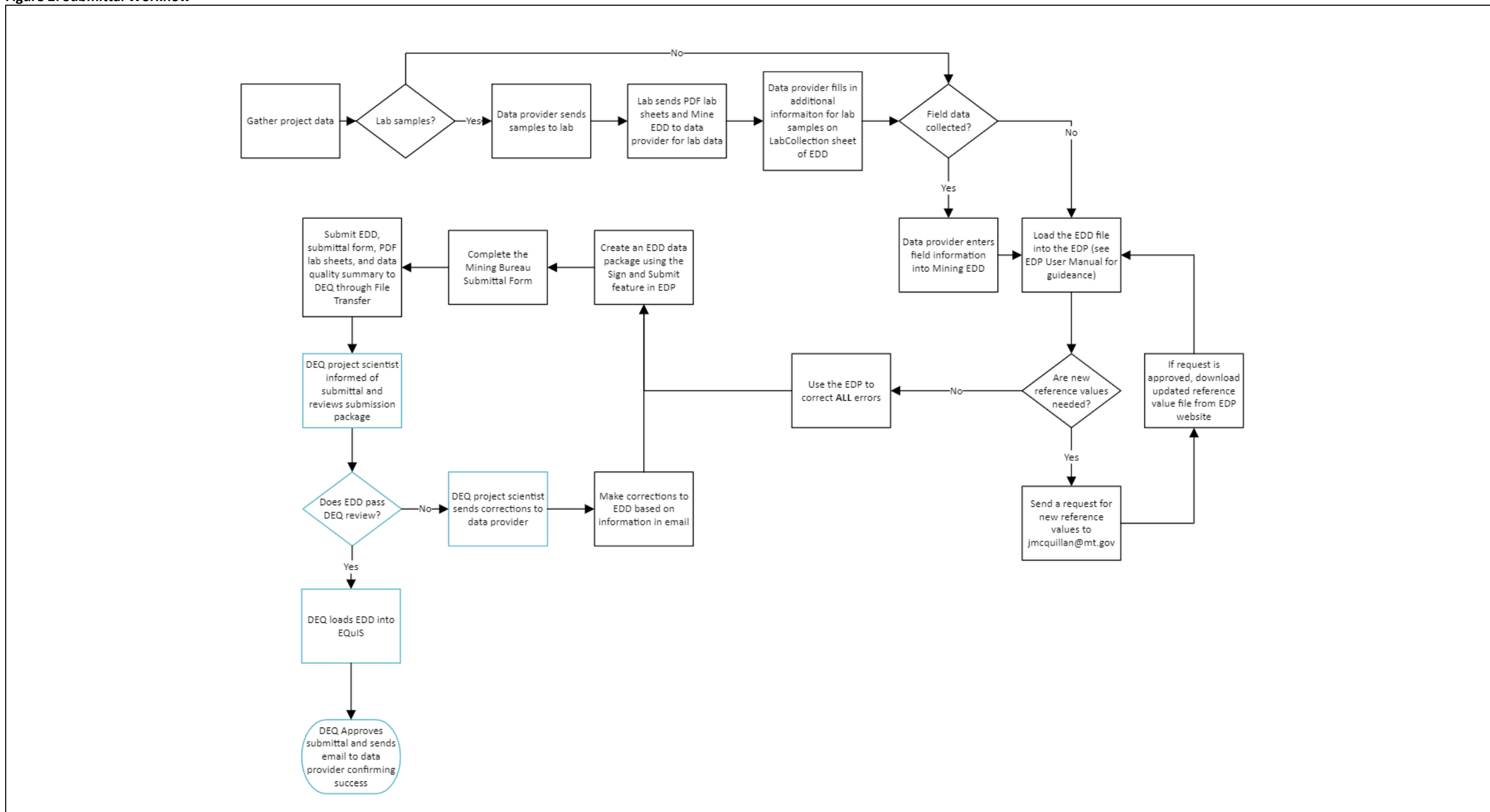
Figure 1: Initial Setup

Figure 2: Submittal Workflow

2.0   INITIAL SET-UP

The steps in **Figure 1** are required for initial set-up only. These are important steps that will register you with the EQuIS system and save you time when you're ready to validate and submit your EDDs.

2.1 JOIN DEQ EQuIS LISTSERV

It is important to stay informed about the Mining EDD and EQuIS updates. Sign-up for the ListServ and receive important updates about EQuIS, including when updated reference value lists are posted, anticipated outages for maintenance, or training opportunities. To register for the DEQ EQuIS Email ListServ:

1. Go to the **DEQ EQuIS Email ListServ**.
2. Enter your email address and select 'Submit'.
3. Check the 'Montana EQuIS' box, located in the Other section, and select 'Submit'.
4. You should receive an email confirming your subscription.

2.2 REGISTER FOR FILE TRANSFER

When you're ready to submit hydrologic data to DEQ's Mining Bureau, you must use the State of Montana's File Transfer Service (FTS). The FTS allows for easy transfer of large electronic files to and from customers of state government. The FTS is accessed via the state's single login service.

If you do not yet have an account to access the FTS, you must create one.

1. Go to the **State of Montana's File Transfer Website**
2. Select 'Register Now" under the Login button.
3. After your account is activated, you'll have full access to the FTS.

2.3 DOWNLOAD AND INSTALL THE EQuIS DATA PROCESSOR (EDP)

The EQuIS Data Processor (EDP) is a standalone application that <u>must</u> be used by data providers to check their EDD files prior to submission to the Mining Bureau. The EDP performs a series of formatting checks on the EDD and then identifies any records that have errors.

<u>To use the EDP application,</u> <u>the following four steps must be completed in the order shown</u>:
All files are available from the **Earthsoft Montana DEQ EDP Mining Format Website**.

1. Download and install the EDP application
2. Download the Montana DEQ Format
3. Download the Montana DEQ Reference Values
4. Register the EDP Application

Detailed guidance for the above four steps can be found in Section 2.0 of the EDP Guidance Manual available from the **Mining Bureau Hydrologic Data Support Website**.

3.0   EDD DEVELOPMENT

Environmental monitoring data for compliance with mining laws must be submitted to DEQ in a specific format. Data providers are required to download the Mining EDD and populate it with their project's data. On its most basic level, the Mining EDD is an Excel (.xls) spreadsheet that contains a series of worksheets that allow data providers to report monitoring data to DEQ. The EDD is comprised of the following worksheets:

- **Location** – Describes locations where samples and field measurements were collected.
- **FieldCollection** – Describes sampling information and results of measurements collected in the field.
- **LabCollection** – Describes sampling information for samples sent to a laboratory.
- **LabResult** – Results of samples analyzed by a laboratory.
- **WellWaterLevel** – Groundwater level measurements, for wells only.

Data providers can report all forms of data collection in a single workbook. For instance, surface water and groundwater lab results may be reported on the same LabResult worksheet.

3.1   GENERAL EDD REPORTING REQUIREMENTS

Each worksheet must be reported exactly as defined in the following sections. Any deviations will result in errors during the EDP submission process. Include all your data in one EDD; this greatly helps when using the EDP for error-checking.

However, the Lab Result sheet is designed to be able to be submitted separately. This would only be appropriate if the data provider wished for the lab to directly send DEQ lab results independent of the data provider sending DEQ sample information.

3.2   DATA MANAGEMENT FORMATS

Data providers may manage their data in any acceptable software tool for editing and formatting data such as a spreadsheet or database, however, when the data is submitted to DEQ it must follow the Mining EDD format described in this manual. The Mining EDD format is provided as an Excel spreadsheet ready for data entry on the **Mining Bureau Hydrologic Data Support Website**. Users of other spreadsheet or database software can either use the provided EDD for data entry or define the EDD in their own data management tool.

3.2.1 Valid Values

Valid values, also known as reference or domain values, govern the contents of some fields in the EDD. In other words, some fields may only be populated with data that exactly matches a value listed in the Mining EDD list of valid values. The complete list of valid values is provided in the Mining EDD Appendices document located on DEQ's **Mining Bureau Hydrologic Data Support Website**. The tables in **Section 3.3** below, indicate which fields require a valid value.

If data providers cannot find a value in the Mining EDD Appendices document, they can request an addition to the valid value list by sending a Valid Value Request to DEQ's Sample Data Management Coordinator, Jolene McQuillan, at jmcquillan@mt.gov. In the email, data providers should include the field name in which the new value should be added, the proposed value name, and a brief description of the meaning of the value. If accepted, DEQ will update the appropriate reference value table and notify

the data provider when an updated version of the reference value file has been posted to the EDP Download webpage. This updated reference value file will allow the EDP to recognize the new value as valid.

3.3 EDD FORMAT DESCRIPTIONS

This section contains tables that define the file structures for each EDD worksheet. Data providers are responsible for enforcing the requirements listed in each table. The EDP, which is described in **Section 0**, will assist in checking each EDD for these requirements. Any deviations from this format will result in errors during the EDP validation process.

The format description tables contain 5 key elements:

- **Column #:** Indicates column placement in the worksheet. It is important to not remove any columns or change the order of the columns in the EDD.
- **Column Name:** Name of the data element and column in the EDD.
- **Data Type:** Indicates what data type is required for the field. **Table 1** describes the various data types used in the format description tables.
- **Required?:** Indicates if the data element is required, conditional, or optional. DEQ expects all fields marked as "Required" to be filled in. Fields marked as "Conditional" are required if certain business rules are met. These rules are included in the Description column. Fields marked "Optional" are not required, but data should be reported if available. When a field is not required and no data is available, the field should be left blank.
- **Description:** Provides a description of the data element and any business rules if applicable.

Table 1: Data Type Descriptions

Type	Description	Comments
Date	Date format is MM/DD/YYYY or, if time is accepted, MM/DD/YYYY HH:MM in 24-hour (military) format.	Example: 03/20/2009 or 03/20/2009 13:21
Numeric	Number	Some fields are shown as text in the EDD, but have a validation requiring a number
Text	Stores characters and numbers.	Length restrictions are indicated in parentheses in Data Type column.
Valid Value	Requires a valid value from that data elements valid value list (complete lists in **Section 6.0**).	

3.3.1 Location

This worksheet is used to establish **new** monitoring locations, also known as stations. Stations describe locations where samples and field measurements are collected. If your mine has an established database in EQuIS, you will be provided with a list of stations that have been already entered into the database by DEQ.

It is important to use these naming conventions as much as possible and only create a new station if needed. Data providers are encouraged to work with DEQ on naming conventions for new sites as the Station ID field can only contain 20 characters. If the Station ID is required to be different that the data

provider's preferred name for the station, the Station Name field (80 characters maximum) may be used to store the preferred name.

If the station has already been established, you can use the established Station ID and do not need to reenter information on the Location worksheet. You may also use the Location worksheet for updating station information for existing sites such as updates to coordinates or the status of the site. When new stations are submitted to DEQ, the Station IDs will be reviewed to make sure they are appropriate.

The Location worksheet contains 25 columns, but only 7 are required to establish a new station record. The remainder are used by the data provider and by DEQ to populate additional information about the site as it becomes available. For instance, DEQ or the data provider may wish to update the status of a monitoring well to note that the well has been appropriately abandoned; records of site abandonment are especially useful for tracking bond requirements for monitoring station abandonment in some Mining Bureau programs.

Table 2: Location Format Description

Column #	Column Name	Data Type	Required?	Description
1	Station ID	Text (20)	Required	Unique identifier for a specific monitoring location. DEQ may require a naming convention to conform with naming standards.
2	Station Name	Text (80)	Optional	Name of the monitoring location. May be identical to Station ID or different.
3	Station Description	Text (255)	Optional	Description of monitoring location. May include surface water basin, directions, other names for the site, or other information about the location.
4	Station Type	Valid Value	Required	Type of monitoring location.
5	Well Subtype	Valid Value	Conditional	If the station type is a well, you must specify the type of well.
6	Station Establishment Date	Date	Optional	Date station was established.
7	Station End Date	Date	Optional	Date station was discontinued.
8	Site Status	Valid Value	Required	Status of monitoring location. Abandoned = properly abandoned according the MT law requirements; Active = actively monitored; Inactive = equipment and site in tact but not actively monitored; Destroyed = site mined through and no abandonment needed; Unknown = status unknown.
9	Latitude	Decimal	Required	Latitude in decimal degrees.
10	Longitude	Decimal	Required	Longitude in decimal degrees.

Column #	Column Name	Data Type	Required?	Description
11	Geopositioning Method	Valid Value	Required	Method used to determine the lat/long.
12	Geopositioning Datum	Valid Value	Required	Datum used to determine the lat/long. MT DEQ standard is NAD83.
13	Surface Elevation	Numeric	Optional	Ground elevation of location.
14	Surface Elevation Unit	Valid Value	Conditional	Required if Elevation is reported. Units used in measuring. Use 'ft' or 'm'.
15	Surface Elevation Method	Valid Value	Conditional	Required if Elevation is reported. Method used to determine elevation.
16	Well Formation Type	Valid Value	Optional	Name of primary way aquifer will be described. Most wells are generalized by hydrogeologic unit.
17	Well Aquifer Name	Valid Value	Optional	Name of aquifer well is in. If well is completed in multiple aquifers or the aquifer is not in the valid values list, contact DEQ.
18	Well Depth	Numeric	Optional	Total depth of well from surface elevation.
19	Well Top Screen Depth	Numeric	Conditional	Required if Well Bottom Screen Depth is reported. Depth from surface elevation to top of screen. If well has multiple screen intervals, contact DEQ.
20	Well Bottom Screen Depth	Numeric	Optional	Depth from surface elevation to bottom of screen. If well has multiple screen intervals, contact DEQ.
21	Well Depth Unit	Valid Value	Conditional	Required if Well Depth, Top Screen Depth, or Bottom Screen Depth is reported. Units used in measuring. Use 'ft' or 'm'.
22	Well Screen Material	Valid Value	Optional	Primary material used in the well screen.
23	Well Stickup Height	Numeric	Optional	Height above ground surface of well casing.
24	Well Stickup Height Unit	Valid Value	Conditional	Required if Well Stickup Heigh is reported. Units used in measuring. Use 'ft' or 'm'.
25	Well Top Casing Elevation	Numeric	Optional	Elevation at the top of the casing. In same units as Surface Elevation and Well Stick Up Height.

3.3.2 Field Collection

This worksheet is used to record both sampling activities and the data collected from field measurements. Field measurements consist of any qualitative or quantitative data obtained on site and

not sent to a laboratory for analysis. Due to the configuration of the EQuIS database, well water levels must be entered in a separate worksheet. Do not enter well water levels in the Field Collection worksheet.

Field Sample IDs and Station ID are the two most critical columns to populate. Field Sample IDs are unique identifiers, but multiple types of measurements may be taken under the same Field Sample ID. For instance, pH, specific conductivity, and water temperature may be measured at a location in one sampling event and can share the same Field Sample ID. However, you cannot have two of the same type of measurement, such as pH, with the same Field Sample ID nor can you have two stations using the same Field Sample ID. A naming convention suggestion to ensure uniqueness is "StationID_mmddyyyy_field", however there is no naming convention requirement for data submittal.

Table 3: Field Collection Format Description

Column #	Column Name	Data Type	Required?	Description
1	Field Sample ID	Text(35)	Required	Unique identifier for the field measurement. Must be unique within the database.
2	Station ID	Text (20)	Required	Unique identifier for a specific monitoring location.
3	Sample Date	DateTime	Required	Date of sample collection or measurement.
4	Personnel	Text(100)	Optional	Name or initials of the sampler.
5	Matrix	Valid Value	Required	Matrix of the sample.
6	Start Depth	Numeric	Conditional	Required if End Depth is reported. The beginning (top) of the sample below ground surface. Leave empty for most ground water samples unless well sampled with packers. Mostly used for sampling surface water at a specified depth or soil / composite samples.
7	End Depth	Numeric	Optional	The end (bottom) of the sample below ground surface. Leave null for most ground water samples unless well sampled with packers. Mostly used for sampling surface water at a specified depth or soil / composite samples.
8	Depth Units	Valid Value	Conditional	Required if Start Depth or End Depth is reported. The unit of measurement of the sample depth.
9	Composite YN	Valid Value	Optional	Yes or No for is the sample is a composite. Not required to fill in N for non-composite samples because the database will default to No.

Column #	Column Name	Data Type	Required?	Description
10	Composite Description	Text(255)	Conditional	Required if Composite YN is reported as Y. Description of the composite sample.
11	Sampling Comments	Text(2000)	Optional	Comments on sampling.
12	Characteristic ID	Valid Value	Required	Unique identifier of the analyte being measured or observation being made. See **Table 7** for a subset of relevant valid values.
13	Characteristic Name	Valid Value	Required	Name of the analyte being measured or observation being made. See **Table 7** for a subset of relevant valid values.
14	Result Value	Text(20)	Conditional	The measured value of the analyte in appropriate significant digits.
15	Result Value Unit	Valid Value	Required	Required if Result Value is a number. The unit of measurement of the result value.
16	Analytical Method ID	Valid Value	Required	Field measurement method. See **Table 7** for a subset of relevant valid values.
17	Reportable Result	Valid Value	Optional	Whether the measurement is reportable. Not required to fill in Y for reportable samples because the database will default to Yes. An example of a non-reportable result is a field measurement from a probe that is suspected to be in error. If the Reportable Result is N, additional comments should be entered in the Result Comment column.
18	Result Comment	Text(2000)	Optional	Any additional information about the test.
19	Crest Gage Last Date Checked	Date	Optional	The last date the crest gage was checked. Only for use with crest gages when entering a Depth or Flow measurement.

3.3.3 Lab Collection

This worksheet is used to record only sampling activities for lab measurements. Because of naming restrictions and slight differences in the data needed for lab vs field measurements, samples collected during a site visit that will be analyzed by a lab must be recorded on a worksheet separate from the Field Collection worksheet.

Laboratories will be able to fill out all of the Lab Results sheet and potentially some of the Lab Collection sheet, depending on the information provided to the laboratory. However, some information will always

be required to be filled in by the data provider. For instance, laboratories will not know which samples are blanks or duplicates.

Sample ID is the most critical columns to populate. Sample IDs are unique identifiers, but multiple types of measurements may be taken under the same Sample ID. For instance, pH, specific conductivity, hydrocarbon suites, and metals concentrations may be analyzed by a lab for a single set of sample bottles and can share the same Sample ID even if they are analyzed in separate batches or on separate days. Field duplicates must have different Lab Sample IDs. Samples collected at the same station but from different sampling devices all analyzed for the same laboratory suite must also have unique names (for example, a stream sampling site with multiple bottles at various heights all analyzed for Total Suspended Sediment). A naming convention suggestion to ensure uniqueness is "StationID_mmddyyyy_sampletype", however there is no naming convention requirement for data submittal.

Table 4: Lab Collection Format Description

Column #	Column Name	Data Type	Required?	Description
1	Sample ID	Text(40)	Required	Unique identifier of the sample. Must be unique in the database.
2	Sample Type	Valid Value	Required	Type of sample collected
3	Medium	Valid Value	Required	General medium of the sample (water, soil, sediment, air).
4	Matrix	Valid Value	Required	Matrix of the sample.
5	Sample Source	Valid Value	Optional	Where the sample came from. Should be field unless lab qc sample is reported. Will populate with a default of 'field' if left empty.
6	Parent Sample ID	Text(40)	Conditional	Required if Sample Type is reported as one of a list of QC types. Sample ID that identifies the parent source of a sample if the sample is a QC sample. For duplicates, this identifies the routine sample taken at the same time as the duplicate.
7	Sample Date	DateTime	Required	Date of sample collection or measurement.
8	Station ID	Text (20)	Conditional	Required for certain types of samples, but not for all QC types. Unique identifier for a specific monitoring location.

Column #	Column Name	Data Type	Required?	Description
9	Sample Start Depth	Numeric	Conditional	Required if End Depth is reported. The beginning (top) of the sample below ground surface. Leave empty for most ground water samples unless well sampled with packers. Mostly used for sampling surface water at a specified depth or soil / composite samples.
10	Sample End Depth	Numeric	Optional	The end (bottom) of the sample below ground surface. Leave null for most ground water samples unless well sampled with packers. Mostly used for sampling surface water at a specified depth or soil / composite samples.
11	Sample Depth Units	Valid Value	Conditional	Required if Start Depth or End Depth is reported. The unit of measurement of the sample depth.
12	Sampler	Text(100)	Optional	Name or initials of the sampler.
13	Sample Collection Method	Valid Value	Required	Method of sample collection
14	Composite YN	Valid Value	Optional	Yes or No if the sample is a composite. Will populate with a default of 'N' if left empty.
15	Composite Description	Text(255)	Conditional	Required if Composite YN is reported as Y. Description of the composite sample.
16	Well Purge Volume	Numeric	Optional	Volume of water purged from a well before sampling.
17	Well Purge Volume Unit	Valid Value	Conditional	Required if Well Purge Volume is reported. The unit of measurement of the purge volume value.
18	Sampling Comments	Text(2000)	Optional	Comments on sampling.
19	Bottle Height	Text(10)	Conditional	Required for Sample Collection Method = autosampler, siphon, or topfill. Height in ft of bottle inlet.
20	Autosampler Last Date Checked	Date	Conditional	Required for Sample Collection Method = autosampler, siphon, or topfill. This is the last date the bottle was last serviced prior to this sampling date.

3.3.4 Lab Result

This worksheet is used to enter results only from samples analyzed in a laboratory. Results can be reported separately from recoding the additional sample information in Lab Collection, but this method

is not recommended without prior consultation with the DEQ Mining Bureau. The two labs currently able to directly export in the Mining EDD format are Energy Labs and Pace Labs. If samples will be analyzed by a different laboratory, contact DEQ prior to sample analysis so that DEQ can assist the lab in correctly mapping the results to the Mining EDD. Most fields in the Lab Result worksheet are optional; if a data provider is filling in this worksheet by hand or if the sheet is being used to enter historic data, many of the fields can be ignored.

Table 5: LabResult Format Description

Column #	Column Name	Data Type	Required?	Description
1	Sample ID	Text (40)	Required	Unique identifier of the sample. Must be identical to corresponding Sample ID on the Lab Collection worksheet.
2	Analytical Method ID	Valid Value	Required	Lab analytical method. See **Table 8** for a subset of relevant valid values.
3	Analysis Date	DateTime	Required	Date of sample analysis.
4	Sample Fraction	Valid Value	Required	Fraction of sample associated with results. If a valid Sample Fraction is not required, 'NA' can be used.
5	Test Type	Valid Value	Optional	The type of test. Not required as EDD will default to Initial.
6	Lab Matrix	Valid Value	Optional	The code which distinguishes between different type of sample matrix. For example, soil samples must be distinguished from ground water samples, etc. The matrix of the sample as analyzed may be different from the matrix of the sample as retrieved (e.g. leachates), so this field is available at both the sample and test level.
7	Basis	Valid Value	Optional	Reporting basis, either dry weight basis, wet, or not applicable.
8	Dilution Factor	Numeric	Optional	Dilution factor of sample.
9	Prep Method	Valid Value	Optional	Sample preparation method ID.
10	Prep Date	DateTime	Optional	The beginning date and time of sample preparation in MM/DD/YYYY HH:MM:SS format.
11	Leachate Method	Valid Value	Optional	The leachate generation method name or description. The method name should be sufficient to reflect operation of the laboratory.
12	Leachate Date	DateTime	Optional	The beginning date and time of leachate preparation in MM/DD/YYYY HH:MM:SS format.
13	Lab Name	Valid Value	Optional	Unique identifier of the laboratory.
14	Lab Sample ID	Text(20)	Optional	Lab sample identifier.

Column #	Column Name	Data Type	Required?	Description
15	Percent Moisture	Text(5)	Optional	The numeric percentage of moisture in the sample portion used in this test, from 0 to 100. This value may vary from test to test for any sample. Can include decimals. Do not enter a % symbol.
16	Result Comment	Text (2000)	Optional	Any additional information about the test.
17	Preservative	Valid Value	Optional	Sample preservative used.
18	Preservation Date	DateTime	Optional	Date sample was preserved.
19	Characteristic ID	Valid Value	Required	Unique identifier of the analyte being measured, typically a CAS Number. See **Table 8** for a subset of relevant valid values.
20	Characteristic Name	Valid Value	Required	Name of the analyte being measured. See **Table 8** for a subset of relevant valid values.
21	Method Speciation	Valid Value	Optional	Speciation of analyte to distinguish how results are reported. See **Table 8** for a subset of relevant valid values.
22	Result Value	Text(20)	Conditional	Required if Detect Flag = 'Y'. The measured value of the analyte in appropriate significant digits. May be null for non-detects only.
23	Result Value Unit	Valid Value	Conditional	Required if Result Value is reported and numeric. The unit of measurement of the result value.
24	Detect Flag	Valid Value	Optional	Detected (Y), not detected (N). Will populate with a default of 'Y' if left empty.
25	Reportable Result	Valid Value	Optional	It can be used to distinguish between multiple results where a sample is retested after dilution. Only one result should be flagged as reportable. Will populate with a default of 'Y' if left empty.
26	Lab Qualifiers	Valid Value	Optional	Qualifier flags assigned by the laboratory.
27	Interpreted Qualifiers	Valid Value	Optional	Qualifiers assigned by DEQ or Data Provider.

Column #	Column Name	Data Type	Required?	Description
28	Method Detection Limit	Text (20)	Optional	Lowest concentration that can be detected by an instrument with correction for the effects of sample matrix and method specific parameters such as sample preparation.
29	Lower Reporting Limit	Text(12)	Conditional	Required if Detect Flag = 'N'. Concentration level above which results can be quantified with confidence. This is a sample-specific detection limit.
30	Quantitation Limit	Text (20)	Optional	Minimum concentration of an analyte that can be measured within specified limits of precision and accuracy. Generally 5 - 10 times the detection limit.
31	Detection Limit Unit	Valid Value	Conditional	Required if Method Detection Limit, Lower Reporting Limit, or Quantitation Limit is reported. The unit of measurement of the detection limit.
32	Lab Batch ID	Text(20)	Optional	Lab batch identifier.
33	Batch Type	Valid Value	Conditional	Required if Lab Batch ID is reported. Analysis batch type.
34	Result Type Code	Valid Value	Optional	Target, tentatively identified, surrogate, internal standards, or spiked compound.
35	QC Original Conc	Numeric	Optional	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 Laboratory Control Samples (LCS) (where the original concentration is assumed to be zero).
36	QC Spike Added	Numeric	Optional	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).

Column #	Column Name	Data Type	Required?	Description
37	QC Spike Measured	Numeric	Optional	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).
38	QC Spike Recovery	Numeric	Optional	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").
39	QC Dup Original Conc	Numeric	Optional	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).
40	QC Dup Spike Added	Numeric	Optional	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.
41	QC Dup Spike Measured	Numeric	Optional	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.

Column #	Column Name	Data Type	Required?	Description
42	QC Dup Spike Recovery	Numeric	Optional	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").
43	QC Rpd	Text(14)	Optional	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").
44	QC Spike Lcl	Text(14)	Optional	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").
45	QC Spike Ucl	Text(14)	Optional	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").
46	QC Rpd Cl	Text(14)	Optional	Relative percent difference control limit. Required for any duplicated sample. Report as percentage multiplied by 100 (e.g., report "25%" as "25").
47	QC Spike Status	Text(10)	Optional	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.
48	QC Dup Spike Status	Text(10)	Optional	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.

Column #	Column Name	Data Type	Required?	Description
49	QC Rpd Status	Text(10)	Optional	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.

3.3.5 Well Water Level

The Well Water Level worksheet is only used for recording groundwater levels in wells. Because of the database structure in EQuIS, wells have a separate table for water levels apart from the field measurements and laboratory results. Unlike lab and field measurements, well water levels do not require a unique sample ID.

Table 6: Well Water Level Format Description

Column #	Column Name	Data Type	Required?	Description
1	Station ID	Text(20)	Required	Unique identifier for a specific monitoring location.
2	Measurement Date	Date	Required	Date of water level measurement.
3	Measurement Point Elevation	Numeric	Conditional	Required if Water Level Elevation is reported. Elevation of well water level measurement point.
4	Water Depth From MP	Numeric	Optional	Depth to water from measurement point.
5	Water Level Elevation	Numeric	Optional	Elevation of water in well. Should be MP elevation minus depth.
6	Depth Unit	Text(15)	Conditional	Required if Measurement Point Elevation, Water Depth From MP, or Water Level Elevation reported. The unit of measurement of the elevation and depth measurements.
7	Dry Well YN	Text(1)	Required	Indicator to denote dry well. Dry wells do not need a Measurement Point elevation, water depth, or water elevation if Dry Well YN = "Y".
8	Reportable YN	Text(1)	Optional	Water level measurements should be Reportable YN = "Y" unless level is known to be inaccurate. Example, a gassy well or broken meter makes artificially high readings. Suspect readings would have reportable marked "N". Will populate with a default of 'Y' if left empty.
9	Personnel	Text(50)	Optional	Personnel taking water level measurements.

Column #	Column Name	Data Type	Required?	Description
10	Comments	Text(2000)	Optional	Comments for water levels.

3.3.6 Data Logger Results

Data logger records are currently not available for loading into EQuIS directly, but the data should be submitted to DEQ in a separate spreadsheet if a logger has been used.

1. Use the Mining Bureau Data Logger Template available on the Mining Bureau Support webpage to format your data logger results.
2. On the Mining Bureau Data Submittal Form, the "Results (data loggers)" box should be checked in the Type of Data Submitted section.

3.3.7 Misc Data

Hydrologic data that is collected but does not fit into one of the worksheets is still required to be submitted to DEQ. Data providers should work with individual Sections in the Mining Bureau to discuss the appropriate format for any form of data that does not conform to the Mining EDD format.

4.0   EDD VALIDATION

To ensure accurate data is being migrated into EQuIS, data providers are required to check their data prior to submittal. There are two main data checks that must occur, first a quality control step that reviews the raw data and then a validation step that verifies the EDD is formatted correctly.

4.1   QUALITY CONTROL

Prior to import, all location metadata should be verified for correct latitude and longitudes that fall on the water body. The raw analytical data should go through a complete quality control process to verify the EDD matches the hardcopy results and appropriate result qualifiers have been added. The minimum QC requirements to follow are:

1. Perform a QC data overview and check for obvious errors.
2. Are reported values within reason for each method?
3. Ensure reported values have the same number of decimal places as the detection limit and limit the result to three significant figures.
4. Ensure analytical units are correct.
5. Ensure detection limits are correct and reported.
6. Ensure correct analytical methods are reported.
7. Ensure analysis dates are reported.
8. Ensure results less than the detection limit reported as Detect YN = N in the Lab Results worksheet. An exception is when lab uses J-flag reporting for results between the MDL and detection limit (reporting limit).
9. Check for holding time exceedance. Use a H-flag for exceedances in the Interpreted Qualifiers column in the Lab Results worksheet if the laboratory has not already flagged the data.
10. Calculate Field Duplicate precision (RPD's). Use a J-flag on associated samples with exceedances in the Interpreted Qualifiers column in the Lab Results worksheet if the laboratory has not already flagged the data.
11. Determine if Field Blanks are reported =/> the detection limit (reporting limit). Use a B-flag on associated data that is =/< 10x the blank hit in the Interpreted Qualifiers column in the Lab Results worksheet if the laboratory has not already flagged the data.
12. Compare lab reports to reported data.
    a. Ensure Sample IDs on the Lab Results worksheet match the Sample IDs on the Lab Collection worksheet.
    b. Compare reported results with EDD results.
13. Review lab generated QC. Flag appropriate data if lab controls are exceeded in the Interpreted Qualifiers column in the Lab Results worksheet if the laboratory has not already flagged the data.

For questions involving quality assurance and quality control of your raw data, contact the appropriate Section in the Mining Bureau.

4.2   THE EQuIS DATA PROCESSOR

After all the appropriate worksheets in the Mining EDD have been populated with data, the EDD is ready for data validation using the EQuIS Data Processor (EDP). The EDP is a standalone application that <u>must</u> be used by data providers to check their EDD files prior to submission to ensure they are formatted as described in this guidance manual. If the EDP detects errors, the errors will be identified and can be

corrected directly within the EDP. After the errors are corrected, the EDP must be re-run to ensure that no errors remain. An EDD must have a clean validation from the EDP prior to submission to DEQ.

Information on using the EDP can be found within the EDP Guidance Manual available from the **Mining Bureau Hydrologic Data Support Website**.

5.0 EDD SUBMITTAL PROCESS

After an EDD has passed through the EDP application error-free, it is ready to be submitted to DEQ. In order to submit an EDD, a Mining EDD Submittal Form must be completed. **Figure 2** details the actions external data providers and DEQ are responsible for when submitting and processing an EDD. Data can be bundled into a .zip file if multiple files are being submitted.

5.1 THE DATA PACKAGE

Data consists of the EDD, PDFs of all analysis conducted by the lab, PDFs of any field notebooks or records as required in the operator's Quality Assurance and Monitoring Plan, and any additional spreadsheets for data that could not be included in the EDD format.

Detailed guidance for creating an EDD data package can be found in Sections 3.7 of the EDP Guidance Manual available from the **Mining Bureau Hydrologic Data Support Website**.

5.2 MINING EDD SUBMITTAL FORM

The Mining EDD Submittal Form is available from the Mining EDD Support webpage and <u>must</u> be submitted along with each EDD to DEQ. The submittal form includes information about the data submitter and about the data being submitted. The submittal form also verifies that proper quality control was followed. After the data in the EDD has been successfully imported to EQuIS, DEQ will send the completed form back to the data provider as proof of submittal.

The form is a pdf form, so enter your information directly into the form. Save the file to your computer where you can access it for the next step, submitting your EDD to DEQ.

5.3 SUBMITTING EDDS TO DEQ (STATE OF MONTANA'S FILE TRANSFER SERVICE)

The data package and submittal form must be submitted to DEQ through the State of Montana's File Transfer Service (FTS). The FTS allows for easy transfer of large electronic files to and from customers of state government.

Send data packages to your respective DEQ program's deadhead email address:

Section	Email
Coal	deqcoal@mt.gov
Hard Rock	*Contact section for directions*
Opencut	*Contact section for directions*

After you send your data package through the FTS, a DEQ Project Scientist will check your data submittal in DEQ's EDP application and verify all additional data submitted in the data package. If the EDD was checked in the EDP prior to submission, there should be no errors and the data should load into EQuIS successfully. The data provider will receive an email confirming successful import into the database and the final Mining EDD Submittal Form will be attached. The submittal form is proof the data was loaded into EQuIS. If there were errors upon import into EQuIS, the data provider will receive an email indicating what needs to be corrected. The errors will need to be corrected and the EDD will need to be resubmitted.

5.4 OTHER REPORT REQUIREMENTS

All data providers should retain receipts of data acceptance, discussed in **Section 5.3**, as proof that the submitted data was received and accepted by DEQ; data submittal to DEQ for reporting purposes is not complete until a receipt is issued to the data provider.

Submittal of data packages through File Transfer does not relieve the data provider from other requirements of reporting that may be listed in the operator's permit or required by mining law. Below are requirements by permit type that must still be followed.

5.4.1 Coal Section

EDD data submittal may replace the semi-annual report due in May if all other data requirements are also submitted at the same time, such as transducer and precipitation data. Data may be submitted for the entire semi-annual period at once or throughout the monitoring period as samples are collected.

The Annual Hydrology Report must be submitted by December 31, but the spreadsheet and PDF lab sheet requirements may similarly be substituted with a single or multiple EDD data submittals throughout the year. Note that the full year of data does not need to be resubmitted with the Annual Hydrology Report through an EDD; only submit data that has not yet been received by DEQ. The Annual Hydrology Report must still discuss the data collected through the year and must still include a discussion of sampling quality assurance and completeness.

5.4.2 Hard Rock Section

The EDD may be used to submit hydrologic monitoring data. Contact the Hard Rock section to discuss individual data submittal needs.

5.4.3 Opencut Section

The EDD may be used to submit hydrologic monitoring data. Contact the Opencut section to discuss individual data submittal needs.

6.0 TYPICAL MINING EDD VALID VALUES FOR FIELD AND LAB MEASUREMENTS

This section provides required values for specific Mining EDD characteristic IDs for field and lab samples that are typically collected. This section does not present a full list of potential analytes and analytical methods. A list of all approved values for fields that require reference values is available on the **Mining Bureau Hydrologic Data Support Website**. The Support Page also lists the complete directions on the Mining EDD data entry and upload process.

If differing analytical methods are used, data from laboratory analytical reports may require different Mining EDD valid values. Data uploaded to EQuIS must be consistent with the laboratory analytical reports and electronic data deliverables (EDDs). Both laboratories and data providers may request that DEQ add a reference value if no appropriate value currently exists.

6.1 FIELD MEASUREMENTS

Field measurements are distinguished from lab measurements by the use of the Field Collection worksheet. **Table 7** lists common field measurements and the most common analytical method for each characteristic ID.

Water levels and flows require special consideration and formatting to enter into the mining EDD. In the most complicated scenario, a surface water site could have a crest gage measurement, instantaneous flow and depth measurement, a water sample from the surface water site, and a single stage bottle collection all on the same day. Differentiation between the types of samples is required for entry into EQuIS.

6.1.1 Groundwater Levels and Observations

Due to the configuration of the EQuIS database, well water levels must be entered in a separate worksheet. Do not enter well water levels in the Field Collection worksheet. Dry wells are recorded only in the Well Water Level worksheet.

6.1.2 Surface Water Depths and Flows: Instantaneous Measurements

For surface water, record the depth and flow of water during the visit in the Field Collection worksheet. When flow is not measured due to a dry streambed, enter the following:
- o Characteristic ID = FLOW
- o Result Value and Units = 0 ft3/sec (or gal/min)
- o Analytical Method ID = FLOW-EST-IEMB
- o Can indicate "dry" in the sample comments and/or result comments

When pond depth is not measured due to a dry pond, enter the following:
- o Characteristic ID = DEPTH
- o Result Value and Units = 0 ft
- o Analytical Method ID = DEPTH-EST-IEMB or DEPTH-GAGE-IEMB
- o Can indicate "dry" in the sample comments and/or result comments

If a sample is grabbed from a surface water body with a bottle, the depth of the water body at the staff gage, flume, or other measuring location should be recorded. The depth the bottle was submerged in

the grab sample does not need to be recorded as a separate measurement, but it could be noted in the comments if the information is important to the sample results.

6.1.3 Crest Gage Readings

Crest gage readings represent the maximum depth of a flow between a given date range and are therefore different than an instantaneous reading from a staff gage. Crest gage readings are recorded in a similar manner to staff gage readings with the addition of the CrestGage_Last_Date_Checked column on the Field Collection worksheet.

- o Characteristic ID = DEPTH
- o Analytical Method ID = DEPTH-CREST-IEMB
- o CrestGage_Last_Date_Checked = Date of last visit to site (minimum date of flow event)

If the site has a rating curve, enter the calculated flow in the Field Collection worksheet

- o Characteristic ID = FLOW
- o Analytical Method ID = FLOW-CREST-IEMB
- o CrestGage_Last_Date_Checked = Date of last visit to site (minimum date of flow event)

6.1.4 Qualitative Site Observations

IEMB-SITEOBS are qualitative indicators for surface water when flow or depth cannot be measured in compliance with Coal Section requirements.

- o The qualifiers "dry" and "flowing-measurable" are deprecated and no longer required as these qualifiers are redundant when recording a numeric flow.
- o Frozen = water present but frozen making a flow or depth estimate difficult or impossible. If water is frozen next to a staff gage, the depth may or may not also be recorded.
- o Wet = water is present but only of a quantity sufficient to moisten the ground. No standing water present.
- o Ponded = water is present but not of a sufficient quantity to flow or to measure a water level. This is mostly used for springs and streams.
- o Flowing-immeasurable = water is present and flowing, but is of insufficient quantity to measure or estimate

IEMB-DISCHARGE is used to record MPDES discharges in compliance with Coal Section requirements for dual MPDES – Coal reporting.

- o Dry – discharging but not due to any precipitation driven event.
- o Wet <= 10yr/24hr – discharging partly due to a precipitation driven event, less than the 10yr/24hr storm event as identified in the mine's MPDES permit.
- o Wet >=10yr/24hr - discharging due to a precipitation driven event greater than 10yr/24hr storm event as identified in the mine's MPDES permit.

Table 7: Typical Field Measurements

Characteristic ID	Characteristic Name	Result Value	Analytical Method ID
TEMP-W	Temperature, water	<value>	FIELD MEASURE
PH	pH	<value>	FIELD MEASURE
SC	Specific Conductance	<value>	FIELD MEASURE
DO	Dissolved oxygen (DO)	<value>	FIELD MEASURE
DO-SAT	Dissolved oxygen saturation	<value>	FIELD MEASURE
ORP	Oxidation reduction potential (ORP)	<value>	FIELD MEASURE
TURB	Turbidity	<value>	FIELD MEASURE
RBP-TURB	RBP Turbidity Code (choice list)	Clear; Slight Turb; Turbid; Opaque	FIELD MEASURE
FLOW	Flow	<value>	FLOW-FLUME-IEMB FLOW-TRANSDUCER-IEMB FLOW-EST-IEMB FLOW-GAGE-IEMB FLOW-CREST-IEMB
DEPTH	Depth	<value>	DEPTH-FLUME-IEMB DEPTH-TRANSDUCE-IEMB DEPTH-EST-IEMB DEPTH-GAGE-IEMB DEPTH-CREST-IEMB
IEMB-SITEOBS	IEMB Site Observation (choice list)	Frozen; Ponded; Wet; Flowing-immeasurable	FLOW-EST-IEMB (for streams and springs) DEPTH-EST-IEMB (for ponds)
IEMB-DISCHARGE	IEMB Reason for Discharge (choice list)	Dry; Wet <= 10yr/24hr; Wet >=10yr/24hr	NA

6.2 LABORATORY MEASUREMENTS

Lab measurements are distinguished from field measurements by the use of the Lab Collection worksheet. **Table 8** lists common field measurements and the most common analytical method for each characteristic ID.

6.2.1 Single Stage Samplers

For surface water samples collected from siphon or top-filling bottles, the height of the bottle must be recorded in the Lab Collection worksheet. The height of the bottle is a separate measurement from the current surface water conditions as the bottle height records the height of water that filled the sample bottle on an unknown date. For example, if a single stage sampler mounted at 0.5 ft collected a sample, the bottle height will be recorded in the Lab Collection worksheet under the Bottle_Height column.

Single stage samplers also require an extra date to be entered, the earliest date that the sampler could have collected a sample. This is usually the date the sampler was last checked, and the date must be recorded in the autosampler_last_date_checked column on the Lab Collection sheet.

Table 8: Typical Lab Measurements

Lab Parameter	Characteristic ID	Characteristic Name	Method Speciation	Typical Sample Fraction	Preferred Analytical Method ID
E. Coli	ECOLI	Escherichia coli		NA	9223-B
Total Coliform	TOTAL-COLIF	Total Coliform		NA	9223-B
Total Suspended Solids (TSS)	TSS	Total suspended solids		NA	2540-D
Total Dissolved Solids (TDS)	TDS	Total dissolved solids		NA	2540-C
Total Dissolved Solids (TDS)	TDS	Total dissolved solids		NA	TDS-CALC-IEMB 1030-E
Total Settleable Solids	TSETT	Settleable solids		NA	
Total Alkalinity	TOTAL-ALK	Alkalinity, total	as CaCO3	NA	2320-B
Acidity (total as CaCO3)	ACIDITY	Acidity, hydrogen ion (H+)	as CaCO3	NA	2310 B
Bicarbonate	71-52-3	Bicarbonate	as HCO3	Total	2320-B
Carbonate	3812-32-6	Carbonate	as CO3	Total	2320-B
Alkalinity, Hydroxide as OH	14280-30-9	Hydroxide	as OH	Total	2320-B
Sulfate	14808-79-8	Sulfate		Total	300.0
Chloride	16887-00-6	Chloride		Total	300.0
Sulfide	18496-25-8	Sulfide		NA	4500-S2(D)
Turbidity	TURB	Turbidity		NA	180.1 or 2130
pH	pH	pH		NA	150.2
Oil & Grease	OIL-GREASE	Oil and Grease		NA	1664A
Specific Conductance	SC	Specific conductance		NA	2510B
Hardness as $CaCO_3$	HARD-CA-MG	Hardness, Ca, Mg	as CaCO3	NA	2340B
Sodium Absorption Ratio (SAR)	SAR	Sodium adsorption ratio [(Na)/(sq root of 1/2 Ca + Mg)]		NA	SAR-CALC-IEMB
Total Persulfate Nitrogen (TPN)	TN	Total nitrogen, mixed forms	as N	Unfiltered	4500-N-C
Dissolved Orthophosphate as P (SRP)	14265-44-2	Orthophosphate	as P	Dissolved	365.1
Total Phosphorus as P	TP	Total Phosphorus, mixed forms	as P	Unfiltered	365.1
Phosphorus	7723-14-0	Phosphorus		Total	200.7
Nitrate-Nitrite as N	NN	Nitrate + Nitrite	as N	Unfiltered Dissolved	353.2
Total Ammonia as N	7664-41-7	Ammonia	as N	Unfiltered	350.1

Lab Parameter	Characteristic ID	Characteristic Name	Method Speciation	Typical Sample Fraction	Preferred Analytical Method ID
				Dissolved	
Total Kjeldahl Nitrogen as N	TKN	Total Kjeldahl nitrogen (Organic N & NH3)	as N	Unfiltered	351.2
Aluminum	7429-90-5	Aluminum			200.7
Antimony	7440-36-0	Antimony			200.8
Arsenic	7440-38-2	Arsenic			200.8
Barium	7440-39-3	Barium			200.7
Beryllium	7440-41-7	Beryllium			200.7
Boron	7440-42-8	Boron			200.7
Cadmium	7440-43-9	Cadmium			200.8
Chromium	7440-47-3	Chromium			200.8
Copper	7440-50-8	Copper		Dissolved	200.8
Iron	7439-89-6	Iron			200.7
Lead	7439-92-1	Lead			200.8
Manganese	7439-96-5	Manganese			200.7
Nickel	7440-02-0	Nickel			200.7
Silver	7440-22-4	Silver			200.8
Thallium	7440-28-0	Thallium			200.8
Uranium, Natural	7440-61-1	Uranium-238			200.8
Vanadium	7440-62-2	Vanadium			200.8
Zinc	7440-66-6	Zinc			200.7
Aluminum	7429-90-5	Aluminum			200.7
Antimony	7440-36-0	Antimony			200.8
Arsenic	7440-38-2	Arsenic			200.8
Barium	7440-39-3	Barium			200.7
Beryllium	7440-41-7	Beryllium		Total Recv	200.7
Boron	7440-42-8	Boron			200.7
Cadmium	7440-43-9	Cadmium			200.8
Calcium	7440-70-2	Calcium			200.7
Chromium	7440-47-3	Chromium			200.8

Lab Parameter	Characteristic ID	Characteristic Name	Method Speciation	Typical Sample Fraction	Preferred Analytical Method ID
Copper	7440-50-8	Copper			200.8
Iron	7439-89-6	Iron			200.7
Lead	7439-92-1	Lead			200.8
Magnesium	7439-95-4	Magnesium			200.7
Manganese	7439-96-5	Manganese			200.7
Nickel	7440-02-0	Nickel			200.7
Potassium	K	Potassium			200.7
Selenium	7782-49-2	Selenium		Total Recv	200.8
Silver	7440-22-4	Silver			200.8
Sodium	7440-23-5	Sodium			200.7
Thallium	7440-28-0	Thallium			200.8
Uranium, Natural	7440-61-1	Uranium-238			200.8
Vanadium	7440-62-2	Vanadium			200.8
Zinc	7440-66-6	Zinc			200.7
Sum of anions	ANION-SUM	Sum of anions		Total	1030-E
Sum of cations	CATION-SUM	Sum of cations		Total	1030-E
Anion/cation Ratio	ACRATIO	Anion/cation ratio		Total	1030-E
Mercury	7439-97-6	Mercury		Total	245.1
Mercury, ultra low-level	7439-97-6	Mercury			245.7 or 1631
Biochemical Oxygen Demand (BOD)	BOD	Biochemical oxygen demand, standard conditions		NA	5210-B
Carbonaceous Biochemical Oxygen Demand (CBOD)	CBOD	Carbonaceous biochemical oxygen demand, standard conditions		NA	405.1 or 5210-B
Dissolved Organic Carbon (DOC)	ORGANIC-C	Organic carbon		Dissolved	5310-B or 5310-C
Total Organic Carbon (TOC)	ORGANIC-C	Organic carbon		Total	5310-C
Bromide	24959-67-9	Bromide		Total	300.0
Fluoride	16984-48-8	Fluoride		Total	4500-F-C
Formaldehyde	50-00-0	Formaldehyde		Total	3500
Methane	74-82-8	Methane		Total	8015M-IEMB

Lab Parameter	Characteristic ID	Characteristic Name	Method Speciation	Typical Sample Fraction	Preferred Analytical Method ID
Gross Alpha Radioactivity	12587-46-1	Alpha particle		NA	900
Gross Beta Radioactivity	12587-47-2	Beta particle		NA	900
Benzene	71-43-2	Benzene		Total	602 or 8021B or 524.2
Ethylbenzene	100-41-4	Ethylbenzene			
Toluene	108-88-3	Toluene			
Xylene	1330-20-7	Xylene			
Total Extractable Hydrocarbons	TEH	Petroleum hydrocarbons, total extractable		Extract.	MA-EPH-IEMB
Total Purgeable Hydrocarbons	TPH	Hydrocarbons, total purgeable		Volatile	MA-VPH-MDEQ-WQ