

Reference

REVISION HISTORY

Document No./ Revision No.	Issue Date	Action	Description
EP-DIR-SOP-10007, R0	1/26/2011	New procedure	New Procedure
EP-DIR-SOP-10007, R1	9/8/2011	Major Revision	Changes made throughout the document and sections; Added Storm Water requirements.
EP-DIV-SOP-20156, R0	4/4/2013	New Document Number	Applicability of document follows at the division level; therefore; document number revised to follow Document Numbering Guide where DIV numbers follow a 20000 series number.
ER-SOP-20156, R0	9/20/2016	Major	Revised to new format. New document number. Previously EP-DIV-SOP-20156. Updates to EIM process. Complete rewrite; change bars have been omitted.

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1. PURPOSE

This standard operating procedure (SOP) describes the process and personnel responsibilities for performing quality checks in preparation of electronic data sets retrieved from the Los Alamos National Laboratory (LANL) web-based data management system, Environmental Information Management (EIM).

Data sets produced as a result of this procedure are provided to the end user and presented in technical publications which include waste management certifications, environmental surveillance reports, periodic monitoring reports, work plans, investigation reports, and regulatory corrective measures actions which are driven by the Compliance Order on Consent.

2. SCOPE

Associate Directorate of Environmental Management (ADEM), Environmental Services Division environmental data professionals are required to use this procedure when performing quality checks and data reporting on samples collected for waste management, groundwater and surface water, environmental surveillance, and corrective actions and cleanup programs.

This procedure does not cover specific instructions for requesting, handling, and managing a data set. See ER-SOP-20145, *Requesting and Managing Data Sets*.

3. BACKGROUND

The LANL environmental data span a wide range of media, including air, soil, rock, sediment, groundwater, surface water, pore gas, waste, foodstuff, and biota, as well as over 1,000 analytes and time periods extending over four decades, resulting in over 15 million records to manage and analyze. To maintain these data, in 2011, LANL adopted the cloud-based EIM system and its public database counterpart, Intellus (www.intellusnm.com).

LANL treats data collected at locations owned by third parties in accordance with supplementary agreements between LANL and the landowners. All data associated with a third-party landowner are reviewed and auto-validated in the same manner as data located on LANL owned locations. The only exception to the normal data management process is the delay of the release of third-party data to the Intellus website. Instead of direct nightly release to Intellus, third-party analytical results are sent via email directly to the landowners for their information and review. During the review process, the data are withheld from release to Intellus in deference to the landowner. Once the landowner has finished review, or the agreed upon default holding window has elapsed, the data are then automatically released nightly to Intellus.

Data collection and deliverable reports are driven by the Compliance Order on Consent, and the Individual Permit National Pollutant Discharge Elimination System (NPDES) (No. M0030759) under the Clean Water Act. The State of New Mexico Environmental Department (NMED) and Environmental Protection Agency (EPA) enforce these executive orders and environmental law.

4. PRECAUTIONS AND LIMITATIONS

A data quality check is required before presenting information in a technical publication. Data that have not undergone a quality check are considered preliminary and are available for internal use.

5. DEFINITIONS

An EIM data dictionary is available in EIM under Support > Data Dictionary.

Environmental Data Professional: A member of the Environmental Services Group who performs data steward functions trained to this SOP and is responsible for performing tasks described within.

EIM Database: Environmental Information Management cloud-based database used at LANL for environmental data management. www.locusfocus.com

Electronic Data Deliverables (EDD): Electronic data files with analytical results submitted by the laboratory.

Location Group: A Location Group in the EIM is the primary method of reporting groups of locations and associated samples and analytical data for sampling events such as the groundwater periodic monitoring events.

Project Chemist: A member of the ADEM who is trained to this SOP and is responsible for performing chemistry reviews and related data steward functions.

Sample Group: A Sample Group in the EIM is the primary method of reporting groups of samples and associated analytical data for site investigations of solid waste management units (SWMUs).

Reference

5. DEFINITIONS (continued)

Validation: For analytical data, validation is a specific set of checks applied to the analytical laboratory quality control parameters/samples to ensure the analytical data are legally defensible. Data validation is performed automatically in EIM by algorithms based on the following:

- For inorganic data - U.S. Environmental Protection Agency (EPA) Contract Laboratory Program (CLP) National Functional Guidelines for Inorganic Data Review
- For organic data - EPA CLP National Functional Guidelines for Organic Data Review
- For radionuclides – Health and Safety Laboratory (HASL)-300 Environmental Measurements Laboratory guidelines

The data validation process results in the assignment of qualifiers to the analytical data. Data rejected during validation as *unusable* are assigned an “R” qualifier.

For additional information on EIM’s auto-validation, please refer to LA-UR-12-26702, Auto-Validation for Chemistry Data Environmental Data Management Technical Paper, LANL, located at: <http://www.intellusnmdata.com/documents/documents.cfm>.

Reference

6. PREREQUISITE ACTIONS

6.1 Planning and Coordination

The LANL EIM process starts with Sample Planning. Each environmental program creates a plan for their sampling events. Events can be planned ad hoc or in advance, and they follow each environmental program's standard processes (see individual sections for specific quality assurance process information). Environmental programs plan where, when, what, and by whom samples will be collected, based on their program requirements. Field forms and chains of custody are created to support the process. Mobile collection is also supported with mobile instructions sent to iOS mobile field devices.

When field sampling is complete, collected samples are delivered to the analytical laboratory following LANL Sample Management Office (SMO) standard procedures. Documentation of the transfer is stored in EIM for sample and invoice tracking.

Following completion of analyses, analytical laboratories electronically upload analytical results and associated data into the EIM system. Data are uploaded and email notifications are sent to LANL SMO staff to initiate LANL data review and processing.

Once data arrive in EIM, LANL SMO staff perform an Electronic Data Deliverable (EDD) review and auto-validation of the electronic data files. Data files are reviewed for errors. Errors originating from an analytical laboratory result in notification to the laboratory requesting correction of the issues, followed by resubmittal of the corrected data. Errors stemming from LANL issues (such as an incorrect location ID) are corrected by the SMO, and re-validated using the auto-validation process. Auto-validation of the data entails running a specified electronic review of the data based on defined analytical chemistry review criteria. The analytical results are then flagged with applicable data validation qualifiers. Data are approved for the final database tables in EIM after auto-validation is complete. Once data are in the final tables, they are available to LANL environmental programs for review, analysis, and reporting. Data transit time in the holding table to final tables is typically less than a day during business hours. Email notifications of data availability to environmental program staff occur once the data are present in the final database tables.

Reference

6.1 Planning and Coordination (continued)

Field (non-analytical) data are collected in conjunction with analytical data. Such data are not sent to analytical laboratories, but imported directly to EIM by the collecting programs. Field data are subject to automated format checking and manual quality assurance reviews. Once reviewed, these data are sent to the final database tables for review, analysis, and reporting by environmental program staff.

EIM has a set of limited customized report formats for Groundwater Periodic Monitoring Reports (PMR), Site Investigations, and NPDES Storm Water reports.

Once data (both field and analytical) are released to the final database tables, they will automatically be released to Intellus on a nightly basis. This is true for all data in EIM with the exception of data associated with LANL's third-party data process, and selected data withhold flags manually applied by LANL.

6.2 Materials and Equipment

A computer workstation equipped with Internet access to web-based application(s) and reporting tools with import and export functions and equipped with MS Office.

Access to EIM at: <https://www.locusfocus.com/eim/database>

Access to a controlled copy of the Automated Waste Determination (AWD) MS Excel workbook (required for waste characterization related data preparation only).

7. PERFORMANCE

Data is downloaded from the EIM once automated computer software checks and auto-validation are complete. Analytical laboratory sample results undergo auto-checks to ensure the EDD is complete and 100% automated validation performed in EIM utilizing algorithms based on the National Functional Guidelines for Organic and Inorganic data review and the HASL-300 guidelines for radionuclides.

Environmental data professionals have the responsibility to check field information and sample analysis to ensure the data set is complete and correct, and prepare an electronic data report for the end user, which is usually the data requestor, an integrated project team member.

Reference

7.1 Groundwater Data Quality Checks

Quality checks are performed on analytical results and sample field information obtained from base-flow, springs, and groundwater samples collected for characterization, monitoring, corrective measures, evaluation, and reporting. The following checks will serve as guidance for project-specific needs.

7.1.1 Sampling and Analysis Completeness

Performing a completeness check on a sampling plan ensures sample and analysis is complete in the EIM database for reporting.

Environmental Data Professional

- [1] **CHECK** sampling plan(s) for completeness. Following a data request, identify sample plan(s) and other pertinent information requestor provided to assist in querying the EIM database for the sample analysis.

NOTE *User may also access sampling plan(s) through the Ad Hoc query tool in EIM.*

- [2] **ACCESS** the Sample Tracking Planned Sample and Analysis Status Report using the following pathway: Input>>Tracking>>Samples>>Sample and Analysis Status.

The screenshot shows a web application interface for "Sample Tracking". The breadcrumb navigation is "Input > Tracking > Samples". The main heading is "Sample Tracking" with a help icon, followed by "Planned Sample and Analysis Status". Below this is a section titled "STEP 1: Samples and analyses filter options".

Under "Samples to show:", there are three radio button options: "Only samples not yet collected", "Only samples that have been collected", and "All samples" (which is selected).

Under "Analyses to show:", there are three radio button options: "Only analyses that are still outstanding", "Only analyses that have been received", and "All analyses" (which is selected).

Under "Group by:", there are three radio button options: "Sample and analytical group¹", "Sample, analytical group, and method¹", and "Sample, analytical group, method, and parameter" (which is selected).

Footnote 1: "When you choose to group by (1) 'Sample and analytical group' or (2) 'Sample, analytical group, and method', EIM will declare the Sample/Analysis to be 'Received' if at least one member result has been received from the lab and uploaded into EIM. Conversely, EIM will declare the Sample/Analysis to be Outstanding only if no member result has been uploaded."

Under "Additional data filters:", there is a checkbox for "Show rejected results only²".

Footnote 2: "Only show analyses with a use flag of 'N' or validation qualifier of 'R' (Rejected)".

At the bottom, there is a "Sampling plan:" field with a dropdown menu set to "Name contains" and an empty text input box. "Cancel" and "Continue" buttons are located at the bottom right.

Reference

7.1.1 Sampling and Analysis Completeness (continued)

- [3] **SELECT** sampling plan(s) for review.
- [4] **ENTER** output options (user can add additional fields to report) and planned/actual sample collection date range entries.
- [5] **EXPORT** to MS Excel for review.

NOTE *A sampling plan is complete when all submitted laboratory analyses have been received, and automatically validated in EIM for each sample/analyte combination. A completeness check may indicate that requested analyses have not been received. If data are missing, ask requestor if evaluation should proceed on the incomplete data set. If the missing data are required, contact SMO staff and/or coordinate data upload and auto-validation in EIM.*

- [6] **IF** sampling plan(s) is complete,
THEN EXPORT analytical results for review to MS Excel or MS Access, as required.
- [7] **CROSS-CHECK** Project Groundwater Sample Plans with Sample Plans in EIM to ensure the analytical group selected is checked against analytical methods received. (Refer to a list of analytical group methods and analytical methods in EIM.)
- [8] **CONFIRM** the total number of samples, analytical suites, and analytical methods agree with the sample plan.
- [9] **CHECK** that the web release date in EIM has been met for data collected from third-party landowner locations (i.e., City of Santa Fe, San Ildefonso Pueblo, etc.). (Refer to third party landowner locations in EIM.)

Reference

7.1.2 Field Sample Information

A field sample check ensures sample information values (codes) are correct and complete. Refer to Valid Value tables in EIM for accepted sample field value and description using the following pathway: Setup>>Valid Values>>Members).

Environmental Data Professional

NOTE *For samples collected for the PMR and Groundwater Settlement Report, Sample Type must be coded WG (wells and springs) or WS (base flow) and Sample Purpose is coded FD (field duplicate) or REG (investigation).*

- [1] **CHECK** Sample Type and Sample Purpose Code field entries are correct and agree with sample matrix and purpose of sample, as required.
- [2] **CHECK** that field duplicate entries agree with parent investigative sample date, sample type, and sample location.
- [3] **CHECK** the Field Prep Code to ensure filtered and unfiltered sample analysis are in agreement with planned samples.
- [4] **CHECK** the well screened interval depths to ensure they are correct and complete.
- [5] **CHECK** that the Location IDs match the newly completed well screen and are correct in EIM.

NOTE *It is important that certain samples (i.e., field QC, waste characterization, screening samples, etc.) be identified and reported separately or as required by the project. (See 7.2, Groundwater General Reporting.)*

- [6] **CHECK** Sample Type, Sample Usage Code, and Sample Purpose codes to identify field QC samples and other samples collected and verify that codes agree. Other sampling analysis may include well development and testing, waste, or screening quality EES6/GGRL laboratory data.

Reference

7.1.3 Analytical Quality

Analytical quality checks ensure completeness and correctness of the sample analysis.

Environmental Data Professional

NOTE *For a complete list of accepted and active methods and parameters (analyte) reference the EIM using the following pathway: Setup>>Analytical>>Lab Methods>>Parameters:*

- [1] **PERFORM** an analyte count per analytical method for completeness, as required.
- [2] **SEGREGATE** redundant records by selecting data with an EIM Best Select Flag of “N” (0, False).
- [3] Except for screening data, **ENSURE** that for each best value flag record of “N” there is a matching and corresponding “Y” record.
- [4] **CONSULT** chemist as needed.

7.1.4 Result and Unit

Results and unit checks ensure the completeness and correctness of the sample analysis, preventing erroneous data entries from reporting.

Environmental Data Professional

- [1] **CHECK** that the unit of measure was correctly reported by the laboratory and correctly converted to the standard reporting unit required by the project.

Reference

7.1.4 Result and Unit (continued)

NOTE See table below for standard unit abbreviations. Also, see the valid value unit of measure member table in EIM.

Matrix	Unit	Unit Description
Water	CFS	cubic feet per second
Water	GPM	gallons per minute
Water	NTU	nephelometric turbidity units
Water	SU	standard pH units
Water	deg C	degrees Celsius
Water	mg/L	milligrams per liter
Water	pCi/L	picocuries per liter
Water	µS/cm	microsiemens per centimeter
Water	µg/L	micrograms per liter

- [2] **CHECK** for zero and blank standard result values in data set.
- [3] **VERIFY** laboratory report, as required, to confirm zero and blank standard values.
- [4] **CONSULT** a project chemist, as required, to determine if zero result and blank standard result values reported should be rejected.
- [5] **CHECK** radionuclide results to ensure that either the minimum detectable activity or the uncertainty value is reported.
- [6] **IF** both minimum detectable activity and uncertainty value are missing,
THEN CONSULT a project chemist to determine if data should be rejected.

NOTE Report MDL and Report DL (PQL) reporting depends on the regulatory program.

- [7] **CHECK** inorganic and organic analytical results to ensure Report MDL and Report DL (PQL) are reported correctly for non-detects qualified (U, LAB) and **VERIFY** with project chemist as needed.
- [8] **IF** both method detection limit and estimated quantitation limit are missing,
THEN CONSULT a project chemist as required.

Reference

7.1.5 Validation

Checks are performed on laboratory qualifier, secondary validation qualifiers, and reason codes assigned in auto-validation to ensure agreement with laboratory results and detection status.

Environmental Data Professional

NOTE *A chemist review is not required for fully validated (auto-validated) data sets unless data quality issue(s) is identified in the review. Additionally, a focused validation may be requested by the integrated project team member or user to address a specific focused review on a parameter(s), result(s), and validation qualifier(s), in which case a project chemist should be consulted.*

[1] **PERFORM** a general review of the qualifier flags in the data set. (Refer to inorganic, organic, and radionuclide routine validation SOPs, or consult a project chemist). Rejected “R” qualified results should be reviewed/confirmed by a chemist.

NOTE *Only a qualified project chemist or equivalent trained to validation procedures can make or request changes to qualifier flags in the EIM.*

[2] **VERIFY** that the qualifier flag and/or the reason code changes requested by the chemist have been updated in the EIM database.

[3] **CHECK** the Detect Flag code (“Y” or “N”) for each record to ensure consistency with validation qualifier.

7.2 Groundwater General Reporting

Generally, data is downloaded from EIM using a text delimited file or MS Excel and compiled to facilitate data review or evaluation. The following steps can be used as guidance for exporting a data feed from the Ad Hoc Query Tool and preparing data tables.

Environmental Data Professional

NOTE *Refer to EIM online instructions on how to build a project specific query data report.*

[1] **ACCESS** the EIM Ad Hoc query tool using the following pathway:
Analysis>>Custom Queries>>Expert.

Reference

7.2 Groundwater General Reporting (continued)

- [2] **SELECT** data query from the EIM Ad Hoc query list.
- [3] **EXPORT** data feed to MS Access or MS Excel for review, screening, and reporting.
- [4] **PREPARE** All Analyses and Exclusionary data tables for final reporting (see table below).

NOTE *Always include the EIM FIELD_SAMPLE_RESULT_RECNO for all records as a cross-reference of each record to EIM and Intellus. The FIELD_SAMPLE_RESULT_RECNO does not need to be included in the delivery of the final formatted data set to the client, but should always be maintained in the archived data set for easy reference in EIM.*

All Analyses Data Table		
1.	All Analyses – As required, prepare a primary results table which will include characterization, investigation, and monitoring sample data. Note: data may be screened against state and federal groundwater and surface water standards and LANL Background. Please refer to the Action Limits and LANL Background tables in EIM.	Record/Count
Excluded (Secondary) Data Tables		
2.	Screening Data – As required, provide a separate table for EES6 or GGRL analytical onsite laboratory data.	Record/Count
3.	Field QC Samples – As required, provide a separate table field QC samples (e.g., field blank, field rinsate, field duplicate, etc.). Note: field duplicate samples may be reported in the primary results table.	Record/Count
4.	Reanalysis – As required, provide a separate table for analytical results Best Select Flag is equal to “No.”	Record/Count
5.	Waste Samples – As required, provide a separate table waste samples.	Record/Count
6.	Rejected Data – As required, provide a separate table for analytical results rejected “R” by project chemist for data quality reasons.	Record/Count
	TOTAL	Record/Count

7.2.1 Groundwater Periodic Monitoring Report

Analytical results and samples obtained from groundwater, base-flow, and springs collected under the Interim Facility Groundwater Monitoring Plan (IFGMP) are reviewed and prepared for quarterly reporting. Refer to the current IFGMP for a list of monitoring groups and scheduled sampling events. The following steps can be used as guidance for exporting and preparing reports.

Reference

7.2.2 Prepare to Generate Periodic Monitoring Report

Environmental Data Professional

- [1] **CREATE** a Location Group in EIM for the groundwater monitoring group. Include all spring, groundwater wells, and base-flow locations for the scheduled periodic monitoring event (PME) sampling plan. Refer to current IFGMP for monitoring group locations.
- [2] **FIND** and **SELECT** the Locations Group and Location Group Member EDD template in EIM.
- [3] **CREATE** and **UPLOAD** location group and members (Location IDs) using the templates for each PMR monitoring group to be reported. This will require database administrative approval once the template has been uploaded to EIM. Refer to the EIM Data Uploads application using the following pathway: Input>>Data Uploads.
- [4] **ACCESS** the data uploads templates using the following pathway in EIM: Input>>Data Uploads.
- [5] **ACCESS** the PMR reports using the following pathway in EIM:
Analysis>>Views>>Analytical>>Customer-Specific>>Periodic Monitoring Reports.
- [6] **SELECT** the “Generate New PMR” button.
- [7] **SELECT** Location Group and **ENTER** PME date range into search window.
- [8] **SUBMIT** the PMR.

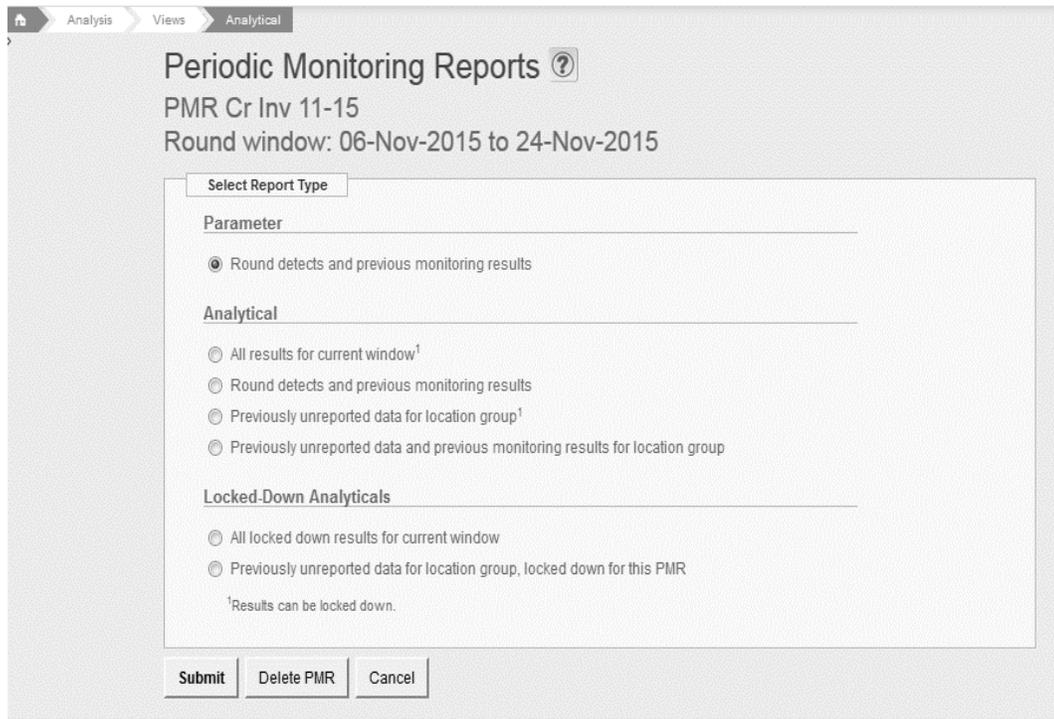
Reference

7.2.3 Generate Periodic Monitoring Report

The PMR reports include field parameters and analytical results for surface water and groundwater pursuant to the Consent Order.

Environmental Data Professional

- [1] **GENERATE** PMR reports as shown below for field parameters and analytical results:



The screenshot displays the 'Periodic Monitoring Reports' interface. At the top, there are navigation tabs for 'Analysis', 'Views', and 'Analytical'. The main title is 'Periodic Monitoring Reports' with a help icon. Below the title, it shows 'PMR Cr Inv 11-15' and 'Round window: 06-Nov-2015 to 24-Nov-2015'. A 'Select Report Type' dialog box is open, containing three sections: 'Parameter', 'Analytical', and 'Locked-Down Analyticals'. The 'Parameter' section has a radio button selected for 'Round detects and previous monitoring results'. The 'Analytical' section has four radio buttons, with 'All results for current window¹' selected. The 'Locked-Down Analyticals' section has two radio buttons, with 'All locked down results for current window' selected. A footnote at the bottom of the dialog box states: ¹Results can be locked down. At the bottom of the dialog box, there are three buttons: 'Submit', 'Delete PMR', and 'Cancel'.

- [2] **SELECT** and **SUBMIT** the “Field Parameter Report.”
- [3] **EXPORT** to MS Excel for review and reporting. The report contains the following parameters: dissolved oxygen, oxidation-reduction, pH, specific conductance, temperature, and turbidity. Report includes the current PME field parameters and last four sample rounds.
- [4] **SELECT** and **SUBMIT** “All Results for Current Window Report.”

Reference

7.2.3 Generate Periodic Monitoring Report (continued)

NOTE *The purpose of the lock down feature in the EIM is to flag analytical records as reported. This applies to the PMR reports only. Each current (PME) data set must be locked down or the previously unreported data report cannot be generated.*

[5] **ENSURE** date range is correct before locking down the data set.

[6] **CLICK** “Lock down these unreported values.” This will flag the unreported values in data set as reported in EIM database.

[7] **EXPORT** to MS Excel for review and reporting. The report contains the analytical data collected during the PME, and includes only samples coded WG, WS and FD, or REG sample types and sample purpose respectively.

NOTE *The “DELETE PMR” button will delete PMR record as well as remove all lockdown information from the database. Use this feature to correct or fix problems such as incorrect date range entry or removal or addition of well locations.*

[8] **SELECT** and **SUBMIT** “Round Detects and Previous Monitoring Results Report.”

[9] **EXPORT** to MS Excel for review and reporting. The report contains the current PME sample results and the last four sample round chemical detects and rad results.

[10] **SELECT** and **SUBMIT** “Previously Unreported Data for Location Group Report.”

[11] **EXPORT** to MS Excel for review and reporting. The report contains previously unreported PME sampling results that were unavailable at the time of reporting and/or results collected outside the current PME.

Reference

7.2.3 Generate Periodic Monitoring Report (continued)

[12] **SELECT** and **SUBMIT** “Previously Unreported Data and Previous Monitoring Results for Location Group Report.”

[13] **EXPORT** to MS Excel for review and reporting. This report provides previously unreported chemical detects, rad results, and last four rounds of results.

CAUTION

DO NOT lock down the report before Step 14. Prematurely locking the data set will remove the report because the lockdown sets the data as reported.

[14] **REPEAT** 7.2.3 [10] and **LOCK DOWN** previously unreported data to flag as reported.

7.2.4 Groundwater Settlement Report

A monthly groundwater data review is conducted on available groundwater results by the groundwater program pursuant to the Consent Order. LANL is required to report analytical results to the state regulator that meet the Reporting Criteria listed below within 15 days following a review, and may require a one-day oral notification for a first time exceedance of a contaminant. The following criteria and steps will guide the review and download of the results from the EIM:

Reporting Criteria

CA. Detection of a contaminant in a well screen interval or spring at a concentration that exceeds either the New Mexico Water Quality Control Commission (NMWQCC) water quality standard, or the federal maximum contaminant level (MCL) if that contaminant has not previously exceeded such water quality standard or maximum contaminant level in such well screen interval or spring.

C-1. Detection of a contaminant that is an organic compound in a spring or screened interval of a well if that contaminant has not previously been detected in the spring or screened interval.

Reference

7.2.4 Groundwater Settlement Report (continued)

- C-2.** Detection of a contaminant that is a metal or other inorganic compound at a concentration above the background level in a spring or screened interval of a well if that contaminant has not previously exceeded the background level in the spring or screened interval.
- C-3.** Detection of a contaminant in a spring or screened interval of a well at a concentration that exceeds either one-half the New Mexico water quality standard or one-half the federal maximum contaminant level, or if there is no such standard for the contaminant, one-half the EPA Region VI Human Health Medium-Specific Screening Level for tap water, if that contaminant has not previously exceeded one-half such standard or screening level in the spring or screened interval.
- C-4.** Detection of perchlorate in a spring or screened interval of a well at a concentration of 2 µg/L or greater if perchlorate at such concentration has not previously been detected in the spring or screened interval.
- C-5.** Detection of a contaminant that is a metal or other inorganic compound in a spring or screened interval of a well at a concentration that exceeds two times the background level for the third consecutive sampling of the spring or screened interval.
- C-6.** Detection of a contaminant in a spring or screened interval of a well at a concentration that exceeds either one-half the New Mexico water quality standard or one-half the federal maximum contaminant level, and that has increased for the third consecutive sampling of that spring or screened interval.

Reference

7.2.4 Groundwater Settlement Report (continued)

Environmental Data Professional

- [1] **ACCESS** and **SELECT** the Groundwater Settlement Report using the following pathway in EIM: Analysis>>View>>Customer Specific >>Groundwater Settlement Report.

NOTE *The monthly data report is downloaded the first week of the month and must capture new analytical results uploaded to EIM during the previous month. A quality review is performed on the results and may include focused validation and request for laboratory chemical reanalysis. Alert the chemist if analytical result(s) have a CA or C-1 code.*

- [2] **SPECIFY** the date range, and **SUBMIT** the report.

The screenshot shows a web-based interface for generating a report. At the top, there is a breadcrumb trail: Home > Analysis > Views > Analytical > Groundwater Settlement Report: Specify Date Range. The main heading is "Groundwater Settlement Report: Specify Date Range". Below this, the instruction reads: "Enter Date Range For Most Recent Data Set (Do not exceed a month)*". There are two date input fields: "From: 03/01/2016" and "To: 03/30/2016", each with a calendar icon to its right. A mouse cursor is pointing at the "To" field. Below the date fields, a note states: "*The most recent data set will be compared to historical data from Jan 1 2000 to the end of your selected data range." Another note below that says: "Note that this report will take a few minutes to prepare." At the bottom, there are three buttons: "Submit", "Return", and a help icon (a question mark inside a circle).

- [3] **EXPORT** report to MS Excel for review and reporting.

Reference

7.3 Site Investigation Data Quality Checks

Quality checks are performed on analytical results and field sample information obtained from soil vapor, canyon sediment, soil, and tuff media collected for monitoring, site investigation and cleanup. The following checks will serve as guidance for site-specific reporting.

7.3.1 Sampling and Analysis Completeness

Performing a completeness check on a sampling plan ensures sample and analysis is complete in the EIM database for reporting.

Environmental Data Professional

- [1] **CHECK** sampling plan(s) for completeness. Following a data request, **IDENTIFY** sample plan(s) and other pertinent information to assist in querying the EIM database for the sample analysis.

NOTE *Sampling plan(s) may also be accessed through the Ad hoc query tool in EIM.*

- [2] **ACCESS** the Sample Tracking Planned Sample and Analysis Status Report using the following pathway: Input>>Tracking>>Samples>>Sample and Analysis Status.

The screenshot shows a web-based interface for "Sample Tracking" with the title "Planned Sample and Analysis Status". The interface is divided into several sections for filtering data:

- STEP 1: Samples and analyses filter options**
- Samples to show:** Radio buttons for "Only samples not yet collected", "Only samples that have been collected", and "All samples" (selected).
- Analyses to show:** Radio buttons for "Only analyses that are still outstanding", "Only analyses that have been received", and "All analyses" (selected).
- Group by:** Radio buttons for "Sample and analytical group¹", "Sample, analytical group, and method¹", and "Sample, analytical group, method, and parameter" (selected).
- Additional data filters:** A checkbox for "Show rejected results only²".
- Sampling plan:** A dropdown menu set to "Name contains" followed by an empty text input field.

Footnotes:
¹ When you choose to group by (1) "Sample and analytical group" or (2) "Sample, analytical group, and method", EIM will declare the Sample/Analysis to be "Received" if at least one member result has been received from the lab and uploaded into EIM.
Conversely, EIM will declare the Sample/Analysis to be Outstanding only if no member result has been uploaded.
² Only show analyses with a use flag of "N" or validation qualifier of "R" (Rejected)

Buttons: "Cancel" and "Continue"

Reference

7.3.1 Sampling and Analysis Completeness (continued)

- [3] **SELECT** the sampling plan(s) to review.
- [4] **ENTER** output options (user can add additional fields to report) and planned/actual sample collection date range entries.
- [5] **IF** data are missing,
THEN ASK requestor if evaluation should proceed on the incomplete data set and **CONTACT** SMO staff and/or coordinate data upload and auto-validation in EIM, if the missing data are required.

NOTE *A sampling plan is complete when all submitted laboratory analyses have been received, and automatically validated in EIM for each sample/analyte combination. A completeness check may indicate that requested analyses have not been received.*

- [6] **IF** sampling plan(s) is complete,
THEN EXPORT analytical results for review to MS Excel or MS Access.
- [7] **CROSS-CHECK** Sample Plans in EIM to ensure the sample and analytical groups planned agree with the analytical methods received from the laboratory. (Refer to a list of analytical group methods and analytical methods in EIM.)
- [8] **CONFIRM** the total number of samples, analytical suites, and analytical methods are in agreement with sample plan.
- [9] **CHECK** that the web release date in EIM has been met for data collected from third-party landowner locations (i.e., City of Santa Fe, San Ildefonso Pueblo, etc.). (Refer to third party landowner locations in EIM.)

Reference

7.3.2 Field Sample Information

A field sample check ensures the sample information is correct and complete. Refer to Valid Value tables in EIM for accepted sample field value and description using the following pathway: Setup>>Valid Values>>Members.

Environmental Data Professional

NOTE *LANL Background Value (LANL BV) screening is dependent on having sample media code and depth (fallout radionuclide screening) as accurate as possible for evaluation.*

- [1] **CHECK** Sample Type and Background Comparison Media Code-field entries are correct and agree and are representative of site-specific sample locations (e.g., soil and tuff samples collected should be coded “S” and “R” and ALLH or Qbt*, respectively).
- [2] **CHECK** Sample Type and Sample Purpose field entries are representative of the data set and are correct (e.g., a water sample should be associated with a field rinsate sample and not an investigative sample collected under a soil data set).
- [3] **CHECK** that location, depth, media code, and date entries are correct and are the same for field duplicate and parent sample pair.
- [4] **CHECK** Excavation field entries are coded “Y” or “N.” Samples flagged “Yes” have been excavated from the site. An excavated sample and associated analysis no longer represent current site conditions and must be removed from main data table and reported separately. (See secondary reporting tables in 7.4, Site Investigation General Reporting.)

NOTE *Certain samples (e.g., field QC, waste characterization, screening, excavated samples, etc.) should be identified and reported separately or as required by project. (See 7.4, Site Investigation General Reporting.)*

- [5] **CHECK** Sample Type, Sample Usage Code, and Sample Purpose codes to identify field QC samples and other samples collected and that codes agree. Other sampling analysis may include and is not limited to waste data or screening quality EES6/GGRL laboratory data.

Reference

7.3.3 Analytical Quality

An analytical quality check ensures completeness and correctness of the sample analysis in the EIM database.

Environmental Data Professional

- [1] **PERFORM** an analyte count per each analytical method to ensure completeness, as required.

NOTE *For a complete list of accepted and active methods see Setup>>Analytical>>Lab Methods.*

- [2] **SEGREGATE** redundant records by selecting data with an EIM Best Select Flag of “N” (0, False).

- [3] Except for screening data, **ENSURE** that for each best value flag record of “N” there is a matching and corresponding “Y” record.

- [4] **CONSULT** a chemist as needed.

7.3.4 Result and Unit

A result and unit check ensures the completeness and correctness of the sample analysis, preventing erroneous data entries in the database from reporting.

Environmental Data Professional

- [1] **CHECK** that the unit of measure was correctly reported by the laboratory and correctly converted to the standard reporting unit required by project.

Reference

7.3.4 Result and Unit (continued)

NOTE See table below for standard unit abbreviations. Also, see the valid value unit of measure table in EIM.

Matrix	Unit	Unit Description
Gas	ppbv	parts per billion by volume
Gas	$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
Gas	pCi/L	picocuries per liter
Soil or solid	%	Percent
Soil or solid	mg/kg	milligrams per kilogram
Soil or solid	pCi/g	picocuries per gram
Soil or solid	$\mu\text{g}/\text{kg}$	micrograms per kilogram
Soil or solid (TCLP extract)	mg/L	milligrams per liter
Soil or solid (TCLP extract)	$\mu\text{g}/\text{L}$	micrograms per liter

- [2] **CHECK** for zero and blank standard result values in data set.
- [3] **VERIFY** laboratory report as required for zero and blank standard result values.
- [4] **CONSULT** a project chemist as required to determine if zero and blank standard result values should be rejected.
- [5] **CHECK** radionuclide results to verify either minimum detectable activity or uncertainty value is reported.
- [6] **IF** both minimum detectable activity and uncertainty value are missing,
THEN CONSULT a project chemist to determine if data should be rejected.
- [7] **CHECK** inorganic and organic analytical results to ensure Report MDL and Report DL (PQL) are reported correctly for non-detects qualified (U, LAB). The reporting depends on the regulatory program.
- [8] **VERIFY** with a project chemist as needed.
- [9] **IF** both method detection limit and estimated quantitation limit are missing,
THEN CONSULT a project chemist.

Reference

7.3.5 Validation

Checks are performed on lab qualifier, secondary validation qualifiers, and reason codes assigned in auto-validation to ensure agreement with laboratory results and detection status.

Environmental Data Professional

NOTE *A chemist review is not required for fully validated (auto-validated) data set unless data quality issue(s) is identified in the review. Additionally, a focused validation may be requested by the integrated project team member or user to address a specific focused review on a parameter(s), result(s), and validation qualifier(s), in which case a project chemist should be consulted.*

[1] **PERFORM** a general review of the qualifier flags in the data set. (Refer to inorganic, organic, and radionuclide routine validation SOPs or consult a project chemist). Rejected “R” qualified results should be reviewed/confirmed by a chemist.

NOTE *Only a qualified project chemist or equivalent trained to validation procedures can make or request changes to a result-validation qualifier and reason code in the EIM.*

[2] **VERIFY** validation qualifier and/or reason code changes requested by the chemist have been updated in the EIM database.

[3] **CHECK** Detect Flag code (“Y” or “N”) to ensure consistent with validation qualifier code.

Reference

7.4 Site Investigation General Reporting

Generally, data is downloaded from EIM using a text delimited file or MS Excel and compiled to facilitate data review or evaluation for site. The following steps can be used as guidance for exporting a data feed from the Ad Hoc Query Tool and preparing data tables.

Environmental Data Professional

- [1] **ACCESS** the EIM Ad Hoc query tool using the following pathway:
Analysis>>Custom Queries>>Expert.

NOTE *Refer to EIM online instructions on how to build a project specific query data report.*

- [2] **SELECT** All Analyses data feed query from the EIM Ad Hoc query list.
- [3] **EXPORT** All Analyses data feed to MS Access or MS Excel for review, preparation, and reporting.
- [4] **PREPARE** All Analyses (primary) and Exclusionary (secondary) data tables for final reporting. See table below.

Reference

7.4 Site Investigation General Reporting (continued)

NOTE *Always include the EIM FIELD_SAMPLE_RESULT_RECNO for all records as a cross-reference of each record to EIM and Intellus. The FIELD_SAMPLE_RESULT_RECNO does not need to be included in the delivery of the final formatted data set to the client but should always be maintained in the archived data set for easy reference to EIM.*

All Analyses Data Table		
1.	All Analyses – As required, prepare a primary investigation results table containing investigation samples where Sample Purpose field value is “REG” or for historical Sample Usage Code field value is “INV” or “CLN.”	Record/Count
Excluded (Secondary) Data Tables		
2.	Screening Samples – As required, provide a separate table for screening samples which include historical vintage type and onsite laboratory analysis.	Record/Count
3.	Excavated Samples- As required provide a separate table for excavated samples flagged Yes.	Record/Count
4.	Field QC Samples – As required, provide a separate table field QC samples.	Record/Count
5.	Duplicate/Reanalysis – As required, provide a separate table for analytical results where Best Select Flag field value is “No.”	Record/Count
6.	Rad Not Evaluated – As required, provide a separate table for gamma spectroscopy and other radionuclides not evaluated in the Laboratory investigation/cleanup.	Record/Count
7.	Waste Samples – As required, provide a separate table for waste samples where Sample Usage Code field value is “WST.”	Record/Count
8.	Rejected Data – As required, provide a separate table for analytical results rejected “R” by project chemist for data quality reasons.	Record/Count
	TOTAL	Record/Count

7.4.1 Site Investigation Reports

Soil reports are available in EIM for site-specific investigation and cleanup activities. The reporting application provides user with multiple filter and report options that include report comparison to LANL Background Values (BV) for sediment, soil, and tuff media, and uses these same BVs for reporting statistical frequency of detects for organic, inorganic, and rad constituents. Refer to Appendix 1 for the Requirements for Soil Sample ID-specific (SID) Table requirements in EIM. Additional report options include a samples collected report, tabular tables for GIS plotting, and data tables for final deliverable reporting. Lastly, with each selected set of reports, a separate summary sheet is exported documenting filter entries and serves as an additional check to ensure entries are correct.

Reference

7.4.1 Site Investigation Reports (continued)

Environmental Data Professional

- [1] **ENTER** data filters for reporting. To access “Soil Investigation Reports: Specify Data Filter Categories” use the following pathway:
Analysis>>Views>>Analytical>>Customer-Specific>>Soil Investigation Reports.
- [2] **SELECT** “By Sample Group” from the primary Standard Options tab. Optionally, select “By Location Group” or “Sampling Plan.”

NOTE *User should select a minimum of five filters to ensure a representative data set as follows. More can be selected to meet reporting requirements: Sample Group, Sample Purpose, Sample Type, Best Flag, and Units. Add more filters if needed.*

- [3] **SELECT** the following filters from the Additional Filters tab:
- Sample Purpose
 - Sample Type
 - Best Result Flag
 - Units
- [4] **SUMBIT** the filters.
- [5] Optionally, **SELECT** and **SUBMIT** from the Exclusions Filters. These filters are optional unless excavated samples and/or rejected “R” qualified results are in the data set. Rejected results will only affect the frequency of detect (FD) tables if they are excluded.
- [6] **ENTER** primary filters from the Available Sample Group window and **SELECT** Sample Group(s).
- [7] **ENTER** sample filters from the window. For a sediment, soil, or tuff data set, **SELECT** Sample Purpose “REG” (investigation sample) and, Sample Type “R” tuff, “S” soil, or “SED” sediment.
- [8] **ENTER** results filters from the window and **SELECT** “Best Result Only,” units “mg/kg,” and “pCi/g.” User does not have to select unit of pCi/g if there are no rad data present.

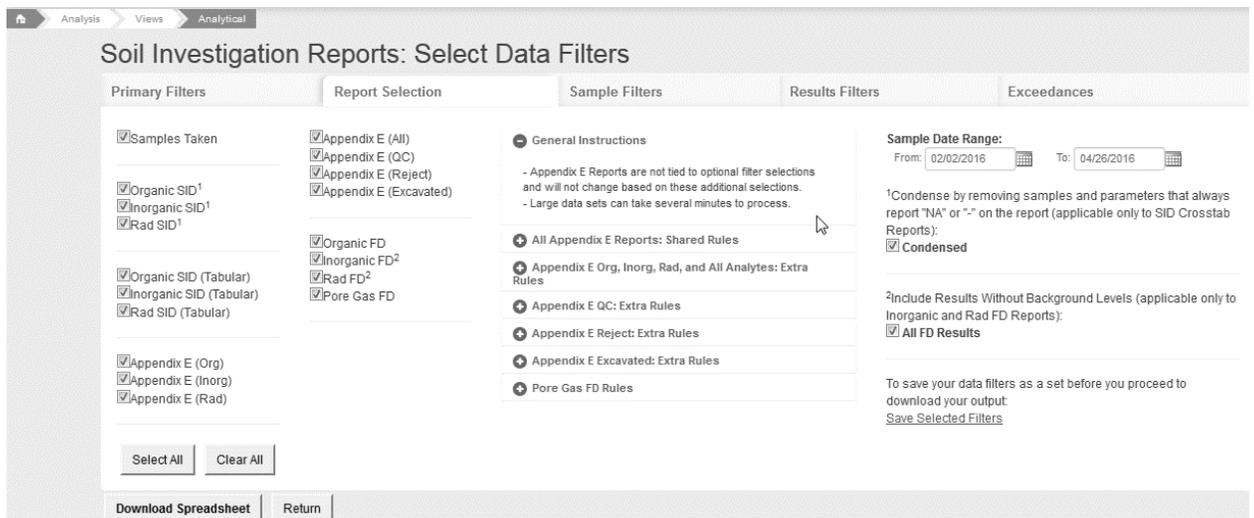
Reference

7.4.1 Site Investigation Reports (continued)

- [9] **SELECT** "Exceedances" from the Available Background Level Groups: QBT1g; QCT; QBO; QBT1v; QBT 2,3,4; Sediment or Soil.
- [10] **SELECT** from the Available Action Limits menu: Construction Worker SAL/SSL; Industrial SAL/SSL; Recreational SAL/SSL and Residential SAL/SSL.

7.4.2 Report Selection

- [1] **CHOOSE** the "Report Selection" tab, **SET** the Primary, Sample, Result, and Exceedance filters, and **SELECT** the list of reports to download.
- [2] **DOWNLOAD** the spreadsheet. The application will export multiple reports or tabs into one MS Excel file.
- [3] **REVIEW** the Summary Sheet tab to ensure filter entries are correct.



- [4] **IF** field duplicates are to be included in the Samples Taken Report, **THEN GENERATE** a separate report to prevent them from appearing in FD and SID reports.
- [5] **SELECT** Samples Taken Report. The Samples Taken Report contains a list of site-specific samples and meta data including laboratory analytical suites and chain of custody.

Reference

7.4.2 Report Selection (continued)

NOTE *Refer to Inorganic and Radionuclide Background Data for Soils, Canyon Sediments, and Bandelier Tuff at Los Alamos National Laboratory, September 1998, LA UR-98-4847.*

[6] **SELECT** Organic SID, a Sample ID-specific pivoted report for organic results. This report contains detect results only. LANL BVs do not apply.

[7] **SELECT** Inorganic SID, a Sample ID-specific pivoted report for inorganic results. This report contains both non-detect and detect chemical results above LANL BVs and detect results where BVs do not apply.

NOTE *There are additional database requirements for fallout radionuclide exceedances sampled in soil media (ALLH, FILL, QAL) and are screened at surface to one foot below ground surface (0-1FT). The exception to the fallout requirement is that it does not apply to tritium. For a complete list of fallout parameters and requirements, and other BV requirements, refer to Appendix 1, Requirements for Soil Sample ID-specific (SID).*

[8] **SELECT** Rad SID, a Sample ID-specific pivoted report for radionuclide results. This report contains detect results above LANL BVs and detect results where BVs do not apply.

[9] **SELECT** the condense box for SID Pivoted or Crosstab report. This will remove samples and parameters that always report "NA" or dash "-" on the report.

[10] **SELECT** Organic FD, an Organic Frequency of Detect Report. This report contains statistical information specific to the data set number of analyte detects.

[11] For Inorganic and Rad FD Reports, **SELECT** "All FD Results" box to include results without LANL BVs.

[12] **SELECT** Inorganic FD, an Inorganic Frequency of Detect Report. This report contains statistical information specific to the data set number of analytes detects and detects above LANL BVs.

Reference

7.4.2 Report Selection (continued)

- [13] **SELECT** Rad FD, a Radionuclide Frequency of Detect Report. This report contains statistical information specific to the data set number of analyte detects and detects above LANL BVs.
- [14] **SELECT** Pore Gas FD, a Pore Gas Organic Frequency of Detect Report. This report contains statistical information specific to the data set number of analyte detects and maximum detects.
- [15] **SELECT** Organic SID Tabular (Organic SID Tabular Report). This report is used for GIS/report mapping.
- [16] **SELECT** Inorganic SID Tabular (Inorganic SID Tabular Report). This report is used for GIS/report mapping.
- [17] **SELECT** Rad SID Tabular (Rad SID Tabular Report). This report is used for GIS/report mapping.
- [18] **SELECT** Appendix E Organic (Organic Pivoted Report for DVD; contains only organic-investigative analytical results pivoted or crosstab format.
- [19] **SELECT** Appendix E Inorganic (Inorganic Pivoted Report for DVD). This report contains only inorganic-investigative analytical results pivoted or crosstab format- LANL BVs are not applied.
- [20] **SELECT** Appendix E Rad (Rad Pivoted Report for DVD). This report contains only radionuclide-investigative analytical results pivoted or crosstab format - LANL BVs are not applied.
- [21] **SELECT** Appendix E All (All Analyses Tabular Report for DVD). This report contains all investigative analyses for the report/deliverable.
- [22] **SELECT** Appendix E QC (Field QC Tabular Report for DVD). This report contains all QC analyses for the report/deliverable.

Reference

7.4.2 Report Selection (continued)

[23] **SELECT** Appendix E Reject (Rejected Results Tabular Report for DVD). This report contains only investigative analytical results that were qualified rejected “R” for quality reason by project chemist in validation.

[24] **SELECT** Appendix E Excavated (Excavated Samples Tabular Report for DVD). This report contains samples that were excavated for site-specific cleanup and flagged “Yes” in the project database.

NOTE *Appendix E reports are not tied to optional filters selections and will not change based on these additional selections. Large data sets can take several minutes to process. See report application for additional rules Appendix E.*

[25] **REVIEW** reports for completeness and correctness.

[26] **VERIFY** that the Samples Taken Report locations, depths, media, suites, and COCs are complete and correct.

NOTE *Rejected “R” qualified results are included in FD statistics unless they are excluded.*

[27] **VERIFY** FD, SID, and SID tabular Reports are complete and correct. Refer to the database screening requirements in Appendix 1.

[28] **CHECK** number of analyses, number of detects, and detects and non-detects above LANL BVs.

[29] **VERIFY** APPENDIX E Pivot, All Analyses, QC, and Rejected Result tables are complete and correct.

[30] **PREPARE** APPENDIX E tables for DVD using the following protocol:

- PIVOT (site-specific sample results searchable by filter)
- All Analyses (site-specific sample analyses searchable by filter)
- QC (site-specific sample QC analyses searchable by filter)
- Rejected Results (site-specific rejected results searchable by filter)

Reference

7.5 Storm Water Data Quality Checks

Quality checks are performed on analytical results, field samples, and measurements obtained from storm water samples collected under the surface water program.

7.5.1 Sampling and Analysis Completeness

Performing a completeness check on a sampling plan ensures sample and analysis is complete in the EIM database for reporting.

Environmental Data Professional

- [1] **CHECK** sampling plan(s) for completeness and, following a data request, **IDENTIFY** sample plan(s) and other pertinent information to assist in querying the EIM database for the sample analysis.
- [2] **ACCESS** the Sample Tracking Planned Sample and Analysis Status Report using the following pathway: Input>>Tracking>>Samples>>Sample and Analysis Status.

NOTE User may also access sampling plan(s) through the Ad Hoc query tool in EIM.

The screenshot shows a web application interface for "Sample Tracking". The breadcrumb navigation at the top indicates the path: Input > Tracking > Samples. The main heading is "Sample Tracking" with a help icon, followed by "Planned Sample and Analysis Status". Below this is a section titled "STEP 1: Samples and analyses filter options" which contains several filter settings:

- Samples to show:** Radio buttons for "Only samples not yet collected", "Only samples that have been collected", and "All samples" (selected).
- Analyses to show:** Radio buttons for "Only analyses that are still outstanding", "Only analyses that have been received", and "All analyses" (selected).
- Group by:** Radio buttons for "Sample and analytical group¹", "Sample, analytical group, and method¹", and "Sample, analytical group, method, and parameter" (selected).
- Additional data filters:** A checkbox for "Show rejected results only²".
- Sampling plan:** A dropdown menu set to "Name contains" followed by an empty text input field.

Footnotes at the bottom of the form explain the group by options: ¹ When you choose to group by (1) "Sample and analytical group" or (2) "Sample, analytical group, and method", EIM will declare the Sample/Analysis to be "Received" if at least one member result has been received from the lab and uploaded into EIM. Conversely, EIM will declare the Sample/Analysis to be Outstanding only if no member result has been uploaded. ² Only show analyses with a use flag of "N" or validation qualifier of "R" (Rejected).

At the bottom right of the form are "Cancel" and "Continue" buttons.

Reference

7.5.1 Sampling and Analysis Completeness (continued)

- [3] **SELECT** sampling plan(s) for review.
- [4] **ENTER** output options (user can add additional fields to report) and planned/actual sample collection date range entries.
- [5] **EXPORT** to MS Excel for review.

NOTE *A sampling plan is complete when all submitted laboratory analyses have been received, and automatically validated in EIM for each sample/analyte combination. A completeness check may indicate that requested analyses have not been received. If data are missing, ask requestor if evaluation should proceed on the incomplete data set. If the missing data are required, SMO staff and/or coordinate data upload and auto-validation in EIM should be contacted.*

- [6] **IF** sampling plan(s) is complete,
THEN EXPORT analytical results for review to MS Excel or MS Access, as required.
- [7] **CROSS-CHECK** storm water sample plans against sample plans in EIM to ensure the analytical group and analytical methods planned agree with received. (Refer to a list of analytical group methods and analytical methods in EIM.)
- [8] **CONFIRM** the total number of samples, analytical suites, and analytical methods agree with sample plan.
- [9] **CHECK** that the web release date in EIM has been met for data collected from third-party landowner locations (i.e., City of Santa Fe, San Ildefonso Pueblo). (Refer to third party landowner locations in EIM.)

7.5.2 Field Sample Information

A field sample check ensures sample information values (codes) are correct and complete. Refer to Valid Value tables in EIM for accepted sample field value and description using the following pathway: Setup>>Valid Values>>Members.

Environmental Data Professional

- [1] **CHECK** Sample Type and Sample Purpose Code field entries are correct and agree with sample matrix and purpose of sample as required.

Reference

7.5.2 Field Sample Information (continued)

NOTE *For storm water samples, ensure Sample Type is coded WT (stormwater) and Sample Purpose is coded FD (field duplicate) or REG (investigation).*

[2] **CHECK** that field duplicate entries agree with parent investigative sample date, sample type, and sample location.

[3] **CHECK** the Field Prep Code to ensure filtered and unfiltered sample analysis are in agreement with planned samples.

NOTE *It is important that certain samples (i.e., field QC, waste characterization, screening samples, etc.) be identified and reported separately or as required by the project. (See 7.6, Storm Water Reporting.)*

[4] **CHECK** Sample Type, Sample Usage Code, and Sample Purpose codes to identify field QC samples and other samples collected and that codes agree. Other sampling analysis may include waste or screening quality EES6/GGRL laboratory data.

7.5.3 Analytical Quality

Analytical quality checks ensure completeness and correctness of the sample analysis.

Environmental Data Professional

NOTE *For a complete list of accepted and active methods and parameters (analyte) reference the EIM using the following pathway: Setup>>Analytical>>Lab Methods>>Parameters:*

[1] **PERFORM** an analyte count per analytical method for completeness as required.

[2] **SEGREGATE** redundant records by selecting data with an EIM Best Select Flag of “N” (0, False).

[3] Except for screening data, **ENSURE** that for each best value flag record of “N” there is a matching and corresponding “Y” record.

[4] **CONSULT** chemist as needed.

Reference

7.5.4 Result and Unit

Result and unit checks ensure the completeness and correctness of the sample analysis, preventing erroneous data entries from reporting.

Environmental Data Professional

- [1] **CHECK** that the unit of measure was correctly reported by the laboratory, and correctly converted to the standard reporting unit required by the project.

NOTE See table below for standard unit abbreviations. Also see the valid value unit of measure member table in EIM.

Matrix	Unit	Unit Description
Water	CFS	cubic feet per second
Water	%	percent
Water	SU	standard pH units
Water	mg/L	milligrams per liter
Water	pCi/L	picocuries per liter
Water	μS/cm	microsiemens per centimeter
Water	μg/L	micrograms per liter

- [2] **CHECK** for zero and blank standard result values in data set.
- [3] **VERIFY** laboratory report as required for zero and blank standard result values.
- [4] **CONSULT** a project chemist as required to determine if zero and blank standard result values reported should be rejected.
- [5] **CHECK** radionuclide results to ensure that either the minimum detectable activity or the uncertainty value is reported.

Reference

7.5.4 Result and Unit (continued)

- [6] **IF** both minimum detectable activity and uncertainty value are missing,
THEN CONSULT a project chemist to determine if data should be rejected.

NOTE *Report MDL and Report DL (PQL) reporting depends on the regulatory program.*

- [7] **CHECK** inorganic and organic analytical results to ensure Report MDL and Report DL (PQL) are reported correctly for non-detects qualified (U, LAB) and **VERIFY** with project chemist as needed.

- [8] **IF** both method detection limit and estimated quantitation limit are missing,
THEN CONSULT a project chemist, as required.

7.5.5 Validation

Checks are performed on lab qualifier, secondary validation qualifiers, and reason codes assigned in auto-validation to ensure agreement with laboratory results and detection status.

Environmental Data Professional

NOTE *A chemist review is not required for fully validated (auto-validated) data set unless data quality issue(s) is identified in the review. Additionally, a focused validation may be requested by the integrated project team member or user to address a specific focused review on a parameter(s), result(s), and validation qualifier(s), in which case consult a project chemist.*

- [1] **PERFORM** a general review of the qualifier flags in the data set. (Refer to inorganic, organic, and radionuclide routine validation SOPs, or consult a project chemist). Rejected "R" qualified results should be reviewed/confirmed by a chemist.

NOTE *Only a qualified project chemist or equivalent trained to validation procedures can make or request changes to qualifier flags in the EIM.*

- [2] **VERIFY** that the qualifier flag and/or the reason code changes requested by the chemist have been updated in the EIM database.

- [3] **CHECK** the Detect Flag code ("Y" or "N") for each record to ensure consistency with validation qualifier.

Reference

7.6 Storm Water Reporting

The Storm Water Tracking System (SWTS) application in the EIM contains numerous formatted reports for commonly performed reporting.

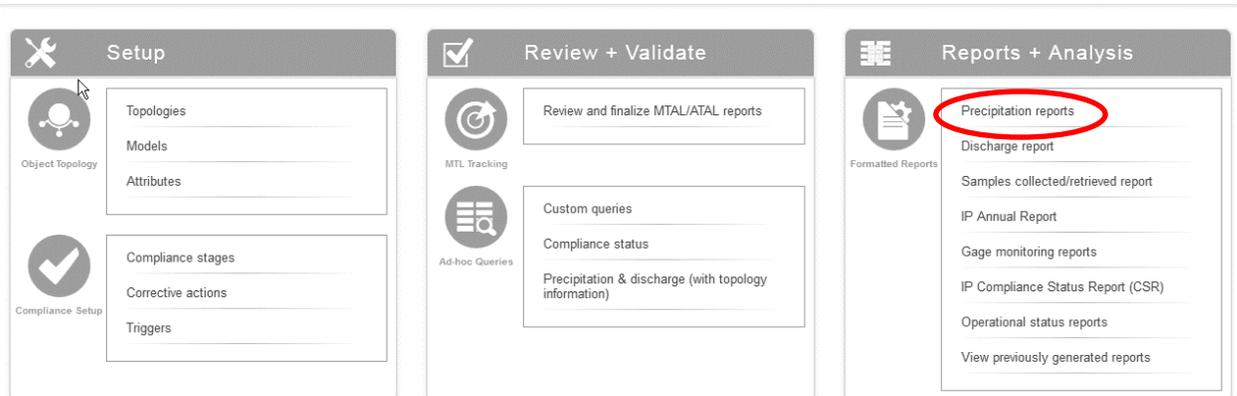
7.6.1 Precipitation Reports

NOTE *The SWTS main page allows users to generate precipitation reports, rainfall intensities and totals crosstab reports (with and without shading), rain event inspection forms, and precipitation maps.*

[1] **GENERATE** precipitation reports using the EIM pre-built query “Precipitation reports.” To access Precipitation Reports, use the following pathway in EIM:
LANL>>Extras>>SWTS>>Precipitation reports.

[2] **SELECT** the Precipitation Reports link from the SWTS Main page.

SWTS (Storm Water Tracking System)



[3] **SELECT** the program for the report to generate and the date range for the reporting period, then **SELECT** “Continue.”

[4] **SELECT** the rain gages for the report.

[5] **CONFIRM** the date range, the minimum 24-hr total, and the minimum 30-min intensity to limit results for crosstab reporting.

Reference

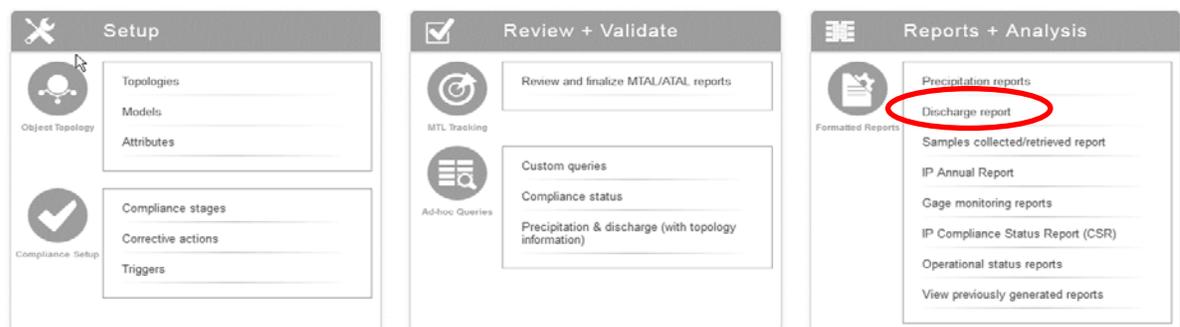
7.6.1 Precipitation Reports (continued)

- [6] **CHOOSE** one or more options to view the data, depending on the report:
- The  **View** button allows for viewing directly from EIM SWTS.
 - The  **Export** button exports that data into an MS Excel file.
 - The  **Map** button opens an EIM eGIS page with Thiessen polygons representing the area that each rain gage is associated with, along with the daily total and intensity.
- [7] **CHECK** the reports for completeness and correctness.
- [8] **ARCHIVE** the final version of the report by selecting the “Save/Archive on Export” check box and selecting either the View  or Export  button for the desired report. This will archive the report and generate either an EIM view of the data, or an MS Excel version of the final archived report.

7.6.2 Discharge Report

- [1] **GENERATE** maximum daily discharge and storm water sampling crosstab reports from the “Discharge Report” link on the SWTS main page.
- [2] **SELECT** the “Discharge Report” link from the SWTS Main page.

 SWTS (Storm Water Tracking System)



- [3] **SELECT** the program for the report to generate, the date range for the reporting period, then **SELECT** “Continue.”
- [4] **SELECT** the locations of interest for the report, and **CONFIRM** the date range.

Reference

7.6.2 Discharge Report (continued)

- [5] **REVIEW** the Maximum Daily Discharge and Storm Water Sampling Crosstab table for correctness by selecting the View button. Alternatively, the Crosstab Table with cell shading may be downloaded into MS Excel by selecting the Export button.

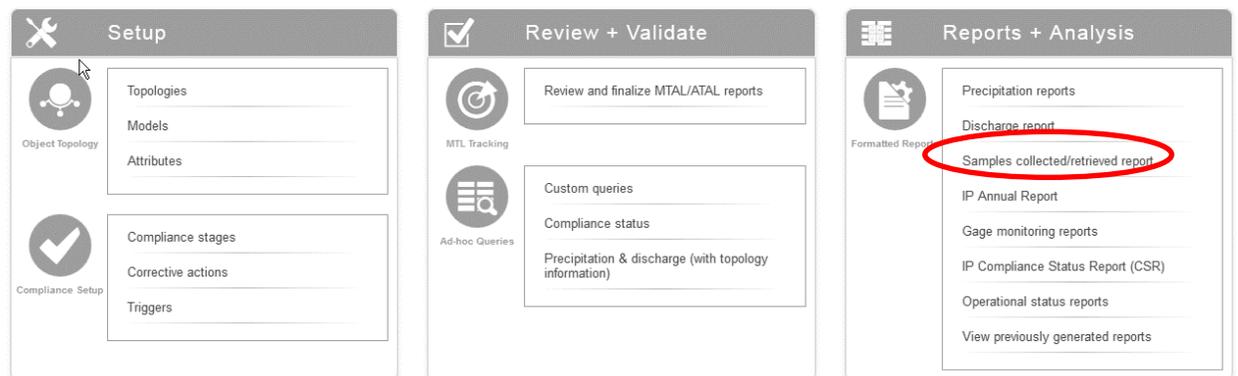
- [6] **ARCHIVE** the final version of the report by selecting the “Save/Archive on Export” check box and selecting either the View  View or Export  Export button for the desired report. This will archive the report and generate either an EIM view of the data or an MS Excel version of the final archived report.

7.6.3 Samples Collected/Retrieved Report

- [1] **GENERATE** a Samples Collected/Retrieved Report using the following pathway in EIM: LANL>>Extras>>SWTS>>Samples Collected/Retrieved Report. The SWTS main page allows users to determine dates of sample collections and retrieval by selecting the IP Annual Report link.

- [2] **SELECT** the Samples Collected/Retrieved Report from the SWTS Main page.

 SWTS (Storm Water Tracking System)



- [3] **SELECT** the Individual Permit Topology, the date range for the reporting period, and **SELECT** “Continue.”

Reference

7.6.3 Samples Collected/Retrieved Report (continued)

- [4] **MOVE** the locations from the list of available location assets on the left to the selected location assets on the right using the on-screen arrows, and **SELECT** multiple locations by holding down the control key as locations are clicked.
- [5] **PREVIEW** or **EXPORT** the Samples Collected/Retrieved Report by selecting the Export button after the desired locations have been chosen. This will open the individual report in MS Excel.
- [6] **CHECK** the reports for completeness and correctness.
- [7] **ARCHIVE** the final version of the report by selecting the “Save/Archive on Export” check box and either selecting the single export or multiple export. This will archive the report and generate an MS Excel version of the final archived report.

7.6.4 IP Annual Report

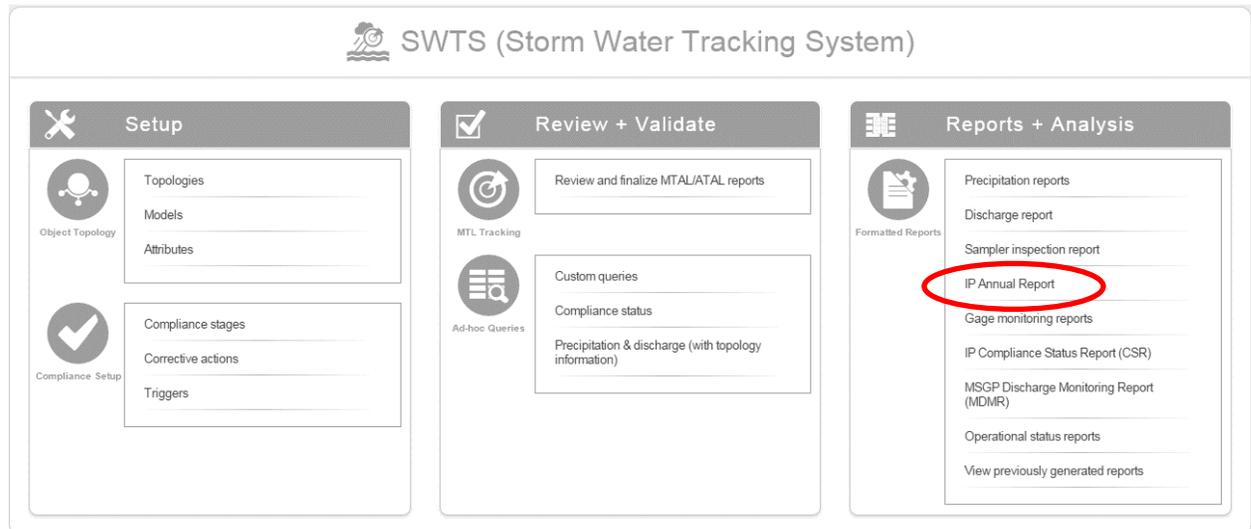
- [1] **GENERATE** any of the IP Annual Report tables from the IP Annual Report link on the SWTS main page. To access Precipitation Reports, use the following pathway in EIM: LANL>>Extras>>SWTS>>IP Annual Report. The following IP Annual Report tables can be generated:

1-2	Permitted Features, SMAs, Sites, and Rain Gauges
1-3	Permitted Features, SMAs, and Sites Summarized by Watershed
3-2	Summary of Confirmation Monitoring
3-3	Baseline Confirmation Monitoring
3-4	Enhanced Control Confirmation Monitoring
3-5	Non-Confirmation Monitoring
3-6	Summary of Confirmation Monitoring TAL Exceedances
4-1	Deadlines for Completion of Corrective Action
4-3	Cumulative List of Individual Permit Sites Certified Corrective Action Complete with No Exposure
4-4	Cumulative List of Individual Permit Sites with a Certificate of Completion under the Consent Order
4-6	Cumulative List of Completed IP Sites
6-1	Rain Gage Network
6-10	Rainfall Intensity and Total Amounts Greater Than or Equal To 0.1-in. 30-Min Maximum Intensity or 0.25-in. Total Rainfall in 24h
7-1	Minor Sampler Location Adjustments
8-2	Summary of Compliance Status
8-3	Site-Specific Compliance Status

Reference

7.6.4 IP Annual Report (continued)

- [2] **SELECT** the “IP Annual Report” link from the SWTS Main page.



- [3] **SELECT** Individual Permit Topology, the date range for the reporting period, and then **SELECT** “Continue.”
- [4] **CONFIRM** the date range for the reporting period, and **UPDATE** if necessary.
- [5] **SELECT** the applicable location information for the following reports (for all other reports, no selection is required):
- For 1-2 Permitted Features, SMAs, Sites, and Rain Gauges, select rain gauge and sampling station locations of interest.
 - For 1-3 Permitted Features, SMAs, and Sites Summarized by Watershed, select stations of interest.
 - For 6-1 Rain Gage Network, select rain gauge locations of interest.
 - For 6-10 Rainfall Intensity and Total Amounts Greater Than or Equal To 0.1-in., 30-Min Maximum Intensity, or 0.25-in. Total Rainfall in 24h, select rain gauge locations of interest.
- [6] **PREVIEW** or **EXPORT** reports by selecting the Export button for an individual report. This will open the individual report in MS Excel.

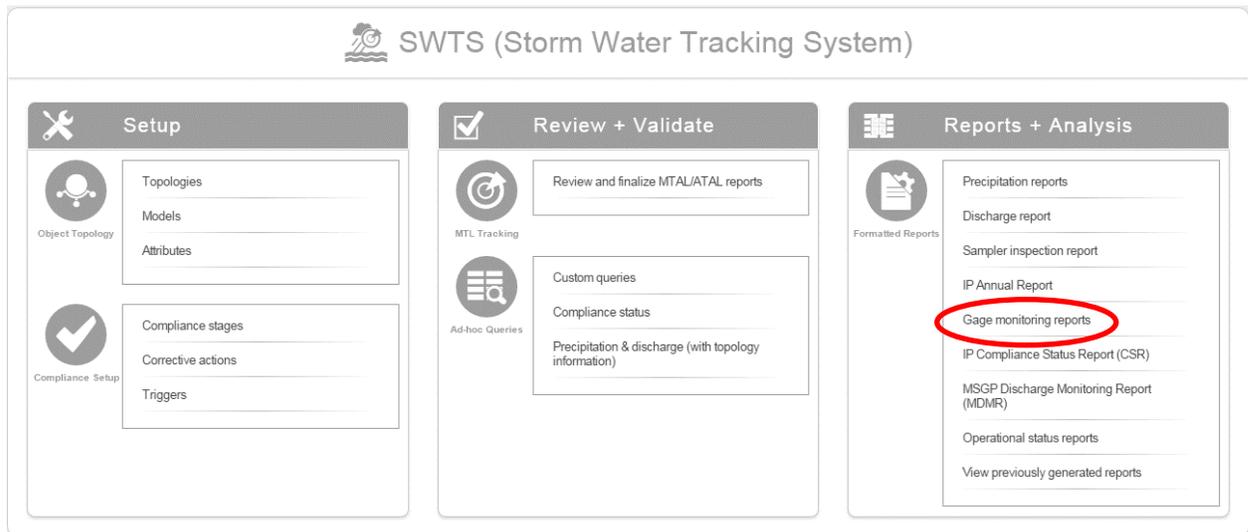
Reference

7.6.4 IP Annual Report (continued)

- [7] To view multiple reports, **SELECT** the “Include in Bulk Report” check box for each report, then **SELECT** the “Bulk Export Selected Reports” button at the bottom of the page. This will open all selected reports on separate worksheets of one MS Excel file.
- [8] **CHECK** the reports for completeness and correctness.
- [9] **ARCHIVE** the final version of the report by selecting the “Save/Archive on Export” check box and either selecting the single export or multiple export options. This will archive the report and generate an MS Excel version of the final archived report(s).

7.6.5 Gage Monitoring Reports

- [1] **GENERATE** the Gage Monitoring Report tables using the following pathway in EIM:
LANL>>Extras>>SWTS>>Gage Monitoring Report.



Reference

7.6.5 Gage Monitoring Reports (continued)

- [2] **SELECT** the Gage Monitoring Report link from the SWTS Main page. SWTS may be used to generate any of the following Gage Monitoring Report Tables:

2.3-1	Maximum Daily Discharge and Stormwater Sampling
2.4-1	Locations and Analytical Suites for Stormwater Samples
2.4-2	Analytical Requirements for Stormwater Samples
2.4-4	Planned and Actual Analyses
2.6-1	Sample Collection and Sample Retrieval Working Day Intervals
4.2-1	NMWQCC Surface Water Standards
4.2-2	Maximum Detected Results By Station and Event above Comparison Values in Stormwater Samples
4.2-3	Dioxin and Furan TEFs for the Dibenzodioxins and Dibenzofurans
4.2-4	TCDD TEQs in Stormwater Samples

- [3] **SELECT** a report table from the menu, input the date range for the reporting period, and **SELECT** “Continue.”
- [4] **SELECT** the sampling plan to include in the data set.
- [5] **SELECT** all applicable action limits for the following reports (for all other reports, no selection is required):
- 4.2-1 NMWQCC Surface Water Standards
 - 4.2.-2 Maximum Detected Results By Station and Event above Comparison Values in Storm Water Samples
- [6] **CONFIRM** the date range for the reporting period, and **UPDATE** if necessary.
- [7] **PREVIEW** reports or **EXPORT** reports by selecting the Export button to open an individual report in MS Excel.
- [8] To view multiple reports, **SELECT** the “Include in Bulk Report” check box for each report and then **SELECT** the “Bulk Export Selected Reports” button at the bottom of the page. This will open all selected reports on separate worksheets of one MS Excel file.
- [9] **CHECK** the reports for completeness and correctness.

Reference

7.6.5 Gage Monitoring Reports (continued)

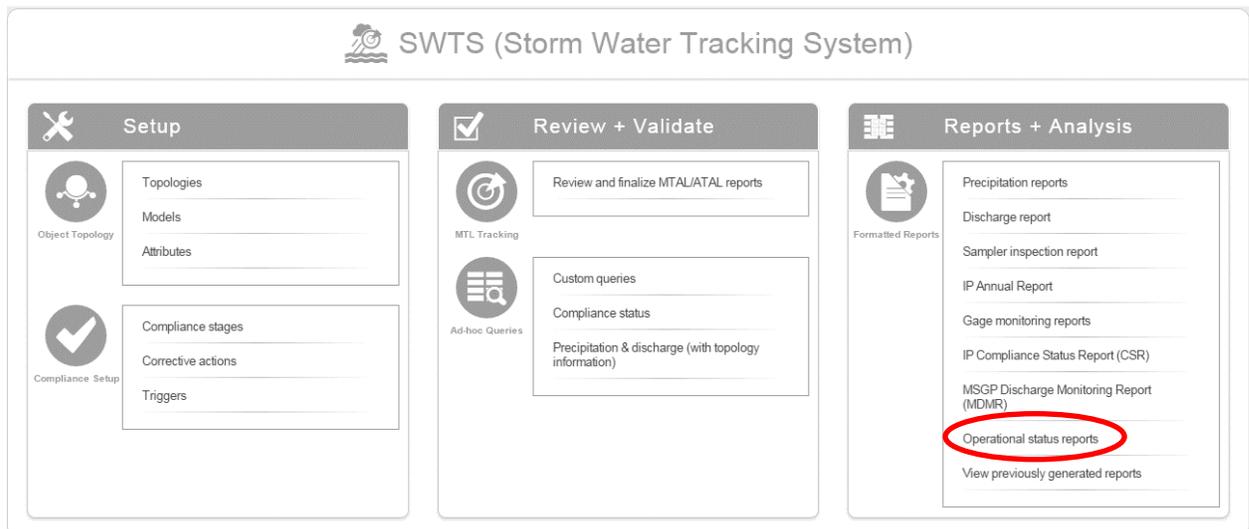
- [10] **ARCHIVE** the final version of the report by selecting the “Save/Archive on Export” check box and either selecting the single export or multiple export options. This will archive the report and generate an MS Excel version of the final archived report(s).
- [11] **GENERATE** Appendix C, Analytical Results, Analytical Reports, and 5-Minute Discharge Results from this page. To view the report, **SELECT** the View button adjacent to Appendix C. This will display the results in a table within EIM. This report cannot be archived but it may be downloaded by selecting the  download button below the table.

7.6.6 Operational Status Reports

The Operational Status Reports section of EIM will generate these reports:

- The IP Path to Completion by SMA/Site order
- Multi Sector General Permit (MSGP) Sample Collection and Visual Inspection Tracking
- MSGP Field Implementation Plan
- MDMR Submittal Tracking reports

- [1] **SELECT** the Operational Status Report link from the SWTS Main page.



- [2] **SELECT** the date range for the reporting period. All active records during the date range are reported. To determine the status at a point in time, **INPUT** the same date in the “From” and “To” fields and **INPUT** the modified “on” or “since” dates, if applicable.

Reference

7.6.6 Operational Status Reports (continued)

- [3] **SELECT** the Export button adjacent to the report of interest to view the reports. This will open the individual report in MS Excel.

NOTE *For the MSGP Sample Collection and Visual Inspection Tracking, the year of the report must be selected from the drop down menu adjacent to the report name to change the default year selection.*

- [4] **CHECK** the reports for completeness and correctness.
- [5] **ARCHIVE** any report by selecting the “Save/Archive on Export” check box and selecting the Export button. This will archive the report and generate an MS Excel version of the final archived report(s).

7.6.7 View Previously Generated Reports

- [1] **OPEN** the archived version of the formatted report(s) using the “View Previously Generated Reports” link at the following pathway in EIM:
LANL>>Extras>>SWTS>>View previously generated reports.
- [2] **IDENTIFY** individual reports by the report type, filename, and run date.
- [3] **CLICK** in the report type field to open a PDF or MS Excel version of the report for the record of interest.

Report Type	Filename	Run By	Run Date
Historical TALs	TAL_Exceedance_Reports_2015.pdf	markp	09/30/2015 00:00:00
Historical TALs	TAL_Exceedance_Reports_2014.pdf	markp	12/31/2014 00:00:00
Historical TALs	MTAL_Exceedance_Reports_2013.pdf	markp	12/31/2013 00:00:00
Historical TALs	MTAL_Exceedance_Reports_2012.pdf	markp	12/31/2012 00:00:00
Historical TALs	MTAL_Exceedance_Report_2011.pdf	markp	12/31/2011 00:00:00

Reference

7.7 Automated Waste Determination (AWD) Data Checks

Data checks for AWD requirements are limited for waste disposal. Most of the cleanup functions are conducted automatically by the AWD program. The Environmental Data Professional chooses the initial set of Sample IDs to be evaluated. With this, the manual cleanup ends. These steps and others are provided in the report instructions below.

Furthermore, the AWD eliminates rejected samples and alerts the user of data deficiencies (e.g., “unrecognized unit,” “no background comparison media listed”). In rare cases, some analytical results may be eliminated manually by deleting rows in the “allSamples” sheet (e.g., elimination of historical data, which may not meet data quality requirements or when the focus validation of the initial analysis and requested reanalysis dictates the choice of the result).

7.8 Waste Determination Reporting

7.8.1 Waste Determination Using the AWD Workbooks

AWD uses a set of three Excel spreadsheets (water, solid, and NOI), all programmed with macros for evaluation of analytical data for waste disposal. Environmental Data Professionals must use the latest set available and maintain an AWD folder on the project directory.

The steps below provide guidance for the most common process for waste evaluation.

Environmental Data Professional

NOTE *Conditions for the query search in EIM should be adjusted to reflect request for data evaluation.*

- [1] **GENERATE** a text file that contains the samples and analyses requested for waste evaluation using the EIM pre-built query “AWD_query_SM20151007” or “AWD_feed_by_SWMU.” To access Expert Custom Queries, use the following pathway in EIM: LANL>>Analysis>>Custom Queries>>Expert.

Reference

7.8.1 Waste Determination Using the AWD Workbooks (continued)

NOTE *Data should be imported to the “water” spreadsheet (ww_XXX.XLSM) first, unless the Environmental Data Professional is certain that no water data is present in the data set. The “water” spreadsheet program will evaluate the data and ask if the evaluation should proceed using water or solid rules. In the file name “ww_XXX.XLSM” ww stands for water waste, and XXX is the current version number. If an evaluation of solids is required, the “ww_XXX.XLSM” workbook will automatically link to all necessary files. For quality assurance purposes, the AWD workbook automatically collects information about the starting point, evaluations, and subsequent opening/saving/name changes.*

[2] **EXPORT** the query results from EIM as a pipe-delimited text file.

NOTE *If data pulled by EIM query contains only solid data, the Environmental Data Professional may start evaluation using “ws_XXX.XLMS,” file to shorten evaluation time. In the file name “ws_XXX.XLMS,” ws stands for waste-solids.*

[3] **OPEN** the AWD master file called “ww_XXX.XLSM.” An official copy of the master file is available in the project directory.

[4] **SELECT** the “Start” tab at the bottom left.

[5] **SELECT** the green “Start” command button in the AWD workbook to **START** macros and **FOLLOW** the options for choosing a data file(s).

[6] When prompted, **CHOOSE** the data file(s) generated in 7.8.1 [1] to import into the AWD workbook.

[7] **FOLLOW** the prompts in the AWD workbook to include entering a file name for the new AWD.

[8] **SELECT** samples to be evaluated. Using the cursor, **SELECT** samples from the list in “Sample ID” column CA, then **PRESS** the green “Accept Sample Choice” command button.

Reference

7.8.1 Waste Determination Using the AWD Workbooks (continued)

- [9] **PRESS** the green “Evaluate” command button. The list of samples that were selected will appear in “Sample list” column D and may include associated blanks in column E and field duplicates in column F of the “Start” sheet.
- [10] **FOLLOW** the prompts and **ANSWER** the questions from the AWD program on unit recalculation and background selection, if applicable.
- [11] **IF** the program concludes some data cannot be released because of the web release date, **THEN CONSULT** the data requestor to determine the best path forward.

NOTE *At the end of the evaluation, the results are saved automatically in MS Excel default directory and the “Results” tab is displayed.*

- [12] **REVIEW** the Result Summary sheet information and forms as applicable for solid or water evaluation. Waste coordinators have the responsibility to check for correctness during their waste disposal evaluation.

- [13] For water or land application evaluation, **SCROLL** down the Results sheet to review the NOI Waste Water Land Application Result Summary and forms as applicable. Waste coordinators have the responsibility to check for correctness during their waste disposal evaluation.

NOTE *Emails with large AWD result file (bigger than 25—30 MB) may not be delivered properly because of user’s email limitations on appendix size. In such cases, evaluator may use transfer.lanl.gov protocol.*

Reference

8. RECORDS MANAGEMENT

The Environmental Data Professional must maintain and submit applicable electronic records on project servers and/or documents generated using this procedure to the Records Processing Facility according to EP-AP-10003, Records Management.

- Electronic records included in ADEM deliverables are reviewed according to EP-DIR-AP-10070, Peer Review of Environmental Programs Documents.
- Final data tables included in ADEM deliverables are submitted by the ADEM Deliverables Compliance Team.
- Final data tables will include Level II data packages, when applicable. For new sample planned data, Environmental Data Professionals or the equivalent will coordinate with the Sample Management Office and provide enough lead time (two weeks minimum) for the preparation of reports.
- For all new data, an EIM auto-validated report will be included in the Level II data packaging, when applicable.

9. REFERENCES

- EP-DIR-AP-10070, Peer Review of Environmental Programs Documents
- EP-AP-10003, Records Management
- ER-SOP-20145, Requesting and Managing Data Sets
- Intellus (<http://www.intellusnm.com>)
- LA-UR-12-26702, Auto-Validation for Chemistry Data Environmental Data Management Technical Paper, LANL

10. APPENDICES

Appendix 1: Requirements for Soil Sample ID-specific Table (SID)

APPENDIX 1
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Requirements for Soil Sample ID-specific Table. (SID)

Background comparison table which summarizes the results of comparing a given dataset with LANL-specific background values for each individual Sample ID/Location ID in the dataset.

Radiochemistry:

Naturally occurring radionuclides

Iso Thorium
Iso Uranium.

Background values are available for all media and applied regardless of depths.

- If detected above BV, include in SID table
- If not detected or not detected above BV, do not include in SID table. (put –dash)

Fallout radionuclides

Americium 241, Cesium-137, Plutonium-238, Plutonium-239
(Sometimes reported as Plutonium-239/240), Strontium-90, and Tritium.

Soil: Undisturbed Soil. Including ALLH, AH, BH, CH

Radionuclide soil Fallout value (background) applies ONLY to soil from 0-1 foot interval (below ground surface).

- If Rad analyte is detected and is below the soil fallout value, from 0-1 Foot interval, then, it is **not** included in the SID table. (put –dash)
- If Rad analyte is detected and is above the soil Fallout value, from 0-1 Foot interval, then, the detected value is included in the SID table.
- If Rad analyte is detected below the 0-1 foot interval, then the detected value is not compared to the soil Fallout value, but presented as a detected result in the SID table.
- The **exception** is Tritium, which is reported IF detected, regardless of depth interval. No associated soil fallout value comparisons are applicable in Soil.

Reference

APPENDIX 1

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Fill: Material brought in from elsewhere to fill in an area (including QAL)

Radionuclide soil Fallout value (background) applies to all Depth intervals.

- If Rad analyte is detected and is above the soil Fallout value at any depth, then it is included in the SID table.
- If Rad analyte is not detected or is detected below the soil fallout value, at any depth, it is not included in the SID table (put -dash).
- The **exception** is Tritium, which is reported IF detected, regardless of depth interval. NO associated soil Fallout value comparisons are applicable in Fill.

Sediment: Material that is broken down by process of weathering or erosion, and subsequently transported by action of wind, water, or gravity acting on the particle itself.

Radionuclide sediment Fallout value (background) applies to all Depth intervals.

- If Rad analyte is detected and is above the sediment Fallout value at any depth, then, it is included in the SID table.
- If Rad analyte is not detected or is detected below the sediment fallout value, at any depth, it is not included in the SID table (put -dash).
- **NOTE:** If Tritium is detected above the sediment Fallout Value (0.093 pCi/g), at any depth, then, it is included in the SID table.

Tuff: Type of rock consisting of consolidated volcanic ash.

No Radionuclide Fallout values (background) are available/applicable for Tuff.

- If Rad analyte is detected, include it in the SID table.
- If Rad analyte is not detected, do not include it in the SID table (put-dash)

Gen RAD NOTE:

If Rad analytes have no Fallout value or Background value, then apply detect status rules.

- If detected, include in the SID table.
- If not detected, do not include in SID table. (put -dash)
- If not analyzed, put NA.

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Inorganics:

Background values are available for all media and applied regardless of depths.

- If Inorganic analyte is detected above BV, include it in SID table
- If Inorganic analyte is not detected or not detected above BV, do not include in SID table. (put –dash)

If no background value, then apply detect status rules.

- If detected, include in the SID table.
- If not detected, do not include in SID table. (put –dash)
- If not analyzed, put NA.

Organic:

No background value applicable.

Always apply detect status rules.

- If detected, include in the SID table.
- If not detected, do not include in SID table. (put –dash)
- If not analyzed, put NA.