



Rocky Mountain Arsenal
Minor Change To The On-Post Record Of Decision For
Landfill Wastewater Treatment System Revisions To Discharge Standards
June 5, 2007

FACT SHEET

Purpose of the Fact Sheet

The purpose of this fact sheet is to document minor changes to the requirements of the Record of Decision (ROD) for the On-Post Operable Unit (OU) for the Rocky Mountain Arsenal (RMA) related to the discharge control mechanism of the Landfill Wastewater Treatment System (LWTS). The LWTS has treated wastewater generated from the operation of the Arsenal's Hazardous Waste Landfill, which holds Arsenal-only waste since 1999. The LWTS is operated under a discharge control mechanism administered and enforced by the Environmental Protection Agency (EPA) called the CERCLA Compliance Document (CCD) that contains operational requirements including treated water discharge standards, reporting/recordkeeping requirements and enforcement provisions. Through the use of the CCD, the Army and the Regulatory Agencies are able to ensure that treated water released from the LWTS is protective of the receiving waters of the State of Colorado. The location of the facilities discussed in this fact sheet is shown in Figure 1.

Use of the LWTS to treat and dispose wastewater from two new projects at RMA required revision of the CCD to adopt new discharge standards for contaminants that may be introduced to the treatment system. In conjunction with this revision, the existing

standards of the CCD were updated to the most recent amendments to the surface water quality regulations of the State of Colorado and the point source categorical standards for hazardous waste landfills promulgated by the EPA.

Remediation Framework

The ROD was signed by the U.S. Army (Army), the EPA and the State of Colorado on June 11, 1996, with concurrence of the U.S. Fish and Wildlife Service and Shell Oil Company (Shell). The Army, serving as the lead agency, and Shell are implementing the selected remedy that includes 31 implementation projects for soils, structures, and the treatment of groundwater contaminants (PMRMA 2006). The EPA, Colorado Department of Public Health and Environment (CDPHE) and the Tri-County Health Department (TCHD) are conducting regulatory oversight. Tetra Tech ECI serves as the Program Management Contractor and selects the subcontractors needed to perform remediation tasks. As the site-wide remediation is completed, most of the On-Post OU of RMA will become a National Wildlife Refuge, as provided for in Public Law #102-402.

Summary of Site History and Contamination Issues

The RMA is a federally owned facility located in Commerce City, Colorado, approximately 10 miles northeast of downtown Denver. In 1942, at the height of World War II, the Army purchased 17,000 acres of land on which to manufacture chemical weapons, such as mustard gas, white phosphorus and napalm to be used as a deterrent during wartime efforts. To foster economic growth in the area, offset operational costs and maintain the facilities for national security, private industry was encouraged to lease facilities at the Arsenal after the war. Under the lease program, Julius Hyman and Company began producing pesticides in 1946. Shell Chemical Company acquired Julius Hyman and Company and continued to produce agricultural pesticides on site until 1982. Common industrial and waste disposal practices during those years resulted in contamination of structures, soil, surface water, and groundwater. Currently, the RMA On-Post OU site encompasses approximately 5.5 square miles and is on the EPA NPL for environmental cleanup as a result of contamination released during previous RMA operations.

In 1984, the Army began a systematic investigation of site contamination in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), and the site was placed on the NPL in 1987. The NPL is a list of the nation's most contaminated sites, also known as Superfund sites. As required by CERCLA, a Remedial Investigation (RI) was conducted to determine the nature and extent of contamination. The RI identified contaminated soils and waste materials in manufacturing and disposal areas including Basin A, South Plants CPA and the Complex Army Trenches. The primary contaminants in these areas are pesticides, solvents, heavy metals and chemical agent by-products. The remedy selected for cleanup of the On-Post OU requires much of the contaminated soil to

be excavated and contained within the on-post Hazardous Waste Landfill and Enhanced Hazardous Waste Landfill.

The LWTS was constructed in 1998 and began treating wastewater from the Hazardous Waste Landfill starting in 1999. As shown in the Figure 1, the treatment system is located west of the Hazardous Waste Landfill in Section 26 of RMA. Prior to the start of LWTS operation, a discharge control mechanism document called the CCD was issued by the EPA to establish the operational requirements for the treatment system. The CCD was issued in September 1998 following public review and comment.

Explanation of Minor Changes to ROD Requirements

Two projects at RMA were implemented in 2006: the Enhanced Hazardous Waste Landfill and the Basin F Wastepile Remediation Project. These projects generate wastewater comprised of potentially contaminated stormwater and decontamination wastewater that are treated by the LWTS. The wastewater from these two projects introduce some potential new contaminants to the LWTS. The intended use of the LWTS to treat these new contaminants required that the CCD be modified to address the changes in water quality standards and waste load allocation. A comprehensive investigation of Applicable or Relevant and Appropriate Requirements (ARARs) was conducted to establish discharge standards for the new contaminants. ARARs are legally applicable or relevant and appropriate Federal or State requirements that pertain to the selected remedy. Section 121(d)(2) of CERCLA requires that remedial actions attain (or provide a waiver for) ARARs upon completion of the remedial action. Modification of the CCD to address ARARs included revisions to discharge standards based on recently promulgated surface water quality standards of the State of Colorado and EPA point source categorical

standards for hazardous waste landfills.
Revisions to the CCD are summarized below:

- Colorado Surface Water Quality Standards Regulation No. 31 (5CCR 1002-31) amended in August 8, 2005 and became effective December 31, 2005. This regulation is considered an ARAR for the LWTS that discharges treated water to a receiving water of the State of Colorado. Consequently, the treated water discharge standards contained in the CCD were updated to be consistent with this amendment to the Colorado Surface Water Quality Standard.
- EPA categorical standards for point source category for Hazardous Waste Landfills promulgated under 40 CFR 445 and adopted by the State of Colorado under 5CCR 1002-63. These standards are considered as ARARs for the operation of the LWTS and have been incorporated into the discharge standards of the CCD.

The changes to the discharge standards in response to the above provisions are reflected in the following tables of the CCD that have been attached to this fact sheet for reference.

- Table 2-1 – Final Effluent Limitations
- Table 2-2 – Outfall 001 Effluent Monitoring Each 500,000 Gallons or Less Discharged

Public Participation

The original CCD finalized in 1999 and the 2001 Amendment to the CCD were both presented during a meeting of the Restoration Advisory Board (RAB). The RAB is a community group that meets regularly to receive information and provide input on the cleanup. These meetings are open to the public. The CCD and other documents that support the changes described herein are part of the Administrative Record and are available at the Joint Administrative Record and Document Facility (JARDF) and the EPA Region 8 Superfund Records Center. The JARDF can be reached at 303-289-0362. Hours of operation are

Monday through Friday, 12 p.m. to 4 p.m., or by appointment. EPA's Superfund Record Center can be reached at 303-312-6473. Hours of operation are Monday through Friday from 8 a.m. to 4:00 p.m.

Document Locations

The documents that support the changes described herein are part of the Administrative Record and are available at the following locations:

- Joint Administrative Record and Document Facility (JARDF)
Rocky Mountain Arsenal, Building 129
Commerce City, Colorado 80022
Monday – Friday 12 – 4 p.m. or by appointment (303) 289-0362
- EPA Superfund Records Center
999 18th Street Denver, CO 80202
303-312-6473
Monday – Friday 8 – 4 p.m.

References

ACOE (Army Corps of Engineers)
1998 (Feb.) *Final Design Analysis, Hazardous Waste Landfill, Rocky Mountain Arsenal.*

FWENC (Foster Wheeler Environmental Corporation)

2002 (Apr. 25) *Basin F Wastepile Remediation Project 100 Percent Design Package.* Revision 1.

1996 (June 11) *Record of Decision for the On-Post Operable Unit.* Version 3.1. (3v.)

TtEC (Tetra Tech EC, Inc.)

(Mar. 16) *Enhanced Hazardous Waste Landfill (ELF) 100 Percent Design Package.* Revision 2.

For more information, please contact:

- Remediation Venture Public Relations Office
Susan Ulrich
Rocky Mountain Arsenal
Building 111
Commerce City, Colorado 80022
(303) 289-0250
- Rocky Mountain Arsenal Web site and Community Information Line
www.rma.army.mil / 303-289-0136
- U.S. Environmental Protection Agency
Jennifer Chergo
Community Involvement Coordinator
(303) 312-6601
- Colorado Department of Public Health & Environment
Ed LaRock
Project Manager
(303) 692-3321

Table 2-1. Final Effluent Limitations Landfill Wastewater Treatment System Rocky Mountain Arsenal - Amendment YR 2006

Constituent	Constituent ID	Standards			MRL OR PQL
		30 Day Avg. (Chronic)	Daily Max. (Acute)	Remarks/ Basis	
General Parameters (mg/l)					
Alkalinity	ALK	Report	Report		5
Ammonia nitrogen	NH3N	0.1	0.62		0.1
Biochemical Oxygen Demand	BOD	30	45*	CO Eff Limitations	2
Bromine	BR	Report	Report		
Chloride	CL	Report	Report		1
Cyanide WAD	CYN	Report	0.005	WQS	5
Fecal Coliform	COLI	200/100ml	Report	WQS	20
Flow (MGD)		Report	Report		
Fluoride	F	Report	Report		1
Hardness, Total (as CaCO ₃)	HARD	Report	Report		1
Nitrate (as N)	NO3	Report	Report		1
Nitrite (as N)	NO2	0.5	Report	WQS	0.5
Oil and Grease	OILGR	Report	10**	CO Eff Limitations	4
pH, s.u. (min. to max.)	PH-L		6.5 to 9.0	BS	
Phosphate (or total phosphorus)	TPO4	Report	Report		10
Sulfate, Total (SO ₄)	SO4	Report	Report		2.5
Total Dissolved Solids	TDS	Report	Report		10
Total Organic Carbon	TOC	Report	Report		1
Total Suspended Solids	TSS	30	45*	CO Eff Limitations	1
Whole Effluent Toxicity, Acute			LC50> 100%	Quarterly	
E.Coli/100 ml		Report	126	WQS	20
Dissolved Oxygen	DO	Report	5	WQS	
Boron	B	Report	0.75	WQS	30
Sulfide (as Hydrogen Sulfide)	S	Report	0.002	WQS	1
Metals (ug/l)					
Antimony	SB	6	Report	water+fish	1
Aluminium	AL	Report	Report		
Arsenic	AS	100	340	WQS/BS	1
Barium	BA	Report	Report		
Bismuth	BI	Report	Report		
Cadmium	CD	4.3	68	WQS	4
Chromium Total	CR	50	Report	WQS	10
Cobalt	CO	Report	Report		
Copper	CU	89	954	WQS	10
Iron - Dissolved		Report	Report		100
Iron - Total Recoverable	FE	1000	Report	WQS	100
Lead	PB	44	1500	WQS	3
Manganese - Total Recoverable	MN	200	Report	WQS	10
Mercury - Total	HG	0.01	1.4	WQS	0.2
Nickel	NI	350	3390	WQS	20
Potassium	K	Report	Report		
Selenium	SE	17	135	WQS	1
Silver	AG	6	35	WQS	2.6
Sodium	NAP	Report	Report		
Tin	SN	Report	Report		
Vanadium	V	Report	Report		
Zinc	ZN	450	500	WQS	10

Organic Compounds (ug/l)					
Acenaphthene	ANAPNE	520	1,700	BS	10
Acenaphthylene	ANAPYL	0.0028	Report	water+fish	10
Acetone	ACET	100	Report	BPJ	100
Aldrin	ALDRN	4.9x10 ⁻⁵	1.5	water+fish/BS	0.1
Aniline		15	24	BPT	
Atrazine	ATZ	3	Report	CBSG	1
Benzene	C6H6	2.2	Report	water+fish	1
Benzo(a)anthracene	BAANTR	0.0038	Report	water+fish	10
Benzo(a)pyrene	BAPYR	0.0038	Report	water+fish	2
Benzo(k)fluoranthene	BKFANT	0.0038	Report	water+fish	10
Benzofluoranthene 3,4	BBFANT	0.0038	Report	water+fish	10
Benzoic acid	BENZOA	73	119	BPT	10
Benzothiazole	BTZ		Report		5
Bicyclo[2,2,1]hepta-2,5-diene	BCHPD		Report		10
Bis (2-Chloroethyl) Ether	B2CLEE	0.03	Report	water+fish	10
Bis-2-ethylhexyl phthalate	B2EHP	1.2	Report		10
Carbon Tetrachloride	CCL4	0.23	Report	water+fish	1
Chlordane	CLDAN	0.0008	1.2	water+fish	1
Chloroacetic acid	CLC2A	Report	Report		
Chlorobenzene	CLC6H5	100	Report	water+fish	5
Chloroform	CHCL3	Report	Report	BS/BPJ	1
Chrysene	CHRY	0.0038	Report	water+fish	10
p-Cresol		Report	Report	BPT	
DDD	PPDDD	0.00031	0.6	water+fish/BS	0.1
DDE	PPDDE	0.00022	Report	water+fish	0.1
DDT	PPDDT	0.00022	0.55	water+fish/BS	0.1
Dibenzo(a,h)anthracene	DBAHA	0.0038	Report	water+fish	10
Dibromochloropropane	DBCP		Report		1
Dichlorobenzene 1,2	12DCLB	420	Report	water+fish	1
Dichlorobenzene 1,3	13DCLB	94	Report	water+fish	1
Dichlorobenzene 1,4	14DCLB	63	Report	water+fish	1
Dichloroethane 1,1	11DCLE		Report		0.2
Dichloroethane 1,2	12DCLE	0.38	Report	water+fish	1
Dichloroethylene 1,1	11DCE	7	Report	water+fish	1
Dichloroethylene 1,2	12DCE	100	Report	water+fish	5
Dichloromethane	CH2CL2	4.6	Report	water+fish	1
Dichlorophenol 2,4	24DCLP	21	Report	water+fish	50
Dichloropropane 1,2	12DCLP	0.50	Report	water+fish	1
Dicyclopentadiene	DCPD		Report		1
Dieldrin	DLDRN	0.000052	0.24	water+fish/BS	0.1
Diisopropylmethyl phosphonate	DIMP	8	Report	CBSG	1
Dimethyl disulfide	DMDS		Report		0.4
Dimethylmethyl phosphonate	DMMP		Report		1
Dimethylphenol 2,4	24DMPN	140	2,120	water+fish/BS	50
Dithiane	DITH		Report		0.412
Endosulfan, Alpha	AENSLF	0.056	0.11	BS	0.1
Endrin	ENDRN	0.036	0.09	BS	0.1
Endrin Aldehyde	ENDRNA	0.29	Report	water+fish	0.1
Endrin ketone	ENDRNK		Report		0.0345
Ethylbenzene	ETC6H5	530	Report	water+fish	10
Fluoroacetic acid	FCZA	Report	Report		
Heptachlor	HPCL	0.000078	0.52	water+fish/BS	0.05
Heptachlor epoxide	HPCLE	0.000039	0.52	water+fish/BS	0.05
Hexachlorobutadiene	HCBD	0.44	90	water+fish/BS	10
Hexachlorocyclopentadiene	CL6CP	5	7	BS	1
Hexachloroethane	CL6ET	0.4	Report	water+fish	10

Indeno (1,2,3-cd) pyrene	ICDPYR	0.0038	Report	water+fish	10
Isodrin	ISODR		Report		0.031
Isophorone	ISOPHR	130	Report	water+fish	10
Isopropylmethyl phosphonic acid	IMPA		Report		100
Malathion	MLTHN	0.1	Report	BS	0.2
Methoxychlor	MEXCLR	0.03	Report	BS	0.5
- Methyl ethyl ketone	MEK	Report	Report		
Methyl isobutyl ketone	MIBK		Report		4
Methyl Chloride	CH3CL	5.6	Report	water+fish	0.833
Methyl phosphoric acid	MPA	Report	Report		
N-Nitrosodimethylamine	NNDMEA	0.00069	Report	water+fish	10
- N-Nitroso-n-propylamine	NNDNPA	0.005	Report	water+fish	
Naphthalene	NAP	22	59	BPT	10
Oxathiane 1,4	OXAT	160	Report	BPJ	10
p-Chlorophenylmethyl sulfide	CPMS	30	Report	BPJ	1.2
p-Chlorophenylmethyl sulfone	CPMSO2	36	Report	BPJ	1.8
p-Chlorophenylmethyl sulfoxide	CPMSO	36	Report	BPJ	2.57
Parathion	PRTHN	0.013	0.065	BS	0.259
Phenol, Single Compound	PHENOL	2100	10,200	BS	50
Pentachlorophenol	PCP	0.27	19	water+fish/BS	1
Pyridine		25	72	BPT	
Supona	SUPONA		Report		0.437
Terpineol		19	42	BPT	
Tetrachloroethane 1,1,2,2	TCLEA	0.17	Report	water+fish	1
Tetrachloroethylene	TCLEE	0.69	5,280	water+fish/BS	1
Thiodiglycol	TDGCL		Report		7.71
Toluene	MEC6H5	1000	17,500	water+fish/BS	5
Total trihalomethanes		80	Report	water+fish	
- Toxaphene	TXPHEN	0.00028	0.73	water+fish	
Trichlorobenzene 1,2,4	124TCB	35	250	BS	5
Trichloroethane 1,1,1	111TCE	200	Report	water+fish	5
Trichloroethane 1,1,2	112TCE	2.7	9,400	water+fish/BS	1
Trichloroethylene	TRCLE	2.5	45,000	water+fish/BS	1
Vapona	DDVP		Report		0.36
Vinyl Chloride	C2H3CL	0.023	Report	water+fish	2
Xylenes	XYLEN	1000	Report	BPJ	5

Notes:

* 7-day average

** instantaneous maximum

CO Eff Limitations: Colorado effluent limitations

WQS: Water quality standard

BS: Basic standards for Surface Water - Aquatic Life Based Criteria

BPJ: Best professional judgment

BPT: Best Practicable Technology

water + fish: Water quality standard based on drinking water quality and its effect on aquatic life.

CBSG: Colorado Basic Standards for Groundwater

MRL Method Reporting Limit

PQL: Practical Quantitation Limit

Methodology for Selection of Discharge Limits:

- 1) Use standards for 30 Day Avg. (Chronic) and Daily Max. (Acute) as discharge limits.
- 2) When MRL or PQL is greater than the standards for the 30 Day Avg. (Chronic) and Daily Max. (Acute), the facility will be in compliance with the discharge control mechanism if the reported concentration is less than the MRL or PQL.
- 3) When there is no 30 Day Avg. (Chronic) standard, the facility will be in compliance with the discharge control mechanism if the reported concentration is less than the MRL or PQL.
- 4) If there are no Daily Max. (Acute) standards, report as required.

Table 2-2. Outfall 001 – Effluent Monitoring For Each 500,000 Gallons or Less Discharged From The Landfill Wastewater Treatment System, Rocky Mountain Arsenal-Amendment YR 2006

Constituent	Constituent ID	Standards		Remarks/ Basis	MRL OR PQL
		30 Day Avg. (Chronic)	Daily Max. (Acute)		
General Parameters (mg/l)					
Alkalinity	ALK	Report	Report		5
Flow (MGD)		Report	Report		
Hardness, Total (as CaCO ₃)	HARD	Report	Report		1
Nitrite (as N)	NO2	0.5	Report	WQS	0.5
Oil and Grease	OILGR	Report	10**	CO Eff Limitations	4
pH, s.u. (min. to max.)	PH-L		6.5 to 9.0	BS	
Total Dissolved Solids	TDS	Report	Report		10
Total Organic Carbon	TOC	Report	Report		1
Total Suspended Solids	TSS	30	45*	CO Eff Limitations	1
Dissolved Oxygen (Minimum 5)	DO	Report	5	WQS	
Boron	B	Report	0.75	WQS	30
Sulfide (as Hydrogen Sulfide)	S	Report	0.002	WQS	1
Metals (ug/l)					
Arsenic	AS	100	340	WQS/BS	1
Cadmium	CD	4.3	68	WQS	4
Chromium Total	CR	50	Report	WQS	10
Copper	CU	89	954	WQS	10
Lead	PB	44	1500	WQS	3
Manganese - Total Recoverable	MN	200	Report	WQS	10
Mercury - Total	HG	0.01	1.4	WQS	0.2
Silver	AG	6	35	WQS	2.6
Organic Compounds (ug/l)					
Aldrin	ALDRN	4.9x10 ⁻⁵	1.5	water+fish/BS	0.1
Benzene	C6H6	2.2	Report	water+fish	1
Carbon Tetrachloride	CCL4	0.23	Report	water+fish	1
Chlordane	CLDAN	0.0008	1.2	water+fish	1
Chlorobenzene	CLC6H5	100	Report	water+fish	5
Chloroform	CHCL3	Report	Report	BS/BPJ	1
DDD	PPDDD	0.00031	0.6	water+fish/BS	0.1
DDE	PPDDE	0.00022	Report	water+fish	0.1
DDT	PPDDT	0.00022	0.55	water+fish/BS	0.1
Dichlorobenzene 1,2	12DCLB	420	Report	water+fish	1
Dichlorobenzene 1,4	14DCLB	63	Report	water+fish	1
Dichloroethane 1,2	12DCLE	0.38	Report	water+fish	1
Dichloroethylene 1,1	11DCE	7	Report	water+fish	1
Dichloromethane	CH2CL2	4.6	Report	water+fish	1
Dichloropropane 1,2	12DCLP	0.50	Report	water+fish	1
Dieldrin	DLDRN	0.000052	0.24	water+fish/BS	0.1
Endrin	ENDRN	0.036	0.09	BS	0.1
Endrin Aldehyde	ENDRNA	0.29	Report	water+fish	0.1
Heptachlor	HPCL	0.000078	0.52	water+fish/BS	0.05
Heptachlor epoxide	HPCLE	0.000039	0.52	water+fish/BS	0.05
Hexachlorobutadiene	HCBD	0.44	90	water+fish/BS	10
Hexachlorocyclopentadiene	CL6CP	5	7	BS	1
Hexachloroethane	CL6ET	0.4	Report	water+fish	10
Isophorone	ISOPHR	130	Report	water+fish	10
Isopropylmethyl phosphonic acid	IMPA		Report		100
Malathion	MLTHN	0.1	Report	BS	0.2
Methoxychlor	MEXCLR	0.03	Report	BS	0.5

Methyl Chloride	CH3CL	5.6	Report	water+fish	0.883
N-Nitrosodimethylamine	NNDMEA	0.00069	Report	water+fish	10
Tetrachloroethane 1,1,2,2	TCLEA	0.17	Report	water+fish	1
Tetrachloroethylene	TCLEE	0.69	5,280	water+fish/BS	1
Toluene	MEC6H5	1,000	17,500	water+fish/BS	5
Total trihalomethanes		80	Report	water+fish	
Trichlorobenzene 1,2,4	124TCB	35	250	BS	5
Trichloroethane 1,1,2	112TCE	2.7	9,400	water+fish/BS	1
Trichloroethylene	TRCLE	2.5	45,000	water+fish/BS	1
Vinyl Chloride	C2H3CL	0.023	Report	water+fish	2

Notes:

* 7-day average

** instantaneous maximum

CO Eff Limitations: Colorado effluent limitations

WQS: Water quality standard

BS: Basic standards for Surface Water - Aquatic Life Based Criteria

BPJ: Best professional judgement

BPT: Best Practicable Technology

water + fish: Water quality standard based on drinking water quality and its effect on aquatic life.

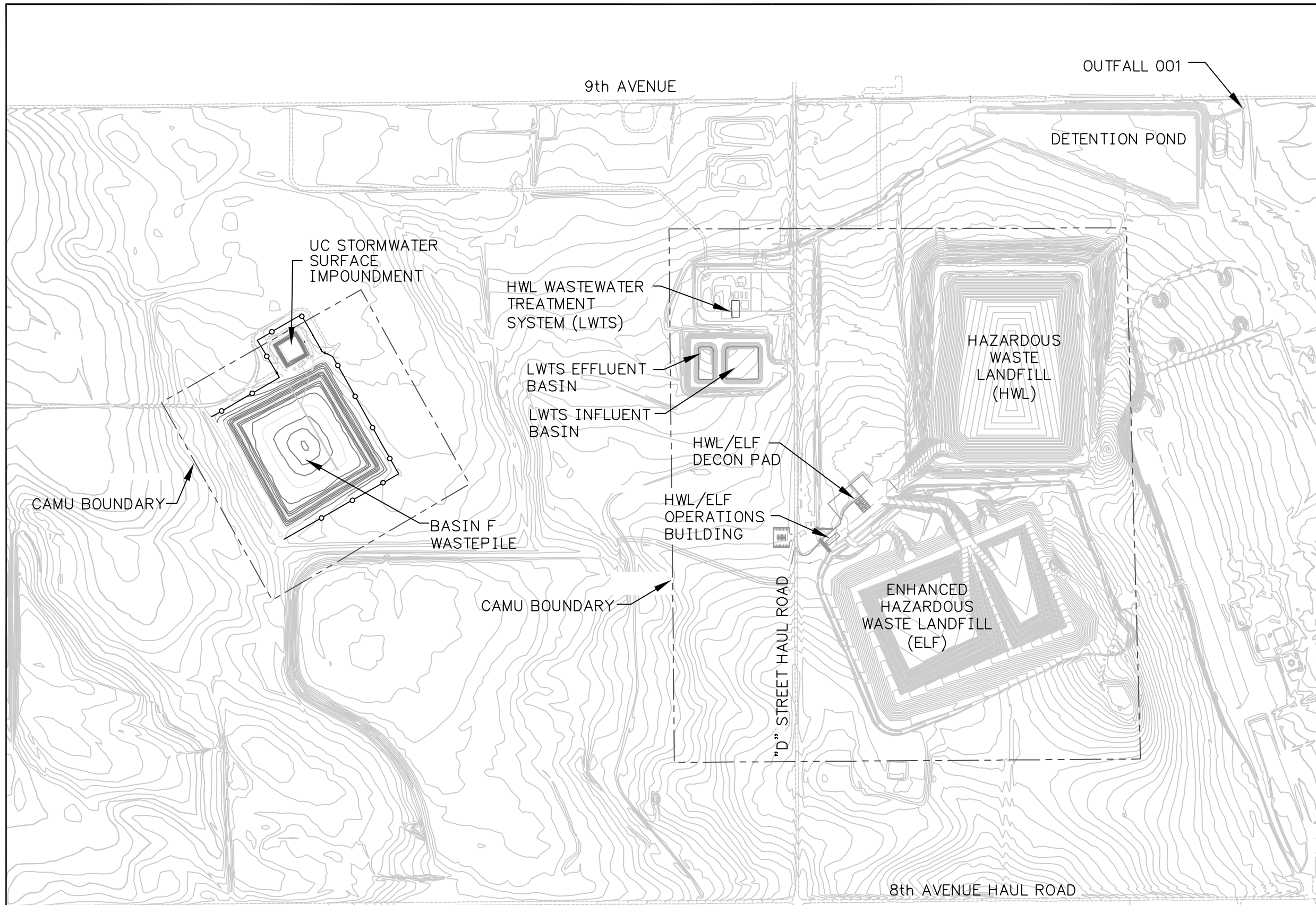
CBSG: Colorado Basic Standards for Groundwater

MRL Method Reporting Limit

PQL: Practical Quantitation Limit

Methodology for Selection of Discharge Limits:

- 1) Use standards for 30 Day Avg. (Chronic) and Daily Max. (Acute) as discharge limits.
- 2) When MRL or PQL is greater than the standards for the 30 Day Avg. (Chronic) and Daily Max. (Acute), the facility will be in compliance with the discharge control mechanism if the reported concentration is less than the MRL or PQL.
- 3) When there is no 30 Day Avg. (Chronic) standard, the facility will be in compliance with the discharge control mechanism if the reported concentration is less than the MRL or PQL.
- 4) If there are no Daily Max. (Acute) standards, report as required.



LANDFILL WASTEWATER
TREATMENT SYSTEM
SITE PLAN

FIGURE 1