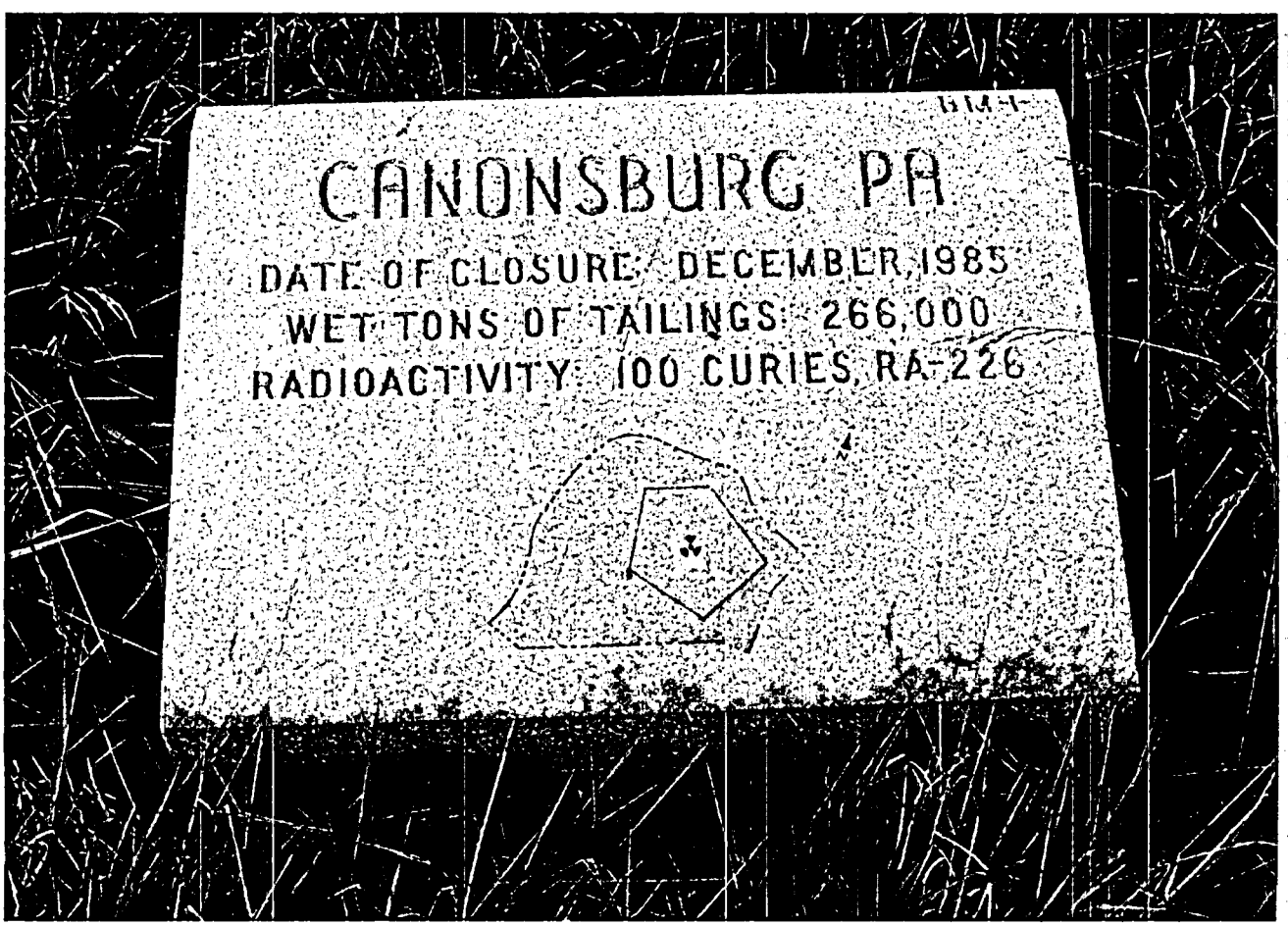
Long-Term Surveillance and Maintenance Program

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

Interim Annual Report for the Period October 1, 1997 Through December 31, 1997

April 1998



Long-Term Surveillance and Maintenance Program

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Interim Annual Report
for the Period
October 1, 1997 Through December 31, 1997

April 1998

Prepared for
U.S. Department of Energy
Albuquerque Operations Office
Grand Junction, Colorado

Prepared by
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Work Performed Under DOE Contract Number DE–AC13–96GJ87335
Task Order Number MAC 98–06
Document Number S0006200

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Summary

This report presents results of annual site inspections and ground-water monitoring at two UMTRCA Title I mill tailings sites in Pennsylvania, the Canonsburg and Burrell sites. Annual site inspections and ground-water monitoring are required by the U.S. Nuclear Regulatory Commission's general license for these two sites. Specific inspection and monitoring requirements are in the Long-Term Surveillance Plan for each site. Both sites were inspected in November 1997. Ground-water monitoring was completed at each site the week prior to the annual inspection. Both sites are in excellent condition, although there are concerns at each site.

The Burrell site was inspected on November 19, 1997. The site was in good condition. Two persistent conditions exist: vegetation growing on the disposal cell and water seeping from along the southern edge of the disposal cell. A screening-level risk assessment is underway to evaluate the risk to human health and environment due to root intrusion into the radon barrier. The assessment will be completed in 1998. The seeps are believed to be natural drainage, not dewatering of the disposal cell, and will continue to be monitored as part of the annual ground-water monitoring program. DOE is considering improving the drainage on the north (upgradient) site of the disposal cell to see if flow from the seeps can be reduced. No cause for follow-up inspections was identified.

The Canonsburg site was inspected on November 18, 1997. The site was in excellent condition, although there are several maintenance concerns. Deadfalls along the security fence will be removed in summer 1998, and the fence will be repaired where necessary. DOE is considering relocation of part of the security fence to avoid vegetation encroachment problems. Vegetation continues to grow in runoff diversion channels and will have to be controlled again, probably in 1999. Gully erosion below the confluence of two runoff diversion channels appears to be a safety hazard. DOE will improve this drainage to improve safety. DOE is negotiating with the U.S. Army Corps of Engineers for a bank stabilization plan to prevent erosion along Chartiers Creek. Uranium concentration in three monitor wells continues above the Maximum Concentration Level established for UMTRCA mill tailings disposal sites. Although the two-year ground-water monitoring requirement at this site has been met, DOE will continue annual monitoring of ground water, at a reduced scale, because of the elevated uranium in some wells. Annual monitoring will continue, as a best management practice, until the UMTRA Ground-Water Project's application for alternative concentration limits (ACLs) is submitted and approved by NRC. Excess monitor wells will eventually be abandoned. No need for follow-up inspections was identified.

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1.0 Introduction

Regulations that implement the Uranium Mill Tailings Radiation Control Act of 1978 require the U.S. Department of Energy (DOE) to inspect licensed Title I sites annually and to report the results of the inspection to the U.S. Nuclear Regulatory Commission (NRC). Prior to September 30, 1997, DOE submitted a separate annual report for each site.

By recent agreement between the DOE Grand Junction Office (GJO) and NRC, GJO will now combine all Title I inspection reports into one annual report. The annual report will cover a calender year (CY) instead of the federal government's fiscal year. The effective date of this agreement was October 1, 1997. Prior to that date, DOE submitted separate annual reports for each site.

During the period from October 1 through December 31, 1997, DOE inspected two sites: the Canonsburg and Burrell, Pennsylvania, sites. Inspection reports for both of these sites are included in this report. The next annual report will be issued early in 1999 and will include reports for all Title I sites inspected in CY 1998.

Beginning with this report, each annual report will include results of ground-water monitoring at sites where it is required by the Long-Term Surveillance Plan (LTSP).

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2.0 Site Inspection Reports

Title I disposal sites are included under the general license of 10 CFR 40.27 when remedial action is completed and NRC accepts the site-specific LTSP. The LTSP describes the DOE's surveillance (or inspection), monitoring, and maintenance program at the site. The DOE's Long-Term Surveillance and Maintenance (LTSM) Program conducts inspections, monitoring, and maintenance in accordance with the LTSP and procedures established by the DOE-Grand Junction Office (GJO) to comply with 10 CFR 40.27.

The purpose of the annual inspection is to confirm the integrity of visible features at the site, to identify changes or new conditions that may affect site integrity, and to determine the need, if any, for maintenance or follow-up inspections and monitoring. Ground-water monitoring is conducted at both sites as a best management practice.

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3.0 Burrell Title I Vicinity Property Disposal Site Blairsville, Pennsylvania

Summary

The Burrell site was inspected on November 19, 1997. The site was in good condition. Two persistent conditions exist: vegetation growing on the disposal cell and water seeping from along the southern edge of the disposal cell. A screening-level risk assessment is underway to evaluate the risk to human health and environment due to root intrusion into the radon barrier. The assessment will be completed in 1998. The seeps are believed to be natural drainage, not dewatering of the disposal cell, and will continue to be monitored as part of the annual groundwater monitoring program. DOE is considering improving the drainage on the north (upgradient) site of the disposal cell to see if flow from the seeps can be reduced. No cause for follow-up inspections was identified.

3.1 Site Access and Specific Site Surveillance Features

The site was inspected by the LTSM Program on November 19, 1997. The site was determined to be in excellent condition. In the descriptions that follow, photographs included in the report are referred to by photograph location (PL) number. The prefix for the site (i.e., BUR for Burrell) appears before the PL number. Site features are shown in Figure 3-1.

The site access gate at Strangford Road and chain-link fencing on both sides of the gate are in excellent condition (BUR PL-1). The gate is secured by chain and padlocks. Although this is a DOE gate on DOE property, there are both DOE and ConRail padlocks on the chain. Farther down Strangford Road, ConRail has placed a pole gate across an informal dirt road that parallels the railroad tracks. It appears that ConRail has taken steps to limit public access along the tracks and to stop illegal dumping along the railroad tracks to the west.

ConRail has attached a "no trespassing" sign to DOE's access gate (BUR PL-2). A DOE entrance (warning) sign will be posted on this gate on or before the next site inspection.

The site access road is in good condition. The road leads from the access gate at Strangford Road southwest across DOE property (Tract 201-E) to DOE's right-of-way across ConRail's tracks. From the tracks, the road continues to the entrance gate and is hard-packed. However, a number of long, deep ruts are in the road north of the rail road tracks. The road is passable to passenger cars, but care should be exercised when rain or snowmelt has turned the ruts into puddles.

The security fence and gates at the site are in good condition. Some sections of the fence are beginning to rust. The fence is 12 years old and is thought to have a life expectancy of 20-to-25 years. (See the section "Site Perimeter Transect" below.)

Although the LTSP states there are two site markers, there is only one. This one marker, SMK-1, is near the entrance gate and is in excellent condition. The second site marker, intended for the crest of the disposal cell, was never installed. Reference to the second site marker in the LTSP will be deleted when the LTSP is revised.

There are three survey monuments (SM) and seven boundary monuments (BM) at this site. An attempt to locate BM-1 on the extreme west end of the site was not successful. The area is heavily wooded, and silt and debris from a recent high stand of the Conemaugh River may cover the monument. Boundary monuments BM-2 through BM-7, located along the north fence line, were also difficult to find due to thick vegetation. Before these monuments become permanently obscured, DOE will consider establishment of a "witness" post, such as a t-post, by each monument so they can easily be found.

Four pairs of erosion control markers (ECM-1 and 2, ECM-3 and 4, ECM-5 and 6, and ECM-7 and 8) were inspected and are in excellent condition. No evidence of erosion or slope instability at any ECM pair was found.

Five pairs of monitor wells were inspected. All were in good condition. Vegetation along a track to each pair of monitor wells is cut each summer so that samplers can drive their sampling vehicle to each well head. (For results of ground-water monitoring, see Section 3.3 below.)

3.2 Areal Features

The overall, or areal, condition of the site was inspected by dividing the site into four specific areas (transects) and inspecting each in turn. The four transects are: (1) the disposal cell itself, (2) the area adjacent to the disposal cell, (3) the site perimeter, and (4) outlying areas.

3.2.1 Disposal Cell Transect

Riprap on the disposal cell is in good condition. However, trees and large shrubs continue to grow on the top and all side slopes of the disposal cell (BUR PL-3). Several attempts have been made to control this vegetation by cutting and spraying. The last such attempt, spraying, was in August 1997. These attempts have not been completely or permanently successful. The vegetation, given abundant rainfall, is aggressive and quickly grows back.

A biointrusion study, begun in 1996, concluded that abundant, deep-rooted Japanese knotweed has increased the hydraulic conductivity of the radon barrier in the root zone of these plants by 3-to-4 orders of magnitude. A screening-level risk assessment, part of the biointrusion study, is currently underway to determine if the increase in water infiltration and possible contaminant leaching will have a measurable effect on human health or the environment. The risk assessment will be completed in 1998. Efforts to control vegetation on the disposal cell will continue pending results of the risk assessment.

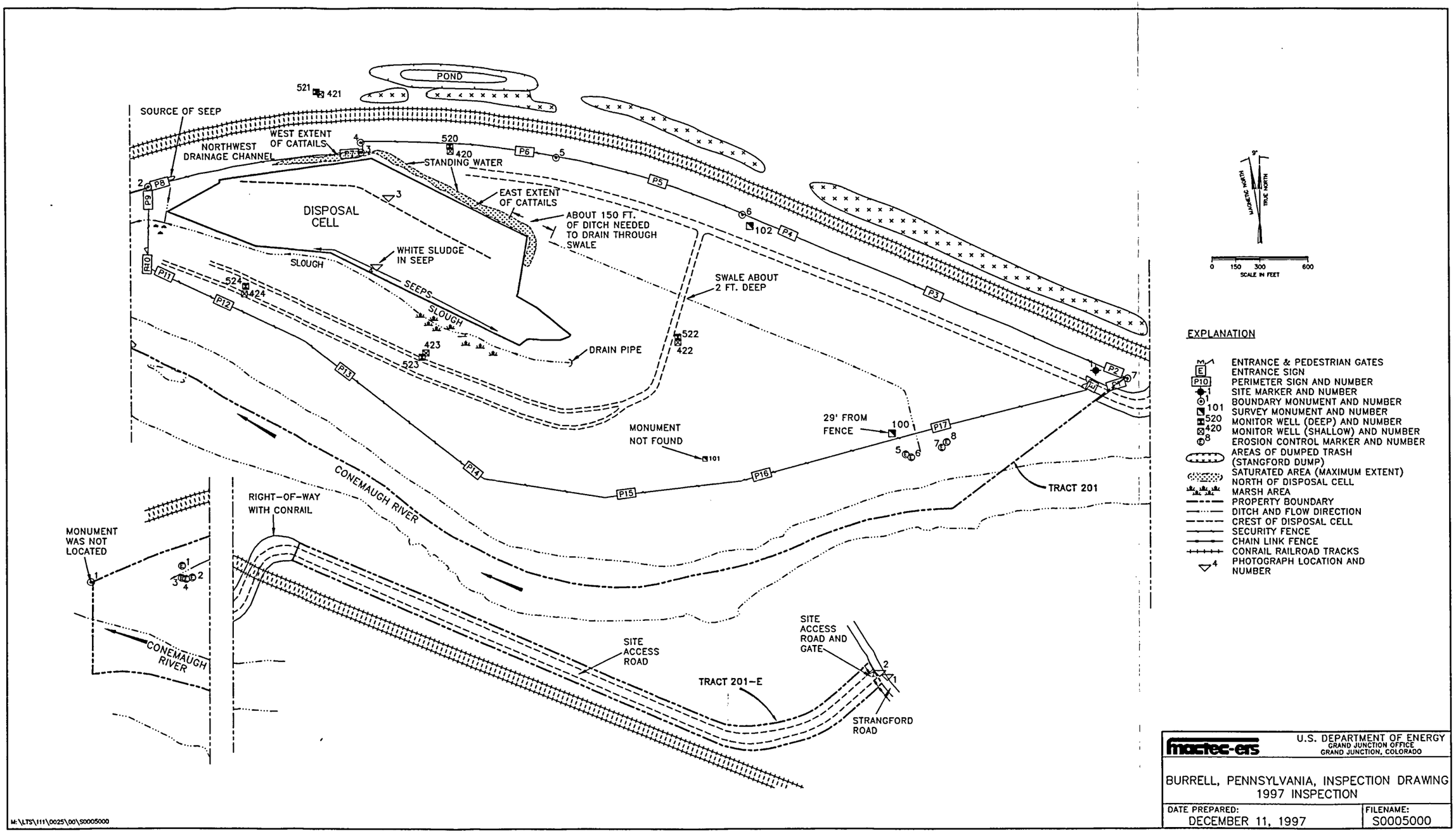

POND
SOURCE OF SEEP
NORTHWEST DRAINAGE CHANNEL
WEST EXTENT OF CATTAILS
STANDING WATER
EAST EXTENT OF CATTAILS
ABOUT 150 FT. OF DITCH NEEDED TO DRAIN THROUGH SWALE
DISPOSAL CELL
WHITE SLUDGE IN SEEP
SLOUGH
SEEPS
SLOUGH
DRAIN PIPE
SWALE ABOUT 2 FT. DEEP
MONUMENT NOT FOUND
29' FROM FENCE
CONEMAUGH RIVER
TRACT 201
RIGHT-OF-WAY WITH CONRAIL
MONUMENT WAS NOT LOCATED
CONEMAUGH RIVER
SITE ACCESS ROAD
SITE ACCESS ROAD AND GATE
TRACT 201-E
STRANGFORD ROAD
P1
P2
P3
P4
P5
P6
P7
P8
P9
P10
P11
P12
P13
P14
P15
P16
P17
521
421
520
420
524
424
423
523
522
422
102
101
100
9°
MAGNETIC NORTH
TRUE NORTH
0 150 300 600
SCALE IN FEET
EXPLANATION
ENTRANCE & PEDESTRIAN GATES
ENTRANCE SIGN
PERIMETER SIGN AND NUMBER
SITE MARKER AND NUMBER
BOUNDARY MONUMENT AND NUMBER
SURVEY MONUMENT AND NUMBER
MONITOR WELL (DEEP) AND NUMBER
MONITOR WELL (SHALLOW) AND NUMBER
EROSION CONTROL MARKER AND NUMBER
AREAS OF DUMPED TRASH (STANGFORD DUMP)
SATURATED AREA (MAXIMUM EXTENT)
NORTH OF DISPOSAL CELL
MARSH AREA
PROPERTY BOUNDARY
DITCH AND FLOW DIRECTION
CREST OF DISPOSAL CELL
SECURITY FENCE
CHAIN LINK FENCE
CONRAIL RAILROAD TRACKS
PHOTOGRAPH LOCATION AND NUMBER
M:\LTS\111\0025\00\S0005000
macTec-ers
U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION OFFICE
GRAND JUNCTION, COLORADO
BURRELL, PENNSYLVANIA, INSPECTION DRAWING
1997 INSPECTION
DATE PREPARED:
DECEMBER 11, 1997
FILENAME:
S0005000

Figure 3-1

Seeps along the base of the south side slope were inspected. Several were flowing, and the bottom of each rivulet was coated with a white organic (algal?) sludge (BUR PL-4). Similar white, sludge-like material was found at the seeps coming from under the railroad embankment west of the disposal cell. (See the section "Site Perimeter Transect" below.) These seeps are a possible concern because they may eventually destabilize the south side slope of the disposal cell. DOE will consider improving the drainage on the north (upgradient) side of the disposal cell to see if flow from the seeps can be reduced. (See Section 3.2.2.) Seeps are sampled annually as part of the ground-water monitoring requirement. (See Section 3.3.)

3.2.2 Area Adjacent to Disposal Cell Transect

Along the base of the north side slope of the disposal cell is a long, narrow depression that often holds water. Standing water in this area is objectionable because it may be supplying the seeps along the south side of the disposal cell. According to the construction design, this area was supposed to drain to the east, into a swale east of the disposal cell, and then off-site into the Conemaugh River. Final grading, however, left an area of high ground that prevents the area from draining. This problem can be corrected by digging a ditch through the high ground. The ditch will be approximately 1-to-1.5 feet (ft) deep, 2 ft wide, and 150 ft long. This work is planned for 1998. (The U.S. Army Corps of Engineers has determined that the area is not a wetland under Section 404 of the Clean Water Act.)

3.2.3 Site Perimeter Transect

This transect comprises the security fence and the bank along the Conemaugh River.

The condition of the security fence, the entrance gate, and the pedestrian gate at the west end of the site is generally good. Vandalism has been a problem in the past, but no vandalism of signs or fence was observed during this inspection. As mentioned above, parts of the fence are beginning to rust.

The fence, where it passes through thickly wooded areas along the southern edge of the site, is subject to damage by tree limbs falling on the fence and by growth of trees through the fence fabric. Thick vegetation also makes inspection of the fence difficult. To maintain site security and extend the life of the fence, trees and shrubs will be removed periodically along the fence for a distance of 5 to 6 ft outward from the fence wherever terrain permits. Vegetation was cleared along the fence line in August 1996 and will likely need to be repeated in 1999 or 2000.

The seep along the security fence, about 60 ft east of perimeter sign P8 (just west of the disposal cell), was flowing from several sources along the fence below the railroad embankment. The bottom of the seeps contained a white sludge similar to that observed in the seeps along the south side of the disposal cell. Seeps in this area will continue to be monitored to ensure that the security fence and the railroad embankment outside the fence remain stable.

An area up to 200 ft wide between the southern fence line and the north bank of the Conemaugh River in included in this transect. The river bank, an old terrace, is about 50 ft high and heavily

wooded with trees and thick understory (primarily Japanese knotweed). The river bank appears stable and is not eroding.

3.2.4 Outlying Areas

The area beyond the site boundary, out for a distance of 0.25 miles, was examined for signs of erosion, development, or other change that might affect the site. Features of concern are north of the site and include the Strangford dump north of the ConRail tracks and a deep depression partly filled with water in the west part of the dump area. This depression holds water all year long.

A dirt road runs along the north side of the ConRail tracks. This road provides DOE with access to a pair of monitor wells, MW-421 and MW-521. It also provides access to a long, narrow wooded area along the railroad tracks that the public has used as an illegal dump. Although refuse has not been removed, it appears that dumping has been halted because the DOE's access gate and ConRail's pole gate at Strangford Road now prevent access by the legally challenged. The dump is about 200 ft upgradient from the disposal cell. DOE's concern is that contaminants from the dump may eventually be detected in samples from DOE monitor wells that are between the dump and the disposal cell. The dump area will continue to be monitored.

3.3 Ground-Water Monitoring

The Burrell site was completed in 1987. EPA-proposed standards for ground-water protection at mill-tailings sites went into effect 8 years later, in January 1995. Therefore, the design of the Burrell disposal cell was grandfathered from compliance with the EPA standards, and there are, in the strictest sense, no point-of-compliance (POC) wells at the site. Nevertheless, LTSM uses the Maximum Concentration Levels (MCLs) in the EPA standards as a benchmark for evaluating the quality of water at the Burrell site.

The LTSP requires the sampling of 10 monitor wells. The 10 wells are in 5 pairs; each pair consists of a shallow well, completed in unconsolidated materials (fill and alluvium), and a deeper, bedrock well completed in the Casselman Formation.

In addition to the monitor wells, seeps along the bottom of the south side slope of the disposal cell are also sampled. Flow from the seeps is variable, but two to three of the seeps are usually flowing sufficiently to provide a sample.

The site was licensed in January 1996. The LTSM Program assumed responsibility for sampling at that time. LTSM sampled the monitoring network twice, on December 4, 1996, and again on November 14, 1997.

Location of all sampling points mentioned in this report is shown in Figure 3-1.

3.3.1 Sampling Results

Results of ground-water monitoring, summarized below, are maintained in the UMTRA Ground-Water Project data base at the GJP.

The LTSP specifies seven analytes that have MCLs as specified by EPA ground-water protection standards. Table 3-1 lists these analytes, their corresponding MCL, and recent analytical results. The table summarizes the range of values over the last 5 years in the third column and gives results for 1996 and 1997 in the last two columns. (The LTSM Program sampled the site in 1996 and 1997. The site was not sampled in 1994 or 1995.)

3.3.2 Discussion

Since ground water at the site, according to MCL standards, is uncontaminated, continuation of sampling on an annual basis is no longer justified. DOE will submit a request for a page-change revision to the LTSP. The revision, which will be submitted to NRC for approval in 1998, will decrease the frequency of sampling from once a year to once every five years. The revision will also reduce the number of analytes to standard field parameters, uranium, and molybdenum.

Table 3-1. Analytes with Maximum Concentration Limits (MCLs) for Ground Water at Burrell[a]

Analyte	MCL	Five-Year Range 1993-1997	1996	1997
Gross Alpha	15 pCi/L	Wells: U - 8.7 Seeps: U - 7.04	Wells: U Seeps: U	Wells: U Seeps: 4.26 - 7.04
Lead	0.05 mg/L	Wells: U - 0.001 Seeps: U - 0.017	Wells: U - 0.001 Seeps: U	Wells: U - 0.001 Seeps: U
Molybdenum	0.1 mg/L	Wells: U - 0.027 Seeps: U - 0.017	Wells: U - 0.019 Seeps: 0.021 - 0.024	Wells: U - 0.027 Seeps: 0.012 - 0.017
Nitrate	44 mg/L	Wells: U - 0.096 Seeps: U - 0.102	Wells: U - 0.168 Seeps: 0.017 - 0.088	Wells: 0.052 - 0.096 Seeps: 0.078 - 0.102
Radium 226 & 228	5 pCi/L	Wells: 0.0 - 4.65 Seeps: 0.1 - 1.2	Wells: 0.13 - 4.65 Seeps: 0.30 - 0.34	Wells: 0.03 - 0.25 Seeps: 0.16 - 0.19
Selenium	0.01mg/L	Wells: U - 0.001 Seeps: U	Wells: U - <0.001 Seeps: U	Wells: U - 0.001 Seeps: U
Uranium	0.044 mg/L	Wells: U - 0.008 Seeps U - 0.002	Wells: U - 0.002 Seeps: 0.001 - 0.002	Wells: U - 0.008 Seeps: 0.001 - 0.002

[a]U = less than detection limit. Values for Rd-228 under the detection limit are not included in the total.

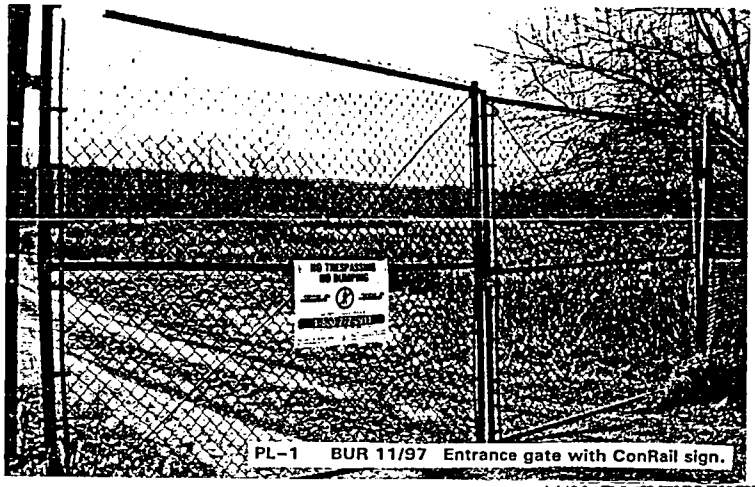
3.4 Conclusion

The Burrell disposal site is in excellent condition. The primary concern is the vegetation on the disposal cell and its long-term effect on the integrity and performance of the radon barrier. This concern is being addressed by a risk assessment that will be completed this year (1998). Other concerns include dense vegetation along the security fence and trash remaining at the Strangford dump that may eventually contaminate ground water at the site.

3.5 Photograph Log and Photographs

Table 3-2. Photograph Descriptions for Burrell Site

Photograph Number	Description of Photographs
BUR PL-1	Entrance gate with ConRail sign.
BUR PL-2	Close up of ConRail sign on entrance gate.
BUR PL-3	Trees and vegetation on disposal cell.
BUR PL-4	Seep on south side of disposal cell.



PL–1 BUR 11/97 Entrance gate with ConRail sign.

PL–2 BUR 11/97 Close up of ConRail sign on entrance gate.

PL–4 BUR 11/97 Seep on south side of disposal cell.

PL–3 BUR 11/97 Trees and vegetation on disposal cell.

4.0 Canonsburg Title I Disposal Site Canonsburg, Pennsylvania

Summary

The Canonsburg site was inspected on November 18, 1997. The site was in excellent condition, although there are several maintenance concerns. Deadfalls along the security fence will be removed in summer 1998, and the fence will be repaired where necessary. DOE is considering relocation of part of the security fence to avoid vegetation encroachment problems. Vegetation continues to grow in runoff diversion channels and will have to be controlled again, probably in 1999. Gully erosion below the confluence of two runoff diversion channels appears to be a safety hazard. DOE will improve this drainage to improve safety. DOE is negotiating with the U.S. Army Corps of Engineers for a bank stabilization plan to prevent erosion along Chartiers Creek. Uranium concentration in three monitor wells continues above the Maximum Concentration Level established for UMTRCA mill tailings disposal sites. Although the two-year ground-water monitoring requirement at this site has been met, DOE will continue annual monitoring of ground water, at a reduced scale, because of the elevated uranium in some wells. Annual monitoring will continue, as a best management practice, until the UMTRA Ground-Water Project's application for ACLs is submitted and approved by NRC. Excess monitor wells will eventually be abandoned. No need for follow-up inspections was identified.

4.1 Specific Site Surveillance Features

The site was inspected by the LTSM Program inspectors on November 18, 1997. The site was determined to be in excellent condition. In the descriptions that follow, photographs included in the report are referred to by photograph location (PL) number. The prefix for the site (i.e., CAN for Canonsburg) appears before the PL number. Site features are shown in Figure 4-1.

The entrance gate, entrance sign, and the auxiliary gate on the north side of the site are in good condition. Padlocks on gates and monitor wells are corroded due to the humid climate. In the future, inspectors and ground-water sampling personnel should be prepared to break inoperable locks and replace them with new locks.

The two site markers, the three survey monuments, and the four boundary monuments were likewise in good condition. (Not all monuments were physically examined because they are in areas of dense grass or other vegetation. In these cases, inspectors examined the immediate area around each monument for signs of disturbance. None were found.)

All four pairs of erosion control markers (ECMs) were undisturbed with one exception: ECM-4A, which was near the edge of the bank along Chartiers Creek at the time of the 1996 inspection, is now lost where the bank has slumped into the creek. (See section on "Bank Stabilization.") ECM-4A does not need to be replaced. The other marker in the pair, ECM-4, can be used for reference.

There are six monitor wells in the LTSM Program monitoring network and one additional well that is sampled for the UMTRA Ground-Water Project. Each monitor well is secured with a cap-and-pin locking system and a standard padlock. In general, the steel casings, concrete collars, caps, and pins, of all wells were in good condition. Padlocks are corroding and will have to replaced from time to time. The concrete collar and surface casing for MW-412 are leaning in the down-slope direction (CAN PL-1). Ground-water monitoring personnel advise that slightly displaced collars are not a serious problem at this site because the casing farther down the borehole is securely grouted to provide a seal against contamination from surface runoff. Replacement of the collar at MW-412 is not required.

Annual monitoring will continue, as a best management practice, until the UMTRA Ground-Water Project's application for ACLs is submitted and approved by NRC.

There were, at one time, 24 monitor wells at the site. As stated above, seven of these wells are in active monitoring networks. The remaining wells, 17 in number, are no longer in use and will be properly abandoned after the UMTRA Ground Water Project's application for ACLs is submitted and approved by NRC. Of these 17 wells, several may have already been abandoned. The count of remaining wells needs to be confirmed. Before proceeding to abandon unused wells, all well sites will be visited to obtain an accurate count of those that have been abandoned and those that have not.

For results of ground-water monitoring, see Section 4.3, below.

4.2 Areal Features

The overall, or areal, condition of the site was inspected by dividing the site into five specific areas (transects) and inspecting each in turn. The five transects are: the disposal cell, grassed areas surrounding the disposal cell, diversion channels and perimeter ditches, the security fence and site perimeter, and outlying areas.

4.2.1 Disposal Cell

The disposal cell itself is in excellent condition. There is no evidence of erosion, slope instability, animal burrowing, or other disturbance.

4.2.2 Grassed Areas Surrounding the Disposal Cell

Thick grass covers the disposal cell and open areas surrounding the disposal cell. Grass extends beyond the security fence on the north as far as the southern bank of Chartiers Creek. The grass is mowed and mulched each summer and is in excellent condition.

There are several groves of brush and large trees in this transect. In August, 1996, dead trees and branches were removed from these groves. The entire area inside the fence is now park-like and appears well kept. Dead trees and branches may have to be removed from these groves periodically, but this will not be necessary in 1998.

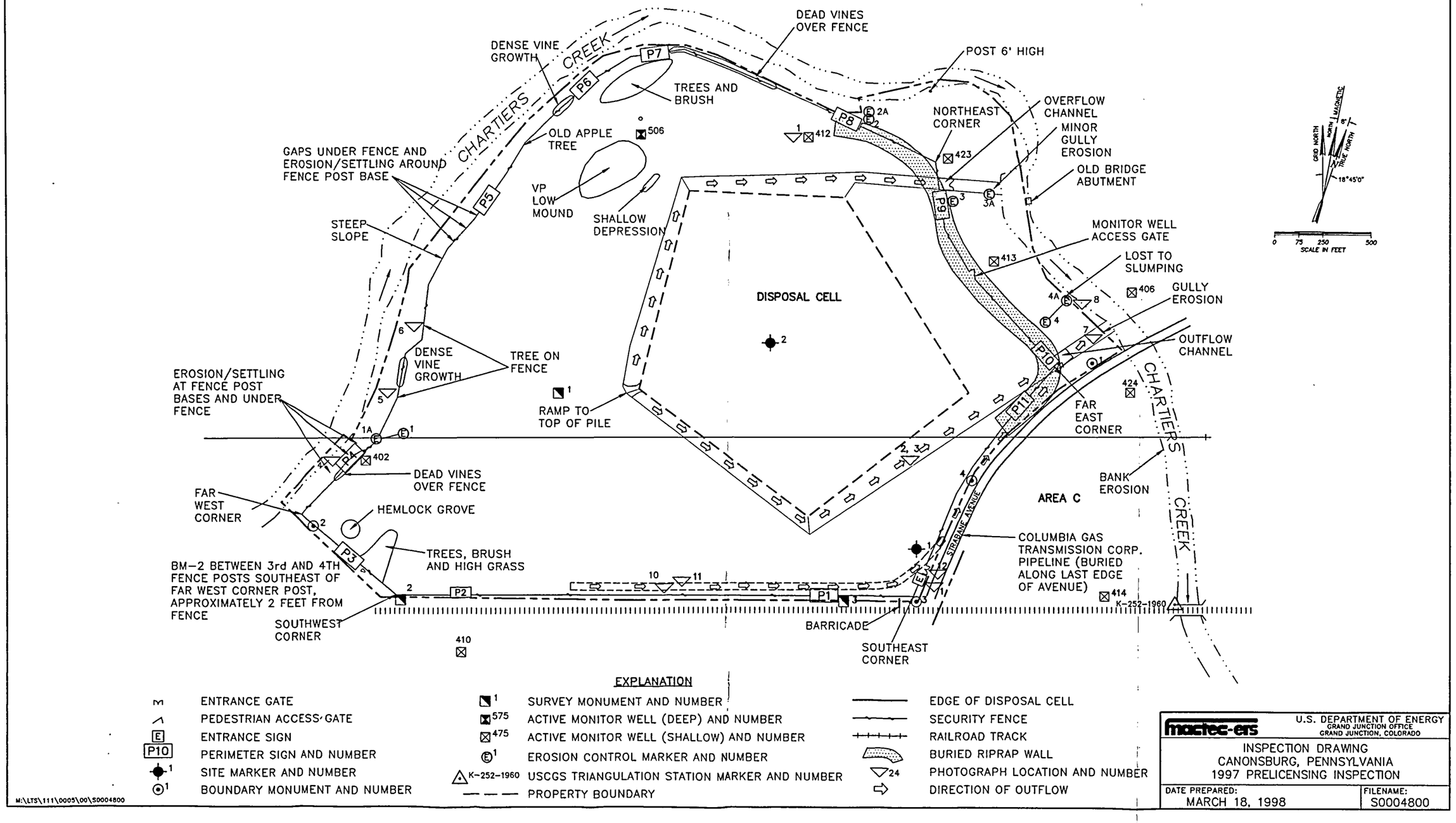

DEAD VINES OVER FENCE
DENSE VINE GROWTH
CREEK
CHARTIERS
P7
P6
TREES AND BRUSH
POST 6' HIGH
P8
2A
NORTHEAST CORNER
OVERFLOW CHANNEL
MINOR GULLY EROSION
OLD APPLE TREE
506
412
GAPS UNDER FENCE AND EROSION/SETTLING AROUND FENCE POST BASE
OLD BRIDGE ABUTMENT
423
P5
VP
LOW
MOUND
SHALLOW DEPRESSION
P9
3
3A
STEEP SLOPE
MONITOR WELL ACCESS GATE
413
LOST TO SLUMPING
DISPOSAL CELL
406
GULLY EROSION
4A
8
4
7
6
DENSE VINE GROWTH
TREE ON FENCE
P10
OUTFLOW CHANNEL
EROSION/SETTLING AT FENCE POST BASES AND UNDER FENCE
2
1
RAMP TO TOP OF PILE
5
1A
1
424
FAR EAST CORNER
CHARTIERS
P11
402
P4
DEAD VINES OVER FENCE
BANK EROSION
AREA C
FAR WEST CORNER
HEMLOCK GROVE
4
STRABANE AVENUE
COLUMBIA GAS TRANSMISSION CORP. PIPELINE (BURIED ALONG LAST EDGE OF AVENUE)
2
P3
TREES, BRUSH AND HIGH GRASS
1
12
CREEK
BM-2 BETWEEN 3rd AND 4th FENCE POSTS SOUTHEAST OF FAR WEST CORNER POST, APPROXIMATELY 2 FEET FROM FENCE
10
11
P2
P1
414
K-252-1960
3
BARRICADE
SOUTHWEST CORNER
SOUTHEAST CORNER
410
GRID NORTH
MAGNETIC NORTH
6°
TRUE NORTH
18°45'0"
0
75
250
500
SCALE IN FEET
EXPLANATION
ENTRANCE GATE
PEDESTRIAN ACCESS GATE
ENTRANCE SIGN
PERIMETER SIGN AND NUMBER
SITE MARKER AND NUMBER
BOUNDARY MONUMENT AND NUMBER
SURVEY MONUMENT AND NUMBER
ACTIVE MONITOR WELL (DEEP) AND NUMBER
ACTIVE MONITOR WELL (SHALLOW) AND NUMBER
EROSION CONTROL MARKER AND NUMBER
USCGS TRIANGULATION STATION MARKER AND NUMBER
PROPERTY BOUNDARY
EDGE OF DISPOSAL CELL
SECURITY FENCE
RAILROAD TRACK
BURIED RIPRAP WALL
PHOTOGRAPH LOCATION AND NUMBER
DIRECTION OF OUTFLOW
M:\LTS\111\0005\00\S0004800
mactec-ers
U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION OFFICE
GRAND JUNCTION, COLORADO
INSPECTION DRAWING
CANONSBURG, PENNSYLVANIA
1997 PRELICENSING INSPECTION
DATE PREPARED:
MARCH 18, 1998
FILENAME:
S0004800

Figure 4-1

4.2.3 Diversion Channels and Perimeter Ditches

The rock in the diversion channels that surround the disposal cell is in excellent condition. Vegetation, however, continues to encroach in all of these channels (CAN PL-2). Encroachment includes shrubs, deciduous trees, and grasses.

Trees and woody bushes growing in the diversion channels are difficult to control. When cut down by hand, many of the plants, both trees and bushes, quickly re-sprout from the base of the cut stump (CAN PL-3). Some combination of cutting and treatment with herbicide may have to be employed. Even this is unlikely to be 100 percent efficient. A soil sterilant can not be used because the channels drain into the creek.

Vegetation was cut and cleared from the channels and ditches in July 1994, and again in August 1996. If the channels are to be maintained in their as-built or vegetation-free condition, they need to be cleared again and perhaps every 2 to 3 years thereafter. The concern, or perception, is that encroaching vegetation may interfere with the ability of these channels to divert runoff during heavy storms. However, the cost and labor to keep vegetation out of these channels will, over time, be considerable and perhaps prohibitive. Intervention on an every 2-to-3-year-basis for the next 200 to 1,000 years is neither realistic nor practical. Options need to be considered. An engineering evaluation of the long-term effect of encroaching vegetation in these channels may be undertaken to see if the long-term effect of uncontrolled growth will unacceptably impair the performance of the diversion channels.

4.2.4 Security Fence and Perimeter Areas

The security fence is in excellent condition except for two concerns: stability of fence posts and vegetation that interferes with the fence. From the far western corner of the site, north along the top of the bank above the creek, to about the position of perimeter sign, P5, the concrete "boot" at the bottom of several fence posts is exposed (CAN PL-4) . Inspectors have been watching this potential problem since the site was first inspected in 1990. So far, all of the posts are still very firmly in place despite exposure of the concrete.

Cause of the problem seems to be settlement of soil around the posts. There is no sign of erosion, slumping, or other movement of soil away from the posts. It is likely that the soil along the edge of the bank above the creek was not compacted after final grading, and that this soil has subsequently settled to expose the concrete at the base of some of the posts.

If the fence posts ever loosen, they will have to be replaced. At such time, relocation of the fence to some reasonable setback from the edge of the bank will be considered. Sufficient setback will allow a tractor with mower to mow a swath along the outside the fence. Mowing along the outside of the fence would be an inexpensive and effective way to control trees and bushes along the fence line.

The bank along Chartiers Creek from the far western corner of the site to about the location of ECM-2 and ECM-2A is heavily forested up. The biomass is considerable, and the forest is old

enough that dying trees and branches are commonplace. Deadfalls continually batter the fence. Truckloads of material were removed from along the fence line in 1996, and new deadfalls were discovered during this year's inspection (CAN PL-5 and CAN PL-6). These will be removed. If the fence beneath the deadfalls is damaged, so as to compromise security, the fence will be repaired. As stated above, relocation of the fence may be the most inexpensive and effective, long-term solution to the problem. (The security fence is 12 years old and is believed to have a 20-to-25 year lifetime.)

At the northeast corner of the site, the northeast outflow channel and the eastern perimeter ditch, both armored with riprap, converge to form one spillway. This spillway is only armored for a short distance below the confluence of the channel and ditch. Runoff, after leaving the armored spillway, flows across a grassed area and into Chartiers Creek; and has eroded a gully 8 to 10 ft deep (CAN PL-7). The mouth of the eroded gully is at creek level.

Bedrock of the Casselman Formation is exposed in part of the gully, but elsewhere the bottom of the gully is clayey and slippery when wet. The gully is not a threat to the disposal cell or to as-built structures on the site because there is a buried erosion control structure along the fence line that will stop headcutting should it advance that far. The gully is, however, outside the security fence and close to Strabane Avenue. DOE, therefore, considers the gully to be a safety hazard. DOE will address the problem in 1998.

4.2.5 Bank Stabilization

The LTSP for this site calls for the DOE to enter into agreement with the U.S. Army Corps of Engineers (COE) to develop a plan for bank stabilization along the south side of Chartiers Creek. On the occasion of this year's annual inspection, the stream bank along the south side of the creek was carefully inspected for evidence of erosion or susceptibility to erosion, especially erosion that might accompany high water, such as a 100-year or rarer flood event.

From the west end of the site, including the bank upstream (to the west) of the site, downstream to ECM-2 and 2A, there is no sign of erosion whatsoever. The bank is heavily forested and apparently very stable and erosion resistant. Water-deposited debris indicates former high stands of water in the creek, but there is no evidence of bank erosion, past or recent.

Downstream from ECM-2 and 2A, and to the east along Area C, the bank is grassed. Changes along this portion of the bank were noted. As stated above, ECM-4A is lost where the bank has slumped into the creek (CAN PL-8). Erosion and loss of bank are not a concern at this location because it is beyond a buried erosion control barrier situated between the disposal cell and the creek. Continued, small-scale slumping of the bank at Area C, where the bank is likewise grassed, was also noted. Erosion here is minor, and most likely only a natural response to an over-steeped bank condition resulting form final grading during the course of remedial action.

Although bank erosion along Chartiers Creek is not an imminent risk to the disposal site, DOE will proceed to work with the COE to develop a bank stabilization design that can be implemented should stability of the bank ever become threatened.

4.2.6 Outlying Areas

No recent developments or changes in land use within 0.25 miles of the site were observed.

Trees growing beneath telephone wires along Strabane Avenue, mentioned in previous reports, were removed by DOE in August 1996. The shoulder along the avenue now looks well cared for.

4.2.7 Area C

Area C is a triangular, grass-covered, vacant property across Strabane Avenue to the east (Figure 4-1). It is bounded by Strabane Avenue, Chartiers Creek, and the railroad. Area C is understood to be owned by the state. (In 1998, DOE will confirm that Area C was subdivided from the disposal site and retained by the state.) DOE understands that the state eventually may give Area C to a local government or other public entity (school district). Area C is remediated except for two thorium anomalies that lie at a depth of about 8 ft. The state understands that the deed for Area C, when transferred to the community, will carry a restriction (or similar instrument) to prevent certain land uses of Area C, uses such as habitation and excavation in the area.

Area C is in good condition. DOE still cuts the grass once a year in Area C, as a courtesy to the state. DOE also has three monitor wells in Area C. One well is still in use as part of the LTSM monitoring network. The other two wells are unused and eventually will be abandoned.

Minor erosion along the grassed bank of Area C is discussed above under Bank Stabilization.

4.3 Ground-Water Monitoring

The Canonsburg site was completed in 1985. EPA standards, at 40 CFR 192, for ground-water protection at mill-tailings sites went into effect 10 years later, in January 1995. Therefore, the design of the Canonsburg disposal cell was grandfathered from compliance with the EPA standards, and there are, in the strictest sense, no point-of-compliance (POC) wells at the site.

The LTSP requires, as a best management practice, the sampling of 6 monitor wells and 3 surface-water locations for 2 years following inclusion of the site under the NRC's general license. The site was licensed in January 1996. The LTSM Program sampled the ground-water monitoring network on December 4, 1996, and again on November 14, 1997 to fulfill the 2-year requirement. However, because some monitor wells continue to show uranium anomalies above the standard, as discussed below, DOE will continue to sample the monitoring network on an annual basis until the UMTRA Ground Water Project submits its Ground-Water Corrective Action Plan, or GCAP, to NRC.

The six LTSM wells are all completed in shallow, unconsolidated materials (unconfined aquifer) that underlie the disposal cell. The three surface samples are all from Chartiers Creek.

In addition to the 6 LTSM wells and 3 surface samples, one additional well, MW-506, was sampled by the UMTRA Ground-Water Project. This well is completed in the shallow bedrock in an area containing contaminated materials that were not placed in the disposal cell.

Locations of all sampling points mentioned in this report are shown in Figure 4-1.

4.3.1 Sampling Results

Results of ground-water monitoring, summarized below, are maintained in the UMTRA Ground-Water Project data base at the GJO.

The LTSP specifies monitoring for two analytes with Maximum Concentration Limits (MCLs), as specified by EPA ground-water protection standards, for two of the nine analytes: molybdenum and uranium.

The MCL for molybdenum is 0.1 mg/l. The MCL for molybdenum has never been exceeded at the six LTSM network wells since sampling began in 1986. In 1996 and 1997, molybdenum was below the detection limit in all wells and surface samples. (The detection limit for molybdenum using ICP mass spectrometry is 0.001 mg/l.)

The MCL for uranium is 0.044 mg/l. Uranium has exceeded the MCL consistently in one well since sampling began in 1986, and in one or two other wells since about 1991 (Table 4-1). Uranium in samples from Chartiers Creek has always been below the detection limit. (The detection limit for uranium using ICP mass spectrometry is generally less than 0.001 mg/l.)

Table 4-1. Analytes With Maximum Concentration Limits (MCLs) for Ground Water at Canonsburg

Analytes Required by LTSP	MCL (mg/l)	Exceedence in CY 1995 (mg/l) Sampling by ERD-UMTRA	Exceedence in CY 1996 (mg/l) Sampling by LTSM	Exceedence in CY 1997 (mg/l) Sampling by LTSM
Molybdenum	0.1	None	None	None
Uranium	0.044	MW-412: 0.103 MW-413: 0.232 MW-414: 0.185	MW-412: 0.213 MW-413: 0.157 MW-414: None	MW-412 0.122 MW-413 0.149 MW-414 0.0814

MW-412. Uranium has been above the MCL in ground water at this well every year since 1991. The time vs. concentration plot for this wells shows a gradual increase in uranium since about 1988 (Figure 4-2). A large peak, 0.213 mg/l, well above the general trend, occurred in 1996. In 1997, the concentration dropped to 0.122 mg/l.

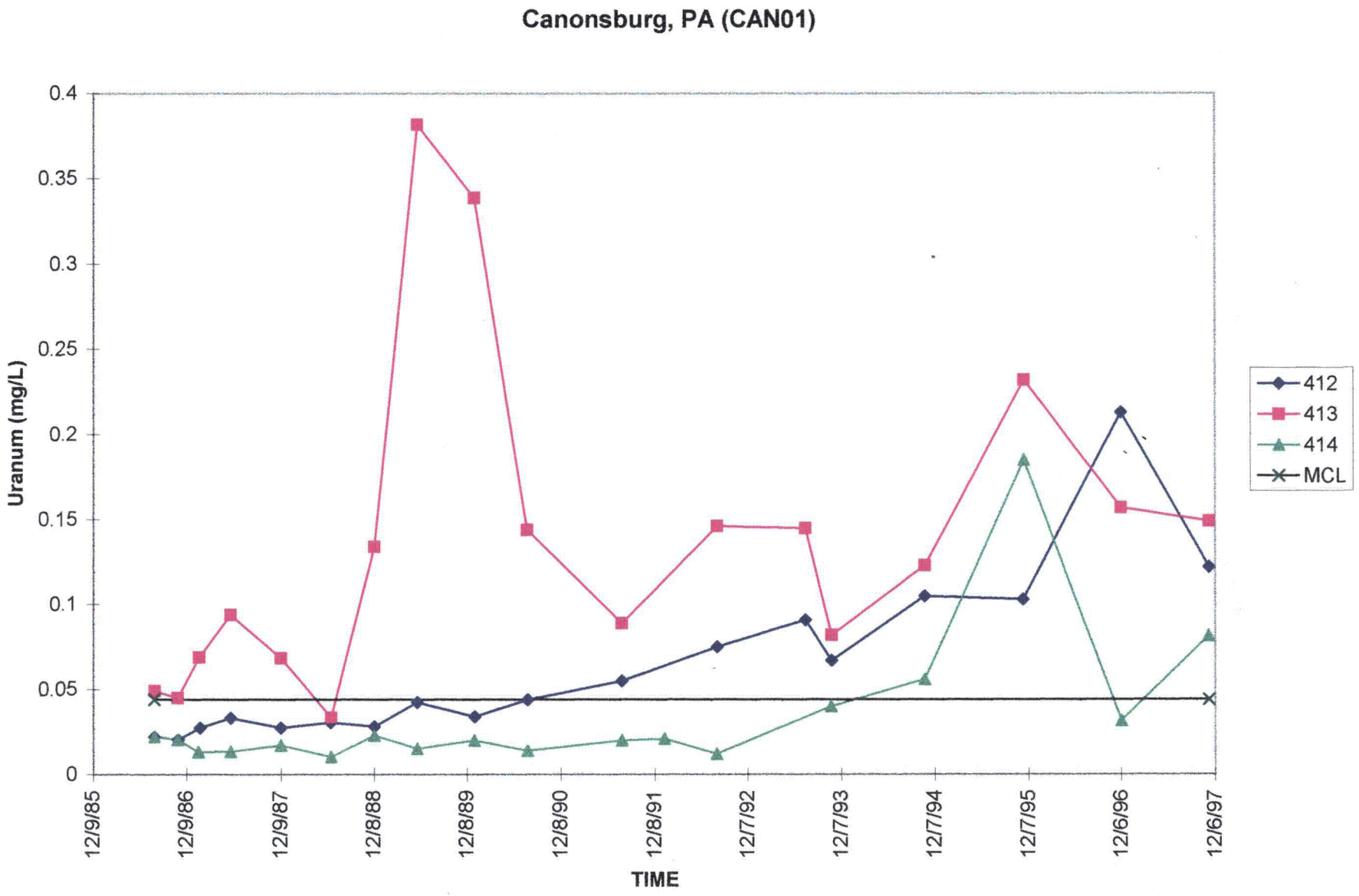

Canonsburg, PA (CAN01)
Uranum (mg/L)
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
12/9/85
12/9/86
12/9/87
12/8/88
12/8/89
12/8/90
12/8/91
12/7/92
12/7/93
12/7/94
12/7/95
12/6/96
12/6/97
TIME
412
413
414
MCL

Figure 4-2.

MW-413. Uranium at this well has exceeded the MCL, with one exception, every year since sampling began in 1986. The time vs. concentration plot is irregular with two peaks, the first during 1989-1990 and the second in 1995 (Figure 4-2). Because of these peaks and the scatter in the rest of the data, there is no apparent trend in the concentration of uranium over time in this well.

MW-414. Uranium in samples from this well was below the MCL until 1993 (Figure 4-3). In 1994, uranium rose above the MCL; and in 1995, it peaked at 0.185 mg/l. In 1996, uranium dropped below the MCL again, but rose slightly above it in 1997. Exceedences in 1994, 1995, and 1997 are significantly above the relatively flat trend established during the early sampling history of this well (prior to 1993).

UMTRA Ground-Water Project Well, MW-506. As explained above, this well is not in the LTSM monitoring network, but is sampled by the UMTRA Ground-Water Project. Molybdenum has been below the MCL (and detection limit) in this well since the first sampling in 1986. Uranium, however, has always exceeded the MCL, although there appears to be a decreasing trend to lower concentration of uranium (Figure 4-2). Uranium contamination at MW-506 is considered to be localized. Another well, MW-510, immediately downgradient from MW-506, historically has had uranium concentrations below the detection limit.

4.3.2 Discussion

Wells, MW-412 and MW-413, are located between the disposal cell and Chartiers Creek in the downgradient direction (Figure 2-4). MW-414 has also been referred to as a downgradient well, although it is located a significant distance southeast of the disposal cell, and may more properly be considered a cross-gradient well. The location of MW-412 and MW-413 along the creek suggests that uranium may be moving from the disposal cell toward the creek. However, it is equally, or perhaps more likely, that the uranium is coming from contaminated materials still in place outside the disposal cell.

The standard for remediation, also called the "cleanup standard," was based on radon, not on uranium, because radon, a uranium daughter product, poses the health hazard. Materials contaminated by uranium may have been left in place if radon concentration at that place was below the cleanup standard.

MW-414 is across the road from the disposal site, in an area designated Area C. It is likely the uranium in this well is also from uranium left in place because the radon concentration was below the cleanup standard.

Uranium in these wells is not considered a hazard to public health, safety or the environment. Nor is the creek an immediate concern. As explained above, uranium in the creek is, and always has been, below the MCL. Clearly, the creek is not contaminated by uranium.

In addition, MW-412 and MW-413 are both on-site and therefore under the institutional control of the DOE. Ground water in the vicinity of these wells is not available to the public.

MW-414 is in Area C, an area understood to be state property, as explained above. The GCAP, explained below, will address uranium contamination in the ground water in this area. It is expected that the GCAP will propose an Alternate Concentration Limit, or ACL, and institutional control for ground water in Area C. During risk assessment of ground-water contamination at the site, the UMTRA Ground-Water Project concluded that the site poses no risk because there are no credible pathways for contamination. Ground water on site and in Area C will continue to be institutionally controlled.

There will be no public access to the ground water either place. There is no agricultural use of the ground water, nor is ground water a source of potable (domestic) water. The City of Houston's water supply is upstream from the site; Canonsburg's water supply is several miles downstream for the site, and the water there is not from Chartiers Creek. Water quality in the creek is poor as a result of sewage and industrial waste.

The UMTRA Ground-Water Project is continuing to evaluate ground water at the site. A Ground-Water Corrective Action Plan (GCAP) is in preparation by the UMTRA Ground-Water Project. It is expected that the GCAP will propose Alternate Concentration Limits as the technical basis for future protection of human health and the environment. This together with deed restriction (or other instrument) for Area C will effectively isolate contaminated ground water from accidental human use or environmental exposure.

DOE will continue to monitor ground water at the site, as a best management practice. Monitoring will continue until the GCAP receives NRC approval; at which time the need for continued monitoring will be reevaluated.

During the extended period of monitoring, the number of monitor wells will be reduced to four: the three wells with elevated uranium, MW-413, MW-414, and MW-414, and the one upgradient, or background, well, MW-406. (It is expected that the UMTRA Ground-Water Project will continue to monitor MW-506 as well. Since uranium concentrations in the creek have always been vanishingly small (below detection limit in all cases), continued sampling of the creek may be of limited usefulness, but will be continued until the GCAP is completed. The analyte list will be reduced to field parameters and uranium.

4.3.3 Conclusions

The Canonsburg disposal site is in excellent condition. Issues include encroachment of vegetation, abandonment of monitor wells, stream-bank stabilization, and uranium above MCL level in three monitor wells.

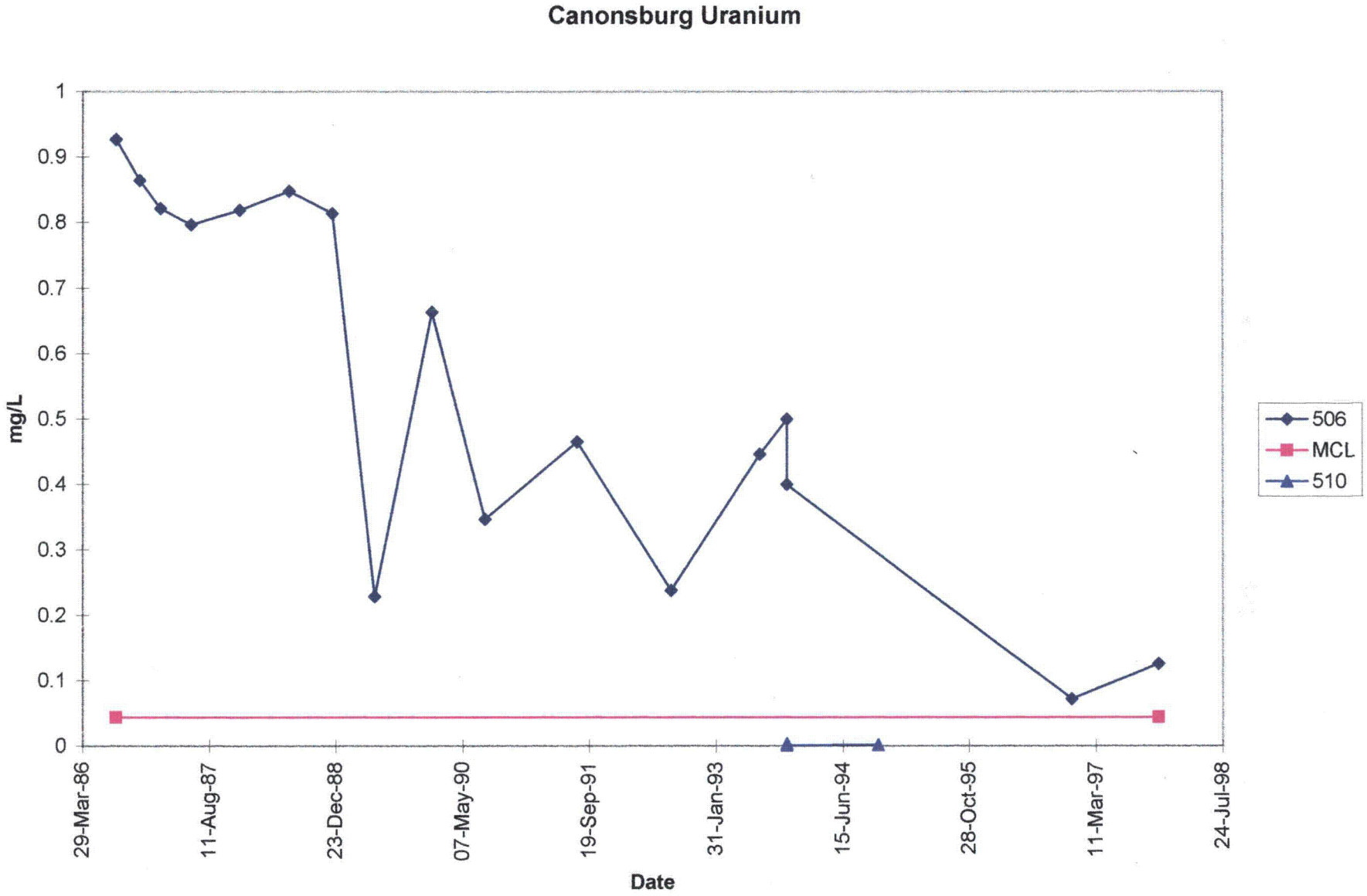

Canonsburg Uranium
mg/L
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
29-Mar-86
11-Aug-87
23-Dec-88
07-May-90
19-Sep-91
31-Jan-93
15-Jun-94
28-Oct-95
11-Mar-97
24-Jul-98
Date
506
MCL
510

Figure 4-3.

4.4 Photograph Log and Photographs

Table 4-2. Photograph Descriptions for Canonsburg Site

Photograph Number	Description of Photographs
CAN PL-1	Condition of casing and collar at MW-412
CAN PL-2	Small trees and woody bushes growing in the southeast perimeter channel.
CAN PL-3	Detail of small trees and woody bushes in southeast perimeter channel.
CAN PL-4	Concrete exposed at base of fence post, northwest fence line near perimeter sign P4. Circular object is apparently a ceramic artifact from old mill.
CAN PL-5	Tree down along northwest fence line.
CAN PL-6	Another tree down along northwest fence line.
CAN PL-7	Gully beyond northeast outflow channel.
CAN PL-8	Slumping of stream bank at former location of erosion control marker, ECM-4A. Disposal cell in background.

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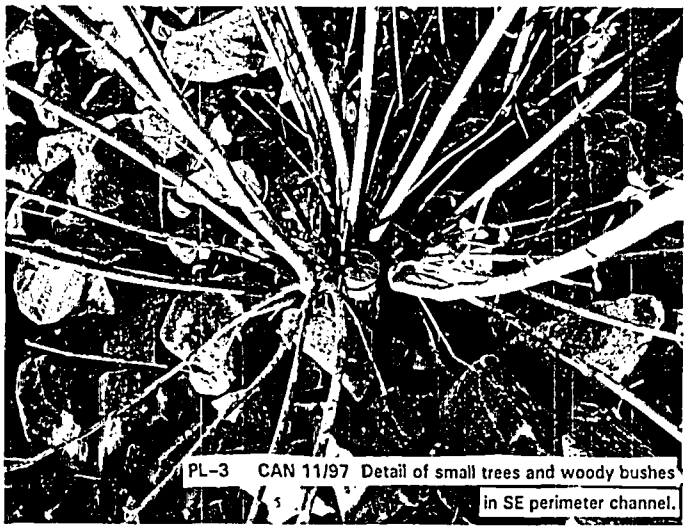
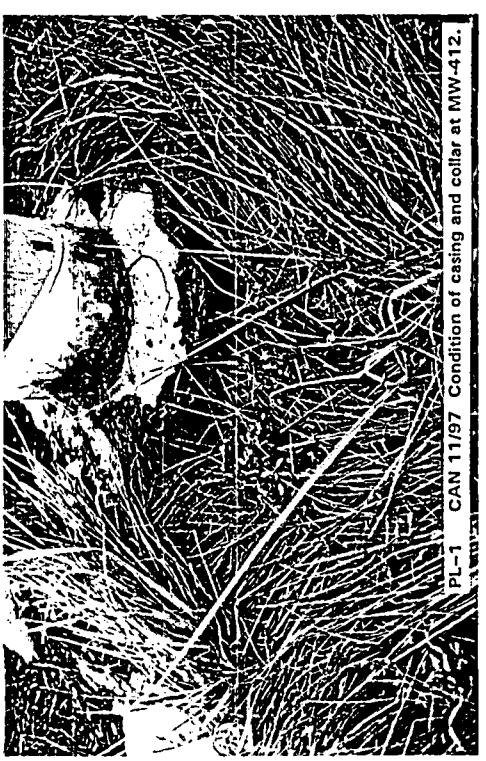
PL-2 CAN 11/97 Small trees and woody bushes growing in SE perimeter channel.

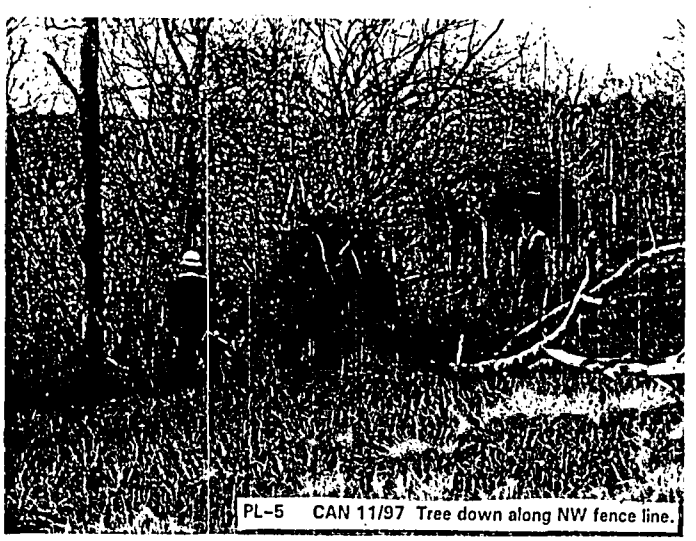


PL-3 CAN 11/97 Detail of small trees and woody bushes in SE perimeter channel.

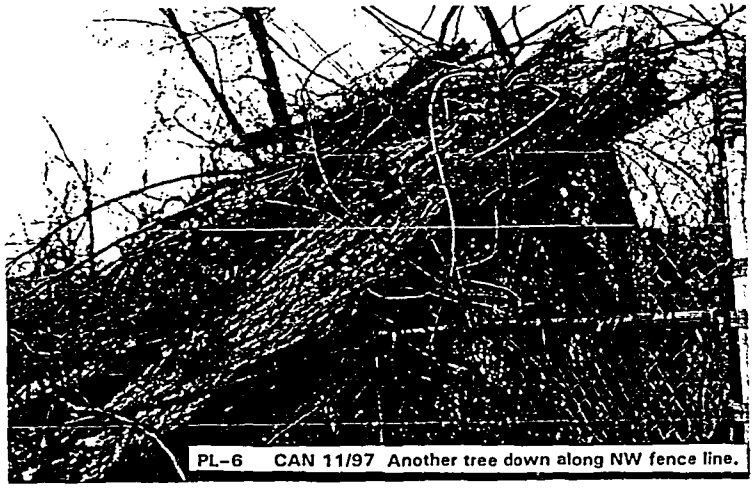
PL-4 CAN 11/97 Concrete exposed at base of fence post near P4. Circular object apparently a ceramic artifact from old mill.



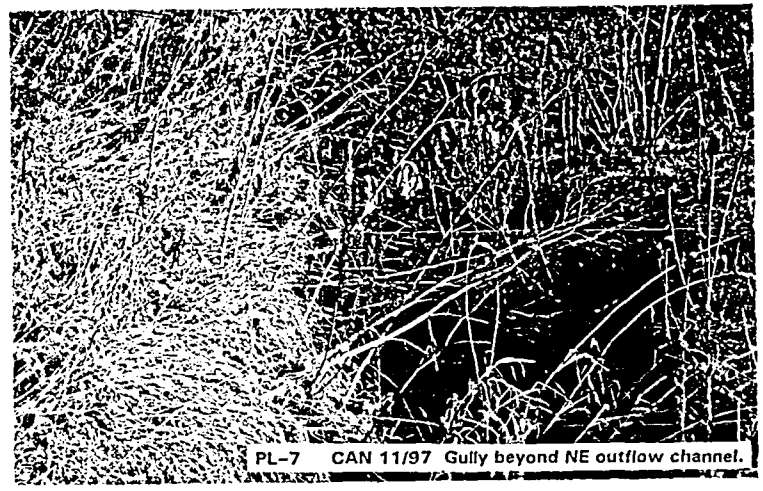
PL-1 CAN 11/97 Condition of casing and collar at MW-412.



PL-5 CAN 11/97 Tree down along NW fence line.



PL-6 CAN 11/97 Another tree down along NW fence line.



PL-7 CAN 11/97 Gully beyond NE outflow channel.

PL-8 CAN 11/97 Slumping of stream bank at former location of ECM-4A. Disposal cell in background.