Quality Assurance Project Plan (QAPP)

For

ITD D2 MS4 Permit &

Monitoring/Assessment Plan

Your Safety • Your Mobility
Your Economic Opportunity

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Acronyms and Abbreviations

ABCA	Analysis of Brownfields Cleanup Alternatives
Anatek	Anatek Labs, Inc.
ASTM	American Society for Testing and Materials
BGS	below ground surface
CFR	Code of Federal Regulations
COC	constituent of concern
DQO	Data Quality Objective
EDB	Ethylene Dibromide
EDC	Ethylene Dichloride
ESA	Environmental Site Assessment
HDPE	High-Density Polyethylene
IDEQ	Idaho Department of Environmental Quality
IDTL	Initial Default Target Level
IDWR	Idaho Department of Water Resources
LCS	Laboratory Control Sample
LLP	Lewiston Levee and Pumping Plants
LGDP	Lower Granite Dam Pool
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MDL	Method Detection Limit
MTBE	Methyl Tert-Butyl Ether
PAH	Polycyclic Aromatic Hydrocarbon
PQL	Practical Quantitation Limit
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Conditions
REM	Risk Evaluation Manual
RPD	Relative Percent Difference
RSL	Regional Screening Level
RUSL	Residential Use Screening Level
TCLP	Toxicity Characteristic Leaching Procedure
UA	Urban Area
USEPA	U.S. Environmental Protection Agency
VOC	Volatile Organic Compound

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1. Project Management

This sampling effort is being conducted as part of the ITD District 2 MS4 Assessment Project. The objective of this Quality Assurance Project Plan (QAPP) is to guide quality assurance and quality control (QA/QC) procedures for District 2 facilities and outfalls under its jurisdiction. This QAPP is intended to endure that sampling activities comply with the U.S. Environmental Protection Agency's (USEPA) requirements for QAPPs (USEPA, 2001). The primary goals will be to characterize potential soil, groundwater, or air contamination, and to potentially provide data for use in the Idaho Department of Environmental Quality's (IDEQ) Risk Evaluation Manual (REM) in order to determine potential hazards and/or risks associated with found contamination. The following sections list the key project personnel and their responsibilities, explain the problem(s) and site history, project schedules, data quality objectives, sampling, oversight, and data validation and use.

1.1 Project/Task Organization

This QAPP provides sampling strategies intended to evaluate the recognized environmental conditions (RECs) identified for the District 2 facilities and outfall sites.

ITD has assigned staff who are responsible for the development and implementation of the QAPP. The District Engineer has full authority to operate and delegate within the ITD. The District Engineer is the only one who can sign the Permit. The District Engineer delegates all tasks associated with the QAPP to the Engineering Manager. The Engineering Manager oversees the QAPP development and implementation. The Engineering Manager also oversees design and construction projects while the Operations Manager also oversees scoping and development of projects. Two Environmental Planners assist in development and implementation. The Operations Managers have responsibilities to oversee the maintenance throughout ITD and assist in implementation of the QAPP. The names and titles of those responsible for SWMP implementation are listed below.

District Engineer	----------	Doral Hoff
Engineering Manager	----------	Bob Schumacher
Operations Managers	----------	Jared Hopkins
Environmental Planner Senior	----------	Shawn Smith
Environmental Planner	----------	Neal Scott

An ITD organizational chart by title is shown below in Figure 1:

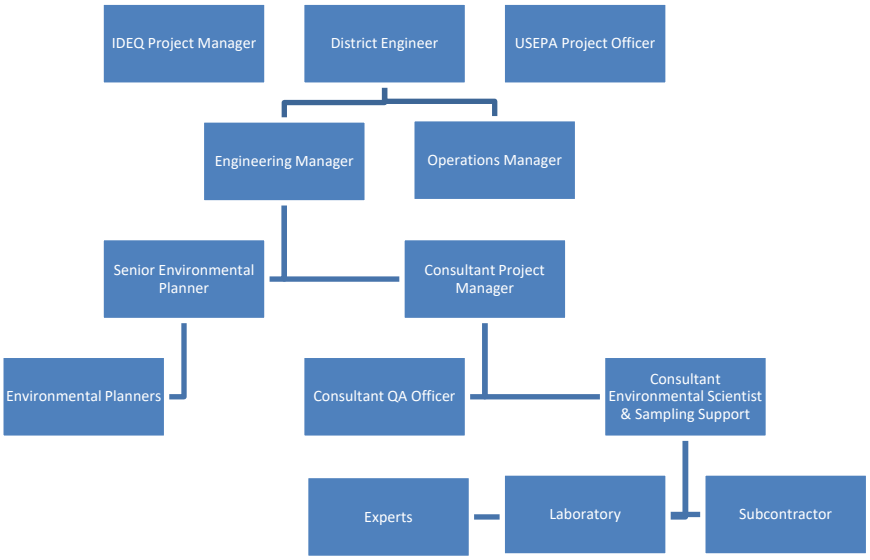

Figure 1: ITD Organizational Chart

1.2 Problem Definition/Background

ITD D2 was tasked with developing a Monitoring/Assessment plan in compliance with their SWMP and MS4 Permit with the goal of quantifying the pollutant loadings from the MS4 into the Clearwater and Snake Rivers for sedimentation/siltation. This Quality Assurance Project Plan (QAPP) will present activities and specific requirements for Quality Assurance practices for the ITD D2 to meet this goal.

1.3 Project Task/Description

The general location of the site in reference to the MS4 permit is shown in Figure 2. ITD D2 currently has 15 outfalls which ultimately discharge into the Clearwater River, see circled locations in Figure 2. These 15 outfalls are to undergo annual dry weather and wet weather outfall screenings.

Sampling activities at outfalls and maintenance yard will be conducted to evaluate the environmental condition of the site to determine potential hazards and/or risks to human health and the environment.

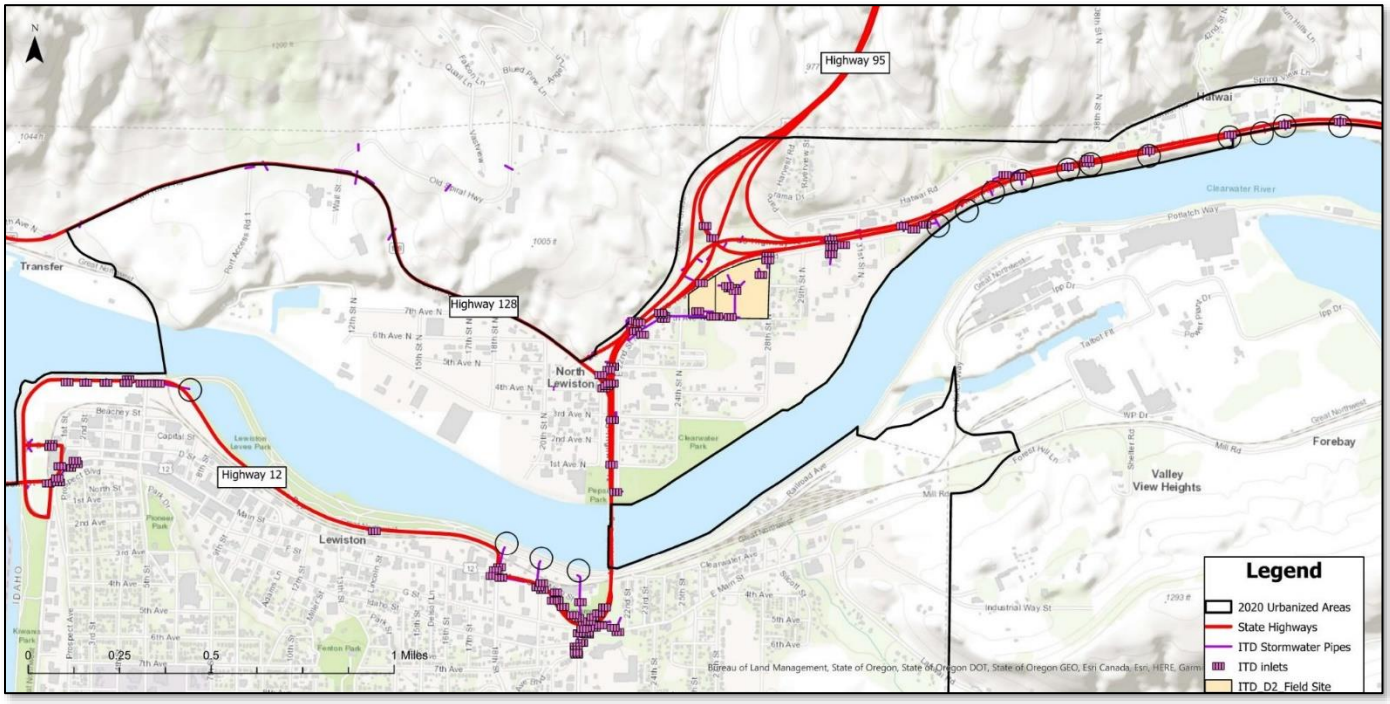

Figure 2 - Outfall Map

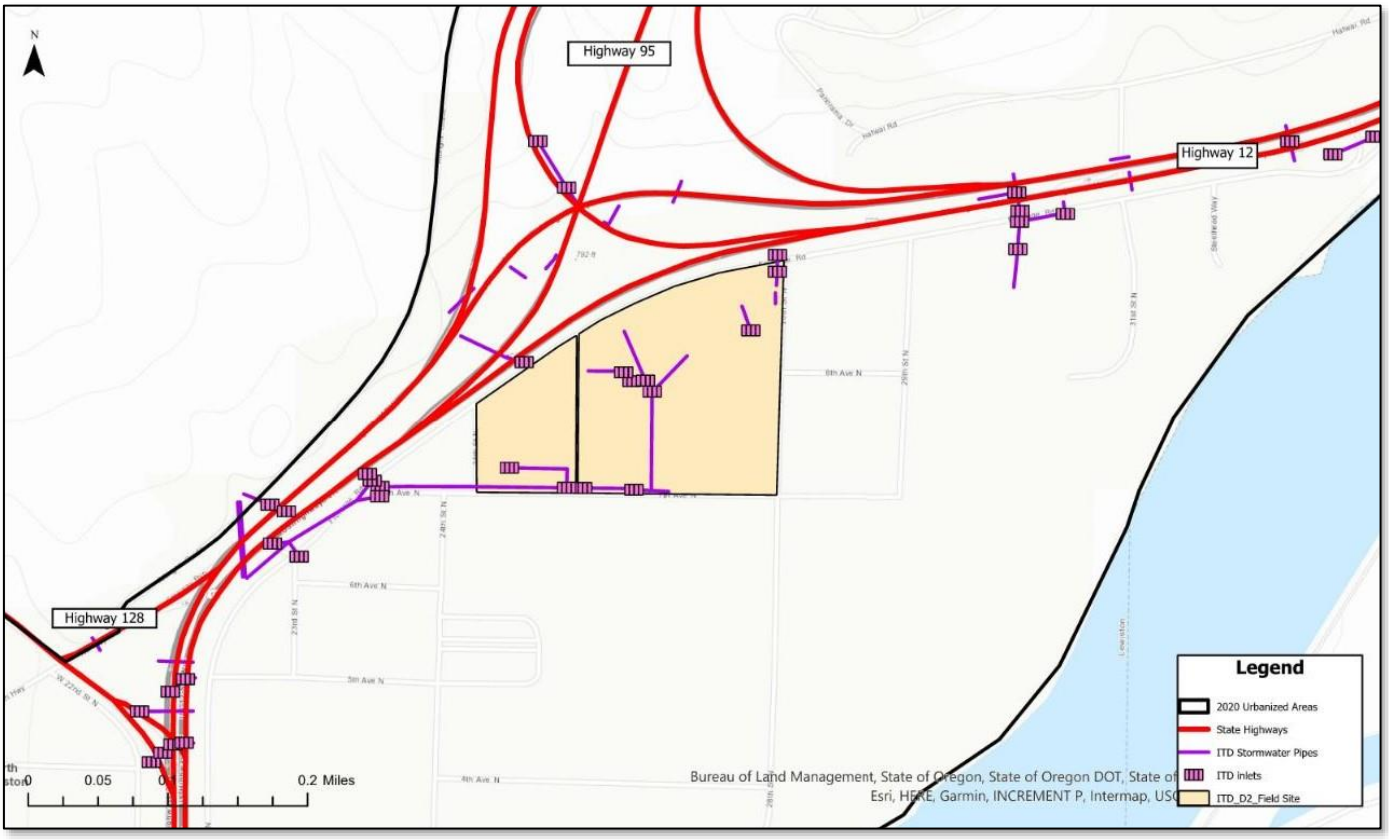

Figure 3 - Maintenance Yard and Office Site

1.3.1 Dry Weather Outfall Screening

ITD will complete a dry weather screening of the outfalls within the MS4 permit area two times annually. The purpose of this screening will be to identify any outfalls that are still discharging in dry weather and investigate the source of the flow if present. Focus will be placed upon identifying any outfalls with illicit discharges or illegal connections.

If discovered, dry weather discharges will be sampled and tested to determine: pH, total chlorine, detergents, total phenols, E. coli, total phosphorus, turbidity, temperature, and suspended solids. Results will be compared to established thresholds and existing water quality standards to determine follow-up actions.

ITD will complete the inspection visually and take pictures to document physical conditions of the outfall. Information will be logged for each outfall, including:

- Date, time, and inspector
- Time since last rain event
- Estimated quantity of last rain event
- Site description
- Visual observations
- Results of sampling/testing

1.3.2 Wet Weather Outfall Screening

ITD will complete a wet weather screening of the outfalls within the MS4 permit area two times annually (during the rainy season). The purpose of this screening will be to monitor the outfalls that are discharging and visually inspect the flow conditions. Focus will be placed upon identifying any outfalls with a high concentration of contaminants discharging to the MS4.

Wet weather discharges will be sampled and tested to determine: pH, total chlorine, detergents, total phenols, E. coli, total phosphorus, turbidity, temperature, and suspended solids. Results will be compared to established thresholds and existing water quality standards to determine follow-up actions.

ITD will complete the inspection visually and take pictures to document physical conditions of the outfall. Information will be logged for each outfall, including:

- Date, time, and inspector
- Current weather conditions
- Site description
- Visual observations
- Results of sampling/testing

1.3.3 Inspection of Existing Facilities

During each of the outfall screenings, any associated structures (catch basins, manholes, etc.) will also be inspected. Physical damage, debris, clogs, or other issues will be noted and logged to be responded to. ITD currently performs normal cleaning of catch basins, roadway sweeping, and other maintenance throughout the year.

ITD will provide Monitoring and Assessment oversight as determined by the plan. Oversight of the Monitoring and Assessment by ITD will be conducted to provide a record and documentation of the planned activities. The intent of the Monitoring and Assessment is to quantify the pollutant loads being conveyed to the Clearwater River as noted in the SWMP. ITD shall note any results, deficiencies, or concerns during the Monitoring and Assessment. ITD may contract with a sampling/testing facility or other contractor to help complete this work.

Should deficiencies or issues be noted, the ITD shall notify DEQ and provide documentation. Corrective action may be required or recommended by DEQ, which will then be evaluated by the ITD in accordance with the plan. Distribution of findings and resolutions of any deficiencies will be by ITD and provided to DEQ in a timely manner.

1.3.4 Report Preparation

Anatek will prepare a report documenting outfall screening/sampling field activities and analytical findings with provided samples from ITD's representative (hired consultant or the City of Lewiston). Analytical test results will be compared to IDEQ Initial Default Target Level's (IDTLs) and/or Residential Use Screening Level's (RUSLs) Concentrations detected above reporting limits will be input to the IDEQ risk evaluation manual to evaluate outfall conditions. The report will include the purpose, scope, methods, and findings for the sampling, screening level/target level comparisons, risk assessment, figures, findings, conclusions, and recommendations for necessary additional investigation, if any. Anatek will submit an electronic draft report to ITD District 2. After receipt and discussion of comments, Anatek will incorporate comments, finalize, and submit to ITD District 2 an electronic version of the final report and figures in Adobe Acrobat format.

1.3.5 Project Timetable

The project timetable is as follows:

- QAPP and site-specific Health and Safety Plan preparation and approval (2023)
- Coordination with Analytical Laboratory (February/March 2024)
- Site Utility locates (February/March 2024)
- Field Work (February/March 2024)
    - Outfall water sampling.
- Laboratory Analysis (April 2024)
- Risk Evaluation (April/May 2024)
- Report Preparation (May/June 2024)
- Draft Report Submittal (April 2025)
- Report Finalization (April 2025)

1.4 Quality Objectives and Criteria

Consideration of data quality begins with the identification of data uses and data types. The USEPA Data Quality Objective (DQO) process used as a model for this project is described in *USEPA Guidance on Systemic Planning Using the Data Quality Objectives Process USEPA QA/G-4* (USEPA, 2006). This document outlines processes that are general in nature to any environmental investigation.

1.4.1 Data Quality Objectives Process

The DQO process results in a set of specifications needed to support the qualitative and quantitative design of a data collection effort. DQOs are used to assess the adequacy of data in relation to their intended use (USEPA, 2002a,b). USEPA's seven-step process for DQO development is presented below (**Figure 4**) to communicate the quality objectives for site and outfall assessment activities associated with the MS4 areas.

1.4.1.1 State the Problem

This assessment will quantify pollutant loadings from the MS4 into the Clearwater and Snake Rivers for sedimentation/siltation. Dry and wet weather discharges will be sampled and tested to determine: pH, total chlorine, detergents, total phenols, E. coli, total phosphorus, turbidity, temperature, and suspended solids.
On September 15, 2020, the U.S. Environmental Protection Agency Region 10 (EPA) issued a National Pollutant Discharge Elimination System (NPDES) permit for discharges from the municipal separate storm sewer systems (MS4) owned and/or operated by the Idaho Transportation Department-District 2 (ITD2) in Nez Perce County, Idaho. The Permit became effective on November 1, 2020 and expires on September 30, 2025.

On May 24, 2021, as a result of Endangered Species Act (ESA) Section 7 consultation with the National Marine Fisheries service (NMFS), EPA proposed to modify the Permit to require additional pollutant reduction activities.
1 EPA explained its rationale in its Modification Fact Sheet that the proposed revisions address the reasonable and prudent measures identified by NMFS in its Biological Opinion dated May 5, 2021.

1.4.1.2 Identify the Decision

Samples will be collected and analyzed against IDEQ discharge levels.
Samples will be collected and analyzed for the analytes identified in **Table 2**. Analyte concentrations will be compared against IDEQ REM IDTLs (IDEQ, 2004) and/or IDEQ petroleum rule RUSLs (IDEQ, 2011).

1.4.1.3 Identify inputs to the decision

Analytical data are needed to adequately evaluate potential impacts to the site's outfalls. The targeted analytes and regulatory action levels (IDTLs/RUSLs) needed to adequately provide information for decisions on potential Constituent of Concern (COCs) are provided in this QAPP (**Table 2**) . Specifics on those methodologies and relevant measurement characteristics can be found in Section 2.0.

1.4.1.4 Define the study boundaries

The portion of the ITD2 MS4 within the Lewiston Urban Area (UA) serves approximately 0.367 square miles along the state highway right of ways, and in general discharges through the Lewiston Levee and Pumping Plants (LLPs) to the Clearwater Arm of the Lower Granite Dam Pool (LGDP). Segments of state highway system that are owned and/or operated by ITD2 include the following:

- Route 1 - U.S. 12: Milepost 0 – 3.29. Length of segment is 3.29 miles. Along U.S. 12, beginning at the west city limits on Interstate Bridge via Snake River Ave., First Street, D Street Extension, east along the Dike Bypass to 18th/Main Street Intersection, continuing east along Main Street to 21st Street/G Street Intersection, then across the Memorial Bridge to the east end of the U.S. 12 – U.S. 95 Interchange.
- Route 2 - U.S. 95: Milepost 310.75 – 312.50. Length of segment is 1.75 miles. Along U.S. 95, beginning at the east city limits, through the U.S. 12 – U.S. 95 Interchange, including all ramps, to the base of Lewiston Hill.
- Route 3 - State Highway 128: Milepost 0 – 2.198. Length of segment is 2.198 miles. Along State Highway 128, beginning at the west city limits, continuing east to S.H. 128/U.S. 12 Intersection including all ramps.
- Route 4 - Frontage Road: Milepost 2.403 – 3.398 on U.S. 12. Length of segment is 0.995 miles. Includes the Frontage Road from 3rd Avenue's intersection of U.S. 12 east to the end of the Frontage Road where it intersects

U.S. 95/U.S. 12.

In July 2001, ITD2 and the City entered into a Cooperative Agreement for Maintenance of State Highway U.S. 12 and its Frontage Road; U.S. 95; and State Highway 128. Under the Cooperative Agreement, the City operates and maintains the physical storm facilities along select routes within City limits, while ITD D2 conducts snow removal, culvert maintenance, and maintenance of unimproved roadsides on U.S. 95 and State Highway 128 only. The City and ITD will perform the regular maintenance and operative functions on each of the sections of roadway as have been specifically delegated in the 2001 Cooperative Agreement. Excerpts from the agreement are included below. ITD D2 currently maintains the MS4 permit for the urbanized areas of Lewiston assigned to them.

MAINTENANCE FUNCTION	AGENCY TO PERFORM WORK				
ROADWAY	Route No. 1	Route No 2.	Route No. 3	Route No.	Route No.
1. Surface Repair	STATE	STATE	STATE		
2. Crack Sealing	STATE	STATE	STATE		
3. Sweeping and Cleaning	CITY	STATE	STATE		
4. Snow Removal	CITY	STATE	STATE		
5. Utilities	CITY	CITY	CITY		
6. Culverts	CITY	STATE	STATE		
7. Storm Sewers	CITY	CITY	CITY		

MAINTENANCE FUNCTION	AGENCY TO PERFORM WORK				
ROADWAY	Route No. 4	Route No.	Route No.	Route No.	Route No.
1. Surface Repair	CITY				
2. Crack Sealing	CITY				
3. Sweeping and Cleaning	CITY				
4. Snow Removal	CITY				
5. Utilities	CITY				
6. Culverts	CITY				
7. Storm Sewers	CITY				

In 2007, ITD2 clarified in its comments submitted to the EPA that, under the Cooperative Agreement, "Within the Lewiston MS4 Area, ITD maintains 11 active culvert locations ….and associated ditches. These facilities rarely receive flow and are often dry, even during rain events……ITD only has…two direct outfalls to the Clearwater River."

1.4.1.5 Develop a decision rule

Site assessments involve collecting environmental data to support cleanup alternatives and/or redevelopment. Cleanup alternatives will likely focus on cleanup or removal of routes of exposure to contamination by human and ecological receptors. To assess the feasibility of cleanup and/or redevelopment, Anatek will evaluate available data and make decisions based on the following decision statements:

- Do portions of the site contain contaminants above cleanup levels that would preclude residential, commercial, and/or recreational redevelopment or use?
- Does contamination at the site have the potential to negatively affect human health and/or the environment?
- Are there portions of the site that will not require any assessment or cleanup prior to redevelopment, remodeling or demolition, and/or continued use?

1.4.1.6 Specify limits on decision errors

Detection limits will meet the DQOs for comparison to the IDTLs and RUSLs or multiples thereof.
To ensure the data quality is acceptable for use, Section 4.0 outlines all the specified tolerable limits and decision errors or the data obtained during this project.

1. State the Problem:

Determine if recognized environmental conditions have negatively impacted the site.

2. Identify the Decision:

Do the recognized environmental conditions (RECs) identified on-site result in concentrations of COCs exceeding IDTLs or RUSLs (Residential Use Screening Levels)?

3. Identify Inputs to the Decision:

Research and/or sample data collected from the project site, including soil and groundwater data.

4. Define the Study Boundaries:

The site, located at 207 N. Main Street, Moscow, Idaho (Figure 3). Soil and groundwater data will be collected.

5. Develop a Decision Rule:

Concentrations for samples collected will be compared against IDTLs and/or IDAPA petroleum rule RUSLs. Vapor data (if later collected) will be compared to USEPA RSLs (which may also have a multiplier depending on the sample location).

6. Specify Limits on Decision Errors:

Detection limits will meet the DQOs for comparison to the IDTLs/RUSLs/RSLs.

7. Optimize the Design for Obtaining Data:

Samples will be collected per this site-specific QAPP to provide data for use in the REM.

Figure 4 - DQO Process Flow Chart

1.4.2 Data Quality Indicators

The purpose of this section is to provide qualitative and quantitative information that defines the goals for data quality at the site. The primary goal of sampling and analysis is to perform a risk assessment using newly acquired and historical defensible data. The data for this project plan must be of known quality. **Table 1** lists the data quality criteria requirements.

1.4.2.1 Precision

Precision is a measure of data variation when more than one measurement is taken on the same sample. The precision estimate for duplicate measurements can be expressed as the relative percent difference (RPD):

$$RPD = \left| \frac{(C_1 - C_2)}{\left(\frac{(C_1 + C_2)}{2}\right)} \right| \times 100\%$$

Where:
RPD = Relative percent difference
C_1 = Concentration of QA/QC sample
C_2 = Concentration of associated original

Acceptable precision limits are based on past databases, as defined by USEPA. Laboratory duplicate measurements will be obtained for each set of samples submitted and analyzed.

1.4.2.2 Accuracy

Accuracy of laboratory analysis is assessed by measuring standard reference material and spiked samples. Standard reference materials are used to calibrate laboratory measurement instruments.
Accuracy is determined by splitting a sample into two portions, spiking one portion with a known quantity of a constituent of interest, and analyzing both portions determine spike recovery. Spike recovery is expressed as percent recovery:

$$\%R_S = \left| \frac{(SC - OC)}{TV} \right| \times 100\%$$

Where:
$\%R_S$ = Percent recovery of spike
SC = Spiked sample concentration
SC = Original concentration
TV = True value of the added spike

Acceptable spike recovery limits are based on past data sets as defined by USEPA.

1.4.2.3 Representativeness

This term expresses the degree to which the data accurately and precisely represent actual conditions or characteristics of the site. Representativeness may be evaluated for this project using background samples collected from areas isolated from, yet similar to, the site and analyzed for the same constituents. Representativeness will most likely not be evaluated for this project.

1.4.2.4 Completeness

Completeness is an estimate of the amount of valid data obtained from the analytical measurement system for a given set of data. The percent completeness is defined as the number of samples analyzed that meet the data quality goals divided by the total number of samples analyzed multiplied by 100. The completeness goal for this project is 95%.

Table 1 - Data Quality Criteria Requirements

Data Quality Parameter	Acceptable Criteria
Precision	±20%
Accuracy (Bias)	75%-125%
Completeness	95%

1.4.2.5 Comparability

Using standard USEPA accepted protocols, all matrix-specific samples will be collected, processed, and analyzed at sufficient detection limits, precision, and accuracy for correlation with existing available data.

1.5 Special Training/Certification

Any personnel performing sampling at the site will have training required by 29 Code of Federal Regulations (CFR) 1910.120 if necessary (Occupational Safety and Health Administration Hazardous Waste Operations Health and Emergency Response Training). Documentation of necessary training and certifications will be provided upon request. It is anticipated that sampling activities will not require hazardous waste certifications.

1.6 Documents and Records

During the Monitoring and Assessment activities, ITD may be required to procure the services of a Testing Lab to provide any testing as required. All reports and results of the sampling and materials testing shall be recorded and provided to DEQ in a timely manner to provide adequate oversight of the project.
ITD will provide updates to DEQ with regards to the permit compliance yearly as identified by the current permit (MS4 Yearly Report). Reports will be generated and distributed by the ITD, as well as posted online.

1.6.1 Field Operation Records

1.6.1.1 Sample Collection Records

ITD will use field specific tablets to electronically document the samplers' names, sample numbers, sample location points, maps and diagrams, equipment/method used for sample collection, weather conditions, and all observations.

1.6.1.2 Photographic Records

Photographs will be taken of representative sampling locations and the surrounding site to show the area, related site activities, and sampling equipment.

1.6.1.3 Chain-of-custody Records

The chain-of-custody record will be filled out and kept to track samples from collection through delivery to the laboratory following the ASTM guidance Standard Guide for Sampling Chain-of-Custody Procedures (D-4840-99) (ASTM, 2004).

1.6.1.4 QA/QC Sample Records

QA/QC samples (i.e., field duplicates) will be documented in the field notebook. This documentation will include custody seals, calibration history, level of standards, and the frequency and type of the QA/QC sample.

1.6.1.5 General Field Procedures

The field procedures will be documented in the field notebook and will specify the method of collection.

1.6.1.6 Corrective Action Reports

Should the primary method of sample collection fail, the corrective action or alternative method will be documented in the field notebook and reported.

1.6.2 Laboratory Records

1.6.2.1 Sample Data

The laboratory will follow the appropriate guidelines, which includes recording the times that samples were analyzed to verify holding times were met. The overall number of samples, sample location information, and date will be reported as well as any corrective action procedures for samples violating this site-specific QAPP protocol.

1.6.2.2 Sample Management Records

The laboratory will maintain detailed procedures for its recordkeeping in order to support the validity of analytical work. Each data report package submitted to Anatek will contain the analytical laboratory's written certification that the requested analytical method was run and that QA/QC checks were performed. After a technical data review conducted by the laboratory and the project QA officer, the data will be sent to the District where it will be archived according to State or Federal records retention policies, whichever is more restrictive.

1.6.2.3 QA/QC Reports

Anatek will complete internal QA/QC to ensure the quality of the data.

1.6.3 Data Handling Records

The laboratory's QA personnel will perform the data validation. The data validation will convert raw data into reportable quantities and units by properly applying significant figures, recording extreme values, and identifying data qualifiers. The data will then be transmitted electronically and/or in hard copy to Anatek, who will perform an internal QA/QC assessment. The internal QA/QC will document that the data meets the proposed DQOs.

2. Data Generation and Acquisition

2.1 Sampling Process Design (Experimental Design)

ITD D2 currently has 15 outfalls, these are seen in **Figure 2**. These 15 outfalls are to be inspected four times annually, two times during the dry season for dry weather outfalls, and two times during the wet season for wet weather outfalls. Each inspection will test the discharge Ph, total chlorine, detergents, total phenols, E. coli, total phosphorus, turbidity, temperature, and suspended solids.

2.2 Sampling Methods

2.2.1 Outfall Sampling

Stormwater Outfall samples will be sampled referencing *NDPES Storm Water Sampling Guidance Document* (USEPA, 1992). Using the required sampling container(s), stormwater grab samples will be collected directly from the pipe flow at the outfall. If the outfall is in a place that is difficult to access, the sampling container(s) may need to be fastened to a pole in order to reach the pipe flow. Glass containers only (as samples testing for total phenols are required to be collected and stored in glass containers, NDPES) shall be used to collect samples of volumes required by USEPA or laboratory standards. As stated in the Monitoring and Assessment Plan, each outfall will be sampled two times annually during both wet weather and dry weather, for a total of four samples annually. Water quality parameters to be measured include: Ph, total chlorine, detergents, total phenols, E. Coli, total phosphorus, turbidity, temperature, and total suspended solids. Results will be compared to established thresholds and existing water quality standards to determine follow-up actions. Outfall water grab samples will be containerized and stored on-site, then disposed of at an appropriate facility once characterized. Based upon information provided by IDEQ, it is assumed the samples will not be considered hazardous waste; however, this will ultimately be determined by sample results.

2.3 Sample Handing and Custody Procedures

The following section identifies the sample numbering system and chain-of-custody procedures. To prevent duplication and allow future users of the data to quickly identify general sample locations by site, all sample numbers will start with the site designations S1, S2, S3, S4, … or S15 as applicable. The Lewiston Levee outfall will have a designation of S1, the furthest east outfall between Hatwai Access Road and 49th Street North will have a designation of S15.

2.3.1 Sample Numbering System

Each Stormwater Outfall water sample collected will have a unique field sample identification code that will include the site designation and the date the sample was collected. The field sample identification name code will be in the following format: Site designation-Annual site sample number-Date (MMDDYYYY). For example, the field sample identification code for the second annual Stormwater Outfall water sample collected from outfall 5 on March 4, 2024 would be S5-2-03042024.

2.3.2 Sample Custody

Each sample will be identified on a chain-of-custody record. Information recorded will include at a minimum the site name, sampler name(s), date and time of sample collection, sample identification code, number of containers for each sample, analyses requested for each sample, and signature blocks for each individual who has custody of the sample(s). Samples will be submitted to the laboratory and maintained at the laboratory under chain-of-custody. Final reports, which include all original laboratory reports and chains-of-custody, will be maintained in Anatek's project file system.

2.4 Analytical Methods

Physical/Chemical Methods (SW-846) (USEPA, 2008) by an off-site analytical laboratory. Sample analysis will be in accordance with approved USEPA analytical methods, and shall comply with 40 CFR 136. See **Table 2** for techniques, method numbers, and reporting limits for analysis. Reporting limits for soil and groundwater will meet or be less than the IDEQ REM IDTLs (IDEQ, 2004) and/or IDEQ petroleum rule RUSLs (IDEQ, 2011).

Table 2 – Laboratory Analyses of Water Quality Samples

Parameter	Method	Detection Limit mg/L (except where noted)	Sample Volume (oz) & Preservative (if needed)	Sample Holding Time (days)
Ph	ASTM D1293-18	6.0-9.0 s.u.	2	15 min (field test)
Chlorine, total	ASTM D1253-08	.04	1	28
Detergents (via surfactants)	ASTM D2330-02, SMEWW 5540C	.25	4	28
Phenols, total recoverable	ASTM D1783-01	.1	16, H_2SO_4 to Ph<2	28
Phosphorous, total	ASTM D515-88	0.05	8	28
Turbidity	ASTM D1889	0.01 NTU	8	2
Solids, total suspended	ASTM D5907-18	2	32	7
Escherichia coli	ASTM D5392-19	1 colony	8[b]	.25

2.5 Quality Control

QC samples will be employed to evaluate data quality. QC samples are controlled samples introduced into the analysis stream whose results are used to review data quality and to calculate the accuracy and precision of the chemical analysis program. The purpose of each type of QC sample, collection and analysis frequency, and evaluation criteria are described in this section.

2.5.1 Field Quality Control Checks

Field QC checks are accomplished through the analysis of controlled samples that are introduced to the laboratory from the field. Field duplicate samples (QC samples) indicate the precision of the sampling and analysis program for detectable analytes. Field duplicates will be collected from stormwater outfalls and submitted to the laboratory, to provide a means of assessing the quality of data resulting from the field sampling program.

The duplicate stormwater sample is collected immediately after the original sample. The sample bottle is labeled as a duplicate sample. The QC samples, along with the original samples, will be sent to the analytical laboratory. QC samples will be collected at a frequency of 1 per sampling event per site (**Table 3**).

Table 3 Field Quality Control Checks

Quality Control Check	Frequency
Field duplicate (outfall water)	1:sampling event

2.5.2 Laboratory Quality Control Checks

QC procedures for the laboratory's analyses will be consistent with the requirements described in the laboratory's Standard Operating Procedures (SOPs) and QA manuals. The laboratory QC will include appropriate duplicates, laboratory control samples (LCS), matrix spikes/duplicates (MS/MSD), method blanks, reporting limits, holding times, dilutions, etc., as outlined in the appropriate guidance document. The frequency of each type of sample is shown in **Table 4**.

Table 4 Laboratory Quality Control Checks

Quality Control Check	Frequency
MS/MSD	1:10 samples
LCS	1:10 samples
Method Blank	1:10 samples
Laboratory Duplicate	1:10 samples

2.6 Instrument/Equipment Testing, Inspection, and Maintenance

Field measurement equipment used to support sampling will be tested, inspected, and maintained in accordance with the manufacturer's specifications. Testing and maintenance activities will be recorded in the field logbook.
The laboratory will be responsible for the maintenance of laboratory instruments and equipment. Instruments, and the measurements made as part of the analytical methodology, will be as specified in the method, without modification. The laboratory's QA program ensures that only trained personnel perform routine maintenance on all major instruments and that repairs are performed by trained laboratory personnel or service technicians employed by the instrument manufacturer or representative. Instrument maintenance will be appropriately documented through the use of instrument logs, which will be included in the laboratory project file.

2.7 Instrument/Equipment Calibration and Frequency

Laboratory instrument calibration and frequency will follow the guidance outlined in USEPA methodology and certification requirements. Field instruments (e.g., PID, water quality probe) will be calibrated in accordance with the manufacturer's specifications, and the calibration confirmation will be documented in the field notebook.

2.8 Inspection/Acceptance of Supplies and Consumables

2.8.1 Anatek

Anatek will use services and supplies of adequate quality. Anatek maintains a procedure for the purchase, storage, and evaluation of supplies and services. Records of inspections, verifications, and supplies will be maintained by Anatek.

2.9 Non-direct Measurements

This project may rely upon secondary data including online IDEQ regulatory data, interviews, and other historical data as shown in **Table 5**.

Table 5 Non-Direct Measurements (i.e., Secondary Data)

Data Sources	Intended Use	Rationale for Use	Acceptance Criteria
Previous Investigation Reports	Historical Background	Accepted source of site information	Not required; reference information only

2.10 Data Management

Figure 5 is a diagram of the data management process.

2.10.1 Data Validation

Anatek will conduct an internal data validation of the laboratory-supplied data in accordance with the USEPA data validation guidance (USEPA, 2002b). This document contains the details on technical data review criteria such as precision, bias, accuracy, representativeness, comparability, and completeness. Specifics on each criterion are discussed in **Section 1.4.2.** Anatek will conduct an internal data validation and QA/QC review of all data collected in the field and provided from the laboratory.

2.10.2 Data Recording

Anatek will receive the data from the laboratory and prepare useful data tables. After Anatek has conducted the internal data validation, the data tables will be updated with relevant data qualifiers.

2.10.3 Data Transformation

The raw or validated data will be available for third party data transformation by request.

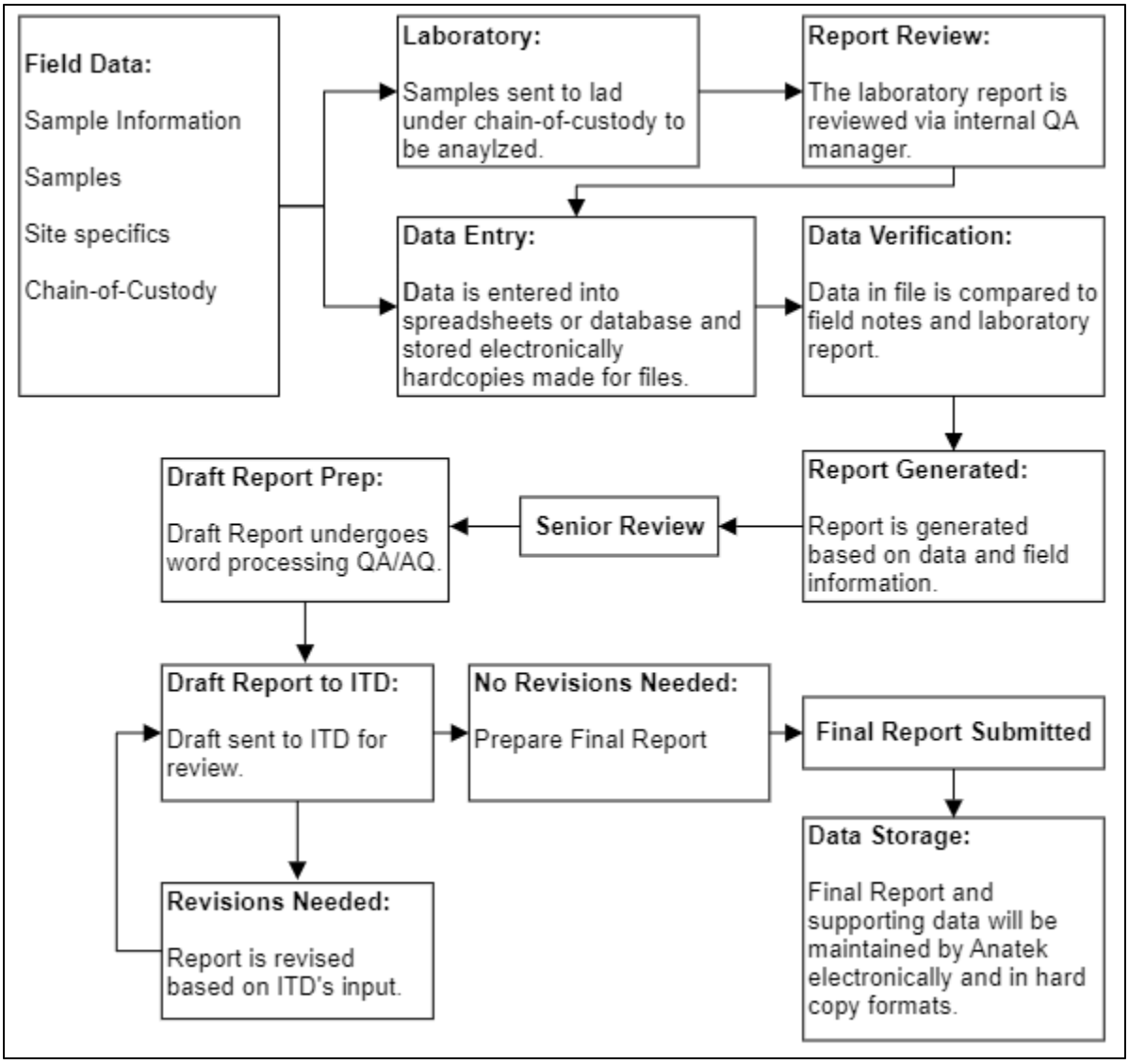

Figure 5 Data Management Diagram

2.10.4 Data Transmittal

Either Microsoft Excel© or Access© will be used for the transmittal and tracking of data.

2.10.5 Data Reduction

No data reduction will be completed as part of this project. Third parties may reduce the data in the future for analysis and modeling.

2.10.6 Data Analysis

The data may be subjected to various statistical analysis and/or modeling supporting risk analysis. In general, minimum, maximum, means, standard deviations, etc., may be generated.

2.10.7 Data Tracking

This project will use Microsoft Excel© or Access© to track sample numbers and forms.

2.10.8 Data Storage and Retrieval

The data will be stored in electronic form as a Microsoft Excel© or Access© document. In addition, hard copies will be available upon request.

3. Assessment and Oversight

3.1 Assessments and Response Actions

Inspections will consist of, as appropriate, an evaluation of QA/QC procedures and the effectiveness of their implementation, an evaluation of work areas and activities, and a review of project documentation, to verify compliance with QAPP requirements. Additional inspection items may be added, as necessary, by the Project Manager, the Environmental Scientist, or ITD.

Field operations assessments by the Environmental Scientist or designee may include evaluating the availability of appropriate and approved procedures; implementation of sampling procedures; calibration and operation of equipment; labeling, packaging, storage, and delivery of samples; and documentation of deviations from the QAPP and nonconformance.

All inspection findings that are not resolved during the course of the assessment and affect the overall quality of the project, will be discussed immediately with the Project Manager, regardless of when they are resolved. The Project Manager will ensure the necessary corrective actions are initiated and completed.

3.2 Reports to Management

During the Monitoring and Assessment activities, the ITD may be required to procure the services of a Testing Lab to provide any testing as required in the plan (turbidity, sedimentation, etc.). Frequency of the testing or nature of the materials to be tested are listed in the Monitoring/Assessment plan. All reports and results of the sampling and materials testing shall be recorded and provided to DEQ in a timely manner to provide adequate oversight of the project. DEQ will review the testing reports and results and distribute as required.ITD will provide oversight to tests or materials to ensure that any recommended improvements are completed in a timely manner.

The data from the sampling events will be made available to ITD, IDEQ, and USEPA. An environmental assessment report will be prepared and delivered to ITD. The report will describe sampling procedures and provide photographs and figures of sampling locations. The report will discuss analytical precision, accuracy, representativeness, comparability, completeness, and sensitivity, and whether the analytical data meet the project DQOs. If COCs are detected above the reporting limits, a site characterization will be provided in the report. Electronic report copies will be provided.

4. Data Validation and Usability

4.1 Data Review, Verification, and Validation

Data deliverables will include a case narrative, analytical results, and laboratory QC sample results. Review of analytical data will be performed by the laboratory under the direction of the laboratory's technical staff and QA Officer. Laboratory procedures for data review are discussed in the Laboratory QA Plan. The case narrative will identify whether any laboratory QC data are outside of the Laboratory's QC criteria. Anatek will track the status of the data from time of sample collection through analysis and reporting. Once the data is reported by the Laboratory, Anatek will review the sample data, case narratives, and lab and field QC data to determine the data quality and assess data usability relative to the project's DQOs.

4.2 Verification and Validation Methods

Data will be verified by reviewing chain-of-custody forms, sample preservation records, analytical holding times, case narratives, sample data as compared to QC sample data, requested turnaround time, and reporting requirements. Problems or questions will be discussed with the Laboratory by the data reviewer for resolution and/or documentation. Data will be validated upon reviewing data quality indicators, and data qualifiers will be applied to the data based on USEPA Guidance on Environmental Data Verification and Data Validation (USEPA, 2002b).

4.3 Reconciliation with User Requirements

Data assessment will involve reviewing the data with respect to project DQOs. A data usability assessment summary will be included in the Phase II report. If project DQOs are not satisfied, Anatek's Project Manager will review the circumstances affecting the data usability and evaluate alternative options or resolutions.