COMPLETE

ENGINEERING CHANGE NOTICE

1. ECN 602946

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	3a. USQ Required?	4. Date
Supplemental [] Direct Revision [x] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	H. M. Knotek, Liquid Effluent Engineering, L6-05, 373-7528	[] Yes [x] No	5/26/95
	5. Project Title/No./Work Order No. L045H//A2217	6. Bldg./Sys./Fac. No. 310//	7. Approval Designator EQ
	8. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-L045H-PLN-004, Rev. 0	9. Related ECN No(s).	10. Related PO No.

11a. Modification Work	11b. Work Package No.	11c. Modification Work Complete	11d. Restored to Original Condition (Temp. or Standby ECN only)
[] Yes (fill out Blk. 11b) [X] No (NA Blks. 11b, 11c, 11d)	N/A	N/A Cog. Engineer Signature & Date	N/A Cog. Engineer Signature & Date

12. Description of Change

- Program Organization and Responsibilities were changed to reflect current organizational structure.
- Sampling frequencies, sampling equipment, and measurement of field parameters were changed to reflect current status.

13a. Justification (mark one)

Criteria Change	[X]	Design Improvement	[]	Environmental	[]	Facility Deactivation	[]
As-Found	[]	Facilitate Const	[]	Const. Error/Omission	[]	Design Error/Omission	[]

13b. Justification Details

Monitoring plan was changed to current operation status.

14. Distribution (include name, MSIN, and no. of copies)

See Distribution Sheet

RELEASE STAMP

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DATE SEP 06 1995

Sta. 21

A-7900-013-2 (11/94) GEF095

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1) 602946

15. Design Verification Required	16. Cost Impact				17. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[] Yes	Additional	[] $	Additional	[] $	Improvement	[]
[X] No	Savings	[] $	Savings	[] $	Delay	[]

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

SDD/DD	[]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Design Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[]
Equipment Spec.	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[]
Vendor Information	[]	Operating Procedure	[]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]	Tickler File	[]
Environmental Report	[]	Inspection Plan	[]		[]
Environmental Permit	[]	Inventory Adjustment Request	[]		[]

19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision

20. Approvals

Signature	Date	Signature	Date
OPERATIONS AND ENGINEERING		ARCHITECT-ENGINEER	
Cog. Eng. C. M. Loll	6/22/95	PE	
Cog. Mgr. D. L. Halgren	6/30/95	QA	
QA M. J. Warn	8/29/95	Safety	
~~Safety~~ N/A		Design	
Environ. R. W. Szelmeczka	8/1/95	Environ.	
SDLA ~~W. E. Strohben~~ M.E Hendrix	7/31/95	Other	
~~L. W. Roberts~~ N/A			
H. M. Knotek	6/29/95		
		DEPARTMENT OF ENERGY	
		Signature or a Control Number that tracks the Approval Signature	
		ADDITIONAL	

RELEASE AUTHORIZATION

Document Number:	WHC-SD-L045H-PLN-004, Rev. 1
Document Title:	300 Area TEDF NPDES Permit Compliance Monitoring Plan
Release Date:	September 9, 1995

This document was reviewed following the procedures described in WHC-CM-3-4 and is:

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:

T.L. Ontiveros — September 9, 1995

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SUPPORTING DOCUMENT

1. Total Pages 29 28

2. Title	3. Number	4. Rev No.
300 Area TEDF NPDES Permit Compliance Monitoring Plan	WHC-SD-L045H-PLN-004	1

5. Key Words	6. Author
Analysis, Compliance, Effluent, Monitoring, TEDF, 300 Area, NPDES, Plan, Sampling	Name: C. M. Loll/H. M. Knotek Signature Organization/Charge Code 86730/A2217

7. Abstract

This document presents the 300 Area Treated Effluent Disposal Facility (TEDF) National Pollutant Discharge Elimination System (NPDES) Permit Compliance Monitoring Plan (MP). The MP describes how ongoing monitoring of the TEDF effluent stream for compliance with the NPDES permit will occur. The MP also includes Quality Assurance protocols to be followed.

8. RELEASE STAMP

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BY WHC
DATE SEP 06 1995
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RECORD OF REVISION	(1) Document Number WHC-SD-L045H-PLN-004	Page 1

(2) Title
300 Area TEDF NPDES Permit Compliance Monitoring Plan

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release	
		(5) Cog. Engr.	(6) Cog. Mgr. Date
0	(7) EDT # 600909, Oct. 13, 1994		
1 RS	ECN # 602946, Direct Revision	9-5-95	9/5/95

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TABLES AND FIGURES

Acronyms/Abbreviations

COC	Chain-of-custody
DMR	Discharge Monitoring Report
DOE-RL	Department of Energy, Richland Operations
Ecology	Washington Department of Ecology
EM	Effluent Monitoring
HDPE	High Density Polyethylene
LEE	Liquid Effluents Engineering
LEF	Liquid Effluent Facilities
MP	Monitoring Plan
MS/MSD	Matrix Spike/ Matrix Spike Duplicate
NPDES	National Pollutant Discharge Elimination System
Operations	LEF Operations Staff
OSHA	Occupational Safety and Health Administration
PLC	Process Logic Controller
QA/QC	Quality Assurance/Quality Control
RPD	Relative Percent Deviation
SAF	Sample Authorization Form
SDLA	Sample Data and Laboratory Administration
SML	Sampling Mobile Laboratories
SOW	Statement of Work
TEDF	Treated Effluent Disposal Facility
TPA	Tri-Party Agreement
TSS	Total Suspended Solids
WAC	Washington Administrative Code
WHC	Westinghouse Hanford Company
WSCF	Waste Sampling and Characterization Facility

Executive Summary

This monitoring plan describes the activities and methods that will be employed at the 300 Area Treated Effluent Disposal Facility (TEDF) in order to ensure compliance with the National Pollutant Discharge Elimination System (NPDES) permit. Included in this document are a brief description of the project, the specifics of the sampling effort, including the physical location and frequency of sampling, the support required for sampling, and the Quality Assurance (QA) protocols to be followed in the sampling procedures.

The TEDF was constructed as project L-045H to meet one of the milestones of the *Hanford Federal Facility Agreement and Consent Order* (Commonly referred to as the Tri-Party Agreement (TPA) (Ecology, 1989)). TEDF consists of a series of treatment processes to reduce suspended solids, dissolved metals, and organics to NPDES permit levels for discharge into the Columbia River.

Sampling will consist of both composite samples and grab samples taken from the effluent line subject to permit constraints. Proper sample collection, sample identification, and field documentation procedures will maintain control over the samples for chain of custody purposes. Samples will be taken on a biweekly basis as required by the permit. Quarterly Whole Effluent Testing (WET) and annual river monitoring analyses will also be performed. Sample analysis will be accomplished by an offsite contract laboratory. Sample Data and Laboratory Administration (SDLA), and Sampling Mobile Laboratories (SML) will provide support services to this sampling effort.

Quality Assurance (QA) protocols will be followed to maintain data integrity. These procedures include specific requirements for both field and final documentation, Quality Control samples, and proper chain of custody. Laboratory QA will also be maintained using the standards set forth in the *Hanford Analytical Services Quality Assurance Plan* (HASQAP, 1995) and the laboratory specific lab manuals. The laboratory specific lab manuals are maintained by the Sample Data and Contracts group as controlled documents.

1.0 Introduction

Sampling at the Treated Effluent Disposal Facility (TEDF) is being performed to meet the requirements of the 300 Area TEDF National Pollutant Discharge Elimination System (NPDES) Permit (Permit No. WA-002591-7).

This Monitoring Plan (MP) describes the field activities and methods associated with the collection and analysis of samples for compliance activities at the TEDF. This document also includes quality assurance documentation to ensure procedures are implemented and sampling and analysis work is performed to the level of control necessary.

2.0 Program Description

This section provides background information on the 300 Area TEDF and it's association to the Hanford site. The approach of the sampling effort and the responsibilities of the contributing organizations are also outlined.

2.1 Background

The TEDF is located on the northern-most boundary of the 300 Area of the Hanford Reservation. The Hanford Reservation is a U.S. Department of Energy (DOE) facility located in south-central Washington adjacent to the Columbia River (see Figure 2-1). A variety of office buildings, research laboratories, and support facilities (e.g., warehouses and shops) are located in the 300 Area. The TEDF collects and treats process wastewater which is discharged to the 300 Area Process Sewer by approximately 55 of these facilities and then discharges the treated wastewater to the Columbia River. The facilities connected to the 300 Area Process Sewer are listed in Table 2-1.

The process wastewater stream which is treated at TEDF consists primarily of potable water, equipment cooling water, steam condensate, water treatment salts, and laboratory and research wastewater. The mean daily flow rate is currently in the range of 130 to 250 gallons per minute, with maximum spikes attaining 1200 gallons per minute.

2.2 Facility Description

The 300 Area TEDF was constructed as part of the *Hanford Federal Facility Agreement and Consent Order* (Commonly referred to as the Tri-Party Agreement (TPA) (Ecology et. al., 1989)), under the project number L-045H. The following is a brief description of the treatment process for the 300 Area process sewer at TEDF. A flow diagram of the facility is included as Figure 2-2.

The various contributions of 300 Area facilities to the process sewer enter a main header at the north end of the 300 Area. The header dumps into the Waste Collection Sump which has a volume of 80,000 gallons. The purpose of this

sump is to collect the wastewaters, monitor them for temperature, pH, conductivity, and radioactive content, and then pump them to the TEDF equalization tank. The 480,000 gallon equalization tank is the feed tank for the TEDF process. Its purpose is to dampen the variations in flow and load from the 300 Area process sewer and the various intermittent recycle streams to maintain a steady state influent stream.

From the equalization tank, the feedwater is pumped to the chemical mix tank as the first step in the iron co-precipitation process. The co-precipitation process consists of a chemical mix tank, flocculation tank, two clarifiers, and gravity filters. The waste stream enters the chemical mix tank where ferric chloride is added to the waste stream along with sodium hydroxide to control the pH at a basic level (pH 9-11). The iron co-precipitation process is based on the tendency of many heavy metals to form relatively insoluble precipitates under neutral or high pH conditions. When iron is added as a co-precipitant, it forms well-settling ferric hydroxide flocs that help settle the other metal precipitates by trapping and adsorbing them on the iron flocs.

A flocculent aid polymer is added to the waste stream as it gravity flows from the chemical mix tank to the flocculator tank. The waste stream is gently mixed in the flocculator in order to increase the size and mass of the floc. The flocculated wastewater then flows by gravity to the clarifiers where settling takes place.

From the clarifiers the wastewater flows through the gravity filters, which use a dual media bed of charcoal and sand to remove suspended solids.

The treated water from the gravity filters flows by gravity into the ion exchange tank, from which it is pumped to the ion exchange column system. Sulfuric acid is added to the wastewater in the ion exchange feed tank to lower pH for improved efficiency in the UV/peroxide unit, which lies in-line directly after the ion exchangers. The wastewater passes through one of the two parallel trains of two ion exchange columns in series. The ion exchanger columns are packed with a resin which has an affinity for mercury and other metals that form insoluble metal sulfides.

From the ion exchange system, the wastewater flows to the UV/peroxide treatment system. The UV/peroxide system destroys organic compounds, sulfide, nitrite, and cyanide by chemical oxidation. Ultraviolet light catalyzes the chemical oxidation reaction by its combined effect on the organic compounds and its reaction with the hydrogen peroxide that is fed to the wastewater upstream of the UV reactor. Organics are converted to carbon dioxide and water.

Following UV/peroxide treatment, the treated effluent is discharged into the effluent tank. Sodium hydroxide is added for adjustment in pH to meet regulatory requirements. The effluent then flows by gravity through the outfall pipeline to the Columbia River where it is discharged via a diffuser.

Table 2-1 Facilities Connected to 300 Area Process Sewer, November 1994.

Building Number	Building Name (Operating Company)[a]
303F	Pumphouse (WHC)
303J	Material Storage Building (PNL)
303M	Uranium Oxide Facility (WHC)[d]
304	Uranium Concretion Facility (WHC)[d]
305	Engineering Test Facility (WHC)
305B	Hazardous Waste Storage Facility (PNL)[d]
306E	Development, Fabrication, and Test Laboratory (WHC)
306W	Materials Development Laboratory (PNL)
308	Fuels Development Laboratory[d]
309	Test Engineering Facility (WHC)
311	Tank Farm (WHC)[d]
313	N Fuels Manufacturing Support Facility (WHC)[d]
314	Engineering Development Laboratory (PNL)
318	Radiological Calibrations Laboratory (PNL)
320	Physical Science Laboratory (PNL)
321	Hydromechanical/Seismic Facility (WHC)[d]
323	Mechanical Properties Laboratory (PNL)
324	Waste Technology Engineering Laboratory (RPS/PS)(PNL)
325	Applied Chemistry Laboratory (RPS)(PNL)
326	Material Science Laboratory (RPS/PS)(PNL)
327	Post Irradiation Test Laboratory (RPS/PS)(PNL)
329	Chemical Science Laboratory (RPS/PS)(PNL)
331	Life Science Laboratory 1 (PNL)
331D	Biomagnetic Laboratory (PNL)
331E	Greenhouse (PNL)
331J	Incinerator (PNL)[d]
333	N Fuels Fabrication Facility (WHC)[d]
334	Process Sewer Monitoring Facility (WHC)[d]
335	Sodium Testing Facility (WHC)[d]
336	High Bay Testing Facility (PNL)
337	Technical Management Center (PNL)
337B	High-Bay nd Service Wing (WHC/PNL)
338	Fabrication Shop (KEH)
382	Pumphouse (WHC)
382	A,B,C Water Storage Tanks (WHC)
384	Powerhouse (WHC)
3100	Future Facility (PNL)
3706	Communication and Documentation Services (WHC)[d]
3707C	Safeguards and Security Maintenance Shop (WHC)[d]
3708	Radioanalytical Laboratory (PNL)
3709	Paint Shop (WHC)
3716	Storage (WHC)
3717	Spare Parts Warehouse (WHC)[d]
3717B	Standards Laboratory (WHC)[d]
3718F	Sodium Storage (WHC)[d]
3720	Chemistry and Metal Sciences Laboratory (PNL)
3722	Construction Shop (KEH)[d]
3730	Gamma Irradiation Facility (PNL)
3732	Old Thoria Laboratory (WHC)[d]
3745A	Electron Accelerator Facility (PNL)
3745B	Positive Ion Accelerator Facility (PNL)
3746	Radiological Physics Laboratory (PNL)
3802A	Steam Pressure Reducing Valve Station (WHC)[d]
3902A	West Elevated Water Tank[d]
3902B	East Elevated Water Tank[d]

[a] WHC = Westinghouse Hanford Co., PNL = Pacific NW Laboratories, KEH = Kaiser Engineers Hanford.
[d] To be disconnected during process sewer upgrade (L-070).

Figure 2-1 Location of the Hanford Site and the 300 Area

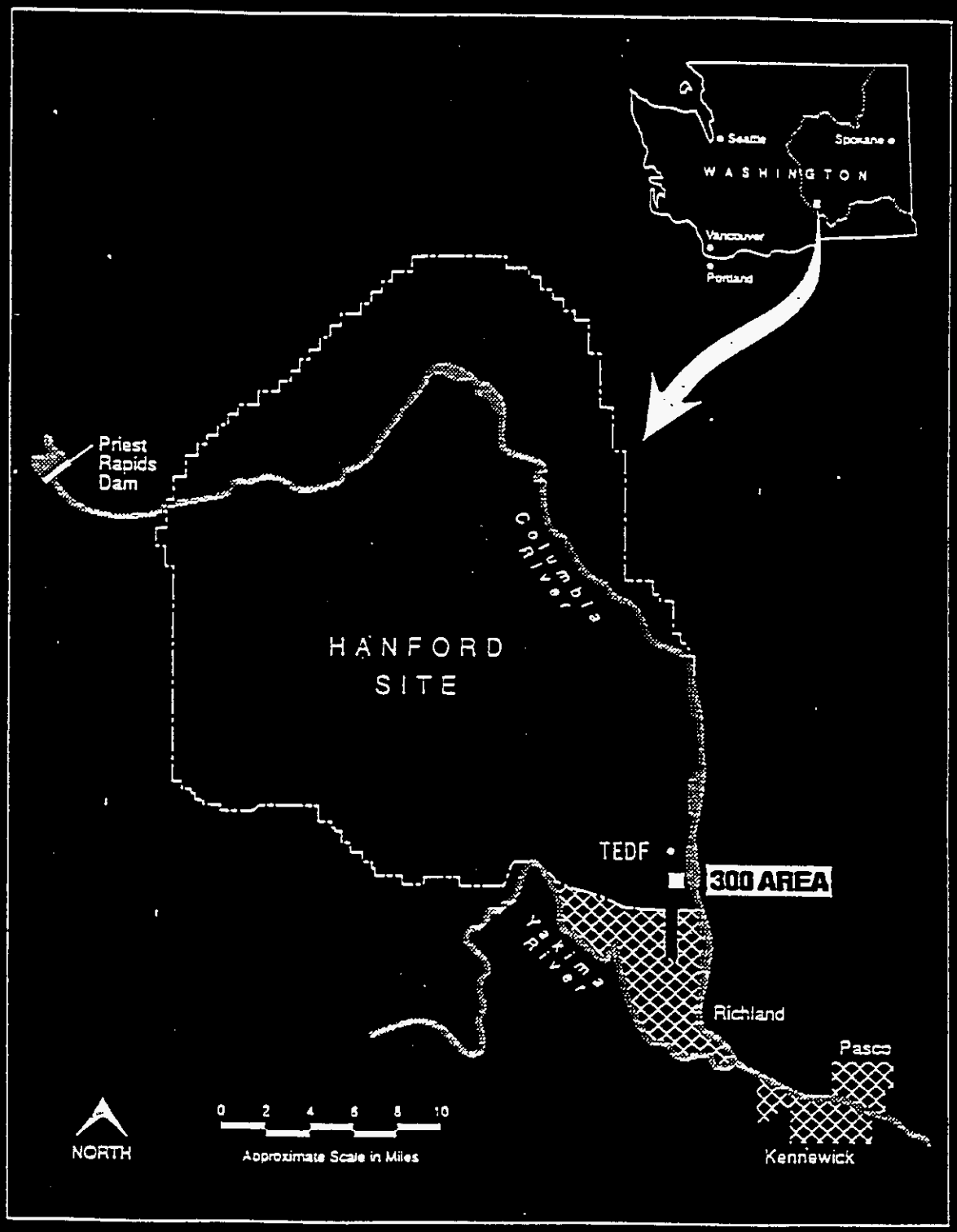
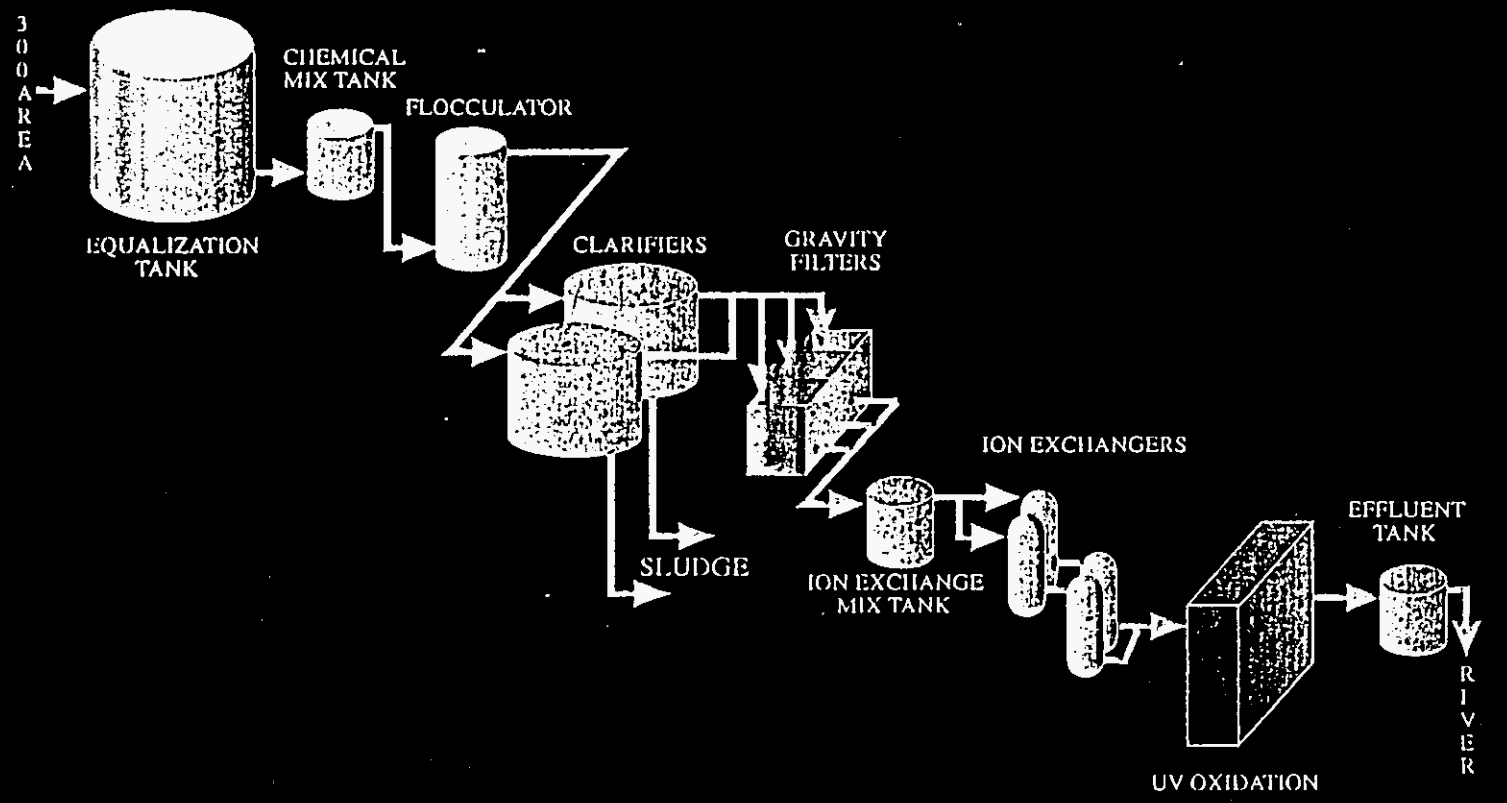


Figure 2-2 TEDF Flow Diagram



2.3 Objectives

This MP describes the effluent discharge sampling for the 300 Area Treated Effluent Disposal Facility. The objective of this effort is to produce reproducible and reliable data which demonstrates compliance with the NPDES permit for discharge to the Columbia river.

Sampling will be conducted on a routine basis by the TEDF facility staff. These individuals will be trained in protocol sampling per Effluent Sampling Procedure 310-OP-024. Analysis of the samples will be performed by an offsite contract lab.

2.4 Approach

The discharge from the 300 Area TEDF will be sampled. Sampling will occur at the North East corner of the TEDF building, at valve TW-V-582 (Figure 2-3). This corner of the facility is used because the discharge line passes through this area after all treatment but prior to exiting the facility. Samples will be analyzed for a variety of constituents. A description of the analytes of interest, analysis methods, and the frequency of sampling can be found in Sections 3 and 4.

Grab samples will be taken on a regular basis, as described in Section 3. Temperature, pH, and flow will be continuously monitored using in-line temperature and pH probes and a flow meter on a continuous basis. Grab samples will be taken manually using the valve discussed above. Analysis of samples will be performed by an off-site contract laboratory.

2.5 Program Organization and Responsibilities

The technical and management structure for sampling activities at the TEDF is shown in Figure 2-4. A flow diagram of sampling responsibilities is provided in Figure 2-5.

2.5.1 Sample Data and Laboratory Administration (SDLA)

SDLA will initiate a Sampling Authorization Form (SAF) which will describe the volume and necessary bottle type for each sample. SDLA will also act as the liaison between the TEDF and the contract laboratory. SDLA will receive data from the laboratory and will immediately forward these data to the TEDF and the Effluent Monitoring Group for incorporation in the Discharge Monitoring Report (DMR).

2.5.2 300 Area Liquid Effluents Engineering (LEE)

300 Area LEE will be responsible for the initial issuance and revision of the sampling plan. In order to fulfill this responsibility, LEE will assign one

of its engineers as Sampling Coordinator. The Sampling Coordinator shall be responsible with the oversight of the sampling effort, which includes ensuring that the sampling is performed per the sampling procedure, ensuring that the requirements of the NPDES Permit are being met, and determining the sample time and date. Once data analysis results are received by LEE, they are incorporated into the proper DMR format and transmitted to DOE-RL for formal transmittal to the Environmental Protection Agency (EPA), as required by Part II.C. of the permit.

2.5.3 LEF Operations

The LEF Operations staff (Operations) shall be responsible for the following tasks:

1. Obtain sample bottles from S&ML.
2. Perform sampling, sample preparation and sample shipment in accordance with procedure 310-OP-024 .
3. Make all entries into the sampling log .
4. Initiate the chain of custody forms and retain custody of the samples until they are transferred to the contract laboratory for analysis.

These individuals will be trained to routine sampling and chain of custody tasks per Effluent Sampling Procedure 310-OP-024. Training will take place during on the job training (OJT). Each operator will have completed the knowledge and performance requirements of section 18.0 of the 300 Area Treated Effluent Disposal Facility Nuclear Process Operator Training Qualification Cards prior to performing any sampling activities.

Figure 2-3 Sampling Location

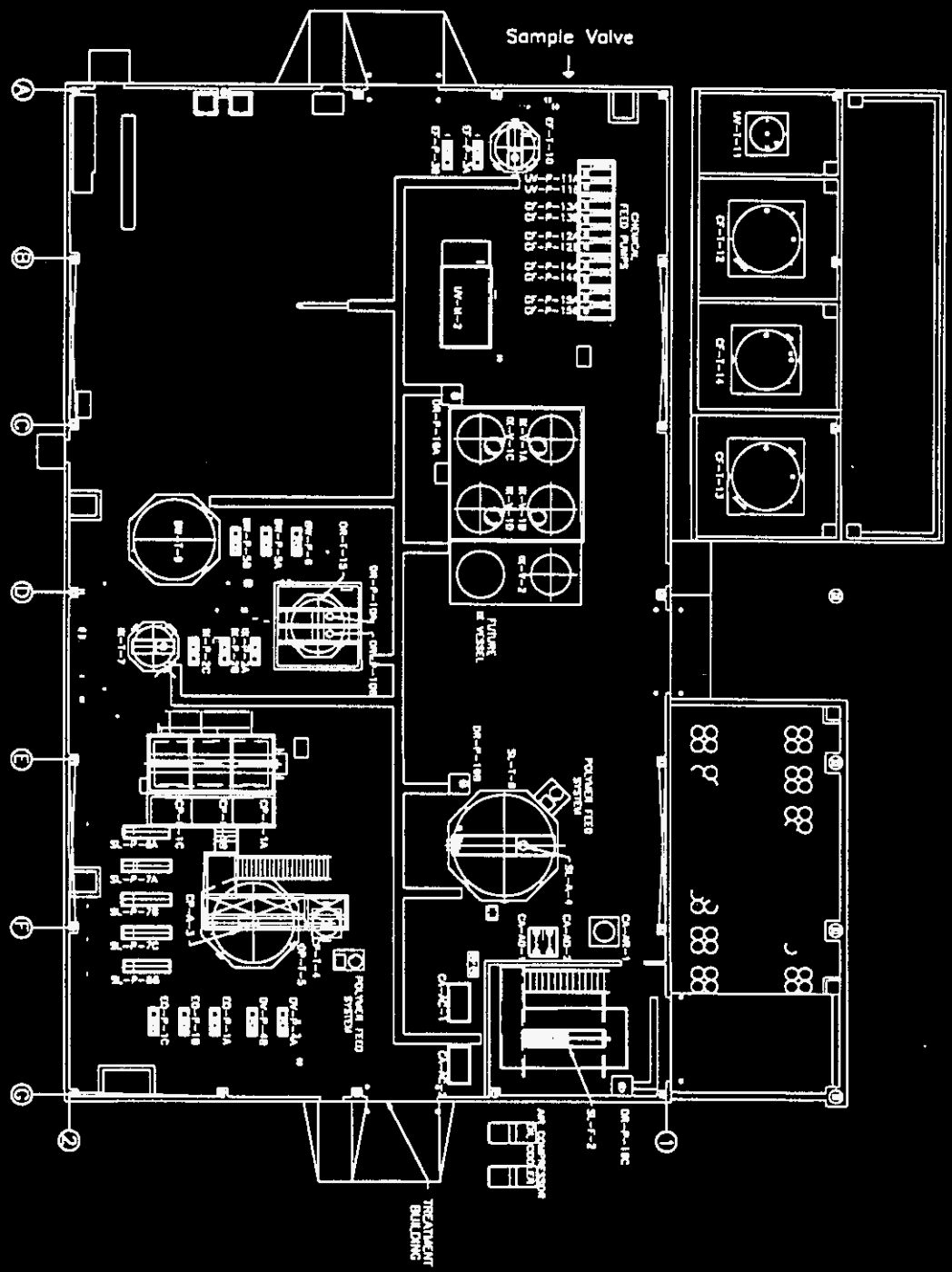


Figure 2-4 TEDF Project Organization

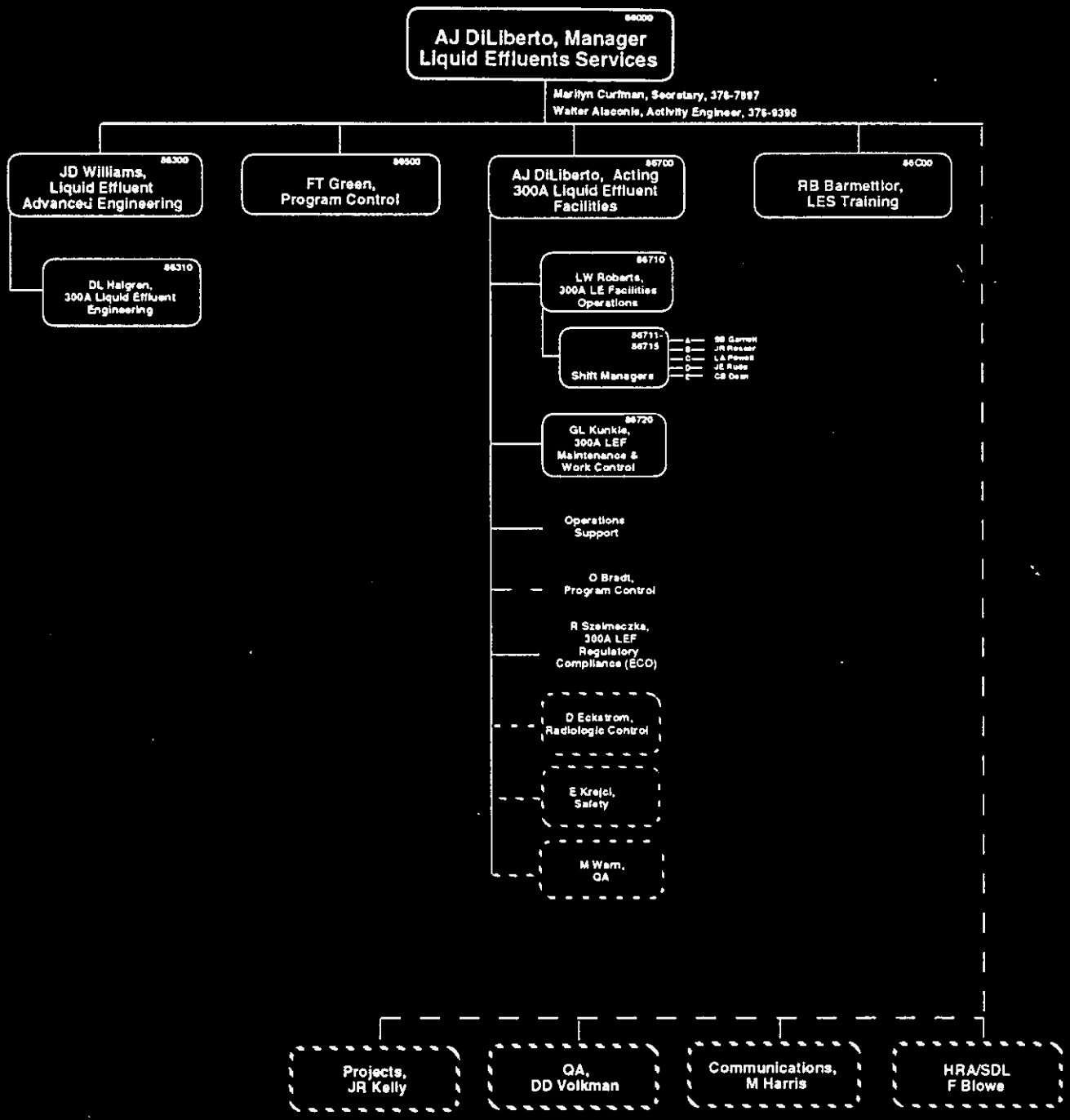
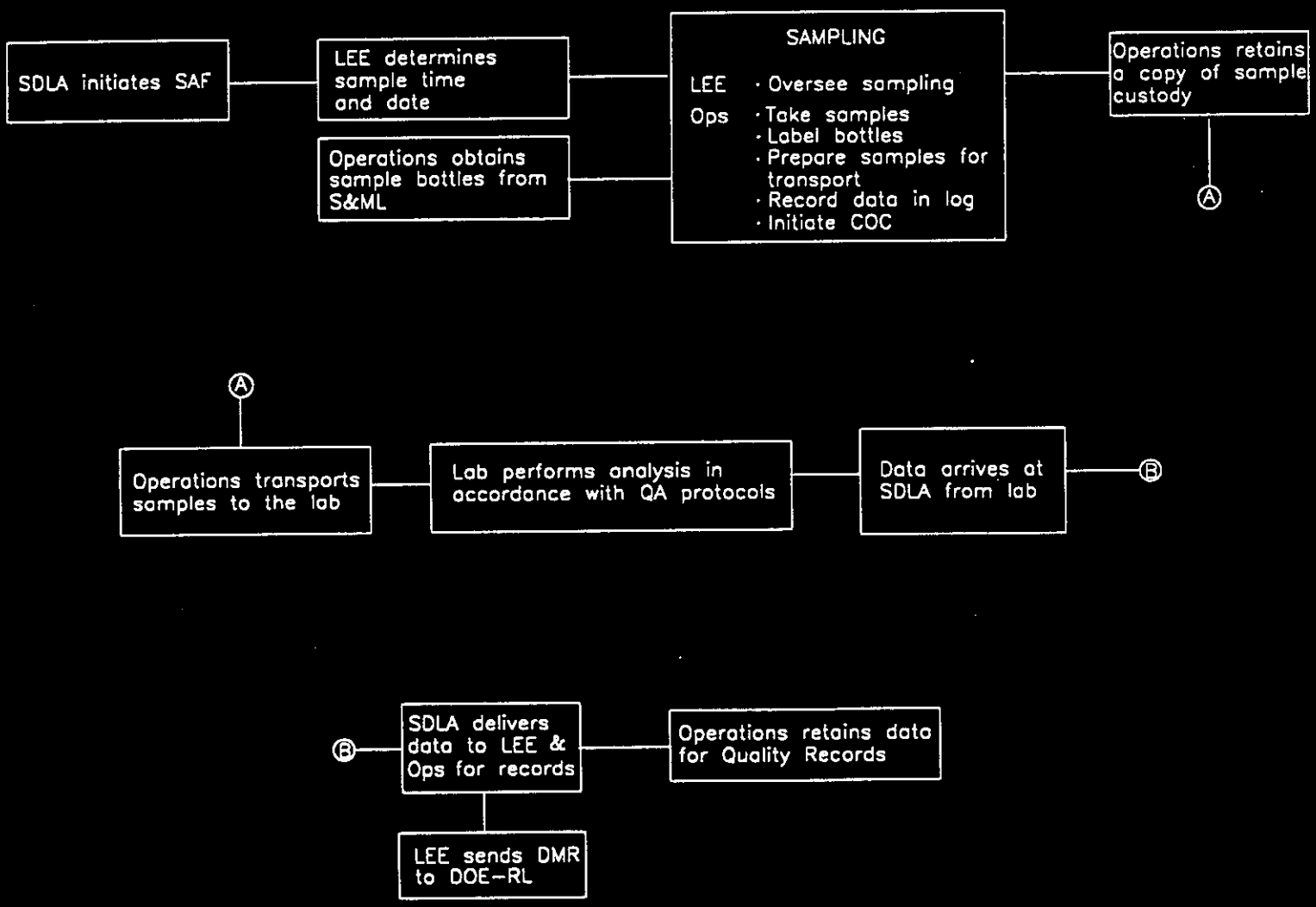


Figure 2-5 Sampling Responsibilities Flow Sheet



3.0 Sampling Location and Sample Frequency

This section will describe the sample location and frequency of sampling. Both sampling location and frequency were chosen to comply with NPDES permit requirements. Frequency of sampling is discussed for discharge sampling, yearly river monitoring, Whole Effluent Testing (WET), and duplicate sampling. In addition, three parameters, effluent flow, pH, and temperature will be continuously monitored as discussed in sections 4.5 and 4.6.

3.1 Location

The 300 Area TEDF discharge will be sampled at the North East corner of the TEDF building. The location of this sampling point is shown in Figure 2-3. Part I.A. of the permit requires sampling "from the effluent stream prior to discharge into the receiving waters." In order to satisfy this requirement, this location was chosen because it is after all treatment and pH adjustment but prior to discharge.

3.2 Frequency

Discharge sampling will occur as required by the permit. Table 3-1 details the sample schedule for each analyte which will be sampled on a routine basis. This subsection describes the guidelines to be followed in determining sample day and time.

3.2.1 Continuous

Selected parameters will be monitored on a continuous basis using the historical data logging ability of the TEDF computer system. Of these parameters three will be retrieved and forwarded to the regulators, they are effluent pH, temperature, and flowrate. The River Discharge Data screen will be used to tabulate the high, low, and average pH, the high and average temperature, and the high and average flowrate each calendar month. The screen will not record effluent data during diversion or effluent pH data during pH probe calibration.

3.2.2 Two Times Per Week

Total suspended solids (TSS) samples are required to be taken two times per week. The samples may be pulled any day of the week not to exceed the frequency of once every twenty-four hours.

3.2.3 Biweekly

Samples of analytes which are required on a biweekly basis (See Table 3-1) shall be taken the first and third week of each month, subject to change due to plant operation as directed by Sampling Coordinator.

Table 3-1 Sample Schedule

Analyte	Schedule
Bis(2-ethylhexl)phthalate	biweekly
Dichlorobromomethane	biweekly
Chlorodiflouromethane[1]	biweekly
Methylene Chloride	biweekly
Toluene	biweekly
1,1,1,-Trichloroethane	biweekly
Trichloroethylene	biweekly
Chloroform	biweekly
1,1-Dichloroethane	biweekly
Tetrachloroethylene	biweekly
Aluminum (Al)	biweekly
Arsenic (As)	biweekly
Beryllium (Be)	biweekly
Cadmium (Cd)	biweekly
Copper (Cu)	biweekly
Cyanide(Cn)	biweekly
Iron (Fe)	biweekly
Lead (Pb)	biweekly
Manganese (Mn)	biweekly
Mercury (Hg)	biweekly
Nickel (Ni)	biweekly
Nitrite (NO3)	biweekly
Selenium (Se)	biweekly
Silver (Ag)	biweekly
Zinc (Zn)	biweekly
Radium (pci/l)	biweekly
TSS	2 per week
Coliform	biweekly
Ammonia (as N)	biweekly
pH (pH units)	daily

[1]Analyte will be observed as a tentatively identified compound (TIC).

3.2.4 Quarterly

Whole Effluent Testing (WET) will be performed on a quarterly basis. WET testing shall consist of the 7-day fathead minnow, *Pimephales promelas*, test, the 7-day *Ceriodaphnia dubia* test, and the 4-day *Selenastrum capricornutum* growth test. These three tests will be conducted four times per year, during the months of February, May, August, and November. The sampling for each quarterly test activity will be completed in the span of one week. During the week of the sampling three 24-hour composites consisting of 5, 5, and 7 liters will be sent on Monday, Wednesday, and Friday respectively. The Sampling Coordinator shall set sample dates within the given months. All test organisms and procedures used will be in accordance with the protocols in EPA/600/4-90/027 and EPA/600/4-89/001, in compliance with Part I.D. of the permit.

3.2.5 Annually

River Monitoring is required once per year. As dictated by the permit, this sample shall be taken "during August of each year and the sampling day each year shall be selected to coincide with a day that effluent sampling is being conducted at the discharge." Therefore the river monitoring effort shall be completed on one of the days designated for sampling during August each year, as determined by the Sampling Coordinator. A minimum of two sample stations will be established in the river along the approximate centerline of the discharge plume. This approximate centerline will be determined by LEE. One station shall be immediately upstream of the TEDF discharge diffuser. The other station is to be located 71 feet downstream of the diffuser. Samples are to be collected immediately below the surface. Samples will be analyzed for all of the analytes in Table 4-1, with the addition of total hardness (as $CaCO_3$), "dissolved", and "total recoverable" analysis on the following analytes: cadmium, copper, lead, nickel, silver, and zinc. Data from these tests are to be submitted the month after sampling with the monthly DMR. This river monitoring effort will be conducted in accordance to Part I.E. of the permit.

Duplicate samples, equipment blanks, trip blanks will be utilized as described in Section 5.2 of this MP.

4.0 Sampling Equipment and Procedures

This section addresses the sampling equipment that will be used and the procedures to be followed for the sampling effort. Items such as sample analytes and process measurements required are addressed. The equipment required for the sampling task, as well as the source of the equipment is included. Sample identification information is also included. This section will also address aspects of security and operational safety which have a bearing on this sampling program.

4.1 Required Measurements and Analyses

The 300 Area TEDF discharge will be sampled for a variety of analytes. These include organics, inorganics, and total Radium radioactivity measurements. The required measurement and analyses for the discharge, along with the permit-mandated EPA methods, are provided in Table 4-1.

4.2 Sampling Procedure

Sample preparation, sampling, and sample shipment will be performed in accordance with operating procedure 310-OP-024.

4.3 Sampling Equipment

Sampling equipment will consist of pre-prepared sample bottles. Samples will be taken directly in the sample bottles, thus limiting possible sources of sample contamination from intermediate equipment.

4.4 Containers and Preservation

Sample container, volume, preservation, and holding times are listed in Table 4-2. This table is subject to change as required by the methods and/or laboratory. All changes will be reflected on the SAF or communicated to the 300 Area TEDF by SDLA.

Sample containers will be provided by Sampling Mobile Laboratories (SML). Any required preservatives will also be provided by SML. Sample containers will be prepared with preservatives by SML or in the TEDF Sample Prep room. Prepared sample containers will be secured in a locked cabinet until used.

Every effort is made to meet the sample preservation requirements specified in analytical procedures. Per procedure samples are put on ice immediately following the sampling. They are usually received at the laboratory within a few hours of sampling. Due to high effluent temperatures (70 and 95° F) and the short time between collection and receipt at the laboratory, samples do not consistently meet the 4° C temperature preservation protocols.

Sample container labels will include the following information:

- Sample Identification Number (ie. TEDF-MMDDYY-xxx)
- Date
- Time (24 hour basis)
- Sample Location
- Sample Preservation
- Scheduled Analysis (ie. EPA Method xxx.x)
- Sampler's Initials

The adhesive labels will be marked with an indelible marker and fixed to the sample container and covered with clear adhesive tape. Tamperproof tape will be applied to the bottle cap to insure sample integrity.

Table 4-1 Permit Mandated Analysis

Analyte	EPA Method
Bis(2-ethylhexl)phthalate	625
Dichlorobromomethane	624
Chlorodiflouromethane	624
Methylene Chloride	624
Toluene	624
1,1,1,-Trichloroethane	624
Trichloroethylene	624
Chloroform	624
1,1-Dichloroethane	624
Tetrachloroethylene	624
Aluminum (Al)	202.2, 200.8
Arsenic (As)	206.2, 200.8
Beryllium (Be)	210.2, 200.8
Cadmium (Cd)	213.2, 200.8
Copper (Cu)	220.2, 200.8
Cyanide (Cn)	CN-4500.E
Iron (Fe)	236.2
Lead (Pb)	239.2, 200.8
Manganese (Mn)	243.2, 200.8
Mercury (Hg)	245.2
Nickel (Ni)	249.2, 200.8
Nitrite (NO3)	353.1
Selenium (Se)	270.2, 200.8
Silver (Ag)	272.2, 200.8
Zinc (Zn)	289.2, 200.8
Radium (pci/l)	903.0
TSS	160.2
Coliform (MPN/100ml)	9221B, 9222B
Ammonia (as N)	350.1

* All analytes to be measured in ppb unless otherwise noted

Table 4-2 Sample Specifics

Analyte	Container Type	Volume	Preservation	Hold Time
Bis(2-ethylhexl)phthalate	Glass	1 l	4±2°C	40 d
Dichlorobromomethane	Glass	40 ml	4±2°C, pH<2 w/HCl	14 d
Chlorodiflouromethane	Glass	40 ml	4±2°C, pH<2 w/HCl	14 d
Methylene Chloride	Glass	40 ml	4±2°C, pH<2 w/HCl	14 d
Toluene	Glass	40 ml	4±2°C, pH<2 w/HCl	14 d
1,1,1,-Trichloroethane	Glass	40 ml	4±2°C, pH<2 w/HCl	14 d
Trichloroethylene	Glass	40 ml	4±2°C, pH<2 w/HCl	14 d
Chloroform	Glass	40 ml	4±2°C, pH<2 w/HCl	14 d
1,1-Dichloroethane	Glass	40 ml	4±2°C, pH<2 w/HCl	14 d
Tetrachloroethylene	Glass	40 ml	4±2°C, pH<2 w/HCl	14 d
Aluminum (Al)	HDPE/Glass	200 ml	HNO_3 to pH<2	6 mo
Arsenic (As)	HDPE/Glass	200 ml	HNO_3 to pH<2	6 mo
Beryllium (Be)	HDPE/Glass	200 ml	HNO_3 to pH<2	6 mo
Cadmium (Cd)	HDPE/Glass	200 ml	HNO_3 to pH<2	6 mo
Copper (Cu)	HDPE/Glass	200 ml	HNO_3 to pH<2	6 mo
Cyanide(Cn)	HDPE/Glass	500 ml	NaOH to pH12 .6g Asbc Acid	14 d
Iron (Fe)	HDPE/Glass	200 ml	HNO_3 to pH<2	6 mo
Lead (Pb)	HDPE/Glass	200 ml	HNO_3 to pH<2	6 mo
Manganese (Mn)	HDPE/Glass	200 ml	HNO_3 to pH<2	6 mo
Mercury (Hg)	HDPE/Glass	100 ml	HNO_3 to pH<2	28 d
Nickel (Ni)	HDPE/Glass	200 ml	HNO_3 to pH<2	6 mo
Nitrite (NO3)	HDPE	50 ml	4±2°C	48 hrs
Selenium (Se)	HDPE	200 ml	HNO_3 to pH<2	6 mo
Silver (Ag)	HDPE/Glass	200 ml	HNO_3 to pH<2	6 mo
Zinc (Zn)	HDPE/Glass	200 ml	HNO_3 to pH<2	6 mo
Radium (pci/l)	HDPE	1 l	HNO_3 to pH<2	6 mo
TSS	HDPE	100 ml	4±2°C	7 d
Coliform (MPN/100ml)	HDPE	125 ml	$Na_2S_2O_3$ (when Cl is present)	6 hrs
Ammonia (as N)	HDPE	500 ml	4±2°C, H_2SO_4<2	28 d

4.5 Measurement of Field Parameters

Temperature, pH, and flow will be measured on a continual basis at the facility using in line measurement equipment. Data will be recorded by the Process Logic Controller (PLC) and downloaded to a hard disk for storage. These data files will be available for viewing or use during normal business hours, or as arranged.

4.6 Flow Measurement

All flow measurements are taken using in-line flow meters. Influent flow is measured just prior to discharge of influent to Equalization tank. Process flow is continually measured at the 300 Area TEDF. Effluent flow is continually measured at a point between the Effluent Tank (EF-T-10) and the permit compliance sampling location. Data recording and availability are discussed in Section 4.4.

4.7 Sample Collection

Samples will be taken in the North East corner of the facility. After samples are collected and labelled, they will be placed in an ice chest for transport and recorded in the sampling log book.

All samples will be taken manually using the sample containers provided by SML. Field duplicates will be collected in an identical manner to actual samples.

4.8 Sample Identification

Samples are to be identified by sequential identification numbers as provided by the Sampling Coordinator. The general format of the identification numbers will consist of the TEDF acronym, the date, and a sequential number (i.e. TEDF-MMDDYY-xxx). These numbers should be recorded as described in Section 4.4 of this MP. It should be noted that an entire sample suite will be regarded as one sample when analyzed and will therefore fall under one number.

4.9 Site Entry

The 300 Area TEDF is a restricted access facility. Proper identification must be displayed at all times. The facility will be open to authorized personnel, but monitored by operations, during normal business hours. The main building is locked during off hours, only authorized entries are made. Visitors to the area must receive authorization from LEF Operations prior to entry.

4.10 Health and Safety

The practices of the Occupational Safety and Health Administration (OSHA) will be followed in all sampling activities to help insure the safety of all those

involved. Furthermore, the Sampling Coordinator shall serve as the person in charge of sampling activities.

4.11 Equipment Decontamination

There will be no intermediate sampling equipment used during sampling therefore equipment decontamination will not be required under this MP. Should other equipment be used, decontamination should be performed as directed by the Sampling Coordinator.

4.12 Revisions to this Monitoring Plan

Revisions to this MP will be made by 300 Area LEE. Changes in sampling or analytical methodology, analytes of interest, or sampling frequency will be forwarded to EPA for approval prior to implementation. Should revisions be suspected of resulting in noncompliance, advance notice must be provided to EPA, in accordance with Part IV.C. of the permit.

5.0 Quality Assurance

This section describes the effort being undertaken to insure the quality of the sampling data. This includes requirements for documentation, both in field logs and in final records, the use and frequency of field quality control sampling, and data validation/acceptance. Also addressed are chain of custody issues including COC documentation and sample transport. A final inclusion is a brief overview of the quality assurance program for the contract laboratory which will provide analysis of the samples.

5.1 Field Documentation

The sample log shall include the following information, to be entered immediately after sampling takes place:

1. The date of sampling
2. The exact location that sampling was performed
3. The identification number(s) of the samples taken (see section 4.8)
4. The time of sampling (in 24 hour format, ie. 4 pm is 1600)
5. The individual(s) who performed the sampling
6. The type of analysis to be performed

A legible photocopy of the sample log is to be placed in a file of the appropriate sample month and held, along with the analysis data and a copy of the DMR, for at least three years from the date of the DMR, as per Part II.F. of the permit.

5.2 Field Quality Control Sampling

This section will deal with the use of Quality Control (QC) samples. Such samples include duplicates, field blanks, and trip blanks.

DUPLICATE SAMPLES: Duplicate samples are independent samples which are collected as close as possible to the same point in space and time. They are two separate samples taken from the same source, stored in separate containers, and analyzed independently. These duplicates are useful in documenting the precision of the sampling process.

FIELD BLANKS: A field blank is a sample of purified water that is placed in the sample bottle in the field using the same sampling and handling procedures as other samples. A field blank is used to assess the potential introduction of contaminants to a sample during sample collection and analysis.

TRIP BLANKS: A trip blank is a sample of analyte-free media taken from the laboratory to the sampling site and returned to the laboratory unopened. A trip blank is used to document contamination attributable to shipping and field handling procedures. This type of blank is useful in documenting contamination of volatile organics samples. Trip blanks will be provided by SML or Operations as required.

5.3 Chain of Custody

Proper chain of custody (COC) procedures per Quality Assurance Manual, WHC-CM-4-2, Chain of Custody for samples of Environmental Media and Wastes, will be followed regarding the samples. The sampler or designated custodian witnessing the sampling shall complete the COC documentation using the WHC Chain of Custody/ Sample Analysis Request Form (BC-6000-828). The sampler or the designated custodian shall retain custody of the samples until such time as they are relinquished to the lab. Custody shall be defined as one or more of the following situations:

1. The custodian has actual physical possession of the sample.
2. After having physical possession, the custodian has the sample in view.
3. After having physical possession, the custodian has placed the sample into locked storage.
4. After having physical possession, the custodian keeps the sample within a secured area. A secured area is one that is restricted to authorized personnel only, with controlled means of access.

If the samples are stored at TEDF they will be kept in the Sample Prep Room. Before placing the samples in the Sample Prep Room the custodian of the samples will ensure that the Chain of Custody is completed, this will consist of ensuring the sample identification numbers, the sample times, and the sample analysis to be taken appears on the Chain of Custody. The custodian

will then complete the "Relinquished By" block on the Chain of Custody and record in the Sample Logbook that the samples have been relinquished to the Sample Prep Room. The Sample Prep Room will remain locked while samples are present. When the samples are ready to be shipped the shipper will obtain custody of the samples.

Before initiating the transfer of the sample, the individual who wishes to relinquish custody must verify that the individual who wishes to obtain custody of the sample is authorized to do so. In order to transfer the sample, both the individual relinquishing the sample and the individual receiving it must sign and enter the date and time on the COC form. Before each transfer of custody, the receiving custodian shall, as a minimum, inspect the chain-of-custody form and samples for deficiencies. If found, all deficiencies shall be noted on the chain-of-custody form. The minimum inspection criteria are:

a. The shipping container is not damaged
b. The outermost tamper-indication device is intact
c. The information on the form is accurate, including descriptions of any deficiencies identified by previous custodians.

Custody of the samples, as defined above, may then be given to the designated receiver of the samples. Transfer of custody is deemed to have taken place only after the above conditions have been met.

5.4 Sample Transport

Once the custody of the samples has been obtained by the shipper, no other transfer of sample custody is permitted prior to the transfer to the contract lab without the express written authorization of the manager of 300 Area LEE or a duly appointed representative.

5.5 Laboratory Quality Assurance

Analytical services shall be provided under purchase order MPV-SVV-239000. Analysis is to be requested on a priority basis with summary data package deliverable. According to the statement of work (SOW), the summary deliverables shall include, but are not limited to, the following items as applicable for the analysis reported:

- Sample results
- Blank results
- MS/MSD or MS and duplicate results, recoveries, and RPDs
- Surrogate results and recoveries.

Laboratories shall employ QA procedures that have been reviewed and accepted for use by WHC. These procedures shall include, but are not limited to, the following items, as spelled out in the SOW:

- Continuing education of laboratory personnel to insure maintenance of job proficiency.
- The laboratory shall be subject to WHC QA audits and surveillances at any time for the duration of the contract. SDLA performs these audits on a once to twice yearly basis for each facility.
- The laboratory shall already be or be working to become accredited under the Washington Department of Ecology's laboratory accreditation program.
- A proprietary copy of the laboratory QA plan will be distributed to DOE-RL, via WHC, for distribution to EPA and Ecology.

5.6 Final Records

300 Area LEE shall insure that the following information is included in the final records, in compliance with Part II.E. of the permit:

1. The date, exact place, and time indicated using the 24-hour military format (HHMM) of sampling or measurement
2. The individual(s) who performed the sampling or measurements
3. The date(s) analyses were performed
4. The individual(s) who performed the analyses
5. The analytical technique or methods used
6. The results of such analyses

These data, along with those data specified in Part II.F. of the permit, shall be retained for a sufficient time to satisfy Part II.F. of the permit.

REFERENCES

1. 300 Liquid Effluent Facilities Operations Procedure, 310-OP-024, Perform Compliance Sampling

2. Analytical Purchase Order # MPV-SVV-239000.

3. Ecology, EPA, and DOE, 1989, Hanford Federal Facility Agreement and Consent Order, Washington State Department of Ecology, U.S. Environmental Protection Agency, U.S. Department of Energy, Olympia, Washington.

4. Hanford Analytical Services Quality Assurance Plan, Rev. 2, June 1995.

5. National Pollutant Discharge Elimination System Permit No. WA-002591-7 for TEDF.

6. Statement of Work, 1993, Westinghouse Hanford Company Environmental and Waste Characterization Analytical Service Statement of Work, Revision 4, WHC-SOW-93-0003, Rev. 4, Westinghouse Hanford Company.

7. Westinghouse Hanford Company Quality Assurance Manual, WHC-CM-4-2, QI 13.4 Rev 1, Chain of Custody for Samples of Environmental Media and Wastes.