U.S. Department of Energy
Grand Junction Office
2597 B¾ Road
Grand Junction, CO 81503

NOV 2 0 2002

Daniel M. Gillen, Chief
Fuel Cycle Facilities Branch
Mail Stop T-8A33
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: 2002 Annual Site Inspection and Monitoring Compliance Report for UMTRCA Title II Disposal Sites

Dear Mr. Gillen:

Four copies of the 2002 *Annual Inspection and Monitoring Compliance Report for Uranium Mill Tailings Radiation Control Act Title II Disposal Sites* are enclosed. This report is submitted to comply with reporting requirements of 10 CFR 40.28.

The report covers the annual inspections of the Bluewater, New Mexico; Edgemont, South Dakota; and Sherwood, Washington Title II disposal sites.

If NRC has comments or questions about this report, please contact me at 970-248-6027.

Sincerely,

John P. Gilmore
Project Manager

Enclosures

cc w/o enclosures:
A. Kleinrath, DOE-GJO
R. Plieness, DOE-GJO
M. Plessinger, Stoller
Project Record File LREP 6.3.2

Gilmore/2002ANNUALNRC1

NM 5508

GJO–2002–375–TAC

Long-Term Surveillance and Maintenance Program

2002 Annual Site Inspection and Monitoring Compliance Report for Uranium Mill Tailings Radiation Control Act Title II Disposal Sites

November 2002

Edgemont, South Dakota, Disposal Cell Site, 2002

Bluewater, New Mexico, Disposal Cell Site, 2002

Work Performed Under DOE Contract No DE–AC13–02GJ79491 for the U S Department of Energy
Approved for public release, distribution is unlimited

GJO-2002-375-TAC
GJO-LREP 6.3.2-5

Long-Term Surveillance and Maintenance Program

2002 Annual Site Inspection and Monitoring Compliance Report for Uranium Mill Tailings Radiation Control Act Title II Disposal Sites

November 2002

Prepared by
U.S. Department of Energy
Grand Junction Office
Grand Junction, Colorado

Work Performed Under DOE Contract Number DE-AC13-02GJ79491
Task Order Number ST03-102

Contents

1.0 Bluewater 1
2.0 Edgemont 13
3.0 Sherwood 23

Figures

Figure 1–1. Bluewater, New Mexico, South Area, 2002 3
Figure 1–2. Bluewater, New Mexico, North Area, 2002 5
Figure 2–1. Edgemont, South Dakota, 2002 15
Figure 3–1. Sherwood, Washington, 2002 25

Tables

Table 1–1. Alluvial Aquifer Analytical Results Summary, October 2002 9
Table 1–2. Photograph Descriptions for Bluewater, New Mexico, Disposal Site 10
Table 2–1. Photograph Descriptions for Edgemont, South Dakota, Disposal Site 18
Table 3–1. Ground Water Sampling and Analysis Results Summary, July 2001 28
Table 3–2. Ground Water Sampling and Analysis Results Summary, August 2002 28
Table 3–3. Piezometer Water Levels, November 2000, July 2001, and August 2002 28
Table 3–4. Photograph Descriptions for Sherwood, Washington, Disposal Site 29

Appendix

Appendix A—Sherwood, Washington, Dam Inspection Checklist

Summary

This report presents results of annual site inspections for the three Uranium Mill Tailings Radiation Control Act (UMTRCA) Title II mill tailings sites that are currently covered by the U.S. Department of Energy (DOE) general license for long-term custody and care of uranium or thorium byproduct materials disposal sites (Title 10 *Code of Federal Regulations* Part 40.28 [10 CFR 40.28]). Specific inspection and monitoring requirements are in the Long-Term Surveillance Plan for each site.

The Bluewater, New Mexico, UMTRCA Title II disposal site was inspected on May 7, 2002. The site is in good condition. No ponded water was present on top of the north end of the main tailings pile during this inspection where water had been discovered during previous inspections. Unauthorized livestock grazing was occurring on site. Livestock intrusion does not threaten the integrity of the disposal site but it does present a management issue for DOE. An unexploded blasting cap, presumed to be leftover from quarry operations, was found in the riprap on the northwest edge of the main tailings disposal cell. A photograph of the blasting cap is included in this report to alert future site inspectors of the appearance of this potential safety hazard. Maintenance repairs to the perimeter road and fence conducted in 2001 remain in excellent condition. Results of alternate concentration limit (ACL) and polychlorinated biphenyl (PCB) ground water monitoring showed all ACLs to be within specified limits and there was no detection of PCBs.

The Edgemont, South Dakota, UMTRCA Title II disposal site was inspected on June 25, 2002. The site is in good condition. Minor fence repairs are recommended. Ground water monitoring is not required for this site.

The Sherwood, Washington, UMTRCA Title II disposal site located on the Spokane Tribe of Indians reservation was inspected on August 20, 2002. The site is in good condition overall. Two items of special interest exist: (1) the classification of the reclaimed tailings impoundment as a dam, and (2) the periodic ponding of water in a small area on the top of the tailings impoundment. The classification of the impoundment as a dam necessitates a dam safety inspection to assure continued compliance with the Federal Dam Safety Act. Occurrence of ponded water on top of the main tailings pile indicates slight settling of the tailings materials. No issues were identified during the dam safety inspection and the pond was dry at the time of the inspection. No evidence of excessive settlement was observed in the pond area. The Nuclear Regulatory Commission representative present during the inspection expressed concerns regarding rock durability on portions of the dam face and recommended implementing a rock-monitoring program. Ground water monitoring and piezometer water level measurements conducted in August 2002 showed all measured parameters to be within acceptable ranges.

End of current text

1.0 Bluewater

Bluewater Site Long-Term Custody Compliance Requirements

The following list comprises the long-term custody compliance requirements for the Bluewater site as defined in Section 3.2 of the site Long-Term Surveillance Plan:

1. Annual site inspection.
2. Annual inspection report.
3. Follow-up inspections and inspection reports, as necessary.
4. Site maintenance as necessary to sustain design functions.
5. Emergency measures in the event of catastrophe.
6. Environmental monitoring as required.

The Bluewater site long-term custody compliance requirements were fulfilled for 2002 as follows:

1. The site was inspected on May 7, 2002 in accordance with the inspection procedure as outlined in Section 3.3.2 of the Long-Term Surveillance Plan (LTSP).
2. This document serves as the annual inspection report.
3. No follow-up inspections were necessary.
4. No maintenance was necessary to sustain design functions.
5. No catastrophic events necessitated emergency measures.
6. The required ground water monitoring, as specified in Section 3.7.1 of the LTSP, was completed and the results are presented in this report.

Bluewater Site Inspection Results

T. G. Kirkpatrick (Chief Inspector) and M. J. Gardner (Assistant Inspector), both of MACTEC–ERS, the Technical Assistance and Remediation contractor at the U.S. Department of Energy (DOE) Grand Junction Office (GJO), conducted the inspection on May 7, 2002. The inspection was conducted in accordance with the *Long-Term Surveillance Plan for the DOE Bluewater (UMTRCA Title II) Disposal Site near Grants, New Mexico* (July 1997) and procedures established by DOE–GJO to comply with requirements of Title 10 *Code of Federal Regulations* Part 40.28 (10 CFR 40.28).

The purposes of the inspection are to confirm the integrity of visible features at the site, to identify changes in conditions that may affect site integrity, and to determine the need, if any, for maintenance or additional inspections and monitoring.

Two photographs are included in the Bluewater report. The photographs are referred to in the text of the report and on Figures 1–1 and 1–2 by photograph location (PL) numbers.

Entrance Gate, Access Road, and Access Gate

The entrance gate (at County Road 334) is a steel, double-swing stock gate. A chain and padlocks belonging to DOE and various utility companies that have rights-of-way across the site secure the gate. The access road leads from the entrance gate to the access gate. The access road is an all-weather road surfaced with crushed basalt and extends northward, along a narrow strip of DOE property, for approximately 1,700 feet to the site access gate. The access gate also is a steel, double-swing stock gate secured by padlocks keyed the same as the entrance gate. The entrance gate, access road, and access gate are all in excellent condition.

Perimeter Signs

Fifty-four perimeter or warning signs, designated P1 through P52 on Figures 1–1 and 1–2 (including perimeter signs P2A, P2B, P9A, and P9B), are posted at access points along right-of-way intersections with the site boundary and around the main and carbonate tailings disposal cells. At the Bluewater site, all signs are identical and convey the information typically conveyed on entrance signs at other Long-Term Surveillance and Maintenance (LTSM) Program sites. Perimeter sign P1, located at the access gate, was missing; inspectors replaced P1 (PL–1).

The signs are mounted about 5 feet above the ground on steel posts set in concrete. Posts for signs along the property boundary are located about 5 feet inside the actual boundary line. The remaining 42 perimeter signs are spaced about 500 feet apart around the main and carbonate tailings disposal cells about 100 feet from the toe of the cells. All signs are in good condition but the trefoil is starting to fade. The 2001 Annual Inspection Report noted that posts for perimeter signs P14, P15, and P16 are loosening, presumably from being used as rubbing posts by livestock. These signposts were checked and they remain sufficiently stable (see "Site Perimeter and Outlying Areas" below).

Site Marker and Boundary Monuments

A granite site marker is located between the southwest corner of the main tailings disposal cell and the northwest corner of the carbonate tailings disposal cell. The marker is in excellent condition.

Twenty-four boundary monuments define the site boundary. These monuments are typically inside the perimeter fence, several feet inside the true corner or boundary line. The boundary monuments and the general area around the monuments were inspected for signs of disturbance. No disturbance was found. Boundary monument BM–21 appears to be buried under about two feet of sand.

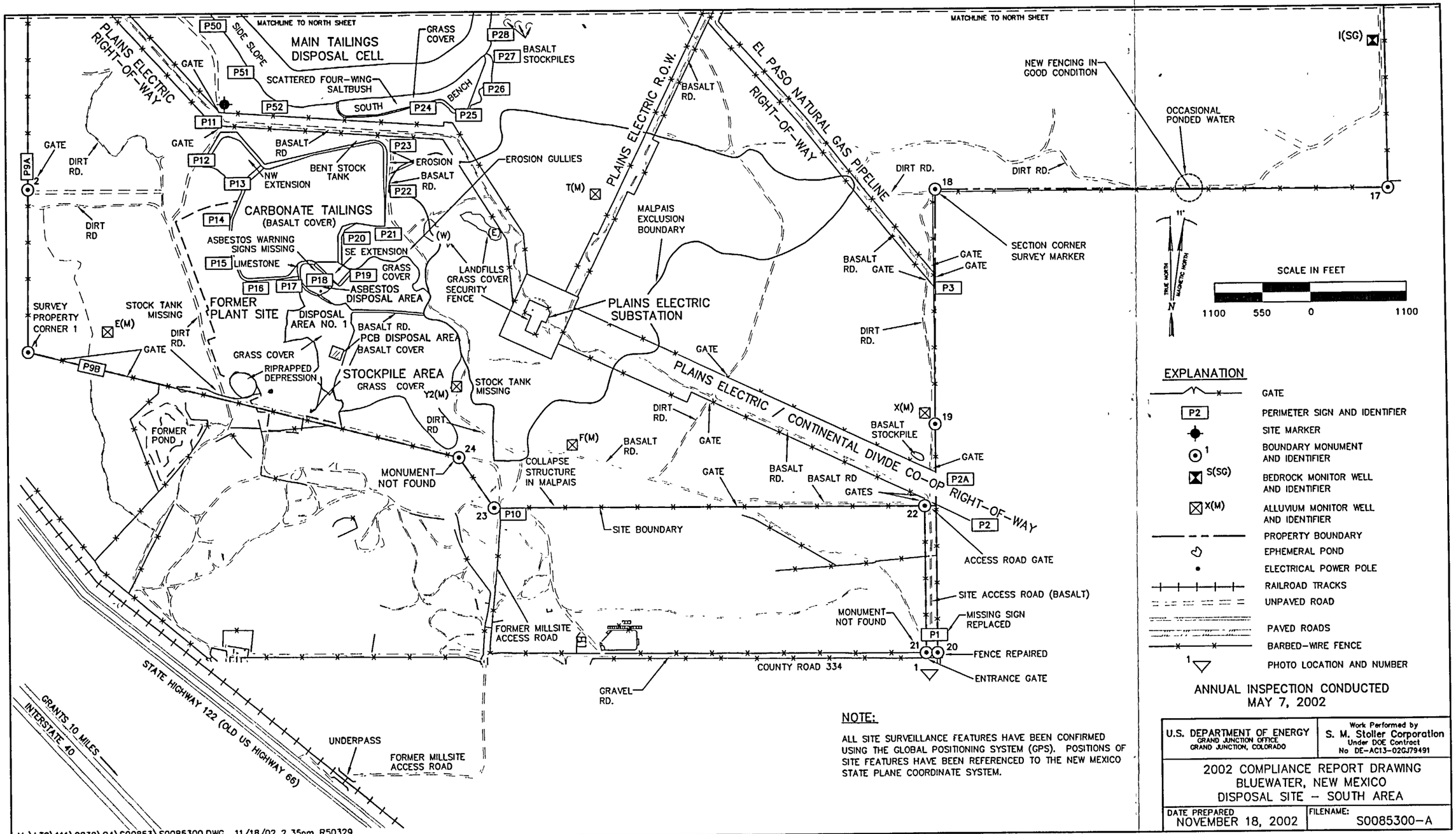


Figure 1–1. Bluewater, New Mexico, South Area, 2002

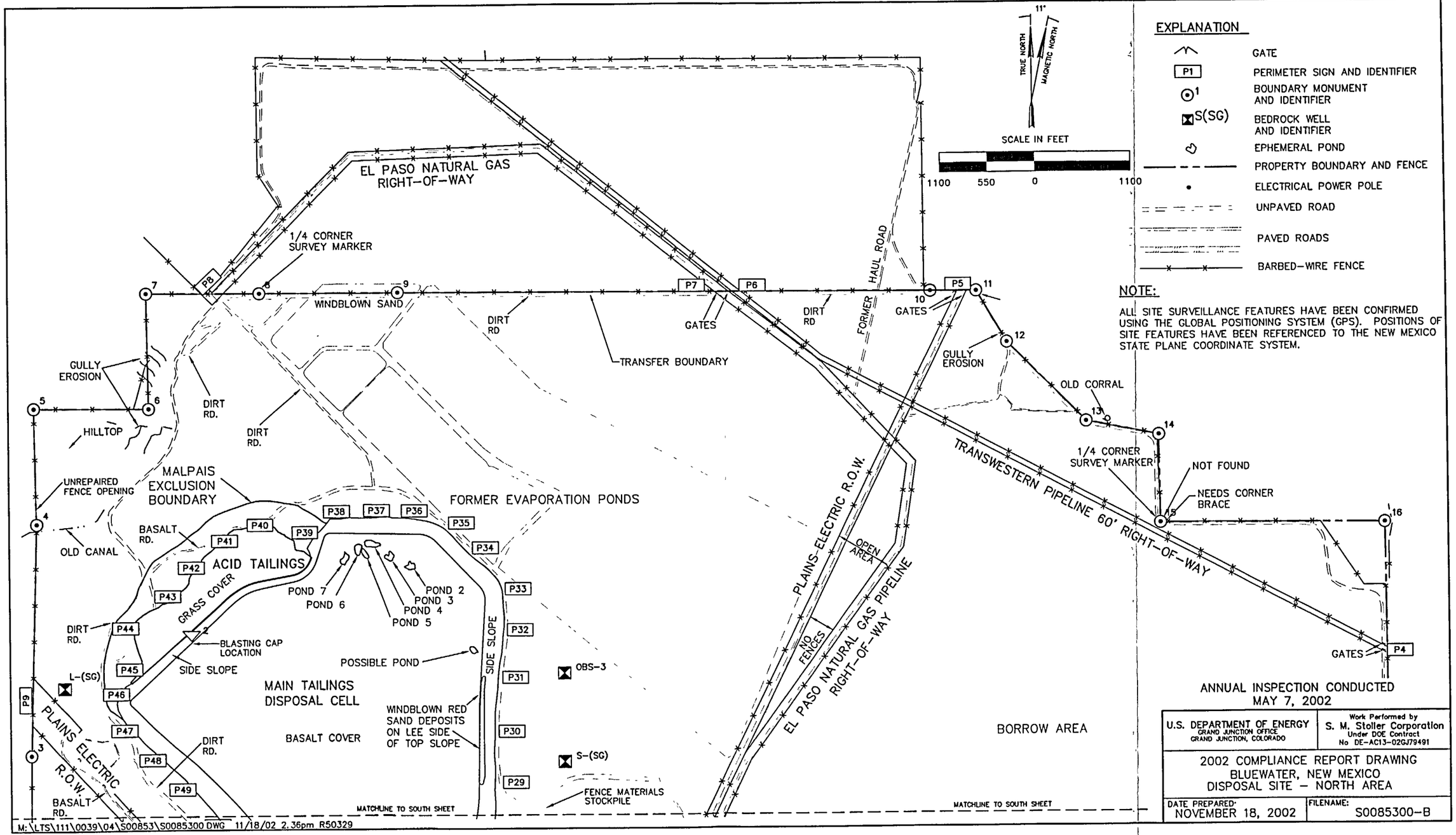


Figure 1–2. Bluewater, New Mexico, North Area, 2002

Monitor Wells

There are nine monitor wells at this site. All are inside the site boundary. The five wells screened in the alluvial aquifer include the letter "M" in the well identifier: E(M), F(M), T(M), X(M), and Y2(M). The other four wells are screened in the San Andres Limestone-Glorieta Sandstone, which is the bedrock aquifer at the site. The bedrock wells are L(SG), OBS–3, S(SG), and I(SG). The aboveground structures at the wells are in fair condition.

Wells previously had dedicated pumps, flow tubes, and stock tanks to contain purge water. Protective fencing placed around each well in 2001 to mitigate livestock damage was in good condition. Tanks were missing from E(M) and Y2(M). Surface support equipment for the monitor wells (wiring and PVC pipes) is weathered and in poor condition but has not impacted sampling activities.

Main Tailings, Acid Tailings, and South Bench Disposal Cells

These three disposal cells are contiguous and together constitute one large disposal area of approximately 320 acres. The main tailings disposal cell is covered with basalt riprap and slopes northward. The top slope grade decreases from 3 to 4 percent at the south end to less than 0.5 percent at the north end. The top slopes of the acid tailings and the south bench disposal areas are essentially flat and covered by grass. The side slopes of all three disposal cells are protected by basalt riprap. All three disposal cells are generally in excellent condition.

Widely scattered dead plants are present on the main tailings disposal cell, mostly on the east side slope. The plants are predominantly Russian thistle, an annual weed. Neither DOE nor the U.S. Nuclear Regulatory Commission (NRC) considers plant encroachment an issue at this site.

Fine-grained windblown sand has been deposited for about 1,000 feet along the top of the east side slope of the main tailings pile. Mostly, the sand surface is 3 to 4 inches beneath the riprap surface, but occasionally the sand fills the riprap interstices to the top. This accumulation is insignificant at this time. Plants are not preferentially establishing in the sand. Because the climate is relatively dry and plant cover upwind from the disposal cell is sparse, blowing sand will likely continue to accumulate. Inspectors will continue to monitor accumulations of windblown sand, here and elsewhere on site.

At the north end of the main tailings disposal cell, the top slope flattens to less than 0.5 percent. In previous years, inspectors found water ponded in this area in depressions. This year the depressions did not contain standing water.

The low spots are the result of settlement or an artifact of construction. Slimes from the settling ponds were placed in the northern part of the main tailings disposal cell. A grade of less than 0.5 percent is hard to achieve over an area as large as the north end of the main tailings disposal cell. Either mechanism could account for the depressions.

Inspectors will continue to monitor for ponding on top of the main tailings disposal cell. Given that evaporation greatly exceeds precipitation in this area, ponding is believed to be infrequent and brief; therefore, it is not a significant concern.

An unexploded blasting cap was found on the northwest edge on the top of the main tailings disposal cell. It was photographed (PL–2) so that inspectors could recognize other potential blasting caps and be cognizant of safety hazards. The blasting cap was not disturbed.

Carbonate Tailings Disposal Cell, Asbestos and PCB Disposal Areas, and Landfills

The top and side slopes of the carbonate tailings disposal cell are covered by basalt riprap (Figure 1–1). The top, for the most part, slopes gently eastward. The small northwest and southeast extensions slope in their respective directions. The carbonate tailings disposal cell and its extensions are in excellent condition. Erosion was observed along the east edge of the apron below the carbonate tailings cell during the 2001 inspection. Soil fill appeared to be washing away from the edge of the apron. This area was inspected in 2002 and remains unchanged. This does not affect the performance of the apron at this time but inspectors should continue to monitor the area.

The asbestos disposal area is a bowl-like feature or depression just south of the carbonate pile. It is in excellent condition. The north, west, and south side slopes of this depression are covered by limestone riprap; the bottom of the bowl is grass covered.

The small riprap-covered polychlorinated biphenyl (PCB) disposal area is in excellent condition. It is easily recognized because it is almost perfectly square, surrounded by grass, and covered with riprap. The two landfills in grass-covered depressions east of the carbonate pile are also in excellent condition.

Other Areas Inside the Site

Other areas inside the site were inspected by driving the site perimeter road and other roads, including some utility right-of-way roads. Much of the southern and western parts of the site are inaccessible by vehicle because they are covered by basalt flows. Inspectors walked portions of the perimeter fence that could not be inspected from the vehicle.

Several utility company rights-of-way cross the site. Stock fences with locked gates enclose these rights-of-way where the rights-of-way intersect one another, cross the site boundary, or cross the perimeter road. In 2000, inspectors cut the chains on access gates because nonstandard locks were installed and the inspection team did not have a key. Gates were re-secured with fence wire. Some of these were repaired in 2001 using repair links. LTSM Program management decided to leave right-of-way gates open as they were encountered, so there was no need to repair all the chains.

An electric power substation is enclosed by a security fence near the center of the site along the Plains Electric Company right-of-way (Figure 1–1). Fencing around this station generally is in good condition.

Two other disposal areas, Disposal Area Number 1 and the Stockpile Area, are located south of the carbonate tailings disposal cell. Both are grass-covered and in excellent condition.

Inspectors found cattle grazing on the site during the inspection (see below, "Site Perimeter and Outlying Areas"). Grazing is not part of the current management plan for this site.

Site Perimeter and Outlying Areas

The perimeter fence, a barbed-wire stock fence set several feet inside the property line, is generally in good condition. In 2001, fences were repaired in several locations, especially along the northwest and western boundaries. Inspectors found these repairs in good condition during the 2002 inspection. The inspectors repaired the fence at one location adjacent to the entrance gate.

In 2001, inspectors found fence purposefully left open in several locations. In 2002, the fence was not found left open and no evidence of intentional vandalism to the fence was apparent. There were a few cattle (approximately eight) on the property on the north side of the main tailings pile. These cattle apparently entered through an opening created by the cattle on the northwest side of the property. No evidence of cattle was found on the disposal cells and no damage was noted that could be attributed to the cattle.

An area along the site boundary at the east end of the site has flooded in the past but was dry this year. A subcontractor repaired approximately 800 feet of the perimeter fence in this area in 2001. The repair remains in excellent condition and is sufficient for keeping cattle out.

The perimeter road consists of a dirt track covered at places with crushed basalt. The road runs along the site boundary in much of the southern and most of the northern and eastern parts of the site. Most of the road is in good to excellent condition, but will require periodic maintenance. A culvert that was washing out south of boundary monument BM–16 was repaired in 2001. The repair was inspected and remains in excellent condition.

The area outside the site boundary for one-quarter mile was visually inspected for erosion, development, change in land use, or other phenomenon that might affect the long-term integrity of the site. None was seen.

Ground Water Monitoring Results

As a result of the timing of this report, ground water sampling and analysis results for 2002 are available. The required ground water sampling was conducted on October 17, 2002. As specified in the LTSP only the alluvial aquifer was sampled in 2002. All concentrations were less than the specified alternate concentration limit (ACL) for each parameter. Table 1–1 below summarizes the analytical results. Results of the U.S. Environmental Protection Agency (EPA)-required PCB sampling are included for completeness. PCBs were not detected. Point of compliance (POC) well T(M) was dry and therefore not sampled.

Table 1–1. Alluvial Aquifer Analytical Results Summary, October 2002

Alluvial Aquifer					
Constituent	ACL	Background Well E(M)	POC Well F(M)	POC Well T(M)	EPA Well Y2(M)
U-Nat, mg/L	0.44	0.001	0.015	dry	N/A
Selenium, mg/L	0 05	0.002	0.002	dry	N/A
Molybdenum, mg/L	0.10	0.002	<0.001	dry	N/A
PCB, µg/L	N/A	ND	ND	dry	ND

N/A = not applicable
ND = constituent concentration was below the method detection limit
mg/L = milligrams per liter

Conclusion

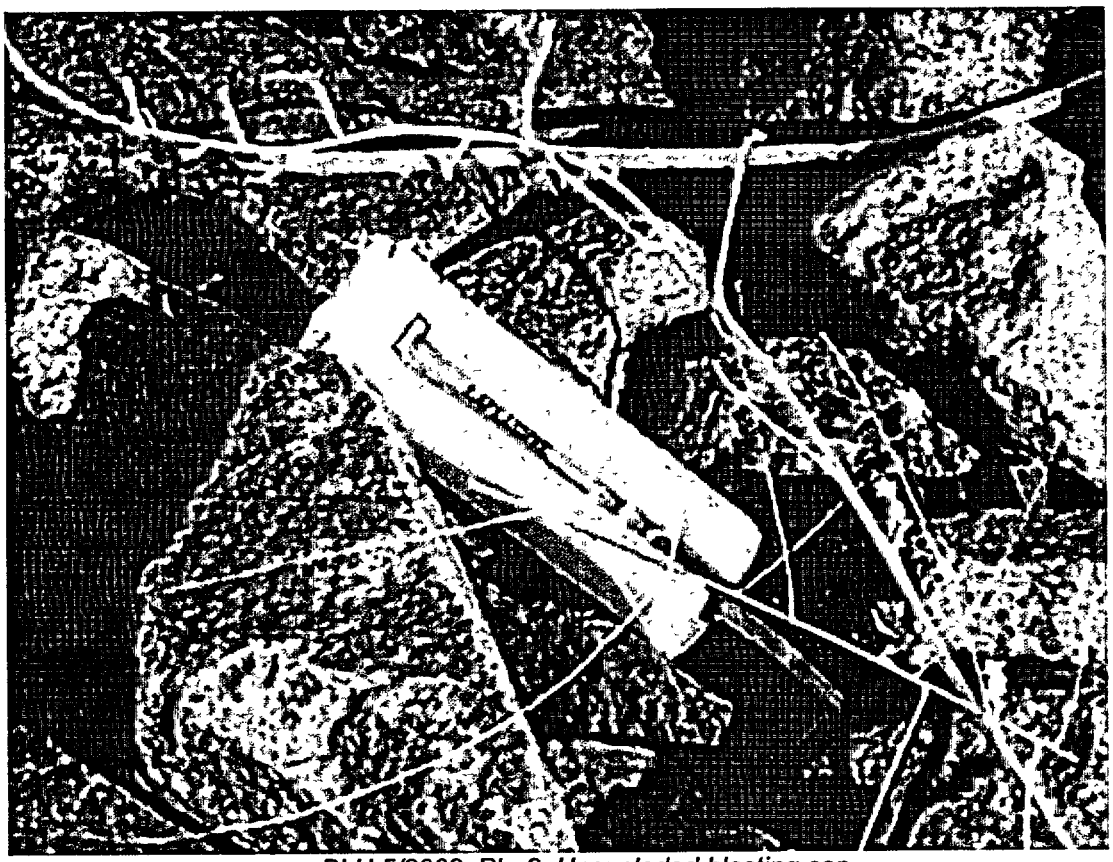
The Bluewater disposal site is in good condition at this time. The occurrence of ponding near the north end of the top of the main tailings pile will continue to be monitored for impacts. Measured ground water constituent concentrations remain less than their respective ACLs.

Bluewater Inspection Photographs

Table 1–2. Photograph Descriptions for Bluewater, New Mexico, Disposal Site

Photograph Location Number	Description
BLU PL–1	Replacing sign at entrance gate.
BLU PL–2	Unexploded blasting cap.

BLU 5/2002. PL-1. Replacing sign at entrance gate. (Date shown is incorrect. Actual date is 5/7/2002).



BLU 5/2002. PL-2. Unexploded blasting cap.

End of current text

2.0 Edgemont

Edgemont Site Long-Term Custody Compliance Requirements

The following list comprises the long-term custody requirements for the Edgemont site as defined in Section 3.2 of the site Long-Term Surveillance Plan:

1. Annual site inspection.
2. Annual inspection report.
3. Follow-up inspections and inspection reports, as necessary.
4. Site maintenance as necessary to sustain design functions.
5. Emergency measures in the event of catastrophe.
6. Environmental monitoring as required.

The Edgemont site long-term custody compliance requirements were fulfilled for 2002 as follows:

1. The site was inspected on June 25, 2002, in accordance with the inspection procedure as outlined in Section 3.3.2 of the Long-Term Surveillance Plan (LTSP).
2. This document serves as the annual inspection report.
3. No follow-up inspections were necessary.
4. Additional minor fence repairs are in order.
5. No catastrophic events necessitated emergency measures.
6. The condition of the grass-covered features of the site were inspected and continue to function as designed. There is no ground water monitoring required for this site.

Edgemont Site Inspection Results

The inspection was conducted on June 25, 2002, by M. P. Plessinger (Chief Inspector) and C. L. Jacobson (Assistant Inspector), both of MACTEC–ERS, the Technical Assistance and Remediation contractor at the DOE Grand Junction Office (GJO). The inspection was conducted in accordance with (1) the Long-Term Surveillance Plan (LTSP) for this site, *Long-Term Surveillance Plan for the DOE Tennessee Valley Authority (UMTRCA Title II) Disposal Site Edgemont, South Dakota, June 1996*, and (2) procedures established by the GJO to comply with requirements of Title 10 *Code of Federal Regulations* Part 40.28 (10 CFR 40.28).

The purposes of the inspection are to confirm the integrity of visible features at the site, to identify changes in conditions that may affect site integrity, and to determine the need, if any, for maintenance or additional inspections and monitoring.

Photographs to support specific observations are identified in the text and on Figure 2–1 by photograph location (PL) numbers.

Access Road, Entrance Gate Area, Fencing, and Boundary Monuments

Access to the Edgemont disposal site is immediately off an all-weather county road and is unimpaired.

The tubular metal entrance gate is secured by a padlocked chain and is in excellent condition. The site marker and site entrance sign (PL–1) also are in excellent condition.

A four-strand barbed-wire fence was installed in spring 1999 along the site boundary to demarcate DOE property and to control grazing on the property. The entire fence line was walked to inspect the fence and the boundary monuments. Minor fence repairs may be necessary at two locations. The wire was stretched on the west property boundary (PL–2) and the fence wire was loose where a metal tee post has pulled out of the ground along the south property boundary. However, based on the condition of the range inside the fence on site property versus outside the fence, the fence is adequately preventing unauthorized grazing. Therefore, fence repairs are not considered critical at this time. DOE will ask the grazing permittee to repair the fence at these locations. Otherwise, the fence is in excellent condition. Three livestock watering tanks were present on site during the inspection (PL–3). The tanks had been filled recently.

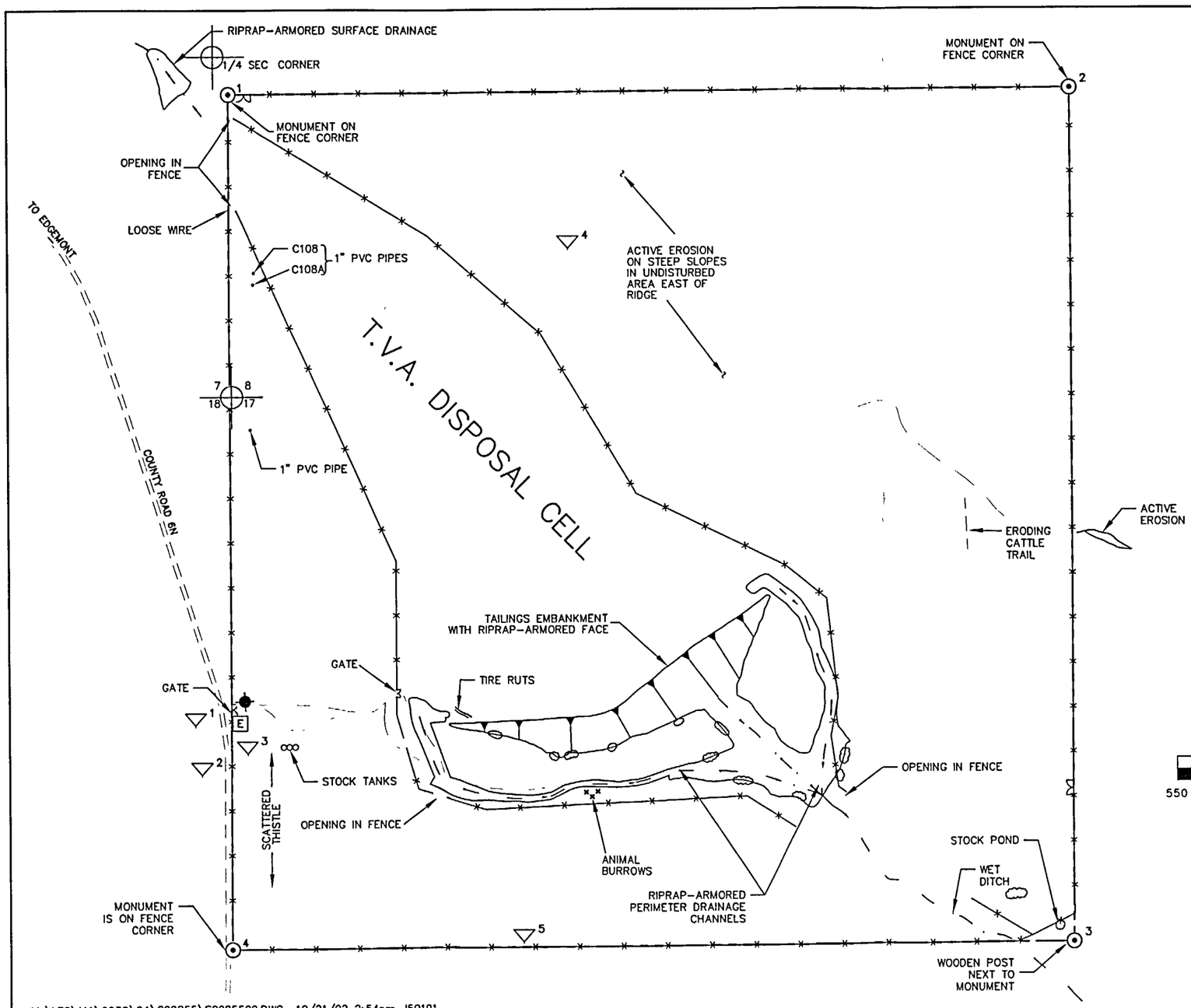
The four boundary monuments are undisturbed and in excellent condition.

Top of Disposal Cell

The 100-acre top of the disposal cell is grass-covered. DOE manages the grass cover through controlled grazing. Approximately 20 cow-calf pairs and one or two bulls were on site the day of the inspection. The grass is well established and was not over-grazed when inspected (PL–4A and PL–4B). Inspectors did not observe any indications of erosion, settlement, or other modifying processes on the disposal cell top. Tire tracks observed north of the west end of the embankment during previous inspections are still evident. The weed control agent probably left the tracks. There was no evidence of increased erosion as a result of the tire tracks.

Tailings Dam Face and Drainage and Diversion Ditches

The tailings dam face is covered with riprap and represents the steepest slope on site. The slope is stable and the riprap shows no signs of degradation. Scattered plants, mostly grass, grow in the riprap (PL–5A, PL–5B, and PL–5C). These plants do not pose an immediate threat to stability or function of this structure. The plant density has not increased over the last few years. Plant density in the riprap dam face will continue to be evaluated during future inspections.



DESCRIPTION OF TVA LAND SALE TRACT NO XEDGB–10:

1. FEE SIMPLE TITLE TO THE SURFACE AND MINERAL ESTATES TO THE NORTHWEST QUARTER (NW 1/4); AND FEE SIMPLE TITLE TO THE SURFACE AND MINERAL ESTATES TO THE WEST ONE–HALF OF THE NORTHEAST QUARTER (W 1/2 NE 1/4); BOTH IN SECTION 17, TOWNSHIP 9 SOUTH, RANGE 3 EAST OF THE BLACK HILLS PRINCIPAL MERIDIAN AND CONTAINING TWO HUNDRED AND FORTY (240) ACRES, MORE OR LESS.
2. FEE SIMPLE TITLE TO THE SURFACE AND MINERAL ESTATES TO THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER (SW 1/4 SE 1/4); FEE SIMPLE TITLE TO THE SURFACE OVERLYING THE SOUTH ONE–HALF OF THE SOUTHWEST QUARTER (S 1/2 SW 1/4); AND A PERMANENT EASEMENT TO THE MINERAL ESTATE UNDERLYING THE SOUTH ONE–HALF OF THE SOUTHWEST QUARTER (S 1/2 SW 1/4); ALL IN SECTION 8, TOWNSHIP 9 SOUTH, RANGE 3 EAST OF THE BLACK HILLS PRINCIPAL MERIDIAN AND CONTAINING ONE HUNDRED AND TWENTY (120) ACRES, MORE OR LESS

NOTES·

1. LOCATION OF THE BOUNDARY MONUMENTS, PROPERTY BOUNDARY, AND SITE MARKERS REMAIN AS DESCRIBED ABOVE FOR THE "DESCRIPTION OF TVA LAND SALE TRACT NO EXEDGB–10".
2. ALL OTHER SITE SURVEILLANCE FEATURES SUCH AS FENCES, GATES, ROADS, TOP AND BOTTOM OF EMBANKMENT HAVE BEEN CONFIRMED BY THE GLOBAL POSITIONING SYSTEM. THE FEATURES SHOWN ON THE DRAWING HAVE BEEN MOVED AND ROTATED TO MATCH THE POSITIONS DETERMINED BY THE GPS INFORMATION.

12–1/2°
TRUE NORTH
MAGNETIC NORTH
N

EXPLANATION

- GATE
- ENTRANCE SIGN
- SITE MARKER
- BOUNDARY MONUMENT AND NUMBER
- PROPERTY BOUNDARY
- DITCH OR RILL AND FLOW DIRECTION
- SLOPE – TRIANGLE POINTS DOWN SLOPE
- SECTION CORNER MARKER AND RESPECTIVE SECTION NUMBERS
- BARBED–WIRE FENCE
- AREAS CONTAINING CANADA THISTLE, A NOXIOUS WEED
- PHOTOGRAPH LOCATION AND NUMBER

SCALE IN FEET

550 275 0 550 1100

ANNUAL INSPECTION CONDUCTED
JUNE 25, 2002

U.S. DEPARTMENT OF ENERGY GRAND JUNCTION OFFICE GRAND JUNCTION, COLORADO	Work Performed by S. M. Stoller Corporation Under DOE Contract No. DE–AC13–02GJ79491
2002 COMPLIANCE REPORT DRAWING EDGEMONT, SOUTH DAKOTA DISPOSAL SITE	
DATE PREPARED OCTOBER 21, 2002	FILENAME· S0085500

Figure 2–1. Edgemont, South Dakota, 2002

Water was present in the drainage outlet below the tailings embankment, as reported previously. The drainage outlet is the lowest point on site and most of the precipitation that falls on the site exits there. The amount of water present was significantly less than that observed during previous inspections. The lack of moisture is due to drought being experienced by the region during the spring and early summer seasons of 2002. Wetland vegetation has established in the drainage outlet below the dam.

Diversion and drainage ditches are grass-covered (upgradient) and riprap-armored (down gradient and on steeper slopes). Minor amounts of vegetation occur in the riprap. The vegetation density may increase over time and should be monitored. However, as discussed above with respect to the riprap-covered tailings dam face, the vegetation density does not appear to have increased in the last few years. Grass in the vegetated portions of the drainage ditches is dense and healthy. There is no erosion.

The riprap-armored drainage channel at the northwest corner of the site property was stable and in good condition.

Area Between the Disposal Cell and the Site Perimeter

The area between the disposal cell and the site perimeter is grass-covered. This area is also grazed in a controlled manner. The grass is well established but minor erosion persists on steeper portions of the site east of the ridge that separates the northeast portion of the site property from the area containing the tailings cell. This erosion does not threaten the integrity of the stabilized tailings.

Outlying Areas

The areas surrounding the Edgemont site boundary for about one-quarter mile were visually inspected at a distance from the boundary fence. The city of Edgemont operates a municipal landfill north-northwest of the site. An occasional piece of wind-blown trash from the landfill was observed on site or along the fences. Minor erosion was observed along ephemeral watercourses east of the site. Inspectors did not observe evidence of activity or change in land use that could affect the site.

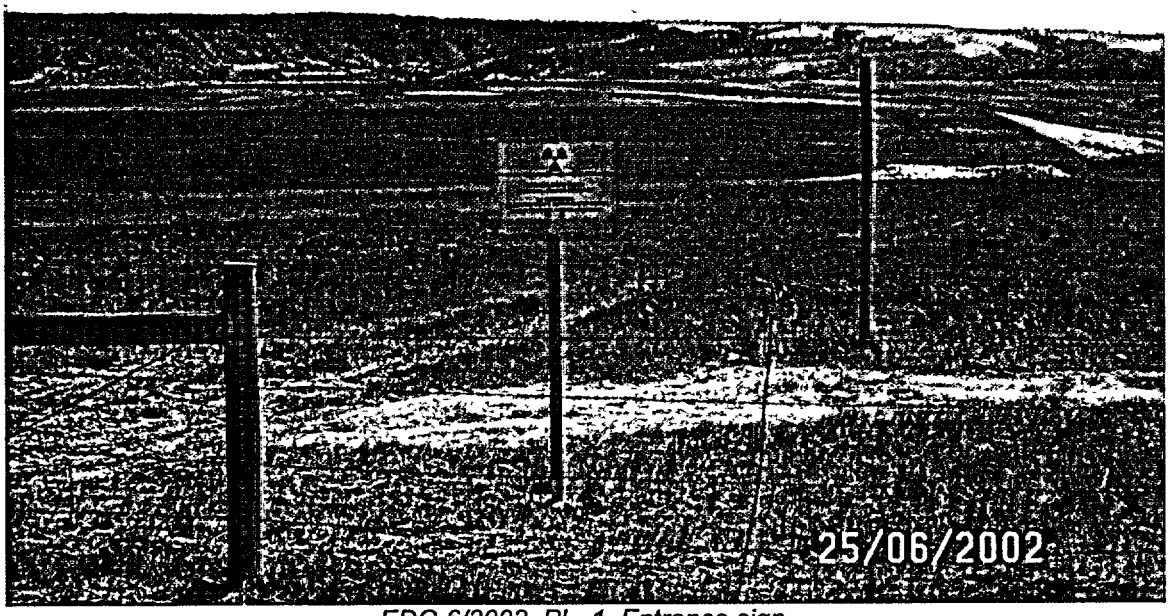
Conclusion

The Edgemont disposal site is in good condition at this time. Minor fence repairs are in order but the fencing is performing as required, therefore the fence repairs are not critical at this time. Vegetation colonizing the riprap will continue to be monitored during future inspections.

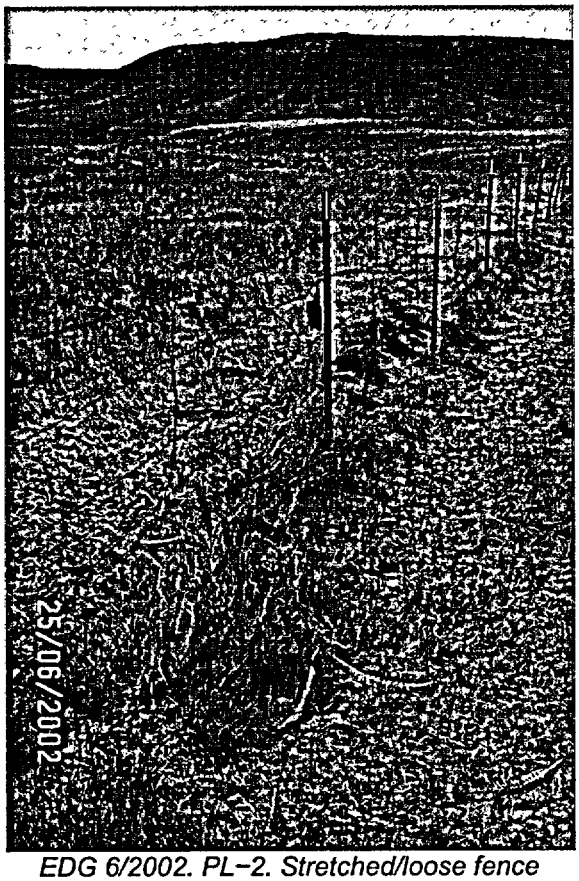
Edgemont Inspection Photographs

Table 2–1. Photograph Descriptions for Edgemont, South Dakota, Disposal Site

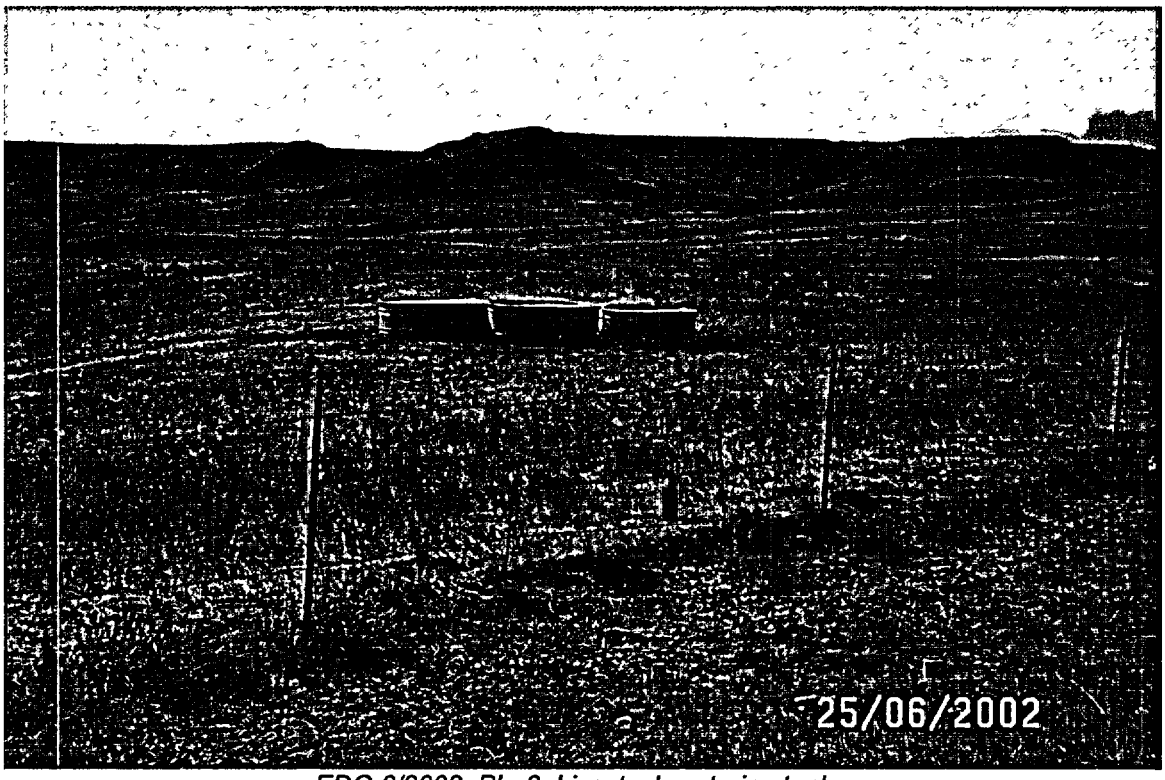
Photograph Location Number	Description
EDG PL–1	Entrance sign.
EDG PL–2	Stretched/loose fence along west boundary.
EDG PL–3	Livestock watering tanks.
EDG PL–4A	Disposal cell cover, looking southwest.
EDG PL–4B	Disposal cell cover, looking west.
EDG PL–5A, 5B, 5C	Embankment face showing plant encroachment.



EDG 6/2002. PL-1. Entrance sign

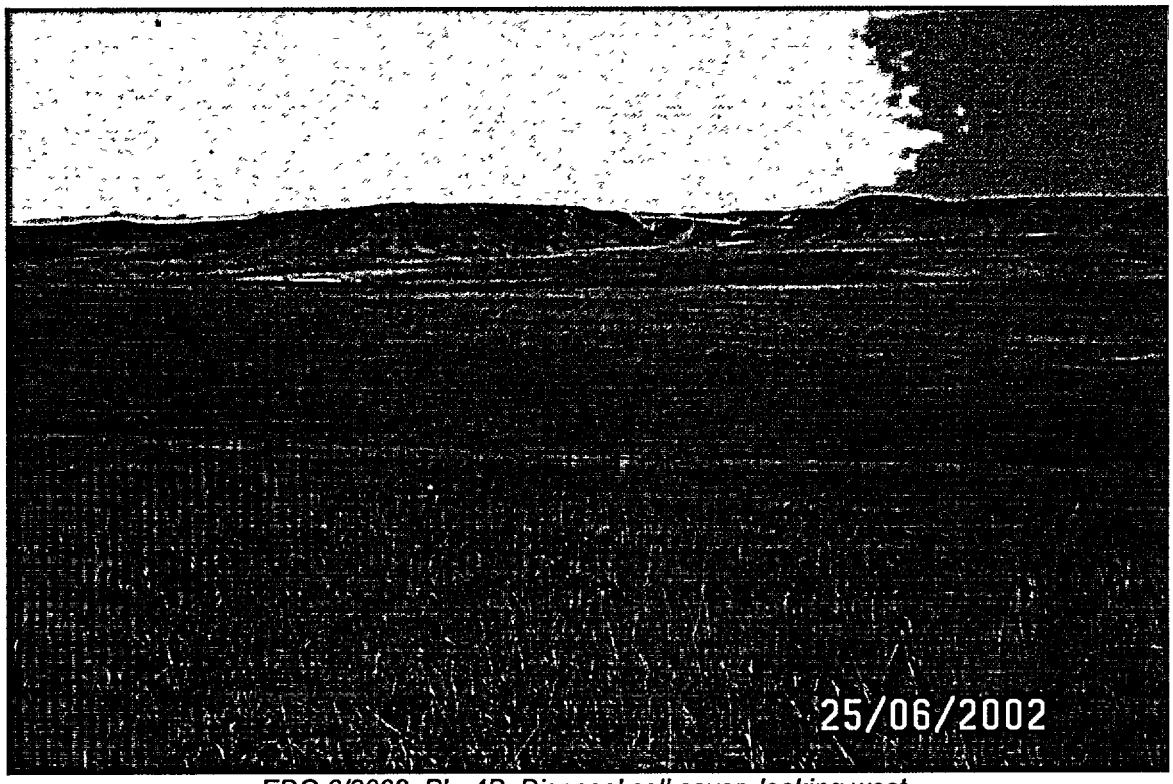


EDG 6/2002. PL-2. Stretched/loose fence along west boundary.

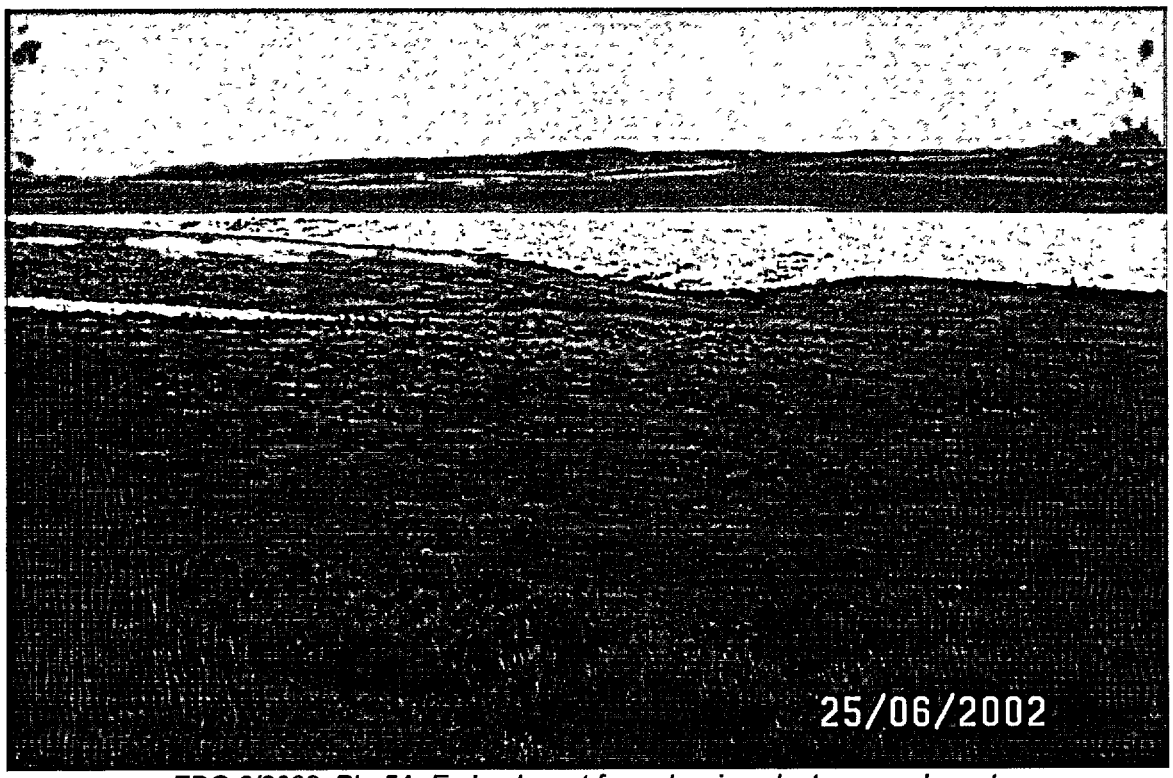


EDG 6/2002. PL-3. Livestock watering tanks.

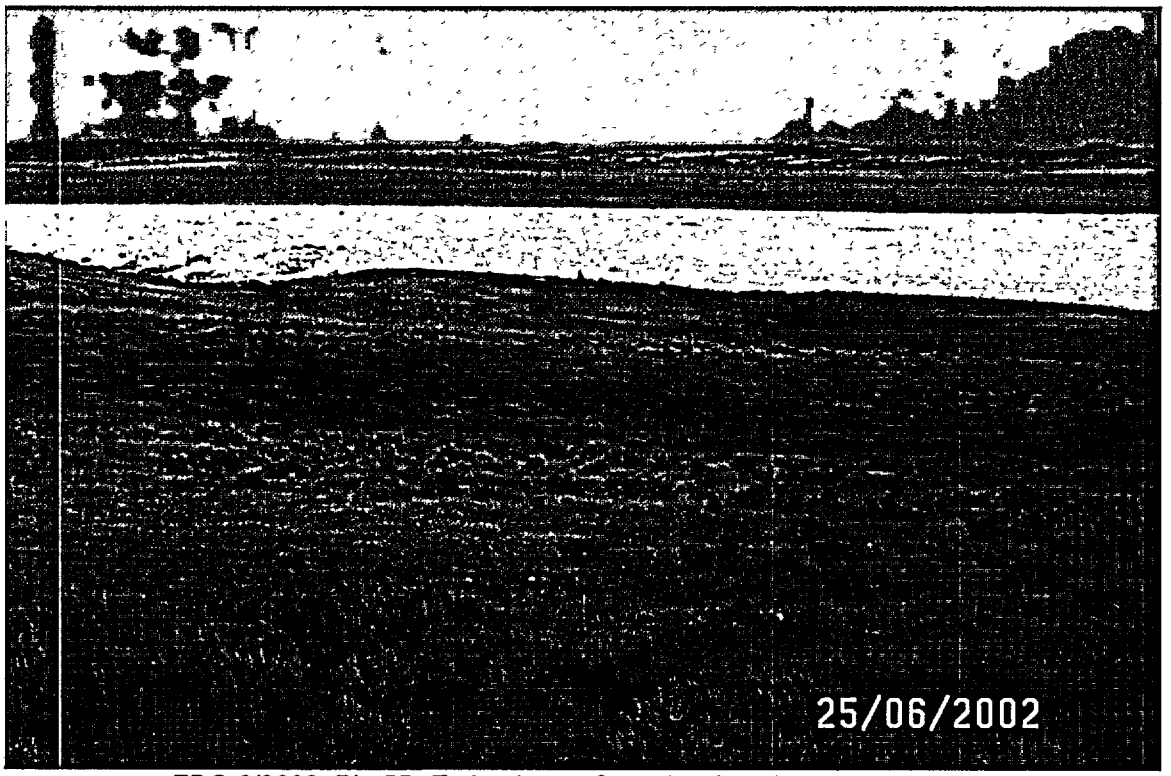
EDG 6/2002. PL-4A. Disposal cell cover, looking southwest.



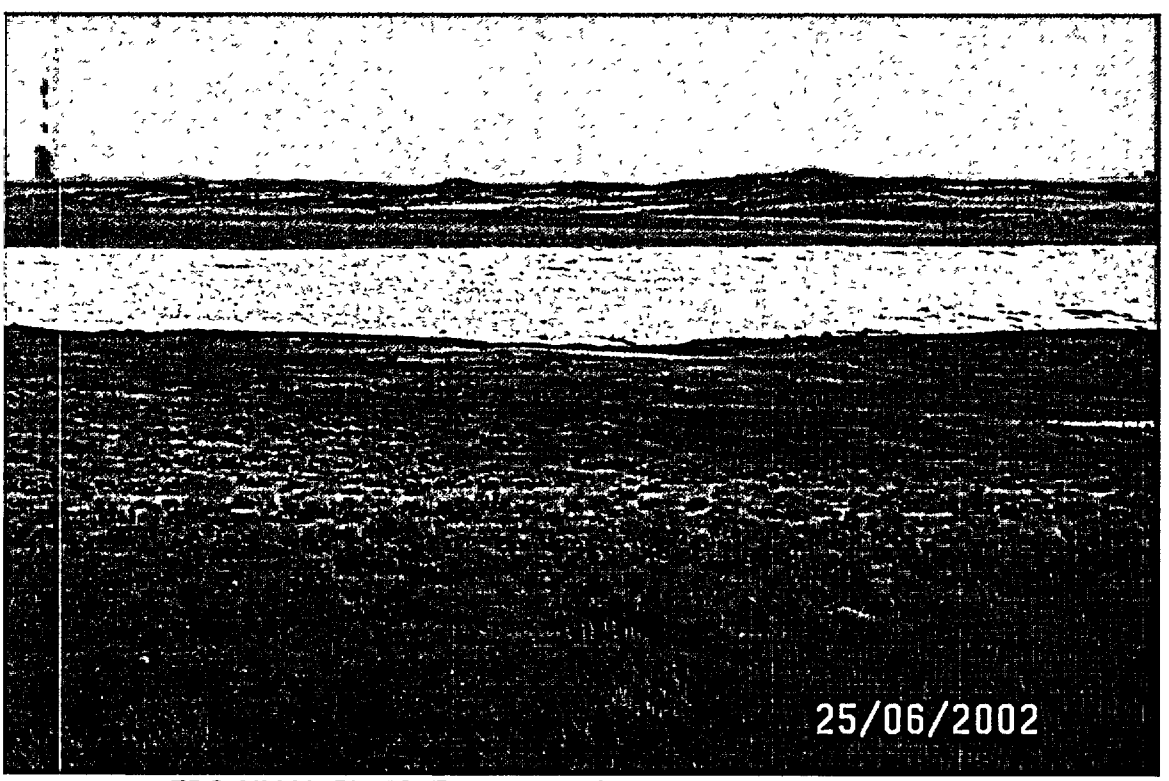
EDG 6/2002. PL-4B. Disposal cell cover, looking west.



EDG 6/2002. PL-5A. Embankment face showing plant encroachment.



EDG 6/2002. PL-5B. Embankment face showing plant encroachment.



EDG 6/2002. PL-5C. Embankment face showing plant encroachment.

3.0 Sherwood

Sherwood Site Long-Term Custody Compliance Requirements

The following list comprises the long-term custody compliance requirements for the Sherwood site as defined in Section 3.2 of the site Long-Term Surveillance Plan:

1. Annual site inspection.
2. Annual inspection report.
3. Follow-up inspections and inspection reports, as necessary.
4. Site maintenance as necessary to sustain design functions.
5. Emergency measures in the event of catastrophe.
6. Environmental monitoring as required.

The Sherwood site long-term custody compliance requirements were fulfilled for 2002 as follows:

1. The site was inspected on August 20, 2002 in accordance with the inspection procedure as outlined in Section 3.3.2 of the Long-Term Surveillance Plan (LTSP).
2. This document serves as the annual inspection report.
3. No follow-up inspections were necessary.
4. No maintenance was necessary to sustain design functions.
5. No catastrophic events necessitated emergency measures.
6. The required ground water monitoring, as specified in Section 3.7.1 of the LTSP, and the Dam Safety Inspection specified in Appendix D of the LTSP, were completed and the results are presented in this report.

Sherwood Site Inspection Results

M. K. Kastens (Chief Inspector) and T. G. Kirkpatrick (Assistant Inspector), of S. M. Stoller Corporation, the Technical Assistance Contractor at the DOE Grand Junction Office (GJO), conducted the inspection on August 20, 2002. T. L. Johnson of the U.S. Nuclear Regulatory Commission (NRC) participated in the inspection. The inspection was conducted in accordance with the *Long-Term Surveillance Plan* (LTSP) *for the DOE Sherwood Project (UMTRCA Title II) Reclamation Cell, Wellpinit, Washington,* (February 2001) and procedures established by DOE–GJO to comply with the requirements of Title 10 *Code of Federal Regulations* Part 40.28 (10 CFR 40.28).

The purposes of the annual inspection are to confirm the integrity of visible features at the site, to identify changes in conditions that may affect site integrity, and to determine the need, if any, for maintenance or additional inspections and monitoring.

Ten photographs are included in the Sherwood report. The photographs are referred to in the text of the report and on Figure 3–1 by photograph location (PL) numbers.

Access Road and Perimeter Signs

The Bureau of Indian Affairs (BIA) maintains the all-weather site access road. A double-swing steel gate controls access to the Sherwood mine area and Spokane Tribe-owned facilities near the disposal site. There is a DOE lock on the gate in addition to the Tribe's lock.

Six perimeter or warning signs, designated P1 through P6, are placed at likely access points around the site property. The signs are attached at a height of about 5 feet above ground to steel posts set in concrete. Perimeter sign P4, north of the site, is located on a fence line north of the actual site boundary on an old two-track road that approaches the site from the northeast. All signs are in excellent condition.

Site Marker and Boundary Monuments

One inscribed granite site marker is present on the southwest side of the site property where the access road lies closest to the site boundary. The marker is in excellent condition.

Six boundary monuments designated BM–1, BM–2, BM–3, BM–3A, BM–4, and BM–5 define the site boundary. All are in excellent condition.

Monitor Wells and Piezometers

Three monitor wells are located on the Sherwood site and are designated MW–2B, MW–4, and MW–10. MW–2B is the up gradient or background well, and wells MW–4 and MW–10 are point-of-compliance wells. The above-ground structures at the wells are in good condition.

Four piezometers, designated PZ–1 through PZ–4, were installed in November 2000 along the crest of the tailings dam as part of the Dam Safety Inspection program. The above-ground structures at the piezometers are in good condition.

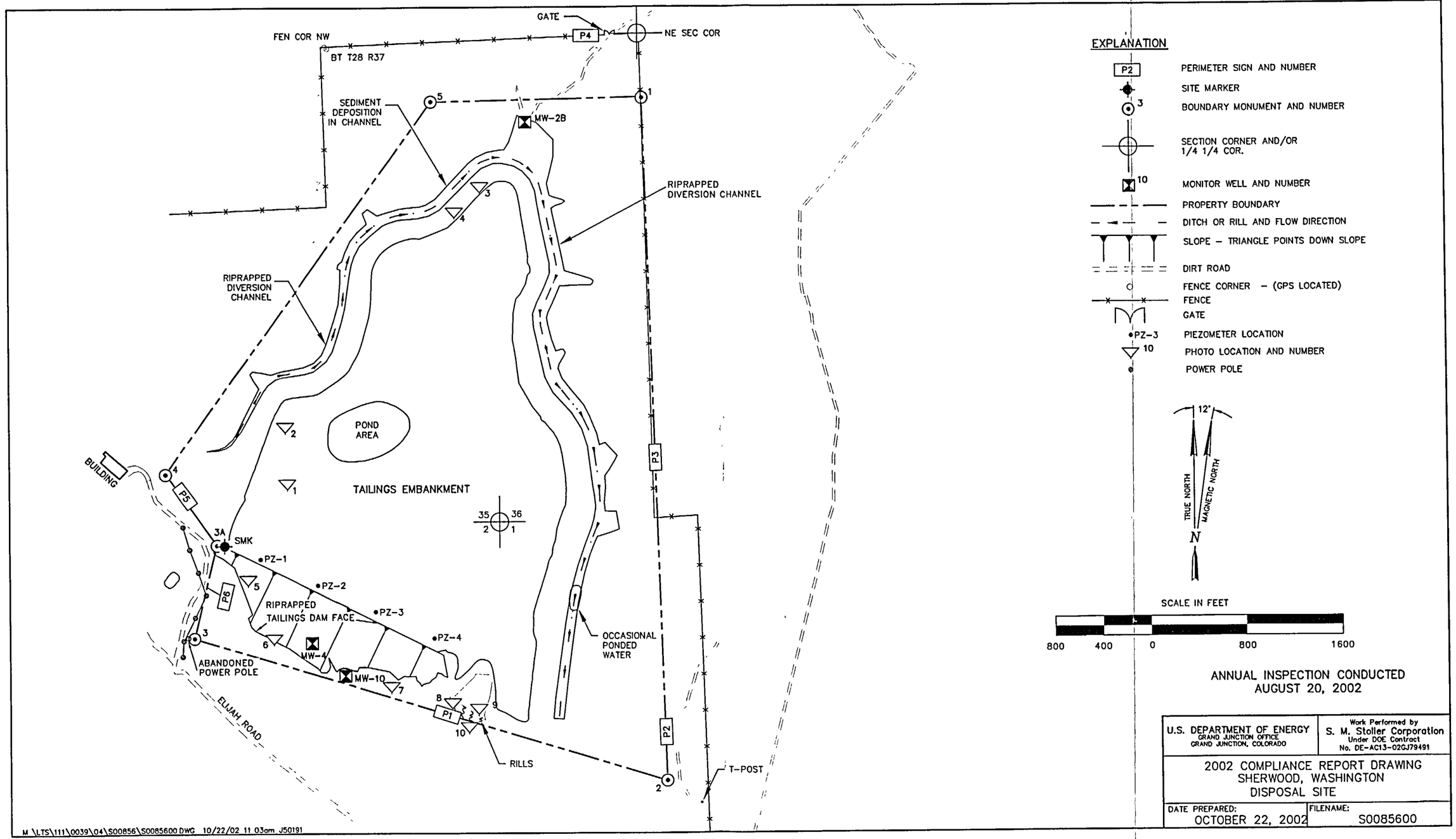


Figure 3–1. Sherwood, Washington, 2002

Tailings Impoundment Cover

The tailings impoundment cover for the Sherwood site consists of 12 to 20 feet of uncompacted soils. During site reclamation, surface soils were seeded and planted with shrubs, forbs, grasses, and trees. Reclamation has been successful, as a healthy stand of vegetation is now established. Inspectors walked traverses across the impoundment cover and found no evidence of differential settlement other than the pond area observed during earlier inspections. The pond area did not appear to have expanded in size (PL–1 and PL–2).

The pond area was dry at the time of the inspection; however, the plant species present indicate that there is year-round moisture below the surface. Vegetation in the pond area is composed primarily of native wetland species such as hardstem bulrush (*Scirpus acutus*), Olney threesquare (*Scirpus americanus*), common spikerush (*Eliocharis palustris*), sandbar willow (*Salix exigua*), and plantain (*Plantago eriopoda*). The pond provides habitat for small mammals, birds, and reptiles and appears to be a water source for larger mammals such as deer and elk, whose sign was abundant in this area.

Diversion Channel and Impoundment Dam Face

Inspectors walked the length of the diversion channel. Volunteer plant intrusion within the diversion channel is evident in most areas of the channel; however, this intrusion is not expected to interfere with the channel's design function. Rock condition is good and is the same as observed during earlier inspections. Sediment deposition is evident in places on the west side of the diversion channel (PL–3 and PL–4), but currently does not interfere with the channel's design function. The degree of sediment deposition should be noted during future inspections although it is not expected to increase to the degree that it could become a maintenance issue. At times, standing water has been observed in the channel along the east side of the impoundment (see Figure 3–1); this area was dry during the 2002 inspection.

The impoundment dam face was inspected in accordance with the appended Dam Inspection Checklist (Appendix A) and photographed (PL–5, PL–6, and PL–7). No evidence of seepage, slumping, erosion, or instability was observed. Ponderosa pines, some as tall as 18 inches, were observed on the face. As these grow in size, they may need to be cut to prevent potential damage to the dam face from blow-down.

The NRC representative, concerned about rock durability, noted that rocks on the western portion of the dam face appeared to be more weathered than those on the eastern portion. He recommended that DOE institute a rock monitoring program for approximately 5-10 years. He suggested a visual observation method whereby photographs of "rock plots" would be taken at selected locations along the dam face on an annual basis.

Adjacent to the eastern end of the dam face is a steep slope that is underlain by rock covered with soil. Numerous rills and gullies noted during previous annual inspections were inspected on this slope (PL–8, PL–9, and PL–10). No new rills were identified and the size of existing rills had not increased since the 2001 inspection. Although these erosional features do not pose a hazard, they should be inspected annually to ensure that the slope remains stable.

Site Perimeter, Outlying Area, and Balance of Site

The inspectors covered the site perimeter while searching for boundary monuments and warning signs. No evidence of off site activity that could affect the integrity of the tailings impoundment was observed. Ponderosa pine forest comprises most of the surrounding area. The site property and surrounding lands are part of the Spokane Tribe of Indians Reservation. There are no residences within 0.25 mile of the site boundary.

Ground Water Monitoring and Piezometer Water Level Results

Both the required ground water sampling and the piezometer water level measurements were conducted on August 4, 2002. Ground water constituent concentrations were less than the action level (Washington water quality criteria) for confirmatory sampling. Ground water analytical results from 2001 and 2002, and piezometer water levels from 2000, 2001, and 2002 are presented in Tables 3–1, 3–2, and 3–3, respectively.

Table 3–1. Ground Water Sampling and Analysis Results Summary, July 2001

Constituent	Water Quality Criteria	Background Well MW–2B	POC Well MW–4	POC Well MW–10
Chloride, mg/L	250	1.460	6.290	2.350
Sulfate, mg/L	250	3.040	27.500	25.500
TDS, mg/L	N/A	242	445	742

N/A = not applicable
mg/L = milligrams per liter

Table 3–2. Ground Water Sampling and Analysis Results Summary, August 2002

Constituent	Water Quality Criteria	Background Well MW–2B	POC Well MW–4	POC Well MW–10
Chloride, mg/L	250	1.790	3.100	2.630
Sulfate, mg/L	250	3.170	20.900	27.500
TDS, mg/L	N/A	258	418	715

N/A = not applicable
mg/L = milligrams per liter

Table 3–3. Piezometer Water Levels, November 2000, July 2001, and August 2002

Parameter	PZ–1	PZ–2	PZ–3	PZ–4
Water Level, November 2000 (initial reading at installation)	Dry	3 05 feet	Dry	Dry
Water Level, July 2001	Dry	1.95 feet	Dry	Dry
Water Level, August 2002	Dry	2.80 feet	Dry	Dry

Conclusion

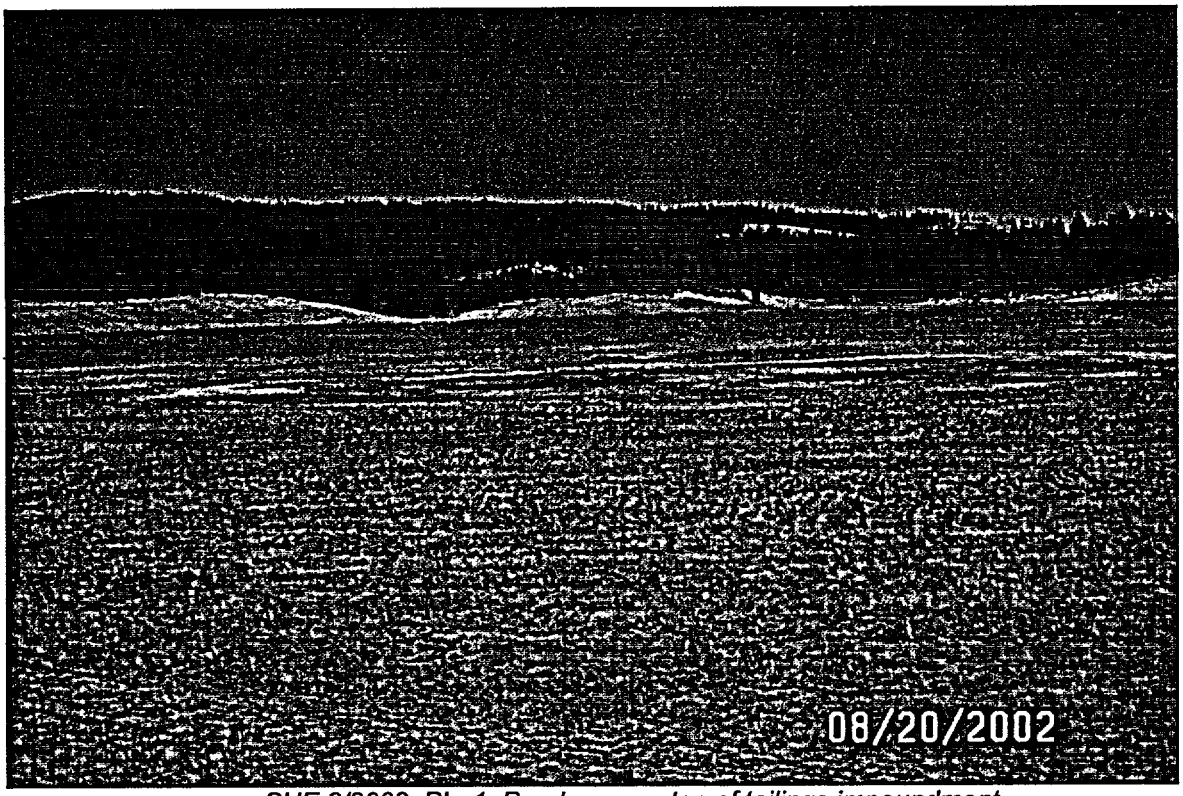
The Sherwood disposal site is in good condition at this time. No issues were identified during the dam safety inspection and no evidence of excessive settlement was observed in the pond area. The pond was dry at the time of the inspection. Ground water monitoring and piezometer water level measurements conducted in August 2002 showed all measured parameters to be within acceptable ranges.

Sherwood Inspection Photographs

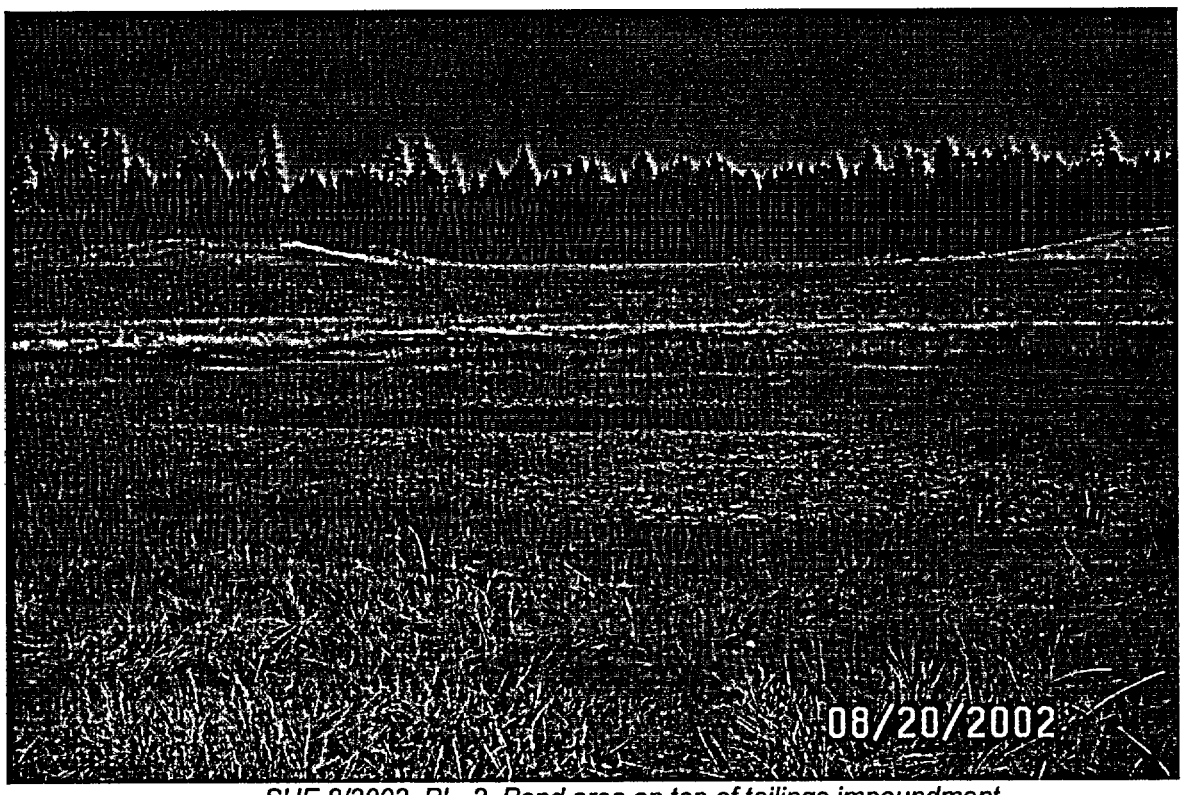
Table 3–4. Photograph Descriptions for Sherwood, Washington, Disposal Site

Photograph Location Number	Description
SHE PL–1	Pond area on top of tailings impoundment
SHE PL–2	Pond area on top of tailings impoundment
SHE PL–3	Sediment in west diversion channel
SHE PL–4	Sediment in west diversion channel
SHE PL–5	View of dam face
SHE PL–6	Vegetation on dam face
SHE PL–7	View of dam face
SHE PL–8	Erosion on steep slope
SHE PL–9	Erosion on steep slope
SHE PL–10	Erosion on steep slope

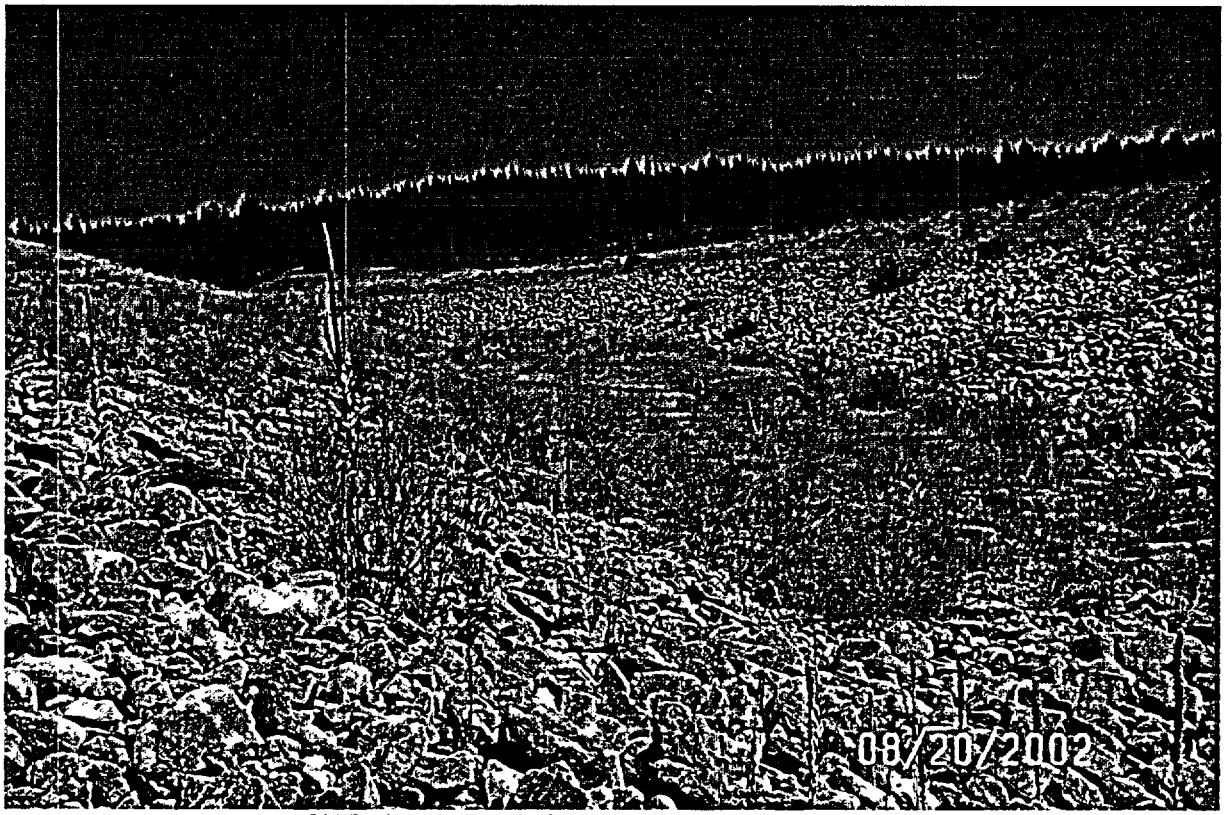
End of current text



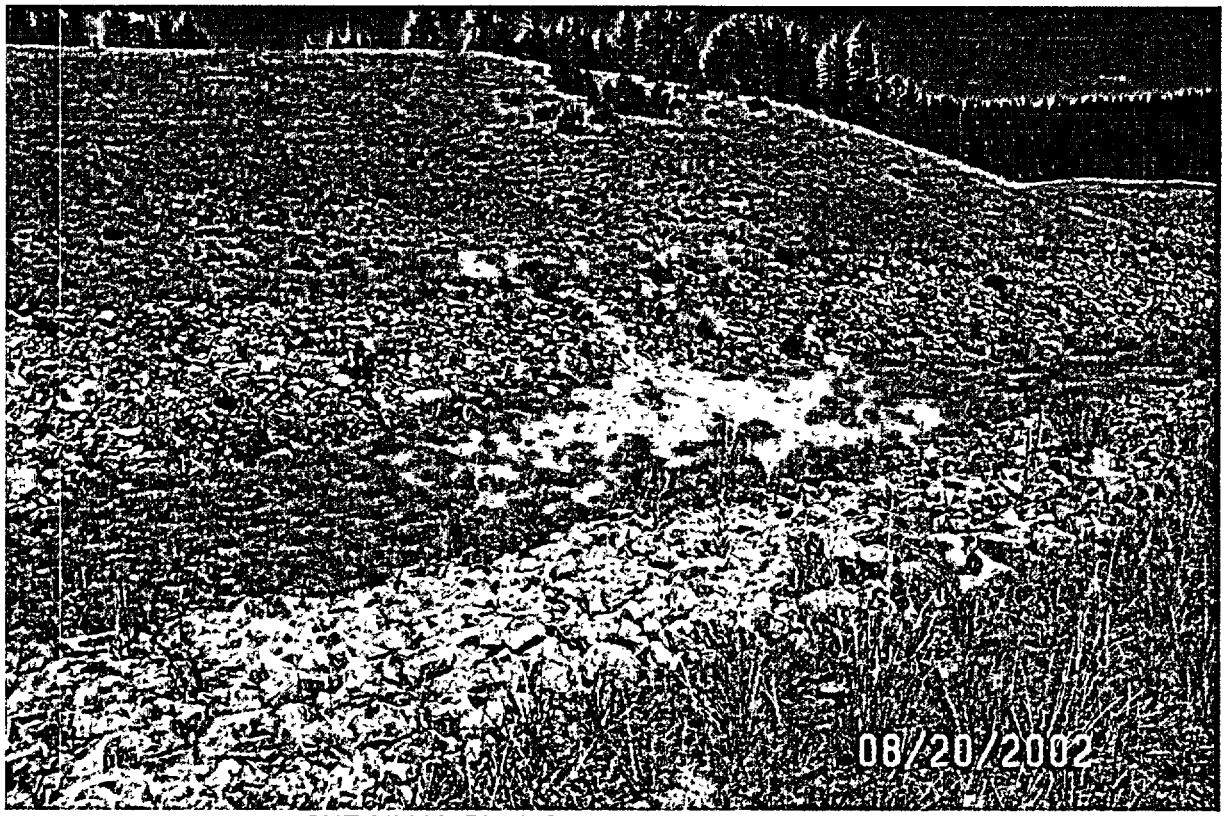
SHE 8/2002. PL-1. Pond area on top of tailings impoundment.



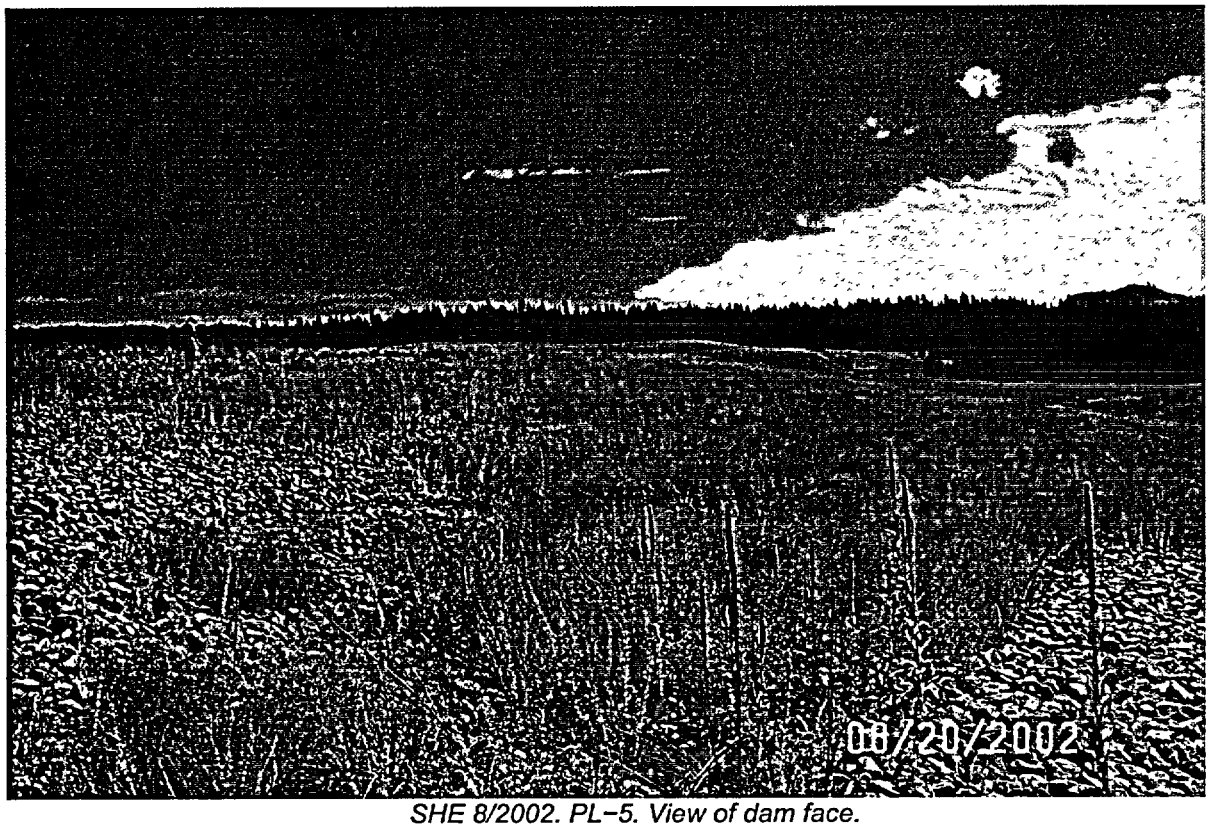
SHE 8/2002. PL-2. Pond area on top of tailings impoundment.



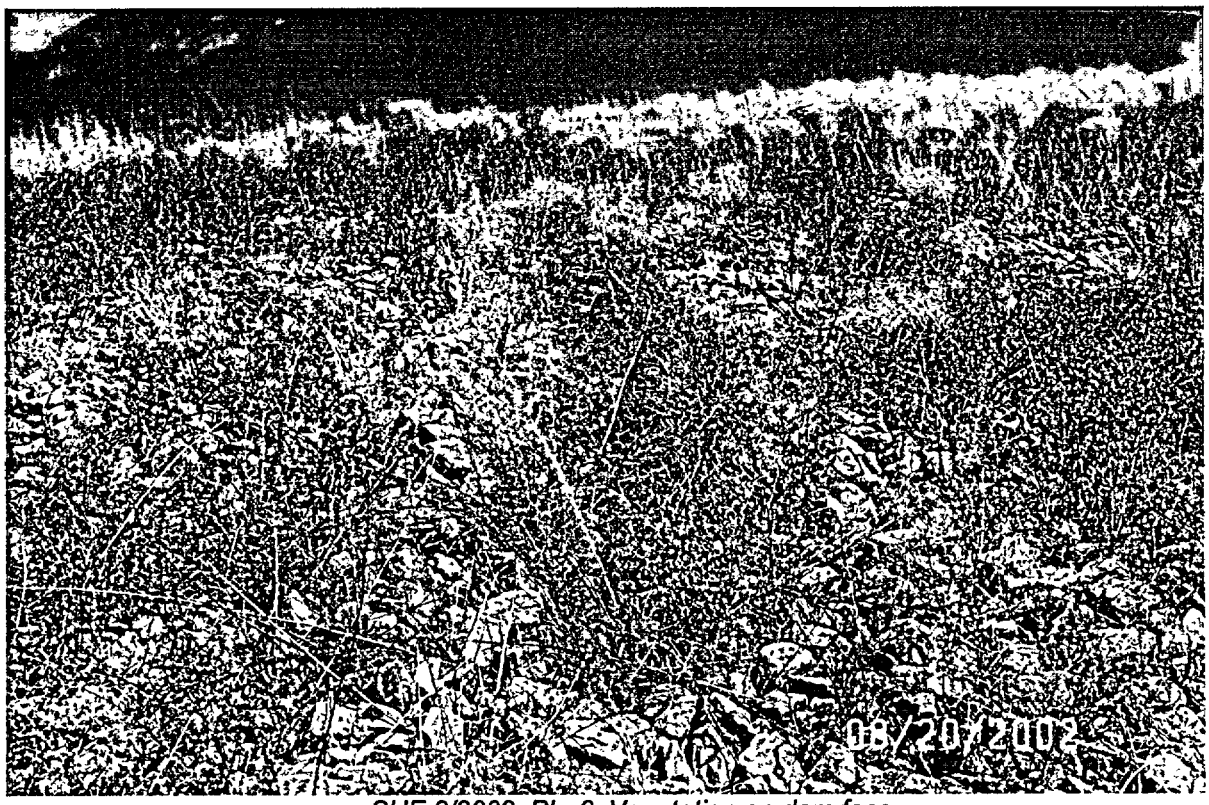
SHE 8/2002. PL-3. Sediment in west drainage channel.



SHE 8/2002. PL-4. Sediment in west drainage channel.



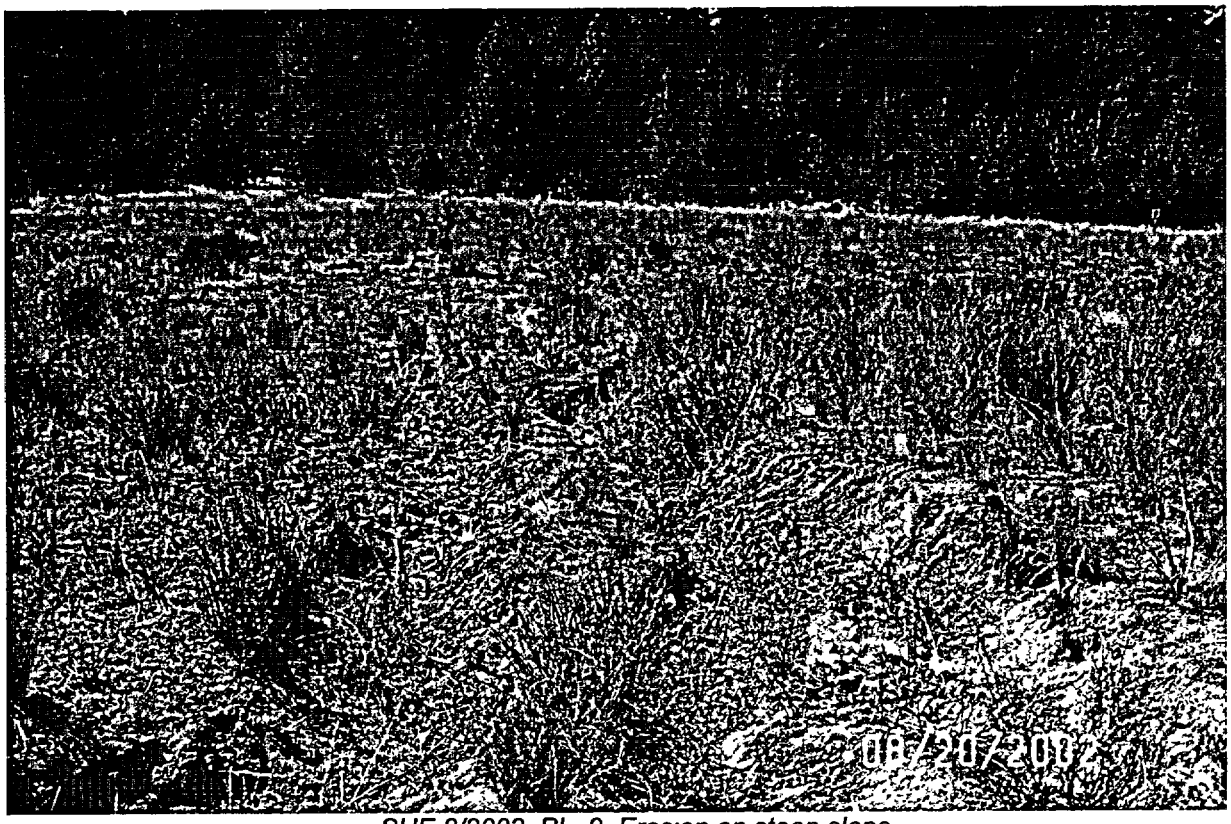
SHE 8/2002. PL-5. View of dam face.



SHE 8/2002. PL-6. Vegetation on dam face.

SHE 8/2002. PL-7. View of dam face.

SHE 8/2002. PL-8. Erosion on steep slope



SHE 8/2002. PL-9. Erosion on steep slope

SHE 8/2002. PL-10. Erosion on steep slope

End of current text

Appendix A

Sherwood, Washington, Dam Inspection Checklist

Dam Inspection Checklist

Piezometer P1 current year water level (feet)	dry
Piezometer P2 current year water level (feet)	2.80
Piezometer P3 current year water level (feet)	dry
Piezometer P4 current year water level (feet)	dry
Was evidence of significant seepage observed on the dam face? If yes discuss in report.	no
Was evidence of significant slumping observed on the dam? If yes discuss in report.	no
Was evidence of significant erosion observed on the dam? If yes discuss in report.	no
Was vegetative growth that could compromise dam stability observed? If yes discuss in report.	no
Was any condition that presents imminent hazard the public health and safety or the environment observed?	no

If yes immediately contact the following:

DOE Project Manager (970) 248-6037
NRC Operations Center (301) 951-0550
Spokane Tribal Police/Sheriff (509) 258-4400

End of current text