

QUARTERLY REPORT

**CONSOLIDATED WATER TREATMENT FACILITY
AND
OU7 PASSIVE SEEP INTERCEPTION AND
TREATMENT SYSTEM**

**FOR JANUARY THROUGH MARCH 1997
INCLUDING DATA SUMMARY FOR
OCTOBER THROUGH DECEMBER 1996**

Rocky Mountain Remediation Services, L.L.C.

April 1997

TABLE OF CONTENTS

	<u>PAGE</u>
SECTION A - CONSOLIDATED WATER TREATMENT FACILITY	
1.0 INTRODUCTION	3
2.0 CWTF OPERATIONS (Jan, Feb, Mar 1997)	3
2.1 QUANTITIES OF WATER COLLECTED AND TREATED	3
2.2 CHEMICAL USAGE	5
2.3 WASTE GENERATION	5
3.0 INFLUENT & EFFLUENT SAMPLING (Oct, Nov, Dec 1996)	8
3.1 OU1 FRENCH DRAIN SUMP, COLLECTION WELL, AND 881 FOOTING DRAIN CHARACTERISTICS	8
3.2 OU2 SURFACE WATER CHARACTERISTICS	9
3.3 TREATED EFFLUENT CHARACTERISTICS	9
4.0 ENVIRONMENTAL COMPLIANCE	9
5.0 ANTICIPATED OPERATIONS FOR NEXT QUARTER	10
SECTION B - OU7 PASSIVE SEEP INTERCEPTION AND TREATMENT SYSTEM	
6.0 INTRODUCTION, OPERATIONS, AND SAMPLING	11
Appendix A - Data Qualifiers and Descriptions	12

TABLES

2-1 Approximate Quantities of Water Collected and Processed	4
2-2 Chemical Usage	6
2-3 Waste Generation	7

3

SECTION A - CONSOLIDATED WATER TREATMENT FACILITY

1.0 INTRODUCTION

The CWTF went on-line February 29, 1996. The CWTF is designed as a comprehensive facility combining individual IM/IRA treatment activities in order to reduce cost, increase efficiency, and offer treatment options to the Rocky Flats Environmental Technology Site (RFETS) in support of on-going Environmental Restoration (ER) activities and remediations.

The Consolidated Water Treatment Facility (CWTF) consists of the following specific unit operations:

- Chemical precipitation (T-900A/T-900B)
- Cross-flow membrane microfiltration (T-900A/T-900B)
- Ultraviolet Light/Hydrogen Peroxide Oxidation (Building 891)
- Granular Activated Carbon (Building 891)
- Ion Exchange (Building 891)

A portable clay absorbent media drum is also available for use at the CWTF during water transfers from tanker trucks to CWTF influent storage tanks as a pretreatment of oily wastewaters. Waters are processed through the various CWTF unit treatment operations based on knowledge of the influent water characteristics in order to maximize treatment and reduce handling costs and waste generation.

The CWTF currently treats contaminated water from the following sources:

- OU1 groundwater and OU2 surface water
- Decontamination water from the Main Decontamination Facility and Protected Area Decontamination Facility
- Other ER waters (e.g., purge water, water pumped from containments, etc.)
- Waters from ER Accelerated Action Projects

The CWTF flowpath is flexible enough to allow waters to be treated through particular unit processes as necessary, and to allow for re-treatment if necessary.

2.0 CWTF OPERATIONS (January, February, March 1997)

2.1 QUANTITIES OF WATER COLLECTED AND TREATED

Table 2-1 summarizes the quantities of water treated at the CWTF for the period January through March 1997. During this period the CWTF accepted water from the following sources:

- OU1 French Drain Sump
- OU1 Collection Well
- OU2 Surface Water Station SW-59
- Snow melt/rain water pumped from CWTF containments
- MDF Water

As can be seen from Table 2-1, a total of approximately 72,715 gallons of water were treated through the Building 891 Ion Exchange Columns during the January through March period. Approximately 7,144 gallons of the total water volume were treated through the chemical precipitation/microfiltration trailers.

TABLE 2-1
 CONSOLIDATED WATER TREATMENT FACILITY
 APPROXIMATE QUANTITIES OF WATER COLLECTED AND PROCESSED a/

Month/Year	Gallons Collected from the OU1 French Drain Sump b/	Gallons Collected from the OU1 Collection Well b/	Gallons Accepted at Bldg 891 from the MDF and Other Sources c/	Gallons Pumped from Bldg. 891 Containments	Gallons Collected from the OU2 SW-59	Gallons Processed through T900A/T900B	Gallons Processed through GAC at Bldg 891	Gallons Processed through IX at Bldg 891
Jan-97	1,125	815	0	1,280	2,297	0	0	0
Feb-97	4,865	840	0	2,970	2,611	7,144	23,418	14,377
Mar-97	8,385	1,210	3,400	3,176	2,360	0	10,102	17,874
1st Quarter Totals	14,375	2,865	3,400	7,426	7,268	7,144	33,520	32,051
Apr-97								
May-97								
Jun-97								
2nd Quarter Totals	0	0	0	0	0	0	0	0
Jul-97								
Aug-97								
Sep-97	0	0	0	0	0	0	0	0
3rd Quarter Totals	0	0	0	0	0	0	0	0
Oct-97								
Nov-97								
Dec-97	0	0	0	0	0	0	0	0
4th Quarter Totals	0	0	0	0	0	0	0	0
Year-to-Date Totals	14,375	2,865	3,400	7,426	7,268	7,144	33,520	32,051

a/ Please note that because the CWTF is equipped with Influent Tanks, the quantity of water collected will not necessarily equate to the quantity of water processed. Also note that a 15,000 gallon surge tank (T-203) is in-line between the UV/GAC unit processes and IX #1, and therefore the quantity of water processed through UV/GAC will not equate to the quantity of water processed through IX.

b/ This ground water is collected each operating day (i.e., 5 days per week).

c/ Other sources may include purge water, ER Accelerated Action Project water, etc.

5

Please note that because the CWTF is equipped with three Influent Tanks, the amount of water treated may be less than or greater than the amount of water collected for any given period.

During the period from January through March, 1997, 95,800 gallons of treated water was released to the South Interceptor Ditch (SID).

As of the end of March, 1997, approximately 3,694,973 gallons of water has been processed through the Building 891 Ion Exchange Columns.

2.2 CHEMICAL USAGE

The following chemicals are utilized during wastewater treatment operations at the CWTF:

- Building 891
 - Hydrogen peroxide (UV oxidation)
 - Hydrochloric acid (ion exchange regeneration and pH adjustment)
 - Sodium hydroxide (ion exchange regeneration)

- T-900A/T-900B trailers
 - Sulfuric acid (pH adjustment: TK-1 and effluent; filter module chemical cleaning)
 - Calcium hydroxide (precipitation)
 - Ferric sulfate (precipitation)
 - Hydrogen peroxide (chemical cleaning of filter modules)
 - Sodium hydroxide (pH adjustment: TK-2)
 - Sodium hypochlorite (chemical cleaning of filter modules)

Table 2-2 summarizes the quantities of chemicals utilized during the period of January through March 1997.

2.3 WASTE GENERATION

The following types of waste are generated during normal wastewater treatment operations at Building 891 and the T-900A/T-900B trailers:

- Building 891
 - used filter socks
 - neutralized ion exchange regenerant
 - personnel protective equipment

- T-900A/T-900B trailers
 - filter press sludge cake
 - personnel protective equipment
 - used filter membranes

Table 2-3 summarizes the types and quantities of the waste generated during wastewater treatment operations at Building 891 and the T-900A/T-900B trailers for the first quarter of 1997. Approximately 13,423 gallons of neutralized regenerant water from Tank T-210 was sent to the 374 evaporator for processing during the January through March 1997 period.

6

**TABLE 2-2
CONSOLIDATED WATER TREATMENT FACILITY
CHEMICAL USAGE**

Month/Year	Building 891					T-900A/T-900B				
	Hydrochloric Acid 36% (gallons)	Sodium Hydroxide 50% (gallons)	Hydrogen Peroxide 50% (gallons)	Sulfuric Acid a/ 98% (gallons)	Calcium Hydroxide (pounds)	Ferric Sulfate (pounds)	Hydrogen Peroxide 35% (gallons)	Sodium Hydroxide 50% (gallons)	Sodium Hypochlorite (gallons)	
Jan-97	0.0	66.0	2.0	0.0	0.0		0.0	0.0	0.0	
Feb-97	339.0	138.0	1.9	1.5	31.4	2.5	6.3	0.0	0.0	
Mar-97	0.0	0.0	5.7	0.0	0.0	0.0	0.0	0.0	0.0	
1st Quarter Totals	339.0	204.0	9.6	1.5	31.4	2.5	6.3	0.0	0.0	
Apr-97										
May-97										
Jun-97										
2nd Quarter Totals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Jul-97										
Aug-97										
Sep-97										
3rd Quarter Totals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Oct-97										
Nov-97										
Dec-97										
4th Quarter Totals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Year-to-Date Totals	339.0	204.0	9.6	1.5	31.4	2.5	6.3	0.0	0.0	

a/ In addition to the sulfuric acid quantity listed in this column, occasionally a small amount (approximately 1 gallon per effluent tank) of sulfuric acid is used in Building 891 for effluent pH adjustment.

TABLE 2-3
 CONSOLIDATED WATER TREATMENT FACILITY
 WASTE GENERATION

Month/Year	Building 891			T-900A/T-900B			Bidg 891/T-900A/T-900B	
	Filter Socks (55-gal drum)	Neutralized Regenerant to 374 (gallons)	Spent Media (drums)	Sludge Production (55-gal drum)	Spent GAC (pounds)	Used Filter Membranes (55-gal drum)	Personal Protective Equip. (55-gal drum) a/	
Jan-97	--	4,136	0	0	0	0	--	
Feb-97	--	4,737	0	0	0	0	--	
Mar-97	--	4,550	0	0	0	0	--	
1st Quarter Totals	0 d/	13,423	0	0	0	0	--	2 drums b/c/
Apr-97	--	0	0	0	0	0	--	
May-97	--	0	0	0	0	0	--	
Jun-97	--	0	0	0	0	0	--	
2nd Quarter Totals	0 d/	0	0	0	0	0	--	
Jul-97	--	0	0	0	0	0	--	
Aug-97	--	0	0	0	0	0	--	
Sep-97	--	0	0	0	0	0	--	
3rd Quarter Totals	0 d/	0	0	0	0	0	--	
Oct-97	--	0	0	0	0	0	--	
Nov-97	--	0	0	0	0	0	--	
Dec-97	--	0	0	0	0	0	--	
4th Quarter Totals	0 d/	0	0	0	0	0	--	
Year-to-Date Totals	0	13,423	0	0	0	0	--	2

- a/ PPE is monitored for radiological contaminants, and if determined to be acceptable for unrestricted release, is sent to the Rocky Flats landfill for disposal. Until the acceptance water from an ER Accelerated Action Project in February 1996, no PPE from Building 891 or the T-900A/T-900B trailers had been found to be radiologically contaminated.
- b/ PPE is collected from water treatment operations, MDF decontamination operations, etc. and is drummed collectively.
- c/ These drums are filled gradually, and therefore only quarterly totals are reported.
- d/ Used filter socks are drummed with other compatible wastes generated onsite, therefore the drums generated cannot be tracked.

SECTION A - CONSOLIDATED WATER TREATMENT FACILITY

3.0 INFLUENT AND EFFLUENT SAMPLING (October, November, December 1996)

3.1 OU1 FRENCH DRAIN SUMP, COLLECTION WELL, AND BUILDING 881 FOOTING DRAIN CHARACTERISTICS

Collection Well water is now collected separately from the French Drain Sump water, and collection and treatment of water from the Building 881 Footing Drain was discontinued in September 1994. Therefore the current French Drain Sump data is representative of only those waters that seep from the groundwater table into the French Drain. For the October, November, December, 1996 period, quarterly sampling was performed at the French Drain Sump, the Collection Well, and the Building 881 Footing Drain.

VOCs, Radionuclides, Metals, and Water Quality for the French Drain Sump, the Collection Well, and the Building 881 Footing Drain have been reviewed and compared to the OU1 ARARs. Note that it has historically been assumed that the OU1 ARARs for radionuclides and metals are dissolved values. Those constituents which did exceed OU1 ARARs include the following:

FRENCH DRAIN SUMP

<u>Compound</u>	<u>Exceedance Value</u>	<u>Units</u>	<u>OU1 ARAR</u>
Selenium (dissolved)	59.5 B	ug/L	10
Total Dissolved Solids	643	mg/L	400

COLLECTION WELL

<u>Compound</u>	<u>Exceedance Value</u>	<u>Units</u>	<u>OU1 ARAR</u>
Tetrachloroethene	53	ug/l	5
Trichloroethene	500	ug/l	5
Selenium	786	ug/l	10
TDS	1082	mg/l	400
Sulfate	261.4	mg/l	250

BUILDING 881 FOOTING DRAIN

<u>Compound</u>	<u>Exceedance Value</u>	<u>Units</u>	<u>OU1 ARAR</u>
Tetrachloroethene	43	ug/L	5
Total Dissolved Solids	517	mg/L	400

The Building 881 Footing Drain is currently being sampled for both total and dissolved radionuclides and metals (refer to DOE letter ER:SRG:10199, dated September 29, 1994).

SECTION A - CONSOLIDATED WATER TREATMENT FACILITY

3.2 OU2 SURFACE WATER CHARACTERISTICS

Surface water is sampled on a quarterly basis from SW-59, SW-61, and SW-132. Although the Environmental Protection Agency and the Colorado Department of Public Health and the Environment authorized the discontinuation of the collection and treatment of SW-61 and SW-132 on April 24, 1994, the two surface water stations continue to be sampled to verify that no increase in contamination is occurring. Collection and treatment for SW-61 and SW-132 was discontinued on May 6, 1994. Presently only SW-59 water is collected and treated. Note that it has historically been assumed that the OU2 ARARs for radionuclides and metals are total values.

The data for OU2 surface water has been reviewed and compared to the relevant ARARs, those constituents which did exceed OU2 ARARs include the following:

SURFACE WATER STATIONS: SW-59, SW-61, and SW-132

<u>Compound</u>	<u>Stations</u>	<u>Exceedance Value</u>	<u>Units</u>	<u>OU2 ARAR</u>
Carbon Tetrachloride	SW-59	54 E	ug/L	5
Chloroform	SW-59	10	ug/L	1
Tetrachloroethene	SW-59	24	ug/L	1
Trichloroethene	SW-59	27	ug/L	5
Vinyl Chloride	SW-61	3	ug/L	3

<u>Compound</u>	<u>Stations</u>	<u>Exceedance Value</u>	<u>Units</u>	<u>OU2 ARAR</u>
Aluminum	SW-59	200	ug/L	200
Aluminum	SW-61	1,128.5	ug/L	200
Iron (L)	SW-59	1,186.1	ug/L	1000
Zinc	SW-59	269.9	ug/L	50
Zinc	SW-61	50.6	ug/L	50
Zinc	SW-132	65.5	ug/L	50

3.3 TREATED EFFLUENT CHARACTERISTICS

Treated effluent from the CWTF is stored in one of three Effluent Storage Tanks prior to discharge. An Effluent Storage Tank is sampled once it is full, and the tank is discharged if the data show that ARARs have not been exceeded.

Effluent tank T-206 was retreated and transferred to T-205. The tank was discharged to the SID following receipt of sample results which showed the water quality to be acceptable for discharge and complied with the ARAR's. T-205 contained treated water from the T3/T4 project which was an ER Accelerated Action Project.

Effluent tank T-207 was retreated and transferred to T-206 and is awaiting sampling.

4.0 ENVIRONMENTAL COMPLIANCE

Periods of Non-Collection: OU2 SW-59

There were no periods of non-collection.

SECTION A - CONSOLIDATED WATER TREATMENT FACILITY

5.0 ANTICIPATED OPERATIONS FOR NEXT QUARTER

Collection and treatment of water from the French Drain Sump will continue as normal. Water from the Collection Well will continue to be collected in the OU1 trailer-mounted container and transported to the CWTF for off-loading and treatment. Purge, incidental, and decontamination pad waters will continue to be accepted and treated.

Collection of SW-59 weir water into T-59 (the double-walled tank located just south of the SW-59 weir box) began on September 30, 1996. This collected water is now periodically transported to the CWTF via tanker truck.

The CWTF will continue to accept and treat waters from ER Accelerated Action Projects. Projects being supported with water treatment activities include the Mound remediation and the IHSS 119.1 remediation.

SECTION B - OU7 PASSIVE SEEP INTERCEPTION AND TREATMENT SYSTEM

6.0 INTRODUCTION, OPERATIONS, AND SAMPLING

The OU7 Passive Seep Interception and Treatment System (PSITS) is designed to collect and treat OU7 seep water and thereby eliminate, to the extent practicable, the discharge of the FO39-listed waste contained in this seep water to the East Landfill Pond. The collection and treatment system is comprised of the following items:

- A seep interception system.
- A settling basin to remove total suspended solids.
- A bag filtration system consisting of two filters operated in parallel (currently 25 micron bags are in use in the system).
- Two 55-gallon drums of granular activated carbon (GAC) are operated in series to remove volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs).

Obtaining and maintaining smooth operation of the OU7 PSITS has been challenging due to the rapid build-up of sediments in the filter socks, air-binding of the system due to the addition of hydrogen peroxide, the small system head differential, and occasionally increased flow to the system due to storm events and seasonal variations. Since the beginning of June 1996, hydrogen peroxide has not been added to the system in an attempt to eliminate the persistent air-binding problem. Hydrogen peroxide was not added to the system during the fourth quarter.

During the first quarter of 1997, the bag filters were changed out as necessary. The bag filters were changed out in January as part of routine operations. During the period from January 9 through January 24, however, the bag filters were changed out three times due to low flow situations which coincided with extremely low temperatures. The system will be closely monitored and maintenance efforts coordinated, as necessary.

One spent GAC drum was replaced with a new drum filled with virgin carbon in March 1997. An existing drum was configured as the lead unit with one new drum placed in the lag position.

A GAC outfall sample was taken on November 20, 1996. There were no exceedances with the sample results for the effluent showing all compounds as nondetect except chloroethane at 20 ug/L and vinyl chloride at 2 ug/l.

The effectiveness of GAC drum series operation will continue to be monitored. EPA will be notified immediately in any instance where by-pass continues longer than 72 hours. Periods of bypass less than 72 hours will be documented in this report.

There were no periods of bypass during the first quarter of 1997.

Appendix A
Data Qualifiers and Descriptions

Selected Laboratory Data Qualifiers and Descriptions

<u>Qualifier</u>	<u>Description</u>
B	< method detection limit but >= instrument detection limit (INORGANIC)
B	Analyte found in blank and sample (ORGANIC)
D	Compound identified using secondary dilution factor (ORGANIC)
E	Concentration exceeds calibration range of instrument (ORGANIC)
E	Estimated due to interference (INORGANIC)
J	Estimated value, < sample's detection limit
N	Spiked recovery not within control limits (INORGANIC)
S	Determined by MSA (INORGANIC)
U	Undetected, analyzed for but not detected
W	Post-digest sample outside of control limit (INORGANIC)

Selected Data Validation Qualifiers and Descriptions

<u>Qualifier</u>	<u>Description</u>
A	Data is acceptable, with qualifications
JA	Estimated, acceptable
R	Data is rejected
V	Data is valid
Y	Analytical results in validation process
Z	Validation was not requested or performed