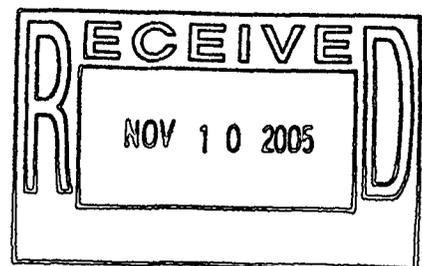


**Closeout Report
for Surface Water Station
SW056 Outfall**

Approval received from the Environmental Protection Agency
(November 10, 2005).

Approval letter contained in the Administrative Record.



November 2005

ADMIN RECORD

SW-A-005217

A small, handwritten signature or initials in the bottom left corner of the page.

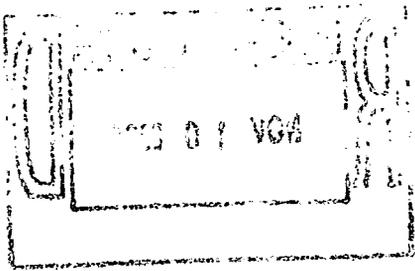


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ACRONYMS

AR	Administrative Record
bgs	below ground surface
CDPHE	Colorado Department of Public Health and Environment
CRA	Comprehensive Risk Assessment
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ER RSOP	Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation
gpm	Gallons per minute
HRC	Hydrogen Release Compound
IMP	Integrated Monitoring Program
K-H	Kaiser-Hill Company, L.L.C.
µg/l	micrograms per liter
NA	not applicable
NLR	no longer representative
RCR	regulatory contact record
RFCA	Rocky Flats Cleanup Agreement
RFETS or Site	Rocky Flats Environmental Technology Site
RI/FS	Remedial Investigation/Feasibility Study
RSOP	RFCA Standard Operating Protocol
SWD	Soil Water Database
SW Std	Surface water standard
VOC	volatile organic compound

EXECUTIVE SUMMARY

This Closeout Report summarizes accelerated action activities conducted at the surface water station SW056 outfall, located at the Rocky Flats Environmental Technology Site (RFETS or Site), Golden, Colorado. Activities were planned and executed in accordance with the Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP) Modification 1 (DOE 2003a). Notification of the planned characterization and removal activities was provided in ER RSOP Notification #05-09 (DOE 2005a).

Activities were conducted in September 2005, and included removal of the french drain and associated gravel pack that daylighted in the Building 991 area, disruption of the gravel packs that provided water to the french drain, and placement of Hydrogen Release Compound (HRC) where contaminated groundwater potentially will pool. A groundwater monitoring well was installed in this area. Groundwater monitoring will continue as described in the IMP (DOE 2005b).

No specific, near-term, or long-term management techniques are required because of environmental conditions. Site access and excavation within the immediate area will continue to be controlled pending implementation of long-term controls including prohibitions on groundwater pumping. This site will be visually inspected, on a regular basis, to look for the potential development of seeps.

The presence of residual volatile organic compounds (VOCs) in groundwater is addressed in the Draft RCRA Facility Investigation/Remedial Investigation/Corrective Measures Study - Feasibility Study for the Rocky Flats Environmental Technology Site (RI/FES) Doe (2005c). The need for and extent of any more general, long-term stewardship activities is evaluated in the RI/FES. Institutional controls and other long-term stewardship requirements for the Site will ultimately be contained in the Corrective Action Decision/Record of Decision.

This Closeout Report and associated documentation will be retained as part of the Rocky Flats Administrative Record file. Approval of this Closeout Report constitutes regulatory agency concurrence that this action is complete and no additional actions are warranted.

1.0 INTRODUCTION

This Closeout Report summarizes accelerated action activities conducted at surface water station SW056 outfall at the Rocky Flats Environmental Technology Site (RFETS or Site) in Golden, Colorado. Figure 1 shows the general location of SW056 at RFETS.

Accelerated action activities were planned and conducted in accordance with the Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP) Modification 1 (DOE 2003). Notification of the planned activities was provided in the Regulatory Contact Record (RCR) dated September 22, 2005 (Appendix A) and in the ER RSOP Notification #05-09 (DOE 2005a), which was approved by the Environmental Protection Agency (EPA) (EPA 2005).

This Closeout Report includes the following:

- Historical and general site information;
- Remedial action objectives and accelerated action goals;
- Description and map of accelerated action area;
- Description of current site conditions;
- Deviations from the ER RSOP;
- Disposition of waste and site reclamation; and
- References, correspondence, and RCRs.

This Closeout Report and associated documentation will be retained as part of the Rocky Flats Administrative Record (AR) file. Approval of this Closeout Report constitutes regulatory agency concurrence that this action is complete and no additional actions are warranted.

2.0 SITE CHARACTERIZATION

SW056 characterization information consists of historical knowledge and analytical data and is summarized in Section 2.1.

2.1 Historical Information

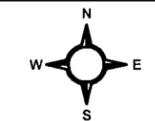
SW056 was a surface water monitoring location at the perforated pipe outfall from a french drain installed to drain the area of the former protected area fence as shown on Figure 1. The flow rate was visually estimated at approximately 2-3 gallons per minute (gpm). Flow was reported to be relatively constant although no measurements were ever taken. The water source was a gravel pack also installed to dewater the area of the former protected area fence. The perforated pipe was thought to be connected to another length of pipe that ran east-west along the former patrol road. These features are also shown on Site Engineering Drawings, from 1980, 27550-017 and 27550-024.

**Figure 1
SW056**

KEY

- ▲ SW056
- ~ Stream or drainage
- ~ Contourclip
- ▨ Paved road - removed
- ▨ Asphalt
- Building**
- ▨ Demolished
- Standing

DRAFT



25 0 25 50 75 Feet

Scale = 1:1,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared for:



**KAISER-HILL
COMPANY**

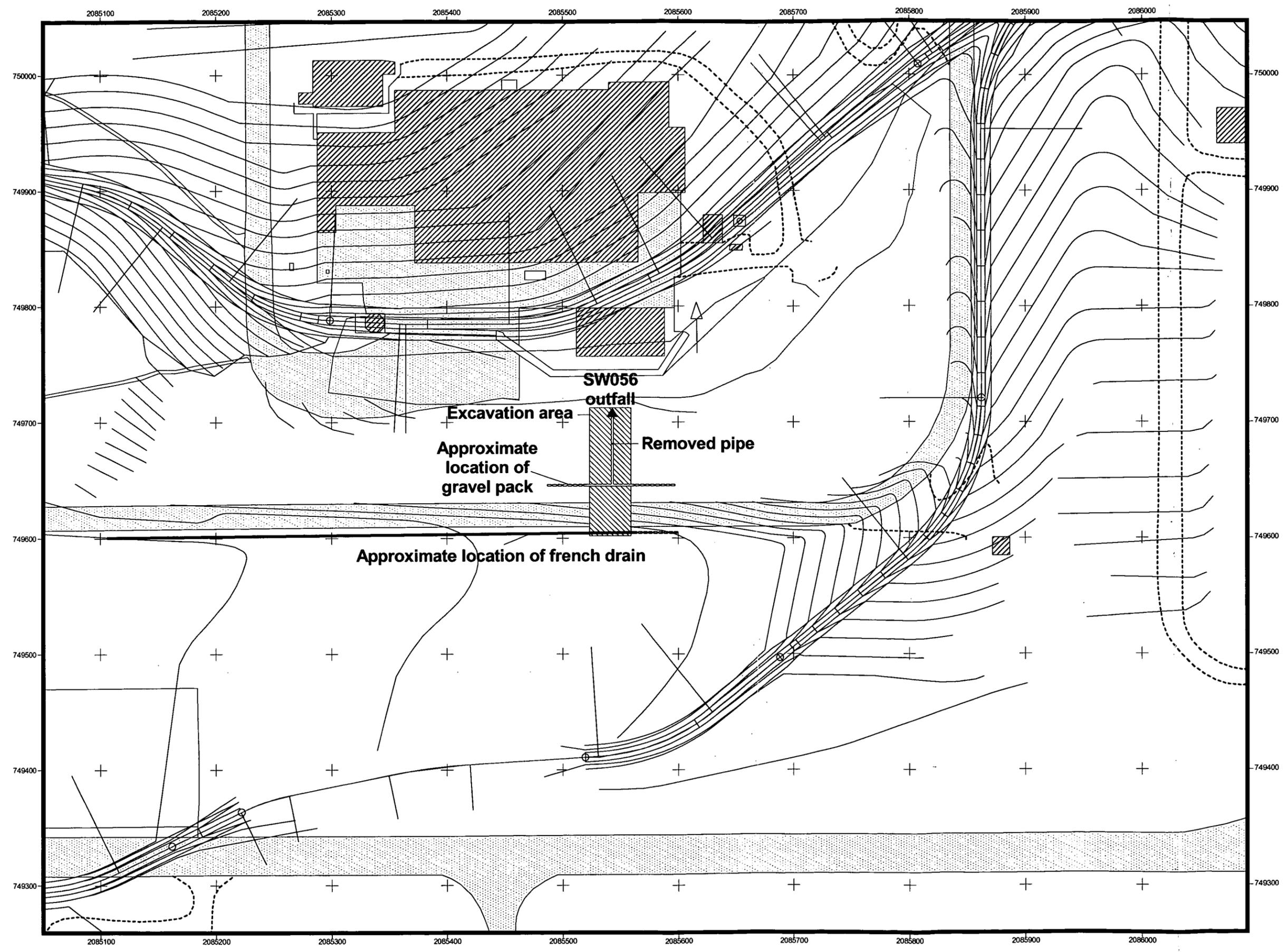
Prepared by:

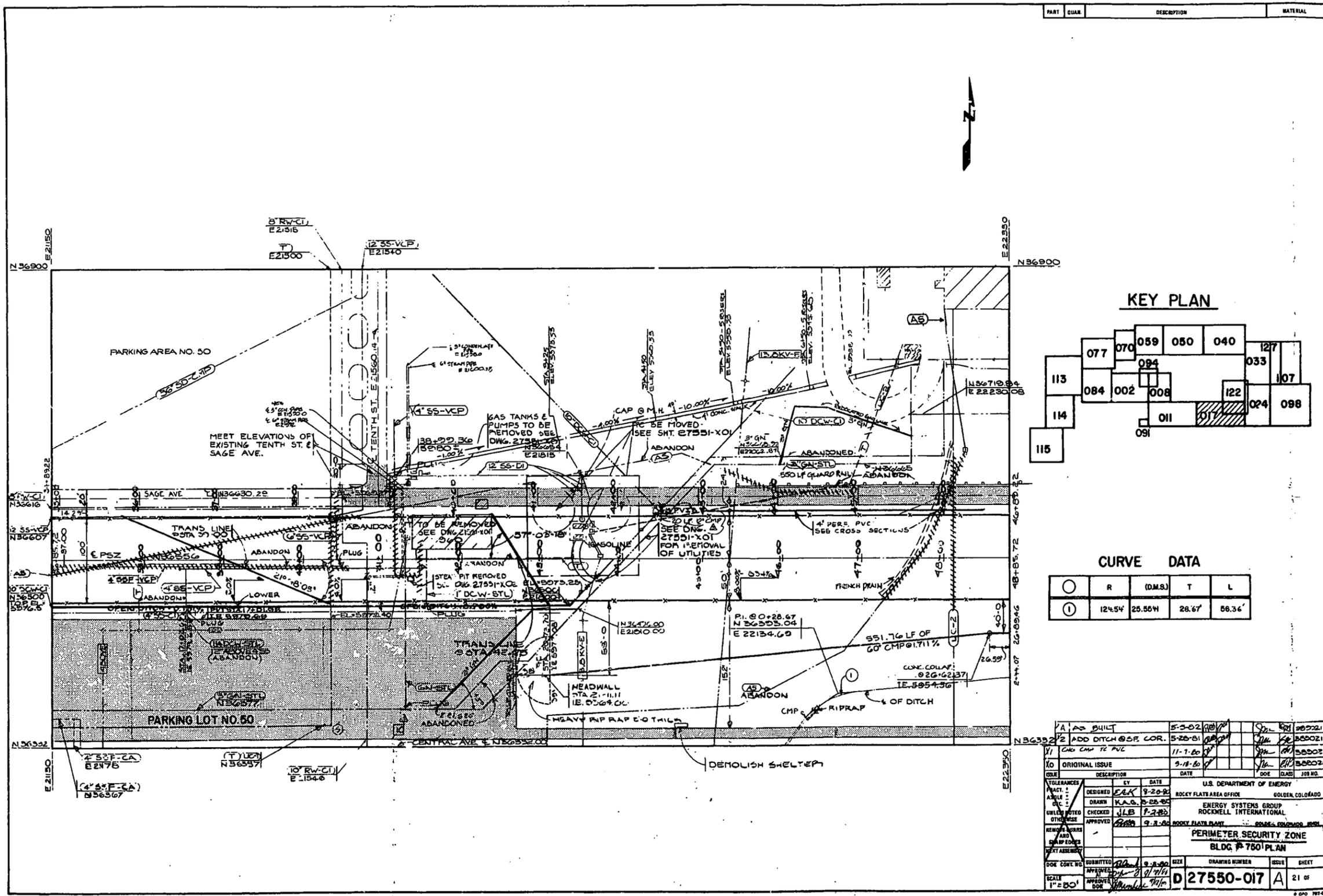


RADMS

File: W/Projects/Fy2005/
SusanSerreze/Newpipe/
Newpipe.apr

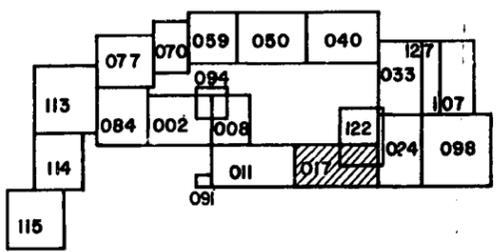
Date: 10/27/2005





PART	QUAN	DESCRIPTION	MATERIAL
------	------	-------------	----------

KEY PLAN



CURVE DATA

Curve ID	R	(D.M.S.)	T	L
1	124.54'	25.50°N	28.67'	56.36'

1	AS BUILT	5-3-02					
2	ADD DITCH @ SE COR.	5-28-81					
3	CHG CMP TO PVC	11-1-80					
4	ORIGINAL ISSUE	9-18-80					

ISSUE	DESCRIPTION	BY	DATE	U.S. DEPARTMENT OF ENERGY
DESIGNED		EJK	9-20-80	ROCKY FLATS AREA OFFICE
DRAWN		K.A.G.	8-25-80	GOLDEN, COLORADO
CHECKED		J.L.B.	7-2-85	ENERGY SYSTEMS GROUP
APPROVED			9-8-80	ROCKWELL INTERNATIONAL

DOE CONC. NO.	SUBMITTED	DATE	ISSUE	DRAWING NUMBER	ISSUE	SHEET
		9-8-80	0122	D 27550-017	A	21 OF

Limited sampling was conducted at the SW056 outfall. Analytical data are available at irregular intervals from 1987 to present. These analytical results show that there were low levels of volatile organic compounds (VOCs) present at concentrations greater than the surface water standards. As shown in Table 1, results greater than surface water standards are in bold. While samples were collected only sporadically, the VOC concentrations appeared to be decreasing over time. A final sample was collected on August 30, 2005 and contained vinyl chloride at 11 ug/l with the surface water standard (SW Std) 2 ug/l, trichloroethene at 34 ug/l (SW Std 5 ug/l), tetrachloroethene 13 ug/l (SW Std 5 ug/l) and cis 1,2 dichloroethene at 110 ug/l (SW Std 70 ug/l).

Table 1
SW056 Results Above Surface Water Standards and Detection Limits

Sample Date	1,2-Dichloroethene (includes Cis1,2DCE) SW Std 70 ug/l		Methylene Chloride SW Std 4.7 ug/l		Tetrachloroethene SW Std 5 ug/l		Trichloroethene SW Std 5 ug/l		Vinyl Chloride SW Std 2 ug/l		Units
	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	
7/21/1987	5	U	-	-	72	-	50	-	-	-	ug/l
6/30/1988	-	-	5	U	5	U	5	U	10	U	ug/l
4/13/1989	25	U	29	-	190	-	120	-	9	J	ug/l
5/11/1989	5	U	1	J	200	-	140	-	9	J	ug/l
6/7/1989	5	U	5	U	190	-	130	-	15	-	ug/l
7/12/1989	5	U	2	J	280	-	130	-	13	-	ug/l
9/14/1989	10	U	10	U	10	U	10	U	20	U	ug/l
11/15/1989	120	-	6	B	110	-	69	-	8	J	ug/l
12/19/1989	5	U	6	-	86	-	69	-	10	-	ug/l
1/25/1990	130	-	5	U	74	-	50	-	10	U	ug/l
2/22/1990	230	-	5	B	120	-	92	-	11	-	ug/l
3/21/1990	5	U	5	U	5	U	5	U	10	U	ug/l
4/18/1990	180	-	5	B	120	-	67	-	8	J	ug/l
5/8/1990	240	-	1	JB	140	-	75	-	2	J	ug/l
6/28/1990	440	E	5	U	190	-	120	-	13	-	ug/l
7/18/1990	270	D	5	U	140	D	81	D	13	-	ug/l
9/11/1990	460	E	5	U	200	E	120	-	16	-	ug/l
10/9/1990	310	-	10	U	140	-	100	-	11	J	ug/l
12/17/1990	260	-	11	B	82	-	65	-	12	J	ug/l
3/26/1991	240	-	5	U	93	-	100	-	15	-	ug/l
4/24/1991	300	-	5	U	97	-	92	-	25	-	ug/l
5/30/1991	210	-	7	U	95	-	73	-	13	-	ug/l
6/17/1991	270	-	6	B	120	-	73	-	14	-	ug/l
7/15/1991	330	D	5	U	150	-	93	-	27	-	ug/l
8/19/1991	280	-	3	JB	110	-	73	-	10	U	ug/l
10/7/1991	300	D	5	U	140	-	98	-	27	-	ug/l
2/5/1992	310	-	5	U	100	-	110	-	22	-	ug/l
11/16/2001	210	-	1	U	44	-	66	-	9.7	-	ug/l
5/13/2002	166	D	13.1	BD	26.9	D	44.2	D	4.3	JD	ug/l
8/30/2005	110	-	1	U	13	-	34	-	11	-	ug/l

- Not analyzed
- U - Not detected at Detection Limit
- J - Detected below Detection Limit
- E - Estimated value above upper equipment calibration limit
- D - Diluted results
- B - Analyte also found in Blank

Metals were analyzed in 1991, 1992, 2001, and 2005. All concentrations were less than surface water standards. Radionuclides were analyzed in 1991, 1992, 2001, and 2005. All activities were less than surface water standards.

3.0 ACCELERATED ACTION

Accelerated action objectives for SW056 were described in ER RSOP Notification #05-09 (DOE 2005a). The accelerated action objectives included the following:

- Trench at the elbow upgradient of the outfall and disrupt the piping. The excavation was anticipated to be 20 to 25 feet deep.
- Remove piping in excavated area. Backfill the lower portion of the excavation where the piping existed with flow fill or other low permeability material. Add HRC to the excavation backfill to enhance groundwater quality in this area.
- Remove piping outfall to at least 3 feet below grade. Backfill with compacted soil.
- Install a monitoring well at a location determined in consultation with the Regulatory Agencies.

Accelerated action activities were conducted between September 27, 2005 and September 30, 2005. Starting and ending dates of significant activities are listed in Table 2. Features removed and remaining are shown on Figure 1.

Table 2
SW056 Accelerated Action Activities

Activity	Starting Date	Ending Date
Excavation and pipe removal	September 27, 2005	September 29, 2005
Addition of HRC	September 29, 2005	September 29, 2005
Final Excavation and Regrade	September 29, 2005	September 30, 2005
Installation of Monitoring Well	September 30, 2005	September 30, 2005

3.1 Accelerated Action Activities

All accelerated action objectives were met as described below:

- The entire length of perforated pipe and associated gravel was removed, approximately 62 feet, not just the section at the outfall and where it intersected the east west trending gravel pack. The excavation was backfilled with low permeability material.
- East-west trending gravel packs were disrupted. The gravel pack that contained water was further disrupted by placing concrete against the western cut edge.
- HRC was added at the junction between the former french drain perforated pipe and the east-west trending gravel pack.
- A monitoring well was installed at a location determined in consultation with the regulatory agencies.

Following is a brief summary of the work performed.

Work was initiated on September 27, 2005. The outfall was excavated sufficiently to expose the perforated pipe and determine the trend of the pipe. Then, the location of the suspected elbow between the north-south trending SW056 outfall and the east-west trending french drain was excavated to a depth of greater than 25 feet. An east-west trending gravel pack was intersected by the excavation and the excavation continued through and beneath it for several feet. The gravel pack consisted of pebbles encased in geotextile. Neither the excavation nor the gravel pack contained water. Therefore, the excavation was backfilled with the excavated materials. The excavation and subsequent backfill thoroughly disrupted this gravel pack as a potential pathway for water migration.

On September 28th, excavation resumed at the SW056 outfall to determine the source of the water by excavating from the north towards the water source and into the hill. The perforated pipe lay within an approximately 1-foot square gravel filled trench. The lowermost portion of the gravel and the pipe contained water. As the excavation proceeded to the south, the pipe and associated gravel were removed and the pipe was disposed as sanitary waste. The open excavation to the north was backfilled as the excavation proceeded to provide a stable working platform. As a result, water flow was contained within the excavation boundaries.

At approximately 62 linear feet, the perforated pipe ended adjacent to an east-west trending, geotextile wrapped gravel pack that contained water. No east-west piping was present. However, water was observed flowing from the gravel pack to the north at approximately the flow rate observed at SW056. This gravel pack was determined to be the source of the water to SW056. The excavation then continued through and beneath the gravel pack.

All of the perforated pipe and associated gravel bedding were removed by excavation activities. Sacks of concrete were placed at the west (upgradient) side of the gravel pack and broken open. The dry concrete mixed with the moisture in the soil to further reduce permeability.

After the potential pathways were disrupted, the lowermost 10 feet of the excavation around the gravel pack was backfilled with soil mixed with 660 pounds of HRC (22 buckets) to further enhance groundwater quality in this area. The rest of the excavation was backfilled with materials previously removed from the excavation.

On September 29th, the Agencies were consulted and a location for a new monitoring well was determined. Well 45605 was installed on September 30, 2005 with the following specifications:

Latitude: 749634.125,

Longitude: 2085501.66,

Top of Screen: 11.07 feet below ground surface,

Bottom of Screen: 33.9 feet below ground surface,

Total Depth of Casing: 34 feet below ground surface,

Total Depth of Boring: 34.5 feet below ground surface,

Top of the Filter: 9 feet below ground surface, and

Top of Bedrock: 33.2 feet below ground surface,

The well was installed with a Geoprobe. The total depth was based on tip refusal. The top of the filter pack/top of the screen was selected to encompass the entire anticipated saturated interval as well as to be above the depth of the gravel lines, both as observed by Annette et al. and as shown on the utility drawings. Post-installation activities included surveying and developing the well (which is not yet completed). The well has not been sampled yet. No soil samples were collected.

4.0 POST-REMEDATION CONDITIONS

All accelerated action objectives were met. The french drain was removed. HRC was added to the excavation and the excavation was backfilled and regraded. A monitoring well was installed. Removed and remaining structures are shown on Figure 1.

5.0 STEWARDSHIP EVALUATION

The SW056 area stewardship evaluation was based on current site conditions.

5.1 Current Site Conditions

Based on the accelerated action activities, the following conditions exist at the SW056 site:

- The perforated pipe at approximately 25 feet below ground surface was removed.
- The pathway to surface water from groundwater in this area was disrupted.
- The gravel pack remains to the west.
- HRC was added to enhance groundwater quality in this area.
- A groundwater monitoring well was installed in this area.

5.2 Near-Term Management Recommendations

No specific, near-term management techniques are required. Sitewide, near-term recommendations include the following:

- Access will be restricted to minimize disturbance to newly revegetated areas.
- Groundwater monitoring will continue at the newly installed well.

Site access will be restricted pending implementation of long-term controls.

5.3 Long-Term Stewardship Recommendations

Based on remaining environmental conditions at the SW056 area, no specific long-term stewardship activities are recommended beyond the generally applicable Site requirements. These requirements may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on groundwater pumping in the area of SW056. This site will be visually inspected, on a regular basis, to look for the potential development of seeps.

No specific institutional or physical controls are recommended as a result of the remaining conditions in this area. Groundwater monitoring was implemented and will continue as described in the IMP (DOE 2005b).

This Closeout Report and associated documentation will be retained as part of the Rocky Flats AR file.

The presence of residual volatile organic compounds (VOCs) in groundwater is addressed in the Draft RCRA Facility Investigation-Remedial Investigation/Corrective Measures Study - Feasibility Study Report for the Rocky Flats Environmental Technology Site (RI/FS) Doe 2005c). The need for and extent of any more general, long-term stewardship activities is evaluated in the RI/FS. Institutional controls and other long-term stewardship requirements for the Site will ultimately be contained in the Corrective Action Decision/Record of Decision.

6.0 DEVIATIONS FROM THE ER RSOP

There were two minor deviations from the ER RSOP Notification #05-09.

- The elbow connecting the french drain to an east-west trending pipe was to be disrupted. No east-west trending pipe was present. Therefore, the gravel pack supplying water to the french drain was disrupted.
- The piping outfall was to be removed to at least 3 feet below grade. Instead, excavation proceeded from the outfall to the south, and the entire length of pipe was removed.

7.0 WASTE MANAGEMENT

Waste from the SW056 accelerated action consisted of PVC pipe removed from the excavation. This was disposed of as sanitary waste.

8.0 SITE RECLAMATION

Backfill was completed using materials removed from the excavation, primarily clay-rich soil. There were no continuous gravel layers left within the excavation. The area was reseeded the week of October 3, 2005.

9.0 NO LONGER REPRESENTATIVE (NLR) SAMPLING LOCATIONS

There are no NLR locations to report. No samples were collected for this project.

10.0 DATA QUALITY ASSESSMENT

No samples were collected for this project.

11.0 CONCLUSIONS

No additional accelerated action is required for SW056 based on the following:

- The pathway to surface water was disrupted.

- HRC was added to the backfill to enhance groundwater quality in this area.
- Groundwater monitoring will continue as described in the IMP (DOE 2005b)
- The stewardship evaluation demonstrated that no additional activities are necessary.

12.0 REFERENCES

EPA, 2005, Correspondence from M. Aguilar, EPA Region 8 to J. Rampe, DOE RFPO RE: Approval of ER RSOP Notification #05-09, SW056 Pipeline, November 2.

DOE, 2003a, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Modification 1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005a, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Notification #05-09, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE 2005b,

DOE 2005, Draft RCRA Facility Investigation-Remedial Investigation/Corrective Measures Study - Feasibility Study Report for the Rocky Flats Environmental Technology Site, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, CDPHE and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, U.S. Department of Energy, Colorado Department of Public Health and Environment, and U.S. Environmental Protection Agency, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

K-H, 2005, Integrated Monitoring Plan FY05, Summary and Background Document, Revision 1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

**APPENDIX A
PROJECT CORRESPONDENCE**

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE ER REGULATORY CONTACT RECORD

Date/Time: 9/22/05 10:00

Site Contact(s)/Phone: John Rampe/DOE, Dave Shelton/K-H, Jan Walstrom/K-H
303-966-6246 303-966-9877 303-966-5028

Regulatory Contact/Phone: Mark Aguilar, Larry Kimmel, David Kruchek, Carl Spreng
303-312-6251 303-312-6659 303-692-3328 303-692-3358

Agency: EPA EPA CDPHE CDPHE

Purpose of Contact: SW056 Disposition

Discussion

As agreed upon, following is the method agreed upon to disposition SW056 location to minimize surface water impacts in this area:

- Trench at the elbow upgradient of the outfall and disrupt the piping. The excavation is anticipated to be 20 to 25 feet deep.
- Remove piping in excavated area. Backfill the lower portion of the excavation where the piping existed with flow fill or other low permeability material. Add HRC to the excavation backfill to enhance groundwater quality in this area.
- Remove piping outfall to at least 3 feet below grade. Backfill with compacted soil.
- Install a monitoring well at a location determined in consultation with the Regulatory Agencies.

An ER RSOP will be developed for this work scope. However, work is authorized to begin under this contact record.

Contact Record Prepared By: Karen Wiemelt

Required Distribution:

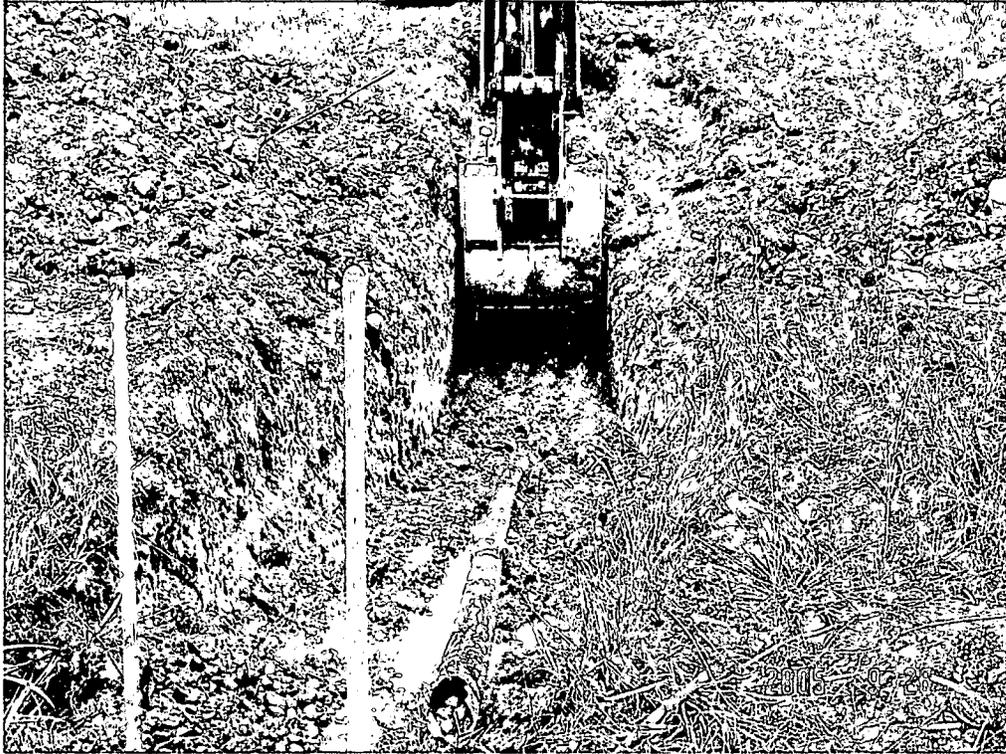
M. Aguilar, USEPA
H. Ainscough, CDPHE
J. Berardini, K-H
B. Birk, DOE-RFPO
L. Brooks, K-H ESS
G. Carnival, K-H RISS
N. Castaneda, DOE-RFPO
C. Deck, K-H Legal
N. Demos, SSOC
S. Garcia, USEPA
S. Johnson, K-H ESS
M. Keating, K-H RISS
L. Kimmel, USEPA

Additional Distribution:

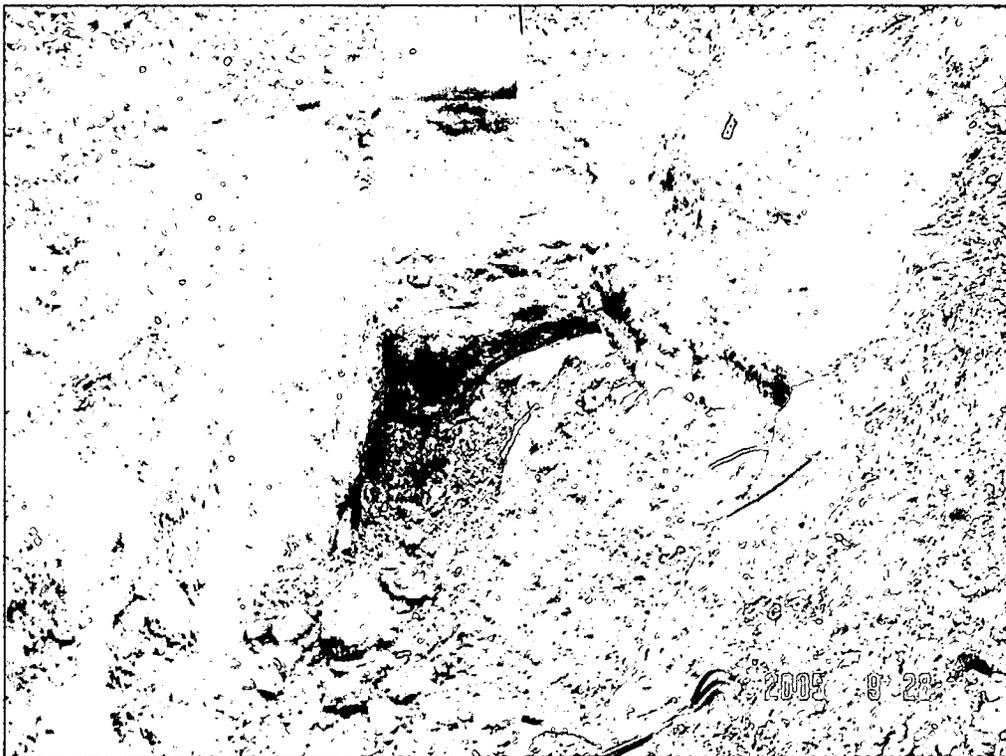
D. Kruchek, CDPHE
S. Nesta, K-H RISS
A. Primrose, K-H RISS
M. Roy, DOE-RFPO
R. Schassburger, DOE-RFPO
S. Serreze, K-H RISS
D. Shelton, K-H ESS
C. Spreng, CDPHE
S. Surovchak, DOE-RFPO
J. Walstrom, K-H RISS
K. Wiemelt, K-H RISS
C. Zahm, K-H Legal

J. Rampe, DOE-RFPO
C. Dayton, K-H ESS
R. Prucha, K-H ESS

**APPENDIX B
PROJECT PHOTOS**



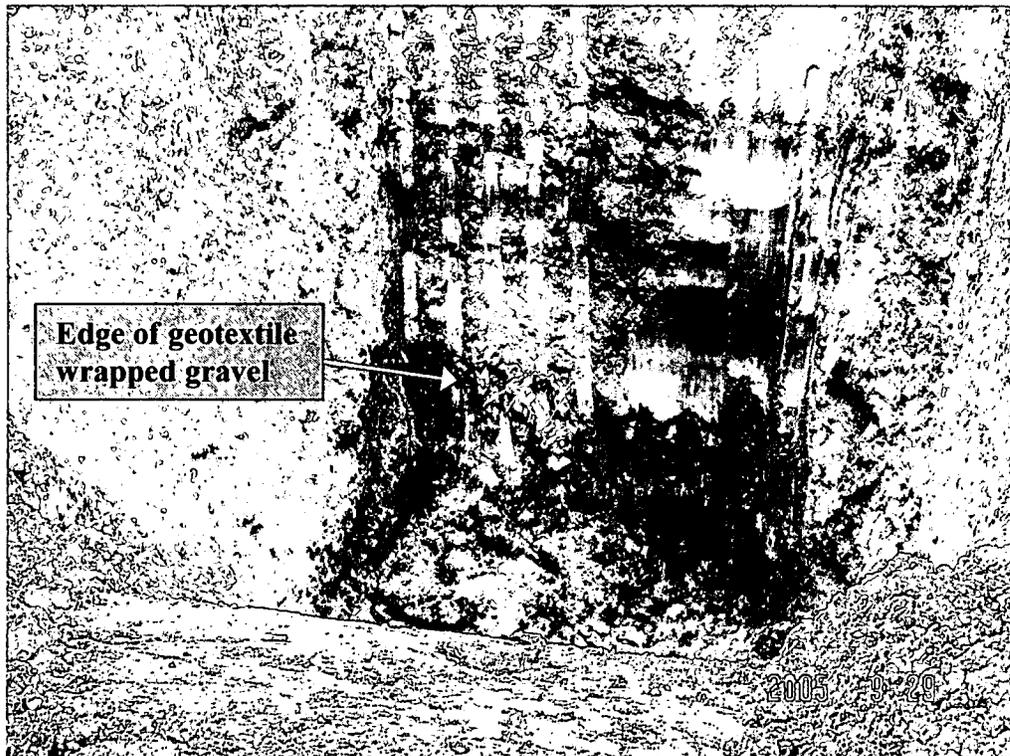
1. Excavation proceeding from the outfall of SW056. Red stake marks northern extent of pipe prior to excavation.



2. Disruption of southernmost east-west gravel pack.



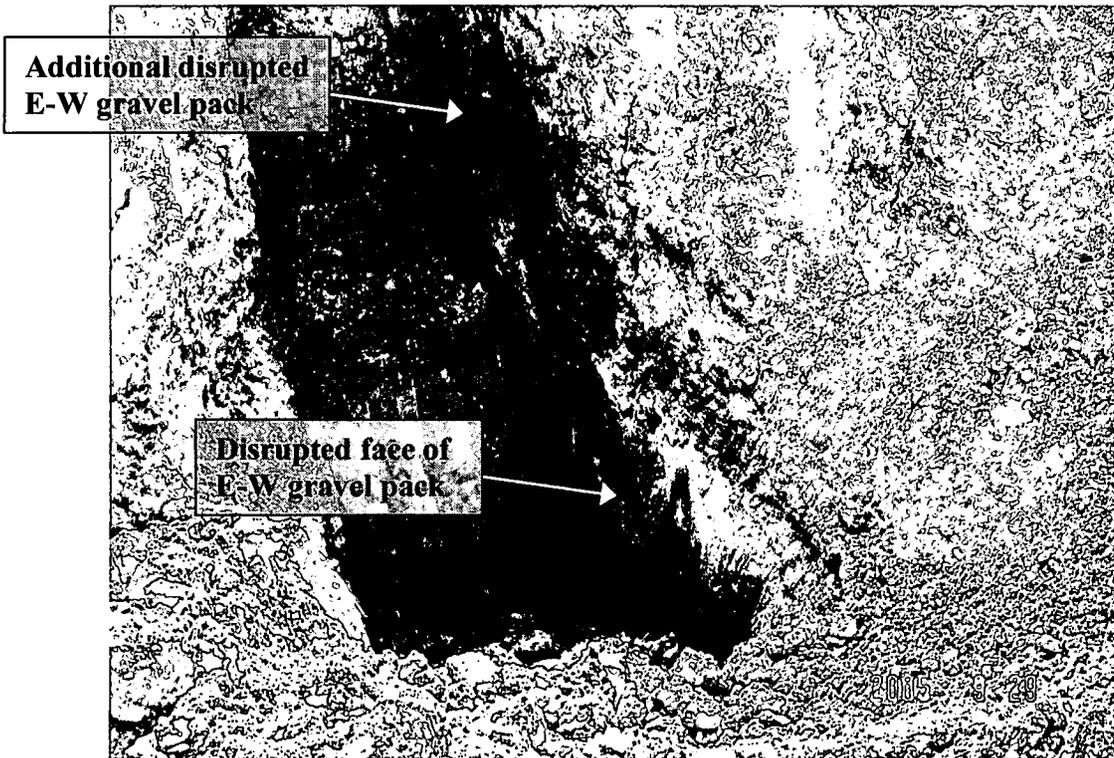
3. French drain during removal. Note limited extent of gravel pack.



4. Area where perforated pipe ended at north edge of east-west trending geotextile wrapped gravel. Note presence of water flowing from gravel.



5. Excavation proceeding from the north.



6. Disruption of the southern east-west trending gravel pack. Note an additional, dry gravel pack to the south that was also disrupted by the excavation.

22/22