Acid/Pueblo Canyon, New Mexico, Site

U.S. DEPARTMENT OF ENERGY | Legacy Management

SITE CERTIFICATION SUMMARY

This Site Certification Summary sheet provides information about the **Acid/Pueblo Canyon, New Mexico, Site**. The U.S. Department of Energy Office of Legacy Management is responsible for long-term stewardship of the site under the **Formerly Utilized Sites Remedial Action Program**.

Site Description and History

The Acid/Pueblo Canyon, New Mexico, Site, also known as Technical Area 45 (TA-45), is located on a mesa that forms the southern rim of Acid Canyon. Beginning in 1943, the Los Alamos National Laboratory (LANL) discharged untreated liquid wastes — residual from process-chemistry, radiochemistry, and general laboratory operations — into the main sewer lines, which then drained into the Acid and Pueblo canyons. From June 1951 to May 1964, the TA-45 treatment plant treated the liquid waste.

The U.S. Atomic Energy Commission (AEC) decommissioned TA-45 in late 1966 and continued decontamination work in Acid Canyon into 1967. During this time, AEC took all contaminated equipment, plumbing, and removable fixtures to solid-radioactive-waste burial areas on the LANL site. AEC demolished the treatment plant's and building's superstructures and concrete foundations and the vehicle-contamination facility's concrete slab. AEC removed and transferred all debris to the disposal areas.

By July 1967, the treatment plant site and Acid Canyon were deemed sufficiently free of contamination to be released from AEC control without restriction. Remaining residual radioactivity was confined to generally inaccessible spots and was not considered to be a health hazard. The property was then transferred to Los Alamos County. Resurveys of the site in 1976 and 1980 indicated that some near-surface contamination exceeding the remedial-action criteria remained near the location of the former industrial waste discharge line, near the former vehicle industrial waste discharge line, and on the canyon floor just below the former industrial waste-discharge line.

Site Remediation Timeline

1951 — LANL constructed the TA-45 treatment plant to treat its liquid wastes.

1966 — AEC decommissioned and demolished the site.

1967 — The site was transferred to Los Alamos County.

1976 — The site was resurveyed for possible inclusion in the Formerly Utilized Site Remedial Action Program (FUSRAP).

May 1981 — The U.S. Department of Energy (DOE) determined the Acid/Pueblo Canyon site to be eligible for FUSRAP.

August 2, 1982 — Remedial action began at the site.

September 30, 1982 — DOE completed remedial action.

October 29, 1984 — DOE published the notice of cleanup certification for the site in the Federal Register.

Pueblo Canyon (2006).

Certification Docket Contents

The Certification Docket consists of documents supporting the certification that the radiological conditions at the former TA-45 treatment plant site and Acid, Pueblo, and Los Alamos canyons are in compliance with radiological guidelines and standards determined to apply to this site and that unrestricted use of these areas will not results in any measurable radiological hazard to the general public.

Remedial Action

LANL conducted a radiological survey between 1976 and 1977, which defined areas requiring remedial action. DOE performed remedial activities at the Acid/Pueblo Canyon site from August 1982 to September 1982. The decontamination and restoration scenario, approved by DOE, specified that two general areas required decontamination. See Fact Sheet for details.

Post-Remediation Sampling

Post-remediation survey techniques included surface gamma measurements, near-surface gamma measurements, and surface beta-gamma measurements. DOE used the same techniques to detect hot spots and to determine post-remedial action compliance with release criteria.

Untreated Waste Outfall Area

Within the untreated waste outfall area, the remedial action covered an area of approximately 100 square meters (m^2) and averaged the data over the remedial action area to determine criteria compliance. The average plutonium-239 concentration in soil in the remedial action area was 36 picocuries per gram (pCi/g); the soil-cleanup criteria is 100 pCi/g average concentration per 100 m^2 area. The maximum plutonium-239 concentration in soil was 370 pCi/g. Five samples, collected from a small area in the ravine, exceeded the criterion for plutonium-239, based on the more stringent food cultivation/ingestion pathway. In this area, the average concentration of plutonium contamination was 226 pCi/g. Using the more appropriate resuspension/inhalation pathway, all soil sample data were less than 5% of the criterion (7,600 pCi/g). In view of the small size of this area relative to the site as a whole and the average concentration of plutonium-239 in the entire remedial action area, DOE concluded that no additional remedial action was warranted based on plutonium-239 concentrations.

Plutonium-238 concentrations over the remedial action area were insignificant at less than 2 pCi/g, or less than 2% of the food cultivation/ingestion pathway criterion for plutonium-238 (100 pCi/g).

DOE analyzed post-remedial samples for americium-241, cesium-247, and strontium-90. Concentrations of these radionuclides were less than 1% of the applicable guide. Therefore, DOE analyzed soil samples collected after hot-spot excavation for only plutonium-238 and -239.

Post-remedial action external exposure rates near the untreated waste outfall was 17 microroentgens per hour (µR/h), compared to the Los Alamos area average range of 9.4 µR/h to 17.4 µR/h. The radiation-exposure rate criterion was 20 µR/h above background.

Former Vehicle Decontamination Facility

Within the former vehicle-decontamination facility area, verification of the adequacy of the remedial action was based on soil sample analysis for the primary contaminants, cesium-137 and strontium-90, and external exposure rates. Based on two soil samples taken in this area, the concentration of cesium-137 after remedial action was less than 10% of the criterion.

While the primary contaminants were cesium-137 and strontium-90, spotty plutonium-239 contamination also existed in the area, as evidenced by one of 10 pre-remedial action samples. However, based on these 10 samples, the maximum permissible area averaged concentration of plutonium-239 (100 pCi/g) was not exceeded.

The external exposure rate near the former vehicle-decontamination facility was 23 µR/h, which is below the radiation-exposure rate criterion. For more detailed results of the post-remediation sampling, see the attached Site Certification Data Summary Worksheet. For a map of the site see the attached Site Overview Map.

Current Site Conditions

Based on the analyses and measurements, both the untreated waste outfall and the former vehicle-decontamination facility were in compliance with remedial action criteria for food cultivation/ingestion or resuspension/inhalation pathways. The LANL Environmental Surveillance Group confirmed compliance. DOE has been responsible for long-term stewardship of the Acid/Pueblo Canyon site since 1985. The stewardship requirements and protocols are captured in the Long-Term Stewardship Plan for Completed FUSRAP Sites, which is available on the DOE Office of Legacy Management website (www.energy.gov/lm/acidpueblo-canyon-new-mexico-site).

ADDITIONAL INFORMATION

Documents related to FUSRAP activities at the Acid/Pueblo Canyon, New Mexico, Site are available on the LM website at lmpublicsearch.lm.doe.gov/SitePages/ConsideredSites.aspx?sitename=Acid_Pueblo.

For other information on site history or current long-term stewardship activities, please contact us at:

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11/2023

Acid/Pueblo Canyon, New Mexico, Site Certification Data Summary Worksheet

Four tables referenced in the Acid/Pueblo Canyon Certification Docket provide the evidence used to certify the site as clean.

When the tables refer to the "Final Report," that is the "Final Report on Remedial Action at the Acid/Pueblo Canyon Site, Los Alamos, New Mexico" (dated October 1984).

When the tables refer to the "Radiological Survey," that is the "Radiological Survey Following Decontamination Activities Near the TA-45 Site" (dated July 1983).

Acid Canyon Post-Remedial Action Soil Sample Data

Table 5-1 from Final Report

Coordinates		pCi/g				
X	Y	Plutonium 239	Plutonium 238	Americium 241	Cesium 137	Strontium 90
40	35	N/A	N/A	5.4 ± 0.5	8.5 ± 0.9	N/A
60	30	N/A	N/A	0.4 ± 0.1	1.2 ± 0.1	N/A
123	63	140 ± 10	0.7 ± 0.6	N/A	N/A	N/A
125	60	200 ± 10	2 ± 1	N/A	N/A	N/A
125	65	230 ± 10	1.2 ± 0.6	N/A	N/A	N/A
125	70	1.9 ± 0.6	0.3 ± 0.3	N/A	N/A	N/A
130	50	18 ± 2	0.2 ± 0.3	N/A	N/A	N/A
130	55	82 ± 3	0.5 ± 0.2	N/A	N/A	N/A
130	60	77 ± 4	0.2 ± 0.3	N/A	N/A	N/A
130	65	190 ± 30	0.5 ± 0.5	N/A	N/A	N/A
130	70	370 ± 10	1.4 ± 0.6	N/A	N/A	N/A
135	45	2 ± 1	0.1 ± 0.1	N/A	N/A	N/A
135	50	11 ± 2	0.1 ± 0.3	N/A	N/A	N/A
135	55	31 ± 3	0.2 ± 0.3	N/A	N/A	N/A
135	60	7 ± 1	0.2 ± 0.4	N/A	N/A	N/A
135	65	2 ± 1	0.1 ± 0.2	N/A	N/A	N/A
135	70	4 ± 1	0.0 ± 0.1	N/A	N/A	N/A
140	45	2 ± 1	0.0 ± 0.3	N/A	N/A	N/A
140	50	6 ± 1	0.1 ± 0.2	N/A	N/A	N/A
140	55	21 ± 3	0.2 ± 0.3	N/A	N/A	N/A
140	60	17 ± 2	0.4 ± 0.3	N/A	N/A	N/A
140	65	0.4 ± 0.3	0.1 ± 0.1	N/A	N/A	N/A
140	70	0.3 ± 0.3	0.0 ± 0.1	N/A	N/A	N/A
145	50	11 ± 1	< 0.1	N/A	N/A	N/A
145	55	6 ± 1	0.5 ± 0.5	N/A	N/A	N/A
145	60	7 ± 1	0.1 ± 0.1	N/A	N/A	N/A
145	65	5 ± 1	0.4 ± 0.4	N/A	N/A	N/A
145	70	2.4 ± 0.4	0.1 ± 0.1	N/A	N/A	N/A
150	45	40 ± 2	0.8 ± 0.3	< 1	< 1	< 0.9
150	50	17 ± 2	< 0.2	N/A	N/A	N/A
150	55	20 ± 3	0.6 ± 0.5	N/A	N/A	N/A
150	60	5 ± 1	0.0 ± 0.1	N/A	N/A	N/A
150	65	3 ± 1	0.2 ± 0.3	N/A	N/A	N/A
150	70	0.5 ± 0.2	0.0 ± 0.1	N/A	N/A	N/A
150	75	16 ± 1.5	0.07 ± 0.15	< 1	2.3 ± 0.2	1.2 ± 0.5
150	0	0.9 ± 0.3	0.06 ± 0.08	< 1	< 1	< 1
150	15	0.6 ± 0.3	0.003 ± 0.009	< 1	0.1 ± 0.1	0.6
150	30	2.2 ± 0.5	0.4 ± 0.2	0.3 ± 0.3	0.6 ± 0.1	< 0.6
155	50	24 ± 1	0.1 ± 0.1	N/A	N/A	N/A
155	55	11 ± 1	0.1 ± 0.1	N/A	N/A	N/A
155	60	0.5 ± 0.2	0.0 ± 0.1	N/A	N/A	N/A
155	65	5 ± 1	0.1 ± 0.2	N/A	N/A	N/A
165	0	0.09 ± 0.13	0.05 ± 0.09	< 1	0.1 ± 0.1	< 0.7
165	15	2 ± 0.5	0.08 ± 0.13	< 1	0.3 ± 0.1	< 0.9
165	30	6 ± 0.8	0.4 ± 0.2	< 1	< 1	< 0.6
165	45	2.5 ± 0.5	0.3 ± 0.2	0.3 ± 0.1	0.3 ± 0.1	< 0.6
180	50	0.3 ± 0.2	0.2 ± 0.2	< 1	< 1	< 0.7

N/A Not analyzed

Acid Canyon Post-Remedial Action External Exposure Rates (Including Background)

Table 5-2 in Final Report

Coordinates		Exposure Rate (μR/h)
X	Y	
Former Vehicle Decontamination Facility		
35	30	32
40	30	22
45	40	22
45	45	19
50	45	21
	Average	23
Untreated Waste Outfall		
135	60	18
140	50	19
140	55	19
140	60	17
145	45	17
150	0	14
150	5	16
150	10	17
150	15	17
150	20	17
150	25	17
150	30	18
150	35	18
150	40	17
150	45	17
150	50	17
150	55	17
150	60	17
150	65	17
150	70	18
150	75	17
155	0	15
155	5	15
155	10	17
155	15	17
155	20	17
155	25	18
155	30	17
155	35	17
155	40	17
155	45	17
155	50	18
155	60	17
160	0	15
160	5	15
160	10	15
160	15	16
160	20	16
160	25	18
160	30	17
160	35	17
160	40	16
160	45	17
160	50	18
160	55	18
160	60	17
160	75	16
165	0	15
165	5	16
165	10	15
165	15	16
165	20	16
165	25	17
165	30	17
165	35	16
165	40	17
165	45	17
165	50	18
165	55	18
170	60	17
170	0	16
170	30	16
170	40	17
170	45	17
175	50	17
180	50	17
185	50	16
	Average	17

Background exposure rates in the Los Alamos area range from 9.4 to 17.4 μR/h.

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Acid/Pueblo Canyon, New Mexico, Site Certification Data Summary Worksheet

Results of Radiological Surface Soil Survey Done on August 16, 1982

Table III in Radiological Survey

Sample Number	Gross Alpha (pCi/g)	Gross Beta (pCi/g)	^{238}Pu (pCi/g)	^{239,240}Pu (pCi/g)	^{241}Am (pCi/g)	^{90}Sr (pCi/g)	^{137}Cs (pCi/g)
Minimum Detectable Limit	25	8	0.002	0.002	0.01	0.01	0.01
Area 3							
Typical Background[a]	10 ± 13		0.003 ± 0.007	0.028 ± 0.058	-	0.29 ± 0.33	0.44 ± 0.89
1	-	-					
2	-	-	0.001 ± 0.002	0.23 ± 0.02	0.5 ± 0.2		0.003 ± 0.001
3	-	-	0.004 ± 0.004	0.48 ± 0.04	0.7 ± 0.2		0.003 ± 0.001
4	-	-					
5	-	-					
6	-	-					
7	230 ± 40	-	0.51 ± 0.06	133 ± 12	8.2 ± 0.4		0.04 ± 0.009
8	270 ± 60	-	0.47 ± 0.04	130 ± 6	4.5 ± 0.3		0.004 ± 0.001
9	230 ± 60	-	0.52 ± 0.04	120 ± 6	2.8 ± 0.2		0.002 ± 0.001
10	-	-					
11	-	-					
12	-	-					
13	-	-					
14	400 ± 70	-	0.32 ± 0.03	77 ± 4	2.2 ± 0.2		0.004 ± 0.001
15	-	-					
16	-	-					
17	-	-					
18	-	-					
19	-	-					
20	-	-					
Area 1							
21	-	-					
22	-	-					
23	-	-					
24	-	-					
25	-	-					
26	-	-					
27	-	-					
Area 2							
28	-	212 ± 12				88 ± 6	17 ± 1
29	-	258 ± 14				101 ± 8	5.3 ± 0.5
30	-	106 ± 10				46 ± 4	5.5 ± 0.4
31	-	106 ± 10				59 ± 4	3.5 ± 0.3
32	-	60 ± 10				26 ± 1	2.0 ± 0.3
33	-	212 ± 12					
34	-	-					
35	-	-					

[a]Typical background radionuclide concentrations in soils are averages of samples taken at six regional sampling locations in northern and central New Mexico during 1981.

Notes:

(1) Gross-beta counting system was only calibrated for ^{90}Sr.

(2) Results reported with ± two standard deviations.

(3) - Means sample activity was less than the minimum detectable limit.
No entry means no analysis was made on the sample.

(4) The ^{238}Pu, ^{241}Am, ^{90}Sr, and ^{137}Cs analyses were done using chemical dissolution and instrumental counting techniques. The gross-alpha and gross-beta analyses were counted with ZnS and plastic scintillator counting systems, respectively, on dried soil samples.

Results of Radiological Surface Soil Survey Done on November 1, 1982

Table IV in Radiological Survey

Untreated Waste Line Discharge Area

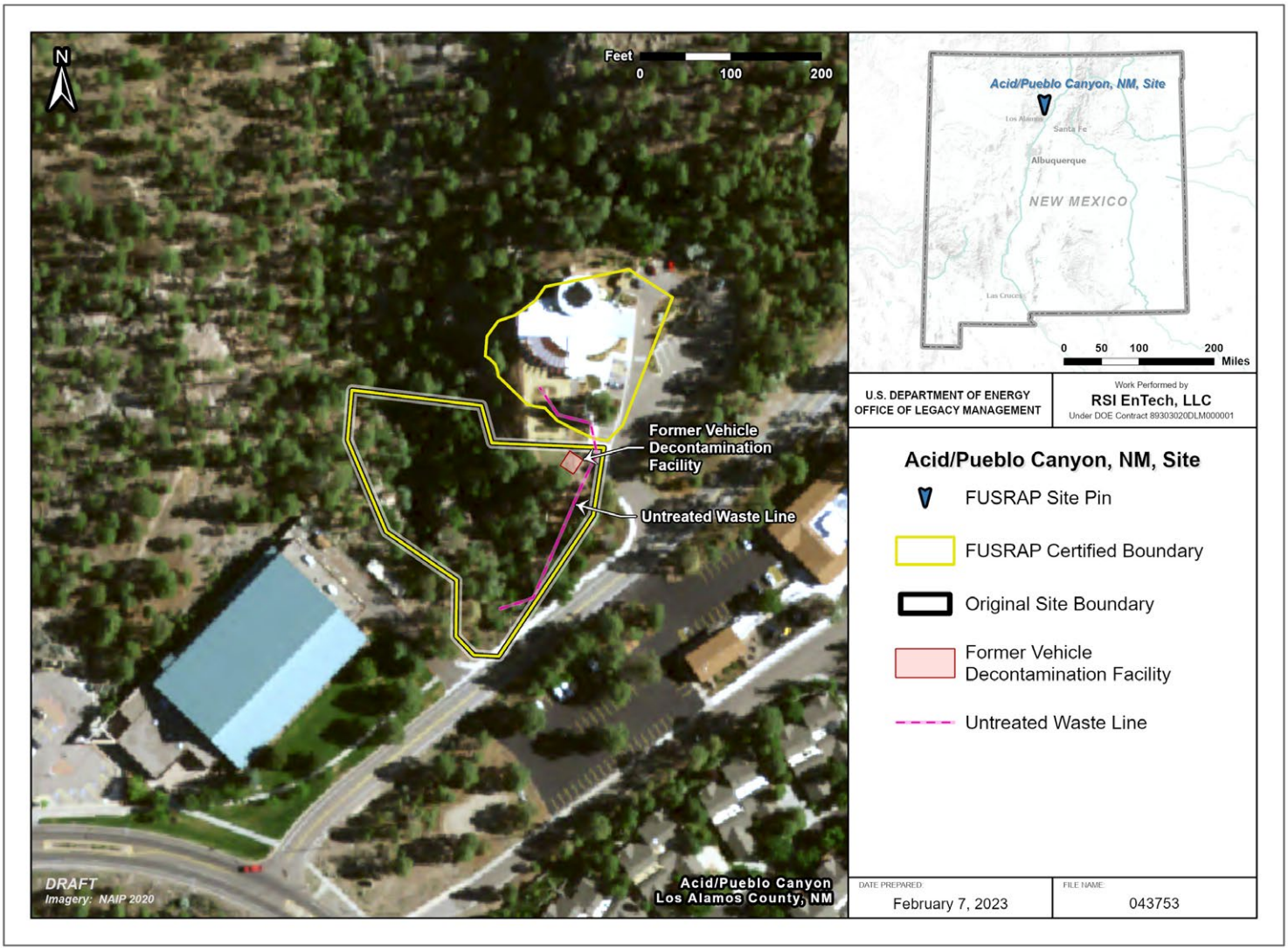
Sample Number	Gross Alpha (pCi/g)
1	a
2	a
3	120 ± 40[b]
4	a
5	---
6	70 ± 50
7	a
8	a
9	a
10	a
11	100 ± 50
12	a
13	a
14	a
15	a
16	a
17	65 ± 38
18	a
19	a
20	a
21	46 ± 48
22	a
23	a
24	a
25	65 ± 38
26	a
27	a
28	a
29	410 ± 60
30	120 ± 60
31	a
32	a
33	410 ± 60
34	53 ± 49
35	a

[a]Sample activity is less than the minimum detectable limit of about 25 pCi/g.

[b]All results reported as X ± 2s.

Note: All samples analyzed for gross-beta activity were less than minimum detectable limit, except for Sample Number 33, which had a gross beta concentration of 23 ± 2 pCi/g.

Acid/Pueblo Canyon, New Mexico, Site Map



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