

INFORMATION
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FILTER PRESS OPERATIONS AND CLEANING
CONSOLIDATED WATER TREATMENT FACILITY

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REVISION 1
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Rocky Flats Environmental Technology Site

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REVISION 1

FILTER PRESS OPERATION AND CLEANING CONSOLIDATED WATER TREATMENT FACILITY

APPROVED BY Alan M. Deuel / Alan Parker, 6/18/96
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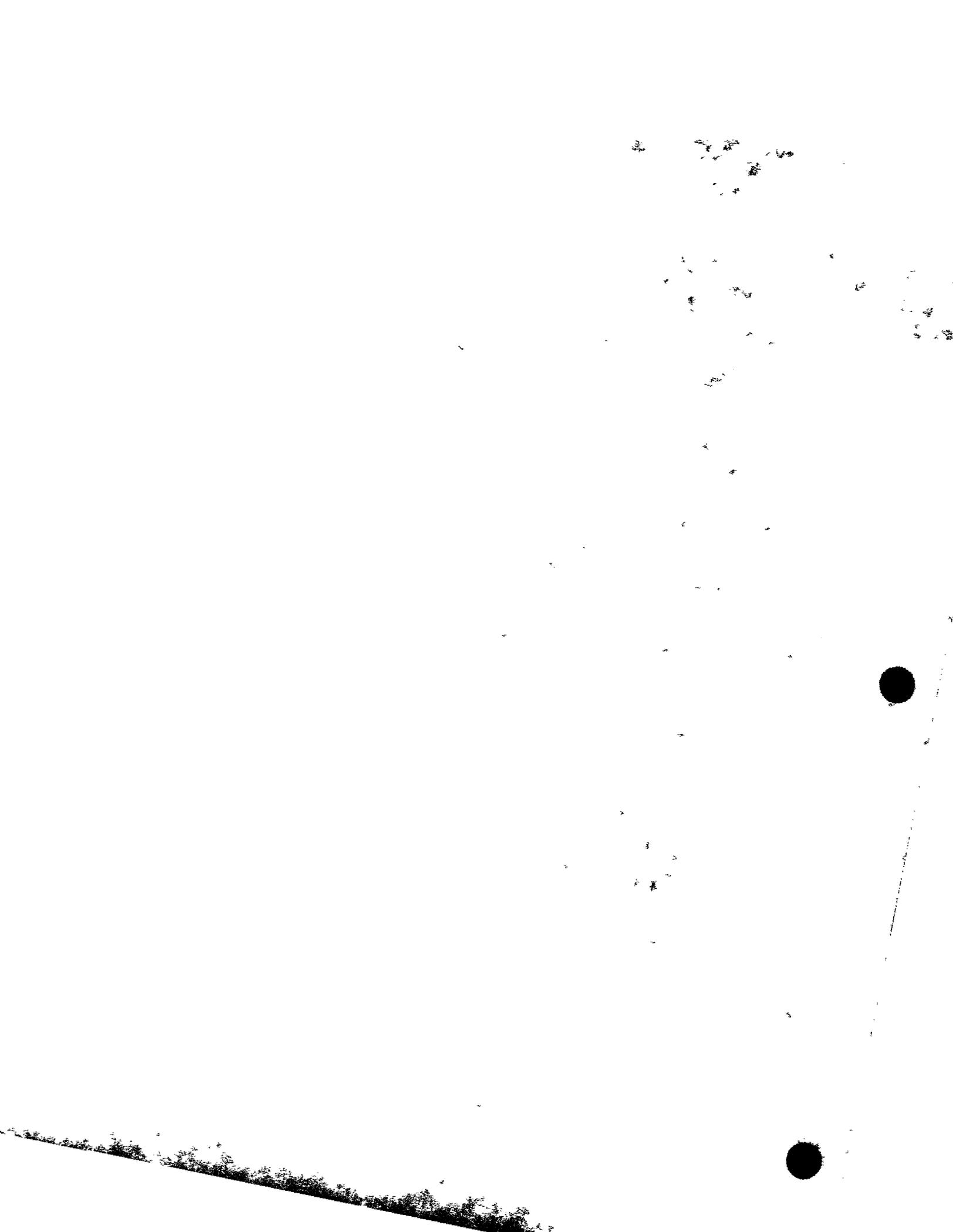
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1 PURPOSE

This procedure describes the administrative and operations steps used at the Rocky Flats Environmental Technology Site (RFETS) for transferring sludge into sludge tank TK-12 (from non-process ER Accelerated Action operations) and for operating or cleaning the JWI™ filter press, both of which are located in treatment trailer T-900B of the Consolidated Water Treatment Facility (CWTF). This procedure provides detailed descriptions and instructions for safe operations when filling, emptying, and cleaning the filter press.

2 SCOPE

This procedure applies to Environmental Restoration Program Division (ERPD) Operations Support and subcontractor personnel.

This procedure addresses the following topics:

- Transferring Sludge into TK-12
- Filling the Filter Press
- Filling Waste Drums
- Using the Pressure Washer
- Cleaning the Filter Press

3 OVERVIEW

The JWI™ filter press solids dewatering system is used to reduce the amount of liquid in the solids contained in the Sludge Holding Tank TK-12 prior to packaging for storage and disposal. The system includes an air-operated slurry pump to transfer concentrated solids from TK-12 to the JWI™ filter press. The JWI™ filter press removes water from the solids and creates a filter cake that is 35 to 50% solids by weight. The filtrate produced by the filter press is recycled to the Concentration Tank TK-8 or to Reaction Tank TK-1 for further treatment. The filter cake is transferred into drums placed beneath the elevated filter press.

4 LIMITATIONS AND PRECAUTIONS

4.1 Transferring Sludge into TK-12

- Proper personal protective equipment (PPE) must be worn for the particular type of sludge to be transferred into TK-12 (if other than concentrate from TK-8). PPE requirements are listed in the Consolidated Water Treatment Facility (CWTF) Health and Safety Plan (HASP).
- Transfer pump and hoses must be inspected and in good condition prior to transfer operations.
- Adequate capacity must be available in TK-12 to accept the volume of sludge to be transferred.
- Sludge must be of a physical and chemical quality and consistency for proper filter press operation and production.

4 LIMITATIONS AND PRECAUTIONS (continued)

4.2 Pressure Washer

- Proper PPE shall be used at all times including face shield and leather gloves.
- Leaving the shutoff gun in OFF for more than 3 min may overheat the pump and cause pump failure
- The wand shall be gripped firmly when starting the pressure washer. Failure to do so could result in injury to the Operator from a whipping wash wand.
- Placing hands or fingers in front of the wash wand or pointing the gun at your body or at anyone else could result in severe personal injury
- Operating the unit with high pressure leaks can cause serious bodily harm
- The washer shall be run on a level surface, and moisture shall be prevented from reaching the power unit or electrical controls

4.3 JWI™ Filter Press

- Before the JWI™ filter press is operated, personnel shall be aware of pinch points
- The air supply switch shall be placed in OFF when the filter press is full, and is NOT going to be emptied immediately.
- The air supply switch shall be placed in OFF when the filter press is open during cleaning
- PPE shall be used at all times when emptying or cleaning the JWI™ filter press. PPE requirements are contained in the CWTF HASP
- Radiological monitoring equipment shall be used in accordance with the CWTF HASP when emptying the filter press

5 PREREQUISITES

5.1 Planning and Coordination

CWTF Responsible Manager

- [1] Ensure that sludge processing (transferring or filter-pressing) is on the Plan of the Day (POD)
- [2] Ensure that the treatment plant operators involved in the implementation of this procedure have appropriate training as detailed in the 1-10000-FUM, Training User's Manual, and that the training is documented

5 1 Planning and Coordination (continued)

CWTF Responsible Manager

- [3] Ensure that the Lead operator is certified Class A, Industrial Wastewater Plant Operator and that all other Operators are certified at a minimum as Class C Industrial Wastewater Plant Operators (refer to Article 9 of Title 25 C R S 1973)
- [4] Ensure that sludge to be transferred into TK-12 is compatible with existing sludge to be filter pressed by analytical data or process knowledge

Lead Operator/Operator

- [1] Attend a pre-shift safety briefing covering plant operations prior to the initiation of this procedure

Health and Safety Specialist

- [1] Conduct a pre-shift safety briefing covering plant operations prior to the initiation of this procedure

5 2 Preparation to Transfer Sludge to TK-12

Lead Operator/Operator

- [1] Inspect all equipment to be used in the sludge transfer for integrity and proper operation
- [2] Ensure that staging area at trailer T-900B is adequate to accept the number of containers of sludge
- [3] Ensure that TK-12 has adequate room to accept sludge to be transferred

5 3 Preparation to Fill JWI™ Filter Press

Lead Operator/Operator

- [1] Ensure that the pressure to the sludge pump SP-2 is 0 psi
- [2] Ensure that sludge holding tank TK-12 is at least three quarters full of solids in order to process two drums of sludge

5 4 Preparation to Fill Waste Drums

Lead Operator/Operator

- [1] Complete the required documentation including Waste Traveler Forms and sampling forms in accordance with Sections 2 0 and 3 0 of 5-23000-WRP Waste Requirements Procedures Manual
- [2] Obtain and place drums and liners in T900B
- [3] Prepare drums and liners in accordance with 5-23000-WRP Waste Requirements Procedures Manual

5 5 Preparation To Use Pressure Washer

CAUTION

Water must be supplied before starting the pressure washer motor or pump damage will result.

Lead Operator/Operator

- [1] Verify that the water supply to the pressure washer is on and supplying a minimum of 2 gpm at a pressure of 30 to 100 psi
- [2] Connect the electrical cord and test the ground fault circuit interrupter (GFCI) contained within the pressure washer plug using the reset test procedures located on the GFCI device DO NOT use the machine if the GFCI device fails the test
- [3] Inspect the pressure washer hose and connections for cuts and defects, and ensure that fittings are secure

5 6 Preparation To Clean JWI™ Filter Press

Lead Operator/Operator

- [1] Verify that the press is empty before opening it to clean the filter plates (Process knowledge dictates that the filter press will be cleaned after processing enough sludge to fill at least one drum)
- [2] Secure the trailer T-900B area to prevent unauthorized personnel from entering the trailer during cleaning operations
- [3] Assemble all equipment necessary for filter press cleaning, PPE handling and clean up of trailer T-900B in the filter press area of trailer T-900B

6 INSTRUCTIONS

6 1 Transferring Sludge into TK-12

Lead Operator/Operator

- [1] Don PPE for transferring sludge into tank TK-12 per the CWTF HASP
- [2] Carefully vent any excess pressure that may have built up in any drums or containers which contain sludge to be transferred into TK-12
- [3] Assemble the transfer pump and discharge hose The pump is selected on the basis of estimated sludge percent solids (operator experience) and hazardous characteristics (chemical analysis)

6 1 Transferring Sludge into TK-12 (continued)

Lead Operator/Operator
IF using an electric drum pump,
THEN

- [A] Ensure that the pump switch is OFF
- [B] Secure the suction tube of the pump into the container
- [C] Secure the discharge hose of the pump into TK-12
- [D] Plug the pump into a 110V outlet, and turn the switch to ON
- [E] When the container has been emptied of sludge, turn the pump switch to OFF, and unplug the pump
- [F] Carefully transfer the pump to the next container and repeat steps [3] [A] through [D] until the transfer has been completed

[4] One operator will man the pump at the container and one operator will monitor the discharge hose and tank TK-12 level

[5] **IF performing the transfer with an air operated diaphragm pump**
THEN

- [A] Locate the diaphragm pump in an appropriate place for the sludge transfer, minimizing the suction hose length
- [B] Secure the suction hose in the drum or container with the sludge to be transferred and secure the discharge hose in TK-12
- [C] Turn on the air compressor in T-900B by placing the switch on the air compressor control panel CP-1 to AUTO
- [D] Ensure that the air regulator on the distribution system is positioned to prevent air flow to the pump
- [E] Connect an air line to the air outlet quick-connect at the distribution line off the air system and the other end to the pump
- [F] Slowly throttle the air regulator to allow air flow to the pump and monitor pump operation
- [G] When pumping is completed, throttle the air regulator to stop air flow and transfer the suction hose to the next container and repeat steps 5 [D] through [G]

6 1 **Transferring Sludge into TK-12 (continued)**

Lead Operator/Operator

- [6] When pumping operations have been completed, flush the pump and hoses with clean water into TK-12

6 2 **Filling JWI™ Filter Press**

Lead Operator/Operator

- [1] Place the air supply switch located on the filter press control panel to ON
- [2] Place the selector switch located on the filter press control panel to CLOSE
- [3] After the press is fully closed, place the hydraulic pump control switch in ON

NOTE 1 *The operator may refer to the Operations and Maintenance manual for the Precipitation and Microfiltration System Volume I Section 3 for detail and location of valves*

- [4] Close MV-997 (air line into filtrate for blowdown from press)

- [5] Open the following valves
- MV-956 (filtrate drain from press)
 - MV-960 (sludge feed to press)
 - MV-990 (filtrate drain from press)
 - MV-991 (filtrate drain from press)

- [6] Open the air supply valve MV-971 to the Wilden Sludge Pump SP-2

NOTE 2 *If other sludges such as sludges from ER Accelerated Action Projects, have been transferred into TK-12 for filter pressing, the filtrate may require additional treatment. Filtrate is typically routed into TK-8 but may be directed into treatment tank TK-1 for further treatment. The CWTF Responsible Manager will direct the Lead Operator/Operator regarding this change in Filter Press Operations*

- [7] Fill the press as follows

- [A] Initially set the pressure to the pump at 20 psi (on PI-7) by adjusting the supply regulator. Increase in increments of 20 psi when the time between pump strokes is one minute. (As the filter press fills, the time between strokes of the pump will increase)
- [B] Increase the pressure to the pump until the maximum pressure of 100 psi is reached

NOTE 3 *When the pressure is 100 psi and the time between pump strokes is greater than two min, the press is full. Filling the JWI™ filter press should take a minimum of 30 min and normally will take 1 to 2 hours.*

6 2 Filling JWI™ Filter Press (continued)

Lead Operator/Operator

- [8] When the press is full close the air supply MV-971 to SP-2 and bleed the pressure from the air supply regulator
- [9] **WHEN** performing an air blowdown of the filter press after each press run, (blowdown evacuates water from the filtrate collection ports of the filter plates)
THEN
- [A] Close the following valves
- MV-956
 - MV-960
 - MV-990
 - MV-991
- [B] Open MV- 997 and regulate the pressure to 40 psi
- [C] Slowly open MV- 990 to allow air to bypass the filter press, and flush the water standing in the return pipe to TK-8
- [D] Close MV-990
- [E] Allow the filter press to blow down for 2 to 3 min
- [F] Close MV-997
- [G] Open the following valves
- MV-956
 - MV-990
 - MV-991
- [H] Allow a minimum of 2 min for the filter press to gravity drain
- [I] Close the following valves
- MV-956
 - MV-990
 - MV-991
- [10] Record all activities in the CWTF Operations Log Book

6 3 Filling Waste Drums

Lead Operator/Operator

- [1] Don the appropriate Personal Protective Equipment (PPE) as required in the HASP

6.3 **Filling Waste Drums (continued)**

Lead Operator/Operator (continued)

- [2] Prepare the drum to be filled by placing two plastic round bottom liners into the drum
- [3] Use a drum cart to place the drum under the barrel fill guide under the filter press
- [4] Open the press by placing the hydraulic switch in OFF, and the selector switch in OPEN
- [5] **WHEN** the hydraulic ram has retracted completely,
THEN place the air supply switch in OFF to prevent the press from being closed during drum filling.
- [6] Separate the filter plates one at a time and direct the cake into the barrel fill guide and into the drum.

CAUTION

Tearing or damaging the filter cloth will render the cloth unusable and result in replacement.

- [7] Use a nylon spatula to dislodge any solids that stick to the plates
- [8] Break up the solids with a nylon spatula as they are put into the drum to eliminate void space, and get a full press of solids into one drum
- [9] **WHEN** the solids from four plates have been placed into the drum,
THEN sample the sludge in accordance with SAP-RFP/ER-WF-OU2 4, Consolidated Water Treatment Facility Sampling and Analysis Plan.
- [10] Evenly spread 1/2 to 3/4 cup of Radsorb over the sludge
- [11] Repeat steps 6.2 [6] through 6.2 [10], as necessary, to fill the drum
- [12] **WHEN** the drum is full of sludge,
THEN evenly spread 1/2 to 3/4 cup of Radsorb over the sludge
- [13] Close the drum in accordance with WO-1101, Solid Radioactive Waste Packaging Outside the PA, located in 5-23000-WRP
- [14] Wipe down the press using a bucket of clean water and a sponge, paying attention to the gasketed areas on the plates
- [15] Empty the cleaning bucket into TK-12
- [16] Close the press for refilling or cleaning

6 3 Filling Waste Drums (continued)

Lead Operator/Operator (continued)

- [17] Immediately clean all loose sludge from the work area using a bucket of clean water and a sponge, to prevent the possibility of dried material becoming airborne
- [18] Empty the cleaning bucket into TK-12
- [19] Rinse the cleaning bucket and sponge with clean water, and empty the cleaning bucket into TK-12
- [20] Contact the Health and Safety Specialist to conduct a radiological survey of the area in accordance with the CWTF HASP
- [21] Record all activities in the CWTF Operations Log Book

6 4 Using The Pressure Washer

Lead Operator/Operator

- [1] Don the appropriate Personal Protective Equipment (PPE) as required in the CWTF HASP including a face shield and leather gloves
- [2] Place the pump control switch in ON
- [3] Grasp the trigger gun firmly and open the trigger on the wash wand
- [4] Sweep the area to be washed with even overlapping strokes
- [5] WHEN cleaning is complete
THEN release the trigger on the wash wand
- [6] Place the pump control switch in OFF
- [7] IF the pressure washer is not to be used within 6 weeks
THEN flush the system with antifreeze for rust protection
- [8] Record all activities in the CWTF Operations Log Book

6 5 Cleaning the Filter Press with Pressure Washer

Lead Operator/Operator

- [1] Don the appropriate Personal Protective Equipment (PPE) as required in the CWTF HASP including a face shield and leather gloves
- [2] Place the air supply switch on the filter press in ON

6 5 Cleaning the Filter Press with Pressure Washer (continued)

- Lead Operator/Operator (continued)**
- [3] Place the selector switch on the filter press in OPEN
 - [4] **WHEN** the hydraulic ram has retracted completely,
THEN place the air supply switch on the filter press in OFF to prevent the press from being inadvertently closed during cleaning
 - [5] Remove the barrel fill guide
 - [6] Remove and stack the filter plates
 - [7] Scrub with a bristle brush and rinse
 - The fixed filter plate
 - Exterior surfaces of the press
 - Trailer walls and the floor
 - [8] Use a shop vacuum to pick up the wash or rinse water to prevent it from flowing to the east end of the trailer
 - [9] Place the filter plates in the trough one at a time, and clean using Section 6 3 Steps [1] through [6], paying attention not to damage the gasketed areas.
 - [10] Wipe down each plate, paying attention to the gasketed areas
 - [11] Place the cleaned plates back in the press, alternating the dot pattern 1,3,1, etc until all the plates are reinserted into the press
 - [12] Place the air supply switch in ON
 - [13] Close the filter press by placing the selector switch in CLOSE.
 - [14] Place the air supply switch in OFF
 - [15] Place the barrel fill guide in the trough, and scrub and rinse
 - [16] Replace the barrel fill guide under the filter press.
 - [17] Procure the electric drum pump from T900B
 - [18] Use the electric drum pump to empty the cleaning water from the trough into TK-12.
 - [A] Place electric drum pump in-trough
 - [B] Verify that the drum pump control switch is in OFF

6 5 Cleaning the Filter Press with Pressure Washer (continued)

Lead Operator/Operator (continued)

[C] Plug the drum pump power cord into a 120V receptacle

[D] Attach a 1 in polyethylene (poly) hose to the discharge of the drum pump

[E] Run the poly hose from the drum pump into TK-12

[F] Place the drum pump control switch in ON and pump contents from trough into TK-12

[G] **WHEN** the trough is empty
THEN place the drum pump control switch in OFF

[19] Fill a 5-gal plastic container with water for flushing the drum pump

[A] Open MV-999 (Effluent from TK-11 recirculate)

[B] Place the FILTRATE TRANSFER PUMP TP-11-1 control switch in HAND and observe that the control switch illuminates

The illuminated control switch lamp is an indication that the pump is RUNNING

[C] Open MV-939

[D] Open the hose spigot MV-962 at the outlet of MV-939 and fill container

[E] **WHEN** the container is full
THEN

[a] Place the FILTRATE TRANSFER PUMP TP-11-1 control switch to OFF

[b] Close MV-939 and hose spigot MV-962

[c] Close MV-999

[20] Rinse the electric drum pump

[A] Place drum pump into the 5-gal rinse water container

[B] Run the poly hose from the drum pump into TK-12

[C] Rinse the exterior of the drum pump suction tube

[D] Place the drum pump control switch in ON and pump rinse water from the 5-gal container into TK-12

6.5 Cleaning the Filter Press with Pressure Washer (continued)

Lead Operator/Operator (continued)

[E] WHEN the 5-gal container is empty,
THEN place the control switch for the drum pump in OFF

[F] Drain the transfer hose into TK-12

[G] Empty the rinse water remaining in the 5-gal container into TK-12

[21] Store the electric drum pump in T900B

[22] Rinse the trough with clean water

[23] Vacuum out the trough using the shop vacuum

[24] Scrub the floor and pick up the water with the shop vacuum

[25] Empty the water from the shop vacuum into a bucket, and empty the bucket into TK-12

[26] Mop the floor, using a mop and a mop bucket filled with clean water

[27] Empty the water from the mop bucket into TK-12

[28] Contact the Health and Safety Specialist to conduct a radiological survey of the area, in accordance with the CWTF HASP

[29] Record all activities in the CWTF Operations Log Book.

7 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 3-21000-ADM-17 01 Quality Assurance Records Management:

- Waste Traveler Form(s)
- Sampling Form(s)
- CWTF Operations Log Book
- Qualification/Training Documentation, as required
- Occurrence Reports as required

Submission of record copies to the ERPD Project File Center will satisfy Administrative Record requirements

7 RECORDS (continued)

There are no nonquality records generated by this procedure

8 REFERENCES

Rocky Flats Plant Consolidated Water Treatment Facility Health and Safety Plan

Consolidated Water Treatment Facility Sampling and Analysis Plan

1-10000-HWR, Hazardous Waste Requirements Manual

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

3-21000-ADM-17 01 Quality Assurance Records Management

5-23000-WRP Waste Requirements Procedures Manual

Operations and Maintenance Manual Precipitation and Microfiltration System Volume I

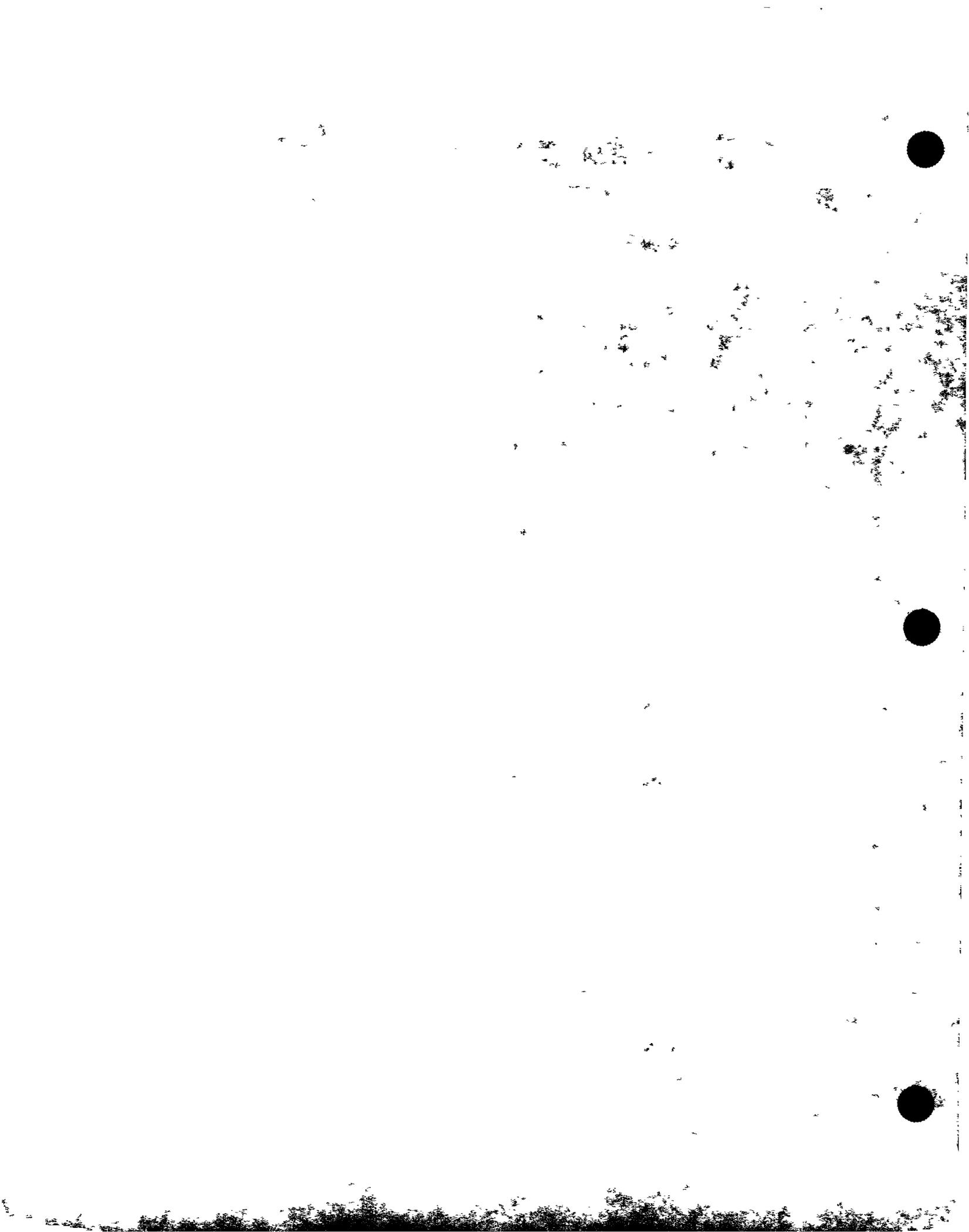


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4 I50 ENV OPS FO 32	Treated Effluent Discharge OU1 Bldg 891	0	04/13/94
4 I51 ENV OPS FO 33	Treated Effluent Recirculation OU1 Bldg 891	0	12/22/94
4 I52 ENV OPS FO 34	Ion Exchange System Normal Operations OU1 Bldg 891	0	11/23/94
95 DMR 000061	Addition of OU1 Form	0	02/14/95
4 I53 ENV OPS FO 35	System Normal Operations Ultraviolet/Hydrogen Peroxide Oxidation and Granular Activated Carbon Systems Consolidated Water Treatment Facility	1	03/26/96
4 I54 ENV OPS FO 36	ION Exchange System Regeneration Operations Operable Unit 1 Bldg 891	0	05/19/95
95 DMR 000727		0	06/27/95
4 I55 ENV OPS FO 37	Neutralization Tank Normal Operations OU1 Bldg 891	0	11/23/94
•4 I56 ENV OPS FO 38	Bulk Chemical Handling Transfer and Storage Consolidated Water Treatment Facility	2	06/20/96
4 I57 ENV OPS FO 39	Calibration Operation and Maintenance of Monitoring and Fluid Handling Equipment OU1 Bldg 891	0	12/02/94
4 I61 ENV OPS FO 43	Filter Press Operation and Cleaning OU2 Field Treatability Unit	0	12/16/94
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4 I60 ENV OPS FO 42	Chemical Cleaning Operations Consolidated Water Treatment Facility	1	02/27/96
•4 I61 ENV OPS FO 43	Filter Press Operation and Cleaning Consolidated Water Treatment Facility	1	06/20/96
4 I62 ENV OPS FO 44	Granular Activated Carbon Transfer OU2 Field Treatability Unit	0	05/22/95

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4 I63 ENV OPS-FO 45	Chemical Handling and Mixing Operations Consolidated Water Treatment Facility	1	04/03/96
4 S72 ENV OPS FO 46	System Normal Operations Oil-Absorbent Media Drum Unit Consolidated Water Treatment Facility	0	05/20/96