

Rocky Flats Environmental Technology Site

4-I55-ENV-OPS-FO.37

REVISION 0

NEUTRALIZATION TANK NORMAL OPERATIONS OPERABLE UNIT 1, BUILDING 891

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DOE RFFO/ER Concurrence on file: Yes No NA

Environmental Protection Agency Approval Received: Yes No NA

Responsible Organization: Environmental Restoration Program Division Effective Date: 11-23-94 *dep*

CONCURRENCE BY THE FOLLOWING DISCIPLINES IS DOCUMENTED IN THE PROCEDURE HISTORY FILE:

- Environmental Engineering and Technology
- Environmental Operations Management
- Industrial Hygiene
- Occupational Safety
- Radiological Health and Engineering
- Remediation Project Management
- Sample Management
- Surface Water Division

USE CATEGORY 3

ORC review not required

The following have been incorporated in this revision:
94-DMR-000185

DOCUMENT CLASSIFICATION
REVIEW WAIVER PER
CLASSIFICATION OFFICE

Periodic review frequency: 1 year from the effective date

LIST OF EFFECTIVE PAGES

<u>Pages</u>	<u>Effective Date</u>	<u>Change Number</u>
1-25	11/23/94	94-DMR-000185

TOTAL NUMBER OF PAGES: 25

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1. PURPOSE

This procedure contains a description of the normal operations steps used at the Rocky Flats Plant for neutralizing and transferring effluent from the Building 891 Groundwater Treatment Facility Neutralization Tank T-210 for the 881 Hillside, Operable Unit 1.

2. SCOPE

This procedure applies to all Environmental Operations Management employees and subcontractors.

This procedure addresses the following topics:

- pH adjustment
- Tank T-210 transfer to tanker

3. OVERVIEW

This procedure describes the steps for neutralizing and transferring water from the ion exchange regeneration system which is collected in Tank T-210 at the Building 891 Groundwater Treatment Facility. The Building 891 Groundwater Treatment Facility consists of a groundwater recovery and storage system, an ultraviolet/hydrogen peroxide (UV/H₂O₂) oxidation system, an ion exchange system with units for acid and caustic regeneration of resin, a spent regenerant neutralization system, and a treated effluent storage and discharge system. A simplified diagram of the system is provided in Appendix 1, Groundwater Recovery/Storage System Diagram. System valve designators, nomenclature, and types are provided in Appendix 2, Valves.

Following regeneration of the ion exchange resins as described in 4-I54-ENV-OPS-FO.36, Ion Exchange System Regeneration Operations, Operable Unit 1, Building 891, all waste acid and caustic is collected in Tank T-210 for neutralization and transfer for final treatment to the Building 374 evaporator. The Building 374 evaporator processes water with:

- pH between 6.0 and 9.0.
- Gross alpha activity less than 13,500 pCi/l.
- Volatile organics less than 1 ppm.

Following neutralization to meet the requirements for the Building 374 evaporator, the waste in Tank T-210 is stored awaiting analytical radiological screening results. When the waste is confirmed as acceptable for treatment at the Building 374 evaporator, the waste is transferred to a tanker truck at the Building 891 Truck Dock for transfer to Building 374. In addition to the radiological screening analysis, one in every 30 Tank T-210 transfers are analyzed for the following:

- Volatile organic compounds
- Nitrates
- Semi-volatiles

3. OVERVIEW (continued)

- Water quality
- Total metals
- Gross α/β
- 233, 234, 235, 238 U
- 89, 90 Sr
- 137 Cs
- 239, 240 Pu
- 241 Am
- 3H

4. RESPONSIBILITIES

4.1 Building 891 Project Manager

Reviews and approves the analytical results.

4.2 Operator

Measures and adjusts the pH.

Inspects and fills the tanker.

4.3 Project Manager

Arranges for the collection and analysis of the samples.

Reviews the analytical results.

Ensures that all personnel, including subcontractors, are trained and qualified to perform the duties, tasks and responsibilities described in this procedure.

5. LIMITATIONS AND PRECAUTIONS

- The steps in this procedure shall be followed to ensure that the treated water from Tank T-210 meets the acceptance criteria for the Building 374 evaporator.
- Treatment of the waste in Tank T-210 involves the use of concentrated hydrochloric acid (HCl) and sodium hydroxide (NaOH). All health and safety requirements for handling these materials contained in the Rocky Flats Plant Operable Unit 1 Groundwater Treatment Facility Health and Safety Plan shall be followed.

6. PREREQUISITES

6.1 Planning and Coordination

Project Manager

- [1] Arrange for the collection and analysis of samples of the neutralized waste water in Tank T-210.

Samples are collected and analyzed in accordance with the Sampling and Analysis Plan for Operation and Maintenance of the Interim Measures/Interim Remedial Action for the 881 Hillside Operable Unit No. 1 and 5-21000-OPS-FO.13, Containerization, Preserving, Handling, and Shipping of Samples.

- [2] Review the analytical results for the waste contained in Tank T-210 requiring transfer to the Building 374 evaporator to ensure that the treated effluent meets the acceptance criteria for the Building 374 evaporator.

6.2 Material and Equipment

6.2.1 Measuring and Test Equipment

Operator

- [1] Ensure that a portable pH monitor is available for use.

6.2.2 Tools

Operator

- [1] Ensure that a bucket suitable for collecting spillage from transfer hoses is available.

7. INSTRUCTIONS—pH ADJUSTMENT

7.1 Abnormal Conditions

Operator

[1] **IF** there is any indication of unexpected chemical reaction, such as increasing tank temperature, fumes emanating from the tank, or popping noises in the tank, **THEN** take the following actions:

[A] Press Emergency Stop pushbutton.

[B] Evacuate the area.

[C] Notify the Project Manager.

7.2 pH Measurement

Project Manager and Operator

[1] Document all activities on the Daily Log in accordance with 2-G18-ER-ADM-17.01, Records Capture and Transmittal.

Project Manager

[2] Verify that all prerequisites in Section 6, Prerequisites have been completed, and record on Daily Log.

NOTE *Before operations to adjust the pH in Tank T-210, accurate measurement of the initial pH and pH following neutralization is necessary. Several methods are available and acceptable for measurement of pH in Tank T-210.*

Operator

[3] Recirculate Tank T-210 to obtain an accurate pH measurement:

[A] Open HVA-210, P-210 Inlet and HVB-210, P-210 Outlet.

[B] Close HVC-210, Discharge Camlock.

[C] Open the following valves:

- V-97, T-210 Purge Port
- V-98, T-210 Sightglass
- V-99, P-210 Effluent Isolation
- V-117, T-210 Recirculation Isolation

[D] Start the recirculation pump, P-210 by placing switch P-210 to ON.

7.2 **pH Measurement (continued)**

Operator (continued)

- [4] Measure the initial pH, and the pH following neutralization, in accordance with one of the following methods:

- [A] Read the pH meter mounted on the east side of Tank T-210.

The in-line pH meter mounted on the piping on the east side of Tank T-210 provides a direct indication of pH in the piping leading to Pump P-210. In order to obtain accurate readings from the instrument, Pump P-210 must be running to ensure that water is flowing through the pipe.

- [B] Read the remote pH meter at the touch screen panel in the motor control center.

The meter records pH from a sensor mounted in the tank.

NOTE *Appropriate personnel protective equipment is required to be worn and monitoring is required to be performed during sampling in accordance with the Rocky Flats Plant Operable Unit 1 Groundwater Treatment Facility Health and Safety Plan²*

- [C] Ensure that the portable pH meter is properly calibrated before use in accordance with the manufacturer's instructions.

- [D] Take a sample of the waste at HVC-210, Discharge Camlock and analyze the sample using a portable pH meter.

- [E] Dispose of the sample in the Building 891 sump.

7.3 **pH Adjustment for Acid Neutralization**

Operator

- [1] **IF** the pH of the waste in Tank T-210 is less than 6.0,
THEN start tank Mixer M-210 by placing switch M-210 to ON.

The switch labeled M-210 is on the MCP 891 Main Control Panel to the left of the touch screen.

- [2] Ensure that HVA-210, P-210 Inlet and HVB-210, P-210 Outlet are OPEN.

- [3] Ensure that HVC-210, Discharge Camlock is CLOSED.

7.3 **pH Adjustment for Acid Neutralization (continued)**

Operator (continued)

[4] Ensure that the following valves are OPEN:

- V-97, T-210 Purge Port
- V-98, T-210 Sightglass
- V-99, P-210 Effluent Isolation
- V-117, T-210 Recirculation Isolation

The flow path of the waste is up the right leg of the tee above the pump.

[5] Ensure that V-100, P-210 Discharge Isolation is CLOSED.

V-100 is on the upright portion of the tee.

[6] Start Pump P-210 by placing switch P-210 to ON.

[7] Open FV-17, Dilute Caustic for T-210 Neutralization and FV-19, Caustic Regenerant.

Valves are on the skid between Tanks T-209 and T-208.

[8] Start Pumps P-3 and P-5.

[A] Verify that the yellow lights on the MCP 891 Main Control Panel are ON.

[9] **AFTER** 5 to 10 sec,
THEN stop P-5.

[10] **AFTER** an additional 5 sec,
THEN stop P-3.

P-3 running flushes the contents of the piping into Tank T-210.

[11] Allow the pH of the water to equilibrate for approximately 10 minutes.

[12] Observe the pH of the water using any of the following:

- On the local readout
- On the Allen/Bradley screen
- With a portable meter

[13] **IF** the waste water pH is still less than 6.0,
THEN repeat Steps [8] through [12] until waste water pH is between 6.0 and 9.0.

7.3 **pH Adjustment for Acid Neutralization (continued)**

Operator (continued)

[14] **WHEN** the waste water pH is between 6.0 and 9.0,
THEN:

[A] Place Switch P-210 to OFF.

[B] Place Switch M-210 to OFF.

[15] Record all activities in the Daily Log including:

- Date.
- Time.
- Activity.

7.4 **pH Adjustment for Caustic Neutralization**

Operator

[1] **IF** the pH of the water in Tank T-210 is greater than 9.0,
THEN start the tank Mixer, M-210 by placing Switch M-210 to ON.

Switch M-210 is on the MCP 891 Main Control Panel to the left of the touch screen.

[2] Open HVA-210, P-210 Inlet and HVB-210, P-210 Outlet.

[3] Close HVC-210, Discharge Camlock.

[4] Ensure that the following valves are OPEN:

- V-97, T-210 Purge Port
- V-98, T-210 Sightglass
- V-99, P-210 Effluent Isolation
- V-117, T-210 Recirculation Isolation

The flow path of the waste is up the right leg of the tee above the pump.

[5] Ensure that V-100, P-210 Discharge Isolation is CLOSED.

V-100 is on the upright portion of the tee.

[6] Start Pump P-210 by placing switch P-210 to ON.

Switch P-210 is on the control panel next to Switch M-210.

7.4 pH Adjustment for Caustic Neutralization (continued)

Operator (continued)

[7] Open FV-7, Dilute Acid for T-210 Neutralization and FV-9, Acid Regenerant.

Valves are on a skid between Tanks T-209 and T-208.

[8] Start Pumps P-3 and P-4.

[A] Verify that the yellow lights on the control panel are ON.

[9] **AFTER** 5 to 10 sec,
THEN stop P-4.

[10] **AFTER** an additional 5 sec,
THEN stop P-3.

P-3 running flushes the contents of the piping into Tank T-210.

[11] Allow the pH of the water to equilibrate for approximately 10 minutes.

[12] Observe the pH of the water using any of the following:

- On the local readout
- On the Allen/Bradley screen
- With a portable meter

[13] **IF** the waste water pH is still greater than 9.0,
THEN repeat Steps [8] through [12] until waste water pH is between 6.0 and 9.0.

[14] **WHEN** the waste water pH is between 6.0 and 9.0,
THEN:

[A] Place Switch P-210 to OFF.

[B] Place Switch M-210 to OFF.

[15] Record all activities in the Daily Log including:

- Date.
- Time.
- Activity.

8. INSTRUCTIONS—TANK T-210 TRANSFER TO TANKER

8.1 Water Acceptability Verification

Project Manager

- [1] **WHEN** the water has been neutralized,
THEN arrange for the collection and analysis of samples in accordance with the Sampling and Analysis Plan for Operation and Maintenance of the Interim Measures/Interim Remedial Action for the 881 Hillside Operable Unit No. 1 and 5-21000-OPS-FO.13.

Sample analysis is performed by Building 881 employees or by an EG&G-approved analytical laboratory.

Building 891 Project Manager

- [2] Review and approve the analytical results before transfer from Tank T-210.
- [3] Forward the results to the Building 374 Evaporator Shift Manager.
- [4] Verify that all of the prerequisites in Section 6, Prerequisites have been completed, and record on the Daily Log in accordance with 2-G18-ER-ADM-17.01.

8.2 Water Transfer

Operator

- [1] Record all water transfers from Tank T-210 on Appendix 3, Material Transfer Checklist.
- [2] Inspect the tanker for the following characteristics:
- Appropriate size
 - Cracks in the frame
 - Wheels chocked
 - Valving for adequate venting during transfer
- [3] Hook up a 2-in. hose from the back bottom connection of the tanker to the Tank T-210 discharge connection at the Building 891 wall.
- A 2 -in. to 3-in. adaptor may be used, as necessary.
- [4] Open HVD-210, Discharge To Truck behind Tank T-209 along the north wall of Building 891.
- [5] Open HVA-210, P-210 Inlet and HVB-210, P-210 Outlet.
- [6] Close HVC-210, Discharge Camlock.

8.2 Water Transfer (continued)

Operator (continued)

- [7] Open the following valves:
- V-97, T-210 Purge Port
 - V-98, T-210 Sightglass
 - V-99, P-210 Effluent Isolation
 - V-100, P-210 Discharge Isolation
- [8] Close V-117, T-210 Recirculation Isolation.
- [9] Open the tanker influent.
- The valve is on the tanker.
- [10] Open vent valves on the tanker.
- [11] Verify the valving and the connections.
- [12] Start Pump P-210 by placing Switch P-210 to ON.
- [13] Observe the level in the sightglass on the east side of Tank T-210 periodically to ensure that P-210 is pumping the water out of Tank T-210.
- Pump P-210 automatically shuts off before the level in Tank T-210 reaches 1 foot.
- [14] Turn the P-210 switch at the control panel to OFF.
- [15] Close HVD-210.
- [16] Close all of the valves on the tanker.
- [17] Don personal protection equipment in accordance with the requirements of Rocky Flats Plant Operable Unit 1 Groundwater Treatment Facility Health and Safety Plan.

NOTE *At this time, the hose contains approximately 10 gal of water.*

- [18] Place a bucket under the hose end to collect water remaining in the hose.
- [19] Carefully disconnect all of the hoses from the tanker and the building, and collect all spillage in the bucket.
- [20] Dump the water collected in the bucket(s) into the Building 891 sump.

8.2 Water Transfer (continued)

Operator (continued)

- [21] Close the vent(s) on the tanker.
- [22] Open V-117.
- [23] Close V-100.
- [24] Notify the Building 374 Evaporator Shift Manager that the tanker is ready to pick up.
- [25] Complete Appendix 4, Neutralized Waste Tank T-210- Logsheets.
- [26] File the Neutralized Waste Tank T-210 Logsheets in the facility operations files.
- [27] Record all activities in the Daily Log including:
 - Date.
 - Time.
 - Activity.

9. RECORDS

Management of all records is consistent with 1-77000-RM-001, Records Management Guidance for Records Sources.

Project Manager

- [1] Ensure that the original and one copy of the following quality related records, as appropriate, are transmitted to the ERPD Project File Center in accordance with 2-G18-ER-ADM-17.01.
 - Material Transfer Checklist
 - Neutralized Waste Tank T-210 Logsheets

Submission of record copies to the ERPD File Center satisfies Administrative Record requirements as defined in 3-21000-ADM-17.02, Administrative Records Screening and Processing.

There are no nonquality records generated by this procedure.

10. REFERENCES

Rocky Flats Plant Operable Unit 1 Groundwater Treatment Facility Health and Safety Plan

Sampling and Analysis Plan for Operation and Maintenance of the Interim Measures/Interim Remedial Action for the 881 Hillside Operable Unit No. 1, 1993

10. References (continued)

1-77000-RM-001, Records Management Guidance for Records Sources

2-G 18-ER-ADM-17.01, Records Capture and Transmittal

3-21000-ADM-17.02, Administrative Records Screening and Processing

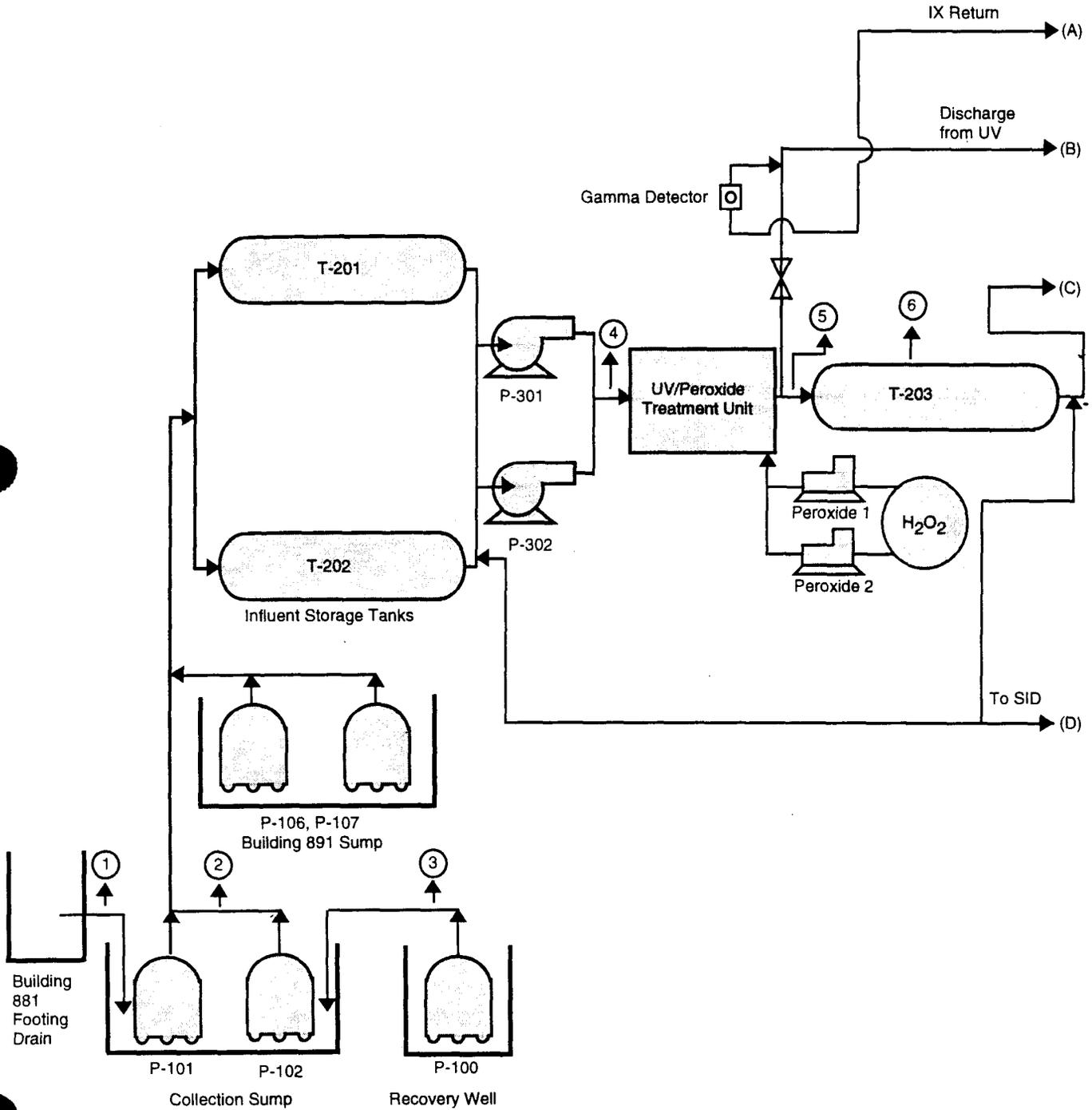
5-21000-OPS-FO.13, Containerization, Preserving, Handling, and Shipping of Samples

4-I54-ENV-OPS-FO.36, Ion Exchange System Regeneration Operations, Operable Unit 1,
Building 891

APPENDIX 1

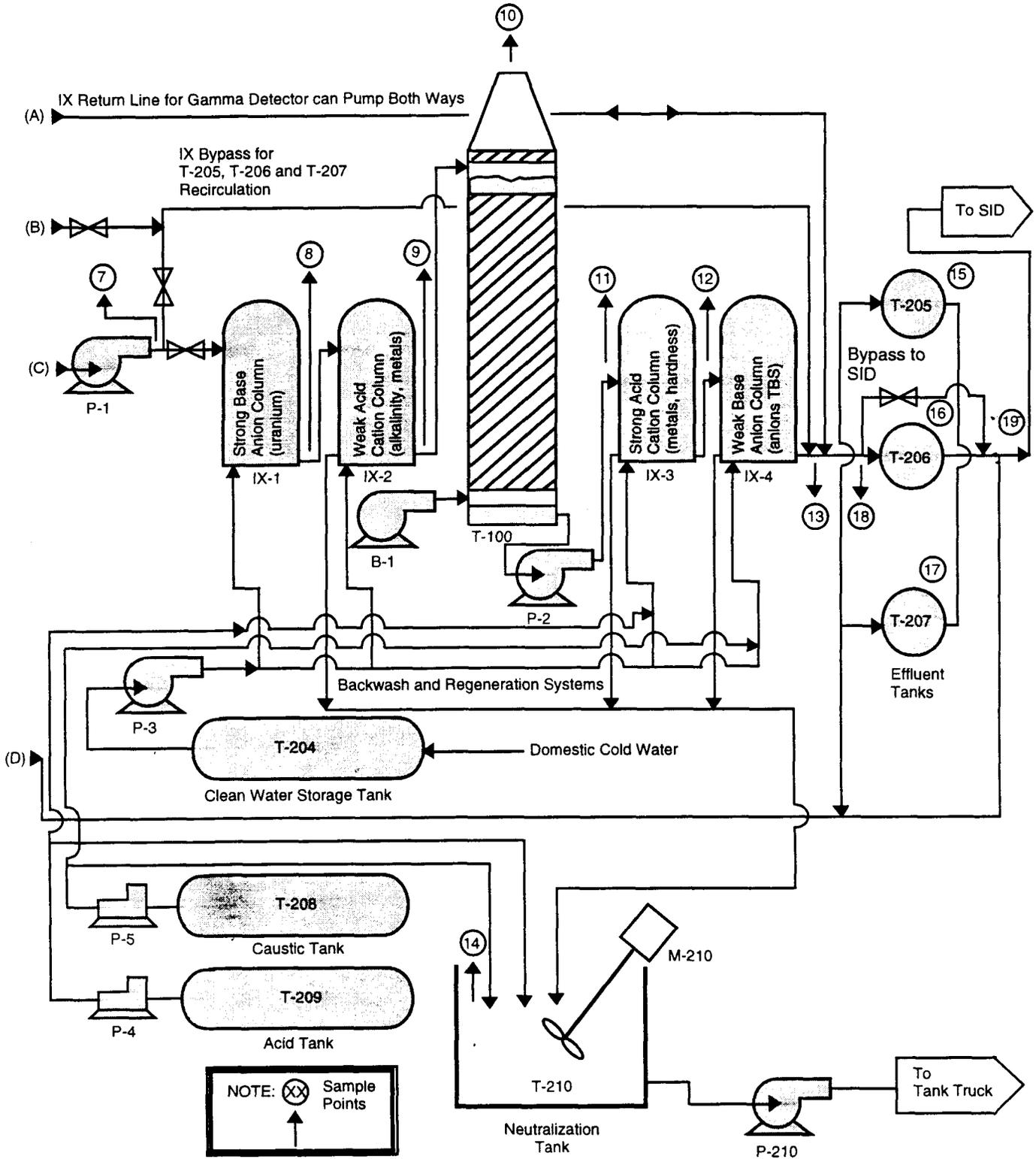
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GROUNDWATER RECOVERY/STORAGE SYSTEM DIAGRAM



APPENDIX 1

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APPENDIX 2

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VALVES

VALVE NO.	DESCRIPTION	TYPE
V-1	P-1 Service Inlet	2-in. Ball
V-2	P-1 Service Outlet	2-in. Ball
V-3	Bag Filter Outlet	2-in. Ball
V-4	IX-1 Inlet Isolation	1 1/2-in. Ball
V-5	IX-1 Outlet Isolation	1 1/2-in. Ball
V-6	IX-2 Inlet Isolation	1 1/2-in. Ball
V-7	IX-2 Outlet Isolation	1 1/2-in. Ball
V-8	Degasifier Inlet Isolation	1 1/2-in. Ball
V-9	Degasifier Outlet/P-2 Inlet	1 1/2-in. Ball
V-10	P-2 Outlet	1 1/2-in. Ball
V-11	IX-3 Inlet Isolation	1 1/2-in. Ball
V-12	IX-3 Outlet Isolation	1 1/2-in. Ball
V-13	IX-4 Inlet Isolation	1 1/2-in. Ball
V-14	UV #2 Sample Port	1/2-in. Ball
V-15	P-3 Inlet	2-in. Ball
V-16	P-3 Outlet	3-in. Ball
V-17	IX-2 Subsurface Backwash Inlet	2-in. Ball
V-18	IX-1 Subsurface Backwash Inlet	2-in. Ball
V-19	IX-3 Subsurface Backwash Inlet	2-in. Ball
V-20	IX-4 Subsurface Backwash Inlet	2-in. Ball
V-21	Bag Filter #2 Inlet	2-in. Ball
V-22	Bag Filter #2 Outlet	2-in. Ball
V-23	Caustic Makeup Water	1-in. Ball
V-24	Acid Makeup Water	1-in. Ball
V-25	P-5 to T-210 Influent	1 1/2-in. Ball
V-26	P-4 to T-210 Influent	1 1/2-in. Ball
V-27	P-5 Service Outlet	3/4-in. Ball
V-28	P-4 Service Outlet	3/4-in. Ball
V-29	P-5 Service Inlet	3/4-in. Ball
V-30	P-4 Service Inlet	1-in. Ball
V-31	T-208 Outlet	3/4-in. Ball
V-32	T-209 Outlet	1-in. Ball
V-33	BLR-2 Outlet	1 1/2-in. Ball
V-34	Degasifier Drain	1-in. Ball
V-35	Bag Filter 2 Drain	1/2-in. Ball

APPENDIX 2

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VALVE NO.	DESCRIPTION	TYPE
V-36	Bag Filter 1 Drain	1/2-in. Ball
V-37	P-5 Caustic Sample Port	1/4-in. Ball
V-38	P-4 Acid Sample Port	1/4-in. Ball
V-39	IX-2 Effluent Sample Port	3/4-in. Ball
V-40	IX-1 Effluent Sample Port	3/4-in. Ball
V-41	IX-3 Sample Port	3/4-in. Ball
V-42	IX-4 Sample Port	3/4-in. Ball
V-43	IX-2 Vent	3/4-in. Ball
V-44	IX-1 Vent	3/4-in. Ball
V-45	IX-3 Vent	3/4-in. Ball
V-46	IX-4 Vent	3/4-in. Ball
V-47	IX-2 Acid Regenerant	1 1/2-in. Ball
V-48	IX-3 Acid Regenerant	1 1/2-in. Ball
V-49	IX-4 Caustic Regenerant	1 1/2-in. Ball
V-50	P-100 Outlet	1 1/2-in. Ball
V-51	P-101 Outlet	1-in. Ball
V-52	P-102 Outlet	1-in. Ball
V-53	Collection Gallery Filter Inlet	2-in. Ball
V-54	Collection Gallery Filter Bypass	2-in. Ball
V-55	Collection Gallery Filter Outlet	2-in. Ball
V-56	P-101, P102 Effluent	2-in. Ball
V-57	T-201, T-202 Influent	2-in. Ball
V-58	Domestic Influent Backflow Preventor	2-in. Ball
V-59	Domestic Influent Backflow Preventor	2-in. Ball
V-61	T-201 Secondary Containment Purge	2-in. Ball
V-62	T-202 Secondary Containment Purge	2-in. Ball
V-63	UV Influent T-201, T-202 Secondary Containment Purge	2-in. Ball
V-64	UV Influent T-201 Secondary Containment Purge	2-in. Ball
V-65	Caustic Dilution Water Flow Control	3/4-in. Gate
V-66	Acid Dilution Water Flow Control	3/4-in. Gate
V-67	Caustic Pressure	2-in. Ball
V-68	Acid Pressure	2-in. Ball
V-69	UV Effluent T-203 Secondary Containment Purge	2-in. Ball
V-70	T-204 Secondary Containment Purge	2-in. Ball
V-71	Chemical Metering Isolation	3/4-in. Ball
V-72	Chemical Metering Isolation	3/4-in. Ball
V-73	T-201 and T-202 Secondary Containment Purge	2-in. Ball

APPENDIX 2

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VALVE NO.	DESCRIPTION	TYPE
V-74	UV Effluent Camlock	2-in. Ball
V-75	UV Basket Strainer Influent	2-in. Ball
V-76	Basket Strainer Camlock	2-in. Ball
V-77	P-301, P-302 Effluent Camlock	2-in. Ball
V-78	UV Influent Sample Port	1/2-in. Ball
V-79	UV #1 Effluent Sample Port	1/2-in. Ball
V-80	Gamma Detection Isolation	2-in. Ball
V-81	H ₂ O ₂ Tank Sample Port	1/2-in. Ball
V-82	H ₂ O ₂ Outlet	1/4-in. Ball
V-83	Chemical Metering Isolation	3/4-in. Ball
V-84	H ₂ O ₂ P-1 Influent	1/4-in. Ball
V-85	H ₂ O ₂ P-2 Influent	1/4-in. Ball
V-86	T-209 Influent Line Sample Port	1/4-in. Ball
V-87	T-208 Influent Line Sample Port	1/4-in. Ball
V-88	H ₂ O ₂ P-1 Effluent	1/4-in. Ball
V-89	Air Scour Unloader	1 1/2-in. Butterfly
V-90	H ₂ O ₂ P-2 Effluent	1/4-in. Ball
V-91	H ₂ O ₂ Splitter Pump Influent	1/2-in. Ball
V-92	Splitter Pump Purge	1/2-in. Ball
V-93	UV Chamber #1 Effluent Pressure	1/2-in. Ball
V-94	IX-4 Effluent	1 1/2-in. Ball
V-95	Plant Effluent	2-in. Ball
V-96	Plant Effluent Sample Port	1-in. Ball
V-97	T-210 Purge Port	1/2-in. Ball
V-98	T-210 Sightglass	2-in. Ball
V-99	P-210 Effluent Isolation	2-in. Ball
V-100	P-210 Discharge Isolation	2-in. Ball
V-101	T-210 Effluent Bypass	2-in. Ball
V-102	Influent Secondary Containment Purge	2-in. Ball
V-103	Truck Dock Influent	2-in. Ball
V-104	Truck Dock Influent Secondary Containment Purge	2-in. Ball
V-105	Influent Line Secondary Containment Purge	2-in. Ball
V-106	Effluent Tank Bypass (underground)	N/A
V-107	UV #1 Drain	1/2-in. Ball
V-108	Recirculation Isolation	2-in. Ball
V-109	UV #2 Drain	1/2-in. Ball
V-110	Makeup Water	2-in. Ball

APPENDIX 2

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VALVE NO.	DESCRIPTION	TYPE
V-111	Inlet H ₂ O ₂ Rotameter 1	1/2-in. Gate
V-112	Inlet H ₂ O ₂ Rotameter 2	1/2-in. Gate
V-113	Inlet H ₂ O ₂ Rotameter 3	1/2-in. Gate
V-114	Outlet H ₂ O ₂ Rotameter 1	1/2-in. Ball
V-115	Outlet H ₂ O ₂ Rotameter 2	1/2-in. Ball
V-116	Outlet H ₂ O ₂ Rotameter 3	1/2-in. Ball
V-117	T-210 Recirculation Isolation	2-in. Ball
V-118	IX Feed Camlock	2-in. Ball
V-119	PSIG IX-1 Purge	1/4-in. Ball
V-120	PSIG IX-2 Purge	1/4-in. Ball
V-121	PSIG IX-2 Purge (no gauge)	1/4-in. Ball
V-122	PSID IX-2 Purge	1/4-in. Ball
V-123	PSID IX-3 Purge	1/4-in. Ball
V-124	PSIG IX-3 Purge	1/4-in. Ball
V-125	PSIG IX-4 Purge	1/4-in. Ball
V-126	PSIG UV #1	1/2-in. Ball
V-127	PSIG UV #2	1/2-in. Ball
V-128	Gamma Detection Isolation	2-in. Ball
V-129	Recirculation Purge	1-in. Ball
V-130	IX-2 Effluent Isolation	2-in. Ball
V-131	IX-4 Effluent Isolation	2-in. Ball
V-132	T-204 Clean Water Line Sample Port	1/4-in. Sample Cock
HV-107	Sump Pump Discharge	2-in. Ball
HV-108	Sump Pump Discharge	2-in. Ball
HV-500	Recirculation From Effluent Storage Tanks	2-in. Ball
HV-501	Recirculation to UV	2-in. Ball
HV-502	Recirculation to IX	2-in. Ball
HV-503	Recirculation	2-in. Ball
FV-7	Dilute Acid for T-210 Neutralization	1 1/2-in. Auto
FV-9	Acid Regenerant	1 1/2-in. Auto
FV-17	Dilute Caustic for T-210 Neutralization	1 1/2-in. Auto
FV-19	Caustic Regenerant	1 1/2-in. Auto
FV-1A	IX-1 Service Inlet	1 1/2-in. Auto
FV-2A	IX-1 Backwash Inlet	1 1/2-in. Auto
FV-5A	IX-4 Backwash Outlet	1 1/2-in. Auto
FV-8A	IX-1 Fast Rinse Inlet	2-in. Auto

APPENDIX 2

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VALVE NO.	DESCRIPTION	TYPE
FV-10A	IX-1 Fast Rinse Outlet	2-in. Auto
FV-11A	IX-1 Air Scour Inlet	1 1/2-in. Auto
FV-12A	IX-1 Subsurface Wash Inlet	1 1/2-in. Auto
FV-13A	IX-1 Air Scour Outlet	1-in. Auto
FV-1B	IX-1 Outlet/IX-2 Service Inlet	1 1/2-in. Auto
FV-2B	IX-2 Backwash Inlet	1 1/2-in. Auto
FV-3B	IX-2 Acid Regenerant/Settler Rinse Inlet	1 1/2-in. Auto
FV-4B	IX-2 Outlet	1 1/2-in. Auto
FV-5B	IX-2 Backwash Outlet	1 1/2-in. Auto
FV-6B	IX-2 Spent Regenerant Outlet	1 1/2-in. Auto
FV-8B	IX-2 Fast Rinse Inlet	2-in. Auto
FV-10B	IX-2 Fast Rinse Outlet	2-in. Auto
FV-11B	IX-2 Air Scour Inlet	1 1/2-in. Auto
FV-12B	IX-2 Subsurface Wash Inlet	1 1/2-in. Auto
FV-13B	IX- Air Scour Outlet	1-in. Auto
FV-1C	IX-2 Service Outlet/IX-3 Service Inlet	1 1/2-in. Auto
FV-2C	IX-3 Backwash Inlet	1 1/2-in. Auto
FV-3C	IX-3 Acid Regenerant/Settler Rinse Inlet	1 1/2-in. Auto
FV-5C	IX-3 Backwash Outlet	1 1/2-in. Auto
FV-6C	IX-3 Spent Regenerant Outlet	1 1/2-in. Auto
FV-8C	IX-3 Fast Rinse Inlet	2-in. Auto
FV-10C	IX-3 Fast Rinse Outlet	2-in. Auto
FV-11C	IX-3 Air Scour Inlet	1 1/2-in. Auto
FV-12C	IX-3 Subsurface Wash Inlet	1 1/2-in. Auto
FV-13C	IX-3 Air Scour Outlet	1-in. Auto
FV-1D	IX-3 Service Outlet/IX-4 Service Inlet	1 1/2-in. Auto
FV-2D	IX-4 Backwash Inlet	1 1/2-in. Auto
FV-3D	IX-4 Caustic Regenerant/Settler Rinse Inlet	1 1/2-in. Auto
FV-4D	IX-4 Service Outlet	1 1/2-in. Auto
FV-5D	IX-4 Backwash Outlet	1 1/2-in. Auto
FV-6D	IX-4 Spent Regenerant Outlet	1 1/2-in. Auto
FV-8D	IX-4 Fast Rinse Inlet	2-in. Auto
FV-10D	IX-4 Fast Rinse Outlet	2-in. Auto
FV-11D	IX-4 Air Scour Inlet	1 1/2-in. Auto
FV-12D	IX-4 Subsurface Wash Inlet	1 1/2-in. Auto

APPENDIX 2

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VALVE NO.	DESCRIPTION	TYPE
FV-13D	IX-4 Air Scour Outlet	1-in. Auto
HVA-201	Influent from French Drain to T-201	2-in. Ball
HVB-201	Effluent From T-201	2-in. Ball
HVA-202	Influent from French Drain to T-202	2-in. Ball
HVB-202	Effluent From T-202	2-in. Ball
HVA-203	UV Effluent to T-203	2-in. Ball
HVB-203	IX Feed From T-203	2-in. Ball
HVA-204	Regenerant Effluent to T-204	2-in. Ball
HVB-204	Regeneration Clean Water From RFP	2-in. Ball
HVC-204	Regeneration Clean Water to P-3	2-in. Ball
HVA-205	Plant Effluent/T-205 Influent	2-in. Ball
HVB-205	T-205 Discharge	4-in. Butterfly
HVC-205	T-205 Recirculation	4-in. Butterfly
HVA-206	Plant Effluent/T-206 Influent	2-in. Ball
HVB-206	T-206 Discharge	4-in. Butterfly
HVC-206	T-206 Recirculation	4-in. Butterfly
HVA-207	Plant Effluent/T-207 Influent	2-in. Ball
HVB-207	T-207 Discharge	4-in. Butterfly
HVC-207	T-207 Recirculation	4-in. Butterfly
HVD-207	T-207 Isolation	2-in. Ball
HVA-208	Caustic Inlet-Truck Dock	2-in. Ball
HVB-208	Caustic Outlet-T-208	2-in. Ball
HVA-209	Acid Inlet-Truck Dock	2-in. Ball
HVB-209	Acid Outlet-T-209	2-in. Ball
HVA-210	P-210 Inlet	2-in. Ball
HVB-210	P-210 Outlet	2-in. Ball
HVC-210	Discharge Camlock	2-in. Ball
HVD-210	Discharge To Truck	2-in. Ball
HVA-301	P-301 Inlet	2-in. Ball
HVB-301	P-301 Outlet	2-in. Ball
HVA-302	P-302 Inlet	2-in. Ball
HVB-302	P-302 Outlet	2-in. Ball
FCV-1	Fail Close Plant Effluent	1 1/2-in. Solenoid
FCV-2	Fail Close Recycle	2-in. Diaphragm
FCV-3	Collection Gallery Flow Control	2-in. Diaphragm
FCV-4	UV Effluent Control	1 1/2-in. Ball

APPENDIX 3
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MATERIAL TRANSFER CHECKLIST

Transfer Date _____ Tanker Number _____

Description

Operator Initials

Tanker inspection is completed.	_____
Transfer hose is connected.	_____
Tanker is properly vented.	_____
Transfer valve lineup is completed and checked.	_____
Transfer is completed. (Gallons transferred _____)	_____
Normal valve lineup is completed and checked.	_____
Hoses are disconnected.	_____
Tanker vent is closed.	_____
Building 374 Evaporator Shift Manager is notified to pick up the tanker.	_____

