Appendix D

Waste Site Descriptions

The waste site descriptions in this Appendix were developed as of April 1, 2011 from data in the Waste Information Data System (WIDs). The information provided in these descriptions was not modified and does not reflect changes to WIDs after that date.

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Site Description

Site ID: 200-E-14
Site Type: Siphon Tank
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-BC-1
Service Dates: January 1956 to October 1957
Volume/Mass Discharged: The approximate effluent discharged from the siphon tank into the BC Cribs was 38.9E+6 L (10.3E+6 gal).

Waste Site Location and Physical Description: The 200-E-14 siphon tank is located south of Route 4S, south of the 200 East Area. The tank is 18 m (60 ft) north of the center line between the 216-B-14 and 216-B-15 cribs[1]. The siphon tank was designed to receive liquid waste from the 200-E-114-PL (Pipeline) and release the waste into the 216-B-14 through 216-B-19 Cribs. The siphon tank was designed to hold the waste until the liquid level reached 1.6 m (5.5 ft). When the level was reached, the siphon action would begin and the tank contents would discharge to the designated crib[2]. The siphon action would stop when the tank level receded to 0.07 m (6 in). The siphon action was intended to flood the crib area with a significant amount of liquid, resulting in a uniform spread of contaminants throughout the crib, instead of a large amount of contaminants concentrating near the discharge point.

Waste Site Coordinates:

E-573639.15478 N-134439.31401

Site Dimensions:

Site Length: 8.2 m (27 ft)
Site Width: 3.9 m (12.8 ft)
Site Area: 32 square m (344.4 ft)
Site Depth: 2.4 m (8 ft)
Cover Thickness: 2.1 m (7 ft)

Release Summary: Estimated release volume from the siphon tank into the BC Cribs is 38.9E+6 L (10.3E+6 gal). The waste received by the siphon tank from the 200-E-114-PL was scavenged uranium recovery process (tributylphosphate [TBP] solvent extraction) liquid waste from the 241-BY Tank Farm and 241-C Tank Farm.

A 1998 evaluation of the IMUST tank contents based on crib inventory data concluded the potential from hydrogen generation, ferrocyanide induced reaction, organic chemical reactions, heat generation, criticality, flammability, noxious vapor emissions, leakage and radiation exposure were all ranked as low.

Related Site Structure(s): The siphon tank is associated with the 200-E-114-PL, the 216-B-14, 216-B-15, 216-B-16, 216-B-17, 216-B-18, and 216-B-19 cribs, 241-BY Tank Farm and 221-U Building.

Site Posting: The area was covered with a minimum of 0.6 m (2 ft) of top soil and posted as Underground Radioactive Material.

Site Characterization Summary: The BC Cribs area was surface stabilized in 1981. Prior to stabilization, a radiological survey found vent hoods and liquid level risers on the cribs and

siphon tank were contaminated with levels ranging from 200 to 30,000 counts per minute. The vent hoods and risers were removed, wrapped in plastic and transported to the burial grounds.

A surface radiological survey of the BC Crib area is done annually. The surface above the siphon tank is also covered in the survey.

Potential Contaminants:

Radioactive: Ferrocyanide, Phosphate, Cesium-137 (1,840 Curies*), Stronitum-90 (1,850 Curies*), Uranium, Cobalt-60 (26 Curies*), Ruthenium, Plutonium (70 grams*), Uranium (1,410 kilograms*)

**Total radionuclide activity for all 6 cribs in 1956 (time of discharge)*

Non-Radioactive:

References:

WIDS Summary Report for site 200-E_14
ArcMap
QMap
Drawing H-2-3232
Drawing H-2-2770 Sheet 1 Rev. 1

Figure 1. ArcMap Image

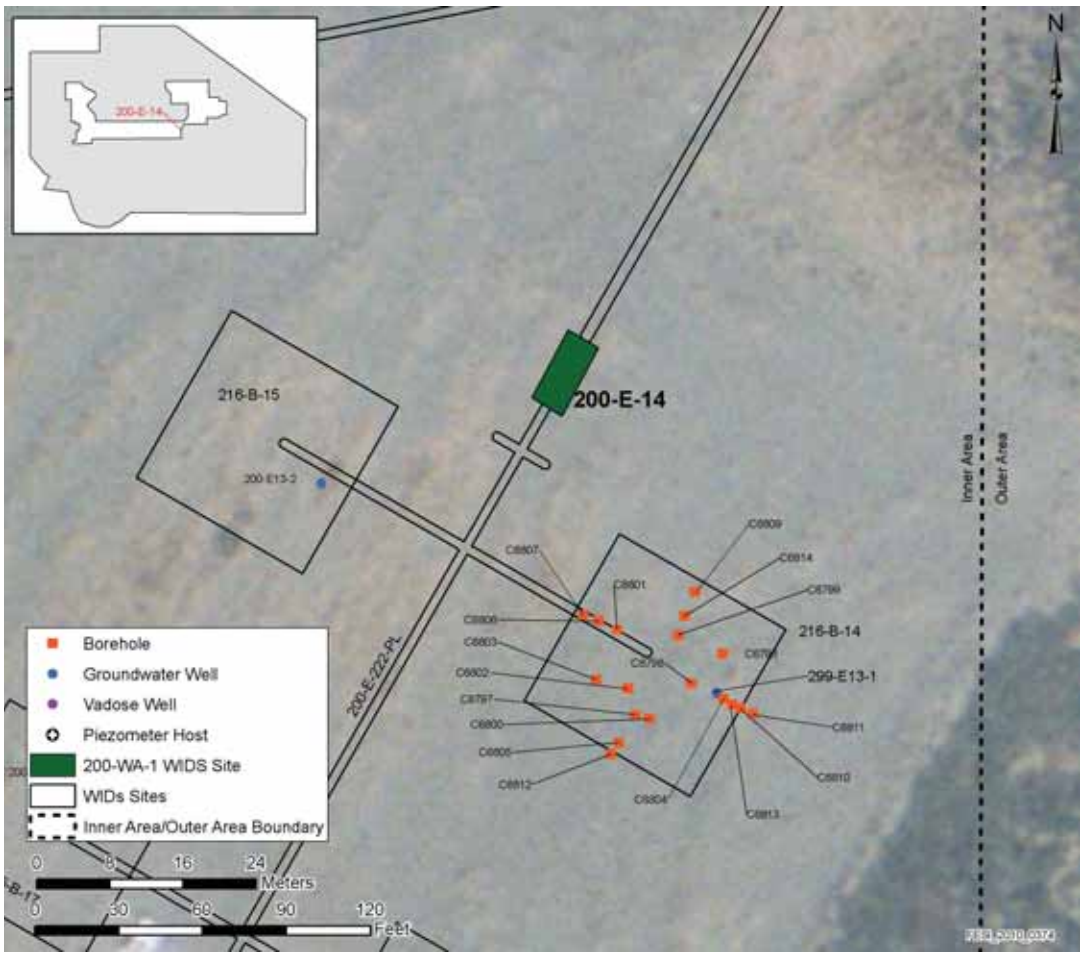


Figure 2. Siphon Tank Location

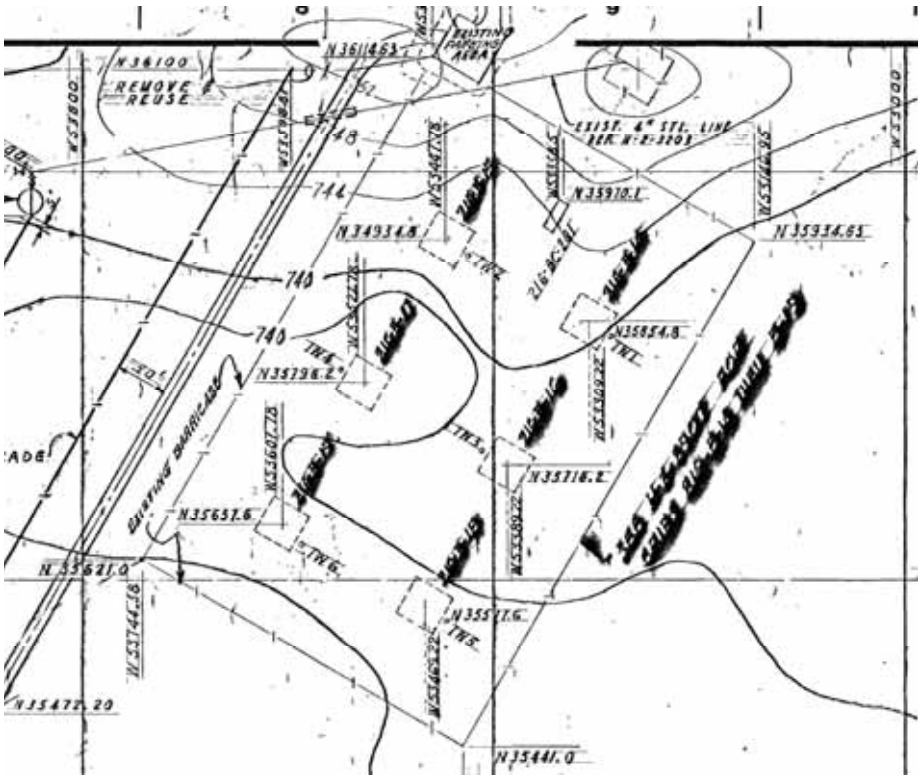
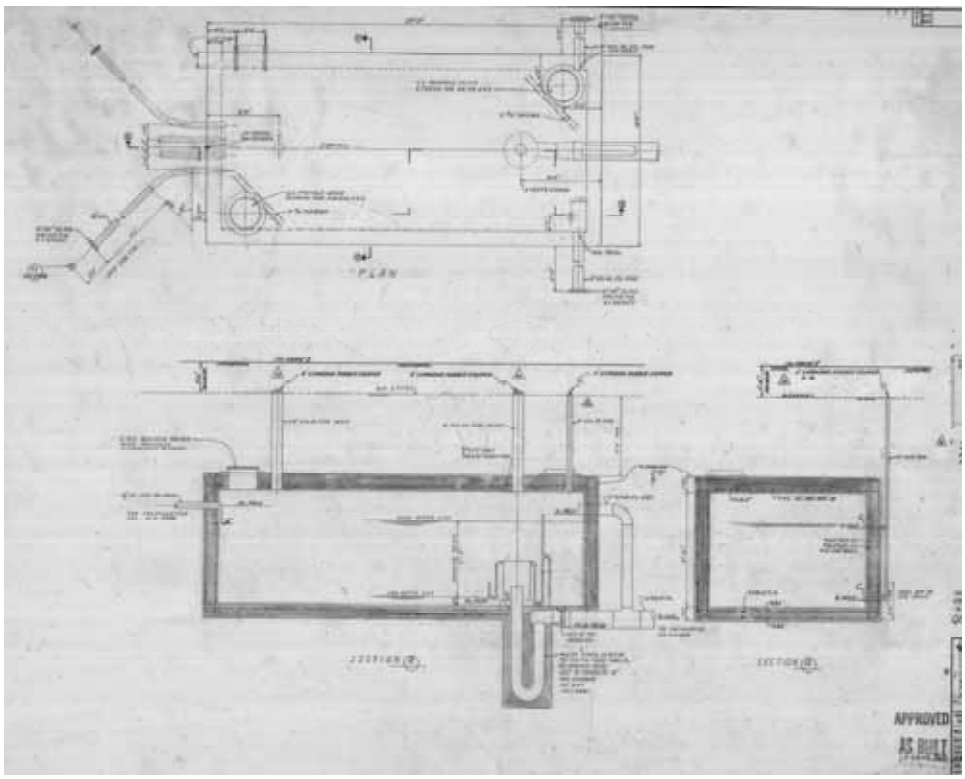


Figure 3. Plan and Elevation View



Site Description

Site ID: 200-W-1, REDOX Mud Pit West
Site Type: Mud Pit
Facility/Geographic Area: S-Plant (REDOX) Area
Current OU Assignment: 200-MG-1
Former OU Assignment: 200-SW-1
Service Dates: Unspecified
Volume/Mass Discharged: Unspecified volume of liquid from equipment decontamination

Waste Site Location and Physical Description: Site 200-W-1 is located west of the REDOX facility, outside of the REDOX exclusion fence, and north of 10th Street (See Figure 2. per QMap and Figure 3. 200-W-1 Location Sketch). Originally described as a pit with a surface area resembling drilling mud; the 200-W-1 Mud Pit is a shallow depression with no vegetation. The Pit has the surface characteristics of a site that has had liquid evaporate or percolate through.

In 1999, two waste sites were surveyed to determine which one was the correct location for 200-W-1, as the site location and description were vague. The exact boundaries of the site are difficult to determine, as the Pit and surrounding area appears to have been disturbed by heavy machinery. The vegetation cover primarily consisted of cheatgrass and tumbleweeds, with some bunchgrass and rabbitbrush. The vegetative cover varied in density from sparse to moderate. The soil consisted of >50% sand, with some surface soil discoloration visible. Other features found within the site include a 2.5cm (1in) diameter rubber hose near the west edge of the site, and discarded lumber and a wooden stake within the unvegetated area.

Waste Site Coordinates:

Lon-567176.56254 Lat-133977.62499

Site Dimensions:

Site Length: 23.0 m (75.5 ft)
Site Width: 20.0 m (65.6 ft)
Site Area: 477.0 m2 (5134.4 ft2)
Site Depth: NA
Cover Thickness: None

Release Summary: No estimated release volume is presented for this waste site. The Pit received liquid waste generated during equipment decontamination. Interviews with retied employees revealed that plutonium contaminated ventilation equipment was rinsed at an unspecified location near this site.

Related Site Structure(s): During trench excavation for Project W-987 on August 9, 1995, two nearby areas of aluminum silicate (200-W-17) and aluminum oxide (200-W-18) were discovered. It is assumed that 200-W-1 is related to these two sites.

Site Posting: Not specified.

Site Characterization Summary: A site characterization is needed for this site (see section 5.3). No radiological surveys have been conducted at this location.

A field visit to determine the exact location of the 200-W-1 Mud Pit occurred on August 18, 1999. Two potential waste sites matched the vague location and site description of the Mud Pit. The site's location was verified and the boundary mapped with Global Positioning Survey (GPS)

equipment on August 26, 1999. Originally, field estimates from 1993 placed the site dimensions at 30.5m (100.0 ft) long by 15.2 m (50.0 ft) wide, with a site area of 464.5 m square (5,000 ft square).

Potential Contaminants:

Radioactive: Not Specified

Non-Radioactive: Not Specified

Figure 1. ArcMap Image

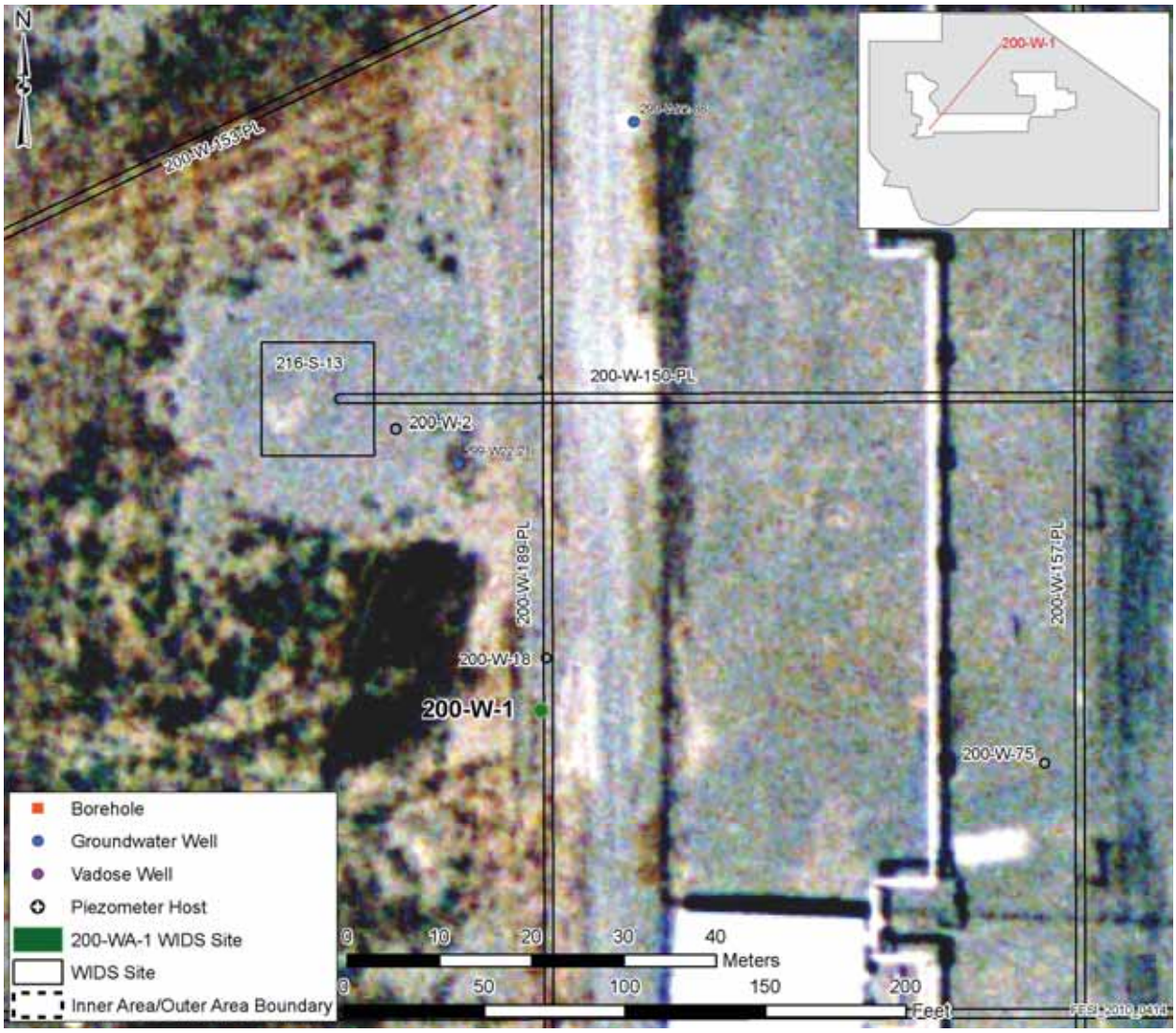
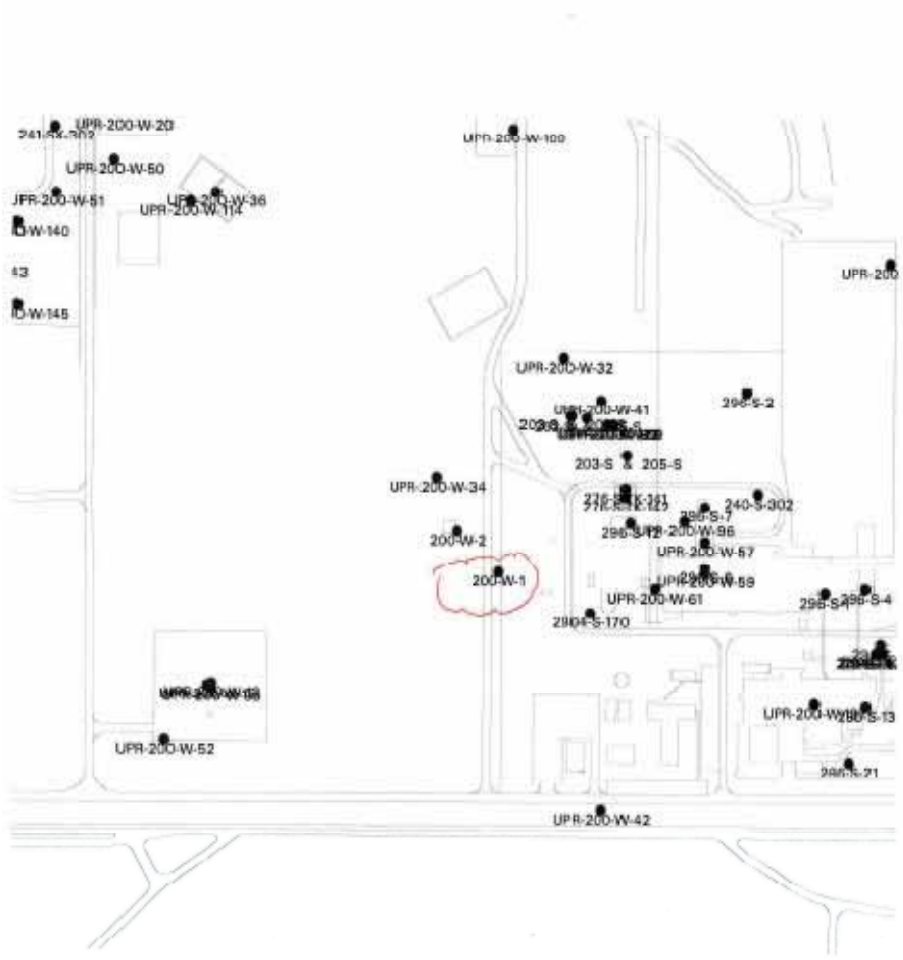


Figure 2. Insert Site Map

Figure not available.

Figure 3. 200-W-1 Location Sketch



Site Description

Site ID: 200-W-101, Contaminated Material West of 216-S-12 Crib
Site Type: Dumping Area
Facility/Geographic Area: S-Plant (REDOX) Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-SW-2, 200-MG-1
Service Dates: Unspecified
Volume/Mass Discharged: Unspecified

Waste Site Location and Physical Description: Site 200-W-101 is located west of Beloit Avenue; west of the 216-S-12 Crib (See Figure 1. ArcMap Image and Figure 2. 200-W-101 Location Sketch). The site consists of two large boxes and a long, rusted metal pipe (shaft) surrounded with light posts and chain. The metal shaft is approximately 18m (60ft) long and extends past the posted area chain. Conversations with staff that worked at this site revealed that the material had been sitting at this location for approximately 15 years. No reference engineering drawing exists for this site as it is an unplanned dump site.

Waste Site Coordinates:

E-567490.64801 N-134130.06729

Site Dimensions:

Site Length: 12.2 m (40.0 ft)
Site Width: 6.1 m (20.0 ft)
Site Area: 72.0 m2 (800.0 ft2)
Site Depth: Not Specified
Cover Thickness: None

Release Summary: The site was used as a dumping area for solid materials. The wastes contained at this site are unspecified, and no release mass is presented for 200-W-101.

Related Site Structure(s): None

Site Posting: The site has been posted with Contaminated Area (CA) and Radiation Area (RA) signs. The radiological posting was changed to from RA/CA to CA in April 2002.

Site Characterization Summary: No responsible parties are identified for this waste site. In addition, the source of contamination and who erected the original radiological zone and when, are also unclear. In 1999, an attempt was made to remove and bury the debris material in conjunction with surface stabilization work at the REDOX railroad cut. However, no responsible party could be located for the site. As a result, the debris material was left undisturbed during stabilization work along the railroad cut.

The site dimensions were estimated during a site walkdown in the 1990's. A second walkdown on January 17, 2002 for verification purposes discovered half of the metal pipe extends outside the posted area. Photographs were taken of the site for documentation purposes.

A radiological survey was conducted on April 2, 2002 to determine the radiological conditions inside the posted area. No contamination was detected on the wooden boxes or the ground surface. A small amount of contamination (2000 dpm) was found on a piece of hose. The radiological posting was changed from Radioactive Area/Contaminated Area to CA. A GM/P-11

Probe (15.5 cm square)(Beta-Gamma) was used during the survey. Site 200-W-101 was mapped using Global Positioning System (GPS) equipment on October 17, 2002.

Potential Contaminants:

Radioactive: Not Specified

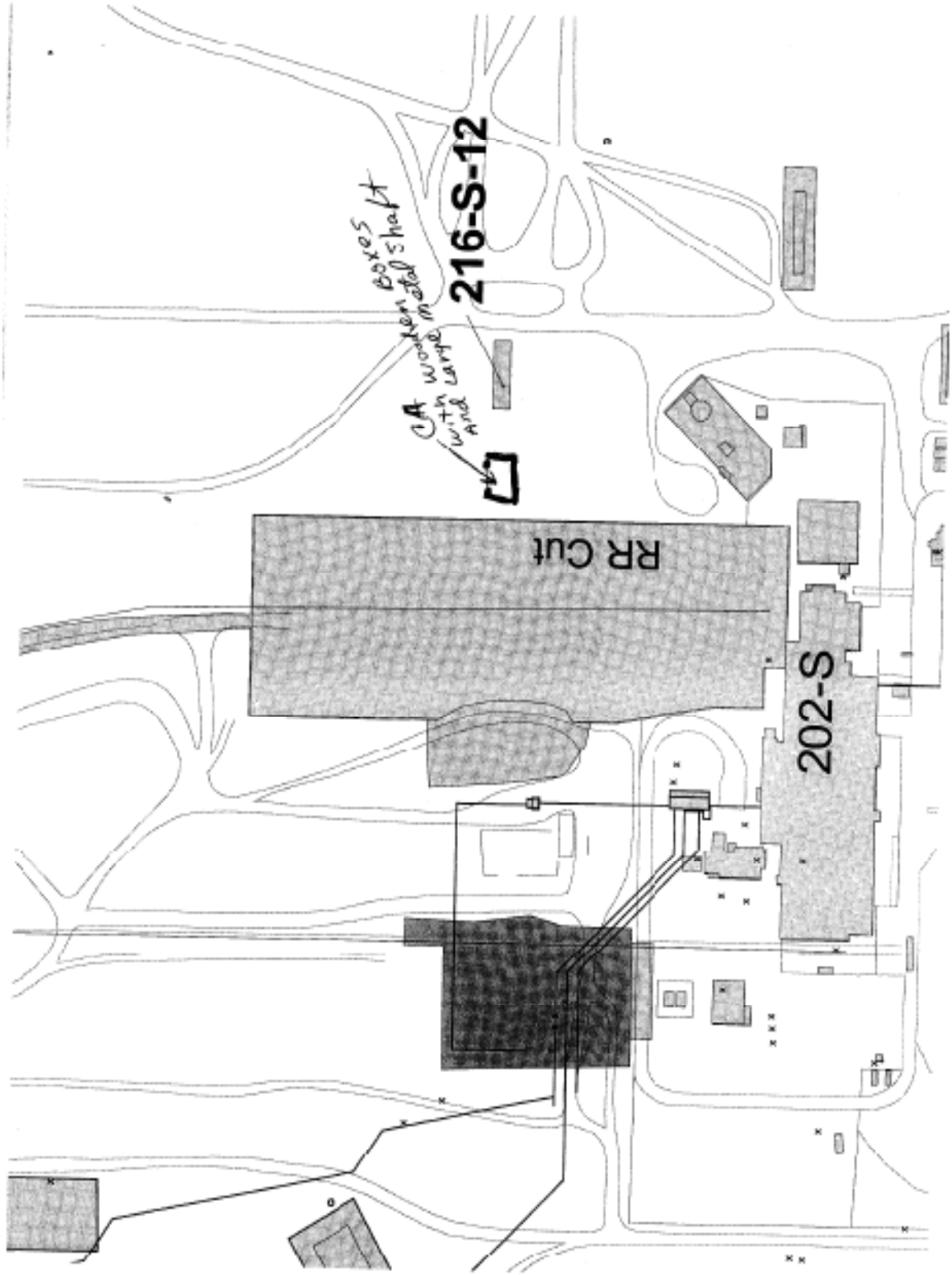
Non-Radioactive: Minor Debris

References

WIDS General Summary Report for site 200-W-101
ArcMap
QMap

Figure 1. ArcMap Image

Figure 2. 200-W-101 Location Sketch



Site Description

Site ID: 200-W-106, Soil Contamination Area Adjacent
Site Type: Unplanned Release
Facility/Geographic Area: T-Plant to 200-W-55
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MW-1, 200-MG-1
Service Dates: Not Specified
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-106 is an unplanned release of contaminated soil west of the 241-TX Tank Farm. The site is west of the 216-T-25 Trench and northeast of the 200-W-55 dump site (See Figure 1. ArcMap Image and Figure 2. Site Map for 200-W-106). 200-W-106 was covered with 15.2 to 30.5 cm (6 to 12 in.) gravel as part of a surface stabilization effort in March 2010. No engineering reference drawings are available for this site. The immediate area supported large, growing rabbit and sagebrush shrubs, suggesting that the vegetation had been growing at the site for several years. The area containing the contamination has little to no vegetation.

Waste Site Coordinates:

E-566449.45300 N-136174.00800

Site Dimensions:

Site Length: 20.4 m (67.0 ft) Site Depth: Not Specified
Site Width: 16.2 m (53.0 ft) Cover Thickness: Not Specified

Release Summary: Site 200-W-106 was discovered on February 13, 2003 when an employee was driving past the 200-W-55 dump site in his vehicle. The employee was unfamiliar with the dump site, and stopped to make a perfunctory radiological investigation of the site. The employee discovered soil contamination on the top rim of the debris pit not associated with or connected to the 200-W-55 dump site. Further investigation of the site indicated that the soil had been dumped at the site many years ago; as indicated by the presence of undisturbed, large, growing rabbit and sagebrush shrubs surrounding the contaminated area. Over fifteen individual contaminated spots were located at this site.

The site consists of a pile of dumped soil and miscellaneous debris. It is unclear where the soil and debris originated from. It is also unclear the amount of time the soil and debris had been present at the site. Large shrubs were observed growing around the soil mound, thus the debris and soil had likely been dumped several years prior. As the total volume of contamination released at this site is not available, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-106 is not associated with any other known waste sites or facilities.

Site Posting: Site 200-W-106 was originally posted as a Surface Contamination Area (SCA). Following surface stabilization work in 2010, the site was down posted to an Underground Radiation Material Area (URMA).

Site Characterization Summary: The site has been surveyed several times since its discovery.

The first radiation survey occurred on February 13, 2003 when a routine contamination survey discovered a maximum surface reading of 3,600 cpm. The levels of contamination increased as investigators probed deeper into the soil profile. Readings taken from the surface showed 300 cpm present, with contamination levels increasing deeper into the soil profile. Readings rose to 7,600 cpm at a depth of 7.6 cm (3 in). Further investigations were conducted to calculate the depth of contamination. Most of the contamination was discovered within 15 cm (6 in) of the ground surface. A maximum reading of 20,100 cpm was found at a depth of 10 cm (4 in).

A second radiation survey took place on February 25, 2003 to further investigate the site's characteristics and the depth of contamination. A maximum contamination level of 20,100 cpm was found at 4 inches below the ground.

A final series of radiation surveys occurred on March 25, 2010 to document the downposting of the site from a SCA to an URM area following surface stabilization. Surface stabilization involved removing non-radiologically contaminated debris and covering the site with a layer of clean backfill 15.2 to 30.5 cm (6 to 12 in) deep. However, some large chunks of asphalt and concrete were left behind and buried beneath the backfill instead. While no contamination was detected on removed debris, spotty contamination was discovered in the soil before surface stabilization occurred. Radiation readings ranged from 15,000 to 20,000 dpm beta gamma. A verification survey took place following the placement of the clean backfill. The survey did not find any contamination in the area after backfilling occurred.

The site was mapped using Global Positioning System (GPS) survey equipment on February 24 and 25, 2003.

It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided for the site. If surveys do occur, the frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Not Specified.

References:

WIDS General Summary Report for site 200-W-106
ArcMap
QMap

Figure 1. ArcMap Image

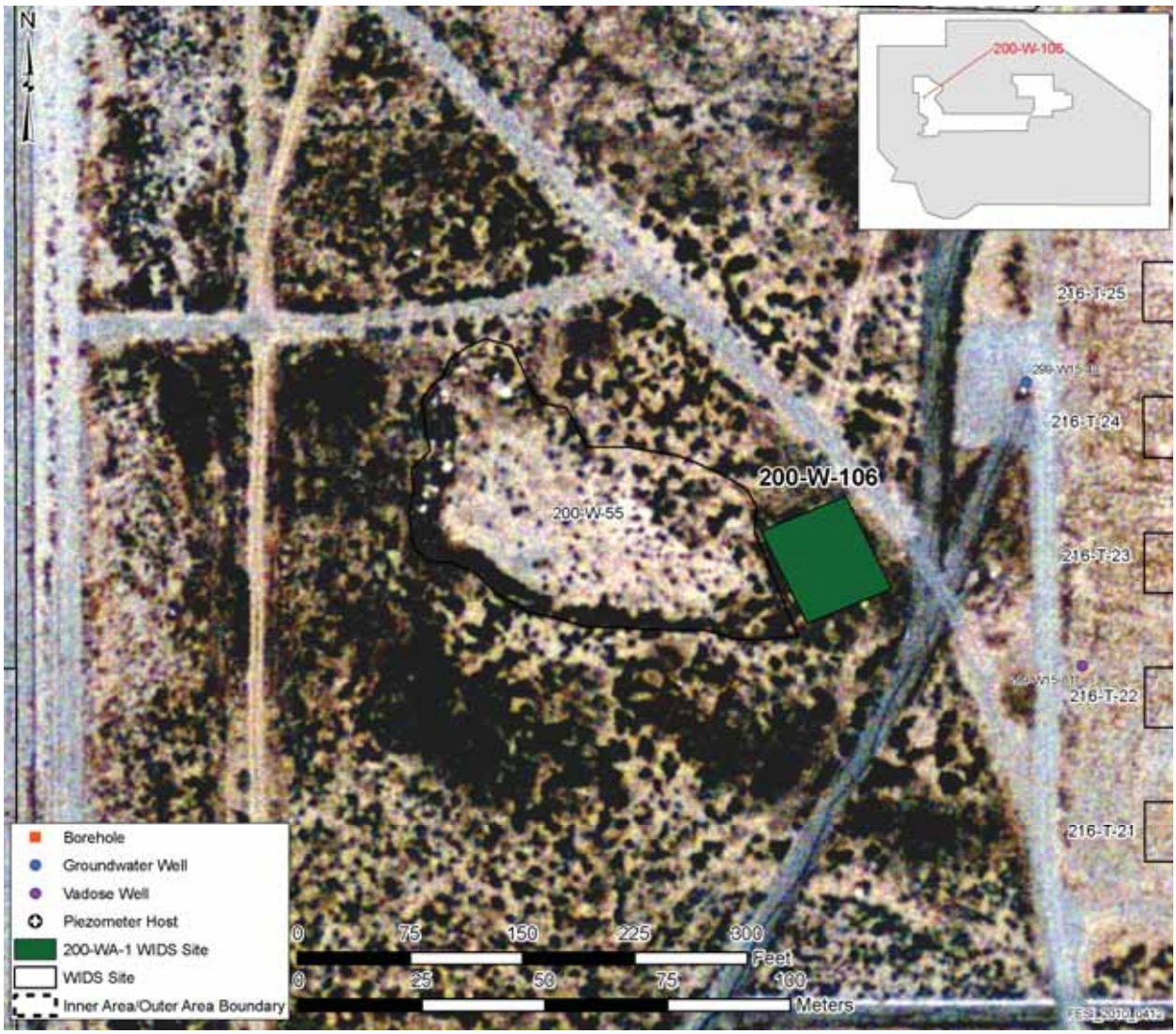
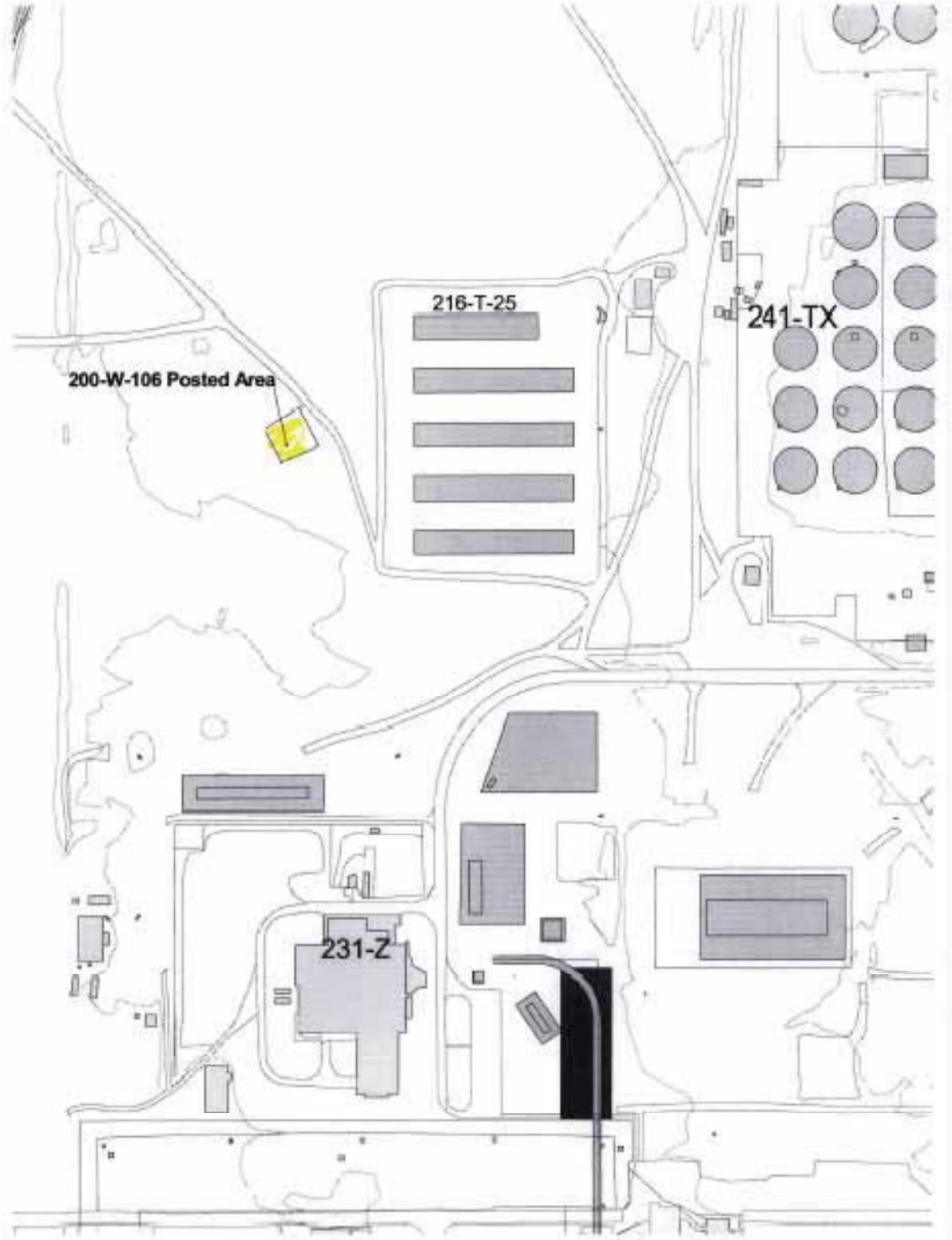


Figure 2. Site Map for 200-W-106



Site Description

Site ID: 200-W-11, Concrete Foundation South of 241-S, S-Farm Foundation and Dump Site
Site Type: Dump Site
Facility/Geographic Area: S-Plant (REDOX) Area
Current OU Assignment: 200-MG-1
Former OU Assignment: 200-SW-1
Service Dates: Unspecified
Volume/Mass Discharged: Unspecified

Waste Site Location and Physical Description: Site 200-W-11 is located south of the 241-S Tank Farm, north of 10th Street, and west of Camden Avenue (See Figure 2. per QMap). The Site includes a concrete foundation, small burn areas, bare areas, and scattered debris (See Photographs 1 and 2). The debris includes barbed wire, welding rods, oil cans, paint cans, solvent cans, glass, cable, melted roofing material, wood, pipe, rubber brick, metal, concrete, and vehicle parts. No drawings related to the foundation have been identified.

Waste Site Coordinates:

Lon-566811.47855 Lat-133980.57857

Site Dimensions:

Site Length: Irregular m (Irregular ft)
Site Width: Irregular m (Irregular ft)
Site Area: 11505.2 m2 (123840.4 ft2)
Site Depth: Not Specified
Cover Thickness: None

Release Summary: The wastes contained at this site are unspecified, and no release volume is presented for 200-W-11. The release type is believed to be a mix of solid and liquid materials. The exact purpose or use the site fulfilled is not specified. It may have been used as a laydown yard, support fabrication area, or used for vehicle maintenance. It is possible the site supported the construction for the 241-S Farm.

Related Site Structure(s): The site is possibly associated with the construction of the 241-SX, 241-SY, 241-S Tank Farms.

Site Posting: Not specified.

Site Characterization Summary: A site characterization is needed for this site as the wastes at this unit are not specified (see section 5.3). No radiological surveys have been conducted at this location.

The site was identified on April 19, 1995 during a RCRA General Inspection. On April 4, 1995, the site was visited to document the various types of debris present and a site walkdown for initial review purposes began. The initial review was completed on September 11, 1995. Following the initial review, the site was mapped using Global Positioning System (GPS) survey equipment from October 25 to November 14, 1995.

Potential Contaminants:

Radioactive: Not Specified

Non-Radioactive: Paint, Solvent

Figure 1. ArcMap Image

Figure 2. Insert Site Map

Figure not available.

Photograph 1. 200-W-11 Photo1

8-7-95 KJ MOSS 200 West
S-Farm Foundation and Dump Site
Rattlesnake Mountain in
Background, Foundation in
Foreground

Photograph 2. 200-W-11 Photo2

8-7-95 KJ Moss 200 West
241-SX/SY Farm in Background
S-Farm and Dump Site in Foreground

Site Description

Site ID: 200-W-12, 200-W-12, 201-W Soil Mound and Plastic Pipe
Site Type: Dumping Area
Facility/Geographic Area: U-Plant
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-1
Service Dates: Not Specified
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-12 is northwest of 201-W, adjacent to the 1970's REDOX Facility, and an estimated 75 m (246 ft) north of 13th Street. The site is also west of Albany Avenue (see Figure 1. ArcMap Image and Figure 2. 201-W Site Map). Site 200-W-12 is a soil mound with one plastic pipe extending 0.8 m (2.5 ft) above ground, and a second pipe extending 20 cm (8 in) above ground. The second pipe is topped with tees and elbows. In addition, insulated electrical wires and an electric heat controller are visible. It is believed that a tank is buried beneath the site; however this has not been verified. The mound rises roughly 0.6 m (2 ft) above ground. No soil discoloration is visible, and the site has a moderate growth of rabbitbrush present. No reference drawings are available for this site.

Waste Site Coordinates:

E-568154.72997 N-134443.43306

Site Dimensions:

Site Length: 3.7 m (12.0 ft)
Site Width: 1.8 m (6.0 ft)
Site Area: Not Specified
Site Depth: Not Specified
Cover Thickness: Not Specified

Release Summary: It is not specified when site 200-W-12 was constructed. In addition, the exact purpose the site fulfilled is not clear. It is thought 200-W-12 was used to test equipment and evaluate processes in support of waste management operations during the 1970's. The site is adjacent to several test sites and pits which were used to evaluate grout, slurry and soil infiltration from the late 1970's to early 1980's. 200-W-12 was likely selected as a test site due to its location next to the REDOX facility, and because the site and surrounding facilities were free of any pre-existing contamination. However, several staff members that were involved with the grout, slurry and infiltration testing had no knowledge of this site when interviewed. Interviewed staff members were also uncertain what the associated plastic piping was used for. In addition, it is possible a tank or some other form of disposed waste is buried beneath the vents. It is stated that 200-W-12 may warrant a SWMU consideration based on discarded materials at the site. Thus, despite the site most likely being a test mound, site 200-W-12 cannot be rejected as a waste management unit until proven otherwise.

The type of waste and the volume of waste released at 200-W-12 are not specified. Therefore, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-12 was associated with other, neighboring test sites (200-W-35 and 200-W-10).

Site Posting: The posting for site 200-W-12 is not specified.

Site Characterization Summary: Two site walkdowns have occurred at 200-W-12. The first occurred on August 7, 1995 as part of an initial review of the site. The second survey took place on August 18, 1999 as part of an RARA walkdown. During that survey, the mound was noted and described as a small mound of dirt with PVC piping protruding from the top of the mound.

A Global Positioning System (GPS) survey mapped the boundaries of the site from October 25 to November 14, 1995.

It is not specified if any remediation work has occurred at the site. In addition, no radiological survey information is presented for 200-W-12. Thus, it is unclear what the radiological conditions are within the site. It is also unclear if 200-W-12 is routinely surveyed or monitored, as no survey results or sample data analyses are provided. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Not Specified.

References:

WIDS General Summary Report for site 200-W-12
ArcMap
QMap

Figure 1. ArcMap Image

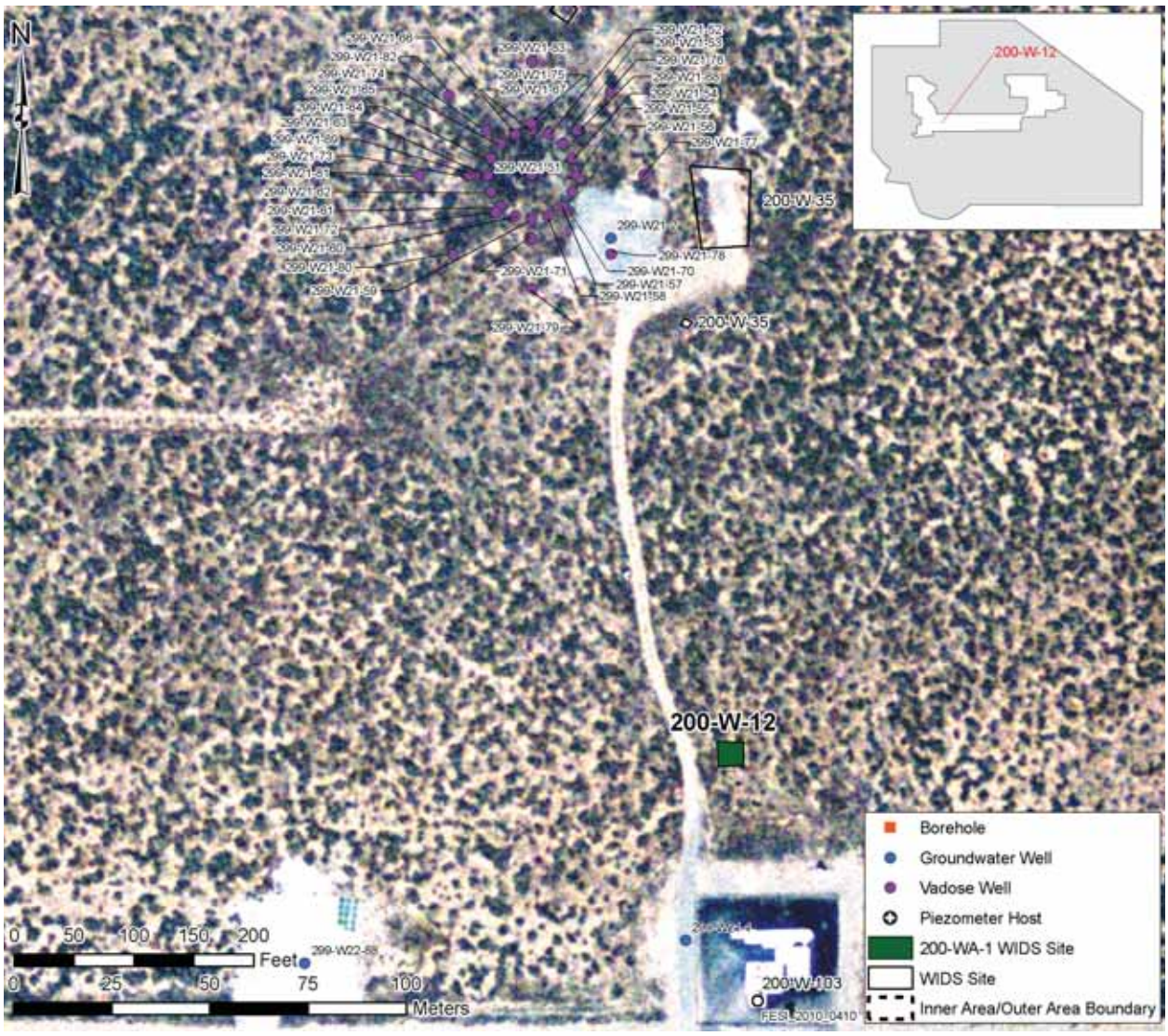
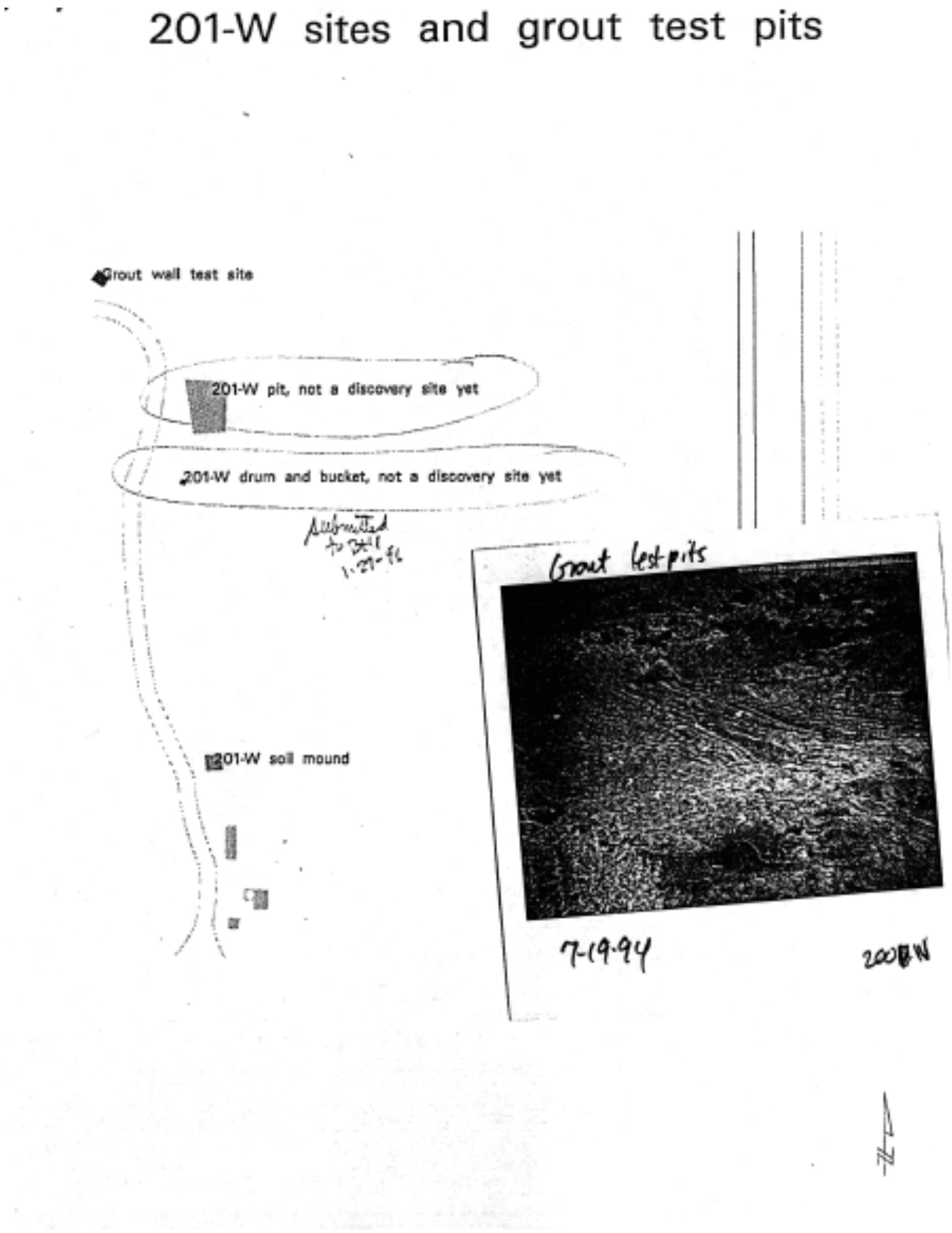


Figure 2. 201-W Site Map



Site Description

Site ID: 200-W-127, Surface Stabilization Area East of UPR-200-W29/UPR-200-W-97 (UN-216-W-5)
Site Type: Unplanned Release
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-2, 200-MW-1
Service Dates: Not Specified
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-127 is an unplanned release located on the south side of 23rd Street. It is west of T Plant and east of UPR-200-W-29/UPR-200-W-97, which is a posted Underground Radioactive Material Area (URMA) on the corner of 23rd Street and Camden Avenue (see Figure 1. ArcMap Image). Two pipelines are buried beneath the site (see Figure 2. Reference Drawing-H-2-3020 Sheet 1 Rev.2 and Figure 3. Reference Drawing H-2-44511 Sheet 126 Rev.5).

Waste Site Coordinates:

E-566961.82304 N-136592.78837

Site Dimensions:

Site Length: 2.0 m (6.6 ft) Site Depth: Not Specified
Site Width: 0.3 m (1.0 ft) Cover Thickness: Not Specified

Single dimensions of each of the six storage units. Each unit extends approximately 0.1 m (4 in) above the ground surface.

Release Summary: It is assumed that waste was released from one of the two pipelines buried beneath the site, resulting in the site becoming contaminated. It is unclear the type of waste or volumes of waste sent through the pipelines beneath this site, or the type of waste or volume of waste that was released that created this waste site. As the total volume of contamination released at this site is not available, no volume estimates can be ascertained for this site.

Related Site Structure(s): The encased pipeline 200-W-129-PL pipeline crosses the URMA of waste site 200-W-127.

Site Posting: Site 200-W-127 is currently posted as an URMA.

Site Characterization Summary: Two underground pipelines run across and intersect each other beneath 200-W-127. One pipeline is an encased tank farm line that connects the 241-T-151 and 241-T-155 diversion boxes. The second line is an underground black iron pipe that ran to the 207-T retention basin. Both pipelines are different than the pipelines that were the source of contamination for the UPR-200-W-29 and UPR-200-W-97 waste sites.

The site was surface stabilized with 0.6 m (2 ft) of clean gravel in 1994. The location of the site was documented using Global Positioning System (GPS) equipment on October 20, 2004. It is not specified if any other surveys or investigations have occurred at this site. It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided for the site. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Not Specified.

References:

WIDS General Summary Report for site 200-W-127
ArcMap
QMap

Figure 1. ArcMap Image

Figure 2. Reference Drawing-H-2-3020 Sheet 1 Rev.2.

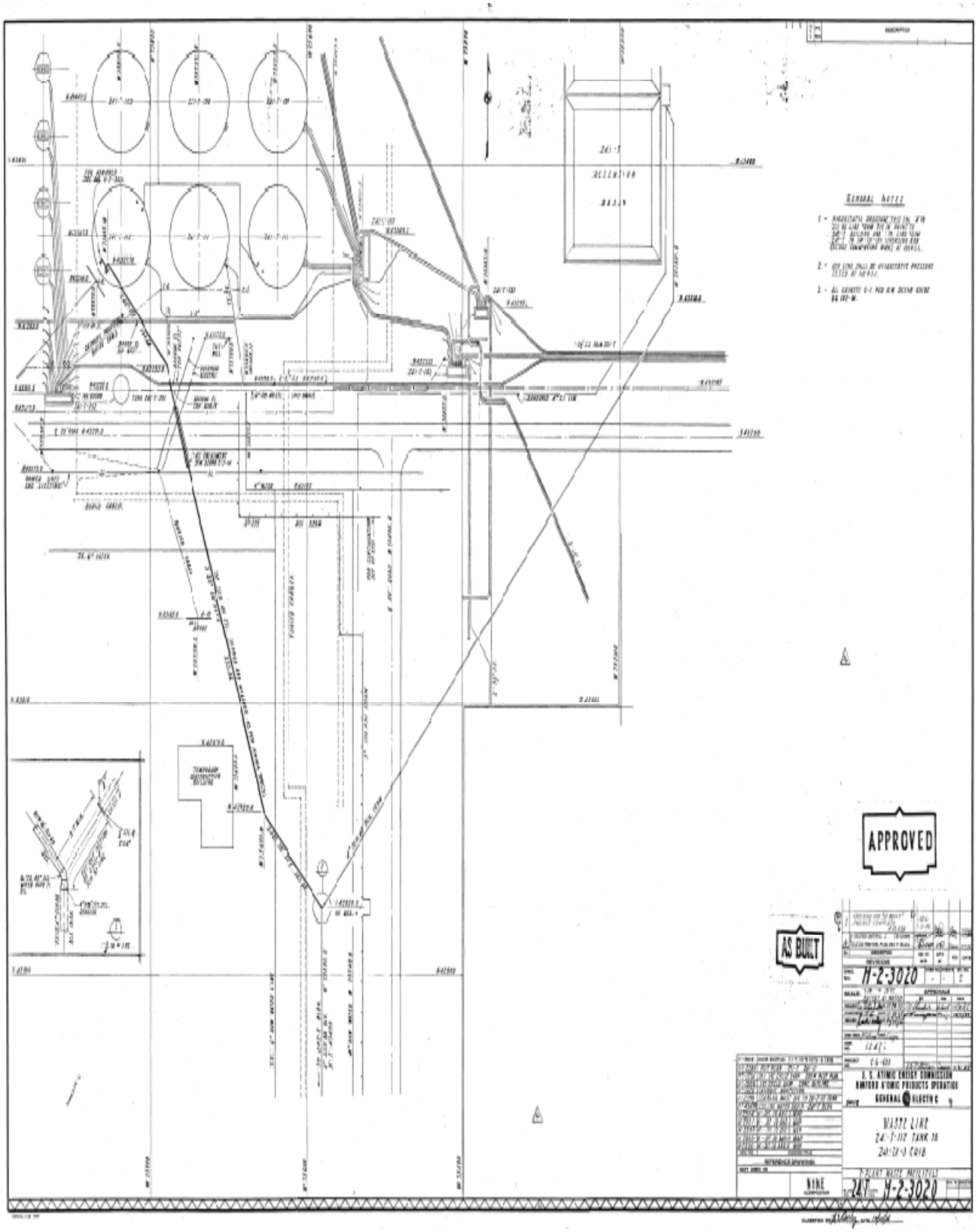
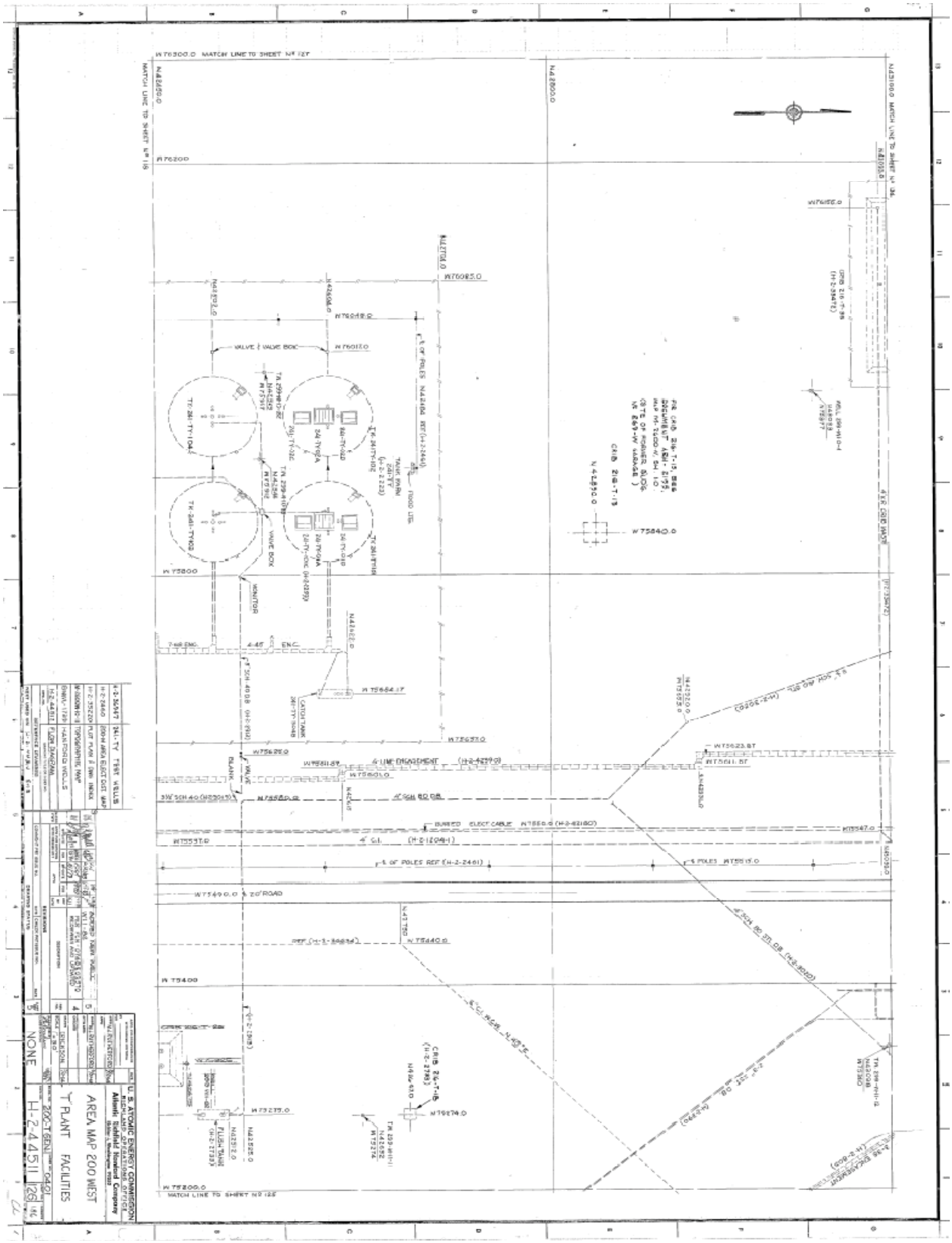


Figure 3. Reference Drawing H-2-44511 Sheet 126 Rev.5



Site Description

Site ID: 200-W-128, Underground Radioactive Material
Site Type: Unplanned Release
Facility/Geographic Area: T-Plant Area East of 218-W-4A.
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-2
Service Dates: Not Specified
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-231 is an unplanned release located 30 m (100 ft) south of 23rd Street, next to the 218-W-4A fence (see Figure 1. ArcMap Image and Figure 2. Site Sketch_200-W-128). The site is posted with Underground Radioactive Material Area(URMA) signs. No engineering reference drawings are available for this site.

Waste Site Coordinates:

E-566406.14592 N-136570.69753

Site Dimensions:

Site Length: 15.2 m (50.0 ft) Site Depth: Not Specified
Site Width: 5.5 m (18.0 ft) Cover Thickness: Not Specified
Dimensions have been estimated by visual observance.

Release Summary: The contaminated sand was deposited onto the site via wind deposition, and was eventually buried beneath an additional layer of blown in sand. The contaminated sand originated from the Burial Ground. It is thought the contamination was first identified in 1988.

The levels of contamination present in the sand are not specified. In addition, it is not specified how deep the layer of contaminated sand was, nor how deep the covering layer of sand is. As the total volume of contamination present is not available, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-128 is associated with the 218-W-4A burial ground.

Site Posting: Site 200-W-128 is posted with URMA signs.

Site Characterization Summary: The site was mapped using Global Positioning System (GPS) equipment on February 10, 2005. No radiological survey data is provided for this site. It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided. If surveys do occur, their frequency is not specified. In addition, it is unclear if any remediation work has occurred at this site.

Potential Contaminants:

Radioactive: Contaminated sand blown in from the Burial Ground.

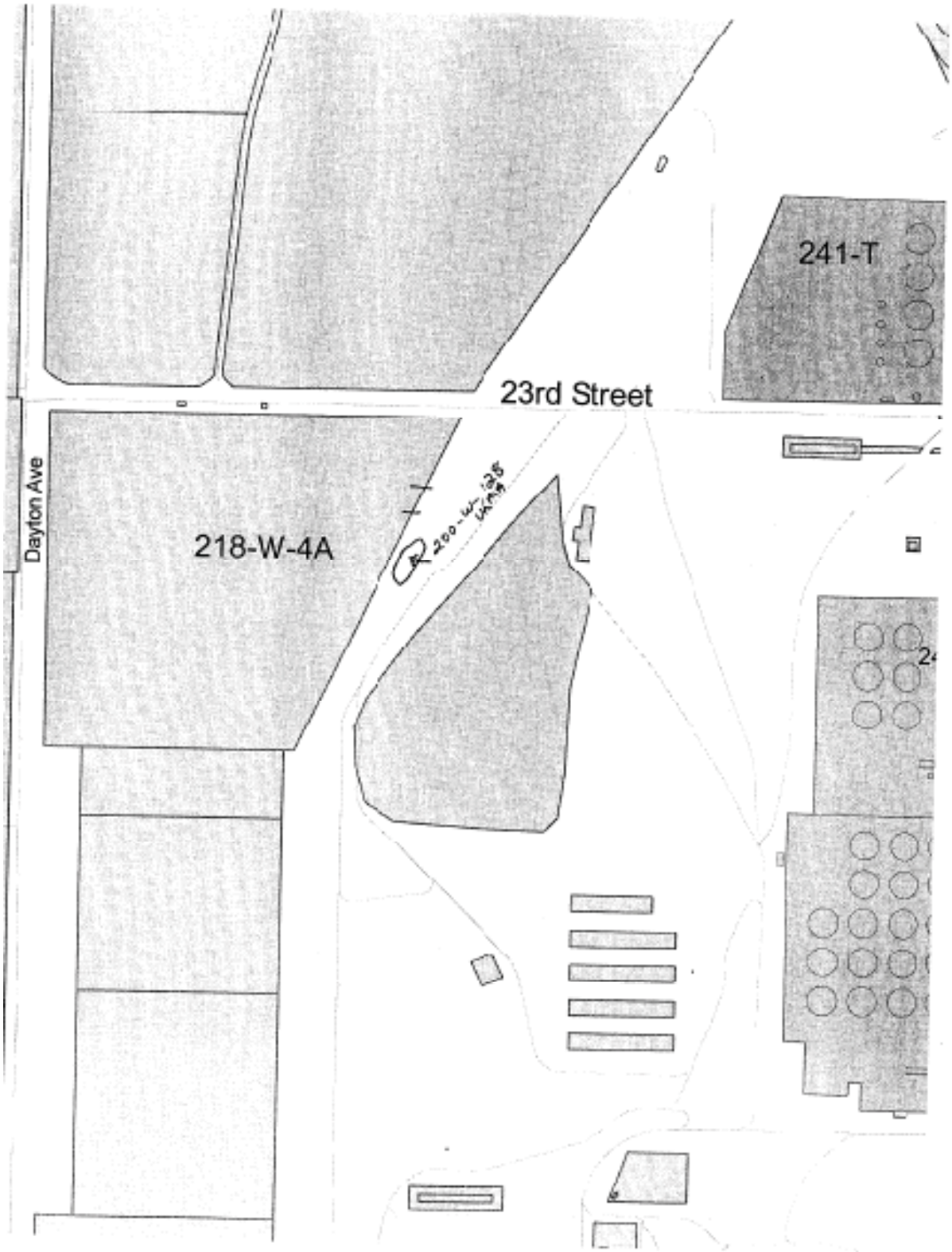
Non-Radioactive: Not Specified.

References:

WIDS General Summary Report for site 200-W-128
ArcMap
QMap

Figure 1. ArcMap Image

Figure 2. Site Sketch 200-W-128



Site Description

Site ID: 200-W-13, 2713-WB Green Hut Complex
Site Type: Maintenance Shop
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UR-1, 200-MG-1
Service Dates: The site was active from an unspecified start date to 1991.
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-13 consists of areas of discolored soil, trash and debris. The site is located north of 19th Street. Site 200-W-13 (alias 2713-WB Green Hut Complex) is approximately 100 m west of Bridgeport Avenue (see Figure 1. ArcMap Image, Figure 2. H-2-90327 Sheet 1 Rev. 1, and Figure 3. SK-4017 Sheet 1 Rev 0). The soil may potentially be discolored by petroleum, and the debris includes vitrified clay pipes, wood, metal, glass, cloth, plastic, rubber, brick, and aerosol cans. In addition, miscellaneous regulated equipment has been stored to the north of 2713-WB. A silver painted Quonset Hut is located onsite. The hut was originally painted green, hence the site's secondary name "the Green Hut Complex".

The site also includes areas with radiation protection posting signs. There is a pink coated stream line on the south side of 2713-WB, suggesting asbestos contamination. In 1995, the north parking area and the area on the west side of the building were chained and posted with Contaminated Area (CA) signs.

Waste Site Coordinates:

E-567180.78772 N-135952.86956

Site Dimensions:

Site Length: 135 m (443.0 ft)
Site Width: 70.0 m (230.0 ft)
Site Area: Not Specified
Site Depth: Not Specified
Cover Thickness: Not Specified

Release Summary: Site 200-W-13 was used for the maintenance and storage of radioactively contaminated equipment and materials; including vehicles. The material and equipment were stored outside and north of 2713-WB until 1991. The inside of the "Green Hut" was used as a Regulated Vehicle repair shop during the 1980's.

The type and volume of wastes released is not specified. In addition, it is not clear how long the site was actively used as a storage yard and maintenance facility for contaminated equipment. Therefore, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-13 is associated with the Minor Construction Area, Paint Shop, Shops, and the Power House.

Site Posting: In 1995, the north parking area and the area on the west side of the building were chained and posted with CA signs. The site also includes areas with radiation protection posting signs.

Site Characterization Summary: It is not specified if any surface stabilization work has occurred at 200-W-13. For initial review purposes, a site walkdown occurred on August 11, 1995. From October 25 to November 14, 1995, the site was mapped using GPS survey equipment. It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided for the site. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Not Specified.

References:

WIDS General Summary Report for site 200-W-13
ArcMap
QMap

Figure 1. ArcMap Image

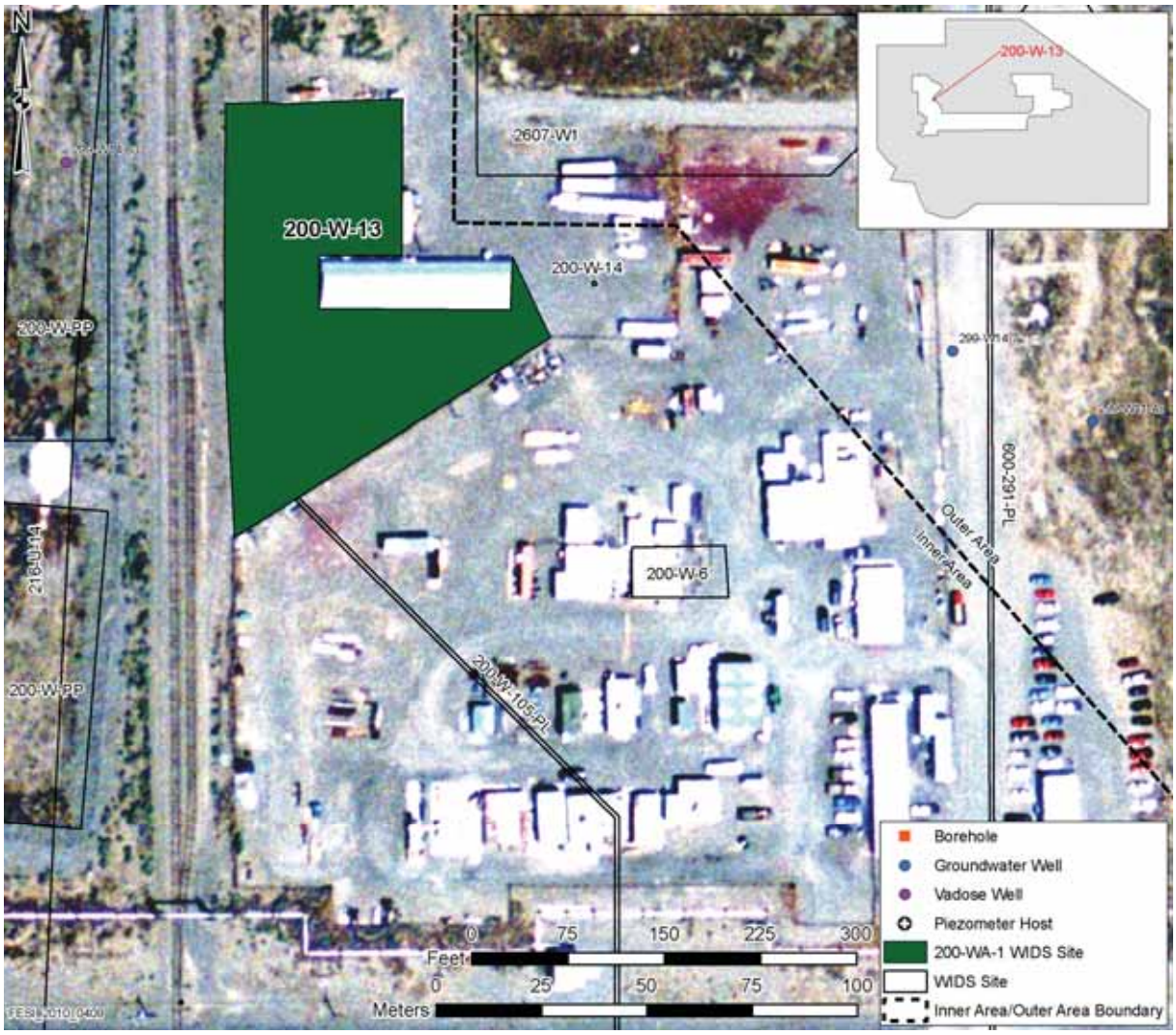


Figure 2. H-2-90327-Sheet 1 Rev. 1

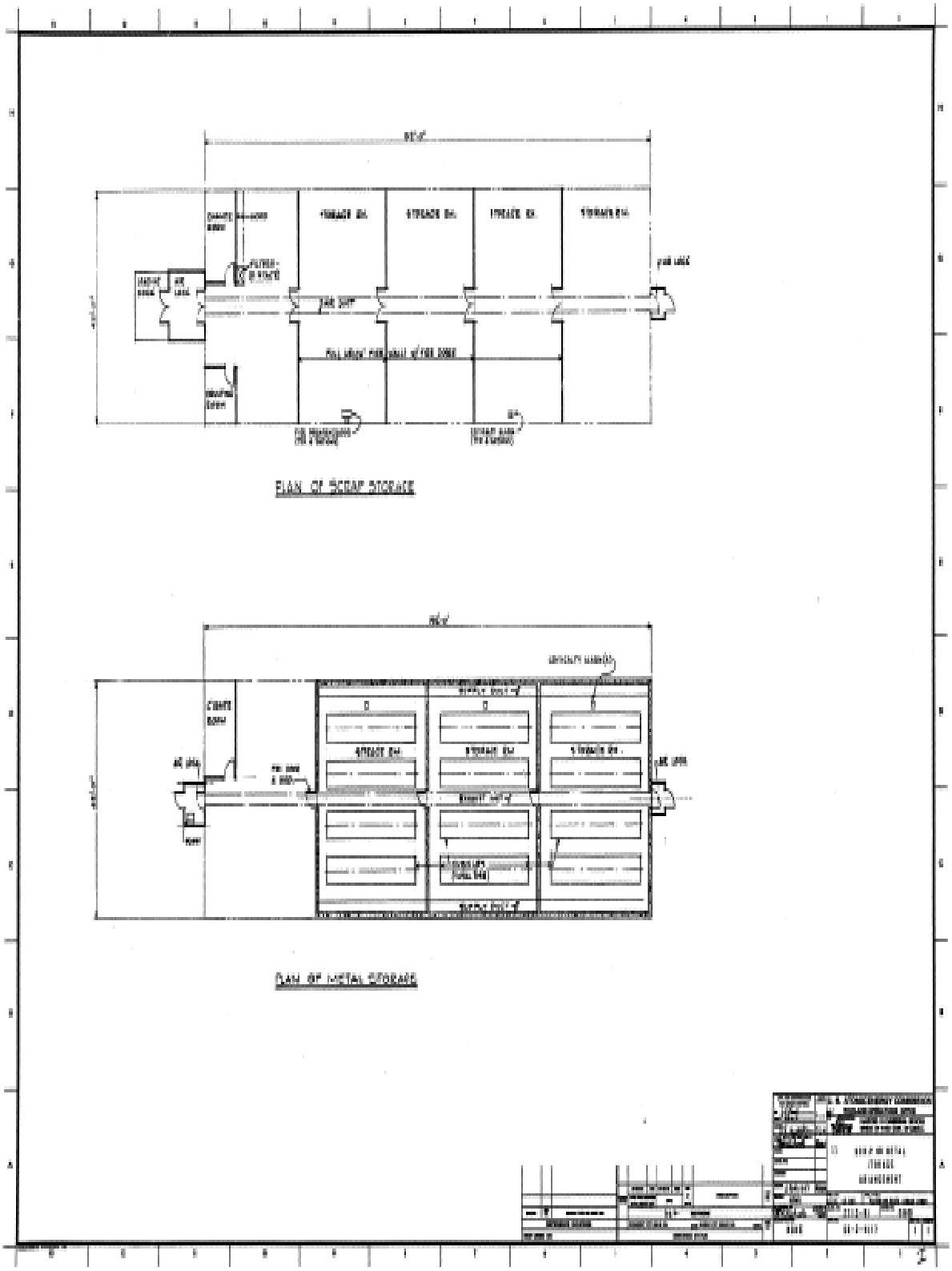


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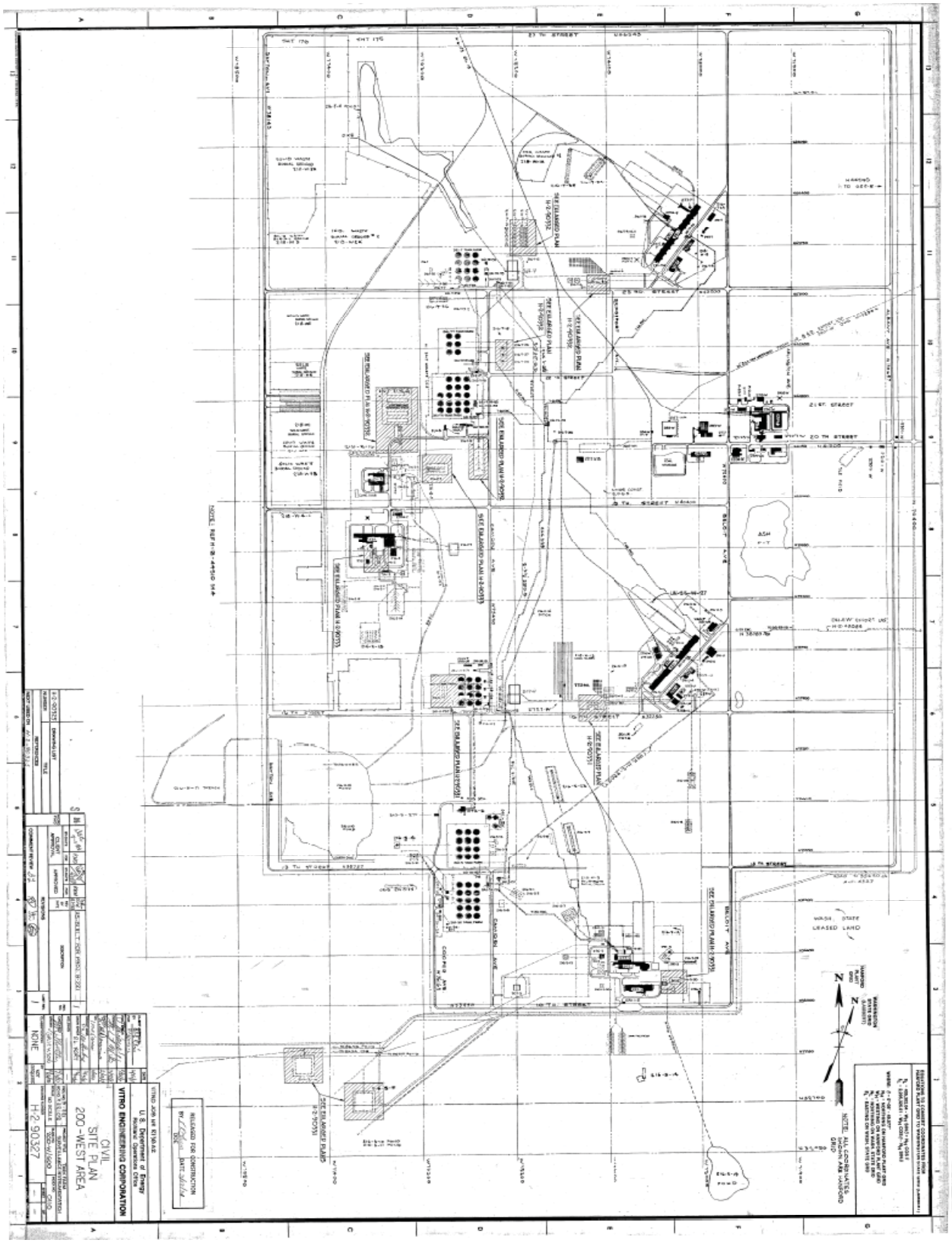
Figure 3. SK-4017 Sheet 1 Rev. 0



Site Description

Site ID: 200-W-136, Underground Radioactive Area including 222-U Building Foundation, Demolished 203-U Area and Contaminated Soil
Site Type: Unplanned Releases, demolished buildings
Facility/Geographic Area: U-Plant
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1, 200-MG-2
Service Dates: 1947 to 2005
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-136 is located east of the 221-U Canyon Building, northeast of 224-U, and southwest of the 291-U exhaust stack. It is west of Beloit Avenue (see Figure 1. ArcMap Image and Figure 2. U-Plant Area Map). The site is an irregular shaped gravel area consisting of demolished buildings and unplanned releases within an Underground Radioactive Material Area (URMA). The 222-U Building foundation is located within the URMA and is not individually marked or posted. The URMA posted area and gravel layer also cover the demolished remains of the 203-U tanks and 272-U Hot Shop and areas of soil contamination created during building demolition. No reference drawings are available for this site.

Waste Site Coordinates:

E-567590.25401 N-135084.09567

Site Dimensions:

Site Length: 49.0 m (160.0 ft) Site Depth: None
Site Width: 12.2 m (40.0 ft) Cover Thickness: Not Specified
Site Area: Not Specified
Note: site dimensions of the original 222-U building, calculated from ArcView.

Site Length: 154.0 m (505.0 ft) Site Depth: None
Site Width: 64.0 m (209.0 ft) Cover Thickness: Not Specified
Site Area: Not Specified
Note: Estimated dimensions of the irregularly shaped, posted URMA polygon. The dimensions were calculated from the Arcview map of this waste site.

Release Summary: The 200-W-136 waste site includes a number of demolished buildings and posted unplanned release sites. The 222-U Building is located within the 200-W-136 waste site. The 222-U Building was constructed in 1944, and was brought online in 1947. The Facility was operational from 1947 through 1972. The 222-U Building was constructed as a Sample Preparation Laboratory to assist the 221-U Canyon. The purpose of the Laboratory was to analyze the 221-U process liquid during different stages of the uranium recovery process to determine whether the process was working within the operational specifications. Later, the building was used to test samples obtained during the uranium trioxide process.

The 200-W-136 waste site also includes the 203-U tanks, which were associated with the 224-U facility Uranium Tri-oxide process. The 203-U tank facility consisted of a concrete enclosure containing two 375,000 L (100,000 gal) uranyl nitrate feed tanks.

The volume of condensate the 222-U Building received during all or part of its operational lifetime is not specified. Therefore, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-136 is associated with the 221-U and 224-U facilities, french drains 200-W-107, 200-W-108, 200-W-109, 200-W-111, and the 216-U-4, 216-U4A and 216-U-4B reverse wells.

Site Posting: Site 200-W-136 is posted as an "Underground Radioactive Material Area" (URMA) signs.

Site Characterization Summary: The 222-U Building and several other structures associated with the 224-U facility were demolished in 2005. As part of the demolition, the metal lids covering the associated french drains were removed. The drains were filled to their top with 7.6 to 10 cm (3 to 4 in) of sand, and crushed rock was added around the drain features. The entire area was covered with clean gravel and 200-W-136 was posted as an URMA.

A site walkdown occurred on October 28, 2005 to document site conditions. Observers discovered that the 222-U foundation had been covered with gravel and posted with URMA signs. A Global Positioning System (GPS) survey mapped the site on January 18, 2006.

No additional site characterization information is presented for 200-W-136. It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Not Specified.

References:

WIDS General Summary Report for site 200-W-136
ArcMap
QMap

Figure 1. ArcMap Image

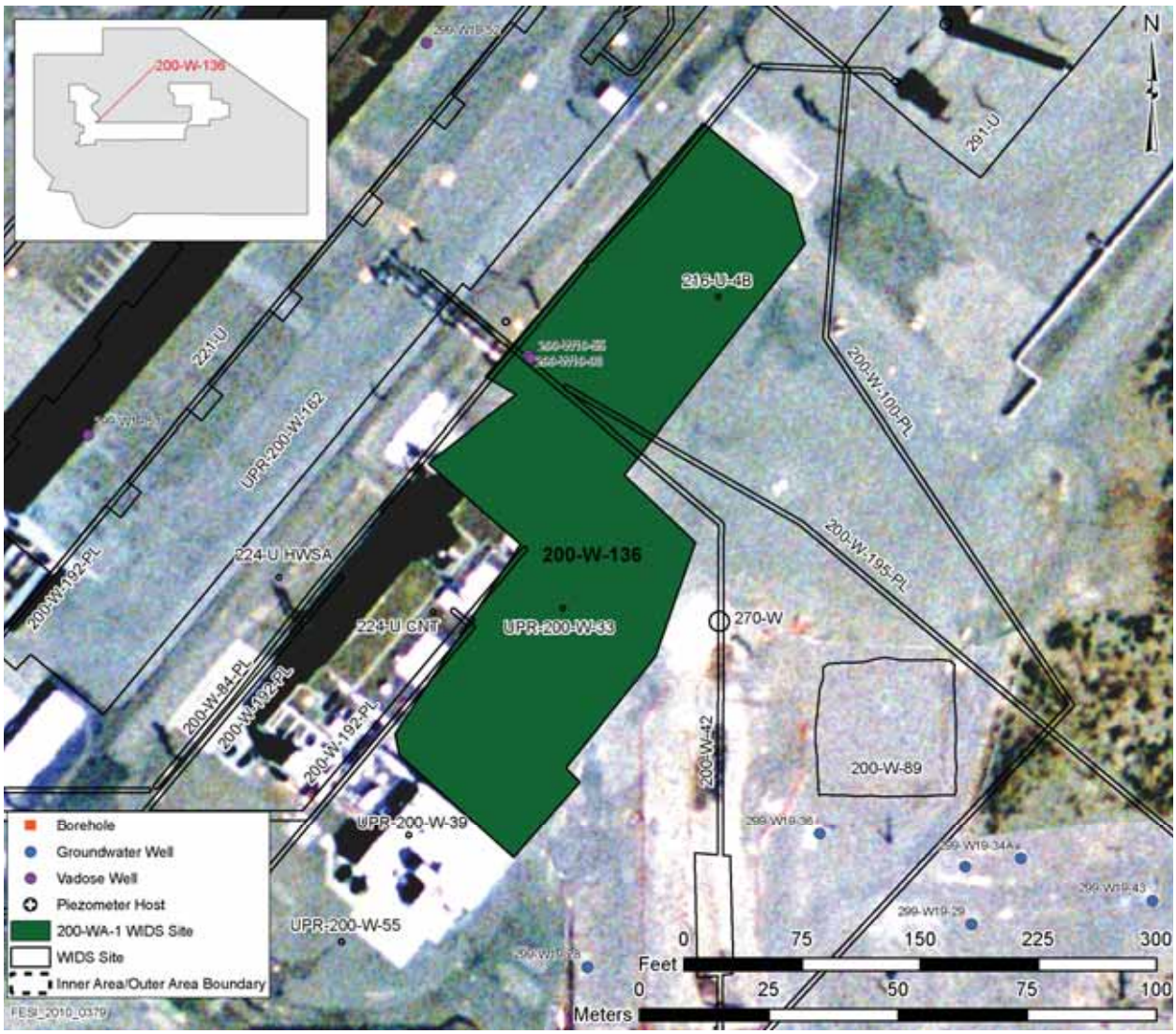
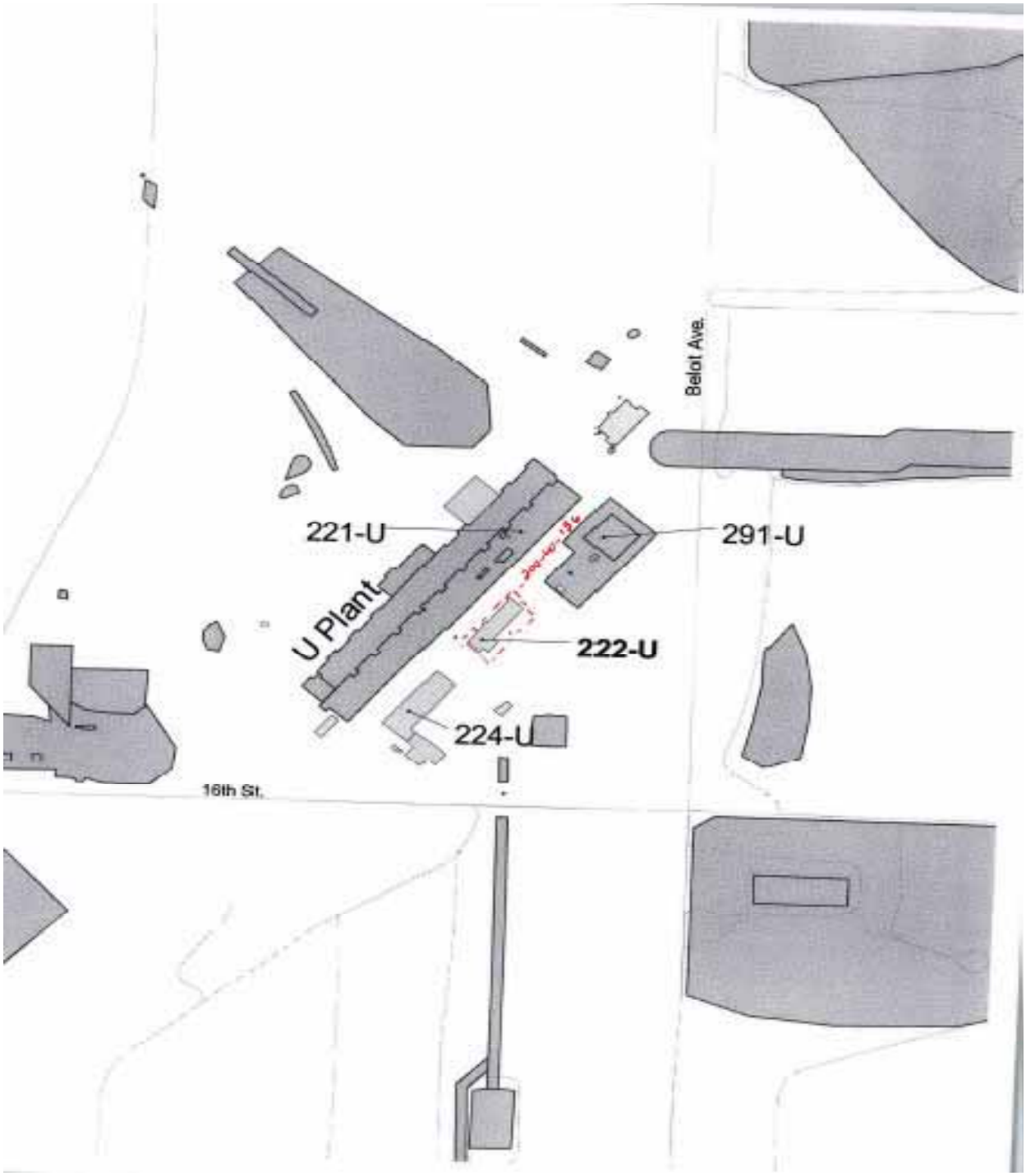


Figure 2. U-Plant Area Map



Site Description

Site ID: 200-W-14, 200 West Heavy Equipment Storage Area
Site Type: Dumping Area
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-MG-1
Former OU Assignment: 200-MW-1
Service Dates: Not Specified
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-14 is a large, irregularly shaped gravel parking (Figure 2) lot that was used for the storage and parking of heavy equipment, including cranes, forklifts, diesel generators, and backhoes. The site includes five or six large patches of petroleum contaminated soil. The site is located northwest of the intersection of Bridgeport Avenue and 19th Street (See Figure 2. per QMap and Figure 3. T-Plant Area Map).

Waste Site Coordinates:

Lon-567259.13595 Lat-135927.87469

Site Dimensions:

Site Length: 24.4 m (80.0 ft)
Site Width: 9.1 m (30.0 ft)
Site Area: Not Specified
Site Depth: 0.6 m (2.0 ft)
Cover Thickness: Not Specified

Dimensions are for the five or six large spots of petroleum contaminated soil.

Site Length: 36.0 m (118.1 ft)
Site Width: 11.0 m (36.1 ft)
Site Area: 360.0 m sq (3,775.0 ft sq)
Site Depth: 0.6 m (2.0 ft)
Cover Thickness: Not Specified

The length and width values are estimates of the irregular shape. These values were obtained from the GPS survey data using ArcInfo and ArcView.

Release Summary: Site 200-W-14 was used for the parking and storage of heavy equipment. Soil contamination occurred at this site overtime due to leaks, seepage, or overflow from the parked vehicles. The leaks and overflow were more frequent during hot weather. No drip pans or containment equipment was used at this site. The soil at the site is contaminated down to a depth 0.6 m (2 ft) or more.

The volume of wastes released is not specified for this site. In addition, it is not clear how long the site was actively used as a storage yard, or how long equipment had been leaking or overflowing. Therefore, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-14 is associated with the building trades and craft shops.

Site Posting: The posting for 200-W-14 is not specified.

Site Characterization Summary: A site walkdown on August 11, 1995 for initial review purposes confirmed that no drain pans or containment equipment was present. In addition, staff

noted that the parked equipment was leaking during the site investigation. The site was mapped on November 14, 1995 using Global Positioning System (GPS) survey equipment.

It is not specified if any surface stabilization work has occurred at 200-W-14. In addition, it is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided for the site. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Petroleum contamination from leaking vehicles and from vehicle overflow.

Figure 1. ArcMap Image

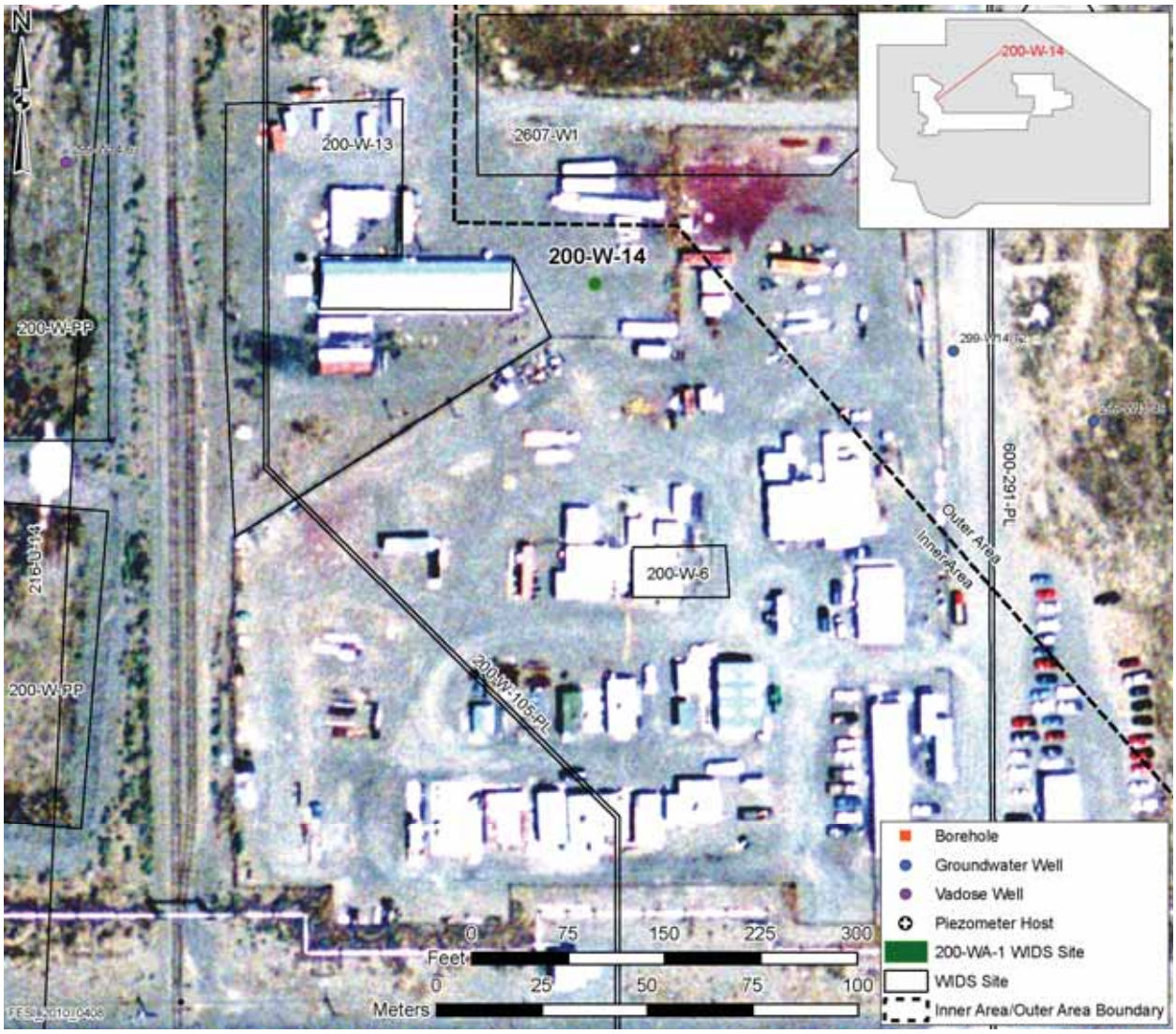


Figure 2.

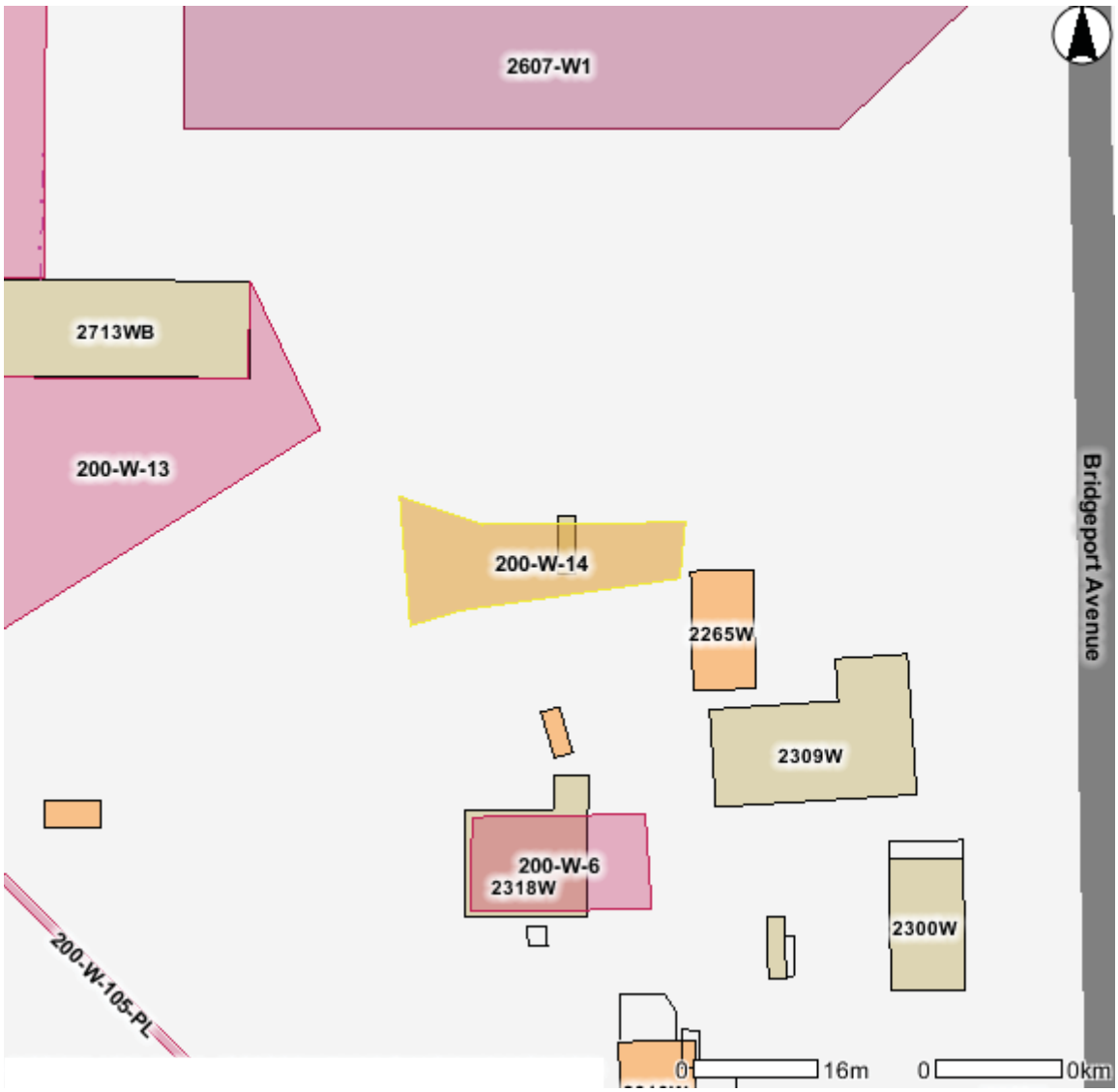
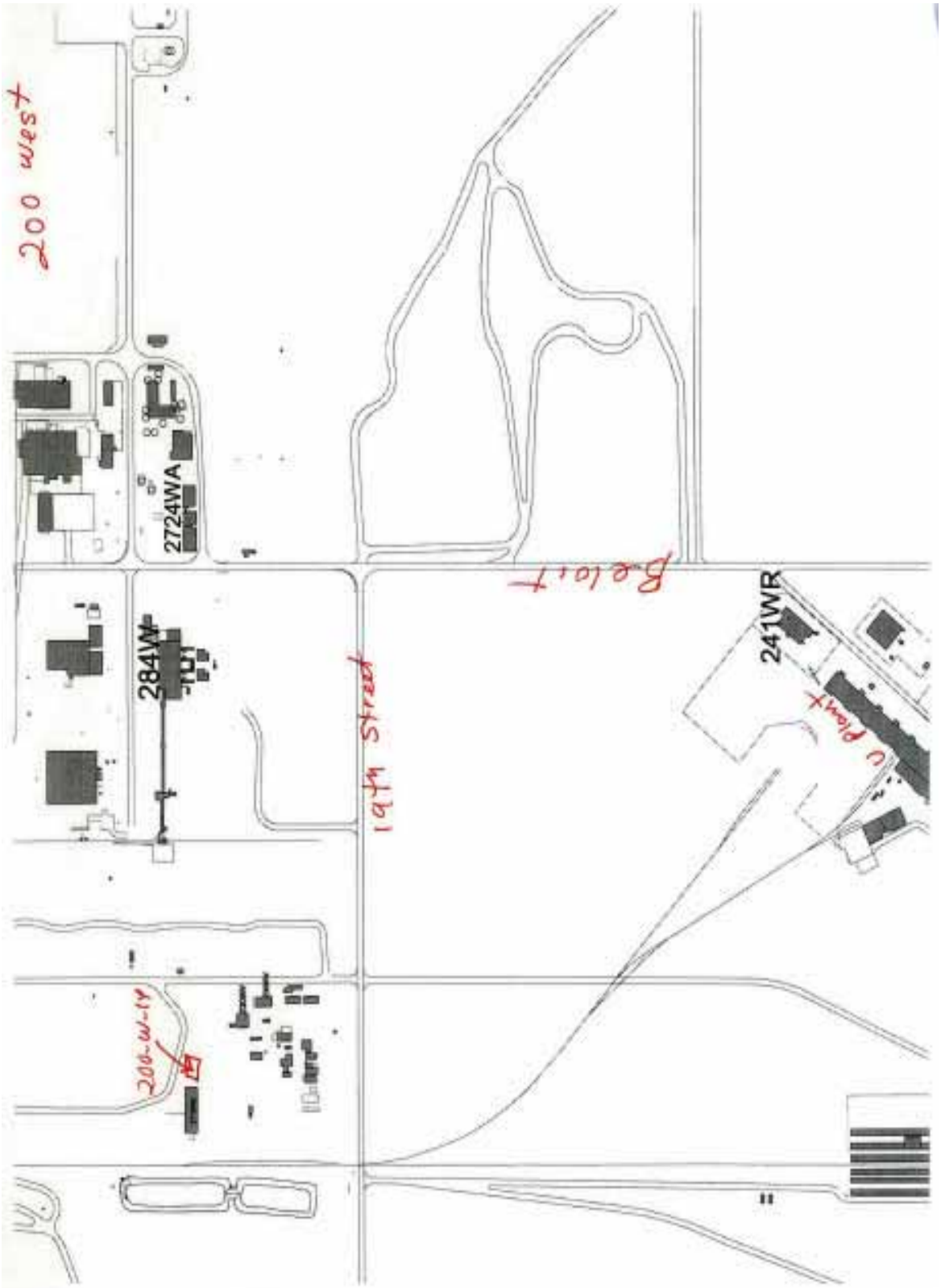

2607-W1
2713WB
200-W-13
200-W-14
2265W
2309W
200-W-6
2318W
2300W
200-W-105-PL
Bridgeport Avenue
0
16m
0
0km

Figure 3. Plant Area Map



Site Description

Site ID: 200-W-15, S Plant Project W-087 Hexone Discovery
Site Type: Unplanned Release
Facility/Geographic Area: S-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UR-1
Service Dates: NA
Volume/Mass Discharged: Unknown

Waste Site Location and Physical Description: The site is located approximately 18 meters (59 feet) southwest of the southwest corner of REDOX (202-S) (see Figures 2 and 3). The pipe trench where the hexone contaminated soil was found has been back filled to grade with soil originally removed from the excavation. Hexone contaminated soil was also put back into the excavation. There is currently no visual evidence of this excavation on the surface. The area is now under asphalt.

Waste Site Coordinates:

E-567306 (m) N-133934 (m)

Site Dimensions:

Site Length: 12.19 m (40 ft)
Site Width: 2.44 m (8 ft)
Site Area: 29.73 m^2 (320 ft^2)
Site Depth: 0.69 m (2 ft)
Cover Thickness: 0.69 m (2 ft)

Release Summary: In June 1995, while excavating pipe trench for Project W-087 (new transfer lines from 222-S to 244-S), a dark 3- inch thick discolored soil layer was observed at a depth about 2 feet (see attached Pipe Trench Construction Photos). It was determined to be hexone and surfactants. The hexone contaminated soil was stockpiled and returned to the excavation after the pipe was installed in the trench. The estimated total volume of contaminated soil is approximately 80 ft^3 (2.27 m^2).

Related Site Structure(s): The site is associated with 202-S, 222-S, and 244-S.

Site Posting: The site is not marked or posted.

Site Characterization Summary: GPS surveys were conducted for the site on November 8 and 14, 1995. Site inspections were performed on August 11, 1995 and August 18, 1999. In August 1999, the site was covered by asphalt and there was no evidence on the surface of where the excavation was located.

Potential Contaminants:

Radioactive: N/A

Non-Radioactive: hexone and surfactants

References:

All information from WIDS Summary Report unless otherwise noted.

Figure 1. ArcMap Image

Figure not available.

Figure 2. Site 200-W-15 Location Map

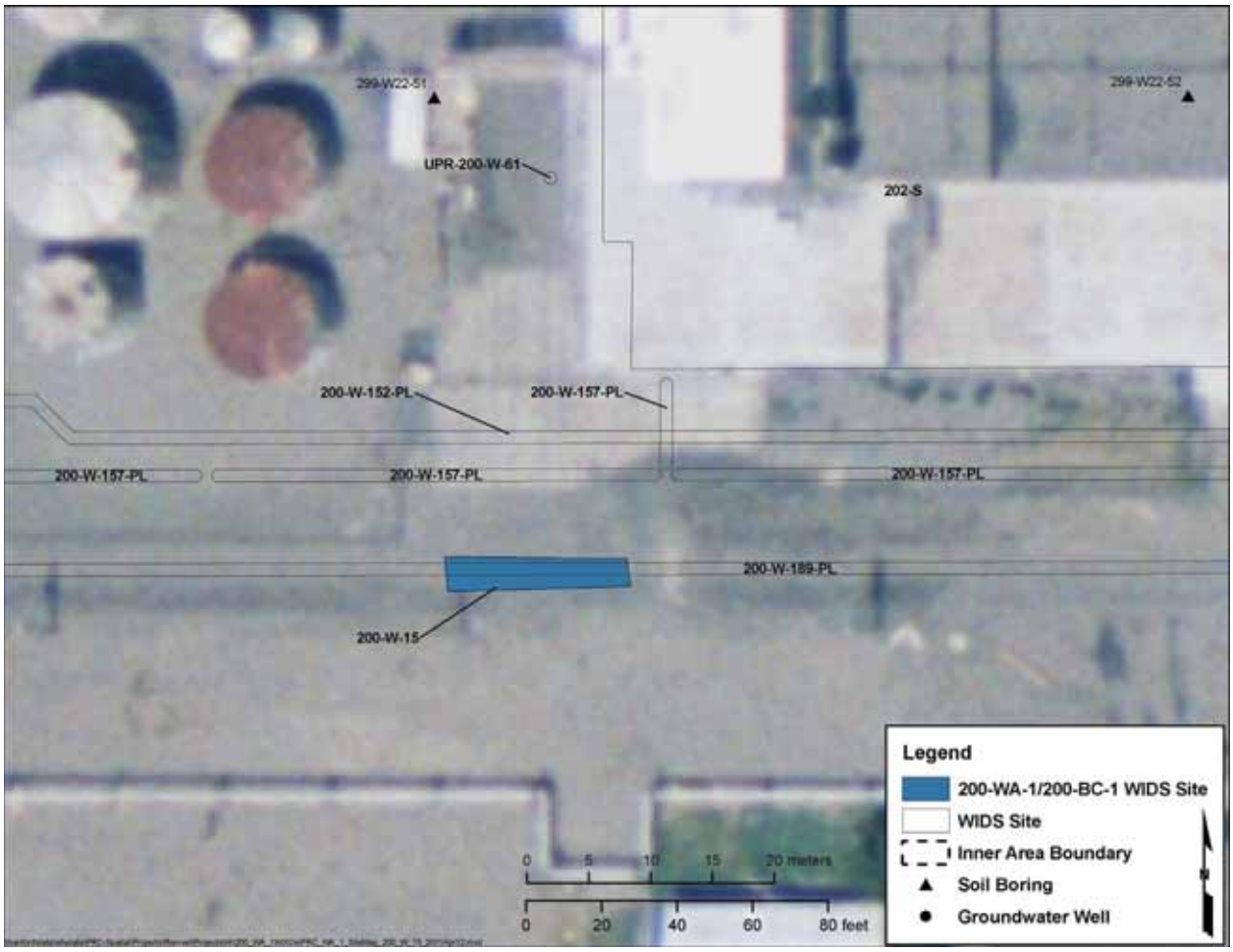
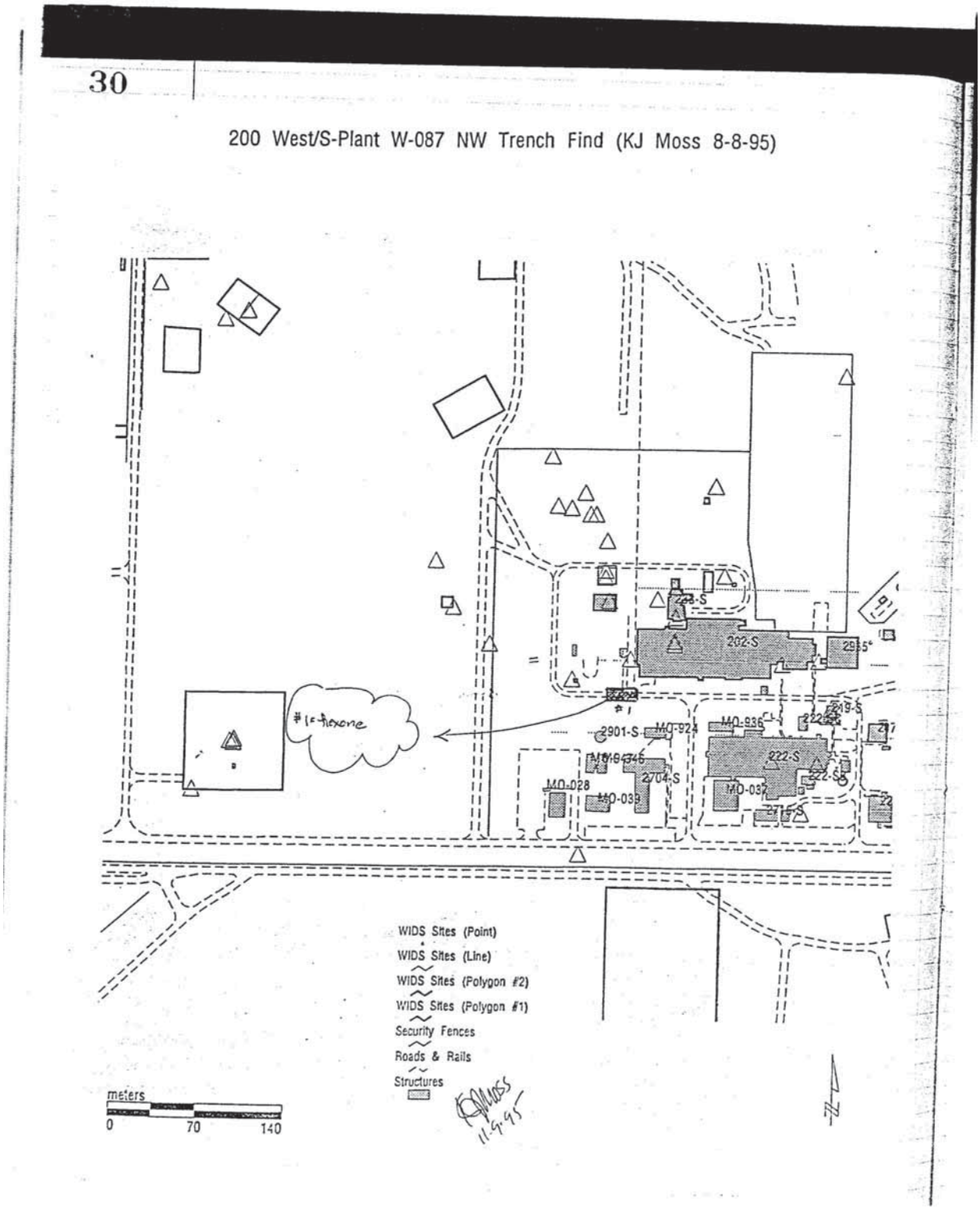


Figure 3. Site 200-W-15 Location Sketch



Pipe Trench Construction Photos

200-W-15

Site Description

Site ID: 200-W-2, REDOX Berms West
Site Type: Spoils Pile/Berm
Facility/Geographic Area: S-Plant (REDOX) Area
Current OU Assignment: 200-MG-1
Former OU Assignment: 200-SW-1
Service Dates: Unspecified
Volume/Mass Discharged: Unspecified

Waste Site Location and Physical Description: 200-W-2 is located northwest of the 202-S Facility, and is outside the REDOX exclusion fenceline (See Figure 2. per QMap and Figure 3. 200-W-2 Site Location Sketch). Site 200-W-2 consists of mostly flat, level, land with several acres of disturbed soil, and two unmarked and unposted bermed areas. One berm is approximately 1.5m (5ft) high and 9.2m (30ft) wide. The second berm is approximately 3.1m (10ft) high and 15.3m (50ft) wide.

Waste Site Coordinates:

Lon-567160.93748 Lat-134008.03128

Site Dimensions:

Site Length: Irregular m (Irregular ft)
Site Width: Irregular m (Irregular ft)
Site Area: 248.0 m2 (2670.0 ft2)
Site Depth: Not Specified
Cover Thickness: None

Release Summary: The wastes contained at this site are unspecified, and no release volume is presented for 200-W-2. However, the berms may cover contaminated soil or debris. It has been reported that ventilation equipment had been cleaned in the area, but the exact location cannot be verified.

Related Site Structure(s): Not specified.

Site Posting: Not specified.

Site Characterization Summary: A site characterization is needed for this site as the wastes at this unit are not specified (see section 5.3). No radiological surveys have been conducted at this location.

A site walkdown and Global Positioning System (GPS) survey occurred on August 18, 1999 to verify the site location and extent, and to map the site boundary. Staff did not find any markings or postings related to the site indicating waste was buried at the location.

Potential Contaminants:

Radioactive: Not Specified

Non-Radioactive: Not Specified

Figure 1. ArcMap Image

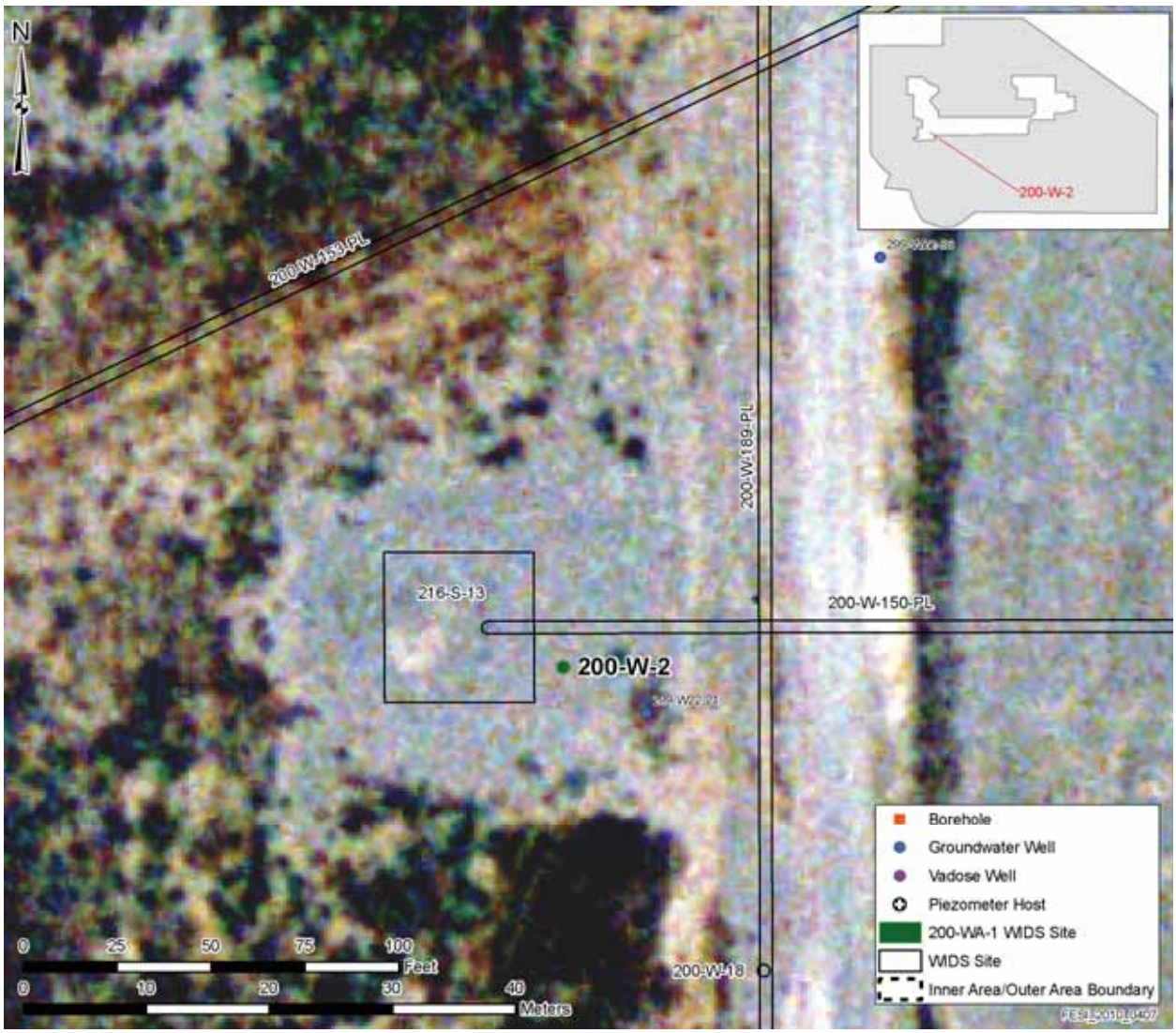
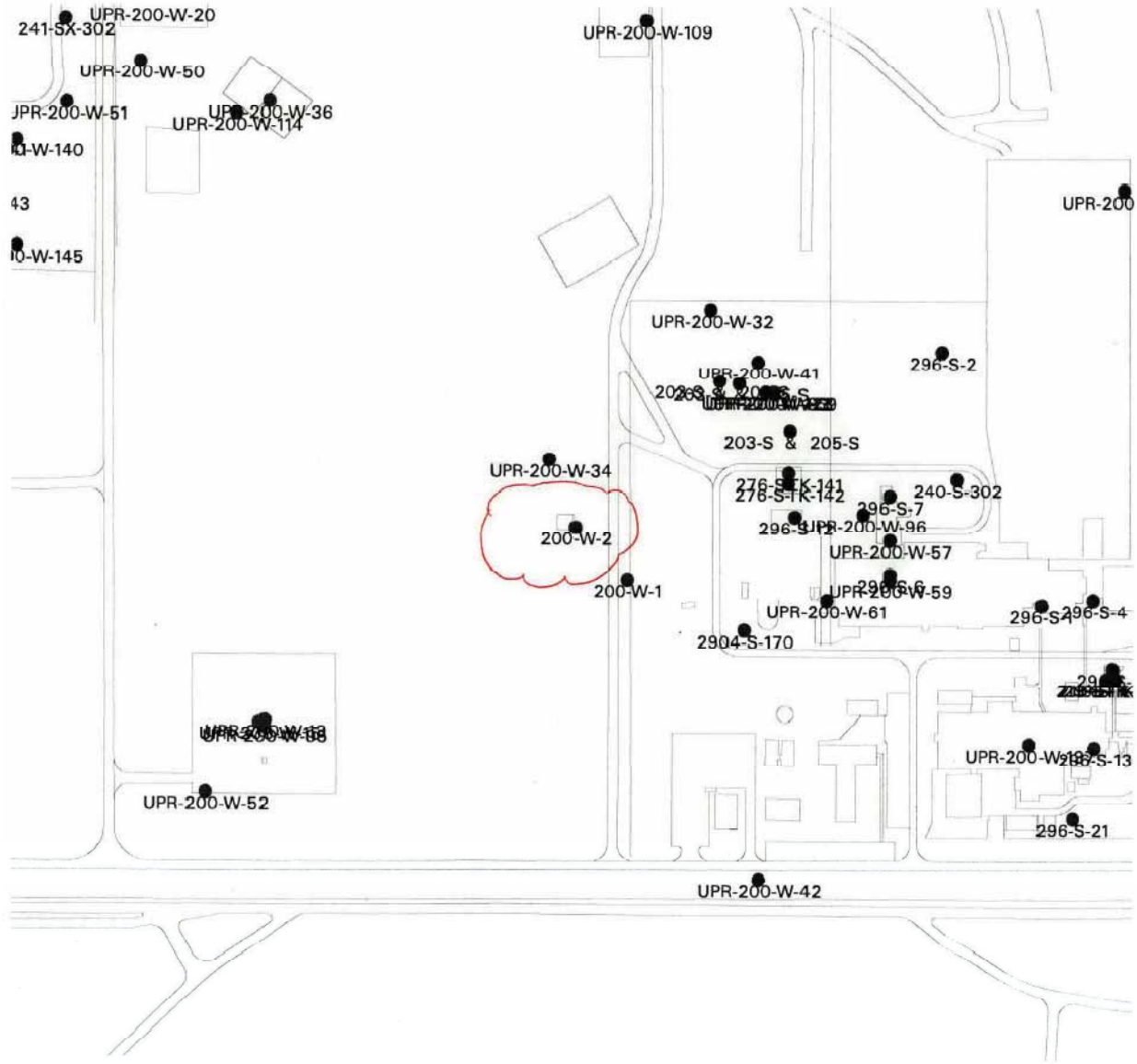


Figure 2. Insert Site Map

Figure not available.

Figure 3. 200-W-2 Site Location Sketch



Site Description

Site ID: 200-W-21, 204-T Unloading Station, T-Plant Waste Railcar Unloading Facility, Unloading Station 1 and Unloading Station 2
Site Type: Pump Station
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-1, 200-MW-1
Service Dates: From 1966 to 1968
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: The 204-T Unloading Station is located west of 221-T at the north end of the 216-T-34 Crib (See Figure 1. ArcMap Image). Site 200-W-21 was an unloading station, and included two unloading platforms: Unloading Station 1, Unloading Station 2, and associated piping (Figure 2. Reference Drawing H-2-32649). In addition, the area has a short railroad siding extending from the main rail line into the T-Plant. Both unloading platforms and their piping were removed in 1996. However, the concrete structural foundations were left behind and were eventually buried beneath a layer of poured concrete. A layer of gravel 15 cm (6 in) deep was later placed on top of the poured concrete. The site is posted with Underground Radioactive Material Area (URMA) signs.

Waste Site Coordinates:

E-567309.49781 N-137135.90074

Site Dimensions:

Site Length: 1.52 m (5.0 ft)
Site Width: 0.91 m (3.0 ft)
Site Area: Not Specified
Site Depth: Not Specified
Cover Thickness: Not Specified

Note: Dimensions are for the two concrete pads.

Release Summary: The platform structures at site 200-W-21 were used to unload 300 Area liquid laboratory waste transported via railroad tanker cars from the 340 Facility. The radioactive laboratory waste was pumped through one of two pipelines into the adjoining 216-T-34 and 216-T-35 Cribs.

In 1967, an estimated 30 cubic meters (40 cubic yards) of contaminated soil was removed from the bottom of the unloading station. Additional surface contamination was discovered and documented in 1987 and 1989. The contamination discovered in 1989 was located within the two unloading platform station drains. Readings taken from the drains showed contamination levels as high as 4,000 dpm of beta/gamma and 1,800 dpm of alpha contamination. Contamination smears on the eastern drain found 600 dpm of removable alpha contamination. In addition, a brick inside the posted URMA was found to have fixed alpha contamination up to 2450 dpm on September 14, 1995. However, the total volume of wastes unloaded or potentially released at this site is not specified. Therefore, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-21 is associated with the 216-T-34 Crib, 216-T-35 Crib, and the 340 Facility in the 300 Area. The pipeline from Unloading Station 1 to the 216-T-34 Crib

is labeled as sitecode 200-W-196-PL. The pipeline from Unloading Station 2 to the 216-T-35 Crib is labeled as sitecode 200-W-197-PL.

Site Posting: Site 200-W-21 is posted as an URMA.

Site Characterization Summary: The ground was partially surface stabilized in 1989, when the pump and piping equipment were removed, and concrete was poured into the drain pads.

In 1996, additional remediation work removed the platform structures, storage sheds and light fixtures. The contaminated area was buried beneath 15 cm (6 in) of gravel and reposted as an URMA.

The site was mapped using Global Positioning System (GPS) equipment on February 11, 1998. On September 14, 1995, a radiation investigation occurred as part of a routine outdoor survey. A PAM (alpha) instrument detected maximum, fixed alpha contamination on a brick inside the posted boundary of 2450 dpm. A site walkdown on March 1, 2000 for verification purposes confirmed that site structures had been removed, and that only the concrete foundation pads remained. A surface radiological survey occurs annually.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Liquid laboratory waste.

References:

WIDS General Summary Report for site 200-W-21
ArcMap
QMap
Reference Drawing_H-2-32649

Figure 1. ArcMap Image

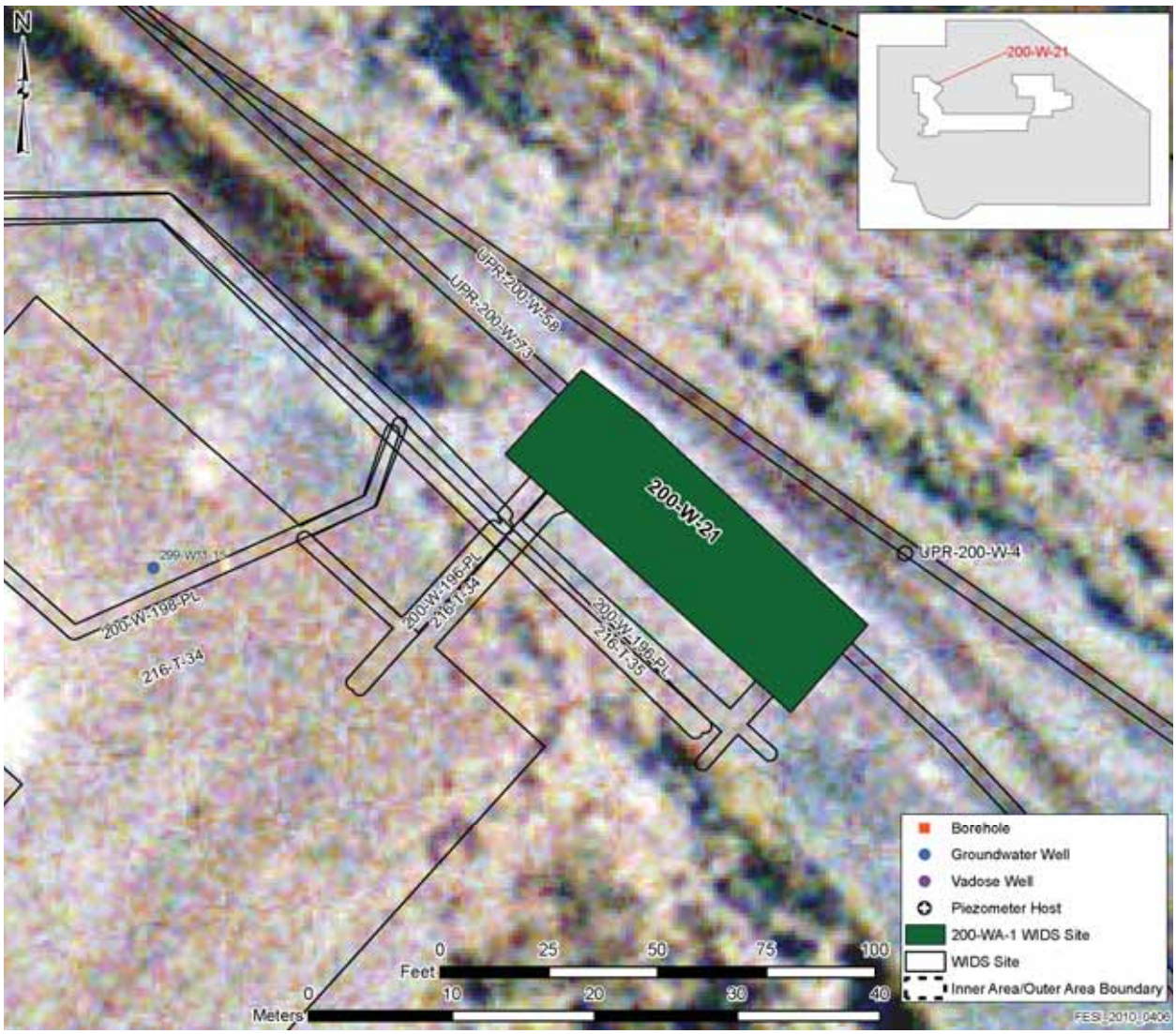
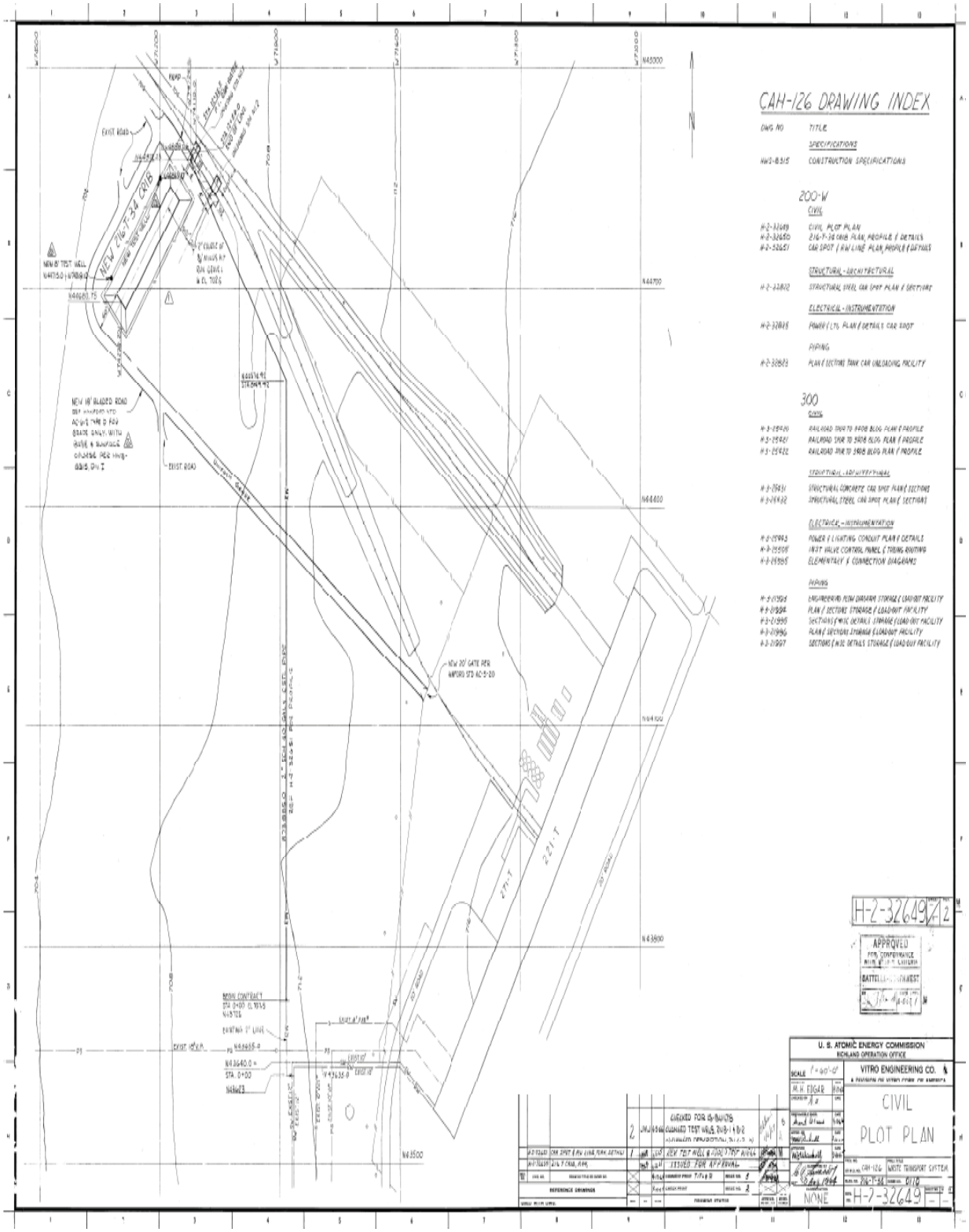


Figure 2. Reference Drawing H-2-32649



Site Description

Site ID: 200-W-22, 203-S/204-S/205-S
Site Type: Unplanned Release Stabilized Area
Facility/Geographic Area: S-Plant (REDOX) Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-PW-2, 200-MG-1
Service Dates: Early 1950's to 1981
Volume/Mass Discharged: Unspecified

Waste Site Location and Physical Description: Site 200-W-22 consists of multiple unplanned releases (UPR's) and areas contaminated during processes associated with REDOX Plant operations. The site includes the 203-S, 204-S and 205-S Facilities and associated Unloading Platforms, and is located northwest of the 202-S Facility (See Figure 1. ArcMap Image and Figure 2. Reference Drawing H-2-44511 Sheet 29). In 1983, the site was decommissioned and all above ground surface features were removed. However, the cement basins and buried piping are still present at the site.

The 203-S and 205-S Facilities were constructed in the early 1950's to process and decontaminate the uranyl nitrate hexahydrate (UNH) produced by Reduction Oxidation (REDOX) operations. The primary process unit consisted of a column filled with silica gel that removed traces of fission products from the UNH. The silica gel column (SG-1) was located in the underground 205-S Vault. The Vault also contained a waste neutralization tank. The 205-S Facility was a two story, aboveground, chemical make-up building. It contained two chemical make-up tanks, a UNH sample room and extensive piping connected to the REDOX facility and the underground vault.

The 203-S Facility was an above ground UNH storage facility that consisted of two 19,000 L (5,000 gal.) stainless steel tanks that were set in an open concrete basin. There was also a 204-S Tank Farm, that consisted of four 190,000 L (50,000 gal) aboveground tanks set in two open concrete basins.

A UNH Unloading Facility was located at the adjacent railroad siding. UNH from the PUREX Plant were transported by truck to the unloading station and placed in the 204-S Tanks. The PUREX solutions were then processed through the silica gel column. An above ground UNH pipeline connected the 203-S, 204-S, 205-S Area to the 224-U Facility.

After REDOX shut down in 1965, the 203-S and 205-S were placed on standby. The Unloading Station was converted to a railcar unloading station, and the 204-S-4 Tank was connected to the 240-S-151 Diversion Box so that waste could be transferred to the Tank Farms

Waste Site Coordinates:

E-567285.86635 N-134098.40974

Site Dimensions:

Site Length: 84.0 m (276.0 ft)
Site Width: 68.0 m (223.0 ft)
Site Area: 5712.0 m2 (61548.0 ft2)
Site Depth: 3.0 m (10.0 ft)
Cover Thickness: 0.6 m (2.0 ft)

Release Summary: Releases at 200-W-22 are associated with the unloading, transportation, and processing of UNH, and the long term storage of contaminated waste.

Waste processed and stored in this area included contaminated UNH from REDOX and PUREX, Thorium Nitrate from PUREX, 100-N Reactor decontamination waste, and 300 Area Laboratory wastes. After 1965, the 204-S-1, S-2 and S-3 Tanks continued to store shipments of these wastes from the Unloading Station. Radiological contaminants may still be present in and around the remaining contaminated structures (cement basins and piping) that were not removed in the 1983 stabilization effort.

In addition to waste stored at the associated facilities, several UPR's occurred over the years at the site. In 1952, the ground around the 203-S Uranium Nitrate Hexahydrate Storage Tanks was contaminated with Uranium. A maximum of 10,000 cpm at 2.5 cm (1 in) was found in this area.

Another two UPR's; UPR-200-W-116, and UPR-200-W-123, involve spills or speck contamination associated with the unloading station. UPR-200-W-116 consists of contaminated soil specks located east of the railcar unloading station. UPR-200-W-123 occurred on January 18, 1979, when a railroad tank car spilled a small amount of radioactive liquid waste from the 300 Area onto the ground at the 204-S Unloading Station.

Related Site Structure(s): The site is associated with the 203-S & 205-S UNH Processing Facilities, the REDOX UNH Unloading Facility, and UPR-200-W-32, UPR-200-83, UPR0200-W-10, UPR-200-W-69, UPR-200-W-86, UPR-200-W-116, UPR-200-W-123.

Site Posting: The site is currently posted as an Underground Radioactive Materials Area (URMA). In addition, there are also two small, posted URMA's located under the abandoned steam line, on the south end of this site.

Site Characterization Summary: The soil in the area that was contaminated with Uranium in 1952 was covered with blacktop and enclosed within a wooden rail fence. The fence was posted with Radiation Zone signs.

Site decommissioning activities in 1983 removed all above ground features, including equipment, structures, utilities, and tanks. In addition, most of the radioactive structures and equipment were removed and buried. Structures were removed to a level equal to 0.6 m (2 ft) below the railroad grade level. No attempt was made to remove the concrete structures or buried piping. The radioactive structures that were covered in place are the 203-S Basin, the 204-S Basin, the 205-S Vault, the 205-S Building base pad, various isolated utility lines, the railcar unloading area, the concrete encased pipeline from the REDOX facility to the tank farm, and the REDOX chemical sewer. Once structures were removed or buried, the site was graded and leveled with clean backfill material. The final closure activities included placing signs and concrete monuments.

The site is radiologically and visually inspected once a year.

Potential Contaminants:

Radioactive: Uranium isotopes and unknown others are present. A maximum of 10,000 cpm at 25 cm (1 in) was found in this area in 1952. In addition, Uranium metal and other metals are also present.

Non-Radioactive: Present, but not specified.

References:

WIDS General Summary Report for site 200-W-22
ArcMap
QMap

Figure 1. ArcMap Image

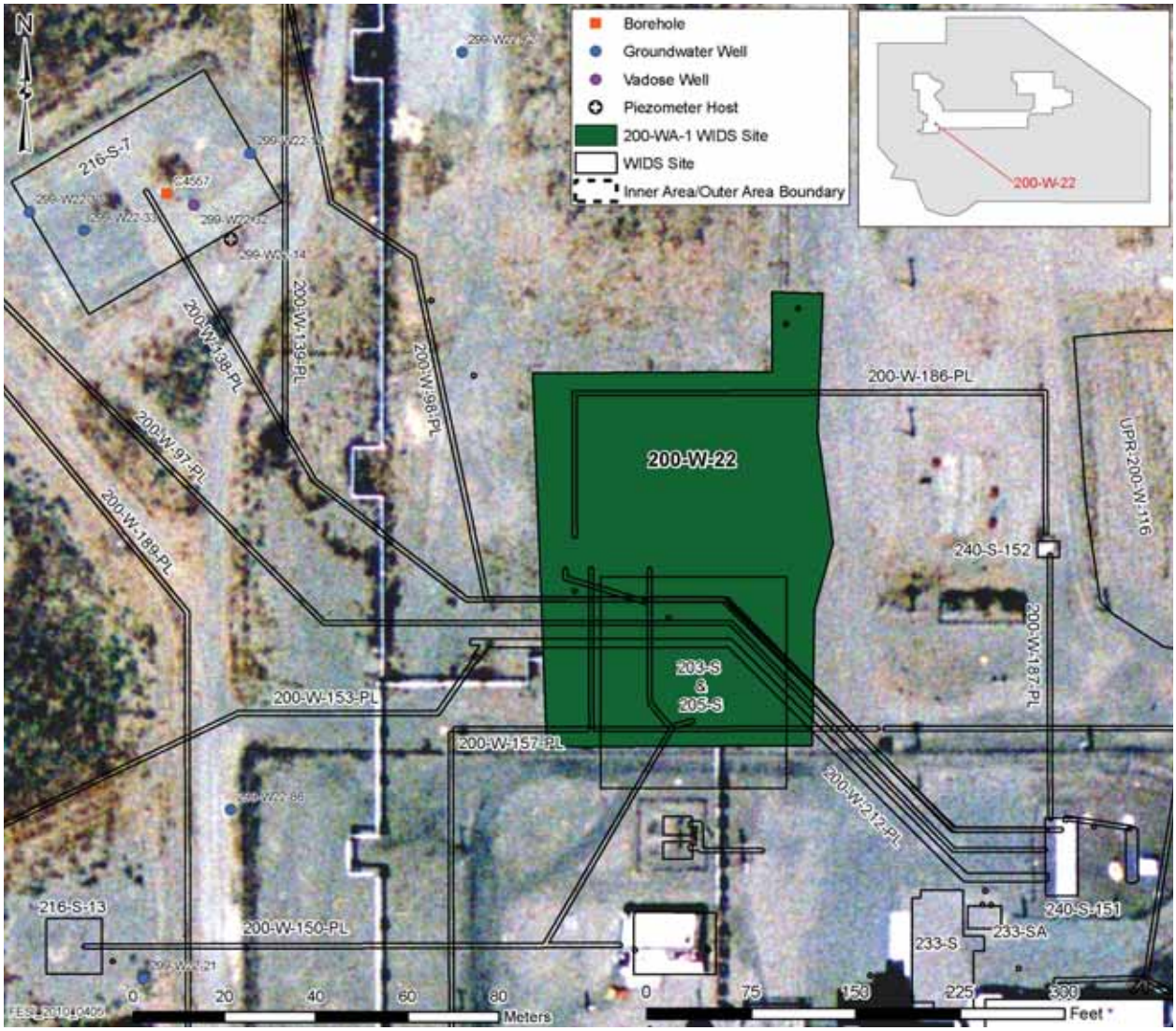
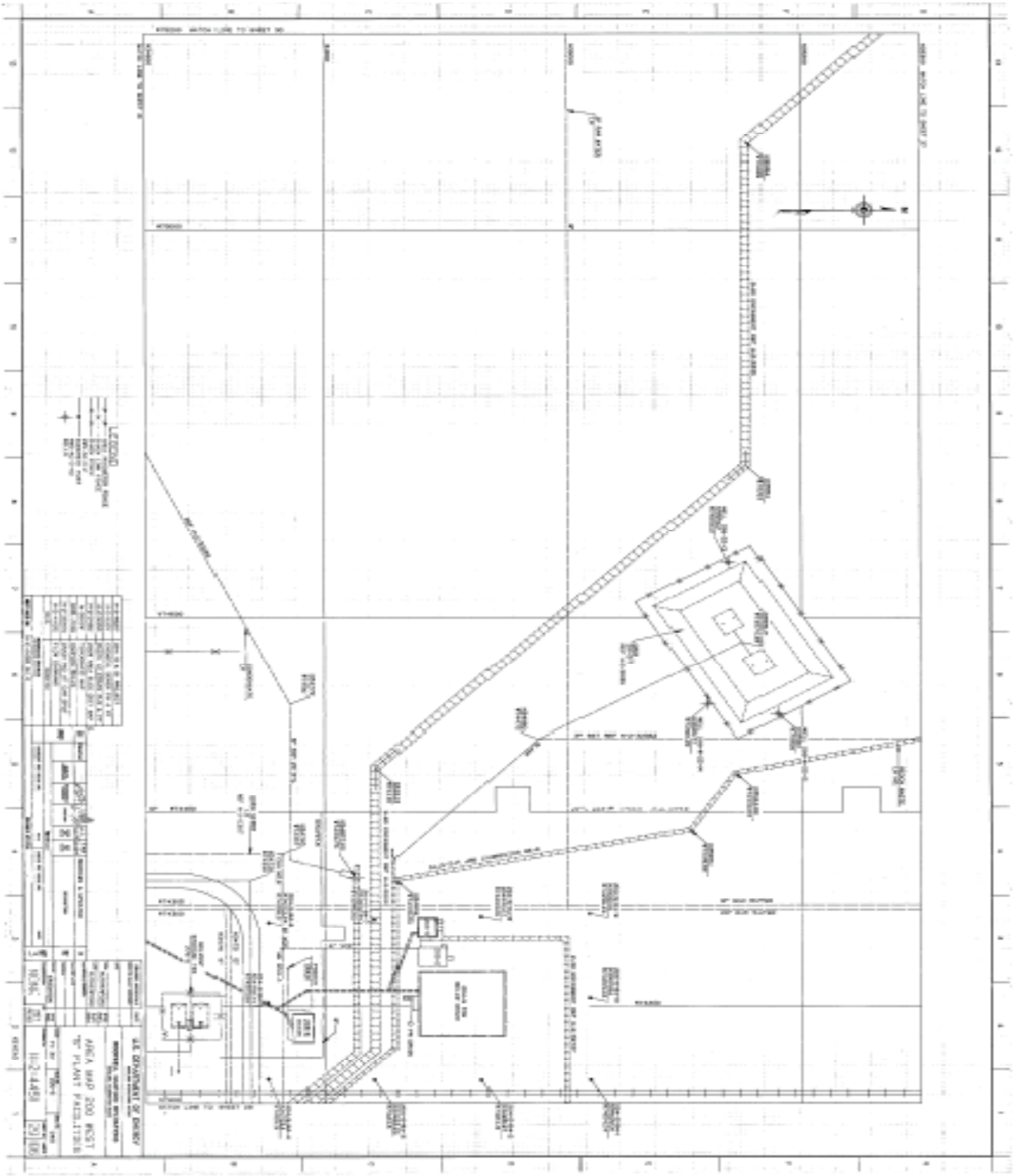


Figure 2. Reference Drawing H-2-44511 Sheet 29



Site Description

Site ID: 200-W-231, Temporary Facilities Construction Trailer Septic Tank and Tile Field
Site Type: Septic Tank
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-2
Service Dates: 1951 to Unspecified Date
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-231is comprised of a septic and tile field. Neither feature is posted or marked, nor are their exact coordinates available. The site is located west of Camden Avenue, and south of 23rd Street (see Figure 1. ArcMap Image). The septic and tile field are roughly 16.7 m (55 ft) south of the 200-W-79-PL pipeline, which is the pipeline that feeds the 216-T-36 Crib (see Figure 2. Reference Drawing H-2-2289 Sheet 1 Rev. 3 and Figure 3. H-2-3019 Sheet 1 Rev. 4). Since the crib was constructed in 1967, it is possible the crib construction could have affected the septic system

Waste Site Coordinates:

E-566762.94453 N-136579.00000

Site Dimensions:

Site Length: Not Specified Site Depth: Not Specified
Site Width: Not Specified Cover Thickness: Not Specified

Release Summary: During the 1950's, numerous Temporary Construction buildings were established to support construction efforts. H-2-2289 was drawn in February 1951, and shows the septic tank and tile field that supported a Temporary Construction office and an X-ray laboratory. The Temporary Construction facilities were set up to support construction activities of the 241-TY Tank Farm.

It is possible that X-ray development solutions were disposed of via the septic system. Solutions may have contained sulphur dioxide, acetic acid, boric acid, potassium sulfite, and sodium sulfite. However, the volume of solution and the amount of chemicals released into the septic tank and tile field are not specified. As the total volume of contamination released is not available, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-231 is associated with the Temporary Construction Facilities used during the construction of the 241-TY Tank Farm.

Site Posting: Site 200-W-231 is currently not posted or marked.

Site Characterization Summary: No survey data or investigative history is provided for this site. It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided. If surveys do occur, their frequency is not specified. In addition, it is unclear if any remediation work has occurred at this site.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: X-ray solution may have been disposed of at this site. The solution may have contained sulphur dioxide, acetic acid, boric acid, potassium sulfite, and sodium sulfite.

References:

WIDS General Summary Report for site 200-W-231
ArcMap
QMap

Figure 1. ArcMap Image

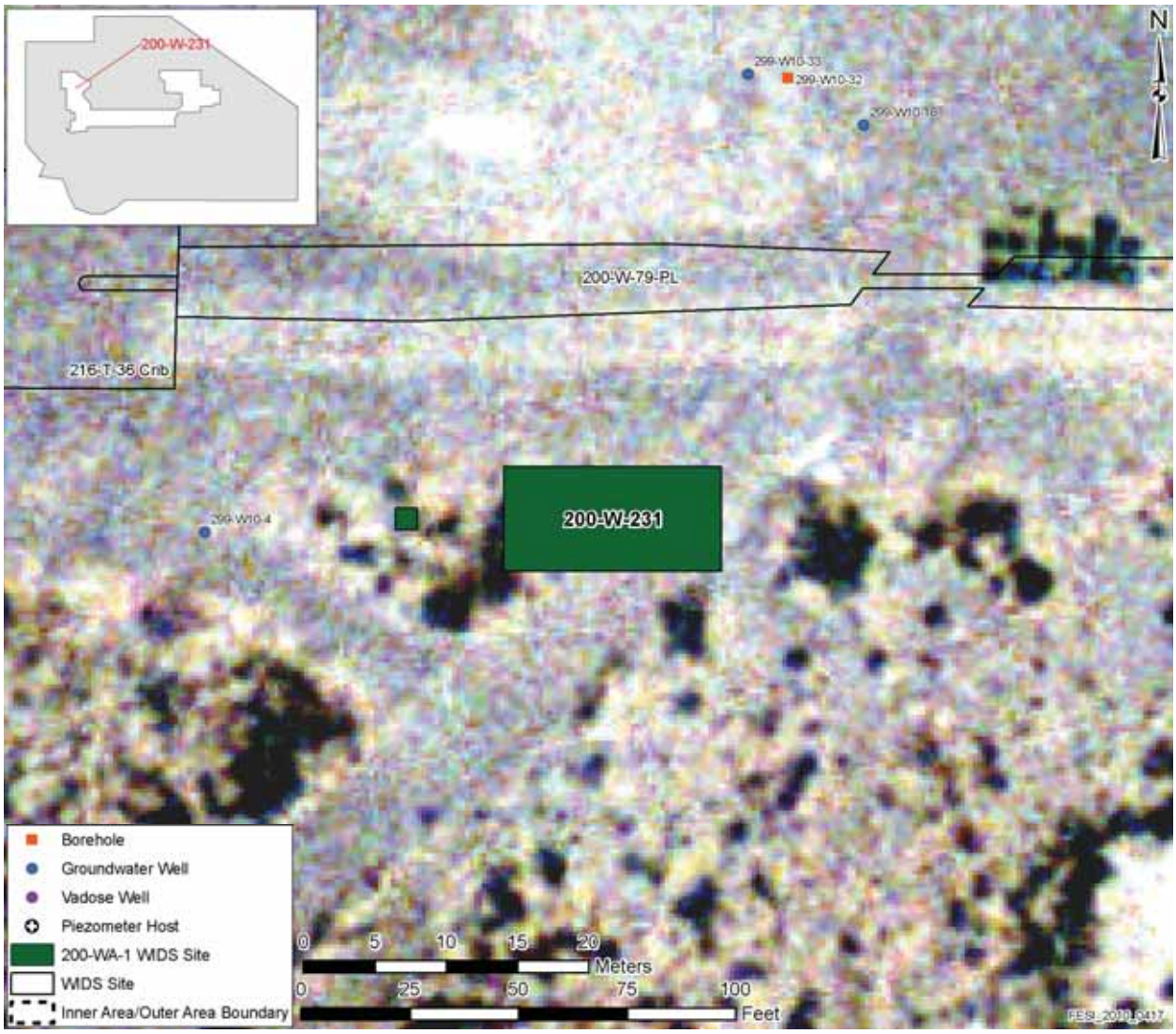


Figure 2. Reference Drawing-H-2-2289 Sheet 1 Rev. 3

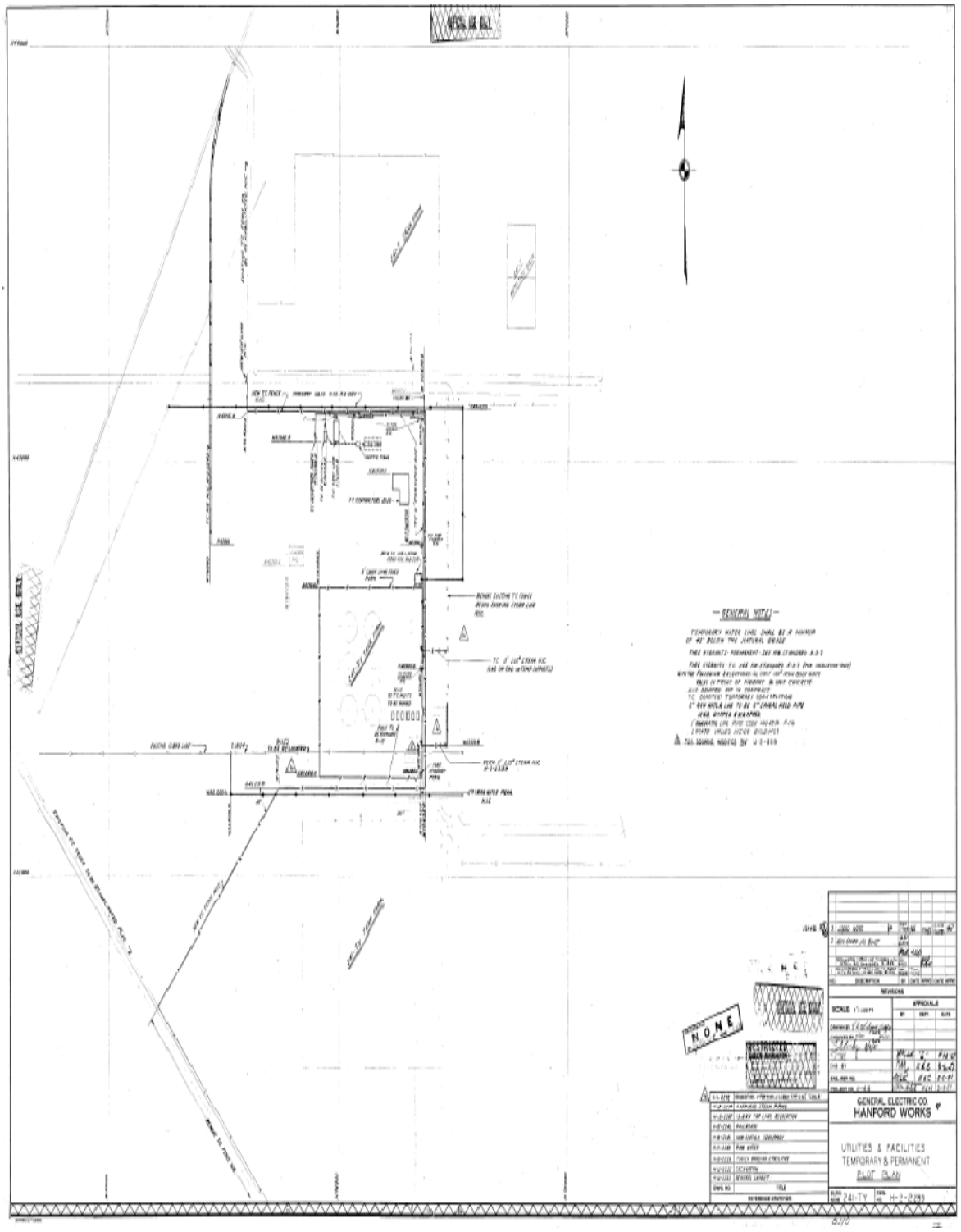
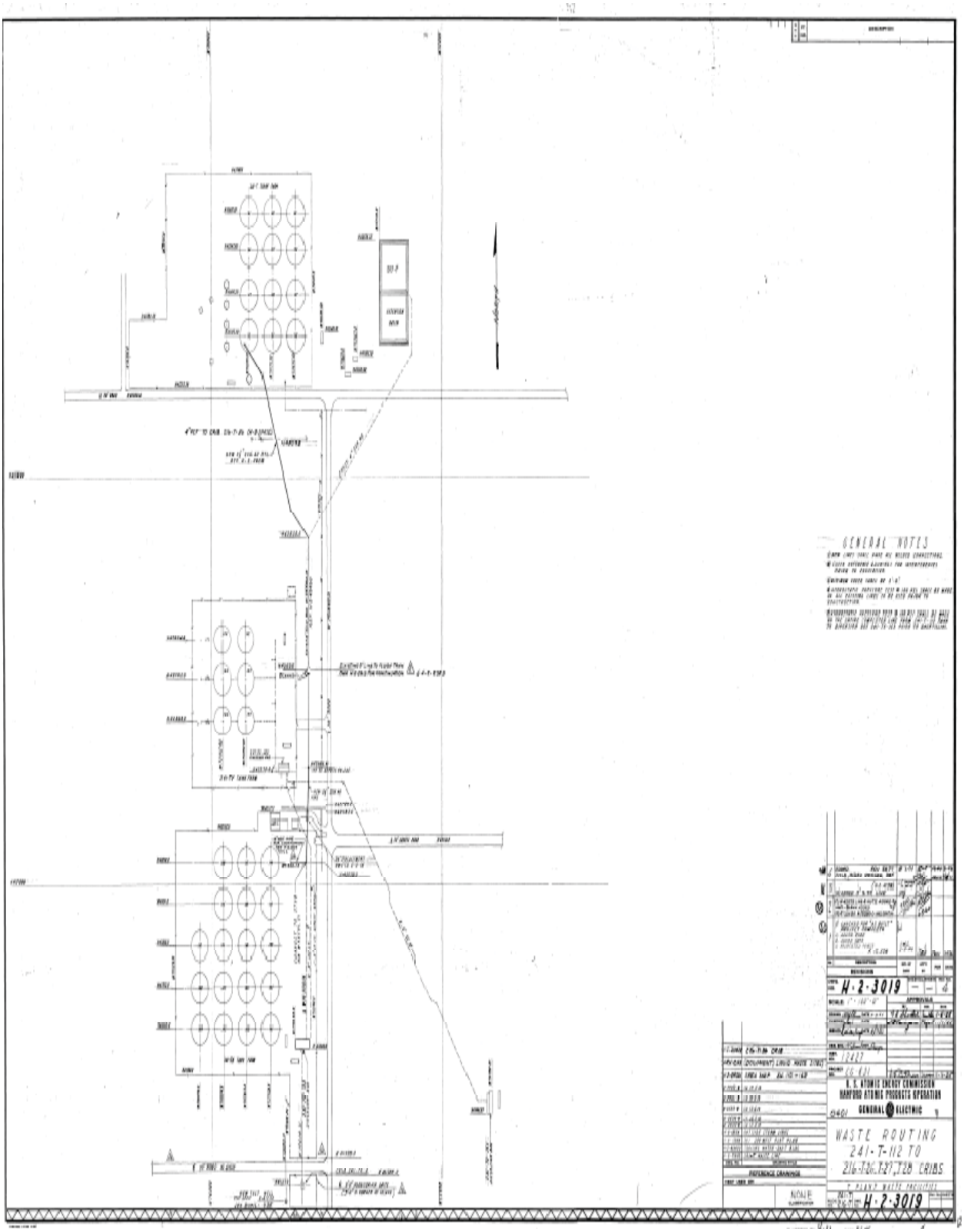


Figure 3. H-2-3019 Sheet 1 Rev. 4



Site Description

Site ID: 200-W-42, U-Plant Radioactive Process Sewer from 221-U to 216-U-8 &216-U-12 Cribs
Site Type: Radioactive Process Sewer
Facility/Geographic Area: U-Plant
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1, 200-MG-1 or 200-MG-2
Service Dates: 1952 to 1988
Volume/Mass Discharged: Not Specified.

Waste Site Location and Physical Description: Site 200-W-42 is a buried vitrified clay pipeline (VCP) that connects the 221-U Building to the 216-U-8 and 216-U-12 Cribs. The pipeline is located west of Beloit Avenue and is marked with steel posts and "Pipeline" signs along the entire length of the pipe (See Figure 1. ArcMap Image). The contaminated area over the pipeline has been split into two separate WIDS waste sites: 200-W-42 and UPR-200-W-163. The contamination located over the pipeline on the north side of 16th Street is labeled 200-W-42 (See Figure 2. Reference Drawing H-2-44510 Sheet 3 Rev. 7 and Figure 3. Reference Drawing H-2-44510 Sheet 9 Rev. 1). Both waste sites are radiologically posted due to ground contamination related to the underground pipeline.

The contaminated soil associated with 200-W-42 has been consolidated with the pipeline. 200-W-42 was posted as a Soil Contamination Area (SCA) until October 2001, when the site was reposted as an Underground Radioactive Material Area (URMA) following surface stabilization work.

Most of the contamination however is located south of 16th Street, and is included inside the boundaries of the UPR-200-W-163 waste site. This pipeline section is located south of 16th Street and connects to the 216-U-8 Crib. This section of pipeline was buried beneath 61 cm (2 ft) of soil and marked with AC-540 concrete posts in 1995. This area is posted with Underground Radioactive Material Area (URMA) signs.

Waste Site Coordinates:

E-567598.08463 N-134714.09784

Site Dimensions:

Site Length: 646.0 m (2119.4 ft) Site Depth: 3.1 m (10.0 ft)
Diameter: 0.2 m (0.5 ft)

Release Summary: The pipeline was used from 1952 to 1988 to convey acidic process condensate from the 221-U and 224-U Buildings and the 291-U Stack to the 216-U-8 and 216-U-12 Cribs. The pipeline was first connected to the 216-U-8 Crib, however the 216-U-12 Crib was built in 1960 to replace the 216-U-8 Crib when evidence of a potential cave-in was detected. A WYE joint was installed on the 216-U-8 Crib pipeline to redirect and extended the pipeline to the 216-U-12 Crib, which in turn was extended further to the south.

From 1952 to 1960, the pipeline conveyed waste from 221-U, 224-U, and 291-U to the 216-U-8 Crib. From April 1960 to May 1967, the pipeline conveyed waste from the 291-U Stack drainage, 241-WR Vault waste, and 224-U process condensate via C-5 Tank, to the 216-U-12

Crib. Additional waste conveyed through the pipeline consisted of occasional waste influxes from the C-7 Tank in the 244-U Building, and contaminated water from 241-WR Vault. The contaminated 241-WR Vault water was a single transfer event to the 216-U-12 Crib for disposal in October 1965. The water included 3.1 kg (6.9 lb) of thorium.

From May 1967 to September 1972, the 241-WR Vault waste and C-7 Tank waste were removed from the waste stream. The pipeline was temporarily removed from service from September 1972 to November 1981. When the pipeline was returned to service in 1981, it was used to convey 224-U Building process condensate with a corrosive average pH range from 0.5 to 1.5. In addition, an unspecified volume of miscellaneous storm drain waste from 224-U was sent through the pipe.

Contamination accumulated on this site overtime, as growing contamination above the pipeline continued to absorb radioactive contamination below the surface. In addition, an unplanned release labeled UPR-200-W-33 occurred on March 1955 from a leaking flange on the C-5 Condensate Line from the 224-U Building. The unplanned release contaminated an area of soil covering 0.29 m^2 (3 ft^2). The contaminated area was located 27 m (90 ft) east of the 224-U Building. However, additional information is provided suggesting that the release actually occurred east of the 221-U Building, adjacent to the north end of the 224-U Building. Following the discovery of the release, the upper 10 cm (4 in) of contaminated soil was removed. The area was brought back to grade with clean fill soil. An area encompassing 3 m (10ft) by 4.5 m (15 ft) was roped off as a Radiation Area (RA).

As the contamination occurred over a prolonged period of time, the volume leaked or released cannot be ascertained. Therefore, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-42 is associated with the 221-U Building, 224-U Facility, 270-W, 291-U Stack, 216-U-8 and 216-U-12 Cribs, UPR-200-W-163, and 200-W-151-PL.

Site Posting: Site 200-W-42 was downposted from an SCA to a URMA following surface stabilization work in October 2001.

Site Characterization Summary: In November 2000, the posted Soil Contamination Area north of 16th Street was submitted as a Discovery Site.

A limited Field Survey was conducted in 1994 to document the conditions at several pre-determined waste sites in the 200-UP-2 Operable Unit, and to assess their contamination risk. The investigation included radiological surveys, in-line camera surveys, soil and vegetation sampling, as well as borehole sediment sampling and logging along the VCP pipeline. The pipeline was surveyed from the 224-U to 216-U-8 and 216-U-12 Cribs. A total of fourteen surface and subsurface samples and four plant samples were gathered for characterization purposes.

In addition, an effort was made to ascertain if any contamination had migrated outward from the pipeline. This determination was made by excavating holes with an auger rig at locations where subsurface contamination had been identified. Analysis of the samples found a rise in radioactivity at roughly 3 m (10 ft) below the surface. However, the auger encountered large cobbles at 3.3 m (11 ft), and could not penetrate deeper. A second auger hole excavated 1.5 m (5 ft) west of the pipeline did not encounter any radiological activity.

With the exception of Strontium-90, the greatest concentrations of contaminants were detected in subsurface soil samples collected near the VCP. Strontium-90 readings were greatest in plant samples taken along the VCP. Additional contaminants detected include americium-241, cesium-137, plutonium-238, plutonium-239, plutonium-240, and uranium.

An "in-line" camera survey was also conducted as part of the 1994 investigation. The camera survey took place inside the VCP pipeline to detail the pipe's characteristics. The camera entered the pipeline at two points, one north of the 216-U-8 Crib and the second west of the 216-U-8 Crib, in the portion of the pipeline connecting to the 216-U-12 Crib. In the northern portion of the pipeline, numerous joints were dislodged and sandy material was seen within the pipeline. The pipeline section connecting to the 216-U-12 Crib was determined to be in very good condition. The joints were not displaced, and additional sandy material was observed.

During the installation of the Replacement Cross Site Transfer Line (Project W-058), it was necessary to cross the existing VCP that led from 224-U to the 216-U-12 Crib. During the excavation, a section of the pipeline close to the 216-U-12 was severed and the exposed ends were grouted. Following the excavation, cracks within the VCP were discovered, and while no smear contamination was detected inside the pipe, direct readings of 500 cpm and 2000 dpm were discovered in the excavated soil. It was determined that cutting and removing a portion of the pipeline under controlled conditions was the best option for remediation. Severed portions of the pipeline were cut into smaller pieces and placed inside the ends of the remaining VCP line. The soil contamination was left in place and backfilled. The excavation was estimated to be 5 m (16 ft) deep, and was located west of Beloit Avenue. The area was roped off and posted with URMA and SCA signs.

In addition, site walkdowns occurred on September 17, 1996 for initial review purposes, and on August 18, 1999 as part of an RARA survey. The results of these surveys are not presented. A final site walkdown occurred on November 21, 2000. During the walkdown, staff confirmed 200-W-42 is a SCA measuring roughly 18 m (60 ft) by 12 m (40 ft) , located above the pipeline on the north side of 16th Street. A second SCA, UPR-200-W-163, is located on the south side of 16th Street. The surface of the second SCA has been surface stabilized and covered with gravel. The site was surveyed with Geophysical Survey (GPS) equipment on March 3, 2005. The survey detected numerous linear anomalies that were determined to be buried utilities. In addition, an area near the northern boundary of the survey, located within the U-Plant fence, was surveyed. The area was heavily disturbed, reducing the accuracy behind any detection or mapping of subsurface features.

While site walkdowns and GPS surveys have occurred, it is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: The pipeline was used from 1952 to 1988 to convey acidic process condensate from the 221-U and 224-U Buildings and the 291-U Stack to the 216-U-8 and 216-U-12 Cribs.

References:

WIDS General Summary Report for site 200-W-42
ArcMap
QMap

Figure 1. ArcMap Image

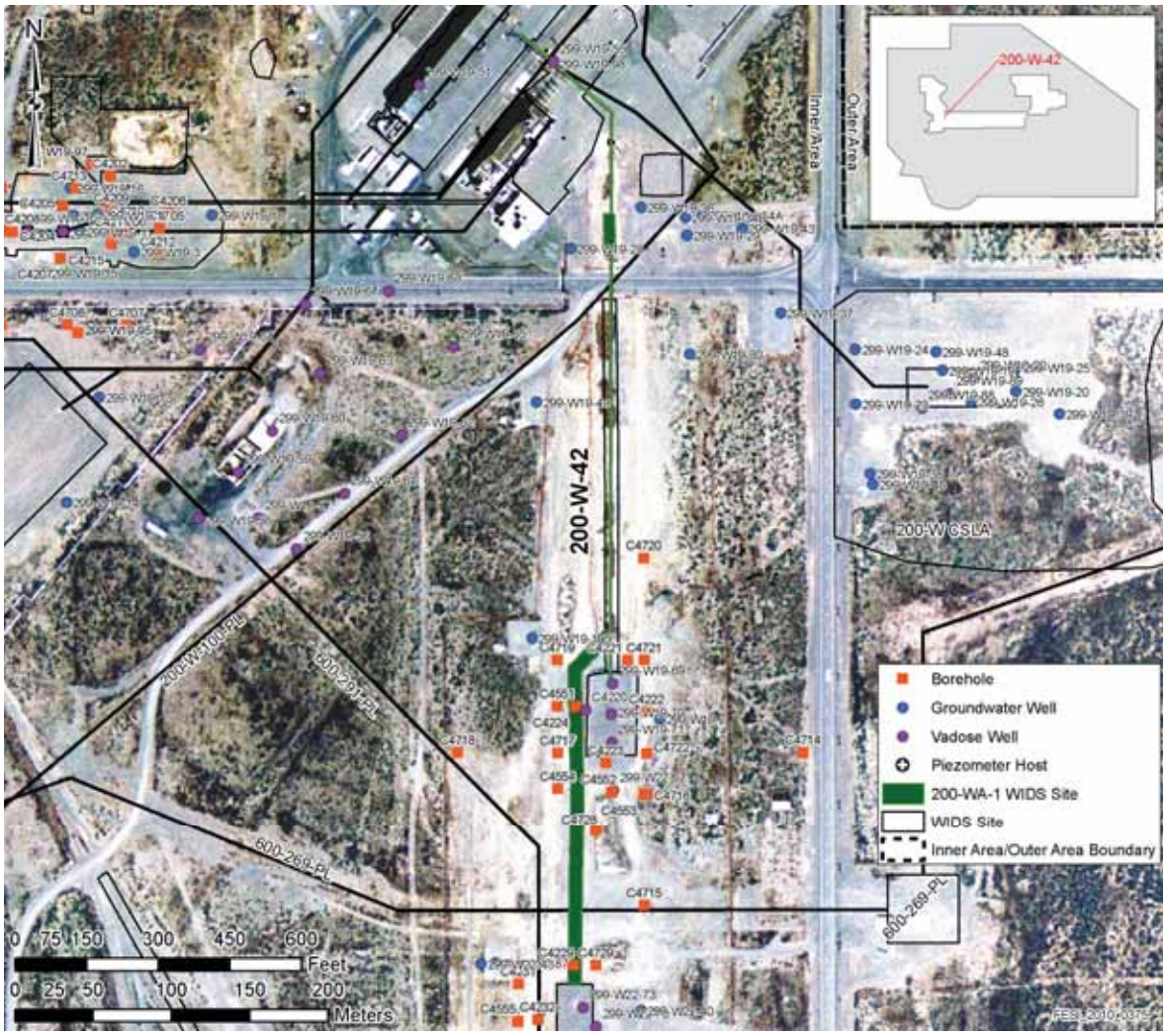


Figure 2. Reference Drawing H-2-44510 Sheet 3Rev. 7

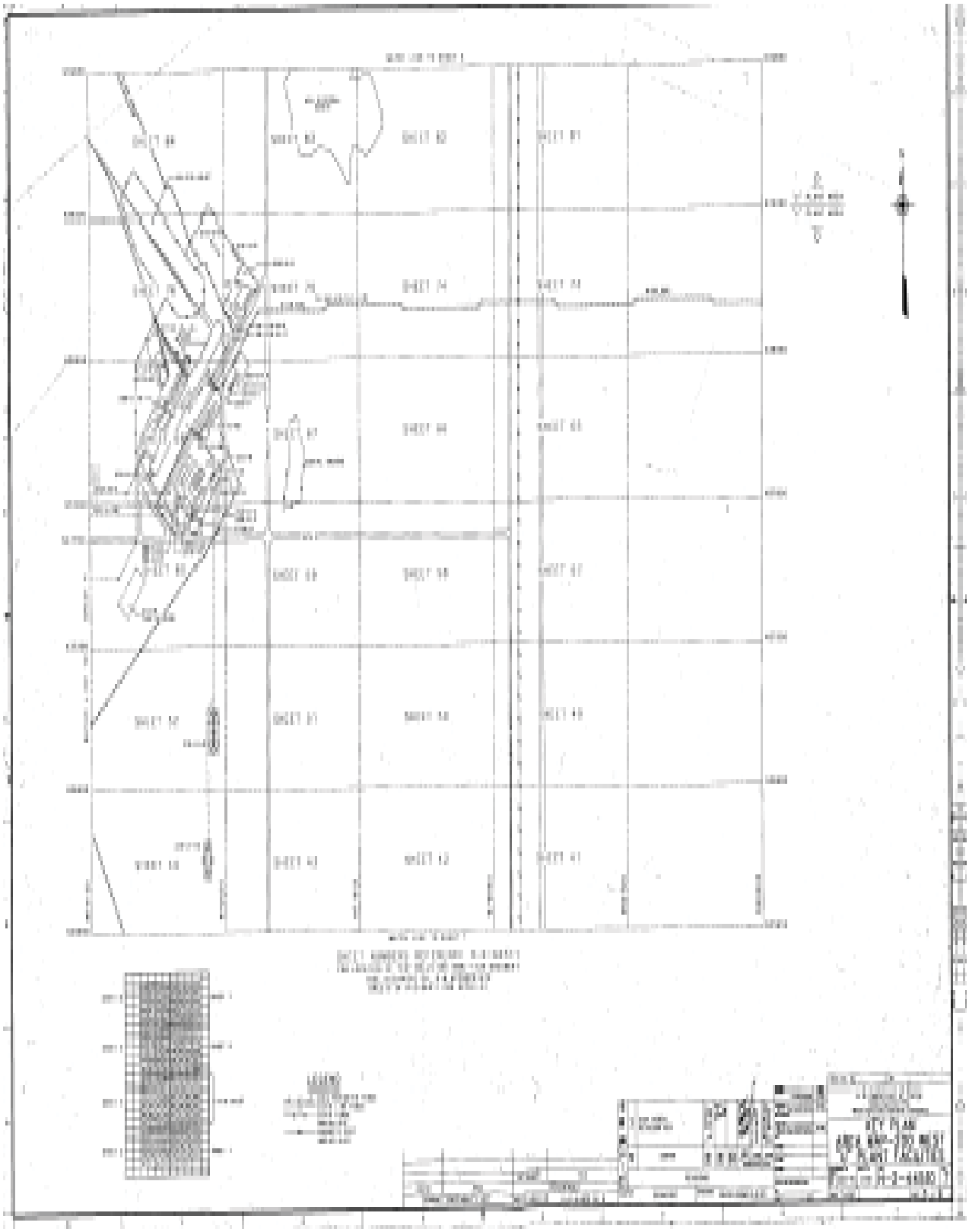
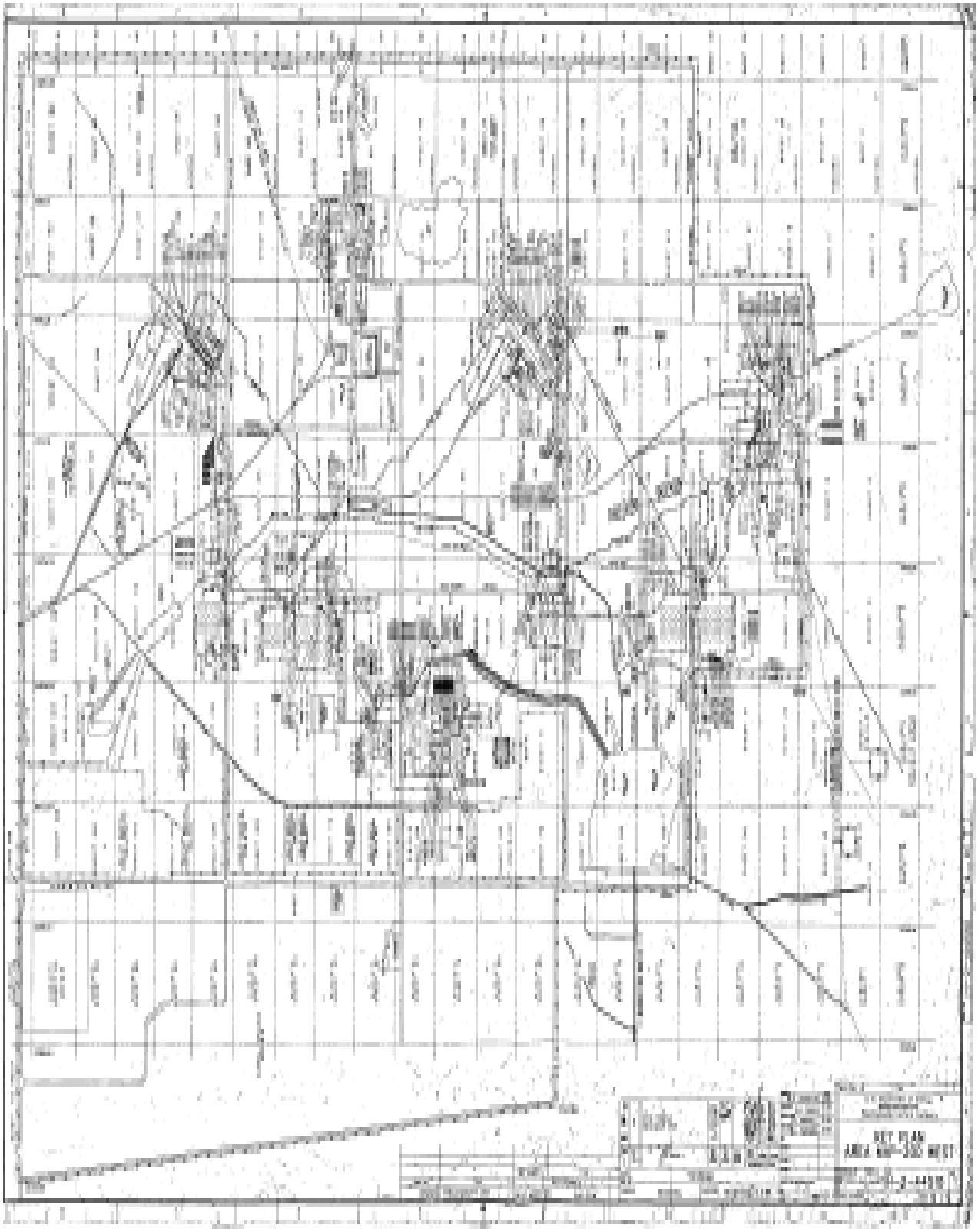


Figure 3. Reference Drawing H-2-44510 Sheet 9 Rev. 1



Site Description

Site ID: 200-W-53, UPR-200-W-166, UN-216-W-31
Site Type: Unplanned Release
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-1, 200-MW-1
Service Dates: Not Specified
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-53 consists of a large area of posted surface soil contamination located east of the 207-T Retention Basins (see Figure 1. ArcMap Image and Figure 2. Reference Drawing 200-W-53). Discovered in 1994, the site covers roughly 14,466 m^2 (155,706 ft^2) or 1.4 ha (3.6 ac) of ground marked and posted as a Soil Contamination Area (SCA) (see Figure 3. Reference Drawing 200-W-53). In 1996, the contaminated soil was scraped and consolidated within the 207-T Retention Basin. The Basins have been completely backfilled and covered with clean dirt. The site is posted as an Underground Radioactive Material Area (URMA).

A small Underground Radioactive Material Area (URMA) surrounding well 299-W11-28, on the west side of the retention basin, is considered to be part of 200-W-53 also. This is discussed further under the Site Characterization Summary section. No reference drawings are available for this site.

Waste Site Coordinates:

E-567038.38433 N-136721.10881

Site Dimensions:

Site Length: 120.0 m (394.0 ft)
Site Width: 120.0 m (394.0 ft)
Site Area: 14,466 m^2 (155,707 ft^2).

Site Depth: Not Specified
Cover Thickness: Not Specified

These are the approximate dimensions of the posted area.

Release Summary: The source of contamination was assumed to be the 241-T Tank Farm and the 207-T Retention Basin. Speck contamination originating from operations at the 241-T Tank Farm spread via the wind and contaminated the soil at site 200-W-53.

The total volume of wastes unloaded or potentially released at this site is not specified. Therefore, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-53 is associated with the 207-T Retention Basin.

Site Posting: Site 200-W-53 is posted as an URMA.

Site Characterization Summary: Soil contamination located east of the 207-T Retention Basin was scraped up and placed inside the 207-T Retention Basin in 1996. The Basins were completely backfilled and covered with clean dirt. The scraped area is currently posted as an URMA.

The pre-stabilization boundary was mapped using Global Positioning System (GPS) equipment on February 13, 1996.

The Tank Waste Remediation Group used the waste site number UN-216-W-31 (alias UPR-200-W-166) to document their 1996 clean-up effort. However, the contaminated soil was not located at the same place as the original UN-216-W-31 that was consolidated and stabilized by the Radiation Area Remedial Action (RARA) in 1992. The original UN-216-W-31 area of contamination was described as being located north and east of 241-T Tank Farms. In 1996, the UN-216-W-41 number was used again for the contamination found further east, because the source of the contamination was assumed to be the same as the source for UN-216-W-31. Due to programmatic responsibility issues, it was necessary to give the second area of contamination a separate site code (200-W-53) to explain the two separate remediation activities.

It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided for the site. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Not Specified.

References:

WIDS General Summary Report for site 200-W-53
ArcMap
QMap

Figure 1. ArcMap Image

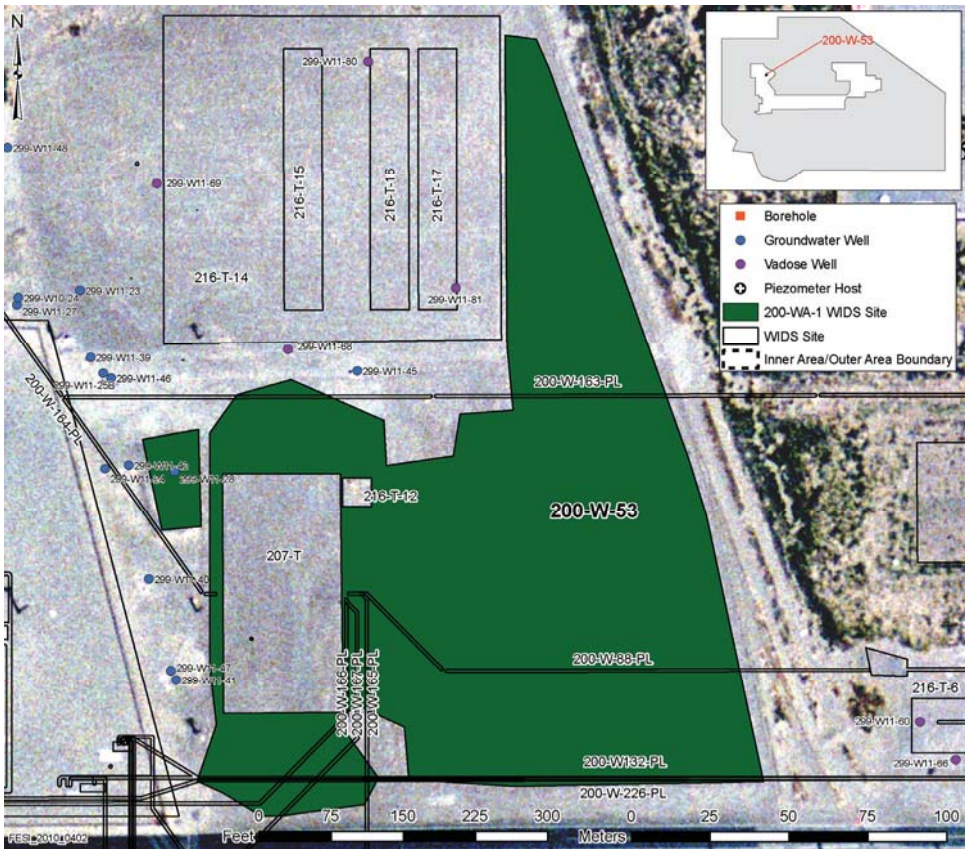


Figure 2. Reference Drawing 200-W-53

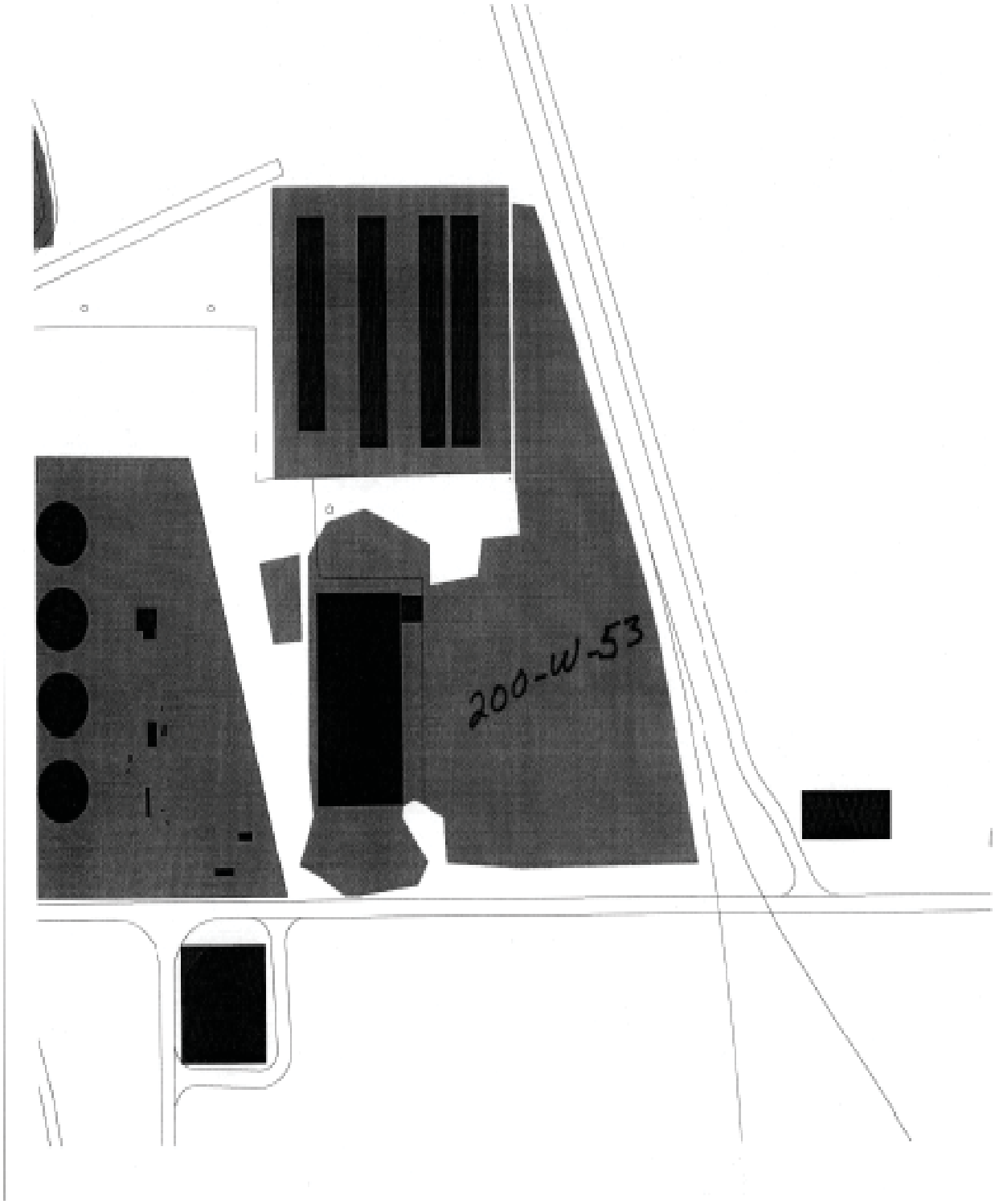
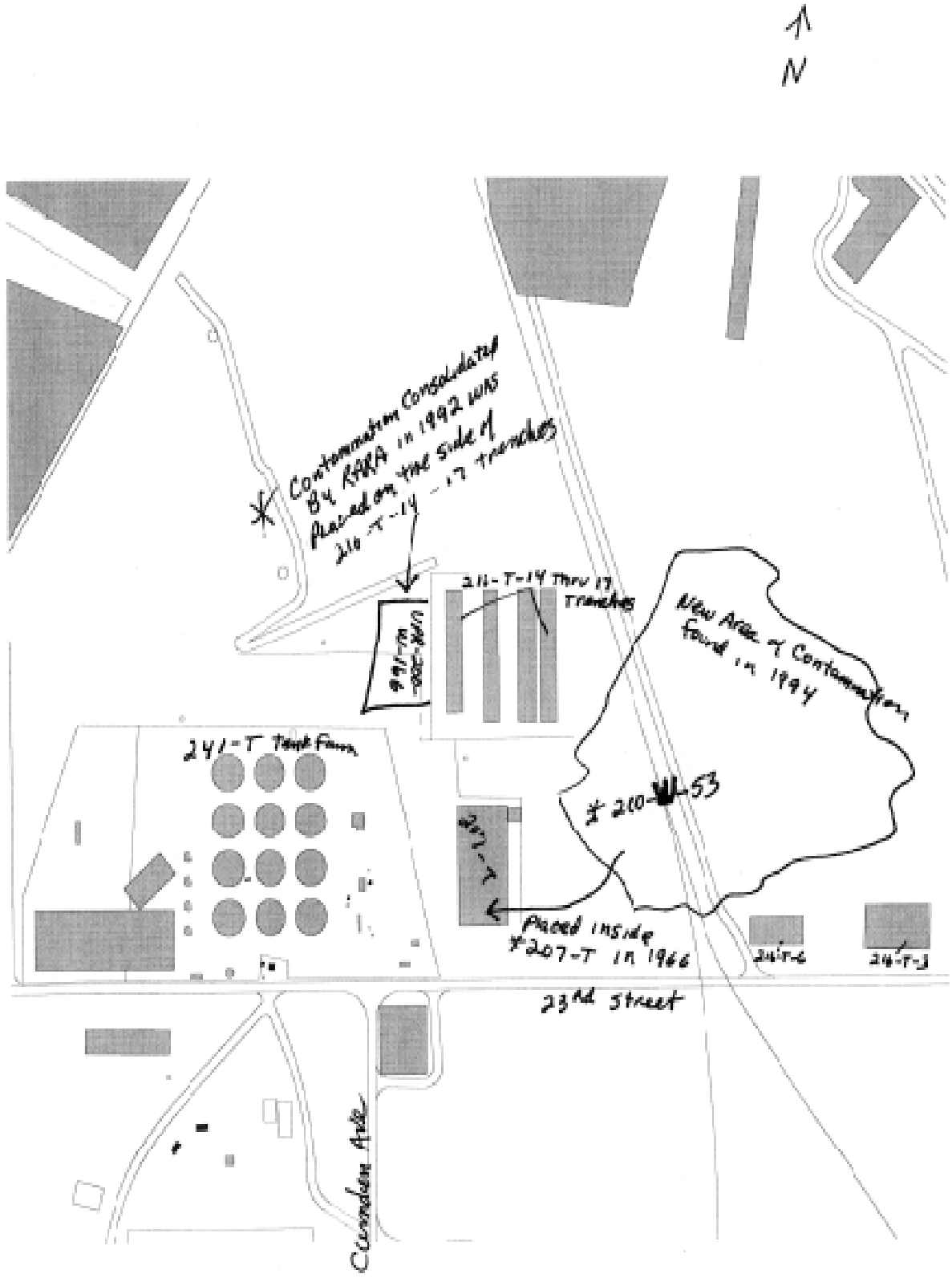


Figure 3. Reference Drawing 200-W-53



Site Description

Site ID: 200-W-54, Contamination Migration from 241-SX Tank Farm
Site Type: Unplanned Release
Facility/Geographic Area: S-Plant (REDOX) Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UR-1, 200-MG-1
Service Dates: Unspecified
Volume/Mass Discharged: Unspecified

Waste Site Location and Physical Description: Site 200-W-54 consists of an expanding area of migrating contamination located east and north of the 241-S, SX, SY Tank Farm fence (See Figure 1. ArcMap Image). The site extends eastward to the west edge of the 216-S-9 Crib. The original unplanned release (UPR) was defined in 1997 as a large, irregular shaped Soil Contamination Area (SCA) located on the east side of 241-S/SX Tank Farms. In 1997, the site measured approximately 175 m (575 ft) by 100 m (330 ft) (See Figure 2. 200-W-54 GPS Survey 3/97). A second GPS survey was conducted in 1998, which expanded the posted SCA approximately 50 m (165 ft) to the west, up to the Tank Farm fence, and approximately 200 m (660 ft) in the north-south direction (Figure 3. 200-W-54 GPS Survey 1998). Site 200-W-54 is moderately vegetated with bunchgrasses, with no soil discoloration or debris visible. There are multiple chained areas with various radiological postings located on the east and north side of the 241-SY Tank Farm. These are discussed further in the following sections.

Waste Site Coordinates:

E-566995.55532 N-134485.02175

Site Dimensions:

Original site dimensions taken in 1997.

Site Length: 175.0 m (574.2 ft)
Site Width: 100.6 m (330.0 ft)
Site Area: 17601.5 m2 (189469.5 ft2)
Site Depth: Unspecified
Cover Thickness: 0.0 m (0.0 ft)

Site dimensions of the expanded area mapped in 1998.

Site Length: 225.0 m (738.2 ft)
Site Width: 300.0 m (984.3 ft)
Site Area: Unspecified
Site Depth: Unspecified
Cover Thickness: 0.0 m (0.0 ft)

Release Summary: All of the contamination in the area is assumed to originate from Tank Farm activities or contamination migration from the adjacent posted contamination areas, as they are the only apparent contamination sources. It is assumed contamination spread from the Tank Farms and through Site 200-W-54 via windblown particulates.

Contaminated tumbleweed fragments, rabbit and mouse feces, and soil specks are frequently identified along the outside of the Tank Farm fence. Attempts to remove the contamination usually eliminate the need to post the contamination with radiological boundaries. In 2009, many contaminated animal droppings were found outside the posted areas. Some of these rabbit feces and speck patches were delineated and posted as a Contaminated Areas (CA).

Related Site Structure(s): The site is associated with activity in the 241-S, SX and SY Tank Farms. There is also one separately posted CA located north of 241-SY Tank Farm, across a gravel road. In 2002, 200-W-54 was consolidated with the 241-S, SX, SY Soil Site (200-W-96), but because of the increasing size of 200-W-54, it was un-consolidated from 200-W-96 in December 2004.

Site Posting: The site is posted as a SCA.

Site Characterization Summary: A Global Positioning System (GPS) survey occurred on March 25, 1997 to document the size and shape of the SCA. Site walkdowns for mapping and verification purposes occurred in 1997 and 2000, and additional GPS surveys of posted contaminated areas near the Tank Farms occurred in 1998 and 1999. The posted size and shape of 200-W-54 change with each additional radiological survey, due to contamination migration. For instance, the site dimensions defined in 1998 were highly irregular, as a narrow area was found to extend along the entire length of the eastern 241-S, SX, SY Tank Farm fence. A wider area, located midway of the Tank Farm fence line extends significantly eastward.

Radiological surveys on November 17, 1998 discovered three additional areas of contamination east of 241-SX Tank Farm. Contaminated media included rabbit feces, tumbleweed fragments, and ant hills. Another 15 individual contaminated areas were discovered on November 22, 1998. Several of the areas consisted of small contamination specks, which were picked up and disposed of as Radioactive Material. The sites that were not picked up were posted and left in place. Maximum readings from November 17, 1998 were 5000 cpm on tumbleweed fragments, while the highest readings from November 22, 1998 were 650 cpm in an area of contaminated dirt and gravel.

A site visit in August of 2000 found a number of additional radiologically chained and posted areas in this vicinity. In September, October, and November 2000, several individual radiologically posted areas in the vicinity of 200-W-54 and the Tank Farm fence were submitted to WIDS as Discovery Sites. All the radiologically posted areas north and east of the Tank Farm fence are incorporated into the 200–W-54 waste site description; as it is believed all the sites share the Tank Farms as their contamination source.

Potential Contaminants:

Radioactive: Contamination migration from S/SX Tank Farm; survey readings from 650-20,000 cpm in November 1998.

Non-Radioactive: None

References:

WIDS General Summary Report for site 200-W-54
ArcMap
QMap

Figure 1. ArcMap Image

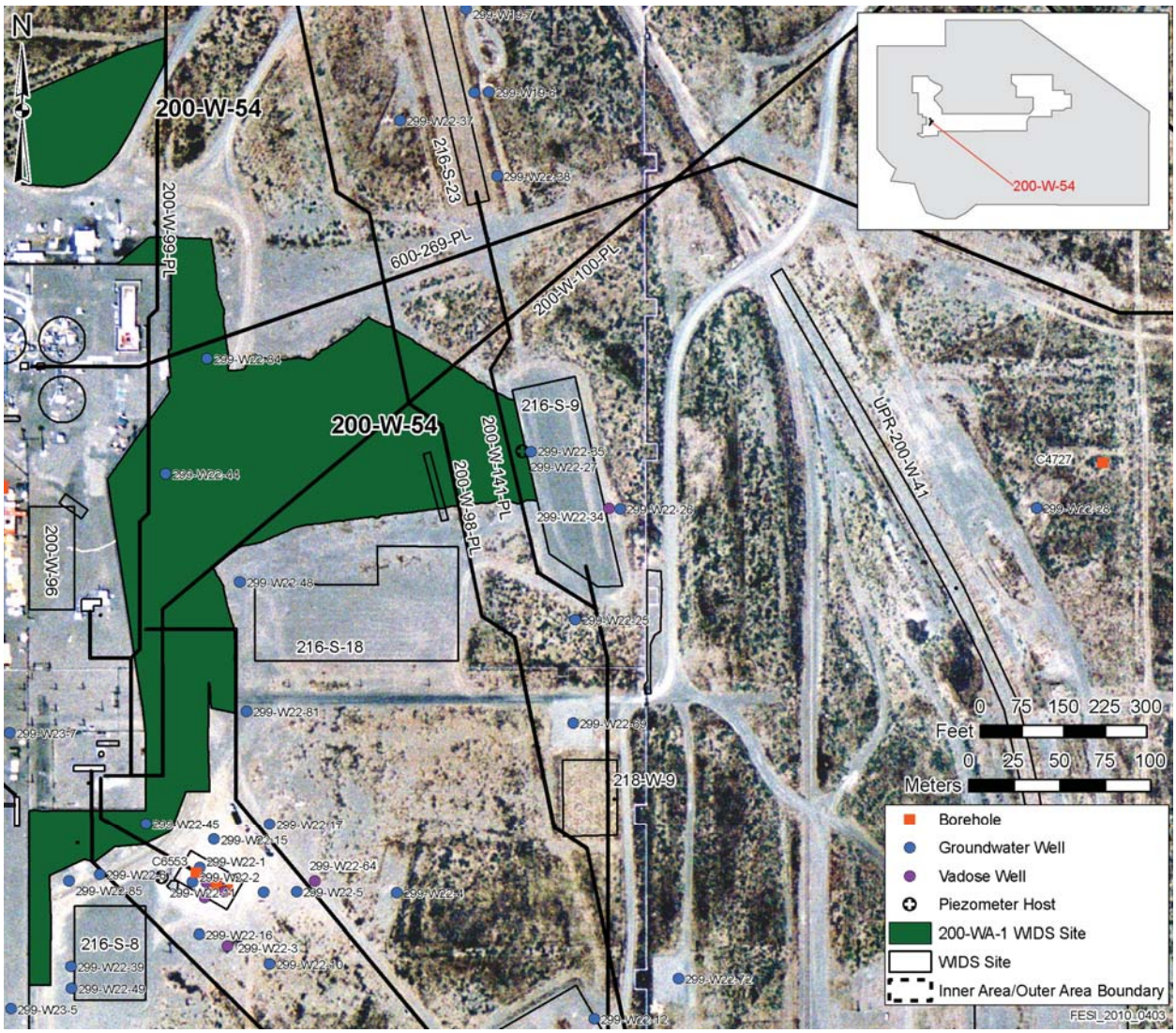


Figure 2. 200-W-54 GPS Survey 3/97

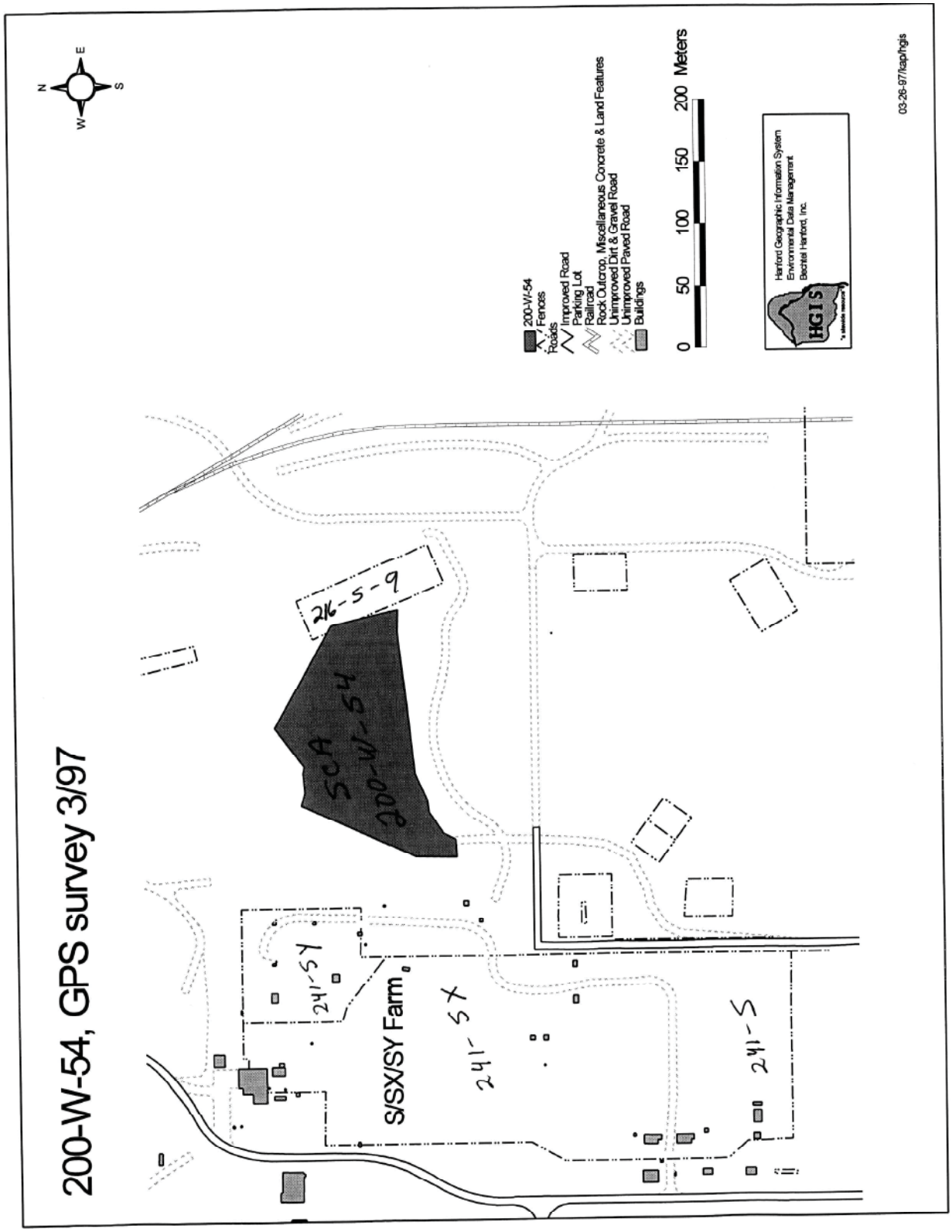
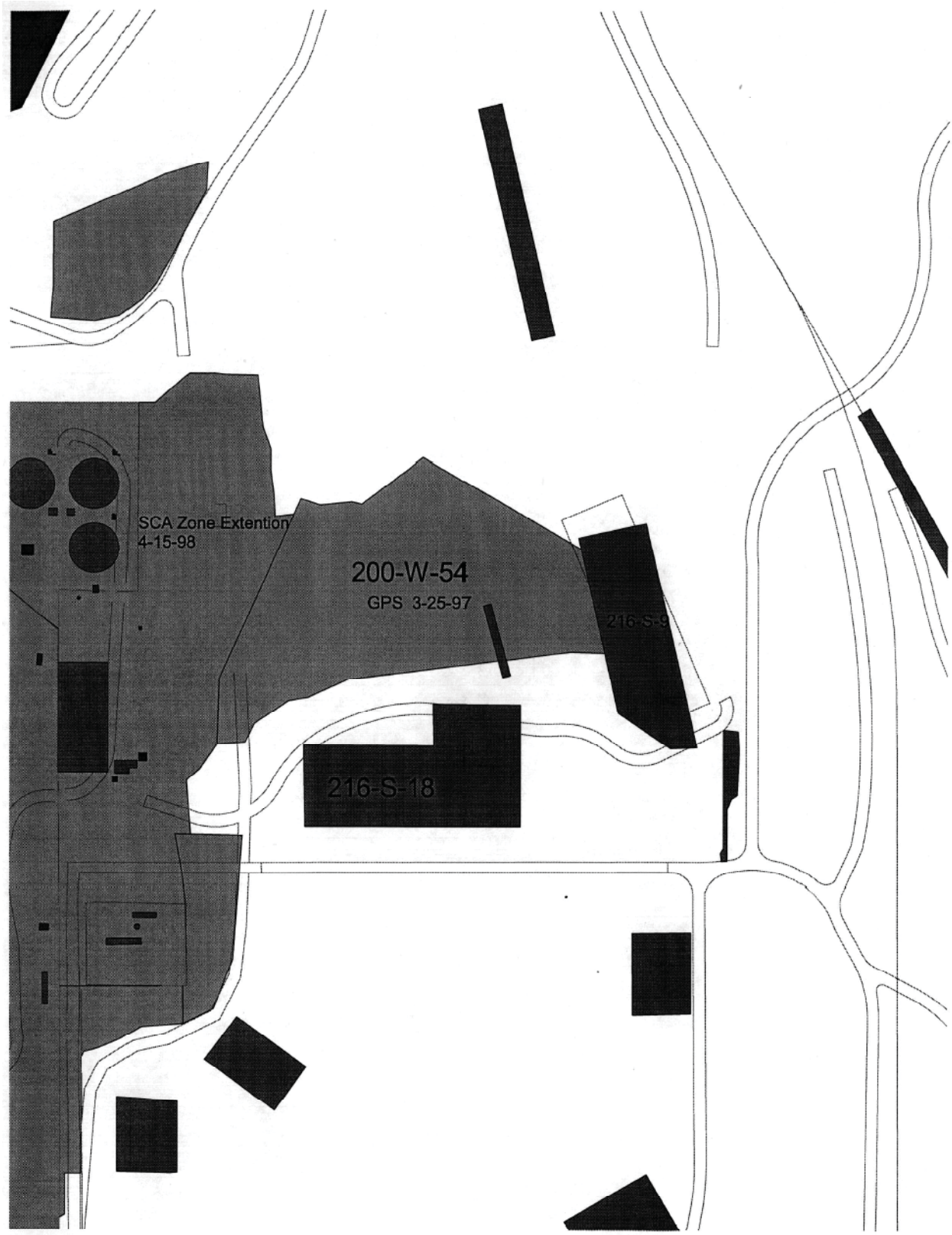


Figure 3. 200-W-54 GPS Survey 1998



Site Description

Site ID: 200-W-6, 200-W Painter Shop Paint Solvent Disposal Area
Site Type: Dumping Area
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-1
Service Dates: Not Specified
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-6 is a dumping area located north of 19th Street and east of Bridgeport Avenue (see Figure 2. QMap Image and Figure 3. U-Plant Area Map). It is within the construction forces shop complex at the 2318W Annex (also known as the 15019 shop building). In 1993, contaminated soil was discovered at the site during building modifications at the paint shop. The shop had existed at the location for years prior to the building modification work. No reference drawings are available for this site.

Waste Site Coordinates:

E-567263.50330 N-135889.01255

Site Dimensions:

Site Length: Not Specified
Site Width: Not Specified
Site Area: Not Specified
Site Depth: Not Specified
Cover Thickness: Not Specified

Release Summary: Site 200-W-6 is the result of paint solvents routinely being dumped onto the ground prior to 1984. In 1993, soil excavated at 200-W-6 emitted a strong solvent odor. The soil was immediately placed back into the excavation and work was halted.

It is unclear exactly when the releases occurred. The volume of wastes released to 200-W-6 is not specified. Therefore, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-6 is associated with the construction forces shop complex.

Site Posting: The posting for Site 200-W-6 is not specified.

Site Characterization Summary: In 1993, a section of the concrete floor was removed to allow for building modification work at the paint shop facility. The soil beneath the removed floor section was being excavated by hand, when a strong solvent odor was detected. Work was immediately halted once the odor was detected. The excavated soil was placed back into the excavation hole and the incident was reported to the construction supervisor. Staff report that prior to 1984, it was common practice to dispose of paint and solvents directly to the ground. A Suspect Waste Site Information Report was submitted to the monitoring group on November 23, 1993. The site was submitted to the WIDS database in January 1994.

It is not specified if any surface stabilization work has occurred at 200-W-6. It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided for the site. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Not Specified.

References:

WIDS General Summary Report for site 200-W-6
QMap

Figure 1. ArcMap Image

Figure 2. QMap Image

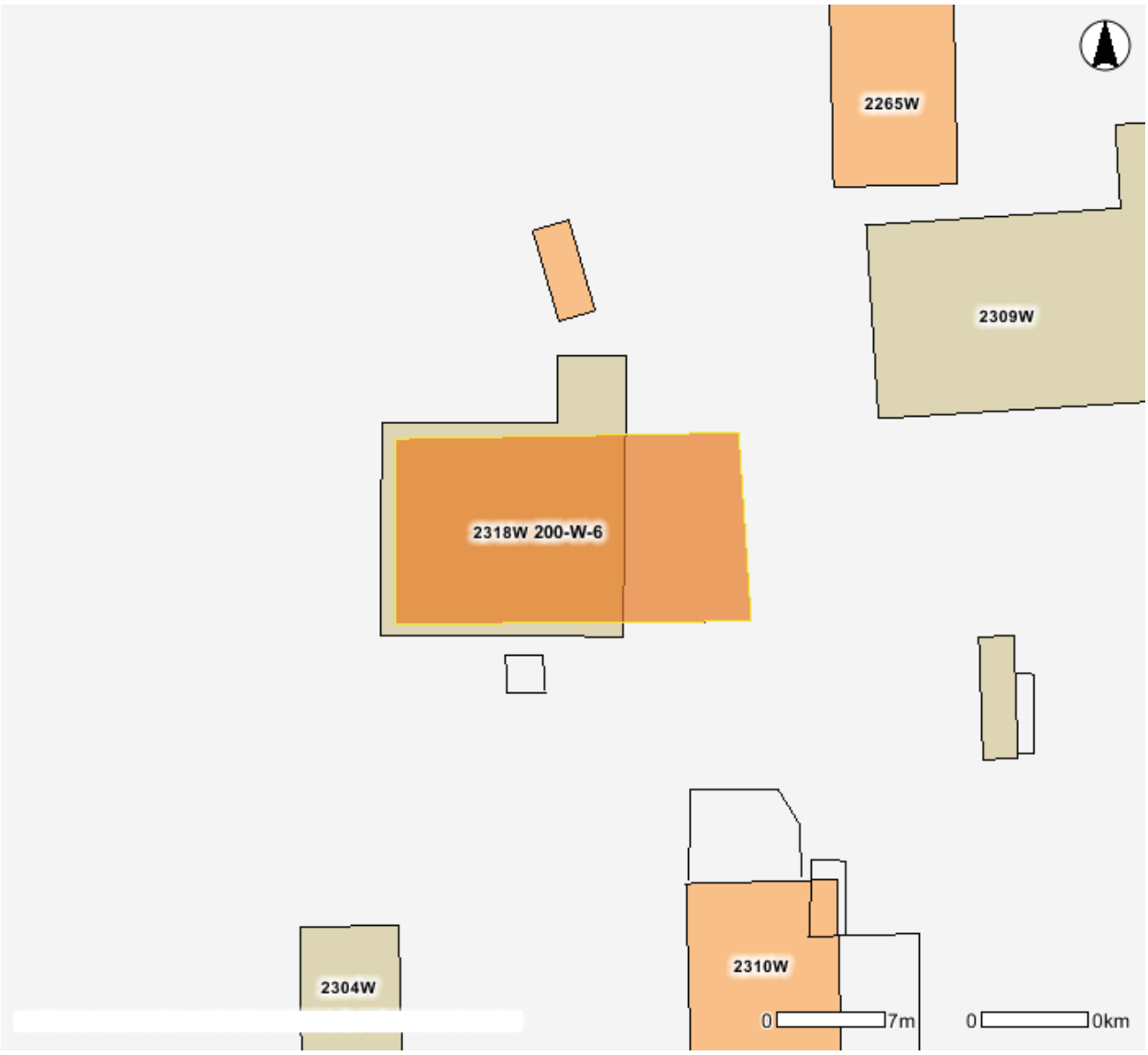
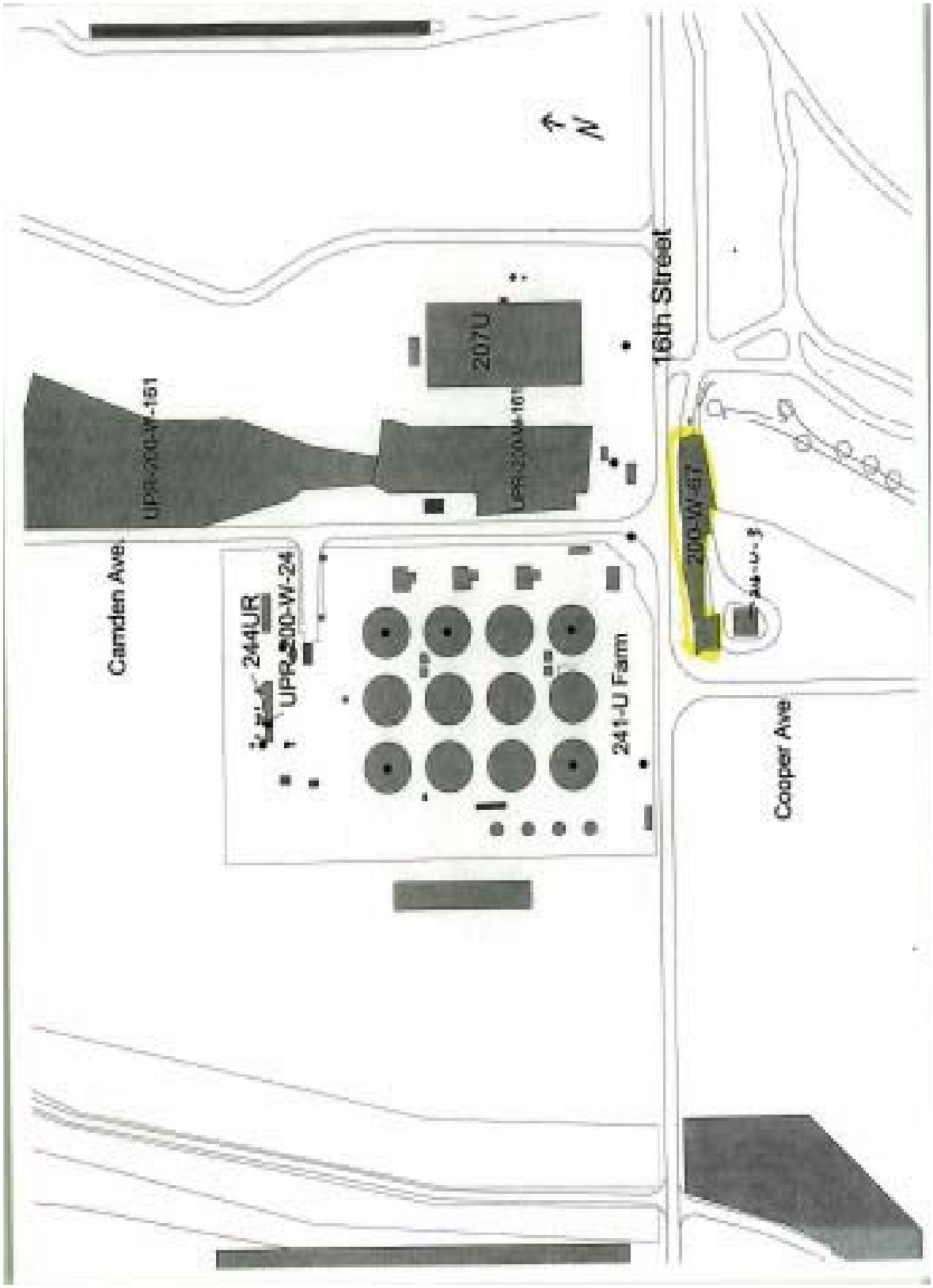


Figure 3. U-Plant Area Map



Site Description

Site ID: 200-W-63, Contaminated Concrete Pad
Site Type: Dumping Area
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-1, 200-MW-1
Service Dates: Not Specified
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-63 is a "T" shaped covered concrete pad. The site was originally posted as a Surface Contamination Area (SCA); however the site was reposted as an Underground Radioactive Material Area (URMA) following the placement of a layer of gravel over the area. The pad is located roughly 180 meters (591 ft) northwest of 241-TY Tank Farm and 80 m (262 ft) south of 23rd Street in 200 West Area (See Figure 2. QMap Image and Figure 3. Reference Map 200-W-63). The debris consists of concrete rubble, wood, cans, pipes, and rusted sheet metal.

Waste Site Coordinates:

E-566518.57541 N-136523.56314

Site Dimensions:

Site Length: 42.7 m (140.0.0 ft) Site Depth: Not Specified
Site Width: 13.7 m (45.0 ft) Cover Thickness: Not Specified

Dimensions of the pad prior to it being covered by a layer of gravel.

Release Summary: Staff reported in interviews regarding this site that the pads were used to store radiologically contaminated tanks in the late 1980's.

The total volume of wastes stored or potentially released at this site is not specified. Therefore, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-63 is not associated with any other waste sites or facilities.

Site Posting: Site 200-W-63 is currently posted as an URMA.

Site Characterization Summary: In 1991, the tanks were removed and the pad was posted as a SCA. A RARA site walkdown occurred on September 1, 1999. During the walkdown, it was noted that the pad had been covered with gravel, and that the pad was posted with old, faded SCA signs and rusted chain. At the time, it did not appear that any group was responsible for surveillance or routine site maintenance. Staff attempted to locate a responsible party for the site, however none was found.

In addition, the site has been mapped and radiologically surveyed. The site was mapped using Global Positioning System (GPS) equipment on September 12, 1997. A radiological investigation occurred on December 5, 1997.A GM/P-11 Probe (15.5 cm^2) (Beta-Gamma) unit detected Beta/Gamma contamination at the Spot #1 up to 50,000 dpm. The average dpm value detected at the site was 2,000.

In addition, coyote tracks through the area suggest that coyotes were drinking water from a small depression in the concrete. A radiological investigation on December 5, 1997 discovered both alpha and beta/gamma contamination on the pad.

It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided for the site. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Not Specified.

References:

WIDS General Summary Report for site 200-W-63
QMap

Figure 1. ArcMap Image

Figure 2. Qmap Image

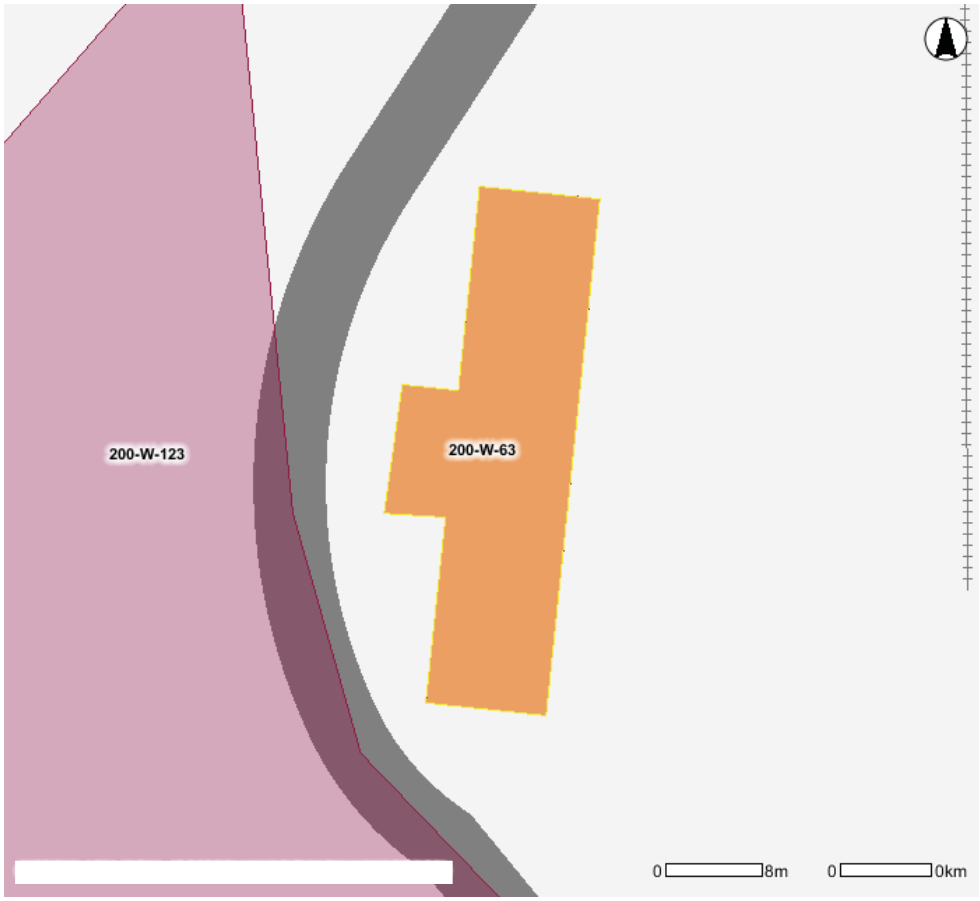
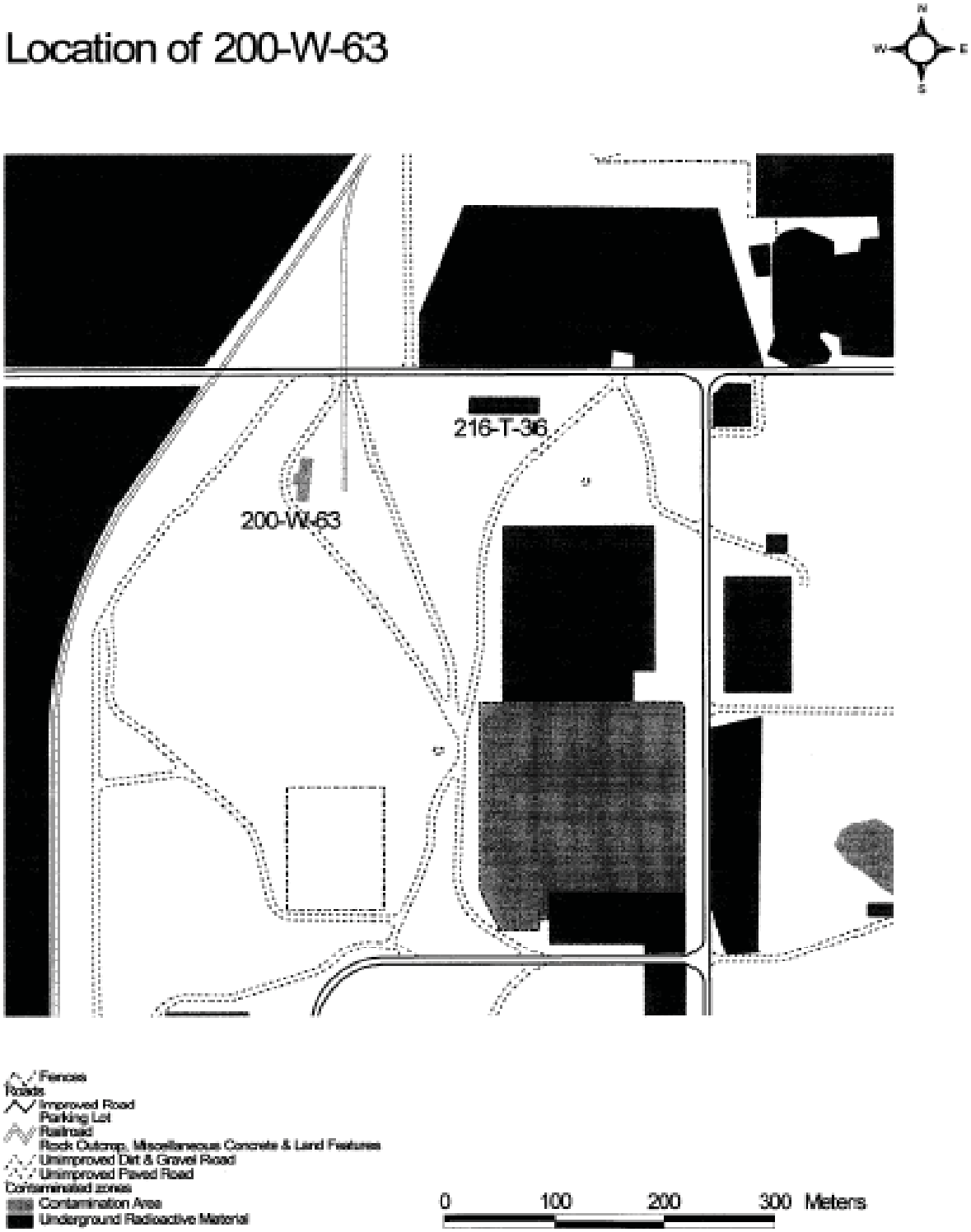


Figure 3. - Reference Map 200-W-63



Site Description

Site ID: 200-W-67, Contaminated Soil at the Corner of Cooper and 16th Street
Site Type: Unplanned Release
Facility/Geographic Area: U-Plant
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1, 200-MG-1
Service Dates: Not Specified
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-67 is an unplanned release located south of 16th Street and Cooper Avenue, and is adjacent to the 216-U-3 Crib (see Figure 1. ArcMap Image and Figure 2. U-Plant Area Map). In 1998, a layer of clean backfill material was placed over the site. The site is currently posted as an Underground Radioactive Material Area (URMA), and covers a 100 m (328 ft) by 18 m (59.1ft) area. No reference drawings are available for this site.

Waste Site Coordinates:

E-566880.47442 N-134951.71579

Site Dimensions:

Site Length: 100.0 m (328.0 ft)
Site Width: 18.0 m (59.1 ft)
Site Area: Not Specified
Site Depth: Not Specified
Cover Thickness: Not Specified

Release Summary: It is unclear what the contamination source is for this site, or when the release occurred. The type of wastes and the volume of wastes released to 200-W-67 are not specified. Therefore, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-67 is not currently associated with any other waste sites or site facilities.

Site Posting: Site 200-W-67 was originally posted as a "Soil Contamination Area" (SCA) in 1998. Currently, the site is posted as an URMA.

Site Characterization Summary: When the waste site was discovered in 1998, it was assumed to be part of UPR-200-W-24, which was an unplanned release in 1953 within the 241-U Tank Farm. However, since it was not possible to definitively connect the contaminated soil found inside the 241-U Tank Farm in 1998 with a release that occurred 45 years earlier, the contaminated area was given a new WIDS number; 200-W-67. Some Radiation Surveys and Stabilization Reports have recorded the site as UPR-200-W-24 despite the name change.

200-W-67 has been surveyed several times over the years. The site was discovered when a radiological investigation on April 17, 1998 located patches of contamination and a contaminated ant hill near the intersection of 16th Street and Cooper Avenue. Radiological readings from the contamination spots were as high as 11 mr/hr, with a second contamination spot having a maximum reading of 6 mr/hr. In addition, the investigation also had readings varying from 500 to 70,000 cpm. The contamination levels at the ant hill were as high as 3,000

cpm. Some areas of contamination were immediately removed after they were discovered. The rest of the area was posted as a CA.

On May 5, 1998, the site that was to become 200-W-67 and a second site were both mapped using Global Positioning Survey (GPS) equipment. The survey was conducted to determine if the southern site (200-W-67) warranted its own separate WIDS label. In February 1999, the southern unit was determined to be a separate unit, and was renamed 200-W-67.

On September 10, 1998, a layer of clean backfill was placed over the site as part of surface stabilization efforts. The site was downposted from a Contamination Area (CA) to an URM area following the stabilization work.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Not Specified.

References:

WIDS General Summary Report for site 200-W-67
ArcMap
QMap

Figure 1. ArcMap Image

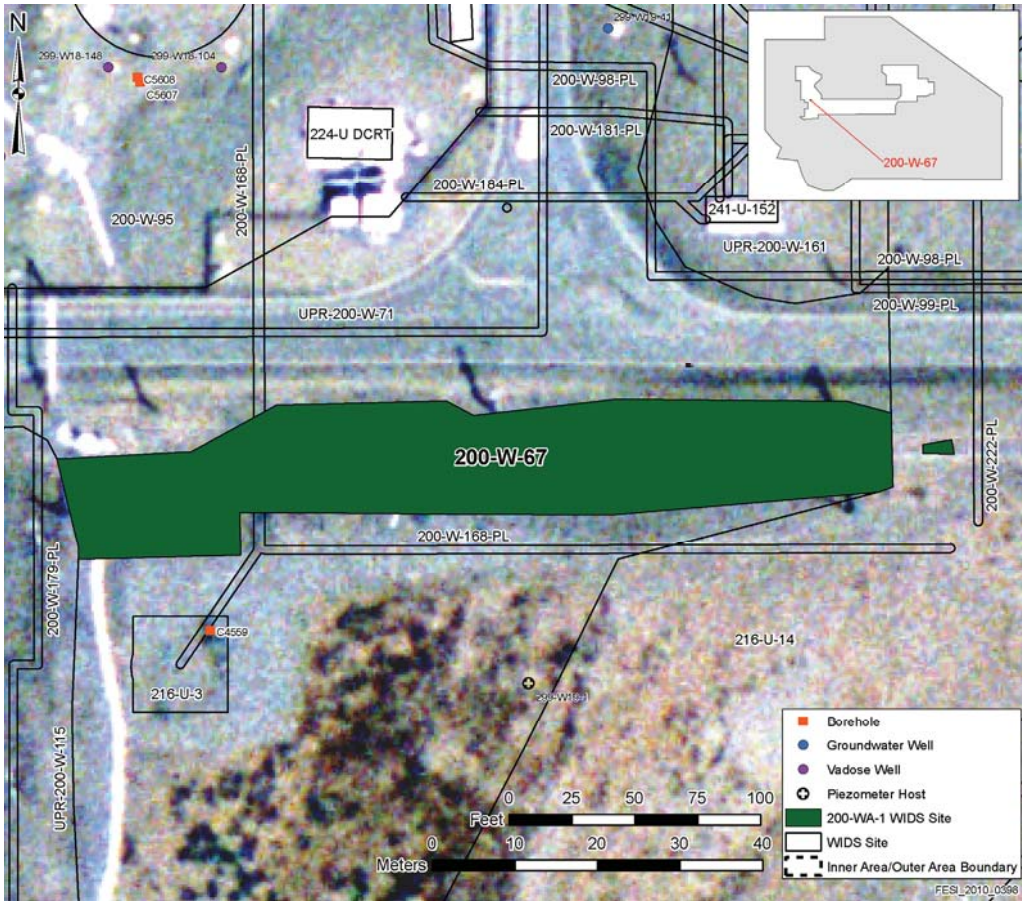
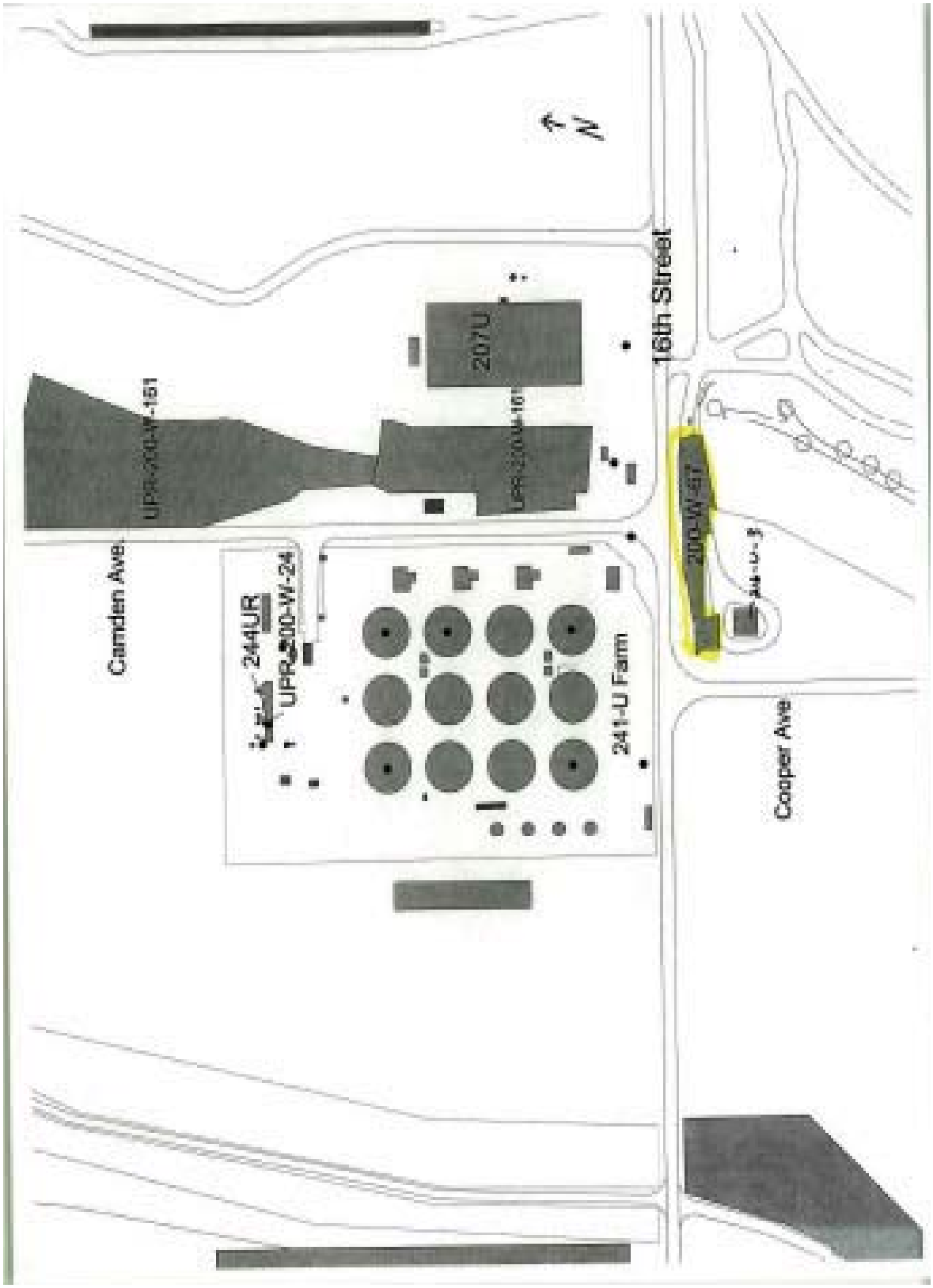


Figure 2. U-Plant Area Map



Site Description

Site ID: 200-W-71, Undocumented Trench, Undocumented Burn Pit
Site Type: Trench
Facility/Geographic Area: U-Plant
Current OU Assignment: 200-MG-1 or 200-MG-2
Former OU Assignment: 200-UW-1
Service Dates: Not Specified
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-71 is an open trench that, based on provided information, was historically used as a burnpit, a spoil pile, and/or a "Maintenance Disposal Ground". The trench was located southeast of the 221-U Facility. It is south of 16th Street and east of Beloit Avenue (See Figure 2. per QMap). The trench has been backfilled; however the area where the trench was located is not marked or posted. The ground surface appears slightly disturbed, and supports a growth of cheatgrass and a few rabbitbrush shrubs. Surface debris located at the site is believed to be associated with the site being used as a lay down area during the re-construction of the U-Plant Facility (Figure 3. H-2-1495_U-Plant Area Map).

Waste Site Coordinates:

Lon-567988.23894 Lat-134889.66953

Site Dimensions:

Site Length: 80.0 m (262.5 ft) Site Depth: Not Specified
Site Width: 15.0 m (49.2 ft) Cover Thickness: Not Specified

The dimensions were estimated by comparing the scar shown in a 1948 aerial photograph with the Arcview image of the same area.

Release Summary: The reason the 200-W-71 trench was constructed and the purpose the trench was to fulfill is unclear. Information is presented that the trench was used as a "Maintenance Disposal Ground" and as a burn pit (Figure 4 and Figure 5 Historical Photographs). However, there are no assigned burial grounds in the area. This site was used as a construction lay down area for the updating of the U-Plant for the uranium recovery process.

Staff members knowledgeable of the area recalled that natural uranium was disposed of in the trench. However, no radioactivity was found during several core sampling efforts undertaken in the surrounding area over the years.

It is unclear what the contamination source is at the site, or when the release occurred. The type of waste and the volume of waste released at 200-W-71 are not specified. Therefore, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-71 is associated with the Construction Surface Lay Down Area (sitecode 200-WCSLA).

Site Posting: Site 200-W-71 is not posted or marked.

Site Characterization Summary: In 1988, the 216-U-17 Crib was constructed immediately to the west of the 200-W-71 trench. Prior to its installation, a meeting on July 2, 1987 occurred to discuss the background of the proposed Crib location. During the meeting, several staff recalled the existence of an old burial ground bordering the 216-U-17 Crib location. The Crib location is heavily documented; however the documentation did not include the area east of Beloit Avenue, which is where the 200-W-71 trench is located. In the 1990's, the 200-UP-1 Ground Water Pump and Treat project was located in this area.

A site walkdown occurred for verification purposes on February 28, 2000. No visible evidence was observed indicating that a trench was present in the area. A Geophysical survey investigation was conducted on December 1, 2003. During the investigation, multiple individual anomalies were discovered. No information is presented detailing the characteristics of the anomalies.

No radiological survey information is presented for the site. It is unclear if the site is routinely surveyed or monitored. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Not Specified.

Figure 1. ArcMap Image

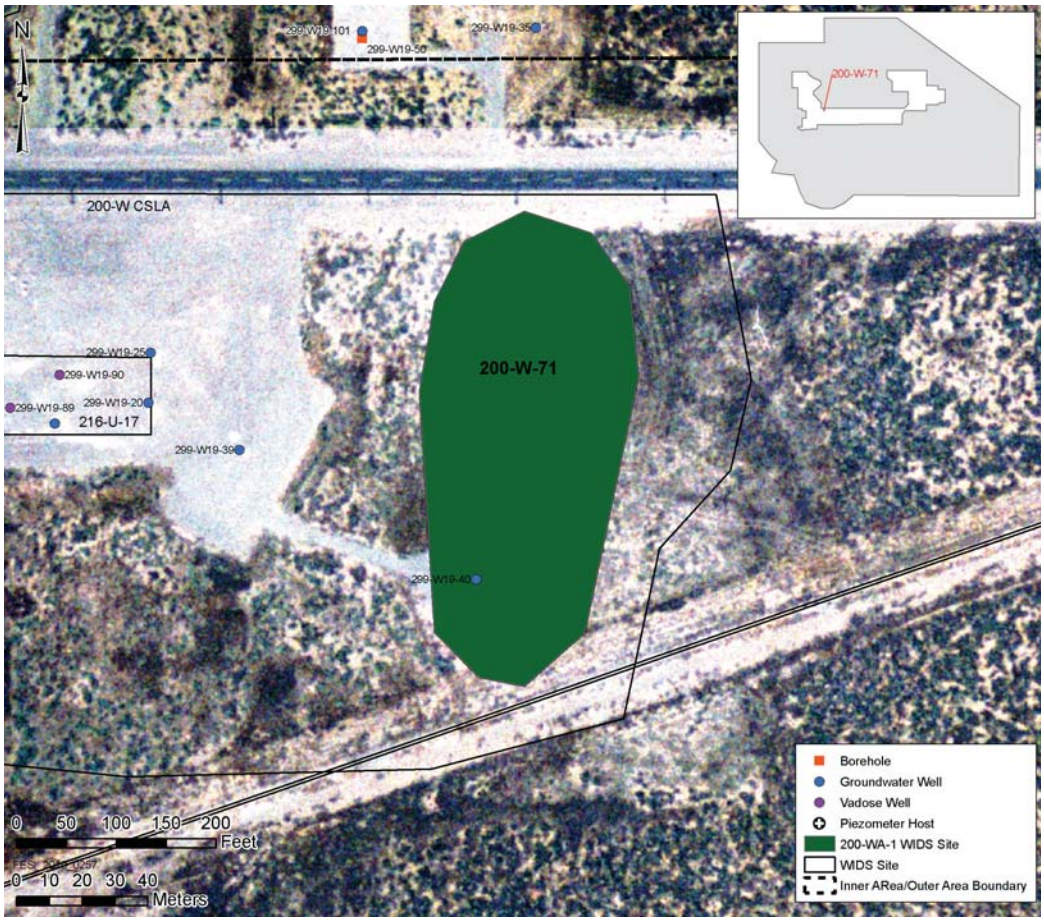


Figure 2. Insert Site Map

Figure not available.

Figure 3. H-2-1495 U-Plant Area Map

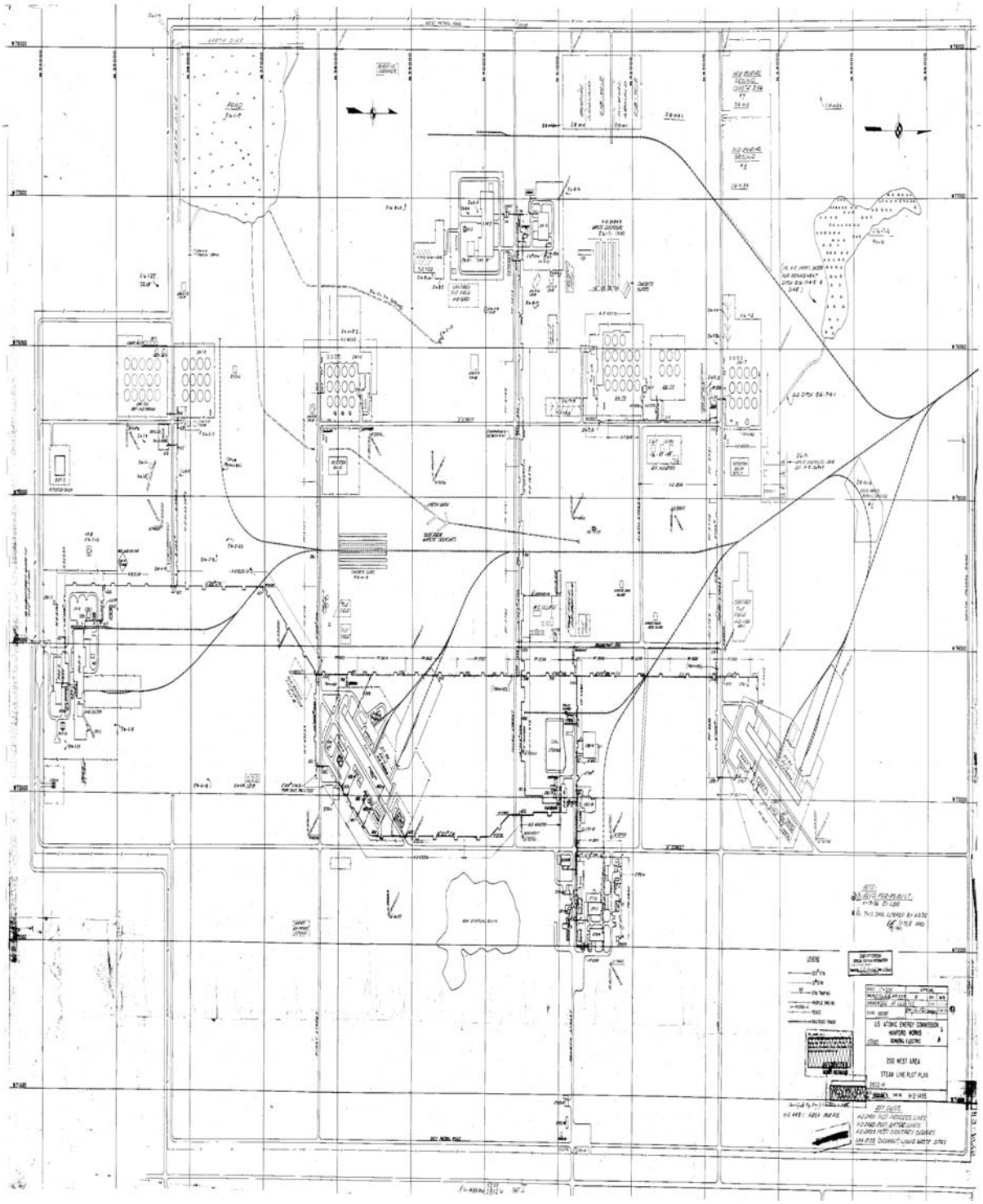
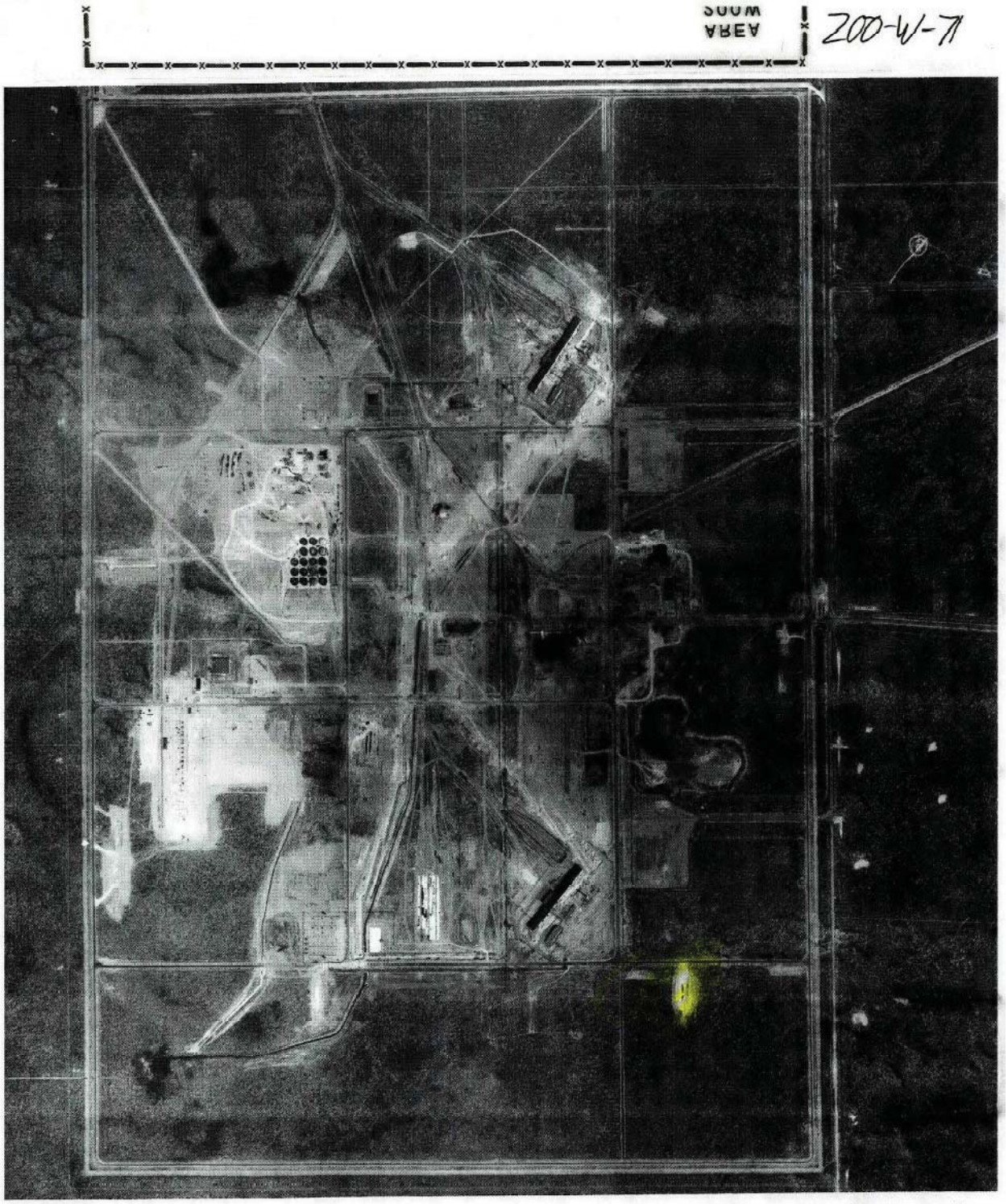


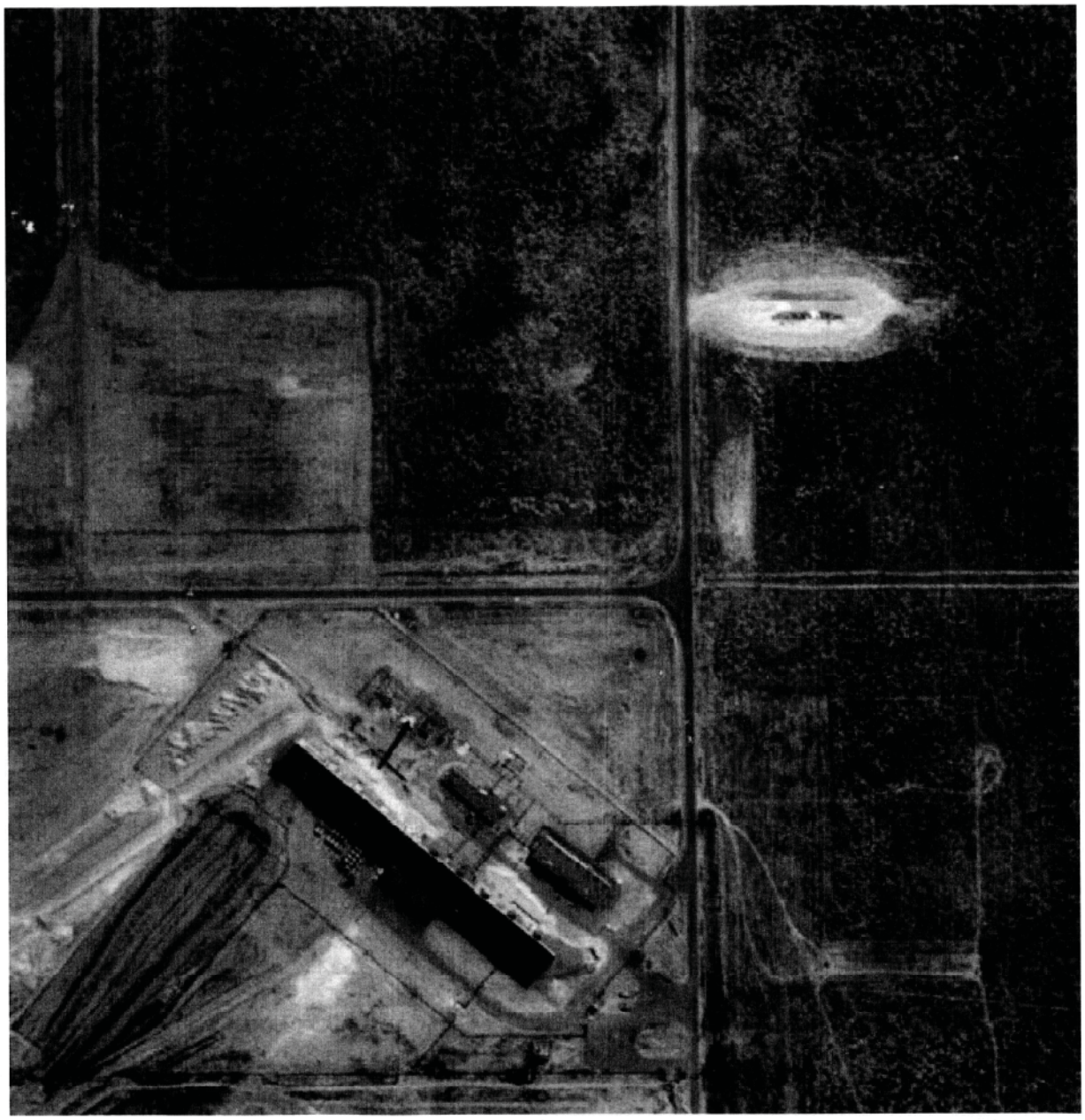
Figure 4. Historical Photographs



'igure 4. Rockwell Hanford Operations Area 200W, June 1, 1948. Approximate scale 1:15,000.

Figure 5. Historical Photographs

1948 Photo



200-W-71

Site Description

Site ID: 200-W-75, Radiological Logging System (RLS) Calibration Silos
Site Type: Experiment/Test Site
Facility/Geographic Area: S-Plant (REDOX) Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-SW-2, 200-MG-1
Service Dates: Site became operational in 1978
Volume/Mass Discharged: Unspecified

Waste Site Location and Physical Description: Site 200-W-75 consists of four buried Radiological Logging System (RLS) equipment calibration silos. Three silos are located west of the 202-S building, south of the 276-S building, and north of the 211-S Tanks (See Figure 1. ArcMap Image and Figure 2. 200-W-75 Sketch Location). The fourth calibration silo is located west of the 211-S Tank, across an asphalt access road. The silos are galvanized steel containers with metal lids bolted on top (See Figure 3. Cross Section of In-Well Calibration Facility). The silos have somewhat different design constructions for calibrating different types of equipment. One type consisted of a 25 cm (6 in) capped well casing inserted through the centers of the silos. There are two risers with bolted lids adjacent to the well casing.

Three of the silos were located within the 211-S posted Contamination Area. This area was covered with a minimum of 15.24 cm (6 in) of clean gravel in November 2002. The three silos are now beneath the clean backfill and are no longer visible. The area was downposted to an Underground Radioactive Material (URM) Area following surface stabilization work.

Waste Site Coordinates:

E-567262.62201 N-133987.43463

Site Dimensions:

Site Length: Not Specified
Site Width: 1.2 m (4.0 ft)
Site Area: 1.13 m^2 (12.6.0 ft^2)
Site Depth: 2.4 m (8.0 ft)
Cover Thickness: 0.015 m (0.05 ft)

Release Summary: The site consists of several contaminated calibration silos used to store solid radioactive material. The calibration silos contained radioactive sources consisting of known quantities of cobalt-60, strontium-90, ruethenium-106 and cerium-144 in sealed capsules. Since the silo covers are posted with URM signs, it is assumed the sources are still inside the silos.

Related Site Structure(s): None.

Site Posting: The site is posted as an URMA.

Site Characterization Summary: In the late 1970's test well mockups were used to calibrate in-well radionuclide detectors. The calibration mockups were constructed of a steel container approximately 2.4 m (8 ft) deep filled with soil. Tubes containing radioactive sources were inserted into the soil at distances of 2.5, 7.6, 15, 30, 46, and 61 cm from the well casing that was located in the center of the mockup. The mockup silo was buried so that a RLS vehicle could drive up to the calibration silo and drop its logging probe in the center well casing.

A Global Positioning System (GPS) survey on February 20, 2001 mapped the boundaries of the site.

Potential Contaminants:

Radioactive: Cobalt-60, Strontium-90, Ruethinium-106, Cerium-144

Non-Radioactive: None

References:

WIDS General Summary Report for site 200-W-75
ArcMap
QMap

Figure 1. ArcMap Image

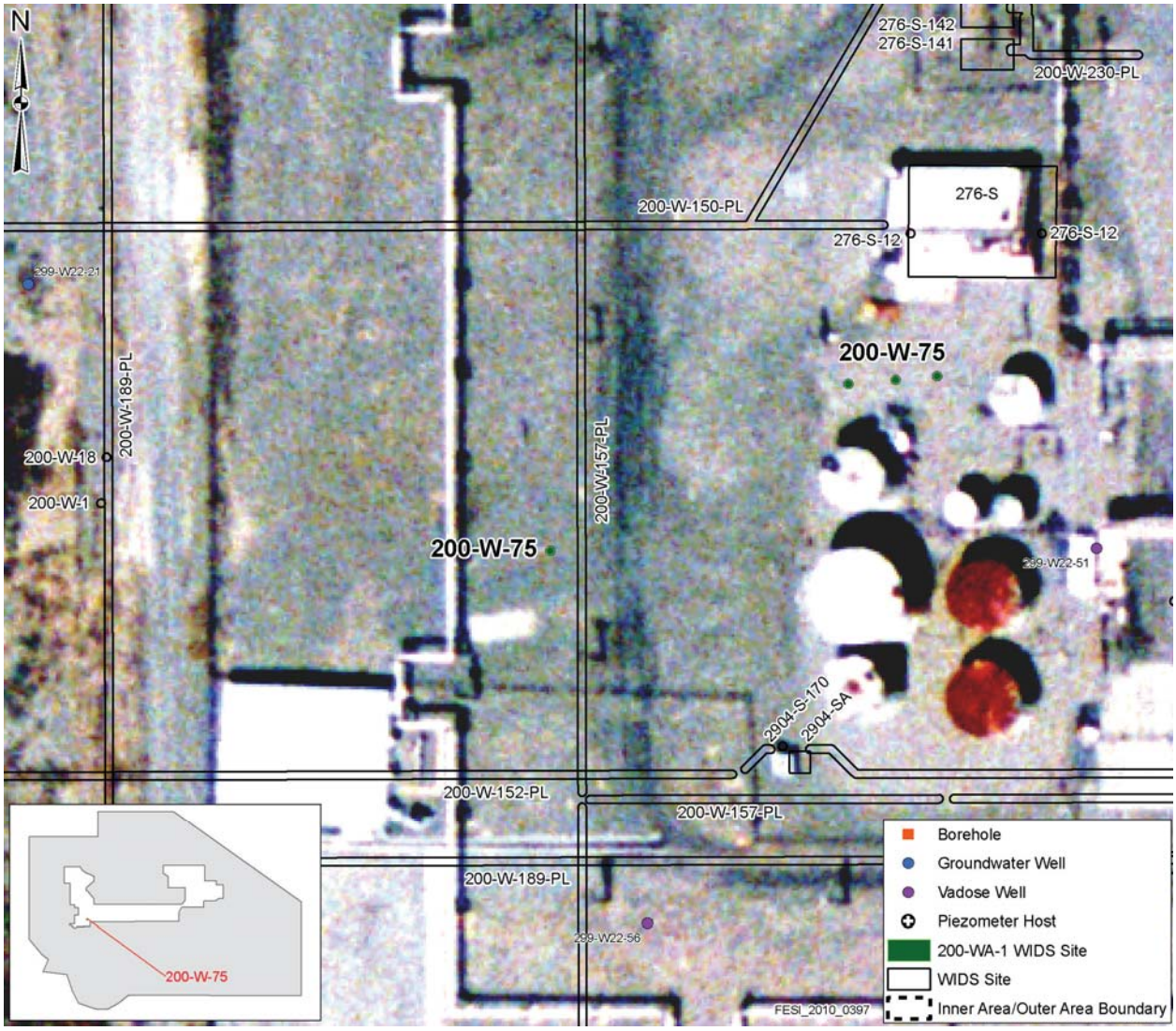


Figure 2. 200-W-75 Location Sketch

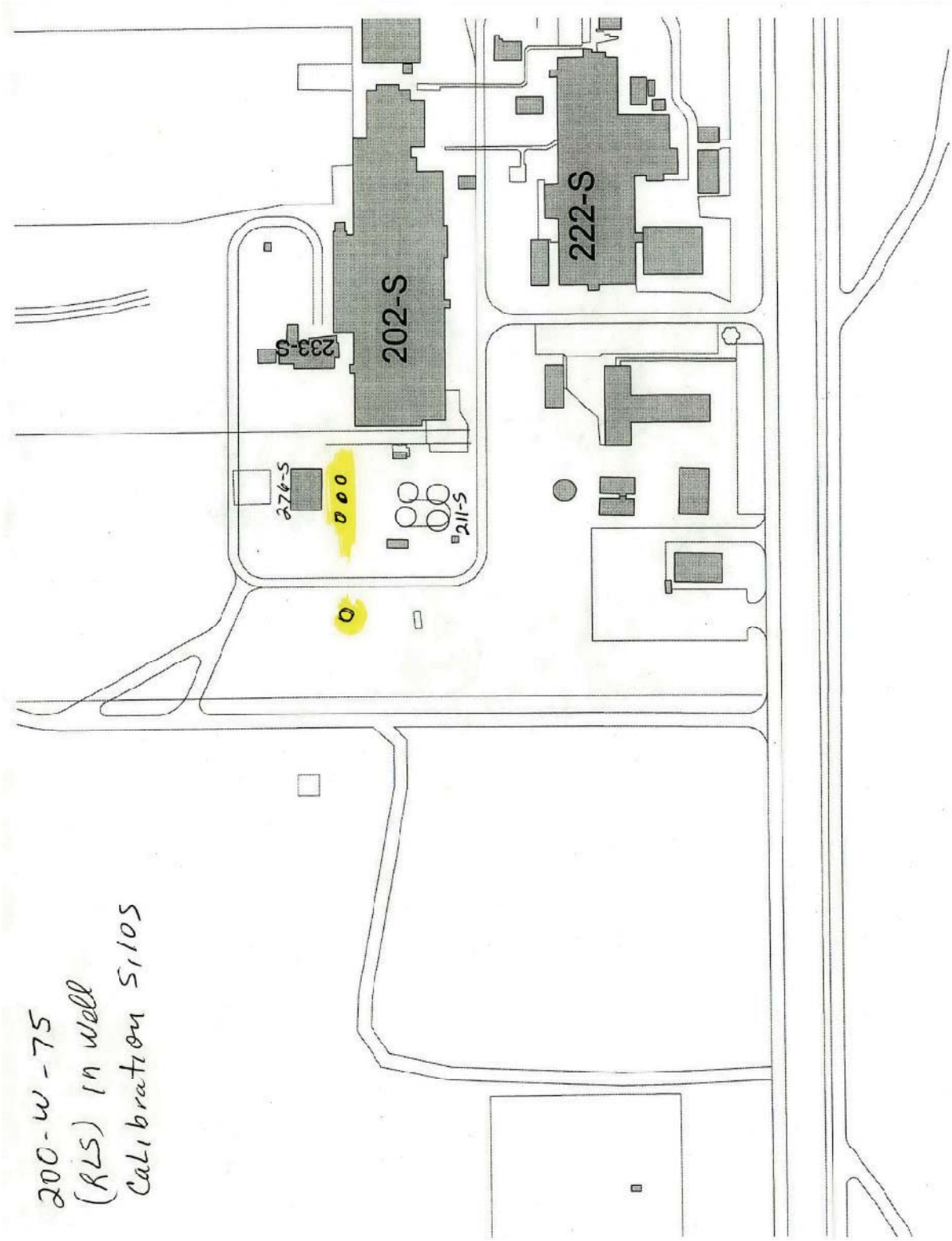


Figure 3. Cross Section of In-Well Calibration Facility (From RHO-ST-14)

RHO-ST-14

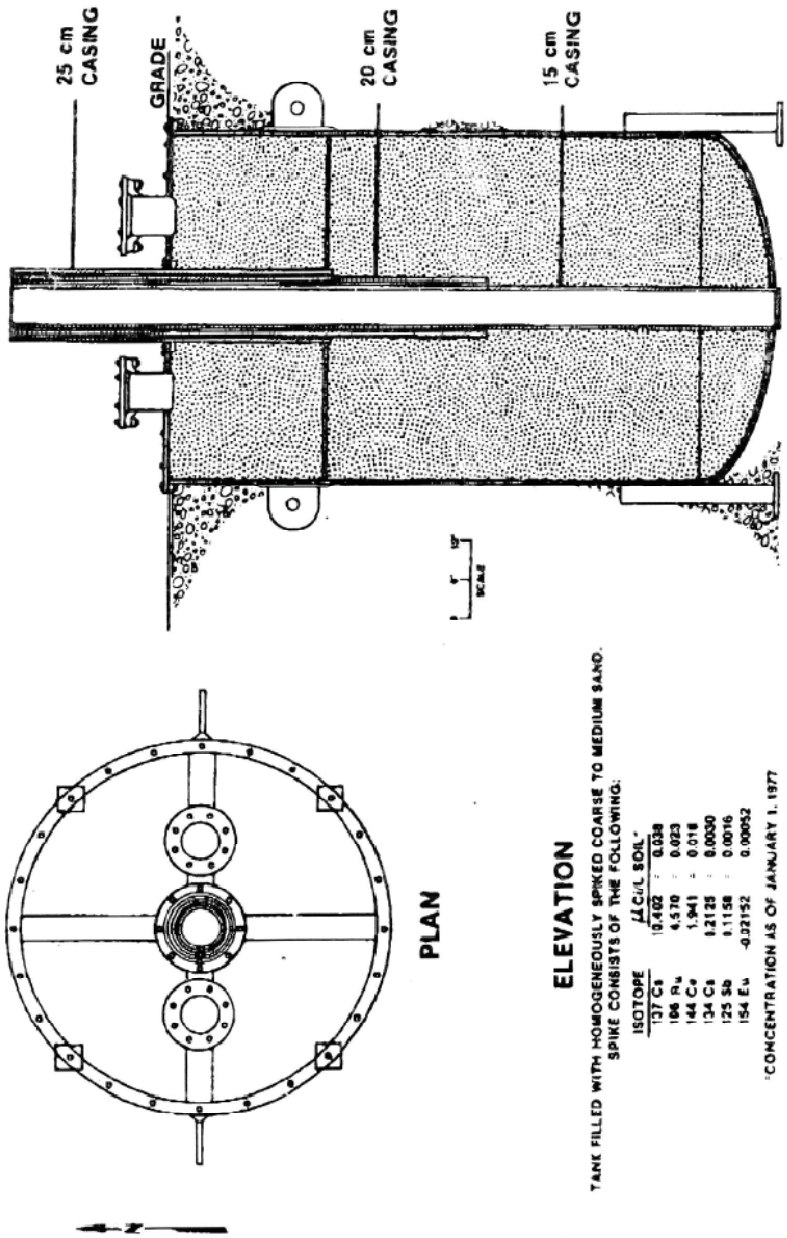


FIGURE J-6. In-Well Calibration Facility.

J-13

Site Description

Site ID: 200-W-77, Posted Contamination Area East of 216-U-14 Ditch
Site Type: Unplanned Release
Facility/Geographic Area: U-Plant
Current OU Assignment: 200-MG-1
Former OU Assignment: 200-UW-1
Service Dates: Not Specified
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-77 was an unplanned release to the ground adjacent to the railroad track, west of 216-U-16 Crib and east of the stabilized 216-U-14 Ditch (See Figure 2. per QMap). The site is a small, 2.4 m (8.0 ft) by 4.6 m (15.0 ft) area marked with posts, chains, and "Contamination Area" (CA) signs. In 2000, the area was covered with a layer of clean gravel backfill and downposted to an Underground Radioactive Material (URM) area. No reference drawings are available for this site.

Waste Site Coordinates:

Lon-567158.10192 Lat-134842.38865

Site Dimensions:

Site Length: 2.4 m (8.0 ft)
Site Width: 4.6 m (15.0 ft)
Site Area: Not Specified
Site Depth: Not Specified
Cover Thickness: Not Specified

Release Summary: Site 200-W-77 is located downwind of the southern portion of the 216-U-14 Ditch, which was undergoing surface stabilization efforts when 200-W-77 was discovered in November 1997. At the time, the 216-U-14 Ditch was a known source for windblown contaminated vegetation for the surrounding areas. Site 200-W-77 was originally posted as a High Contamination Area. In September 2000, radiological investigations found contamination levels up to 10,000 cpm on tumbleweed fragments in the posted area, which were subsequently removed. 200-W-77 was reposted as a CA after contamination spots was removed. It is assumed that the 216-U-14 Ditch is the source of the contaminated tumbleweeds found at 200-W-77.

It is unclear when the release occurred, or how long the contaminated vegetation had been present. No volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-77 is associated with the 216-U-14 Ditch.

Site Posting: Site 200-W-77 was originally posted as a High Contamination Area when it was first discovered. The site was downposted to a CA after contaminated tumbleweed fragments were removed. Following interim remediation activities in 2000, the site was downposted a final time to an URM area.

Site Characterization Summary: The site has been surveyed several times over the years. The site was mapped using Global Positioning Survey (GPS) equipment in 1999. A radiation survey on September 20, 2000 led to the discovery of the contaminated tumbleweed fragments, which were immediately removed. A GM/P-11 Probe (15.5 sq cm) (Beta-Gamma) was used during the

investigation. A site walkdown occurred on November 1, 2000 to verify the site location and the condition of the site.

The site was covered with a layer of clean gravel backfill and downposted from a SCA to an URM area in 2000. No subsequent radiological survey or site characterization information is presented for the site. It is unclear if the site is routinely surveyed or monitored. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Not Specified.

Figure 1. ArcMap Image

Figure 2. Insert Site Map

Figure not available.

Figure 3. U-Plant Area Map

Figure not available.

Site Description

Site ID: 200-W-80, Stabilized Contaminated Soil Area Southwest of T Plant, Mound of Contaminated Soil Southwest of T Plant
Site Type: Spoils Pile/Berm
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-1, 200-MW-1
Service Dates: Not Specified
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-80 is composed of a gravel area and soil mound encompassed by posts and chain. Originally surrounded by radiation rope and posted as a Contamination Area (CA), the site is currently posted with Underground Radioactive Material Area (URMA) signs. The mound was roughly 1.5 m (5 ft) tall, 8.2 m (27 ft) long, and 3 m (10ft) wide. The mound and the immediate area contain numerous pieces of asphalt, similar to that in the neighboring T-Plant parking lot. Approximately 3m (10 ft) east of the site is a small posted URMA, with one capped well inside the posted area and a second capped well located just outside the boundary. This second well is locked and is posted with a potential contamination warning.

In addition, postings on the fence line along the northern section of the CA indicate an underground pipeline is present, running from the east to the west. This area is also posted as an URMA. The site is located west of 221-T and northeast of the 241-T-361 settling tank. It is about 15 m (50 ft) west of the steam pipeline (See Figure 1. ArcMap Image). No reference drawings are available for this site.

Waste Site Coordinates:

E-567370.95721 N-136762.31332

Site Dimensions:

Site Length: 15.0 m (49.2.0 ft) Site Depth: 1.5 m (4.9 ft)
Site Width: 14.0 m (46.0 ft) Cover Thickness: Not Specified

Dimensions of the posted area. The mound is 1.5 m (5 ft) tall.

Site Length: 8.2 m (27.0 ft) Site Depth: 1.5 m (5.0 ft)
Site Width: 3.1 m (10.0 ft) Cover Thickness: Not Specified

Dimensions of the soil mound located inside the posted area.

Release Summary: Site 200-W-80 consists of a mound of soil encompassed by radiation rope and CA signs. While no radiation contamination was discovered during a radiological survey in 1999 or 2000, it is possible that contamination is present inside the mound itself. However, no information is provided detailing the waste released or stored at the site. Therefore, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-80 is associated with the 216-T-27 and 216-T-28 Cribs. The pipeline associated with the unloading station is labeled as 200-W-188-PL.

Site Posting: Site 200-W-80 is currently posted as an URMA.

Site Characterization Summary: The site was mapped with Global Positioning System (GPS) equipment on July 7, 1998. A radiological investigation of the soil mound on November 30, 1999 did not discover any contamination on the mound surface. However, the survey did detect up to 100 cpm of contamination west of the T Plant. A second radiation survey occurred on December 18, 2000 as part of a final radiation survey. The second survey also failed to detect any contamination on the ground surface of the mound. A GM/P-11 Probe (15.5 cm square) (Beta-Gamma) was used during both surveys. Due to the presence of asphalt inside and surrounding the mound, it is assumed that the mound was created several years prior during a parking lot expansion at T Plant.

The mound and its CA posting were submitted to WIDS as a Discovery Site on May 2000. In December 2000, the site was surface stabilized. The soil mound was leveled and a layer of gravel was placed over the area. The site was surveyed and downposted to a URMA following the remediation work. A site walkdown on October 12, 2000 occurred to evaluate the conditions of the site. The results of this investigation are not presented.

It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided for the site. If surveys do occur, their frequency is not specified.

Potential Contaminants:

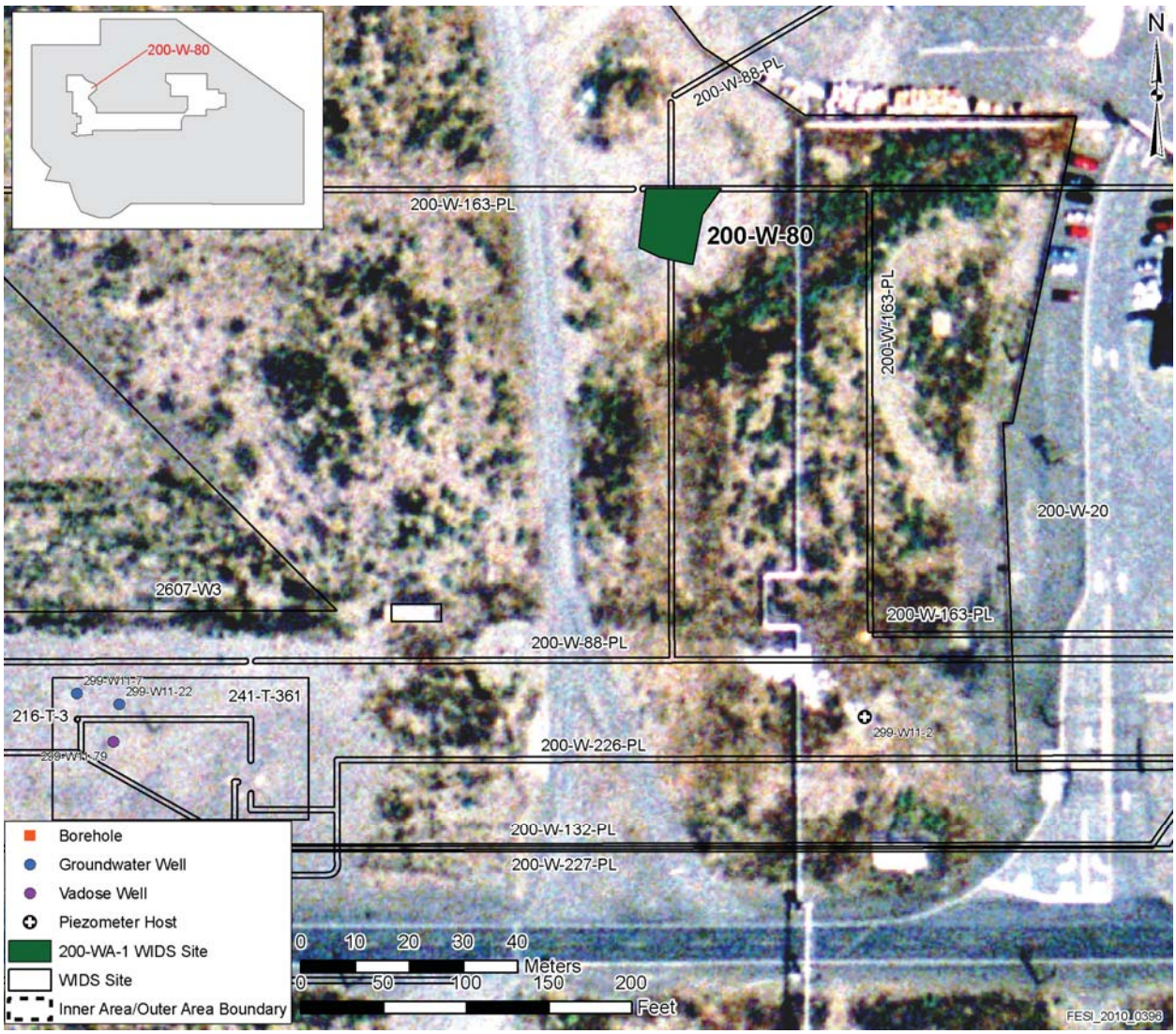
Radioactive: Not Specified.

Non-Radioactive: Unspecified contamination in a soil mound.

References:

WIDS General Summary Report for site 200-W-80
ArcMap
QMap

Figure 1. ArcMap Image



Site Description

Site ID: 200-W-81, Contaminated Tumbleweed Fragments Along Railroad Track East
Site Type: Unplanned Release
Facility/Geographic Area: T-Plant_
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-1, 200-MW-1
Service Dates: Not Specified
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-81 consists of three posted Contamination Areas (CA). The three CA's are located on the railroad tracks east of the 218-W-3AE Burial Grounds and south of 12th Street and the 610 Gate (See Figure 1. ArcMap Image). No reference drawings are available for this site.

Waste Site Coordinates:

E-566848.77629 N-137283.07443

Site Dimensions:

Site Length: 30.5 m (100.0.0 ft) Site Depth: Not Specified
Site Width: 12.2 m (40.0 ft) Cover Thickness: Not Specified

Site Length: 1.8 m (6.0 ft) Site Depth: Not Specified
Site Width: 1.8 m (6.0 ft) Cover Thickness: Not Specified

Site Length: 6.1 m (20.0 ft) Site Depth: Not Specified
Site Width: 3.1 m (10.0 ft) Cover Thickness: Not Specified

Note: Provided above are the three dimensions of the three CA's discovered on railroad tracks on a portion of the T-Plant Spur.

Release Summary: The site consists of three areas that have been contaminated by blown in tumbleweed fragments. The tumbleweed fragments have contaminated the soil, which in turn has led to additional vegetation contamination. The windblown, contaminated tumbleweed fragments are believed to originate from the southern end of the 218-W-3AE Burial Grounds. The total volume of wastes stored or potentially released at this site is not specified. Therefore, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-81 is not associated with any other waste sites or facilities.

Site Posting: Site 200-W-81 is currently posted as an URMA.

Site Characterization Summary: The three posted areas contain blown in contaminated tumbleweeds and tumbleweed fragments. The three sites were submitted to WIDS together, for incorporation into the WIDS database as a single Discovery Site.

The site has been surveyed several times since its discovery. On June 29, 1998, a railroad survey using a GM/P-11 Probe (15.5 cm square)(Beta-Gamma) discovered contamination on a railroad tie and within the soil in a portion of the T-Plant Spur. A second radiation survey on July 31,

2000 identified the three CA's that were created as a result of a consolidation of blow in contaminated tumbleweeds and new vegetation growth. In addition, a site walkdown on November 15, 2000 for verification purposes confirmed the site's location and noted that the three posted CA's still contained blown in tumbleweeds.

During a routine radiological investigation within the burial ground, contaminated vegetation with readings up to 7,000 dpm were found. The contaminated vegetation was subsequently removed. A verification survey conducted after vegetation was removed discovered contaminated soil with beta/gamma readings of 70,000 dpm. Staff sprayed the site with soil cement and posted the area as a CA.

In 2009, all three CA's were radiologically surveyed and downposted to Soil Contamination (SC) Areas. Later that same year, each SCA was covered with 6 in (3 cm) of clean gravel and the postings at each site were changed to URMA.

It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided for the site. If surveys do occur, their frequency is not specified.

Potential Contaminants:

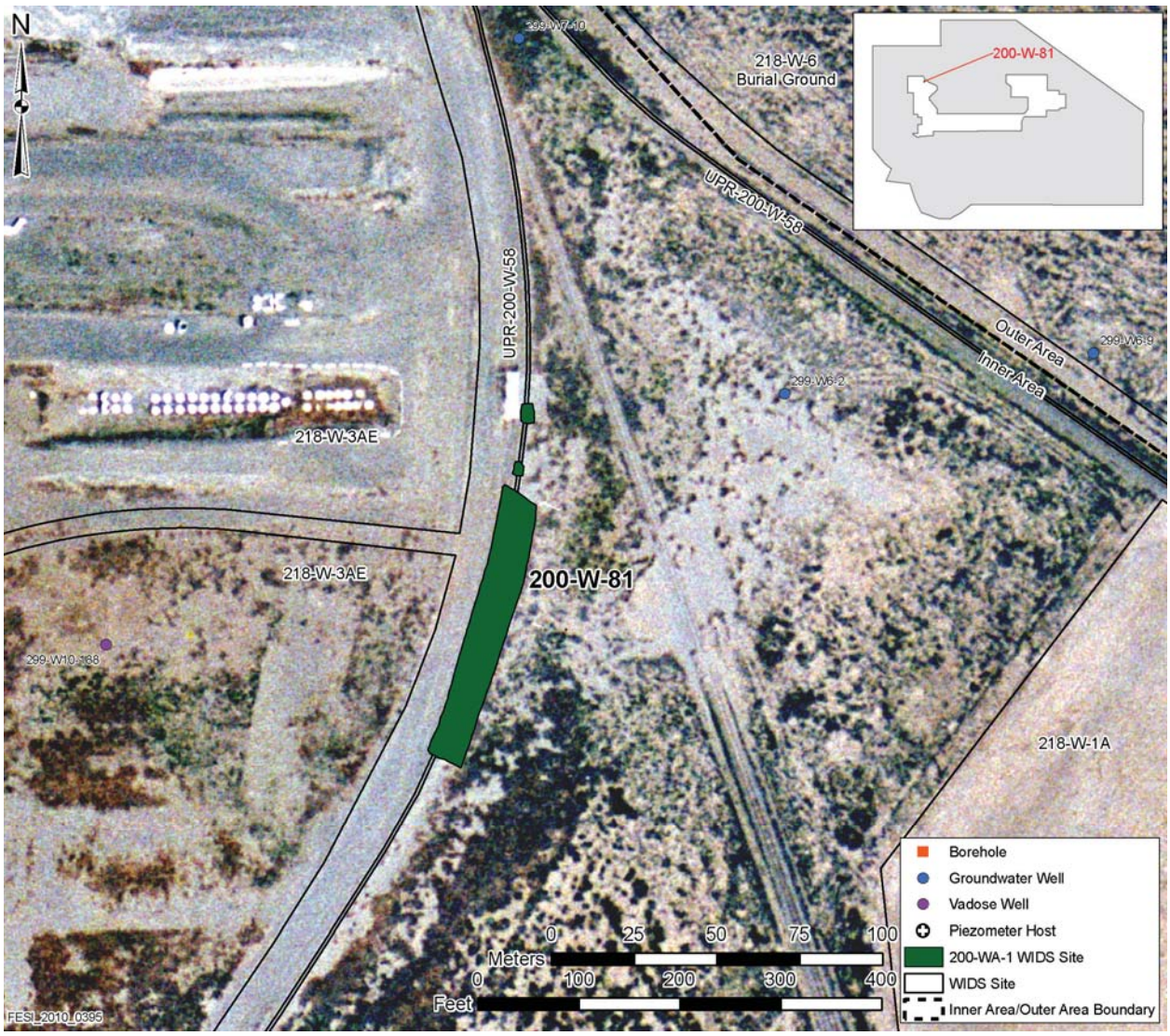
Radioactive: Contaminated vegetation with readings up to 7,000 dpm

Non-Radioactive: Not Specified

References:

WIDS General Summary Report for site 200-W-81
ArcMap
QMap

Figure 1. ArcMap Image



Site Description

Site ID: 200-W-82, Risers East of 216-TY-201, 216-T-26, 216-T-27, 216-T-28 Cribs, Crib Unloading Station
Site Type: Product Piping
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-1, 200-MW-1
Service Dates: Not Specified
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-82 consists of two 1.2 x 1.2 m (4.0 x 4.0 ft) concrete pads, each with a stainless steel flanged riser. The metal pipe flanges have a bolted top, and rise approximately 7 cm (3 in) above the level of the concrete. The site is located east of Camden Avenue, 30 m (100 ft) east of the 216-TY-201 Flush Tank and 216-T-26, 216-T-27, and 216-T-28 Cribs (See Figure 1. ArcMap Image).

The unloading station was constructed to fit tanker trucks unloading 300 Area liquid wastes into the 216-T-27 and 216-T-28 Cribs. The unloading station conveyed waste from the trucks to the cribs and was capable of unloading up to two trucks at once. The two cement pads with risers are located east of the blanked pipeline 200-W-188-PL, which ran towards the 216-TY-201 Flush Tank. Just south of the Flush Tank, the pipe continued to run westward to the 216-T-26, 216-T-27, 216-T-28 Crib line. (Figure 2. Reference Drawing SK-2-3706). The site is posted with Contamination Area (CA) signs and covers approximately 6 x 12 m (20 x 40 ft) of ground.

Waste Site Coordinates:

E-566975.54038 N-136404.59529

Site Dimensions:

Site Length: 10.7 m (35.0 ft)
Site Width: 4.9 m (16.0 ft)
Dimensions measured from Arcview image.

Site Depth: Not Specified
Cover Thickness: Not Specified

Release Summary: There is some uncertainty regarding the source of waste sent to the 200-W-82 unloading station. The more likely scenario is that 300 Area wastes, originating from the 340 Waste Transfer Facility, were discharged into the 216-T-28 Crib. However, an additional source states that the waste from the 340 Waste Transfer Facility was instead combined with T Plant and 2706-T waste and discharged into the 216-T-28 Crib via single-shell tanks. This suggests that the 300 Area waste was added to the tank farm tanks instead of disposed of into the 216-T-28 Crib. Based on available drawings and the presence of the unloading platform to the east of the Crib series, it is assumed that the latter statement is incorrect.

It is believed that site 200-W-82 was constructed for use as a truck unloading station for liquid waste from the 300 Area. It is thought that 200-W-188-PL, which is the short pipeline connected to the station, extended eastward to the risers. The waste at the unloading station is located on the underground transfer piping, on the risers and pads, and within the ground in areas exposed to contamination via leaks.

The total volume of wastes unloaded or potentially released at this site is not specified. Therefore, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-82 is associated with the 216-T-27 and 216-T-28 Cribs. The pipeline associated with the unloading station is labeled as 200-W-188-PL.

Site Posting: Site 200-W-82 is currently posted as a CA area.

Site Characterization Summary: Drawings indicate that the "T" pipe (200-W-188-PL) was originally designed for the construction of three additional cribs that were scheduled to receive wastes from the 216-TY-201 Flush Tank. However, the additional cribs were never constructed.

A site walkdown on November 15, 2000 occurred for verification purposes. The site walkdown confirmed the dimensions of the two concrete pads and the site posting. It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided for the site. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Not Specified.

References:

WIDS General Summary Report for site 200-W-82
ArcMap
QMap

Figure 1. ArcMap Image

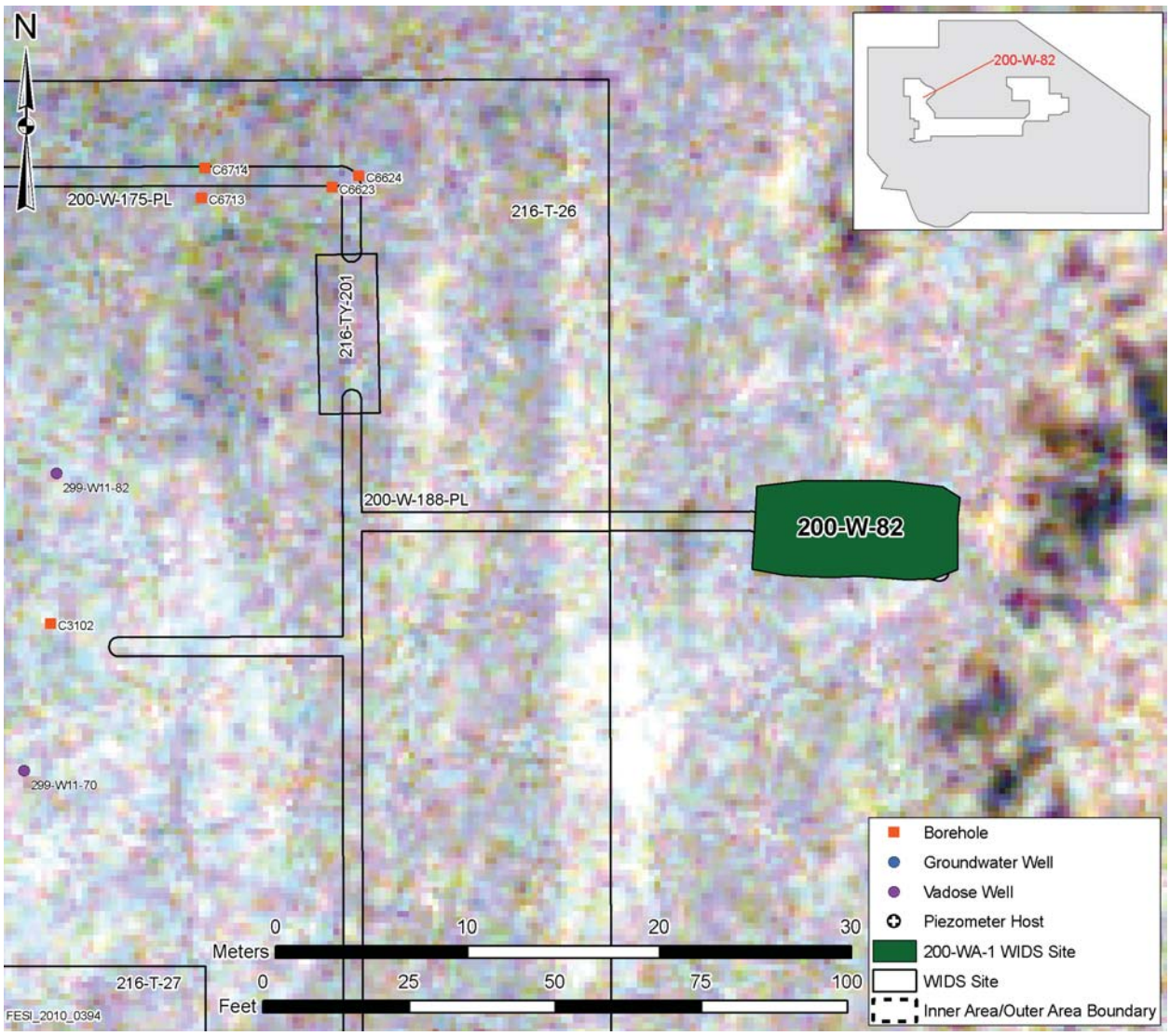
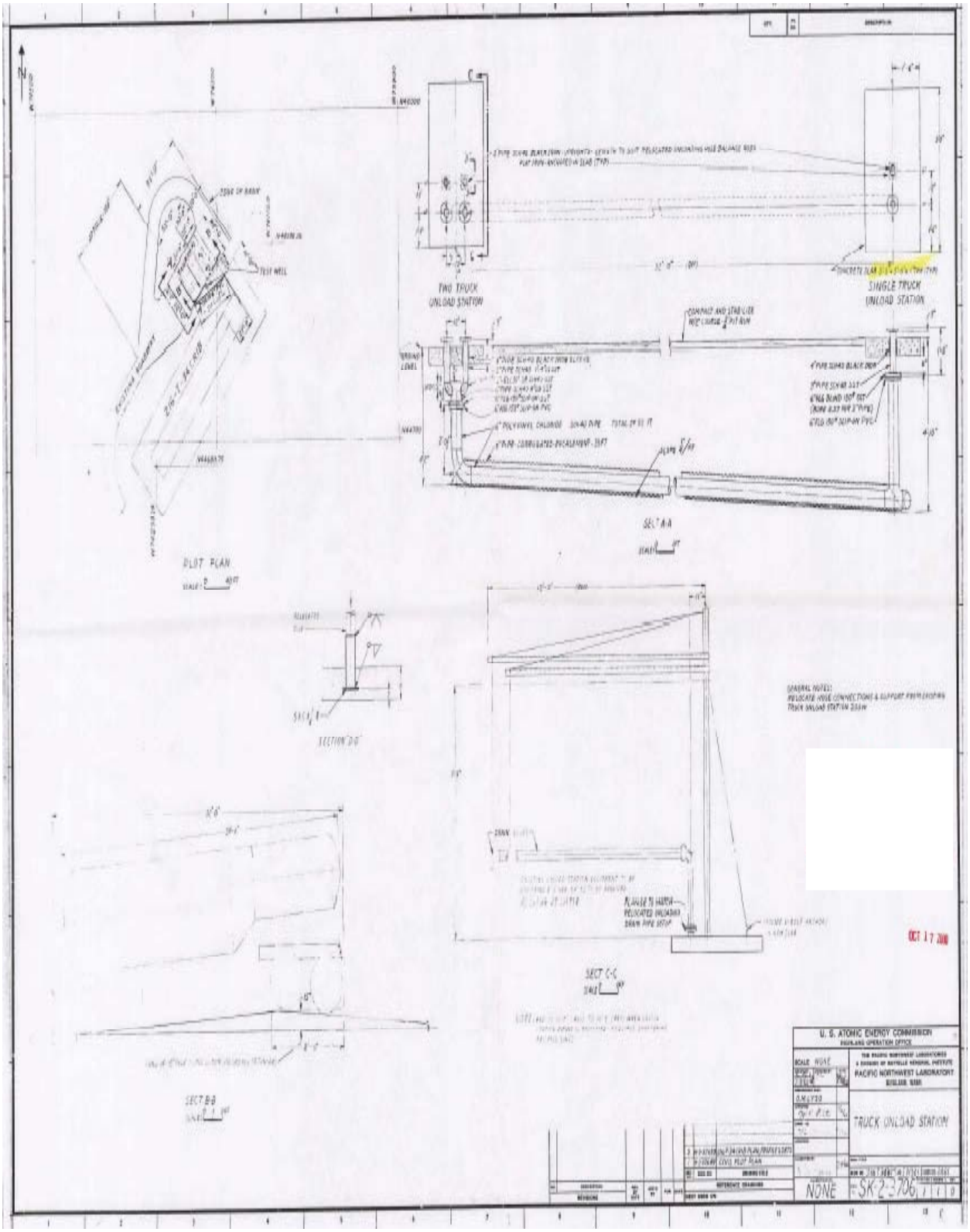


Figure 2. Reference Drawing SK-2-3706



Site Description

Site ID: 200-W-83, Soil Contamination Area North of 2727 W
Site Type: Unplanned Release
Facility/Geographic Area: U-Plant
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1, 200-MG-1
Service Dates: Not Specified
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-83 was an unplanned release to the ground at the railroad tracks north of the 2727-WA Sodium Storage Building (See Figure 1. ArcMap Image and Figure 2. U-Plant Area Map). When discovered, the site was posted as a "Contamination Area" (CA). The site was downposted to an Underground Radioactive Material Area (URMA) after the site was covered by clean backfilled soil in April 2007. The posted area extends across the railroad track and covers an estimated 18.3 m (60 ft) by 7.6 m (25.0 ft) area. Roughly 100 m (100 yd) of the site is posted with "Danger" signs. The railroad tracks have been abandoned. No reference drawing is available for this site.

Waste Site Coordinates:

E-567146.08334 N-135203.43796

Site Dimensions:

Site Length: 18.3 m (60.0 ft)
Site Width: 7.6 m (25.0 ft)
Site Area: Not Specified
Site Depth: Not Specified
Cover Thickness: Not Specified

Release Summary: It is unclear what the contamination source is at the site, or when the release occurred. The type of waste and the volume of waste released at 200-W-83 are not specified. Therefore, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-83 is associated with the 2727-WA Sodium Storage Building and railroad track.

Site Posting: Site 200-W-83 was originally posted as a CA when it was first discovered. The site was downposted from CA to URMA after interim remediation activities in April 2007. The 2727-W Building and three neighboring trailers are also posted as "Radiological Material" (RM) areas. In addition, the 2727-W Building, and approximately 100 m (100 yd) of the 200-W-83 site is also posted with "Danger" signs due to the sodium stored inside the 2727-W Building.

Site Characterization Summary: The site was discovered during a radiation survey on March 4, 1990. The survey was part of a routine radiological investigation documenting radiological conditions along railroad tracks in the 200 West Area. Surveys were conducted using a rail mounted survey vehicle. At the time of discovery, site 200-W-83 consisted of speck of contamination with readings up to 3 milirem/hr on the tracks near the "concrete slabs" west of 221-U.

A Radiological Problem Report was issued in March 1990, following the discovery of 200-W-83 and three other contamination areas identified along 200 West Area railroad tracks. Site

200-W-83 was submitted to WIDS as a Discovery Site in September 2000. When it was submitted, the radiological conditions within the site were unclear, as no radiological surveys or site characterization probes had occurred since 1990. The most recent radiological survey for 200-W-83 occurred in March, 2005.

The site has been surveyed several times since its discovery. In September 2000, the site was surveyed with Global Positioning System (GPS) equipment to map the site. A site walkdown on November 1, 2000 verified that the CA posting extended north across the railroad tracks. A second walkdown on May 24, 2001 occurred to determine the contamination source based on site conditions, and to document site characteristics. However, no obvious contamination source was located during the site visit. A radiation survey on March 8, 2005 updated site conditions. During the survey, a few additional specks of contamination were located. The radiological posting was changed from CA to "Soil Contamination Area" (SCA).

Interim remediation occurred in April 2007. The site was covered with a layer of clean soil backfill and the site was downposted from a SCA to an URMA. It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided since 2005. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified

Non-Radioactive: Not Specified

References:

WIDS General Summary Report for site 200-W-83
ArcMap
QMap

Figure 1. ArcMap Image

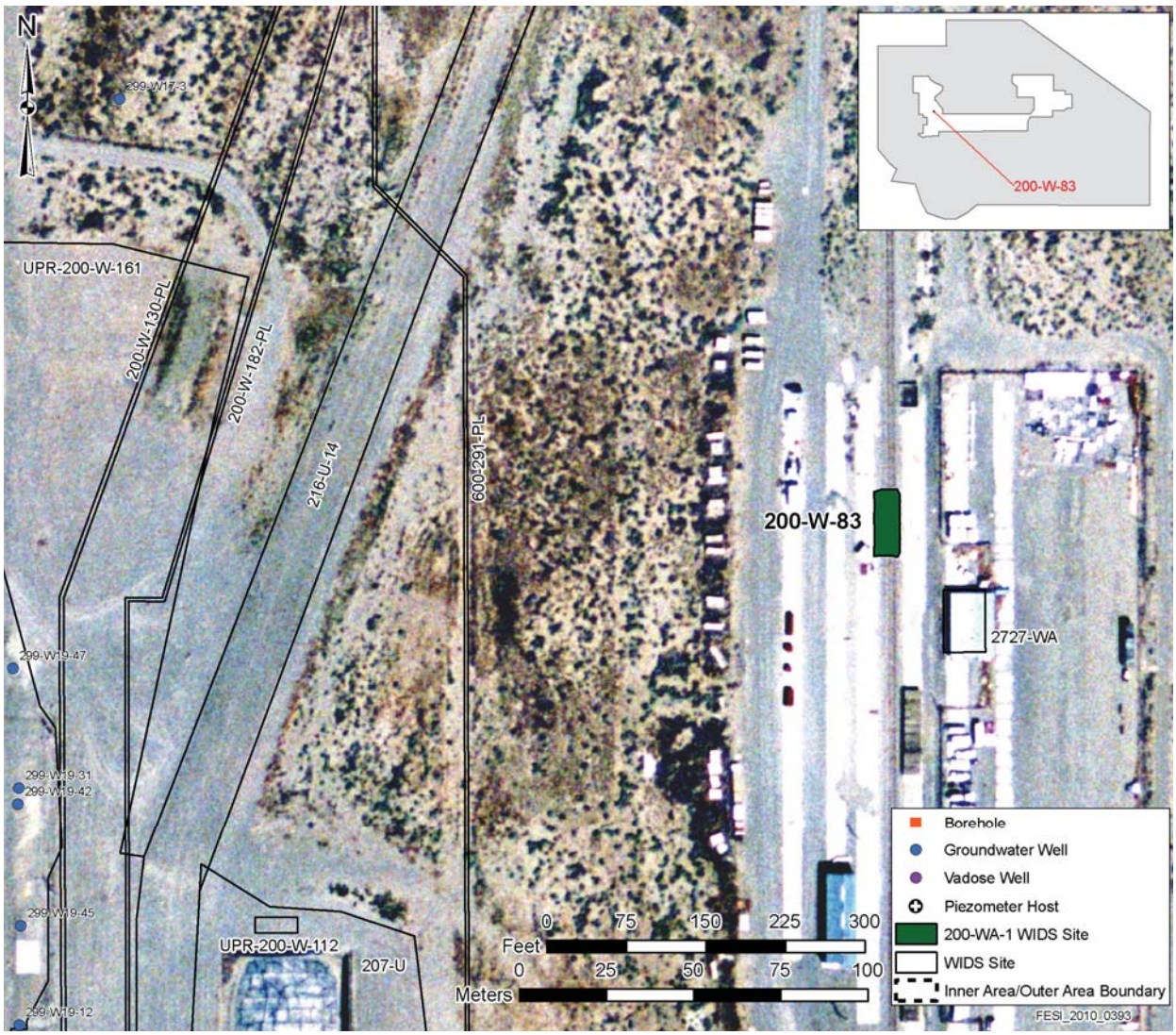
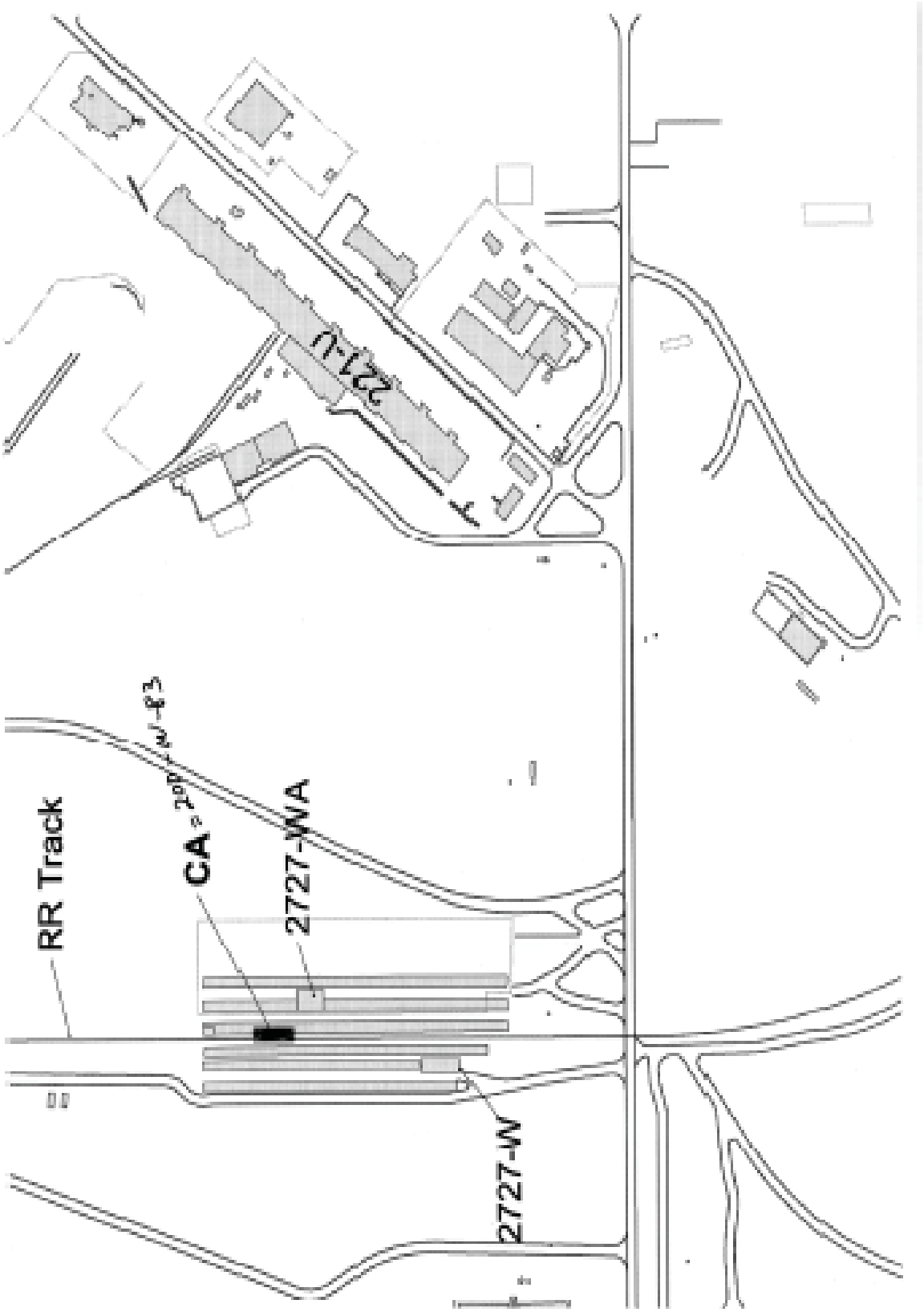


Figure 2. U-Plant Area Map



Site Description

Site ID: 200-W-85, Soil Contamination Area East of 2727 W
Site Type: Unplanned Release
Facility/Geographic Area: U-Plant
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1, 200-MG-2
Service Dates: Not Specified
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-85 was an unplanned release to the ground approximately 30 m (100 ft) east of the fenced 2727-WA Equipment Storage Yard (See Figure 1. ArcMap Image and Figure 2. U-Plant Area Map). When discovered, the site was posted as a "Soil Contamination Area" (SCA) with no visible soil discoloration or disturbances. The posting encompassed an area supporting live rabbitbrush and grasses. In December 2001, the area was buried beneath a layer of clean backfill material and downposted to an Underground Radioactive Material Area (URMA). No reference drawings are available for this site.

Waste Site Coordinates:

E-567281.25950 N-135142.92639

Site Dimensions:

Site Length: 6.1 m (20.0 ft)
Site Width: 6.1 m (20.0 ft)
Site Area: Not Specified
Site Depth: Not Specified
Cover Thickness: Not Specified

Release Summary: It is unclear what the contamination source is at the site, or when the release occurred. The type of waste and the volume of waste released at 200-W-85 are not specified. Therefore, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-85 is associated with the 2727-WA Equipment Storage Yard.

Site Posting: Site 200-W-85 was originally posted as a SCA when it was discovered. The site was downposted from SCA to URMA after interim remediation activities in December 2001.

Site Characterization Summary: The site has been surveyed several times over the years. In September 2000, the site was mapped using Global Positioning System (GPS) equipment. A Ground Penetrating Radar scan was done in February 2005. The GPR scan discovered a disturbed area close to the center of the site. Several pieces of buried metal debris were found in the posted area.

In addition, a site walkdown to verify site conditions occurred on November 1, 2000. Staff observed sparse rabbitbrush and grass growing inside the posted area. The vegetation did not appear stressed by site conditions, and no soil discoloration was observed. Interim remediation occurred in December 2001. The site was covered with a layer of clean backfill material and downposted from a SCA to a URMA.

Site 200-W-85 was submitted to WIDS as a Discovery Site on an unspecified date. No radiological survey or site characterization information is presented for the site. It is unclear

when the site was originally posted or what the radiological conditions are of the site. It is also unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Not Specified.

References:

WIDS General Summary Report for site 200-W-85
ArcMap
QMap

Figure 1. ArcMap Image

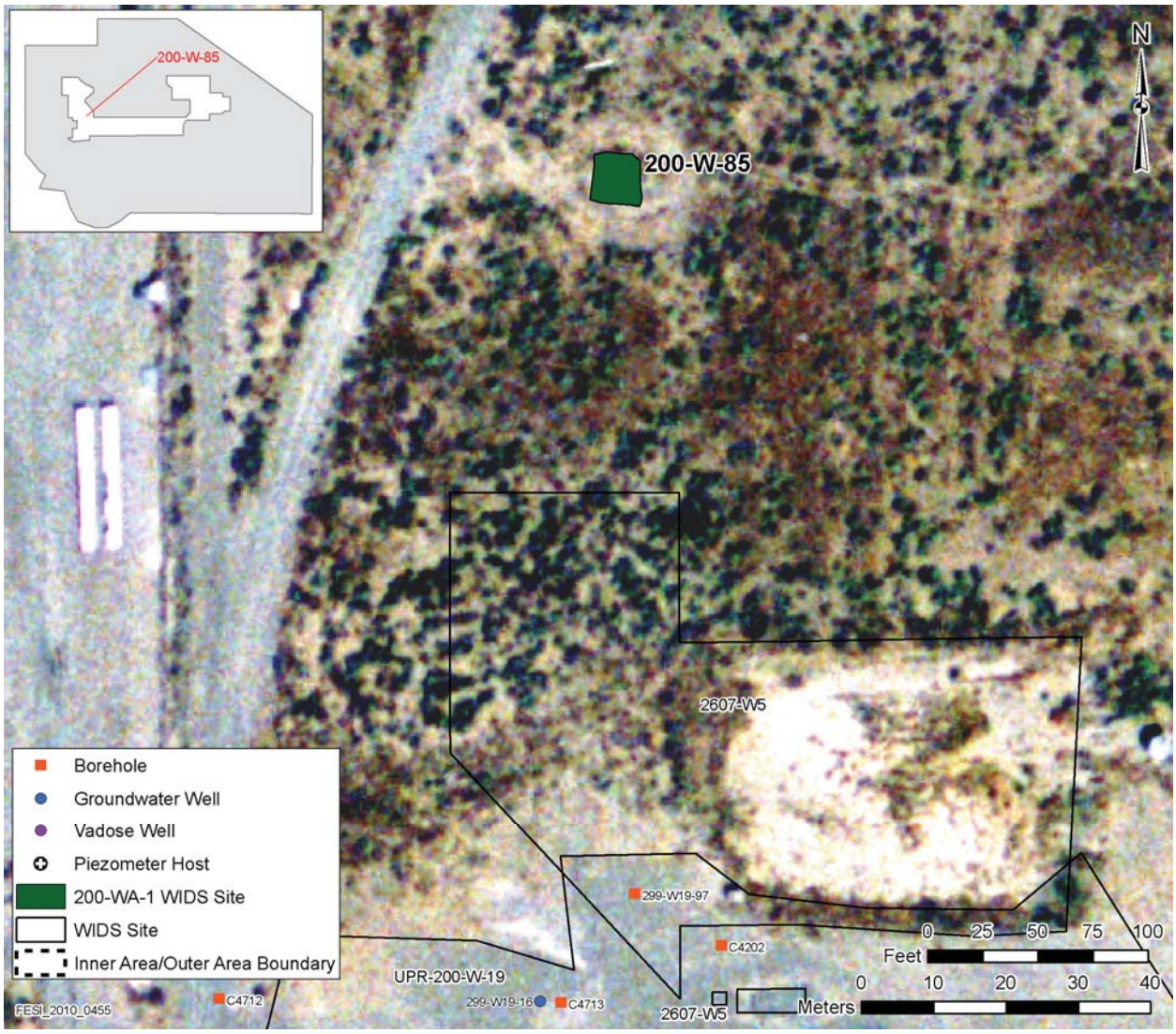
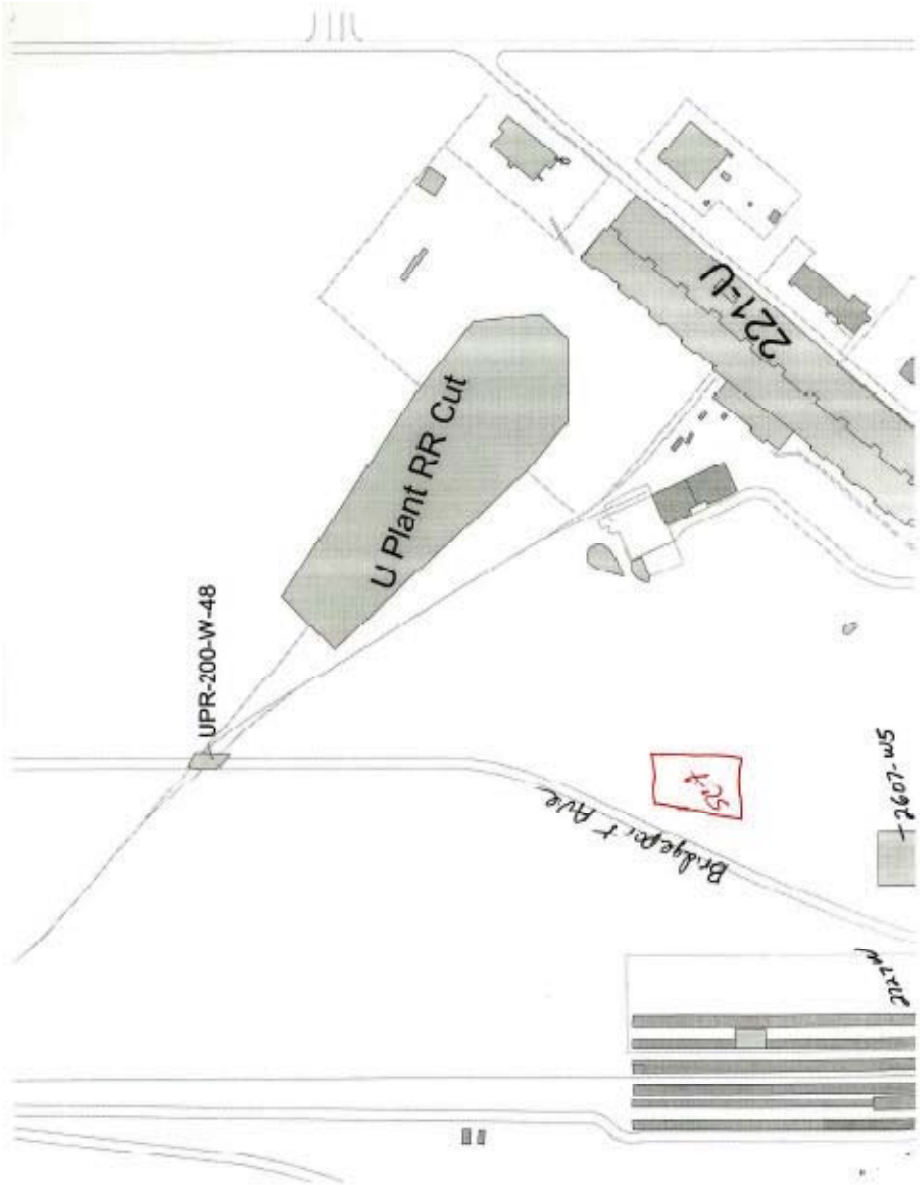


Figure 2. U-Plant Area Map



Site Description

Site ID: 200-W-86, Contamination Area Around Light Pole
Site Type: Unplanned Release
Facility/Geographic Area: U-Plant
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1, 200-MG-1
Service Dates: Not Specified
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-86 was an unplanned release around an active (in-use) light pole with a street light attached on Bridgeport Avenue, which is a gravel road. The site is located northwest of 221-U (See Figure 1. ArcMap Image and Figure 2. SCA Around Power Pole), and covers an estimated 3.1 m (10 ft) by 3.1 m (10 ft) area on each side. In December 2001, the utility pole was removed and the area was buried by a layer of clean gravel or rock backfill. Following interim remediation work, the site was downposted from Soil Contamination Area (SCA) to Underground Radioactive Material Area (URMA). No reference drawing is available for this site.

Waste Site Coordinates:

E-567327.70339 N-135507.21781

Site Dimensions:

Site Length: 3.1 m (10.0 ft)
Site Width: 3.1 m (10.0 ft)
Site Area: Not Specified
Site Depth: Not Specified
Cover Thickness: Not Specified

Release Summary: The history, source, and volume of contamination at site 200-W-86 are not known. The unplanned release consisted of a small SCA surrounding a power pole. It is unclear what the contamination source is at the site, or when the release occurred. The type of waste and the volume of waste released at 200-W-86 are not specified. Therefore, no volume estimates can be ascertained for this site.

Related Site Structure(s): The light pole at site 200-W-86 is associated with electrical utility facilities.

Site Posting: It is not clear when site 200-W-86 was originally posted. The site was downposted from SCA to URMA after interim remediation activities in December 2001.

Site Characterization Summary: Site 200-W-86 was submitted to WIDS as a Discovery Site in 2000. No radiological surveys are presented for this site, and the conditions inside the posted area, and the source of contamination, are not known.

Interim stabilization work in December 2001 removed the utility pole and buried the site beneath a layer of clean backfill material. The area was downposted from a SCA to a URMA following interim work. It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided for the site. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Not Specified.

References:

WIDS General Summary Report for site 200-W-86
ArcMap
QMap

Figure 1. ArcMap Image

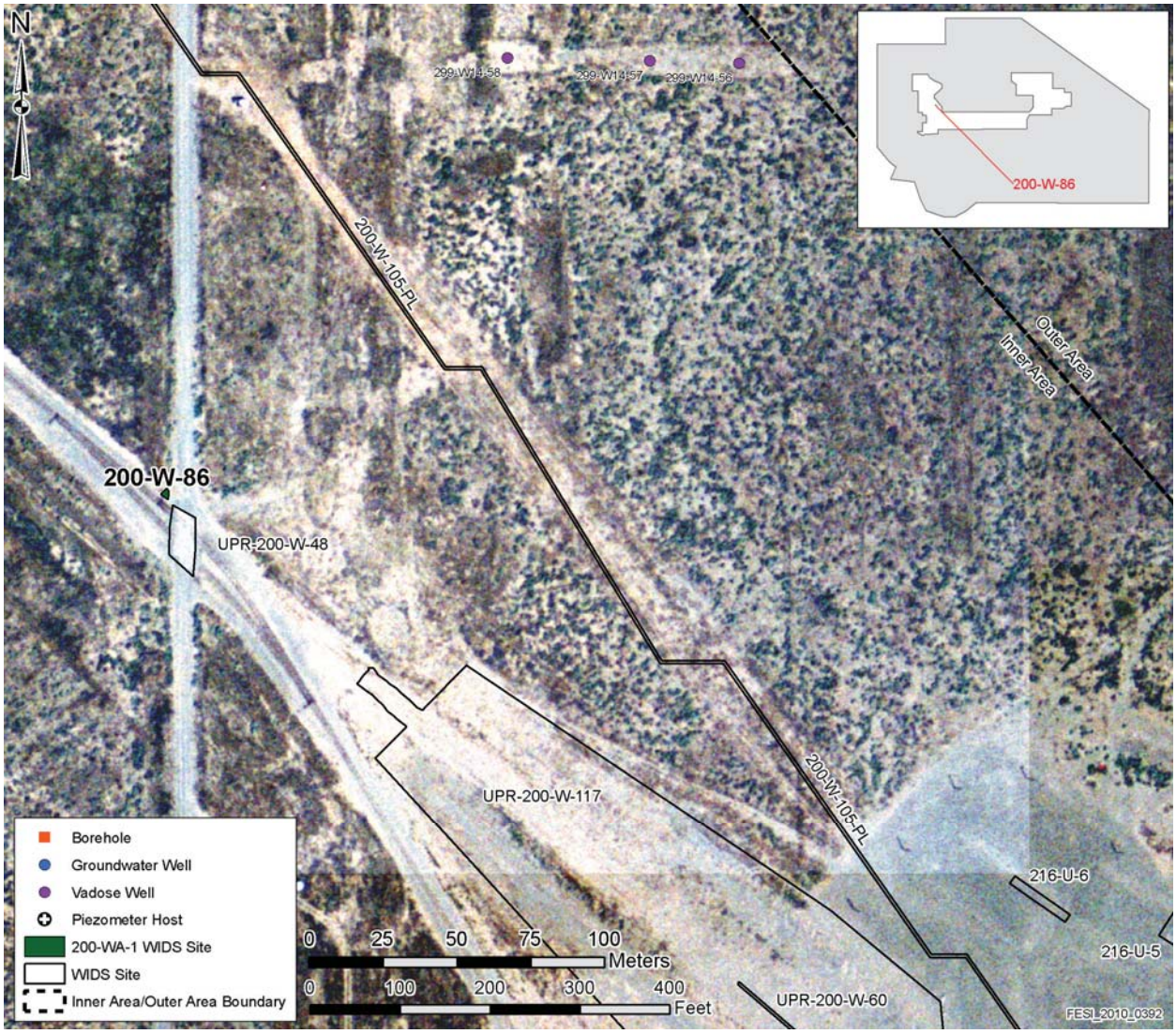
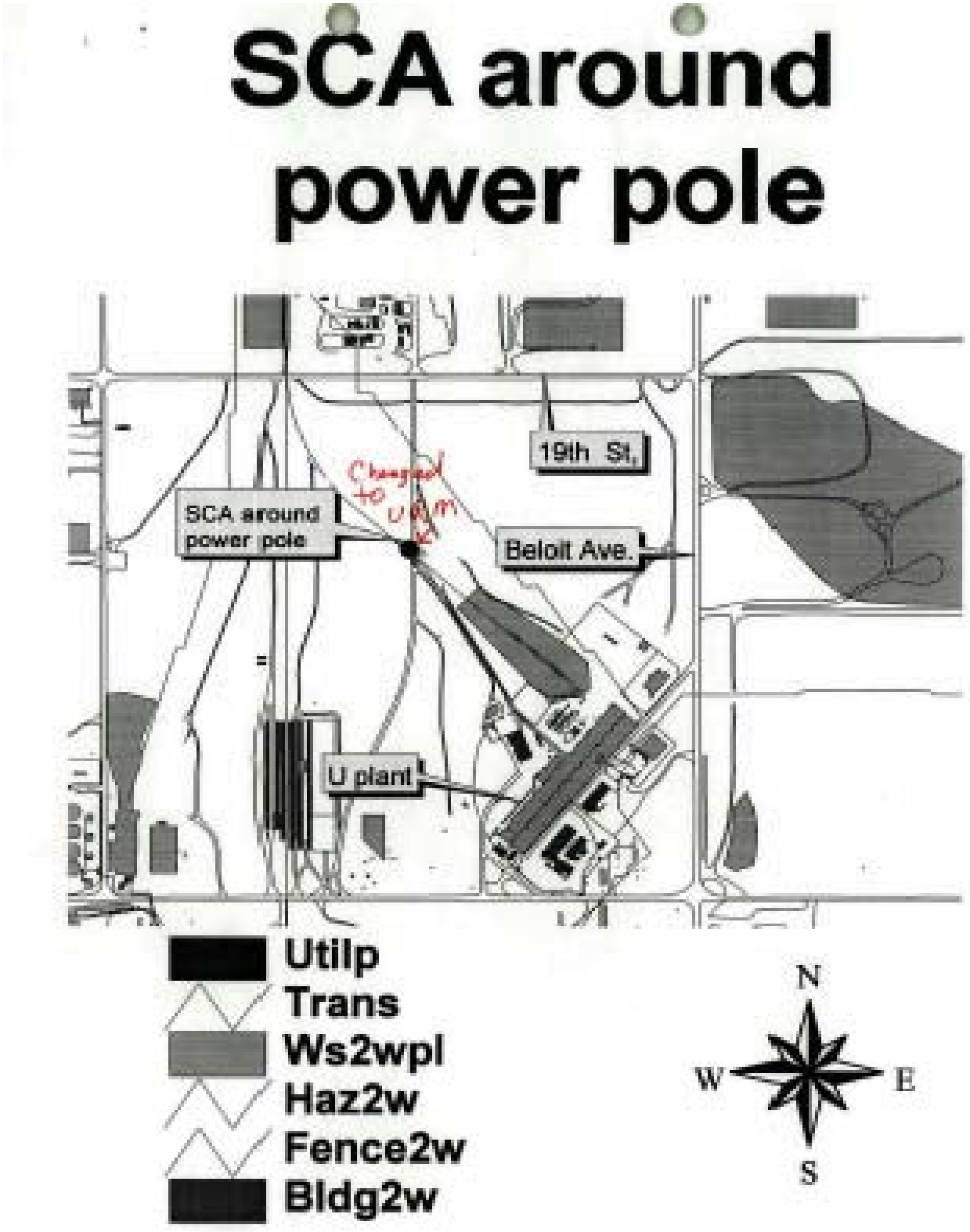


Figure 2. SCA Around Power Pole



Site Description

Site ID: 200-W-87, Unplanned Release of Chemical Spur Railroad Track Northwest of 221-U Plant
Site Type: Unplanned Release
Facility/Geographic Area: U-Plant
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-2, 200-MW-1
Service Dates: Not Specified
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-87 consists of an unplanned release on an abandoned railroad track. The site is located roughly 61 m (200 ft) northwest of the 2714-U Building and T-Hopper yard on the U Plant chemical spur railroad track (see Figure 1. ArcMap Image). A portion of the railroad spur was originally posted as a "Contamination Area" (CA). In December 2001, the area was covered with clean backfill material and downposted to an "Underground Radioactive Material Area" (URMA). No reference drawing is available for this site.

Waste Site Coordinates:

E-567462.51743 N-135291.88241

Site Dimensions:

Site Length: 36.6 m (120.0 ft)
Site Width: 9.1 m (30.0 ft)
Site Area: Not Specified
Site Depth: Not Specified
Cover Thickness: Not Specified

Note: These are the estimated dimensions based on visual observations.

Release Summary: The railroad spur was used to move chemicals to and from the 211-U Tank Farm and also to transport "T-Hopper" containers. The containers held calcined uranium powder that had undergone processing at the 224-U Uranium Trioxide (UO3) plant. The containers were kept in a fenced area west of the 2714-U Building for storage. The URMA signs were erected due to the spur being used to park rail cars and engines, not due to the transport and storage of chemicals.

The posted CA was submitted to the WIDS database as a Discovery Site in September 2000. No radiological survey could be located to explain the radiological conditions inside the posted area. In March 1996, a small train used at the PUREX Railroad cut and tunnel was transferred to this location and was roped off for potential radiation concerns. The train remained at the site until it was transported back to the PUREX facility in 1998. The rail cars did not have smearable contamination; however the site was still posted as a precaution, based on the potential of contamination from the engine and railcars. When the railcars were removed, the posted status of the site was overlooked and the posting was not removed or downposted.

No waste volume information is available for site 200-W-87. The amount of waste in the "T-Hopper" containers and the number of containers stored at the site is not specified. In addition, the volume of material transported along the railroad spur during all or part of its

operational lifetime is not specified. Therefore, no volume estimates can be ascertained for this site.

Related Site Structure(s): The site is associated with the 222-U Building and the 200-W-136 stabilized area.

Site Posting: Site 200-W-87 is currently within the posted zone of the URMA remediation stabilization area known as 200-W-136. The URMA was created when the 222-U Building was demolished in 2005. The site is a posted CA on the U-Plant chemical spur railroad track.

Site Characterization Summary: A site walkdown of 200-W-87 occurred on November 15, 2000 for site verification. Observers noted that some tumbleweeds were growing on the track bed, both inside and outside the posted area. Whether the vegetation was removed or not is not specified.

It is unlikely that any contamination remains in the area. The rail cars were free of any smearable contamination. In addition, in December 2001, the area was covered with clean backfill and downposted to an URMA.

No site characterization information is presented for 200-W-87. It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided. If surveys do occur, their frequency is not specified.

Potential Contaminants:

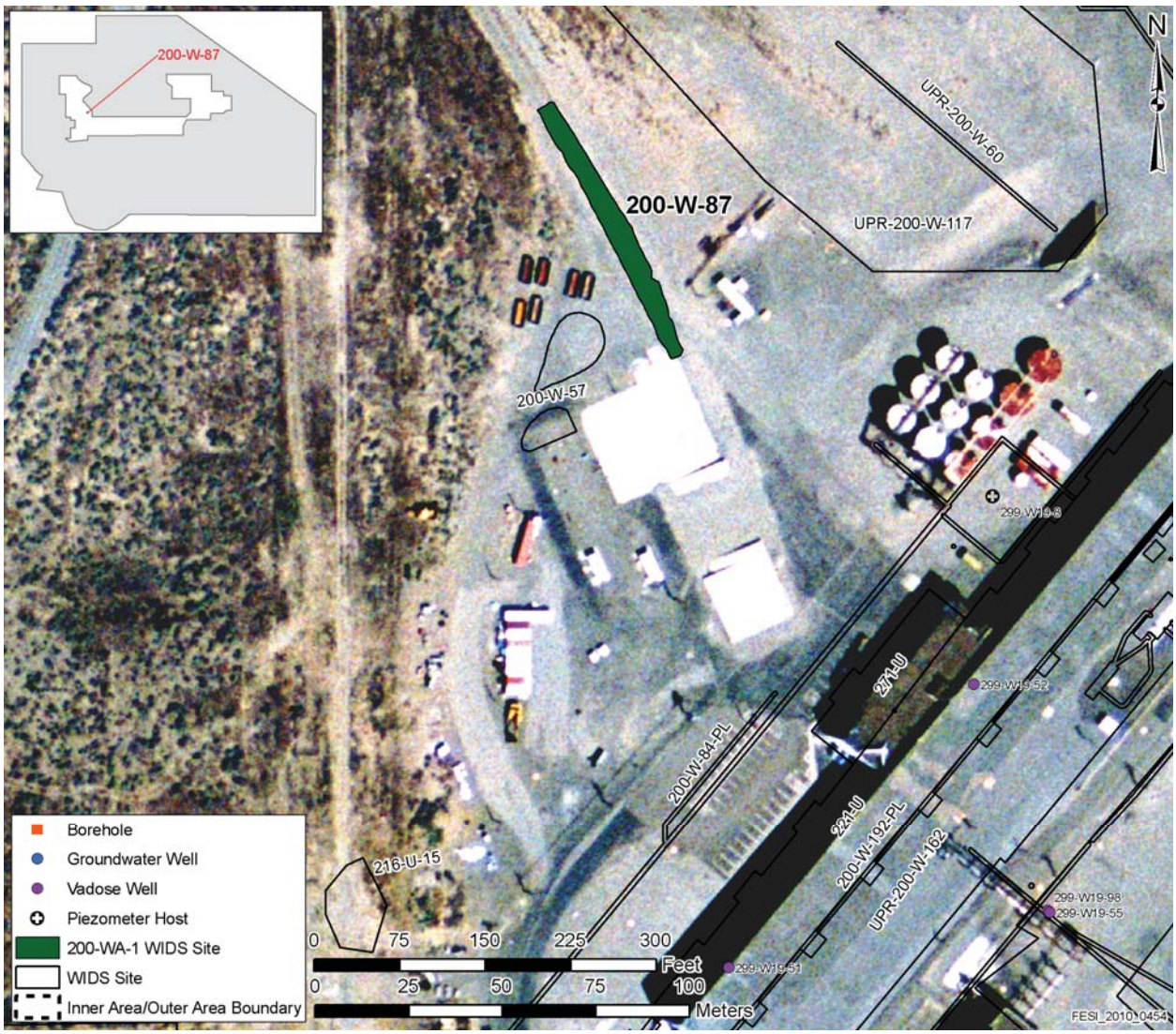
Radioactive: Not Specified.

Non-Radioactive: Not Specified.

References:

WIDS General Summary Report for site 200-W-87
ArcMap
QMap

Figure 1. ArcMap Image



Site Description

Site ID: 200-W-89, 252-U, U Plant Electrical Substation, C8S17 Substation, U-Cat Substation
Site Type: Foundation
Facility/Geographic Area: U-Plant
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1, 200-MW-1
Service Dates: Not Specified
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-89 is located near the intersection of Beloit and 16th Street in the 200 West Area, east of the 224-U Building (see Figure 1. ArcMap Image). The site is a large, posted gravel Underground Radioactive Material Area (URMA) where the 252-U Electrical Substation had been located (see Figure 2. Reference Drawing H-2-44511 Sheet 68).

Waste Site Coordinates:

E-567647.69083 N-135037.37563

Site Dimensions:

Site Length: 30.5 m (100.0 ft)
Site Width: 30.5 m (100.0 ft)
Site Area: Not Specified
Site Depth: Not Specified
Cover Thickness: Not Specified

Note: This is the estimated dimensions of the site based on visual observations.

Release Summary: Prior to being decommissioned, the 252-U Substation provided electric utility support to the 221-U and 224-U facilities. The 200-W-89 waste site is located where the Substation was originally located. The site has lingering radioactive contamination confined within the soil, and a posted URMA remains after the demolition of the 252-U Substation. Additional contamination was discovered inside the Substation in 1994. It is believed the existing metal discoloration and metal contamination present at this site occurred overtime from exposure to fallout from the neighboring 224-U stack, generated during the Uranium Tri-Oxide (UO3) facility operations. Surveys detected Cesium-134 and Cesium-137 contamination, in addition to some barium, cadmium, chrome and lead contamination. Most recently, contaminated rodent feces have been found at the site.

Related Site Structure(s): The site is associated with the 221-U and the 224-U Buildings.

Site Posting: Site 200-W-89 is currently within the posted zone of the URMA remediation stabilization area known as 200-W-136. The URMA was created when the 222-U Building was demolished in 2005.

Site Characterization Summary: In 1994, radiological surveys detected contamination on equipment in the Electrical Substation. Direct readings of 5,000 dpm beta/gamma and 3,500 dpm alpha were discovered on discolored metal objects. On August 1, 1998 samples of black mastic, gray mastic, charcoal disks, metal and ceramic objects and asbestos fibers were gathered for analytical testing. Tests detected Cesium-134 and Cesium-137 contamination on metal and ceramic items and in the asbestos fibers. In addition, varying levels of barium, cadmium,

chrome, and lead were also detected. No gross alpha or beta contamination, nor PCB's or silver, were detected in the samples. All samples were determined to be below regulatory limits except for the black mastic.

In 1998, the 252-U Substation was deactivated. The site was surface stabilized with a layer of gravel in 1999 and posted with URMA signs. All of the contaminated equipment was sent offsite to Oak Ridge, Tennessee to be recycled except for a single, large transformer. The transformer was posted with Fixed Contamination (FC) signs and left in place as it was too expensive to remove. A site walkdown on November 21, 2000 occurred to verify site conditions. Staff noted that the remaining transformer was located in the center of the posted area and surrounded with rope and Radioactive Material Area (RMA) signs. In 2005, the transformer was sent to ERDF with other material associated with the 224-U facility demolition.

Following the deactivation of the Substation, contaminated mouse droppings were discovered under the switch gear and in the soil. The mouse feces had readings up to 700 cpm. It is unclear if the site is routinely surveyed or monitored. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified

Non-Radioactive: Not Specified

References:

WIDS General Summary Report for site 200-W-89
ArcMap
QMap

Figure 1. ArcMap Image

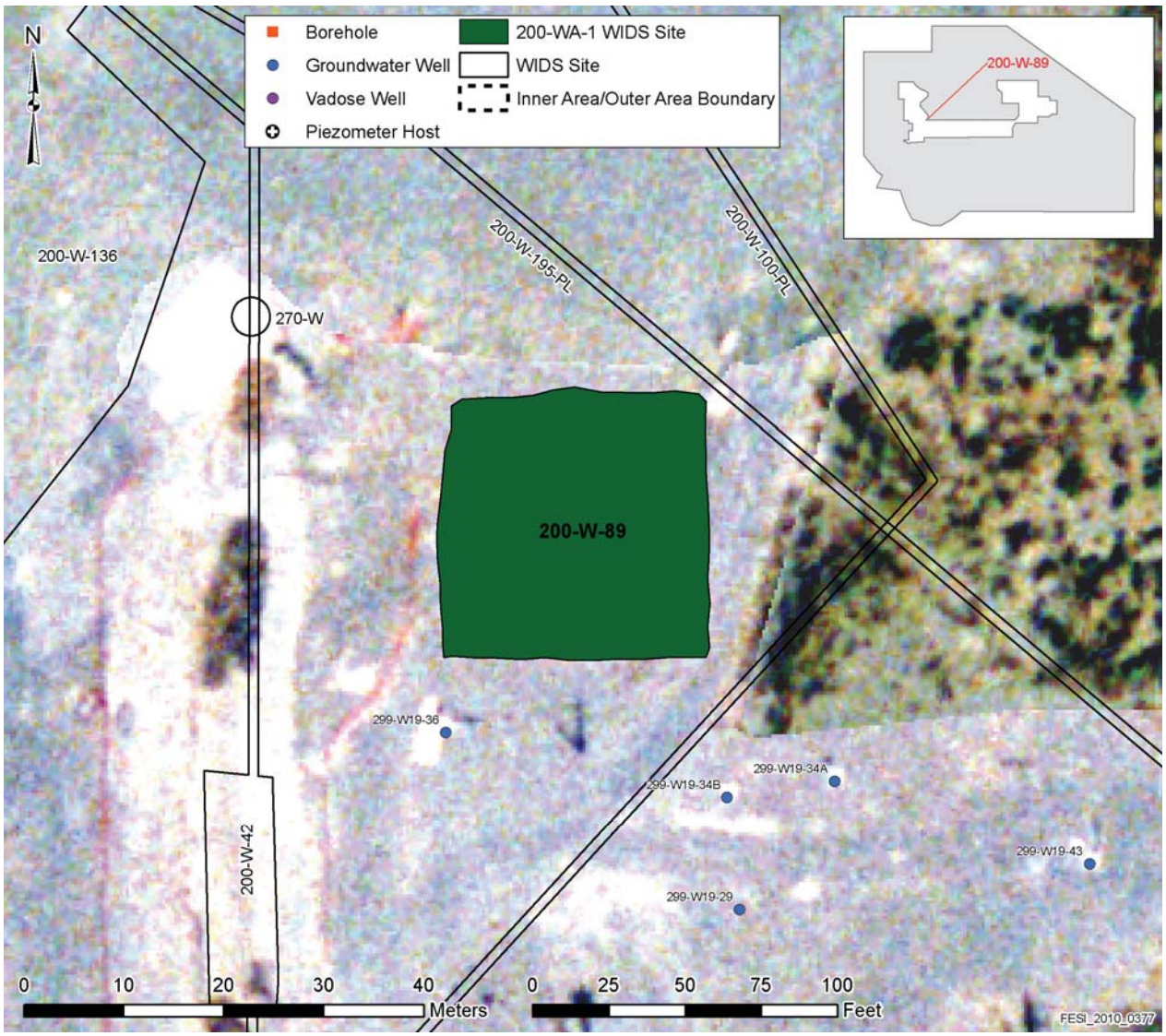
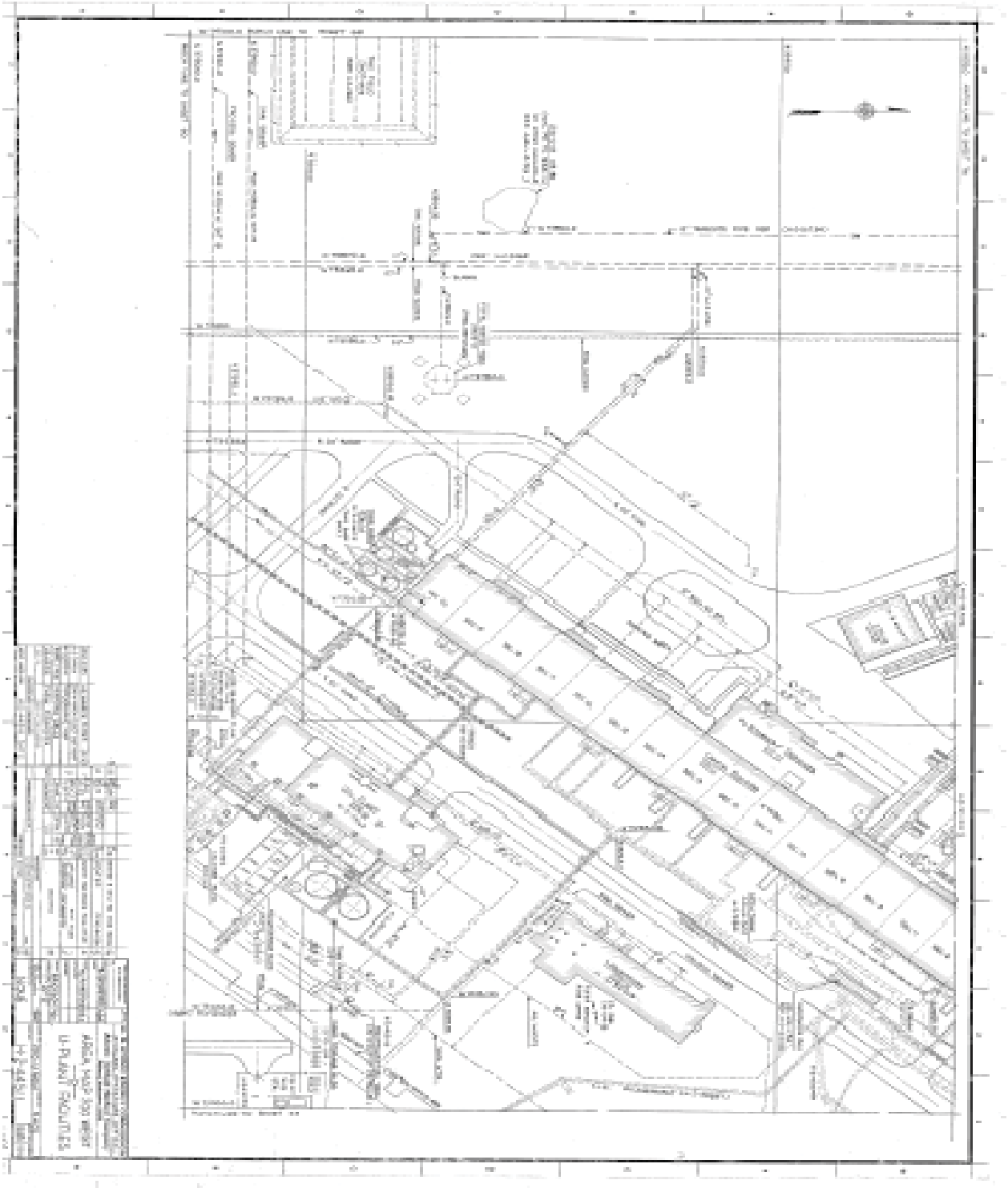


Figure 2. Reference Drawing H-2-44511 Sheet 68



Site Description

Site ID: 200-W-9, 200-W-9, Project W291 Excavation VCP Contamination
Site Type: Unplanned Release
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UR-1, 200-MG-1
Service Dates: 1994
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-9 is an unplanned release located near the southeast corner of 221-T (See Figure 1. ArcMap Image). It is 42 m (138 ft) north of 23rd Street (See Figure 2. Reference Drawing H-2-44511 Rev. 6 Sheet 132). The site includes two metal caissons in a gravel covered area. The tops of the caissons are labeled MH T-1 and MH T-2. The site is not marked or posted. The 200-W-163-PL pipeline is located in the area, and is a 25 cm (10 in) vitrified clay pipe. The 200-W-163-PL pipeline was uncovered during an excavation for the MH T-2 manhole for the new waste line from T-Plant to the 200 Area Treated Effluent Disposal Facility (Project W291).

Waste Site Coordinates:

E-567467.18743 N-136676.90629

Site Dimensions:

Site Length: Not Specified
Site Width: Not Specified
Site Area: Not Specified
Site Depth: 1.8 m (6.0 ft)
Cover Thickness: Not Specified
Overburden Depth: 1.5 m (5.0 ft)

Release Summary: Site 200-W-9 is the result of the discovery of smear contamination on an old vitrified clay pipeline that was used to carry chemical sewer effluent. The discovery occurred when pipeline 200-W-163-PL was uncovered during excavation for the new T-Plant waste line. A reading taken from a 100 cm^2 (15.5 in^2) smear on the pipe revealed contamination up to 3000 dpm, with a 5500 dpm direct reading. It is unclear when the release occurred that resulted in the smear contamination. The volume of wastes released is not specified. Therefore, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-9 is associated with 200-W-163-PL, which was used to convey chemical sewer effluent from 291-T, 222-T, and 224-T to the 216-T-3 Crib.

Site Posting: The posting for Site 200-W-9 is not specified.

Site Characterization Summary: 200-W-163-PL is an old vitrified clay pipeline that was uncovered while excavating for the MH T-2 manhole for the 200 Area Treated Effluent Disposal Facility (project W291). The pipeline was left in place following the excavation.

It is not specified if any surface stabilization work has occurred at 200-W-9. A site walkdown did occur on March 3, 2000 for verification purposes. The site visit confirmed that both manholes are labeled, however, no radiological posting was observed at the location. It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided for the site. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: A reading taken from a 100 cm^2 (15.5 in^2) smear on the pipe revealed contamination up to 3000 dpm, with a 5500 dpm direct reading.

Non-Radioactive: Not Specified.

References:

WIDS General Summary Report for site 200-W-9
ArcMap
QMap

Figure 1. ArcMap Image

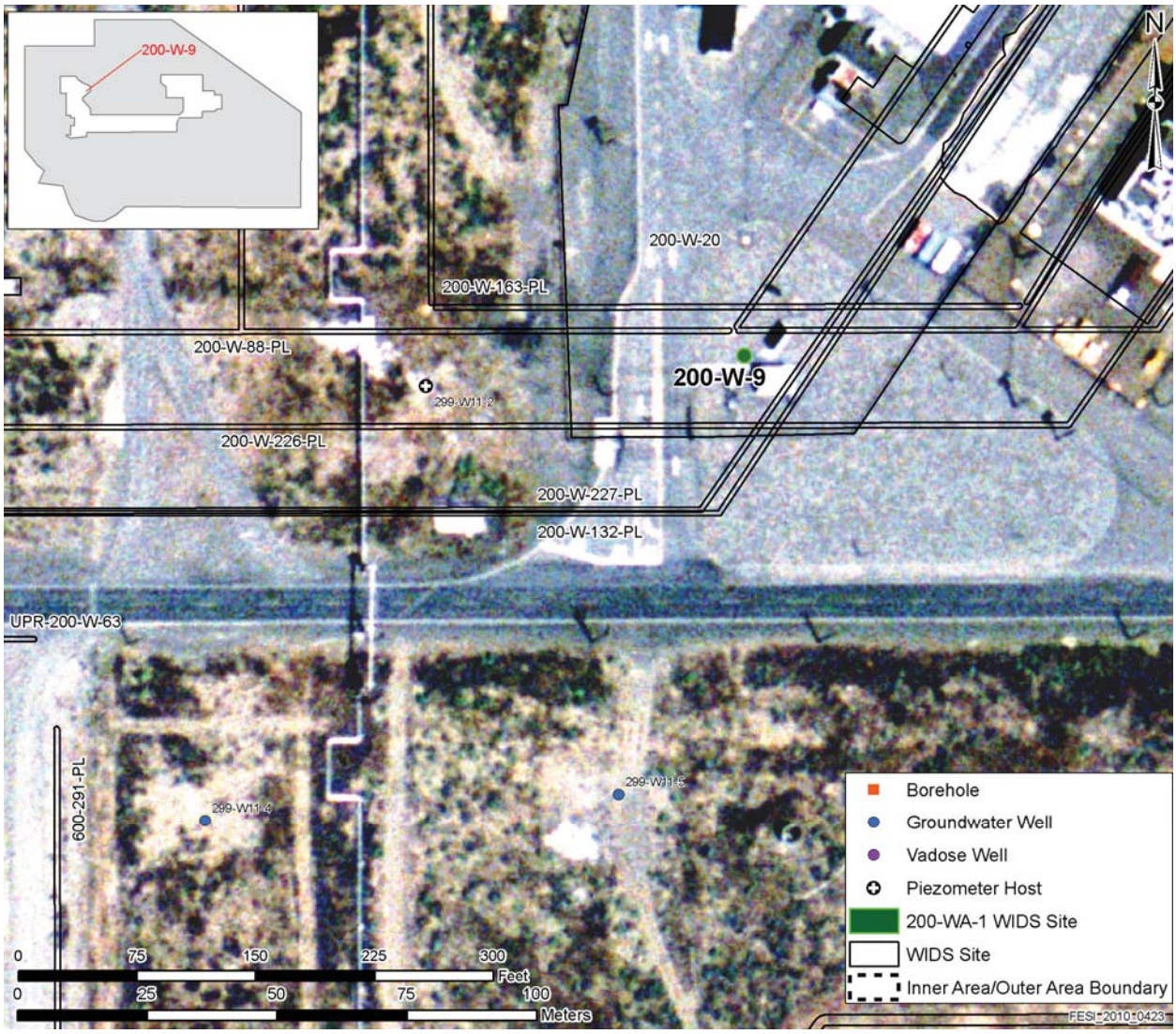
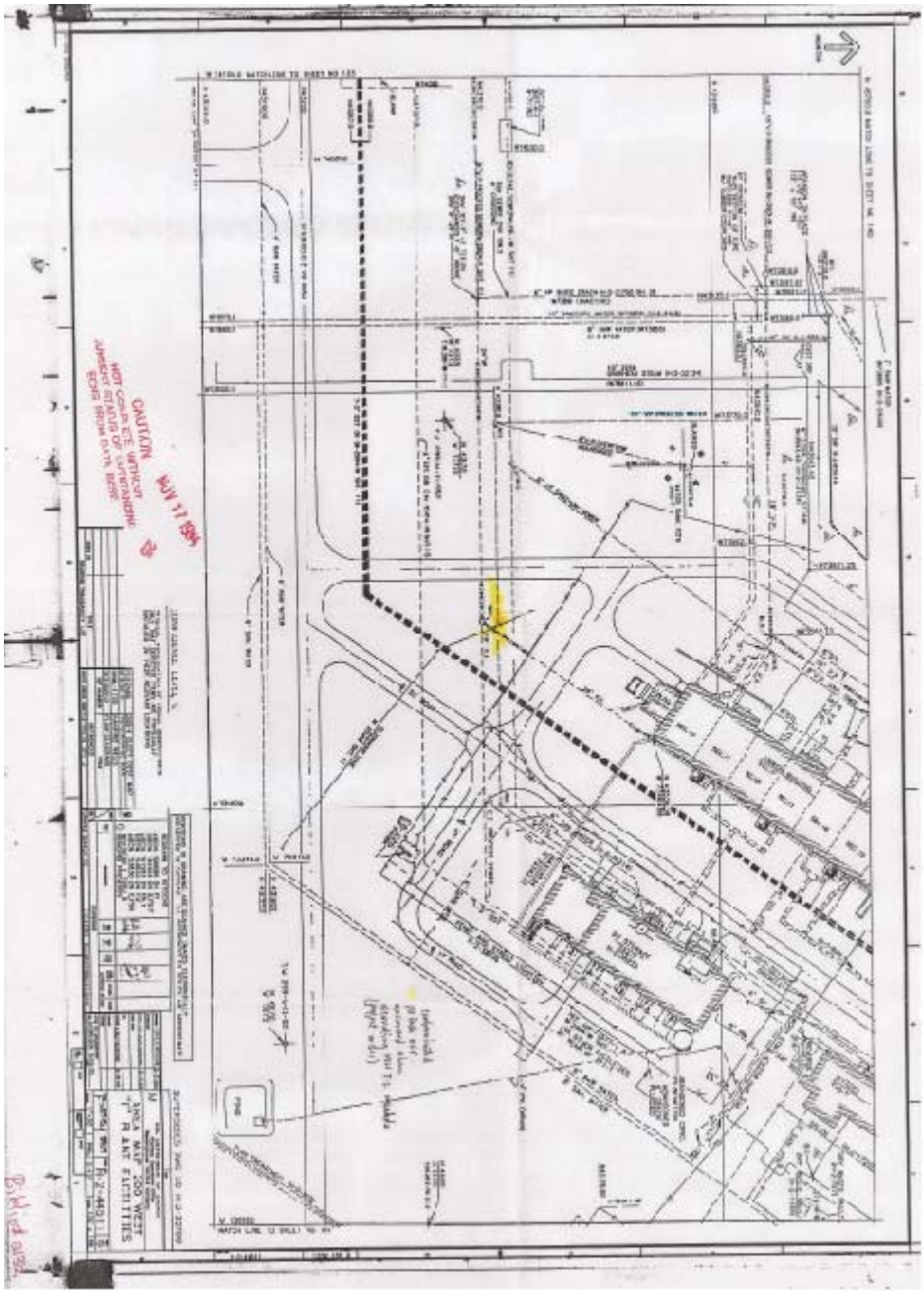


Figure 2. Reference Drawing H-2-44511 Sheet 132 Rev. 6



Site Description

Site ID: 200-W-90, Underground Radioactive Material Areas Posted Along 23rd Street in 200 West
Site Type: Unplanned Release
Facility/Geographic Area: T-Plant_
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MW-1, 200-MG-1
Service Dates: Not Specified
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-90 consists of three posted Underground Radioactive Material (URM) areas. Two are located on the south shoulder of 23rd Street, between Camden and Dayton Avenue, across from the 218-W-2A Burial Ground (see Figure 1. ArcMap Image). The third waste site is located further east, on the south end of 23rd Street, across from the 241-T Tank Farm. There are no underground pipelines in the area. The ground of all three sites is bare, with no live or growing vegetation present.

No reference drawings are available for this site.

Waste Site Coordinates:

E-566399.78498 N-136621.65819

Site Dimensions:

Site Length: 6.1 m (20.0 ft) Site Depth: Not Specified
Site Width: 3.1 m (10.0 ft) Cover Thickness: Not Specified

Dimensions of each of the posted areas.

Release Summary: Site 200-W-90 consists of three unplanned releases that are relatively the same size and in close proximity of one another. The type and volume of waste released are not presented. It is also unclear what the contamination source is for this site. However, the three waste sites are located close to the 218-W-2A Burial Ground, thus it is possible the contamination originated from there. As the total volume of wastes released at this site is not available, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-90 may be related to UPR-200-W-63.

Site Posting: Site 200-W-90 is posted as an URMA.

Site Characterization Summary: The three posted areas that make up 200-W-90 were submitted to WIDS as a Discovery Site in 2000. The 3 sites are similar in size. No radiological investigation describing the characteristics of the site could be located, or when they were originally posted.

A site walkdown on January 9, 2001 occurred for verification purposes. The site walkdown confirmed the dimensions of the three posted areas and their location along the south side of 23rd Street. It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided for the site. If surveys do occur, their frequency is not specified.

Potential Contaminants:

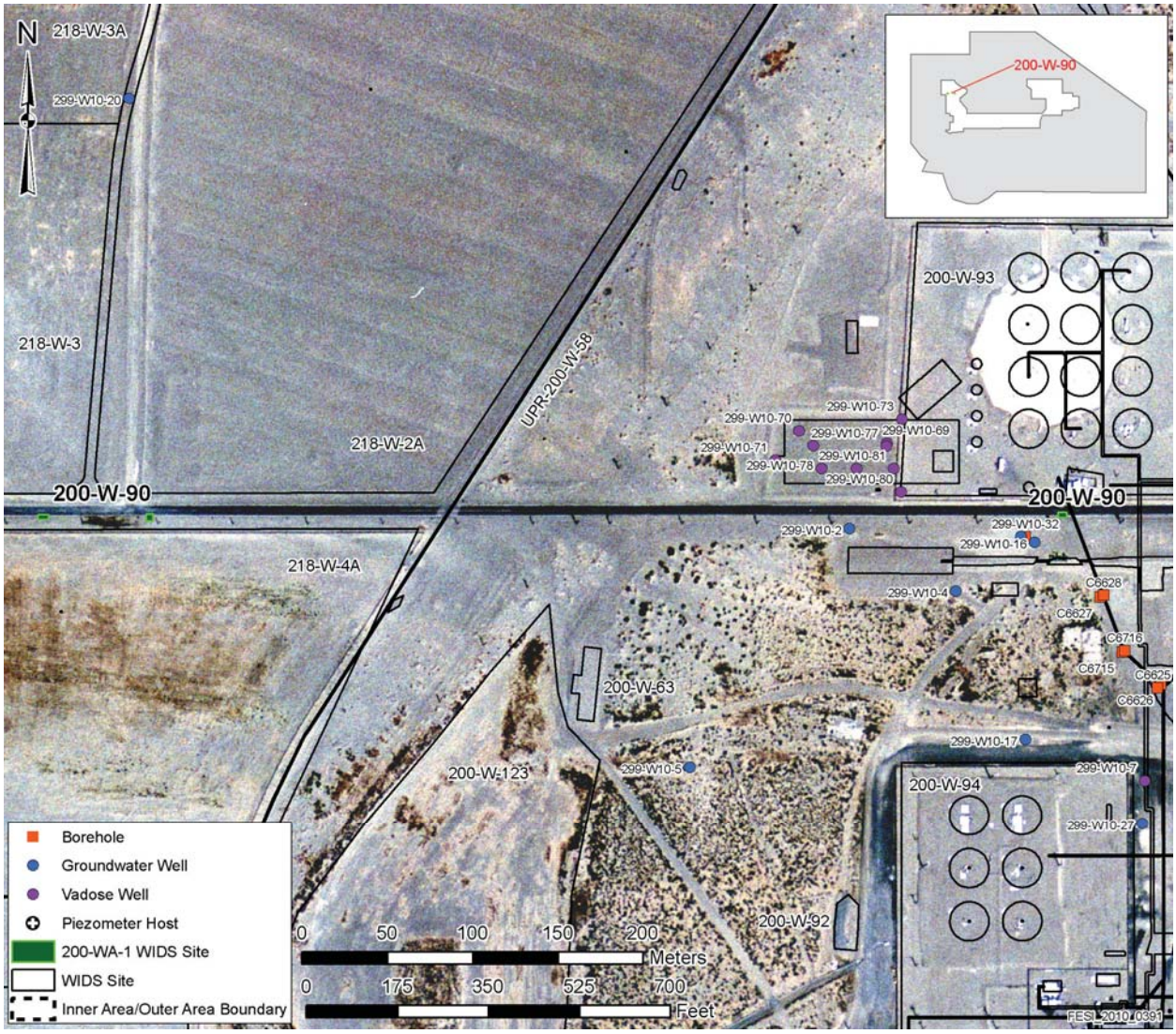
Radioactive: Not Specified.

Non-Radioactive: Not Specified.

References:

WIDS General Summary Report for site 200-W-90
ArcMap
QMap

Figure 1. ArcMap Image



Site Description

Site ID: 200-W-92, Contaminated Mound of Soil and Debris, Soil Mound West of 241-TY Tank Farm
Site Type: Dumping Area
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-MG-1
Former OU Assignment: 200-MW-1
Service Dates: Not Specified
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 200-W-92 is a soil mound roughly 1.5 m (5 ft) tall. The site is surrounded by chain and posted with Contamination Area (CA) signs. A few radiation flags identifying significant contamination are located on the mound. In addition, rocks and chunks of asphalt and cement are visible. Rabbitbrush and other vegetation were observed growing on the mound. The site is covered with a layer of gravel and is currently posted with Underground Radioactive Material (URM) signs. The mound is located west of an unnamed gravel road, west of the 241-TY Tank Farm (See Figure 2. per QMap and Figure 3. Area Map of 200-W-92). No reference engineering drawings are available for this site.

Waste Site Coordinates:

Lon-566670.40106 Lat-136382.51632

Site Dimensions:

Site Length: 24.4 m (8.0.0 ft) Site Depth: Not Specified
Site Width: 9.2 m (10.0 ft) Cover Thickness: Not Specified

Release Summary: Site 200-W-92 consists of a pile of dumped soil and miscellaneous debris. It is unclear where the soil and debris originated from. It is also unclear the amount of time the soil and debris had been present at the site. Rabbitbrush shrubs were observed growing on the soil mound, thus the debris and soil had likely been dumped several years prior. As the total volume of contamination released at this site is not available, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-92 is not associated with any other known waste sites or facilities.

Site Posting: Site 200-W-92 was originally posted as a CA. Following surface stabilization work in 2007, the site was down posted to an URM area.

Site Characterization Summary: On May 23, 2001, a large mound of contaminated soil and miscellaneous debris was discovered west of the 241-TY Tank Farm during an environmental investigation. Following its discovery, the extent of contamination was identified and the boundary was posted. A GM/P-11 Probe (15.5 cm sq) (Beta-Gamma) was used during the survey. The probe detected a maximum direct reading of 40,050 cpm on a 10 cm rock.

After the contamination's discovery, the site was submitted to WIDS as a Discovery Site. In 2001, contamination levels were detected up to 1.6 million dpm per 100 square cm of beta gamma and 14,000 dpm per 100 cm square of alpha in the soil and debris. It is believed that the

soil was dumped at this site several years prior.

The three posted areas that make up 200-W-90 were submitted to WIDS as a Discovery Site in 2000. The 3 sites are similar in size. No radiological investigation describing the characteristics of the site could be located, or when they were originally posted.

A site walkdown on July 17, 2001 occurred for verification purposes. The walkdown confirmed the location of the posted mound and documented the site characteristics. In addition, staff noted that a moderate amount of vegetation, primarily rabbitbrush, was growing on the soil pile. The site was mapped using Global Positioning System (GPS) equipment on October 24, 2004. The site was surface stabilized with clean gravel in April 2007.

It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided for the site. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Not Specified.

Figure 1. ArcMap Image

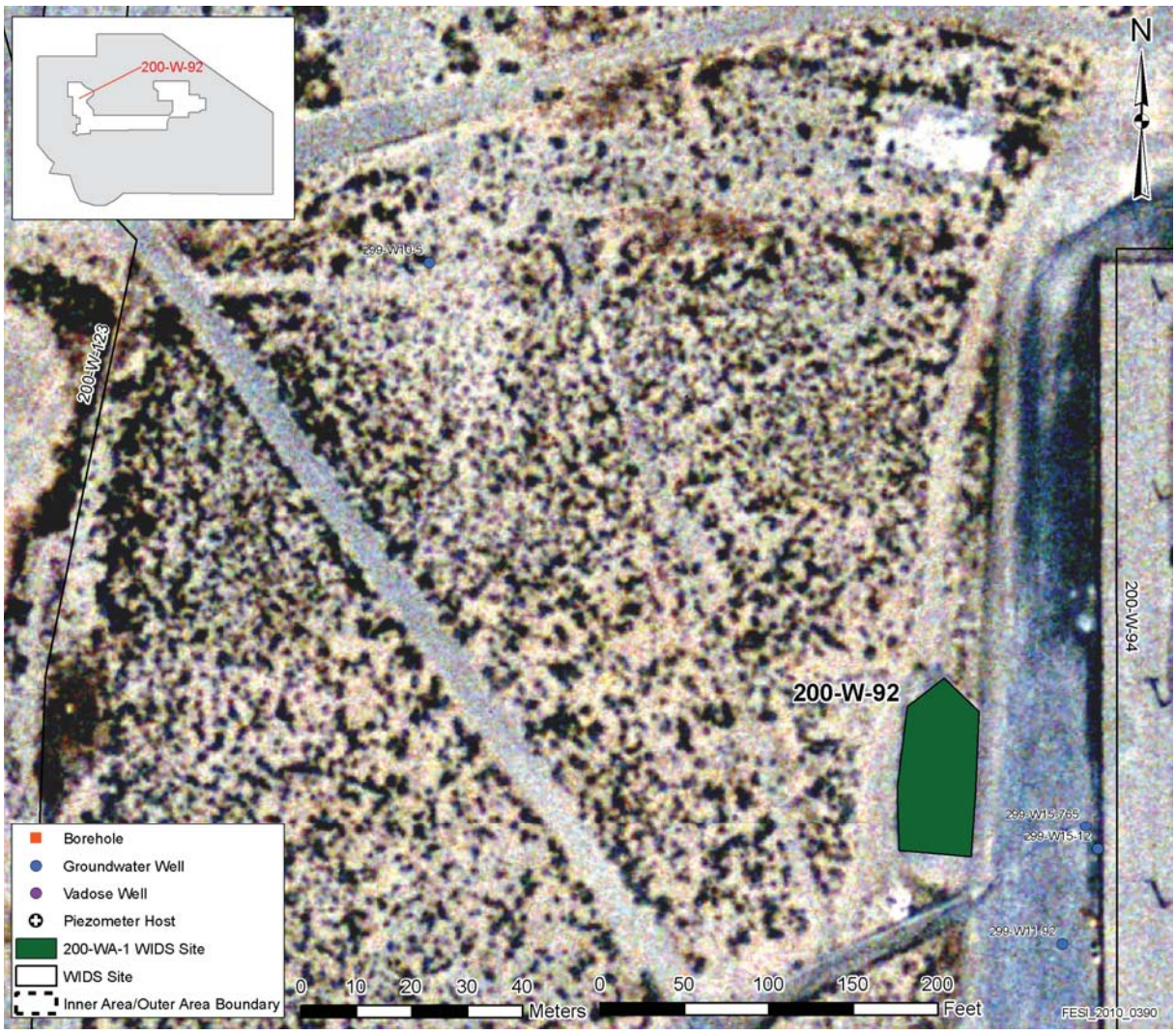
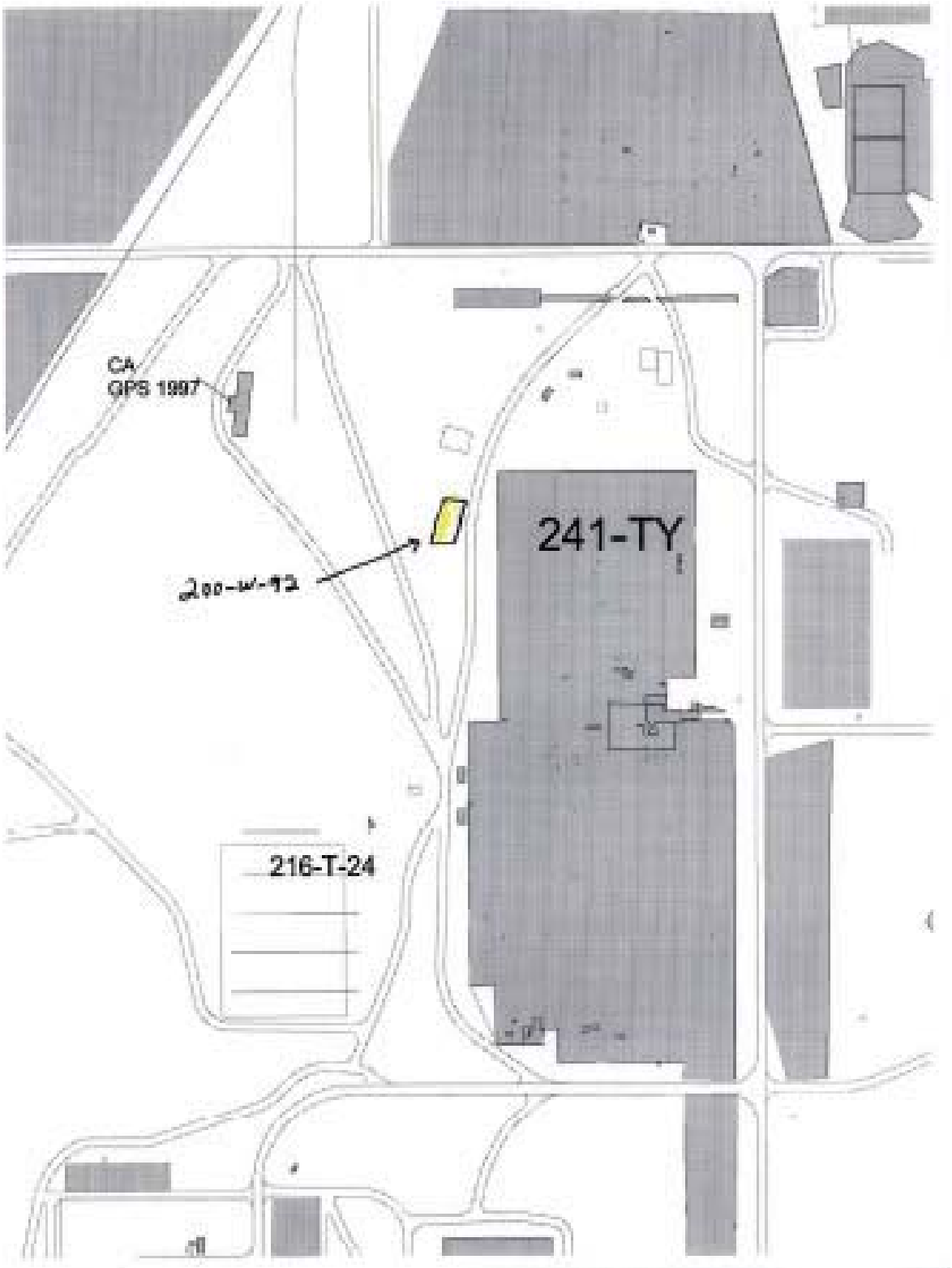


Figure 2. Insert Site Map

Figure not available.

Figure 3. Area Map of 200-W-92.



Site Description

Site ID: 207-S
Site Type: Retention Basin
Facility/Geographic Area: S-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-CW-2
Service Dates: 1951 to April 1954
Volume/Mass Discharged: Unknown

Waste Site Location and Physical Description: 207-S is located west of the 222-S Laboratory Building and north of 10th Street (see Figure 1. ArcMap Image). The site is a Retention Basin with an associated Overflow Tank and piping. The Basin was a 39.6 m x 39.6 m (130 ft x 130 ft) concrete structure with 25 cm (10in) thick walls, and a 20.3 cm (8 in) thick floor (see H-2-5541). The Overflow Tank was 1.7 m (5.5 ft) high with 0.48 cm (3/16 in) steel walls, and was located at in the north and center end of the Basin, just within the north Basin wall. A 61cm (24 in) vitrified clay pipe roughly 610 m (2,000 ft) in length carried waste water into and out of the Overflow Tank. The concrete floors and walls of the basin were found to be grossly contaminated and subsequently filled with dirt to prevent contamination from spreading. In June 1975, the soil was treated with herbicides and covered with an additional 23cm (9 in) of gravel to prevent radioactive weed growth. The most recent surface stabilization effort at this Basin occurred in 1993.

Waste Site Coordinates:

E-566978.44077 N-133891.93441

Site Dimensions:

Site Length: 39.6 m (130 ft)
Site Width: 39.6 m (130 ft)
Site Area: 1,570 m^2 (16,900 ft^2)
Site Depth: 2.06 m (ft)
Cover Thickness: 0.45 to 0.60 m (1.5 to 2.0 ft)

Release Summary: No estimated release volume is presented in WIDS for this waste site.

The Basin received process cooling water and steam condensate from the 202-S Building via the 200-W-152-PL, a 61cm (24 in) diameter and 610 m (2,000 ft) long vitrified clay pipeline. The water was released via the 200W-152 PL pipeline into the 216-S-16 and 216-S-17 Ponds. Several coil leaks within the 202-S Building caused contaminated effluent to be released into the Basin.

The first leak discussed in WIDS occurred in October 1952. An Unplanned Release of liquid or steam waste occurred due to a steam coil failure in the REDOX D-12 Waste Concentrator, causing gross contamination of the process cooling water.

In November 1952, an Unplanned Release of liquid or steam waste resulted from a leak in the Oxidizer Vessel (H-4) steam coil at the REDOX Facility caused further gross contamination within the Basin.

In 1993, the Basin was backfilled with contaminated soil from a Soil Contamination Area located east of 241-S/SX Tank Farm (UPR-200-W-114). The soil at this UPR site contained

contaminated specks from the 241-S/SX Tank Farm operations. The 207-S Basin was then covered with an additional 46 to 61cm (18 to 24 in) of uncontaminated backfill to meet the approximate grade level of the surrounding area.

Related Site Structure(s): The Basin is associated with the 202-S Facility, the 216-S-16 and S-17 Pond, UPR-200-W-13, UPR-200-W-15, UPR-200-W-95, 241-S/SX Tank Farm, UPR-200-W-114, and 200-W-152-PL.

Site Posting: The Basin is posted as an Underground Radioactive Material Area (URMA), and is surrounded by concrete marker posts and URMA signs.

Site Characterization Summary: The November 1952 an Unplanned Release resulted in contamination measuring between 2 to 200 mr/hr at 2 inches for the Processing Cooling Header; and 80 mrep/hr, including 40mr/hr to 250 mrep/hr and 70 mr/hr readings approximately 5 feet above the cooling water condensate.

A radiation survey conducted on September 4, 1981 reported maximum readings of 9,000 cpm on blowing tumbleweeds measured inside the basin.

Potential Contaminants:

Radioactive: 9000 cpm beta/gamma in September 1981

Non-Radioactive: Unknown

References:

WIDS General Summary Report for site 207-S
ArcMap
QMap
H-2-5541

Figure 1. ArcMap Image

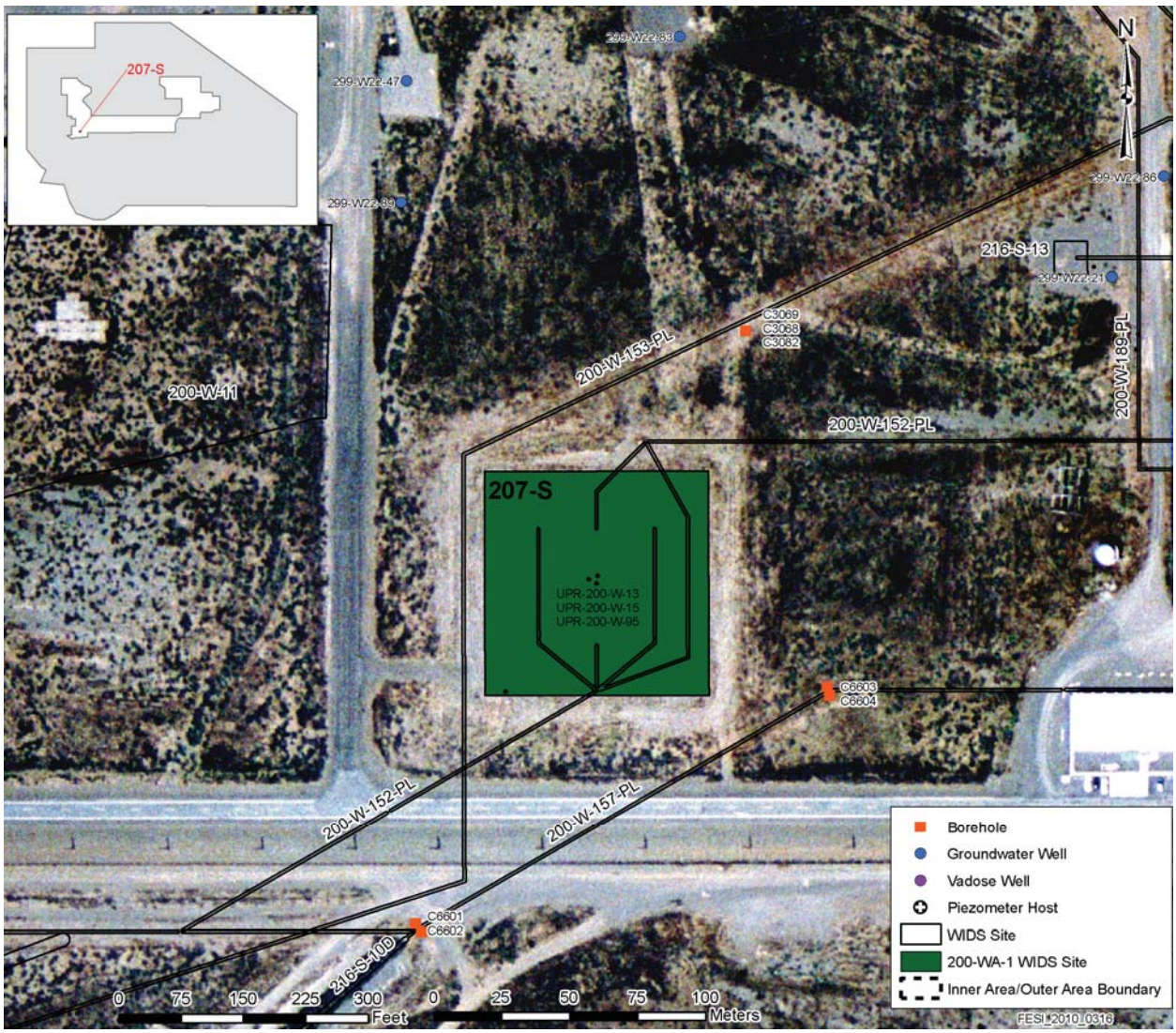
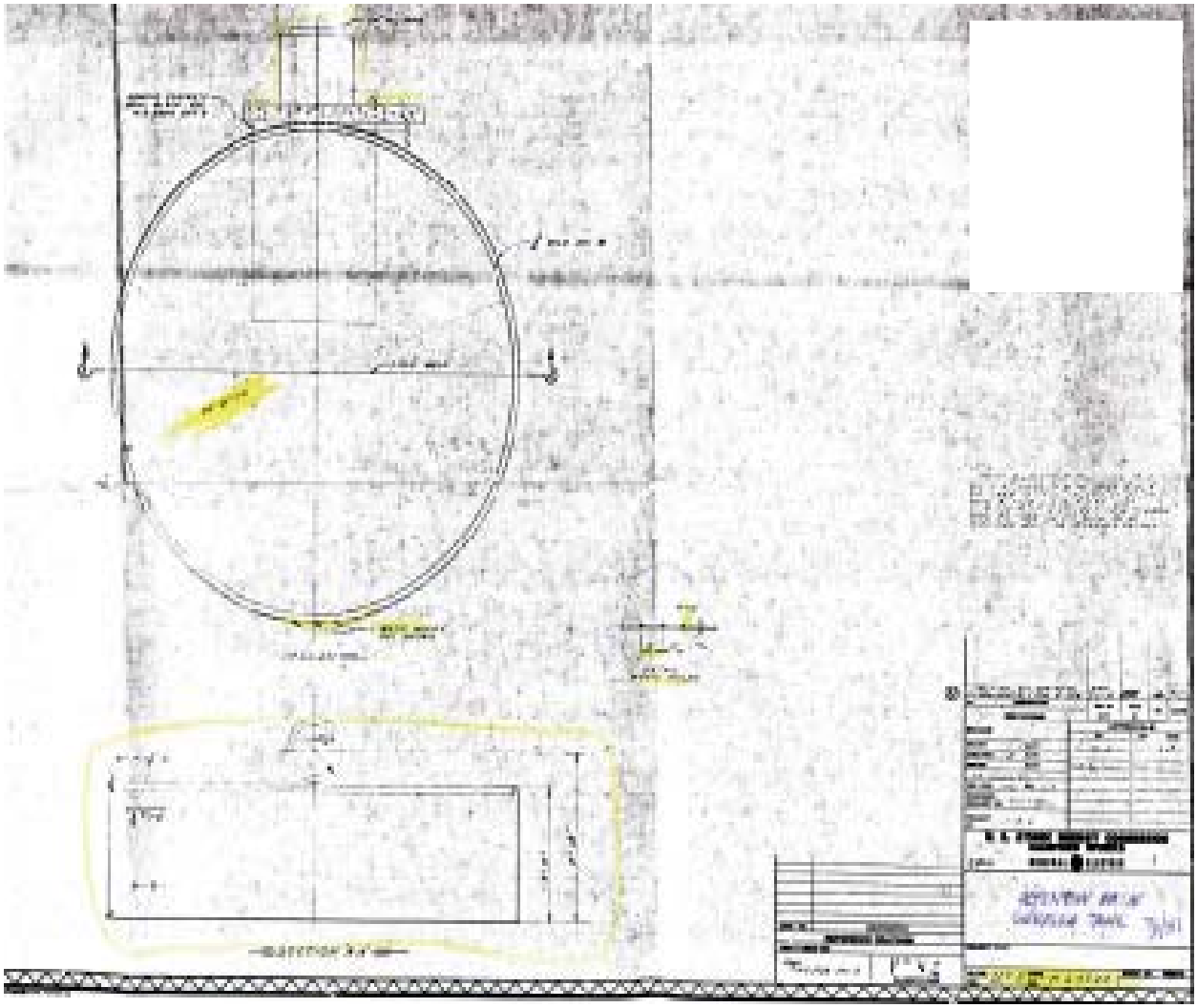


Figure 2. H-2-5541



Site Description

Site ID: 207-T, T-Plant Retention Basin, 207-T Retention Basin
Site Type: Septic Tank
Facility/Geographic Area: T-Plant_
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-2
Service Dates: 1944 to 1995
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: The 207-T Retention Basin has been backfilled to match the surrounding grade. The site is posted as an Underground Radioactive Material Area(URMA), and is marked with T Posts at each corner. The site is located west of 221-T Building and north of 23rd Street (see Figure 1. ArcMap Image).

The basin is a concrete feature split into two halves, with a 3.8E6 L (1E6 gal) capacity. The bottom dimensions for each half is 32.3 x 32.3 m (106 x 106 ft). Two 40.6 cm (16 in) diameter cast iron pipes were connected to two 0.9 m (3 ft) sumps, one for each basin. An estimated 1830 m (6,000 ft) of 61 cm (24 in) diameter vitrified clay pipeline was used to convey waste water to and from the basin (see Figure 2. Reference Drawing H-2-3019 Sheet 1 Rev. 4 and Figure 3. Reference Drawing H-2-3020 Sheet 1 Rev. 2). A black pipeline leaves the east side of the basin, heading south. The pipeline terminates at a pipeline that feeds into the 216-TY-201 flush tank.

Waste Site Coordinates:

E-566969.04471 N-136705.03107

Site Dimensions:

Site Length: 75.0 m (246.0 ft)
Site Width: 37.5 m (123 ft)
Area: 2,811 m^2 (30,258 ft^2)

Site Depth: 2.0 m (6.5 ft)
Cover Thickness: Not Specified

Note: Total dimensions for both basins. In 1996, the Basins were backfilled with contaminated soil from adjacent areas and capped with (2 ft) of clean soil.

Release Summary: The 207-T Retention Basin received potentially low-level radioactive cooling water effluent and ventilated steam condensate from 221-T and 224-T. The 207-T Retention Basin was operable from 1944 to 1995. The effluent entered the Basins through an outlet structure on the east side of the Basins. The basin effluent was released to the 216-T-4-1 and 216-T-4-2 Ditches via an outlet structure on the west site, adjacent to the outside walls of the Basins, and opposite the inlet structure.

From November 1944 to the 1950's, the site received process cooling water from process equipment jackets in the 221-T and 2224-T Buildings. From the early 1950's to 1955, 242-T Evaporator cooling water was added to the waste stream. From 1955 to 1965, the 242-T Evaporator cooling water was removed from the waste stream. The 242-T Evaporator cooling water was added back to waste stream from 1965 to the late 1960's. The Evaporator cooling water was removed a second time from the waste stream during the late 1960's to 1973, and then added back to the effluent sent to the Basin from 1973 to 1976. After 1976, the site received intermittent flow from the 221-T, 221-TA, and 224-T Building. The effluent discharge was

rerouted to the 200 Area TEDF in 1995. The Basin was backfilled with soil as part of the deactivation process in 1996.

On September 12, 1985, the T-Plant sent 1900 L (500 gal) of aqueous 5% sodium hydroxide solution containing 100 kg (219 lb) of sodium hydroxide to the Basins and subsequently to the 214-T-4-2 Ditch. At the time of the release, pH was 12.5. No cleanup actions were undertaken. After 6 hours of dilution by continued condensate discharge, the pH was 7.7.

Over time, the sludge that built up on the floor of the Basins was occasionally cleaned out. The sludge was set in holes spaced along the boundary of the Basin and covered with a layer of clean dirt. It is likely that holes were dug and filled with sludge and were not individually documented.

The total amount of effluent the Retention Basin received during its lifetime is not specified. As the total volume of effluent sent to the site is not available, no volume estimates can be ascertained.

Related Site Structure(s): The Retention Basins are associated with the 221-T and 224-T, facilities, waste sites 216-T-12 and 200-W-53, and with the 216-T-4-1 and 216-T-4-2 Ditches. The inlet pipelines associated with this basin are WIDS sitecodes 200-W-88-PL, 200-W-165-PL, 200-W-166-PL, and 200-W-167-PL. The outlet pipeline that leads to the 216-T-4 ditch is WIDS sitecode 200-W-164-PL.

Site Posting: 207-T is posted as an URMA.

Site Characterization Summary: A contaminated site north of the 207-T Basins was labeled as site UPR-200-W-166 (also called UN-216-W-31). The contaminated dirt was scraped and relocated on the crest of the 216-T-14 through 216-T-17 trenches and buried beneath a layer of clean soil in 1992. In 1994, further contamination was discovered east of the 207-T Basins. At the time, it was thought that the contamination was from the same source and this additional contamination was also labeled as UPR-200-W-166. This second contamination patch was scraped and used inside the Basins as fill material in 1996. To differentiate between the 1992 and the 1993 contaminated sites, the second site was re-labeled as 200-W-53.

The 207-T Retention Basins and 200-W-53 were temporarily stabilized in May 1996. Between 7.6 to 45.7 cm (3 to 18 in) of contaminated soil were scraped from 200-W-53 and disposed of at the bottom of the Basin. The Basin was then capped with 45.7 to 60.9 cm (18-24 in) of clean soil and downposted from a Surface Contamination Area (SCA) to URMA.

When active, water samples were collected weekly and composited for analysis. A radiological investigation was conducted December 11, 1997 as part of a routine survey of the area. No contamination was discovered during the investigation. A GM/P-11 Probe (15.5 sq cm) (Beta-Gamma) was used for the survey.

Potential Contaminants:

Radioactive: Low-level radioactive cooling water effluent and Ventilated steam condensate from 221-T and 224-T.

Non-Radioactive: Not Specified.

References:

WIDS General Summary Report for site 207-T
ArcMap
QMap

Figure 1. ArcMap Image

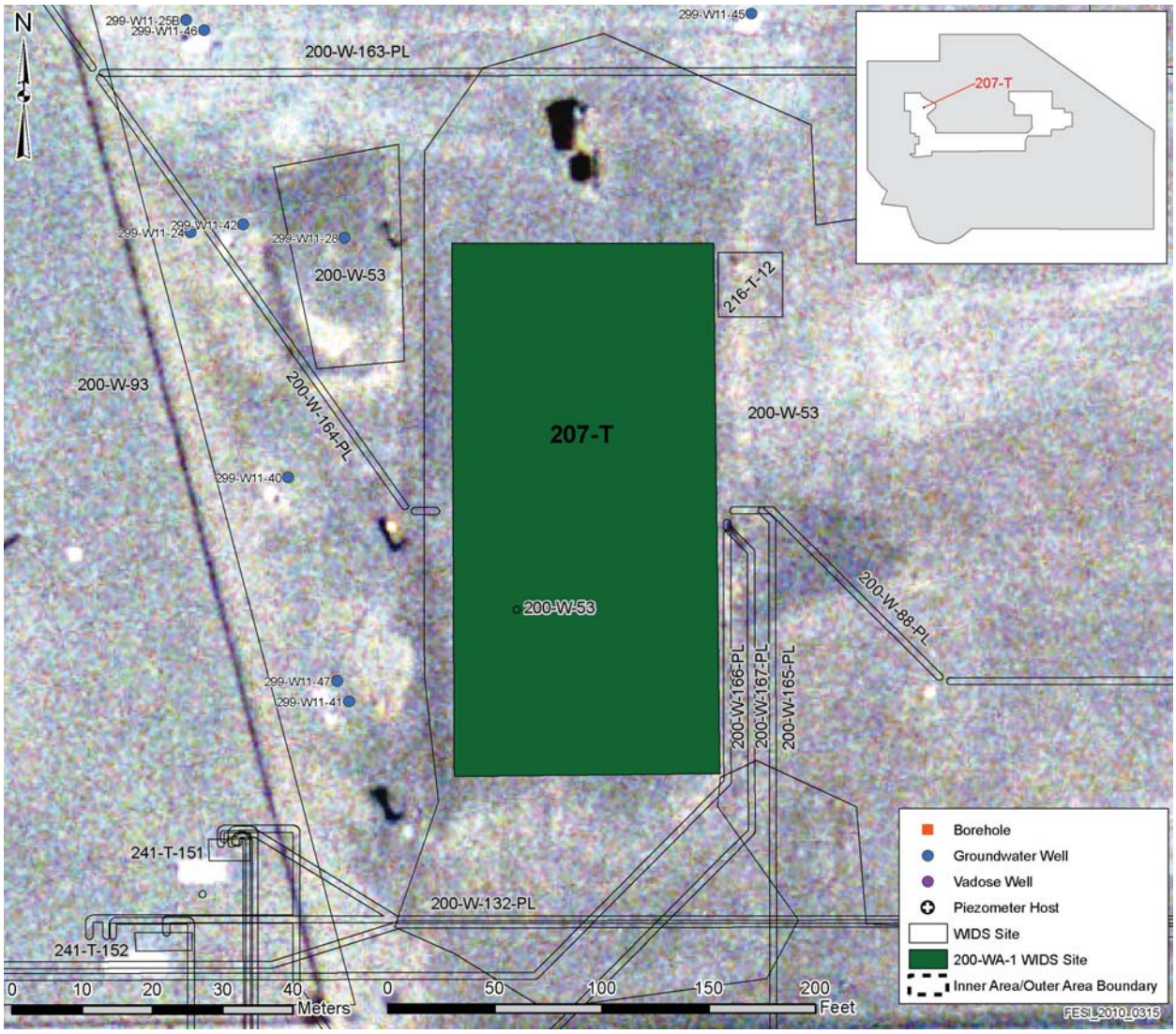


Figure 2. Reference Drawing H-2-3019 Sheet 1 Rev.4

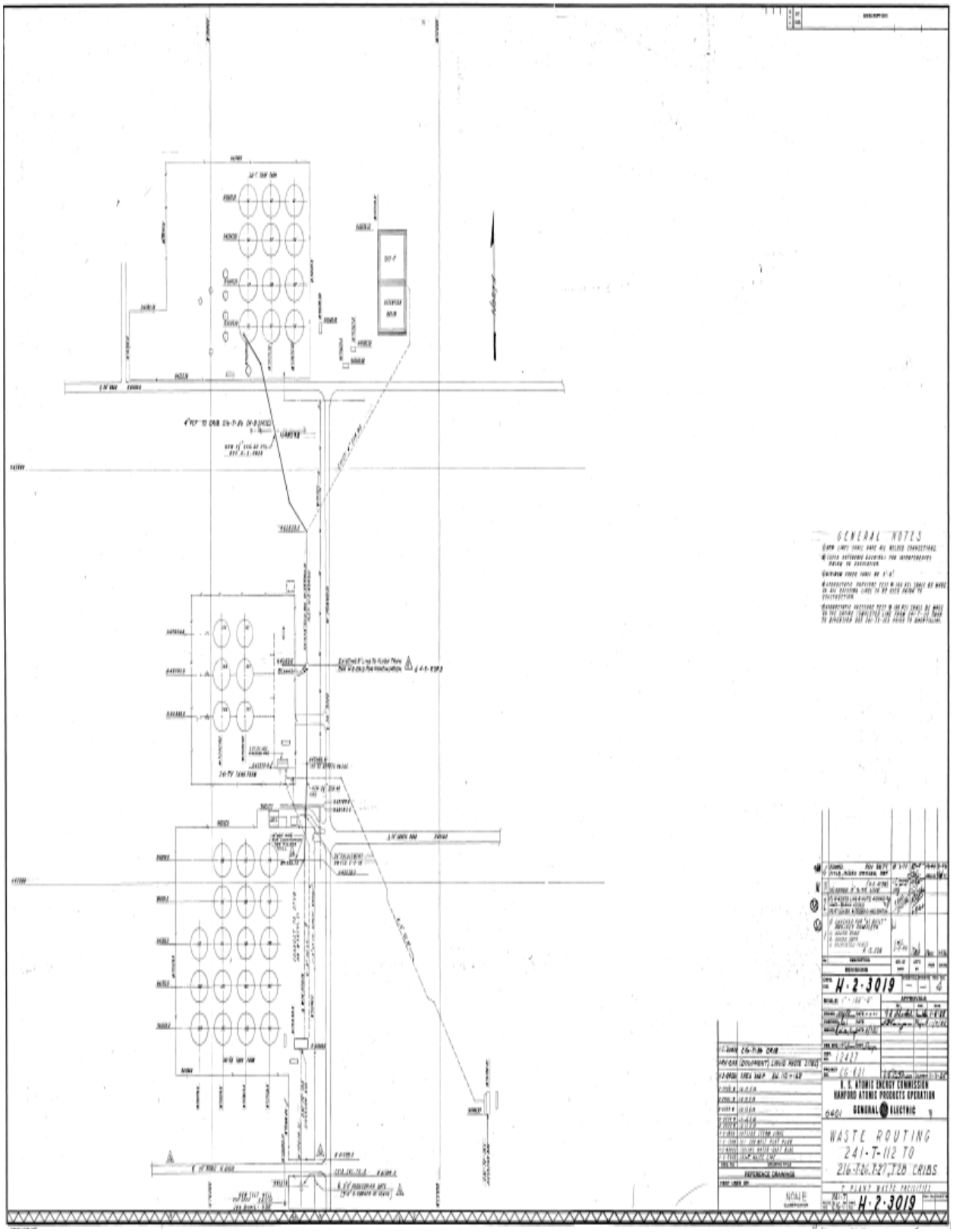
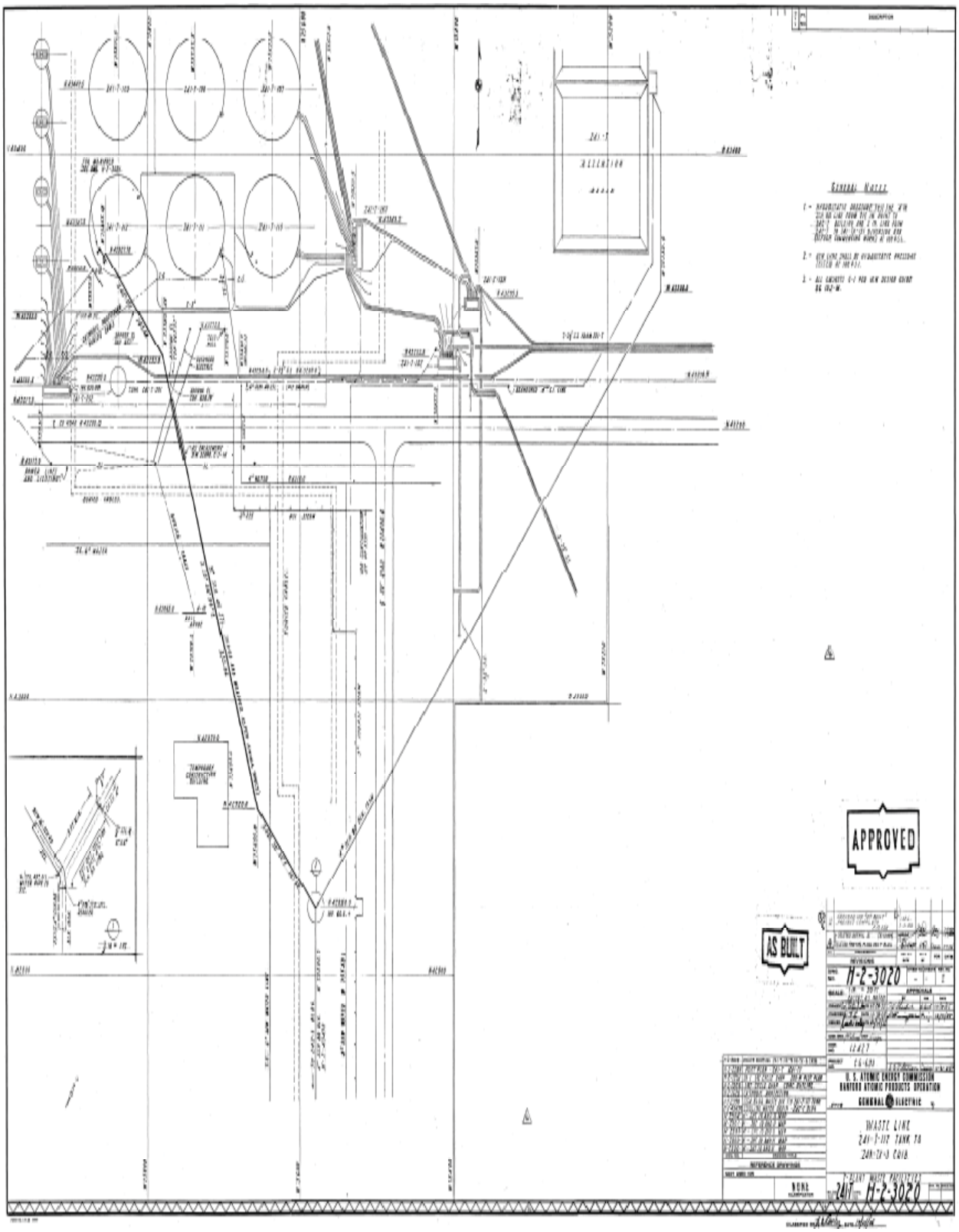


Figure 3. Reference Drawing H-2-3020 Sheet 1 Rev.2



Site Description

Site ID: 207-Z, 207-Z Retention Basin, 241-Z Retention Basin, 241-Z-RB
Site Type: Retention Basin
Facility/Geographic Area: Z-Plant (PFP Area)
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-SC-1, 200-MG-2
Service Dates: 1949 to 1959
Volume/Mass Discharged: 152,000 L (40,000 gal) may have leaked from the 241-Z Basins.

Waste Site Location and Physical Description: Site 207-Z is located inside the Z Plant Exclusion Area fence, south of 236-Z Building, and inside the Plutonium Finishing Plant fence (See Figure 1. ArcMap Image). The site consists of a concrete basin that is split into two half sections. The two sections were separated by a 0.3 m (1.0 ft) thick concrete wall. Each section contained a sump with a sump pump. A 1.8 m (6 ft) tall chain link fence encompasses the basins. Both basins were filled with high density grout. No reference drawings are available for this site.

Waste Site Coordinates:

E-566574.67115 N-135522.57778

Site Dimensions:

Site Length: 15.2 m (50.0 ft)
Site Width: 12.2 m (40.0 ft)
Site Area: 186.0 m^2 (2000.0 ft^2)
Site Depth: 3.0 m (10.0 ft)
Cover Thickness: None

Release Summary: The 207-Z Basins were constructed in 1949 for use as a holding facility for potentially contaminated waste. The waste consisted of steam condensate and cooling water, and was conveyed through the D-3 piping system into the Basins. From the Basins, the condensate and cooling water were sent to the 216-Z-1 and 216-Z-11 ditches for disposal.

No estimates are presented for the volume of wastes sent to 207-Z Basins. However, estimates indicate that roughly 152,000 L (40,000 gal) of steam condensate potentially leaked from the 241-Z Basins. It is not specified to where the waste was released, or when the leak occurred.

Related Site Structure(s): The site is associated with the 241-Z and 234-5Z facilities. The 200-W-209-PL pipeline is associated with this site. Additional pipelines linked to the 207-Z Basin are discussed further under sitecode 200-W-209-PL.

Site Posting: The posting for the site is not specified.

Site Characterization Summary: The 207-Z Basin was occasionally confused with the 216-Z-21 Seepage Pond; however both are separate waste sites and are located in different locations within the Z Plant facility. The 216-Z-21 Seepage Pond was constructed east of the Z Plant Exclusion Area, while the 207-Z Basin is inside the PFP fence. The 216-Z-21 depression was originally named the 207-Basin. The 207-Basin was renamed in 1987 to 216-Z-21, which more accurately reflects its basin usage, and resolves any misidentification with its original name.

The site was retired in 1959. In 2006 both basins were filled with high density grout as part of a site clean-up. No further information regarding the clean-up and/or deactivation process are presented.

A radiation survey was performed on April 4, 2006 as part of a routine annual survey of the site. No contamination was identified within the 207-Z Basin. A Micro/R Meter and a PAM (Alpha) unit were used to detect micro-rads/hour and alpha contamination. The results from any prior or subsequent radiological surveys are not provided.

Potential Contaminants:

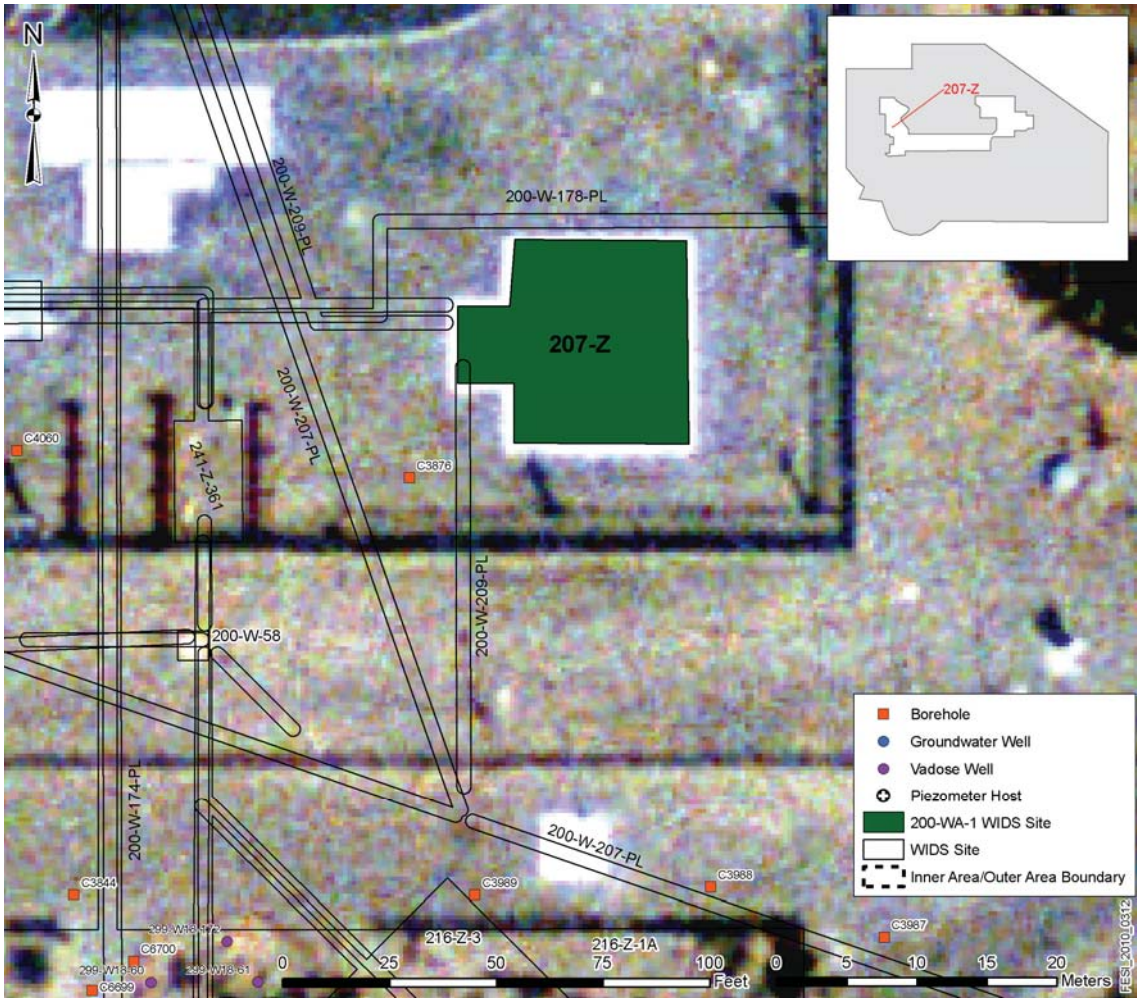
Radioactive: Unknown

Non-Radioactive: Unknown

References:

WIDS General Summary Report for site 207-Z
ArcMap
QMap

Figure 1. ArcMap Image



Site Description

Site ID: 216-B-14 Crib **Site Type:** Crib
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: January and February 1956
Volume/Mass Discharged: 8.71E+6 L (2.30E+6 Gal)

Waste Site Location and Physical Description: The Crib is located south of the 200 East Area (across Route 4S) in the BC Crib Area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The Crib is a dispersion structure 3.0 m x 3.0 m x 0.9 m (10 ft x 10 ft x 3 ft) high, made of wood, cinderblock, and steel, over a 1.5 m (5 ft) bed of 7.6 cm (3 in) gravel, with a 35.6 cm (14 in) inlet pipe located 1.8 m (6 ft) below grade. The bottom dimensions of the excavation are 12.2 m by 12.2 m (40 ft by 40 ft) and 3.9 m (13 ft) deep. The side slope is 2:1. The excavated area surrounding the Crib at the surface is 24.4 m x 24.4 m (80 ft x 80 ft) (see Figure 2).

Waste Site Coordinates:

E-573648.95762 N-134407.55730

Site Dimensions:

Site Length: 24.4 m (80 ft) (at ground surface) Site Depth: 4.0 meters (13 ft) to bottom of structure
Site Width: 24.4 m (80 ft) (at ground surface) Cover Thickness: 0.6 m (2 ft)
Site Area: 595.4 m^2 (6400 ft^2)

Release Summary: The Crib received 8.71E+6 L (2.30E+6 gal) tributylphosphate (TBP) supernatant waste from the U-Plant Uranium Recovery operations and scavenged tank farm waste via underground pipelines. From 1952 to 1958, waste containing uranium and fission products, produced by the bismuth phosphate separations process, where removed from underground storage tanks and reprocessed at 221-U Plant to recover the uranium from the waste. After the uranium was removed, the cesium and strontium content of the effluent was precipitated by adding ferrocyanide. The addition of ferrocyanide to the waste was called "scavenging". The supernate liquor was released to the ground in the BC Cribs and Trenches via the 200-E-114-PL (pipeline). The waste is liquid process effluent, high in salt and is neutral to basic. The waste contained inorganic compounds such as ferrocyanide, nitrate and phosphate.

$PV_{released}$ = 8.71E+6 L/ (595.4 m^2*106 m*0.3*1000 L/m^3) = 0.46

Therefore, the Crib is assumed to exhibit deep vadose effects.

Related Site Structure(s): The site is associated with the 200-E-14 Siphon Tank, 200-E-114-PL Pipeline and UPR-200-E-83.

Site Posting: The area has been covered with clean soil and posted as an URMA.

Site Characterization Summary: In May 1958, smearable contamination was detected on the crib vent risers measuring 40,000 counts per minute and 10,000 counts per minute on the ground

under a flange that was part of the over ground pipeline. Contaminated rabbit droppings reading 5,000 to 10,000 cpm were identified. The maximum value detected was 200 mr/hr.

In August 2005, MSCM tractor surveys found extensive wind damage on the stabilization cover. Surface contamination was found at several locations. Contamination levels up to 25 millirem per hour were found.

The Crib was characterized in 2008 with Direct Push Technology (DPT) and gamma logging.

The BC Cribs and Trenches area was interim stabilized as a single unit in 1981. During stabilization 200-E-114-PL to the Cribs was valved out. The BC Cribs area was revegetated and weed growth was controlled with selective herbicide. The stabilization cover has been badly damaged over time by wind erosion.

An annual surface radiation survey is performed.

Potential Contaminants:

Radioactive: Stronium-90, Cesium-137

Non-Radioactive: Nickel Ferrocyanide, Nitrate, Phosphate

References:

WIDS General Summary Report for site 216-B-14
ArcMap
QMap
HW-55176 Part VI Appendix C-24

Figure 1. ArcMap Image

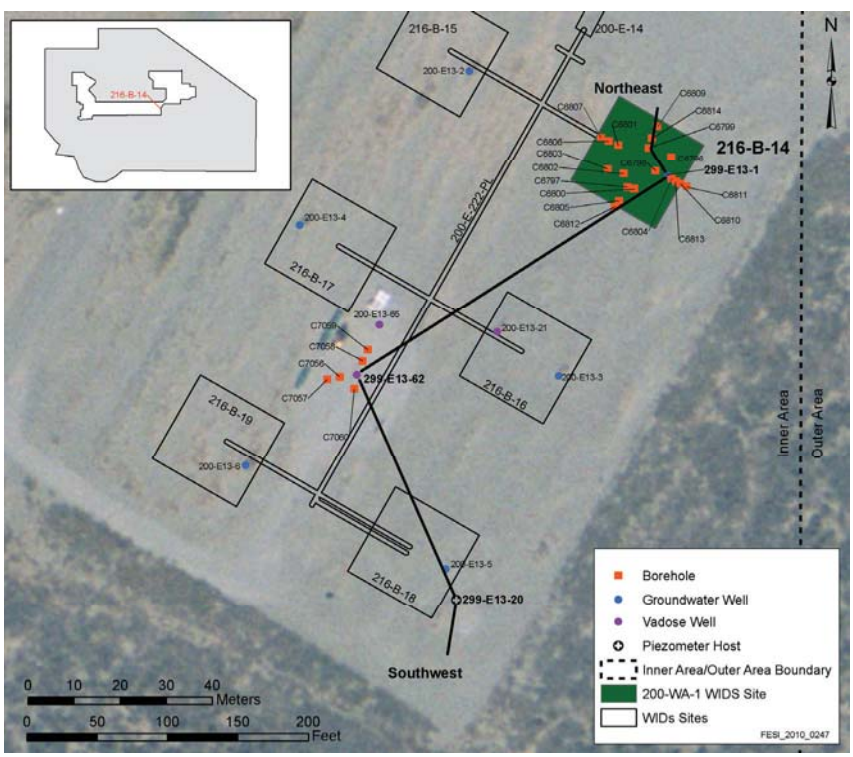
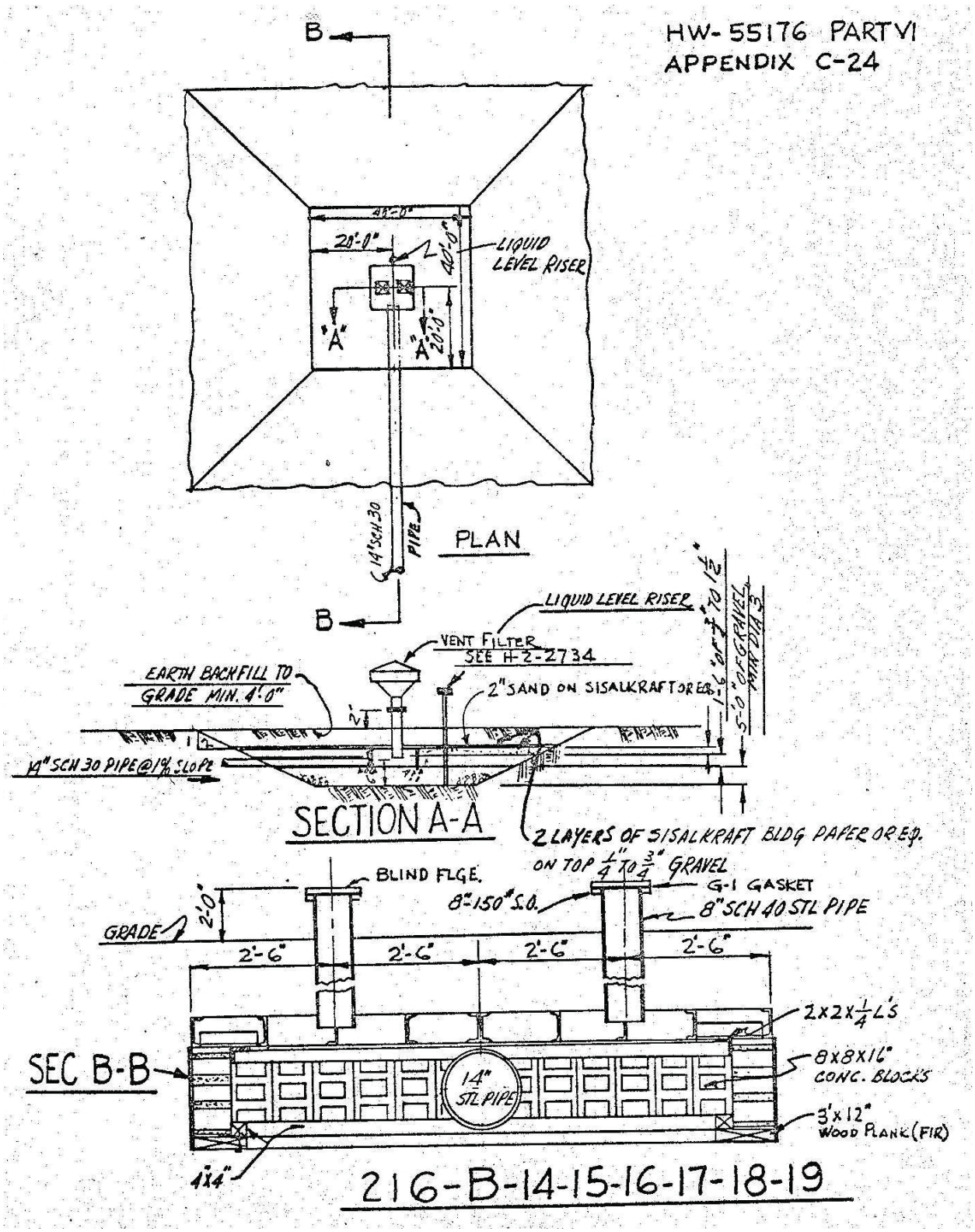


Figure 2. Plan and Section



Site Description

Site ID: 216-B-15 Crib **Site Type:** Crib
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: April 1956 to December 1957
Volume/Mass Discharged: 6.3E6 L (1.7E6 Gal)

Waste Site Location and Physical Description: The Crib is located south of the 200 East Area (across Route 4S) in the BC Crib Area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. – ArcMap Image). The Crib is a dispersion structure 3.0 m x 3.0 m x 0.9 m (10 ft x 10 ft x 3 ft) high, made of wood, cinderblock, and steel, over a 1.5 m (5 ft) bed of 7.6 cm (3 in) gravel, with a 35.6 cm (14 in) inlet pipe located 1.8 m (6 ft) below grade. The bottom dimensions of the excavation are 12.2 m x 12.2 m (40 ft x 40 ft) and 4.0 m (13 ft) deep. The side slope is 2:1. The excavated area surrounding the Crib at the surface is 24.4 m x 24.4 m (80 ft x 80 ft) (see Figure 2. Site Plan and Section).

Waste Site Coordinates:

E-573606.64511 N-134431.82295

Site Dimensions:

Site Length: 24.4 m (80 ft) (at ground surface) Site Depth: 4.0 meters (13 ft)
Site Width: 24.4 m (80 ft) (at ground surface) Cover Thickness: 0.6 m (2 ft)
Site Area: 595 m^2 (6400 ft^2)

Release Summary: The Crib received 6.3E6 L (1.7E6 Gal) tributylphosphate (TBP) supernatant waste from the U-Plant Uranium Recovery operations and scavenged tank farm waste via underground pipelines. From 1952 to 1958, waste containing uranium and fission products, produced by the bismuth phosphate separations process, where removed from underground storage tanks and reprocessed at 221-U Plant to recover the uranium from the waste. After the uranium was removed, the cesium and strontium content of the effluent was precipitated by adding ferrocyanide. The addition of ferrocyanide to the waste was called "scavenging". The supernate liquor was released to the ground in the BC Cribs and Trenches via the the 200-E-114-PL (pipeline). The waste is liquid process effluent, high in salt and is neutral to basic. The waste contained inorganic compounds such as ferrocyanide, nitrate, and phosphate.

$PV_{released}$ = 6.3E6 L/ (595.4 m^2*106 m*0.3*1000 Liters/m^3) = 0.33

Therefore, the Crib is assumed to exhibit deep vadose effects.

Related Site Structure(s): The site is associated with the 200-E-14 Siphon Tank, 200-E-114-PL Pipeline and UPR-200-E-83.

Site Posting: The area has been covered with clean soil and posted as an URMA.

Site Characterization Summary: In May 1958, smearable contamination was detected on the crib vent risers measuring 40,000 counts per minute and 10,000 counts per minute on the ground

under a flange that was part of the over ground pipeline. Contaminated rabbit droppings reading 5,000 to 10,000 cpm were identified. The maximum value detected was 200 mr/hr.

In August 2005, MSCM tractor surveys found extensive wind damage on the stabilization cover. Surface contamination was found at several locations. Contamination levels up to 25 millirem per hour were found.

The BC Cribs and Trenches area was interim stabilized as a single unit in 1981. During stabilization 200-E-114-PL to the Cribs was valved out. The BC Cribs area was revegetated and weed growth was controlled with selective herbicide. The stabilization cover has been badly damaged over time by wind erosion.

An annual surface radiation survey is performed.

Potential Contaminants:

Radioactive: Stronium-90, Cesium-137

Non-Radioactive: Nickel Ferrocyanide, Nitrate, Phosphate

References:

WIDS General Summary Report for site 216-B-15
ArcMap
QMap
HW-55176 Part VI Appendix C-24

Figure 1. ArcMap Image

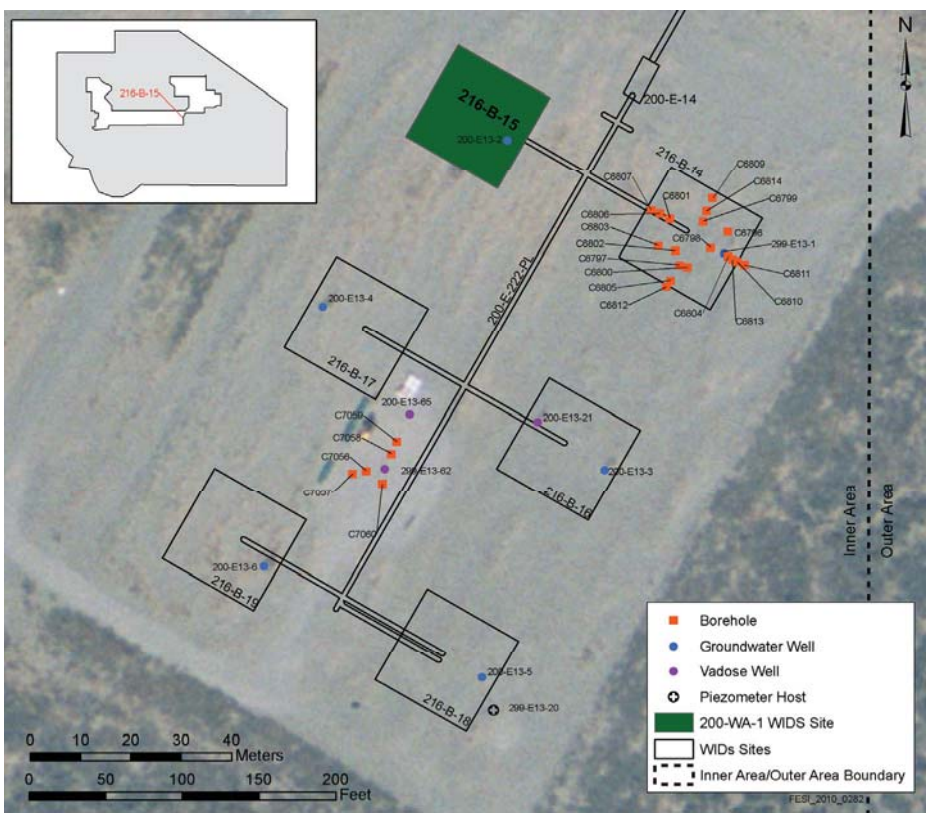
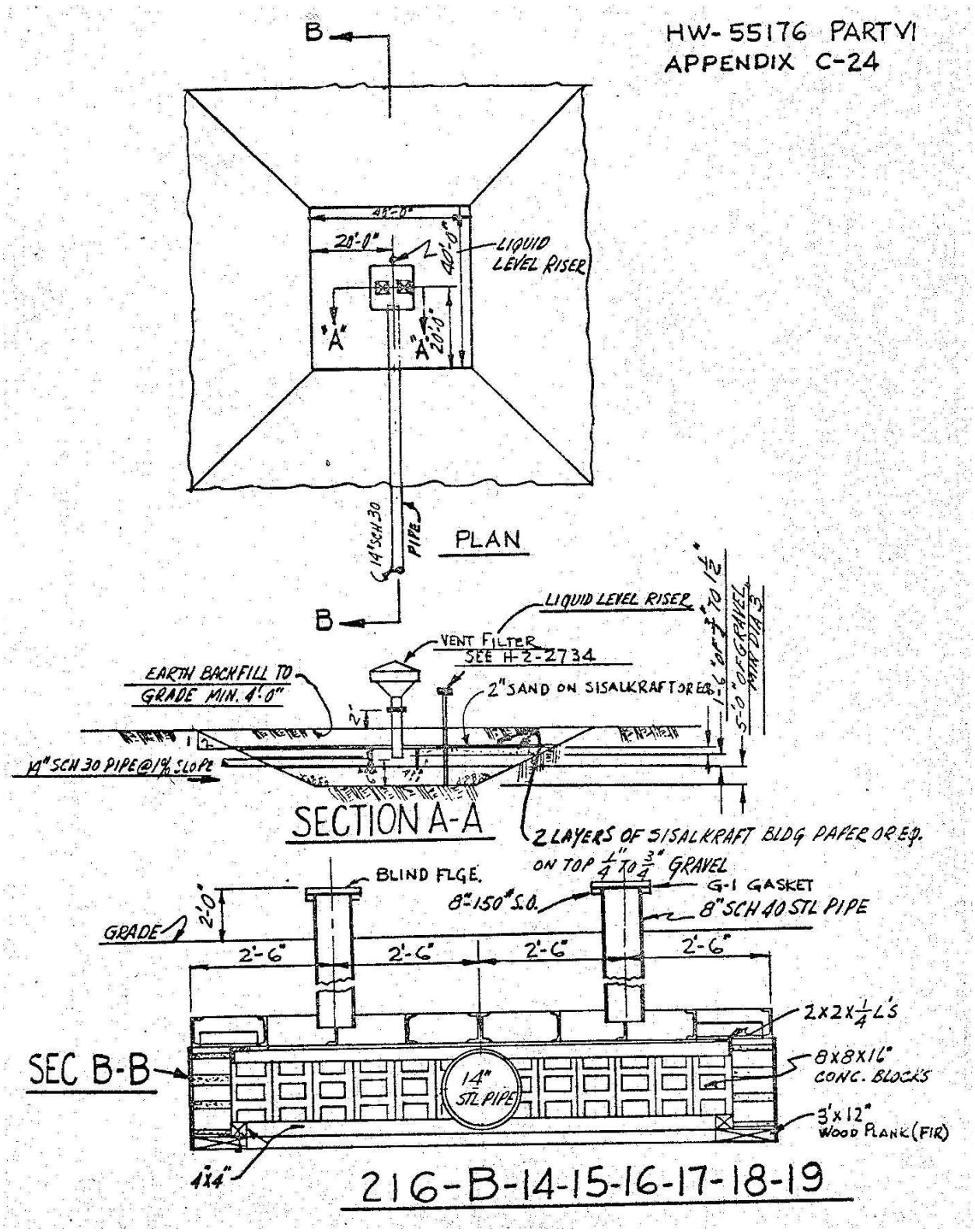


Figure 2. Site Plan and Section



Site Description

Site ID: 216-B-16 Crib **Site Type:** Crib
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: April to August 1956
Volume/Mass Discharged: 5.6E6 L (1.5E6 Gal)

Waste Site Location and Physical Description: The Crib is located south of the 200 East Area (across Route 4S) in the BC Crib Area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure. 1 ArcMap Image). The Crib is a dispersion structure 3.0 m x 3.0 m x 0.9 m (10 ft x 10 ft x 3 ft) high, made of wood, cinderblock, and steel, over a 1.5 m (5 ft) bed of 7.6 cm (3 in) gravel, with a 35.6 cm (14 in) inlet pipe located 1.8 m (6 ft) below grade. The bottom dimensions of the excavation are 12.2 m x 12.2 m (40 ft x 40 ft) and 4.0 m (13 ft) deep. The side slope is 2:1. The excavated area surrounding the Crib at the surface is 24.4 m by 24.4 m (80 ft by 80 ft) (see Figure 2. Site Plan and Section).

Waste Site Coordinates:

E-573624.68821 N-134365.24498

Site Dimensions:

Site Length: 24.4 m (80 ft) (at ground surface)
Site Width: 24.4 m (80 ft) (at ground surface)
Site Area: 595.4 square m (6400 square ft)
Site Depth: 4.0 meters (13 ft) to bottom of structure
Cover Thickness: 0.6 m (2 ft)

Release Summary: The Crib received 5.6E6 L (1.5E6 Gal) tributylphosphate (TBP) supernatant waste from the U-Plant Uranium Recovery operations and scavenged tank farm waste via underground pipelines. From 1952 to 1958, waste containing uranium and fission products, produced by the bismuth phosphate separations process, were removed from underground storage tanks and reprocessed at 221-U Plant to recover the uranium from the waste. After the uranium was removed, the cesium and strontium content of the effluent was precipitated by adding ferrocyanide. The addition of ferrocyanide to the waste was called "scavenging". The supernate liquor was released to the ground in the BC Cribs and Trenches via the the 200-E-114-PL (pipeline). The waste is liquid process effluent, high in salt and is neutral to basic. The waste contained inorganic compounds such as ferrocyanide, nitrate and phosphate.

$PV_{released}$ = 5.6E6 L/ (595.4 m^2*106 m*0.3*1000 L/m^3) = 0.30

Therefore, the Crib is assumed to exhibit deep vadose effects.

Related Site Structure(s): The site is associated with the 200-E-14 Siphon Tank, 200-E-114-PL Pipeline and UPR-200-E-83.

Site Posting:

The area has been covered with clean soil and posted as an Underground Radioactive Material area.

Site Characterization Summary:

In May 1958, smearable contamination was detected on the crib vent risers measuring 40,000 counts per minute and 10,000 counts per minute on the ground under a flange that was part of the over ground pipeline. Contaminated rabbit droppings reading 5,000 to 10,000 cpm were identified. The maximum value detected was 200 mr/hr.

In August 2005, MSCM tractor surveys found extensive wind damage on the stabilization cover. Surface contamination was found at several locations. Contamination levels up to 25 millirem per hour were found.

The BC Cribs and Trenches area was interim stabilized as a single unit in 1981. During stabilization 200-E-114-PL to the Cribs was valved out. The BC Cribs area was revegetated and weed growth was controlled with selective herbicide. The stabilization cover has been badly damaged over time by wind erosion.

An annual surface radiation survey is performed.

Potential Contaminants:

Radioactive: Stronium-90, Cesium-137

Non-Radioactive: Nickel Ferrocyanide, Nitrate, Phosphate

References:

WIDS General Summary Report for site 216-B-16ArcMap
QMap
HW-55176 Part VI Appendix C-24

Figure 1. ArcMap Image

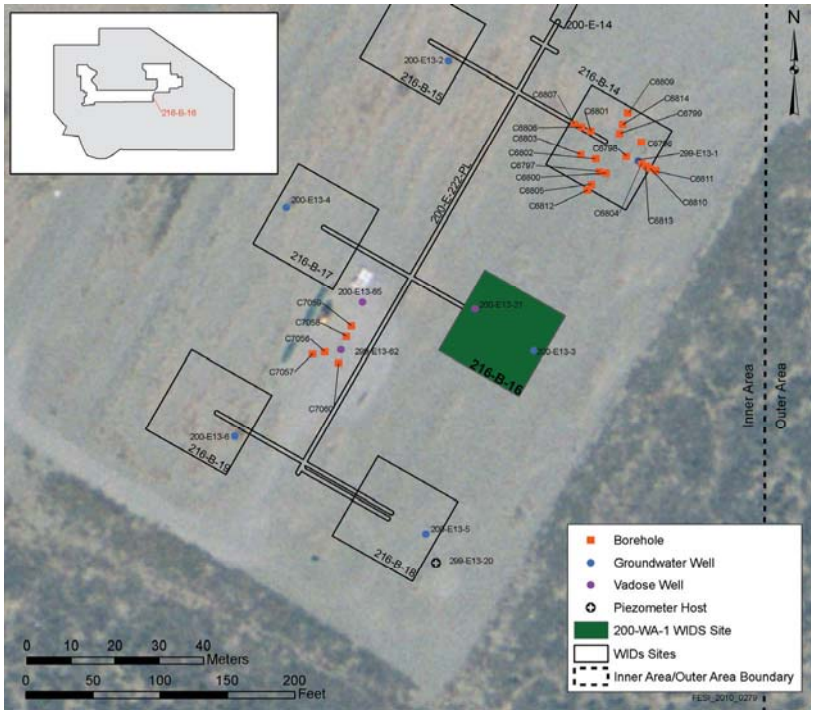
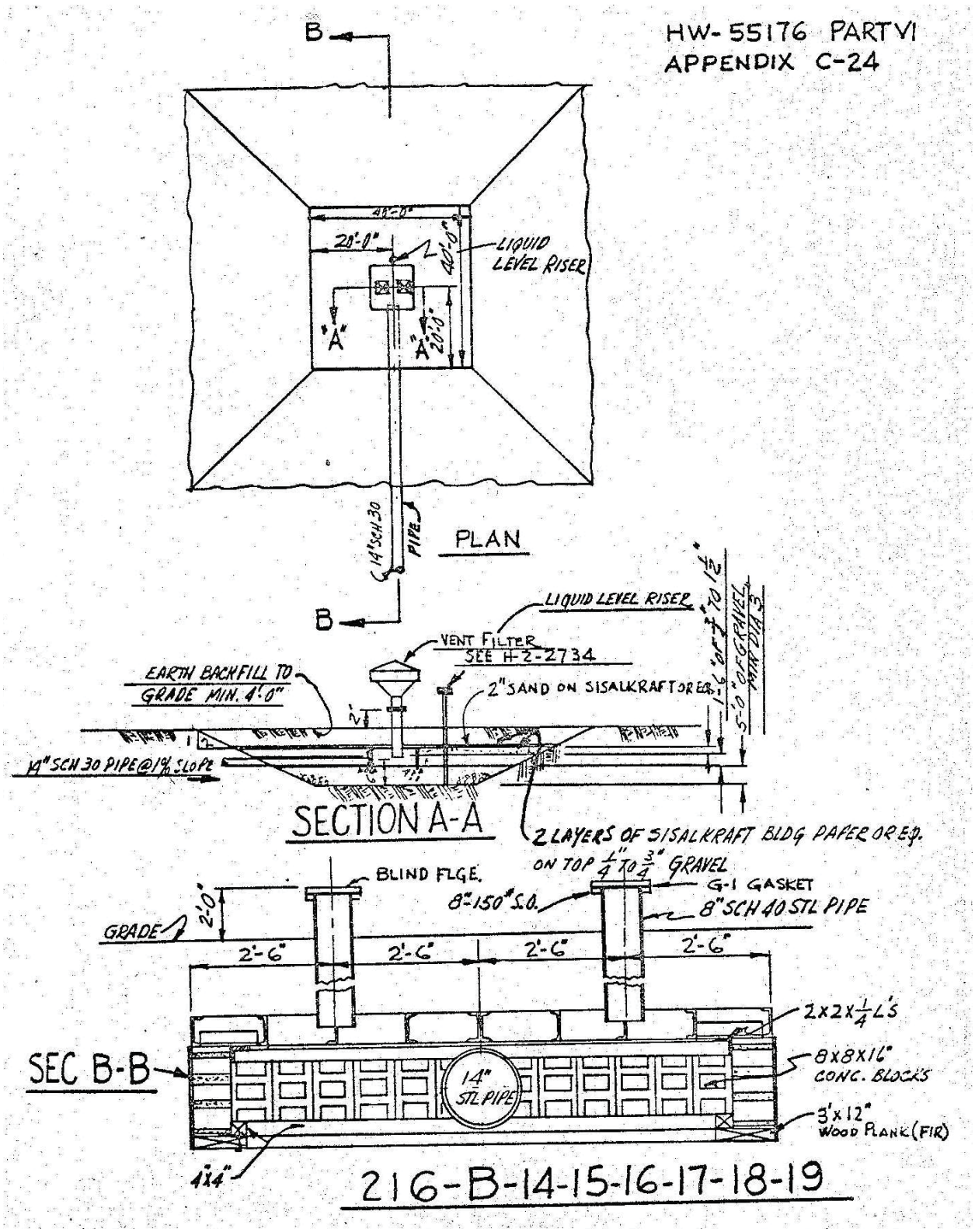


Figure 2. – Site Plan and Section



Site Description

Site ID: 216-B-17 Crib
Site Type: Crib
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: January 1956
Volume/Mass Discharged: 3.4E6 L (0.9E6 Gal)

Waste Site Location and Physical Description: The 216-B-17 Crib is located south of the 200 East Area (across Route 4S) in the BC Crib Area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The Crib is a dispersion structure 3.0 m x 3.0 m x 0.9 m (10 ft x 10 ft x 3 ft) high, made of wood, cinderblock, and steel, over a 1.5 m (5 ft) bed of 7.6 cm (3 in) gravel, with a 35.6 cm (14 in) inlet pipe located 1.8 m (6 ft) below grade. The bottom dimensions of the excavation are 12.2 m by 12.2 m (40 ft by 40 ft) and 4.0 m (13 ft) deep. The side slope is 2:1. The excavated area surrounding the Crib at the surface is 24.4 m x 24.4 m (80 ft x 80 ft) (see Figure 2. Site Plan and Section).

Waste Site Coordinates:

E-573582.39515 N-134389.51043

Site Dimensions:

Site Length: 24.4 m (80 ft) (at ground surface)
Site Width: 24.4 m (80 ft) (at ground surface)
Site Area: 595.4 square m (6400 square ft)
Site Depth: 4.0 meters (13 ft) to bottom of structure
Cover Thickness: 0.6 m (2 ft)

Release Summary: The Crib received 3.4E6 L (0.9E6 Gal) tributylphosphate (TBP) supernatant waste from the U-Plant Uranium Recovery operations and scavenged tank farm waste via underground pipelines. From 1952 to 1958, waste containing uranium and fission products, produced by the bismuth phosphate separations process, were removed from underground storage tanks and reprocessed at 221-U Plant to recover the uranium from the waste. After the uranium was removed, the cesium and strontium content of the effluent was precipitated by adding ferrocyanide. The addition of ferrocyanide to the waste was called “scavenging”. The supernate liquor was released to the ground in the BC Cribs and Trenches via the 200-E-114-PL (pipeline). The waste is liquid process effluent, high in salt and is neutral to basic. The waste contained inorganic compounds such as ferrocyanide, nitrate and phosphate.

$PV_{released}$ = 3.4E6 L/ (595.4 m^2*106 m*0.3*1000 L/m^3) = 0.18

Therefore, the Crib is assumed to exhibit no deep vadose effects.

Related Site Structure(s): The site is associated with the 200-E-14 Siphon Tank, 200-E-114-PL Pipeline and UPR-200-E-83.

Site Posting: The area has been covered with clean soil and posted as an URMA.

Site Characterization Summary: In May 1958, smearable contamination was detected on the crib vent risers measuring 40,000 counts per minute and 10,000 counts per minute on the ground

under a flange that was part of the over ground pipeline. Contaminated rabbit droppings reading 5,000 to 10,000 cpm were identified. The maximum value detected was 200 mr/hr.

In August 2005, MSCM tractor surveys found extensive wind damage on the stabilization cover. Surface contamination was found at several locations. Contamination levels up to 25 millirem per hour were found.

The BC Cribs and Trenches area was interim stabilized as a single unit in 1981. During stabilization 200-E-114-PL to the Cribs was valved out. The BC Cribs area was revegetated and weed growth was controlled with selective herbicide. The stabilization cover has been badly damaged over time by wind erosion.

An annual surface radiation survey is performed.

Potential Contaminants:

Radioactive: Stronium-90, Cesium-137

Non-Radioactive: Nickel Ferrocyanide, Nitrate, Phosphate

References:

WIDS General Summary Report for site 216-B-17ArcMap
QMap
HW-55176 Part VI Appendix C-24

Figure 1. ArcMap Image

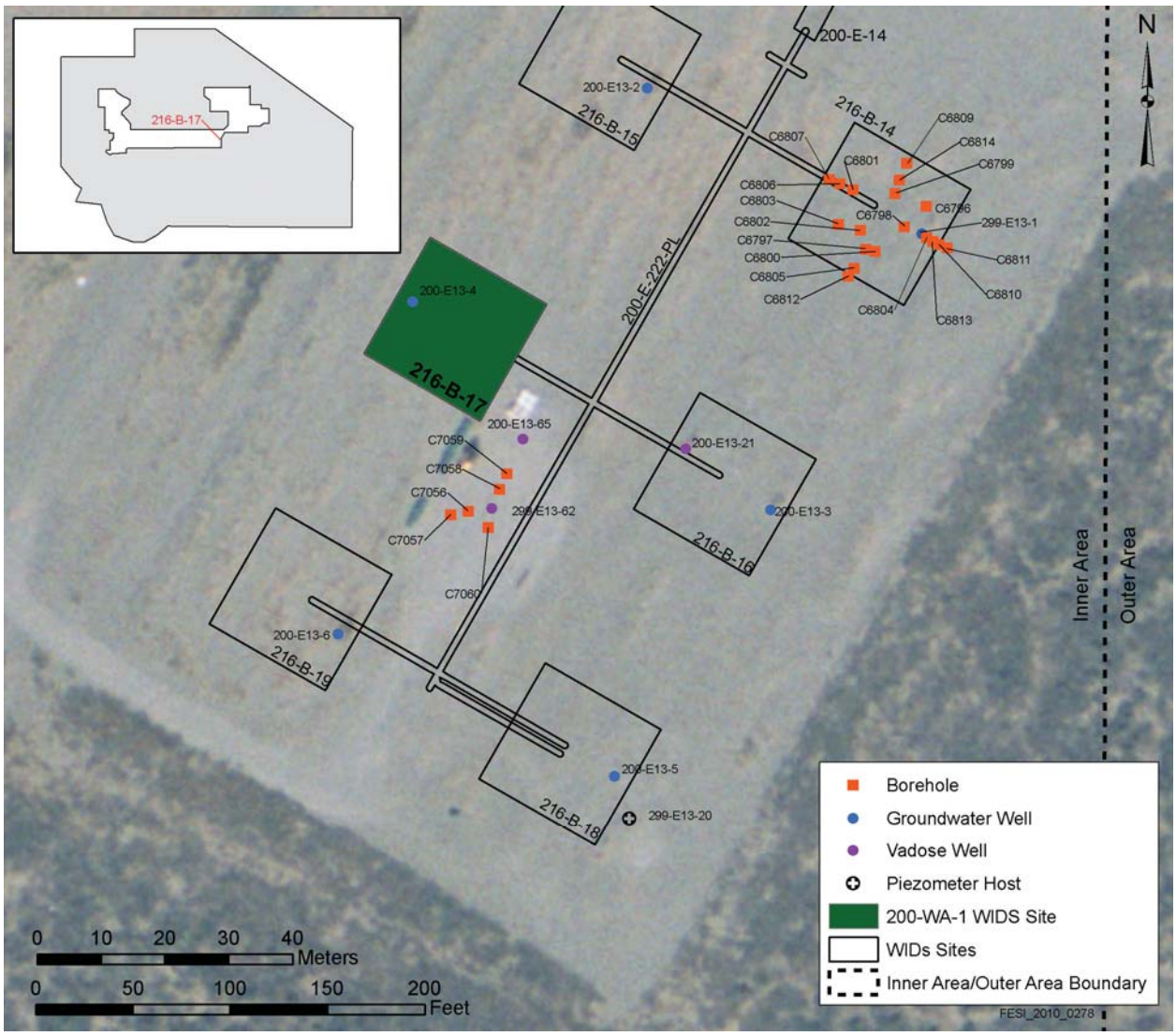
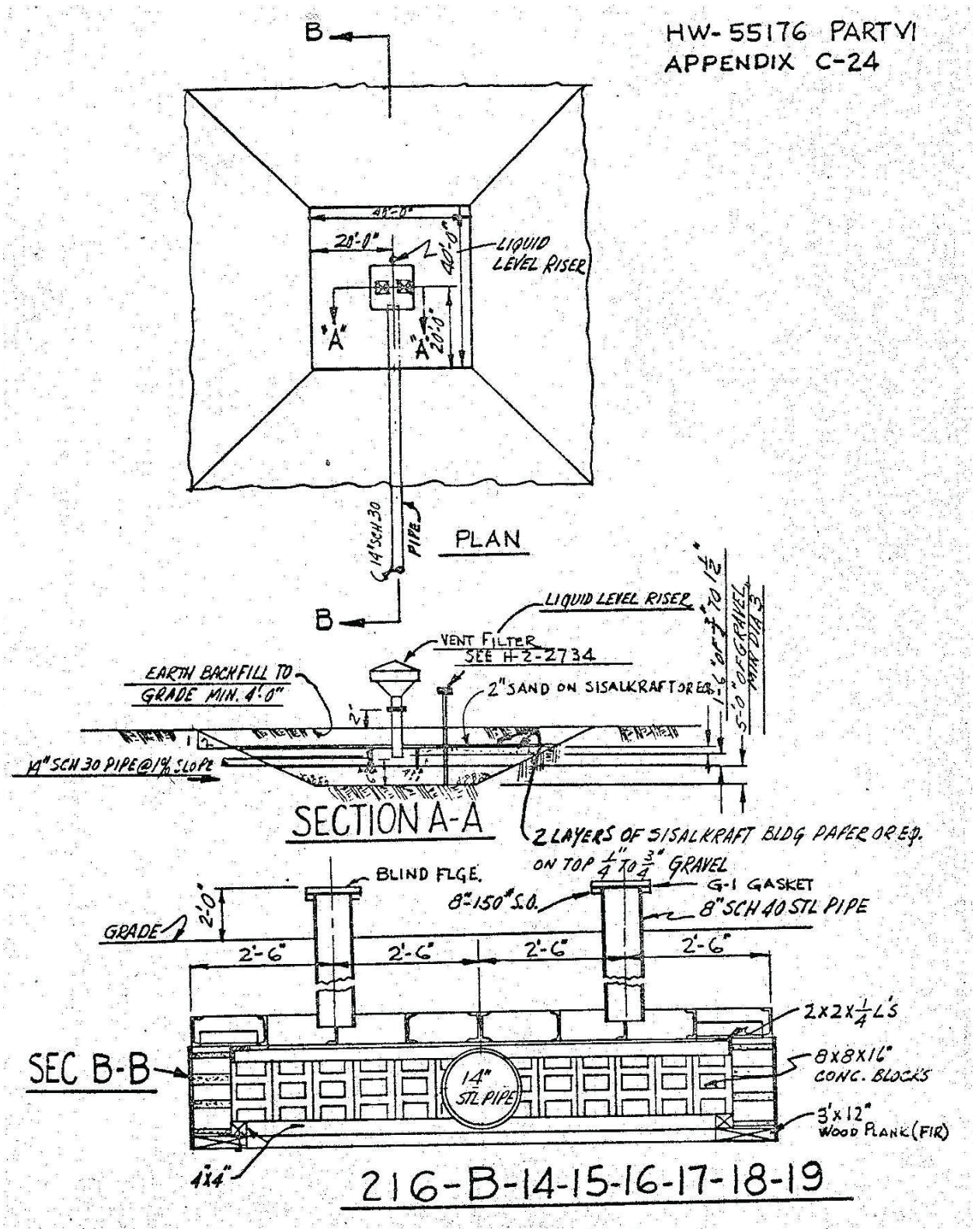


Figure 2. Site Plan and Section



Site Description

Site ID: 216-B-18 Crib **Site Type:** Crib
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: March to April 1956
Volume/Mass Discharged: 8.5E6 L (2.3E6 Gal)

Waste Site Location and Physical Description: The Crib is located south of the 200 East Area (across Route 4S) in the BC Crib Area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The Crib is a dispersion structure 3.0 m x 3.0 m x 0.9 m (10 ft x 10 ft x 3 ft) high, made of wood, cinderblock, and steel, over a 1.5 m (5 ft) bed of 7.6 cm (3 in) gravel, with a 35.6 cm (14 in) inlet pipe located 1.8 m (6 ft) below grade. The bottom dimensions of the excavation are 12.2 m x 12.2 m (40 ft x 40 ft) and 4.0 m (13 ft) deep. The side slope is 2:1. The excavated area surrounding the Crib at the surface is 24.4 m x 24.4 m (80 ft x 80 ft) (see Figure 2. Site Plan and Section).

Waste Site Coordinates:

E-573600.41741 N-134322.93487

Site Dimensions:

Site Length: 24.4 m (80 ft) (at ground surface) Site Depth: 4.0 meters (13 ft) to bottom of structure
Site Width: 24.4 m (80 ft) (at ground surface) Cover Thickness: 0.6 m (2 ft)
Site Area: 595.4 square m (6400 square ft)

Release Summary: The Crib received 8.5E6 L (2.3E6 Gal) tributylphosphate (TBP) supernatant waste from the U-Plant Uranium Recovery operations and scavenged tank farm waste via underground pipelines. From 1952 to 1958, waste containing uranium and fission products, produced by the bismuth phosphate separations process, were removed from underground storage tanks and reprocessed at 221-U Plant to recover the uranium from the waste. After the uranium was removed, the cesium and strontium content of the effluent was precipitated by adding ferrocyanide. The addition of ferrocyanide to the waste was called "scavenging". The supernate liquor was released to the ground in the BC Cribs and Trenches via the 200-E-114-PL (pipeline). The waste is liquid process effluent, high in salt and is neutral to basic. The waste contained inorganic compounds such as ferrocyanide, nitrate and phosphate.

$PV_{released}$ = 8.5E6 L/ (595.4 m^2*106 m*0.3*1000 L/m^3) = 0.45

Therefore, the Crib is assumed to exhibit deep vadose effects.

Related Site Structure(s): The site is associated with the 200-E-14 Siphon Tank, 200-E-114-PL Pipeline and UPR-200-E-83.

Site Posting: The area has been covered with clean soil and posted as an URMA.

Site Characterization Summary: In May 1958, smearable contamination was detected on the crib vent risers measuring 40,000 counts per minute and 10,000 counts per minute on the ground

under a flange that was part of the over ground pipeline. Contaminated rabbit droppings reading 5,000 to 10,000 cpm were identified. The maximum value detected was 200 mr/hr.

In August 2005, MSCM tractor surveys found extensive wind damage on the stabilization cover. Surface contamination was found at several locations. Contamination levels up to 25 millirem per hour were found.

The BC Cribs and Trenches area was interim stabilized as a single unit in 1981. During stabilization 200-E-114-PL to the Cribs was valved out. The BC Cribs area was revegetated and weed growth was controlled with selective herbicide. The stabilization cover has been badly damaged over time by wind erosion.

An annual surface radiation survey is performed.

Potential Contaminants:

Radioactive: Stronium-90, Cesium-137

Non-Radioactive: Nickel Ferrocyanide, Nitrate, Phosphate

References:

WIDS General Summary Report for site 216-B-18
ArcMap
QMap
HW-55176 Part VI Appendix C-24

Figure 1. ArcMap Image

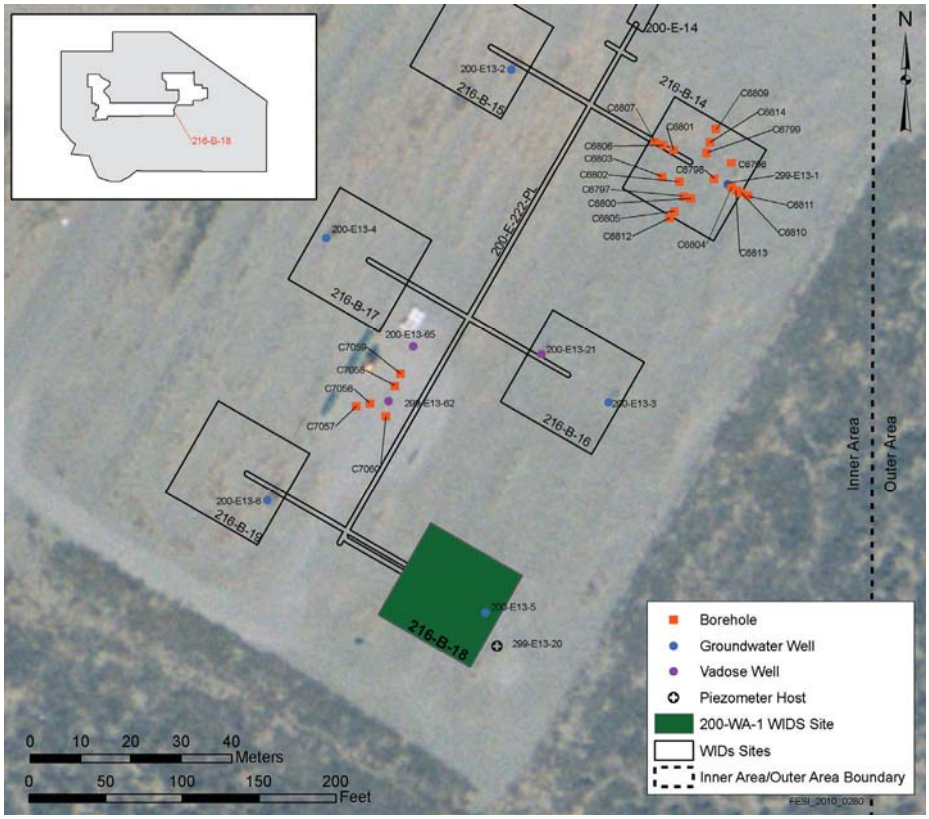
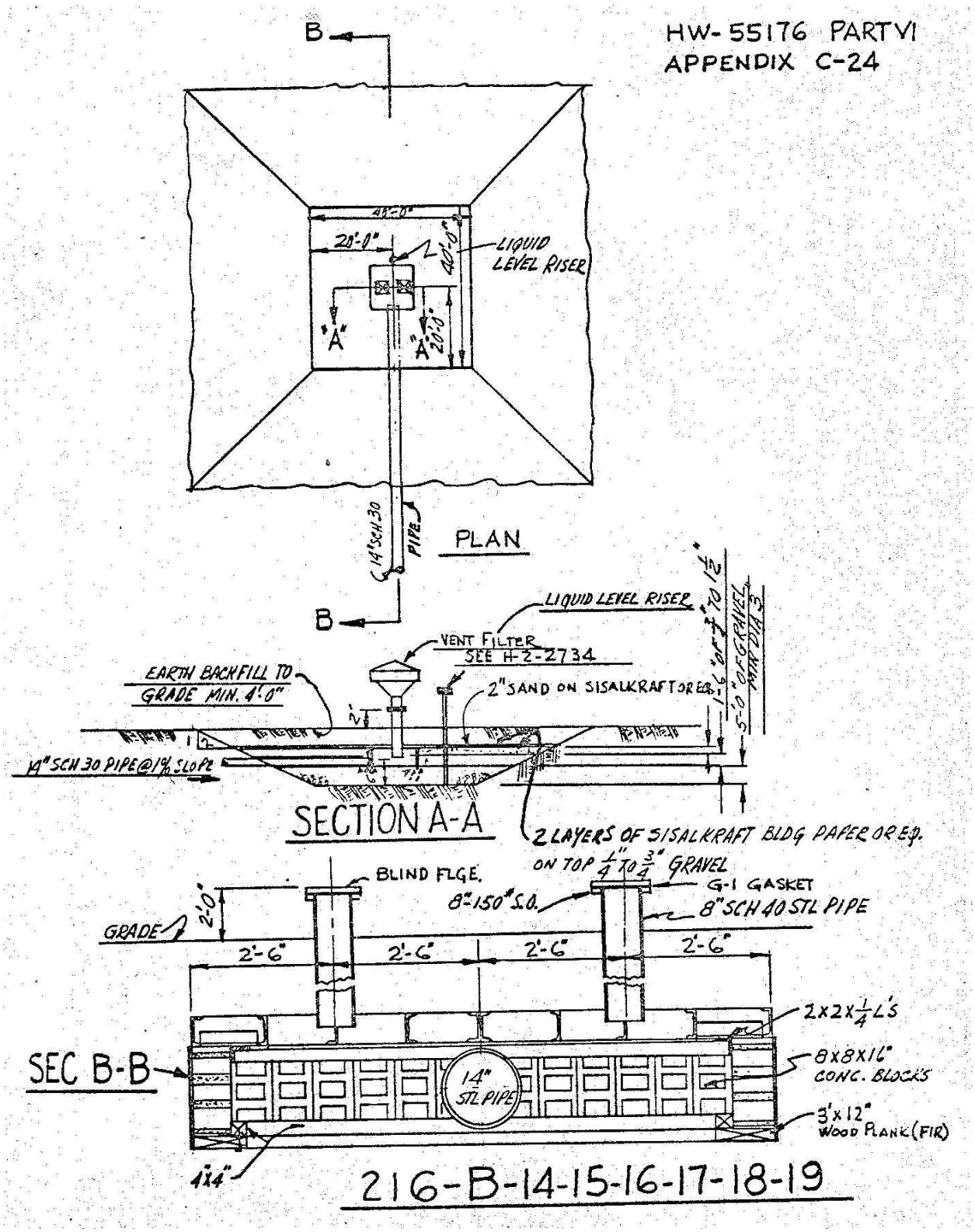


Figure 2. Site Plan and Section



Site Description

Site ID: 216-B-19 Crib **Site Type:** Crib
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: February to October 1957
Volume/Mass Discharged: 6.4E6 L (1.7E6 Gal)

Waste Site Location and Physical Description: The Crib is located south of the 200 East Area (across Route 4S) in the BC Crib Area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The Crib is a dispersion structure 3.0 m x 3.0 m x 0.9 m (10 ft x 10 ft x 3 ft) high, made of wood, cinderblock, and steel, over a 1.5 m (5 ft) bed of 7.6 cm (3 in) gravel, with a 35.6 cm (14 in) inlet pipe located 1.8 m (6 ft) below grade. The bottom dimensions of the excavation are 12.2 m x 12.2 m (40 ft x 40 ft) and 4.0 m (13 ft) deep. The side slope is 2:1. The excavated area surrounding the Crib at the surface is 24.4 m x 24.4 m (80 ft x 80 ft) (see Figure 2. Site Plan and Section).

Waste Site Coordinates:

E-573558.12501 N-134347.19534

Site Dimensions:

Site Length: 24.4 m (80 ft) (at ground surface)
Site Width: 24.4 m (80 ft) (at ground surface)
Site Area: 595.4 square m (6400 square ft)
Site Depth: 4.0 meters (13 ft) to bottom of structure
Cover Thickness: 0.6 m (2 ft)

Release Summary: The Crib received 6.4E6 L (1.7E6 Gal) tributylphosphate (TBP) supernatant waste from the U-Plant Uranium Recovery operations and scavenged tank farm waste via underground pipelines. From 1952 to 1958, waste containing uranium and fission products, produced by the bismuth phosphate separations process, were removed from underground storage tanks and reprocessed at 221-U Plant to recover the uranium from the waste. After the uranium was removed, the cesium and strontium content of the effluent was precipitated by adding ferrocyanide. The addition of ferrocyanide to the waste was called "scavenging". The supernate liquor was released to the ground in the BC Cribs and Trenches via the 200-E-114-PL (pipeline). The waste is liquid process effluent, high in salt and is neutral to basic. The waste contained inorganic compounds such as ferrocyanide, nitrate and phosphate.

$PV_{released}$ = 6.4E6 L/ (595.4 m^2*106 m*0.3*1000 L/m^3) = 0.34

Therefore, the Crib is assumed to exhibit deep vadose effects.

Related Site Structure(s): The site is associated with the 200-E-14 Siphon Tank, 200-E-114-PL Pipeline and UPR-200-E-83.

Site Posting: The area has been covered with clean soil and posted as an URMA.

Site Characterization Summary: In May 1958, smearable contamination was detected on the crib vent risers measuring 40,000 counts per minute and 10,000 counts per minute on the ground

under a flange that was part of the over ground pipeline. Contaminated rabbit droppings reading 5,000 to 10,000 cpm were identified. The maximum value detected was 200 mr/hr.

In August 2005, MSCM tractor surveys found extensive wind damage on the stabilization cover. Surface contamination was found at several locations. Contamination levels up to 25 millirem per hour were found.

The BC Cribs and Trenches area was interim stabilized as a single unit in 1981. During stabilization 200-E-114-PL to the Cribs was valved out. The BC Cribs area was revegetated and weed growth was controlled with selective herbicide. The stabilization cover has been badly damaged over time by wind erosion.

An annual surface radiation survey is performed.

Potential Contaminants:

Radioactive: Stronium-90, Cesium-137

Non-Radioactive: Nickel Ferrocyanide, Nitrate, Phosphate

References:

WIDS General Summary Report for site 216-B-19
ArcMap
QMap
HW-55176 Part VI Appendix C-24

Figure 1. ArcMap Image

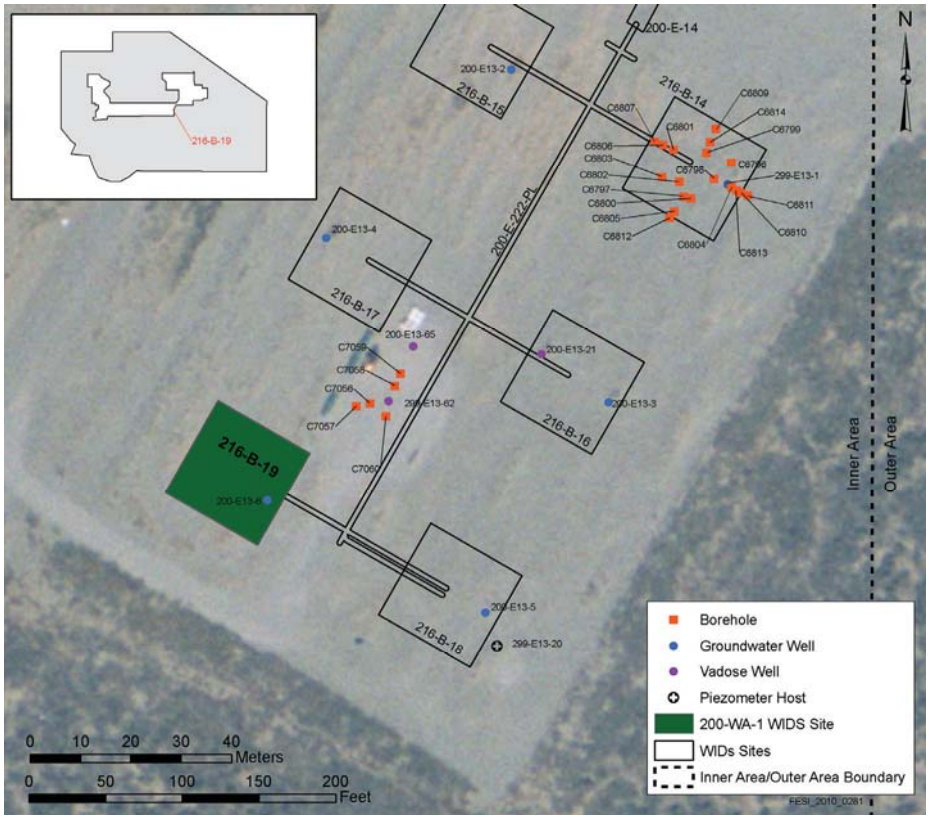
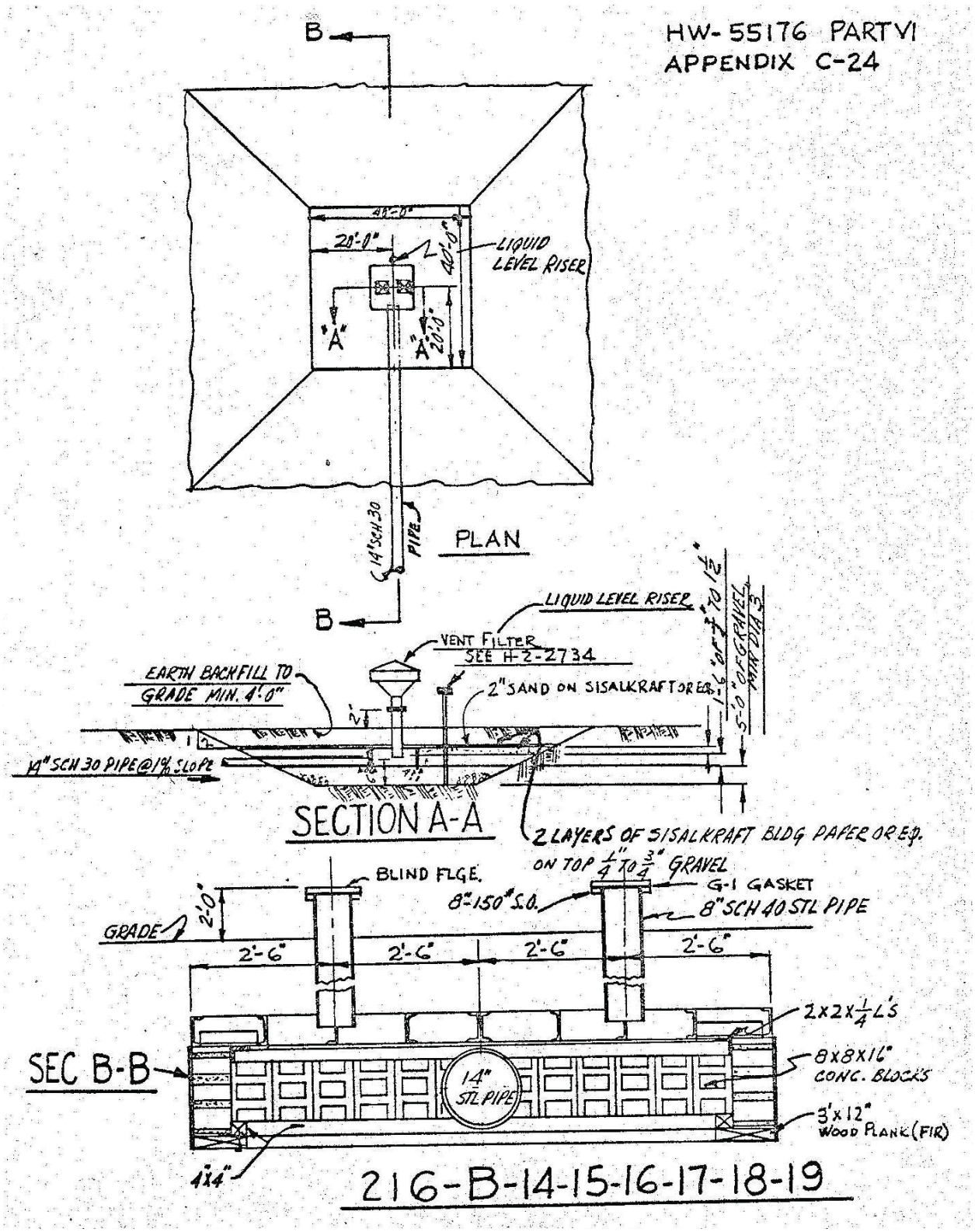


Figure 2. Site Plan and Section



Site Description

Site ID: 216-B-20 Trench **Site Type:** Trench
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: August to September 1956
Volume/Mass Discharged: 4.7E6 L (1.2E6 gal)

Waste Site Location and Physical Description: 216-B-20 Trench is located south of the 200 East Area (across Route 4S) in the BC Cribs and Trenches area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The Trench was divided into 19 m (62.5 ft) sections by 0.6 m (2 ft) high earthen dams. The side slope is 1:1.5. The depth was designated to be 3 m (10 ft) but is often documented as 1.8 m (6 ft). A sisalkraft cover with wooden frame was constructed over the trench (see Figure 2, Figure 3, and Figure 4).

Waste Site Coordinates:

E-573418.77445 N-134376.14761

Site Dimensions:

Site Length: 152.4 m (500 ft) Site Depth: 3.1 meters (10 ft)
Site Width: 3.1 m (10 ft) Cover Thickness: 15.2 cm (6 in) (in 1969)
Site Area: 464.8 m^2 (5000 ft^2)

Release Summary: 216-B-20 Trench received 4.7E6 L (1.2E6 gal) of scavenged tributylphosphate (TBP) supernate liquid waste from the 221-U Building during uranium recovery operations. After the uranium was removed, the cesium and strontium content of the effluent was reduced through precipitation by adding ferrocyanide. The waste was received into the trench via an above ground transfer line extending from the 200-E-114-PL pipeline. The waste is liquid process effluent, high in salt and is neutral to basic. The waste contained inorganic compounds such as ferrocyanide, nitrate and phosphate.

The 216-B-20 Trench was backfilled after it reached its specific retention capacity. In 1969, Trenches 216-B-20, 21, 22 and 28 were covered with 15 cm (6 in) of gravel. The area was further stabilized and revegetated in September 1981 and 1982. The stabilization cover has been badly damaged over time by wind erosion.

$PV_{released}$ = 4.7E6 L/ (464.8 m^2*106 m*0.3*1000 L/m^3) = 0.32

Therefore, the Trench is assumed to exhibit deep vadose effects.

Related Site Structure(s): The Trench is associated with U Plant uranium recovery process and UPR-200-E-83.

Site Posting: The Trench has been backfilled with clean soil and posted URMA. Concrete AC 540 markers outline the area where the trenches are located, but do not identify specific trench locations.

Site Characterization Summary: In May 1958, an Unplanned Release (UPR-200-E-83) occurred when a large area was found to be contaminated with radioactive rabbit feces reading 5,000 to 10,000 counts per minute. A burrow in Trench 216-B-28, containing contaminated salt, was believed to be the source of the material ingested by the rabbits. Also detected was smearable contamination on the crib vent risers of 40,000 counts per minute and 10,000 counts per minute on the ground under a flange that was part of the above ground pipeline.

In 1969, contaminated Russian thistle was identified growing on some of the BC Trenches. To inhibit weed growth, 60,000 cubic yards of sand and gravel was placed on top of the Trenches. In 1981, the area was covered with additional top soil, time release herbicides and rodent deterrent. The area was surface stabilized again in 1982.

In March 1981, radiological surveys detected an area east of the 216-B-20 Trench with a dose rate of 500 millirem per hour. Buried contaminated equipment related to the above ground transfer line was identified as the source. After the equipment and surrounding soil was removed, a follow up survey detected a plume of contamination measuring approximately 4.6 m (15 ft) long extending to the dirt road east of the trenches. The plume readings detected up to 3000 cpm.

In August 2005 an MCSM tractor survey found extensive wind damage on the stabilization cover at the BC Cribs and Trenches. Surface contamination with levels up to 25 millirem per hour was detected.

A surface radiation survey is performed annually.

Potential Contaminants:

Radioactive: Stronium-90, Cesium-137

Non-Radioactive: Nickel Ferrocyanide, Nitrate, Phosphate

References:

WIDS General Summary Report for site 216-B-20
ArcMap
QMap
HW-55176 Part VI Appendix C-25, C-26 and C-26A

Figure 1. ArcMap Image

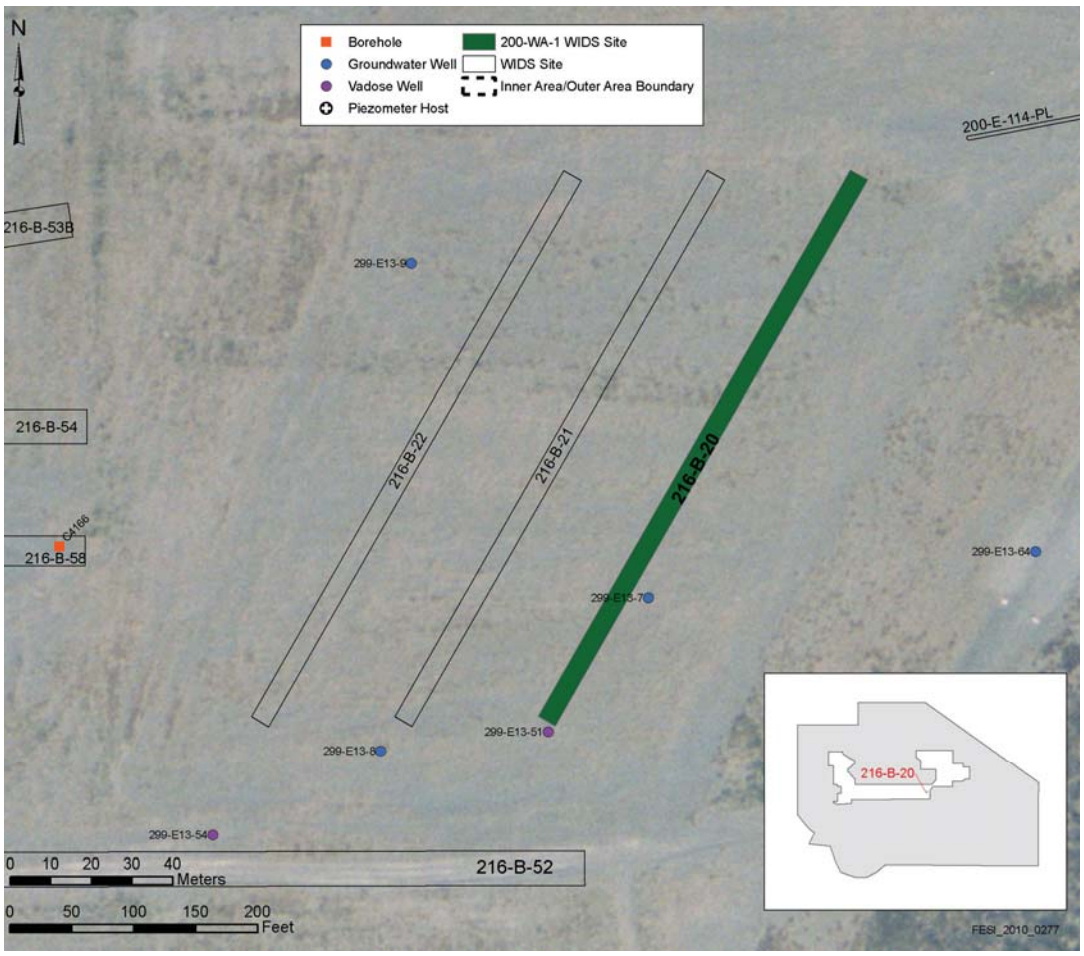


Figure 2. Trench Elevation View

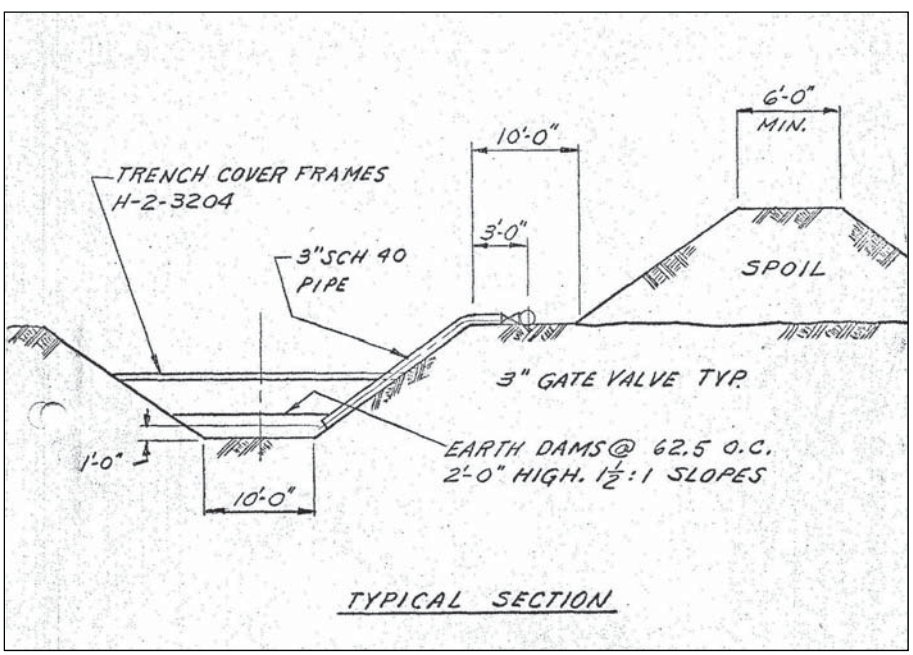


Figure 3. Trench Plan View

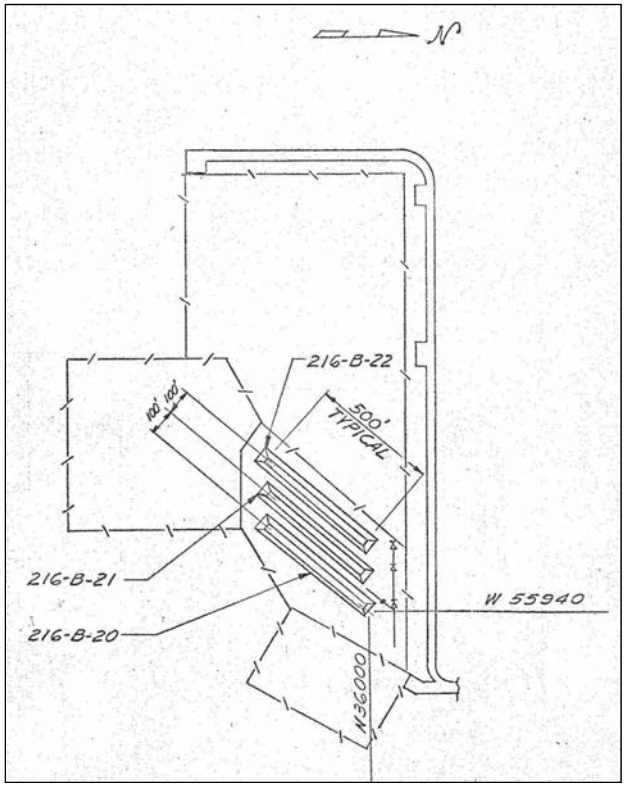
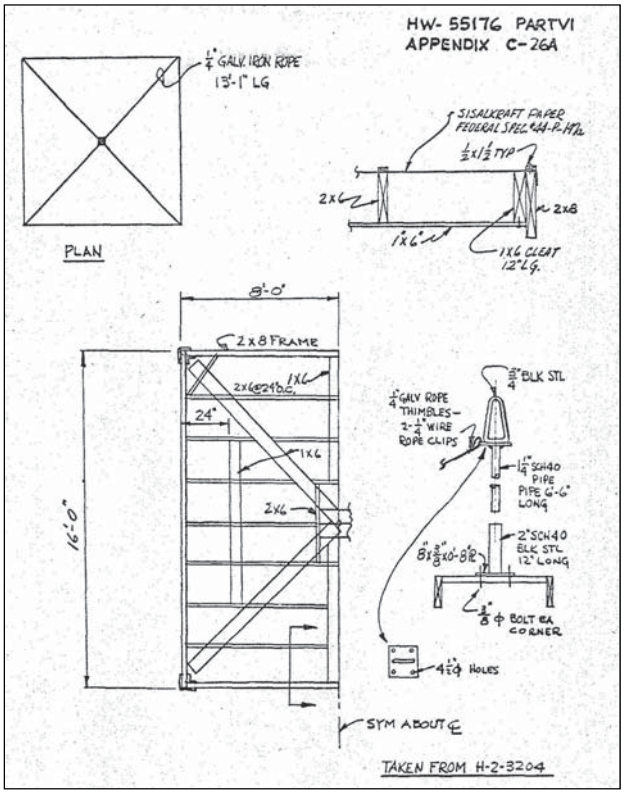


Figure 4. Trench Cover



Site Description

Site ID: 216-B-21 Trench
Site Type: Trench
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: September to October 1956
Volume/Mass Discharged: 4.7E6 L (1.2E6 gal)

Waste Site Location and Physical Description: 216-B-21 Trench is located south of the 200 East Area (across Route 4S) in the BC Cribs and Trenches area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The Trench was divided into 19 m (62.5 ft) sections by 0.6 m (2 ft) high earthen dams. The side slope is 1:1.5. The depth was designated to be 3 m (10 ft) but is often documented as 1.8 m (6 ft). A sisalkraft cover with wooden frame was constructed over the trench (see Figure 2, Figure 3, and Figure 4).

Waste Site Coordinates:

E-573383.51025 N-134375.94369

Site Dimensions:

Site Length: 152.4 m (500 ft)
Site Width: 3.1 m (10 ft)
Site Area: 464.8 square m (5000 square ft)
Site Depth: 3.1 meters (10 ft)
Cover Thickness: 15.2 cm (6 in) (in 1969)

Note: These are bottom dimensions.

Release Summary: 216-B-21 Trench received 4.7E6 L (1.2E6 gal) of scavenged tributylphosphate (TBP) supernate liquid waste from the 221-U Building during uranium recovery operations. After the uranium was removed, the cesium and strontium content of the effluent was reduced through precipitation by adding ferrocyanide. The waste was received into the trench via an above ground transfer line extending from the 200-E-114-PL pipeline. The waste is liquid process effluent, high in salt and is neutral to basic. The waste contained inorganic compounds such as ferrocyanide, nitrate and phosphate.

The Trench was backfilled after it reached its specific retention capacity. In 1969, Trenches 216-B-20, 21, 22 and 28 were covered with 15 cm (6 in) of gravel. The area was further stabilized and revegetated in September 1981, the stabilization cover has been badly damaged over time by wind erosion.

$PV_{released}$ = 4.7E6 L/ (464.8 m^2*106 m*0.3*1000 L/m^3) = 0.32

Therefore, the Trench is assumed to exhibit deep vadose effects.

Related Site Structure(s): The Trench is associated with U Plant uranium recovery process and UPR-200-E-83.

Site Posting: The Trench has been backfilled with clean soil and posted URMA. Concrete AC 540 markers outline the area where the trenches are located, but do not identify specific trench locations.

Site Characterization Summary: In May 1958, an Unplanned Release (UPR-200-E-83) occurred when a large area was found to be contaminated with radioactive rabbit feces reading 5,000 to 10,000 counts per minute. A burrow in Trench 216-B-28, containing contaminated salt, was believed to be the source of the material ingested by the rabbits. Also detected was smearable contamination on the crib vent risers of 40,000 counts per minute and 10,000 counts per minute on the ground under a flange that was part of the above ground pipe.

In 1969, contaminated Russian thistle was identified growing on some of the BC Trenches. To inhibit weed growth, 60,000 cubic yards of sand and gravel was placed on top of the Trenches. In 1981, the area was covered with additional top soil, time release herbicides and rodent deterrent. The area was surface stabilized again in 1982.

In March 1981, radiological surveys detected an area east of the 216-B-20 Trench with a dose rate of 500 millirem per hour. Buried contaminated equipment related to the above ground transfer line was identified as the source. After the equipment and surrounding soil was removed, a follow up survey detected a plume of contamination measuring approximately 4.6 m (15 ft) long extending to the dirt road east of the trenches. The plume readings detected up to 3000 cpm.

In August 2005 an MCSM tractor survey found extensive wind damage on the stabilization cover at the BC Cribs and Trenches. Surface contamination with levels up to 25 millirem per hour was detected.

The Trench is monitored by groundwater well 299-E13-8. A surface radiation survey is performed annually.

Potential Contaminants:

Radioactive: Stronium-90, Cesium-137

Non-Radioactive: Nickel Ferrocyanide, Nitrate, Phosphate

References:

WIDS General Summary Report for site 216-B-21
ArcMap
QMap
HW-55176 Part VI Appendix C-25, C-26 and C-26A

Figure 1. ArcMap Image

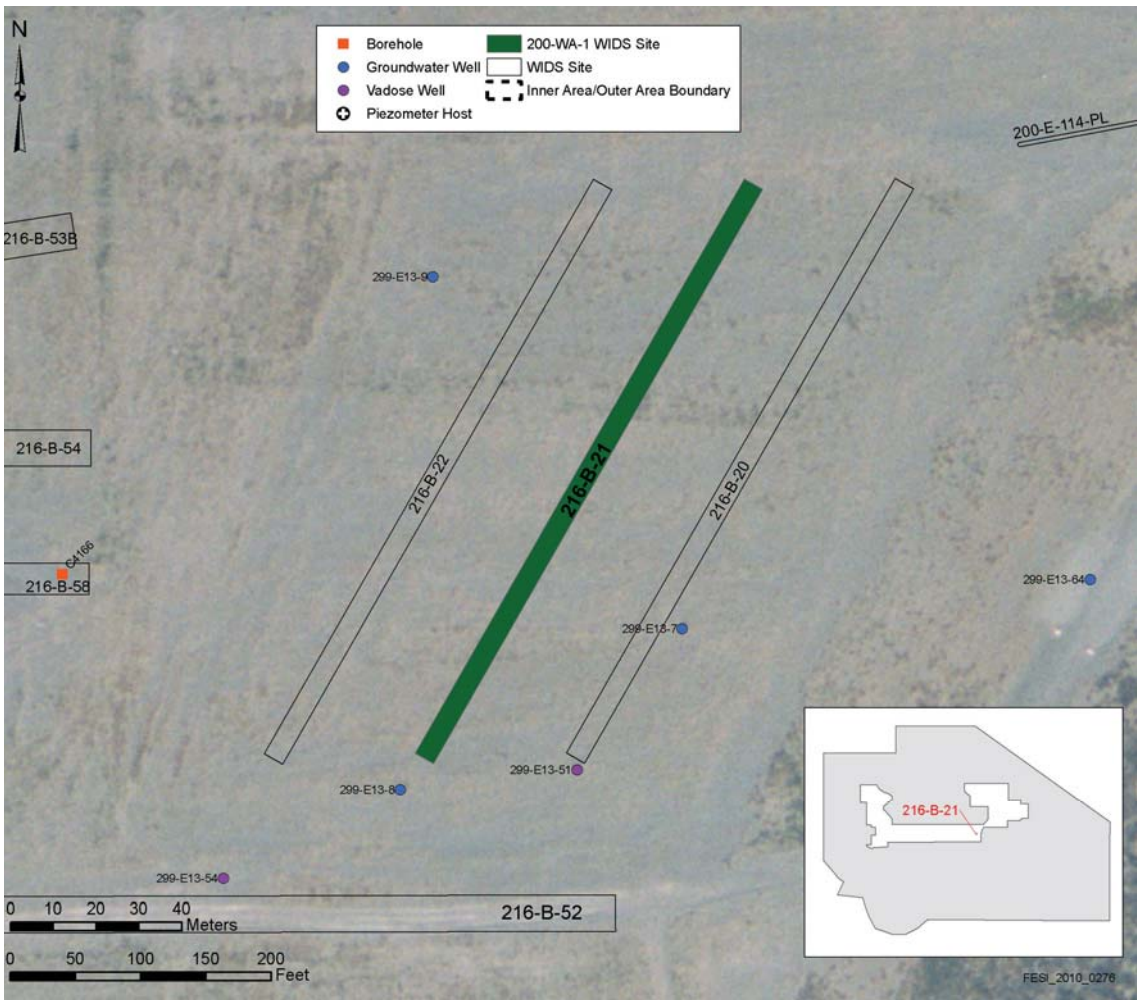


Figure 2. Trench Elevation

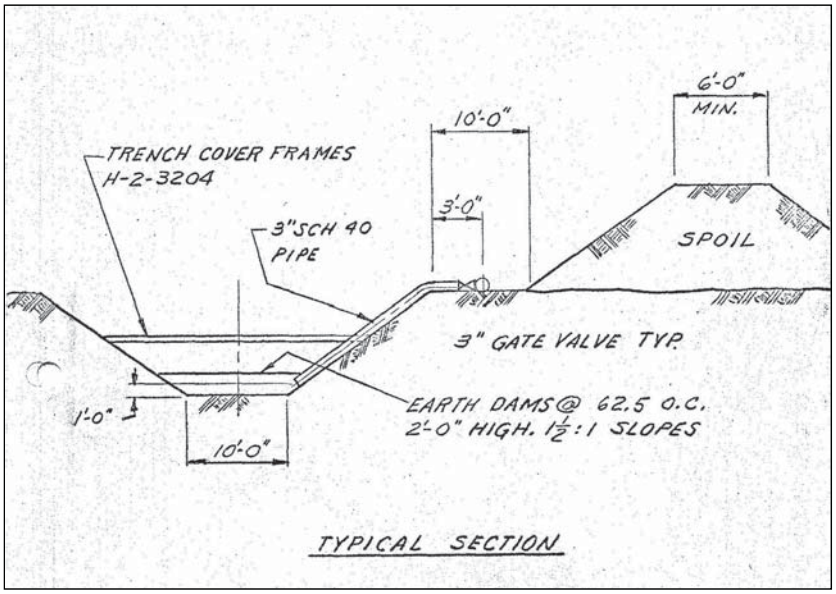


Figure 3. Trench Plan View

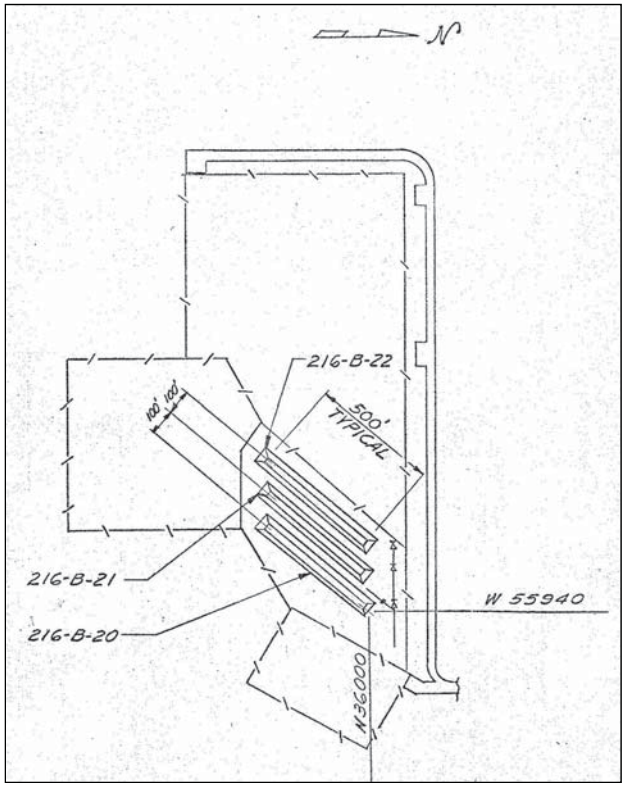
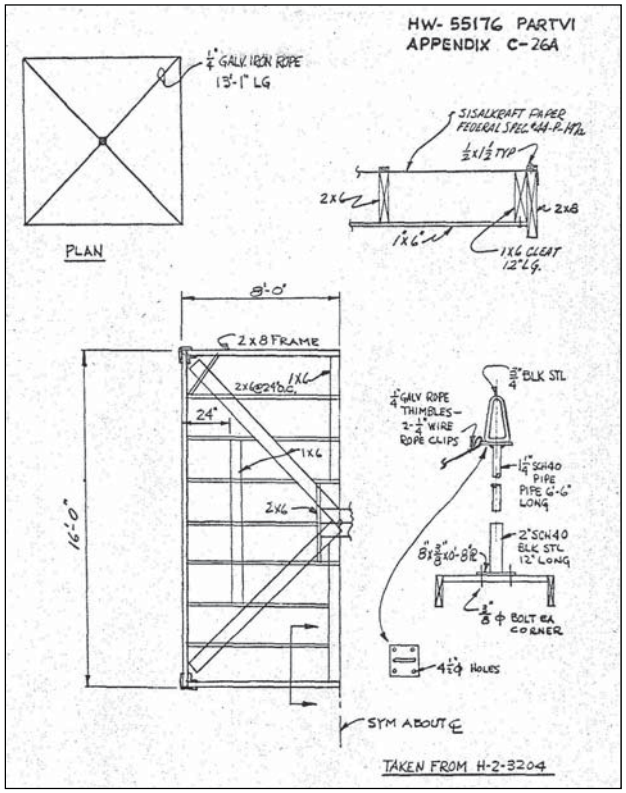


Figure 4. Trench Cover



Site Description

Site ID: 216-B-22 Trench **Site Type:** Trench
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: October 1956
Volume/Mass Discharged: 4.7E6 L (1.3E6 Gal)

Waste Site Location and Physical Description: 216-B-22 Trench is located south of the 200 East Area (across Route 4S) in the BC Cribs and Trenches area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The Trench was divided into 19 m (62.5 ft) sections by 0.6 m (2 ft) high earthen dams. The side slope is 1:1.5. The depth was designated to be 3 m (10 ft) but is often documented as 1.8 m (6 ft). A sisalkraft cover with wooden frame was constructed over the trench (see Figure 2, Figure 3, and Figure 4).

Waste Site Coordinates:

E-573348.30230 N-134375.80626

Site Dimensions:

Site Length: 152.4 m (500 ft) Site Depth: 3.1 meters (10 ft)
Site Width: 3.1 m (10 ft) Cover Thickness: 15.2 cm (6 in) (in 1969)
Site Area: 464.8 m^2 (5000 ft^2)

Note: These are bottom dimensions.

Release Summary: 216-B-22 Trench received 4.7E6 L (1.3E6 gal) of scavenged tributylphosphate (TBP) supernate liquid waste from the 221-U Building during uranium recovery operations. After the uranium was removed, the cesium and strontium content of the effluent was reduced through precipitation by adding ferrocyanide. The waste was received into the trench via an above ground transfer line extending from the 200-E-114-PL pipeline. The waste is liquid process effluent, high in salt and is neutral to basic. The waste contained inorganic compounds such as ferrocyanide, nitrate and phosphate.

The Trench was backfilled after it reached its specific retention capacity. In 1969, Trenches 216-B-20, 21, 22 and 28 were covered with 15 cm (6 in) of gravel. The area was further stabilized and revegetated in September 1981, the stabilization cover has been badly damaged over time by wind erosion.

$PV_{released}$ = 4.7E6 L/ (464.8 m^2*106 m*0.3*1000 L/m^3) = 0.32

Therefore, the Trench is assumed to exhibit deep vadose effects.

Related Site Structure(s): The Trench is associated with U Plant uranium recovery process and UPR-200-E-83.

Site Posting: The Trench has been backfilled with clean soil and posted URMA. Concrete AC 540 markers outline the area where the trenches are located, but do not identify specific trench locations.

Site Characterization Summary: In May 1958, an Unplanned Release (UPR-200-E-83) occurred when a large area was found to be contaminated with radioactive rabbit feces reading 5,000 to 10,000 counts per minute. A burrow in Trench 216-B-28, containing contaminated salt, was believed to be the source of the material ingested by the rabbits. Also detected was smearable contamination on the crib vent risers of 40,000 counts per minute and 10,000 counts per minute on the ground under a flange that was part of the above ground pipe.

In 1969, contaminated Russian thistle was identified growing on some of the BC Trenches. To inhibit weed growth, 60,000 cubic yards of sand and gravel was placed on top of the Trenches. In 1981, the area was covered with additional top soil, time release herbicides and rodent deterrent. The area was surface stabilized again in 1982.

In March 1981, radiological surveys detected an area east of the 216-B-20 Trench with a dose rate of 500 millirem per hour. Buried contaminated equipment related to the above ground transfer line was identified as the source. After the equipment and surrounding soil was removed, a follow up survey detected a plume of contamination measuring approximately 4.6 m (15 ft) long extending to the dirt road east of the trenches. The plume readings detected up to 3000 cpm.

In August 2005 an MCSM tractor survey found extensive wind damage on the stabilization cover at the BC Cribs and Trenches. Surface contamination with levels up to 25 millirem per hour was detected.

The Trench is monitored by groundwater well 299-E13-9. A surface radiation survey is performed annually.

Potential Contaminants:

Radioactive: Stronium-90, Cesium-137

Non-Radioactive: Nickel Ferrocyanide, Nitrate, Phosphate

References:

WIDS General Summary Report for site 216-B-22
ArcMap
QMap
HW-55176 Part VI Appendix C-25, C-26 and C-26A

Figure 1. ArcMap Image

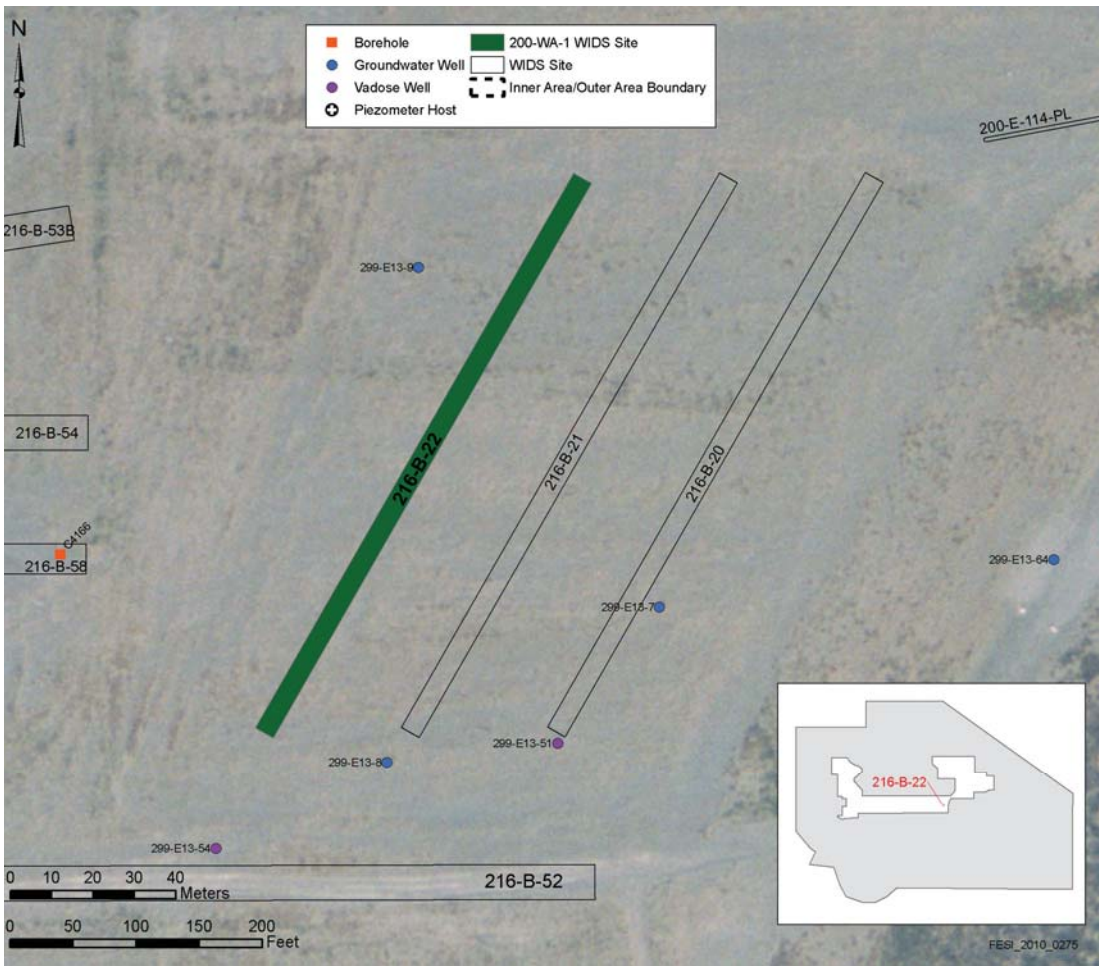


Figure 2. Trench Elevation

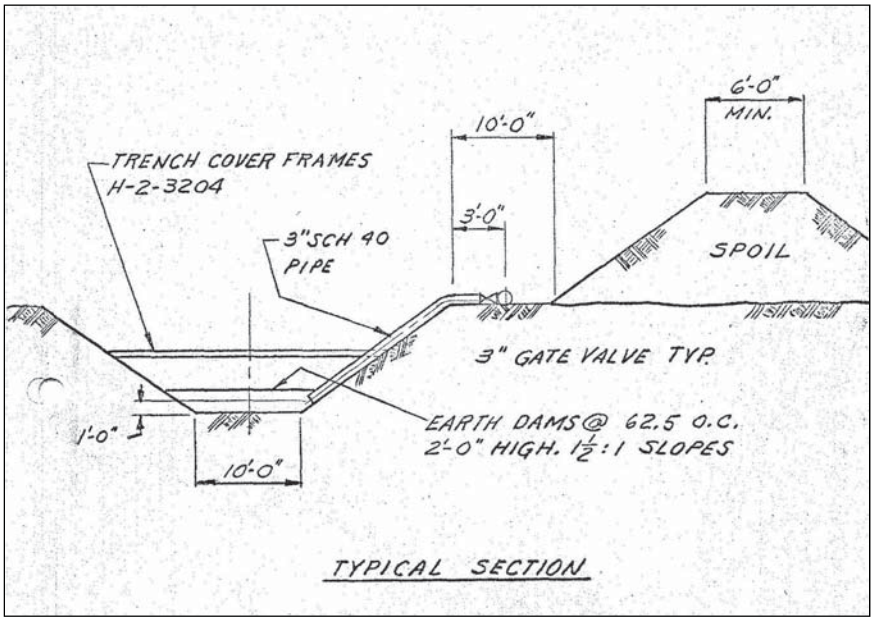


Figure 3. Trench Plan View

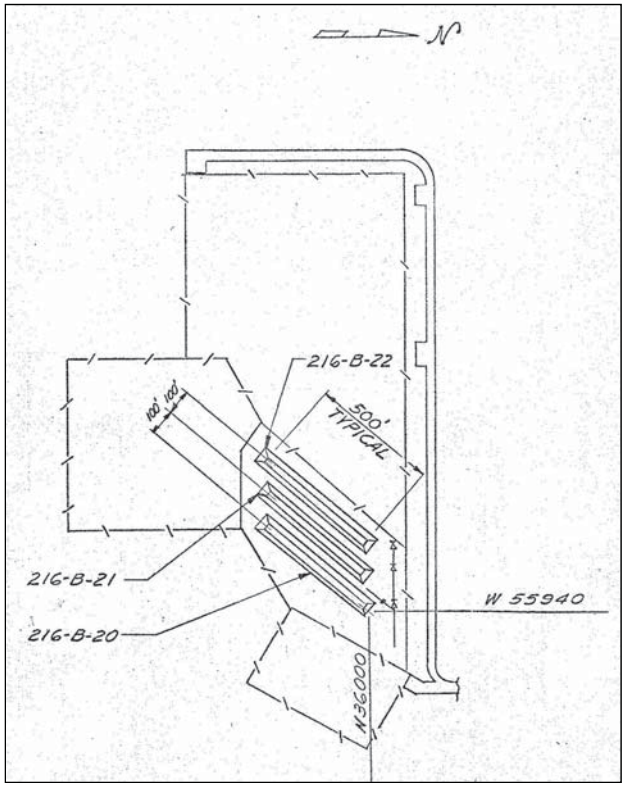
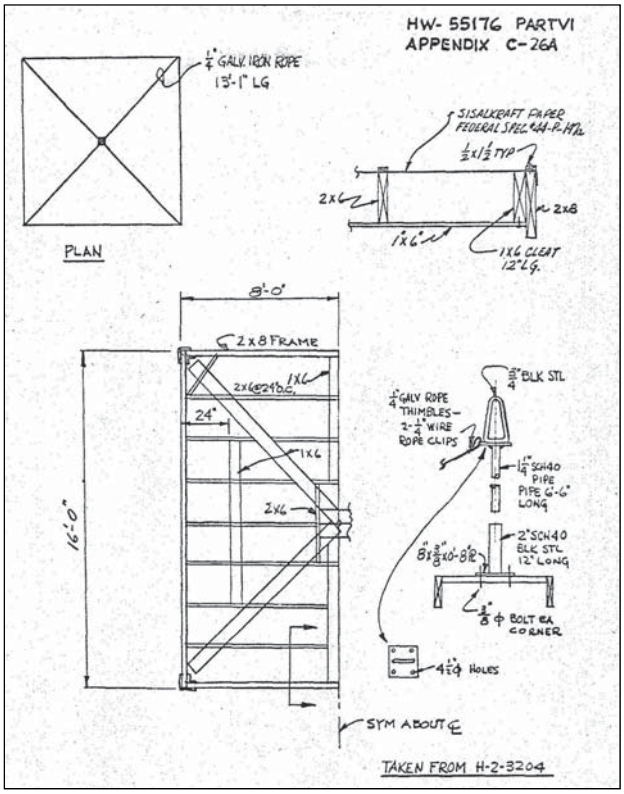


Figure 4. Trench Cover



Site Description

Site ID: 216-B-23 Trench **Site Type:** Trench
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: October 1956
Volume/Mass Discharged: 4.5E6 L (1.2E6 gal)

Waste Site Location and Physical Description: 216-B-23 Trench is located south of the 200 East Area (across Route 4S) in the BC Cribs and Trenches area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The Trench was divided into eight 19 m (62.5 ft) sections by 1.2 m (4 ft) high earthen dams. The side slope is 1:1.5. The depth was 3 m (10 ft). A wooden frame cover was constructed over the trench (see Figure 2, Figure 3, and Figure 4).

Waste Site Coordinates:

E-573288.35929 N-134237.46889

Site Dimensions:

Site Length: 152.4 m (500 ft) Site Depth: 3.1 meters (10 ft)
Site Width: 3.1 m (10 ft) Cover Thickness: 2.4 m (8 ft)
Site Area: 464.8 square m (5000 square ft)

Note: These are bottom dimensions.

Release Summary: 216-B-23 Trench received 4.5E6 L (1.2E6 gal) of scavenged tributylphosphate (TBP) supernate liquid waste from the 221-U Building during uranium recovery operations. After the uranium was removed, the cesium and strontium content of the effluent was reduced through precipitation by adding ferrocyanide. The waste was received into the trench via an above ground transfer line extending from the 200-E-114-PL pipeline. The waste is liquid process effluent, high in salt and is neutral to basic. The waste contained inorganic compounds such as ferrocyanide, nitrate, and phosphate.

The Trench was backfilled after it reached its specific retention capacity.

$PV_{released}$ = 4.5E6 L/ (464.8 m^2*106 m*0.3*1000 L/m^3) = 0.31

Therefore, the Trench is assumed to exhibit deep vadose effects.

Related Site Structure(s): The Trench is associated with U Plant uranium recovery process and UPR-200-E-83.

Site Posting: The Trench has been backfilled with clean soil and posted URMA. Concrete AC 540 markers outline the area where the trenches are located, but do not identify specific trench locations.

Site Characterization Summary: In May 1958, an Unplanned Release (UPR-200-E-83) occurred when a large area was found to be contaminated with radioactive rabbit feces reading

5,000 to 10,000 counts per minute. A burrow in Trench 216-B-28, containing contaminated salt, was believed to be the source of the material ingested by the rabbits.

In 1969, contaminated tumbleweeds were identified growing on some of the BC Trenches. To inhibit weed growth, 45,870 m^3 (60,000 yd^3), approximately 15.2 cm (6 in) of sand and gravel, was placed on top of the Trenches to. In 1981, the area was covered with additional top soil, time release herbicides and rodent deterrent. The area was surface stabilized again in 1982.

A surface radiation survey is performed annually.

Potential Contaminants:

Radioactive: Stronium-90, Cesium-137

Non-Radioactive: Nickel Ferrocyanide, Nitrate, Phosphate

References:

WIDS General Summary Report for site 216-B-23
ArcMap
QMap
HW-55176 Part VI Appendix C-26, C-27 and C-28

Figure 1. ArcMap Image

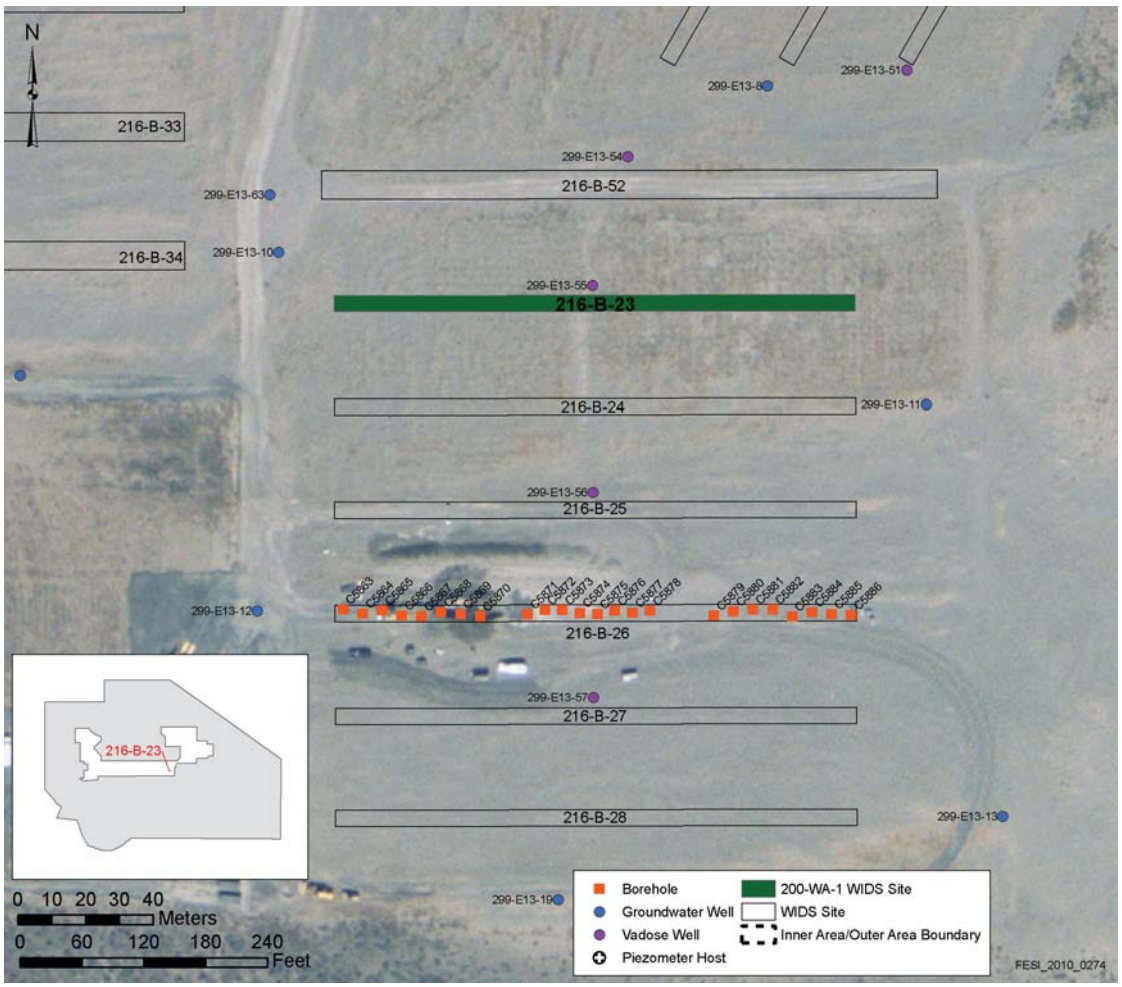


Figure 2. Trench Elevation

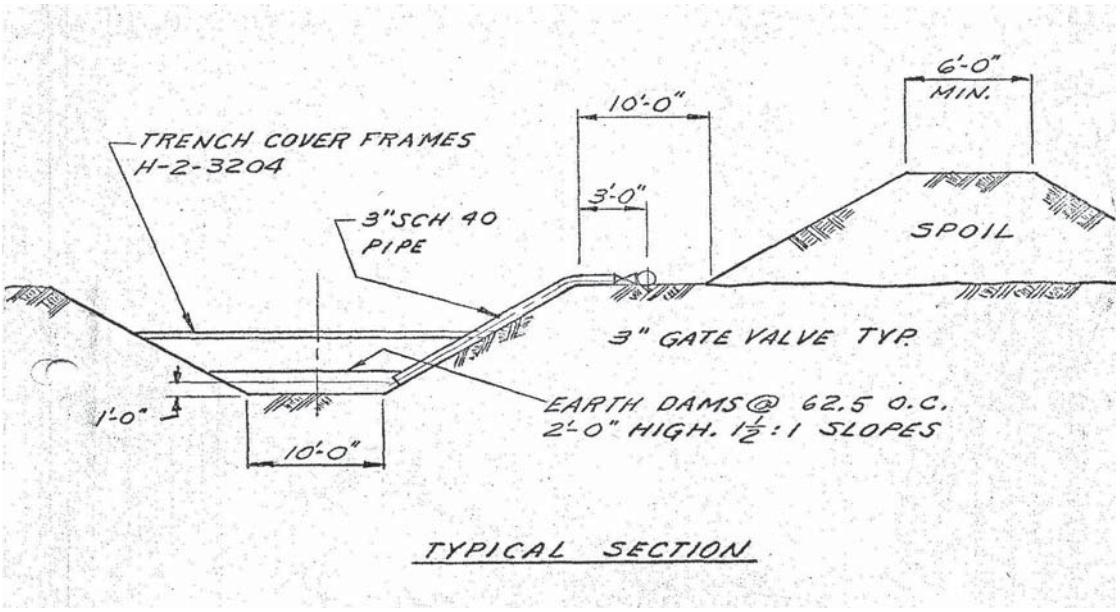


Figure 3. Trench Plan View

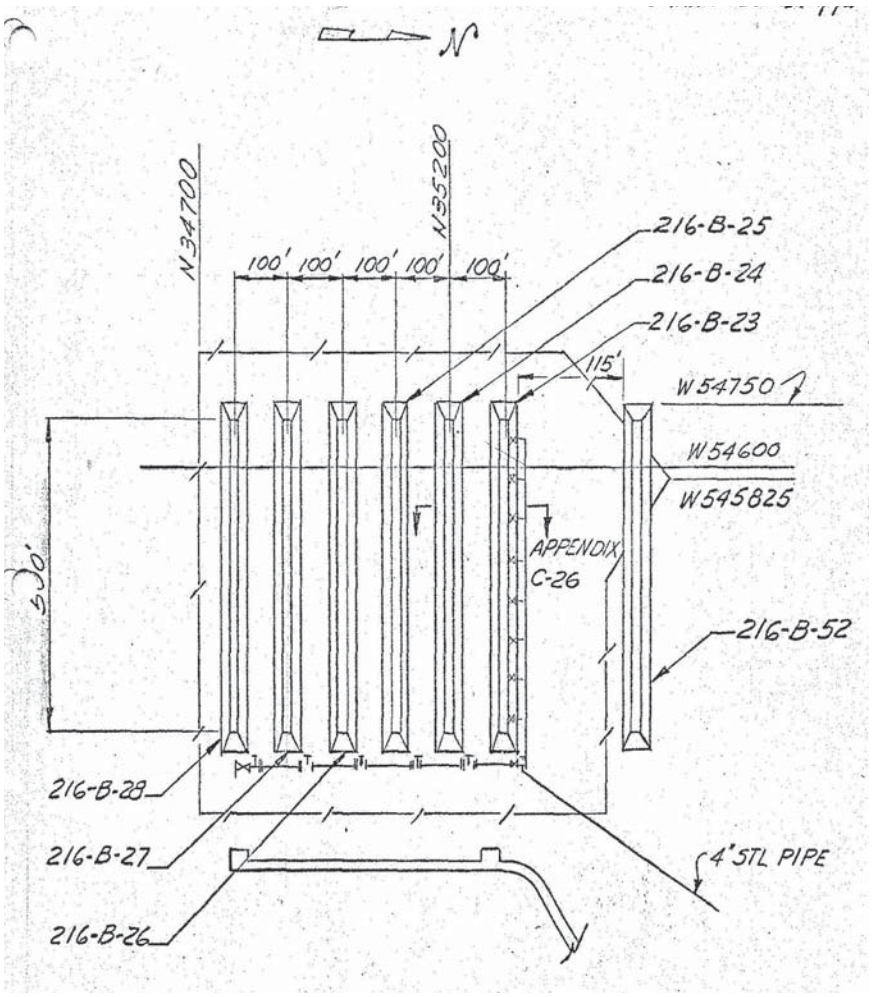
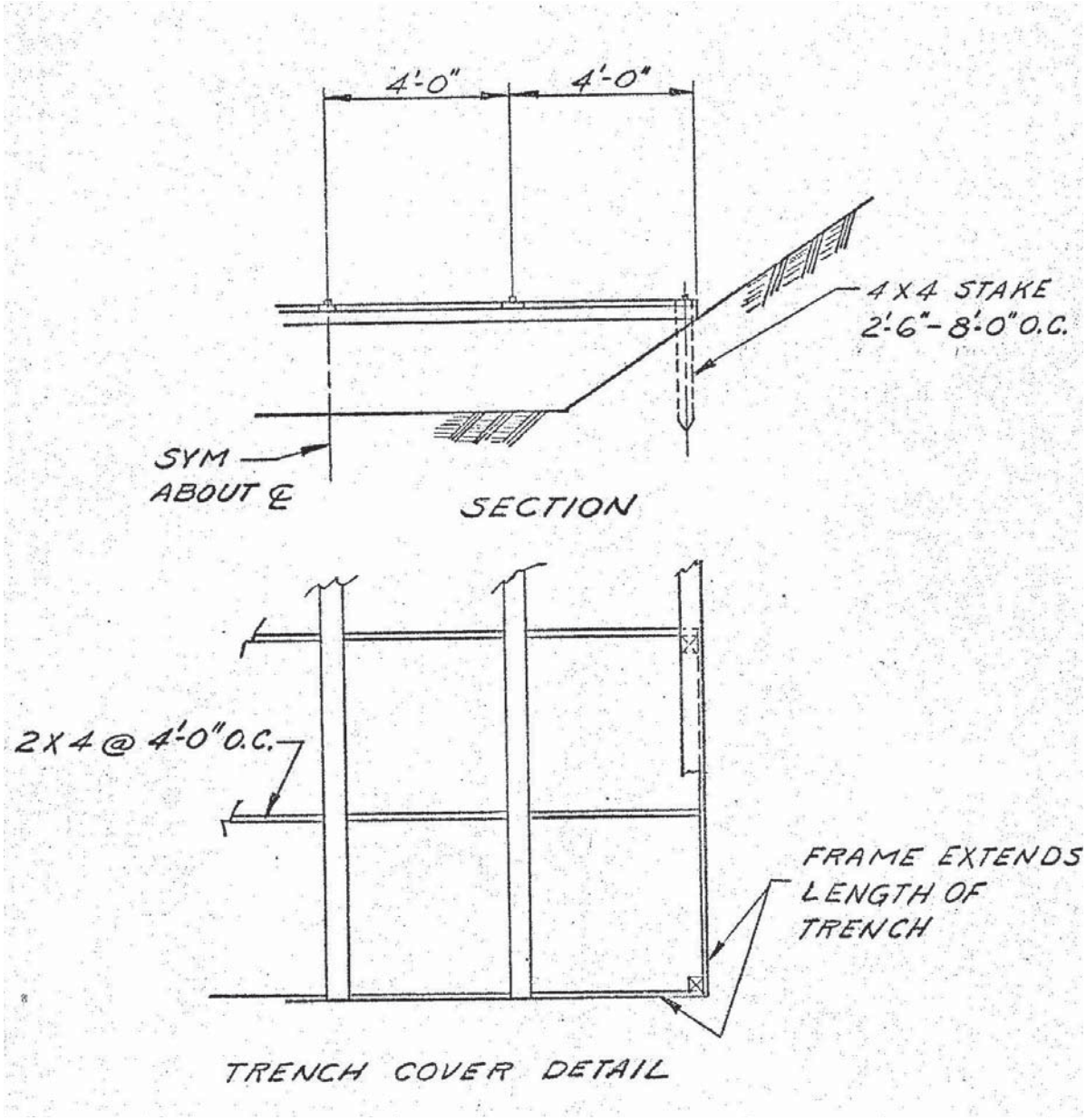


Figure 4. Trench Cover



Site Description

Site ID: 216-B-24 Trench **Site Type:** Trench
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: October and November 1956
Volume/Mass Discharged: 4.7E6 L (1.2E6 gal)

Waste Site Location and Physical Description: 216-B-24 Trench is located south of the 200 East Area (across Route 4S) in the BC Cribs and Trenches area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The Trench was divided into eight 19 m (62.5 ft) sections by 1.2 m (4 ft) high earthen dams. The side slope is 1.5:1. The depth was 3 m (10 ft). A wooden frame cover was constructed over the trench (see Figure 2, Figure 3, and Figure 4).

Waste Site Coordinates:

E-573288.46875 N-134206.99215

Site Dimensions:

Site Length: 152.4 m (500 ft) Site Depth: 3.1 meters (10 ft)
Site Width: 3.1 m (10 ft) Cover Thickness: 2.4 m (8 ft)
Site Area: 464.8 square m (5000 square ft)

Note: These are bottom dimensions.

Release Summary: 216-B-24 Trench received 4.7E6 L (1.2E6 gal) of scavenged tributylphosphate (TBP) supernate liquid waste from the 221-U Building during uranium recovery operations. After the uranium was removed, the cesium and strontium content of the effluent was reduced through precipitation by adding ferrocyanide. The waste was received into the trench via an above ground transfer line extending from the 200-E-114-PL pipeline. The waste is liquid process effluent, high in salt and is neutral to basic. The waste contained inorganic compounds such as ferrocyanide, nitrate and phosphate.

The Trench was backfilled after it reached its specific retention capacity.

$PV_{released}$ = 4.7E6 L/ (464.8 m^2*106 m*0.3*1000 L/m^3) = 0.32

Therefore, the Trench is assumed to exhibit deep vadose effects.

Related Site Structure(s): The Trench is associated with U Plant uranium recovery process and UPR-200-E-83.

Site Posting: The Trench has been backfilled with clean soil and posted URMA. Concrete AC 540 markers outline the area where the trenches are located, but do not identify specific trench locations.

Site Characterization Summary: In May 1958, an Unplanned Release (UPR-200-E-83) occurred when a large area was found to be contaminated with radioactive rabbit feces reading

5,000 to 10,000 counts per minute. A burrow in Trench 216-B-28, containing contaminated salt, was believed to be the source of the material ingested by the rabbits.

In 1969, contaminated tumbleweeds were identified growing on some of the BC Trenches. To inhibit weed growth, 45,870 m^3 (60,000 yd^3) of sand and gravel was put on top of the trenches. Approximately 15.2 cm (6 in) of sand and gravel, was placed on top of each trench. In 1981, the area was covered with additional top soil, time release herbicides and rodent deterrent. The area was surface stabilized again in 1982.

The Trench is monitored by groundwater well 299-E13-11. A surface radiation survey is performed annually.

Potential Contaminants:

Radioactive: Stronium-90, Cesium-137

Non-Radioactive: Nickel Ferrocyanide, Nitrate, Phosphate

References:

WIDS General Summary Report for site 216-B-24
ArcMap
QMap
HW-55176 Part VI Appendix C-26, C-27 and C-28

Figure 1. ArcMap Image

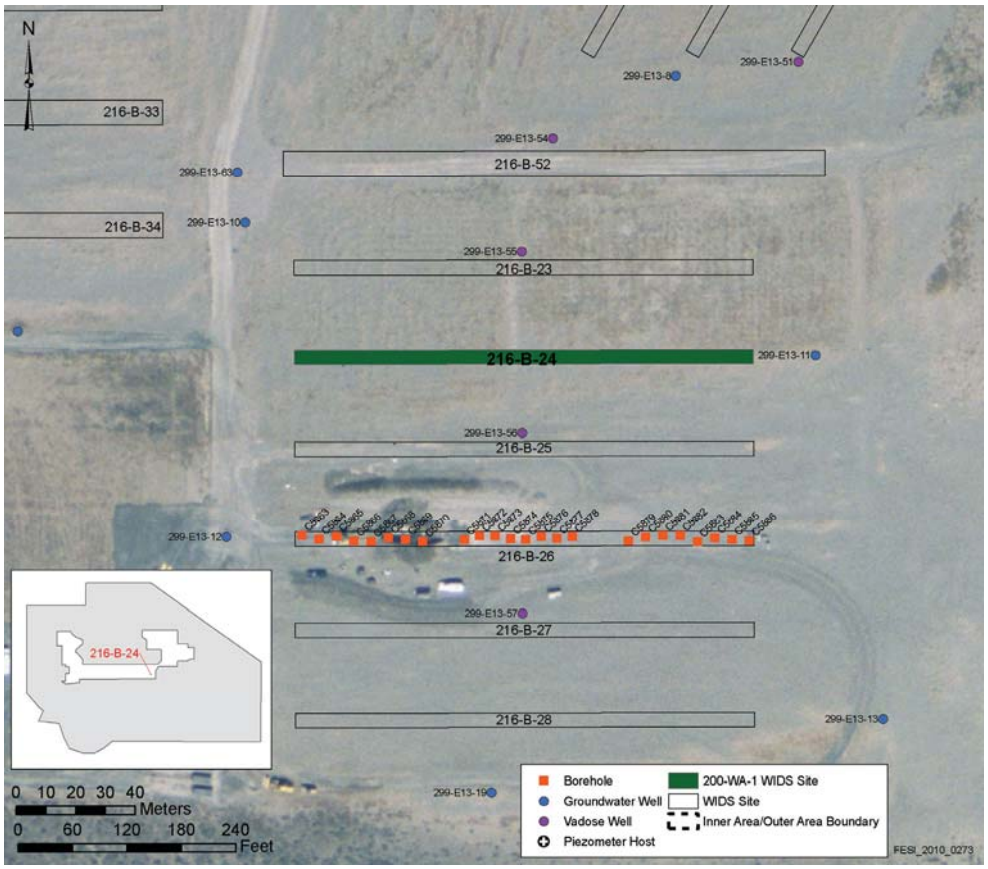


Figure 2. Trench Elevation

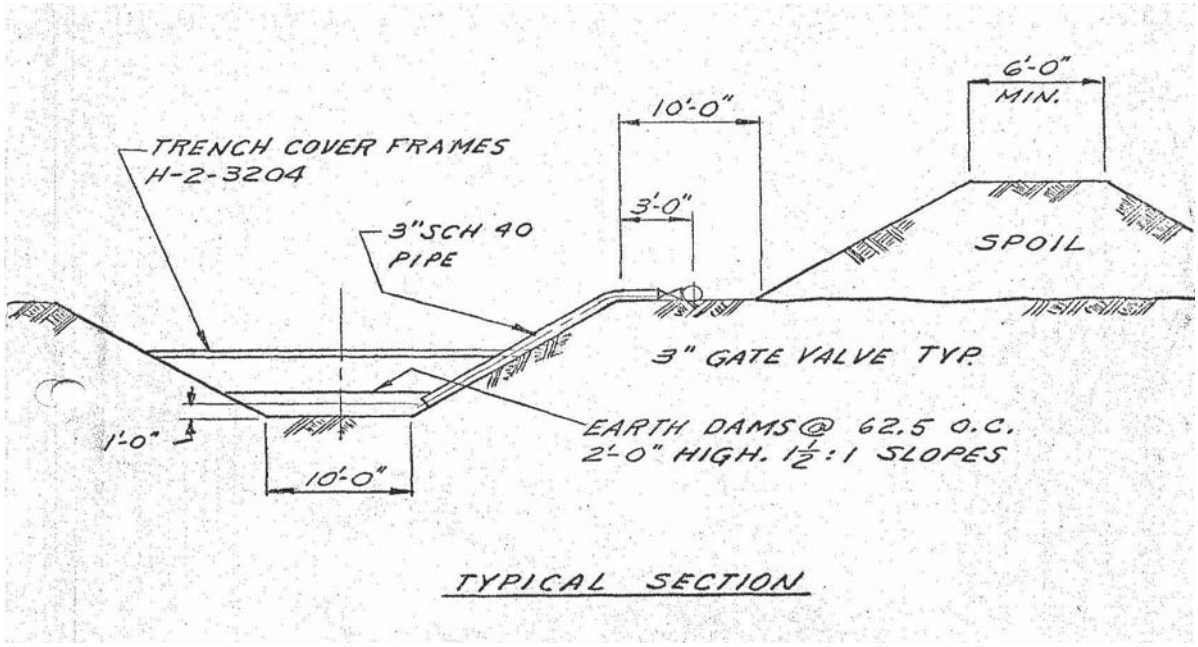


Figure 3. Trench Plan View

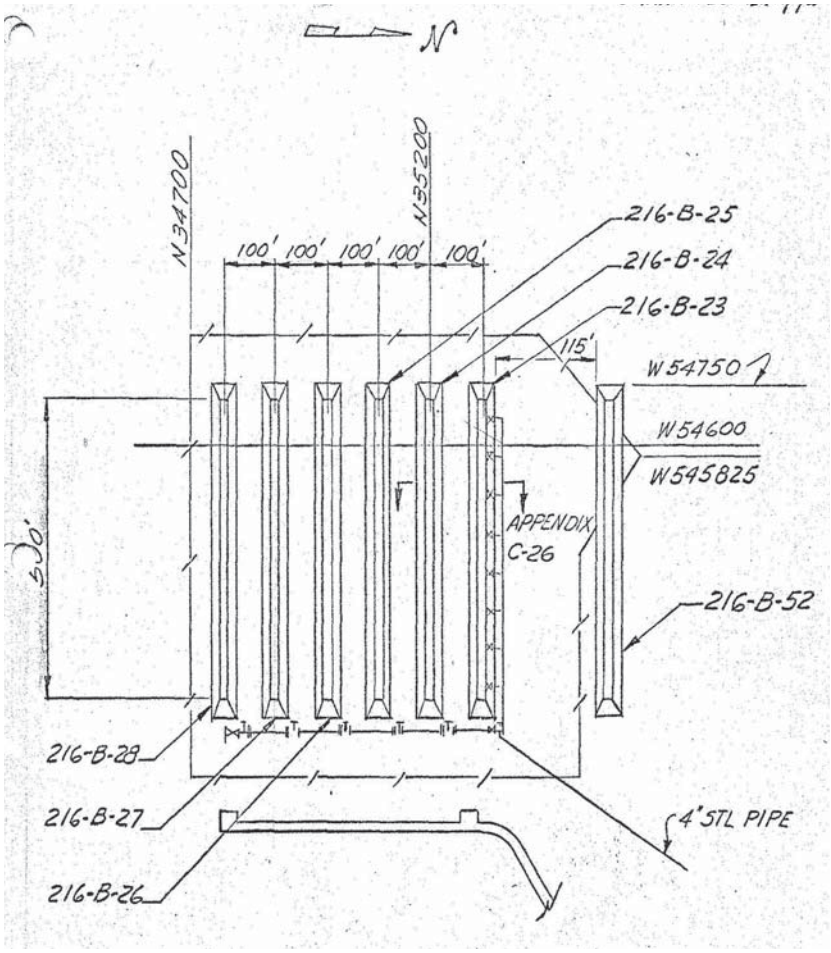
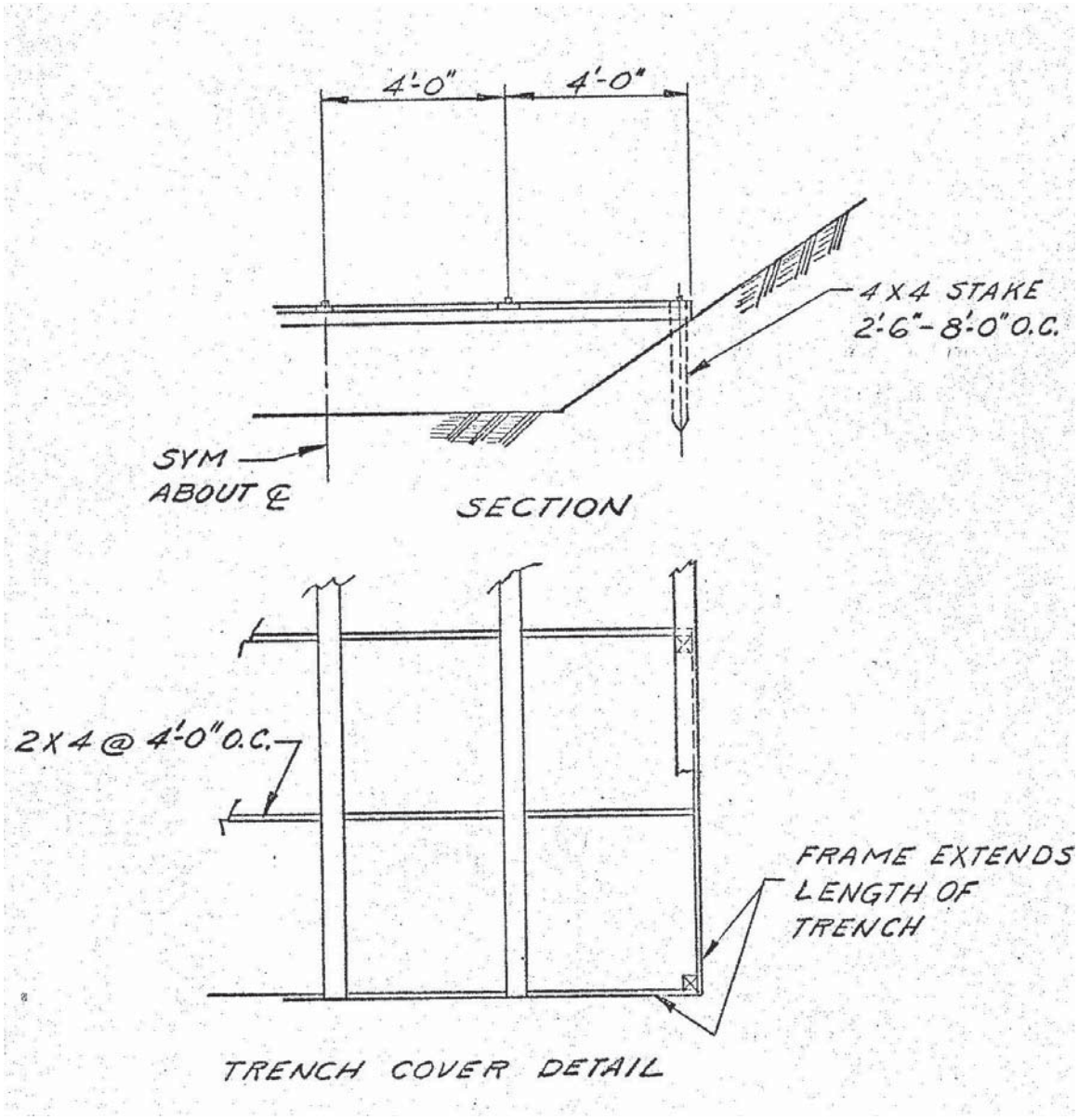


Figure 4. Trench Cover



Site Description

Site ID: 216-B-25 Trench **Site Type:** Trench
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: November and December 1956
Volume/Mass Discharged: 3.8E6 L (0.9E6 gal)

Waste Site Location and Physical Description: 216-B-25 Trench is located south of the 200 East Area (across Route 4S) in the BC Cribs and Trenches area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure. 1 ArcMap Image). The Trench was divided into eight 19 m (62.5 ft) sections by 1.2 m (4 ft) high earthen dams. The side slope is 1.5:1. The depth was 3 m (10 ft). A wooden frame cover was constructed over the trench (see Figure 2, Figure 3, and Figure 4).

Waste Site Coordinates:

E-573288.53130 N-134176.51560

Site Dimensions:

Site Length: 152.4 m (500 ft) Site Depth: 3.1 meters (10 ft)
Site Width: 3.1 m (10 ft) Cover Thickness: 2.4 m (8 ft)
Site Area: 464.8 square m (5000 square ft)

Note: These are bottom dimensions.

Release Summary: 216-B-25 Trench received 3.8E6 L (0.9E6 gal) of scavenged tributylphosphate (TBP) supernate liquid waste from the 221-U Building during uranium recovery operations. After the uranium was removed, the cesium and strontium content of the effluent was reduced through precipitation by adding ferrocyanide. The waste was received into the trench via an above ground transfer line extending from the 200-E-114-PL pipeline. The waste is liquid process effluent, high in salt and is neutral to basic. The waste contained inorganic compounds such as ferrocyanide, nitrate and phosphate.

The Trench was backfilled after it reached its specific retention capacity.

$PV_{released}$ = 3.8E+6 L/ (464.8 m^2*106 m*0.3*1000 L/m^3) = 0.25

Therefore, the Trench is assumed to exhibit deep vadose effects.

Related Site Structure(s): The Trench is associated with the U Plant uranium recovery process and UPR-200-E-83.

Site Posting: The Trench has been backfilled with clean soil and posted URMA. Concrete AC 540 markers outline the area where the trenches are located, but do not identify specific trench locations.

Site Characterization Summary: In May 1958, an Unplanned Release (UPR-200-E-83) occurred when a large area was found to be contaminated with radioactive rabbit feces reading

5,000 to 10,000 counts per minute. A burrow in Trench 216-B-28, containing contaminated salt, was believed to be the source of the material ingested by the rabbits.

In 1969, contaminated Russian thistle was identified growing on some of the BC Trenches. To inhibit weed growth, 45,870 m^3 (60,000 yd^3), approximately 15.2 cm (6 in) of sand and gravel on each, was placed on top of the Trenches. In 1981, the area was covered with additional top soil, time release herbicides and rodent deterrent. The area was surface stabilized again in 1982.

A surface radiation survey is performed annually.

Potential Contaminants:

Radioactive: Stronium-90, Cesium-137

Non-Radioactive: Nickel Ferrocyanide, Nitrate, Phosphate

References:

WIDS General Summary Report for site 216-B-25
ArcMap
QMap
HW-55176 Part VI Appendix C-26, C-27 and C-28

Figure 1. ArcMap Image

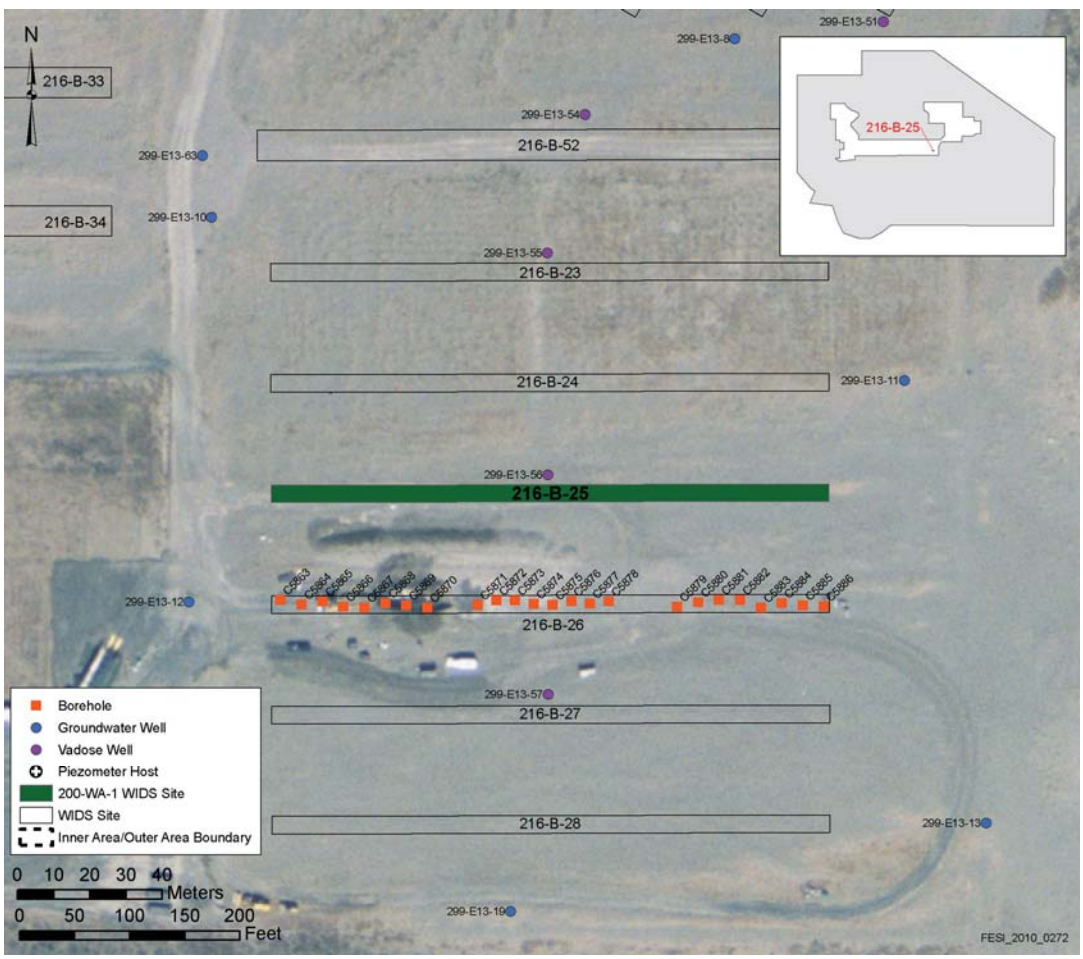


Figure 2. Trench Elevation

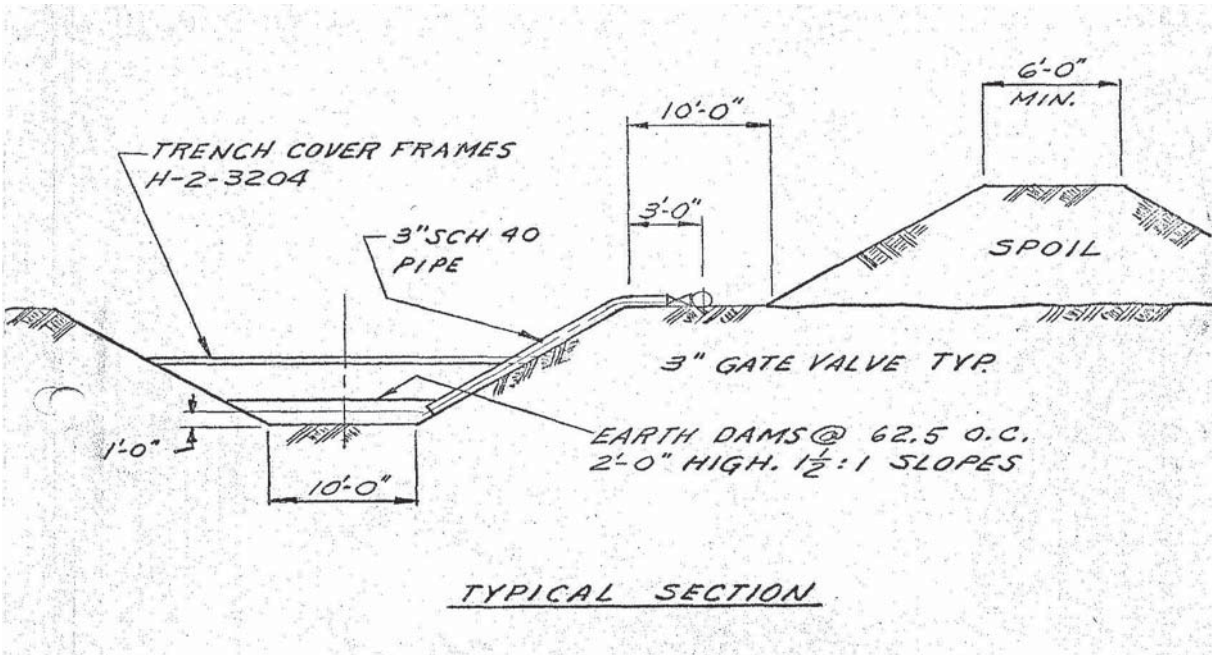


Figure 3. Trench Plan View

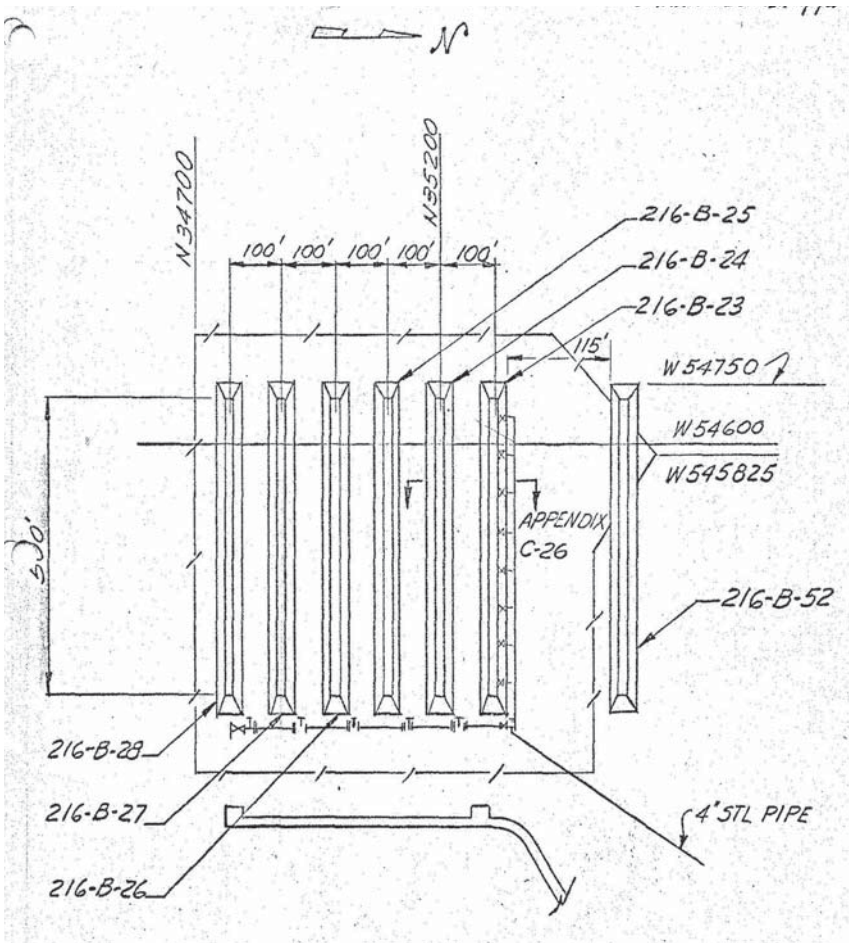
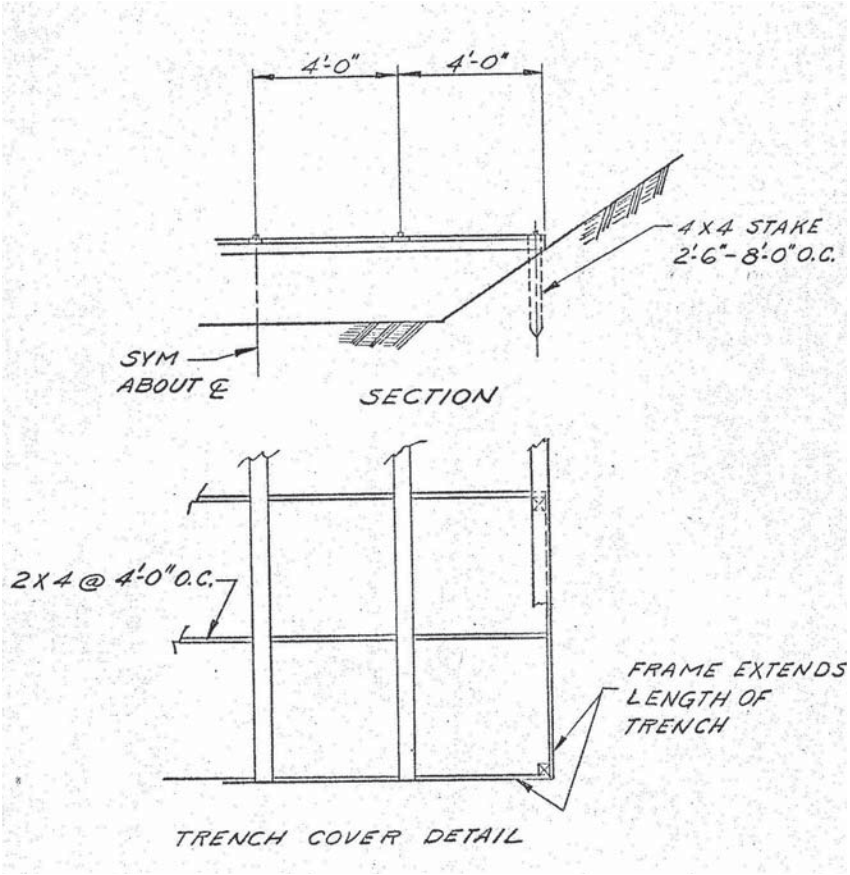


Figure 4. Trench Cover



Site Description

Site ID: 216-B-26 Trench **Site Type:** Trench
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: December 1956 to February 1957
Volume/Mass Discharged: 5.9E6 L (1.6E6 gal)

Waste Site Location and Physical Description: 216-B-26 Trench is located south of the 200 East Area (across Route 4S) in the BC Cribs and Trenches area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The Trench was divided into eight 19 m (62.5 ft) sections by 1.2 m (4 ft) high earthen dams. The side slope is 1.5:1. The depth was 3 m (10 ft). A wooden frame cover was constructed over the trench (see Figure 2, Figure 3, and Figure 4).

Waste Site Coordinates:

E-573288.64104 N-134146.03889

Site Dimensions:

Site Length: 152.4 m (500 ft) Site Depth: 3.1 meters (10 ft)
Site Width: 3.1 m (10 ft) Cover Thickness: 2.4 m (8 ft)
Site Area: 464.8 square m (5000 square ft)

Note: These are bottom dimensions.

Release Summary: 216-B-26 Trench received 5.9E6 L (1.6E6 gal) of scavenged tributylphosphate (TBP) supernate liquid waste from the 221-U Building during uranium recovery operations. After the uranium was removed, the cesium and strontium content of the effluent was reduced through precipitation by adding ferrocyanide. The waste was received into the trench via an above ground transfer line extending from the 200-E-114-PL pipeline. The waste is liquid process effluent, high in salt and is neutral to basic. The waste contained inorganic compounds such as ferrocyanide, nitrate and phosphate.

The Trench was backfilled after it reached its specific retention capacity.

$PV_{released}$ = 5.9E6 L/ (464.8 m^2*106 m*0.3*1000 L/m^3) = 0.40

Therefore, the Trench is assumed to exhibit deep vadose effects.

Related Site Structure(s): The Trench is associated with U Plant uranium recovery process and UPR-200-E-83.

Site Posting: The Trench has been backfilled with clean soil and posted URMA. Concrete AC 540 markers outline the area where the trenches are located, but do not identify specific trench locations.

Site Characterization Summary: In May 1958, an Unplanned Release (UPR-200-E-83) occurred when a large area was found to be contaminated with radioactive rabbit feces reading

5,000 to 10,000 counts per minute. A burrow in Trench 216-B-28, containing contaminated salt, was believed to be the source of the material ingested by the rabbits.

In 1969, contaminated tumbleweeds were identified growing on some of the BC Trenches. To inhibit weed growth, 45,870 m^3 (60,000 yd^3), approximately 15.2 cm (6 in) of sand and gravel, was placed on top of the Trenches to. In 1981, the area was covered with additional top soil, time release herbicides and rodent deterrent. The area was surface stabilized again in 1982.

In December 2004 and January 2005, characterization borehole C4191 and six Direct Push Technology (DPT) boreholes were placed through the Trench. A Trench Excavation Treatability Test was done in 2008. Sixty three shallow (7.6 m [25 ft] deep) DPT boreholes were installed within the footprint and to the side of the trench to assess lateral extent of contamination. Fifty five of the DPT holes were logged. Eight of these DPT holes were selected to become boreholes. A surface radiation survey is performed annually. Approximately one third of the Trench was excavated in July, 2008. The excavated contaminated soil was taken to the Environmental Restoration Disposal Landfill (ERDF).

Potential Contaminants:

Radioactive: Stronium-90, Cesium-137

Non-Radioactive: Nickel Ferrocyanide, Nitrate, Phosphate

References:

WIDS General Summary Report for site 216-B-26
ArcMap
QMap
HW-55176 Part VI Appendix C-26, C-27 and C-28

Figure 1. ArcMap Image

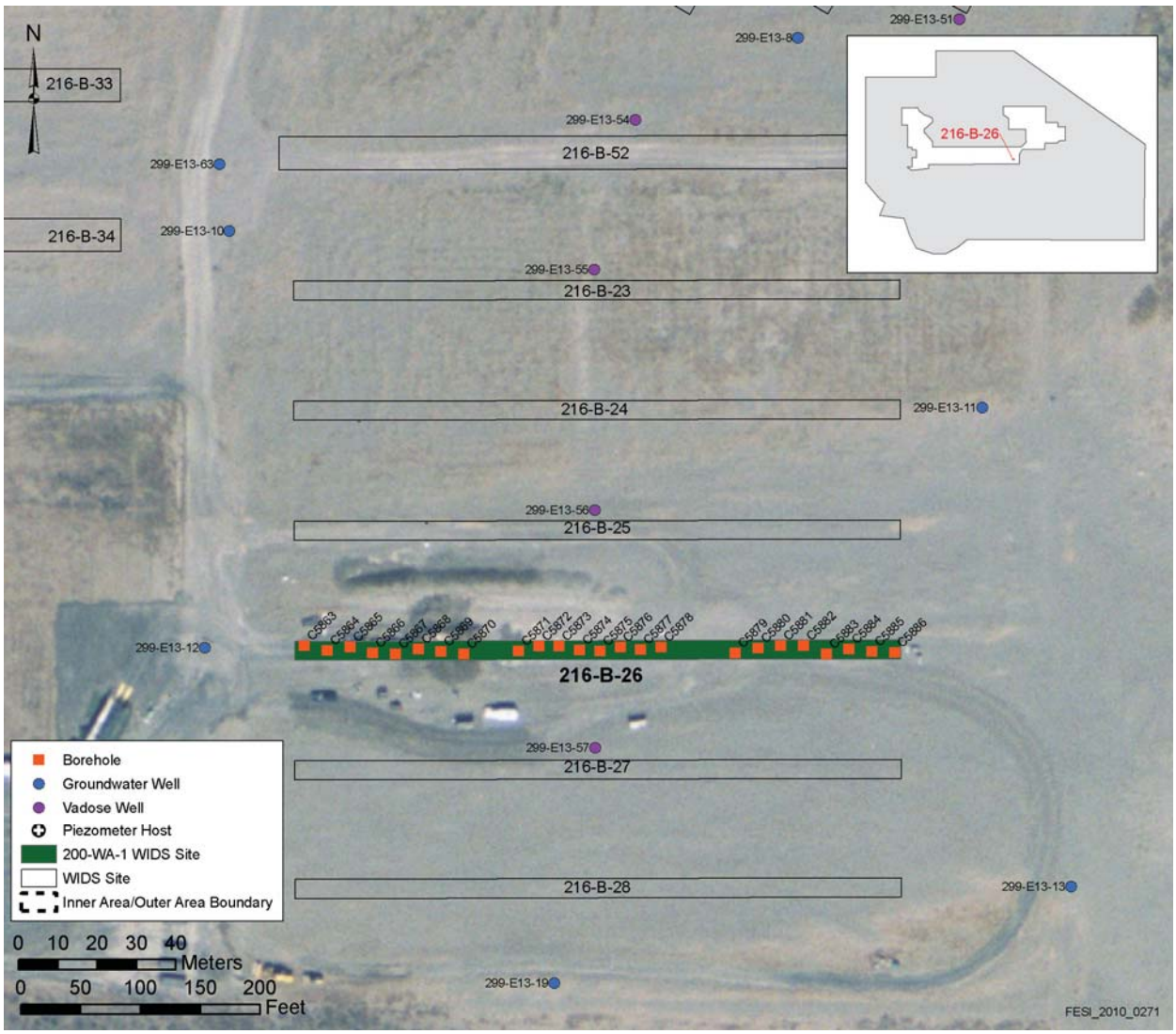


Figure 2. Trench Elevation

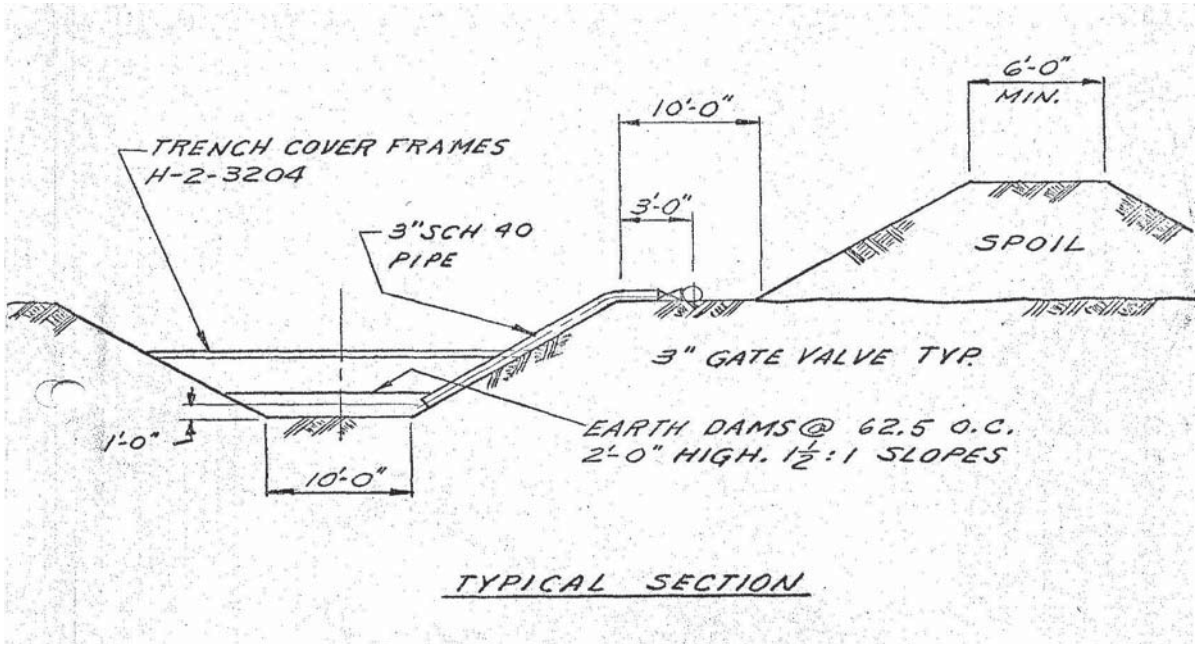


Figure 3. Trench Plan View

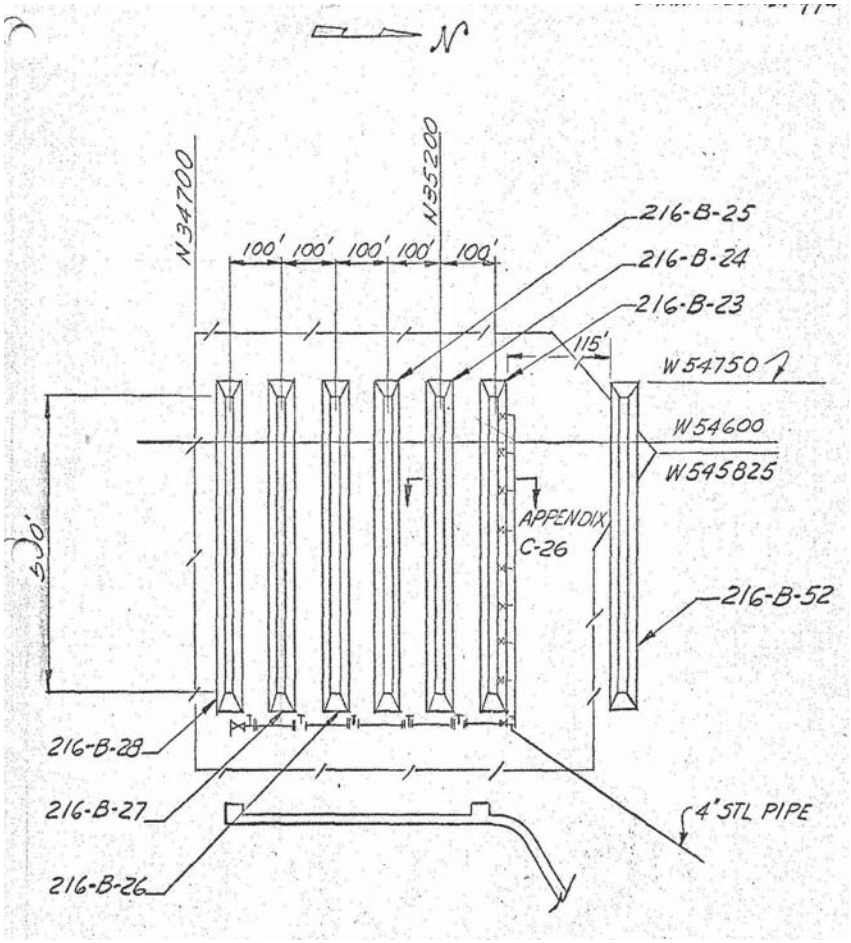
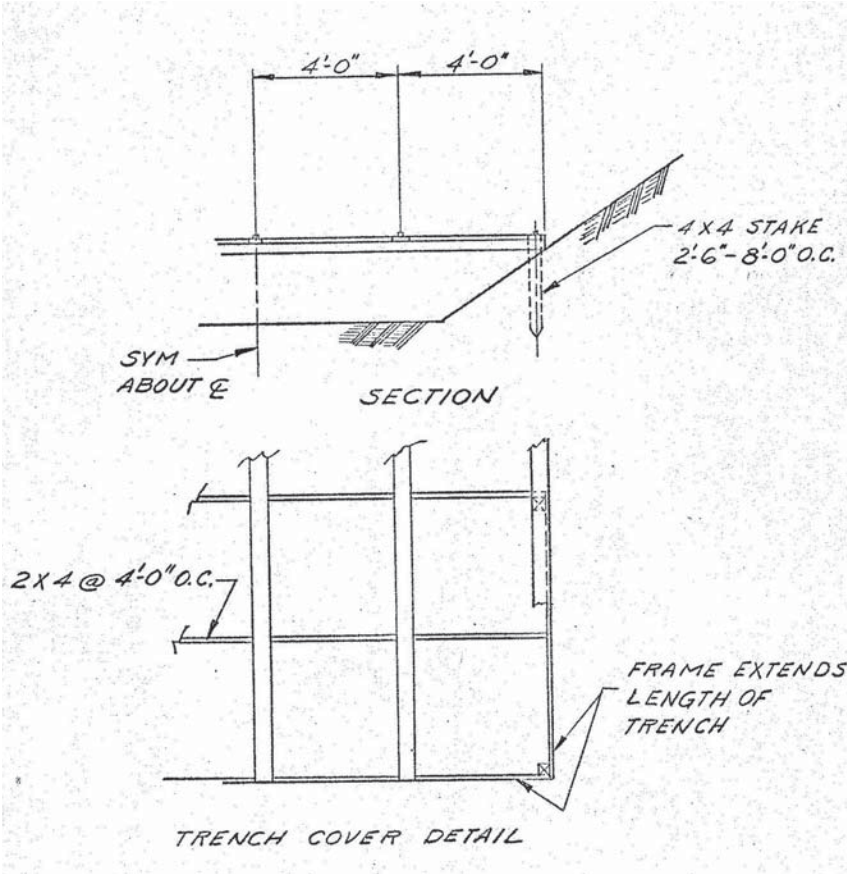


Figure 4. Trench Cover



Site Description

Site ID: 216-B-27 Trench **Site Type:** Trench
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: February to April 1957
Volume/Mass Discharged: 4.4E6 L (1.2E6 gal)

Waste Site Location and Physical Description: 216-B-27 Trench is located south of the 200 East Area (across Route 4S) in the BC Cribs and Trenches area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The Trench was divided into eight 19 m (62.5 ft) sections by 1.2 m (4 ft) high earthen dams. The side slope is 1.5:1. The depth was 3 m (10 ft). A wooden frame cover was constructed over the trench (see Figure 2 & Figure 3).

Waste Site Coordinates:

E-573288.71901 N-134115.56253

Site Dimensions:

Site Length: 152.4 m (500 ft) Site Depth: 3.1 meters (10 ft)
Site Width: 3.1 m (10 ft) Cover Thickness: 2.4 m (8 ft)
Site Area: 464.8 square m (5000 square ft)

Note: These are bottom dimensions.

Release Summary: 216-B-27 Trench received 4.4E6 L (1.2E6 gal) of scavenged tributylphosphate (TBP) supernate liquid waste from the 221-U Building during uranium recovery operations. After the uranium was removed, the cesium and strontium content of the effluent was reduced through precipitation by adding ferrocyanide. The waste was received into the trench via an above ground transfer line extending from the 200-E-114-PL pipeline. The waste is liquid process effluent, high in salt and is neutral to basic. The waste contained inorganic compounds such as ferrocyanide, nitrate and phosphate.

The Trench was backfilled after it reached its specific retention capacity.

$PV_{released}$ = 4.4E+6 L/ (464.8 m^2*106 m*0.3*1000 L/m^3) = 0.30

Therefore, the Trench is assumed to exhibit deep vadose effects.

Related Site Structure(s): The Trench is associated with U Plant uranium recovery process and UPR-200-E-83.

Site Posting: The Trench has been backfilled with clean soil and posted URMA. Concrete AC 540 markers outline the area where the trenches are located, but do not identify specific trench locations.

Site Characterization Summary: In May 1958, an Unplanned Release (UPR-200-E-83) occurred when a large area was found to be contaminated with radioactive rabbit feces reading

5,000 to 10,000 counts per minute. A burrow in Trench 216-B-28, containing contaminated salt, was believed to be the source of the material ingested by the rabbits.

In 1969, contaminated tumbleweeds were identified growing on some of the BC Trenches. To inhibit weed growth, 45,870 m^3 (60,000 yd^3), approximately 15.2 cm (6 in) of sand and gravel, was placed on top of the Trenches. In 1981, the area was covered with additional top soil, time release herbicides and rodent deterrent.

The area was surface stabilized again in 1982.

A surface radiation survey is performed annually.

Potential Contaminants:

Radioactive: Stronium-90, Cesium-137

Non-Radioactive: Nickel Ferrocyanide, Nitrate, Phosphate

References:

WIDS General Summary Report for site 216-B-27
ArcMap
QMap
HW-55176 Part VI Appendix C-26, C-27 and C-28

Figure 1. ArcMap Image

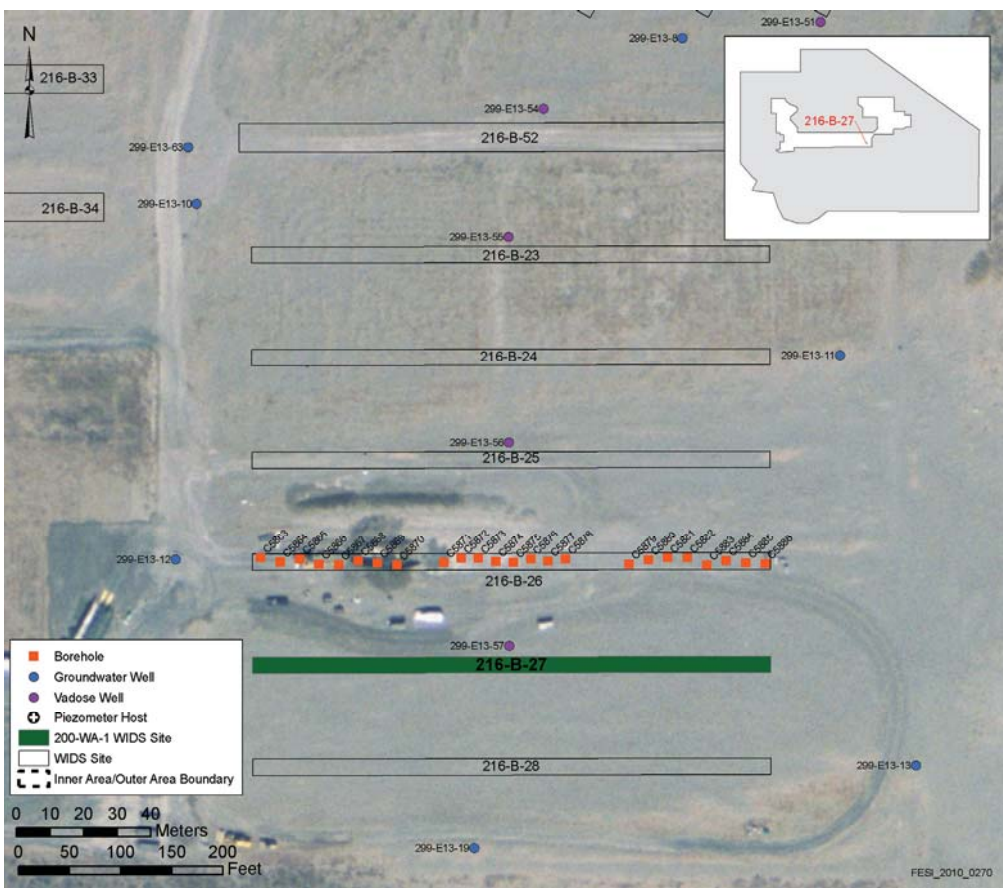


Figure 2. Trench Plan View

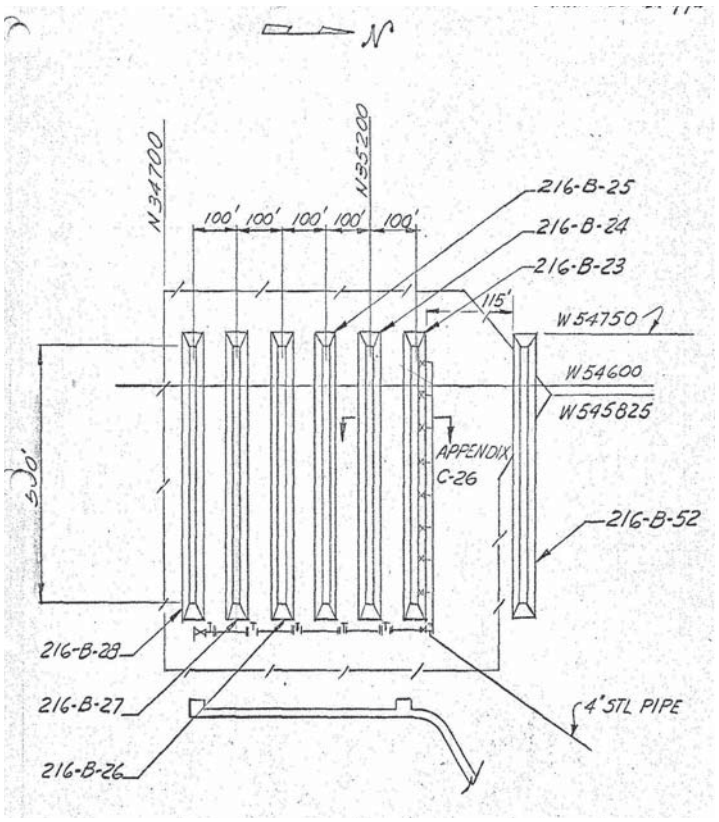
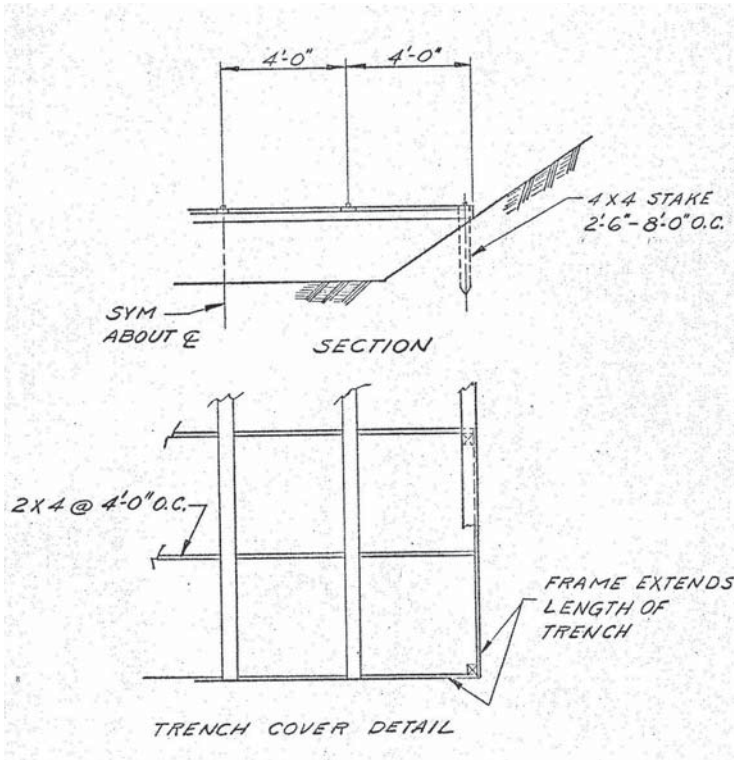


Figure 3. Trench Cover



Site Description

Site ID: 216-B-28 Trench **Site Type:** Trench
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: April to June 1957
Volume/Mass Discharged: 5.1E6 L (1.3E6 gal)

Waste Site Location and Physical Description: 216-B-28 Trench is located south of the 200 East Area (across Route 4S) in the BC Cribs and Trenches area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The Trench was divided into eight 19 m (62.5 ft) sections by 1.2 m (4 ft) high earthen dams. The side slope is 1.5:1. The depth was 3 m (10 ft). A wooden frame cover was constructed over the trench (see Figure 2, Figure 3, and Figure 4).

Waste Site Coordinates:

E-573288.79614 N-134085.08614

Site Dimensions:

Site Length: 152.4 m (500 ft) Site Depth: 3.1 meters (10 ft)
Site Width: 3.1 m (10 ft) Cover Thickness: 2.4 m (8 ft)
Site Area: 464.8 square m (5000 square ft)

Note: These are bottom dimensions

Release Summary: 216-B-28 Trench received 5.1E6 L (1.3E6 gal) of scavenged tributylphosphate (TBP) supernate liquid waste from the 221-U Building during uranium recovery operations. After the uranium was removed, the cesium and strontium content of the effluent was reduced through precipitation by adding ferrocyanide. The waste was received into the trench via an above ground transfer line extending from the 200-E-114-PL pipeline. The waste is liquid process effluent, high in salt and is neutral to basic. The waste contained inorganic compounds such as ferrocyanide, nitrate and phosphate.

The Trench was backfilled after it reached its specific retention capacity.

$PV_{released}$ = 5.1E6 L/ (464.8 m*106 m^2*0.3*1000 L/m^3) = 0.34

Therefore, the Trench is assumed to exhibit deep vadose effects.

Related Site Structure(s): The Trench is associated with U Plant uranium recovery process and UPR-200-E-83.

Site Posting: The Trench has been backfilled with clean soil and posted URMA. Concrete AC 540 markers outline the area where the trenches are located, but do not identify specific trench locations.

Site Characterization Summary: In May 1958, an Unplanned Release (UPR-200-E-83) occurred when a large area was found to be contaminated with radioactive rabbit feces reading

5,000 to 10,000 counts per minute. A burrow in Trench 216-B-28, containing contaminated salt, was believed to be the source of the material ingested by the rabbits.

In 1969, contaminated Russian thistle was identified growing on some of the BC Trenches. To inhibit weed growth, 45,870 m^3 (60,000 yd^3), approximately 15.2 cm (6 in) of sand and gravel, was placed on top of the Trenches. In 1981, the area was covered with additional top soil, time release herbicides and rodent deterrent. The area was surface stabilized again in 1982.

The Trench is monitored by groundwater wells 299-E13-13 and 299-E13-19. Date indicate a breakthrough to the groundwater had not occurred at the Trench as of June 1977. A surface radiation survey is performed annually.

Potential Contaminants:

Radioactive: Stronium-90, Cesium-137

Non-Radioactive: Nickel Ferrocyanide, Nitrate, Phosphate

References:

WIDS General Summary Report for site 216-B-28
ArcMap
QMap
HW-55176 Part VI Appendix C-26, C-27 and C-28

Figure 1. ArcMap Image

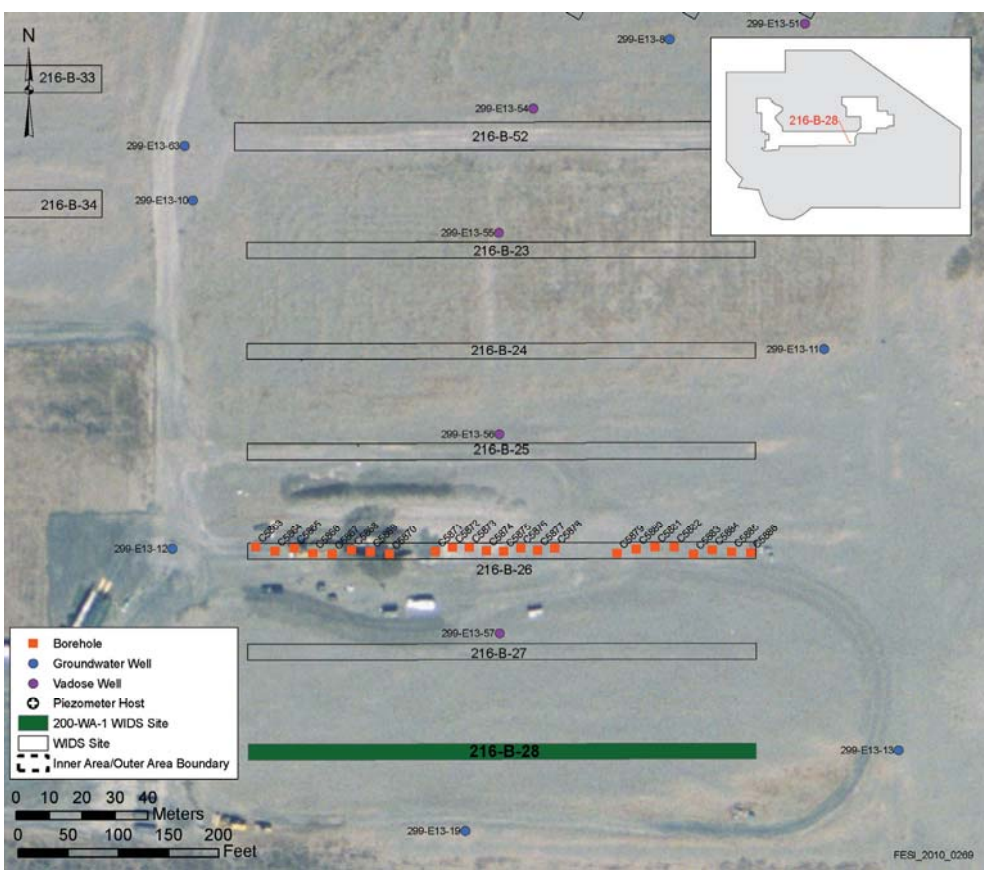


Figure 2. Trench Elevation

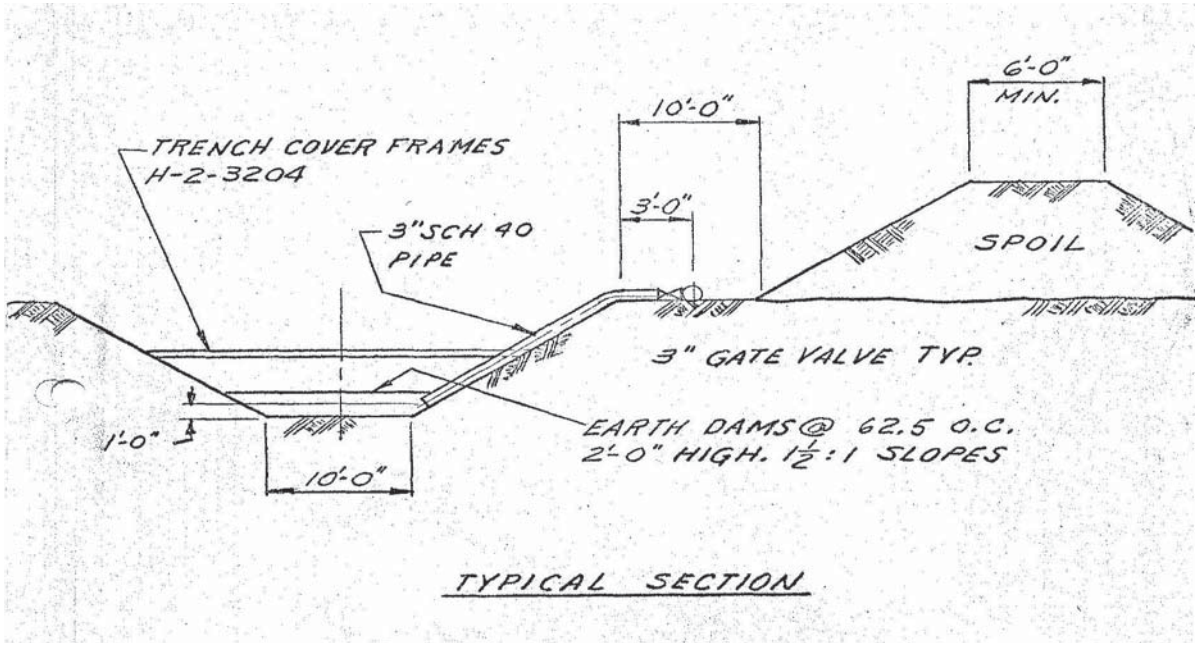


Figure 3. Trench Plan View

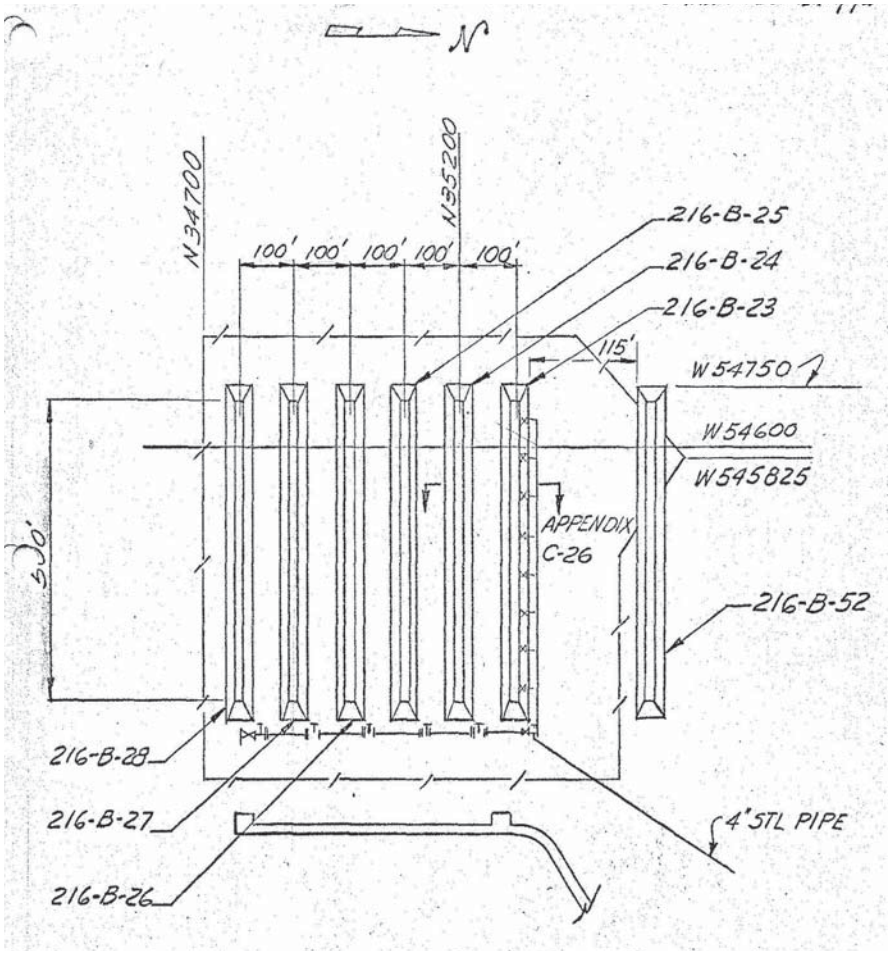
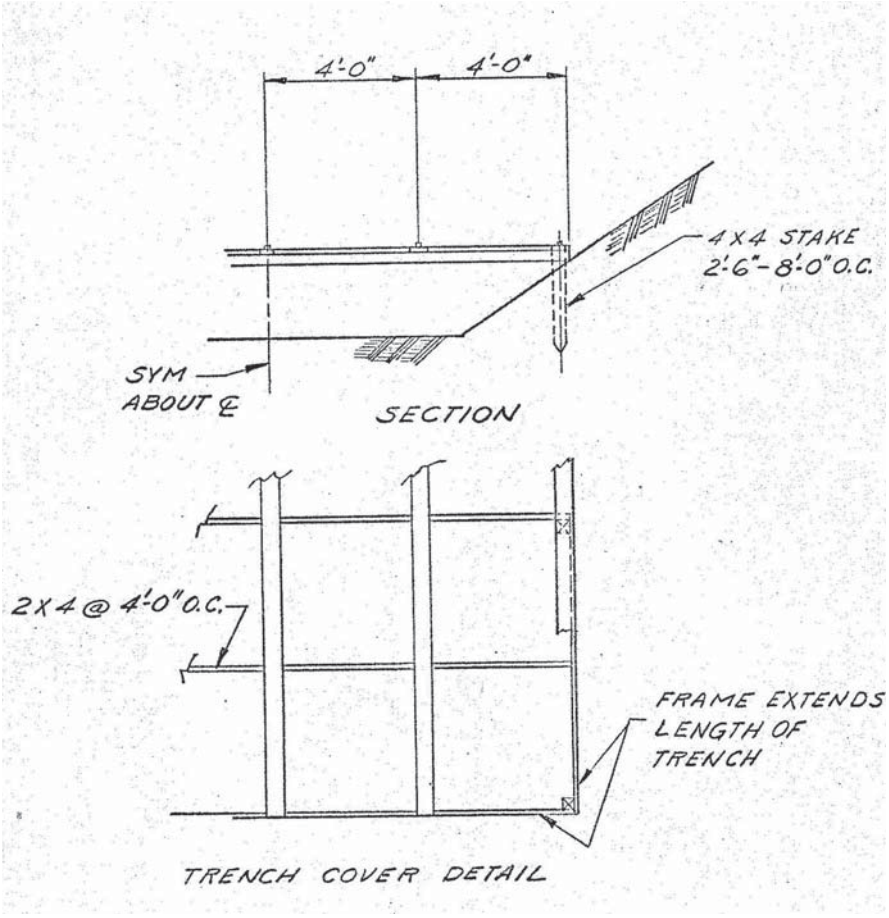


Figure 4. Trench Cover



Site Description

Site ID: 216-B-29 Trench **Site Type:** Trench
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: June to July 1957
Volume/Mass Discharged: 4.8E6 L (1.3E6 gal)

Waste Site Location and Physical Description: 216-B-29 Trench is located south of the 200 East Area (across Route 4S) in the BC Cribs and Trenches area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The Trench was divided into two equal sections by an earthen dam 1.5 m (5 ft) high and 1.5 m (5 ft) high at the top. The Trench had side slope of 1:1.75. Liquid was discharged into the Trench via four 7.6 cm (3 in) Schedule 40 pipes extending laterally from a 10.2 cm (4 in) pipe which ran along the top edge of the Trench. Liquid discharge was controlled by gate valves located at the top of the lateral lines. A cover constructed of 2.5 cm x 15.2 cm (1 in x 6 in) and 5 cm x 10.2 cm (2 in x 4 in) wood framing and sisalkraft paper extended the length of the Trench. The vertical distance from the cover to the Trench bottom was a minimum of 1.5 m (5 ft) (see Figure 2 & Figure 3). When the Trench reached its specific retention capacity the above ground pipeline to the Trench was removed and the Trench was backfilled. The wood frame cover was left in place and probably collapsed under the weight of the overlying soil during the backfilling activities. The removed pipeline was buried in a shallow Trench between 216-B-29 and 216-B-53A.

Waste Site Coordinates:

The centerline coordinates of the Trench are N-36000 and W-54800.

Site Dimensions:

Site Length: 152.4 m (500 ft) (bottom dimension)
Site Width: 3.1 m (10 ft) (bottom dimension)
Site Area: 464.8 m^2 (5000 ft^2)

Site Depth: 2.4 meters (8 ft) minimum
Cover Thickness: 3.0 m (10 ft) minimum, including backfill and stabilization cover

Release Summary: 216-B-29 Trench received 4.8E6 L (1.3E6 gal) of scavenged tributylphosphate (TBP) supernate liquid waste from the 221-U Building during uranium recovery operations. After the uranium was removed, the cesium and strontium content of the effluent was reduced through precipitation by adding ferrocyanide. The waste was received into the trench via above ground transfer lines extending from the 200-E-114-PL pipeline. The waste is liquid process effluent, high in salt and is neutral to basic. The waste contained inorganic compounds such as ferrocyanide, nitrate and phosphate.

$PV_{released}$ = 4.8E6 L/ (464.8 m^2*106 m*0.3*1000 L/m^3) = 0.32

Therefore, the Trench is assumed to exhibit deep vadose effects.

Related Site Structure(s): The Trench is associated with U Plant uranium recovery process and UPR-200-E-83.

Site Posting: The Trench has been backfilled with clean soil and posted URMA. Concrete AC 540 markers outline the area where the Trenches are located, but do not identify the specific Trench location.

Site Characterization Summary: In May 1958, an Unplanned Release (UPR-200-E-83) occurred when a large area was found to be contaminated with radioactive rabbit feces reading 5,000 to 10,000 counts per minute. A burrow in Trench 216-B-28, containing contaminated salt, was believed to be the source of the material ingested by the rabbits.

In 1969, contaminated Russian thistle was identified growing on some of the BC Trenches. To inhibit weed growth, 45,870 m^3 (60,000 yd^3), approximately 15.2 cm (6 in) of sand and gravel, was placed on top of the Trenches. In 1981, the area was covered with additional top soil, time release herbicides and rodent deterrent. The area was surface stabilized again in 1982.

A radiation survey performed in January 2006 detected a 1.2 m by 1.2 m (4 ft by 4 ft) area of contamination with a maximum direct reading of 5,000 counts per minute.

The Trench is monitored by groundwater well 299-E13-14. Data indicate a breakthrough to the groundwater had not occurred at the Trench as of June 1977. A surface radiation survey is performed annually.

Potential Contaminants:

Radioactive: Stronium-90, Cesium-137

Non-Radioactive: Nickel Ferrocyanide, Nitrate, Phosphate

References:

WIDS General Summary Report for site 216-B-29
ArcMap
QMap
HW-55176 Part VI Appendix C-29, C-30

Figure 1. ArcMap Image

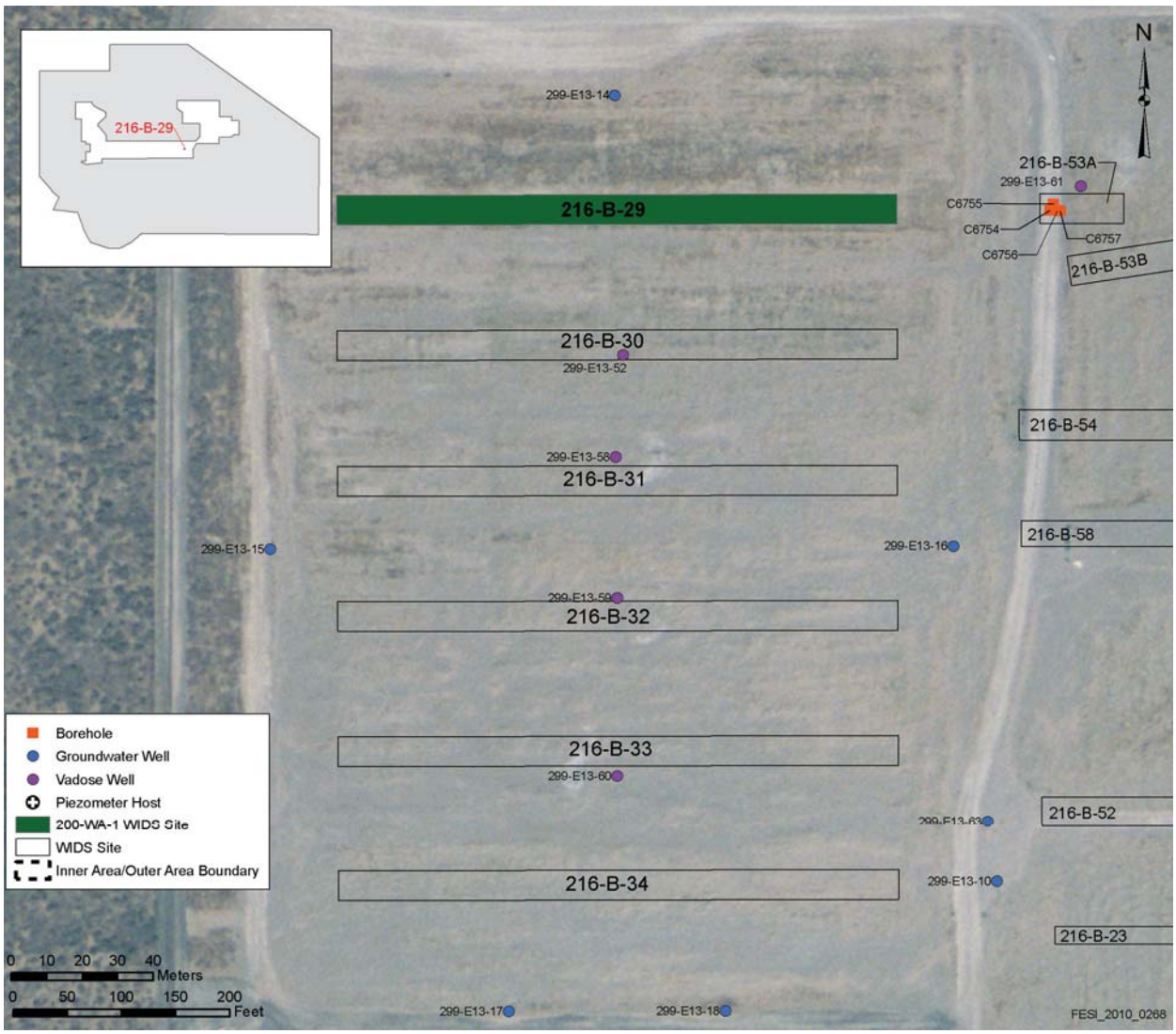


Figure 2. Trench Plan View

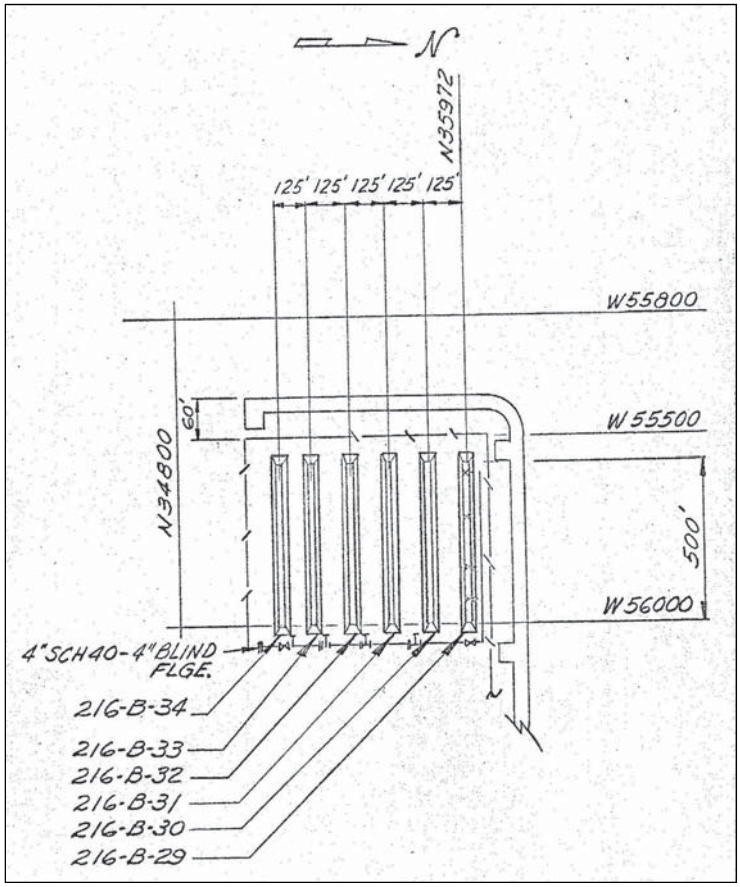
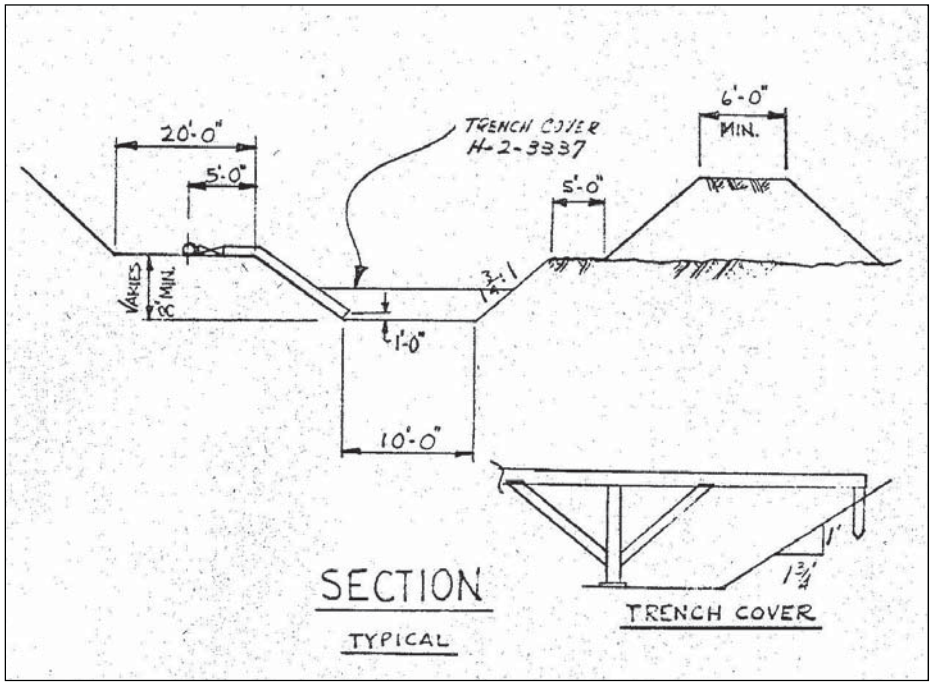


Figure 3. Trench Elevation



Site Description

Site ID: 216-B-30 Trench **Site Type:** Trench
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: July 1957 (RHO-CD-673)
Volume/Mass Discharged: 4.8E6 L (1.3E6 gal)

Waste Site Location and Physical Description: 216-B-30 Trench is located south of the 216-B-29 Trench, directly south of the 200 East Area (across Route 4S) in the BC Cribs and Trenches area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The Trench was divided into two equal sections by an earthen dam 1.5 m (5 ft) high and 1.5 m (5 ft) wide at the top. The Trench had side slope of 1:1.75. Liquid was discharged into the Trench via four 7.6 cm (3 in) Schedule 40 pipes extending laterally from a 10.2 cm (4 in) pipe which ran along the top edge of the Trench. Liquid discharge was controlled by gate valves located at the top of the lateral lines. A cover constructed of 2.5 cm x 15.2 cm (1 in x 6 in) and 5 cm x 10.2 cm (2 in x 4 in) wood framing and sisalkraft paper extended the length of the Trench. The vertical distance from the cover to the Trench bottom was a minimum of 1.5 m (5 ft) (see Figure 2 and Figure 3). When the Trench reached its specific retention capacity the above ground pipeline to the Trench was removed and the Trench was backfilled. The wood frame cover was left in place and probably collapsed under the weight of the overlying soil during the backfilling activities. The removed pipeline was buried in a shallow Trench between 216-B-29 and 216-B-53A.

Waste Site Coordinates:

W-573087.96035 N-134403.77703

Site Dimensions:

Site Length: 152.4 m (500 ft) (bottom dimension)
Site Width: 3.1 m (10 ft) (bottom dimension)
Site Area: 464.8 m^2 (5000 ft^2)

Site Depth: 2.4 meters (8 ft) minimum
Cover Thickness: 3.0 m (10 ft) minimum, including backfill and stabilization cover

Release Summary: 216-B-30 Trench received 4.8E6 L (1.3E6 gal) of scavenged tributylphosphate (TBP) supernate liquid waste from the 221-U Building during uranium recovery operations. After the uranium was removed, the cesium and strontium content of the effluent was reduced through precipitation by adding ferrocyanide. The waste was received into the trench via above ground transfer lines extending from the 200-E-114-PL pipeline. The waste is liquid process effluent, high in salt and is neutral to basic. The waste contained inorganic compounds such as ferrocyanide, nitrate and phosphate.

$PV_{released}$ = 4.8E+6 L/ (464.8 m^2*106 m*0.3*1000 L/m^3) = 0.32

Therefore, the Trench is assumed to exhibit deep vadose effects.

Related Site Structure(s): The Trench is associated with U Plant uranium recovery process and UPR-200-E-83.

Site Posting: The Trench has been backfilled with clean soil and posted URMA. Concrete AC 540 markers outline the area where the Trenches are located, but do not identify the specific Trench location.

Site Characterization Summary: In May 1958, an Unplanned Release (UPR-200-E-83) occurred when a large area was found to be contaminated with radioactive rabbit feces reading 5,000 to 10,000 counts per minute. A burrow in Trench 216-B-28, containing contaminated salt, was believed to be the source of the material ingested by the rabbits.

In 1969, contaminated tumbleweeds were identified growing on some of the BC Trenches. To inhibit weed growth, 45,870 m^3 (60,000 yd^3), approximately 15.2 cm (6 in) of sand and gravel, was placed on top of the Trenches. In 1981, the area was covered with additional top soil, time release herbicides and rodent deterrent. The area was surface stabilized again in 1982.

A surface radiation survey is performed annually.

Potential Contaminants:

Radioactive: Stronium-90, Cesium-137

Non-Radioactive: Nickel Ferrocyanide, Nitrate, Phosphate

References:

WIDS General Summary Report for site 216-B-30
ArcMap
QMap
RHO-CD-673 Part III. S-200E
HW-55176 Part VI Appendix C-29, C-30

Figure 1. ArcMap Image

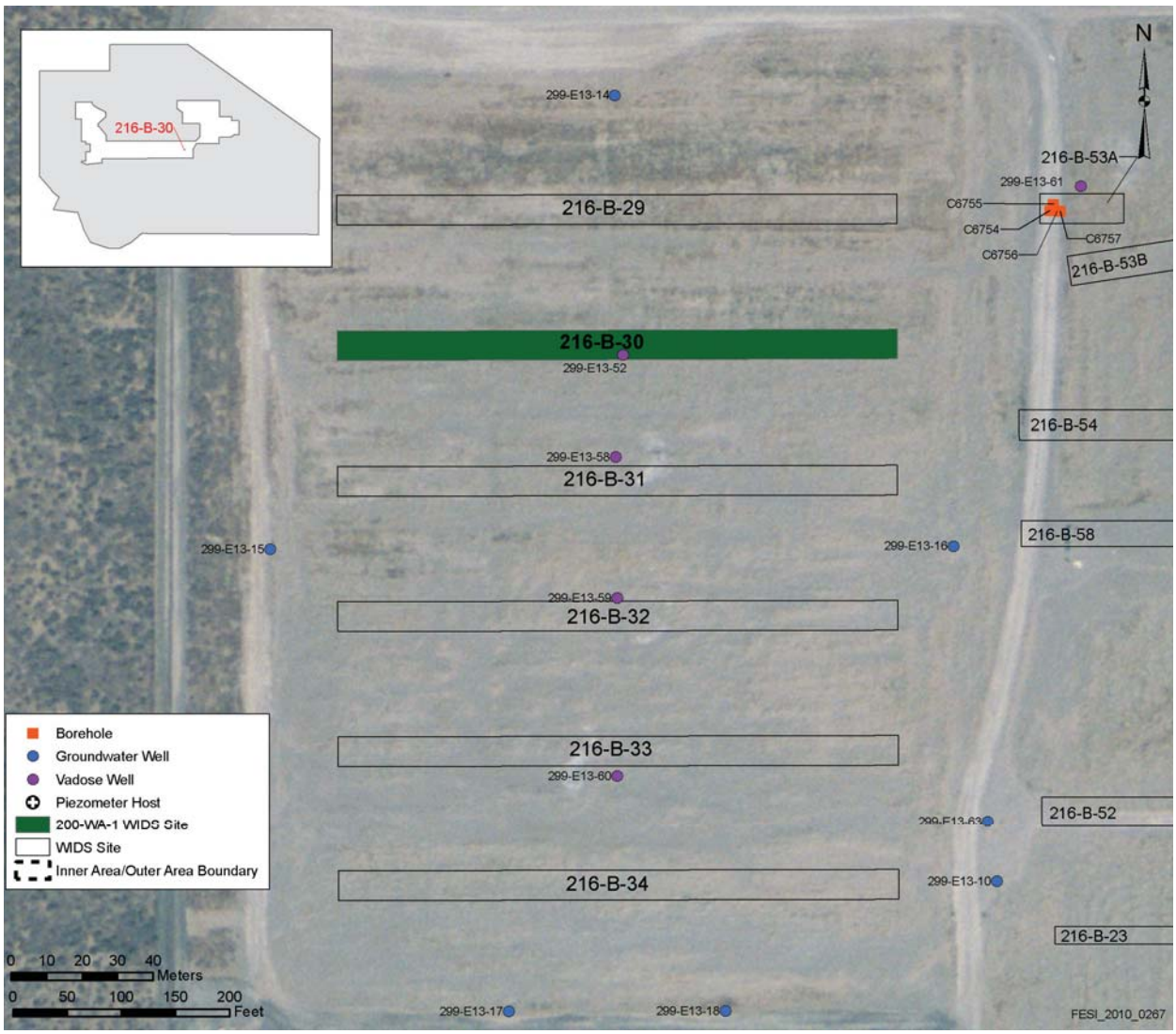


Figure 2. Trench Plan View

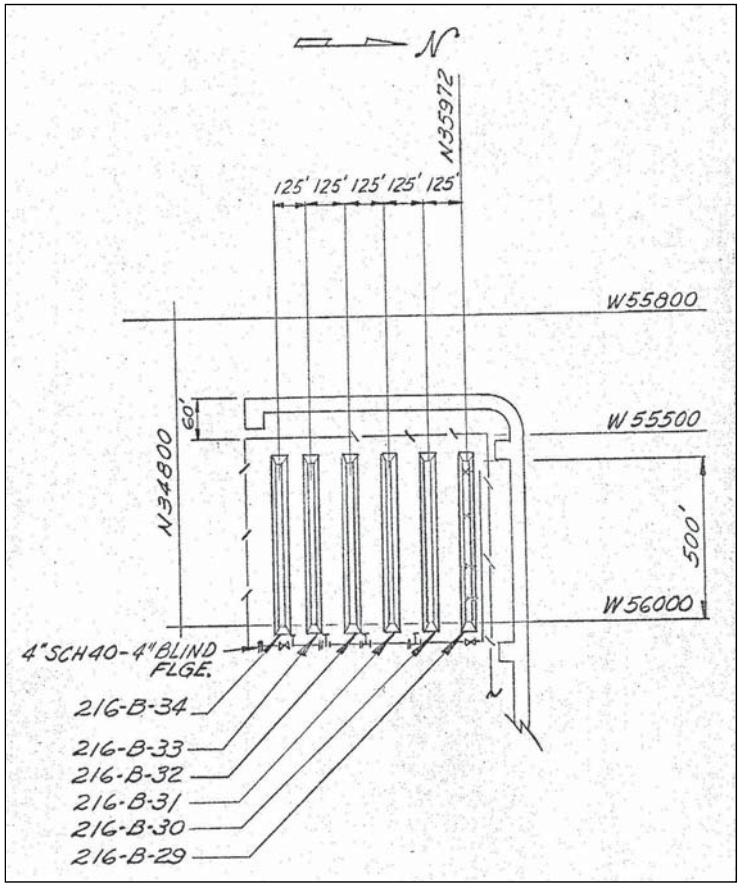
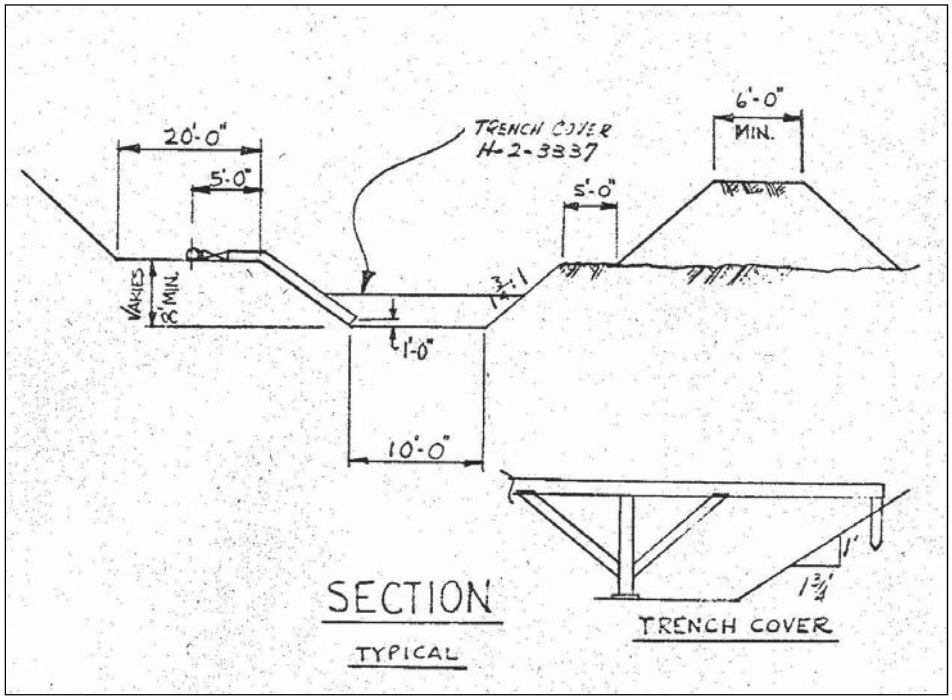


Figure 3. Trench Elevation



Site Description

Site ID: 216-B-31 Trench **Site Type:** Trench
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: July to August 1957 (RHO-CD-673)
Volume/Mass Discharged: 4.7E6 L (1.3E6 gal)

Waste Site Location and Physical Description: 216-B-31 Trench is located directly south of the 216-B-30 Trench, south of the 200 East Area (across Route 4S) in the BC Cribs and Trenches area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The Trench was divided into two equal sections by an earthen dam 1.5 m (5 ft) high and 1.5 m (5 ft) wide at the top. The Trench had side slope of 1:1.75. Liquid was discharged into the Trench via four 7.6 cm (3 in) Schedule 40 pipes extending laterally from a 10.2 cm (4 in) pipe which ran along the top edge of the Trench. Liquid discharge was controlled by gate valves located at the top of the lateral lines. A cover constructed of 2.5 cm x 15.2 cm (1 in x 6 in) and 5 cm x 10.2 cm (2 in x 4 in) wood framing and sisalkraft paper extended the length of the Trench. The vertical distance from the cover to the Trench bottom was a minimum of 1.5 m (5 ft) (see Figure 2 & Figure 3). When the Trench reached its specific retention capacity the above ground pipeline to the Trench was removed and the Trench was backfilled. The wood frame cover was left in place and probably collapsed under the weight of the overlying soil during the backfilling activities. The removed pipeline was buried in a shallow Trench between 216-B-29 and 216-B-53A.

Waste Site Coordinates:

Lon-573088.06930 Lat-134365.68348

Site Dimensions:

Site Length: 152.4 m (500 ft) (bottom dimension)
Site Width: 3.1 m (10 ft) (bottom dimension)
Site Area: 464.8 m^2 (5000 ft^2)

Site Depth: 2.4 meters (8 ft) minimum
Cover Thickness: 3.0 m (10 ft) minimum, including backfill and stabilization cover

Release Summary: 216-B-31 Trench received 4.7E6 L (1.3E6 gal) of scavenged tributylphosphate (TBP) supernate liquid waste from the 221-U Building during uranium recovery operations. After the uranium was removed, the cesium and strontium content of the effluent was reduced through precipitation by adding ferrocyanide. The waste was received into the trench via above ground transfer lines extending from the 200-E-114-PL pipeline. The waste is liquid process effluent, high in salt and is neutral to basic. The waste contained inorganic compounds such as ferrocyanide, nitrate and phosphate.

$$PV_{released} = 4.7E+6\ L/\ (464.8\ m^2 * 106\ m * 0.3 * 1000\ L/m^3) = 0.32$$

Therefore, the Trench is assumed to exhibit deep vadose effects.

Related Site Structure(s): The Trench is associated with U Plant uranium recovery process and UPR-200-E-83.

Site Posting: The Trench has been backfilled with clean soil and posted URMA. Concrete AC 540 markers outline the area where the Trenches are located, but do not identify the specific Trench location.

Site Characterization Summary: In May 1958, an Unplanned Release (UPR-200-E-83) occurred when a large area was found to be contaminated with radioactive rabbit feces reading 5,000 to 10,000 counts per minute. A burrow in Trench 216-B-28, containing contaminated salt, was believed to be the source of the material ingested by the rabbits.

In 1969, contaminated tumbleweeds were identified growing on some of the BC Trenches. To inhibit weed growth, 45,870 m^3 (60,000 yd^3), approximately 15.2 cm (6 in) of sand and gravel, was placed on top of the Trenches. In 1981, the area was covered with additional top soil, time release herbicides and rodent deterrent. The area was surface stabilized again in 1982.

A surface radiation survey performed in August 2005 found soil erosion and surface contamination on the Trench with a maximum reading of 25 millirad per hour.

The Trench is monitored by groundwater wells 299-E13-15 and 299-E13-16. Data indicate a breakthrough to the groundwater had not occurred at the Trench as of June 1977. A surface radiation survey is performed annually.

Potential Contaminants:

Radioactive: Stronium-90, Cesium-137

Non-Radioactive: Nickel Ferrocyanide, Nitrate, Phosphate

References:

WIDS General Summary Report for site 216-B-31
ArcMap
QMap
RHO-CD-673 Part III. S-200E
HW-55176 Part VI Appendix C-29, C-30

Figure 1. ArcMap Image

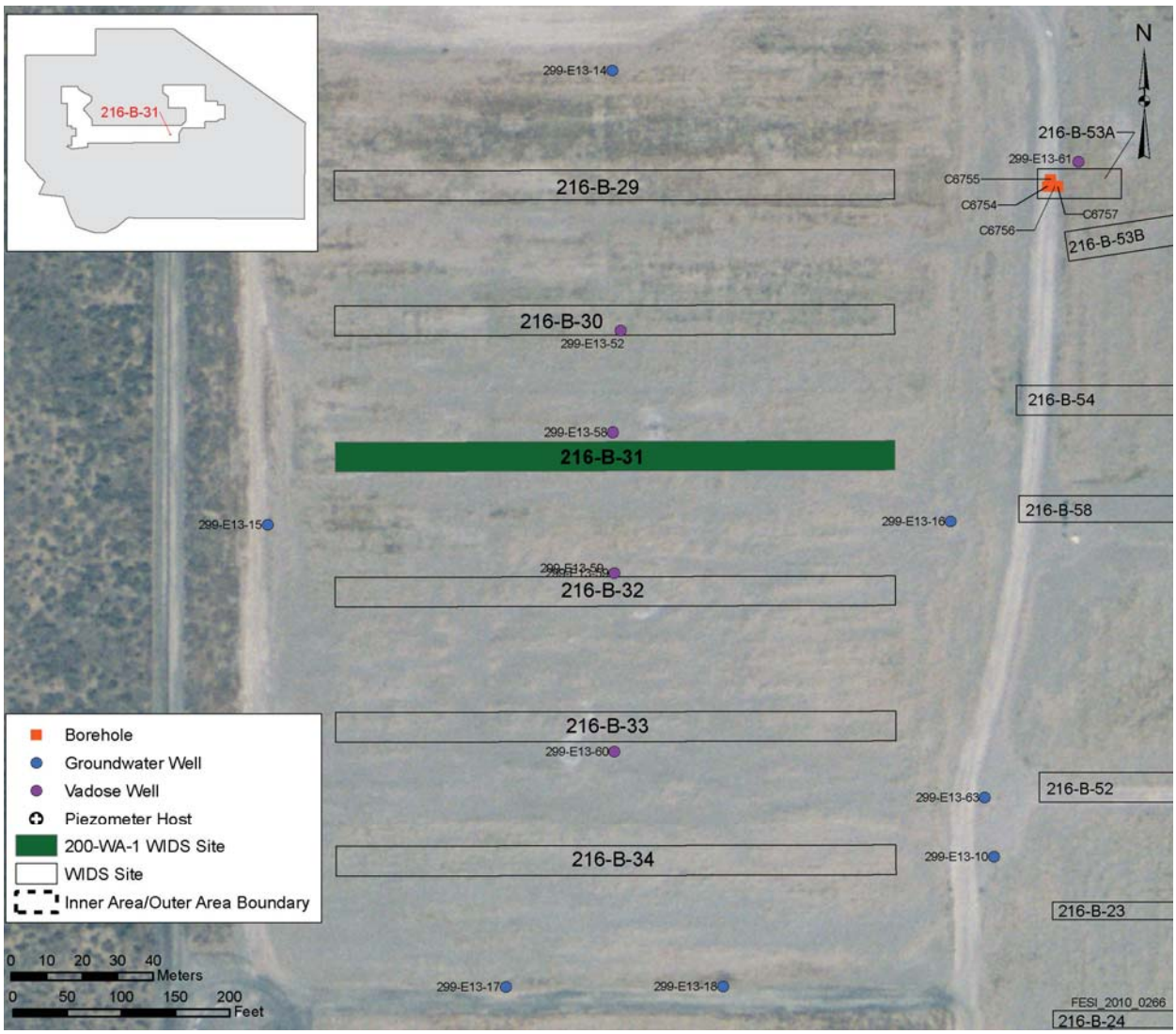


Figure 2. Trench Plan View

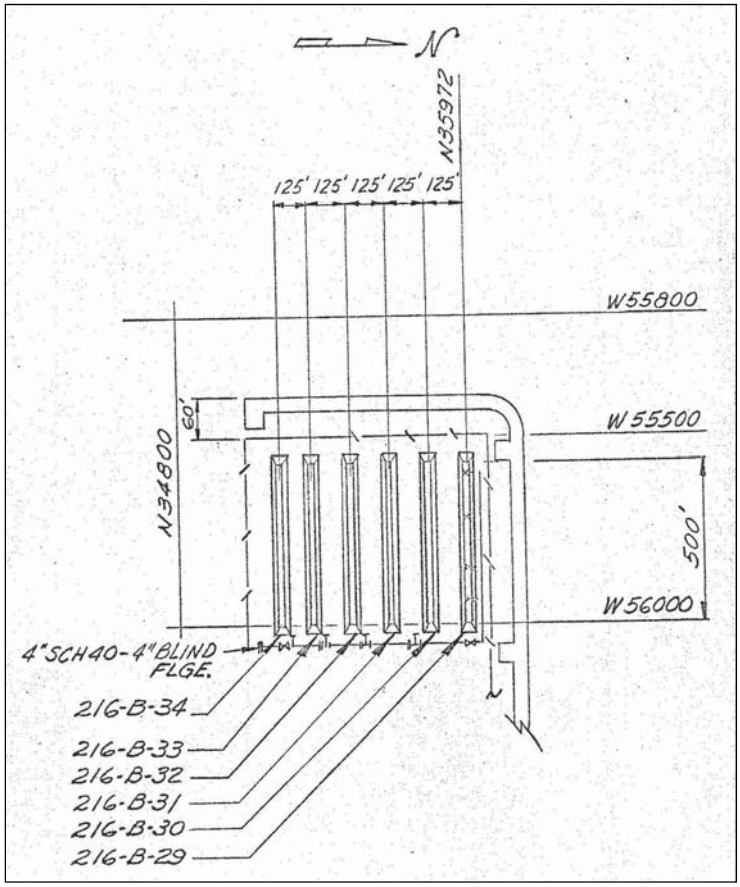
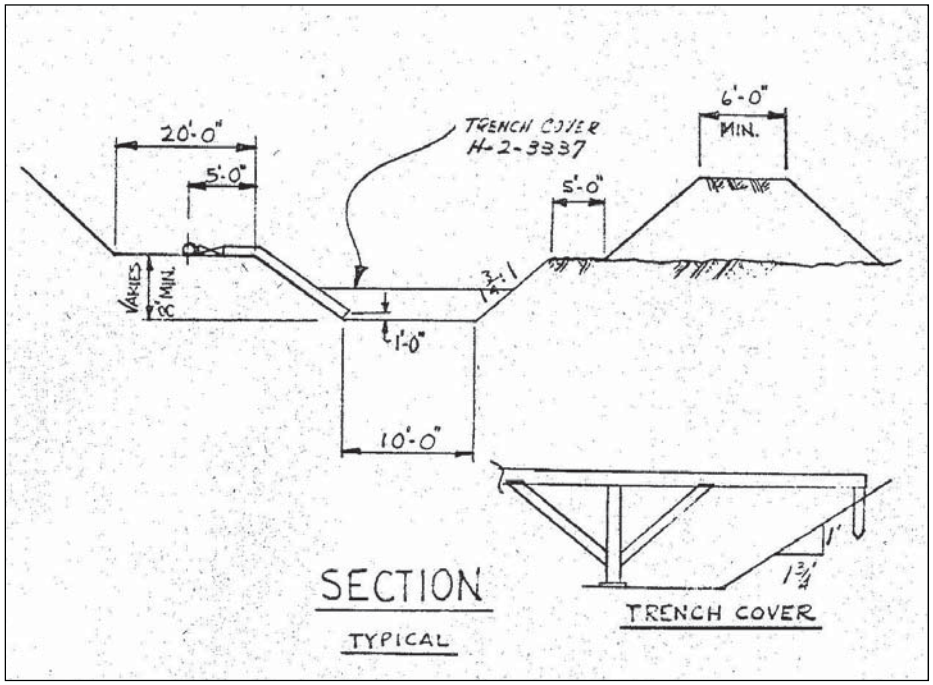


Figure 3. Trench Elevation



Site Description

Site ID: 216-B-32 Trench **Site Type:** Trench
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: August to September 1957
Volume/Mass Discharged: 4.8E6 L (1.3E6 gal)

Waste Site Location and Physical Description: 216-B-32 Trench is located directly south of the 216-B-31 Trench, south of the 200 East Area (across Route 4S) in the BC Cribs and Trenches area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The Trench was divided into two equal sections by an earthen dam 1.5 m (5 ft) high and 1.5 m (5 ft) wide at the top. The Trench had side slope of 1:1.75. Liquid was discharged into the Trench via four 7.6 cm (3 in) Schedule 40 pipes extending laterally from a 10.2 cm (4 in) pipe which ran along the top edge of the Trench. Liquid discharge was controlled by gate valves located at the top of the lateral lines. A cover constructed of 2.5 cm x 15.2 cm (1 in x 6 in) and 5 cm x 10.2 cm (2 in x 4 in) wood framing and sisalkraft paper extended the length of the Trench. The vertical distance from the cover to the Trench bottom was a minimum of 1.5 m (5 ft) (see Figure 2 & Figure 3). When the Trench reached its specific retention capacity the above ground pipeline to the Trench was removed and the Trench was backfilled. The wood frame cover was left in place and probably collapsed under the weight of the overlying soil during the backfilling activities. The removed pipeline was buried in a shallow Trench between 216-B-29 and 216-B-53A.

Waste Site Coordinates:

Lon-573088.17839 Lat-134327.59006

Site Dimensions:

Site Length: 152.4 m (500 ft) (bottom dimension)
Site Width: 3.1 m (10 ft) (bottom dimension)
Site Area: 464.8 m^2 (5000 ft^2)

Site Depth: 2.4 meters (8 ft) minimum
Cover Thickness: 3.0 m (10 ft) minimum, including backfill and stabilization cover

Release Summary: 216-B-32 Trench received 4.8E6 L (1.3E6 gal) of scavenged tributylphosphate (TBP) supernate liquid waste from the 221-U Building during uranium recovery operations. After the uranium was removed, the cesium and strontium content of the effluent was reduced through precipitation by adding ferrocyanide. The waste was received into the trench via above ground transfer lines extending from the 200-E-114-PL pipeline. The waste is liquid process effluent, high in salt and is neutral to basic. The waste contained inorganic compounds such as ferrocyanide, nitrate and phosphate.

$PV_{released}$ = 4.8E+6 L/ (464.8 m^2*106 m*0.3*1000 L/m^3) = 0.32

Therefore, the Trench is assumed to exhibit deep vadose effects.

Related Site Structure(s): The Trench is associated with U Plant uranium recovery process and UPR-200-E-83.

Site Posting: The Trench has been backfilled with clean soil and posted URMA. Concrete AC 540 markers outline the area where the Trenches are located, but do not identify the specific Trench location.

Site Characterization Summary: In May 1958, an Unplanned Release (UPR-200-E-83) occurred when a large area was found to be contaminated with radioactive rabbit feces reading 5,000 to 10,000 counts per minute. A burrow in Trench 216-B-28, containing contaminated salt, was believed to be the source of the material ingested by the rabbits.

In 1969, contaminated Russian thistle was identified growing on some of the BC Trenches. To inhibit weed growth, 45,870 m^3 (60,000 yd^3), approximately 15.2 cm (6 in) of sand and gravel, was placed on top of the Trenches. In 1981, the area was covered with additional top soil, time release herbicides and rodent deterrent. The area was surface stabilized again in 1982.

A surface radiation survey is performed annually.

Potential Contaminants:

Radioactive: Stronium-90, Cesium-137

Non-Radioactive: Nickel Ferrocyanide, Nitrate, Phosphate

References:

WIDS General Summary Report for site 216-B-32
ArcMap
QMap
HW-55176 Part VI Appendix C-29, C-30

Figure 1. ArcMap Image

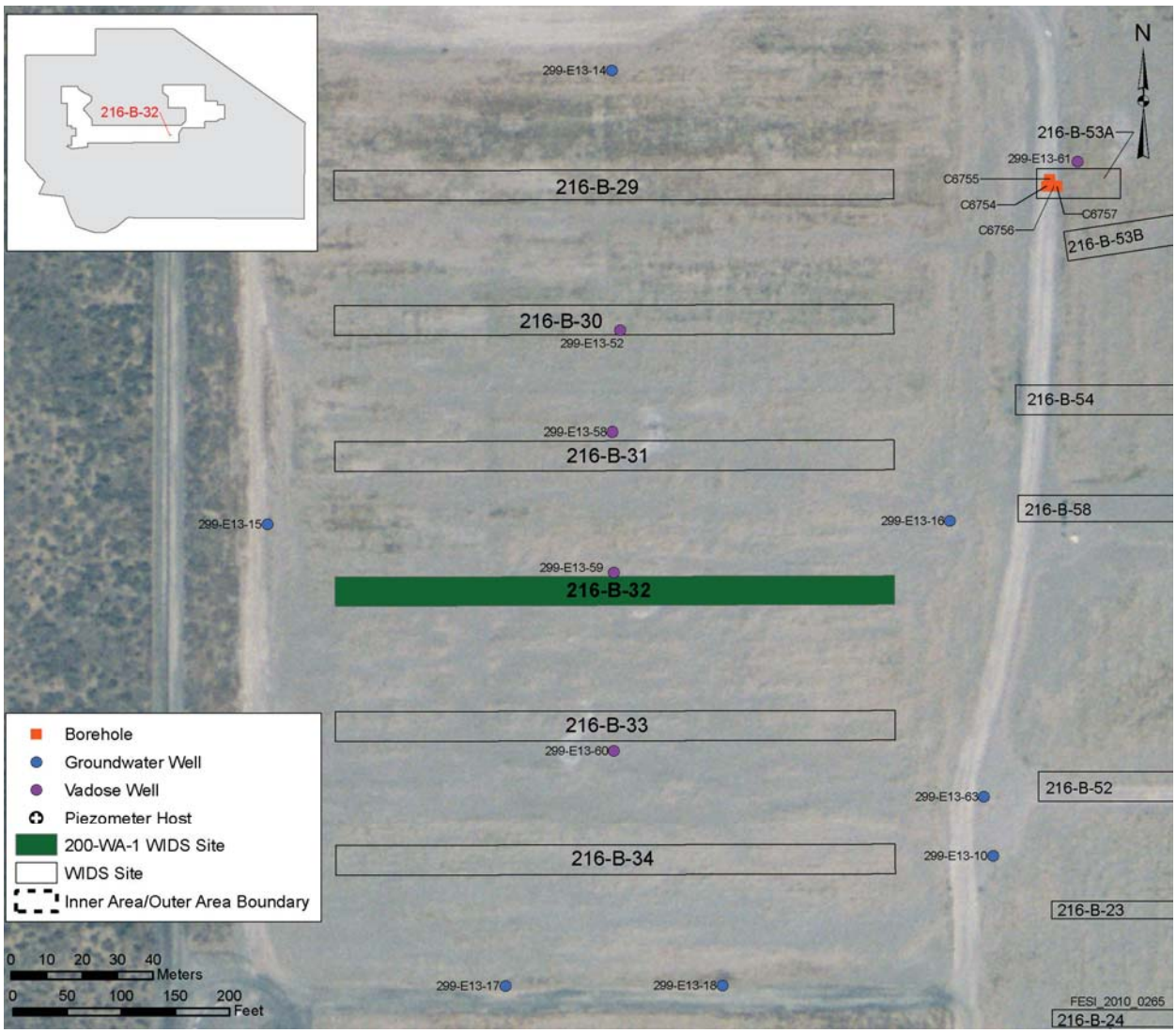


Figure 2. Trench Plan View

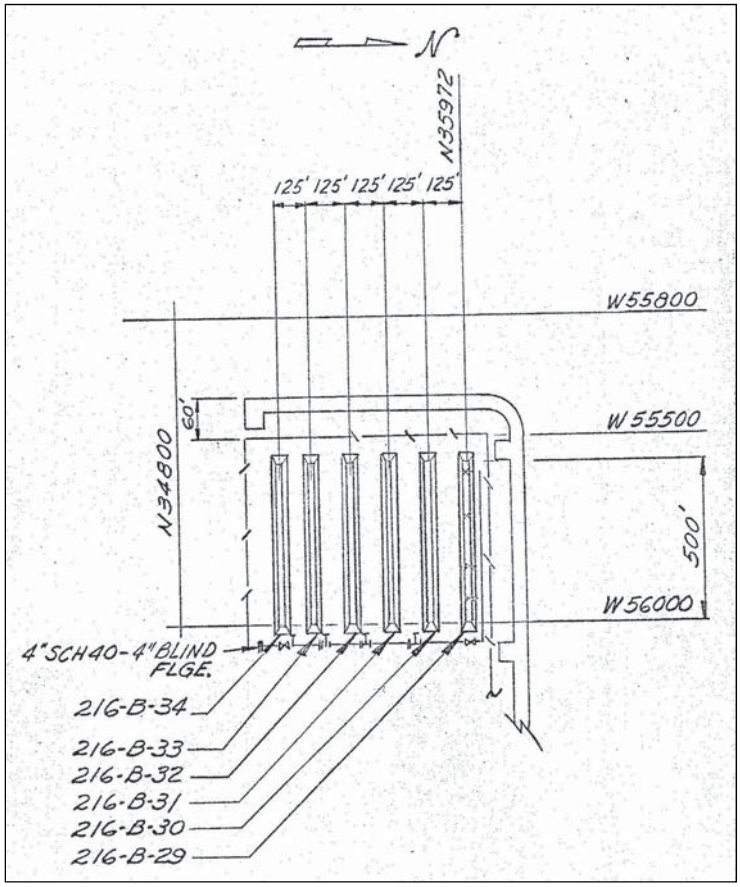
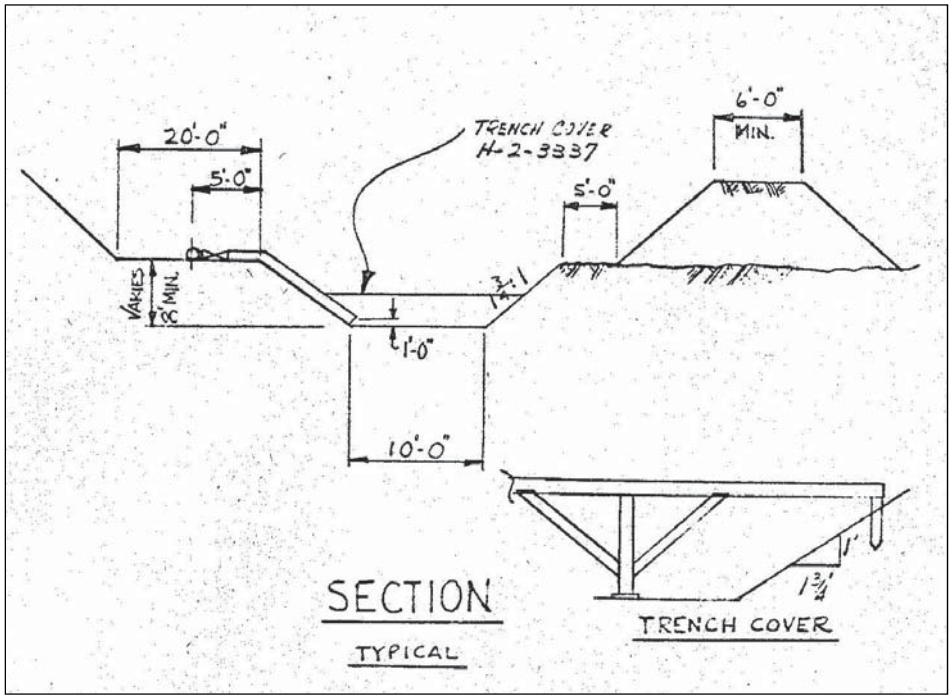


Figure 3. Trench Elevation



Site Description

Site ID: 216-B-33 Trench **Site Type:** Trench
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: September to October 1957
Volume/Mass Discharged: 4.7E6 L (1.3E6 gal)

Waste Site Location and Physical Description: 216-B-33 Trench is located directly south of the 216-B-32 Trench, south of the 200 East Area (across Route 4S) in the BC Cribs and Trenches area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The Trench was divided into two equal sections by an earthen dam 1.5 m (5 ft) high and 1.5 m (5 ft) high at the top. The Trench had side slope of 1:1.75. Liquid was discharged into the Trench via four 7.6 cm (3 in) Schedule 40 pipes extending laterally from a 10.2 cm (4 in) pipe which ran along the top edge of the Trench. Liquid discharge was controlled by gate valves located at the top of the lateral lines. A cover constructed of 2.5 cm x 15.2 cm (1 in x 6 in) and 5 cm x 10.2 cm (2 in x 4 in) wood framing and sisalkraft paper extended the length of the Trench. The vertical distance from the cover to the Trench bottom was a minimum of 1.5 m (5 ft) (see Figure 2 and Figure 3). When the Trench reached its specific retention capacity the above ground pipeline to the Trench was removed and the Trench was backfilled. The wood frame cover was left in place and probably collapsed under the weight of the overlying soil during the backfilling activities. The removed pipeline was buried in a shallow Trench between 216-B-29 and 216-B-53A.

Waste Site Coordinates:

Lon-573088.31255 Lat-134289.49220

Site Dimensions:

Site Length: 152.4 m (500 ft) (bottom dimension)
Site Width: 3.1 m (10 ft) (bottom dimension)
Site Area: 464.8 m^2 (5000 ft^2)

Site Depth: 2.4 meters (8 ft) minimum
Cover Thickness: 3.1 m (10 ft) minimum, including backfill and stabilization cover

Release Summary: 216-B-33 Trench received 4.7E6 L (1.3E6 gal) of scavenged tributylphosphate (TBP) supernate liquid waste from the 221-U Building during uranium recovery operations. After the uranium was removed, the cesium and strontium content of the effluent was reduced through precipitation by adding ferrocyanide. The waste was received into the trench via above ground transfer lines extending from the 200-E-114-PL pipeline. The waste is liquid process effluent, high in salt and is neutral to basic. The waste contained inorganic compounds such as ferrocyanide, nitrate and phosphate.

$$PV_{released} = 4.7E+6\ L/\ (464.8\ m^2*106\ m*0.3*1000\ L/m^3) = 0.32$$

Therefore, the Trench is assumed to exhibit deep vadose effects.

Related Site Structure(s): The Trench is associated with U Plant uranium recovery process and UPR-200-E-83.

Site Posting: The Trench has been backfilled with clean soil and posted URMA. Concrete AC 540 markers outline the area where the Trenches are located, but do not identify the specific Trench location.

Site Characterization Summary: In May 1958, an Unplanned Release (UPR-200-E-83) occurred when a large area was found to be contaminated with radioactive rabbit feces reading 5,000 to 10,000 counts per minute. A burrow in Trench 216-B-28, containing contaminated salt, was believed to be the source of the material ingested by the rabbits.

In 1969, contaminated tumbleweeds were identified growing on some of the BC Trenches. To inhibit weed growth, 45,870 m^3 (60,000 yd^3), approximately 15.2 cm (6 in) of sand and gravel, was placed on top of the Trenches. In 1981, the area was covered with additional top soil, time release herbicides and rodent deterrent. The area was surface stabilized again in 1982.

A surface radiation survey is performed annually.

Potential Contaminants:

Radioactive: Stronium-90, Cesium-137

Non-Radioactive: Nickel Ferrocyanide, Nitrate, Phosphate

References:

WIDS General Summary Report for site 216-B-33
ArcMap
QMap
HW-55176 Part VI Appendix C-29, C-30

Figure 1. ArcMap Image

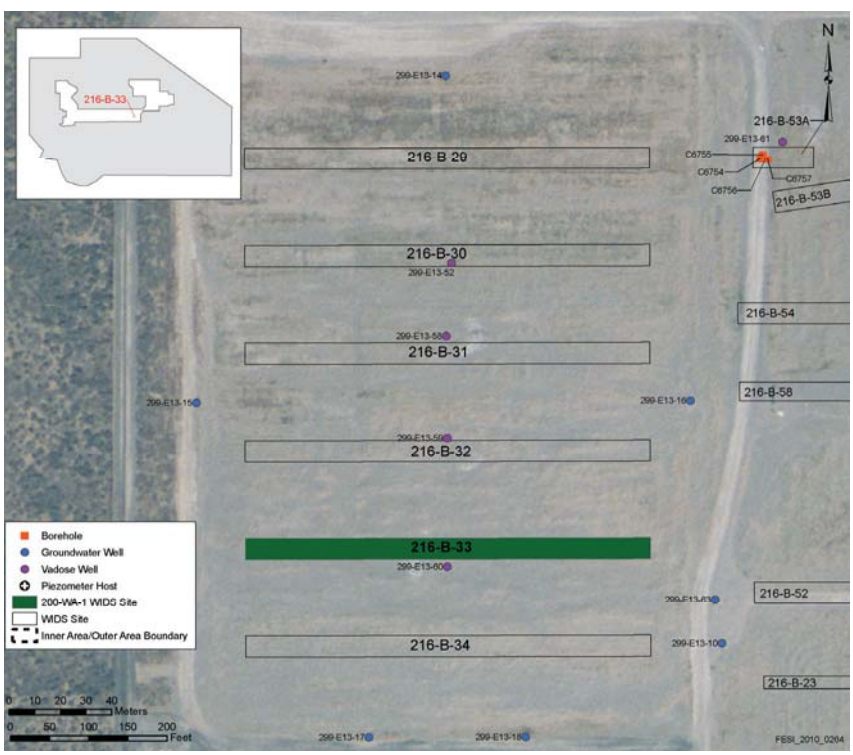


Figure 2. Trench Plan View

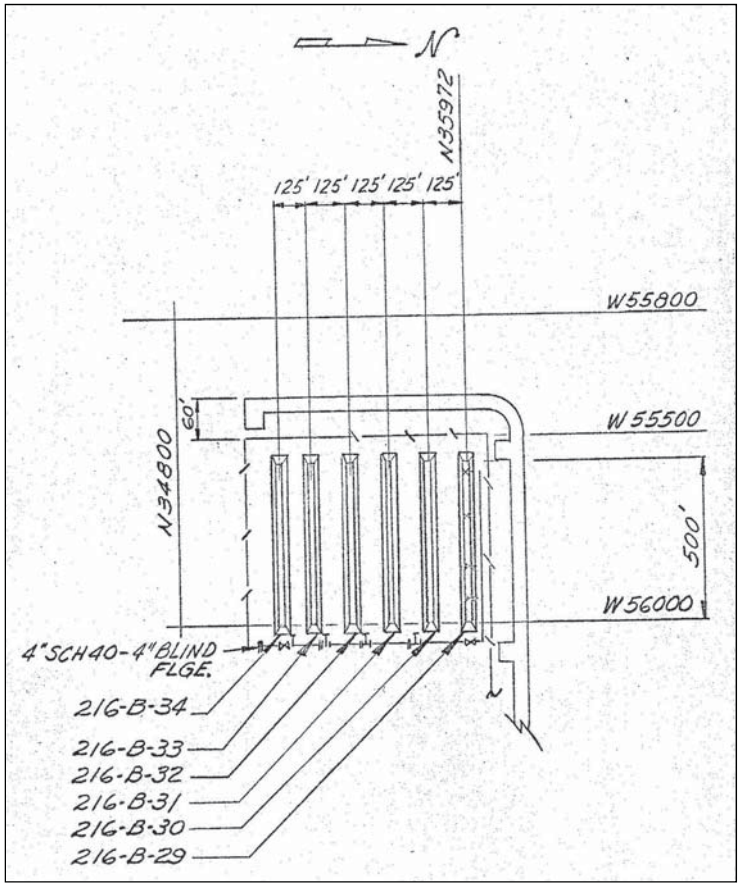
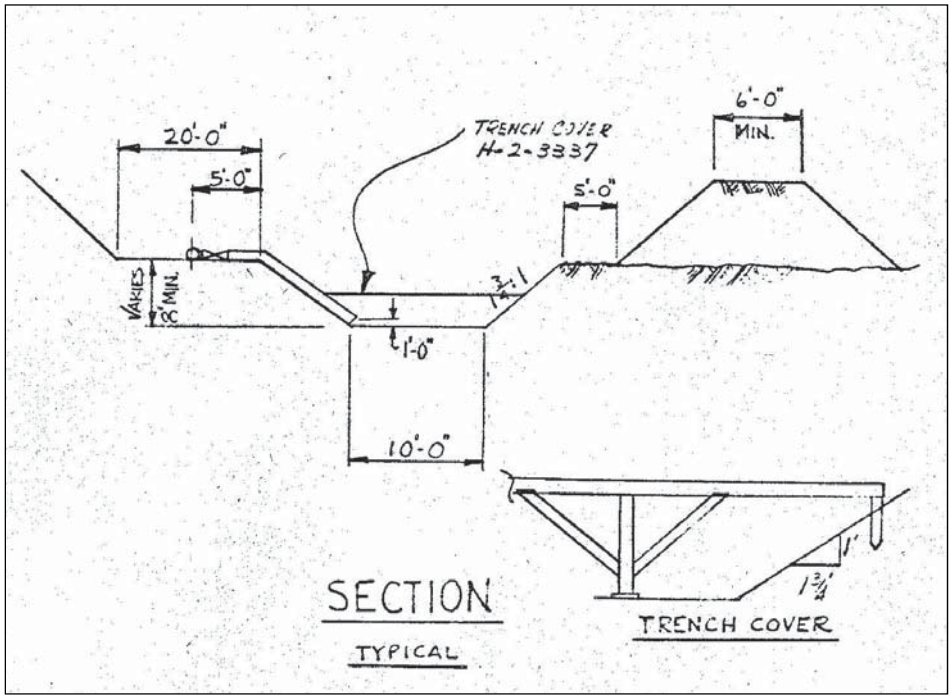


Figure 3. Trench Elevation



Site Description

Site ID: 216-B-34 Trench **Site Type:** Trench
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: October 1957
Volume/Mass Discharged: 4.9E6 L (1.3E6 gal)

Waste Site Location and Physical Description: 216-B-34 Trench is located directly south of the 216-B-33 Trench, south of the 200 East Area (across Route 4S) in the BC Cribs and Trenches area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The Trench was divided into two equal sections by an earthen dam 1.5 m (5 ft) high and 1.5 m (5 ft) wide at the top. The Trench had side slope of 1:1.75. Liquid was discharged into the Trench via four 7.6 cm (3 in) Schedule 40 pipes extending laterally from a 10.2 cm (4 in) pipe which ran along the top edge of the Trench. Liquid discharge was controlled by gate valves located at the top of the lateral lines. A cover constructed of 2.5 cm x 15.2 cm (1 in x 6 in) and 5 cm x 10.2 cm (2 in x 4 in) wood framing and sisalkraft paper extended the length of the Trench. The vertical distance from the cover to the Trench bottom was a minimum of 1.5 m (5 ft) (see Figure 2 & Figure 3). When the Trench reached its specific retention capacity the above ground pipeline to the Trench was removed and the Trench was backfilled. The wood frame cover was left in place and probably collapsed under the weight of the overlying soil during the backfilling activities. The removed pipeline was buried in a shallow Trench between 216-B-29 and 216-B-53A.

Waste Site Coordinates:

Lon-573088.42216 Lat-134251.39817

Site Dimensions:

Site Length: 152.4 m (500 ft) (bottom dimension)
Site Width: 3.1 m (10 ft) (bottom dimension)
Site Area: 464.8 m^2 (5000 ft^2)

Site Depth: 2.4 meters (8 ft) minimum
Cover Thickness: 3.1 m (10 ft) minimum, including backfill and stabilization cover

Release Summary: 216-B-34 Trench received 4.9E6 L (1.3E6 gal) of scavenged tributylphosphate (TBP) supernate liquid waste from the 221-U Building during uranium recovery operations. After the uranium was removed, the cesium and strontium content of the effluent was reduced through precipitation by adding ferrocyanide. The waste was received into the trench via above ground transfer lines extending from the 200-E-114-PL pipeline. The waste is liquid process effluent, high in salt and is neutral to basic. The waste contained inorganic compounds such as ferrocyanide, nitrate and phosphate.

$PV_{released}$ = 4.9E+6 L/ (464.8 m^2*106 m*0.3*1000 L/m^3) = 0.33

Therefore, the Trench is assumed to exhibit deep vadose effects.

Related Site Structure(s): The Trench is associated with U Plant uranium recovery process and UPR-200-E-83.

Site Posting: The Trench has been backfilled with clean soil and posted URMA. Concrete AC 540 markers outline the area where the Trenches are located, but do not identify the specific Trench location.

Site Characterization Summary: In May 1958, an Unplanned Release (UPR-200-E-83) occurred when a large area was found to be contaminated with radioactive rabbit feces reading 5,000 to 10,000 counts per minute. A burrow in Trench 216-B-28, containing contaminated salt, was believed to be the source of the material ingested by the rabbits.

In 1969, contaminated tumbleweeds were identified growing on some of the BC Trenches. To inhibit weed growth, 45,870 m^3 (60,000 yd^3), approximately 15.2 cm (6 in) of sand and gravel, was placed on top of the Trenches. In 1981, the area was covered with additional top soil, time release herbicides and rodent deterrent. The area was surface stabilized again in 1982.

A radiation survey conducted in January 2006 detected contaminated rabbit feces, reading 8,000 counts per minute. Evidence of severe wind erosion was also noted.

The Trench is monitored by groundwater wells 299-E13-10, 299-E13-17 and 299-E13-18. Data indicate a breakthrough to the groundwater had not occurred at the Trench as of June 1977. A surface radiation survey is performed annually.

Potential Contaminants:

Radioactive: Stronium-90, Cesium-137

Non-Radioactive: Nickel Ferrocyanide, Nitrate, Phosphate

References:

WIDS General Summary Report for site 216-B-34
ArcMap
QMap
HW-55176 Part VI Appendix C-29, C-30

Figure 1. ArcMap Image

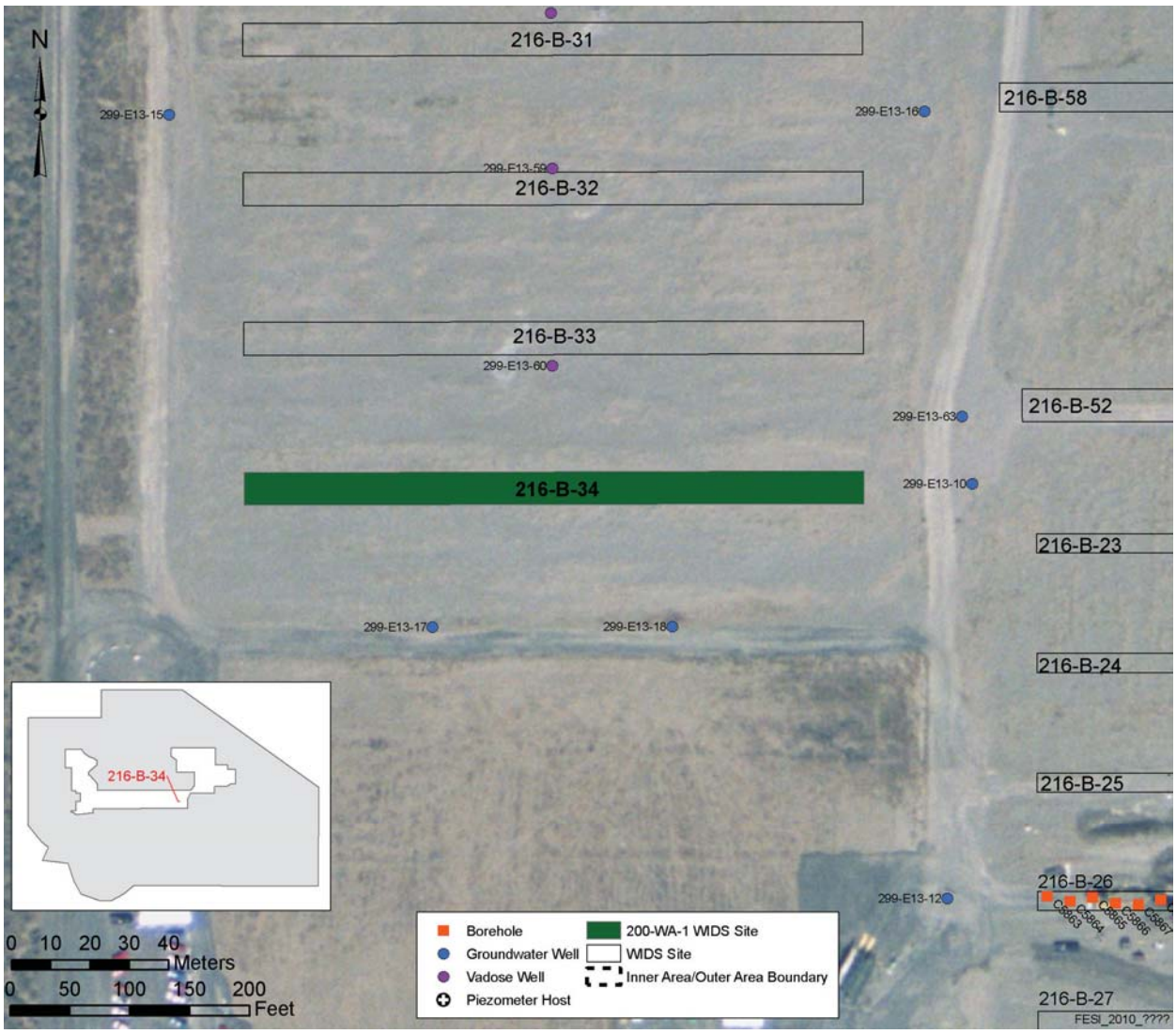


Figure 2. Trench Plan View

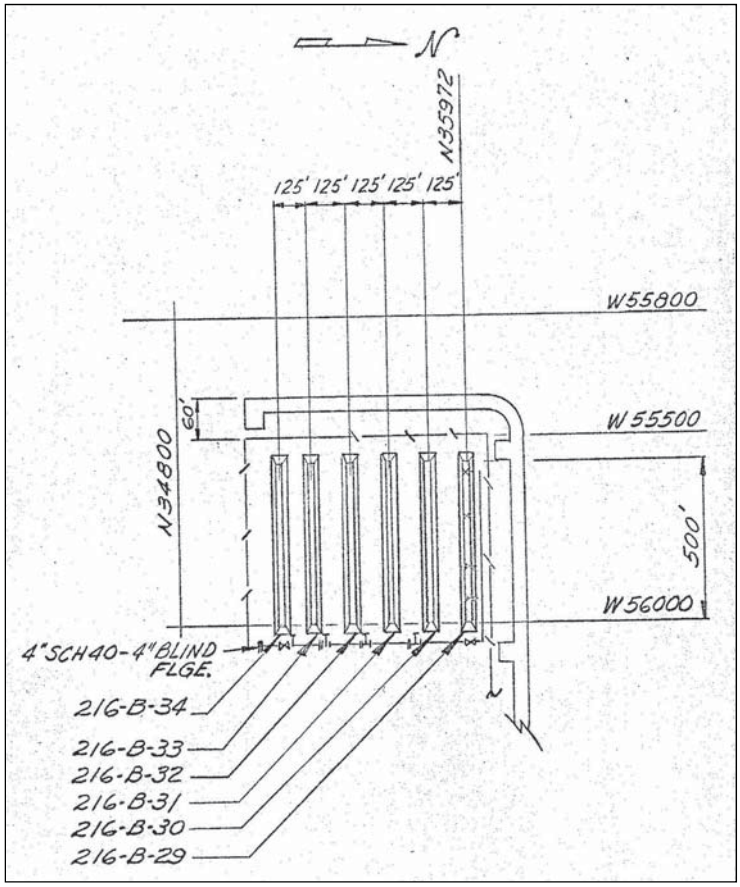
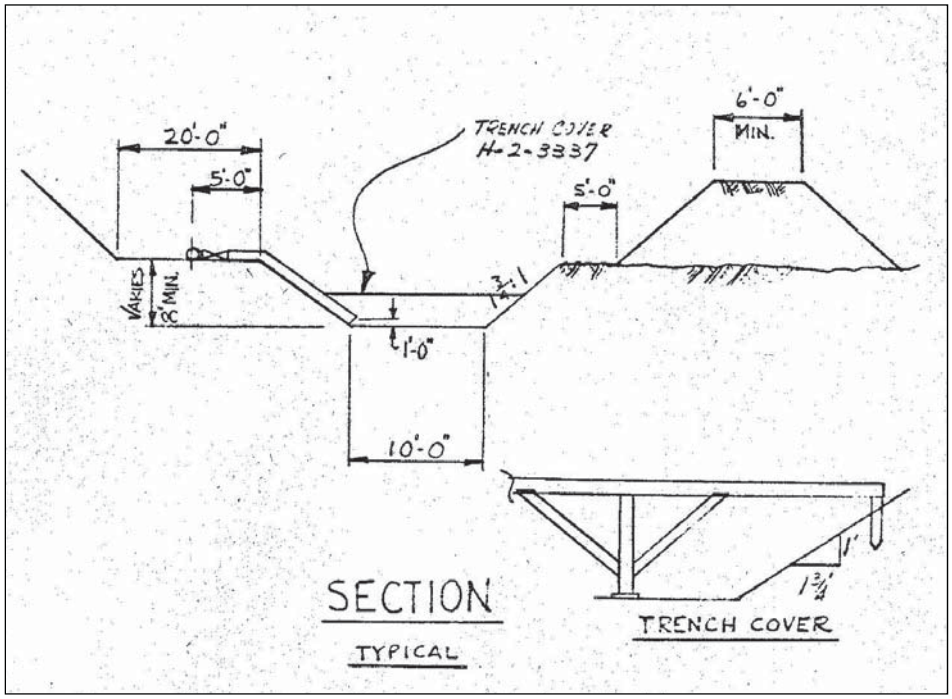


Figure 3. Trench Elevation



Site Description

Site ID: 216-B-52 Trench **Site Type:** Trench
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: December 1957 and January 1958
Volume/Mass Discharged: 8.5E6 L (2.3E6 gal)

Waste Site Location and Physical Description: 216-B-52 Trench is located immediately north of the 216-B-32 Trench, south of the 200 East Area (across Route 4S) in the BC Cribs and Trenches area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The Trench was divided into two equal sections by an earthen dam 1.5 m (5 ft) high and 1.5 m (5 ft) wide at the top. The Trench had side slope of 1.25:1. A wood framed and sisalkraft paper cover extended the length of the Trench (see Figure 2 & Figure 3). When the Trench reached its specific retention capacity the above ground pipeline to the Trench was removed and the Trench was backfilled.

Waste Site Coordinates:

Lon-573298.62500 Lat-134272.54685

Site Dimensions:

Site Length: 176.8 m (580 ft) (bottom dimension)
Site Width: 3.1 m (10 ft) (bottom dimension)
Site Area: 548.1 m^2 (5800 ft^2)

Site Depth: 2.4 meters (8 ft) minimum
Cover Thickness: 3.0 m (10 ft) minimum, including backfill and stabilization cover

Release Summary: 216-B-52 Trench received 8.5E6 L (2.3E6 gal) of scavenged tributylphosphate (TBP) supernate liquid waste from the 221-U Building during uranium recovery operations. After the uranium was removed, the cesium and strontium content of the effluent was reduced through precipitation by adding ferrocyanide. The waste was received into the trench via above ground transfer lines extending from the 200-E-114-PL pipeline. The waste is liquid process effluent, high in salt and is neutral to basic. The waste contained inorganic compounds such as ferrocyanide, nitrate and phosphate.

$PV_{released}$ = 8.5E6 L/ (548.1 m^2*106 m*0.3*1000 L/m^3) = 0.50

Therefore, the Trench is assumed to exhibit deep vadose effects.

Related Site Structure(s): The Trench is associated with U Plant uranium recovery process and UPR-200-E-83.

Site Posting: The Trench has been backfilled with clean soil and posted URMA. Concrete AC 540 markers outline the area where the Trenches are located, but do not identify the specific Trench location.

Site Characterization Summary: In May 1958, an Unplanned Release (UPR-200-E-83) occurred when a large area was found to be contaminated with radioactive rabbit feces reading 5,000 to 10,000 counts per minute. A burrow in Trench 216-B-28, containing contaminated salt, was believed to be the source of the material ingested by the rabbits.

In 1969, contaminated tumbleweeds were identified growing on some of the BC Trenches. To inhibit weed growth, 45,870 m^3 (60,000 yd^3), approximately 15.2 cm (6 in) of sand and gravel, was placed on top of the Trenches. In 1981, the area was covered with additional top soil, time release herbicides and rodent deterrent. The area was surface stabilized again in 1982.

A surface radiation survey is performed annually.

Potential Contaminants:

Radioactive: Stronium-90, Cesium-137

Non-Radioactive: Nickel Ferrocyanide, Nitrate, Phosphate

References:

WIDS General Summary Report for site 216-B-52
ArcMap
QMap
HW-55176 Part VI Appendix C-28, C-29, C-30

Figure 1. ArcMap Image

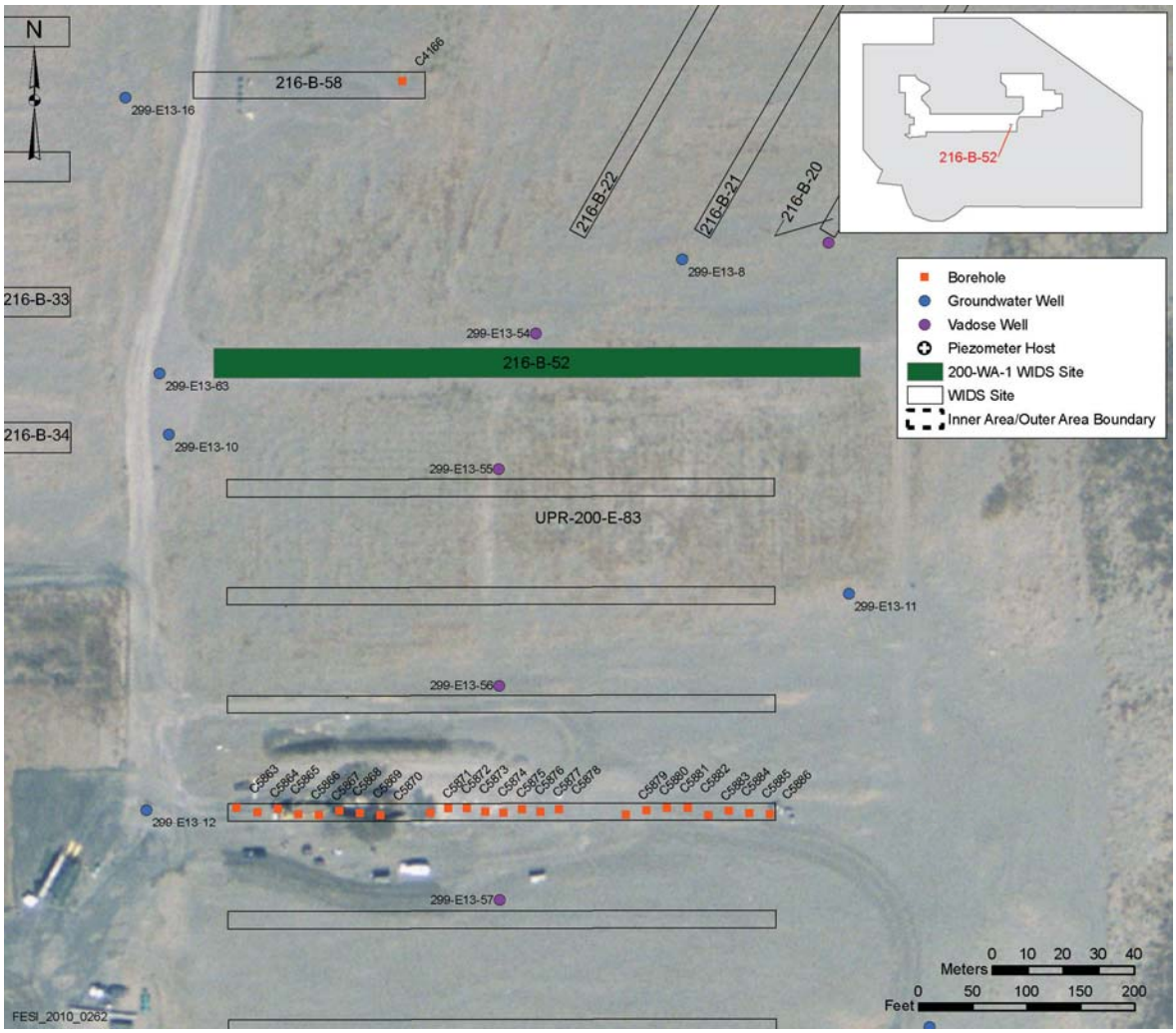


Figure 2. Trench Plan View

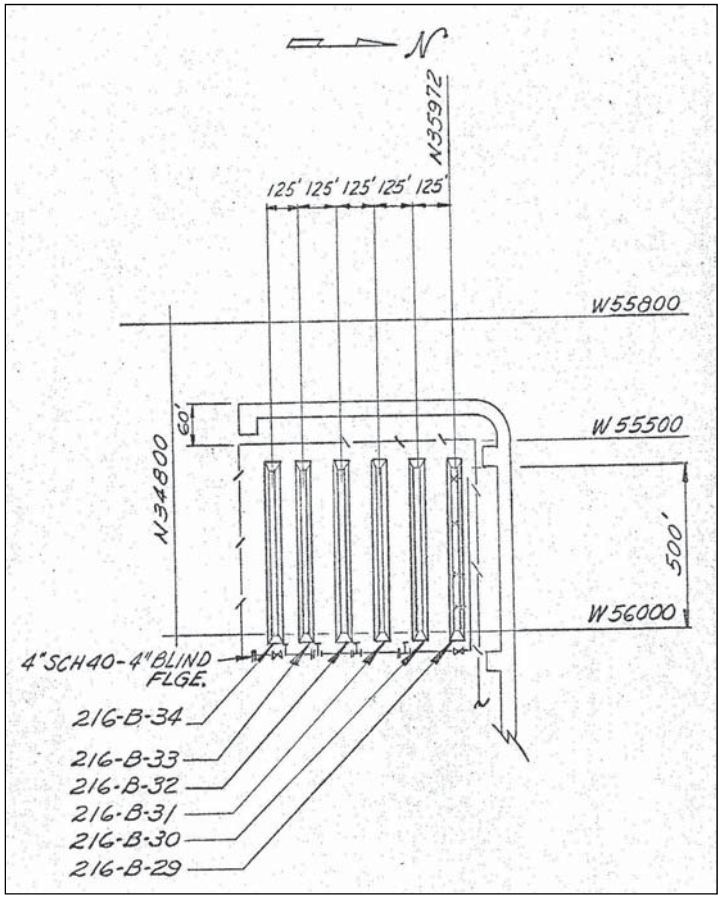


Figure 3. Trench Elevation

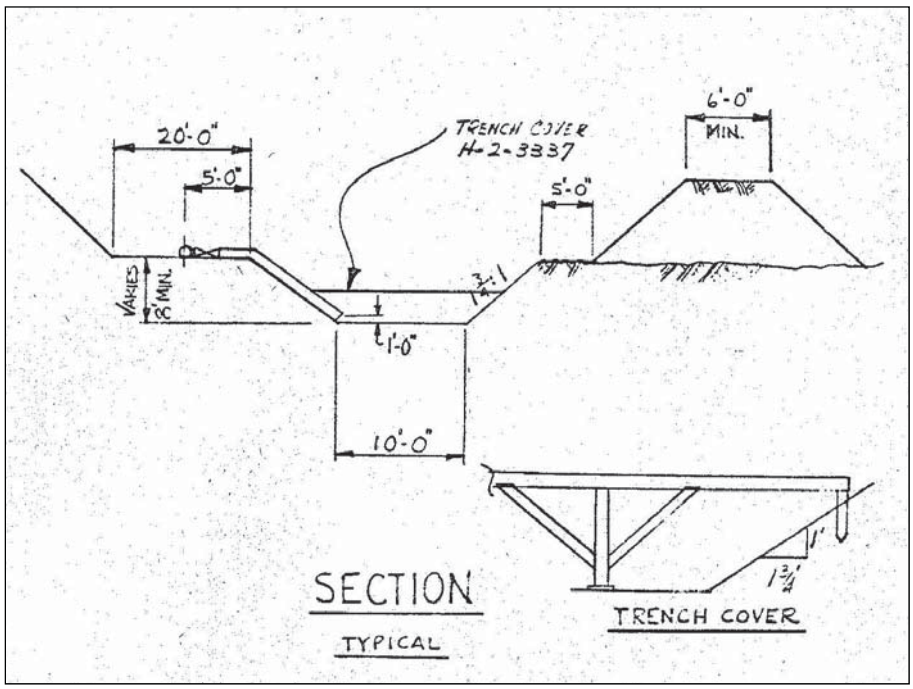
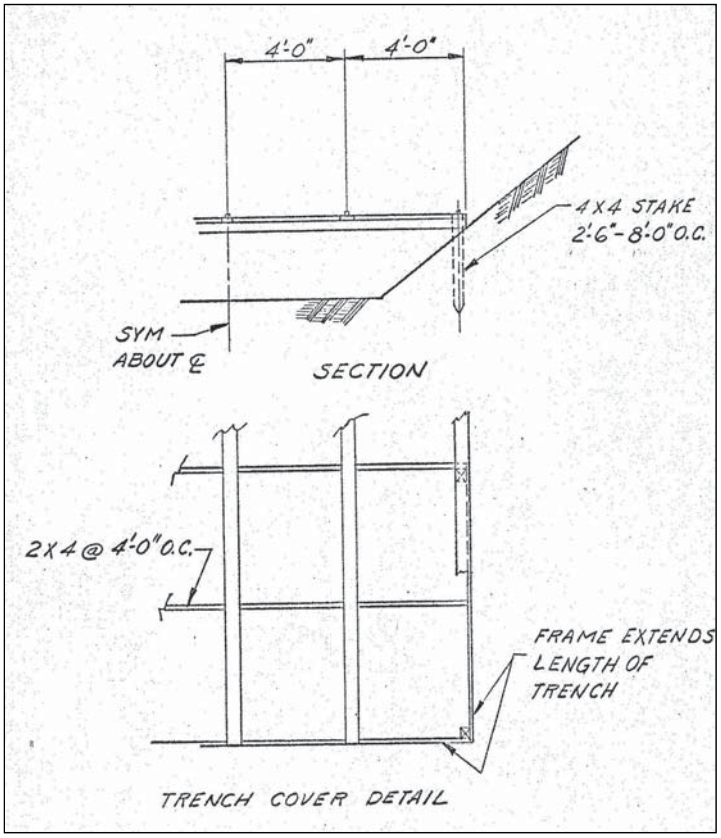


Figure 4. Trench Cover Detail



Site Description

Site ID: 216-B-53A Trench **Site Type:** Trench
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: October and November 1965 (RHO-CD-673)
Volume/Mass Discharged: 5.49E+5 L (1.45E+5 gal)

Waste Site Location and Physical Description: 216-B-53A Trench is located south of the 200 East Area (across Route 4S) in the BC Cribs and Trenches area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The trench was an open excavation divided into two sections by an earthen dam at the center (see Figure 2). The dam was 1.5 m (5 ft) high and 13 cm (5 in) wide at the top. The Trench had side slope of 1.75:1. Use of the trench was discontinued when specific retention capacity was reached.

Waste Site Coordinates:

E-73218.87502 N-134442.20313

Site Dimensions:

Site Length: 18.3 m (60 ft) (bottom dimension) Site Depth: 3.1 m (10 ft) minimum
Site Width: 3.1 m (10 ft) (bottom dimension) Cover Thickness: 1.5 m (5 ft) overburden depth
Site Area: 56.7 m^2 (600 ft^2)

Release Summary: 216-B-53A Trench received 5.49E+5 L (1.45E+5 gal) of neutral to basic liquid waste from a liquid release at the Plutonium Recycle Test Reactor (PRTR) in the 300 Area. Contaminated liquid was transported to the 200 Area via tanker trucks. Of all the specific retention trenches at this location, only 216-B-53A is considered to be a Transuranic (TRU) waste site, containing 100 grams of plutonium. On September 29, 1965 an accident occurred in the 300 Area when test fuel at the PRTR in the 309 building failed, causing failure of the process tube which contaminated the 309 reactor's moderator coolant system. The Rupture Loop Ion Exchange (RLIX) test loop and the PRTR main cleanup system were both contaminated with residual plutonium fuel and fission products. Nearly 3.8E+6 L (1.0 E+6 gal) of light water was initially contaminated. However additional cooling water was added over many days following the accident and the contaminated water volume rose to nearly 53E+6 L (14E+6 gal). The contaminated effluent was transferred to the 340 facility and then transported by tanker trucks to the 200 Area.

It is not known if the PRTR waste was trucked to a 200 Area tank farm and transported to the Trench through underground pipeline to the BC Area or if the trucks emptied the waste directly into the trench. It is possible additional piping was used to unload liquid waste from tanker trucks to the Trench.

$PV_{released}$ = 5.49E+5 L/ (56.7 m^2*106 m*0.3*1000 L/m^3) = 0.30

Therefore, the Trench is assumed to exhibit deep vadose effects.

Related Site Structure(s): The Trench is associated with the 309 building, the 340 facility and an incident that occurred in the 309 building ion exchange column (309-W S-2).

Site Posting: The Trench has been backfilled and covered with clean soil and posted Underground Radioactive Material. Concrete AC 540 markers outline the area where the trenches are located, but do not identify the specific trench location.

Site Characterization Summary: The trench was characterized in 2008 with Direct Push Technology (DPT) and gamma logging.

In May 1958, an Unplanned Release (UPR-200-E-83) occurred when a large area was found to be contaminated with radioactive rabbit feces reading 5,000 to 10,000 counts per minute. A burrow in Trench 216-B-28, containing contaminated salt, was believed to be the source of the material ingested by the rabbits.

In 1969, contaminated Russian thistle was identified growing on Trenches 216-B-53A, 216-B-53B and 216-B-54. The maximum dose rate was 1500 millirem/hr. To inhibit weed growth, 45,870 m^3 (60,000 yd^3), approximately 15.2 cm (6 in) of sand and gravel, was placed on top of the Trenches. In 1981, the area was covered with additional top soil, time release herbicides and rodent deterrent.

A surface radiation survey is performed annually.

Potential Contaminants:

Radioactive: Plutonium

Non-Radioactive: Undetermined

References:

WIDS General Summary Report for site 216-B-53A
RHO-CD-673 Part III S-200E
ArcMap
QMap

Figure 1. ArcMap Image

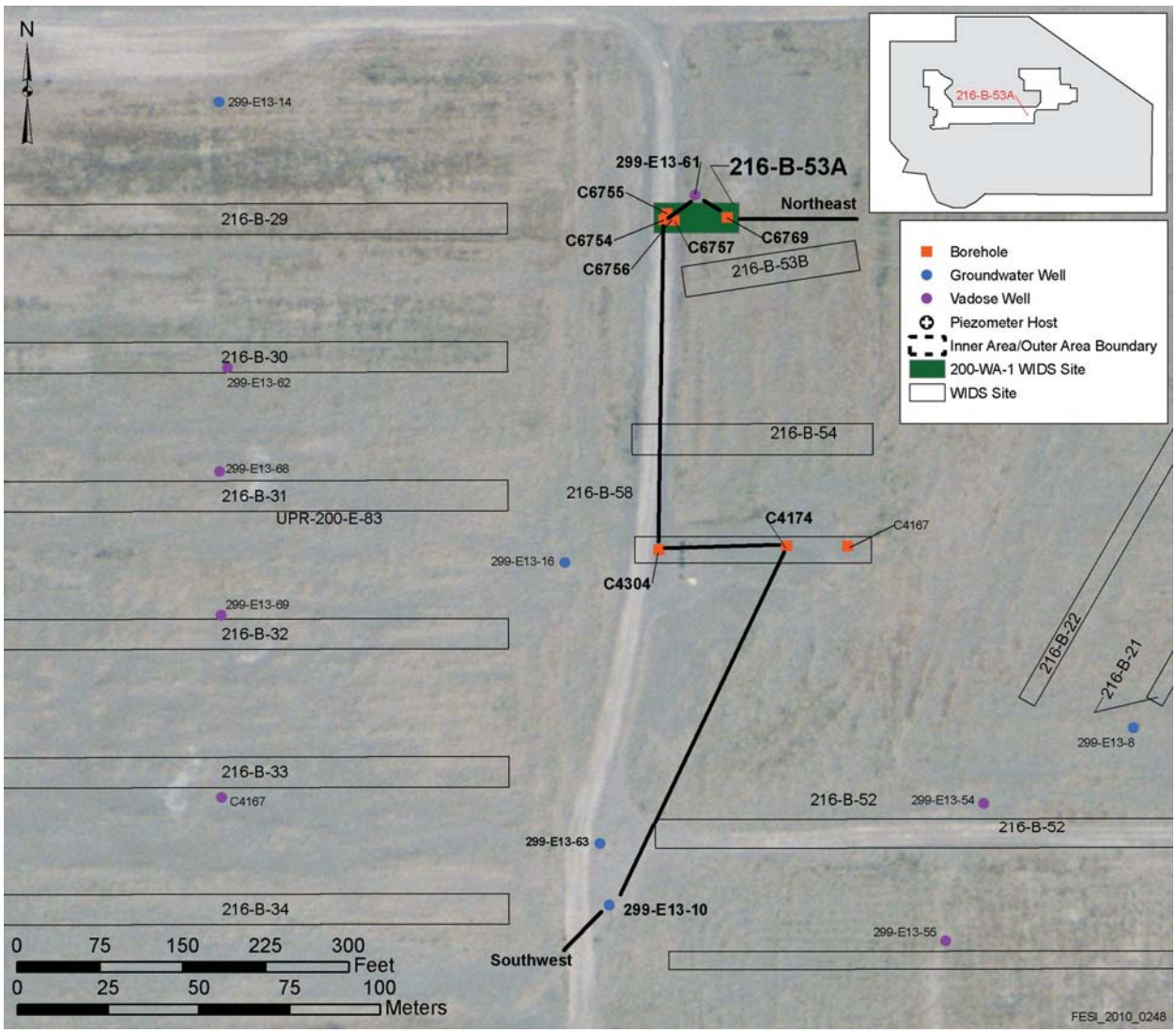
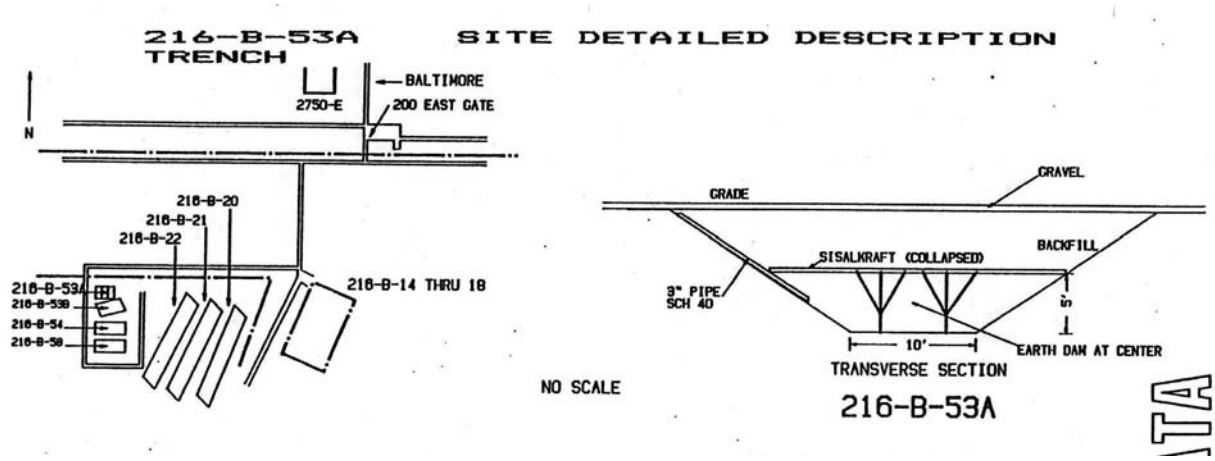


Figure 2. Plan and Elevation View



Site Description

Site ID: 216-B-53B Trench **Site Type:** Trench
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: November 1962 to March 1963 (RHO-CD-673)
Volume/Mass Discharged: 15.1E3 L (4.0E3 gal)

Waste Site Location and Physical Description: 216-B-53B Trench is located south of the 200 East Area (across Route 4S) in the BC Cribs and Trenches area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The Trench was an open excavation divided into two sections by an earthen dam at the center (see Figure 2). The dam was 1.5 m (5 ft) high and 13 cm (5 in) wide at the top. The Trench had side slope of 1.75:1. Use of the Trench was discontinued when specific retention capacity was reached.

Waste Site Coordinates:

Lon-573239.34367 Lat-134428.24222

Site Dimensions:

Site Length: 45.7 m (150 ft) (bottom dimension) Site Depth: 3.1 m (10 ft) minimum
Site Width: 3.1 m (10 ft) (bottom dimension) Cover Thickness: 1.5 m (5 ft) overburden depth
Site Area: 141.7 m^2 (1000 ft^2)

Release Summary: 216-B-53B Trench received 15.1E3 L (4.0E3 gal) of liquid waste from the 300 Area Hanford Laboratory Operations. The waste was low salt and neutral to basic. The liquid waste was sent to the 340 facility via the process sewer. Waste that was above the release limits for the 300 Area Process Ponds was sent by tanker truck to the 200 Area for disposal. It is not known if the 300 Area waste was trucked to a 200 Area tank farm and transported to this Trench through the underground pipeline to the BC area or if the trucks emptied the waste directly into the Trench. It is possible additional piping was used to unload liquid waste from tanker trucks to the trench.

$PV_{released}$ = 15.1E3 L/ (141.7 m^2*106 m*0.3*1000 L/m^3) = 0.003

Therefore, the Trench is assumed to exhibit no deep vadose effects.

Related Site Structure(s): The Trench is associated with the 300 Area laboratory waste and the 340 facility.

Site Posting: The Trench has been backfilled and covered with clean soil and posted URMA. Concrete AC 540 markers outline the area where the Trenches are located, but do not identify the specific Trench location.

Site Characterization Summary: In May 1958, an Unplanned Release (UPR-200-E-83) occurred when a large area was found to be contaminated with radioactive rabbit feces reading 5,000 to 10,000 counts per minute. A burrow in Trench 216-B-28, containing contaminated salt, was believed to be the source of the material ingested by the rabbits.

In 1969, contaminated Russian thistle was identified growing on Trenches 216-B-53A, 216-B-53B and 216-B-54. The maximum dose rate was 1500 millirem per hour. To inhibit weed growth, 45,870 m^3 (60,000 yd^3), approximately 15.2 cm (6 in) of sand and gravel, was placed on top of the Trenches. In 1981, the area was covered with additional top soil, time release herbicides and rodent deterrent.

A surface radiation survey is performed annually.

Potential Contaminants:

Radioactive: Undetermined

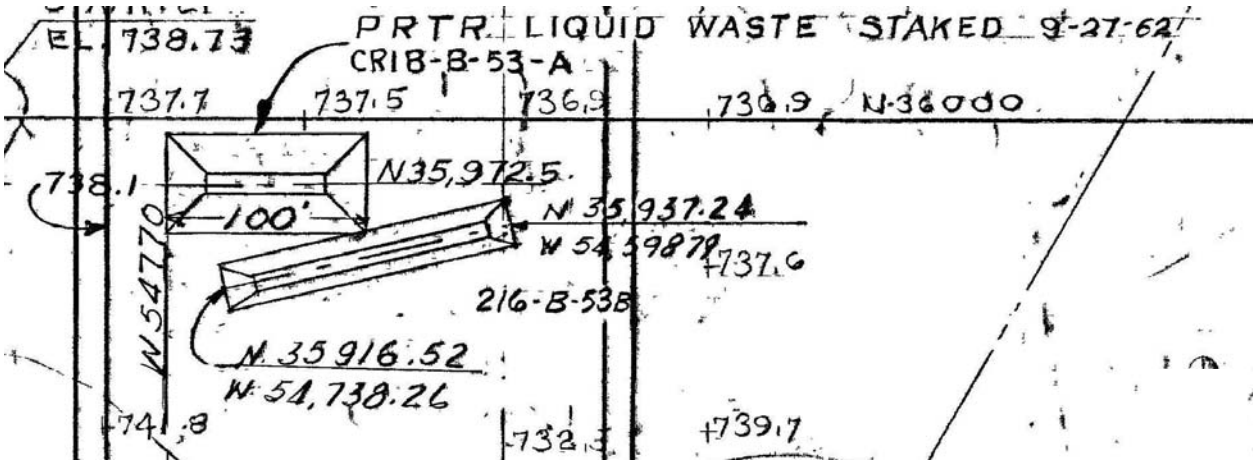
Non-Radioactive: Undetermined

References:

WIDS General Summary Report for site 216-B-53B
ArcMap
QMap
RHO-CD-673 Part III S-200E
Drawing H-2-3336

Figure 1. ArcMap Image

Figure 2. Plan View



Site Description

Site ID: 216-B-54 Trench **Site Type:** Trench
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: March 1963 to October 1963
Volume/Mass Discharged: 99.9E+4 L (26.4E+4 gal)

Waste Site Location and Physical Description: 216-B-54 Trench is located south of the 200 East Area (across Route 4S) in the BC Cribs and Trenches area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The Trench was an open excavation divided into two sections by an earthen dam at the center (see Figure 2). The dam was 1.5 m (5 ft) high and 13 cm (5 in) wide at the top. The trench had side slope of 1.75:1. Use of the trench was discontinued when specific retention capacity was reached.

Waste Site Coordinates:

E-573234.32771 N-134381.30149

Site Dimensions:

Site Length: 61 m (200 ft) (bottom dimension) Site Depth: Not Specified
Site Width: 3.1 m (10 ft) (bottom dimension) Cover Thickness: 2.4 m (8 ft) overburden depth
Site Area: 189.1 m^2 (2000 ft^2)

Release Summary: 216-B-54 Trench received 99.9E+4 L (26.4E+4 gal) of liquid waste from the 300 Area Hanford Laboratory Operations. The waste was low salt and neutral to basic. The liquid waste was sent to the 340 facility via the process sewer. Waste that was above the release limits for the 300 Area Process Ponds was sent by tanker truck to the 200 Area for disposal. It is not known if the 300 Area waste was trucked to a 200 Area tank farm and transported to this Trench through the underground pipeline to the BC area or if the trucks emptied the waste directly into the Trench. It is possible additional piping was used to unload liquid waste from tanker trucks to the trench.

$PV_{released}$ = 99.9E+4 L/ (189.1 m^2*106 m*0.3*1000 L/m^3) = 0.16

Therefore, the Trench is assumed to exhibit no deep vadose effects.

Related Site Structure(s): The Trench is associated with the 300 Area laboratory facilities and the 340 facility.

Site Posting: The Trench has been backfilled and covered with clean soil and posted URM. Concrete AC 540 markers outline the area where the trenches are located, but do not identify the specific trench location.

Site Characterization Summary: In May 1958, an Unplanned Release (UPR-200-E-83) occurred when a large area was found to be contaminated with radioactive rabbit feces reading 5,000 to 10,000 counts per minute. A burrow in Trench 216-B-28, containing contaminated salt, was believed to be the source of the material ingested by the rabbits.

In 1969, contaminated Russian thistle was identified growing on Trenches 216-B-53A, 216-B53B and 216-B-54. The maximum dose rate was 1500 millirem/hr. To inhibit weed growth, 45,870 m^3 (60,000 yd^3), approximately 15.2 cm (6 in) of sand and gravel, was placed on top of the Trenches. In 1981, the area was covered with additional top soil, time release herbicides and rodent deterrent.

A surface radiation survey is performed annually.

Potential Contaminants:

Radioactive: Undetermined

Non-Radioactive: Undetermined

References:

WIDS General Summary Report for site 216-B-54
ArcMap
QMap
RHO-CD-673 Part III S-200E
H-2-3336

Figure 1. ArcMap Image

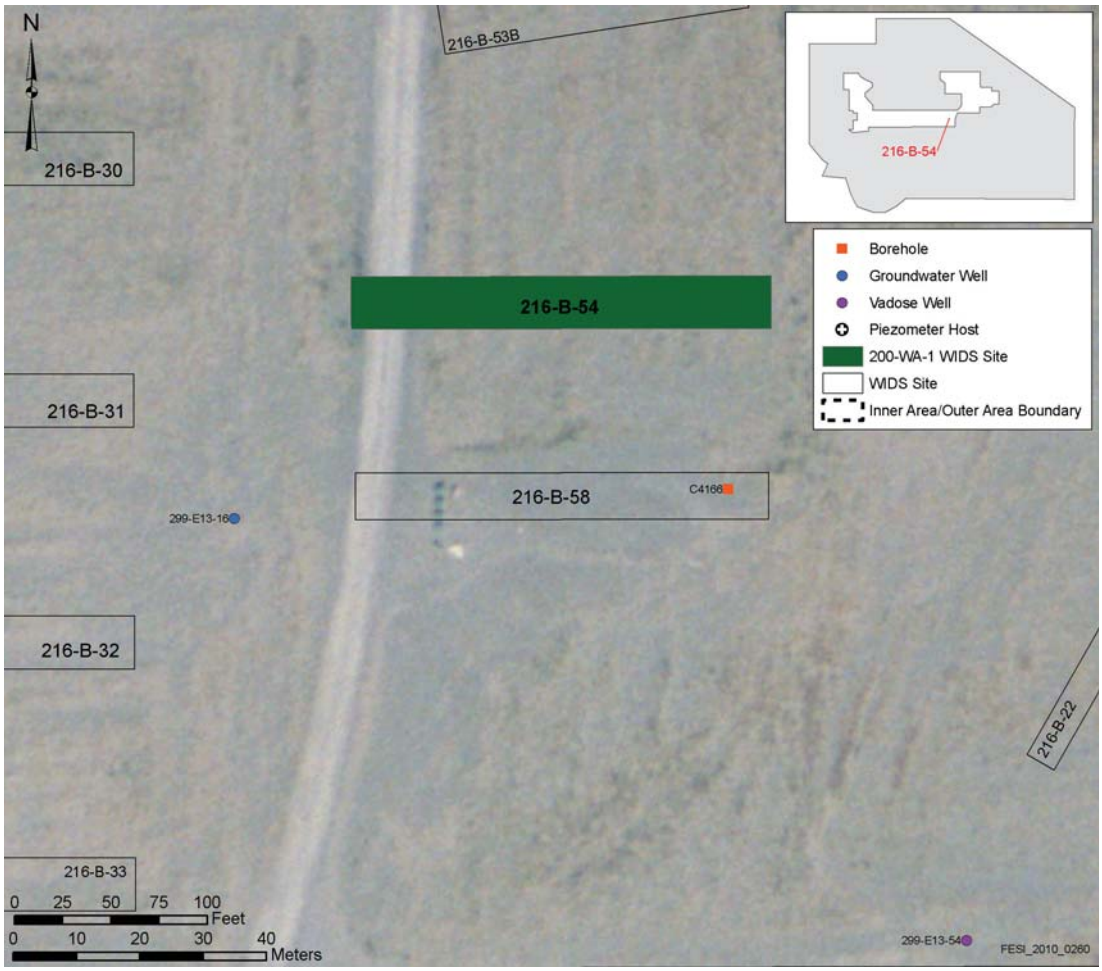


Figure 2. Plan View

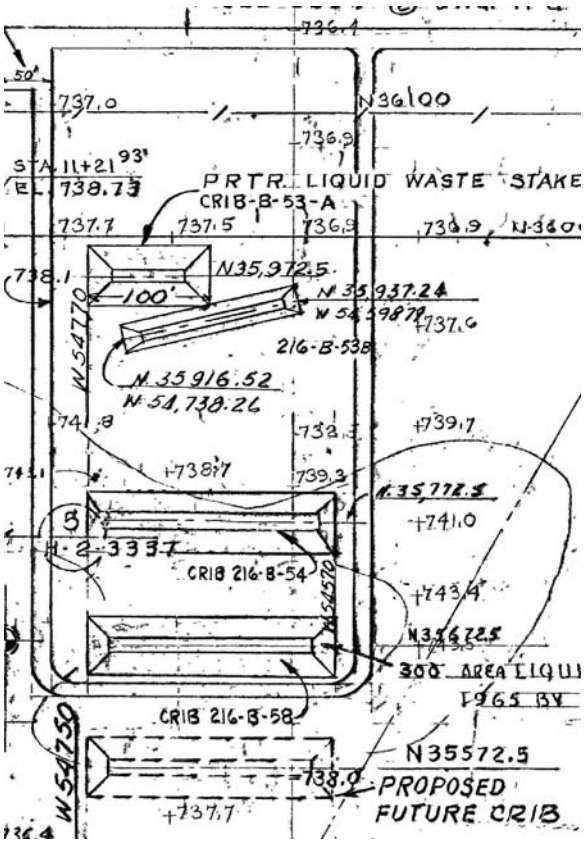
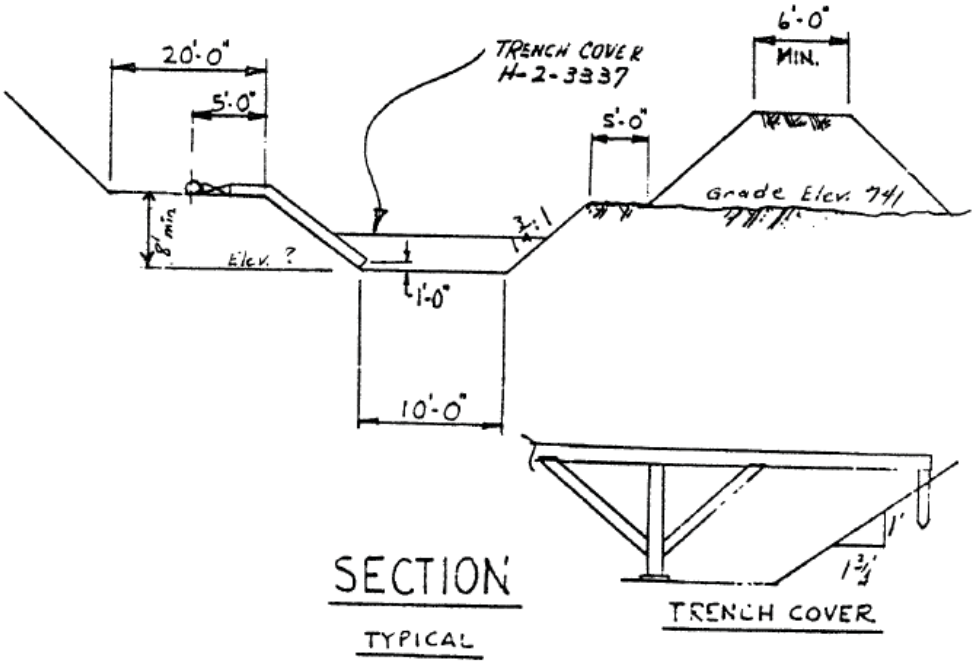


Figure 3. H-2-3337



Site Description

Site ID: 216-B-58 Trench **Site Type:** Trench
Facility/Geographic Area: BC Cribs and Trenches
Current OU Assignment: 200-BC-1
Former OU Assignment: 200-TW-1
Service Dates: November 1965 to June 1967 (RHO-CD-673)
Volume/Mass Discharged: 4.13E+3 L (10.9E+3 gal)

Waste Site Location and Physical Description: 216-B-58 Trench is located south of the 200 East Area (across Route 4S) in the BC Cribs and Trenches area. The BC Cribs and Trenches are located inside the BC Controlled Area (see Figure 1. ArcMap Image). The trench was an open excavation divided into 7.6 m (25 ft) sections by 1.2 m (4 ft) high earthen dams. A 1.2 m (4 ft) diameter pipe was placed along the bottom of the Trench. The pipe was corrugated with five 10 cm (4 in) diameter holes around the bottom half. The trench was covered with 8 wooden cover frames, 5.5 m (18 ft) wide x 8.5 m (28 ft) long. A 7.6 cm (3 in) schedule 40, carbon steel pipe, approximately 7 m (23 ft) long was placed along the side of the structure.

Waste Site Coordinates:

E-573234.40630 N-134350.83595

Site Dimensions:

Site Length: 61 m (200 ft) (bottom dimension) Site Depth: Not Specified
Site Width: 3.1 m (10 ft) (bottom dimension) Cover Thickness: 2.4 m (8 ft) overburden depth
Site Area: 189.1 m^2 (2000 ft^2)

Release Summary: 216-B-58 Trench received 4.13E+5 L (10.9E+4 gal) of liquid waste from the 300 Area Hanford Laboratory Operations. The waste was low salt and neutral to basic. The liquid waste was sent to the 340 facility via the process sewer. Waste that was above the release limits for the 300 Area Process Ponds was sent by tanker truck to the 200 Area for disposal. It is not known if the 300 Area waste was trucked to a 200 Area tank farm and transported to this Trench through the underground pipeline to the BC area or if the trucks emptied the waste directly into the Trench. It is possible additional piping was used to unload liquid waste from tanker trucks to the trench.

$PV_{released}$ = 4.13E+3 L/ (189.1 m^2*106 m*0.3*1000 L/m^3) = 0.07

Related Site Structure(s): The Trench is associated with the 300 Area laboratory facilities and the 340 facility.

Site Posting: The Trench has been backfilled and covered with clean soil and posted Underground Radioactive Material. Concrete AC 540 markers outline the area where the trenches are located, but do not identify the specific trench location.

Site Characterization Summary: Eight Direct Push Technology (DPT) holes were placed through the trench. The highest concentration of radionuclides was found 4.1 m to 6.1 m (13.5 ft to 20 ft) below ground surface. The maximum cesium-137, strontium-90, americium and plutonium concentrations were 14.6E+3 pCi/g, 18.4E+3 pCi/g, 412 pCi/g and 310 pCi/g respectively.

In May 1958, an Unplanned Release (UPR-200-E-83) occurred when a large area was found to be contaminated with radioactive rabbit feces reading 5,000 to 10,000 counts per minute. A burrow in Trench 216-B-28, containing contaminated salt, was believed to be the source of the material ingested by the rabbits.

In 1969, contaminated Russian thistle was identified growing on Trenches 216-B-53A, 216-B-53B and 216-B-54. The maximum dose rate was 1500 millirem per hour. To inhibit weed growth, 45,870 m^3 (60,000 yd^3), approximately 15.2 cm (6 in) of sand and gravel, was placed on top of the Trenches. In 1981, the area was covered with additional top soil, time release herbicides and rodent deterrent.

A surface radiation survey is performed annually.

Potential Contaminants:

Radioactive: Cesium-137, Strontium-90, Americium, Plutonium

Non-Radioactive: Undetermined

References:

WIDS General Summary Report for site 216-B-58
ArcMap
QMap
RHO-CD-673 Part III S-200E

Figure 1. ArcMap Image

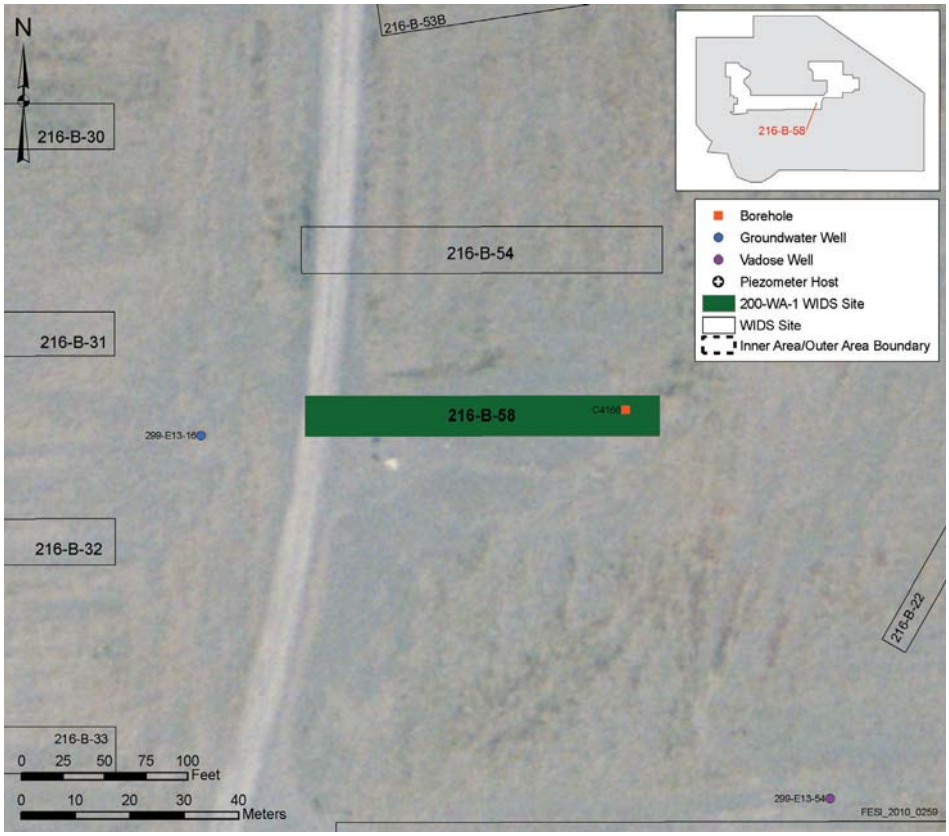
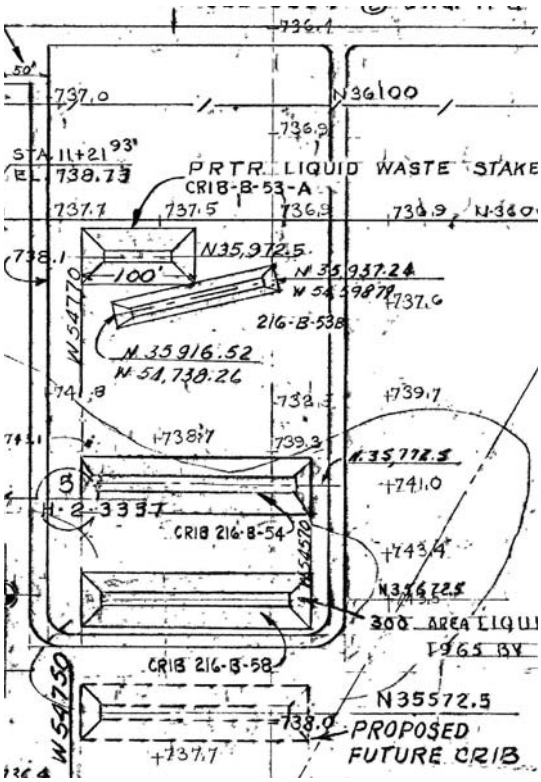


Figure 2. Plot Plan



Site Description

Site ID: 216-S-1&2, 216-SL-1&2 Crib
Site Type: Crib 216-SL-2
Facility/Geographic Area: S-Plant Area
Current OU Assignment: 200-LW-2
Former OU Assignment: Not Specified
Service Dates: January 1952 to January 1956
Volume/Mass Discharged: 1.6E+07 L (4.3E+07gal) (See Figure_1_for further detail).

Waste Site Location and Physical Description: The 216-S-1&2 Cribs are located east of the 241-SX Tank Farm, and southeast of the 241-S-151 Diversion Box (See Figure_2_per QMap). The site contains two open-bottomed wooden crib boxes and associated piping set in a gravel lined trench covered with backfill (Figure_3_Reference Drawing of 216-S-20 Crib Plot Plan, Figure_4_Reference Drawing_H-2-44511 Sheet38 and Figure_5_Reference Drawing_H-2-44511 Sheet20). The cribs are connected in series, with a buried pipe conveying overflow from Crib S-1 to Crib S-2.

Waste Site Coordinates:

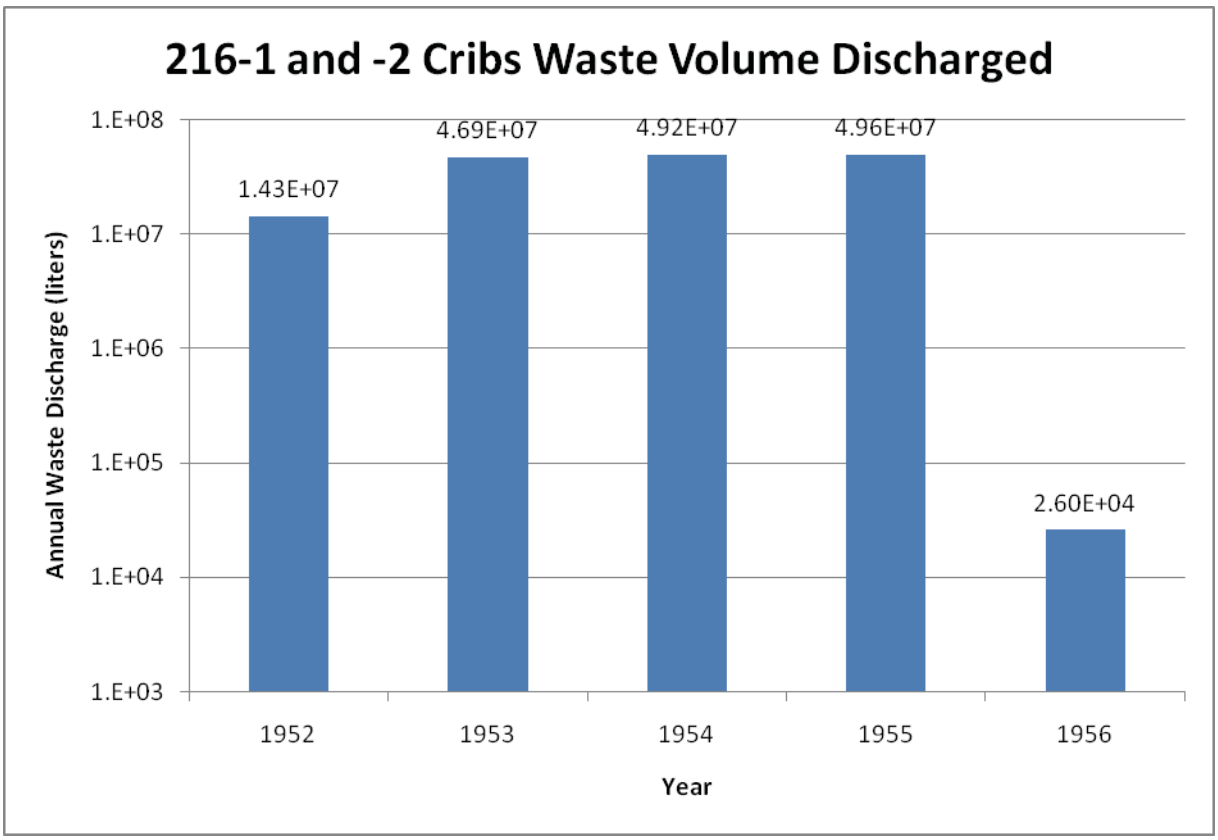
Lon-566979.43753
Lat-134261.11720

Site Dimensions:

Site Length: 27.4 m (90.0 ft)
Site Depth: 10.7 m (35.0 ft)
Site Width: 12.2 m (40.0 ft)
Cover Thickness: 1.8 m (6 ft) of overburden
Site Area: Not specified

Release Summary: The 216-S-1&2 Cribs were active from January 1952 to January 1956. The Cribs were used for the subsurface distribution of cell drainage from the D-1 Receiver Tank and process condensate from the D-2 Receiver Tank in the 202-S Building. The liquid waste contained the inorganic chemicals nitrate, aluminum nitrate, nitric acid, and sodium, and had a pH of 2.1. The waste was discharged to the cribs in batches, with 10 batches discharged per day on average. Each batch contained approximately 19,000 L (4940 gal) of process effluent. Over their lifetime, the Cribs received 1.6E+07 L (4.3E+07gal) of process effluent containing approximately 750,000 Curies of mixed fission products.

Figure 1. Waste Volume Discharged into 216-S-1&2 Cribs in Liters per Year.



Related Site Structure(s): The 216-S-1&2 Crib site is associated with the 241-S-151 Diversion Box, 200-W-137-PL pipeline, and the 216-S-7 Crib.

Site Posting: The Cribs are located within a common radiologically posted area. The area is marked and posted with Underground Radioactive Material (URM) and Cave-in Potential signs. There is a second, smaller posted URM area that borders the 299-W22-11 well and the Cribs on their southern end (See Site Characterization Summary for further discussion).

Site Characterization Summary: In August 1955, process vapors and high dose rates were detected by the Cribs. The source was determined to be a contaminated well cap on test well 207-S-11 (also known as the 299-W22-3 well), which is adjacent to the Cribs. The well cap was found to have a dose rate of 4 rad/hr. During sampling, gurgling noises were heard coming from the well. It was decided the well casing had failed or ruptured, and that process waste was bypassing the crib soil column and penetrating the water column via the rupture. The well was backfilled with sand upon this discovery and the 216-S-1&2 Cribs were deactivated and replaced by the 216-S-7 Crib. The pipeline which fed into the Cribs was capped at the 241-S-151 Diversion Box and the waste was redirected to the 216-S-7 Crib. This unplanned release is recorded as UPR-200-W-36.

A number of wells monitor the site, six of which were drilled in 1956 to document the 1955 unplanned release (UPR-200-W-36). Core samples taken from the wells showed Cesium-137 had penetrated the upper strata beneath the Cribs and that Strontium-90 was present in the groundwater. Core samples from another five wells drilled in the area surrounding the Cribs in

1966 found that 90% of the Cesium-137 and <10% of the Strontium-90 were located between 4.8 m (16 ft) to 10 m (33 ft) below the Cribs. Samples taken during drilling by the groundwater table had 1200 microcuries per gram of Strontium-90. Groundwater samples contained 0.00005 microcuries per milliliter of Strontium-90. These findings were five times higher than the permissible limit for this contaminant in groundwater. Additional scintillation logging and borehole gamma spectrometry were conducted in 1984. Readings of Cesium-137 were greatest immediately below the crib bottom, with levels dropping quickly deeper into the soil column. There was no significant variation between the 1984 gamma activity profiles and the profiles taken in 1958.

Since deactivation, work has occurred to stabilize and characterize the Site. The Site's ground surface was stabilized in 1994. In addition, the site is kept free of vegetation due to the discovery of contaminated weeds growing in the site in September 2000; which were subsequently removed. A site walkdown of the area on January 9, 2001 lead to the discovery of a 6 m by 3 m (20 by 10 ft) URM area bordering the southern edge of the Cribs. In addition, visual and radiological surveys occur annually, and several ground water monitoring wells monitor the site. In 2008, the Cribs were characterized with Direct Push Technology and by the drilling borehole C6835.

Potential Contaminants:

Radioactive: 750,000 Curies of mixed fission products

Non-Radioactive: 1.6E+07 L (4.3E+07gal) of process effluent containing the inorganic chemicals nitrate, aluminum nitrate, nitric acid, and sodium, with a pH of 2.1.

Figure 2. ArcMap Image

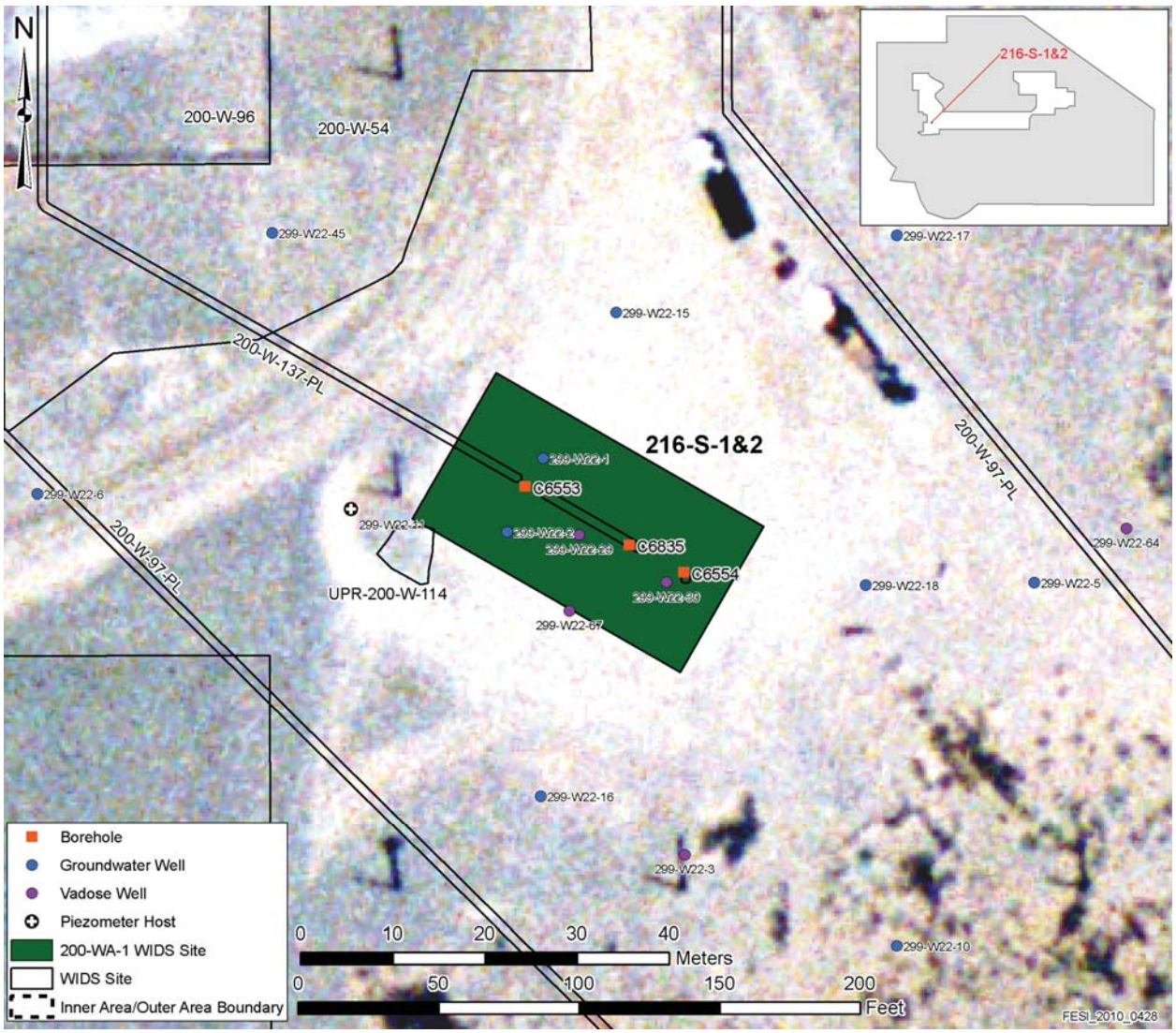


Figure 3. Insert Site Map

Figure not available.

Figure 4. Reference Drawing of 216-S-1&2 Crib Plot Plan

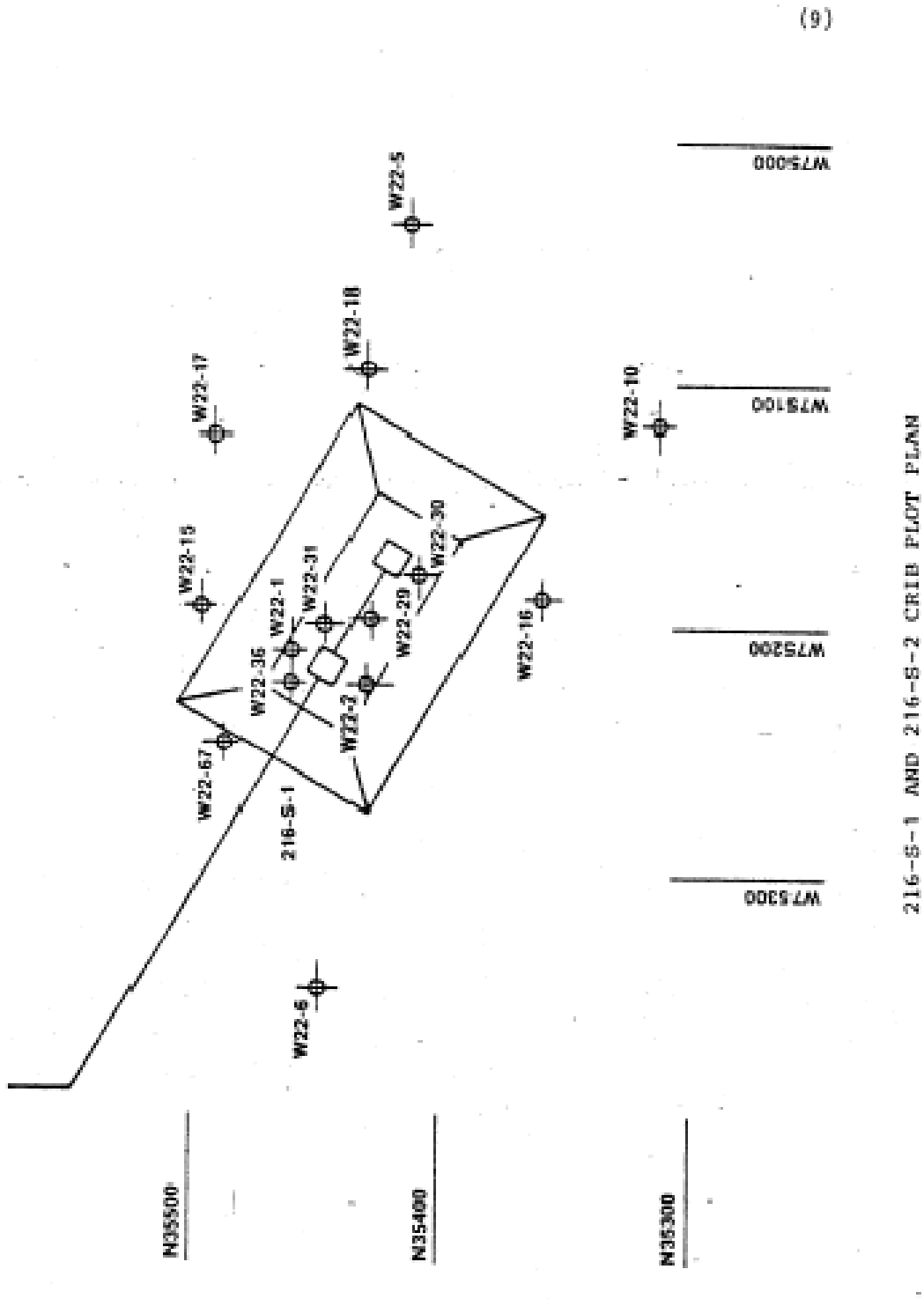


Figure 5. Reference Drawing H-2-44511 Sheet38

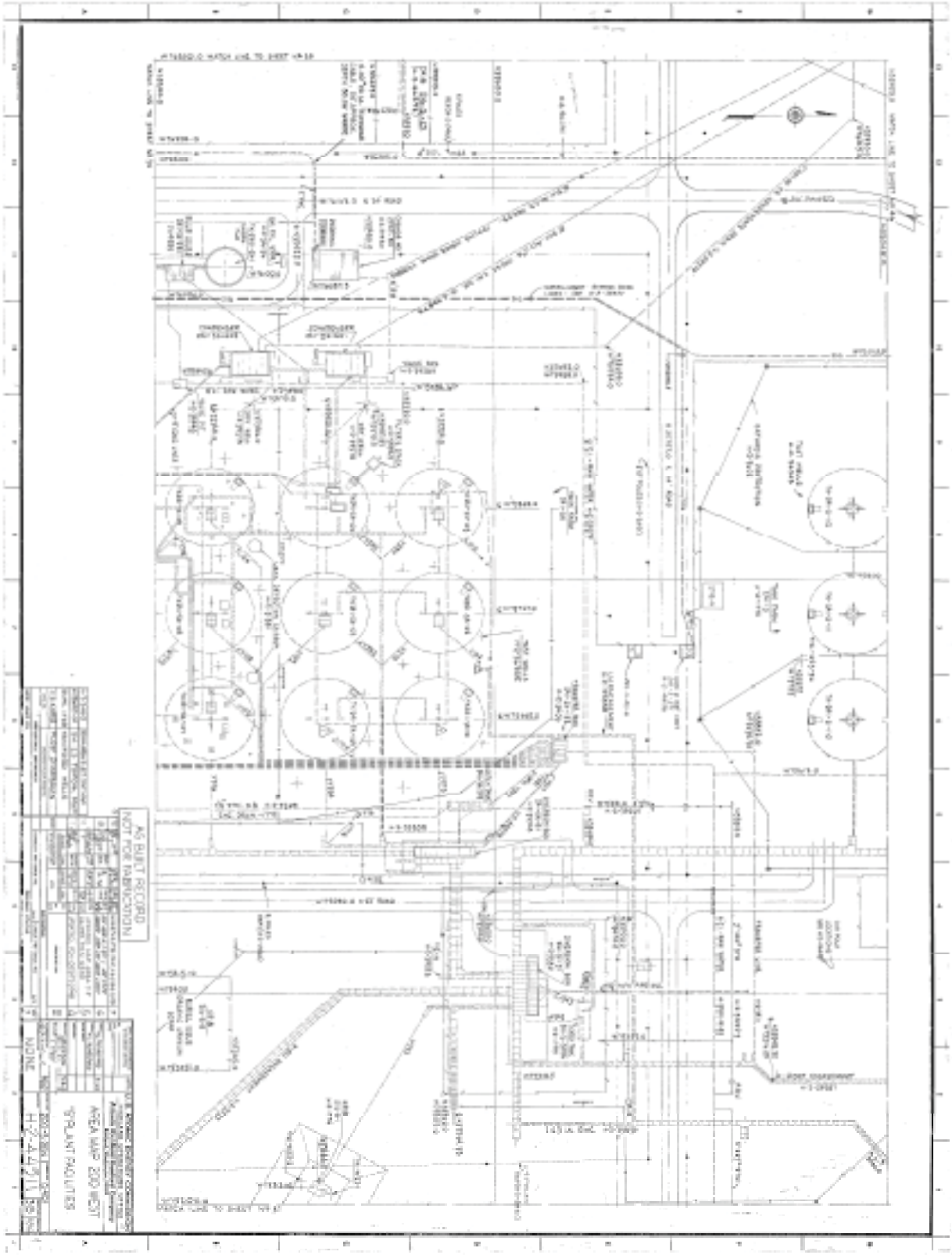
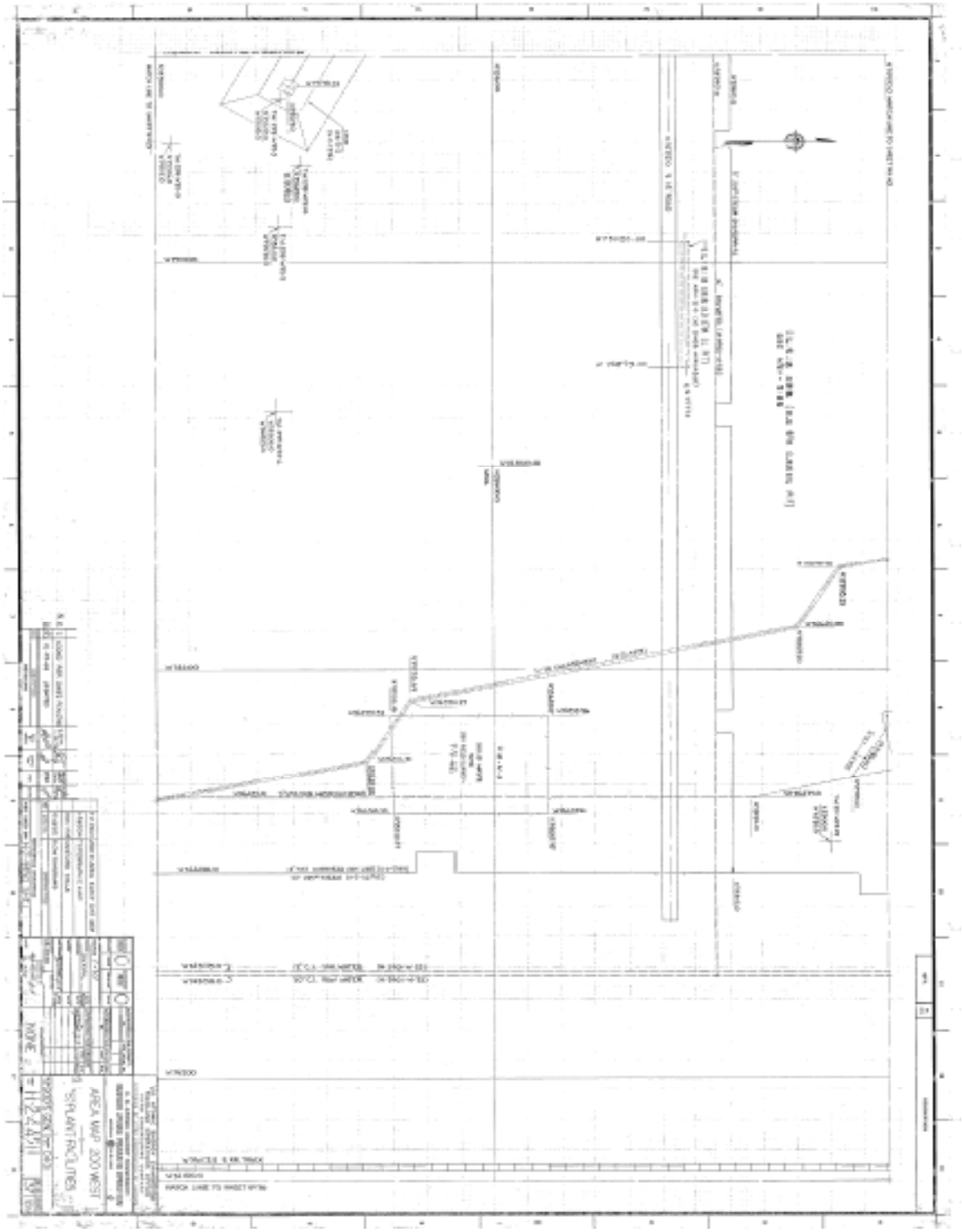


Figure 6. Reference Drawing H-2-44511 Sheet20



Site Description

Site ID: 216-S-12, UPR-200-W-30 (duplicate site). **Site Type:** Crib
Facility/Geographic Area: S-Plant Area
Current OU Assignment: 200-MG-2
Former OU Assignment: 200-MW- I
Service Dates: July 1954 to an unspecified date
Volume/Mass Discharged: 68,100 L (18,000 gal) of liquid flush water

Waste Site Location and Physical Description: The site consists of a single use liquid waste disposal trench that was used for the liquid disposal of 219-S Stack flush water, which occurred through the month of July, in 1954. The site is located northeast of the 202-S (REDOX) facility and north of the 291-S Stack. The trench was fed with an above ground pipeline (See Figure_2_reference engineer drawing H-2-44511 Sheet 28 Rev3). The trench was deactivated after the flush operation was complete by removing the temporary above ground pipe and backfilling the trench.

Waste Site Coordinates:

Lon-567544.69808 Lat-134117.13538

Site Dimensions:

Site Length: 27.4 m (90.0 ft)
Site Width: 6.1 m (20.0 ft)
Site Area: 167.2 m 2 (1800.2 ft2)
Site Depth: 3.0 m (10.0 ft)
Cover Thickness: NA

Release Summary: In July 1954, approximately 68,100 L (18,000 gal) of flush water was drained from the REDOX stack into 216-S-12. The water contained 600 kg of ammonium nitrate. An estimated 5 Ci of beta particle emitters and 2-3 Ci of gamma particle emitters were present in the waste stream, with ruthenium and zirconium-niobium predominant.

Related Site Structure(s): The site is associated with the 291-S Stack. The site is also known as the 29 1-S Stack Wash Sump, REDOX Stack Flush Trench. UPR-200-W-30 has an identical site description and history and is considered to be a duplicate of 216-S-12.

Site Posting: The site is surrounded with cement marker posts and chain, posted with Underground Radioactive Material (URM) signs.

Site Characterization Summary: Visual and radiological surveys are performed at this site. No description is provided detailing the frequency of surveys. The last documented GPS survey occurred on January 13, 2000 when the area located within the AC-5-40 markers was re-mapped from a point to a polygon feature.

Potential Contaminants: Radioactive: 5 curies of beta particle emitters and 2-3 curies of gamma emitters, that were predominantly ruthenium and zirconium-niobium. Cobalt-60, Strontium-90,cesium- 137, plutonium 239/240, uranium 238 in May 1987.

Nonradiological: 600 kg Ammonium nitrate

Figure 1. ArcMap Image

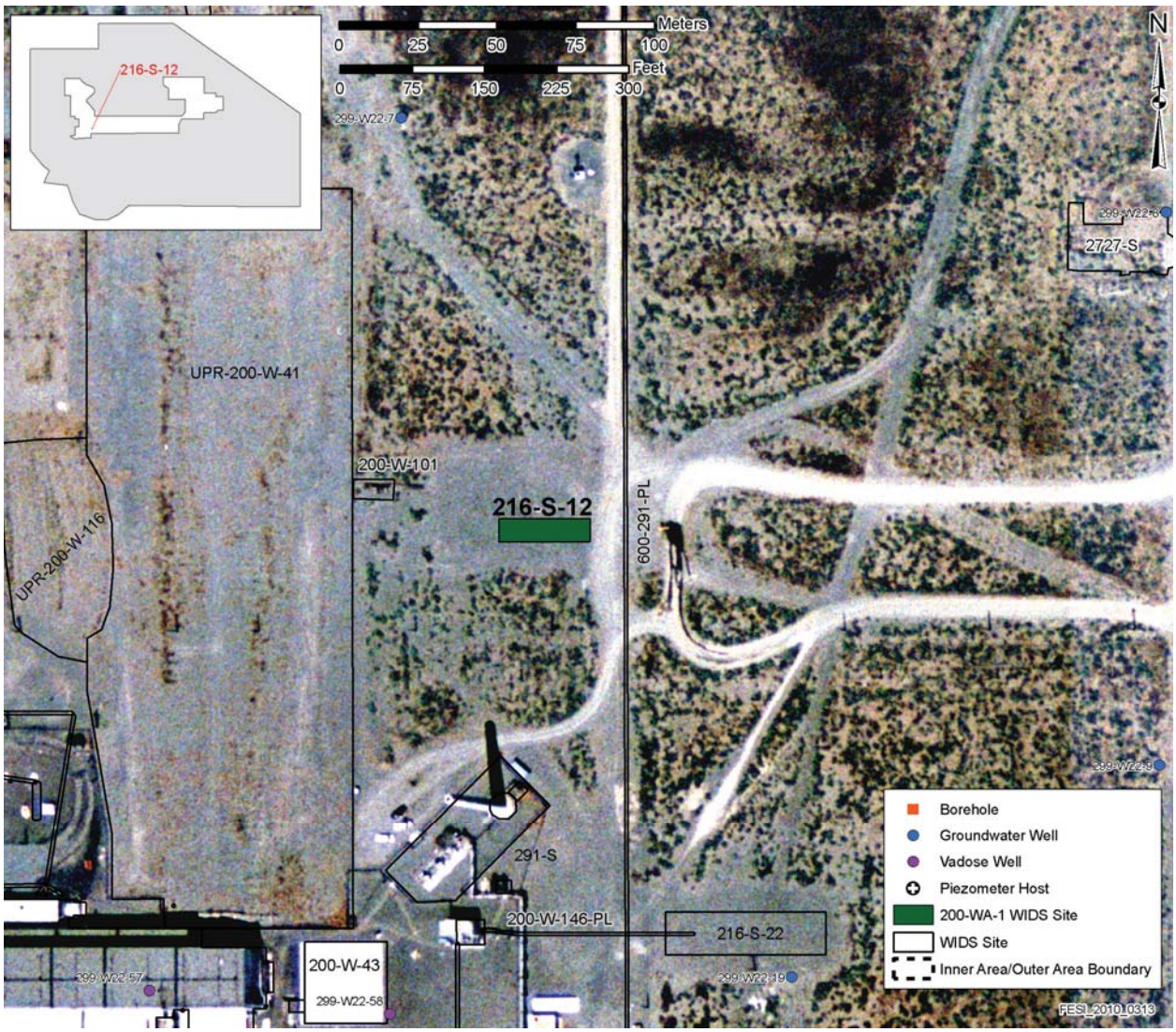
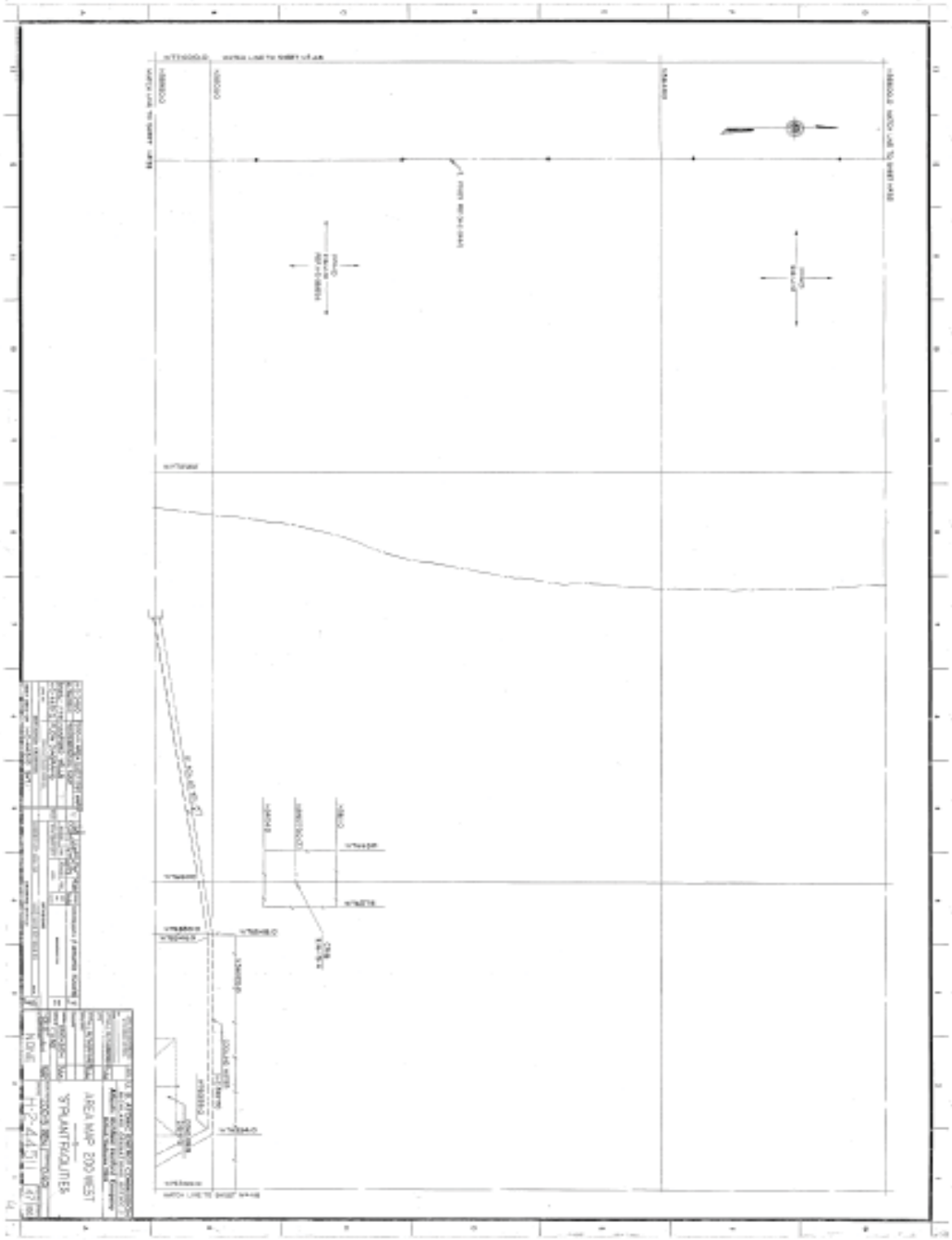


Figure 2. Insert Site Map

Figure not available.

Figure 3. Reference Drawing H-2-44511 Sheet 28 Rev3



Site Description

Site ID: 216-S-14, Buried Contaminated Hexone, 216-S-4 Burial Contaminated Hexone
Site Type: Trench
Facility/Geographic Area: S-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-PW-1
Service Dates: December 1951 to January 1952
Volume/Mass Discharged: 76,000 L (20,000 gals)

Waste Site Location and Physical Description: The site is located 1,273 ft south of the 202-S canyon building and northwest of 216-S-19 Pond. It is approximately 46 meters (150 feet) southeast of the 222-S Sanitary Tile Field (see Figures 1 and 2). The site consists of a backfilled trench that received hexone contaminated with trace amounts of unirradiated uranium from the initial test runs in the 201-S REDOX facility. The waste site was fed with an aboveground pipeline. The site was retired when discharge of hexone to the unit was completed and then deactivated by removing the aboveground piping and backfilling the area.

Early site drawings place the trench center point at N33100/W73700 and indicate security fencing around the trench. Currently no fence exists (see Figure 3 for site phote). The Technical Baseline Report (1991) states "south of and in line with the trench, there is a row of roughly 10 clay tile pipes that rise above grade running in an east-west line. The surface of this area has grass cover." However, a site visit and Global Positioning Survey done in 1998 determined the tile pipes are located north of the documented trench coordinates. Evidence of a few wooden fence posts was noted approximately near the southwest corner of the trench. An area of distressed vegetation was also noted southwest of the trench (See site photo).

Waste Site Coordinates:

E-567430 (m) N-133541 (m)

Site Dimensions:

Site Length: 30.48 m (100.00 ft)
Site Width: 2.44 m (8.00 ft)
Site Area: 74.32 m^2 (800.00 ft^2)
Site Depth: 1.83 m (6.00 ft)
Cover Thickness: 1.83 m (6.00 ft)

Release Summary: The site was used from December 1951 to January 1952 for disposal of REDOX start up waste. Approximately 76,000 L (20,000 gals) of hexone contaminated with only trace quantities of unirradiated uranium used in the initial tests of REDOX was disposed through an aboveground piping in the trench. The site was deactivated by removing the above-ground piping and backfilling the trench with clean soil. The area was then enclosed above ground with a single rail wooden fence and posted with radiation zone and 'To Not Excavate within 20 feet" signs.

Based on the buried waste volume of 76,000 L, the calculated potential lifetime discharge is less than 0.23 vadose pore volume:

$PV_{released}$ = 7.6E+04 L / (74.32 m^2 x 72.54 m x 0.3 x 1000 L/m^3) = 0.047

Related Site Structure(s): The site is associated with the 202-S Building.

Site Posting: Currently, the site is not marked or posted.

Site Characterization Summary: After discharge of hexone to the site was completed in January 1952, the trench was delineated with wooden fence and posted with Radiation Zone, Do Not Excavation signs. Core drillings were made of this site during February 1971. There was a strong odor of hexone from each of the sample cores and the core holes, but no radioactivity was found. The site was released from radiation zone status in February 1971. It is assumed that the fence and radiation warning signs were removed at this time.

Potential Contaminants:

Radioactive: N/A

Non-Radioactive: hexone

References:

All information from WIDS Summary Report unless otherwise noted.

Figure 1. ArcMap Image

Figure not available.

Figure 2. Site 216-S-14 Location Map

Figure 3. Site 216-S-14 Location Map

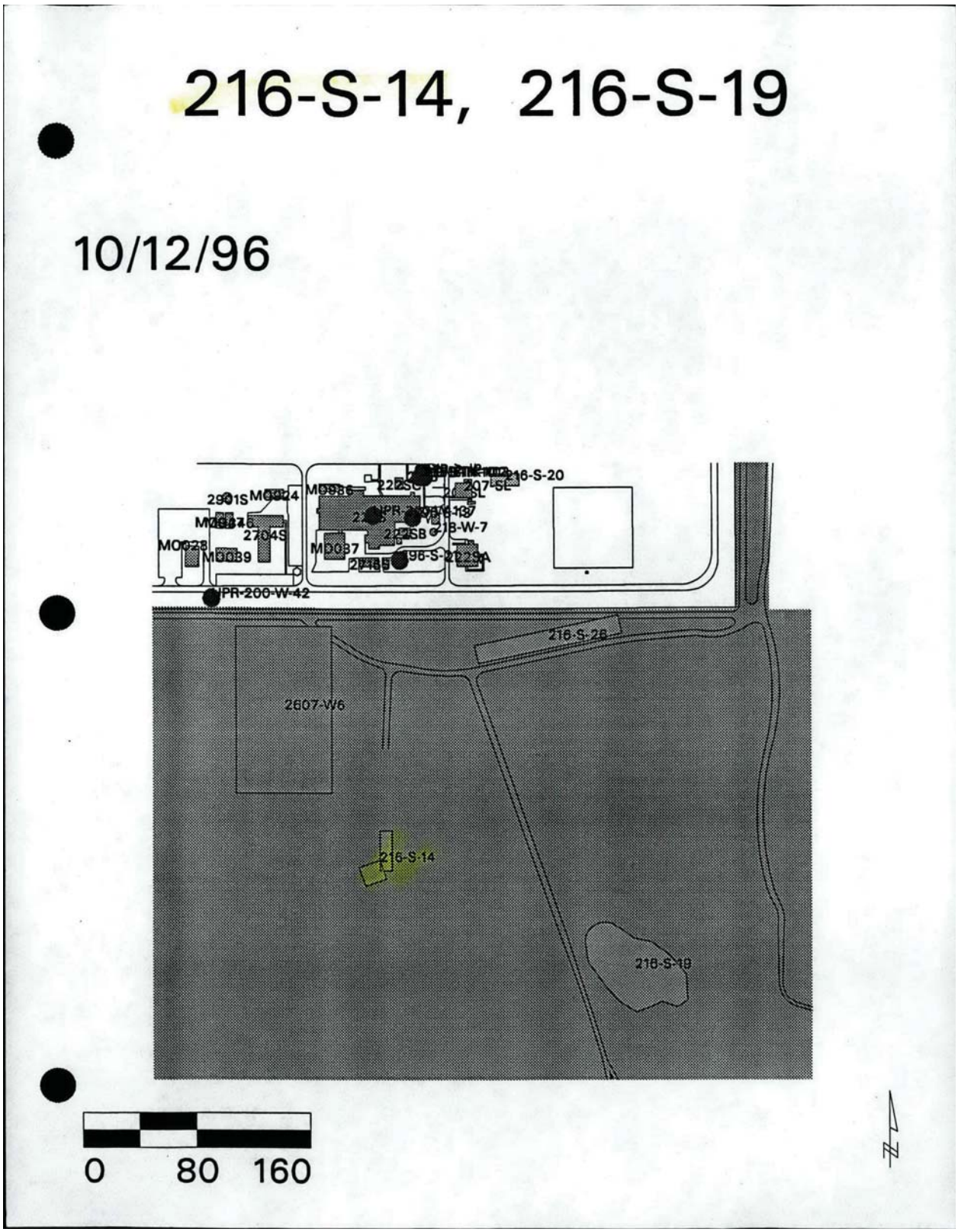
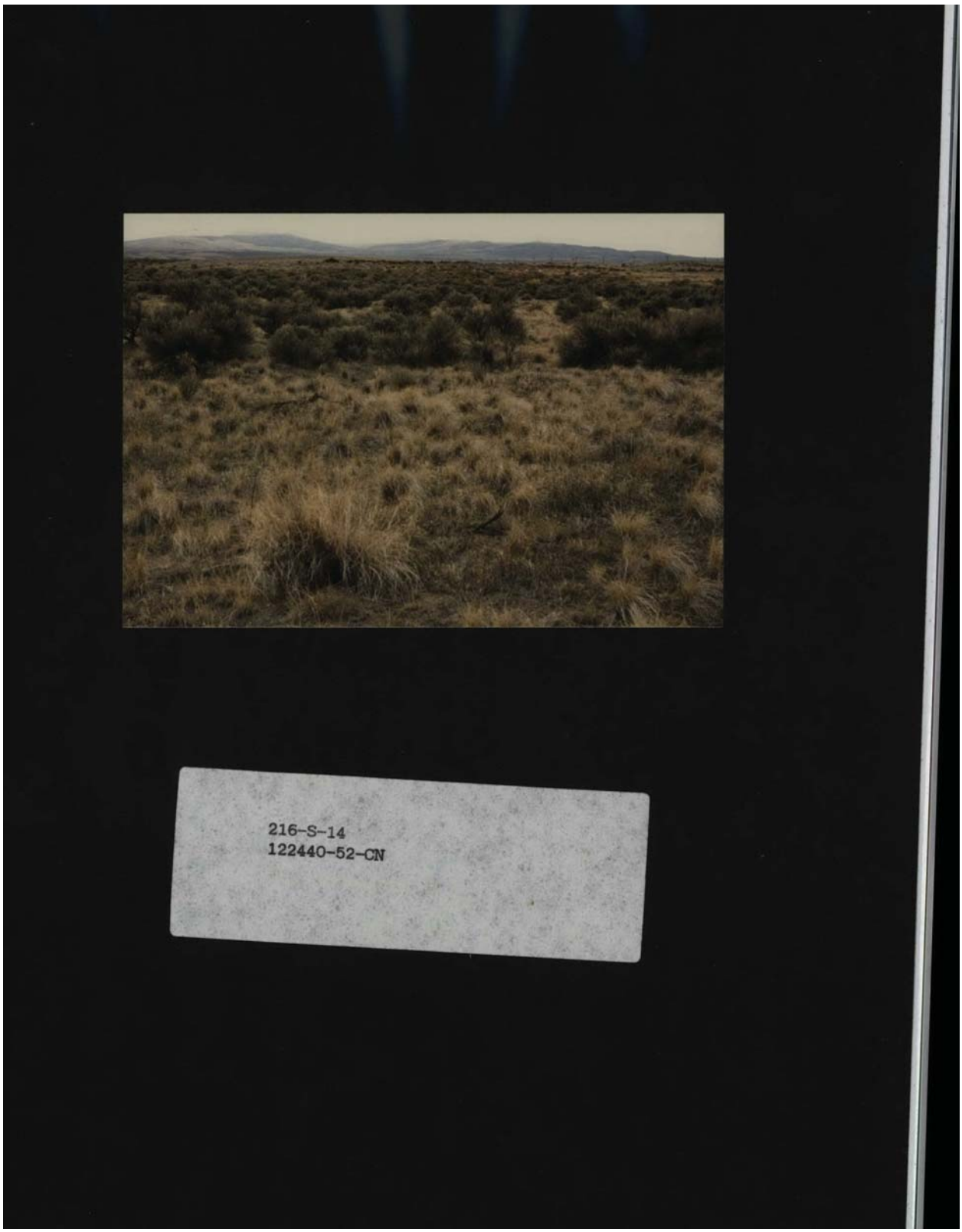


Figure 4. Site 216-S-14 Photo



Site Description

Site ID: 216-S-18, 241-SX Steam Cleaning Pit, **Site Type**: Trench 216-S-14 Steam Cleaning Pit
Facility/Geographic Area: S-Plant Area (S/U Farm Area)
Current OU Assignment: 200-MG-2
Former OU Assignment: 200-MW-1
Service Dates: 1954 to an unspecified date
Volume/Mass Discharged: 9.8E+04 L (2.6E+04 gal)

Waste Site Location and Physical Description: 216-S-18 consists of one backfilled trench, and is located east of the 241-S Tank Farms and southwest of the 216-S-9 Crib. The trench runs in an east-west direction, adjacent to the north side of 13th Street. This site was first used in October 1954 as a steam cleaning pit for contaminated vehicles. After October 1954, the site was used to consolidate contaminated soil from the surrounding area.

This site was originally mapped at two separate locations. It was determined that H-2-44511-Sheet37 showed the correct location of the trench, updated on 10-27-69 (See Figure_2_reference engineer drawing H-2-44511 Sheet 37). The sheets with the incorrect location were edited in Arcview to show the correct location of the site.

Waste Site Coordinates:

Lon-567066.91420 Lat-134409.76140

Site Dimensions:

Site Length: 38.0 m (125.0 ft)
Site Width: 4.6 m (160.0 ft)
Site Area: 174.8 m 2 (2000.0 ft2)
Site Depth: 2.0 m (6.0 ft)
Cover Thickness: 0.3-0.6 m (1-2 ft)

Release Summary: The trench received an unspecified volume of steam condensate during its use as a vehicle decontamination pit in October 1954. Following its use as a decontamination pit, the trench was used to consolidate contaminated soil from surrounding waste sites. After contamination specks were discovered in the trench during stabilization work for UPR-200-W-165 and UPR-200-W-114 in 1995, additional contaminated material from nearby waste sites was consolidated and deposited into the trench. In 1997, a small, residual patch of contaminated soil remaining from UPR-200-W-114 was deposited into the 216-S-18 trench.

While the volume of water and amount soil deposited in the trench is not specified, the trench received an estimated 98,400 liters of mixed water and soil during its lifetime.

Related Site Structure(s): The site is associated with the 241-S Tank Farms, UPR-200-W-165 and UPR-200-W-114.

Site Posting: Site 216-S-18 was posted with light weight chain and "Underground Radioactive Material Area" (URM) signs following interim surface stabilization work.

Site Characterization Summary: In October 1972, an excavation within the trench led to the discovery of contaminated objects. The contaminated materials were removed and disposed of in a 200 West Area burial ground. Following the removal of the objects, the trench was backfilled, raised to grade, and released from radiation zone status.

Radioactive items were discovered during the excavation of the trench in October 1972. The contaminated objects were removed and deposited in the 200 West Dry Waste Burial Ground. After removal, the trench was backfilled, brought to grade, and released from radiation zone status. However, in 1995, contamination specks were discovered in the trench during stabilization work for UPR-200-W-165 and UPR-200-W-114, and site 216-S-18 was reposted as a radiation area. Contamination from surrounding waste sites was deposited into the trench in 1995. The contamination source is assumed to be speck contamination from 241-S Tank Farm operations. In 1997, contaminated soil from UPR-200-W-114 was deposited into the 216-S-18 trench. After the deposition, the trench was covered with clean soil and reposted as an URM.

Potential Contaminants:

Radioactive: Unknown

Nonradiological: Unknown

Figure 1. ArcMap Image

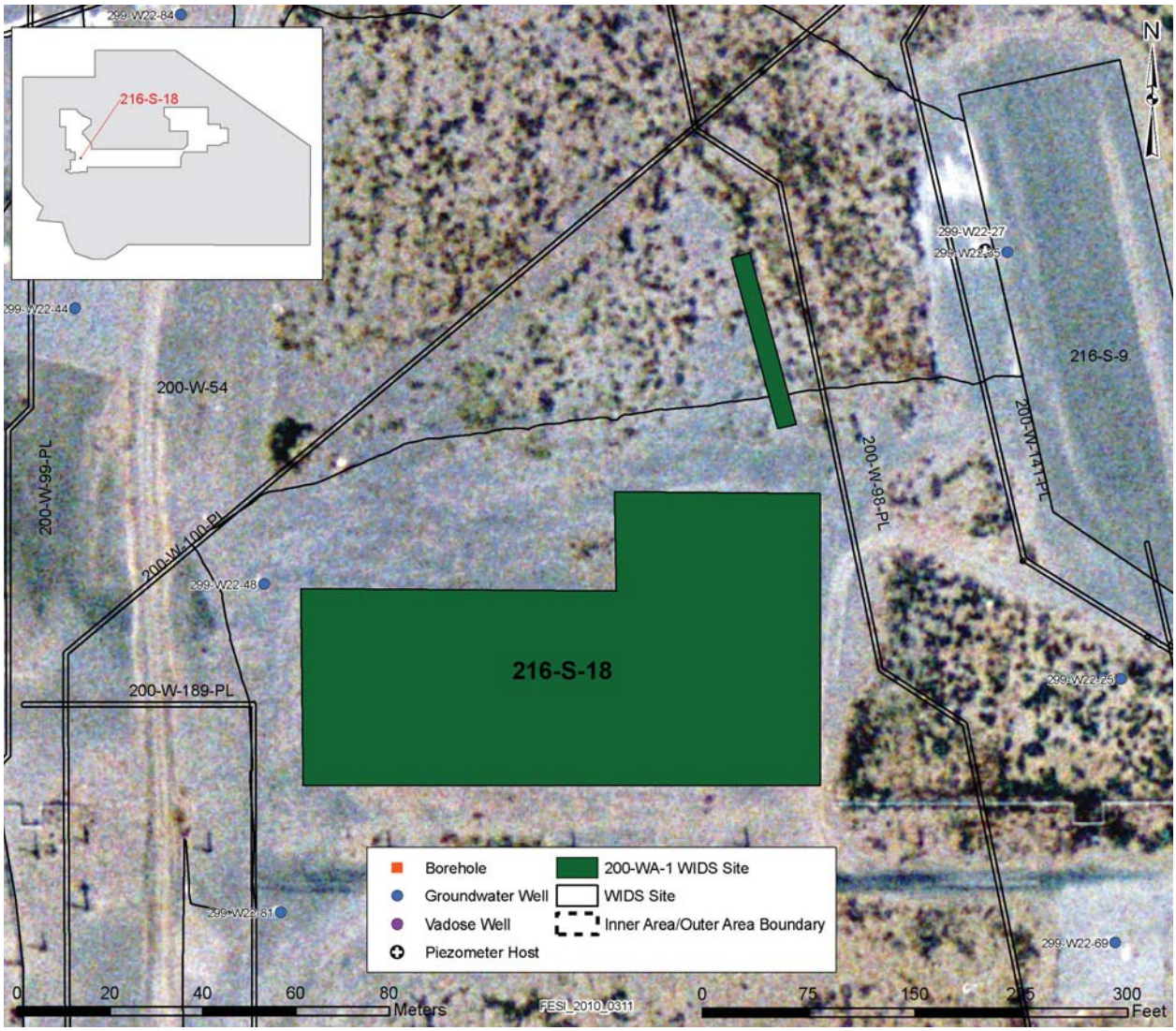
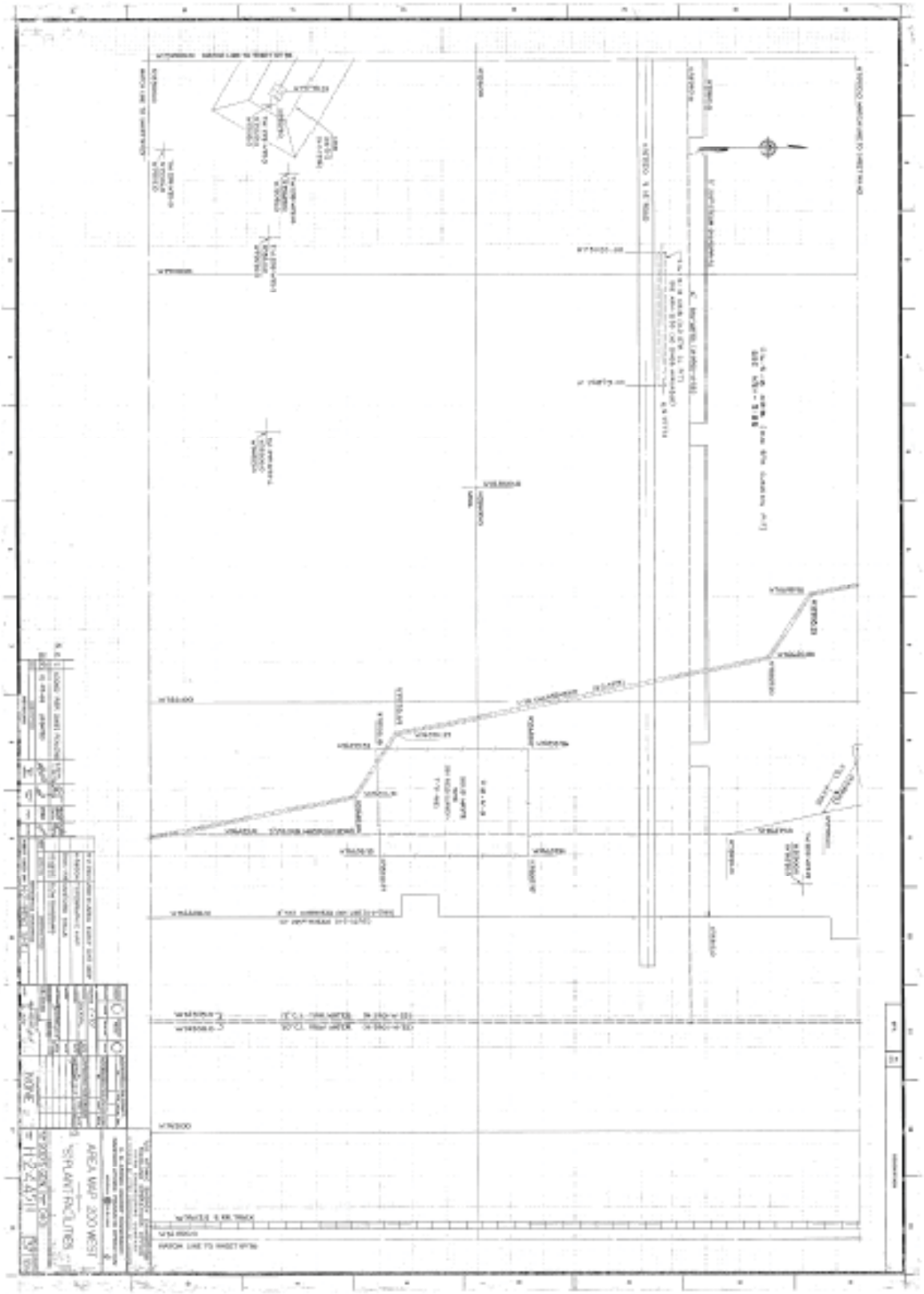


Figure 2. Insert Site Map

Figure not available.

Figure 3. Reference Drawing H-2-44511 Sheet 37



Site Description

Site ID: 216-S-20, 216-SL-1&2 Crib
Site Type: Crib 216-SL-2
Facility/Geographic Area: S-Plant Area
Current OU Assignment: 200-LW-2
Former OU Assignment: Not Specified
Service Dates: 1952 to 1972
Volume/Mass Discharged: 1.4E+08 L (3.6E+067gal) (See Figure_1_ for details).

Waste Site Location and Physical Description: Site 216-S-20 is located southeast of the 202-S (REDOX) Facility, and are east of the 222-S Laboratory building (See Figure_2_per QMap). 216-S-20 contains two wooden crib boxes and associated piping (Figure_3_Reference Drawing of 216-S-20 Crib Plot Plan and Figure_4_ H-2-5229 Sheet1 Rev6). An abandoned waste unloading station and manhole are located approximately 7.6 m (25 ft) south of the posted Cribs (See Reference Drawing_Figure_4_H-2-44511 Sheet20).

The two wooden crib boxes both measure 3.7 m by 3.7 m (12 ft by 12 ft) in area, and are 15 m (50 ft) apart, and 2.9 m (9.6 ft) deep. The bottom of each crib box was covered with 1.2 m (4 ft) of gravel, and both boxes had two risers each extending from the top of the box to above ground. The crib boxes were connected in series with the first box overflowing into the second box via an overflow pipe. After the Cribs were abandoned, they were backfilled with approximately 6.4 m (21 ft) of overburden to match the grade of the surrounding area.

The dimensions posted below in the "Site Dimensions" section are for the posted surface area. This includes the area covered by both Cribs.

Waste Site Coordinates:

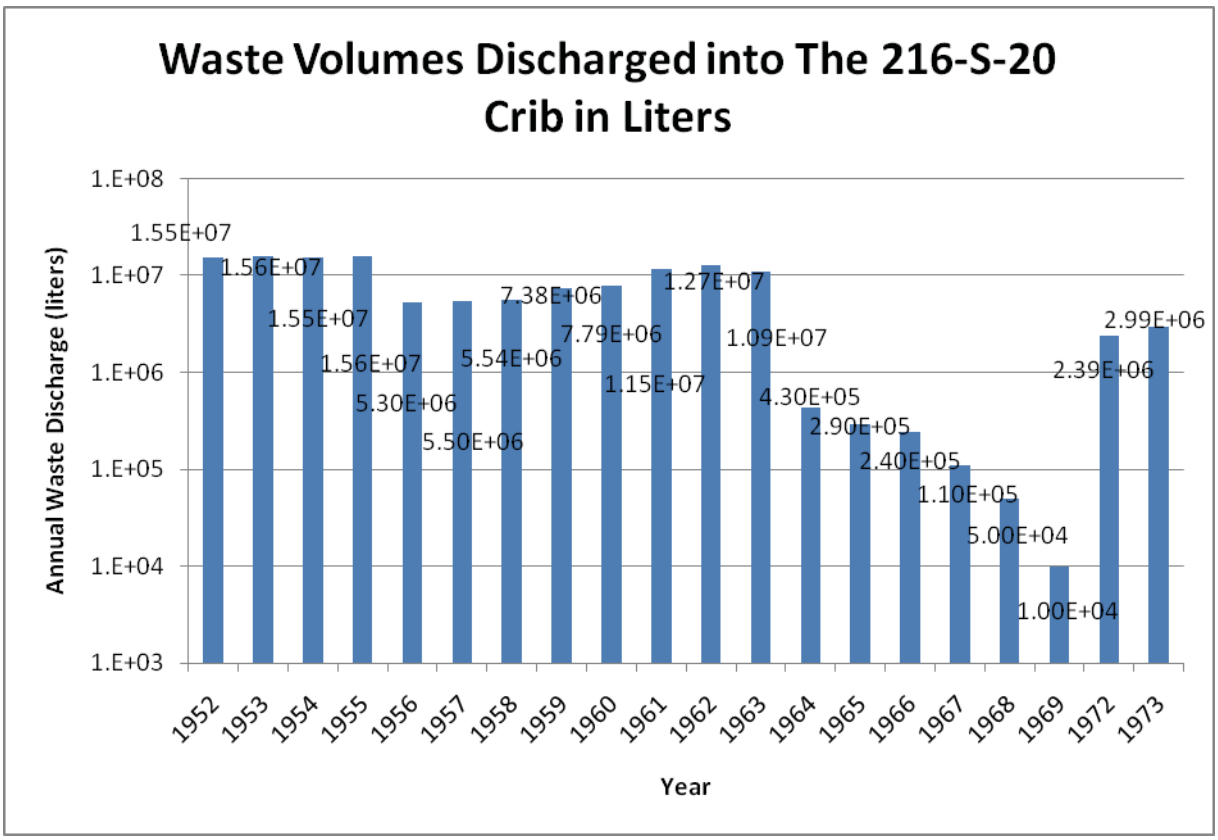
Lon-567553.59374
Lat-133916.54687

Site Dimensions:

Site Length: 27.4 m (90.0 ft)
Site Depth: 9.3 m (30.6 ft)
Site Width: 12.2 m (40.0 ft)
Cover Thickness: 6.4 m (21 ft) of overburden
Site Area: Not specified

Release Summary: The 216-S-20 Cribs were active from 1952 to 1972 and received an estimated 1.4E+08 L (3.6E+067gal) of liquid waste during its operational lifetime. From January 1952 to July 1953, the Cribs received miscellaneous waste from lab hoods and decontamination sinks in the 222-S Building via the 219-S Retention Building. From July 1953 to September 1963, the site received additional miscellaneous waste via the 207-SL Retention Basin, the 219-D Retention Building and 300 Area Laboratory via truck. The miscellaneous waste was deposited into the Cribs via the manhole unloading structure. From September 1963 to January 1969, the site received miscellaneous waste from lab hoods and decontamination sinks in 222-S via the 219-S Retention Building. From January 1969 to November 1972, the crib was inactive due to surface subsidence on this unit, which is discussed further in the "Site Characterization Summary" section.

Figure 1. Waste Volumes Discharged in Liters per Year



Related Site Structure(s): The 216-S-20 Crib site is associated with the 222-S Building, 219-S Building, the 207-SL Retention Basin, and the "manhole" unloading station that received 300 Area Laboratory wastes via truck. The 200-W-149-PL pipeline is associated with this Crib.

Site Posting: The site is posted with Underground Radioactive Material (URM) signs at each corner. In addition, the abandoned waste unloading station adjacent to the Cribs is posted with Contaminated Area (CA) signs. Within this site's URM posted area, there are two areas above the Crib structures that are marked with post and chain and Cave-In Potential signs. The Cave-In signs were posted July 22, 1998.

Site Characterization Summary: The unit has a history of surface subsidence. During the past 15 years, sink holes at this site have been filled in on three different occasions with several cubic yards of fill dirt. As part of the ongoing stabilization effort and additional surface subsidence within the site, the Cribs were brought offline from January 1969 to November 1972. The site was deactivated by closing the valve and removing the valve wheel on the discharge line that connected 216-S-20 to the 207-SL Retention Basin. During the deactivation period, effluents from within 222-S were rerouted to the 202-S Building concentrators for boildown, while the 300 Area Laboratory waste was rerouted to the 216-T-28 Crib. In addition, the gang valve on the discharge line from the 219-S Building to this Site was locked out. The steam supply line to the value was removed and all openings into this Unit were closed by removing the vents and capping off all risers and filling sink holes within the zone to ground level. The work was completed December 13, 1974. It is unlikely any cavities remain below the ground surface.

Additional efforts to stabilize Site 216-S-20 include site characterization surveys. This includes the drilling of borehole C4176 into the Cribs in August 2004. On September 13, 2004, samples collected during the drilling of the C4176 borehole were submitted to the HEIS database. Ongoing environmental monitoring for this site includes routine radiological surveys, visual inspections, and ground water monitoring via the C4176 borehole. Sampling results from the 2004 drilling, or from more recent radiological surveys or inspections, are not included in the WIDS General Summary Report.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Not Specified.

Figure 2. ArcMap Image

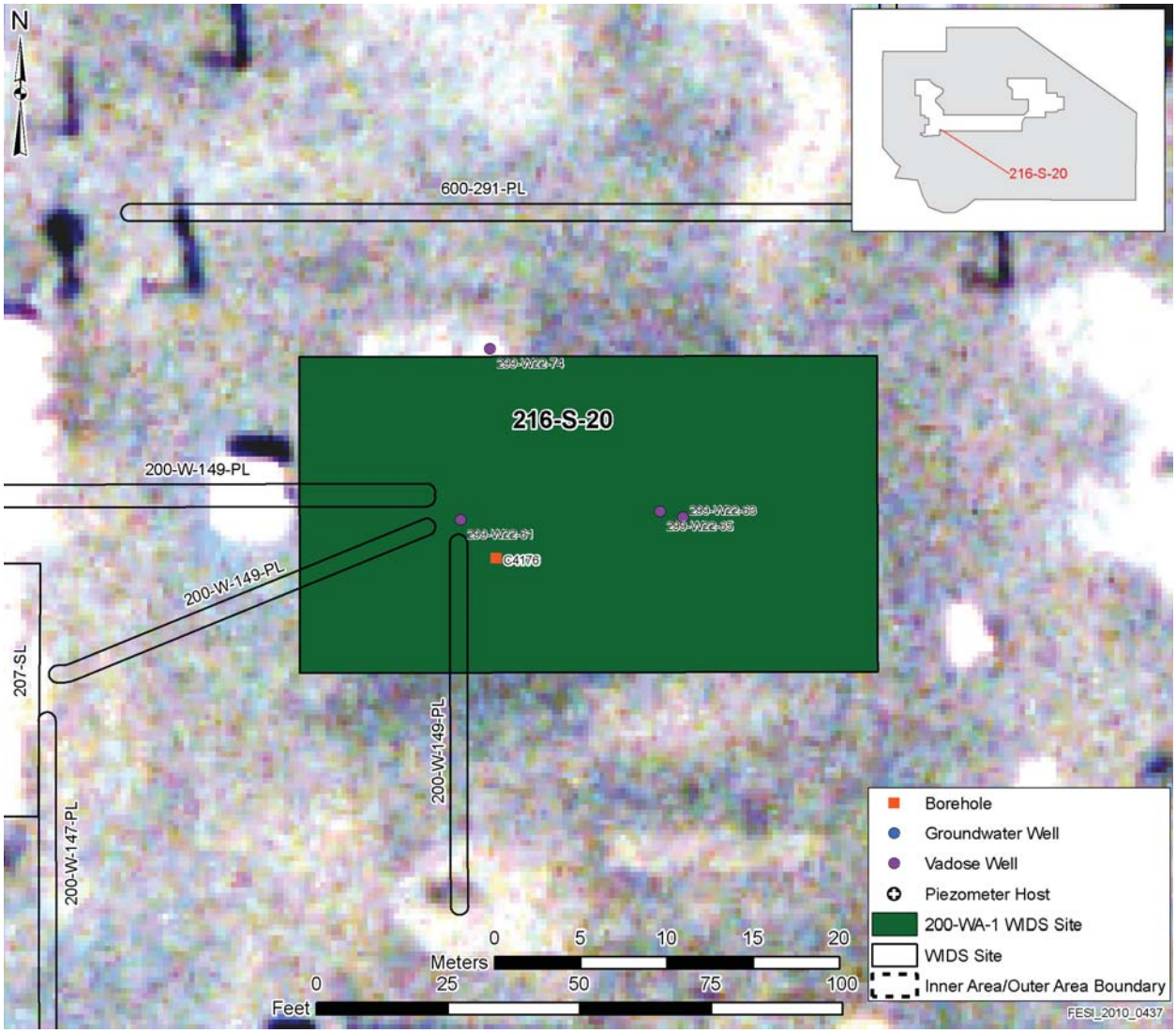


Figure 3. Insert Site Map

Figure not available.

Figure 4. Reference Drawing of 216-S-20 Crib Plot Plan

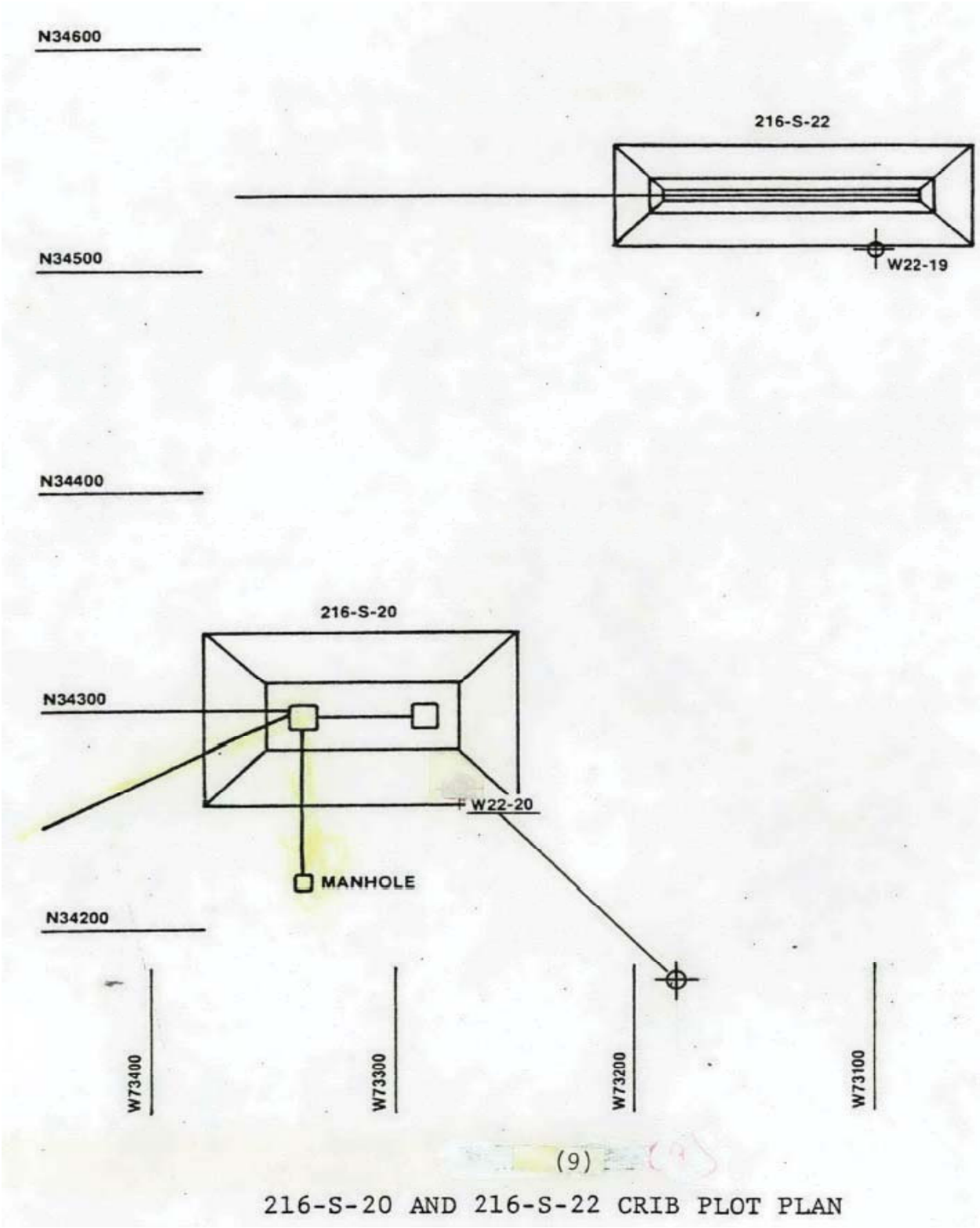


Figure 5. Reference Drawing H-2-5229 Sheet1 Rev6

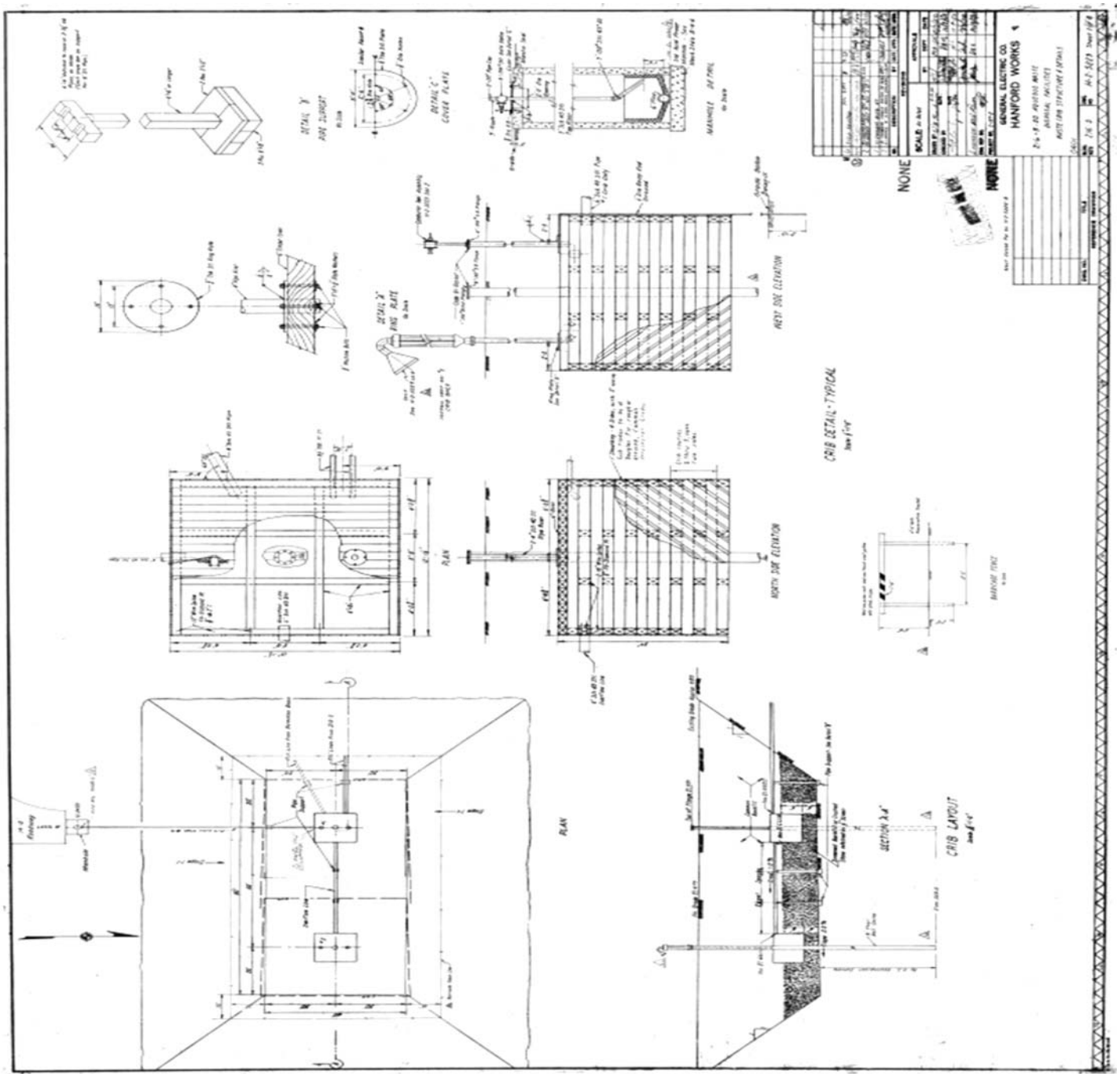
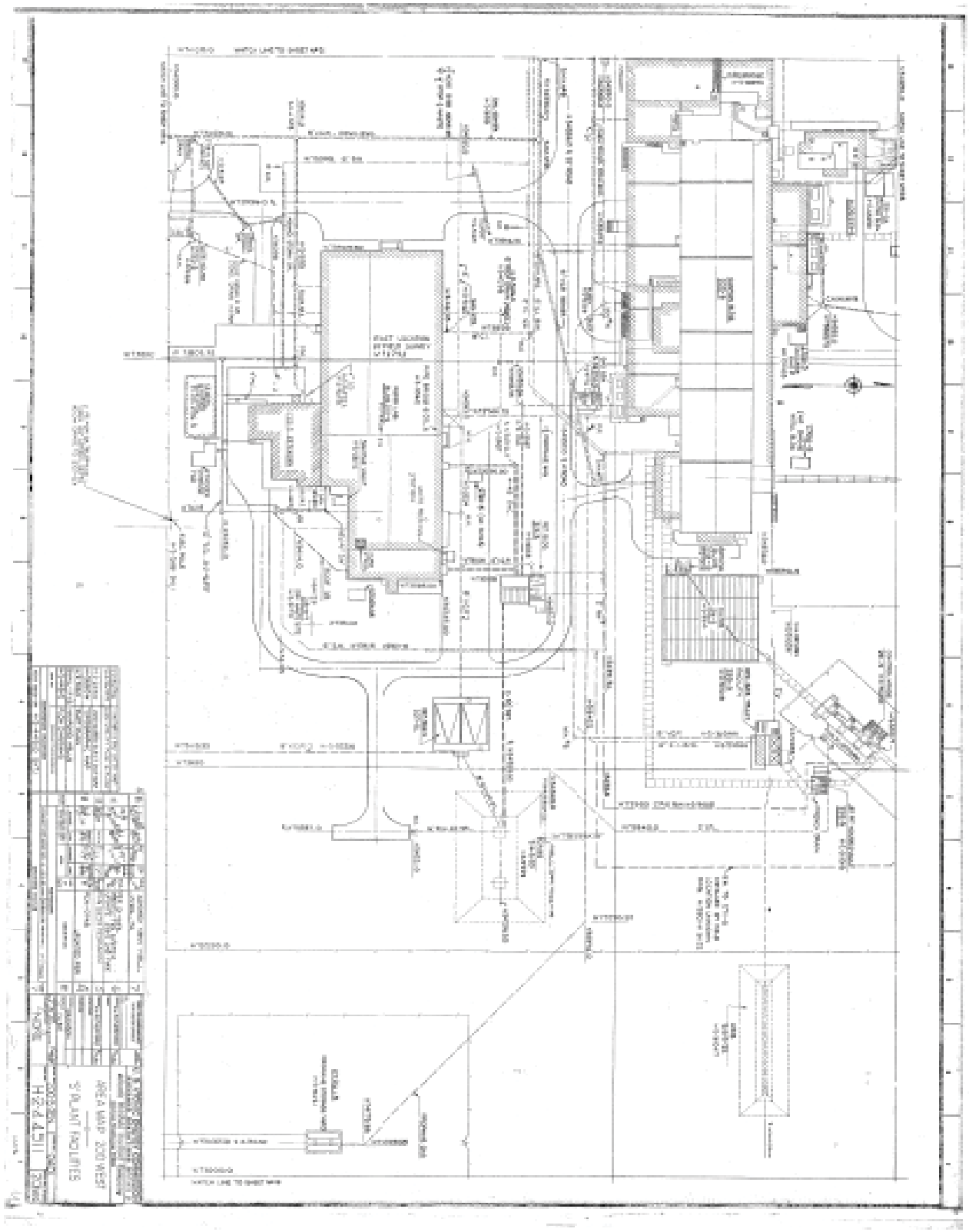


Figure 6. Reference Drawing H-2-44511 Sheet20



Site Description

Site ID: 216-S-22, 216-S-22 Crib **Site Type:** Crib
Facility/Geographic Area: S-Plant Area
Current OU Assignment2 200-MG-1
Former OU Assignment:N Not Specified
Service Dates: October 1957 to June 1967
Volume/Mass Discharged: 98,400.0 L (25,994 gal) of process effluent

Waste Site Location and Physical Description: Site 216-S-22 consists of a crib and associated piping, located east of the 202-S Building and northeast of the 216-S-20 Crib (See Figure_1_per QMap). The 216-S-22 Crib is a gravel structure with a 1:1.5 side slope. A pipe enters the unit below grade and branches out at right angles downwards, to the bottom of the structure (See Reference_Drawings_Figure_1_H2-44551 Sheet 20 Rev7 and Figure_2_H2-31047 Sheet1 Rev2). The pipe runs along the bottom of the Crib for its entire length. The section of pipe along the crib bottom has open joint. The rest of the structure is filled with backfill.

Waste Site Coordinates:

Lon-567608.42190 Lat-133989.03262

Site Dimensions:

Site Length: 30.5 m (100.0 ft) Site Depth: 3.0 m (9.8 ft)
Site Width: 1.1 m (3.6 ft) Cover Thickness: Not Specified
Site Area: Not specified

Release Summary: The 216-S-22 Crib operated from October 1957 to June 1967. The Crib was used for the disposal of liquid waste from the acid recovery facility located in the 293-S Building. Both nitrate and sodium were deposited into the Crib. Approximately 98,400 L (25,994 gal) of liquid process effluent was deposited into the Crib. The site was retired when production operations were terminated at REDOX.

Related Site Structure(s): The 216-S-22 Crib is associated with the 293-S Building. The pipeline associated with this Crib is labeled as 200-W-146-PL under the WIDS sitecode.

Site Posting: The 216-S-22 Crib is marked and posted with Underground Radioactive Material (URM) signs.

Site Characterization Summary: The piping in the 293-S Building was blanked in 1967. In July 2000, the vent risers were sealed as a preventative measure for potential passive radioactive emissions.

The groundwater at the site is monitored by Well #299-W22-19. In addition, visual and surface radiological surveys occur annually. The results of these surveys are not provided in WIDS.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Liquid processing waste containing Nitrate and Sodium.

Figure 1. ArcMap Image

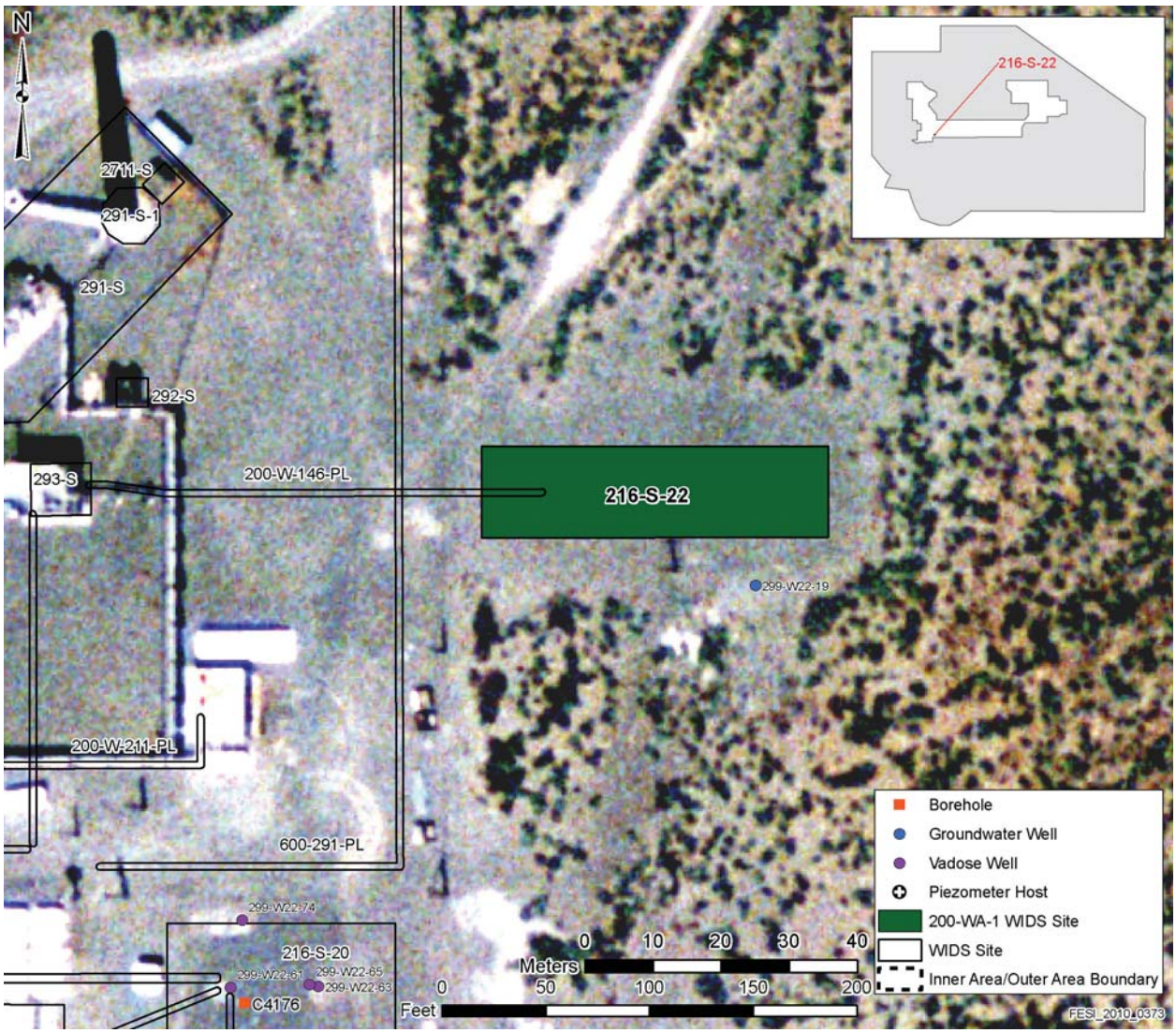


Figure 2. Insert Site Map

Figure not available.

Figure 3. Reference Drawing H-2-44551 Sheet20 Rev7

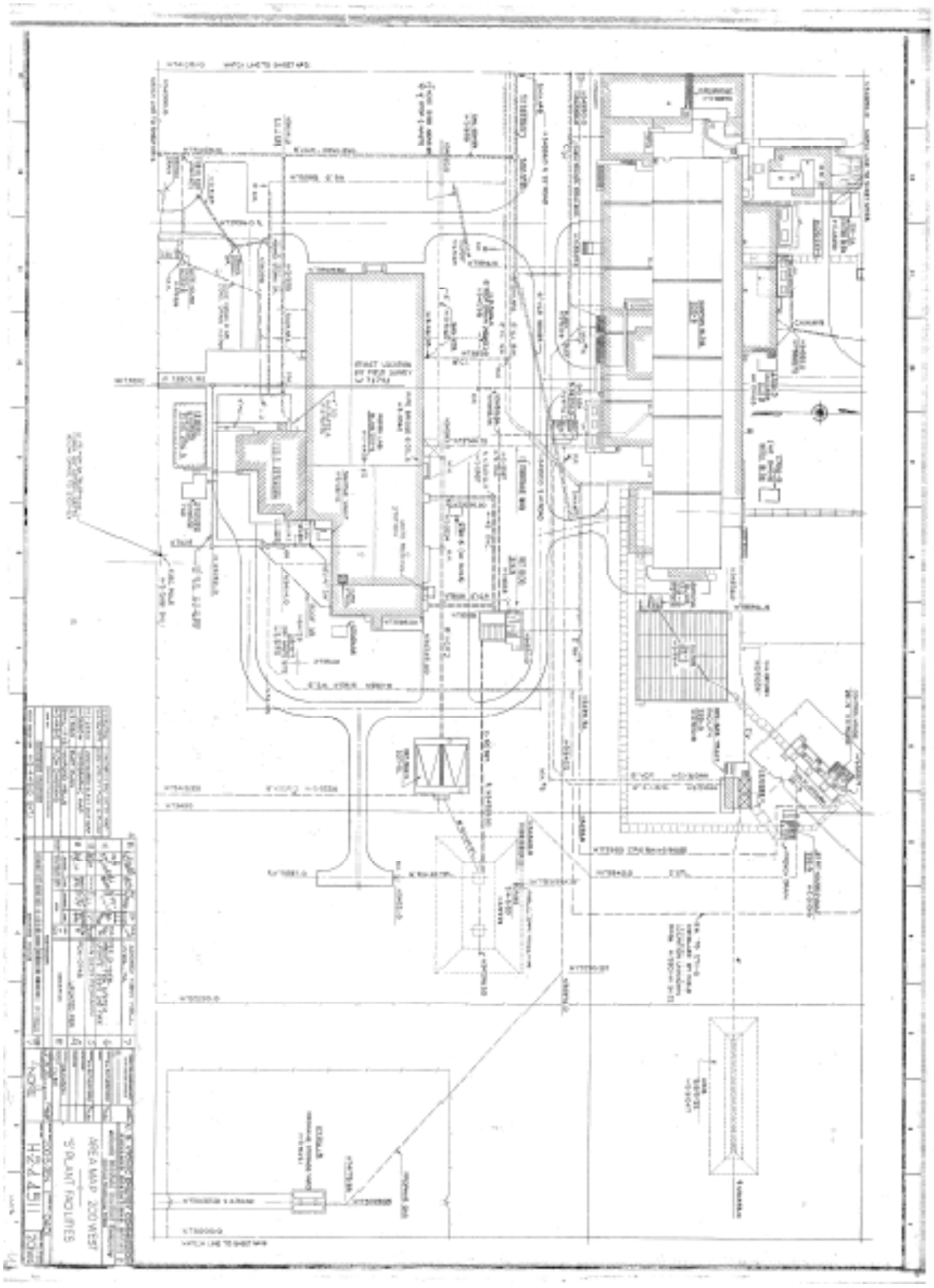
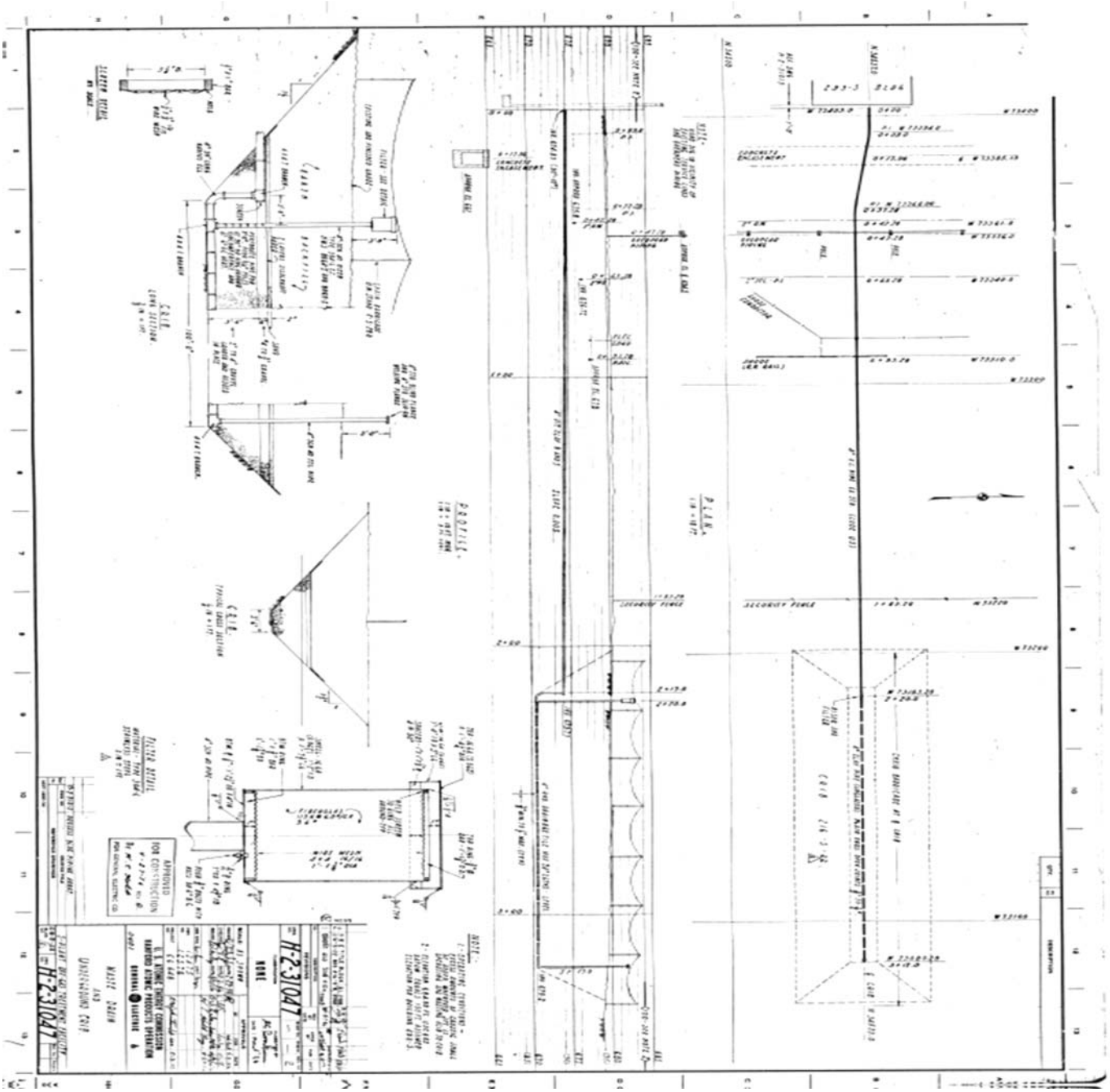


Figure 4. Reference Drawing H-2-31047 Sheet1 Rev2



Site Description

Site ID: 216-S-23, 216-S-23 Crib
Site Type: Crib
Facility/Geographic Area: S-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-PW-4
Service Dates: January 1969 to January 1972
Volume/Mass Discharged: 34,000,000.0 L (8,994,709.0 gal) of process condensate effluent (low salt, neutral to basic process effluent [See Figure_1_ for more details])

Waste Site Location and Physical Description: Site 216-S-23 consists of a crib and associated piping, located northeast of the 241-SY Tank farm and north of the 216-S-9 Crib (See Figure 3. per QMap). The 200-W-141-PL pipeline, which feeds into the 216-S-23 Crib, was tied into the 216-S-9 pipeline; pipeline 200-W-141-PL. The crib was constructed to replace the 216-S-9 Crib. The 216-S-23 Crib is a gravel and fill structure with a 1:1 side slope. A pipe enters the unit below grade and runs the length of the crib within a gravel layer. The rest of the crib contains backfill (See Figure 4. Reference_Drawing H-2-46111 Sheet 1 Rev2 and Figure 5. Reference Drawing H-2-31407 Sheet1 Rev2). The pipe runs along the bottom of the Crib for its entire length. The section of pipe along the crib bottom has open joint.

Waste Site Coordinates:

Easting-567115 Northing-134691

Site Dimensions:

Site Length: 109.7 m (360.0 ft)
Site Width: 3.1 m (10.0 ft)
Site Area: 334.5 m2 (3600 ft2)
Site Depth: 8.5 m (28.0 ft)
Cover Thickness: 0.6 m (2.0 ft)

Release Summary: The 216-S-23 Crib operated from January 1969 to January 1972. The Crib received REDOX process condensate from the D-2 receiving tank in the 202-S building. The waste was low salt and neutral to basic. However, a total of approximately 300 kg (136 lb) of nitric acid was received in the crib. Several radionuclides were also present in the waste including cobalt-60, strontium-90, ruthenium-106, and cesium-137. Approximately 34,000,000 L (8,994,709 gal) of liquid process effluent was deposited into the Crib. The site was retired when production operations were terminated at REDOX.

Related Site Structure(s): The 216-S-23 Crib is associated with the 202-S Building the 240-S-151 Diversion Box, the 216-S-7 Crib, and the 216-S-23 Crib. The pipelines associated with this Crib include the 200-W-138-PL, 200-W-139-PL, and 200-W-141-PL pipelines.

Site Posting: The 216-S-23 Crib is marked with concrete AC-540 markers, and is posted with Underground Radioactive Material (URM) signs.

Site Characterization Summary: The groundwater in the vicinity of the site is monitored by Wells 299-W19-5, 299-W19-6, 299-W19-7, 299-W22-37, and 299-W22-38. In 1976 scintillation probe profiles from these wells indicated that breakthrough of radionuclide groundwater had not occurred. However, both cesium-137 and strontium-90 have been detected in groundwater in wells adjacent to 216-S-23.

In 1995, soil from the surround UPR-200-W-165 site was scraped and consolidated onto the surface of the 216-S-23 Crib. The Crib was interim stabilized afterwards with 0.6 m (2 ft) of clean backfill material.

Potential Contaminants:

Radioactive: Cobalt-60, strontium-90, ruthenium-106, and cesium-137

Non-Radioactive: Liquid processing waste containing Nitrate.

Figure_1_Waste Volumes Discharged in Liters Per Year.

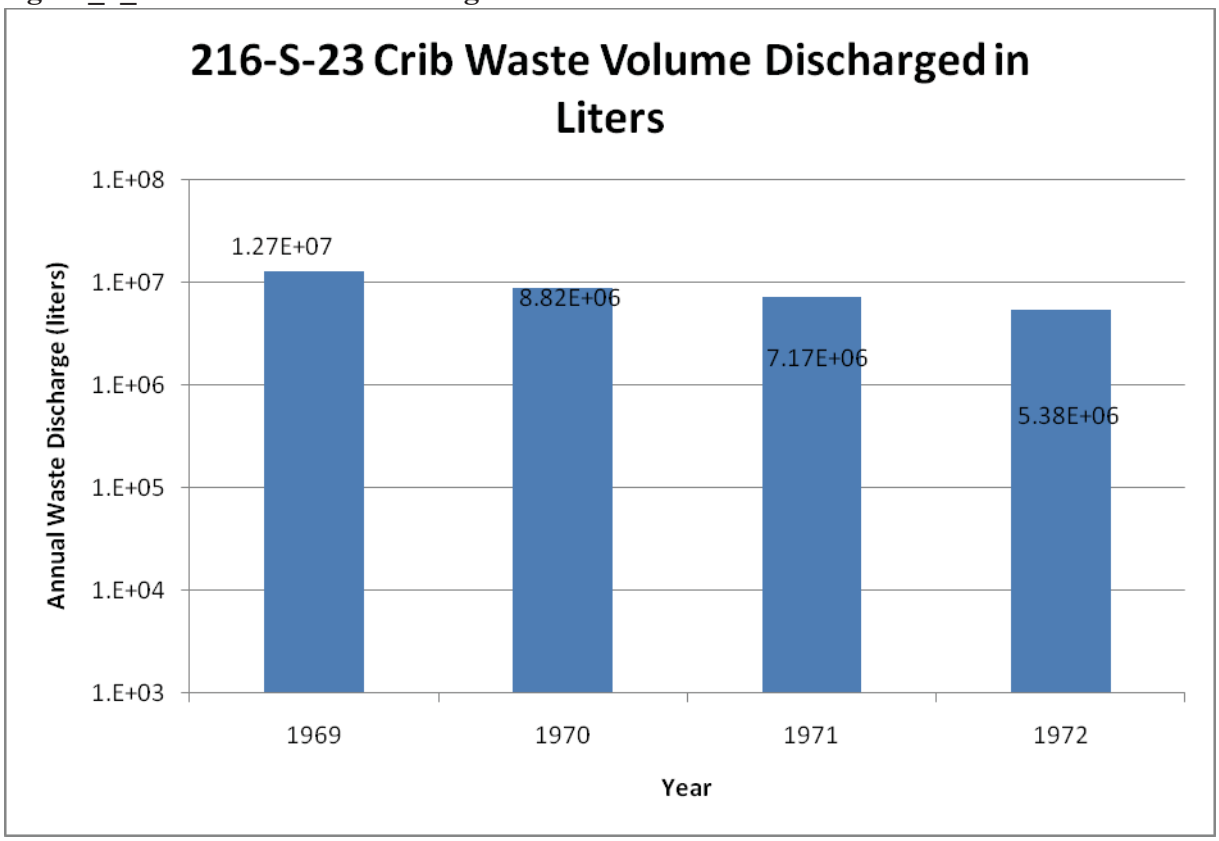


Figure 2. ArcMap Image

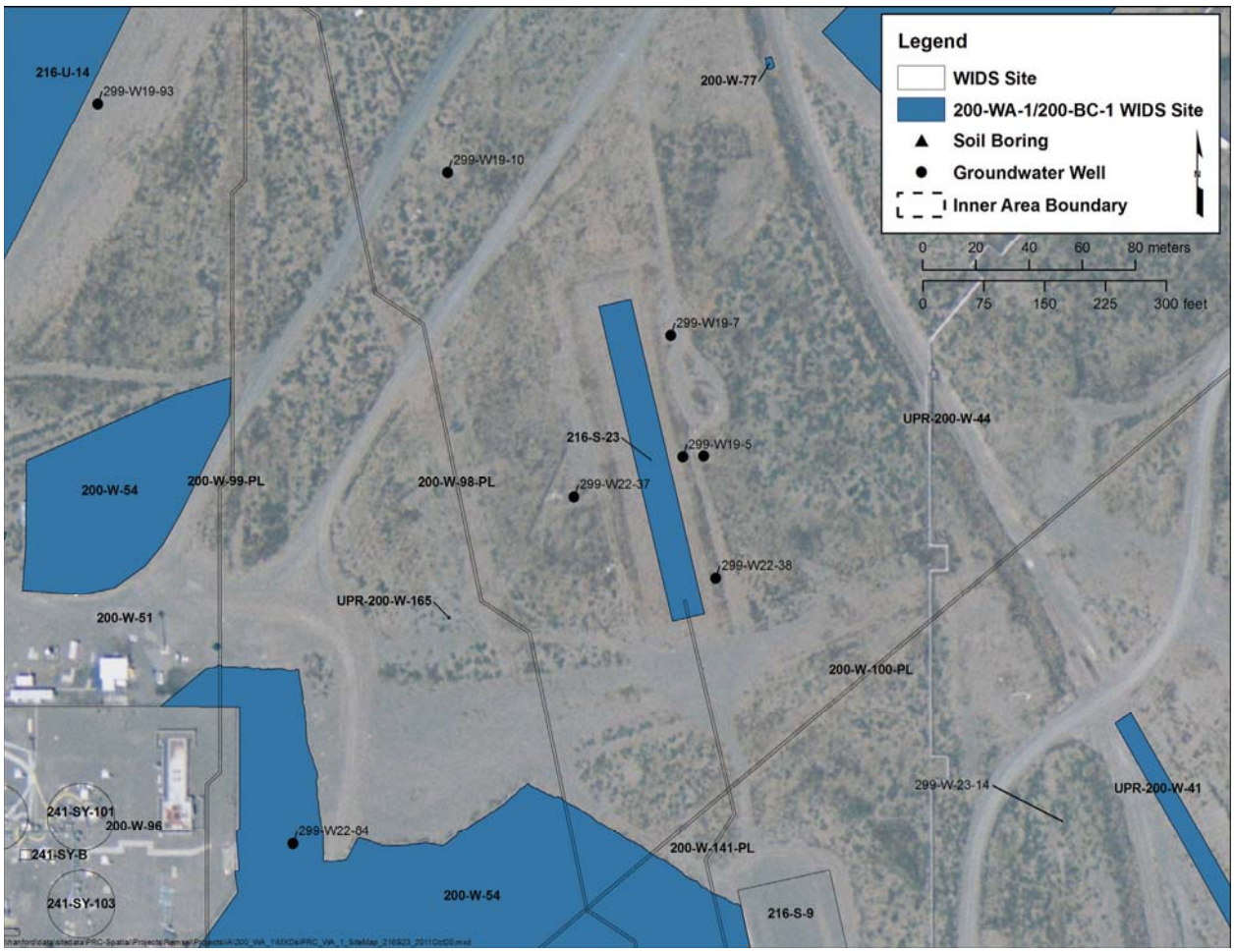


Figure 3. Insert Site Map

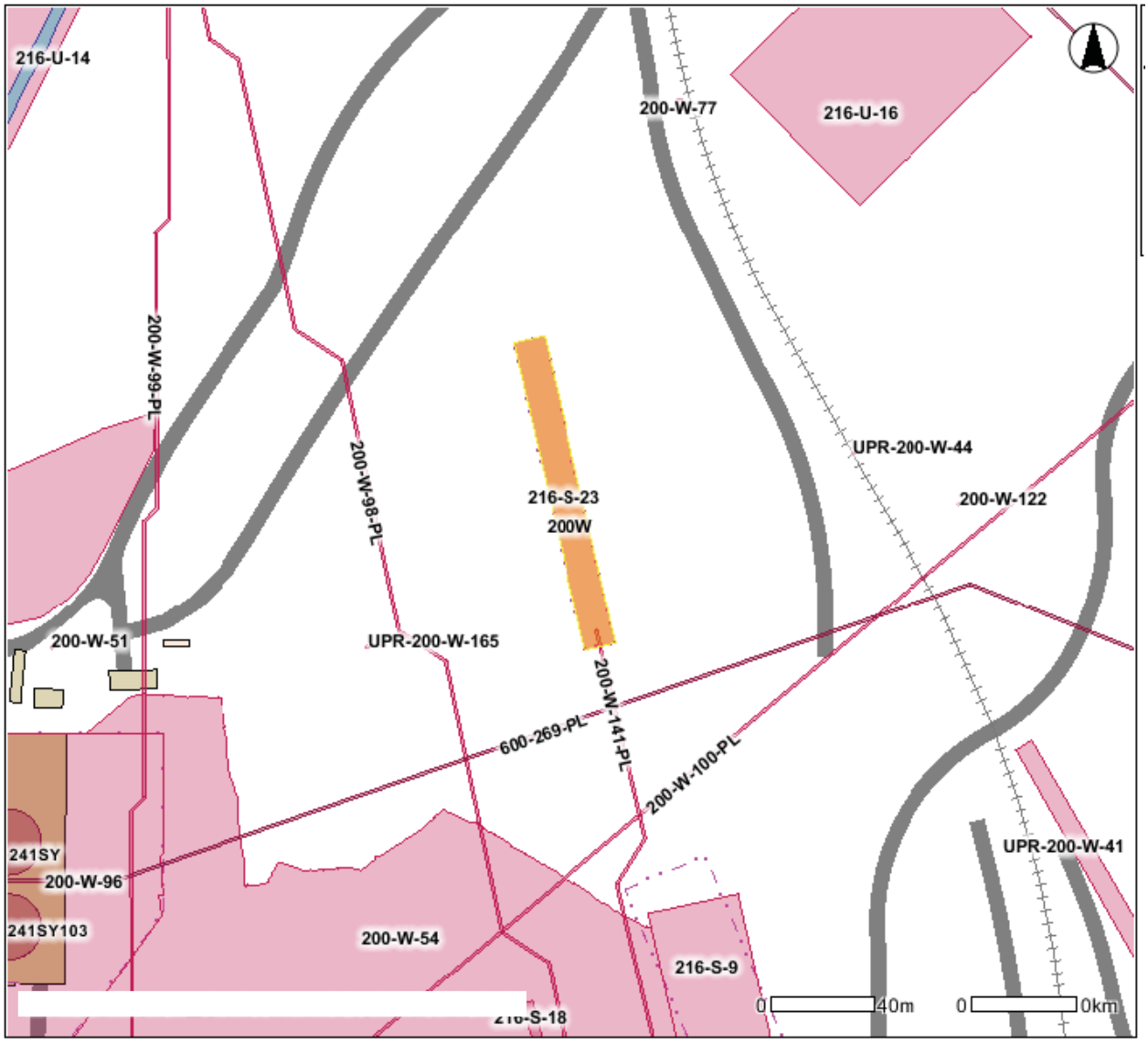


Figure 4. Reference Drawing H-2-46111 Sheet1 Rev2

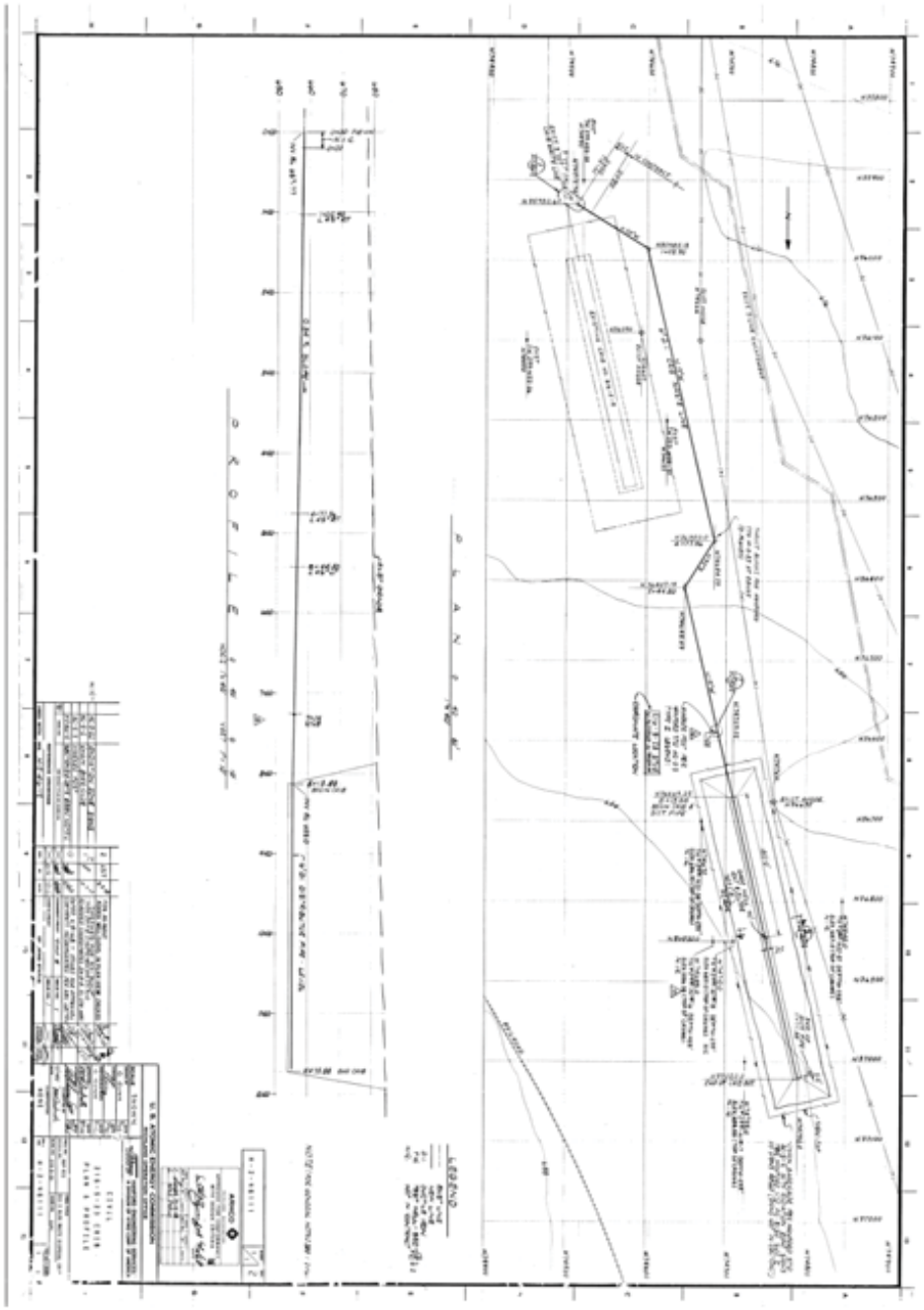
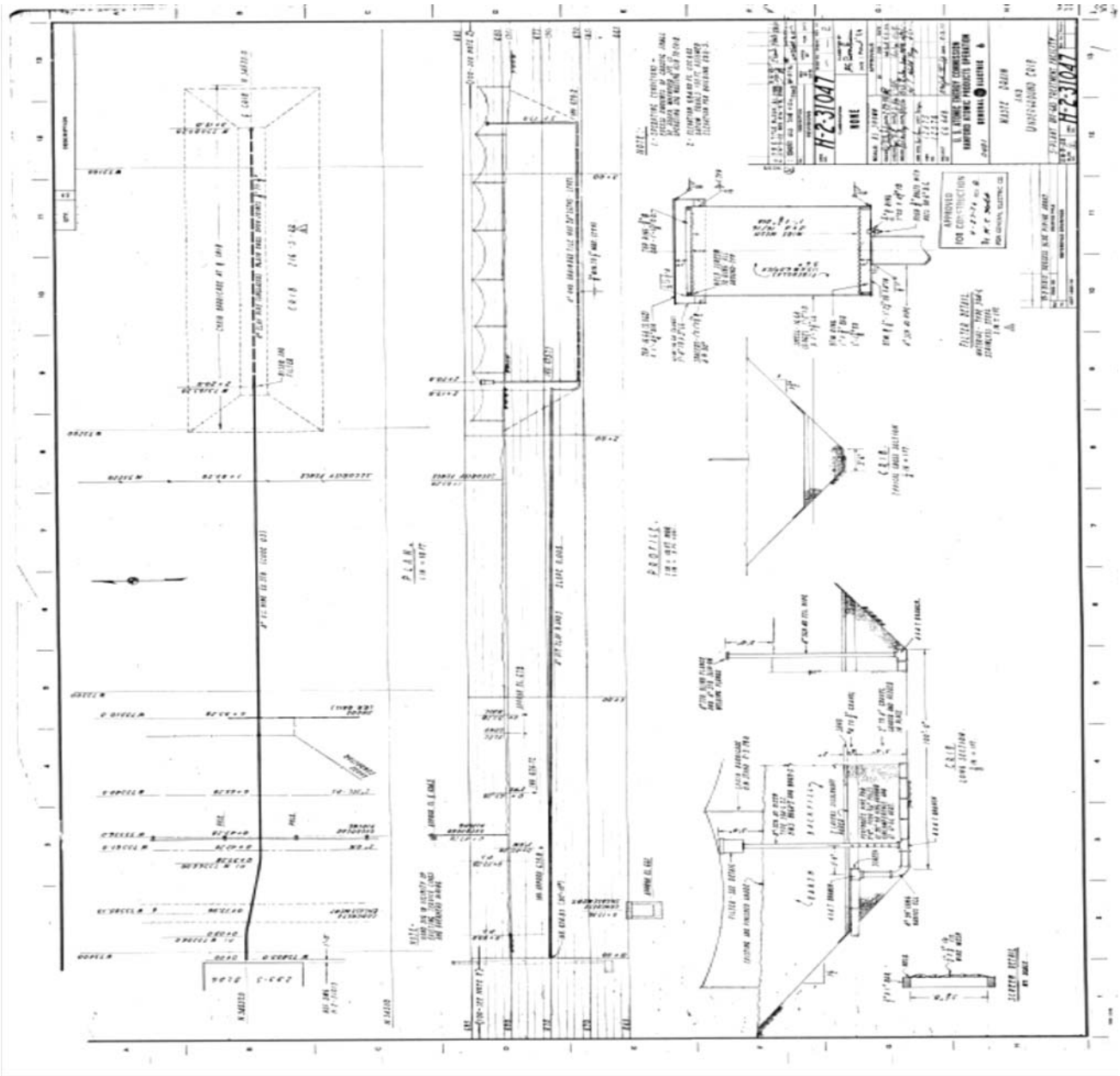


Figure 5. Reference Drawing H-2-31047 Sheet1 Rev2



Site Description

Site ID: 216-S-25, 216-S-25 Crib
Site Type: Crib
Facility/Geographic Area: S-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-SC-1
Service Dates: January 1973 to January 1992
Volume/Mass Discharged: 288,000,000 L (76,190,476 gal) of process steam condensate effluent, tank farm cooling water, and 216-U-1&2 groundwater pump-and-treat effluent

Waste Site Location and Physical Description: Site 216-S-25 consists of a crib and associated piping, located west of 241-S/SX Tank farm and north of the 216-S-4 Crib (See Figure 2. per QMap). The 216-S-23 Crib is a gravel and fill structure with an approximate 1.5:1 side slope. A distribution pipe enters the unit below grade and runs the length of the crib within a gravel layer. The pipe is currently 7 ft below grade. Three gage and vent wells are attached to the distribution pipe. The bottom 3 ft of the crib consists of gravel, overlain by approximately 1 ft of sand, with remainder of the crib containing backfill (See Figure 3. Reference_Drawings H-2-46292 Sheet 1 Rev1 and DOE/RL-2008-45, Rev 0). The pipe runs along the bottom of the Crib for its entire length. The Crib received effluent from the 242-S Evaporator Building via the 200-W-161-PL pipeline; which is a 10cm (4in) diameter pipeline buried 2.1m (7.0ft) below grade. In 1984, the 200-W-159-PL Pipeline from 241-SX-402 was tied into the 200-W-161-PL Pipeline for deposition into the Crib.

Waste Site Coordinates:

Easting-566572 Northing-134285

Site Dimensions:

Site Length: 175.3 m (575.0 ft)
Site Width: 3.1 m (10.0 ft)
Site Area: 534.2 m2 (5750 ft2)
Site Depth: 3.1 m (10.0 ft)
Cover Thickness: 1.8 m (6.0 ft)

Release Summary: The 216-S-25 Crib operated from January 1973 to January 1992. The Crib received REDOX process steam condensate from the 242-S evaporator building until November 1980, at which time the Evaporator was placed in standby mode. After Novermber 1980, the crib received intermittent streams of 241-SX tank farm cooling water. In 1985, the crib received effluent from groundwater pump-and-treat associated with 216-U-1&2. The waste was basic and low salt. Several radionuclides were also present in the waste including cesium-137, strontium-90, and ruthenium-106. Approximately 288,000,000 L (76,190,476 gal) of liquid was deposited into the Crib. In 1992 the 241-SX sludge cooler steam heater was shut off due to leaking tubes. A new steam heater unit was scheduled for installation in 1993 and slated for start up in the winter of 1995. However, it is not specified whether the new heater unit was ever brought online. The heater unit was scheduled to operate through the winter and into early spring; approximately 5 months total. The unit was slated to produce roughly 15 to 30L (4-8gal) of condensate per hour that would be sent to the 216-S-26 Crib for disposal. Use of the crib was discontinued in 1992.

Related Site Structure(s): The 216-S-25 Crib is associated with the 242-S Evaporator Building. The pipelines associated with this Crib are 200-W-161-PL and the 200-W-159-PL from the 241-SX Tank Farm.

Site Posting: The 216-S-25 Crib area is marked with AC-540 markers and posted with Underground Radioactive Material (URM) signs.

Site Characterization Summary: In 1976 scintillation probe profiles from wells 299-W23-9, 299-W23-10, and 299-W23-11 indicated that breakthrough of radionuclide groundwater had not occurred. The groundwater in the vicinity of the site is monitored by Wells 299-W23-09. Gross alpha, gross beta, uranium isotopes, and tritium have been detected in groundwater from the well.

A radiation survey occurred on June 18, 1997 as part of a routine site survey. One dust particle with a reading of 150,000 d/m was detected and subsequently removed. No other contamination was found within the Crib. A GM/P-11 Probe (15.5 cm^2) for Beta/Gamma was used during the survey. Radiological surveys are performed annually, however there is no documentation detailing recent survey results

Potential Contaminants:

Radioactive: Cesium-137, strontium-90, and ruthenium-106.

Non-Radioactive: Treated pump-and-treat water potentially containing uranium.

Figure 1. ArcMap Image

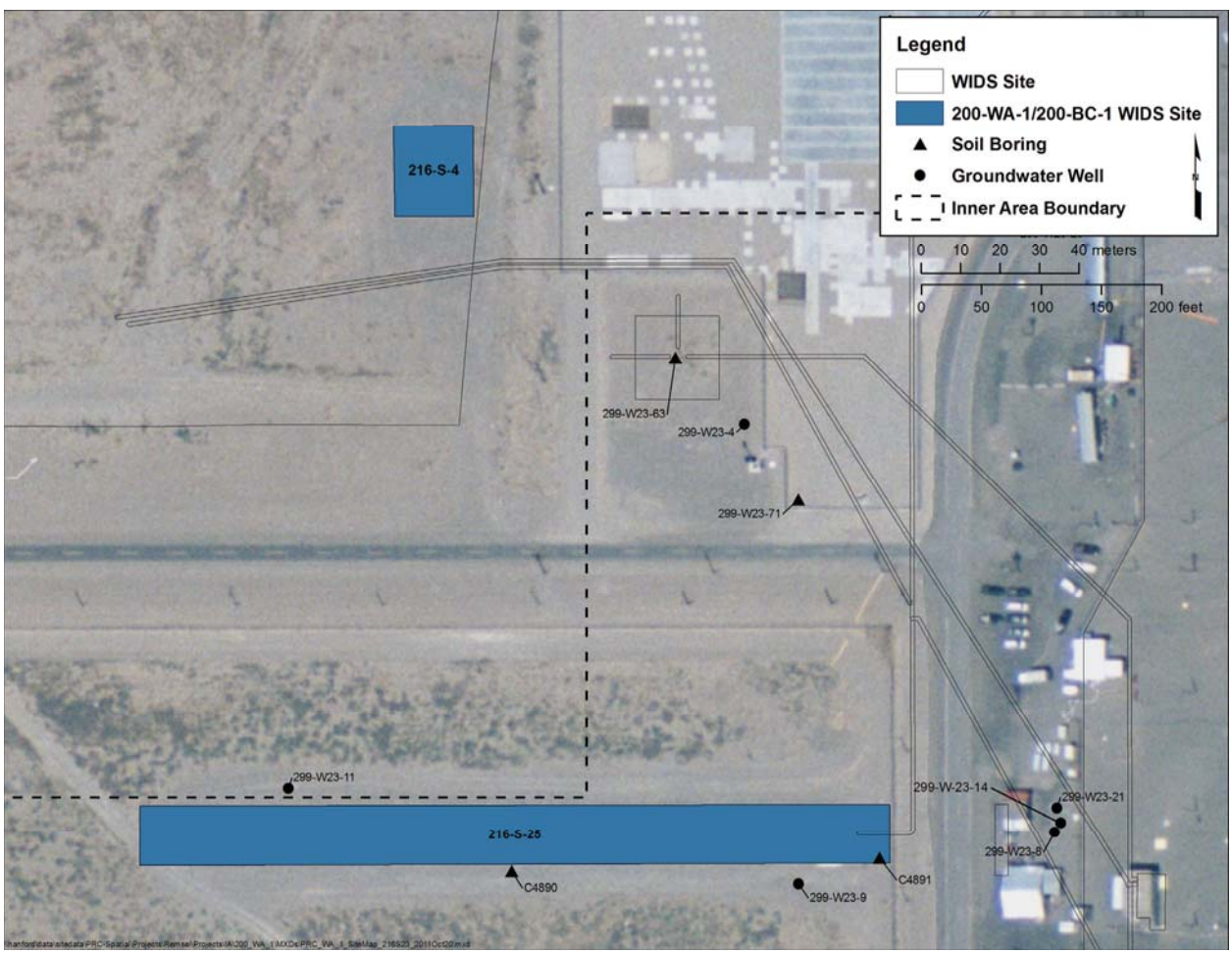


Figure 2. Insert Site Map

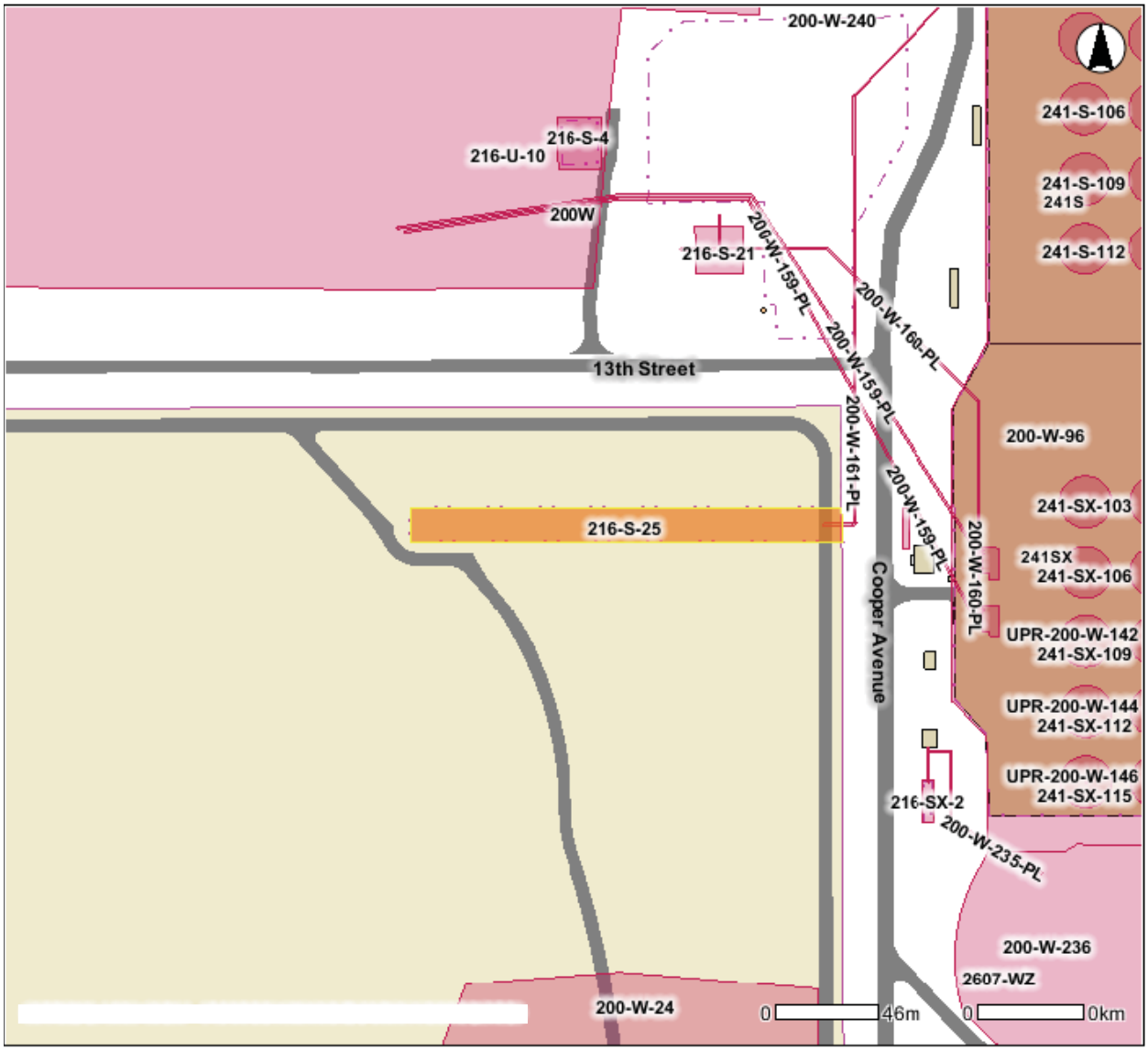
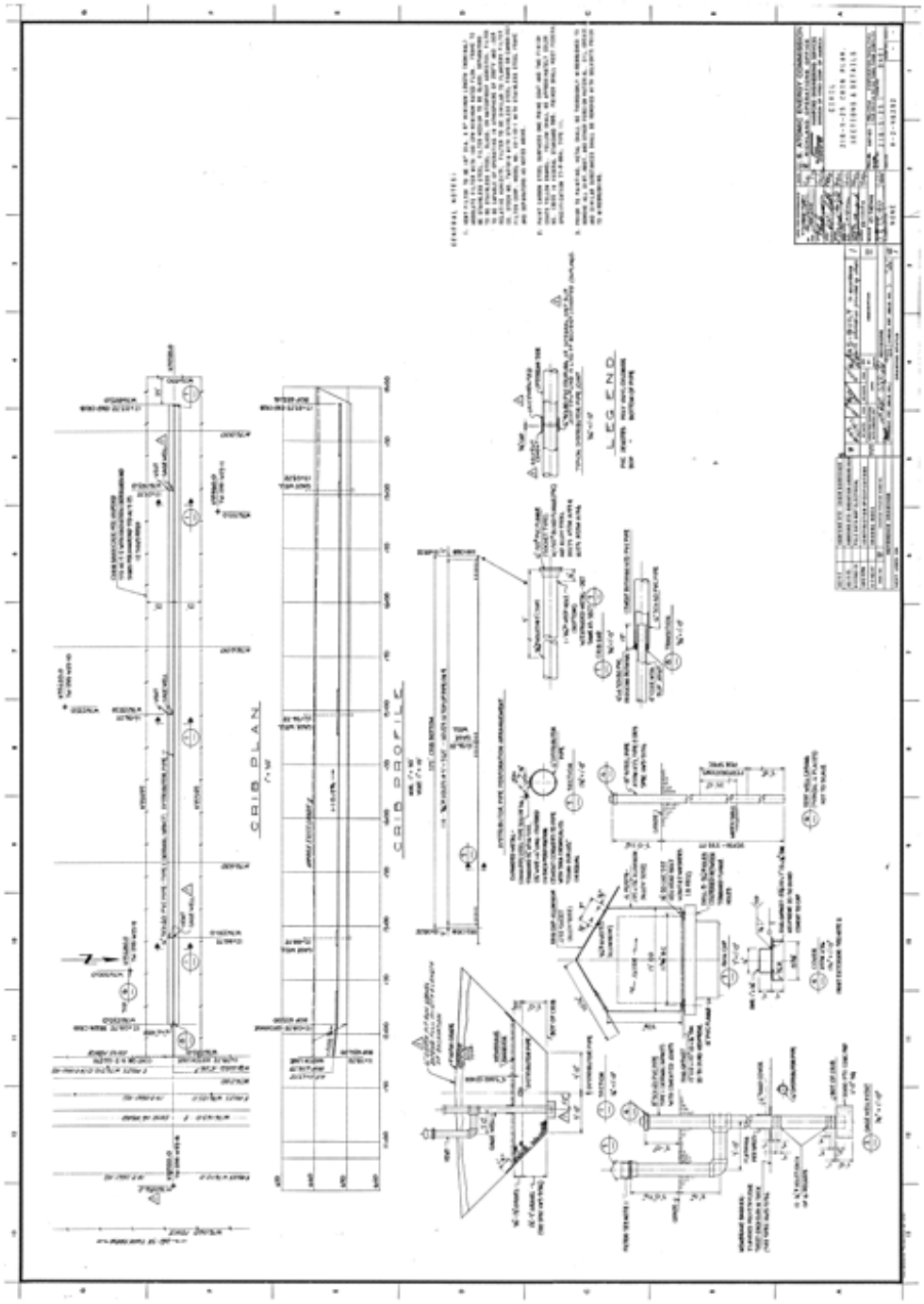


Figure 3. Reference Drawing H-2-46292 Sheet1 Rev1



Site Description

Site ID: 216-S-3 **Site Type:** Crib
Facility/Geographic Area: S Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: WMA S/SX
Service Dates: September 1953 to August 1956
Volume/Mass Discharged: 4.2E+06 L (1.1E+06 gal)

Waste Site Location and Physical Description: The unit was located outside the 241-S Tank Farm east fence (See Figure 1). In 1996, the eastern tank farm fence line was expanded. The crib is now inside the tank farm fence. The unit consists of two open bottomed crib boxes 3.1 m (10 ft) by 3.1 m (10 ft) made of timbers. The two crib boxes are connected in series 15 m (50 ft) apart, with overflow from one box into the other via a pipe. These boxes are set into a gravel layer in the bottom of a trench. The trench was the backfilled. Each box contains two flanged riser pipes extending from the top of the box. The site was deactivated by removing the above-ground piping in the tank farm to the crib after the tank air condensers were reactivated.

Waste Site Coordinates:

Lon 566893.945 Lat 134437.538

Site Dimensions:

Site Length: 30.48 m (100 ft) Site Depth: 1.83 m (6 ft)
Site Width: 3.05 m (10 ft) Cover Thickness: N/A
Site Area: 92.96 m^2 (1000 ft^2)

Release Summary: The site received condensate from condensers on the 241-S-101 and 241-S-104 Tanks in the 241-S Tank Farm. The waste is low in salt and is neutral to basic. The inorganics at the site consist of nitrate, sodium, sodium dichromate, sodium hydroxide, sodium aluminate, and ammonium nitrate. Prior to the construction of the 241-SY Tank Farm, slightly contaminated surface soil was scraped off and placed over a depressed area along the 241-S east fence line.

The depressed area was either the 216-S-3 or 216-S-15 Site. The soil was generally contaminated to approximately 1000 counts per minute.

The estimated total volume of process effluent discharged to the site is approximately 4.2E+06 L (1.1E+06 gal) and the calculated potential lifetime discharge could exceed one vadose zone pore volume.

$PV_{released}$ = 4.2E+06 L/ (92.96 square m*74 m*0.3*1000 Liters/m^3) = 1.16

Related Site Structure(s): The crib is associated with the condensers on the 241-S-101 and 241-S-104 tanks located inside the 241-S Tank Farm. The site is also associated with the 216-S-15 Pond.

Site Posting: The site is posted with "Underground Radioactive Material" signs.

Site Characterization Summary: Visual and radiological surveys are being performed at this site. The condensate diverted to this crib was sampled and the analysis indicated 95% of the activity was due to zirconium-niobium.

Potential Contaminants:

Radioactive: N/A

Non-Radioactive: nitrate, sodium, sodium dichromate, sodium hydroxide, sodium aluminate, and ammonium nitrate

References:

All information from WIDS Summary Report unless otherwise noted.

Figure 1. ArcMap Image

Figure 2. Insert Site Map From Qmap

Figure not available.

Site Description

Site ID: 216-S-4, 216-S-7, 216-S-4 Sump **Site Type:** Crib water or Crib UN-216-W-1
Facility/Geographic Area: S-Plant Area (200 W Ponds Area)
Current OU Assignment: 200-MG-1
Former OU Assignment: 200-PW- 4
Service Dates: August 1953 to August 1956
Volume/Mass Discharged: 1,000,000.00 Liters Not Specified

Waste Site Location and Physical Description: 216-S-4 is located east of the 216-U-10 Pond and northwest of the 216-S-21 Crib (See Figure_1_QMAP location). The site is constructed of two vertically buried metal culvert pipes. The culverts are rock-filled, 6.1 m (20 ft) long and connected in series (See Figure_2_reference engineer drawing H-2-44511 Sheet 47 Rev3). The site received liquid from the 241-S-101 and 241-S-104 tank condensers via an above ground pipe. The site operated from August 1953 to August 1956. The site was retired when the 241-S-Tank air condensers were reactivated. The site was deactivated by removing the above-ground piping in the tank farm to the units.

Waste Site Coordinates:

Lon-566549.25301 Lat-134456.60475

Site Dimensions:

Site Length: NA Site Depth: 6.6 m (21.8 ft)
Site Width: 0.9 m (2.5 ft) Cover Thickness: 0.3-0.6 m (1-2 ft)
Site Area: 1.0 m 2 (10.8 ft2)

Release Summary: From August to September 1953, the site received condensate and cooling water effluent contaminated with chemical nitrate from the 241-S-101 and 241-S-104 Tank Condensers. Both condensers are located within the 241-S Tank Farm. From September 1953 to August 1956, only cooling water was sent to the site, as the condensate waste was routed to the 216-S-3 Crib.

Related Site Structure(s): The site is associated with the condensers on the 241-S-101 and 241-S-104 Tanks located inside the 241-S Tank Farm.

Site Posting: The site was marked and posted with Underground Radiological Material signs following interim surface stabilization work in 1991.

Site Characterization Summary: Interim surface stabilization work in 1991 covered the site with clean backfill material. Two site hazards are listed for this site. On October 13, 1997 the site was listed as a potential hazard due to the presence of chemicals. The site was listed on July 22, 1998 as being at risk of collapse.

Visual and surface radiological surveys are performed at this site. However, no details are provided regarding survey frequency or survey results.

Potential Contaminants:

Radioactive: Tc-99, Sr-90, H3, U-238

Nonradiological: Ag, As, Hg, NO3, Hex Cr

Figure 1. ArcMap Image

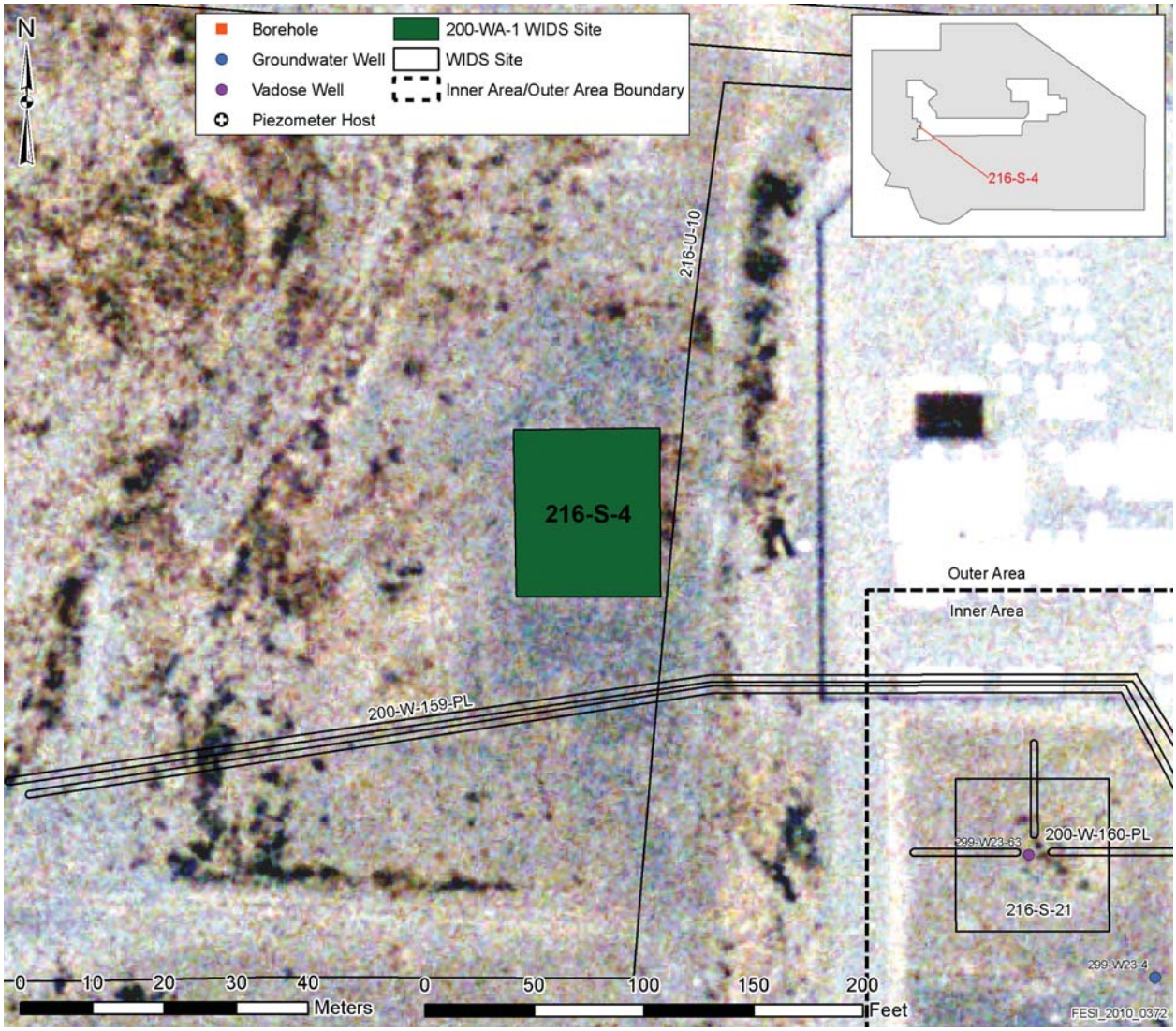
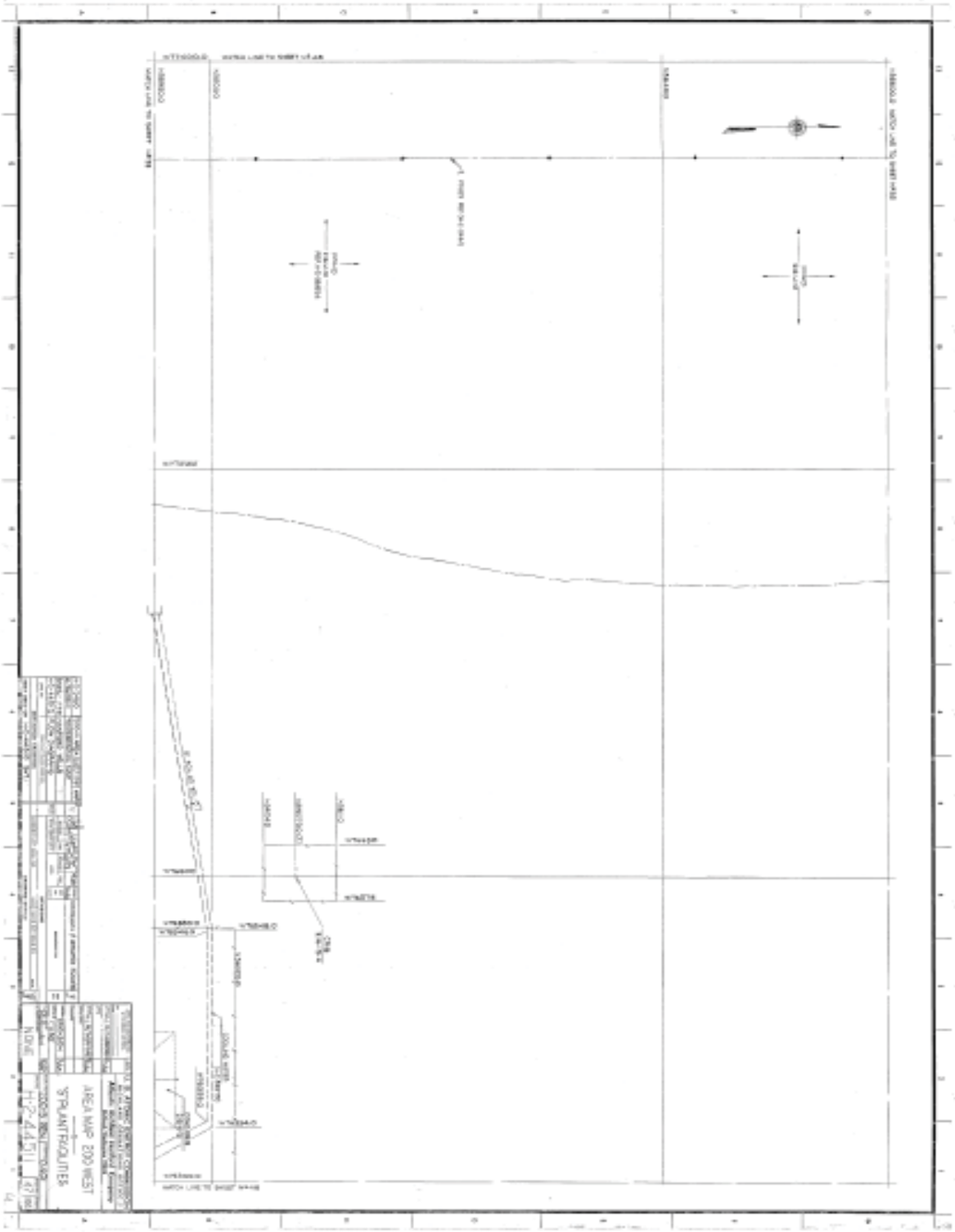


Figure 2. Insert Site Map

Figure not available.

Figure 3. H-2-44511 Sheet 47 Rev3



Site Description

Site ID: 216-S-5, 216-S-5 Cavern #1 **Site Type:** Crib
216-S-9, 216-S-5:1, 216-S-6 Crib (See Related Site Structures section)
Facility/Geographic Area: S-Plant Area
Current OU Assignment: 200-SC-1
Former OU Assignment: Not Specified
Service Dates: March 1954 to 1957
Volume/Mass Discharged: 4.10E+09 L (1.10E+08gal)(See Figure_1_for more details).

Waste Site Location and Physical Description: Site 216-S-5 is located outside of the 200 West Area perimeter fence, southwest of 207-S Retention Basin, and west of the 216-S-10 Ditch (See Figure_2_per QMap). The site consists of a gravel-filled crib and an overflow trench (See Figure_3_ reference engineer drawings H-6-466 Sheet 8 Rev0 and Figure_4_H-2-44511 Sheet7 Rev1). The site was originally labeled an underground swamp. The overflow trench is to the south of the Crib. The Crib is constructed of two lengths of perforated, corrugated metal pipe that form a "t" or cross. Interim surface stabilization work has occurred at the site, however the work conducted and/or the depth of any interim covering is not specified in WIDS.

Waste Site Coordinates:

Lon-566358.57850 Lat-133308.21620

Site Dimensions:

Site Length: 64.0 m (210.0 ft) Site Depth: 4.6 m (15.0 ft)
Site Width: 64.0 m (210.0 ft) Cover Thickness: None
Site Area: Not specified

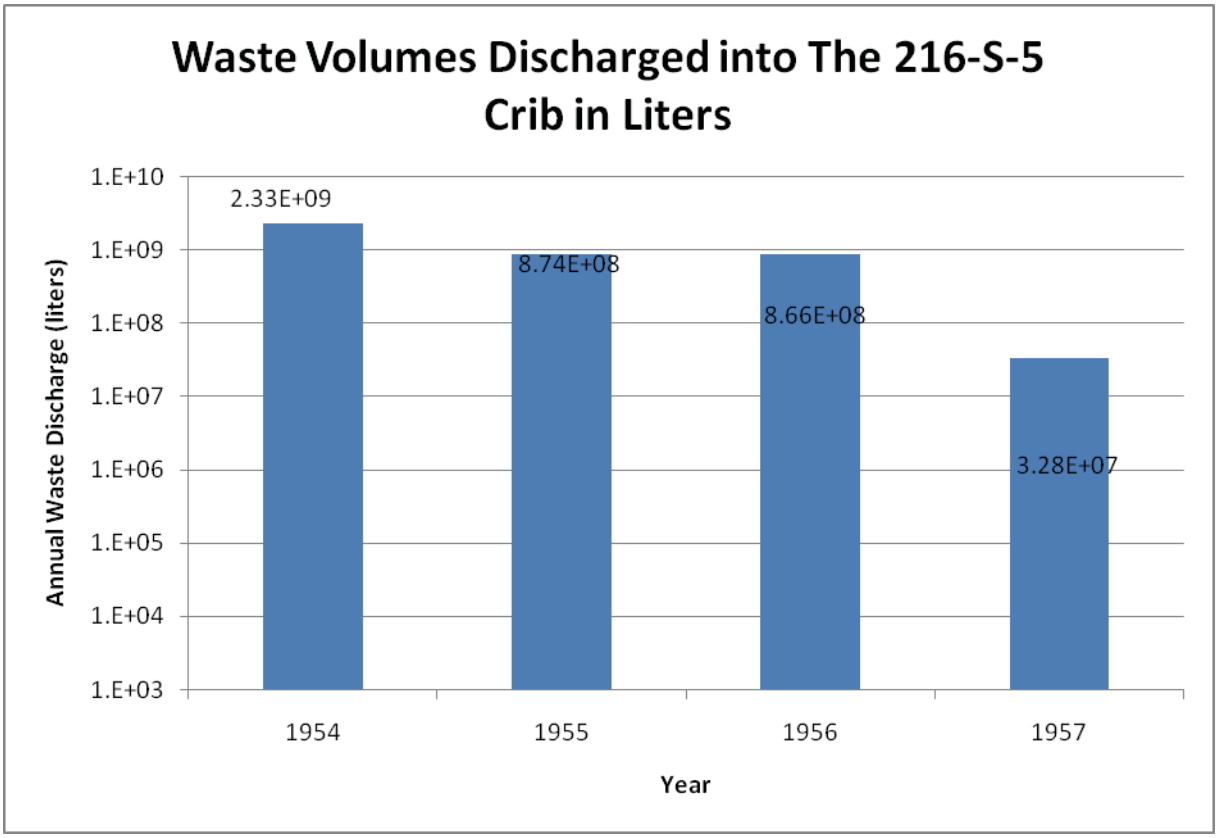
Release Summary: The 216-S-5 Crib operated from March 1954 to 1957 and was used for the subsurface disposal of an estimated volume of 4.10E+09 L (1.10E+08gal) of acidic, liquid waste containing nitrates. The effluent consisted of process vessel cooling water and steam condensate from the 202-S Building, which was deposited into the Crib through an underground clay pipeline via the 207-S Retention Basin.

The 216-S-5 Crib was constructed as a temporary disposal site, for the replacement of the heavily contaminated 216-S-17 pond. In addition, the 216-S-5 Crib was also used for the Segregation Project. The Segregation Project routed REDOX effluent with a high potential for contamination to the 216-S-6, while effluent with a low contamination potential was sent to the 216-S-5 Crib.

In September 1955, both the 216-S-5 and 216-S-6 Cribs were operated at rates beyond their capacity level. As a result, in 1956 the site was at risk of flooding due to the high volumes of cooling water discharged. To prevent flooding, a hole was cut along the top edge of 216-S-5 to discharge overflow cooling water into a trench southwest and adjacent to the Crib structure. The overflow rate was estimated at 50 to 100 gallons per minute; which represented approximately 5% of the total flow to the 216-S-5 Crib. The emergency overflow continued throughout the summer of 1956. In September 1956, the REDOX A-2 dissolver and H-4 coils failed. Contamination readings taken along the edge of the Crib overflow area increased from 100

mRad/hr to 350 mRad/hr; with several areas reading up to 17 rad/hr. The emergency crib overflow pond was used until the 216-S-16 Pond was completed in September 1957.

Figure 1. Waste Volumes Discharged in Liters Per Year.



Related Site Structure(s): The 216-S-5 Crib is associated with the 202-S Building, the 207-S Retention Basin, REDOX A-2 dissolver and H-4 coils, and the 216-S-6 Crib. Pipelines associated with this site include the 200-W-154-PL and 200-W-152-PL. In addition, several site features are connected to, and considered part of, the 216-S-5 Crib. These features include the 216-S-5;2, 216-S-5 Overflow Pond, and the 216-S-5 Overflow Trench.

Site Posting: The 216-S-5 Crib is marked and posted with Underground Radioactive (URM) Material signs.

Site Characterization Summary: In 1954, the 207-S Retention Basin was bypassed due to heavy contamination. The Basin was later backfilled with soil to prevent contamination migration. The 216-S-5 Crib was deactivated three years later by valving out and locking the pipeline to the unit. The waste was redirected to the 216-S-16 Pond.

In 1974, action was taken to fill in four “cave-in” depressions at the 216-S-5 Crib. In addition, the surface of the 216-S-5 Crib was stabilized in August 1990. The site was mapped using Global Positioning System (GPS) equipment on April 16, 1998.

Ongoing surveys at this Site include groundwater monitoring and visual and radiological surveys. The frequency of surveys and their results are not provided in WIDS. Groundwater wells 2990W2601, 299-W26-3, 299-W26-4, and 200-W26-5 monitor the 216-S-5 Crib.

Potential Contaminants:

Radioactive: Contamination readings taken along the edge of the Crib overflow area after the REDOX A-2 dissolver and H-4 coils failed in 1956 increased from 100 mRad/hr to 350 mRad/hr, with several areas reading up to 17 rad/hr.

Non-Radioactive: acidic vessel cooling water and steam condensate containing nitrates

Figure 2. ArcMap Image

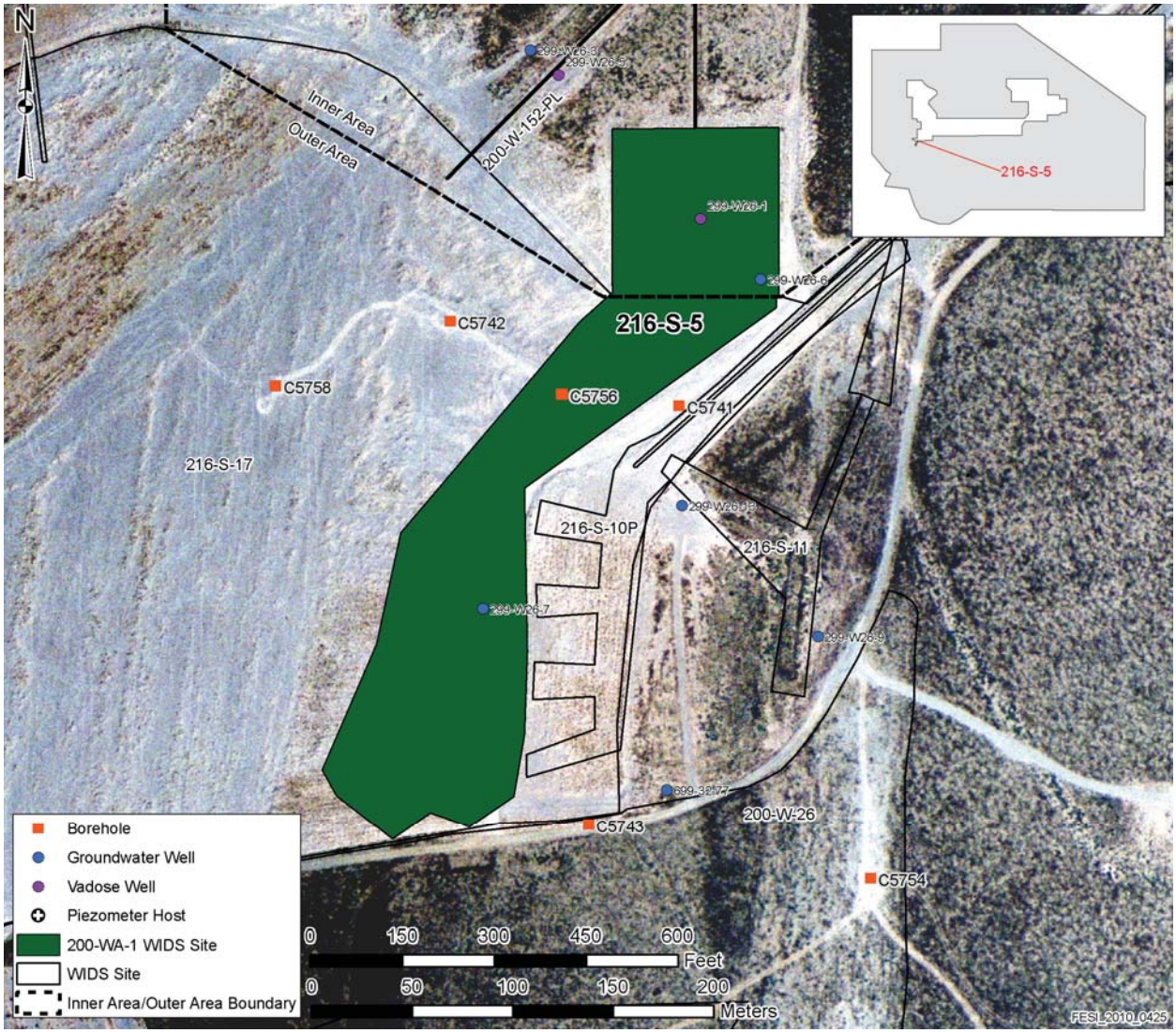


Figure 3. Insert Site Map

Figure not available.

Figure 4. H-6-466 Sheet 8 Rev0

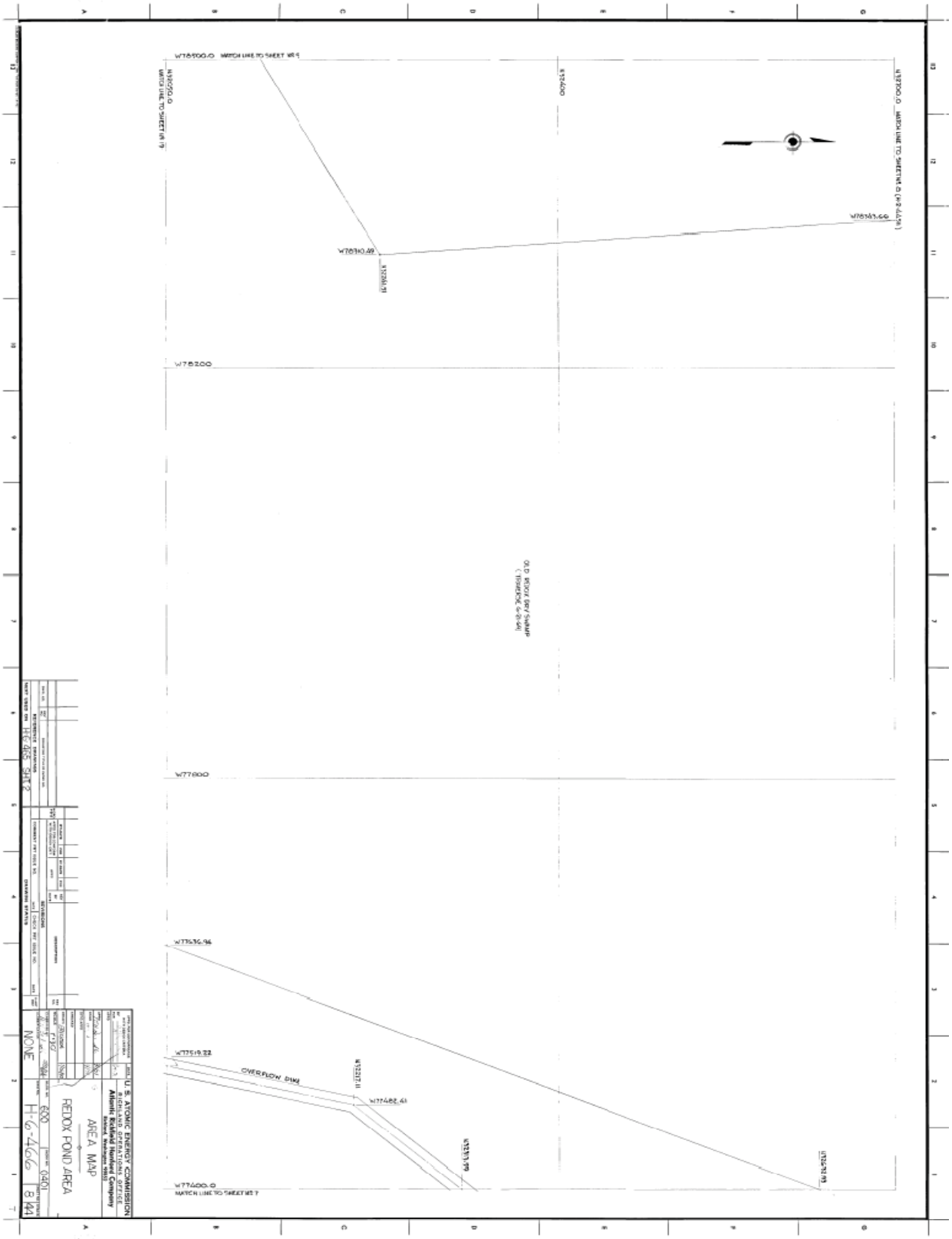
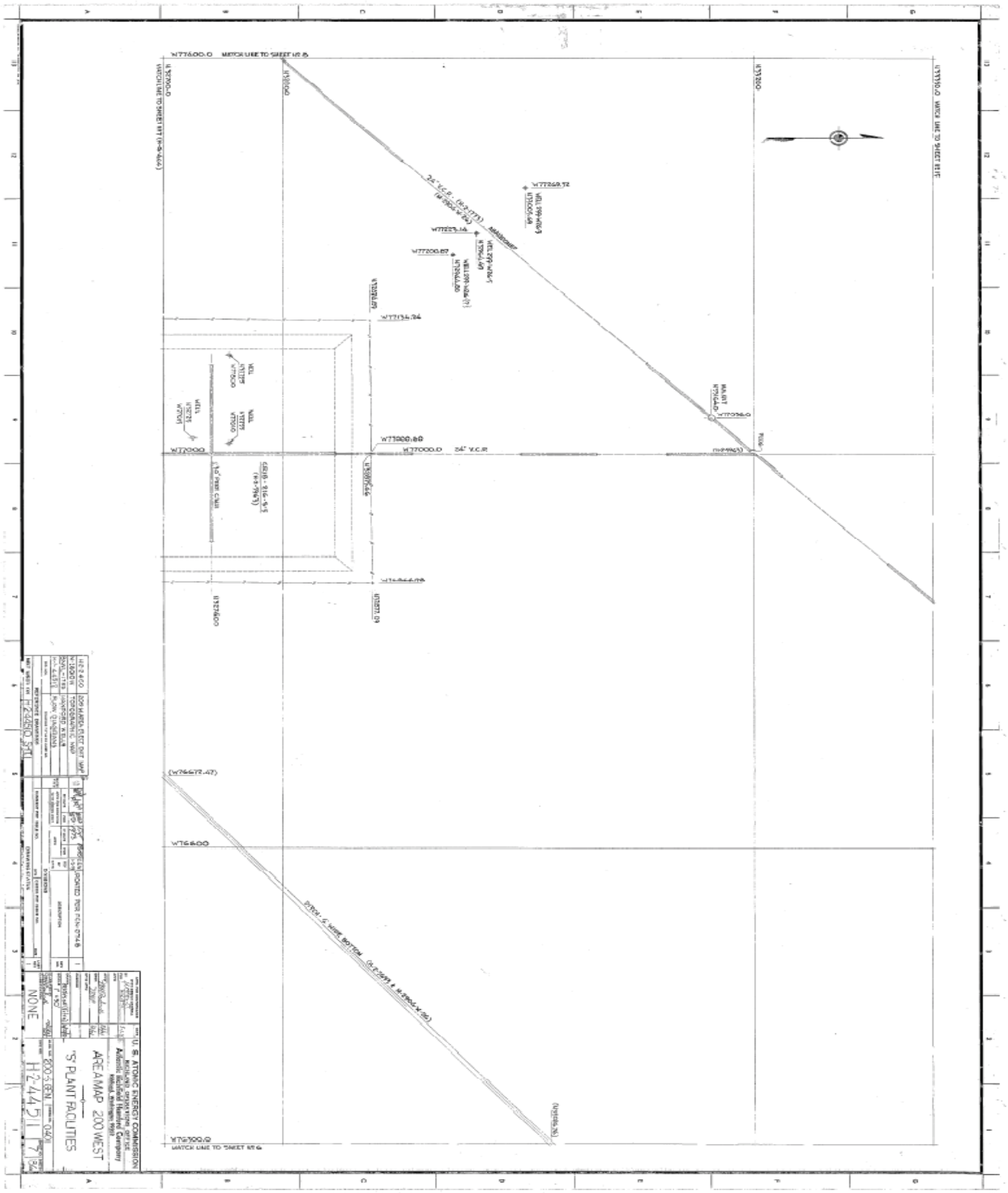


Figure 5. H-2-44511 Sheet7 Rev1



Site Description

Site ID: 216-S-6, 216-S-6 Cavern #2 216-S-5 Crib, 216-S-13 Crib (See Related Site Structures section)
Site Type: Crib
Facility/Geographic Area: S-Plant Area
Current OU Assignment: 200-SC-1
Former OU Assignment: Not Specified
Service Dates: November 1954 to July 1972
Volume/Mass Discharged: 4.50E+09 L (1.20E+09gal) of process vessel cooling water and steam condensate (See Figure 1. for more information).

Waste Site Location and Physical Description: Site 216-S-6 is located outside the 200 West Area perimeter fence, northwest of the 216-S-5 Crib, and north of the 216-S-17 Pond (See Figure 3. per QMap). The site consists of a gravel filled square shaped pit, with corrugated metal perforated piping running through the center (See Figure 4. reference engineer drawings H-2-45511 Sheet 16 Rev1 and Figure 5. Diagram 216-S-6). Six pipes branch off at perpendicular angles to the main pipe. The site is covered by an unspecified amount of backfill.

Waste Site Coordinates:

Lon-566216.68745 Lat-133591.79297

Site Dimensions:

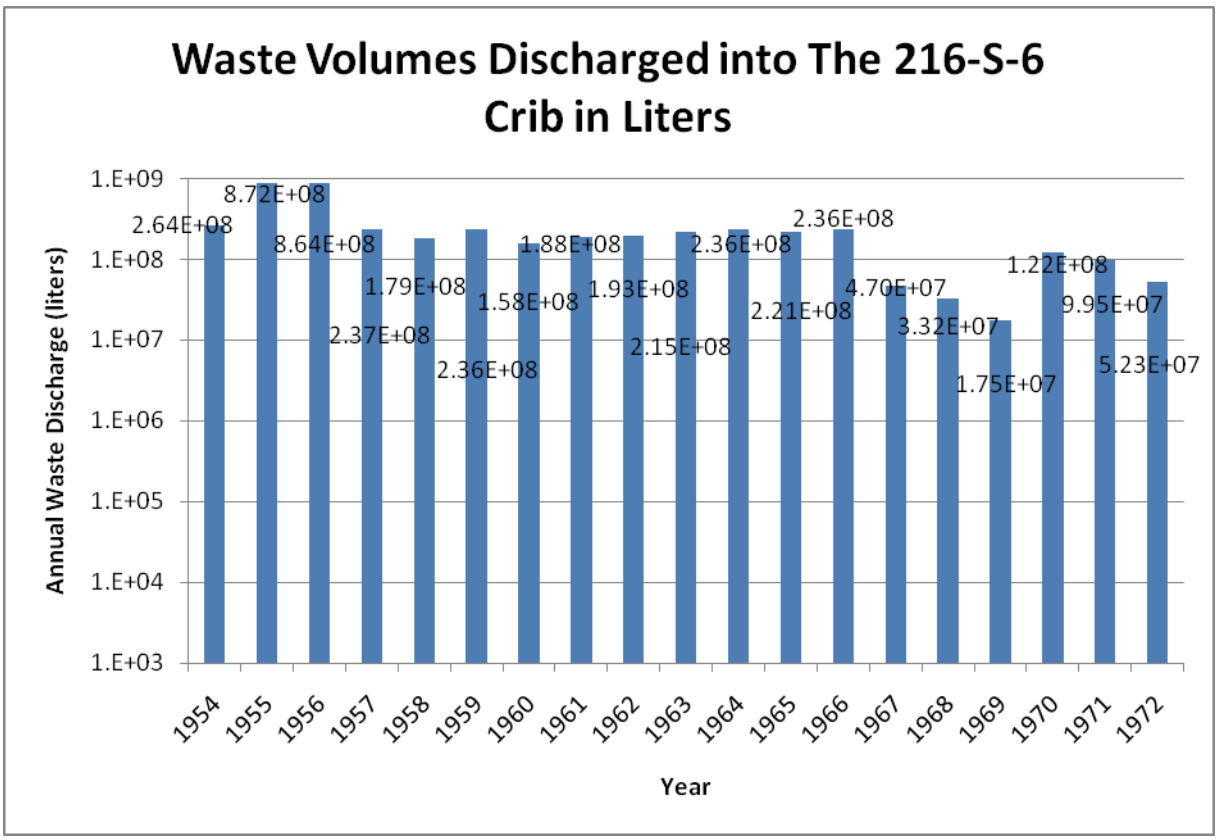
Site Length: 64.0 m (210.0 ft)
Site Width: 64.0 m (210.0 ft)
Site Area: Not specified
Site Depth: 4.6 m (15.0 ft)
Cover Thickness: None

Release Summary: The 216-S-6 Crib began operation in November 1954, and was constructed as part of the Segregation Project. The Segregation Project routed REDOX effluent with a high potential for contamination to the 216-S-6, while effluent with a low contamination potential was sent to the 216-S-5 Crib. The 216-S-6 Crib received an estimated 4.50E+09 L (1.20E+09gal) of liquid waste during its operational lifetime.

The 216-S-6 Crib was used for the subsurface disposal of process vessel cooling water and steam condensate from the 202-S Building. The waste was deposited into the Crib through underground pipelines 200-W-153-PL, 200-W-155-PL, and 200-W-156-PL, via the 207-S Retention Basin. From June 1967 to July 1967, production operations were shut down and the 202-S Building was put on standby. After July 1967, the Site received the steam condensate from the D-12 and D-14 Waste Concentrators in the 202-S Building. The waste was low in salt, neutral to basic, and contained nitrates.

In September 1955, both the 216-S-5 and 216-S-6 Cribs were operated at rates beyond their capacity level. Interim relief was provided by blading off the corner of the 216-S-6 Crib and excavating a run off trench. The overflow was considered a better option than allowing the Crib to flood and damage the roof seal. No contamination problems were noted in the overflow area in 1955.

Figure 1. Waste Volumes Received by the 216-S-6 Crib by Liter Per Year



Related Site Structure(s): The 216-S-6 Crib is associated with the 202-S Building, the 207-S Retention Basin, and the 216-S-5 Crib. Pipelines associated with this site include the 200-W-153-PL, 200-W-155-PL, and 200-W-156-PL. In addition, the 2904-S-171 Control Structure was built to measure and regulate flow of process waste being routed to the 216-S-6 Crib.

Site Posting: The 216-S-6 Crib is marked and posted with Underground Radioactive (URM) Material signs.

Site Characterization Summary: The 216-S-6 Crib was stabilized in September 14, 1990. Ongoing surveys at this Site include borehole characterization and annual visual and radiological surveys. The results of the surveys are not provided in WIDS. Characterization borehole (C6174) was drilled in this Crib in 2008.

The site was mapped using Global Positioning System (GPS) equipment on April 16, 1998.

Potential Contaminants: Radioactive: Not Specified.

Non-Radioactive: neutral to basic vessel cooling water and steam condensate with a low salt content, which contained Nitrates.

Figure 2. ArcMap Image

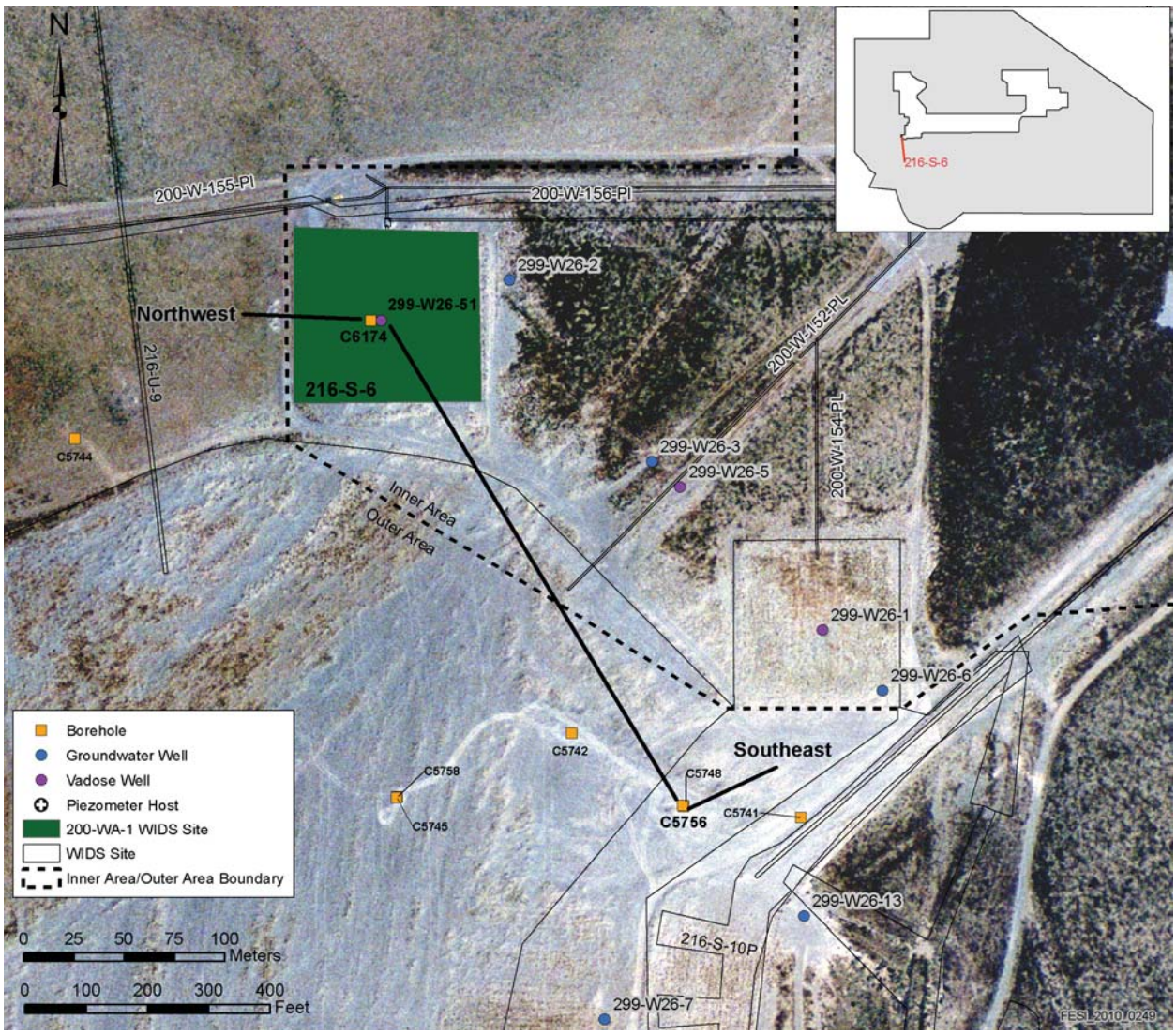


Figure 3. Insert Site Map

Figure not available.

Figure 4. H-2-44511 Sheet 16 Rev1

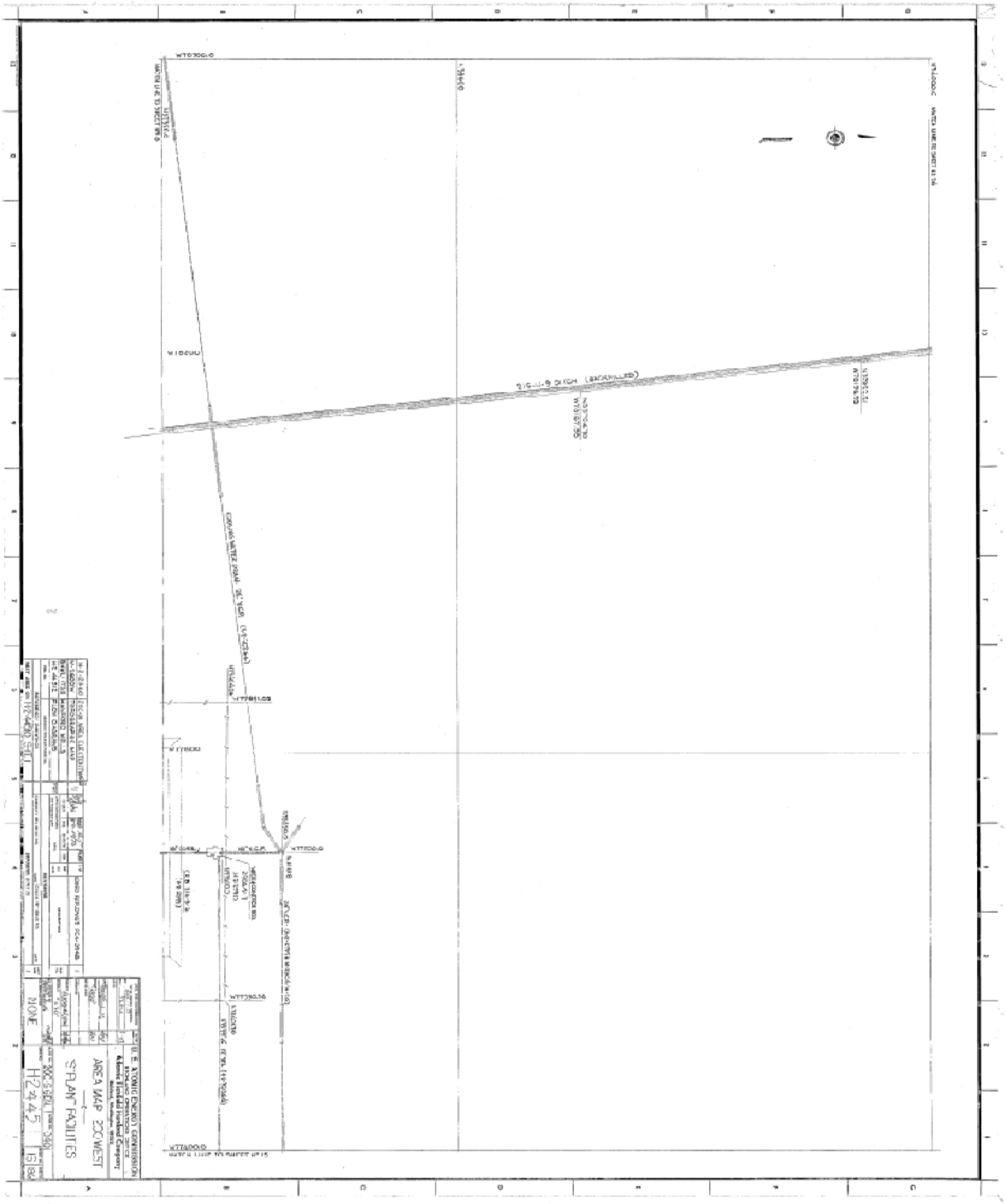
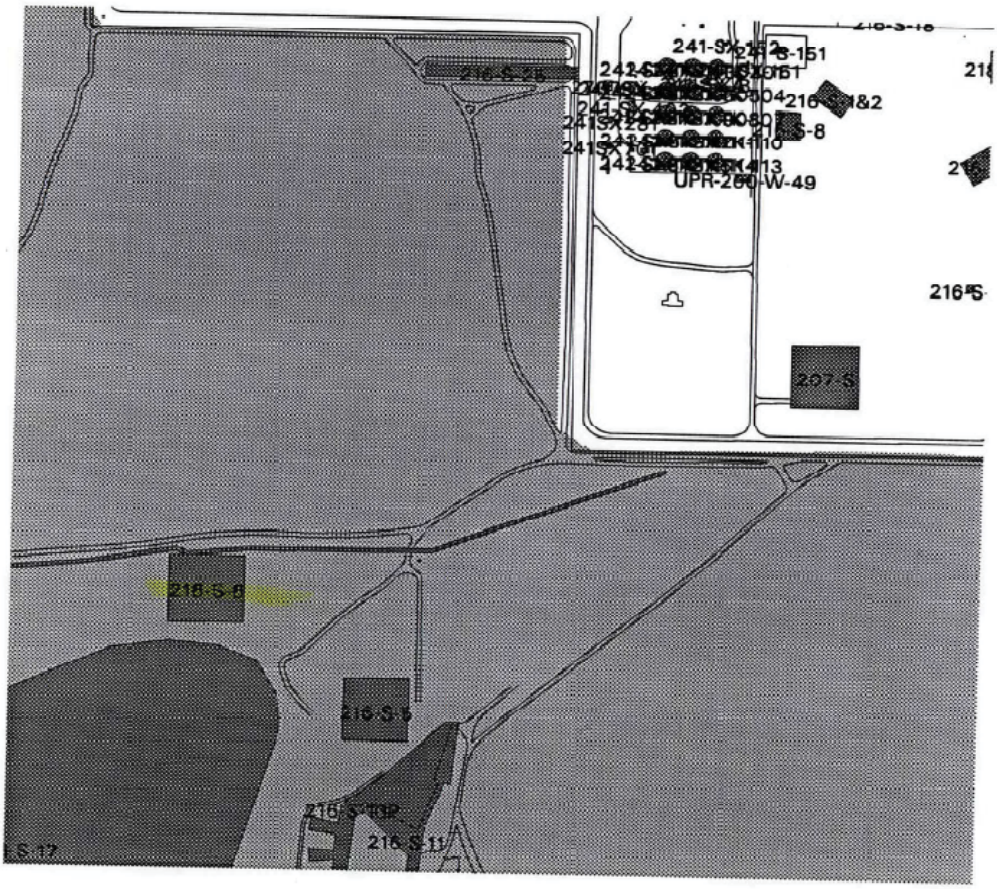


Figure 5. Site Location Sketch

216-S-6

10/15/96



0 100 200

Site Description

Site ID: 216-S-7, 216-S-7 Crib
Site Type: Crib 216-S-15
Facility/Geographic Area: S-Plant Area
Current OU Assignment: 200-PW-2
Former OU Assignment: Not Specified
Service Dates: January 12, 1956 to July 1965
Volume/Mass Discharged: 3.90E+08 L (103E+06gal) of cell drainage and process condensate (See Figure 1. for further information).

Waste Site Location and Physical Description: Site 216-S-7 is located north of 10th Street and northwest of the 202-S Building (See Figure 2. per QMap). The site consists of two wooden cribs measuring 4.9 m2 (16.1 ft2) and 1.6 m2 (5.2 ft2) (See Figure 3. reference engineer drawing H-2-45511 Sheet 1 Rev3). Both crib boxes are located in the same excavation pit, and are spaced 15.3 m (50 ft) from each other, center to center. The boxes are set in a layer of gravel and covered with backfill. A pipe connected the two cribs allowed for the waste entering the site to be equally distributed between both cribs. Each Crib box had two risers that extended to the surface. The depth of overburden is 4.5 m (14.6 ft).

Waste Site Coordinates:

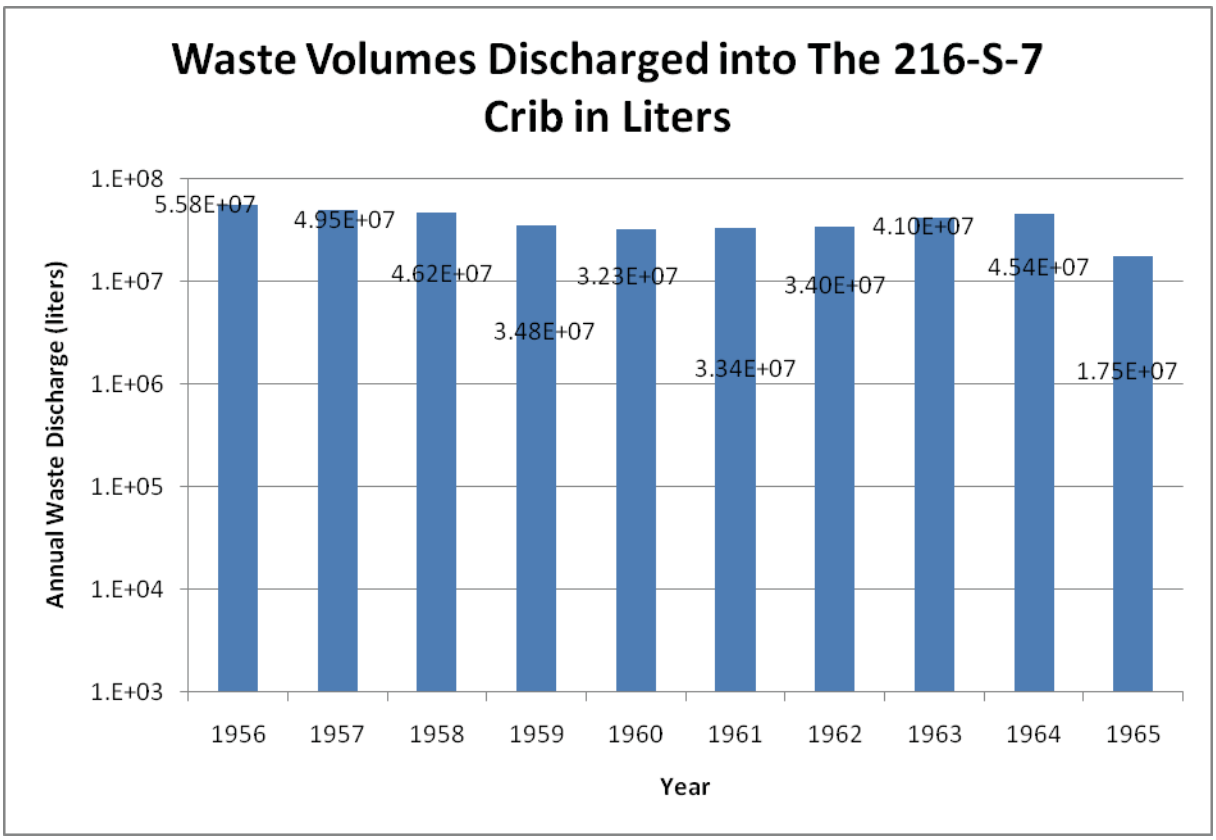
Lon-567168.28122 Lat-134176.49220

Site Dimensions:

Site Length: 30.5 m (100.0 ft)
Site Width: 15.3 m (50.0 ft)
Site Area: Not specified
Site Depth: 6.6 m (21.8 ft)
Cover Thickness: overburden is 4.5 m (14.6 ft).

Release Summary: The 216-S-7 Cribs were constructed as a replacement to the 216-S1 and S-2 Cribs. From January 12, 1956 to April 12, 1959, the Cribs were used for the subsurface disposal of REDOX cell drainage from the D-1 Receiver Tank, process condensate from the D-2 Receiver Tank, and condensate from the H-6 Condenser in the 202-S Building. The Site was used for the disposal of D-1 and D-2 waste until July 1965. However, the Site stopped receiving the H-6 waste material after a buildup of beta activity was reported. The H-6 waste was redirected to the underground waste storage tanks for disposal after the jumper charges were finished on April 12, 1959. The liquid wastes disposed at this site contained chemical waste in the form of nitrate, aluminum nitrate, nitric acid, and sodium.

Figure 1. Waste Volumes Received by the 216-S-7 Crib by Liter Per Year



Related Site Structure(s): The 216-S-7 Cribs are associated with the 202-S Building, REDOX D-1 and D-2 Receiver Tank, 240-S-151 Diversion Box and the 200-W-138-PL pipeline.

Site Posting: The 216-S-7 Crib is marked and posted with Underground Radioactive (URM) Material and Cave-In Potential signs.

Site Characterization Summary: The Site was retired in July 1965, when it reached the set radionuclide disposal limit. The site was deactivated by capping the pipeline that fed the Cribs at the northwest corner of the 202-S perimeter fence. After capping, the D-2 waste was redirected to the 216-S-9 Crib, while the D-1 waste was concentrated and deposited into the underground storage tanks.

In 1966, two wells were drilled at the Cribs to document the amount of radionuclide activity and spread beneath the surface. Core samples from well 299-W22-13A (also known as 200-W22-33) revealed a maximum of 13 microcuries per gram for Cesium-137 and 2.7 microcuries per gram of Strontium-90 at 6.4 m (21 ft) beneath the surface.

In November 2004, the drilling for characterization borehole C4557 began. The borehole was finished and deactivated in January 2005. The well was drilled to 69.0 m (226.5 ft) below ground surface and a Downhole Spectral Gamma-Ray Logging System was used to identify and document the distribution of radionuclides. Sample analyses from four soil samples showed a maximum concentration of two million picocuries per gram at 7.6 m (25 ft) below ground surface.

Interim stabilization activities have occurred at this site in 1975, 1992, and in 2004. In August 1975, the above ground piping was removed and the leftover piping was blanked beneath the surface. In addition, several sink holes were filled and the ground surface was graded above the Cribs. Additional surface stabilization work occurred in 1992, when another 0.61 m (2 ft) of clean dirt was deposited at the site.

Ongoing surveys at this Site include ground water monitoring and annual radiological surveys. The well monitoring and radiological survey results are not provided in WIDS.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: The liquid wastes disposed at this site contained chemical waste in the form of nitrate, aluminum nitrate, nitric acid, and sodium.

Figure 1. ArcMap Image

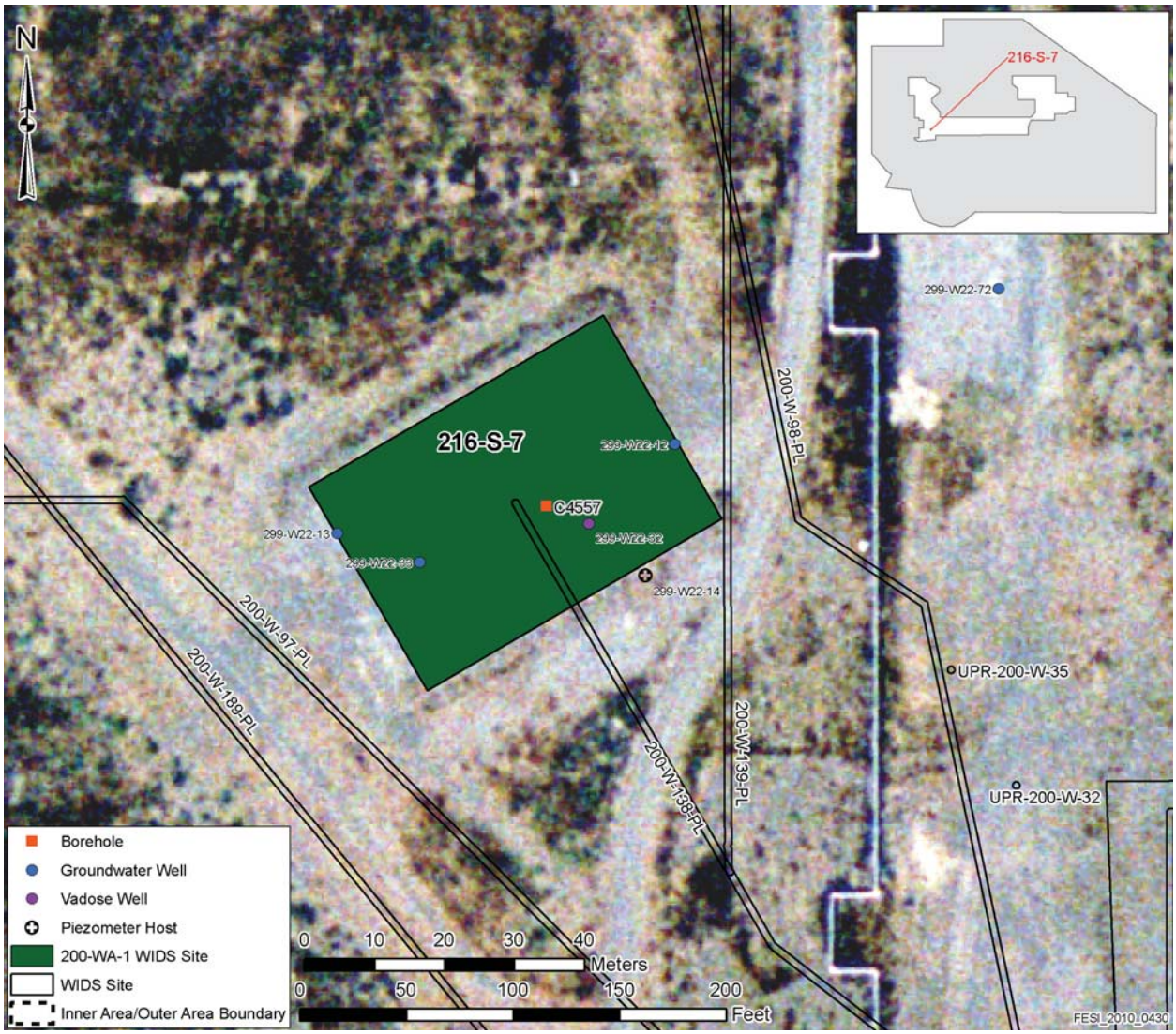
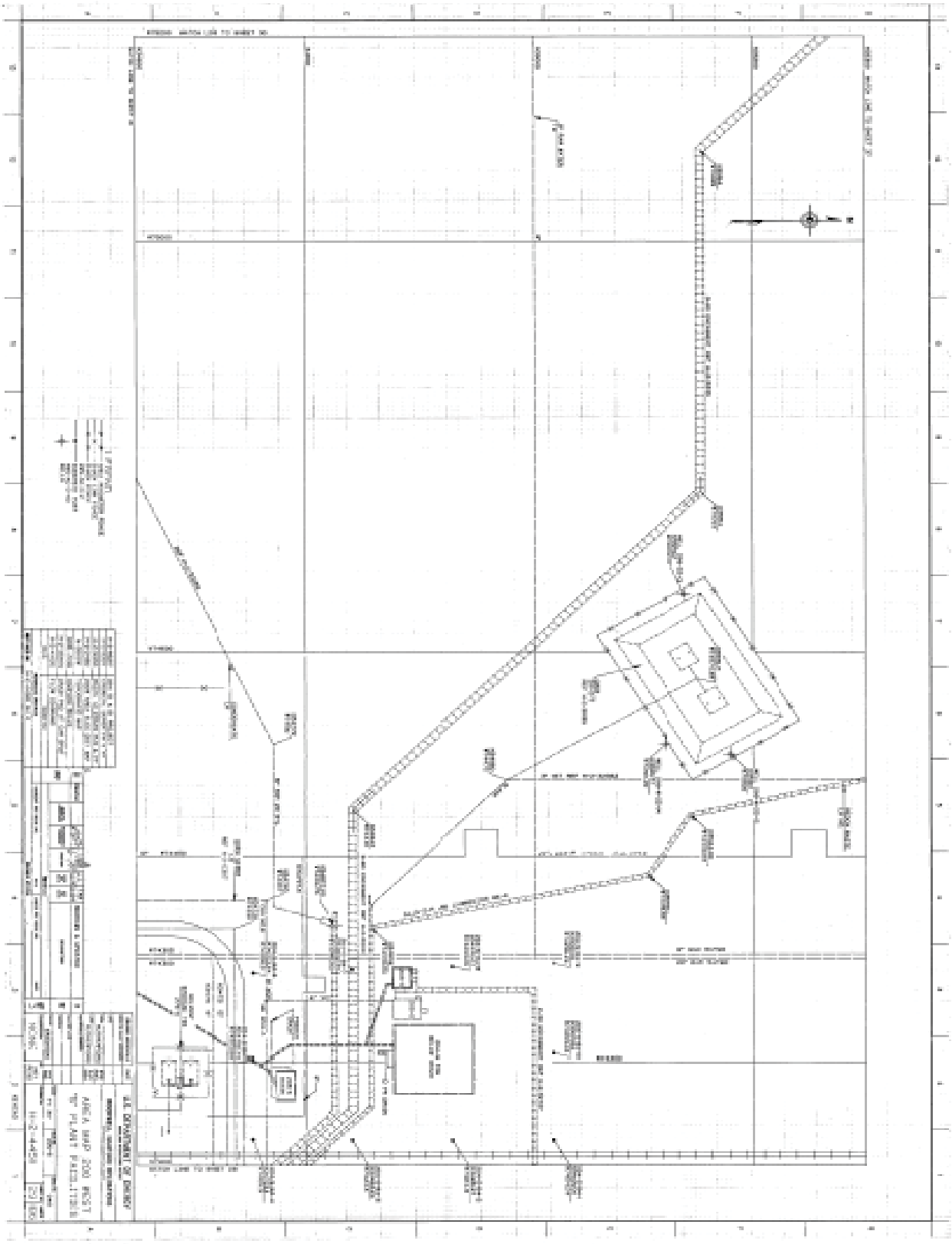


Figure 2. Insert Site Map

Figure not available.

Figure 3. Reference Drawing H-2-45511 Sheet 1 Rev3



Site Description

Site ID: 216-S-8, Cold Aqueous Trench, Cold Aqueous Crib, 216-S-3, Unirradiated Uranium Waste Trench, Cold Aqueous Grave
Site Type: Trench
Facility/Geographic Area: S-Plant Area
Current OU Assignment: 200-MG-1
Former OU Assignment: Not Specified
Service Dates: 1951 to 1952
Volume/Mass Discharged: 1.0E+07 L (2.6E+06 gal) or 3.1E+06 L (8.1E+04 gal) of unirradiated uranium (See Figure 1. for further detail).

Waste Site Location and Physical Description: Site 216-S-8 is located on the east side of the 241-SX Tank Farm and southwest of the 216-S1&2 Cribs (See Figure 3. QMAP for site location). The Site consists of a single trench that was constructed for a single discharge event. The trench has been backfilled to grade (See Reference Drawing Figure 4. H-2-44511 Sheet38 and Figure 5. H-2-44511 Sheet30 Rev6).

Waste Site Coordinates:

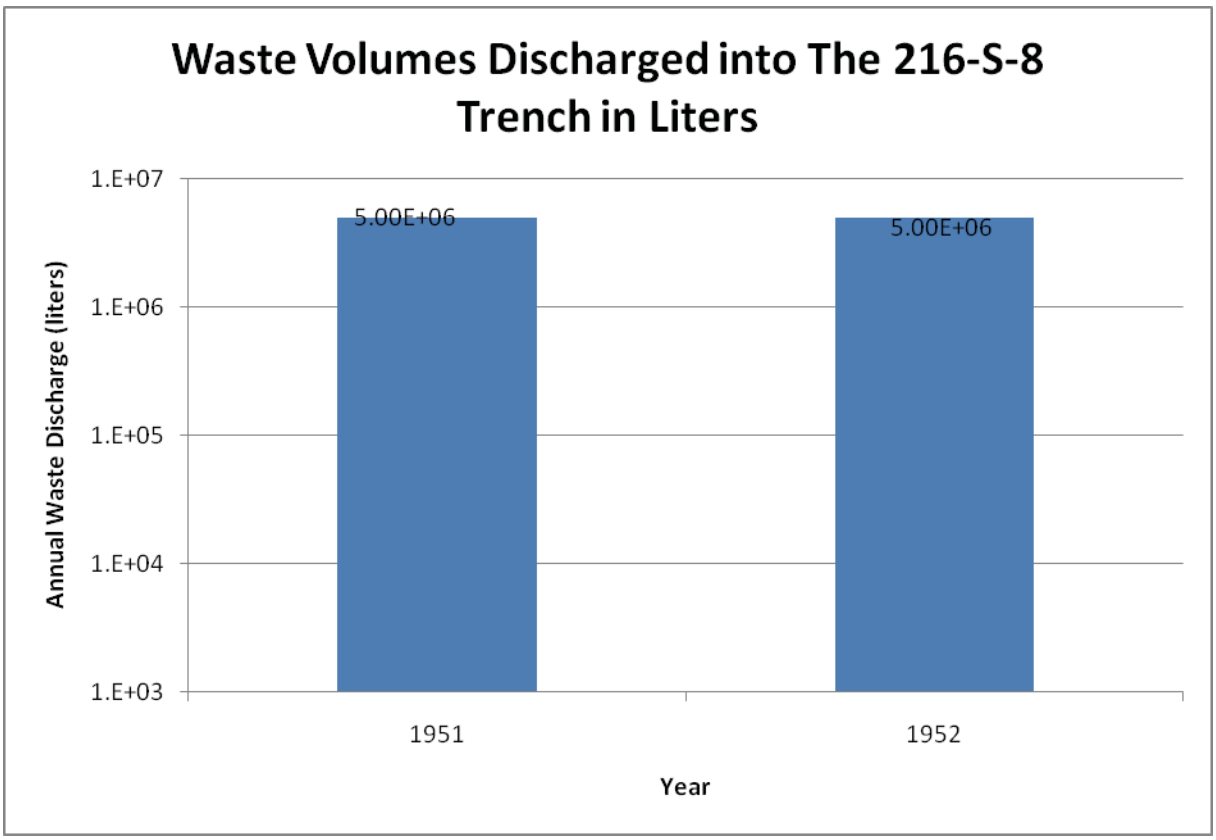
Lon-566925.32814 Lat-134220.90721

Site Dimensions:

Site Length: 30.5 m (100.0 ft)
Site Width: 18.3 m (60.0 ft)
Site Area: Not specified
Site Depth: 7.6 m (25.0 ft)
Cover Thickness: Not Specified

Release Summary: The 216-S-8 Trench operated from November 1951 to February 1952. The Trench was a single use structure that received unirradiated uranium start-up waste from the 202-S Building. Waste concentrations were estimated to be 0.2 grams of uranium per liter. The estimated total volume was expected to be only 152,000 L (40,000 gal). The WIDS General Summary Report cites document HW-28471, which states that the trench was used between October 1951 through January 1952, and that a total of 3.1E+06 L (8.1E+04 gal) containing 193 kg (430 lbs) of unirradiated uranium was discharged to this trench. The Site was retired once the discharge of start-up waste from the 202-S Building was finished.

Figure 1. Waste Volume Discharge by Liter per Year into the 216-S-8 Crib.



Related Site Structure(s): Site 216-S-8 is associated with the 202-S Building.

Site Posting: The 216-S-8 Trench is marked and is posted with Underground Radioactive Material (URM) signs.

Site Characterization Summary: Interim stabilization occurred at this site in 1994. The interim actions and the amount of material used for temporary stabilization are not specified.

The site is monitored by groundwater wells. In addition, radiological surveys are conducted on an annual basis. The results of these surveys are not provided in WIDS, and the frequency of groundwater monitoring is not specified.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Unirradiated Uranium.

Figure 2. ArcMap Image

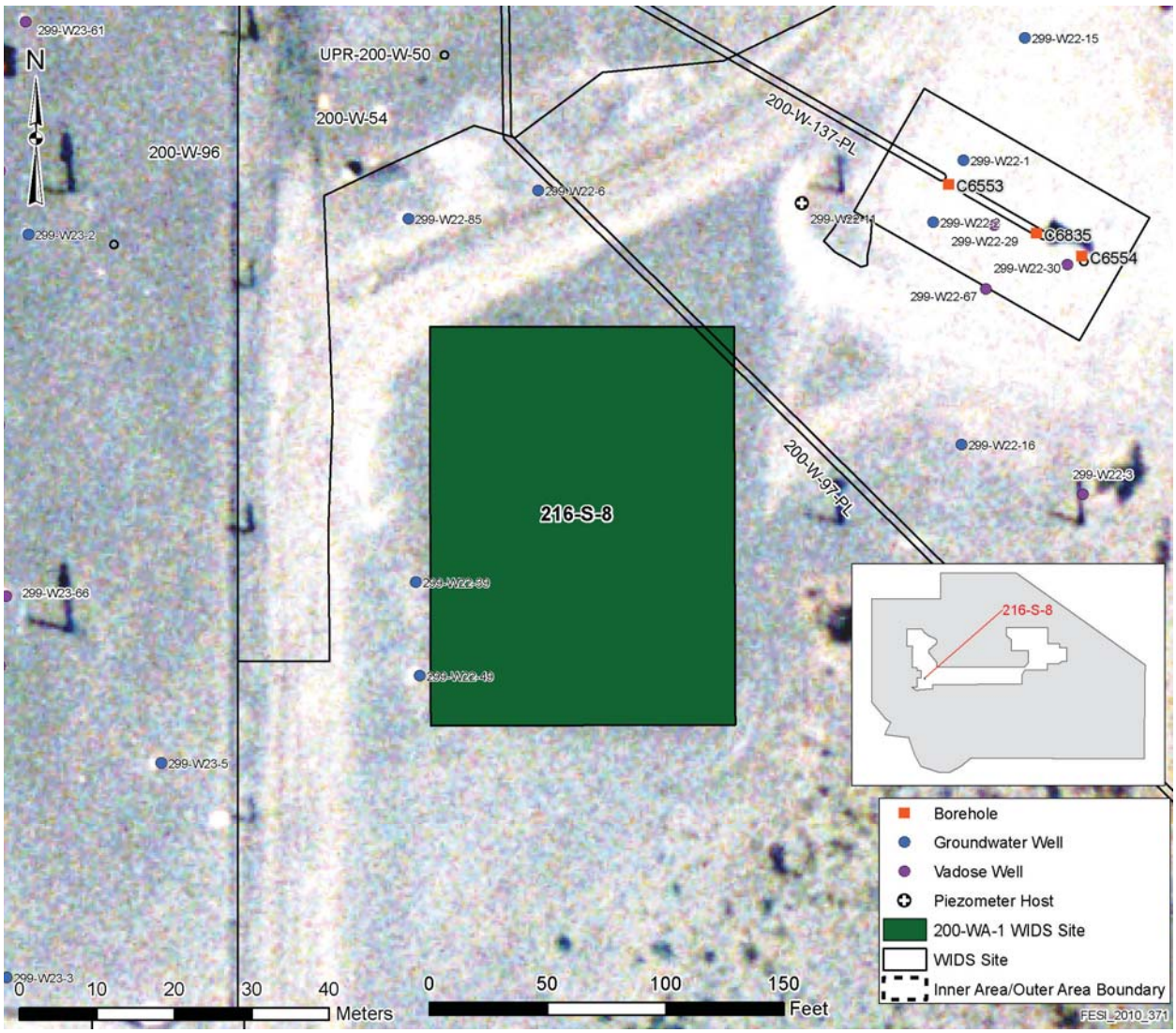


Figure 3. Insert Site Map

Figure not available.

Figure 4. Reference Drawing H-2-44511 Sheet 38

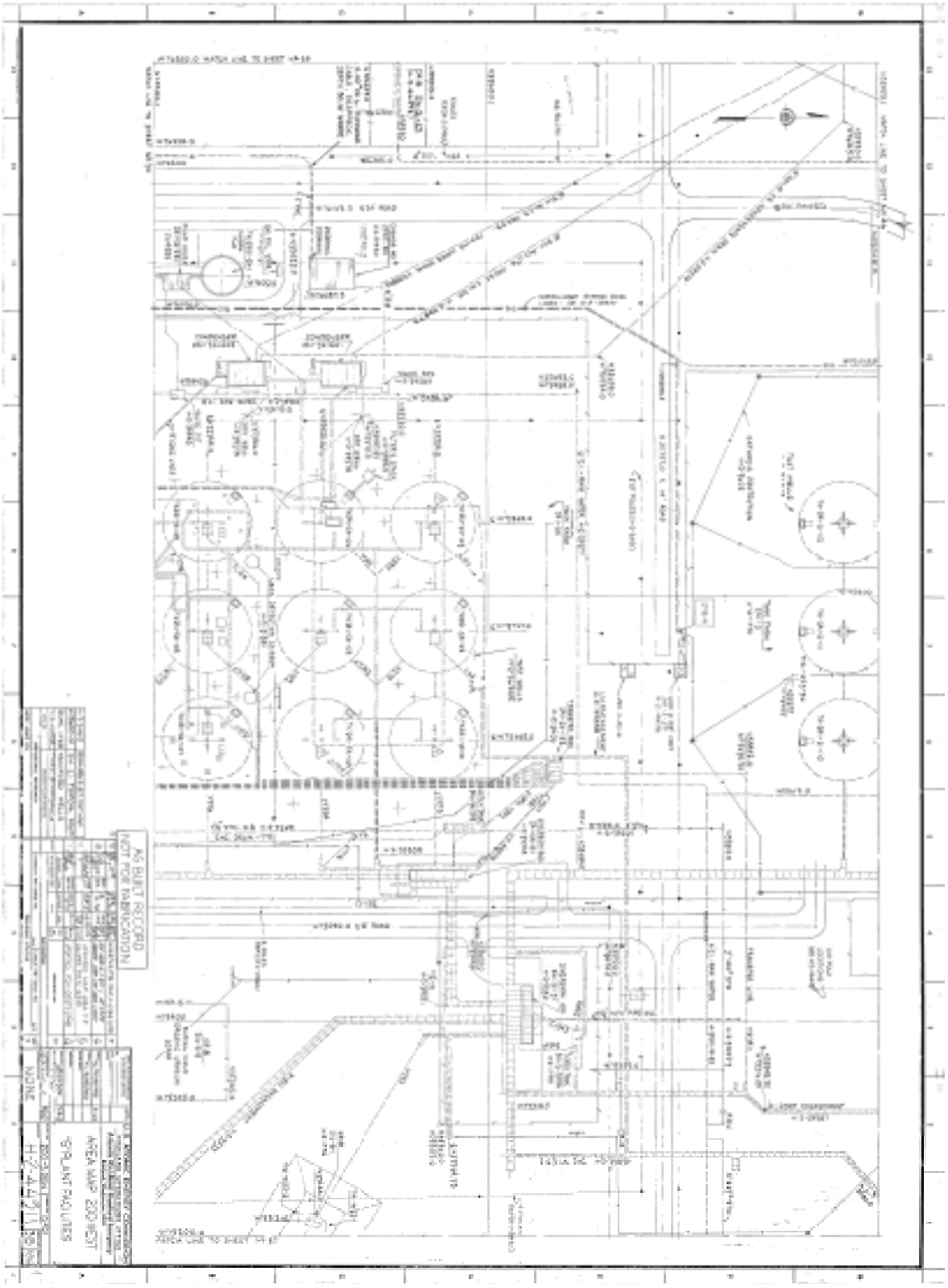
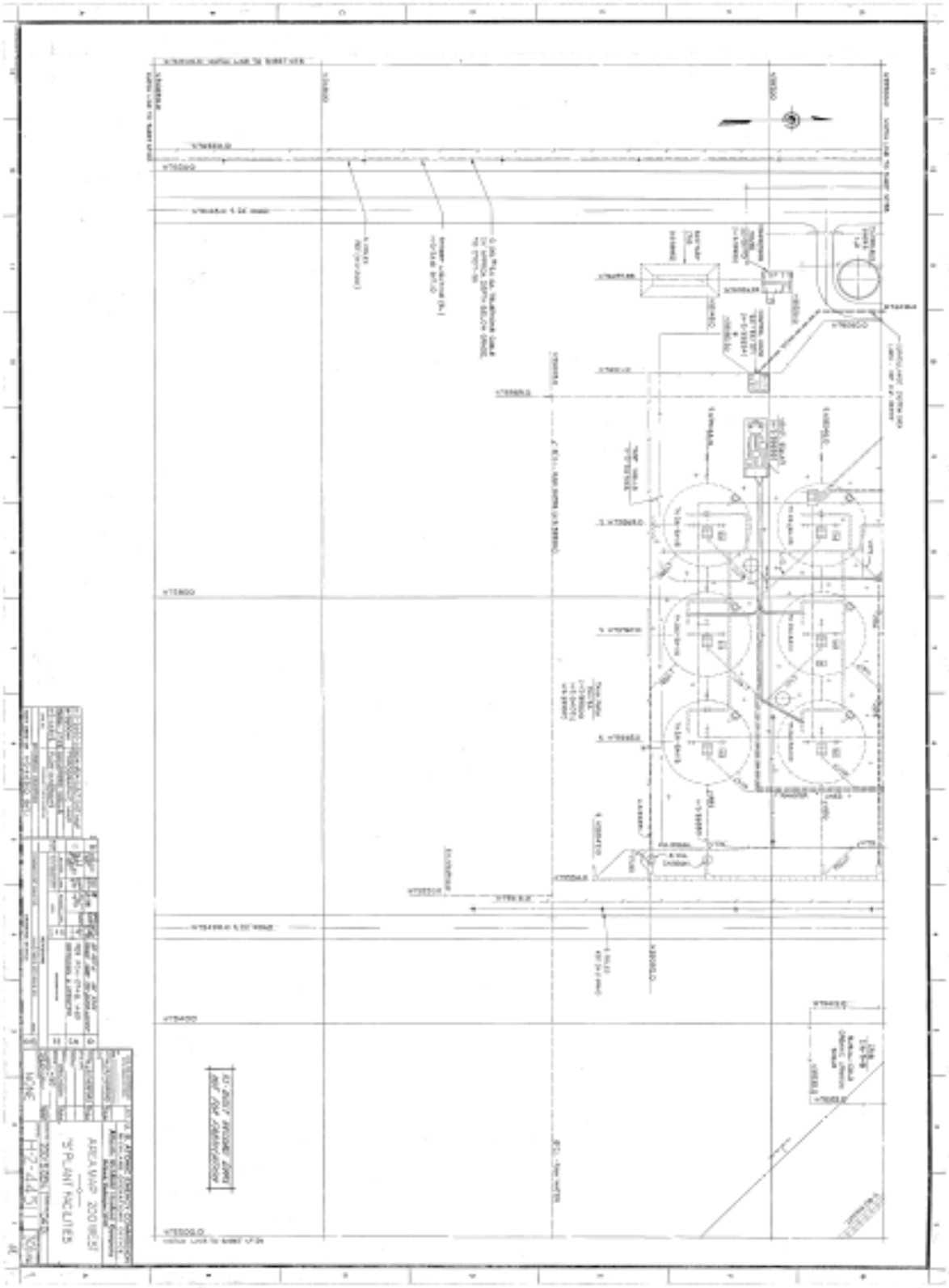


Figure 5. Reference Drawing H-2-44511 Sheet30 Rev6



Site Description

Site ID: 216-SX-2, 216-SX-2 Crib
Site Type: Crib
Facility/Geographic Area: S-Plant Area
Current OU Assignment: 200-MG-2
Former OU Assignment: Not Specified
Service Dates: 1952 to 1965
Volume/Mass Discharged: Not specified

Waste Site Location and Physical Description: The 216-SX-2 Crib is filled with gravel and is topped with a subsurface layer of Sisalkraft paper. The Crib is located on the east side of Cooper Ave., adjacent to the 241-SX Tank Farm (See Figure 1. per QMap). The Crib is connected to the 241-SX-701 Compressor House, which is located approximately 7.6 m (25 ft) to the south (See Reference Drawing Figure 3. H-2-44511 Sheet30 Rev6 and

Figure 4. Reference Drawing_H-2-39952 Sheet1 Rev3). The 241-SX Tank Farm fence is roughly 23 m (75 ft) to the west of the Crib.

Waste Site Coordinates:

Lon-566703.81248 Lat-134164.72661

Site Dimensions:

Site Length: 19.0 m (62.3 ft)
Site Width: 8.0 m (26.3 ft)
Site Area: Not specified
Site Depth: Not Specified
Cover Thickness: None

Release Summary: During its operational lifetime, the 216-SX-2 Crib received mixed liquid waste in the form of steam condensate from the 241-SX-701 Compressor House. The Crib was brought online in 1952, and was abandoned in 1965 when the Crib stopped percolating. As flow rates to the Crib are not specified, the total estimated volume of waste the 216-SX-2 Crib received over its lifetime cannot be estimated.

Related Site Structure(s): The 216-SX-2 Crib is associated with the 241-SX-701 Compressor House. The pipeline labeled with sitecode 200-W-162-PL is also associated with this Crib.

Site Posting: The 216-SX-2 Crib is currently surrounded by light post and chain and posted with Underground Radioactive Material (URM) signs. It is labeled “216-SX-2” on three sides with old style black and white signs.

Site Characterization Summary: The site was mapped using Global Positioning System (GPS) survey equipment from October 8 to October 29, 1996. A site walkdown occurred on March 25, 1997 to observe the site and its condition. It was determined the Crib was easily identifiable, due to its proximity just outside the western edge of the 241-S Tank Farm fence. The radiological posting at the site was confirmed on this date as well.

In July 2000, the vent risers were sealed as a preventative measure for potential passive radioactive emissions.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Not Specified.

Figure 1. ArcMap Image

Figure 2. Insert Site Map

Figure not available.

Figure 3. Reference Drawing H-2-44511 Sheet30 Rev6

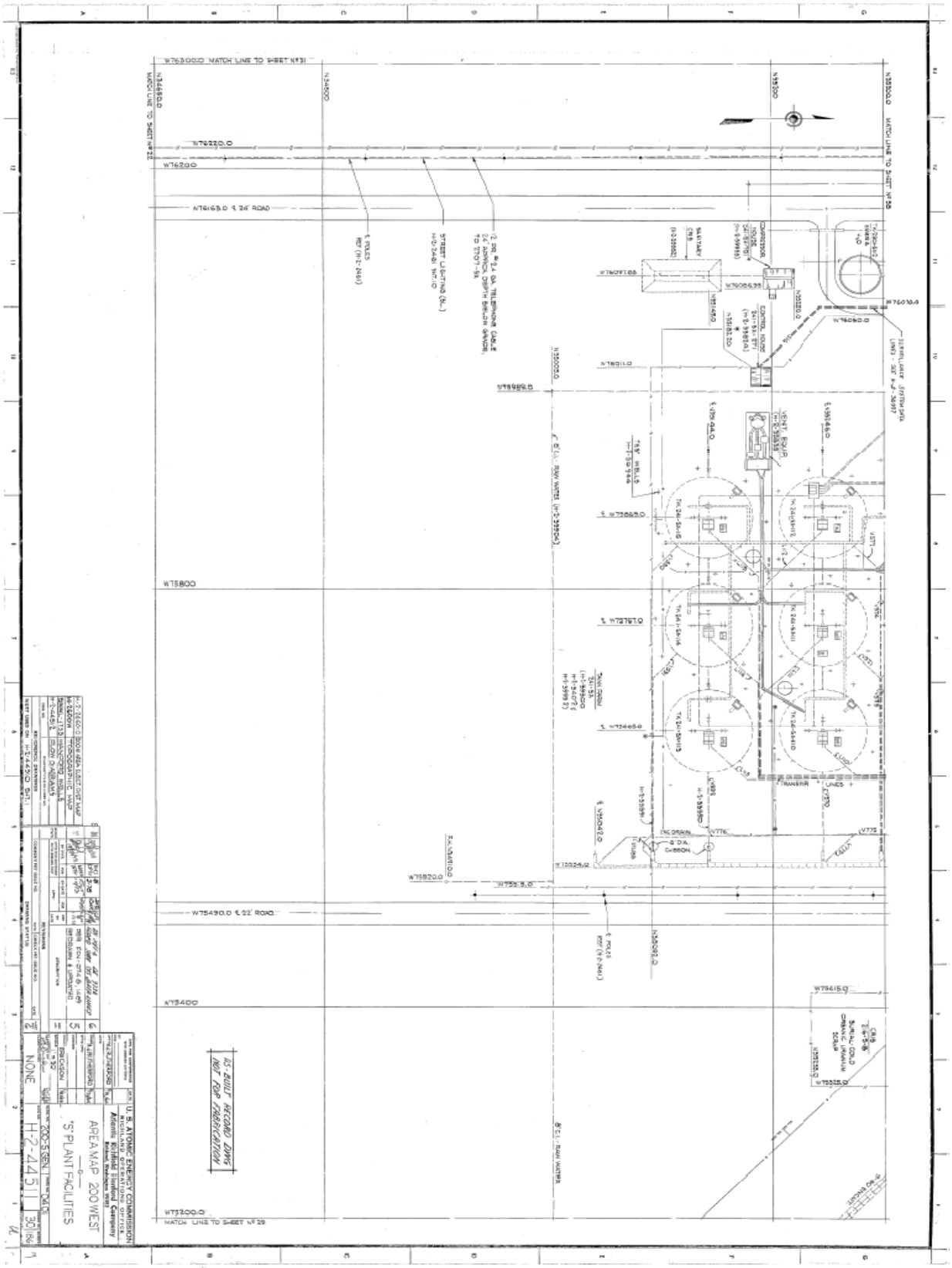
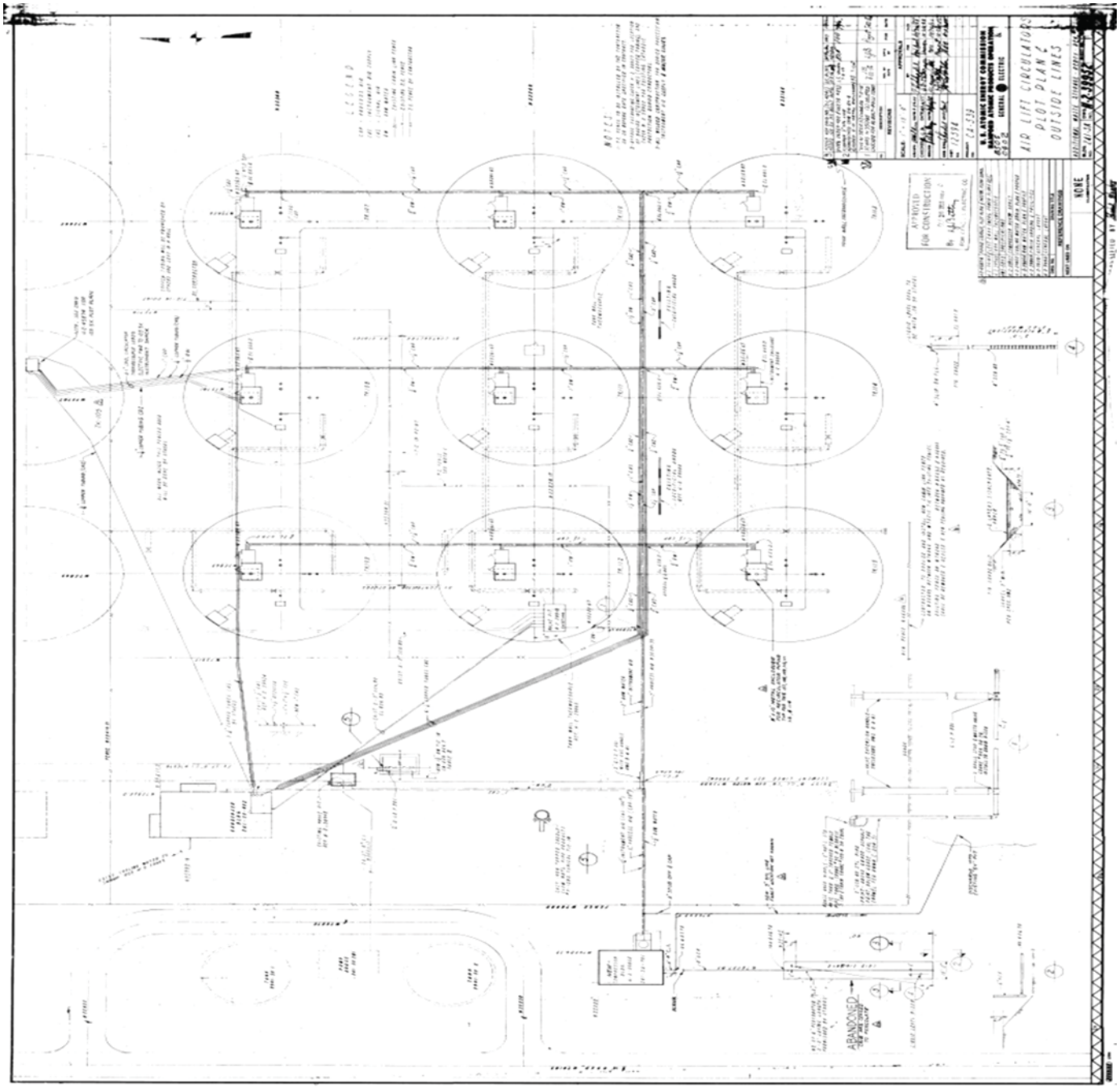


Figure 4. Reference Drawing H-2-39952 Sheet1 Rev3



Site Description

Site ID: 216-T-10, Decontamination Trenches, Equipment Decontamination Area
Site Type: Trench
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-MG-2
Former OU Assignment: Not Specified
Service Dates: 1951 to 1954
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 216-T-10 is located west of the 221-T Building and southwest of the 216-T-33 Crib (See Figure 2. QMap Site Location). The site consists of a decontamination wash trench that has been backfilled (See Figure 3. Reference Drawing H-2-32526 Sheet 1 Rev. 3). The trench is no longer mark or posted.

Waste Site Coordinates:

Lon-567355.68124 Lat-136842.95177

Site Dimensions:

Site Length: 15.2 m (50.0 ft) Site Depth: 1.8 m (6.0 ft)
Site Width: 3.1 m (10.0 ft) Cover Thickness: Not Specified

Release Summary: The 216-T-10 trench was constructed for the subsurface disposal of liquid contaminated with heavy equipment and vehicle decontamination waste. The trench was in use from June 1951 to March 1954.

Contrasting information is presented regarding potential contamination at this site. While no radionuclide or chemical contamination has been documented, contamination with readings up to 3,000 cpm were removed and shipped to the 200 Area Burial Ground for disposal. In addition, while no cleaning agents are listed as having been used, it is possible that hazardous chemical contamination is present due to the trench receiving vehicle decontamination waste.

The amount of decontaminate waste the trench received, and the levels of chemical and radionuclide contamination potentially deposited into the trench are not specified. In addition, the amount of contamination removed during remediation activities in 1972 is not specified. As the total volume of decontamination waste is not available, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 216-T-10 is associated with waste sites 216-T-29 and 216-T-11.

Site Posting: Site 216-T-10 was released from radiation zone status and is currently not marked or posted.

Site Characterization Summary: The 216-T-10 trench was deactivated in 1954. Following the site's deactivation, vehicle decontamination operations were transferred to the 269-W garage facility. A second date of March 1957 is also provided as the termination date for the Trench. However, the March 1957 ending date is likely incorrect as the site was backfilled in 1954 as part of the deactivation process.

In May 1972, the site was exhumed and all contamination was removed and sent to the 200 West Area Dry Waste Burial Ground for disposal. Maximum contamination readings reached 3,000 cpm. After the contamination was removed, the 216-T-9, 216-T-10 and 216-T-11 trenches were released from radiation zone status.

A site walkdown for surveillance purposes occurred on February 28, 1998. The results of the walkdown are not presented. In addition, no survey data is provided for this site. It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Unspecified volume of decontamination wash effluent.

Non-Radioactive: Not Specified.

Figure 1. ArcMap Image

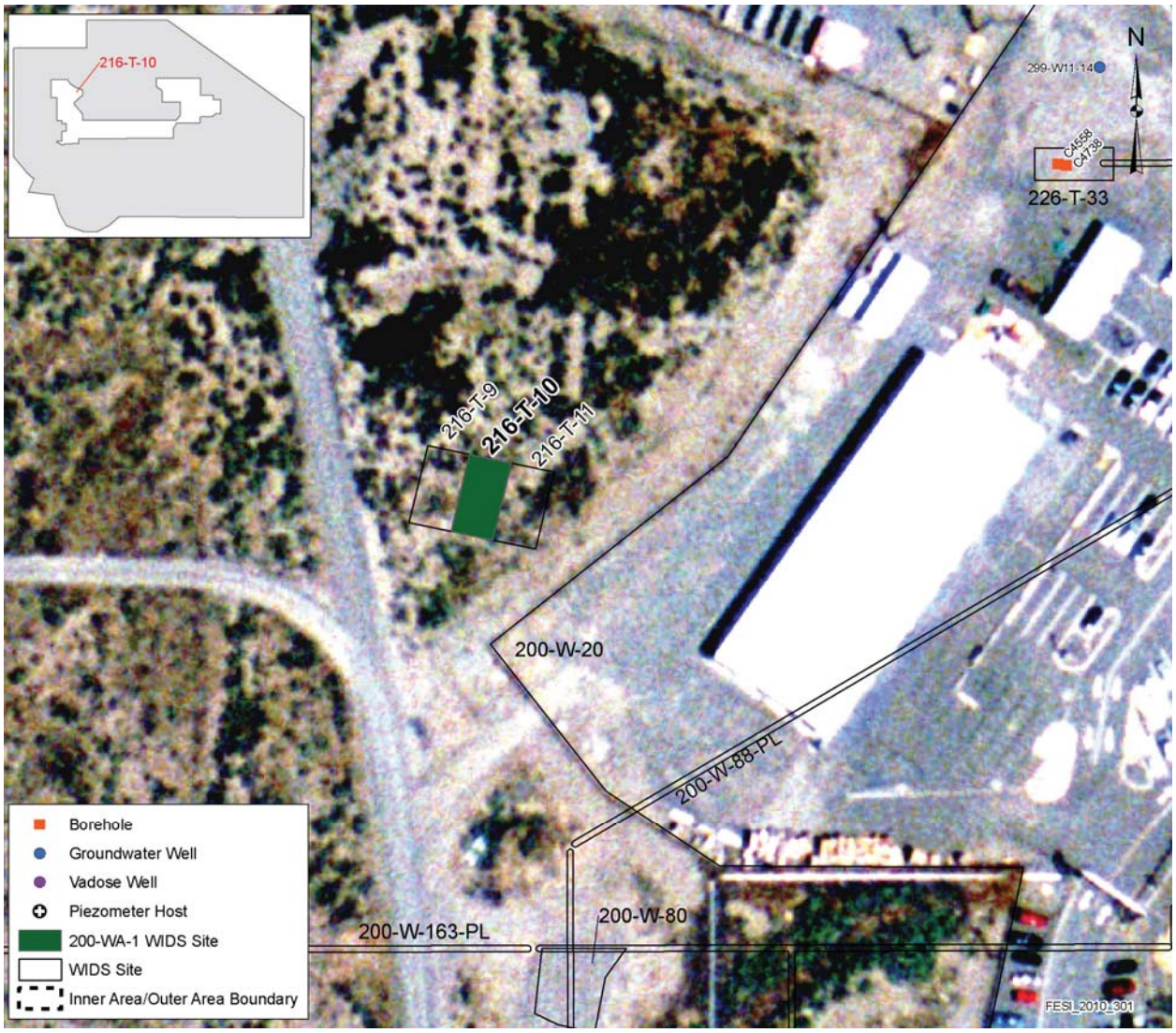
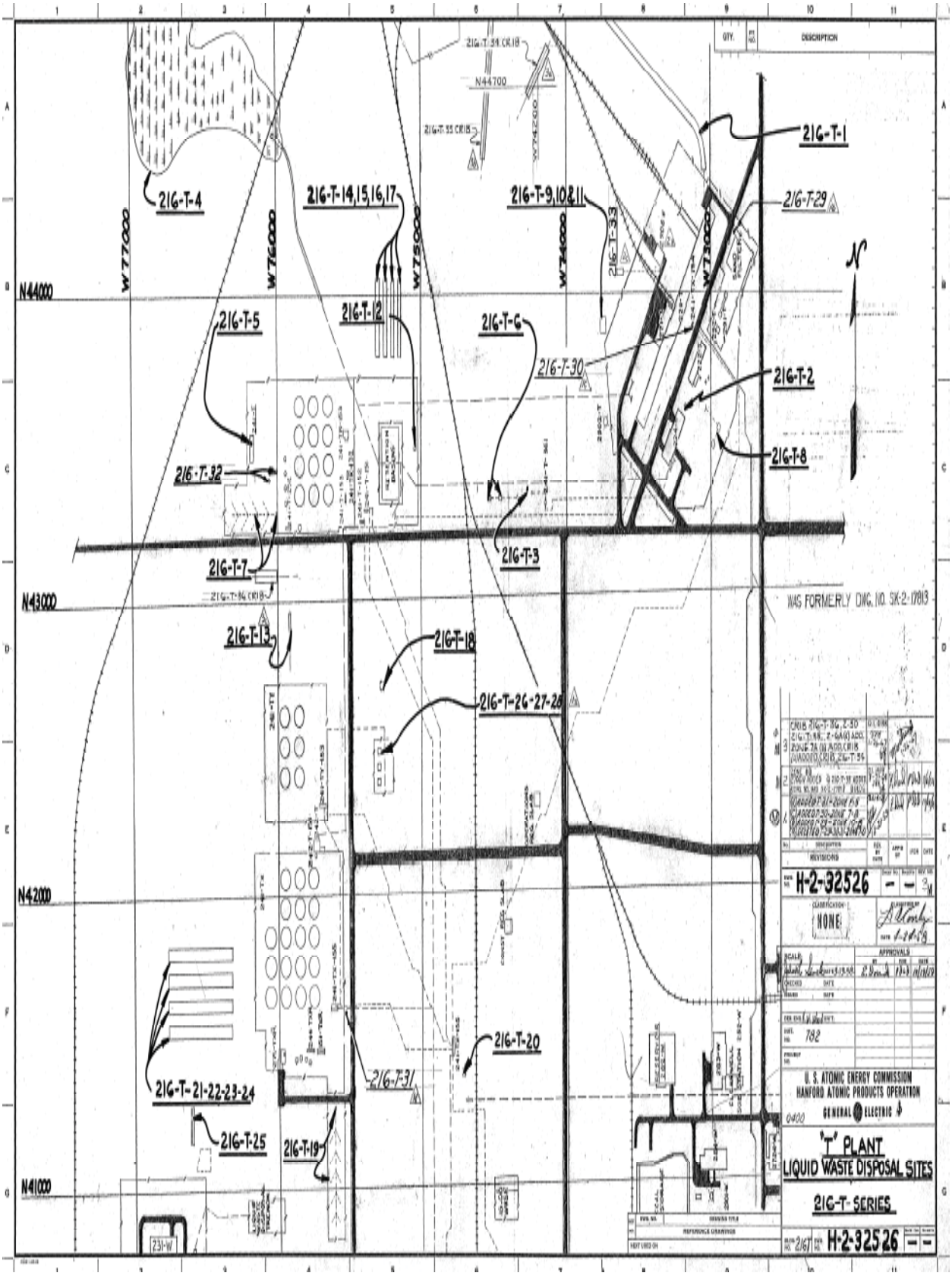


Figure 2. Insert Site Map

Figure not available.

Figure 3. Reference Drawing H-2-32526 Sheet 1 Rev. 3.



Site Description

Site ID: 216-T-11, Decontamination Trenches, Equipment Decontamination Area
Site Type: Trench
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-MG-2
Former OU Assignment: Not Specified
Service Dates: 1951 to 1954
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site 216-T-11 consists of a trench located west of 221-T and southwest of the 216-T-33 Crib (See Figure 2. QMap Site Location and Figure 3. Reference Drawing H-2-44511 Sheet 1 Rev. 5). The Trench has been backfilled and is no longer marked or radiologically posted.

Waste Site Coordinates:

Lon-567362.66941 Lat-136841.50583

Site Dimensions:

Site Length: 15.2 m (50.0 ft) Site Depth: 1.8 m (6.0 ft)
Site Width: 3.1 m (10.0 ft) Cover Thickness: Not Specified

Release Summary: The 216-T-11Trench was constructed in 1951 for the subsurface disposal of liquid heavy equipment and vehicle decontaminate waste. The Trench received decontaminate waste from June 1951 to March 1954. However, a second date deactivation date of March 1957 is also provided as the termination date for the Trench. The March 1957 ending date is likely incorrect as the site was backfilled in 1954 as part of the deactivation process.

Contrasting information is presented regarding potential contamination at this site. While no radionuclide or chemical contamination has been documented, contamination with readings up to 3,000 cpm were removed and shipped to the 200 Area Burial Ground for disposal. In addition, while no cleaning agents are listed as having been used, it is possible that hazardous chemical contamination is present due to the trench receiving vehicle decontamination waste.

The amount of decontaminate waste the trench received, and the levels of chemical and radionuclide contamination potentially deposited into the trench are not specified. In addition, the amount of contamination removed during remediation activities in 1972 is not specified. As the total volume of decontamination waste is not available, no volume estimates can be ascertained for this site.

Related Site Structure(s): The structures and features associated with 216-T-11 are not presented.

Site Posting: Site 216-T-11 is not currently marked or posted.

Site Characterization Summary: The 216-T-11 Trench was backfilled in 1954 as part of the site's deactivation. The decontamination waste was transferred to the 269-W garage facility after the 216-T-11 Trench was deactivated.

In May 1972, the site was exhumed and all contamination was removed and sent to the 200 West Area Dry Waste Burial Ground for disposal. Maximum contamination readings reached 3,000 cpm. After the contamination was removed, the 216-T-9, 216-T-10 and 216-T-11 trenches were released from radiation zone status.

A site walkdown for surveillance purposes occurred on February 18, 1998. The results of the walkdown are not presented. In addition, no survey data is provided for this site. It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: An estimated 5.0+E06 L of contaminated sludge.

Non-Radioactive: Not Specified.

Figure 1. ArcMap Image

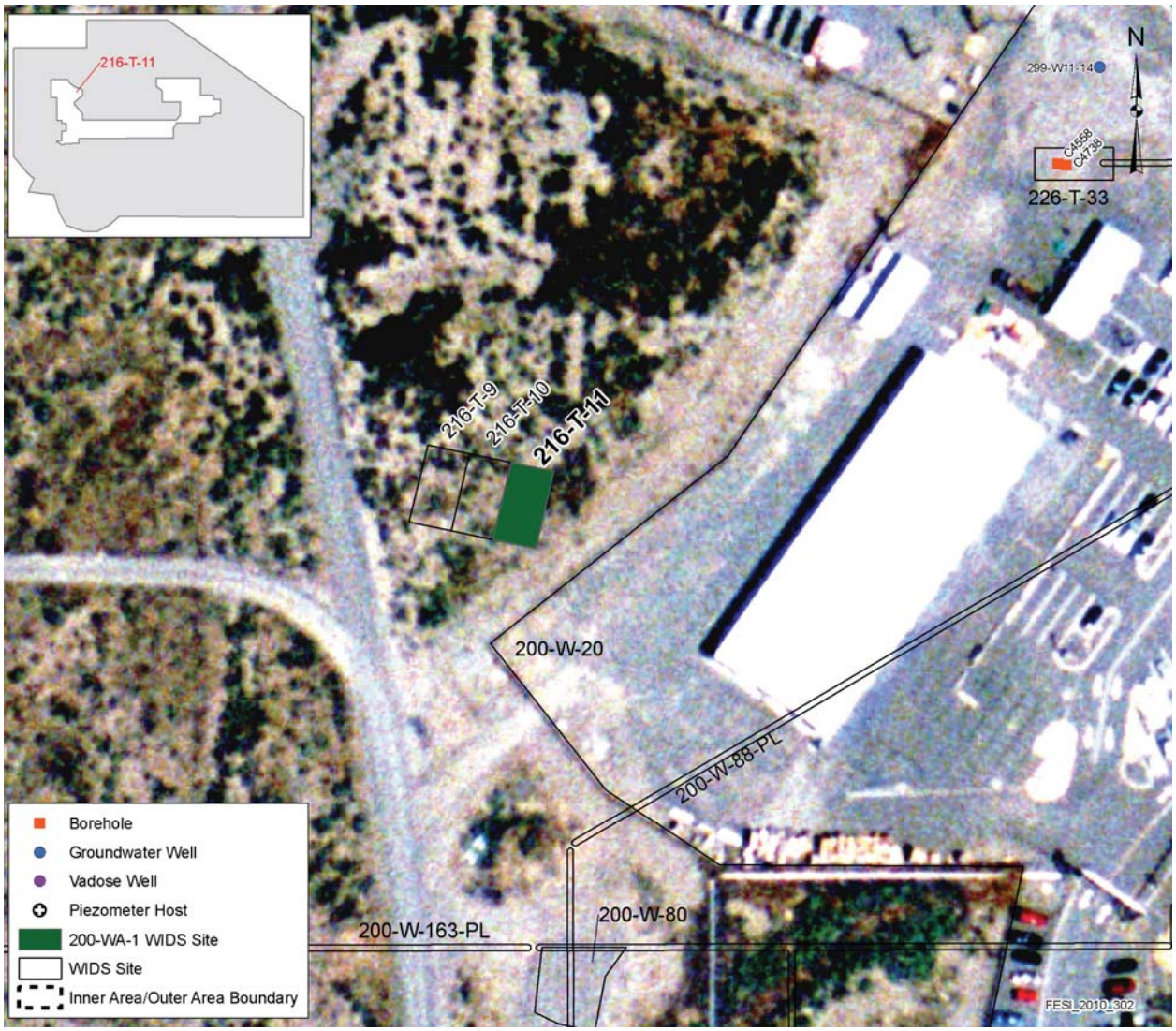
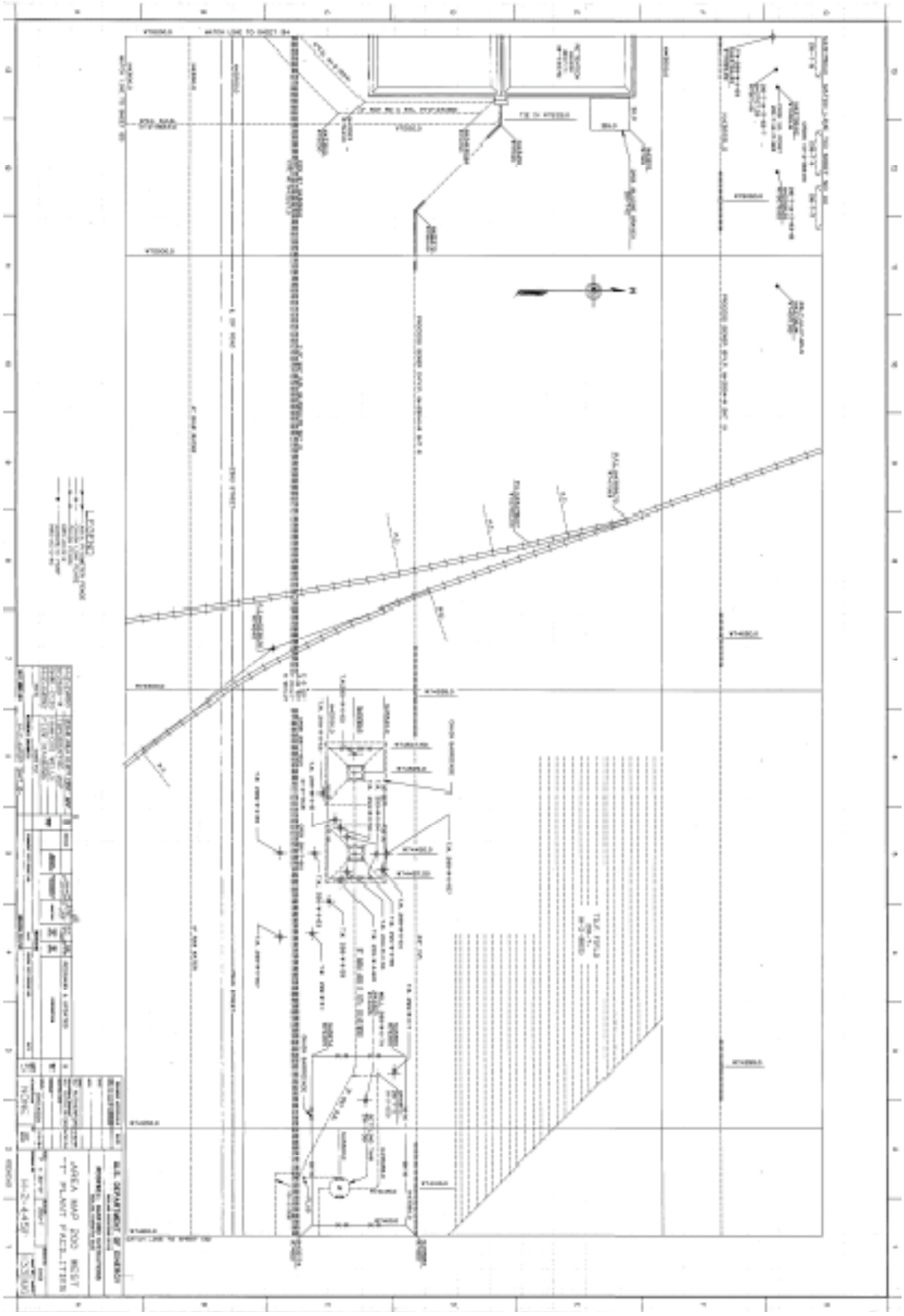


Figure 2. Insert Site Map

Figure not available.

Figure 3. Reference Drawing H-2-44511 Sheet 1 Rev. 5.



Site Description

Site ID: 216-T-12, 207-T Sludge Grave, 207-T Sludge Pit, 216-T-11
Site Type: Trench
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-2
Service Dates: 1954 to 1954
Volume/Mass Discharged: An estimated 5.0E6 L of contaminated sludge was deposited into the trench.

Waste Site Location and Physical Description: Site 216-T-12 is a small trench located at the northeast corner of the 207-T Retention Basin (See Figure 1. ArcMap Image & Figure 2). The trench is not visible, as the northeastern edge of the trench, along with the entire area surrounding the 207-T Retention Basin, was covered by a layer of clean backfill. This larger area is posted with Underground Radioactive Material (URM) signs. The trench is not individually marked.

Waste Site Coordinates:

E-566992.60930 N-136737.05210

Site Dimensions:

Site Length: 4.6 m (15.0 ft) Site Depth: 2.4 m (8.0 ft)
Site Width: 3.1 m (10.0 ft) Cover Thickness: Not Specified

Release Summary: The 216-T-12 trench was constructed in November 1954 for the disposal of sludge dredged from the 207-T Retention Basin. The sludge was covered once it was placed in the trench. An estimated 5.0E6 L of contaminated sludge was deposited into the trench. The sludge was low in salt and was neutral to basic in nature.

Related Site Structure(s): Site 216-T-12 is associated with the 207-T Retention Basin.

Site Posting: Site 216-T-12 is not individually posted. It shares an URM posting with the larger 207-T Retention Basin stabilized area.

Site Characterization Summary: A backhoe was used for the construction of the trench in 1954. That same year, a radiological investigation was conducted prior to the sludge being covered. Radiological equipment detected contamination readings up to 15 millirads/hour from the sludge. However, most of the readings ranged from 2 to 5 millirads/hour. The pit was used for a single disposal event, and was backfilled once the dredging operations were finished.

An additional cover layer was placed over the site in 1996, when the 207-T Retention Basin and surrounding area was backfilled with clean soil and posted as an URM area. The 216-T-12 trench site was included in the surface stabilization effort due to its proximity to the Retention Basin.

Radiological surveys are conducted on a regular basis for the backfilled portion of the 207-T Retention Basin. The 216-T-12 trench is also investigated during these surveys.

A site walkdown for surveillance purposes occurred on February 28, 1998. The results of the walkdown are not presented. In addition, no survey data is provided for this site. It is unclear if

the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: An estimated 5.0E6 L of contaminated sludge.

Non-Radioactive: Not Specified.

Figure 1. ArcMap Image

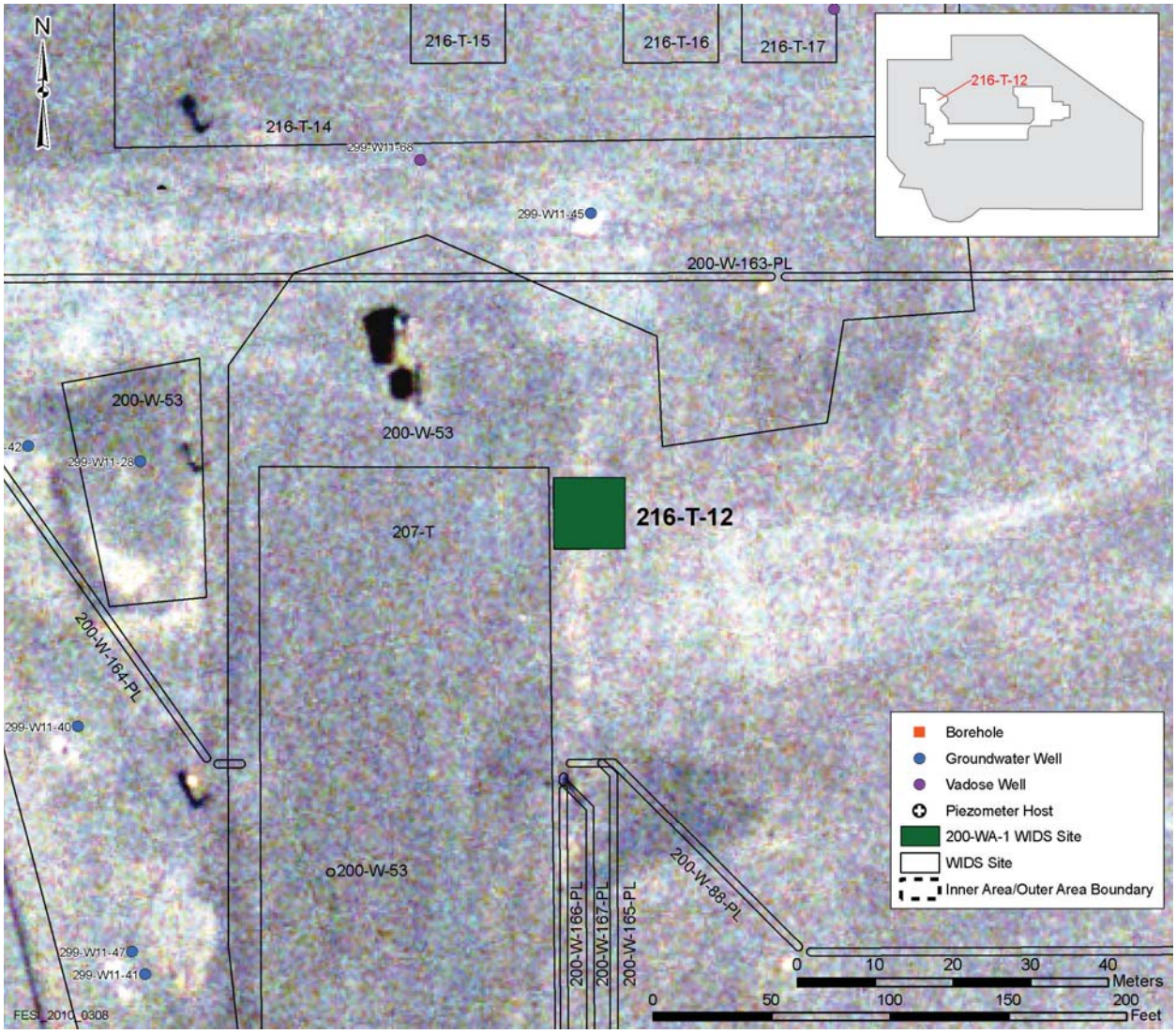
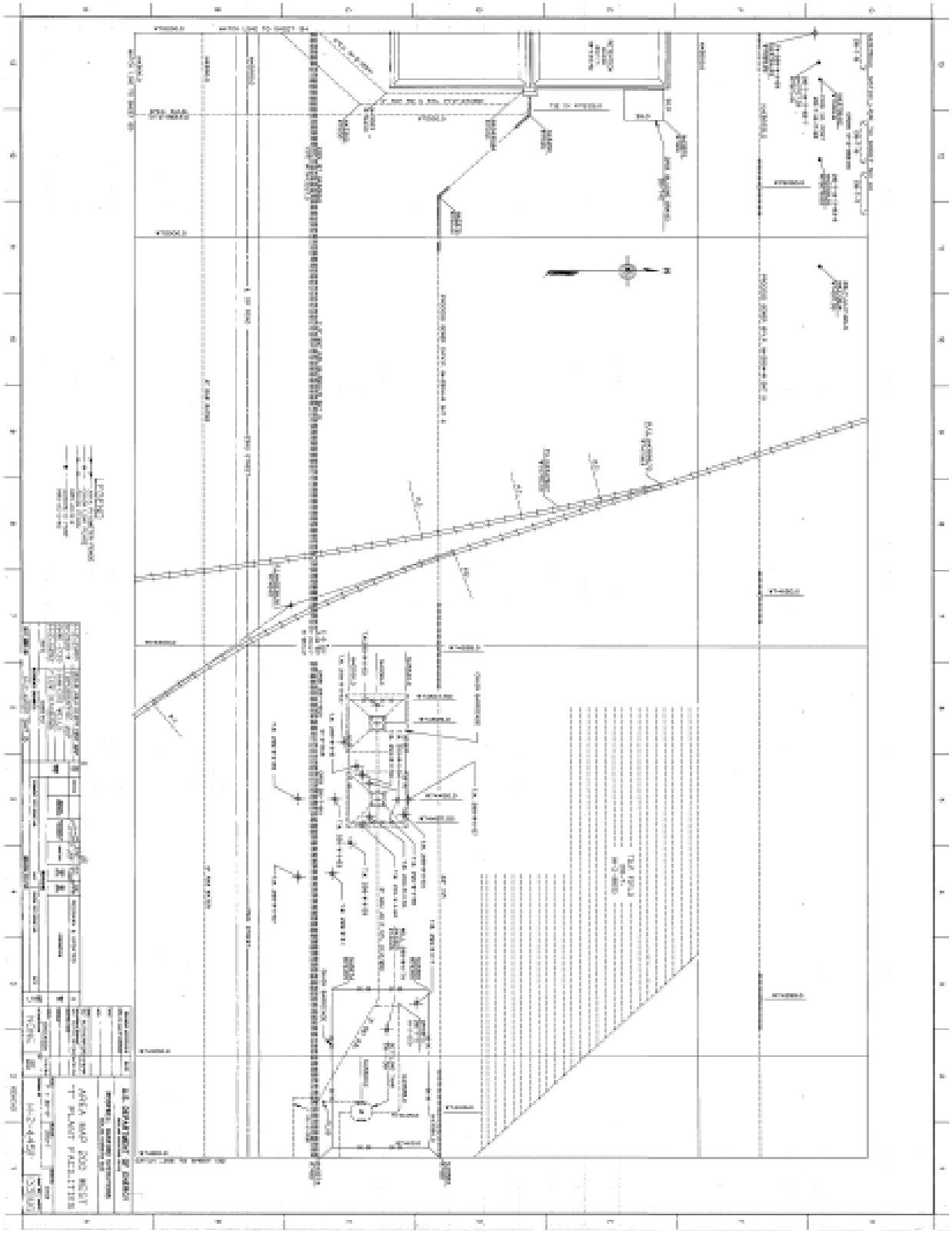


Figure 2. Reference Drawing H-2-44511 Sheet 133 Rev. 5



Site Description

Site ID: 216-T-13, 269-W Regulated Garage, 269-W Decontamination Pit or Trench, 216-T-12, 269-W Regulated Garage Decontamination Pit
Site Type: Trench
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-MG-2
Former OU Assignment: Not Specified
Service Dates: June 1954 to June 1964
Volume/Mass Discharged: An estimated 0.98E+05 liters (0.22E+05 gal) of contaminated soil

Waste Site Location and Physical Description: Site 216-T-13 is comprised of a single, open trench that was used to decontaminate vehicles. A Tip Rack was located in the bottom of the open trench. Vehicles were driven into the trench and onto the rack, where they were sprayed with water or steam to remove any contamination.

The Trench is located west of the 269-W Regulated Garage, which has been demolished. The concrete building foundation of the garage still remains at the site. The trench is located on the north side of the 241-TY Farm, north of the tank farm perimeter fence (See Figure 2. QMap Site Location, Figure 3. Reference Drawing H-2-32526 Sheet 1 Rev.3, and Figure 4. Reference Drawing H-2-1495). A concrete ramp is located at the site, buried beneath 0.6 m (2 ft) of gravel. The ramp is visible near the footprint of the garage. In addition, a dirt unloading ramp is located to the west, near the trench. However, the ramp was used to unload equipment, and its use was not related to the decontamination activities that occurred in the trench. The trench is no longer marked of posted.

In addition, the ground around the site is mostly level. However, surface disturbances and small soil mounds are located surrounding the site. The substrate is a mix of sand and gravel, and a moderate growth of vegetation, consisting mostly of rabbitbrush and bunchgrass, is present.

Waste Site Coordinates:

Lon-566776.50000 Lat-136521.35938

Site Dimensions:

Site Length: 6.1 m (20.0 ft) Site Depth: 3.1 m (10.0 ft)
Site Width: 6.1 m (20.0 ft) Cover Thickness: Not Specified
The trench was 7.6 m (25 ft) long, 3.1 m (10 ft) wide and 2.4 m (8 ft) deep.

Release Summary: The 216-T-13Trench was constructed in 1954 for the subsurface disposal of vehicle decontamination waste. The Trench received decontaminate waste from June 1954 to June 1964. No cleaning agents are listed as having been used at the site. However, since the site was used for decontamination purposes, it is possible that hazardous chemical contamination is present. An estimated 0.98E+05 liters (0.22E+05 gal) of contaminated soil was removed from the site in 1972.

Related Site Structure(s): Site 216-T-13 is associated with the 269-W Regulated Garage. Vehicles were cleaned at the 216-T-13 Trench prior to being sent to the Garage for servicing. The two structures are not physically linked to each other.

Site Posting: Site 216-T-11 is no longer posted or marked.

Site Characterization Summary: The site was deactivated in June 1964 after all decontamination activities were transferred to the 2706-T Building (also called the 2706-W). The site was backfilled in 1964 as part of the deactivation process. In April 1972, the site was excavated and contamination readings up to 1500 cpm were discovered over a 3.1 cubic meters (10.0 cubic ft) area of ground. The contaminated soil was removed and transported to the 200 West Area Dry Waste Burial Ground. The site was removed from radiological posting following the removal of the contaminated soil.

An estimated inventory of the contaminated soil through 1972 states the total volume of contaminated soil was 0.98E+05 liters, <0.100E+00 grams of plutonium, 0.840E+02 curies of beta, 0.100E+00 curies of Strontium-90, 0.400E+02 curies of Ruthenium-106, 0.100E+00 curies of Cesium-137, <0.100+00 curies of Cobalt-60, < pound of uranium. Readings up to 1,500 cpm were detected in the soil excavated in 1972, prompting its removal from the area. In addition, in April 2005, two characterization test pits; T-13A and T-13B, were excavated at the site. The first test pit was dug to roughly 7.6 m (25 ft) beneath the ground, while the second was dug to 2.7 m (9 ft) deep.

Information is presented detailing two different mapped locations provided for this site. The first trench location is shown next to the south side of the 269-W Garage and northwest of the 241-TY Tank Farm. A second location provided for this site is due north of the 241-TY Tank Farm. In December 2001, a final mapping effort was undertaken for this site to determine the location of the backfilled Trench. However, Ground Penetrating Radar (GPR) and Electromagnetic Induction (EMI) scans were unable to locate the covered trench. The survey did identify two areas of relatively high concentrations of anomalies (buried debris) during the survey. It is not clear whether either is associated with the 216-T-13 Trench.

The first drawing has the 269-W Garage further north from the site than is accurate. The building's orientation is also incorrect on the first drawing. In addition, conversion to the Washington State Plain coordinate system distorted the site's location, based on the existing building foundations. An interview with a staff member indicated that the second location is the correct location.

In addition, historical photographs were reviewed for verification purposes.

A site walkdown for surveillance purposes occurred on February 18, 1998. The results of the walkdown are not presented. In addition, no survey data is provided for this site. It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: An estimated 0.98E+05 liters (0.22E+05 gal) of contaminated Soil.

Non-Radioactive: Not Specified.

Figure 1. ArcMap Image

Figure 2. Insert Site Map

Figure not available.

Figure 3. Reference Drawing H-2-32526 Sheet 1 Rev.3

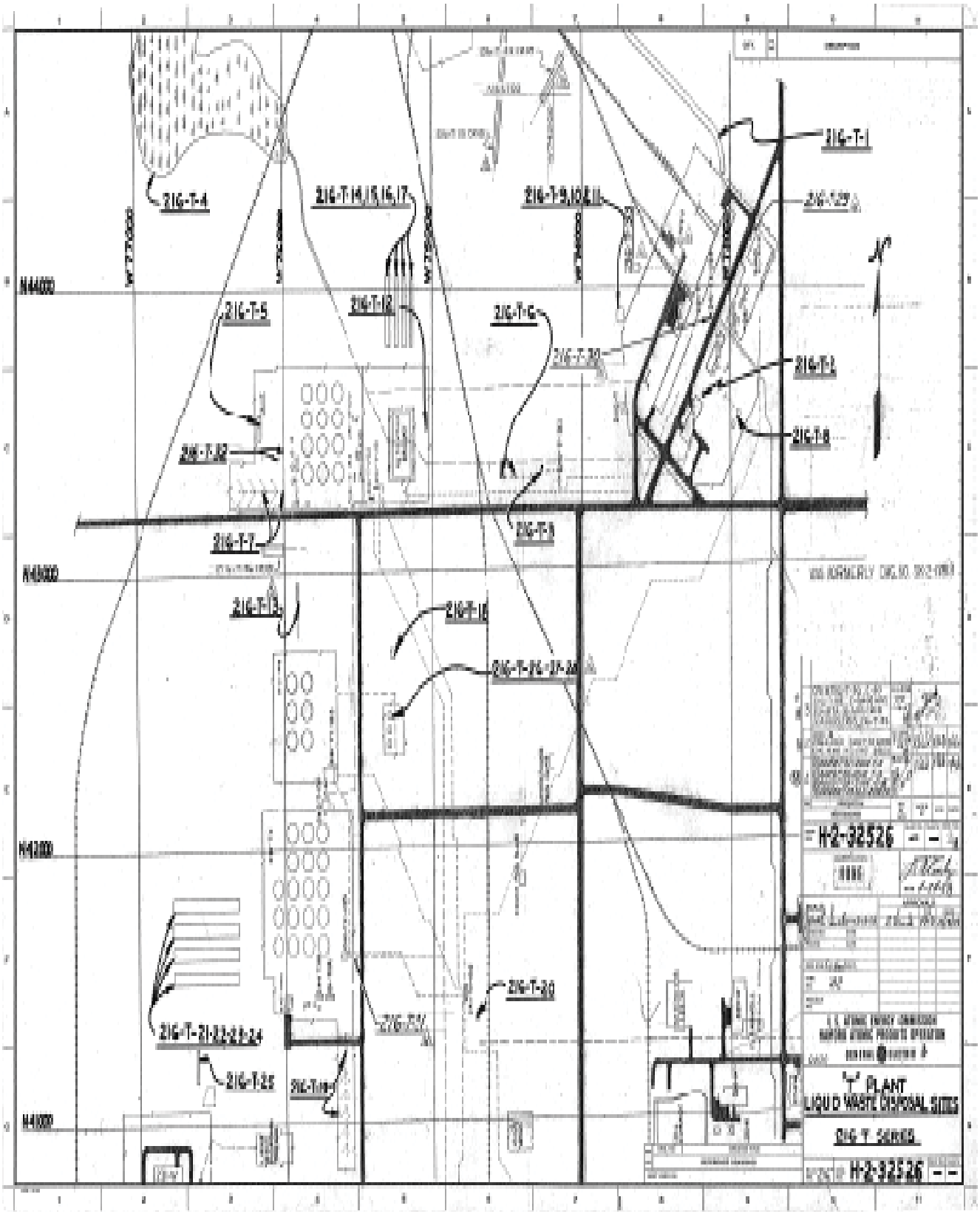
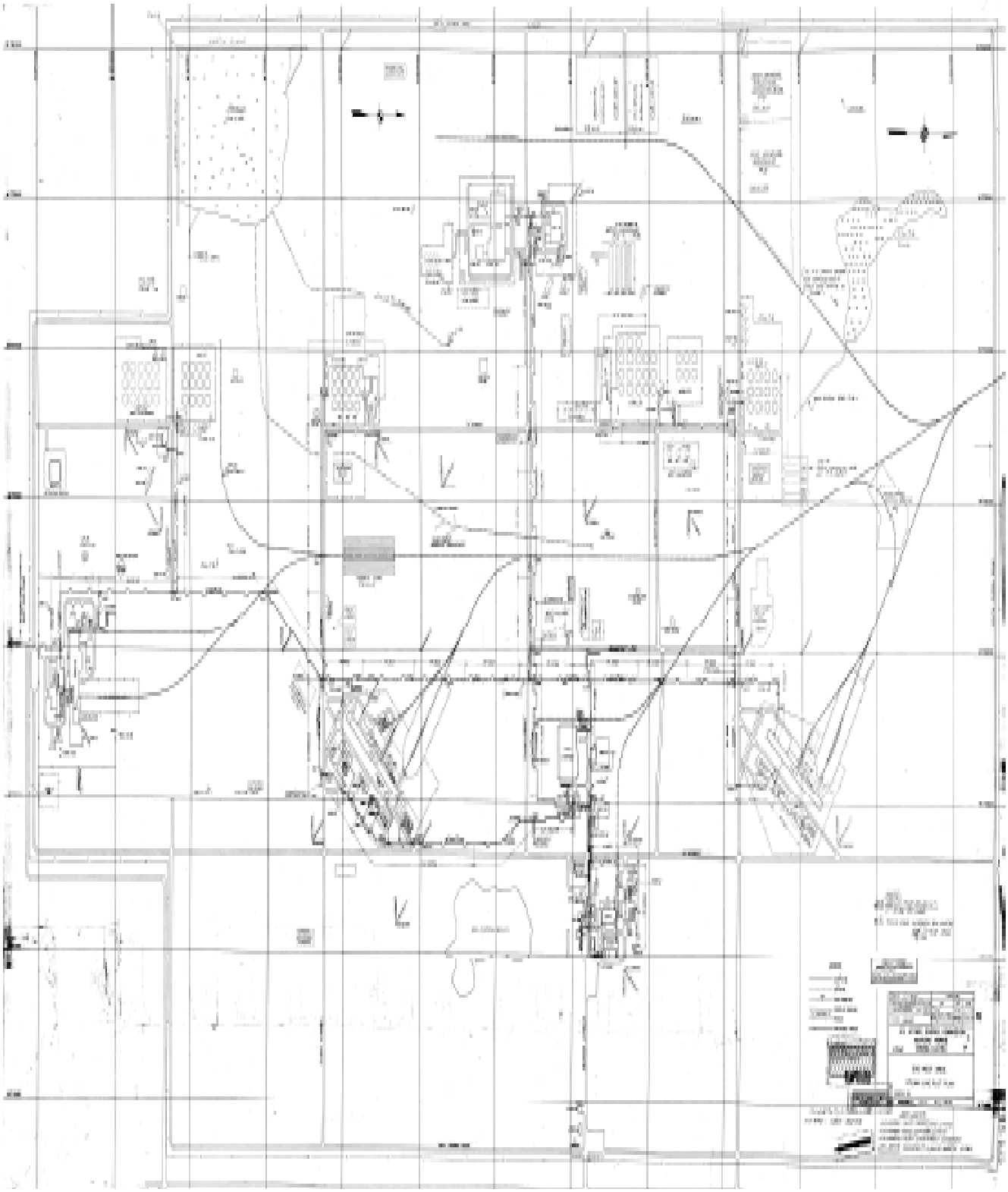


Figure 4. Reference Drawing H-2-1495.



Site Description

Site ID: 216-T-2, 216-T-2, 222_T-110 Dry Well, 222-T Reverse Well
Site Type: Injection/Reverse Well
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-MG-2
Former OU Assignment: 200-LW-2
Service Dates: January 1945 to May 1950
Volume/Mass Discharged: An estimated 6E+06 L (1.6E+06 gal) of acidic decontamination waste from the 222-T Building. Approximately 2.6 curies of fission products and 600 milligrams of plutonium were discharged per month.

Waste Site Location and Physical Description: The 216-T-2 Injection/Reverse Well is located near the southwest corner of the 222-T Building (See Figure 2. QMap Site Location). Site 216-T-2 consists of a below-grade reverse well with a 15.2 cm (6.0 in) well casing and a 7.6 cm (3 in) diameter vent pipe (See Figure 3. 216-T-2 Design and Figure 4. 216-T-2 Design). The vent pipe extends roughly 1.2 m (4 ft) above the surface and has been capped. In addition, the pipe connected to the reverse well extends vertically 22.9 m (75.0 ft) below grade, with the final 6.1 m (20 ft) of the pipe perforated with thirty-nine holes. Each hole is 1.3 cm (0.5 in) in diameter, with holes spaced roughly 12 per foot. The site is surrounded with light post and chain, and is posted as an Underground Radioactive Material (URM) area. A single cement AC-540 marker identifies the site.

Waste Site Coordinates:

Lon-567588.87500 Lat-136781.89059

Site Dimensions:

Site Length: Not Specified
Site Width: Not Specified)
Diameter: 0.2 m (0.5 ft)
Site Depth: 22.9 m (75.0 ft)
Cover Thickness: Not Specified

Release Summary: The 216-T-2 reverse wells were constructed for the disposal of acidic decontamination laboratory "hot" sink waste and acidic sample slurper waste from the 221-T Building. The site was operable from January 1945 to May 1950, and received an estimated 6E+06 L (1.6E+06 gal) of waste over its lifetime. Each month, the 222-T building discharged waste with an estimated 2.6 curies of fission products and 600 milligrams of plutonium into the dry wells.

Related Site Structure(s): Site 216-T-2 is associated with activities at the 222-T Laboratory.

Site Posting: Site 216-T-2 is posted as an URM area.

Site Characterization Summary: During the bismuth phosphate fuel separation process, batch samples were analyzed at the 222-T and 222-B laboratories. The reverse wells were placed to support the disposal of 222-T Building laboratory "hot" sink and sample table decontamination waste.

Little information is provided regarding the site's deactivation. The pipeline was blanked at the well in 1950. The laboratory waste was redirected to the 216-T-8 Crib. The site was mapped

using Global Positioning System (GPS) survey equipment between February 11 and March 11, 2998.A site walkdown occurred on February 19, 1998 for surveillance purposes. The results of the site walkdown are not specified. In addition, no survey data is provided for this site. It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided. If surveys do occur, their frequency is not specified.

Potential Contaminants: Radioactive: An estimated 6E+06 L (1.6E+06 gal) of acidic decontamination waste from the 222-T Building. Approximately 2.6 curies of fission products and 600 milligrams of plutonium were discharged per month.

Non-Radioactive: Not Specified.

Figure 1. ArcMap Image

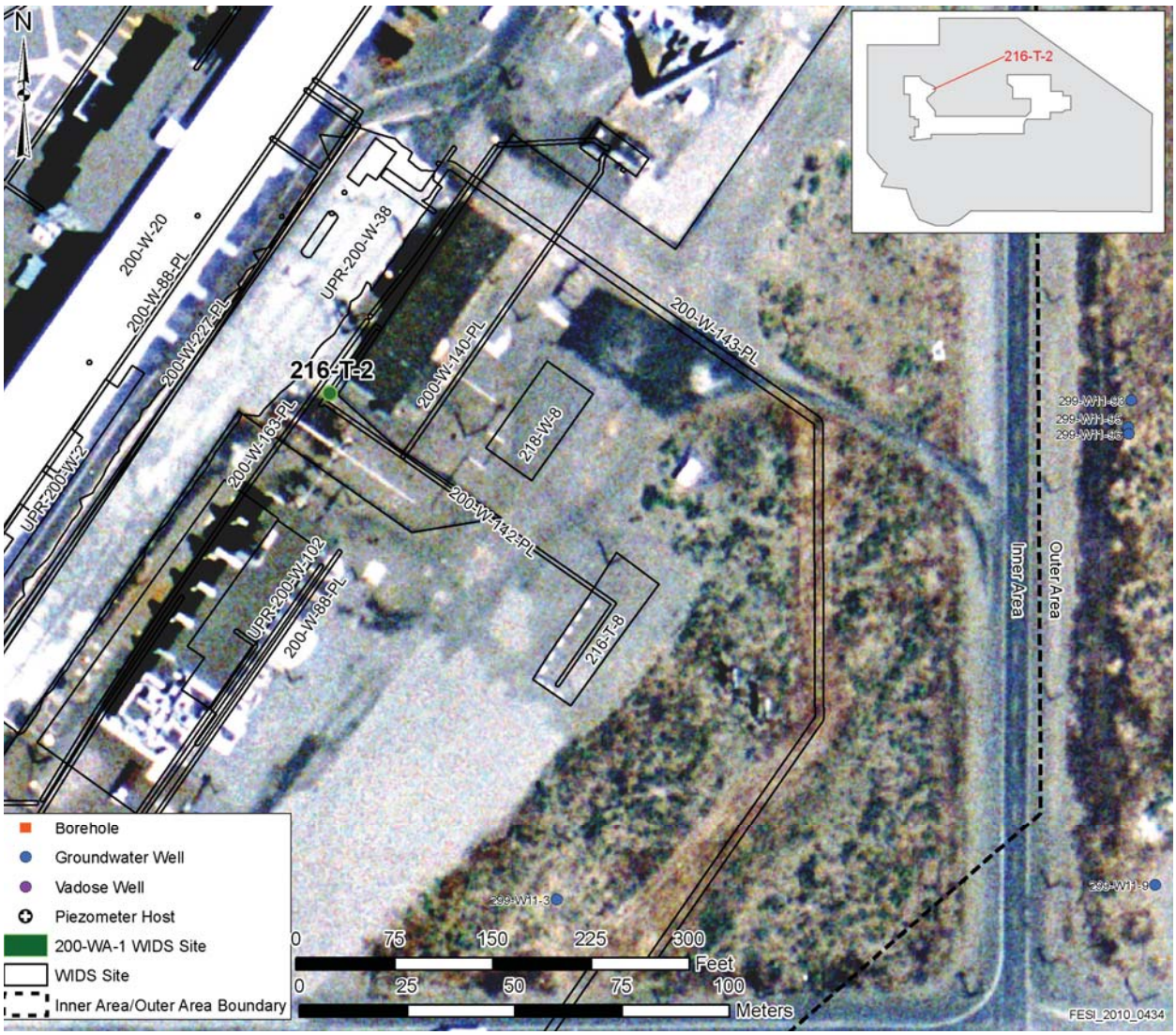


Figure 2. Insert Site Map

Figure not available.

Figure 3. 216-T-2 Design

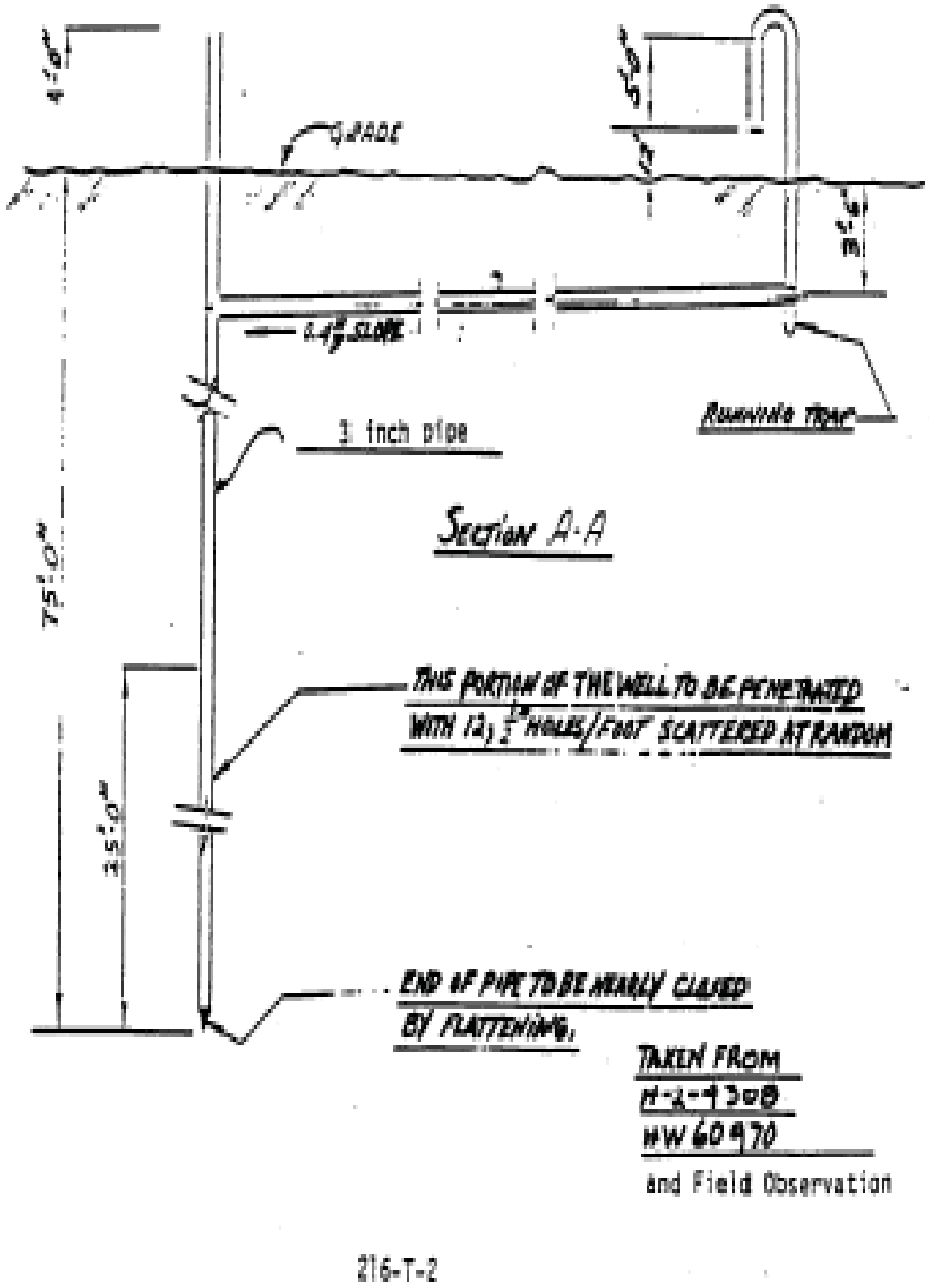
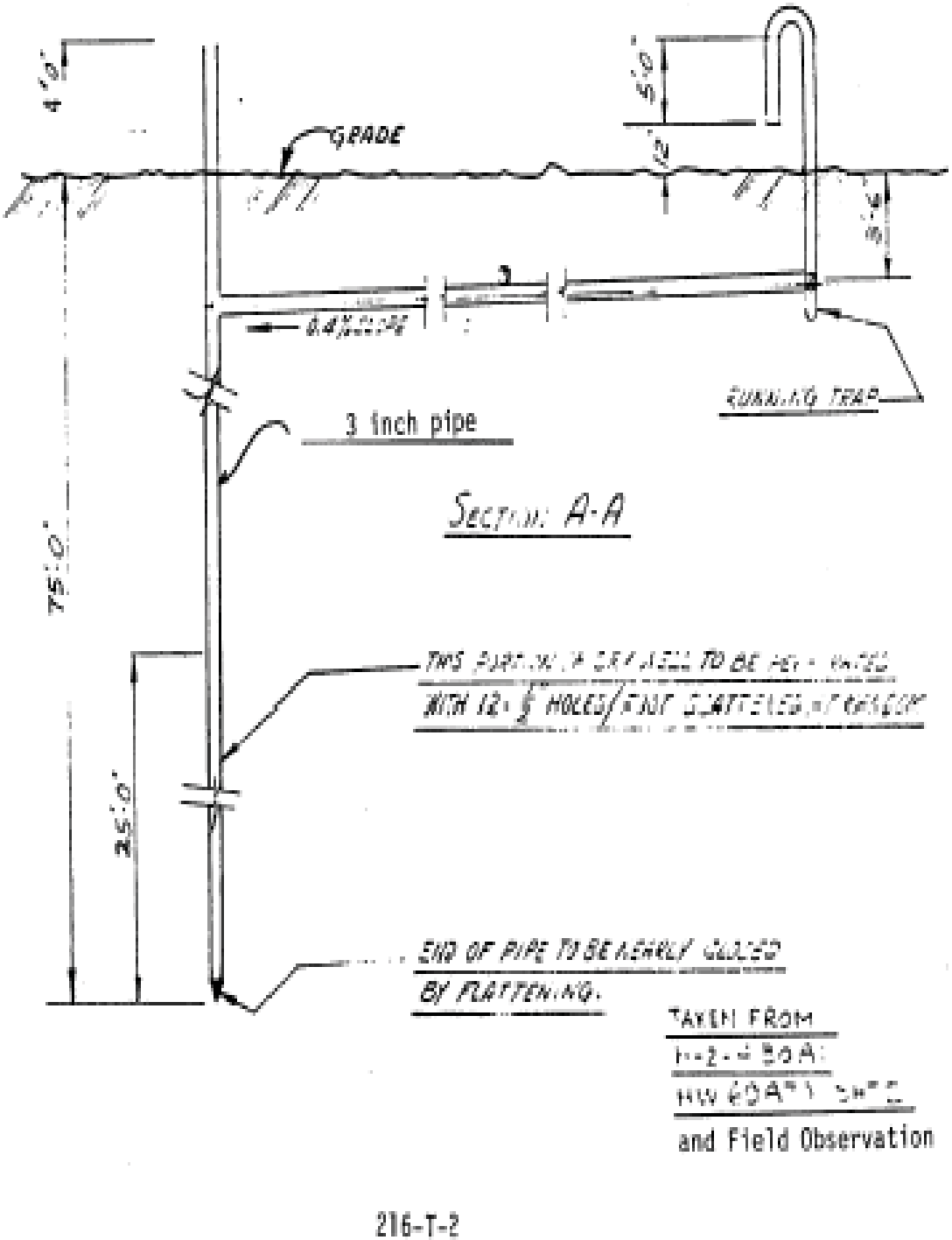


Figure 4. 216-T-2 Design



Site Description

Site ID: 216-T-20, 216-TX-2, 216-T-20 Crib, 241-TX-155 Contaminated Acid Grave
Site Type: Trench
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-MG-1
Former OU Assignment: Not Specified
Service Dates: November 1952 to November 1952
Volume/Mass Discharged: 1.8E+04 L of process effluent consisting of contaminated nitric acid.

Waste Site Location and Physical Description: Site 216-T-20 is a trench located east of Camden Avenue (See Figure 2. QMap Site Location). The southern boundary of this waste site is formed by the northern edge of the 200 West Area Power House Pond (Figure 3. Reference Drawing H-2-44510 Sheet 9 Rev.1). When constructed, the trench excavation resembled a pit. The excavated hole has since been filled with backfill material. On the surface, a small concrete block structure with a metal lid is visible. The lid is labeled as a "Confined Space" and with signs warning of "Potential Internal Contamination". In addition, there is a concrete marker with an "Underground Radioactive Material" (URM) sign. The concrete block structure is surrounded with cobbles, the same type which covers the surface of the Powerhouse Pond.

Waste Site Coordinates:

Lon-567118.93750 Lat-136074.22660

Site Dimensions:

Site Length: 3.1 m (10.0 ft)
Site Width: 3.1 m (10.0 ft)
Overburden Depth: 1.2 m (4.0 ft)
Site Depth: Not Specified
Cover Thickness: Not Specified

Release Summary: The 216-T-20 trench was constructed for the subsurface disposal of a single release of contaminated nitric acid from the 241-TX-155 Diversion Box Catch Tank. The site was active during November 1952, and received 1.8E+04 L of process effluent.

Related Site Structure(s): Site 216-T-20 is associated with the 241-TX-155 Diversion Box.

Site Posting: Site 216-T-20 is posted with URM area and Potential Internal Contamination signs.

Site Characterization Summary: The start date was November 1952 and the end date was November 1952. During deactivation, the above-ground piping was removed and the trench was backfilled.

A site walkdown for surveillance purposes occurred on April 5, 2000. The results of the walkdown are not presented. In addition, no survey data is provided for this site. It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: .8E+04 L of process effluent consisting of contaminated nitric acid.

Non-Radioactive: Not Specified.

Figure 1. ArcMap Image

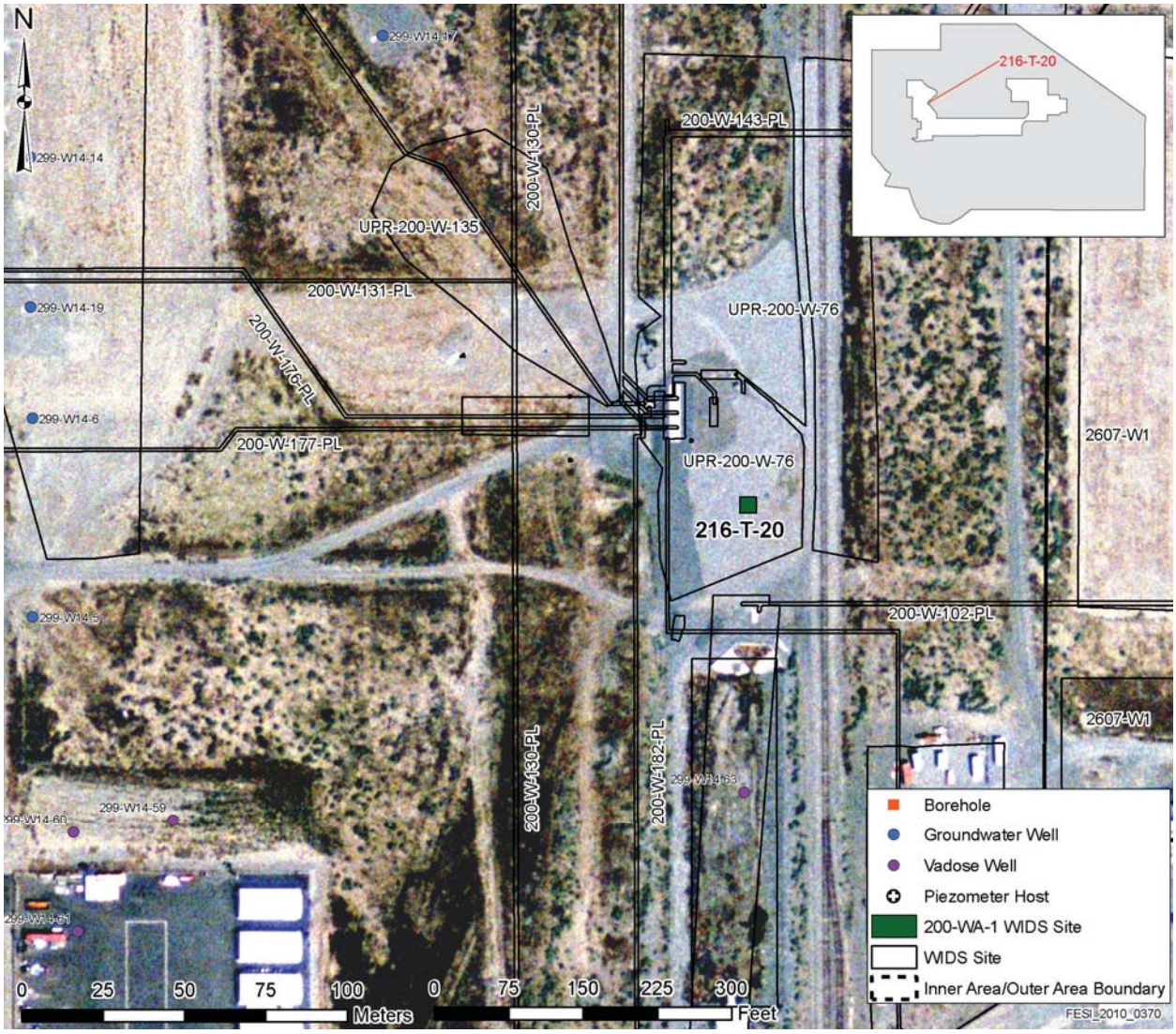
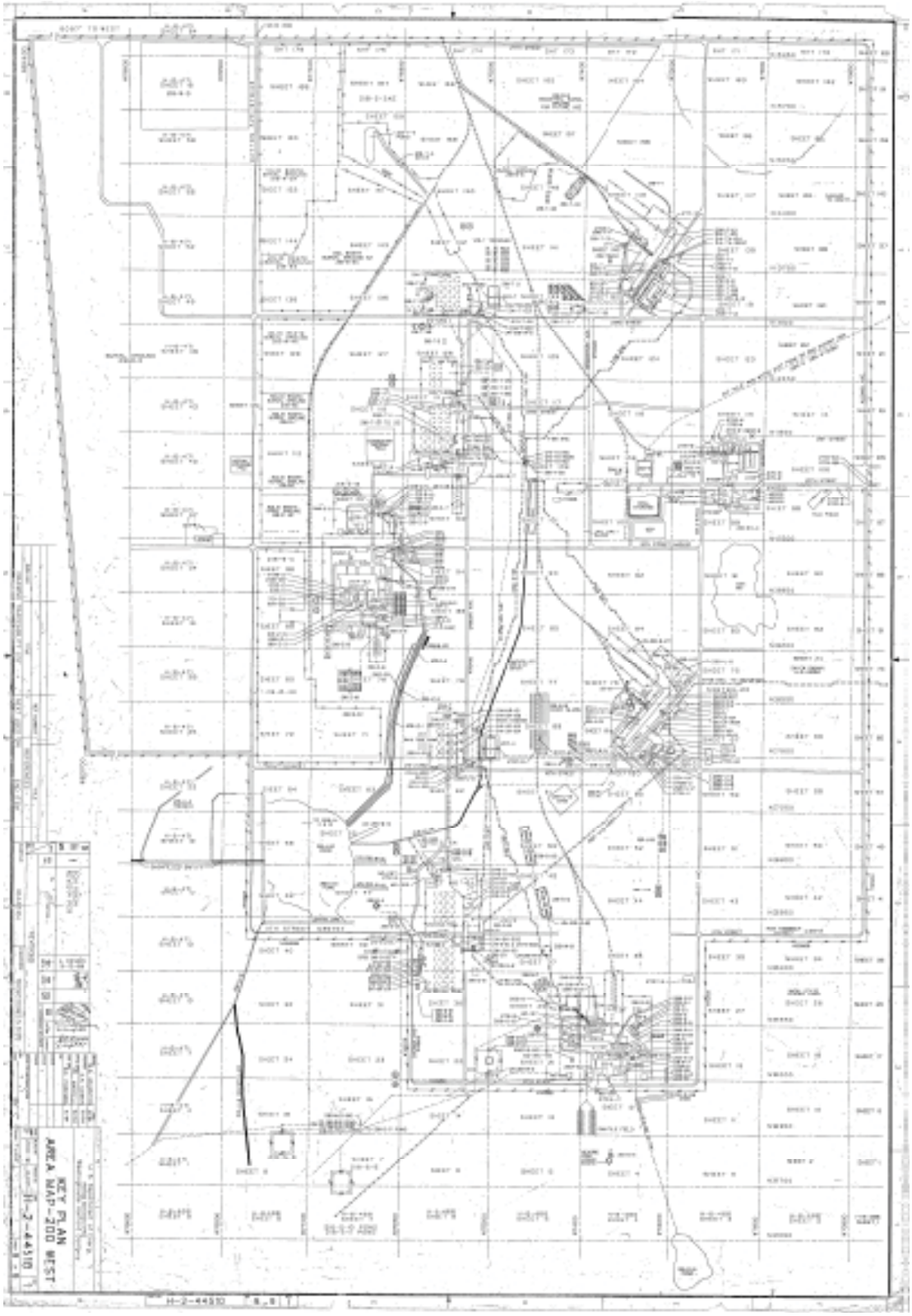


Figure 2. Insert Site Map

Figure not available.

Figure 3. Reference Drawing H-2-44510 Sheet 9 Rev.1.



Site Description

Site ID: 216-T-27, 216-TY-3 Cavern, 216-TY-3 Crib, 216-TX-3 Cavern, 216-TX-3 Crib
Site Type: Crib
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-LW-1
Former OU Assignment: Not Specified
Service Dates: September1965 to November 1965
Volume/Mass Discharged: Uncertain. See Release Summary Section Below.

Waste Site Location and Physical Description: The 216-T-26, 216-T-27, and 216-T-28 Cribs are located within the same enclosure. The enclosure is posted as an Underground Radioactive Material (URM) area, and is surrounded by a common steel post and chain barricade. The enclosure is south of 23rd Street and east of Camden Avenue (See Figure 2. QMap Site Location). The 216-TY-201 flush tank is located in the northeast corner of the site (See Figure 3. Reference Drawing H-2-2735 Sheet 1 Rev. 3 and Figure 4. Reference Drawing H-2-44511 Sheet 118). A crib riser may have been used during the disposal of 300 Area Wastes into the 216-T-28 Crib.

Waste Site Coordinates:

Lon-566932.49995 Lat-136372.82815

Site Dimensions:

Site Length: 9.1 m (30.0 ft) Site Depth: 4.6 m (15.0 ft)
Site Width: 9.1 m (30.0 ft) Cover Thickness: Not Specified
Dimensions are for the bottom of the excavation.

Release Summary: The 216-T-27 Crib was used for the disposal of T-Plant facility liquid waste and 300 Area Laboratory waste. Wastes deposited into the 216-T-27 Crib consisted of steam condensate and process decontamination waste from the 241-T-112 tank in the 241-T Tank Farm, and 2607-T equipment decontamination waste. In 1963 or 1964, 300 Area Laboratory waste was added to the waste stream deposited into the 216-T-28 Crib. In November 1965, the 300 Area waste was redirected from the 216-T-28 Crib to the 216-T-27 Crib for deposition, due to the presence of cesium and strontium contamination in the groundwater beneath the 216-T-28 Crib.

There is some uncertainty regarding the volume of 300 Area waste sent to Cribs 216-T-27 and 216-T-28. Information is provided stating that the waste was scheduled for disposal into the 216-T-27 Crib. However, contradicting information is also shown, stating that over 100 truckloads of waste from the 300 Area's PRTR release were deposited into the 216-T-28 Crib between September and October 1965. Finally, the WIDS document for the 216-T-28 waste site states that approximately 189 truckloads of PRTR waste were shipped to the 216-T-28 Crib for disposal. This would equate to approximately 3.6E+06 L (9.5E+05 gal) of liquid waste. The same truck unloading station would have been used for either Crib, thus is it difficult to ascertain the amount of waste discharged into either Crib.

Related Site Structure(s): The 216-T-27 Crib is associated with the 221-T Building, 2706-T Building, 216-TY-201 Flush Tank, with pipeline 200-W-188-PL, and with waste site 200-W-82.

Site Posting: The enclosure that surrounds the 216-T-26, 216-T-27, and 216-T-28 Cribs is posted as a URM area.

Site Characterization Summary: In November 1965, a limited volume of 300 Area waste and T-Plant waste was rerouted from the 216-T-28 Crib to the 216-T-27 Crib due to the presence of groundwater contamination beneath the 216-T-28 Crib. I it was assumed the 216-T-27 Crib would only be in use for 18 months. However, it was recommended that the Crib be retired earlier than originally scheduled, as collected data suggested that the 300 Area waste reacted poorly to the Crib soil.

The 216-T-27 Crib was deactivated in November 1965, when its set radionuclide disposal limit was reached. The site was deactivated by inserting a blank flange in the pipeline that fed the 216-T-27 and T-28 Cribs.

From 1969 to 1979, several live, contaminated Russian thistles were discovered surrounding the Crib. Most of the thistles were removed immediately after they were discovered, however some had deteriorated, releasing contamination onto the ground surface. A radiological investigation in May 1975 located spotty ground contamination with readings up to 30,000 cpm. Surface stabilization work occurred in June and July, and involved blading 15 cm (6 in) of soil from the contaminated areas. The soil was then collected and deposited into the 200 West Dry Waste Burial Grounds for disposal. Following the removal of the contaminated soil and vegetation, the ground was brought back to its previous grade with a layer of clean soil.

The site was surface stabilized a second time on May 21, 1990. The details regarding the second surface stabilization effort are not presented. The site is monitored by groundwater wells 299-W14-2 and 299-W14-3. The document states also that visual and radiological surveys are performed annually. However, no survey results or sample data analyses are provided.

Potential Contaminants:

Radioactive: Cesium and strontium contamination beneath the Crib. The Contamination has penetrated through the soil and entered the groundwater.

Non-Radioactive: Approximately 4.2E+07 L (1.1E+07 gal) of waste, consisting of steam condensate and process decontamination waste from the 241-T-112 tank, and laboratory waste from the 300 Area's 340 Laboratory Facility.

Figure 1. ArcMap Image

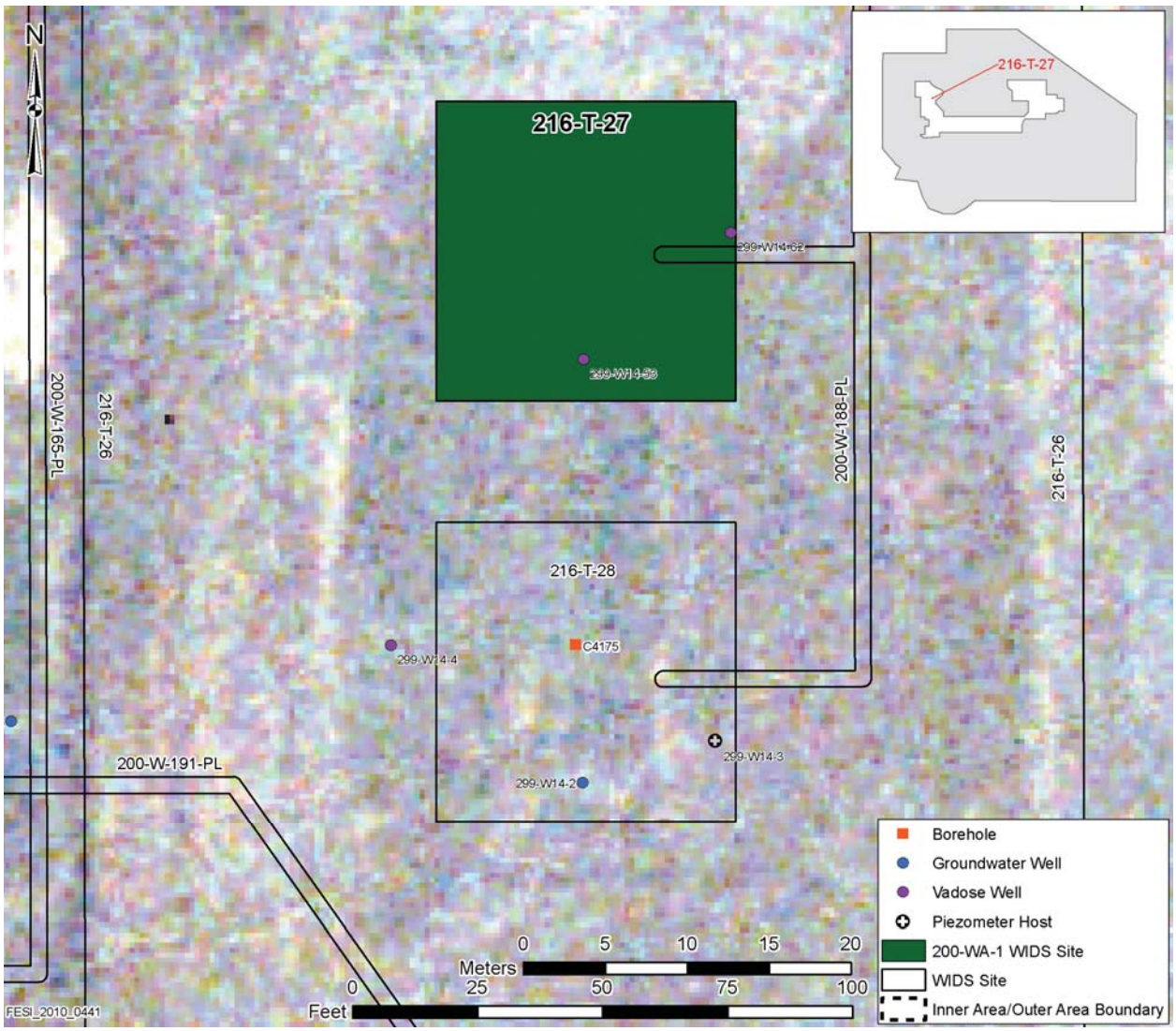


Figure 2. Insert Site Map

Figure not available.

Figure 3. Reference Drawing H-2-2735 Sheet 1 Rev. 3.

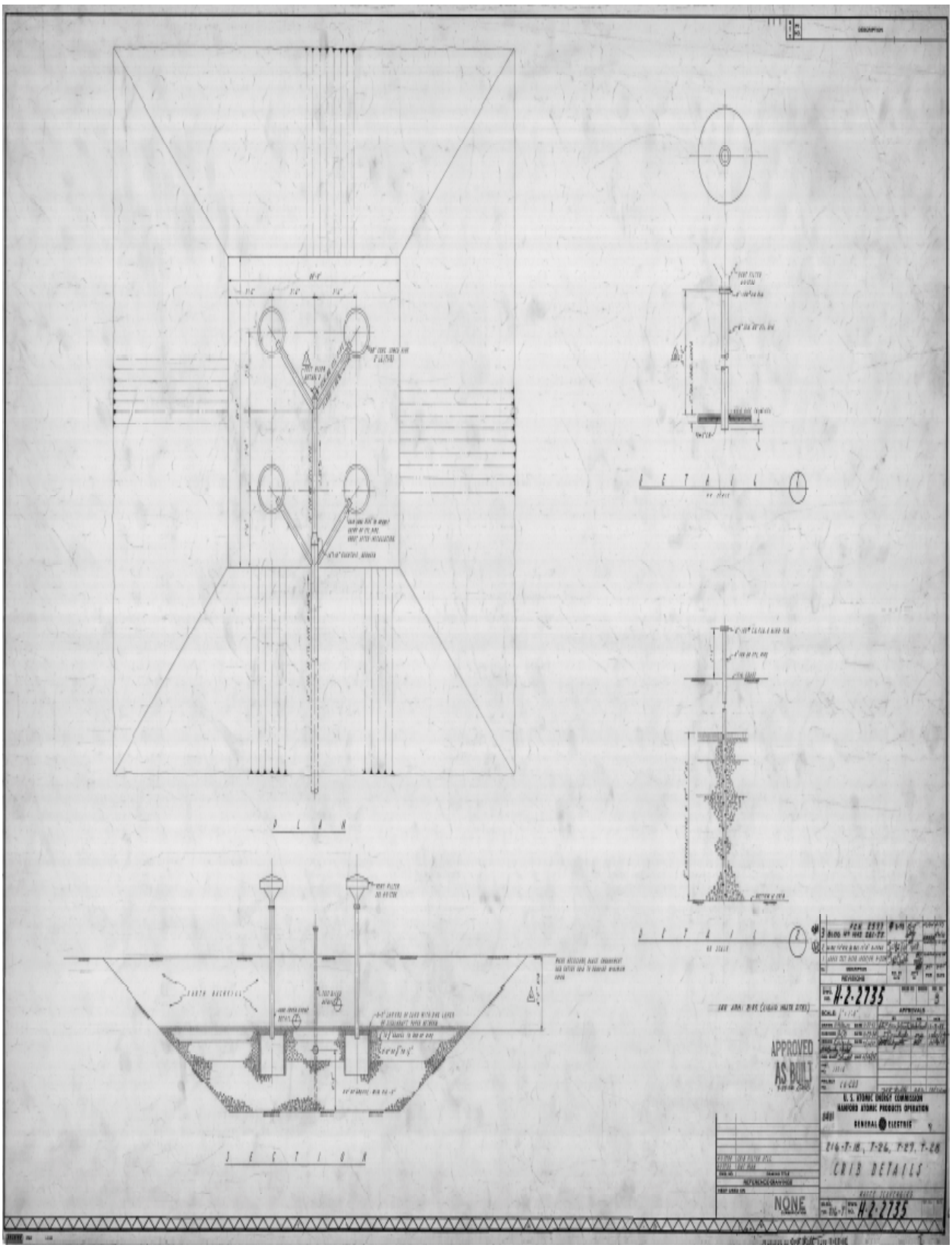
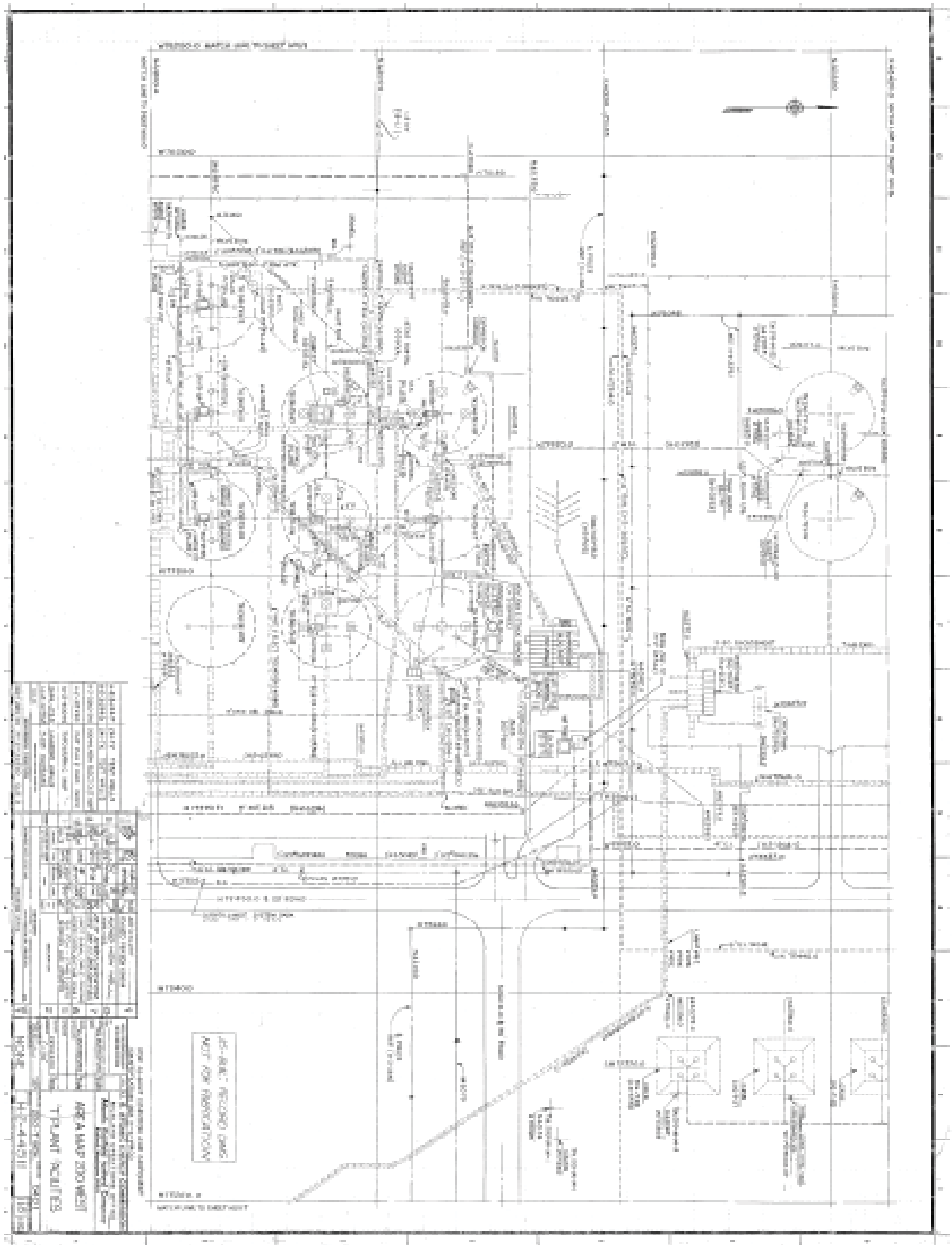


Figure 4. Reference Drawing H-2-44511 Sheet 118



Site Description

Site ID: 216-T-28, 216-TY-3 Cavern, 216-TY-3 Crib, 216-TX-3 Cavern, 216-TX-3 Crib
Site Type: Crib
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-LW-1
Former OU Assignment: Not Specified
Service Dates: 1960 to 1966
Volume/Mass Discharged: Approximately 4.2E+07 L (1.1E+07 gal) of waste, consisting of steam condensate and process decontamination waste from the 241-T-112 tank, and laboratory waste from the 300 Area's 340 Laboratory Facility.

Waste Site Location and Physical Description: The 216-T-26, 216-T-27, and 216-T-28 Cribs are located within the same enclosure. The enclosure is posted as an Underground Radioactive Material (URM) area, and is surrounded by a common steel post and chain barricade. The enclosure is south of 23rd Street and east of Camden Avenue (See Figure 2. QMap Site Location). The 216-TY-201 flush tank is located in the northeast corner of the site (See Figure 3. Refrence Drawing H-2-3019 and Figure 4. Refrence Drawing H-2-2733). A crib riser may have been used during the disposal of 300 Area Wastes into the 216-T-28 Crib.

Waste Site Coordinates:

Lon-566932.49995 Lat-136347.15625

Site Dimensions:

Site Length: 9.1 m (30.0 ft) Site Depth: 4.6 m (15.0 ft)
Site Width: 9.1 m (30.0 ft) Cover Thickness: Not Specified
Dimensions are for the bottom of the excavation.

Release Summary: The 216-T-28 Crib was used for the disposal of liquid waste from February 1960 to December 1966. From February 1960 to February 1963, steam condensate and process decontamination waste from the 241-T-112 tank in the 241-T Tank Farm was deposited into the Crib. In 1963 or 1964, 300 Area Laboratory waste was added to the waste stream deposited into the 216-T-28 Crib. The laboratory waste was shipped via truck from the 340 facility. It is believed that between September 1965 and October 25, 1965, approximately 189 truck loads, equivalent to roughly 3.6E+06 L (9.5E+05 gal) of liquid waste, were shipped from the 300 Area and deposited into the Crib. The majority of the waste originated from the PRTR rupture that had occurred previously. The estimated volume sent to the Crib during its lifetime is 4.2E+07 L (1.1E+07 gal).

However, there is some uncertainty regarding the volume of 300 Area waste sent to Cribs 216-T-27 and 216-T-28. Information provided in the WIDS report for 216-T-27states that the waste was scheduled for disposal into the 216-T-27 Crib. However, contradicting information is shown on page 2 of that same report, stating that over 100 truckloads of waste from the 300 Area's PRTR release were deposited into the 216-T-28 Crib between September and October 1965. Finally, the WIDS document for the 216-T-28 waste site states that approximately 189 truckloads of PRTR waste were shipped to the 216-T-28 Crib for disposal. This would equate to approximately 3.6E+06 L (9.5E+05 gal) of liquid waste. The same truck unloading station would

have been used for either Crib, thus is it difficult to ascertain the amount of waste discharged into either Crib.

In 1965, it was discovered that radioactive strontium and cesium had penetrated the soil profile and entered the groundwater beneath Crib 216-T-28. Following this discovery, in November 1965 the waste stream was temporarily rerouted to the 216-T-27 Crib. The 216-T-28 Crib was deactivated in 1966, when the set radionuclide limit for the Crib was reached. The 216-T-36 Crib was constructed to take the place of 216-T-28.

Related Site Structure(s): The 216-T-28 Crib is associated with the 221-T Building, the 2706-T Building, the 216-TY-201 Flush Tank, and waste site 200-W-82.

Site Posting: The enclosure that surrounds the 216-T-26, 216-T-27, and 216-T-28 Cribs is posted as a URM area.

Site Characterization Summary: The 216-T-28 Crib was deactivated in 1966. In May 1966, waste from the 2706-T Building was rerouted to the 216-T-4 Ditch. In December 1966, the pipeline that fed into the Crib and the 300 Area waste disposal riser were isolated. The 300 Area Laboratory waste was redirected to the 216-T-34 Crib, while the T-Plant effluent was rerouted to the 216-T-36 Crib.

From 1969 to 1979, several live, contaminated Russian thistles were discovered surrounding the Crib. Most of the thistles were removed immediately after they were discovered, however some had deteriorated, releasing contamination onto the ground surface. A radiological investigation in May 1975 located spotty ground contamination with readings up to 30,000 cpm. Surface stabilization work occurred in June and July, and involved blading 15 cm (6 in) of soil from the contaminated areas. The soil was then collected and deposited into the 200 West Dry Waste Burial Grounds for disposal. Following the removal of the contaminated soil and vegetation, the ground was brought back to its previous grade with a layer of clean soil.

The site was surface stabilized a second time on May 21, 1990. The details regarding the second surface stabilization effort are not presented. A characteristic borehole (C4175) was drilled into the crib in November 2004. Samples were obtained during the drilling of the borehole, and the results were submitted to the HEIS database. In addition, the site is monitored by groundwater wells 299-W14-1, 299-W14-2, and 299-W14-3. The document also states that visual and radiological surveys are performed annually. However, no survey results or sample data analyses are provided.

Potential Contaminants:

Radioactive: Cesium and strontium contamination beneath the Crib. The contamination has penetrated through the soil and entered the groundwater.

Non-Radioactive: Approximately 4.2E+07 L (1.1E+07 gal) of waste, consisting of steam condensate and process decontamination waste from the 241-T-112 tank, and laboratory waste from the 300 Area's 340 Laboratory Facility.

Figure 1. ArcMap Image

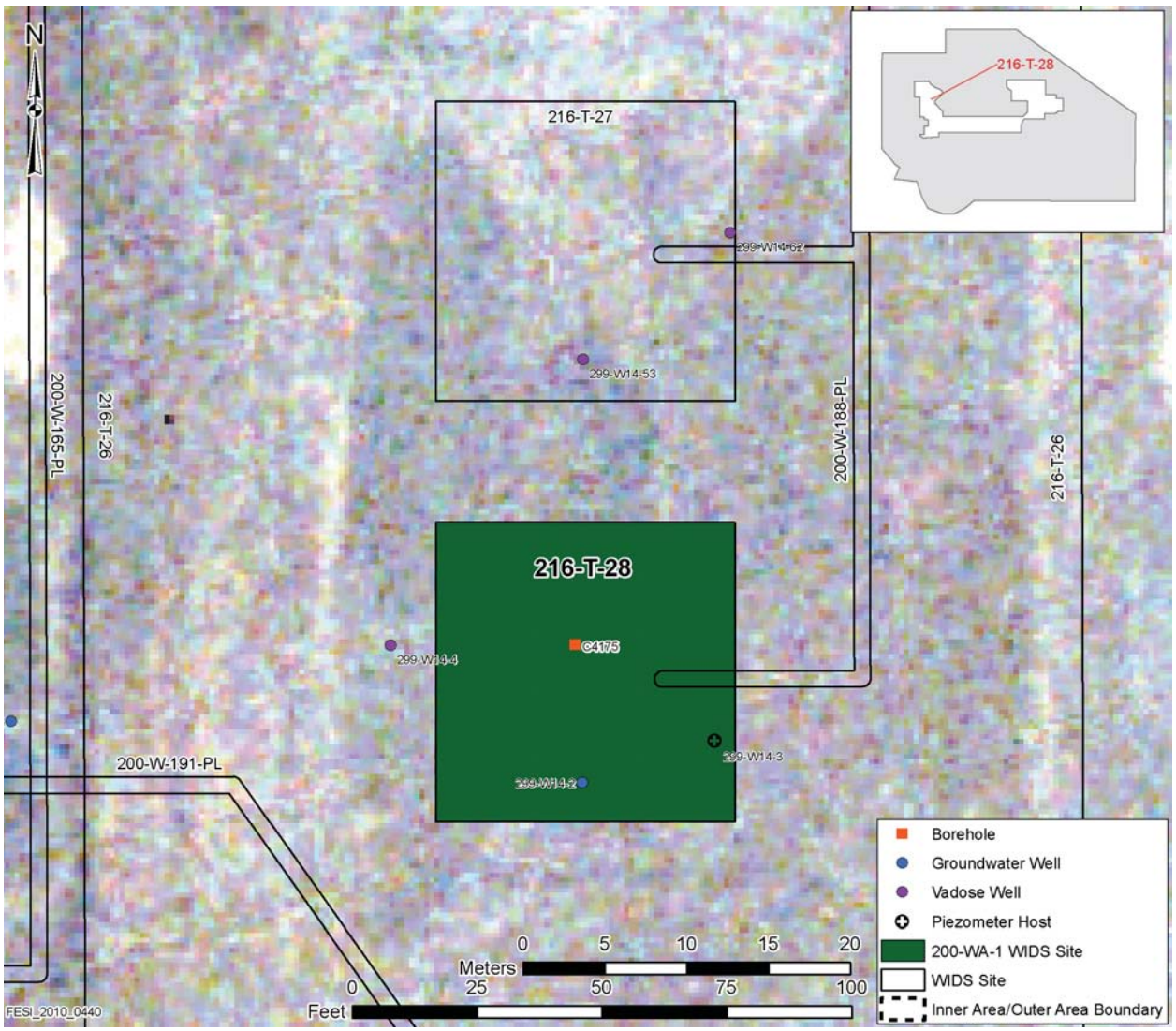


Figure 2. Insert Site Map

Figure not available.

Figure 3. Refrence Drawing H-2-3019

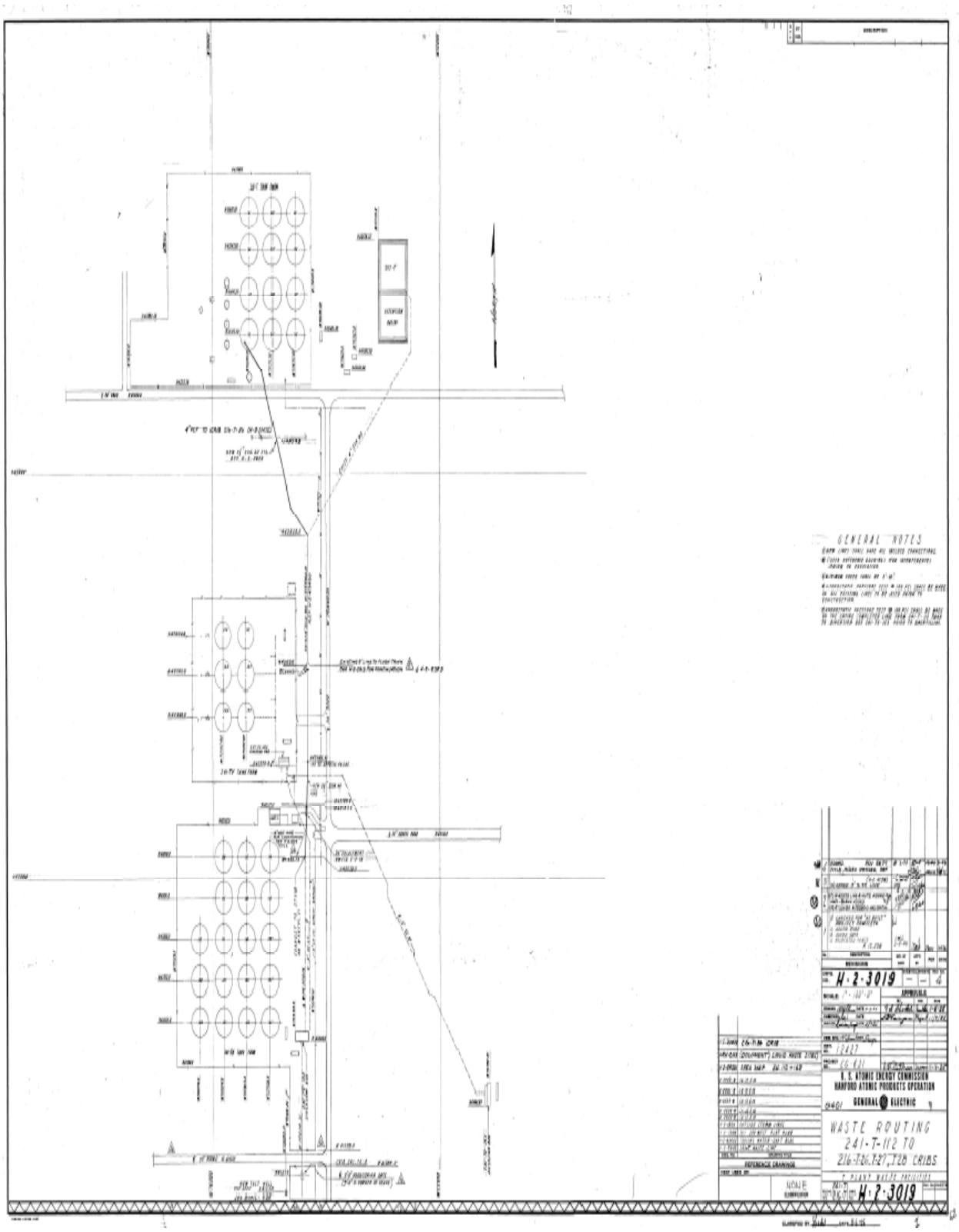
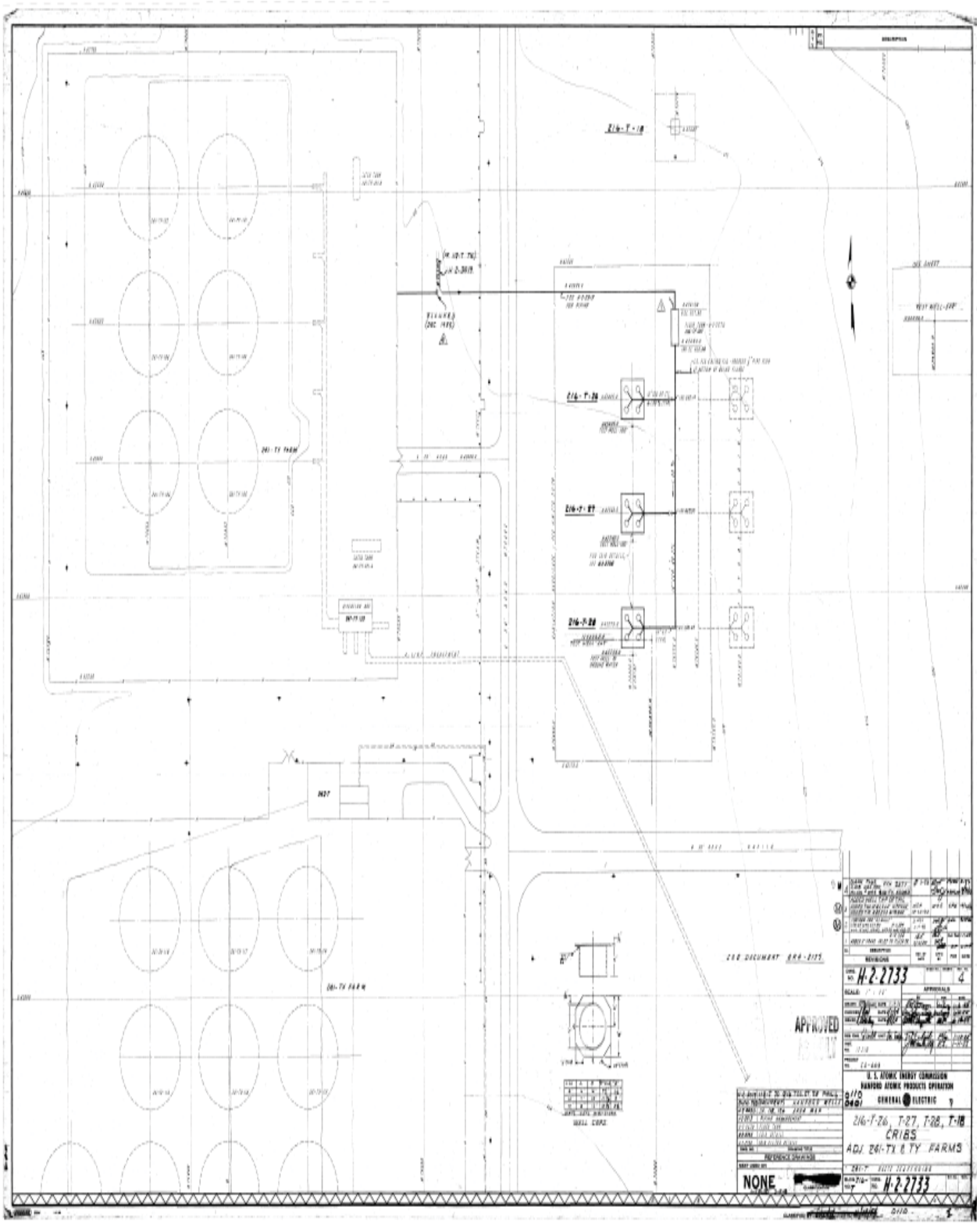


Figure 4. Refrence Drawing H-2-2733



Site Description

Site ID: 216-T-29, 216-T-29 French Drain, 291-T Sand Filter Sewer
Site Type: French Drain
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-MG-2
Former OU Assignment: Not Specified
Service Dates: 1954 to 1964
Volume/Mass Discharged: An estimated 7.4E+04 liters (2.0E+04 gal) of steam condensate containing an estimated 8000 kg (1.8E+04 lb) of nitric acid.

Waste Site Location and Physical Description: Site216-T-29 consists of a french drain system located northeast of the 221-T Building (See Figure 2. QMap Site Location). The 216-T-29 French Drain is part of the 291-T Sand Filter system, which is adjacent to the north end of the 291-T Sand Filter (See Figure 3. Reference Drawing H-2-1378 Sheet 1 Rev.0 and Figure 4. Reference Drawing H-2-34762 Sheet 1 Rev.7). The sand filter is marked and posted as a Contamination Area (CA).

There is some uncertainty regarding the location and site characteristics of the 216-T-29 French Drain. While the exact location of the french drain is not certain, the drain is assumed buried beneath the sand filter's northwestern corner. This point is noticeable on the ground, as the vent riser extends through the sand filter's ceiling at this location. In the 1950's, silver reactor filters, made of fiberglass soaked in silver nitrate, were added to the stack ducts.

However, information is presented regarding the similarities between the B and T plant construction designs. The french drain for the B Plant Sand Filter is located near the center and eastern end of the Sand Filter, and is not underneath the Sand Filter structure. Due to their similar designs, there is a possibility that the french drain for the T-Plant Sand Filter is also similarly located.

Additional information is presented concerning the characteristics of the site. It is unclear if the Sand Filter system consists of sixty french drains, one of which is the 219-T-29 French Drain; or if the 216-T-29 French Drain is a separate, single french drain that extends into the ground at the north corner of the sand filter. The french drains are all described as being 6 inches (15.2 cm) in diameter, 1.1 m (3.5 ft) in length, and filled with coarse gravel. The gravel is located 4.2 m (13.7 ft) beneath the top of the sand filter structure.

Waste Site Coordinates:

Lon-567695.06251 Lat-136928.81246

Site Dimensions:

Site Length: 1.1 m (3.5 ft)
Site Width: Not Specified
Diameter: 0.2 m (0.5 ft)
Site Depth: Not Specified
Cover Thickness: Not Specified

Release Summary: The 216-T-29 French Drain was brought online in March 1954 to convey moisture condensed canyon air away from the 291-T Sand Filter. An estimated 7.4E+04 liters (2.0E+04 gal) of steam condensate containing an estimated 8000 kg (1.8E+04 lb) of nitric acid was sent to the french drain during its lifetime. In the 1950's, silver reactor filters made from

fiberglass soaked in silver nitrate were added to the stack ducts. The filters reacted with the radioiodine to form silver iodide.

Related Site Structure(s): The 216-T-29 French Drain is associated with 200-W-45 (291-T Sand Filter)

Site Posting: Site 216-T-29 is associated with the 291-T Sand Filer, which is posted as a CA.

Site Characterization Summary: In March 1964, the drain was deactivated by removing the sand filter bypass water seal. The deactivation occurred due to the installation of new air filters in each cell of the 221-T Building. With the removal of the sand filter bypass water seal, the 221-T Building exhaust air could flow directly to the 291-T-1 Stack.

A site walkdown occurred on March 8, 2000 for verification purposes. Staff noted that it was assumed that the french drain was located beneath the sand filter structure, and that the vent pipe visible on the northwest corner was believed connected to the french drain.

No additional survey history and no radiological data are provided for this site. It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: An estimated 7.4E+04 liters (2.0E+04 gal) of steam condensate containing an estimated 8000 kg (1.8E+04 lb) of nitric acid.

Figure 1. ArcMap Image

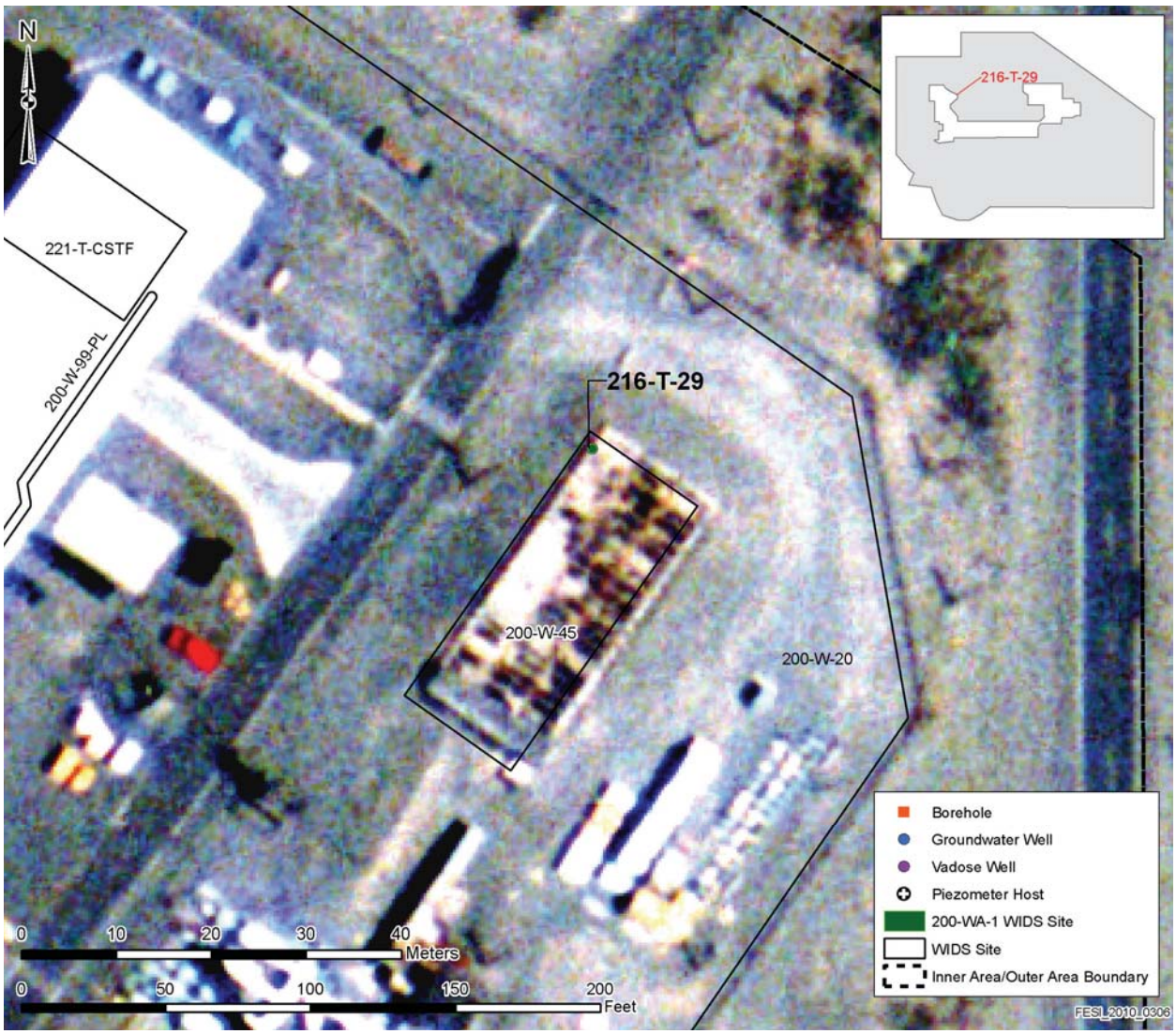


Figure 2. Insert Site Map

Figure not available.

Figure 3. Reference Drawing H-2-1378 Sheet 1 Rev.0.

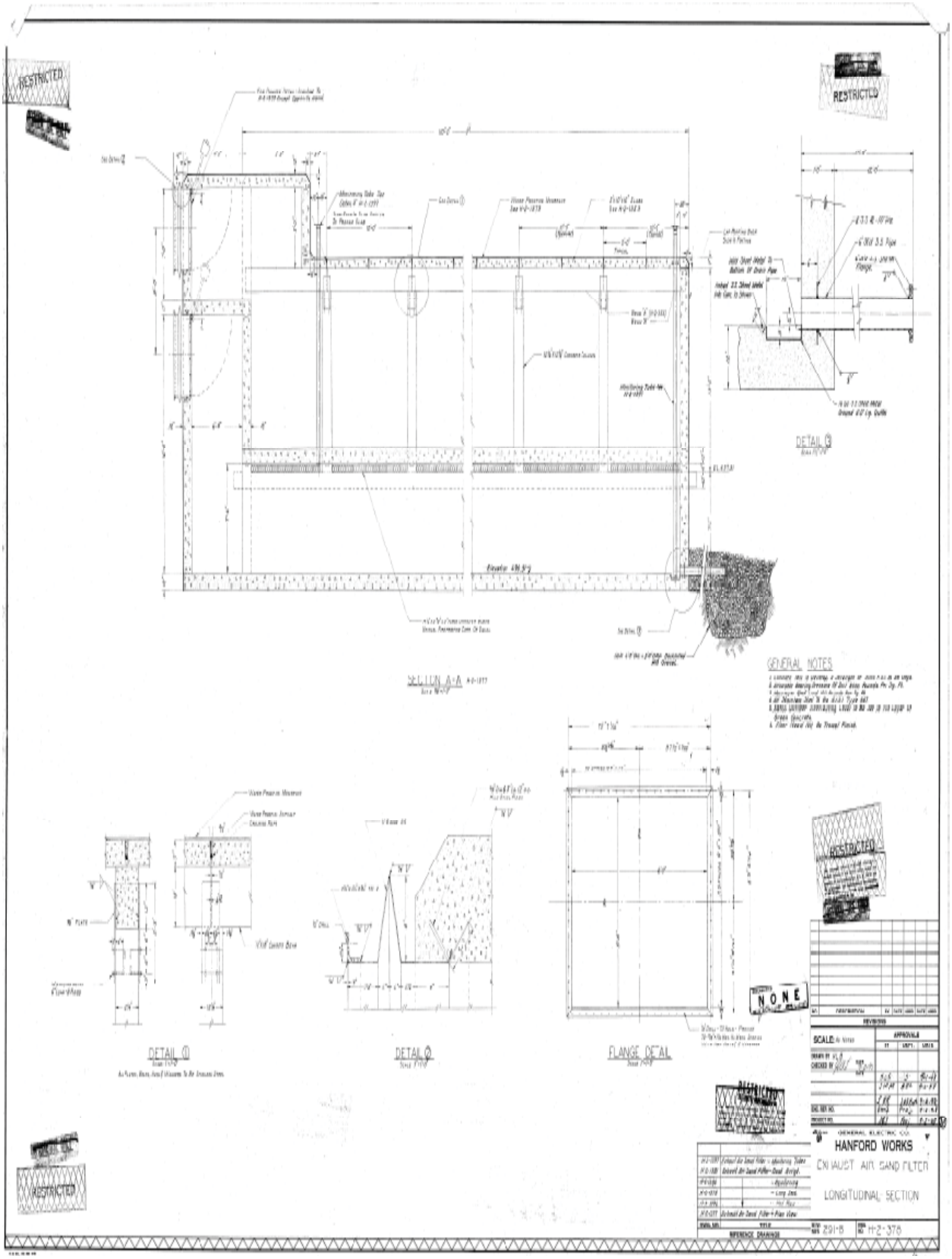
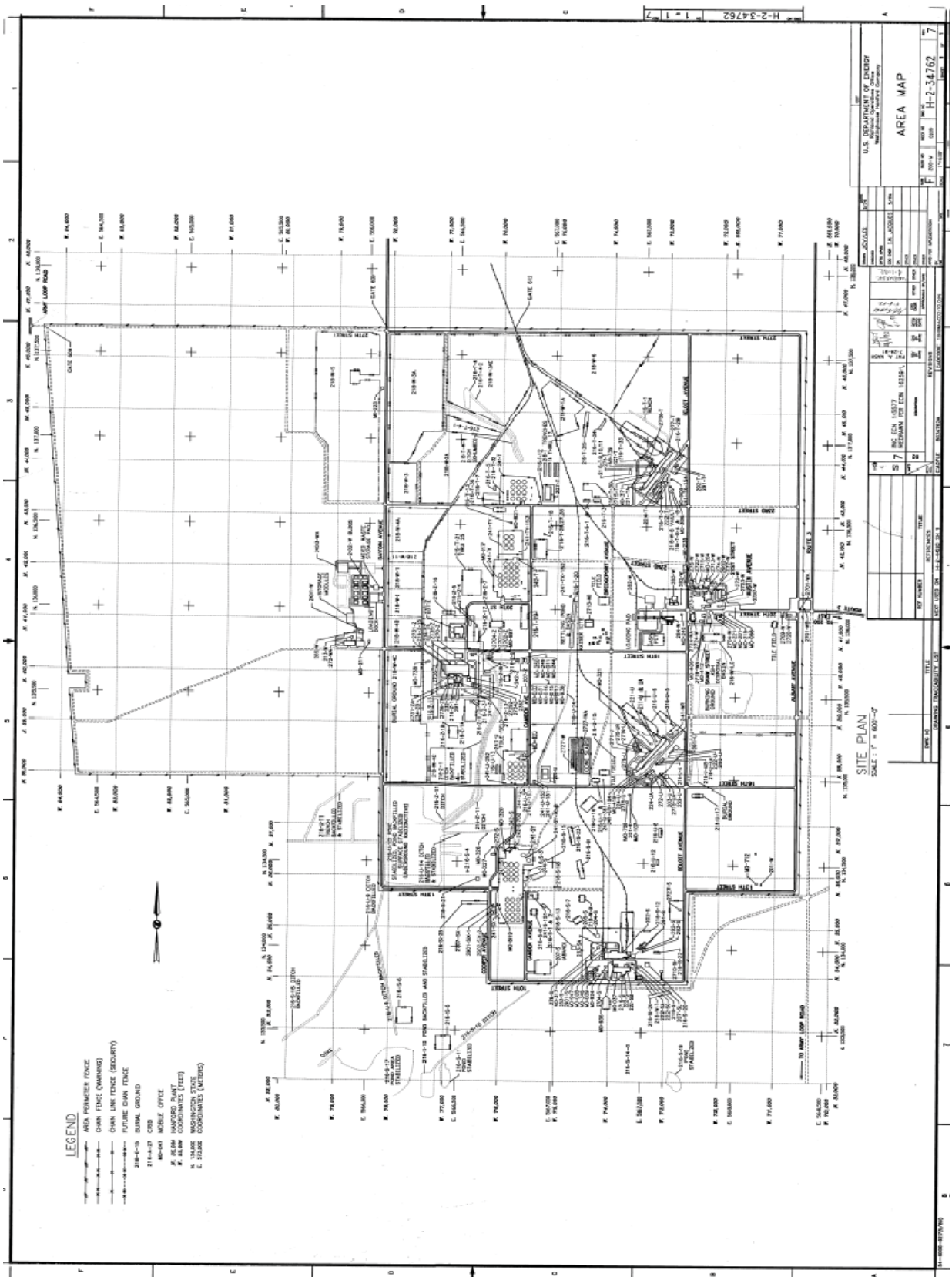


Figure 4. Reference Drawing H-2-34762 Sheet 1 Rev.7.



Site Description

Site ID: 216-T-31, 216-T-31 French Drain
Site Type: French Drain
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-MG-2
Former OU Assignment: Not Specified
Service Dates: 1954 to 1962
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: The 216-T-31 french drain was located west of Camden Avenue, near the southeast corner of the 241-TX Farm, on the east side of 241-TX Tank Farm fence (See Figure 2. QMap Site Location). The french drain is comprised of 0.9 m (3.0 ft) diameter french drain which was unearthed in 1962 and left unmarked (See Figure 3. Reference Drawing H-2-44511 Sheet 110 Rev. 5 and Figure 4. Reference Drawing H-2-32526 Sheet 1 Rev. 3). The approximate location of the french drain was later posted with the WIDS sitecode 216-T-31. The contaminated culvert, gravel and soil associated with this site have been removed.

Waste Site Coordinates:

Lon-566872.77500 Lat-136159.54998

Site Dimensions:

Site Length: Not Specified
Site Width: Not Specified
Diameter: 0.9 m (3.0 ft)
Site Depth: Not Specified
Cover Thickness: Not Specified

Release Summary: The french drain was in use from 1954 to 1959. The drain was accidentally contaminated by radioactive steam condensate during attempts to unclog a blocked waste line in October 1959. A new steam line and steam condensate drain were built in 1959 to take the place of the contaminated french drain.

The amount of steam condensate and the levels of contamination released into the french drain are not specified. In addition, the radiation levels detected in the contaminated soil are not specified. As the total volume of contamination released is not available, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 216-T-31 is not associated with any other waste sites or with buildings in the T Plant area.

Site Posting: Site 216-T-31was released from radiation zone status in February 1962.

Site Characterization Summary: Information is presented detailing a discrepancy regarding the dates the french drain was operational, and when the french drain became contaminated. It is believed that the french drain was in use from 1954 to 1959, and that the drain was unearthed in 1962. After the french drain was unearthed, the contaminated culvert, gravel and soil were taken offsite and placed in the 200 West Area Burial Ground for disposal.

No survey data or investigative history is provided for this site. It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Not Specified.

Figure 1. ArcMap Image

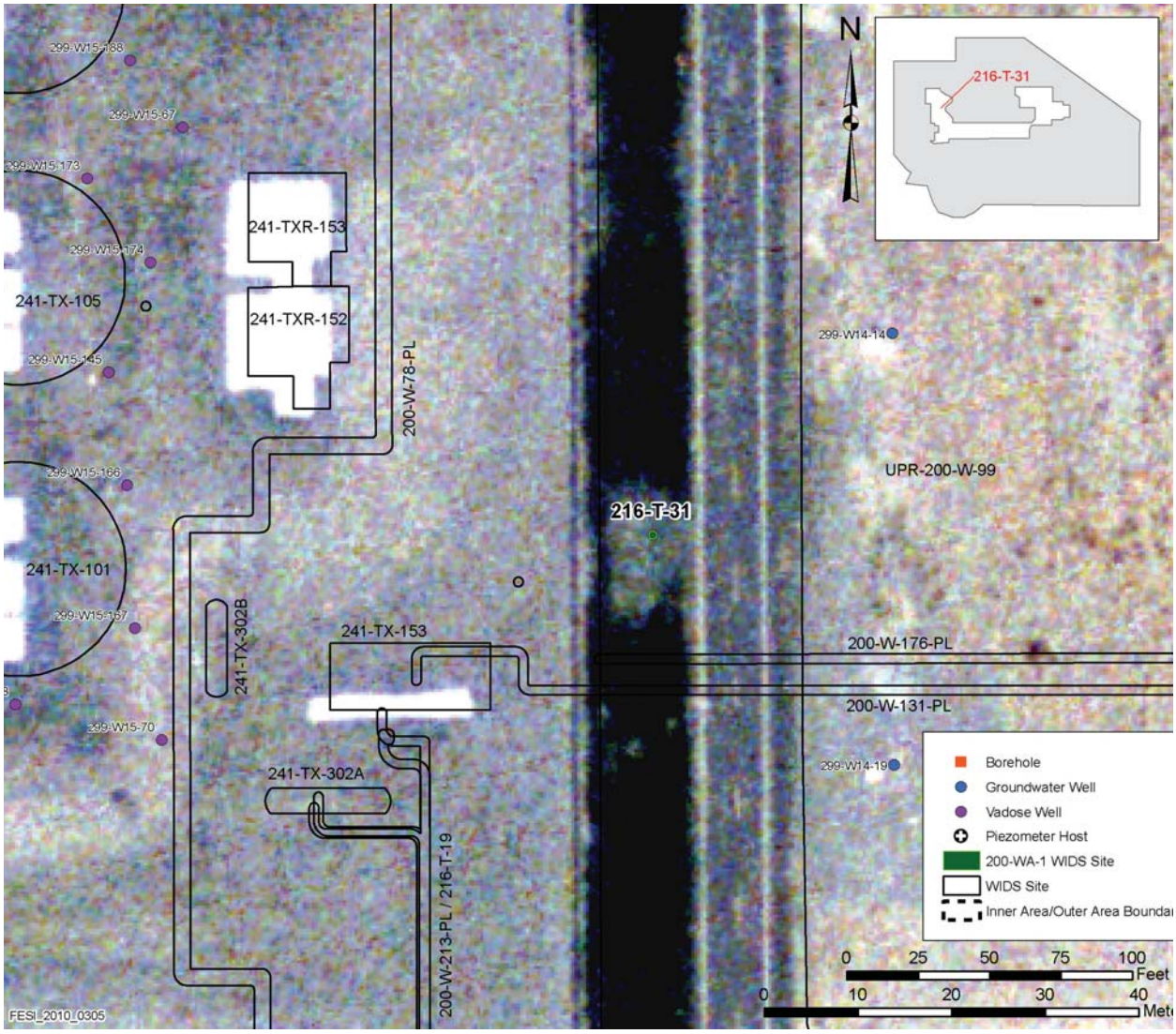


Figure 2. Insert Site Map

Figure not available.

Figure 3. Reference Drawing H-2-44511 Sheet 110 Rev. 5.

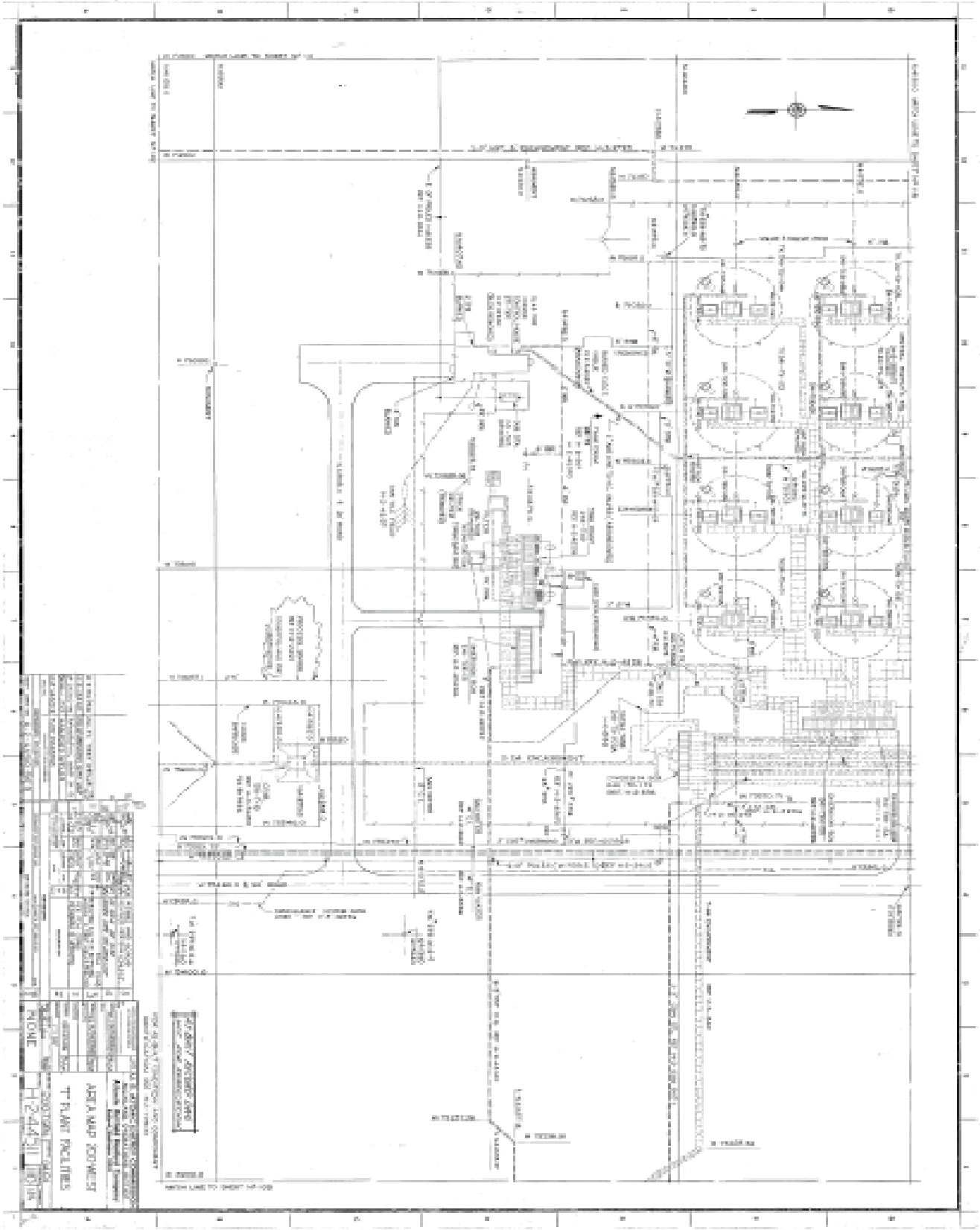
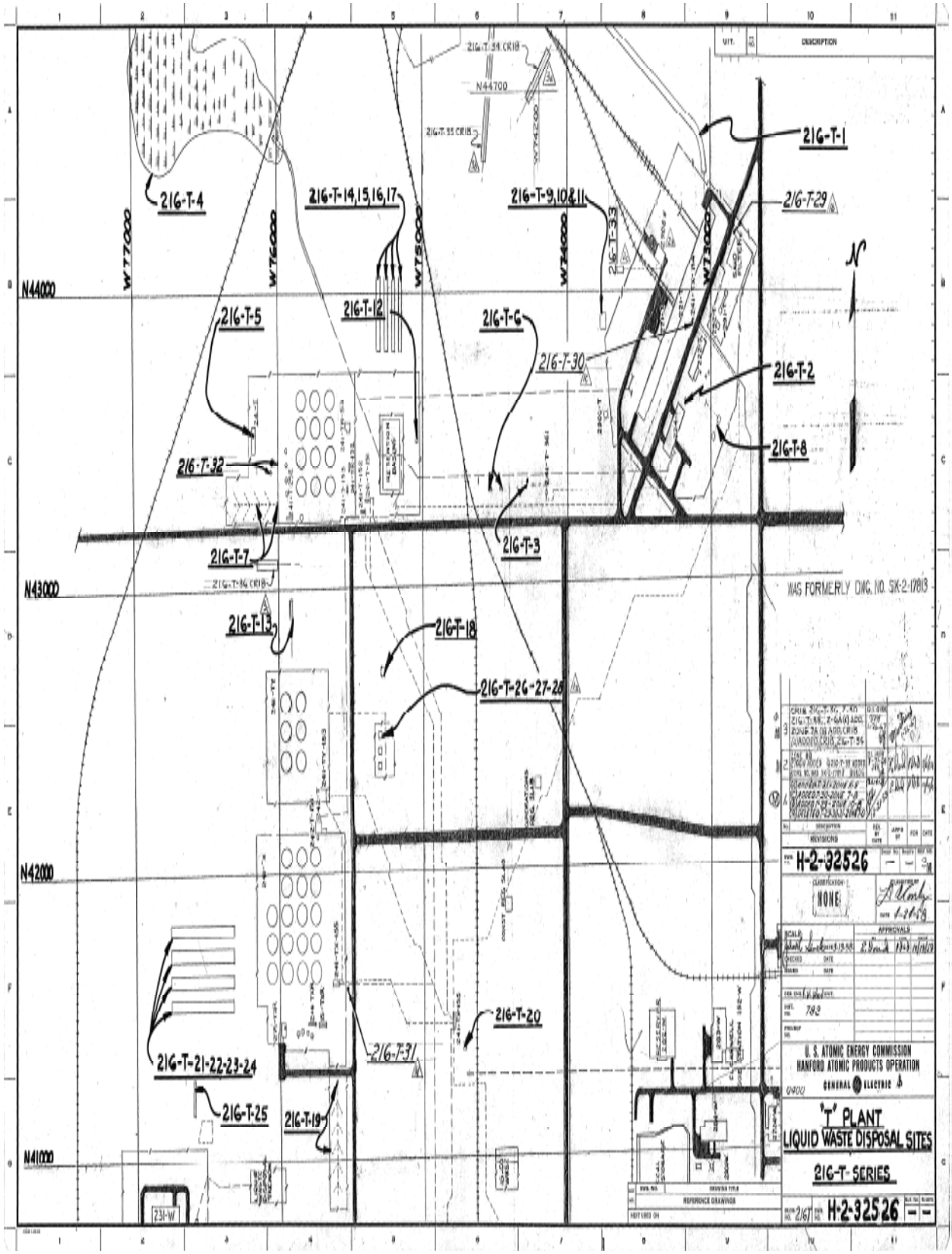


Figure 4. Reference Drawing H-2-32526 Sheet 1 Rev. 3.



Site Description

Site ID: 216-T-33
Site Type: Crib
Facility/Geographic Area: 200 Inner Area West
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-2
Service Dates: January to February 1963
Volume/Mass Discharged: 1.9 E+6 L (0.5 E+6 gal)

Waste Site Location and Physical Description: The crib is located west of the 221-T Canyon Building and southwest of 2706-T. The crib bottom dimensions are 9.1 m (30 ft) long, 1.5 m (5 ft) wide and 3.3 m (11.8 ft) deep. The top dimensions of the crib are 12.2 m (40 ft) long and 6.1 m (20 ft) wide [1]. The overburden depth is 2.1 m (6.8 ft) deep. The crib had a vitreous clay inlet pipe set into a gravel layer. A layer of plastic sheeting, clean sand and backfill are above the pipe. The line to the crib plugged shortly after the crib became active and it is believed the line retained all of the waste. Portions of the underground crib pipeline were removed in 1963.

Waste Site Coordinates:

Lon-567453.62185 Lat-136897.94142

Site Dimensions:

Site Length: 9.1 m (30 ft) (bottom dimension)
Site Width: 1.5 m (5 ft) (bottom dimension)
Site Area: 13.7 square m (150 square ft)
Site Depth: 3.3 meters (11.8 ft) minimum
Cover Thickness: 2.1 m (6.8 ft)

Release Summary: 216-T-33 Crib received 1.9 E+6 L (0.5 E+6 gal) of liquid equipment decontamination waste from the 2706-T Building. The waste was low in salt, neutral to basic, and contained sodium hydroxide. The total effluent discharged to the crib is questionable since the discharge line plugged shortly after the crib became active. Sections of the tile line were removed and the building effluent was rerouted to the 216-T-28 crib via the 241-T-112 Tank in the 241-T Tank Farm.

$PV_{released}$ = 1.9E+6 L/ (13.7 square m*79 m*0.3*1000 Liters/m^3) =5.8

Therefore, the crib is assumed to have impacted groundwater.

Related Site Structure(s): The crib is associated with the 2706-T Decontamination Building and pipeline 200-W-173-PL.

Site Posting: The site is surrounded with light metal posts and chain and is posted with Underground Radioactive Material signs.

Site Characterization Summary: Characterization borehole C4738 was drilled at this crib in February 2005 to a depth of 40.3 m (132.5 ft). Samples were analyzed for radionuclides, metals and inorganic/organic chemicals. Groundwater wells monitor this site. Visual and radiological surveys are performed at this site.

Potential Contaminants:

Radioactive:

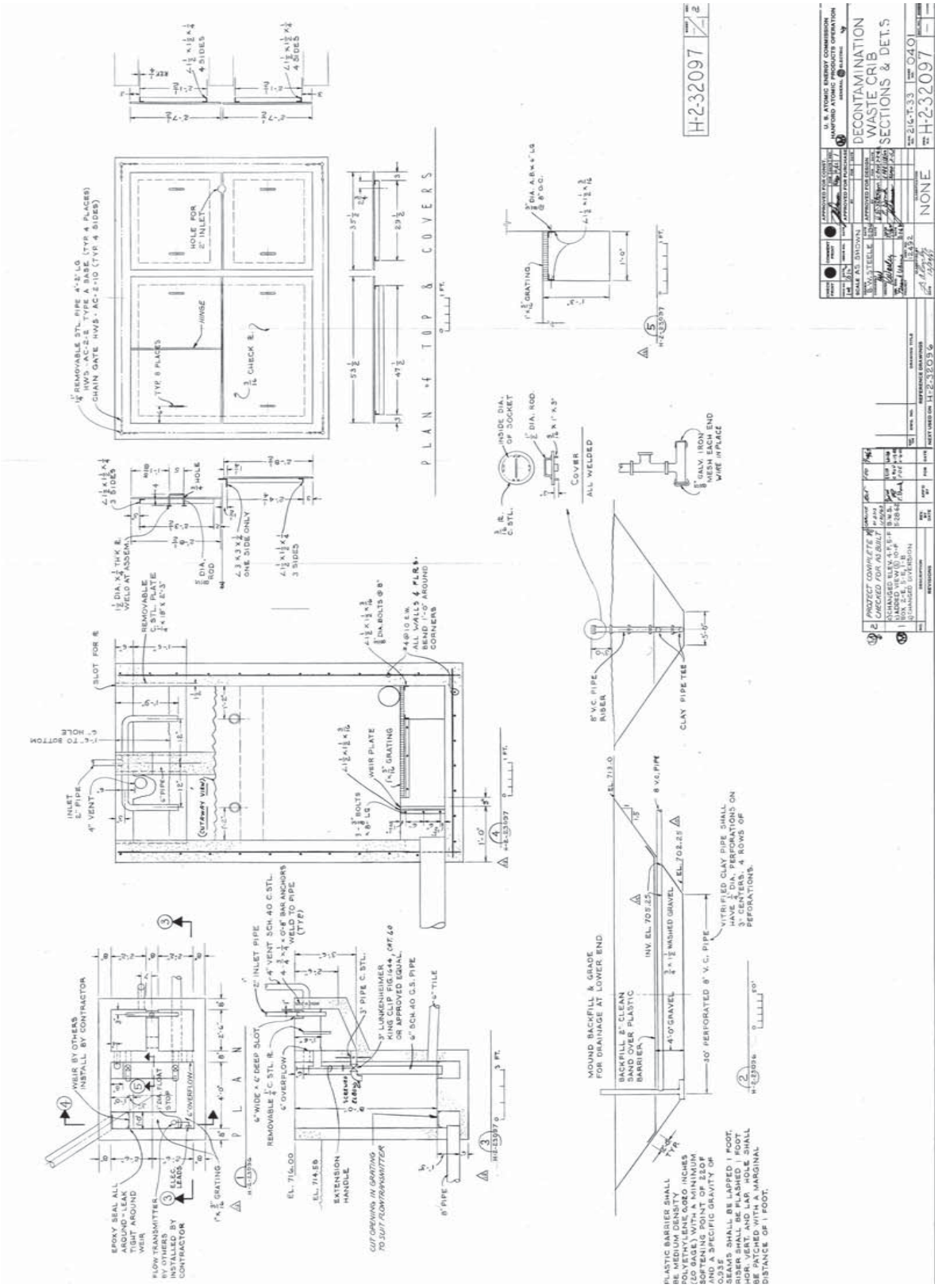
Non-Radioactive:

References:

All information from WIDS Summary Report unless otherwise noted.
Drawing H-2-32097

Figure 1. ArcMap Image

Figure 2. Crib Drawing



Site Description

Site ID: 216-T-34
Site Type: Crib
Facility/Geographic Area: 200 Inner Area West
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-LW-1
Service Dates: May 1966 to March 1967
Volume/Mass Discharged: 17.3E+6 L (4.6 E+6 gal)

Waste Site Location and Physical Description: The crib is located northwest of the 221-T Building, on the east side of the 216-T-35 Crib (see Figure 1. ArcMap Image). The crib bottom dimensions are 61 m (200 ft) long, 9.1 m (30 ft) wide, and 4.6 m (15 ft) deep (see Figure 2 & Figure 3). The crib's piping consisted of perforated vitrified clay pipe rectangular loop, and a vitreous clay pipe extending into the center of the crib. The piping rested on a layer of gravel. Two gage well risers and one filter riser are visible from the surface. The drain line from an unloading station located in the northwest corner of the 216-T-34 Crib was extended to the 216-T-35 Crib distributor pipe. The 216-T-34 Crib drain line was blanked.

Waste Site Coordinates:

E-567265.71212 N-137111.26556

Site Dimensions:

Site Length: 61 m (200 ft) (bottom dimension)
Site Width: 9.1 m (30 ft) (bottom dimension)
Site Area: 555 m^2 (6,000 ft^2)
Site Depth: 4.6 meters (15 ft) minimum
Cover Thickness: Unspecified

Release Summary: 216-T-34 Crib received 17.3E+6 L (4.6 E+6 gal) of liquid disposal waste from the 340 Building in the 300 Area. The waste was low in salt, neutral to basic, and contained nitrate. The waste was transported to the 200 West Area in railroad tank cars and 18.9 E+3 L (5.0 E+3 gal) trucks.

$$PV_{released} = 17.3E+6\ L/\ (555\ m^2 * 79\ m * 0.3 * 1000\ L/m^3) = 1.3$$

Therefore, the crib is assumed to have impacted groundwater.

Related Site Structure(s): The crib is associated with the 340 waste facility located in the 300 Area. A railcar tanker unloading station (200-W-21) was removed from the northwest corner of the 216-T-34 Crib in 1996. The pipeline from the railcar unloading station to the crib is sitecode 200-W-196-PL. The pipeline from the truck unloading station to the crib is sitecode 200-W-198-PL.

Site Posting: The crib is posted with "Underground Radioactive Material" signs.

Site Characterization Summary: The site operated from May 1966 to March 1967. Due to increased radionuclide content in the waste being sent to the crib, contamination began to be detected in the groundwater after only 5 months of use. The site was deactivated when the crib reached its radionuclide limit. The pipeline northeast of the crib was capped. The waste was rerouted to the 216-T-35 Crib. During the construction and tie-in of the 216-T-35 Crib in

February 1967, low-level beta/gamma soil contamination up to 30,000 counts per minute was found around the 216-T-34 Unloading Station piping. Contaminated soil was removed and buried in the 200 West Dry Burial Ground. Residual contamination remained near the ground surface at the unloading station.

The 216-T-34 Crib was interim stabilized on July 26, 1990.

Visual and surface radiological surveys are performed at the site annually. Groundwater wells 299-W11-15 and 299-W11-16 monitor the site.

Potential Contaminants:

Radioactive: Unspecified

Non-Radioactive: Nitrate

References:

WIDS General Summary Report for site 216-T-34
ArcMap
QMap
H-2-32649
H-2-32650

Figure 1. ArcMap Image

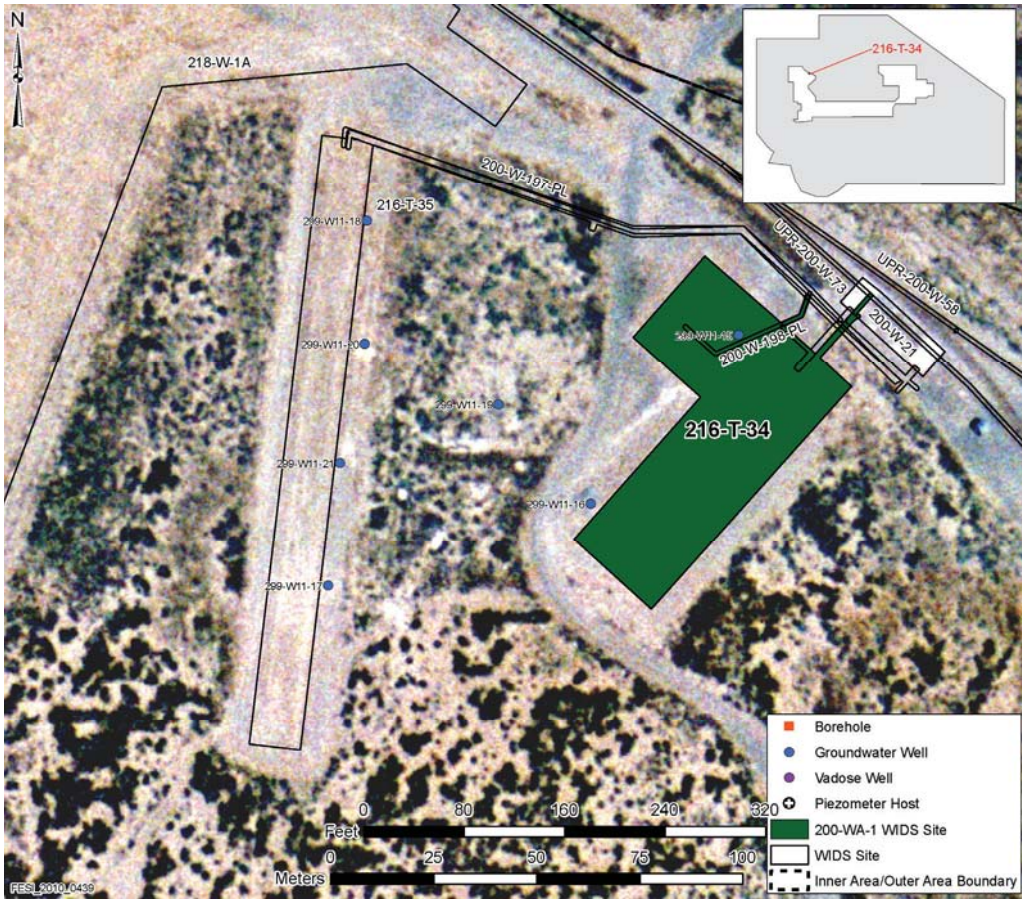


Figure 2. H-2-32649

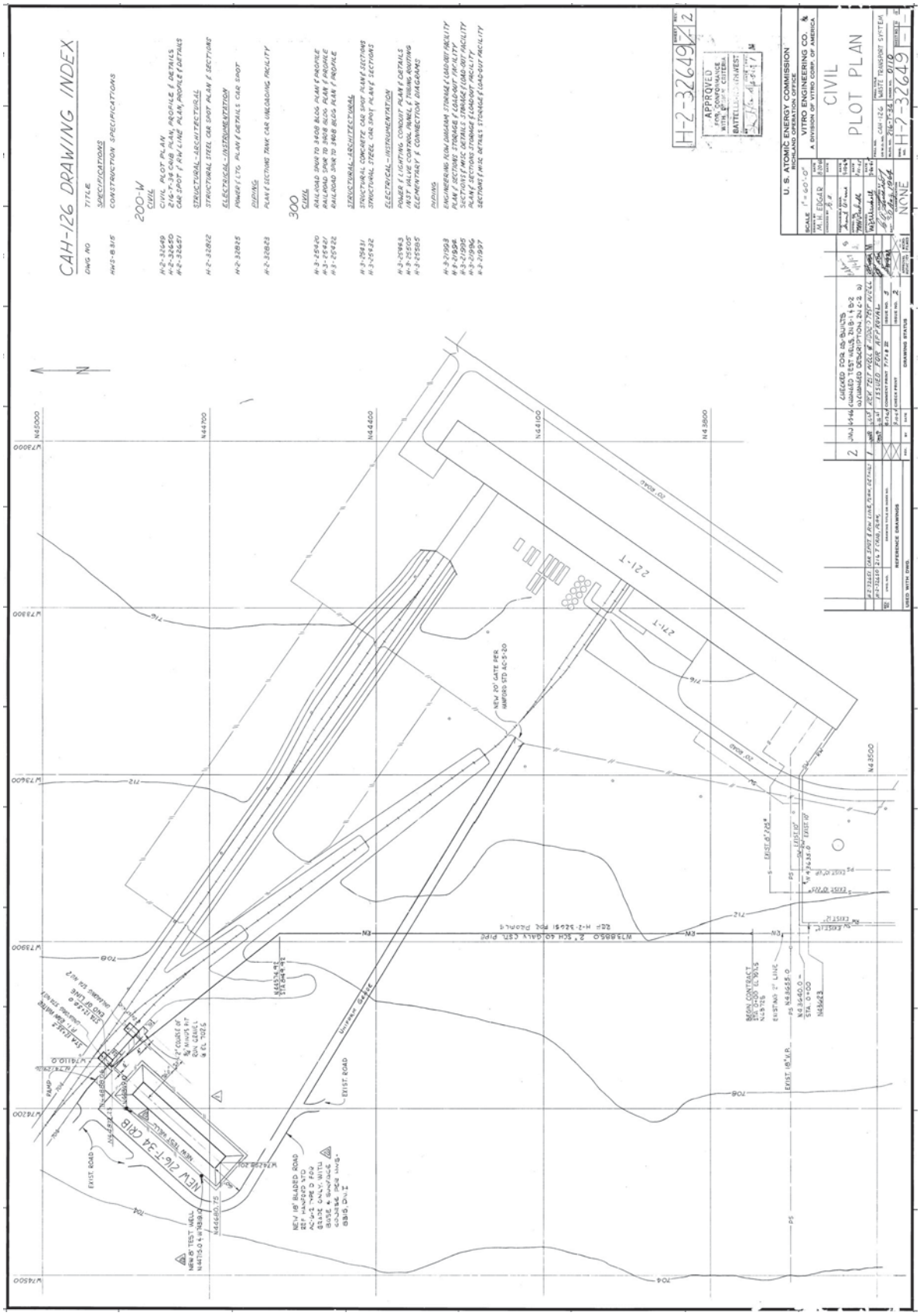
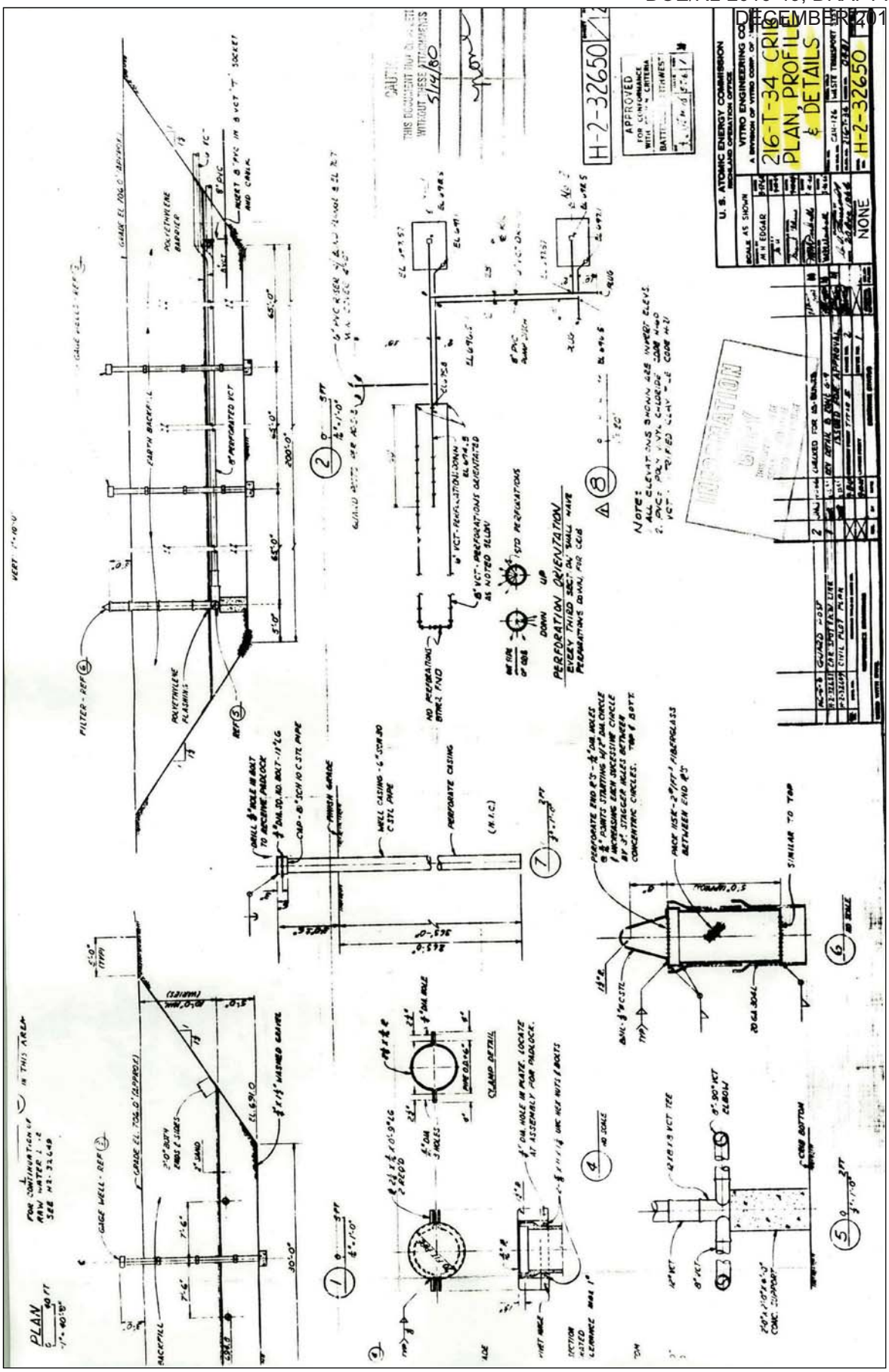


Figure 3. H-2-32650



Site Description

Site ID: 216-T-35
Site Type: Crib
Facility/Geographic Area: 200 Inner Area West
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-LW-1
Service Dates: March 1967 to January 1968
Volume/Mass Discharged: 5.7E6 L (1.5 E6 gal)

Waste Site Location and Physical Description: The crib is located west of the 221-T Building and west of the 216-T-34 Crib (see Figure 1. ArcMap Image). The crib bottom dimensions are 137 m (450 ft) long, 3.1 m (10 ft) wide and 4.6 m (15 ft) deep (see Figure 2 & Figure 3). The crib was constructed with one perforated drain line, and one perforated crib waste distribution line, in parallel. Both liners were placed horizontally below grade and covered by gravel. The crib has two gage well risers and one vent riser visible from the surface. The 216-T-35 Crib replaced the 216-T-34 Crib. The drain line from the unloading station located in the northwest corner of the 216-T-34 Crib was extended to the 216-T-35 Crib distributor pipe.

Waste Site Coordinates:

E-567178.46538 N-137114.03835

Site Dimensions:

Site Length: 137 m (450 ft) (bottom dimension)
Site Width: 3.1 m (10 ft) (bottom dimension)
Site Area: 411 m^2 (4,500 ft^2)
Site Depth: 4.6 meters (15 ft) minimum
Cover Thickness: Unspecified

Release Summary: 216-T-35 Crib received 5.7E6 L (1.5 E6 gal) of liquid disposal waste from the 340 Building in the 300 Area. The waste contained nitrate. The waste was transported to the 200 West Area in railroad tank cars and 18.9 E+3 L (5.0 E+3 gal) trucks.

$PV_{released}$ = 5.7E6 L/ (411 m^2*79 m*0.3*1000 L/m^3) = 0.59

Therefore, the crib is assumed to exhibit deep vadose effects.

Related Site Structure(s): The crib is associated with the 340 waste facility located in the 300 Area and the railcar unloaded station (200-W-21) and the 216-T-34 Crib. The pipeline associated with the crib is 200-W-197-PL. The pipeline from the truck unloading station is 200-W-198-PL.

Site Posting: The crib is surface stabilized and posted with “Underground Radioactive Material” signs.

Site Characterization Summary: The 216-T-35 Crib was interim stabilized on July 26, 1990. Visual and surface radiological surveys are performed at the site annually. Groundwater wells 299-W11-17, 299-W11-18, 299-W11-19, 299-W11-20 and 299-W11-21 monitor the site.

Potential Contaminants:

Radioactive: Unspecified

Non-Radioactive: Nitrate

References:

WIDS General Summary Report for site 216-T-35ArcMap
QMap
H-2-44511 Sheet 149H-2-33447

Figure 1. ArcMap Image

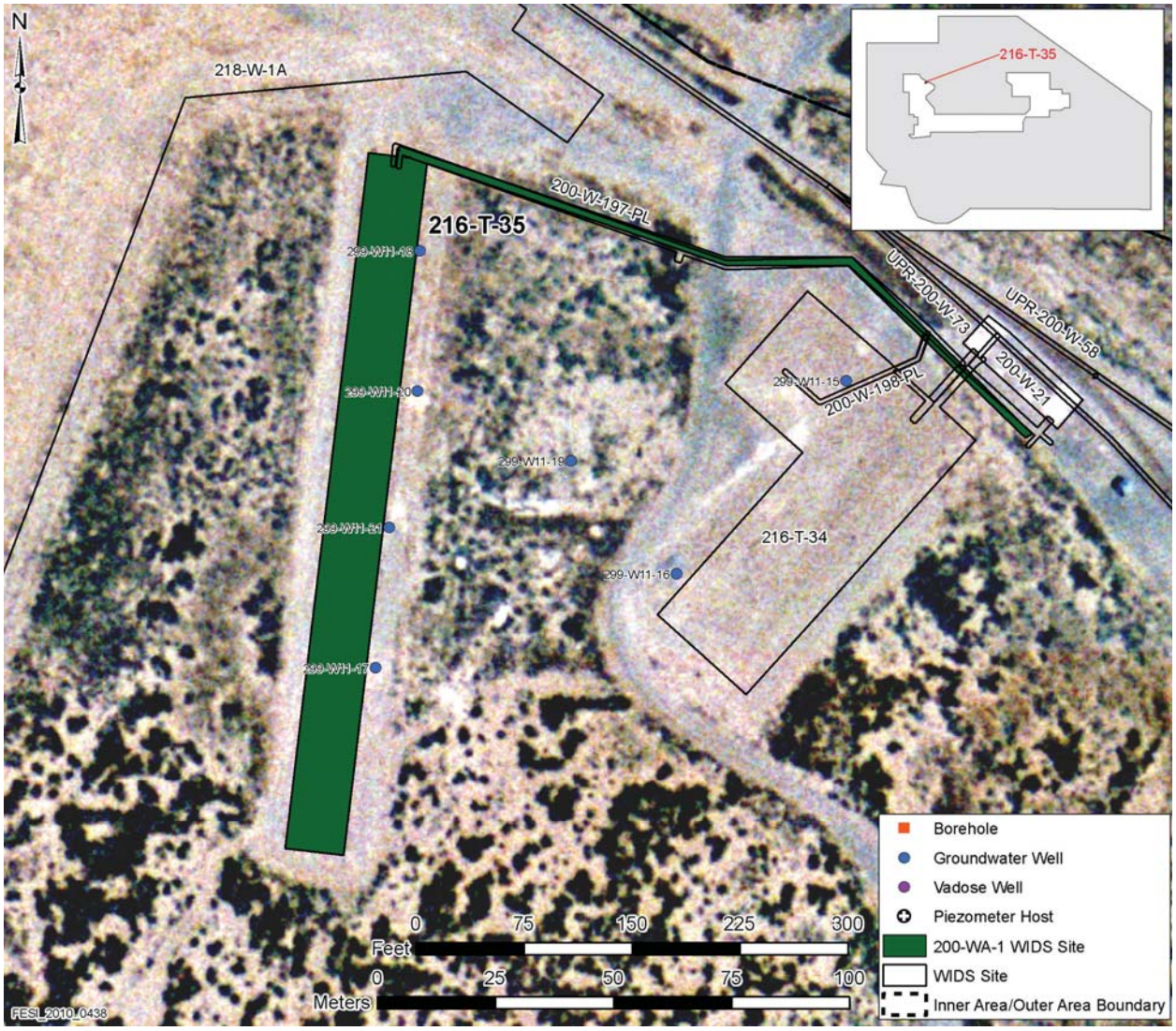


Figure 2. H-2-44511 Sheet 149

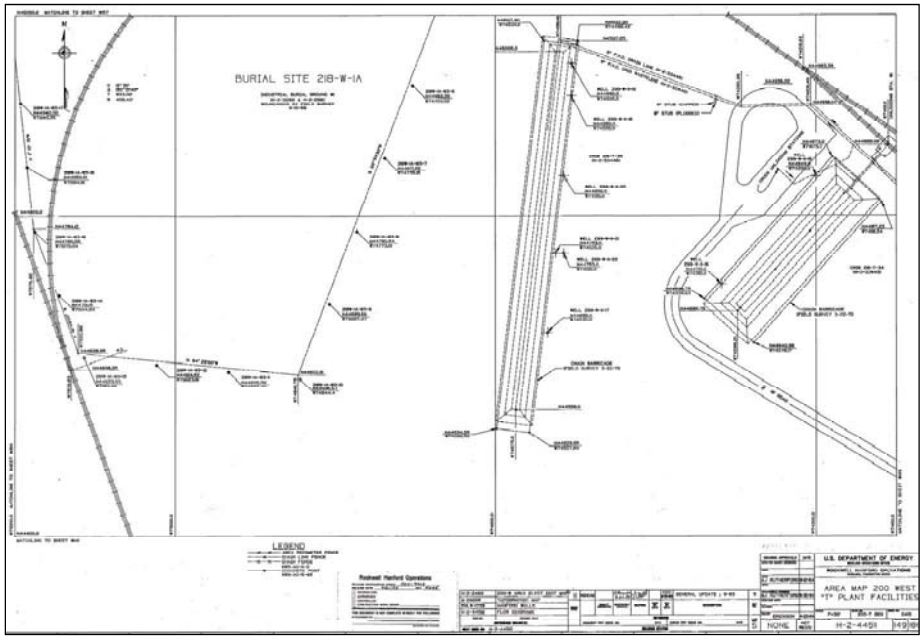
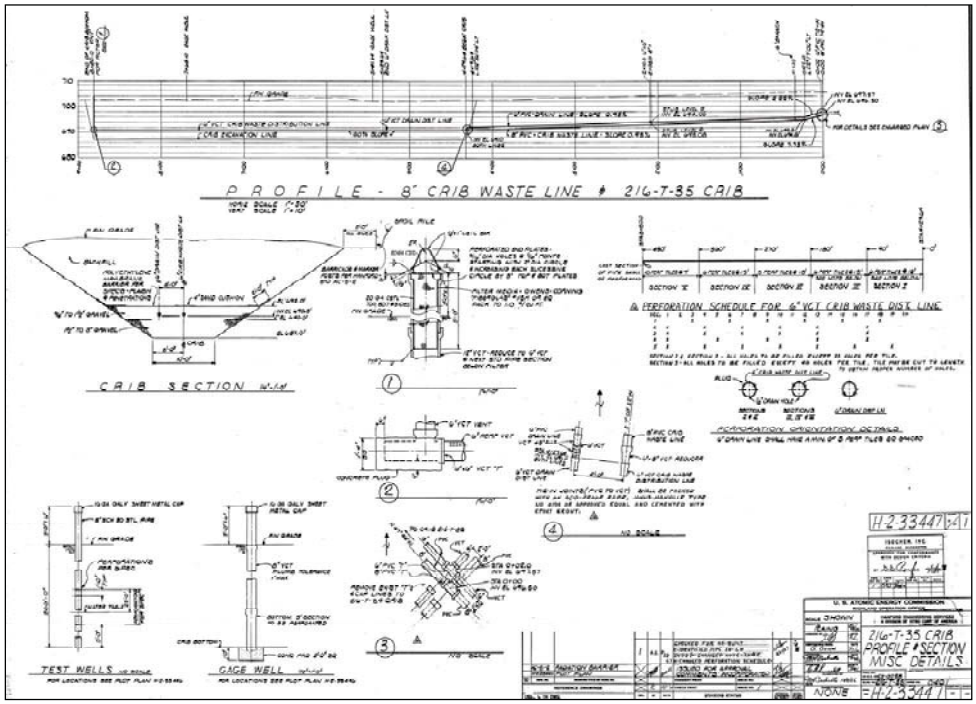


Figure 3. H-2-33447



Site Description

Site ID: 216-T-36
Site Type: Crib
Facility/Geographic Area: 200 Inner Area West
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-SC-1
Service Dates: May 1967 to unspecified end date
Volume/Mass Discharged: 5.2E5 L (1.4E5 gal)

Waste Site Location and Physical Description: The crib is located southwest of the 241-T Tank Farm and south of the 216-T-7 Tile Field (see Figure 1. ArcMap Image). The crib dimensions are 49 m (160 ft) long, 3.1 m (10 ft) wide, and 4.6 m (15 ft) deep(see Figure 2. H-2-33472 Sheet 1 Rev. 1). The crib consists of a single vitreous clay distribution pipe resting in a gravel layer that is in a rectangular trench. Backfill covers the pipe and gravel. The crib also has a gage well riser and a filter riser. The crib was built to replace the 216-T-28 Crib.

Waste Site Coordinates:

Lon-566701.99077 Lat-136595.95881

Site Dimensions:

Site Length: 49 m (160 ft) (bottom dimension)
Site Width: 3.1 m (10 ft) (bottom dimension)
Site Area: 152 m^2 (1,600 ft^2)
Site Depth: 4.6 meters (15 ft) minimum
Cover Thickness: 3.0 m (9.7 ft)

Release Summary: 216-T-36 Crib received 5.2E5 L (1.4 E5 gal) of liquid disposal consisting of steam condensate, equipment decontamination waste, and miscellaneous waste from the 221-T and 221-U Buildings and decontamination waste from the 2706-T Building. The waste contained sodium hydroxide. The site shutdown date as been documented between 1970 and 1973.

$PV_{released}$ = 5.2E+6 L/ (152 m^2*79 m*0.3*1000 L/m^3) = 0.14

Therefore, the crib is assumed to exhibit no deep vadose effects.

Related Site Structure(s): The crib is associated with the 221-T, 221-U, 2706-T Buildings and the 241-T-151 Diversion Box. The associated pipelines are 200-W-79-PL and 200-W-130-PL.

Site Posting: The crib has been interim surface stabilized and posted with Underground Radioactive Material (URM) signs.

Site Characterization Summary: The 216-T-36 Crib vent risers were sealed as a preventative measure for potential passive radioactive emissions. In May 2000 a long, narrow area of posted contamination was identified adjacent to the east end of the crib. In November 2000, a bio-barrier and a layer of clean gravel were placed over the contamination area on the pipeline east of the crib and the area downposted to URMA.

Wells 299-W10-2 and 299-W10-4 monitor this unit. Well data indicate breakthrough to groundwater has not occurred at the site. Visual and radiological surveys are performed at this site.

Potential Contaminants:

Radioactive: Unspecified

Non-Radioactive: Sodium Hydroxide

References:

WIDS General Summary Report for site 216-T-36.
ArcMap.
QMap.
H-2-33472 Sheet 1 Rev. 1.

Figure 1. ArcMap Image

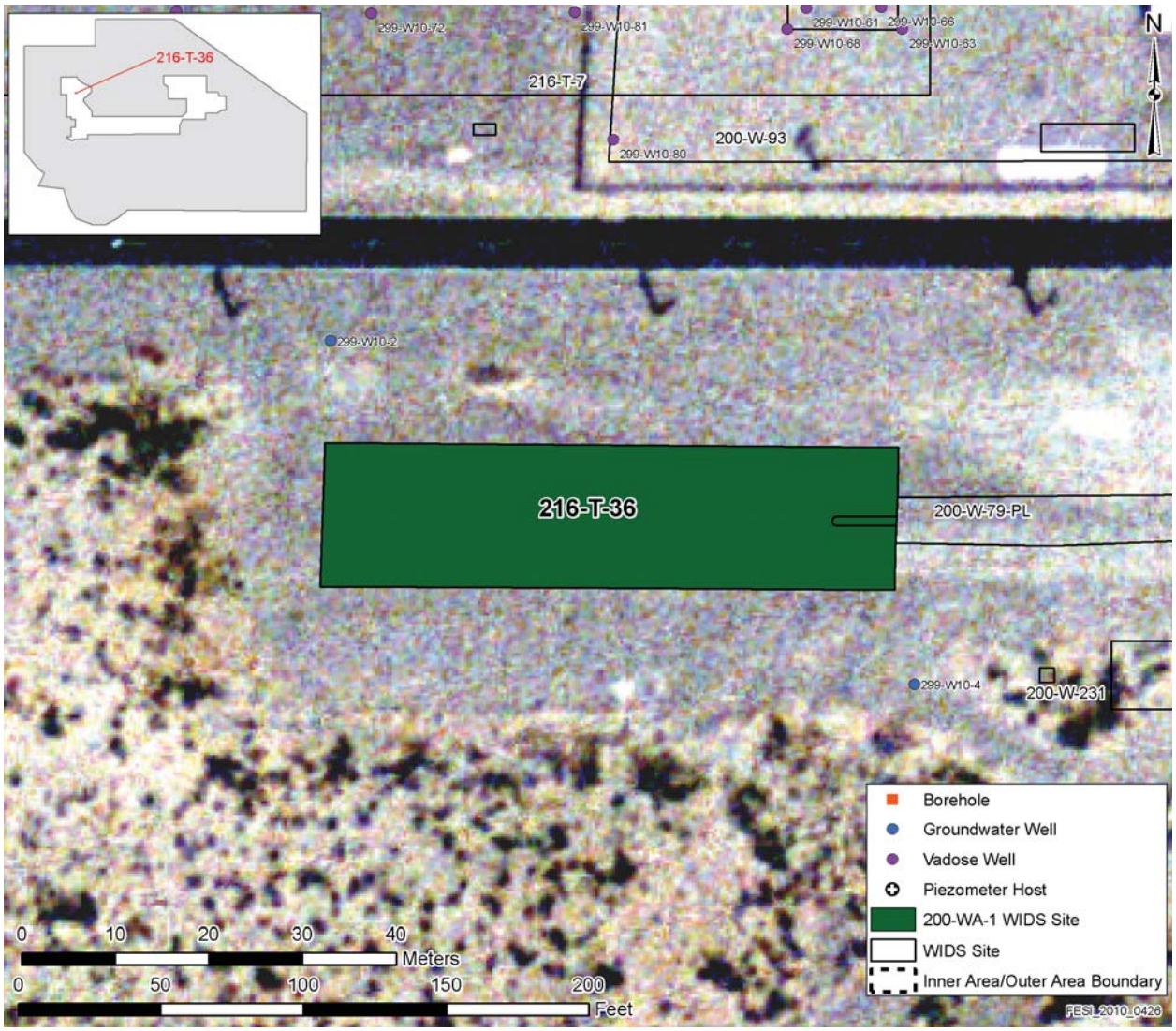
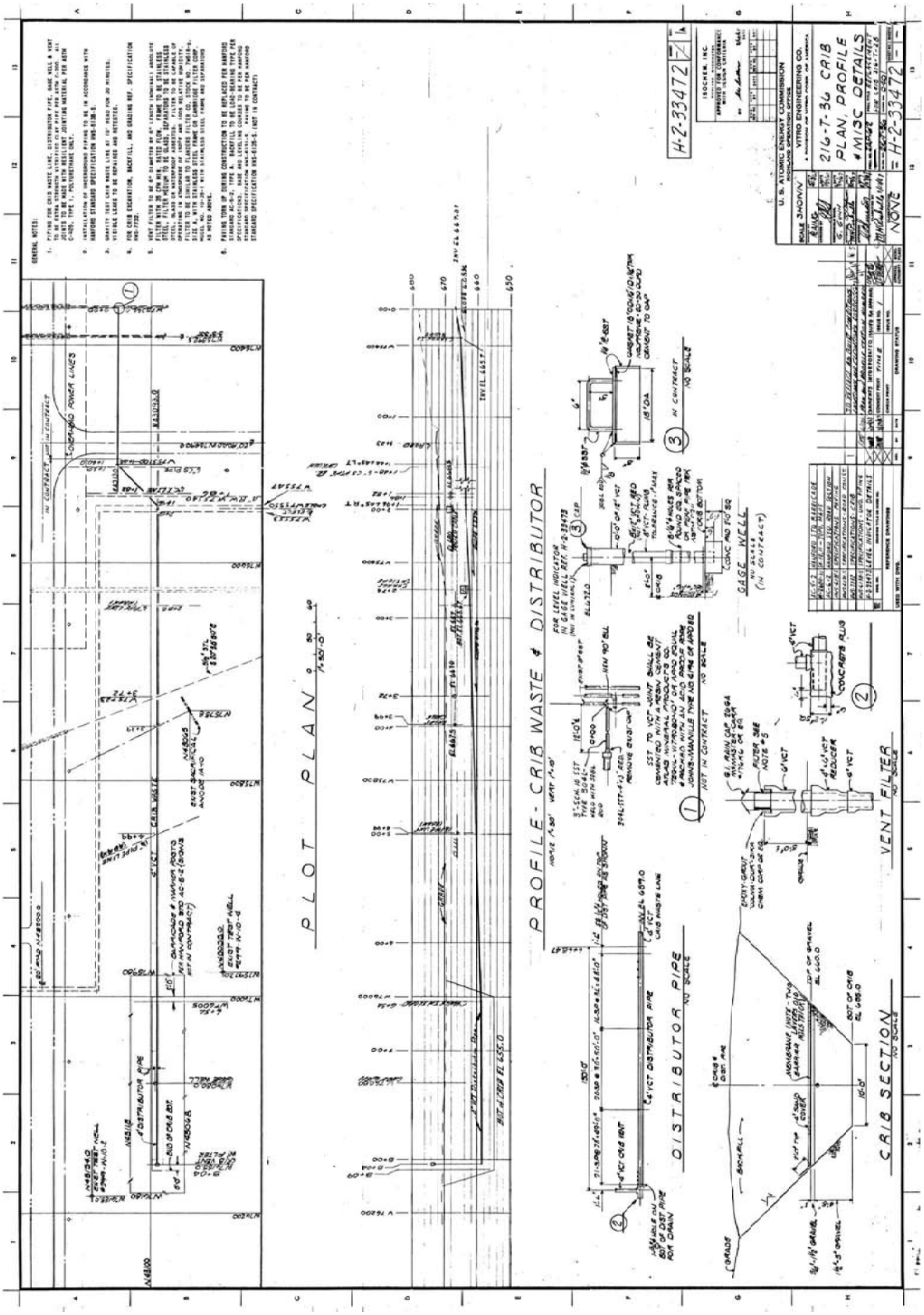


Figure 2. H-2-33472 Sheet 1 Rev. 1



Site Description

Site ID: 216-T-4-1D
Site Type: Ditch
Facility/Geographic Area: 200 Inner Area West
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-2
Service Dates: November 1944 to May 1972
Volume/Mass Discharged: Unspecified

Waste Site Location and Physical Description: The ditch is located north of 23rd Street, west of the 221-T Building and northwest of the 241-T Tank Farm. The original ditch is not currently visible. The original ditch bottom dimensions are 259 m (850 ft) long by 2.4 m (8 ft) wide. The ditch was replaced by the 216-T-4-2 Ditch in 1972. The first 15 m (50 ft) of the original 216-T-4-1D Ditch was reused in the replacement ditch construction.

Waste Site Coordinates:

Lon-566773.95573 Lat-136976.02378

Site Dimensions:

Site Length: 259 m (850 ft) (bottom dimension)
Site Width: 2.4 m (8 ft) (bottom dimension)
Site Area: 622 m^2 (6,800 ft^2)
Site Depth: unspecified
Cover Thickness: unspecified

Release Summary: 216-T-4-1D Ditch received process cooling water from the 221-T and 224-T Buildings via the 207-T Retention Basin and steam condensate from 221-T Building. The ditch also received condenser cooling water and steam condensate from the 242-T Evaporator. The ditch also received decontamination waste from 2706-T. The total plutonium received was 1.41 grams (3.1E-3 lbs). The release volume is not specified.

Related Site Structure(s): The ditch is associated with the 216-T-4A Pond and the 216-T-4-2 Ditch. Pipeline 200-W-163-PL connected to the ditch and the pipeline that fed the ditch from 207-T Retention Basin was sitecode 200-W-164-PL.

Site Posting: The area is posted as an URMA.

Site Characterization Summary: By 1971 the 216-T-4-1D Ditch had become contaminated to a maximum of 20,000 counts/minute at the bottom, was overgrown with aquatic plants, shrubs and small willow trees and was an attractive nuisance for area waterfowl. The berm for the new 216-T-4-2 Ditch was used to cover 216-T-4-1D in 1972. The original ditch is not visible and it was surface stabilized by backfill and clean dirt cover, along with the replacement ditch in 1995.

The radionuclide inventory is included in the 216-T-4A Pond inventory.

Potential Contaminants:

Radioactive: Plutonium

Non-Radioactive: Unspecified

References:

WIDS General Summary Report for site 216-T-4-1D.
ArcMap.
QMap.
H-2-34998 Sheet 1 Rev. 1.

Figure 1. ArcMap Image

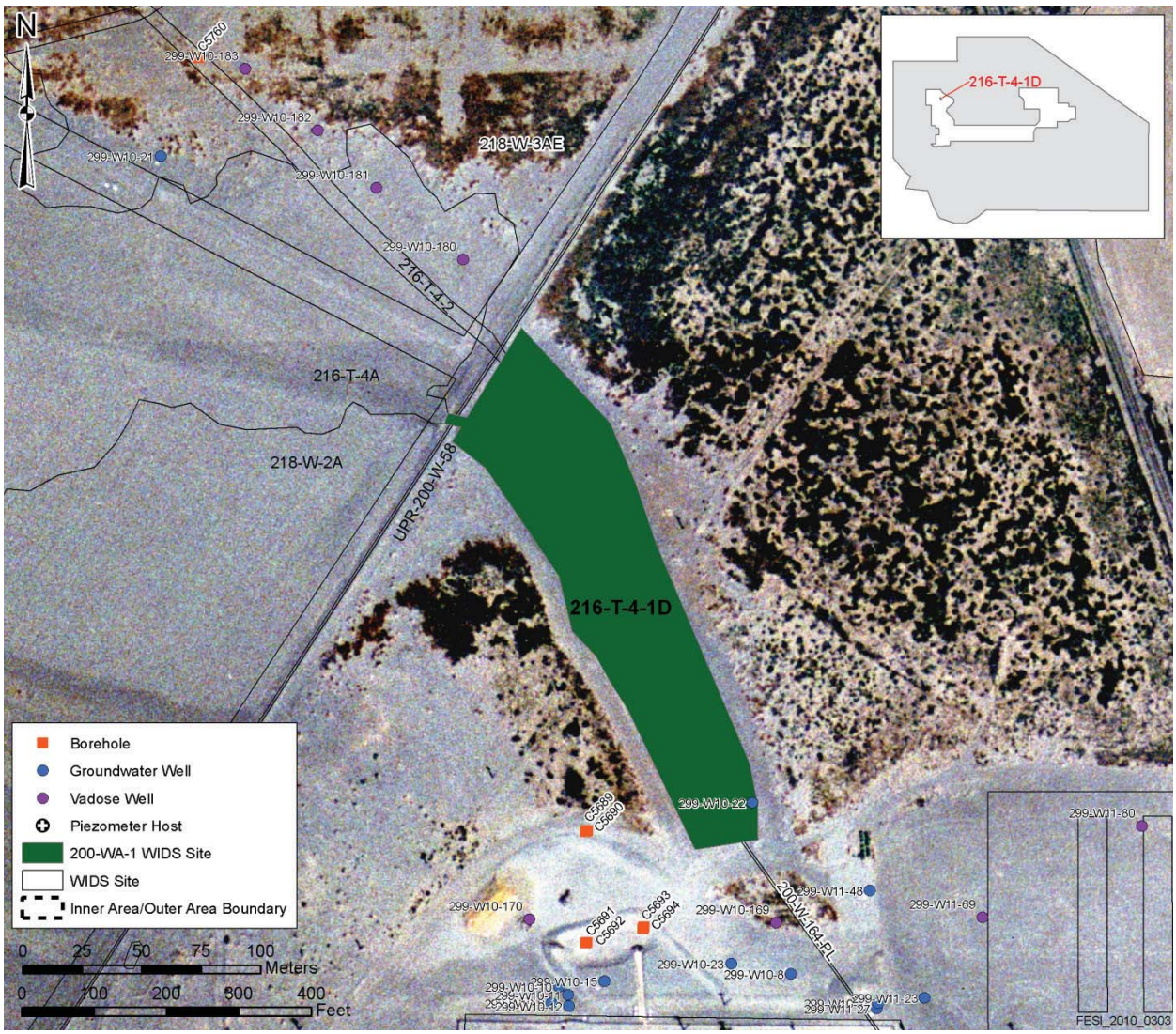
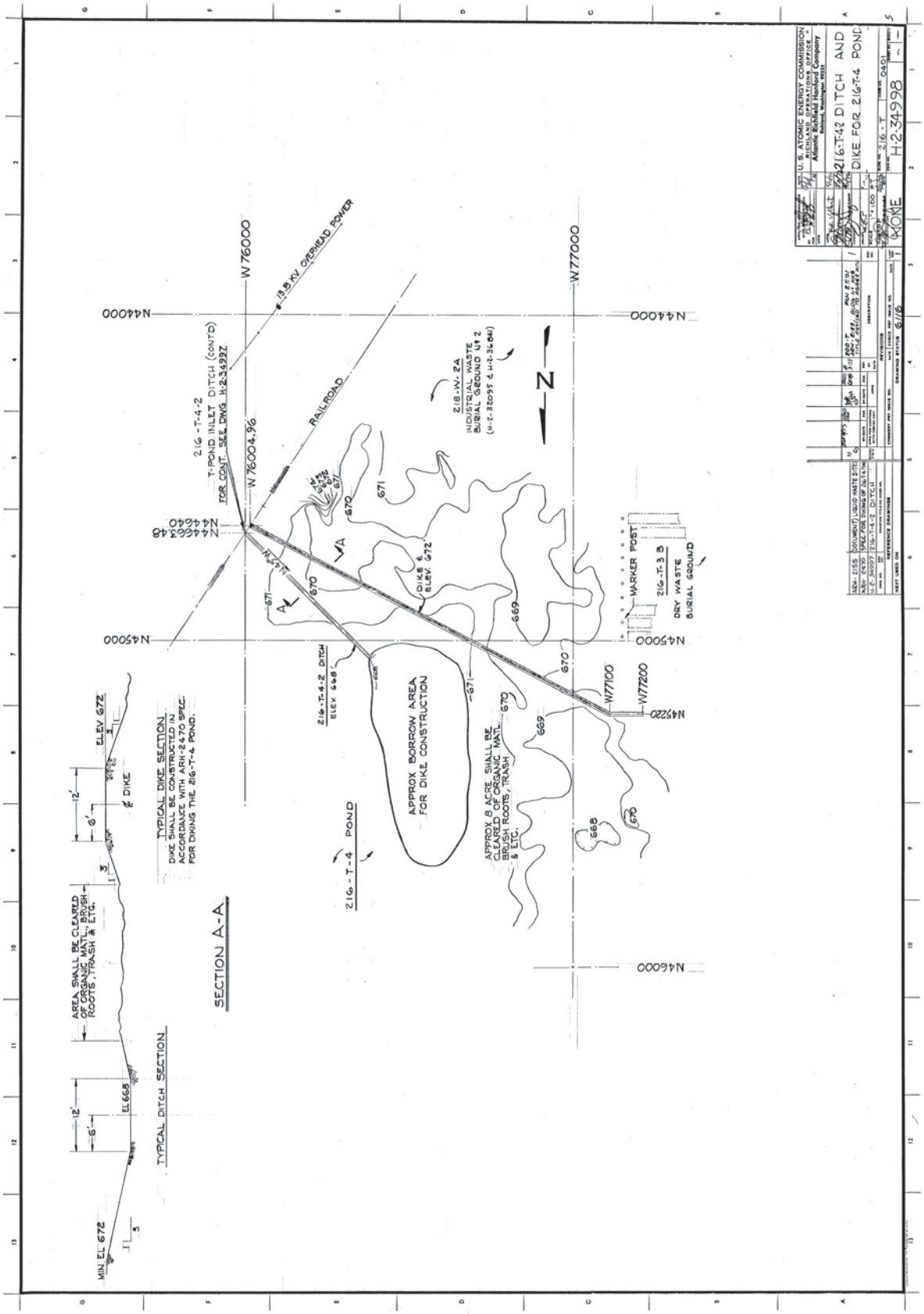


Figure 2. H-2-34998 Sheet 1 Rev. 1



Site Description

Site ID: 216-T-8
Site Type: Crib
Facility/Geographic Area: 200 Inner Area West
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-LW-2
Service Dates: May 1950 to September 1951
Volume/Mass Discharged: 5.0E+5 L (1.3 E+5 gal)

Waste Site Location and Physical Description: The crib is located just on the east side of the 224-T Building [1]. The crib is two wood crib boxes, each set into a pit with sloped sides. Each crib pit has 4.3 m (14 ft) by 4.3 m (14 ft) bottom dimension with a 1:1 side slope. The pits are 23 m (75 ft) apart [2]. The wood boxes have risers connected in series by a pipe, one box overflowing into the other. The pits are backfilled.

Waste Site Coordinates:

Lon-567650.73167 Lat-136726.89976

Site Dimensions:

Site Length: 4.3 m (14 ft) (bottom dimension)
Site Width: 4.3 m (14 ft) (bottom dimension)
Site Area: 18.5 square m (196 square ft)
Site Depth: 5.2 meters (17 ft) overburden depth
Cover Thickness:

Release Summary: 216-T-8 Crib received 5.0E+5 L (1.3 E+5 gal) of liquid disposal for 222-T Decontamination Sink Waste and Sample Slurper waste. A pipeline from 292-T tied into the 216-T-8 waste line. The process effluent waste was neutral to basic and contained sulfuric acid, nitric acid and sodium dichromate.

$PV_{released}$ = 5.0E+6 L/ (18.5 square m*79 m*0.3*1000 Liters/m^3) = 1.14

Therefore, the crib is assumed to have impacted groundwater.

Related Site Structure(s): The crib is associated with the 222-T and 292-T Facilities and pipeline 200-W-142-PL.

Site Posting: The crib was interim stabilized in 1991 and posted with Underground Radioactive Material (URM) signs.

Site Characterization Summary: The pipeline to the crib was blanked inside 222-T when the operations were shut down. Visual and radiological surveys are performed at this site. The crib is monitored by a groundwater well.

Potential Contaminants:

Radioactive: Unspecified

Non-Radioactive: Sulfuric acid Nitric acid Sodium dichromate

References:

All information from WIDS Summary Report unless otherwise noted.
Drawing H-2-353 Sheet 1 Rev. 3
Drawing H-2-44511 Sheet 131 Rev. 2

Figure 1. ArcMap Image

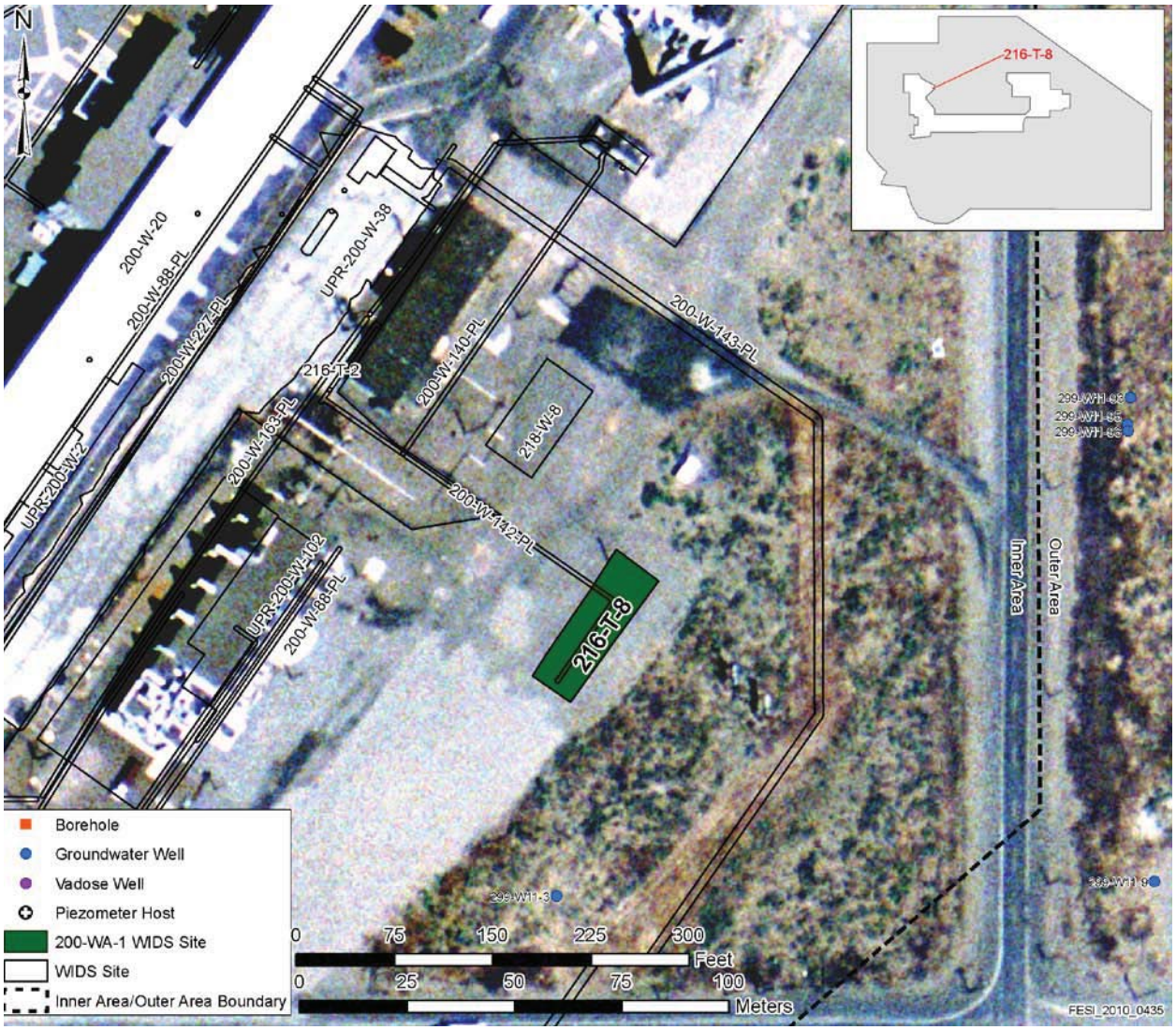
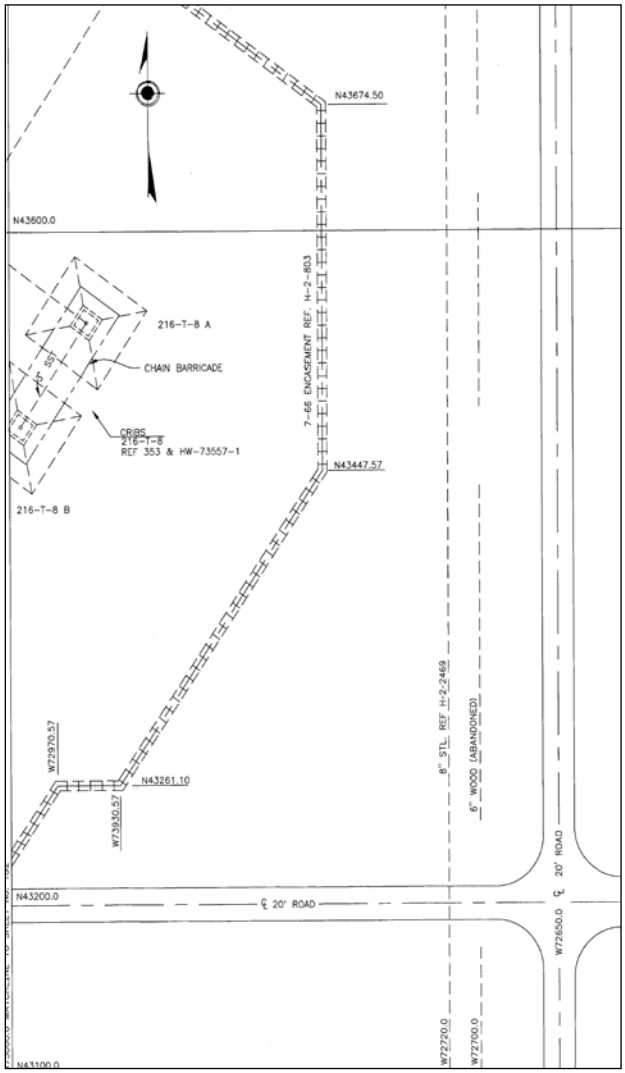


Figure 2. Crib Location

Figure 3. Crib Plan View



Site Description

Site ID: 216-T-9
Site Type: Trench
Facility/Geographic Area: 200 Inner Area West
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-2
Service Dates: February 1951 to March 1954
Volume/Mass Discharged: Unspecified

Waste Site Location and Physical Description: The trench is located west of the 221-T Building and southwest of the 216-T-33 Crib (see Figure 1. ArcMap Image & Figure 2. H-2-44511 Sheet 140 Rev. 10). The trench was backfilled in 1954 and is not marked or posted.

Waste Site Coordinates:

Lon-567348.77648 Lat-136844.36533

Site Dimensions:

Site Length: 15.2 m (50 ft) (bottom dimension)
Site Width: 3.1 m (10 ft) (bottom dimension)
Site Depth: 1.8 meters (6 ft)
Cover Thickness: The site was exhumed and no backfill activities after exhumation are specified
Site Area: 47 m^2 (500 ft^2)

Release Summary: 216-T-9 Trench received liquid disposal of vehicle decontamination waste from heavy equipment and other vehicles. No radionuclide or chemical contamination has been documented; however, all contamination was exhumed. The possibility of hazardous chemical contamination exists.

Related Site Structure(s): The crib is associated with the 222-T and 292-T Facilities, trenches 216-T-10 and 216-T-11, and pipeline 200-W-142-PL.

Site Posting: The crib was interim stabilized in 1991 and posted with Underground Radioactive Material (URM) signs.

Site Characterization Summary: Decontamination operations were transferred to the 269-W garage facility that discharged to the 216-T-13 Trench. The 216-T-9 Trench was exhumed in May 1972. All contamination (maximum 3,000 counts per minute) was taken to the 200 West Area Dry Waste Burial Ground. The trench was then released from radiation zone status.

A site walkdown was performed in February 1998.

Potential Contaminants:

Radioactive: Unspecified

Non-Radioactive: Unspecified

References:

WIDS General Summary Report for site 216-T-9.
ArcMap.
QMap.
H-2-44511 Sheet 140 Rev. 10.

Figure 1. ArcMap Image

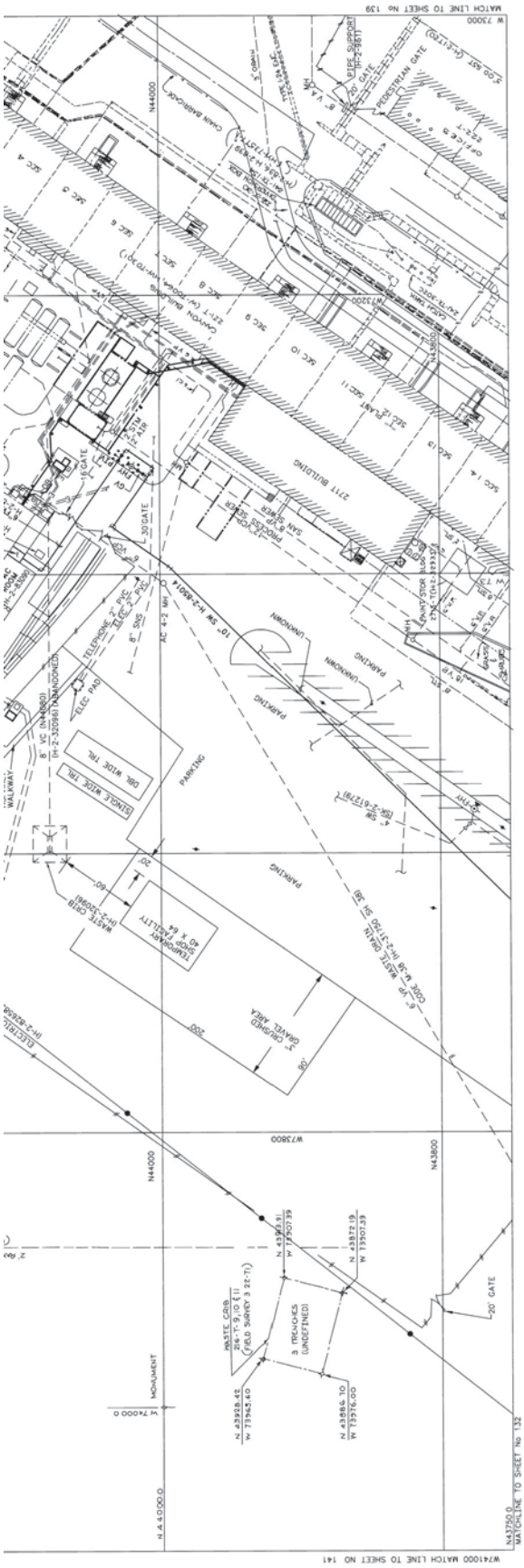


Figure 2. H-2-44511 Sheet 140 Rev. 10

Site Description

Site ID: 216-U-1&2
Site Type: Crib
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1
Service Dates: 1951 to 1967
Volume/Mass Discharged 1: 1.59E+07 L (4.2E+06 gal)

Waste Site Location and Physical Description: The cribs are located north of 16th Street, west of 221-U and east of the 207-U Retention Basin (See Figure 2). The cribs are two wooden structures (See Figure 3) that received overflow from the 241-U-361 Settling Tank via pipeline 200-W-194-PL. The crib area has been surface stabilized with clean dirt.

Waste Site Coordinates:

Lon-567254.32799 Lat-135001.76302

Site Dimensions:

Site Length: 27.13 m (89 ft)
Site Width: 8.53 m (28 ft)
Site Area: 231 m^2 (2,492 ft^2)
Site Depth: 6.1 meters (20 ft)
Cover Thickness: 45 to 61 cm (18 to 24 in)

Release Summary: The cribs received approximately 1.59E+07 L (4.2E+06 gal) [1] of process liquid waste overflow from the 216-U-361 Settling Tank. From March 1952 to June 1957, the tank received cell drainage from Tank 5-6 in the 221-U Building and waste from the 224-U Building until the Uranium Recovery process operations shut down in 1957. From June 1957 to July 1957, the site received waste from the 224-U Building and contaminated solvent from the 276-U Settling Tank Solvent Storage area. From July 1957 through May 1967, the 216-U-1&2 Cribs received waste from the 224-U Building and equipment decontamination waste and reclamation waste from the Chemical Processing Division Services Operations in the 221-U Building canyon. The waste is low in salt and is neutral to basic. A detailed summary of the waste discharge to the cribs are shown in Figure 4.

Related Site Structure(s): The cribs are associated with the 241-U-361 Settling Tank and pipeline 200-W-194-PL.

Site Posting: The Site is delineated with posts and chain with Cave-In Potential signs and is located in a common Underground Radioactive Material area.

Site Characterization Summary: In 1995, three characterization boreholes (299-W19-95, 299-W19-96 and 299-W19-97) were drilled near the 216-U-1&2 Cribs. Borehole sediment sample and surface soil samples were collected and analyzed. No lateral movement of contaminants was identified in the vadose zone. The highest zone of contamination for the borehole drilled through the 216-U-1 Crib was found at a depth of 6 to 12 m (20 to 40 ft). Maximum contamination levels in this zone included 2,400,000 pCi/g of strontinum-90, 1,430,000 pCi/g of cesium-137 and 438 pCi/g of plutonium-239/240. An in-line camera survey was done of the stainless steel pipeline connecting 224-U to the 216-U-1&2 Cribs and the pipeline was found to be intact. Due to the cave-in potential, only the perimeter of the cribs is

radiologically surveyed annually. On September 29, 2004, contaminated tumbleweeds were found in the 216-U-1&2 Underground Radioactive Material Area, with maximum contamination level of 198,000 d/m.

Potential Contaminants:

Radioactive: Not specified

Non-Radioactive: Not specified

References:

All information from WIDS Summary Report unless otherwise noted.
Need to add reference to sources of the 200 West Effluent Volumes spreadsheet values

Figure 1. ArcMap Image

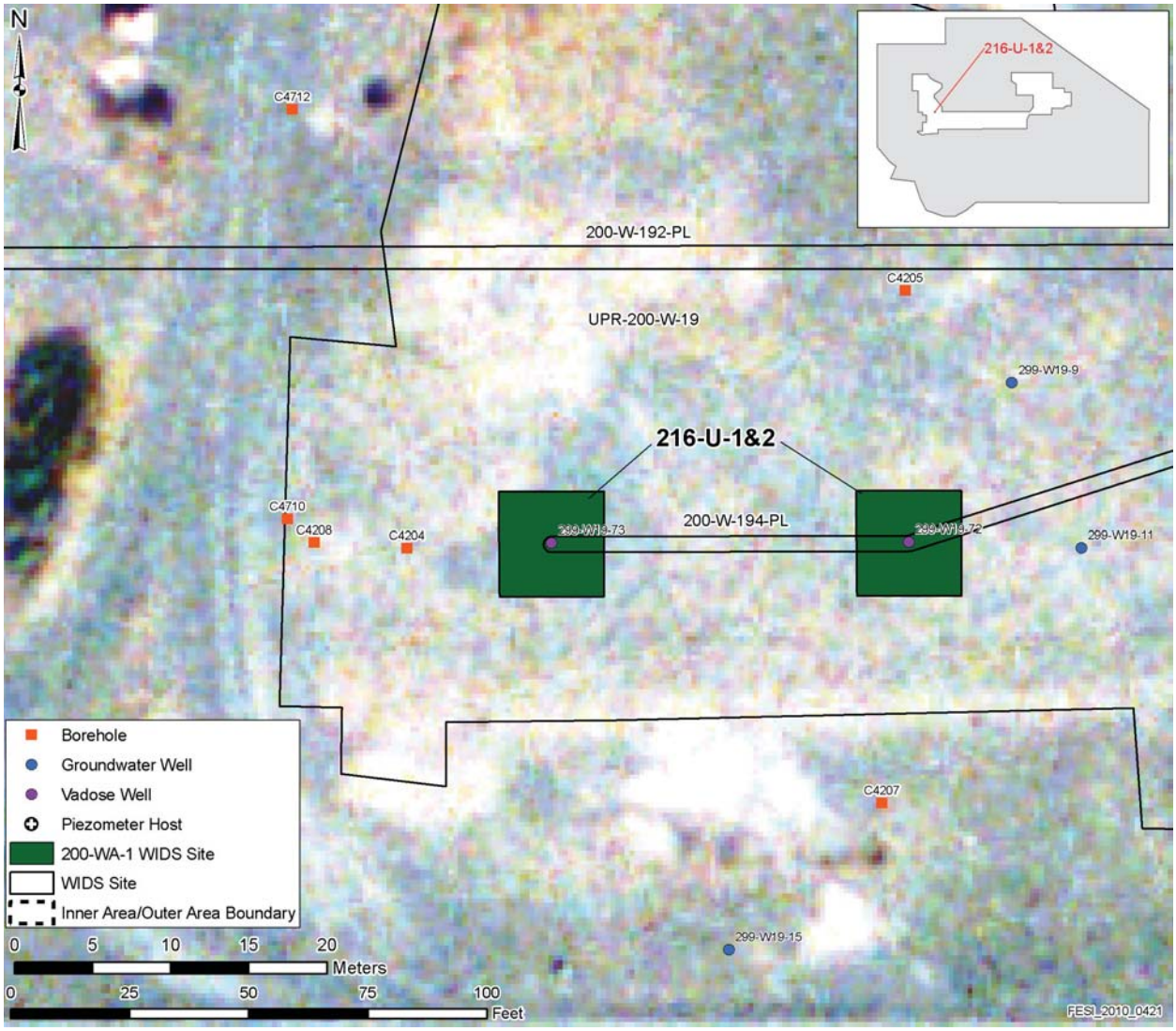


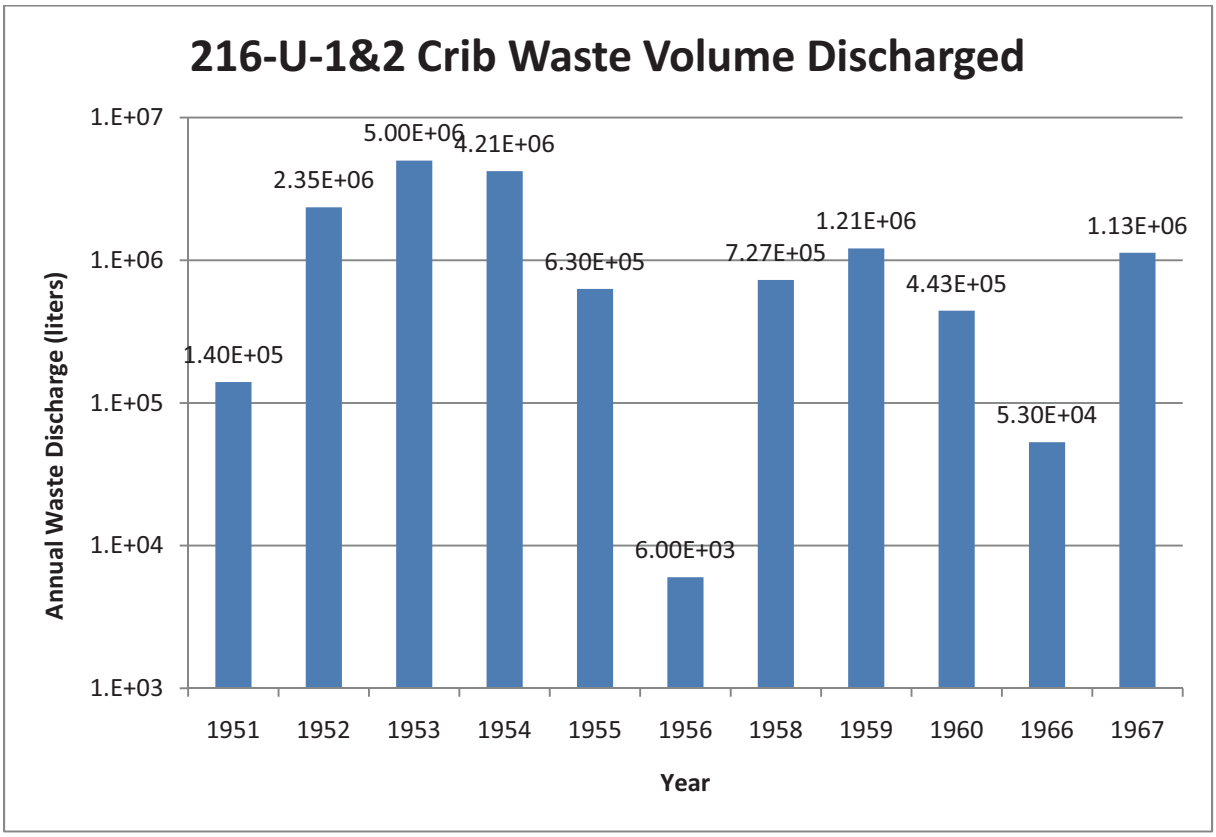
Figure 2. Insert Site Map from QMQP

Figure not available

Figure 3. Insert engineering diagram from "H-2 50061 Sheet 1 Rev.7.pdf"

Figure not available

Figure 4. 216-U-1&2 Crib Waste Volume Discharged Summary



Site Description

Site ID: 216-U-12
Site Type: Crib
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1
Service Dates: 1960 to 1988
Volume/Mass Discharged: 1.5E+08 L (3.96E+07 gal)

Waste Site Location and Physical Description: The Crib is located south of 16th Street, west of Beloit Avenue, and south of the 216-U-8 Crib (See Figure 1. ArcMap Image). The bottom of the crib was filled with approximately 264 m^3 (9,320 ft^3) of gravel. A perforated 30 cm (12 in) vitrified clay pipe runs horizontally the length of the unit below grade. In 1988, the pipeline connecting to the 216-U-12 Crib (200-W-42) was cut and capped.

Waste Site Coordinates:

E-567592.09208 N-134501.26825

Site Dimensions:

Site Length: 30.48 m (100 ft)
Site Width: 3.05 m (10.00 ft)
Site Area: 92.96 m^2 (1,000 ft^2)
Site Depth: 4.57 meters (15 ft) to bottom of structure
Overburden Depth: 2.9 m (9.5 ft)

Release Summary From April 1960 to May 1967, the site received 291-U-1 Stack drainage, 241-WR Vault waste, and 224-U process condensate via the C-5 Tank. Contaminated water from the 241-WR Vault was discharged to the crib in October 1965 that included 3.14 kg (6.9 lbs) of thorium. From May 1967 to September 1972, the site received the above wastes (excluding the 241-WR Vault waste) and occasional waste via the C-7 Tank in the 224-U building. From September 1972 to November 1981, the site was taken out of service. From November 1981 to January 1987, the site received corrosive process condensate (typical pH range is 0.5 – 1.5) from the 224-U building. The crib also received miscellaneous storm drain wastes from 224-U building. Between April 1960 and September 1972, 6.7+E05 kg (1.5E+06 lbs) of nitrate was released to the crib from the Uranium Tri-Oxide process.

The estimated volume of liquid waste discharged to the site is approximately 1.5E+08 L (3.96E+07 gal) and the calculated potential lifetime discharge would exceed one vadose zone pore volume.

$PV_{released}$ = 1.5E+08 L/ (92.96 m^2*81 m*0.3*1000 L/m^3) = 66.4

A detailed summary of the waste discharge to the crib is shown in Figure 2.

Related Site Structure(s): The 216-U-12 Crib was built to replace the 216-U-8 Crib when it showed signs of cave-in potential. The 216-U-12 Crib received drainage from the 224-U facility and 291-U stack via an underground vitrified clay pipeline, 200-W-42.

Site Posting: The Site is marked and posted with Underground Radioactive Material.

Site Characterization Summary: Radiological surveys of the surface are performed annually. Surveillance and maintenance inspections are done quarterly. A site walkdown was conducted on September 17, 1996. In June 2003, well 299-W22-75, located near the crib center line was characterized with gamma logging equipment. Cesium-137 was detected in the zone located from 5.1 to 18.3 m (17 to 61 ft) below the ground surface.

Potential Contaminants:

Radioactive: Not specified

Non-Radioactive: Not specified

References:

WIDS General Summary Report for site 216-U-12.
ArcMap.
QMap.

Figure 1. ArcMap Image

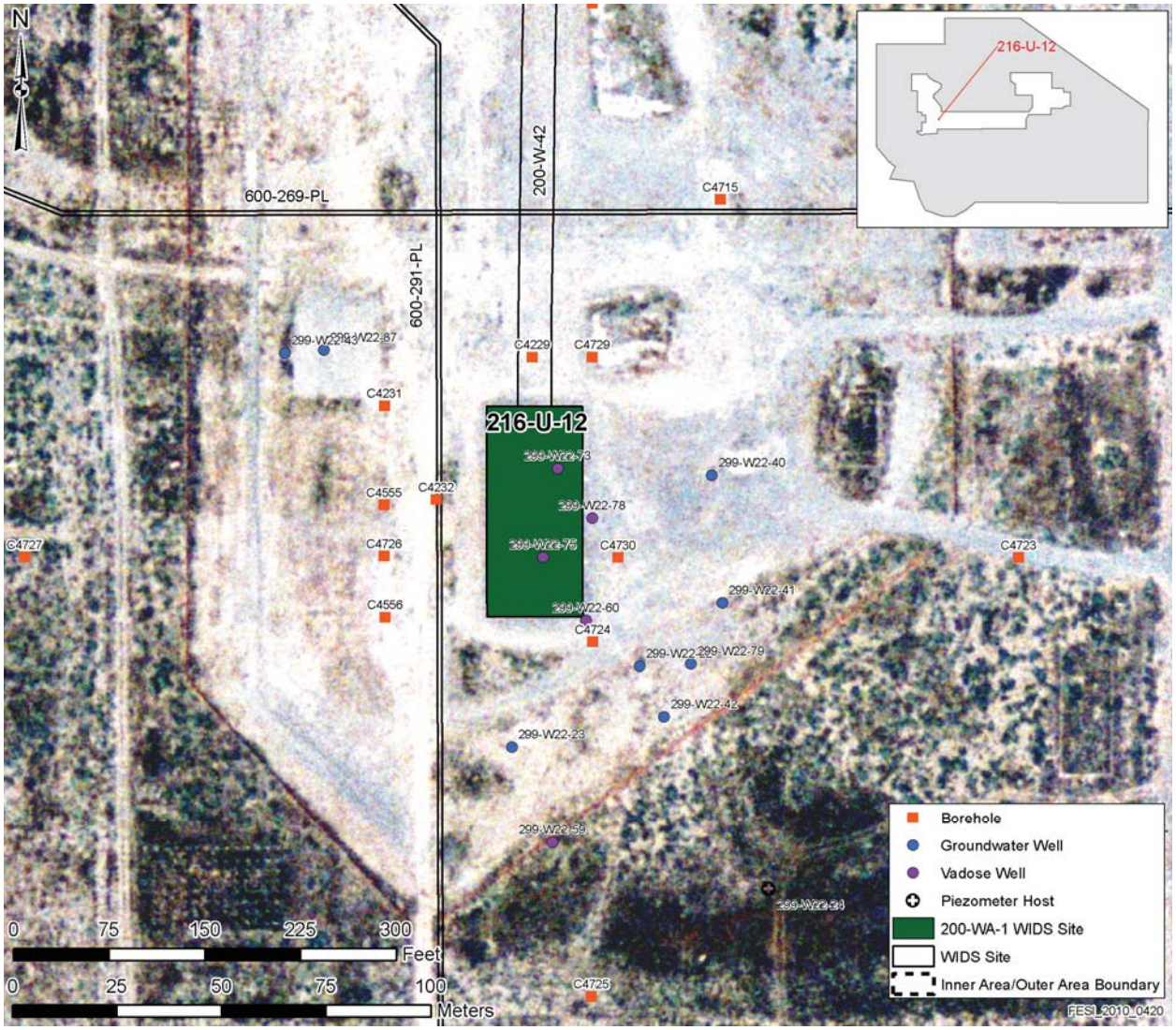
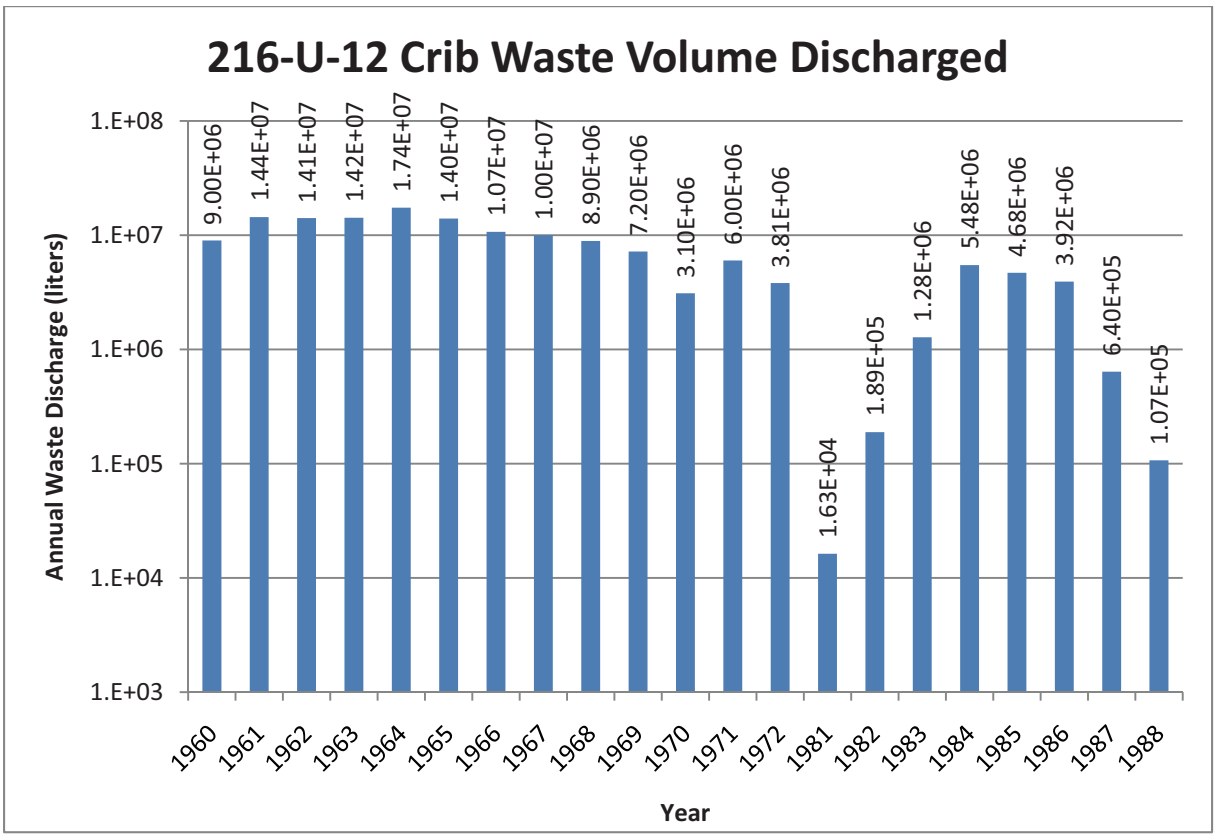


Figure 2. 216-U-12 Crib Waste Volume Discharged Summary



Site Description

Site ID: 216-U-13
Site Type: Trench
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-2
Service Dates: March 1952 to March 1956
Volume/Mass Discharged: 1.14E+04 L (3.01E+03 gal)

Waste Site Location and Physical Description: This Trench was located west of the 241-U Tank Farm and was consisted of two trenches of equal dimensions (see Figure 1. ArcMap Image). The trenches were sloped so that vehicles could be driven down to the decontamination station at the bottom. Some debris is visible in the area and the area is not level. Many deep gullies are located in the area west of the 241-U Tank Farm. When the pits were deactivated in 1956, contaminated soils in the bottom of the pits were removed. The steam cleaning equipment was removed in the 1960's and the pits were backfilled.

Waste Site Coordinates:

E-566717.62455 N-135067.46484

Site Dimensions:

Site Length: 61 m (200 ft)
Site Width: 6.1 m (20 ft)
Site Area: 372 m^2 (4,000 ft^2)

Site Depth: 5.49 meters (18 ft) to bottom of structure
Cover Thickness: N/A

Note: These are the dimensions for each trench

Release Summary: The open trenches operated as a decontamination pit and received drainage from equipment steam cleaning and decontamination activities done inside the trenches. The pits were used mainly to decontaminant trucks and cranes bearing low levels of radioactive contamination. Several large pumps used in the Uranium Recovery operation were also cleaned here, but the residue was scrapped and taken to the 200 West Burial Grounds. The site waste may include traces of detergent and nitric acid.

The estimated volume of liquid waste discharged to the site is approximately 1.14E+04 L (3.01E+03 gal) and the calculated potential lifetime discharge would not exceed one vadose zone pore volume.

$PV_{released}$ = 1.1E+04 L/ (372 m^2*81 m*0.3*1000 L/m^3) = 0.001

A detailed summary of the waste discharge to the crib is shown in Figure 2.

Related Site Structure(s): N/A

Site Posting: N/A

Site Characterization Summary: A radiation survey of the site was performed on September 24, 1981, and except for two spots, all ground surface and vegetation at the trench site was less than background. On August 10 and 11, 1982, excavations of the trenches were done to allow for

sub-surface radiation surveys. The results found the site to be free of surface and subsurface radiological contamination.

Potential Contaminants:

Radioactive: Not specified

Non-Radioactive: Detergent and nitric acid

References:

WIDS General Summary Report for site 216-U-13
ArcMap
QMap

Figure 1. ArcMap Image

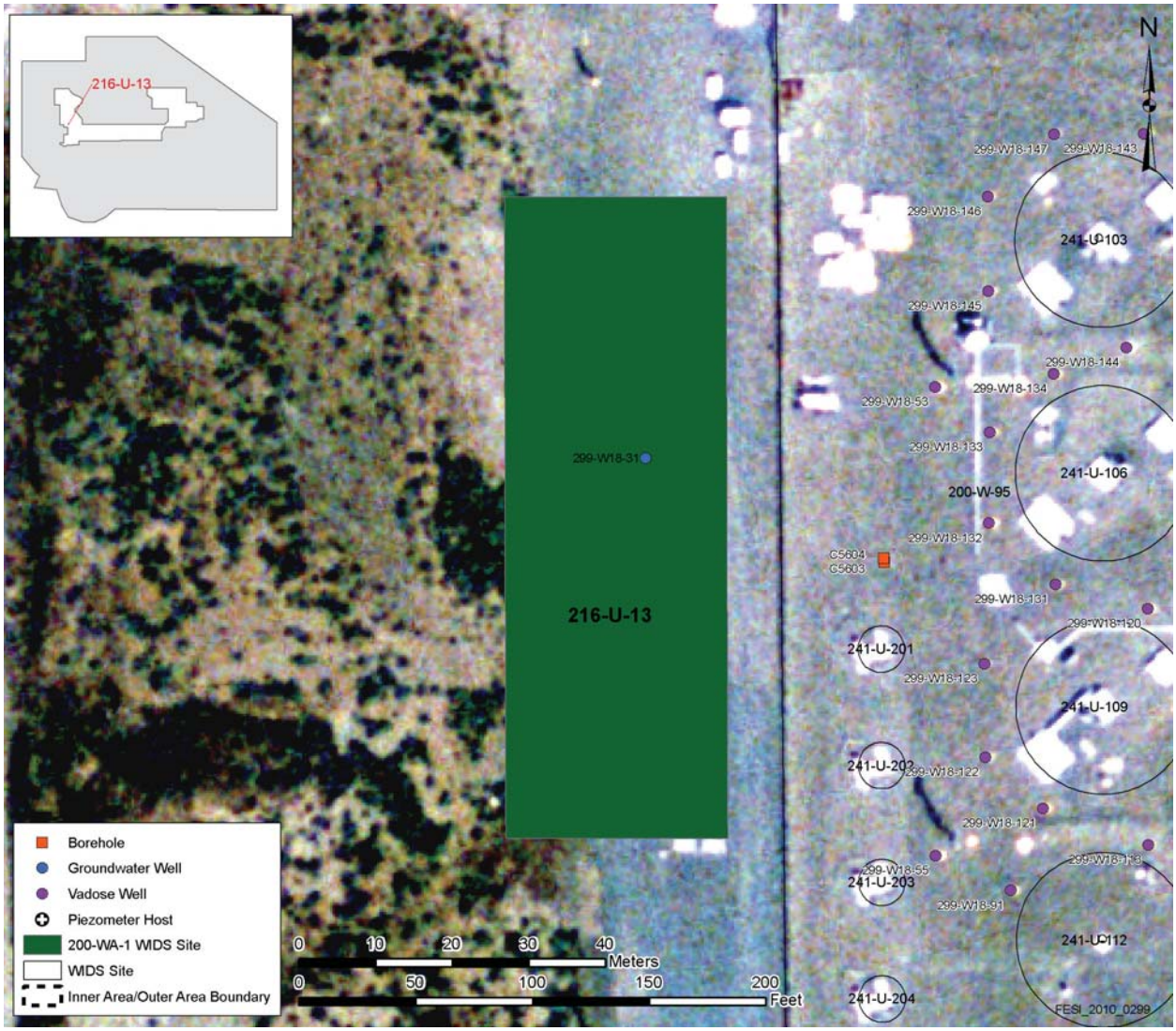
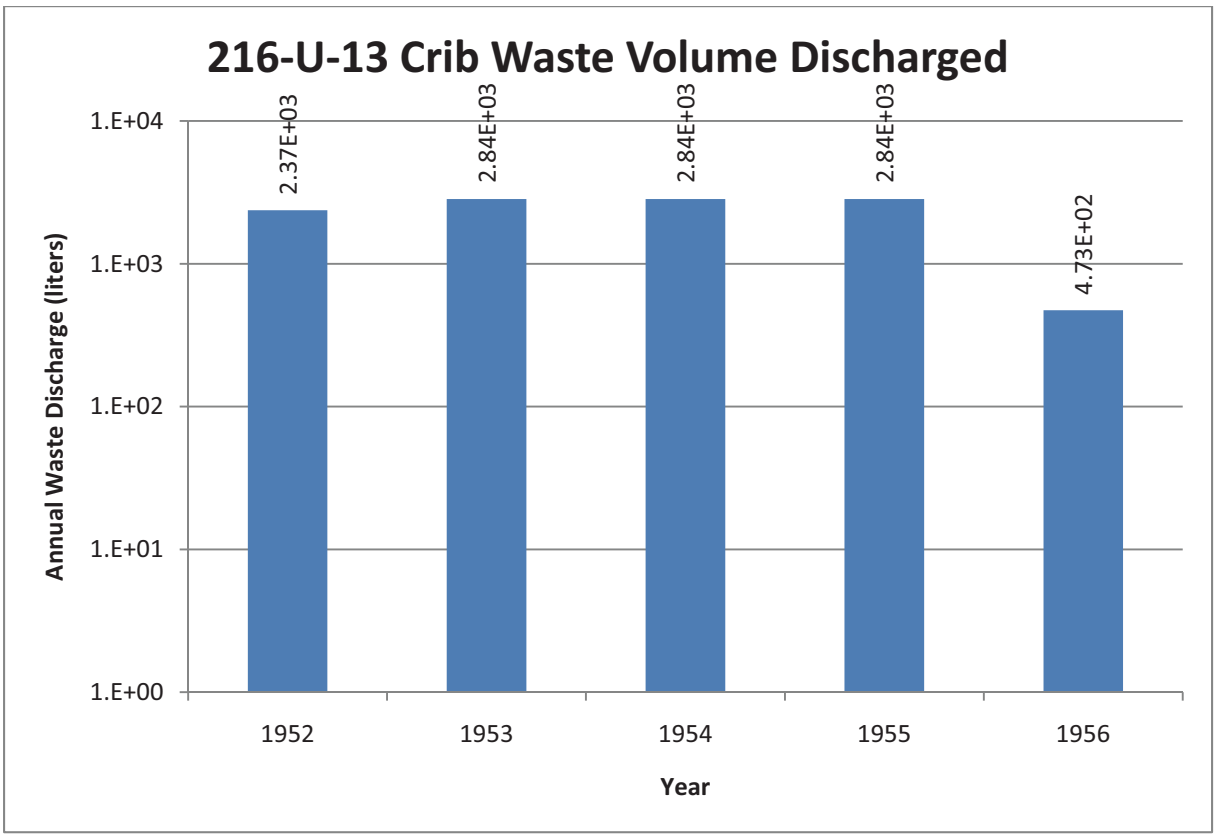


Figure 2. 216-U-13 Crib Waste Volume Discharged Summary



Site Description

Site ID: 216-U-14
Site Type: Ditch
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-2
Service Dates: 1944 to 1995
Volume/Mass Discharged: 1.22E+09 L (3.22E+08 gal)

Waste Site Location and Physical Description: The ditch originated west of the 284-W Powerhouse, west of Bridgeport Avenue and extended southward, terminating at the 216-U-10 Pond (see Figure 1. ArcMap Image). The ditch was an unlined and open manmade channel filled with large cobbles. Near the head end of the ditch, a 0.6 m (2 ft) diameter pipe allowed 284-W Powerhouse and laundry effluent to flow under 19th Street and connect to the main portion of the ditch. The ditch also had a 1.22 m (4 ft) diameter culvert that allowed effluent to flow under 16th Street to the portion of the ditch located north of the 242-S Evaporator and also flowed under Cooper Ave. to terminate at 216-U-10 Pond. The ditch was deactivated and stabilized by 1995; the stabilization included backfilling with a minimum of 0.61 m (ft) of clean dirt. In 1997, the cobbles were covered with "pit run" gravel, and the site was posted as URM.

Waste Site Coordinates:

E-566906.67492 N-135126.22815

Site Dimensions:

Site Length: 1,731 m (5,680 ft)
Site Width: 2.44 m (8 ft)
Site Area: 4,224 m^2 (45,440 ft^2)
Site Depth: 3.05 meters (10 ft) to bottom of structure
Cover Thickness: N/A

Release Summary: The 216-U-14 Ditch was the original effluent route to the 216-U-10 Pond. It received powerhouse wastewater, laundry wastewater (until 1981) via 200-W-102 Pipeline, and steam condensate and cooling water from 221-U, 224-U and the 242-S Evaporator.

From 7/44 to 9/44, the site received wastewater from the 284-W Powerhouse. From 9/44 to 1/50, the site received the same wastewater plus waste from 2723-W (original laundry and mask cleaning station). From 1/50 to 3/52, the site received wastewater from 284-W and 2724-W Laundry Building (new laundry facility). From 3/52 to 5/54, the site received the same wastewater plus chemical sewer waste from 221-U and cooling water from 224-U. From 5/54 to 8/55, the site received the same wastewater plus cooling water from 241-U-110 condenser tank. From 8/55 to 11/73, the site received the same wastewater plus 271-U cooling water. From 11/73 to 4/80, the site received the same wastewater plus 242-S Evaporator condensate and cooling water. From 4/80 to 9/81, the site received the same wastewater except 242-S condensate, 2723-W and 2724-W waste. From 9/81 to 7/84, the site received the same wastewater except 221-U, 224-U, and 271-U waste. The 221-U and 224-U effluent entered the ditch after passing through the 207-U Retention Basin. The 216-U-16 crib was built in 1984 to accept 224-U effluent that had previously been discharged to the ditch. However, the 216-U-16 crib failed in 1985. Some 224-U effluent was diverted back to the 216-U-14 Ditch until November 1994, when the outlet pipe to the 207-U Retention Basin was permanently isolated and filled with concrete.

The portion of the ditch, located west of Cooper Ave., received effluent from the 242-S Evaporator and remained active until April 1995. Discharge from the 242-S Evaporator was eliminated in 1995 ending all discharges to the 216-U-14 Ditch.

In addition, Occurrence Report 86-46 states that on August 6, 1986, 2,365 L (625 gal) of recovered nitric acid, containing 39 kg (86 lbs) of uranium was discharged through the chemical sewer to the 207-U Retention Basin. Prior to the discovery of the release, the outlet valves on the retention basin were open to the 216-U-14 Ditch. The acid released to the ditch was greatly diluted with the 1,140 L (300 gal) per minute flow of cooling water from the 224-U facility being processed through the chemical sewer system. The outlet valves from the retention basin were closed shortly after the discovery of the release and the remainder of the acid release was contained in the retention basin. The effluent in the retention basin was neutralized with 270 kg (600 lbs) of sodium carbonate. Contrary to the release information provided in the Occurrence Report 86-46, the Hanford Site Waste Management Units Report stated approximately 3,000 L (796 gal) of 50% reprocessed nitric acid was released to the unit. The total release to the environment consisted of approximately 101,250 kg (225,000 lbs) of corrosive solution (pH less than 2.0) and 45.4 kg (100 lbs) of uranium.

The estimated total volume of process effluent discharged to the site is approximately 1.22E+09 L (3.22E+08 gal) and the calculated potential lifetime discharge would exceed one vadose zone pore volume.

$PV_{released}$ = 1.22E+09 L/ (4,224 m^2*81 m*0.3*1000 L/m^3) = 11.89

A detailed summary of the waste discharge to the crib from 1985 to 1993 is shown in Figure 2.

Related Site Structure(s): The ditch is associated with the 284-W Powerhouse, 2723-W (old laundry facility), 2724-W (new laundry facility), 221-U, 224-U, 271-U, the 242-S Evaporator building, and the 241-U-110 Tank. The 200 West Area Powerhouse Pond was constructed over the location of the head end of the 216-U-14 Ditch. The direct pipeline from 221-U is 200-W-84-PL. The pipeline from 2724-W is 200-W-102-PL. A pipeline from the 241-U Tank Farm to the 216-U-14 ditch is 200-W-168-PL. The outlet pipe from 207-U is 200-W-222-PL. The effluent discharge pipe from 242-S Evaporator to the 216-U-14 ditch is 200-W-223-PL.

Site Posting: The Site is posted as an URMA.

Site Characterization Summary: A surface radiological survey is done on the backfilled ditch annually. Sediment, soil and vegetation samples were collected to characterize the 216-U-14 Ditch several times. In 1981, contamination levels found in sediment at the head end of the ditch, to a depth of 175 cm (70 in), were above background levels for all radionuclides analyzed. The average concentration for all depths was 76.6 pCi/g cesium- 137, 113.4 pCi/g cobalt-60, 101.6 pCi/g strontium-90 and 89.1 pCi/g plutonium 239/240. The highest concentrations of cobalt-60 were found in the head end of the ditch. The highest concentration of cesium-137 was found near where the ditch entered U- Pond.

Core samples were collected in 1987 to determine the effects of the accidental nitric acid and uranium release that occurred in 1986. A maximum of 185 pCi/g of uranium was found at a depth of 15 to 30 cm (6 to 12 in).

Test pits were excavated in the ditch in 1992 to support the Groundwater Impact Assessment for the 216-U-14 Ditch. The test pits were located in the portion of the ditch west of Cooper Ave and east of the 216-U-10 pond. Data indicated the contaminants were concentrated within a few feet of the bottom of the ditch.

Potential Contaminants:

Radioactive: Cs-137, Sr-90, U-238, Co-60, Pu-239/240, Tn and Tc-99

Non-Radioactive: Not specified

References:

WIDS General Summary Report for site 216-U-14
ArcMap
QMap

Figure 1. ArcMap Image

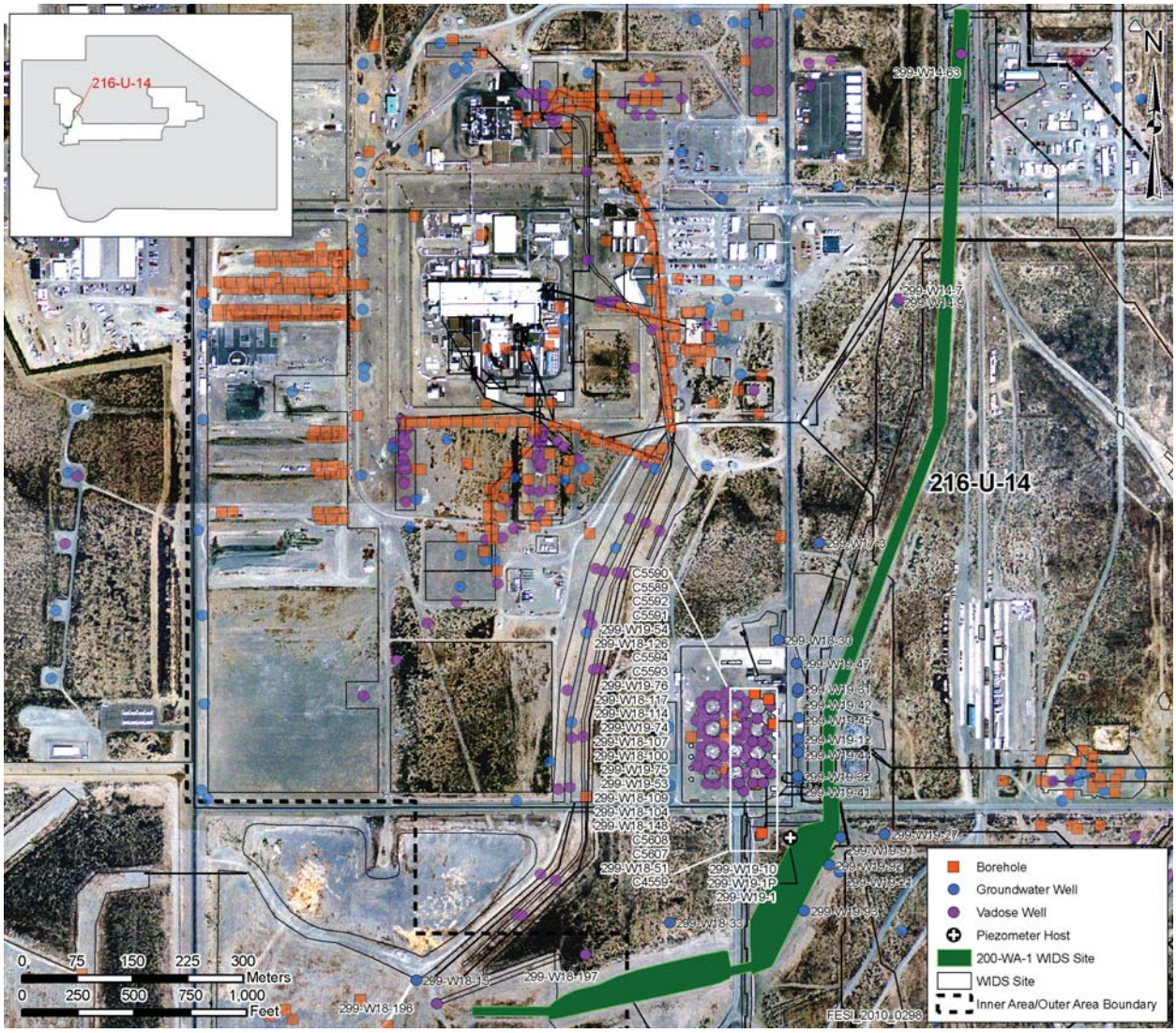
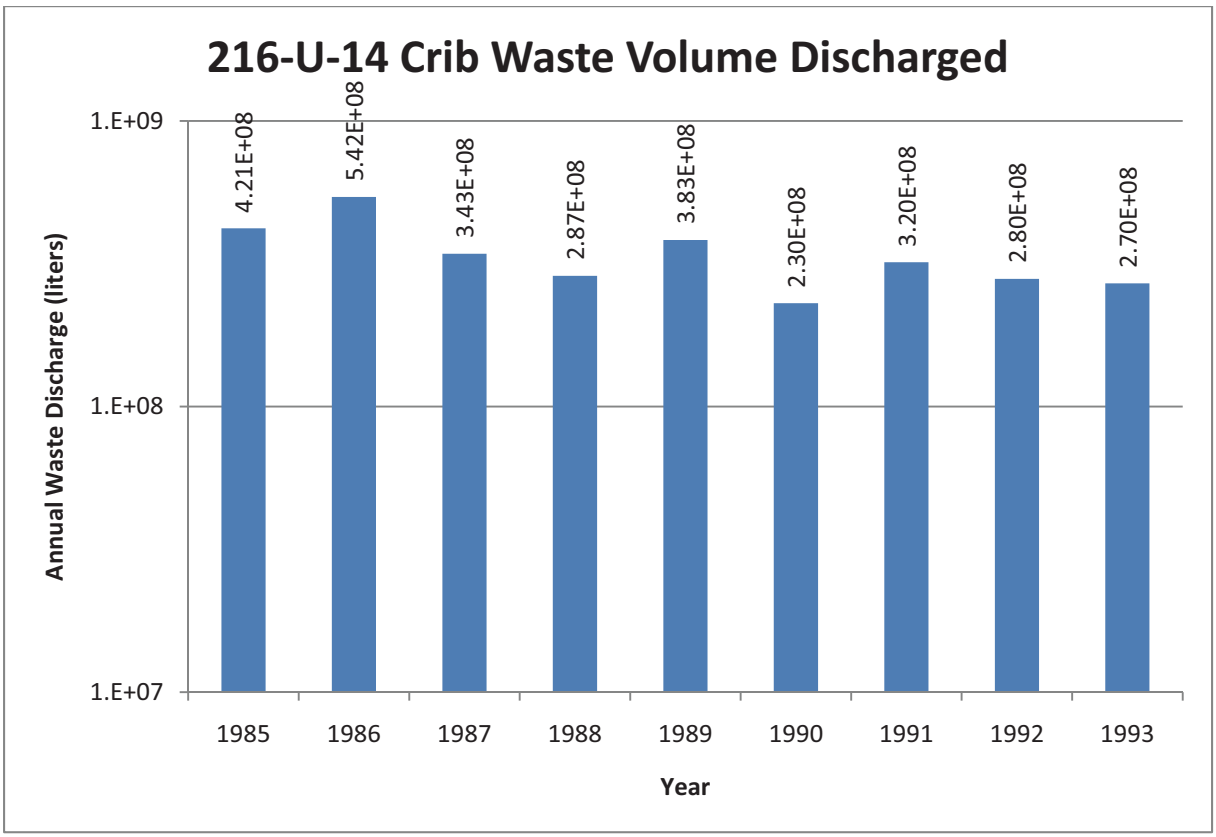


Figure 2. 216-U-14 Crib Waste Volume Discharged Summary



Site Description

Site ID: 216-U-15
Site Type: Trench
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1
Service Dates: During May 1957
Volume/Mass Discharged[1]: 6.8E+04 L (1.8E+04 gal)

Waste Site Location and Physical Description: The trench is the result of a deliberate discharge of liquid waste into a hole in the ground. The site was deactivated by backfilling the hole and removing the above ground piping.

This trench was located west of the 271-U Building and north of 16th Street. In August 2002, translated GPS coordinates were used to locate the area documented in 1957 as the disposal pit site. No visual signs of the site were noted, since the perimeter fence and all identification markings of this site were removed in 1971. Ground Penetrating Radar scans were done of several potential site locations in February 2005. GPR results found no subsurface disturbances, only a linear pipe anomaly, beneath the location identified as the spot documented with Hanford Site coordinates. A large disturbed area was noted west and south of the Hanford Site coordinate spot. This large disturbance was determined to be the most likely 216-U-15 site location. Figure 2. Diagram of Possible 216-U-15 Locations, show the three possible site locations based on the GPS Survey result from May 2005. The location marked ARH-2155 represents the converted coordinates found in document ARH-2155. The location marked WIDS represents the converted coordinates shown in the waste site coordinates below section, which is an estimated data point location. The location marked SH68 represents the center of the converted coordinates found on sheet 68 of H-2-44511. See Figure 3. H-2-44511 Sheet 68 Rev. 6 to view the as built drawing of the site's location.

Though there are many surveys, sources, and speculations on where this site is, there is no conclusive evidence that gives an exact location for site 216-U-15.

Waste Site Coordinates: There is no conclusive evidence that gives an exact location for site 216-U-15.

Site Dimensions:

Site Length: 6.1 m (20 ft)
Site Width: 6.1 m (20 ft)
Site Depth: 4.57 m (15 ft) to bottom of structure
Cover Thickness: N/A

Release Summary: This site received waste from the 388-U Tank in the 276-U Solvent Building. The waste consisted of interface crud, activated charcoal, and diatomaceous earth containing approximately 1 curie of fission products. HW-50584 presents conflicting information. The May 1957 montly report states that the site received 79,494 liters (21,000 gallons) of organic solution (RAX) was originally scheduled to be transferred to the PUREX plant, but was buried because it was found to be incompatible with the PUREX process. The material was buried, with minor ground contamination occurring when the overground line used to transport the material from 276-U leaked. One 8 inch culvert was replaced and the contaminated ground was dug up and buried.

The estimated total volume of process effluent discharged to the site is approximately 6.8E+04 L (1.8E+04 gal) [1] and the calculated potential lifetime discharge is not expected to exceed one vadose zone pore volume.

$PV_{released}$ = 6.8E+04 L/ (37.21 square m*81 m*0.3*1000 Liters/m^3) = 0.08

Related Site Structure(s): The 216-U-15 Trench was associated with the 388-U Tank and the 276-U Solvent Storage Area.

Site Posting: All identification markings of this site were removed in 1971.

Site Characterization Summary: Exploratory core samples were taken in 1970 at the point of listed coordinates. No radioactivity was detected. The core sample results may have contributed to the removal of the Underground Radioactive Material signs.

Potential Contaminants[2]:

Radioactive: Co-60 (2.33E^{-3} curies), Sr-90 (4.84E^{-2} curies), Cs-137 (5.07E^{-2} curies), Pu-239 (5.71E^{-3} curies)_Pu-240 (1.54E^{-3} curies), U-238 (7.6E^{-4} curies)

Non-Radioactive: Paraffin hydrocarbons (40,000 kg), tributyl phosphate (13,000 kg)

**These values are decayed through April 1, 1986.*

References:

WIDS General Summary Report for site 216-U-15.
ArcMap.
QMap.
H-2-44511 Sheet 68 Rev. 6
1. EVSDS Database. Virtual Library. BHI-00608 Rev.1
2. “Chemicals Disposed & Radionuclide Inventories.pdf Page 5.

Figure 1. ArcMap Image

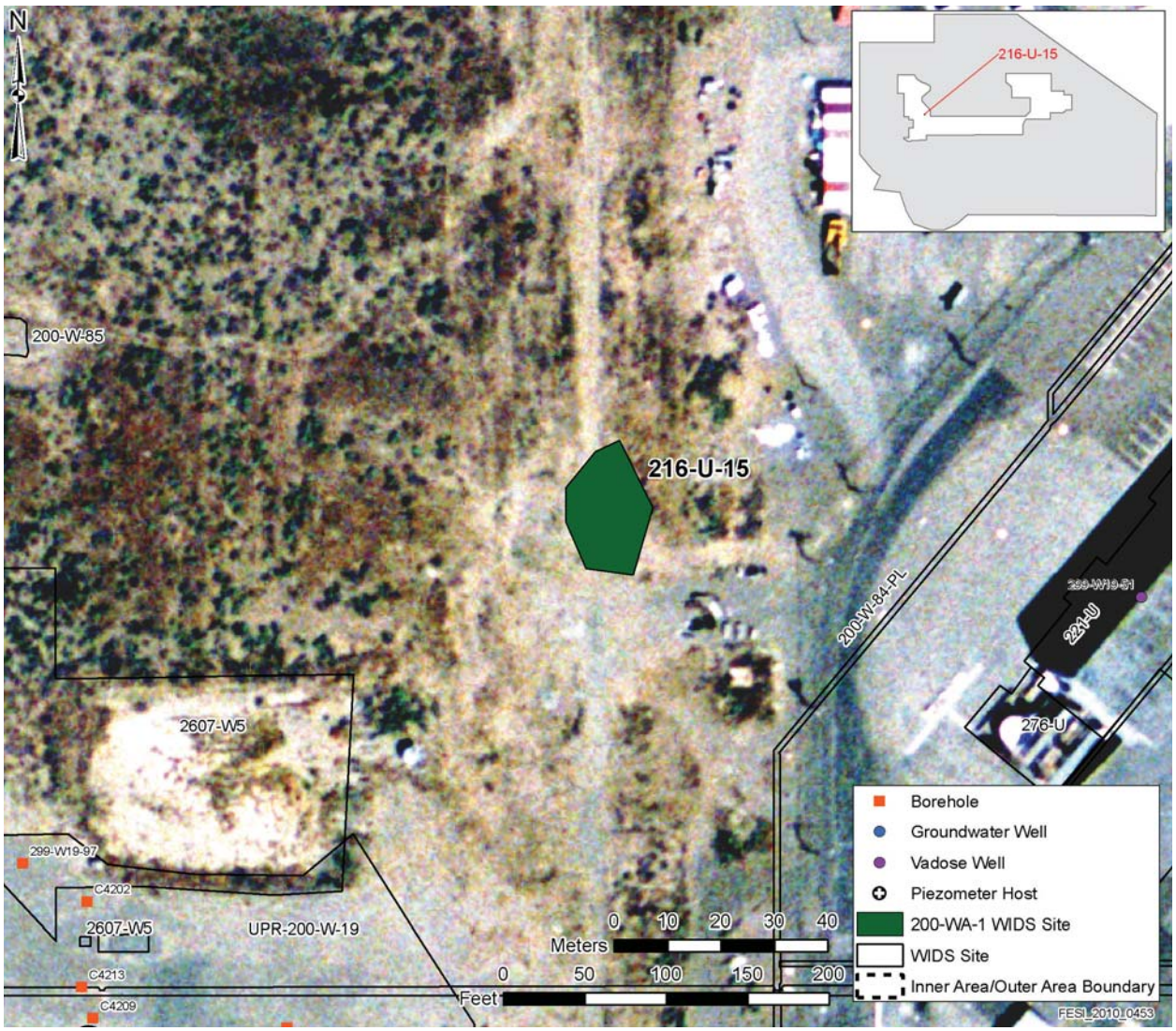
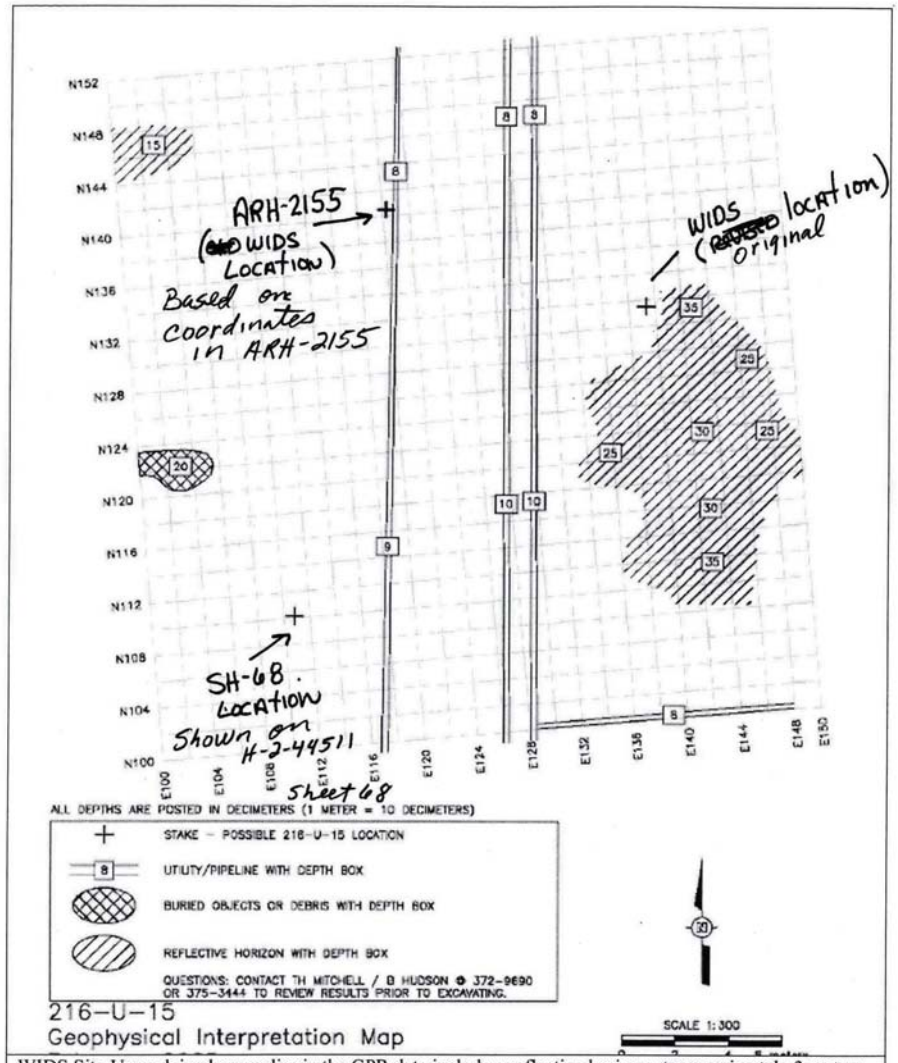
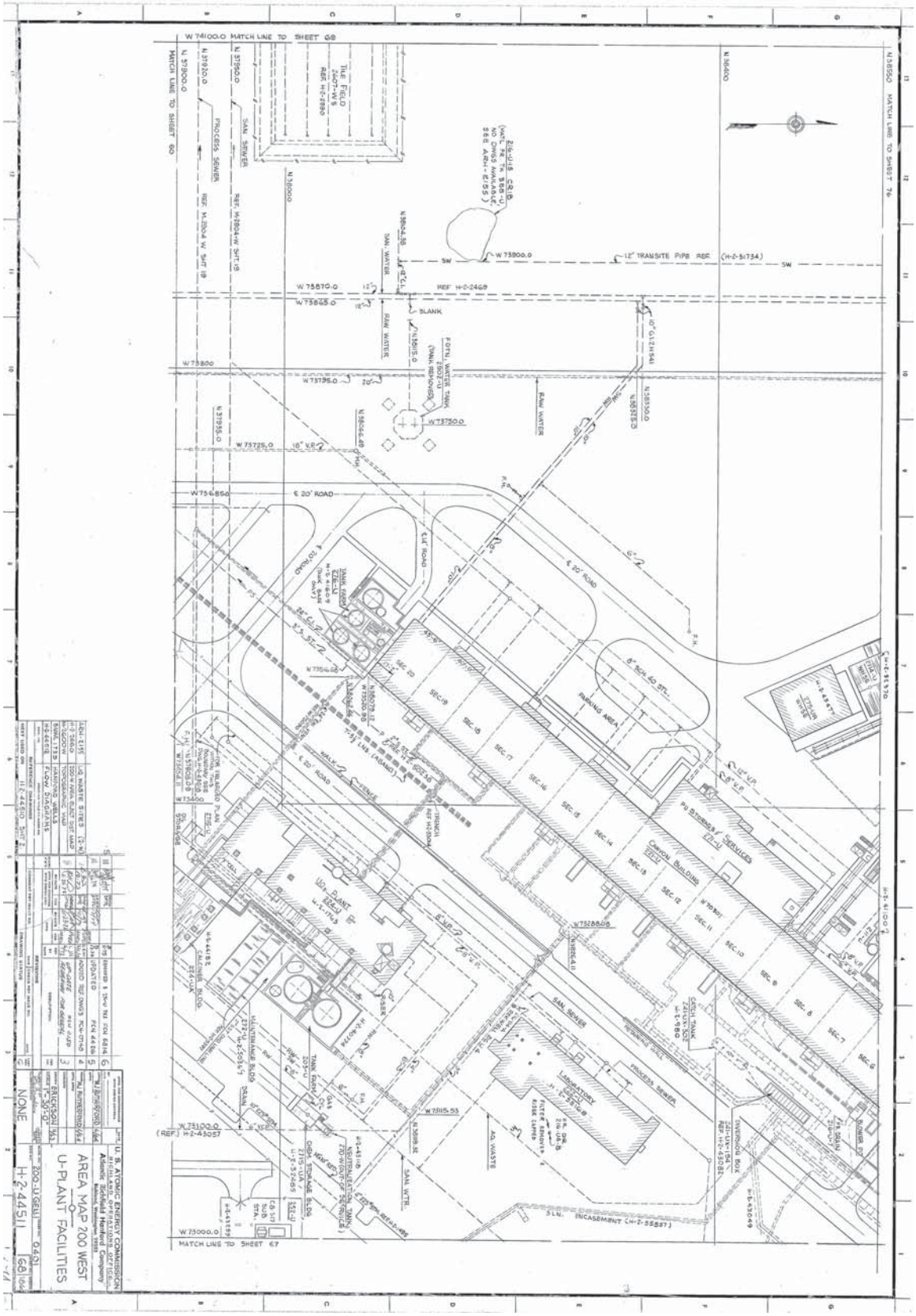


Figure 2. Diagram of Possible 216-U-15 Locations.



WIDS Site:Unexplained anomalies in the GPR data include a reflective horizon at approximately 3 meters depth along the eastern edge of the site. This feature is very low amplitude and may be caused by natural, geologic variation in the subsurface. It's proximity to one possible location for the 216-U-15 crib makes it worthy of note.

Figure 3. H-2-44511 Sheet 68 Rev. 6



Site Description

Site ID: 216-U-16
Site Type: Crib
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1
Service Dates: July 20, 1984 to 1987
Volume/Mass Discharged: 4.09E+08 L (1.08E+08 gal)

Waste Site Location and Physical Description: The crib is located south of 16th Street, between Beloit and Cooper Avenues, southwest of the 224-U Building (See Figure 1. ArcMap Image). The crib is constructed of two header pipes, 20 cm (8 in) reducing to 15 cm (6 in) that are located 0.9 m (3 ft) above the crib bottom, running the length of the unit, one on each side. At each end of the pipe is a 15 cm (6 in) vent pipe. Connecting the two header pipes were twenty-two 10 cm (4 in) perforated pipes running the width of the unit, equally spaced, 0.9 m (3 ft) above the bottom. Each header pipe has a 10 cm (4 in) vent riser. An acid resistant distribution box is located at the crib inlet (northeast edge) (See Figure 2. Engineering Drawing for 216-U-16 Crib (figure from H-2-94256 Sheet 1 Rev.1)). A short pipeline connected the crib to the existing VCP Process Sewer line. In February 1996, the cirb was permanently isolated by filling Manhole #1 with concrete. The action was done by Westinghouse Tank Farm Operations in preparation for transferring responsibility to the Environmental Restoration Contractor. In July 2000, the vent risers were sealed and cut off below grade. The riser openings were sealed with polyvinyl chloride (PVC) cap and the risers were backfilled to grade.There are three gage wells, one near the north and south ends and one near the center. The bottom is filled with 1.5 m (5 ft) of gravel. Covering the gravel is a reinforced polyethylene liner extending 2.4 m (8 ft) up the sides of the excavation. The crib structure has been backfilled over to grade. A 15 cm (6 in) subdrainage pipe runs the width of the unit at the west side.

Waste Site Coordinates:

E-567235.60145 N-134861.31606

Site Dimensions:

Site Length: 79.86 m (262 ft)
Site Width: 58.22 m (191 ft)
Site Area: 4,649 m^2 (50,042 ft^2)
Site Depth: 5.18 meters (17 ft) to bottom of structure
Cover Thickness: N/A

Release Summary: The 216-U-16 crib received 224-U steam condensate, 224-U chemical sewer waste, 271-U compressor cooling water, 221-U chemical sewer waste, and 224-U process condensate. The 224-U effluent stream had previously gone to the 216-U-10 pond by way of the 216-U-14 ditch, Due to plans to deactivate the ditch and stabilize the pond, the 216-U-16 crib was constructed. By February 1985, high flow rates of liquid discharged to the 216-U-16 Crib caused a pooling above a caliche layer located 50 m (165 ft) below the crib. The crib effluent moved laterally, northward to the 216-U-1 & 2 cribs. The liquid flushed contaminants from the 216-U-1&2 cribs into the groundwater, using an existing groundwater well as a pathway. After confirming the effluent source was the 216-U-16 crib, the use of the crib was discontinued and an investigation was initiated. The effluent was routed to the 216-U-14 ditch.

In 1984 and 1985, approximately 2.86E+08 L and 1.23E+08 L of liquid waste were discharged to the 216-U-16 crib, respectively[1]. The estimated total volume of process effluent discharged to the site is approximately 4.09E+08 L (1.08E+08 gal) and the calculated potential lifetime discharge could exceed one vadose zone pore volume.

$PV_{released}$ = 4.09E+08 L/ (4649 square m*81 m*0.3*1000 Liters/m^3) = 3.62

Related Site Structure(s): The crib is associated with the 224-U and the 221-U facilities and the 216-U-14 ditch. The pipeline that feeds this crib is 200-W-170-PL.

Site Posting: The site is posted with Underground Radioactive Material signs.

Site Characterization Summary : Surface radiological surveys are performed annually. The 1986 Groundwater Monitoring Report for well 299-W19-13 showed elevated alpha and total U levels exceeding the U-238 concentration limit since July 1984. The 1994 Groundwater Monitoring Report indicates the uranium levels have decreased considerably since 1986, but remain greater than the proposed MCL. The uranium plume extends into the 600 Area to the east of 200 West Area.

On June 7th, 1995 a radiation survey was conducted as part of a routine survey. No contamination was found. On April 5th, 2000 a site walkdown was completed for verification purposes. Also on the 4th of December 2003 a geophysical survey was completed for characterization purposes.

Potential Contaminants:

Radioactive: Uranium-238

Non-Radioactive: Not specified

References:

WIDS General Summary Report for site 216-U-16.QMap.
ArcMap.H-2-94256 Sheet 1 Rev. 1
1. EVSDS Database. Virtual Library. BHI-00608 Rev.1

Figure 1. ArcMap Image

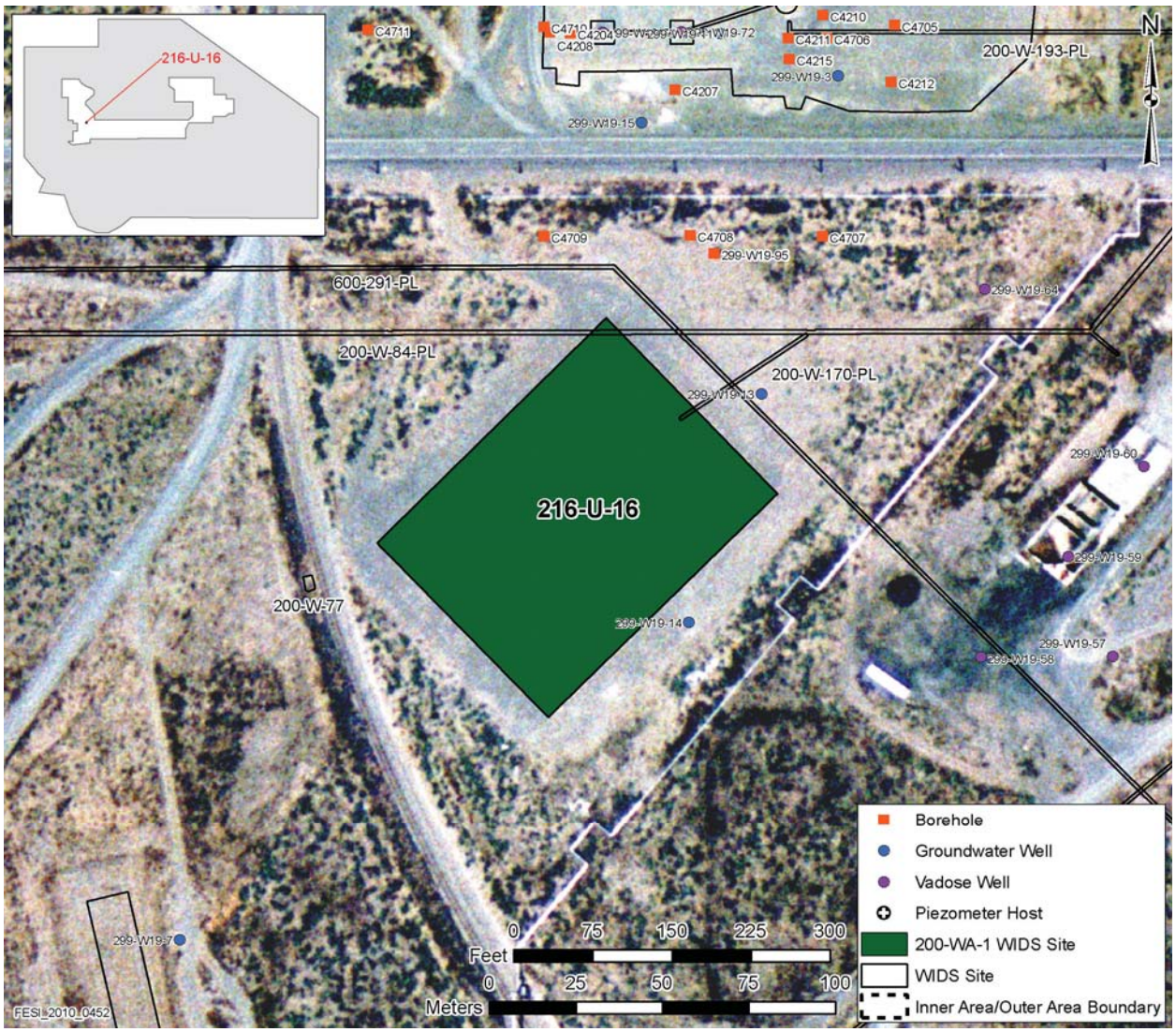
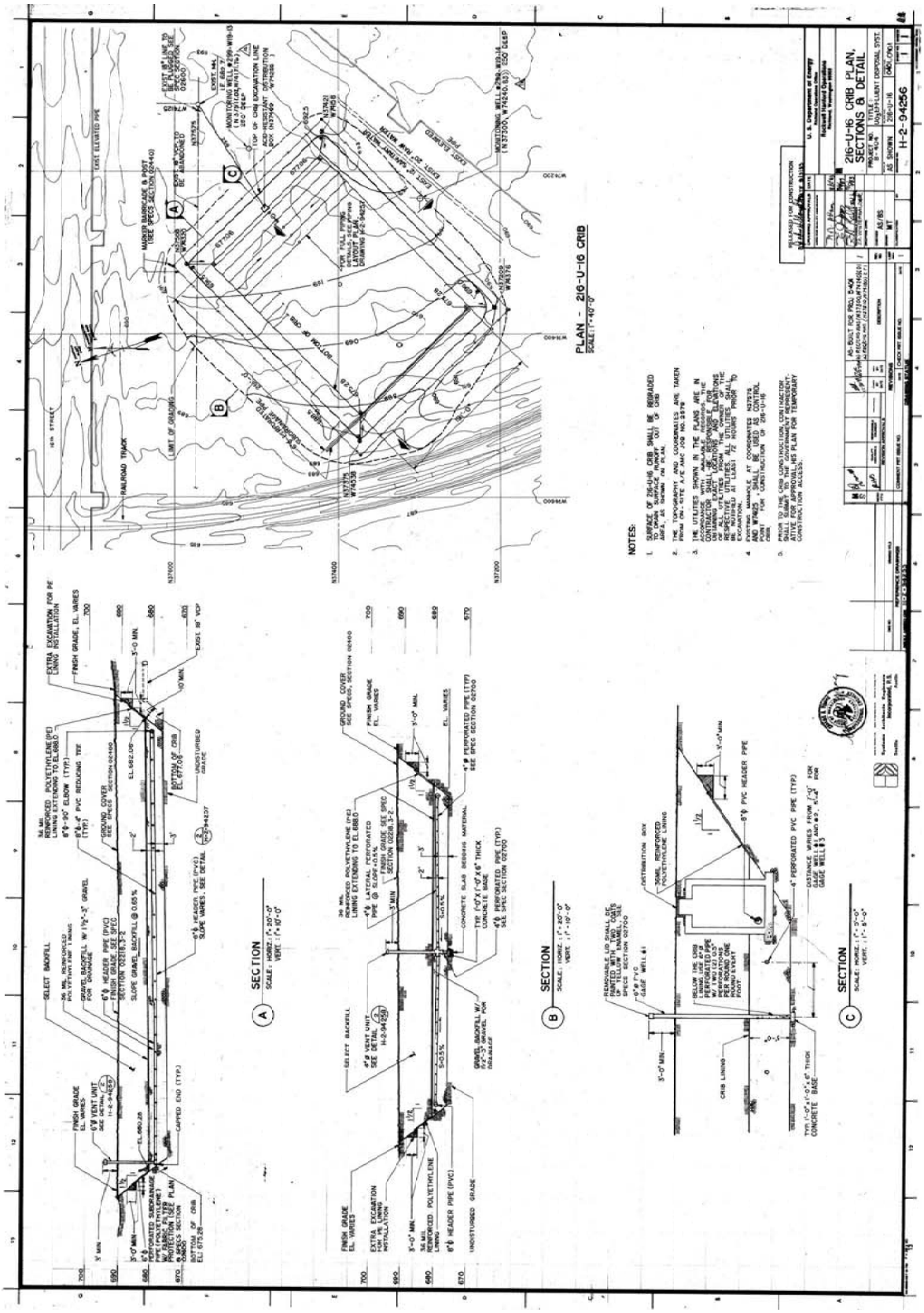


Figure 2. Engineering Drawing for 216-U-16 Crib (figure from H-2-94256 Sheet 1 Rev.1)



Site Description

Site ID: 216-U-17
Site Type: Crib
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1
Service Dates: 1988 to September 1994
Volume/Mass Discharged[1]: 4.97E+06 L (1.3E+06 gal)

Waste Site Location and Physical Description: The crib is located south of 16th Street and east of Beloit Ave. inside the 200 West Area, and southeast of the 221-U facility (See Figure 1. ArcMap Image and Figure 2. SITE MAP from H-2-77174 Sheet 1 Rev.1). Figure 3. Engineering Drawing for 216-U-17 from H-2-77175 Sheet 1 Rev.1 shows the detail design of the crib. A large amount of debris was identified on the surface of the site prior to crib construction. It was determined the site had previously been used as a construction laydown area. In July 2000, the vent risers were sealed as a preventative measure for potential passive radioactive emissions. On November 9th, 1994, the 224-U Facility was permanently isolated from the crib by cutting and capping the crib pipeline.

Waste Site Coordinates:

E-567839.36161 N-134903.32494

Site Dimensions:

Site Length: 45.72 m (150 ft)
Site Width: 3.05 m (10.00 ft)
Site Area: 139 m^2 (1,500 ft^2)
Site Depth: 5.49 meters (18 ft) to bottom of structure
Cover Thickness: N/A
Overburden depth: 3.51 m (11.50 ft.)

Release Summary: The crib received effluent from the 224-U building process condensate from the conversion of urynal nitrate hexahydrate (UNH) to Uranium Tri-oxide (UO3) through the calcining operations. Effluent flow was evenly distributed over the entire unit from the distribution line lying in an aggregate field with a PVC vapor barrier. A neutralization system was placed into operation before startup of this crib to preclude the discharge of process condensate outside the range of 2.0 to 12.5 pH.

The estimated total volume of process effluent discharged to the site is approximately 4.97E+06 L (1.3E+06 gal) [1] and a detailed discharge summary for the crib is shown on Figure 4. 216-U-17 Crib Waste Volume Discharged Summary[1]. The calculated potential lifetime discharge could exceed one vadose zone pore volume.

$PV_{released}$ = 4.97E+06 L/ (139 square m*81 m*0.3*1000 Liters/m^3) = 1.5

Related Site Structure(s): The crib is associated with the 224-U facility and the 200-W CSLA. The pipeline associated with the crib is 200-W-195-PL.

Site Posting: The crib is marked and posted with Underground Radioactive Material signs.

Site Characterization Summary: On May 2nd, 1996 a GPS Survey was performed and the data is stored in HGIS.A radiological survey was conducted on June 30, 1997 and no contamination

was found. On December 4th, 2003 a geophysical survey was performed for characterization purposes.

Potential Contaminants:

Radioactive: Not specified

Non-Radioactive: Not specified

References:

WIDS General Summary Report for site 216-U-17.QMap.
ArcMap.
1. EVSDS Database. Virtual Library. BHI-00608 Rev.1
H-2-77174 Sheet 1 Rev. 1
H-2-77175 Sheet 1 Rev. 1

Figure 1. ArcMap Image

Figure 2. SITE MAP from H-2-77174 Sheet 1 Rev.1

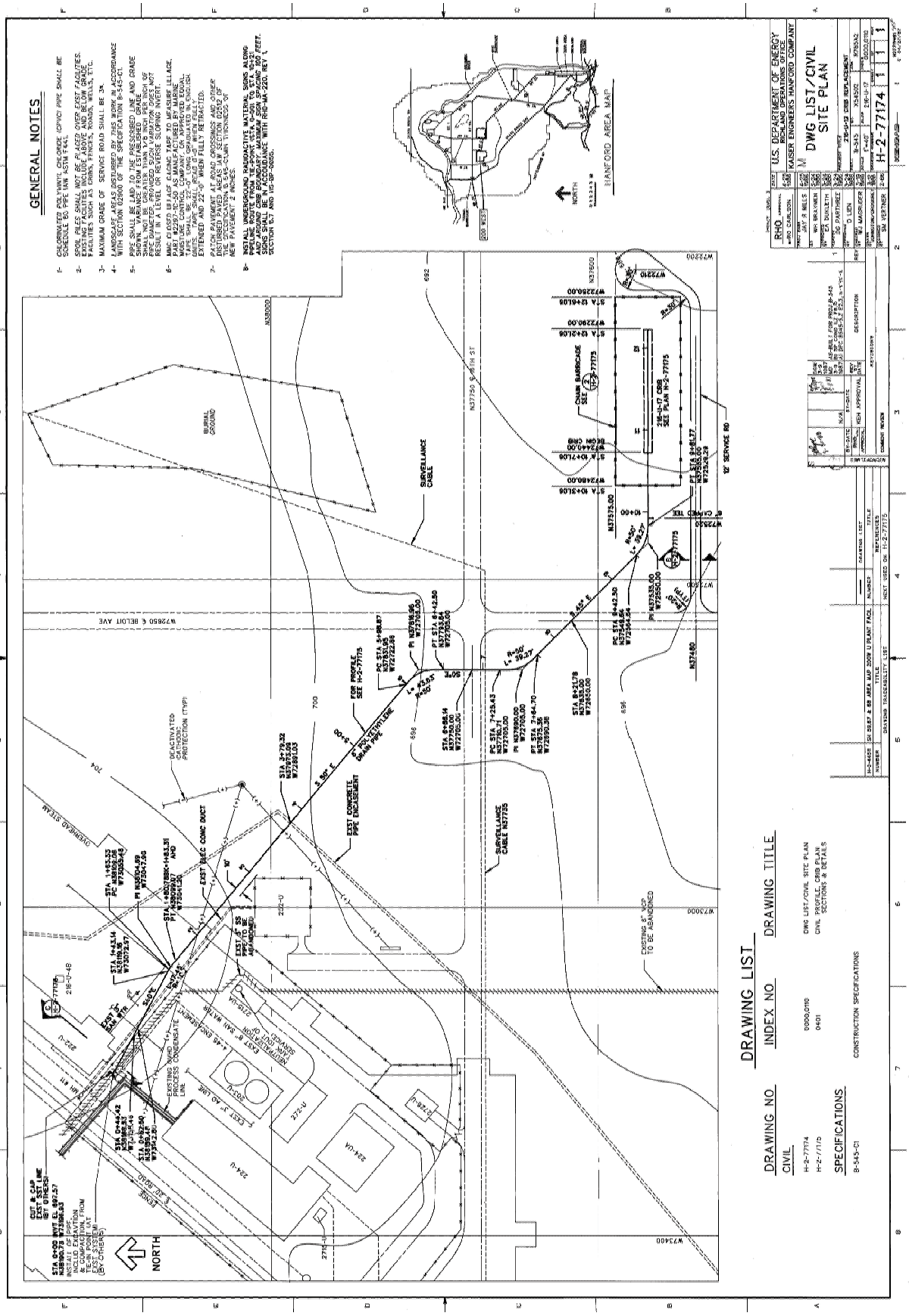


Figure 3. Engineering Drawing for 216-U-17 from H-2-77175 Sheet 1 Rev.1

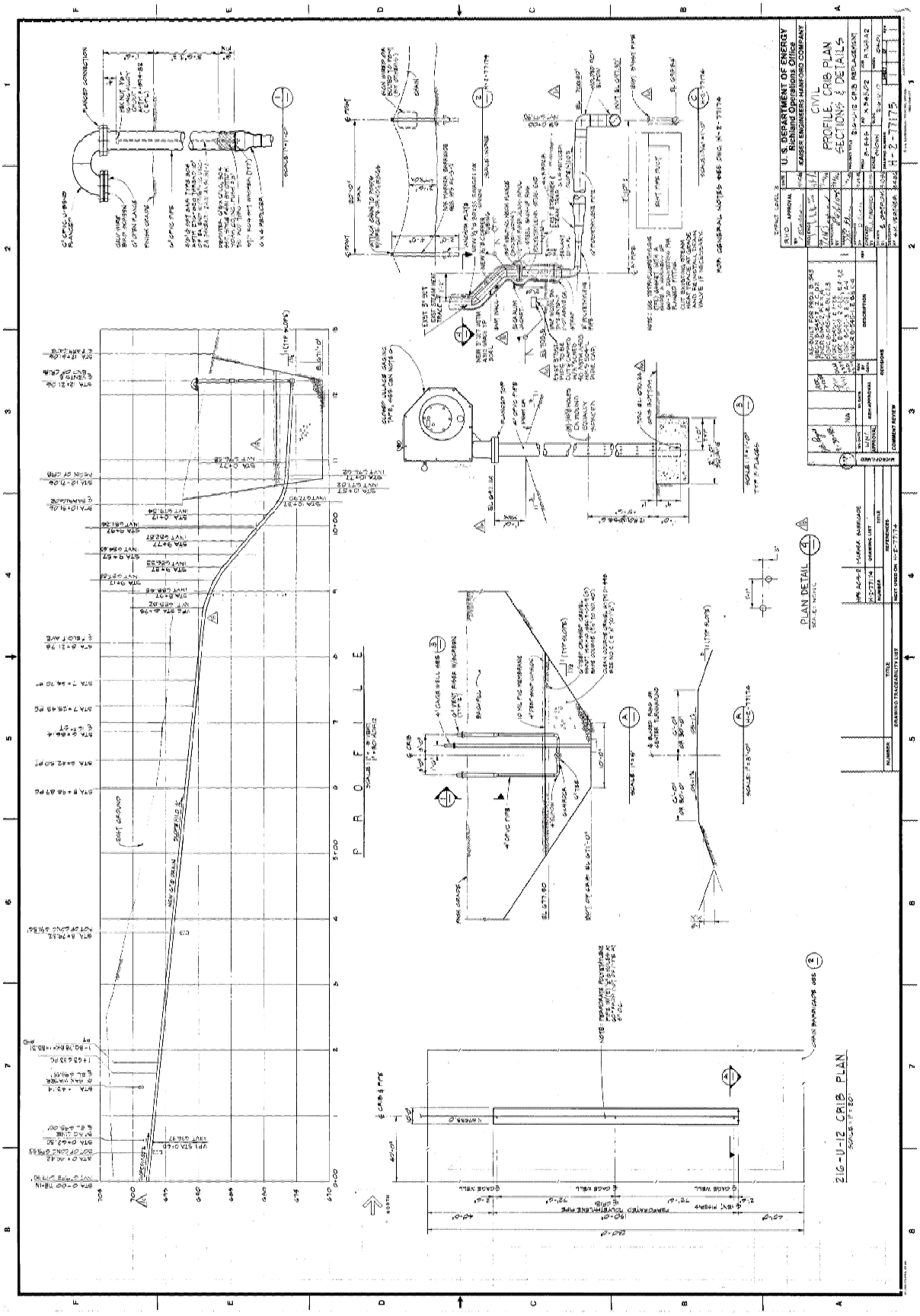
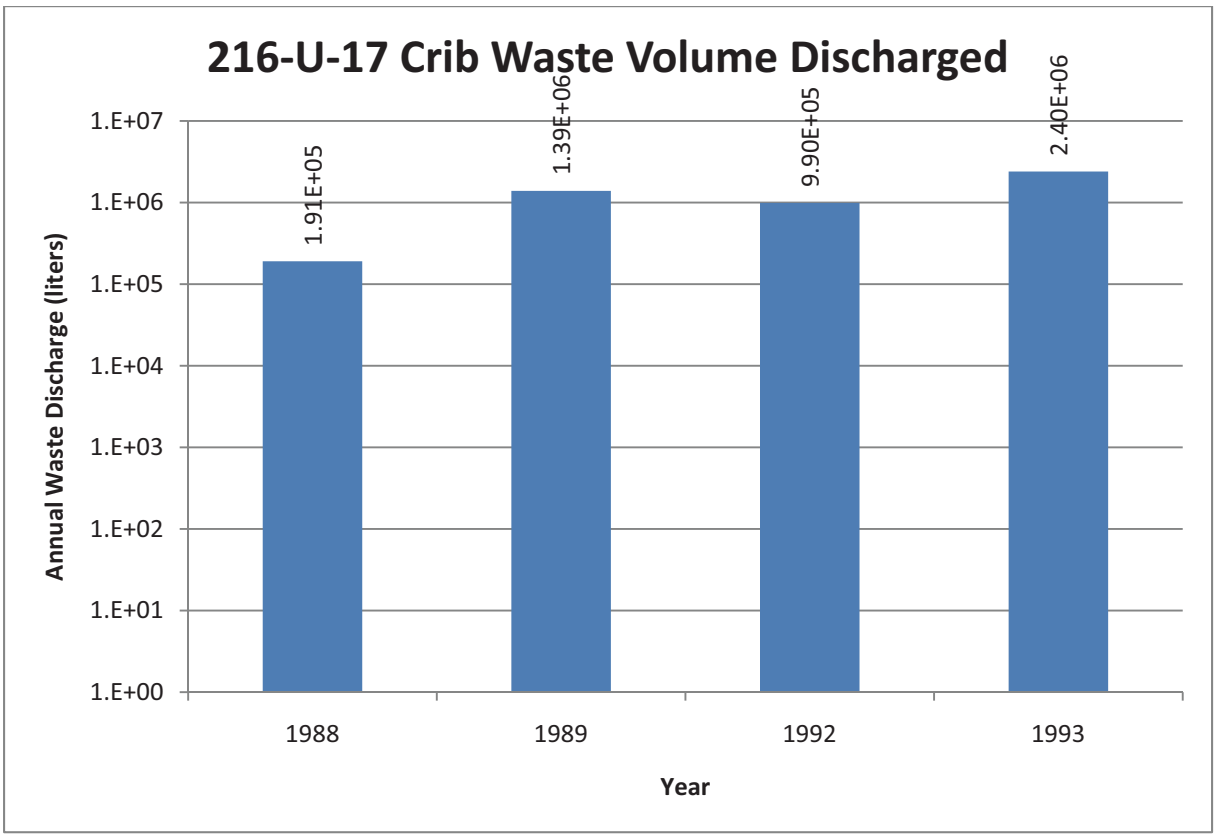


Figure 4. 216-U-17 Crib Waste Volume Discharged Summary



Site Description

Site ID: 216-U-3
Site Type: French Drain
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-2
Service Dates: May 1954 to August 1955
Volume/Mass Discharged: 7.91E+05 L (2.09E+05 gal)

Waste Site Location and Physical Description: The round French drain is located south of the 241-U Tank Farm on the south side of 16th Street (See Figure 1. ArcMap Image). The drain is a rock-filled excavation with a 1:1 sloping sides and a 10 cm (4 in) diameter vent riser. The site had a 1.8 m (6 ft) bottom diameter and the surface diameter of the excavation was 5.5 m (18 ft) (See figure 2. Engineering Drawing for 216-U-3 from H-2-44004 Sheet 1 Rev. 11). The site was deactivated in 1955 by valving out the condenser piping. A large depression was noticed in 1985 and the cave-in was backfilled. It is assumed that a subsurface wash out had occurred.

Waste Site Coordinates:

E-566844.73101 N-134927.88972

Site Dimensions:

Site Diameter: 1.83 m (6 ft)
Site Area: 2.63 m^2 (28.26 ft^2)
Site Depth: 3.66 meters (12 ft) to bottom of structure
Cover Thickness: N/A

Release Summary: This site received condensate from the steam condensers on the 241-U-104 and 241-U-110 Tanks. The 241-U-104 and 241-U-110 tanks held REDOX boiling waste. The site waste contains nitrate.

The site received 6.48E+05 L and 1.43E+05 L of liquid waste in 1954 and 1955, respectively[1]. The estimated total volume of process effluent discharged to the site is approximately 7.91E+05 L (2.09E+05 gal) and the calculated potential lifetime discharge could exceed one vadose zone pore volume.

$PV_{released}$ = 7.91E+05 L/ (2.63 square m*81 m*0.3*1000 Liters/m^3) = 12.4

Related Site Structure(s): The French drain is associated with the 241-U-104, 241-U-110 Tanks and the 200-W-169-PL pipeline.

Site Posting: The site is marked with light steel posts and chain with "Underground Radioactive Material" signs.

Site Characterization Summary: Visual and radiological surveys are performed at this site. In December 2004, a characterization borehole (C4559) was drilled through the French drain to a depth of approximately 39.5 m (129.5 ft). HEIS samples B19938 through B19972 were analyzed for radionuclides, metals, inorganic chemicals and organic chemicals.

Potential Contaminants:

Radioactive: Co-60 ($1.85E^{-3}$ curies), Sr-90 ($4.5E^{-2}$ curies), Cs-137 ($4.73E^{-2}$ curies), and U-238 ($6.06E^{-3}$ curies or 18.1kg), Plutonium (0.1gm)[2]

**Values decayed through 31 Mar. 1986.*

Non-Radioactive: Nitrate

References:

WIDS General Summary Report for site 216-U-3.QMap.ArcMap.
H-2-44004 Sheet 1 Rev. 11
1. EVSDS Database. Virtual Library. BHI-00608 Rev.1. 200 West Effluent Volumes spreadsheet values
2. WIDS "Chemicals Disposed & Radionuclide Inventories.pdf" Page 5.

Figure 1. ArcMap Image

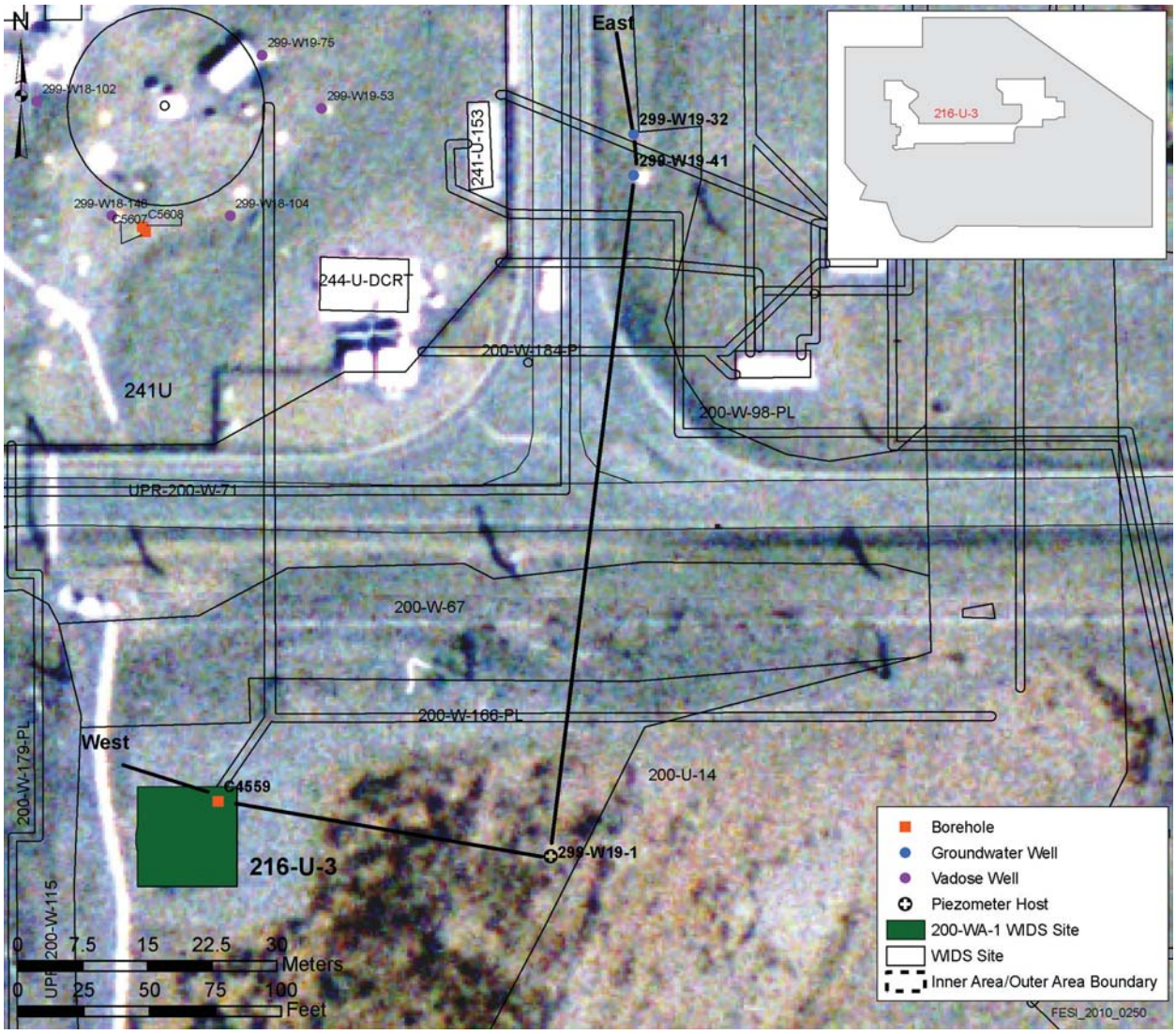
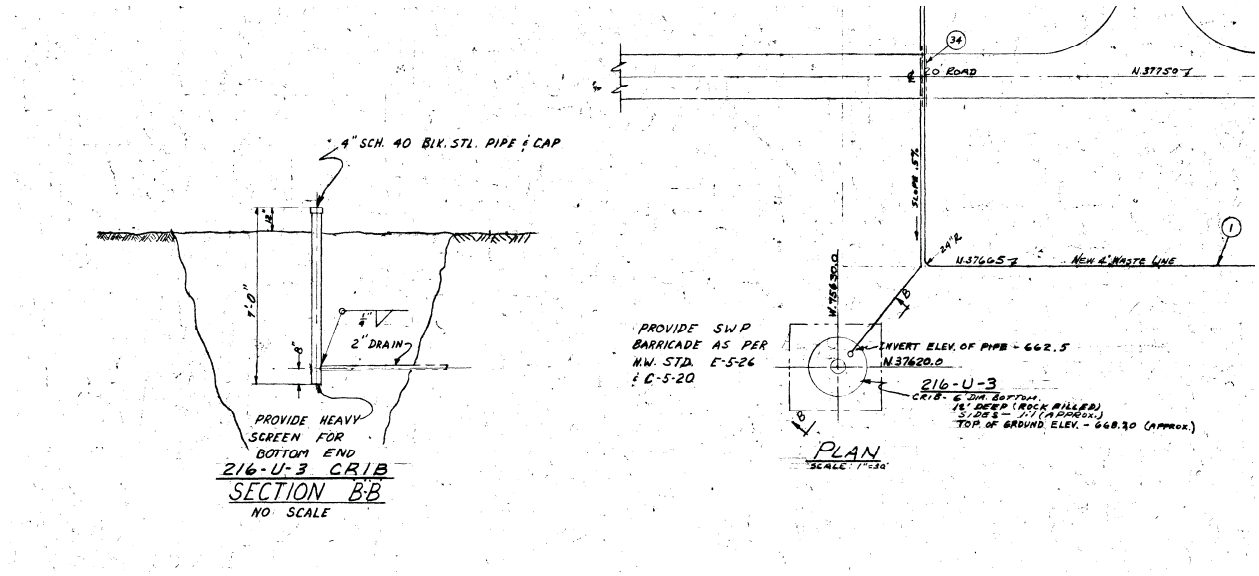


Figure 2. Engineering Drawing for 216-U-3 from H-2-44004 Sheet 1 Rev. 11



Site Description

Site ID: 216-U-4
Site Type: Injection/Reverse Well
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1
Service Dates: 1947 to 1955
Volume/Mass Discharged: 3.0E+05 L (7.9E+04 gal)

Waste Site Location and Physical Description: The 216-U-4 Injection/Reverse Well is located at the southwest corner of the 222-U Building (See Figure 1. ArcMap Image, and Figure 2. H-2-44511 Sheet 68 Rev. 6). The well is marked with a small cement cover and a bronze medallion. The well is consists of pipe sunk into the ground with the bottom 8 m (25 ft) of pipe perforated. The end of the pipe is nearly closed by flattening. The site was sealed off during deactivation by installing an overflow line to the new 216-U-4A French Drain.

Waste Site Coordinates:

E-567579.10700 N-135108.92299

Site Dimensions:

Site Diameter: 0.08 meters (0.25 ft) Site Depth: 22.86 m (75 ft)
Site Area: 0.005 m^2 (0.049 ft^2) Cover Thickness: N/A

Release Summary: The site received acidic decontamination waste containing fission products from the 222-U Laboratory hood sinks. Both plutonium and fission products were discharged to the site from laboratory hoods and sinks. The site waste contains nitrate.

The estimated total volume of process effluent discharged to the site is approximately 3.0E+05 L (7.9E+04 gal) and the calculated potential lifetime discharge could exceed one vadose zone pore volume.

$PV_{released}$ = 3.0E+05 L/ (0.005 square m*81 m*0.3*1000 Liters/m^3) = 2457

Related Site Structure(s): The site is associated with the 222-U Building.

Site Posting: The site is posted as "Underground Radioactive Material".

Site Characterization Summary: Visual and radiological surveys are performed at this site. In 1994, characterization borehole 299-W19-98 was drilled between 216-U-4 and 216-U-4A to characterize these two waste sites. On August 1, 1993 through August 1, 1994 analytical sampling occurred. Cesium-137, cobalt-60 and europium-154 were identified. Logging of characterization well 299-W19-98 found maximum Cesium-137 readings of 1460 pCi/g at a depth of 18.7 m (61.5 ft), maximum Cobalt 60 readings of 2.5 pCi/g at a depth of 16.4 m (54 ft) and maximum Europium readings of 5 pCi/g at a depth of 15.7 m (51.5 ft). The values of 200 to 300 pCi/g Cesium is in the 1 to 4.6 m (3 to 15 ft) depth range. Little contamination was noted until the interval of 38 to 68 ft.

A site walk was conducted on October 27, 2005 where a hole was hand dug around the 3 inch well extension. A 8 5/8 inch casing and a steel plate was found below grade, attached to the extension pipe. The 3 inch annulus was accessed with a camera and a plumb bob. The camera got stuck at the point where the 3 inch and 8 5/8 inch casings were welded together. They found the well to be clear to approximately 40 feet, which is the shoe of the 8 5/8 inch casing.

Potential Contaminants:

Radioactive: Cesium-137 (1460 pCi/g), Cobalt-60 (2.5 pCi/g), Europium-154 (5 pCi/g), Plutonium, and Fission products

Non-Radioactive: Nitrate

References:

WIDS General Summary Report for site 216-U-4.
ArcMap.
QMap.
H-2-44511 Sheet 68 Rev. 6

Figure 1. ArcMap Image

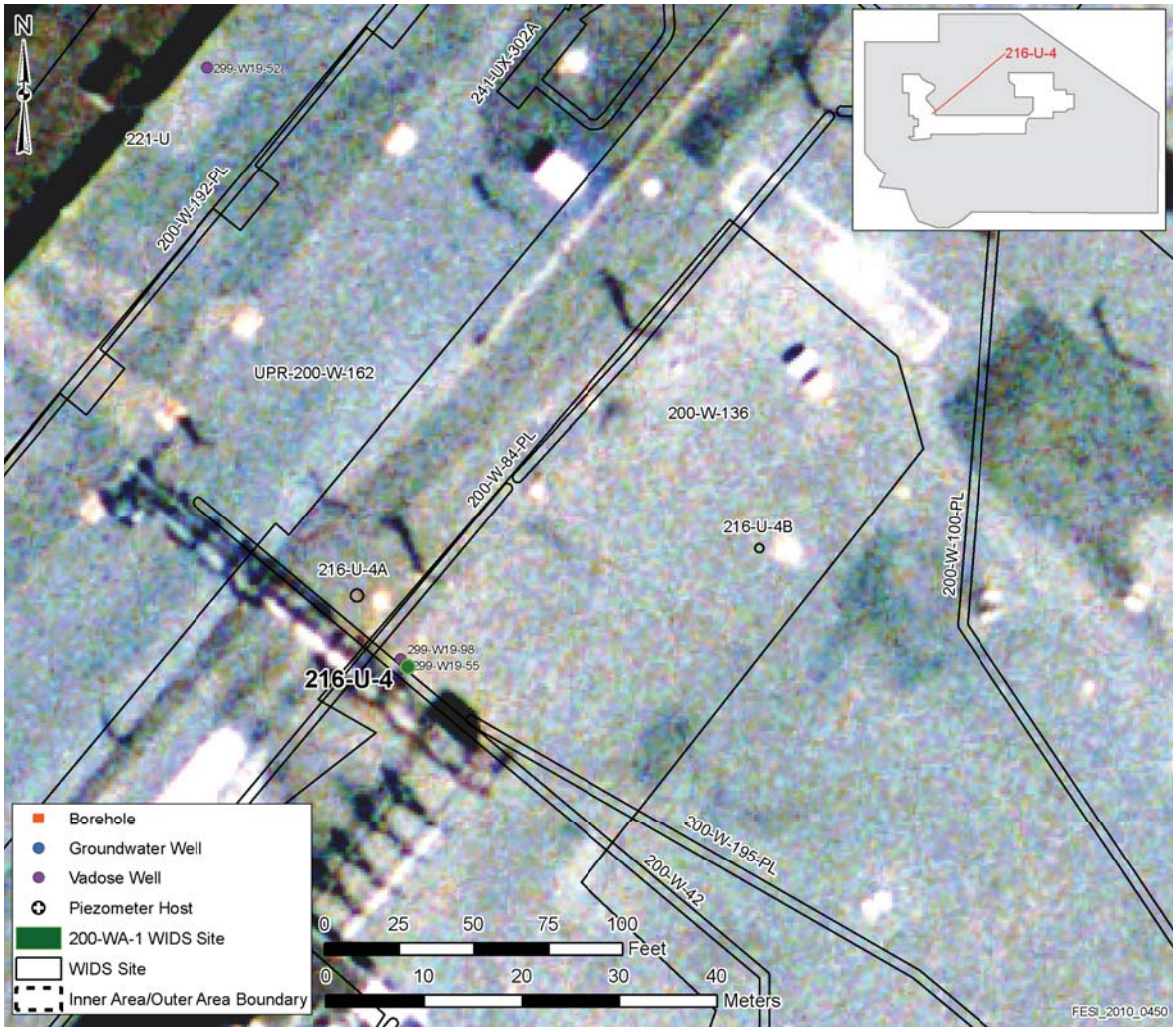
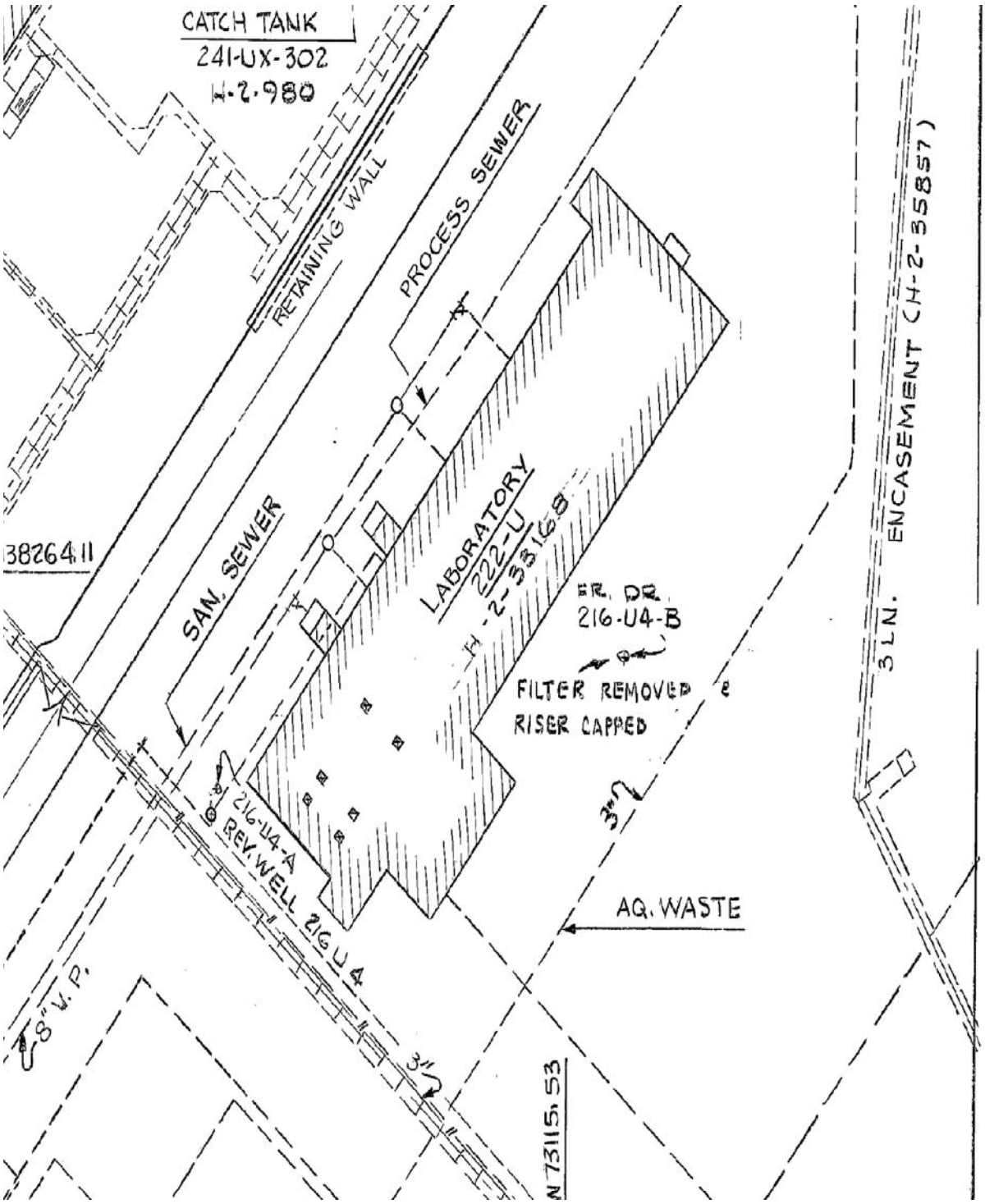


Figure 2. H-2-44511 Sheet 68 Rev. 6



Site Description

Site ID: 216-U-4A
Site Type: French Drain
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1
Service Dates: July 1955 to January 1970
Volume/Mass Discharged: 5.45E+05L (1.44E+05gal)

Waste Site Location and Physical Description: The 216-U-4A French Drain is located at the southwest corner of the 222-U Building (See Figure 1. ArcMap Image, and Figure 2. Site Map[1]). The drain consists of a vertically set concrete pipe. The drain resets on undisturbed soil and is not gravel filled. The top of the drain is painted yellow and has a removable lid (See Figure 3. Engineering Diagram for 216-U-4A)[1].

Waste Site Coordinates:

E-567573.91899 N-135116.07404

Site Dimensions:

Site Diameter: 1.3 m (4.25 ft)
Site Area: 1.33 m^2 (14.18 ft^2)
Site Depth: 2.74 meters (9 ft) to bottom of structure
Cover Thickness: N/A

Release Summary: From July 1955 to January 1965 the site received acidic decontamination waste containing fission products from hood sinks in the 222-U. Waste flowed to the 216-U-4A French Drain via the overflow line from the 216-U-4 Reverse Well. From January 1965 to July 1970 the site received Pacific Northwest Laboratory operations decontamination waste from a hood sink in the 222-U Building.

A detailed discharge summary is included in Figure 4[2]. The estimated total volume of process effluent discharged to the site is approximately 5.45E+05L (1.44E+05gal) and the calculated potential lifetime discharge could exceed one vadose zone pore volume.

$PV_{released}$ = 5.45E+05 L/ (1.33 square m*81 m*0.3*1000 Liters/m^3) = 16.9

Related Site Structure(s): The site is associated with the 222-U Building and the 216-U-4 Reverse Well.

Site Posting: This French drain is posted as “Underground Radioactive Material”.

Site Characterization Summary: Visual and radiological surveys are performed at this site. The site waste contains nitrate, phosphate, and sodium. RHO-CD-673 states that both plutonium and fission products were discharged to the site from laboratory hoods and sinks. A limited field investigation of high-priority waste units was conducted from August 1993 through

August 1994. DOE/RL-95-13 includes information related to characterization borehole 299-W19-98 that was drilled between 216-U-4 and 216-U-4A. On August 1, 1993 analytical sampling of borehole 299-W19-98 was completed. Cesium-137, cobalt-60 and europium-154 were identified.

Potential Contaminants:

Radioactive: Plutonium, Fission products, Cesium-137, Cobalt-60, and Europium-154

Non-Radioactive: Nitrate, Phosphate, and Sodium

References:

WIDS General Summary Report for site 216-U-4A.
ArcMap.
QMap.
1. "Site Location Map & Cross Sections.pdf" Pages 2-3.
2. EVSDS Database. Virtual Library. BHI-00608 Rev.1 200 West Effluent Volumes spreadsheet values

Figure 1. ArcMap Image

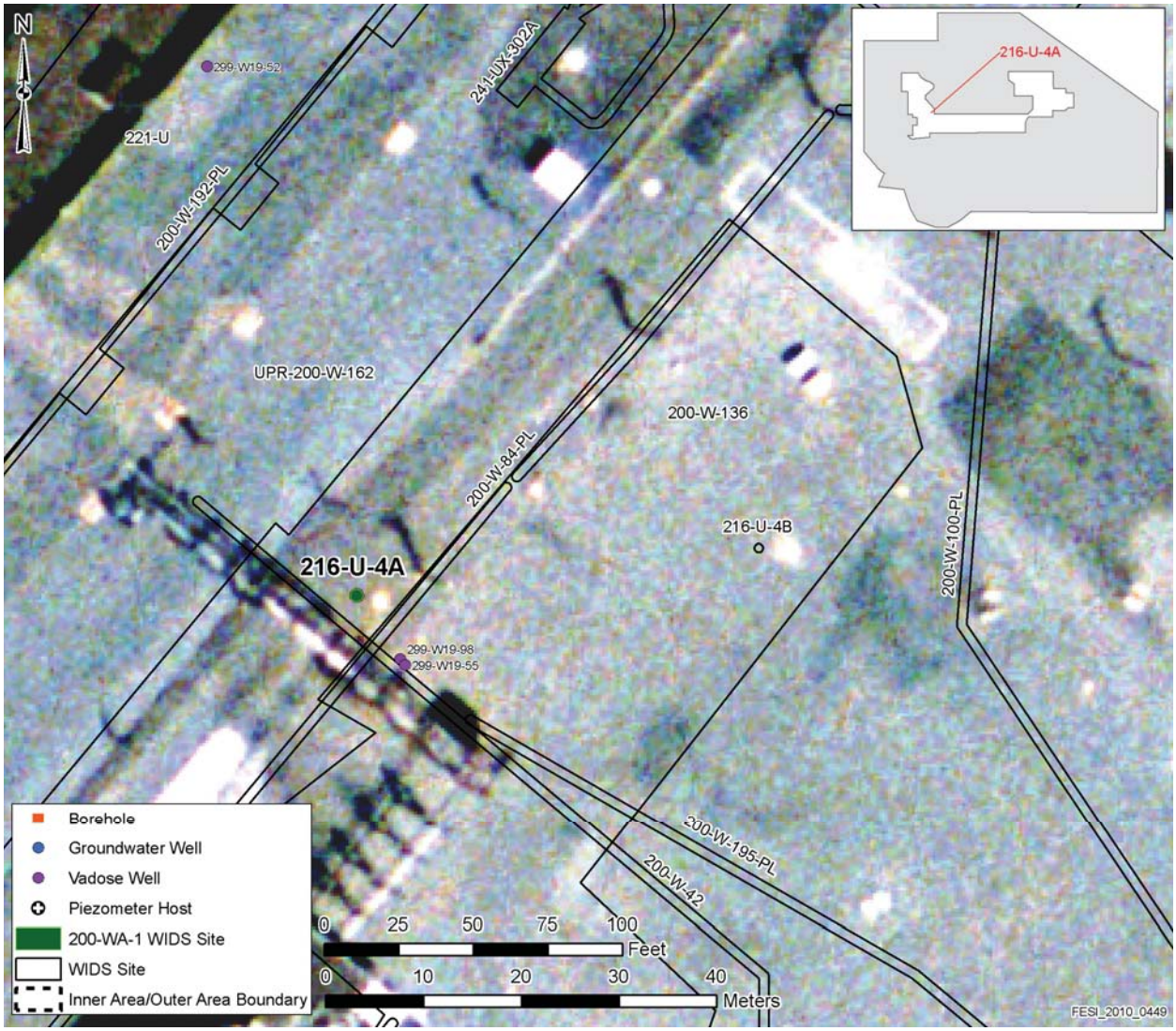


Figure 2. Site Map

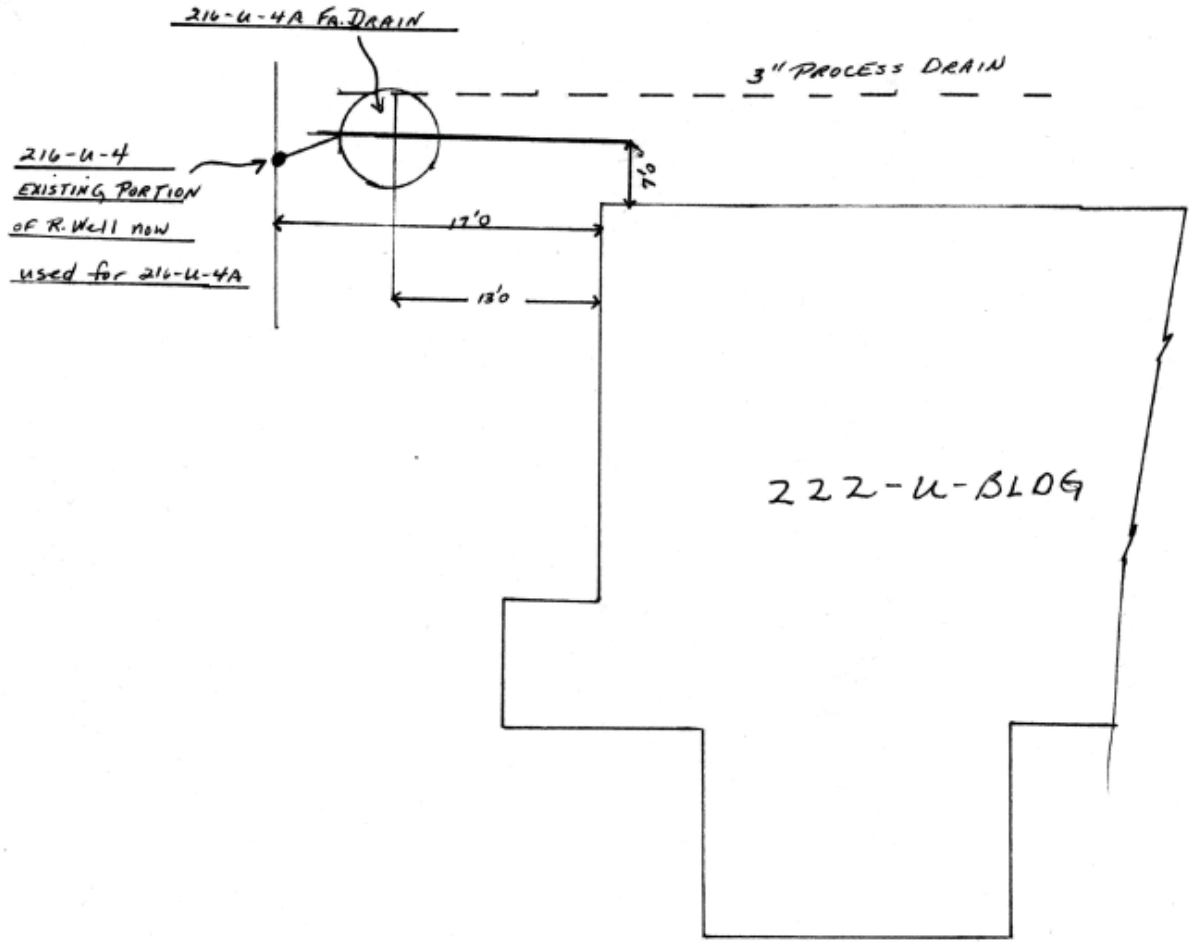


Figure 3. Engineering Diagram for 216-U-4A

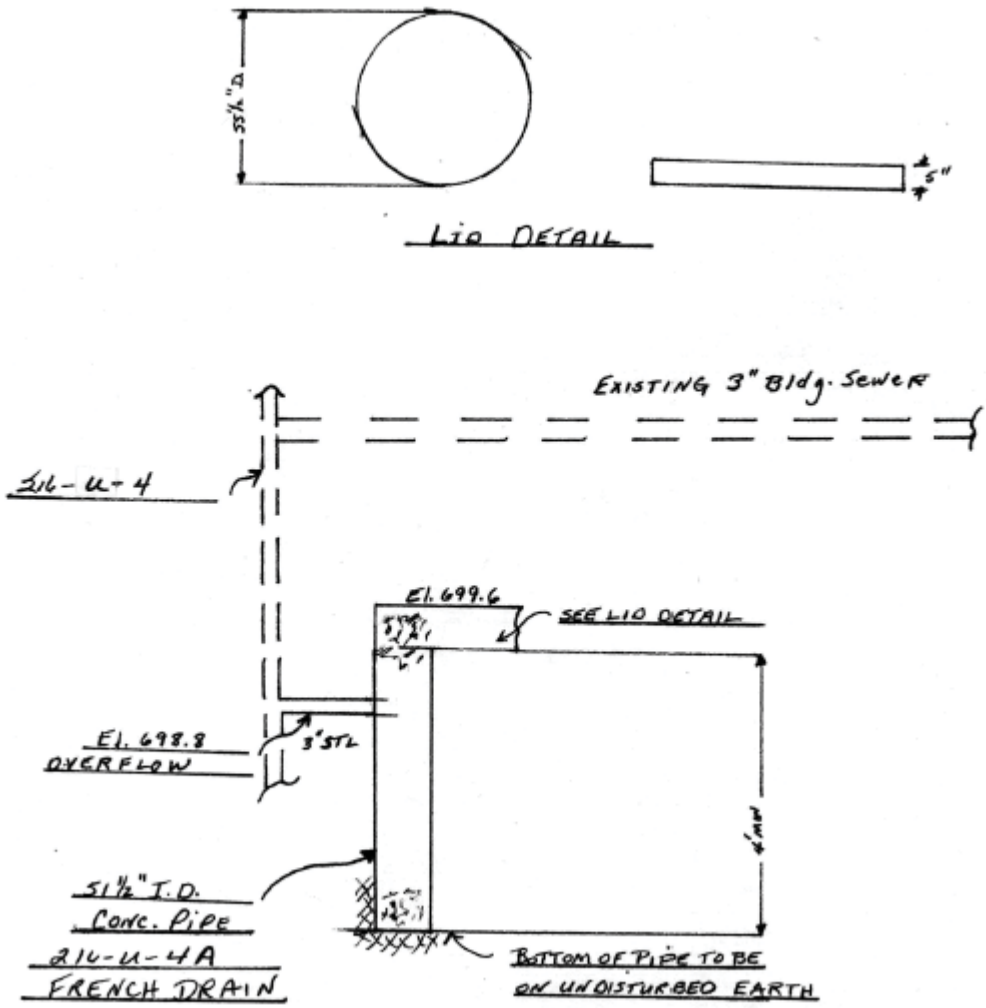
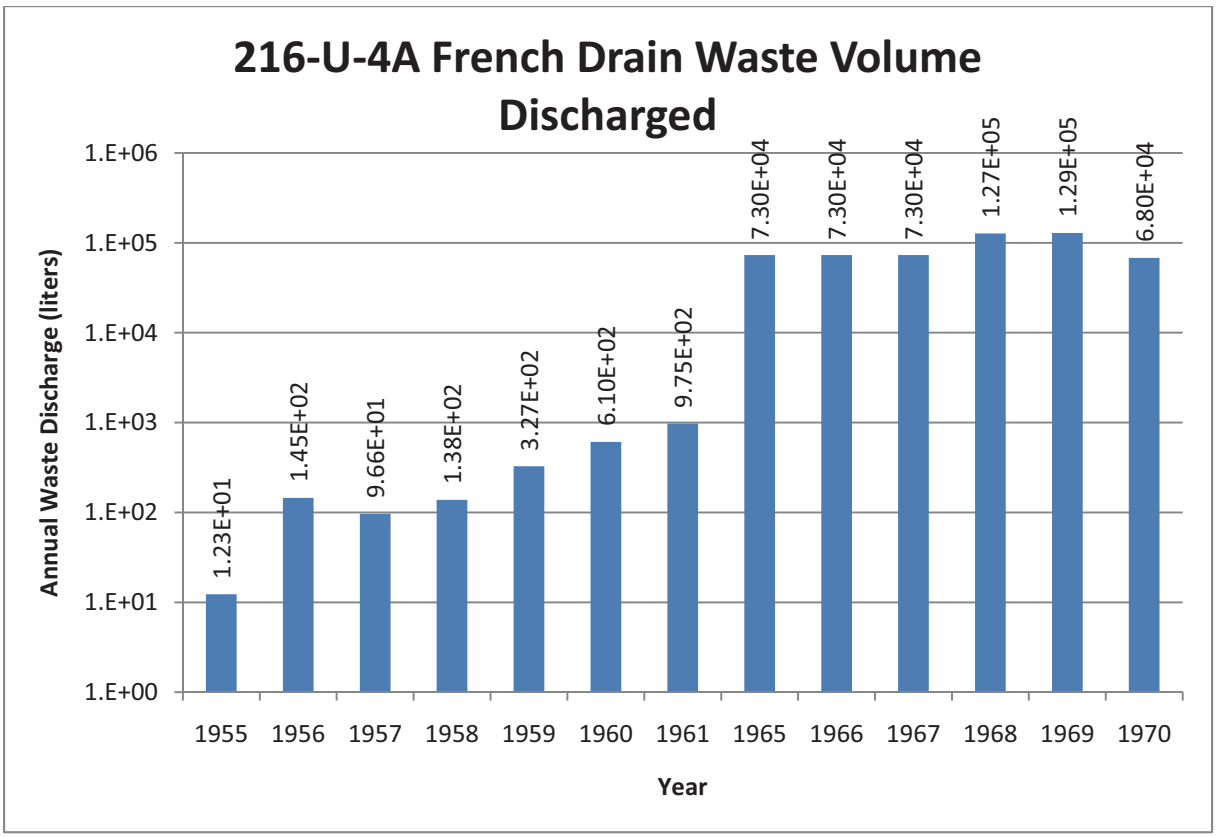


Figure 4. 216-U-4A French Drain Waste Volume Discharged Summary



Site Description

Site ID: 216-U-4B
Site Type: French Drain
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1
Service Dates: January 1960 to July 1970
Volume/Mass Discharged: 3.3E+04 L (8.7E+03 gal)

Waste Site Location and Physical Description: This site is located on the southeast side of the 222-U Building (Figure 1. ArcMap Image, and Figure 2. Site Location Map Extracted from H-2-44511 Sheet 68 Rev. 6). The site consists of a french drain that is under a cement pad. A one inch diameter stainless steel vent riser extends approximately 1.2 m (4 ft) above the surface. The unit was deactivated when Pacific Northwest Laboratory operations in the 222-U Building were shutdown.

Waste Site Coordinates:

E-567615.03800 N-135120.89801

Site Dimensions:

Site Diameter: 0.91m (3 ft)
Site Area: 0.65 m^2 (7.07 ft^2)
Site Depth: 3.05 meters (10 ft) to bottom of structure
Cover Thickness: N/A

Release Summary: From January 1960 to July 1970 the site received waste from a hot cell and hood in the 222-U Building. From January 1965 to July 1970 the site received hot cell and hood waste from Pacific Northwest Laboratory experiments conducted in 222-U. The site waste contains nitrate, Sr-90 and Cs-137.[2]

A detailed summary of discharge volume for 216-U-4B is shown on Figure 3. 216-U-4B French Drain Waste Volume Discharged Summary. [2] The estimated total volume of process effluent discharged to the site is approximately 3.3E+04 L (8.7E+03 gal) and the calculated potential lifetime discharge could exceed one vadose zone pore volume.

$PV_{released}$ = 3.3E+04 L/ (0.65 square m*81 m*0.3*1000 Liters/m^3) = 2.09

Related Site Structure(s): The site is associated with the 222-U Building.

Site Posting: The site is posted with "Underground Radioactive Material" sign.

Site Characterization Summary: Visual and radiological surveys are performed at this site. The March 3, 2005 Geophysical Survey indicated that the subsurface beneath the investigation area is heavily disturbed. One north-south linear anomaly along the east edge of the investigation area is interpreted as a utility. Several isolated anomalies indicate buried debris.

There was also a site walk down on July 15, 2002 that led to the discovery of a small yellow drain cover, adjacent to the 222-U building wall, which was incorrectly labeled as 216-U-4B. Notification was made to U Plant Operations to fix the label mistake.

Potential Contaminants:

Radioactive [1]: Sr-90 ($1.81E^{-3}$), Cs-137 ($2.14E^{-1}$), Plutonium ($5.4E^{-2}$)

Non-Radioactive: Nitrate

References:

WIDS General Summary Report for site 216-U-4B.
H-2-44511 Sheet 68 Rev. 6
1. WIDS "Waste Radionuclide Inventories.pdf" Page 1.
2. EVSDS Database. Virtual Library. BHI-00608 Rev.1 200 West Effluent Volumes spreadsheet values

Figure 1. ArcMap Image

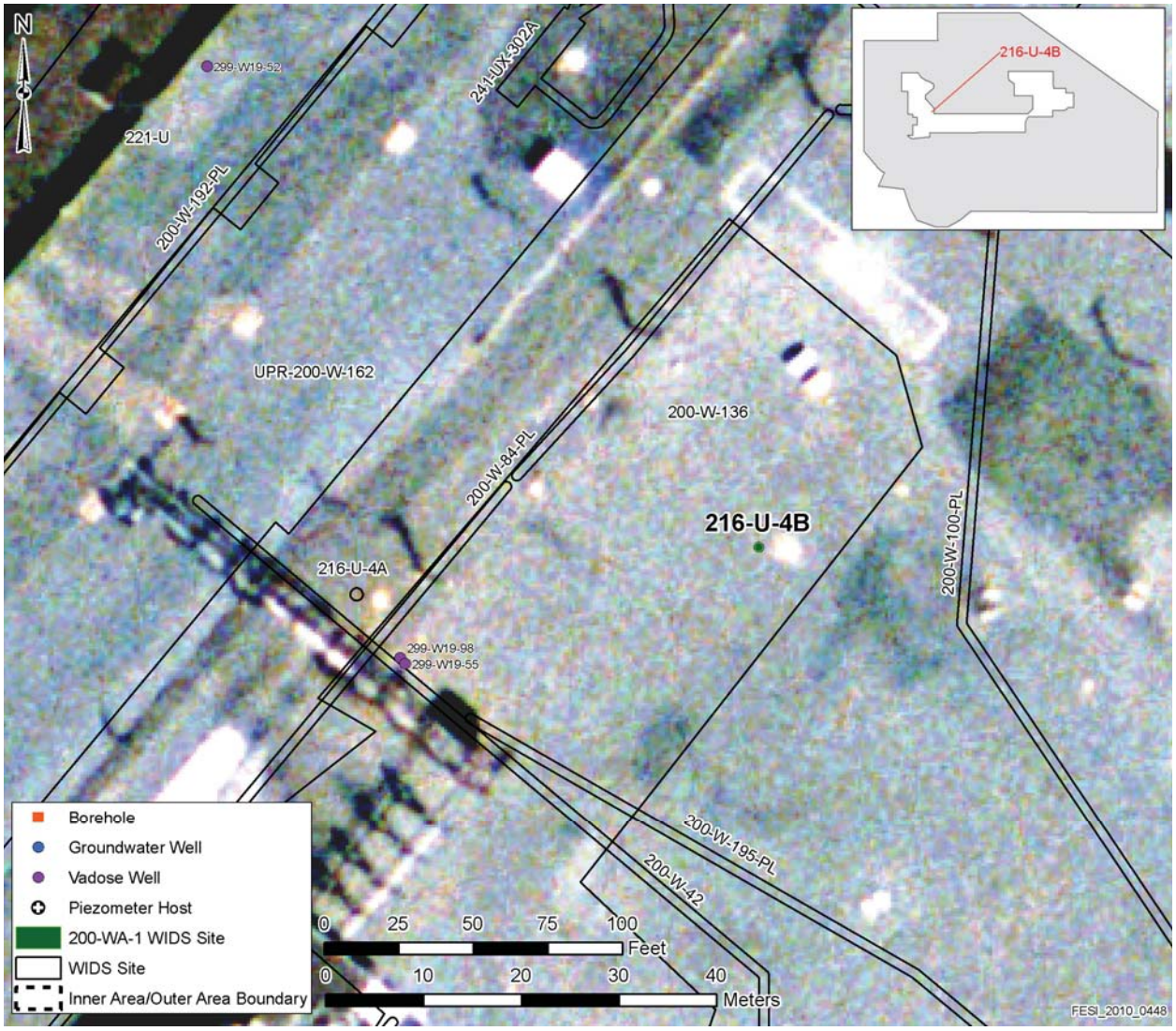


Figure 2. Site Location Map Extracted from H-2-44511 Sheet 68 Rev. 6

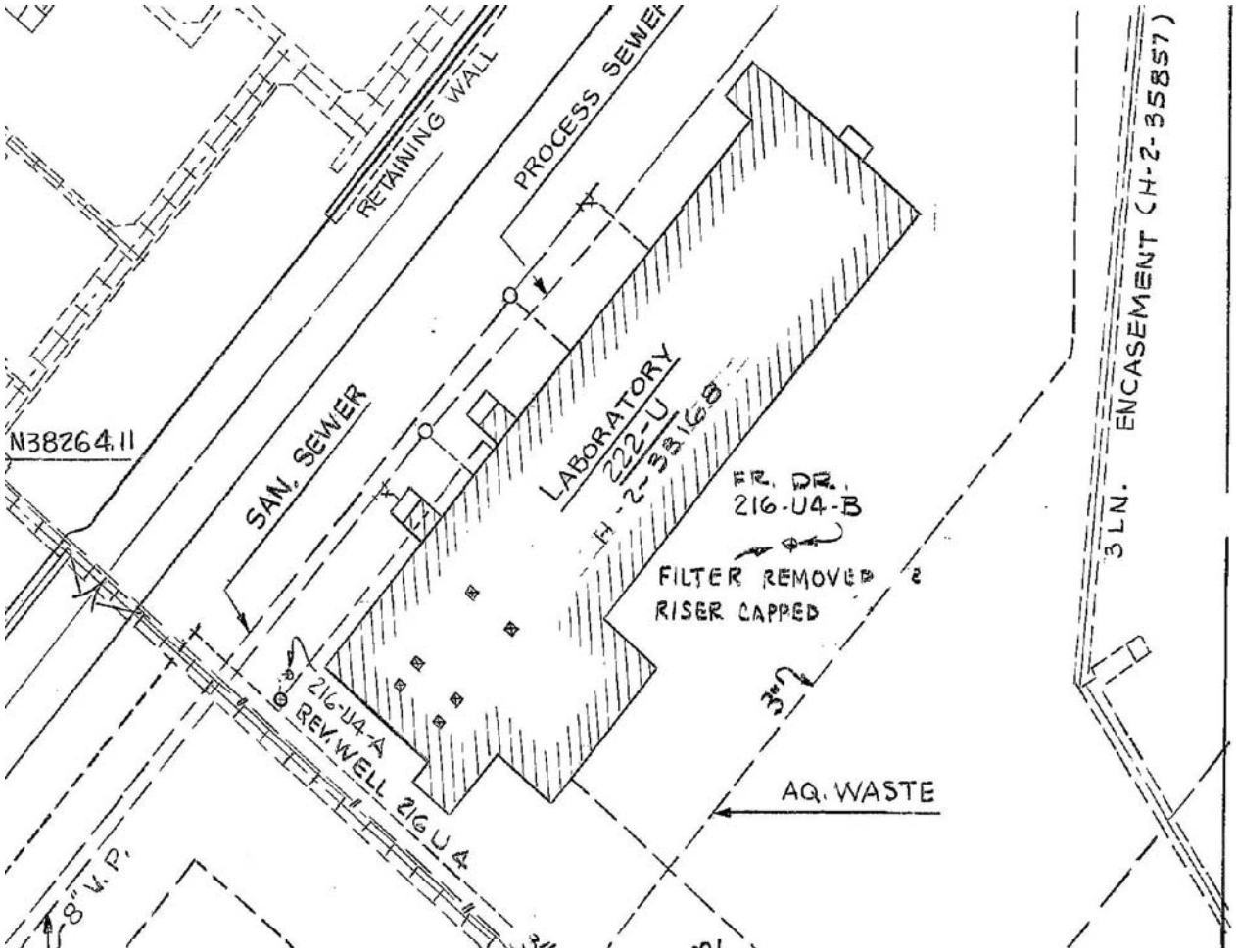
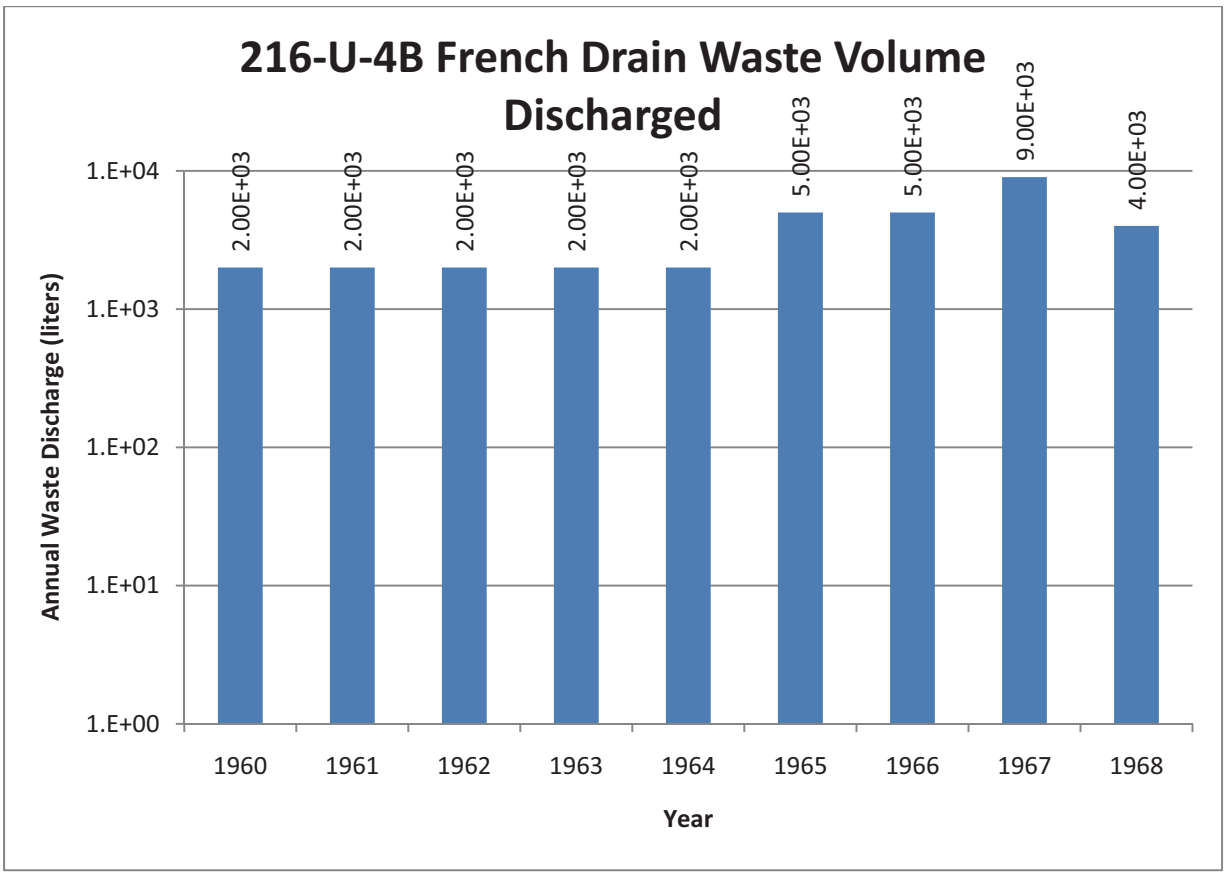


Figure 3. 216-U-4B French Drain Waste Volume Discharged Summary



Site Description

Site ID: 216-U-5
Site Type: Trench
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1
Service Dates: March 1952
Volume/Mass Discharged: 2.25E+06 L (5.9E+05 gal)

Waste Site Location and Physical Description: The site is located northwest of the 221-U-Building (Figure 1. ArcMap Image). The site consists of a backfilled trench that was deactivated when the start up waste disposal operation was complete. The above ground piping was removed and the trench was backfilled. The site was interim stabilized in 1994 with 0.61 m (2 ft) of clean dirt.

Waste Site Coordinates:

E-567672.93748 N-135359.31255

Site Dimensions:

Site Length: 12.19 m (40 ft)
Site Width: 3.05 m (10.00 ft)
Site Area: 37.2 m^2 (400 ft^2)
Site Depth: 3.05 meters (10.0 ft)
Cover Thickness: 0.61 m (2 ft)

Release Summary: This site was used as liquid disposal site for unirradiated uranium waste from the cold start-up run at the 221-U Building. The waste contained 200 kg of nitrate.

The estimated total volume of process effluent discharged to the site is approximately 2.25E+06 L (5.9E+05 gal) and the calculated potential lifetime discharge could exceed one vadose zone pore volume.

$PV_{released}$ = 2.25E+06 L/ (37.2 square m*81 m*0.3*1000 Liters/m^3) = 2.49

Related Site Structure(s): The site is associated with the 221-U Building and the 216-U-6 Trench.

Site Posting: The site is posted as “Underground Radioactive Material”.

Site Characterization Summary: Annual radiological surveys are performed at this site. On April 22, 2002 a GPS survey was completed and the data is stored in HGIS. On February 1, 2005 a geophysical survey was completed as part of the U Plant remediation activities.

Potential Contaminants:

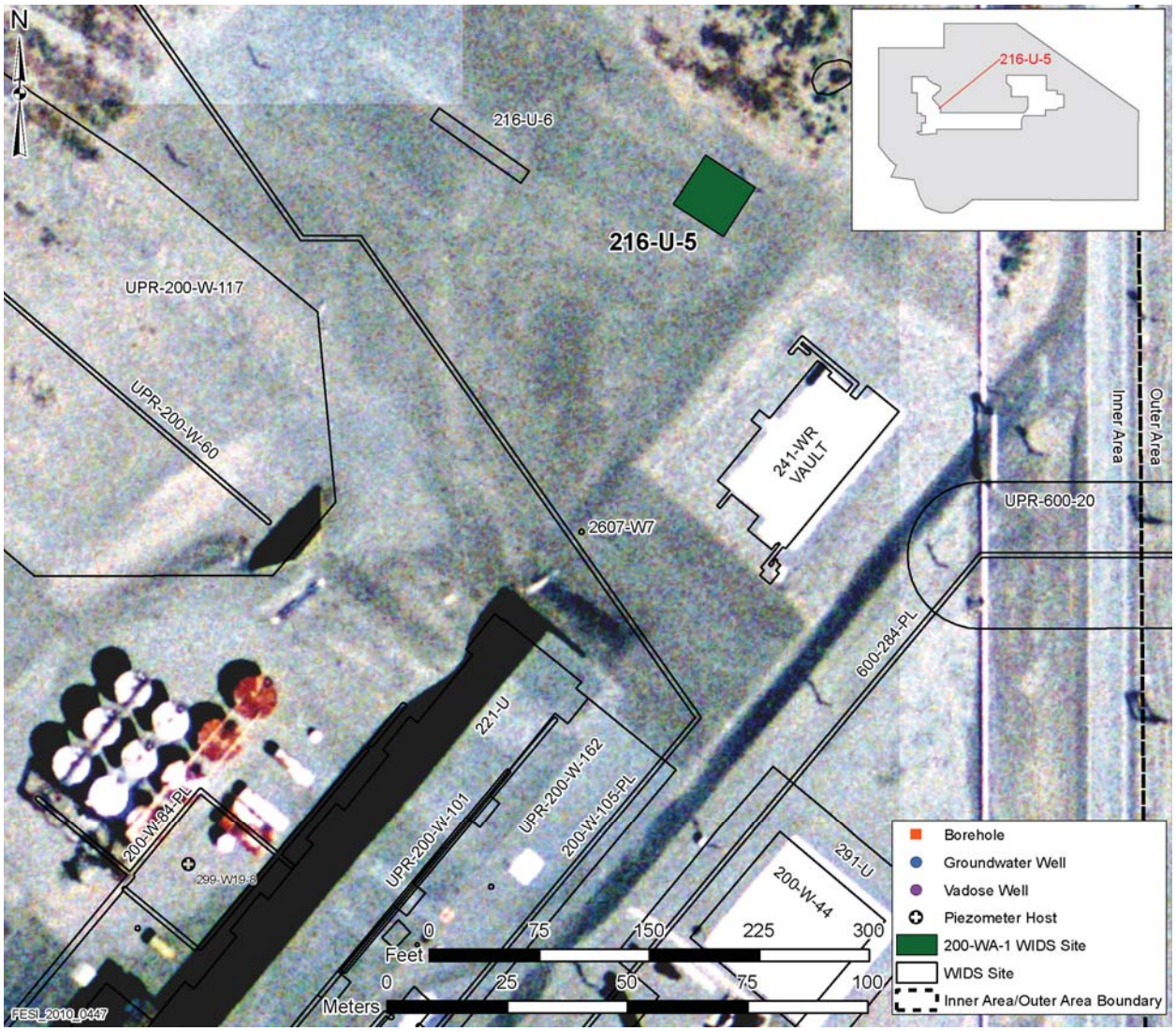
Radioactive: Uranium

Non-Radioactive: Nitrate (200kg)

References:

WIDS General Summary Report for site 216-U-5.
QMap.
ArcMap.

Figure 1. Arcmap Image



Site Description

Site ID: 216-U-6
Site Type: Trench
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1
Service Dates: March 1952
Volume/Mass Discharged: 2.25E+06 L (5.94E+05 gal)

Waste Site Location and Physical Description: The 216-U-6 Trench is located northwest of the 221-U Building. The trench was deactivated when the start up waste disposal operation was complete. The above ground piping was removed and the trench was backfilled. In 1994, the crib surface was interim stabilized with 46 to 61 cm (18 to 24 in) of uncontaminated backfill.

Waste Site Coordinates:

E-567624.21539 N-135369.77825

Site Dimensions (Bottom Dimensions):

Site Length: 22.86 m (75 ft)
Site Width: 3.05 m (10.00 ft)
Site Area: 69.7 m^2 (750 ft^2)

Site Depth: 3.05 meters (10.0 ft)
Cover Thickness: N/A

**These are bottom dimensions.*

Release Summary: This site was used as liquid disposal site for unirradiated uranium waste from the cold start-up run at the 221-U Building. The waste included 200 kg of nitrate.

The estimated total volume of process effluent discharged to the site is approximately 2.25E+06 L (5.9E+05 gal) and the calculated potential lifetime discharge could exceed one vadose zone pore volume.

$PV_{released}$ = 2.25E+06 L/ (69.7 square m*81 m*0.3*1000 Liters/m^3) = 1.33

Related Site Structure(s): The site is associated with the 221-U Building and the 216-U-5 Trench.

Site Posting: The site is posted as “Underground Radioactive Material”.

Site Characterization Summary: An annual routine radiological survey is done at this site.

On April 22, 2002 a GPS Survey of the site was completed and the data is stored in HGIS. Also on February 1, 2005 a geophysical survey was completed as part of the U Plant remediation activities.

Potential Contaminants:

Radioactive: Co-60 ($7.1E^{-4}$ curies), Sr-90 ($2.14E^{-2}$ curies), Cs-137 ($2.26E^{-2}$ curies), U-238 ($1.22E^{-1}$ curies or 363kg), Plutonium (0.050gm)

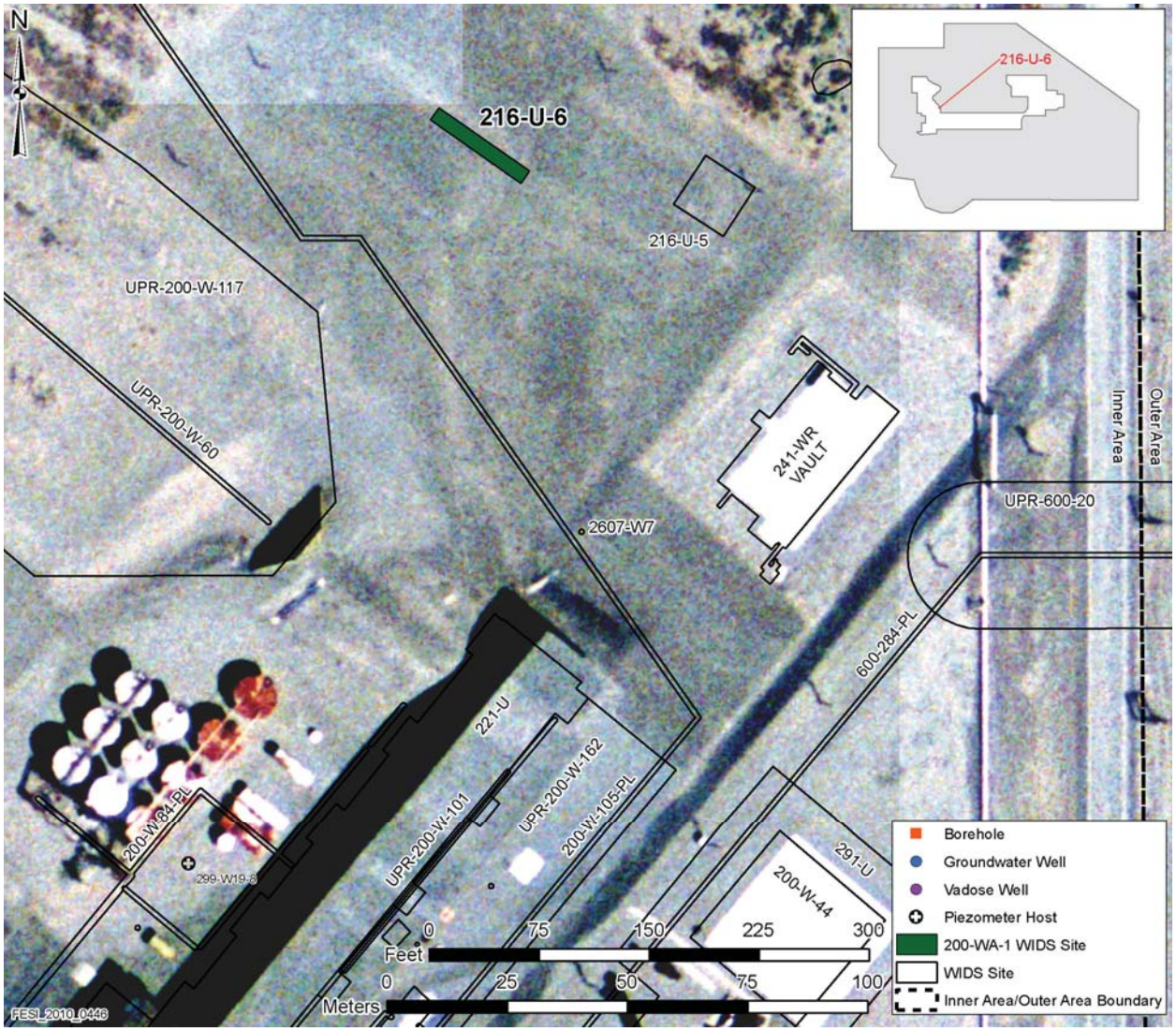
**These values were decayed through 31 Mar. 1986.*

Non-Radioactive: Nitrate (200kg)

References:

WIDS General Summary Report for site 216-U-6.
QMap.
ArcMap.1. WIDS "Chemicals Disposed & Radionuclide Inventories.pdf" Page 2

Figure 1. ArcMap Image



Site Description

Site ID: 216-U-7
Site Type: French Drain
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-2
Service Dates: March 1952 to June 1957
Volume/Mass Discharged: 7E+03 L (1.85E+03 gal)

Waste Site Location and Physical Description: This site is located on the southeast side of the 221-U Building near Section 6 and northwest of the 241-UX-154 Diversion Box (Figure 1. ArcMap Image). This drain is constructed of a concrete pipe set vertically into the ground. Gravel fills 1.1 meters (3.5 feet) of the pipe (See Figure 2. Engineering Design for 216-U-7). The French drain was retired when the Uranium Recovery operations in the 221-U Building were shut down. The site was deactivated by removing the cell jumpers in the 221-U Building. In 1998, the contaminated areas on the east side of the 221-U building were surface stabilized with material from the 200 Area Ash Pit.

Waste Site Coordinates:

E-567606.92172 N-135205.54293

Site Dimensions:

Site Diameter: 0.76 m (2.5 ft)
Site Area: 0.45 m^2 (4.9 ft^2)
Site Depth: 5.18 meters (17 ft)
Cover Thickness: N/A

Release Summary: The site received liquid wastes from a counting box floor drain during the metal recovery program. The site waste contains nitrate. Due to UPR-200-W-138, it is assumed that 13 kg (30 lbs.) of uranium in uranyl nitrate hexahydrate (UNH) solution were also introduced to the soil through the 216-U-7 French Drain. However, the release associated with UPR-200-W-138 may be associated with a different french drain. The release information is vague. It is possible the event affected the 216-U-7 French Drain if sufficient liquid volume was released to the surface to flow southward and reach the 216-U-7 French Drain location.

The estimated total volume of process effluent discharged to the site is approximately 7E+03 L (1.85E+03 gal) and the calculated potential lifetime discharge may exhibit deep vadose effects.

$PV_{released}$ = 7E+03 L/ (0.45 square m*81 m*0.3*1000 Liters/m^3) = 0.64

Related Site Structure(s): The site is associated with the 221-U Building, UPR-200-W-162 and UPR-200-W-138. The pipeline from the counting box to the French drain is 200-W-217-PL.

Site Posting: The area is posted as Underground Radioactive Material.

Site Characterization Summary: Visual and radiological surveys are performed at this site.

Potential Contaminants:

Radioactive: Uranium in Uranyl Nitrate Hexahydrate (13kg or 30lbs.)

Non-Radioactive: Nitrate

References:

WIDS General Summary Report for site 216-U-7.
QMap.
ArcMap.
H-2-43078 Sheet 1 Rev. 5.

Figure 1. ArcMap Image

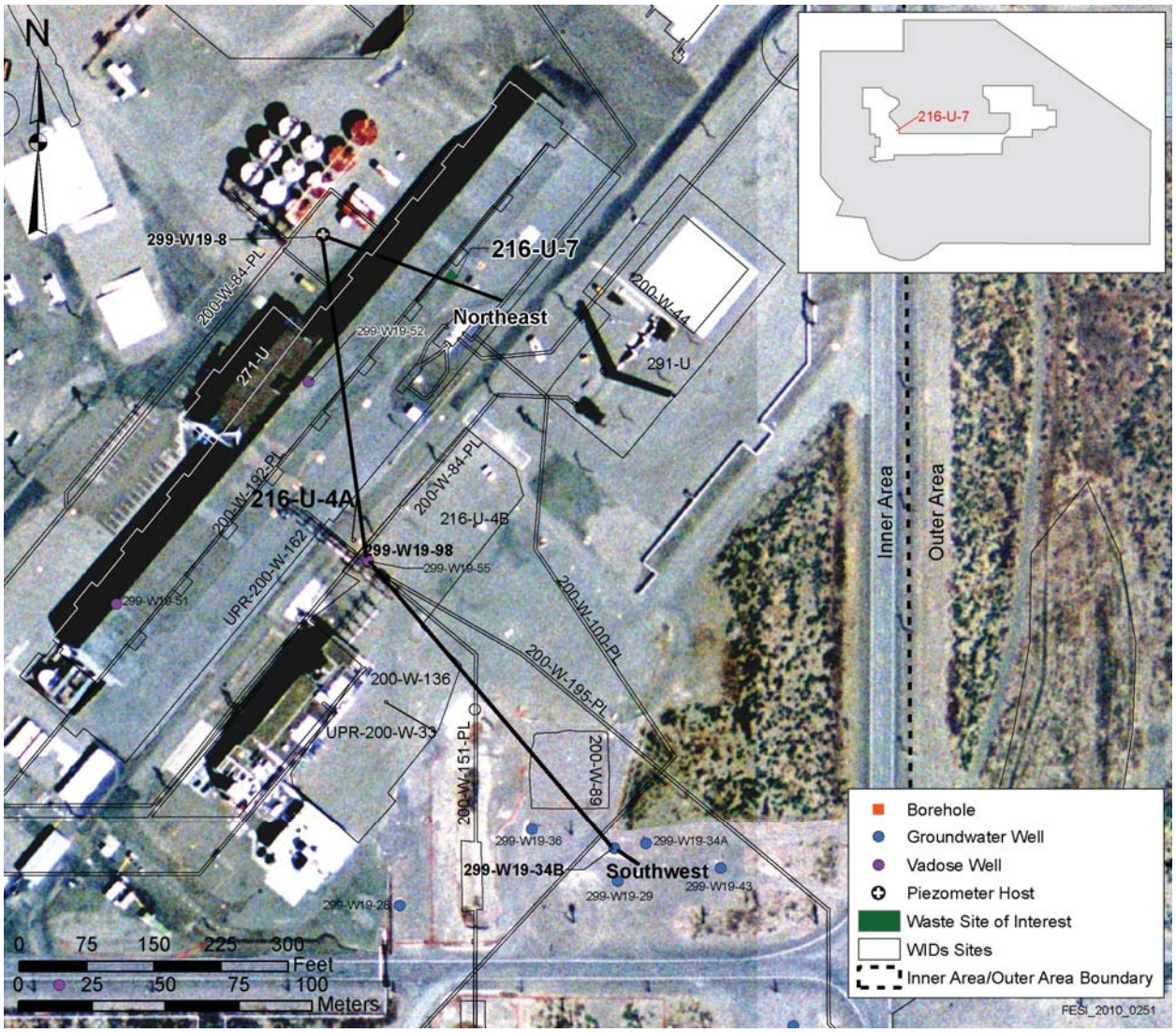
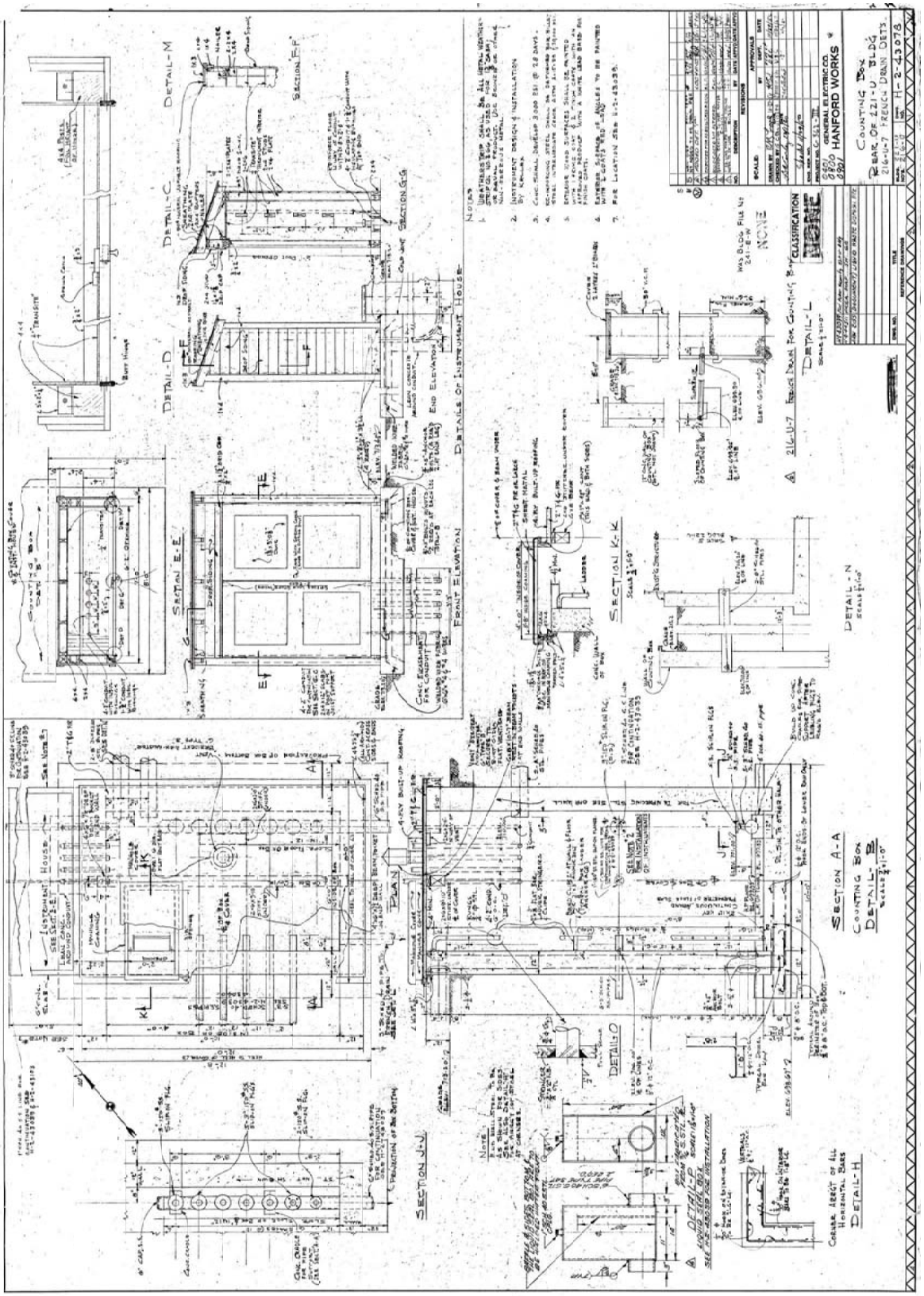


Figure 2. Engineering Design for 216-U-7



Site Description

Site ID: 216-U-8
Site Type: Crib
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1
Service Dates: 1952 to 1960
Volume/Mass Discharged: 3.79E+08 L (1.00.E+08 gal)

Waste Site Location and Physical Description: The site is located west of Beloit Avenue and south of 16th Street (Figure 1. ArcMap Image). The site consists of three wood timber cribs set in series. Each crib is 4.9 by 4.9 by 3.0 m deep (16 by 16 by 10 ft deep). The cribs were filled with 1.3 cm (0.5 in) crushed stone to the tops of the wooden structures (See Figure 2. Engineering Diagram for 216-U-8 Crib (From H-2-43028)). There is roughly 2,070 m^3 (73,000 ft^3) of gravel fill in the cribs. The cribs were fed by a vitrified clay pipeline. The site was deactivated by blanking the pipeline north of the unit in 1960, when ground settling occurred around the crib vent risers. Approximately 57 m^3 (75 yd^3) of dirt was used to fill the sink holes. The crib surface and adjacent Surface Contamination Area (UPR-200-W-163) were interim stabilized in 1995. Contaminated soil from UPR-200-W-163 was consolidated onto the surface of the 216-U-8 Crib and the contaminated soil was covered with 0.3 to 0.6 m (1 to 2 ft) of clean soil.

Waste Site Coordinates:

E-567615.95189 N-134697.39153

Site Dimensions:

Site Length: 48.77 m (160 ft)
Site Width: 15.24 m (50 ft)
Site Area: 743 m^2 (8,000 ft^2)
Site Depth: 9.81 meters (32.2 ft) to bottom of structure
Cover Thickness: N/A

Release Summary: The cribs received acidic process condensate from the 221-U and 224-U buildings along with drainage from the 291-U stack via an underground vitrified clay pipeline. Contaminated soil from UPR-200-W-163 was scraped and consolidated onto the surface of the 216-U-8 Crib during the 1995 interim stabilization. The UPR-200-W-163 release consisted of radiologically contaminated vegetation growing above the underground pipeline to the 216-U-8 crib.

A detailed summary of liquid waste discharged to 216-U-8 is shown in Figure 3. 216-U-8 Crib Waste Volume Discharged Summary. The estimated total volume of process effluent discharged to the site is approximately 3.79E+08 L (1.00.E+08 gal) and the calculated potential lifetime discharge could exceed one vadose zone pore volume.

$PV_{released}$ = 1.00E+08 L/ (743 square m*81 m*0.3*1000 Liters/m^3) = 21

Related Site Structure(s): The site is associated with 216-U-12, 200-W-42, the 221-U and 224-U Buildings and the 291-U Stack.

Site Posting: The site is marked and posted with Underground Radioactive Material signs.

Site Characterization Summary : During the 1995 Limited Field Investigation, borehole (299-W19-94) was drilled though the crib and abandoned following characterization. Gamma logging detected cesium-137, europium-154, uranium-235 and uranium-238 in the borehole. Borehole soil samples were collected and analyzed.

Four surface and near-surface soil samples and four vegetation samples were also collected and analyzed. Surface soil samples showed only background levels of contaminants. Subsurface soil samples collected to a maximum depth of 13 ft showed high concentrations of cesium-137 and strontium-90 at depth, near the underground vitrified clay pipeline. Vegetation samples also showed high concentrations of cesium-137 and strontium-90 in vegetation collected near the clay pipeline.

An in-line camera survey performed on the vitrified clay pipeline revealed many dislodged joints in the portion of the pipeline between 224-U and the 216-U-8 Crib.

Potential Contaminants:

Radioactive: cesium-137, europium-154, uranium-235, uranium-238, and strontium-90.

Non-Radioactive: Not specified

References:

WIDS General Summary Report for site 216-U-8.ArcMap.
QMap.
H-2-43028 Sheet 1 Rev. 6.
EVSDS Database/Virtual Library. BHI-00608 Rev.1. 200 West Effluent Volumes spreadsheet values.

Figure 1. ArcMap Image

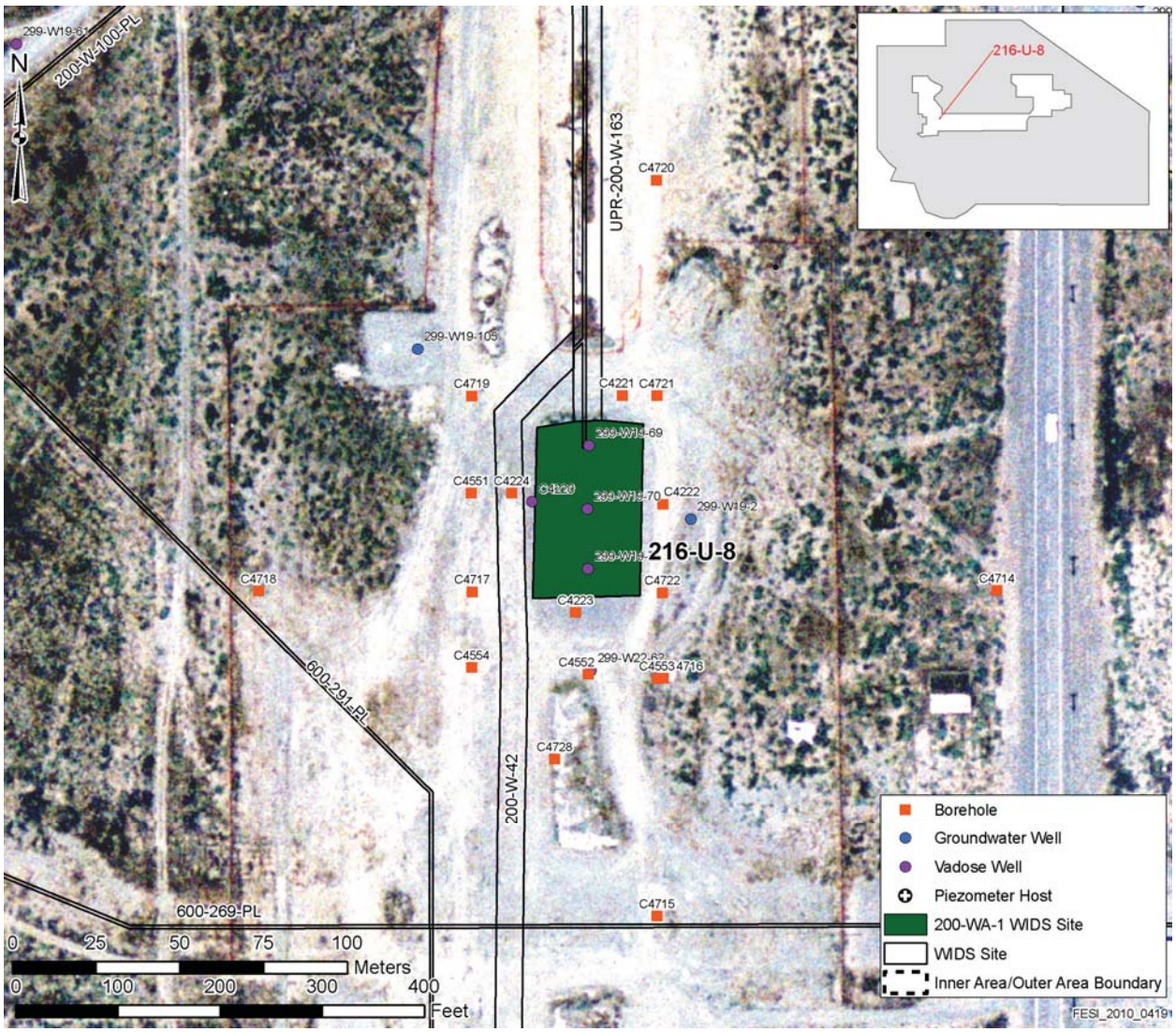


Figure 2. Engineering Diagram for 216-U-8 Crib (From H-2-43028)

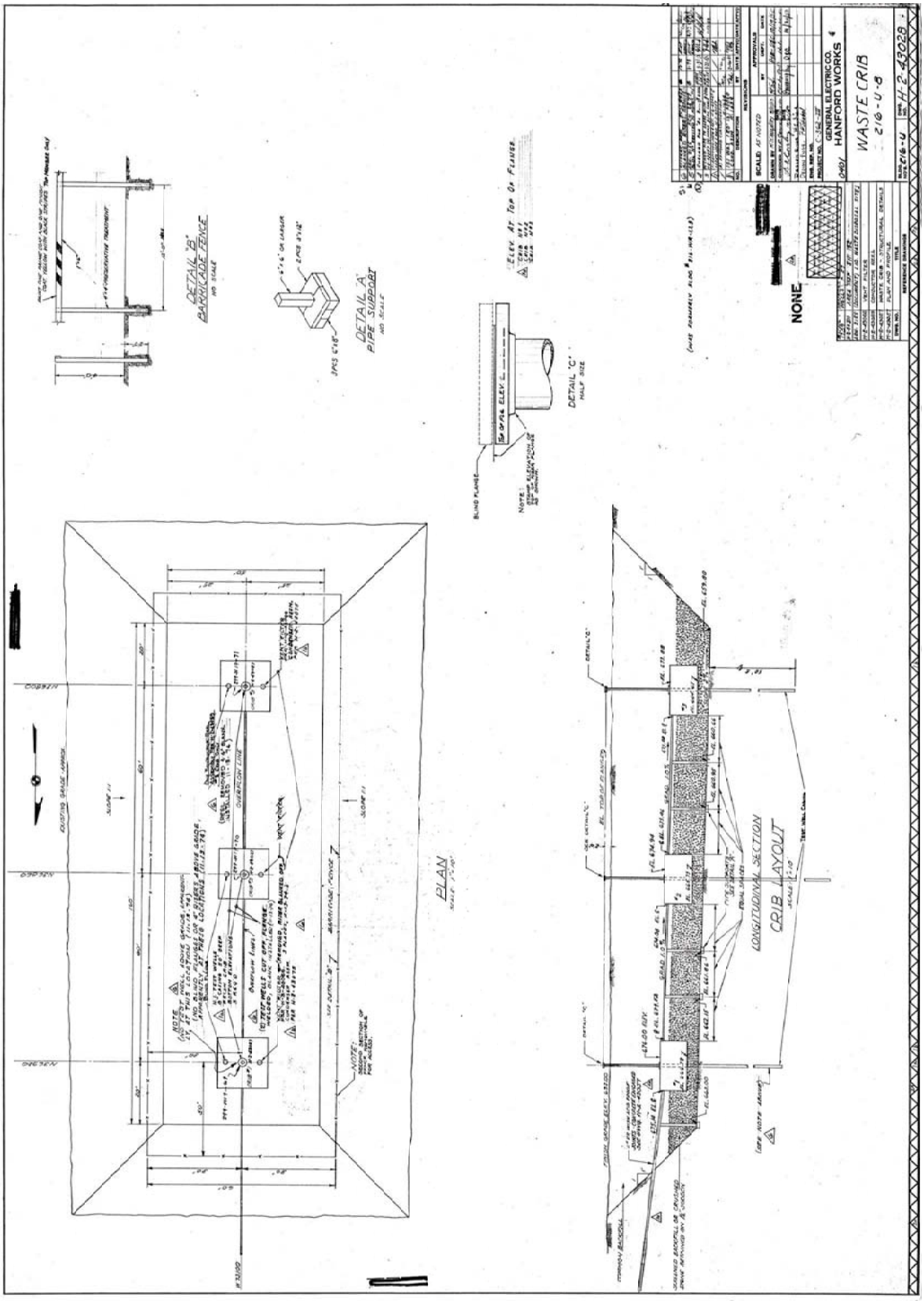
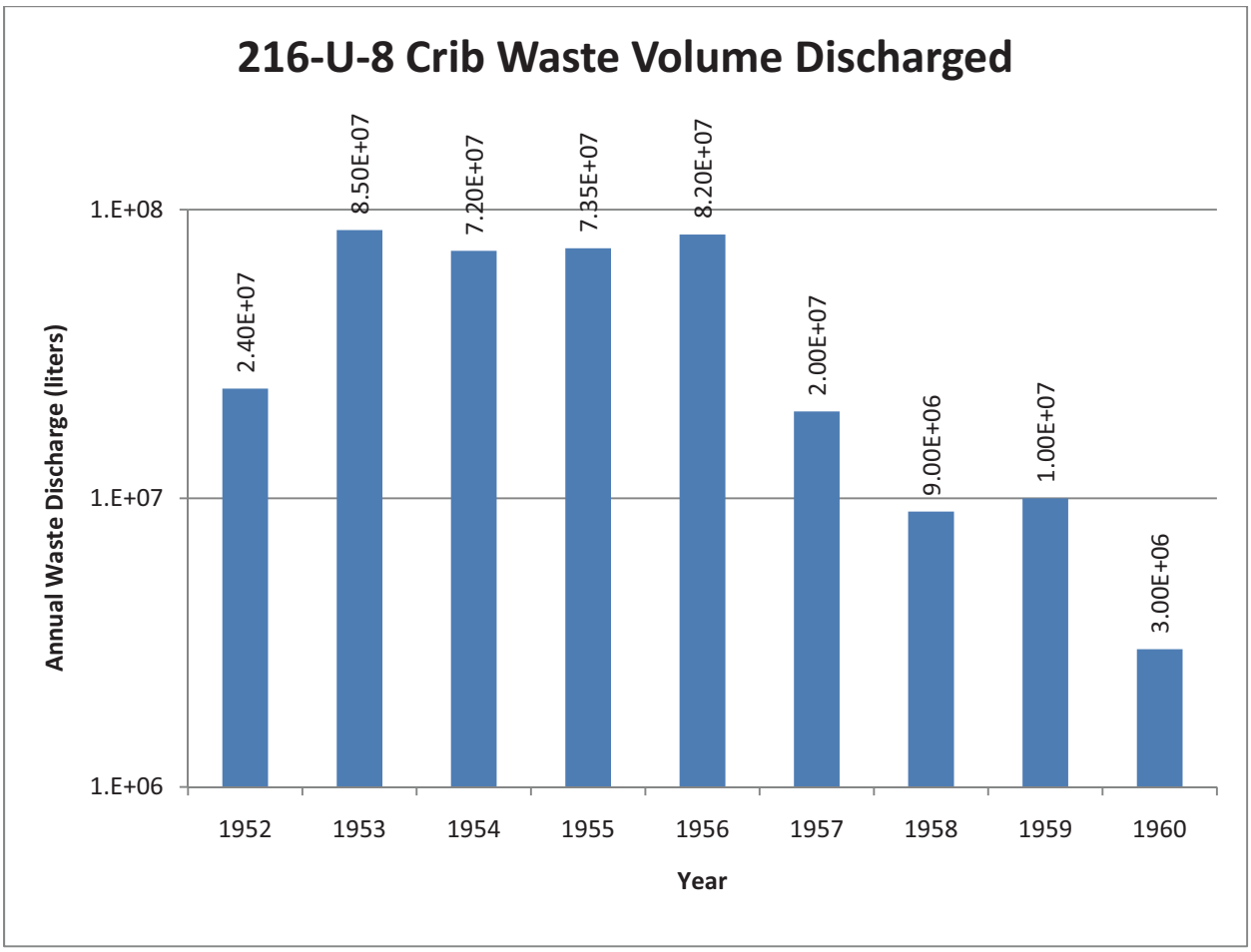


Figure 3. 216-U-8 Crib Waste Volume Discharged Summary



Site Description

Site ID: 216-Z-16
Site Type: Trench
Facility/Geographic Area: Z-Plant (PFP Area)
Current OU Assignment: 200-MG-1
Former OU Assignment: 200-LW-2
Service Dates: 1968 to 1977
Volume/Mass Discharged: 1.0E+08L (2.7E+07 gal) of laboratory waste (See Figure 1. for further information).

Waste Site Location and Physical Description: Site 216-Z-16 is located northwest of the 231-Z Building (See Figure 3. per QMap). The site is a rectangular excavation with a gravel floor covering the bottom third of the hole. The gravel is covered with a polyethylene barrier. A perforated pipe runs the across the excavation (See Figure 4. Reference Drawing H-2-26074 Sheet1 Rev1). The excavation has been backfilled and the Site now sits at grade with its surroundings. Approximately 2.7 m (9.0 ft) of overburden covers the site.

Waste Site Coordinates:

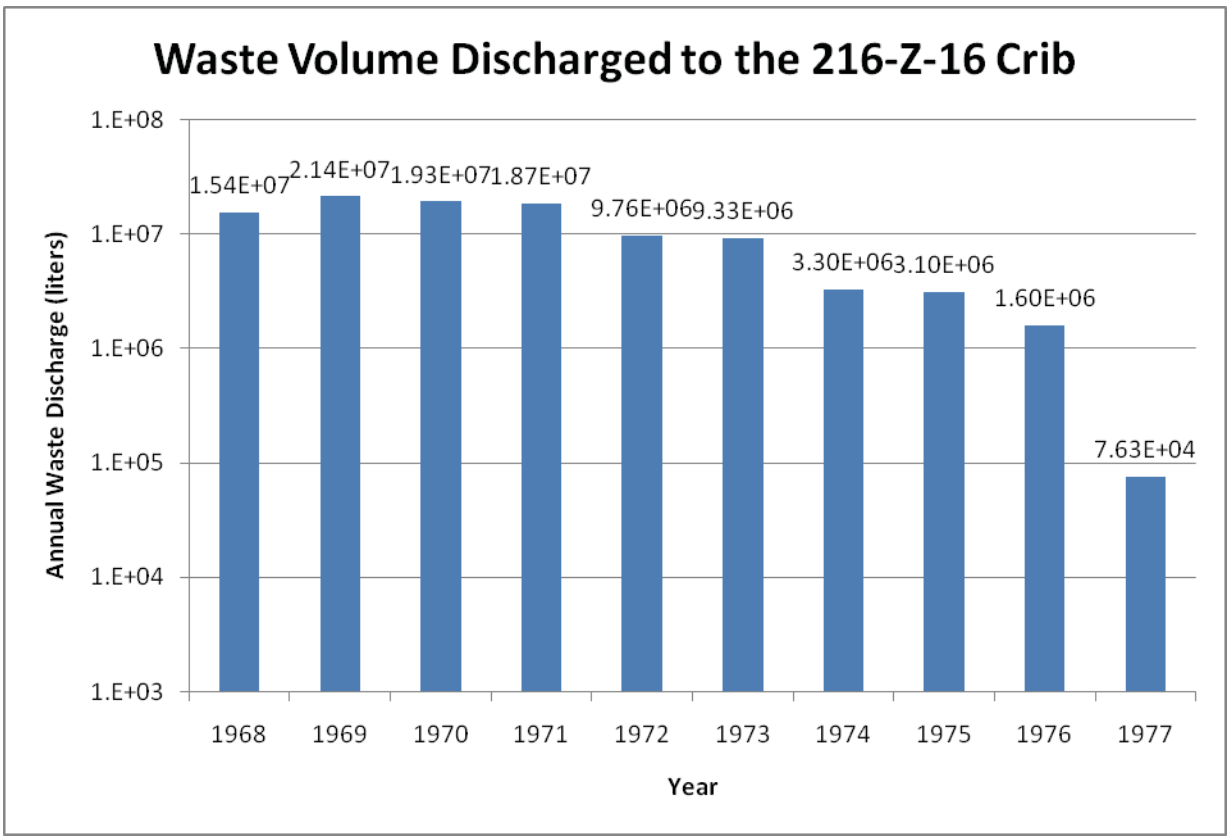
Lon-566430.07815 Lat-135991.34242

Site Dimensions:

Site Length: 55.0 m (180.0 ft)
Site Width: 3.0 m (10.0 ft)
Site Area: Not Specified
Site Depth: 4.8 m (16.0 ft)
Cover Thickness: Not Specified
Overburden depth: 2.7 m (9.0 ft)

Release Summary: The 216-Z-16 Crib was constructed for use as a subsurface disposal site for liquid laboratory waste from the 231-Z Building. The waste was neutral to basic, and included an estimated 0.08 kg (0.16 lb) of plutonium. The Crib was operational from 1968 to 1977, and received approximately 1.0E+08 L (2.7E+07 gal) of laboratory waste.

Figure 1. Waste Volumes Discharged to the 216-S-16 Crib by Liter per Year



Related Site Structure(s): Structures associated with the 216-Z-16 Crib include eleven crib penetrating monitoring wells, one gage well, two monitoring wells adjacent to the Crib, a vent riser, and the waste transfer line from the 231-Z Building. The sitecode for the Crib pipeline is 200-W-200-PL.

Site Posting: The 216-Z-16 Crib is marked and posted as an Underground Radioactive Material (URM) area.

Site Characterization Summary:

The Crib was backfilled to grade upon its deactivation. Any additional actions taken in 1977 during the deactivation process are not specified.

A site walkdown for photo documentation purposes occurred on May 18, 2000. In July 2000, the vent risers were sealed as a preventative measure for the potential passive release of radioactive emissions. The potential of a release occurring from this site is deemed low.

The Site is monitored by two monitoring wells adjacent to the 216-Z-16 Crib. Research indicates that the real extent of the contamination appears to be limited to the Crib boundaries. No further information is presented regarding any visual or radiological surveys or results at this Site.

Potential Contaminants:

Radioactive: Not Specified.

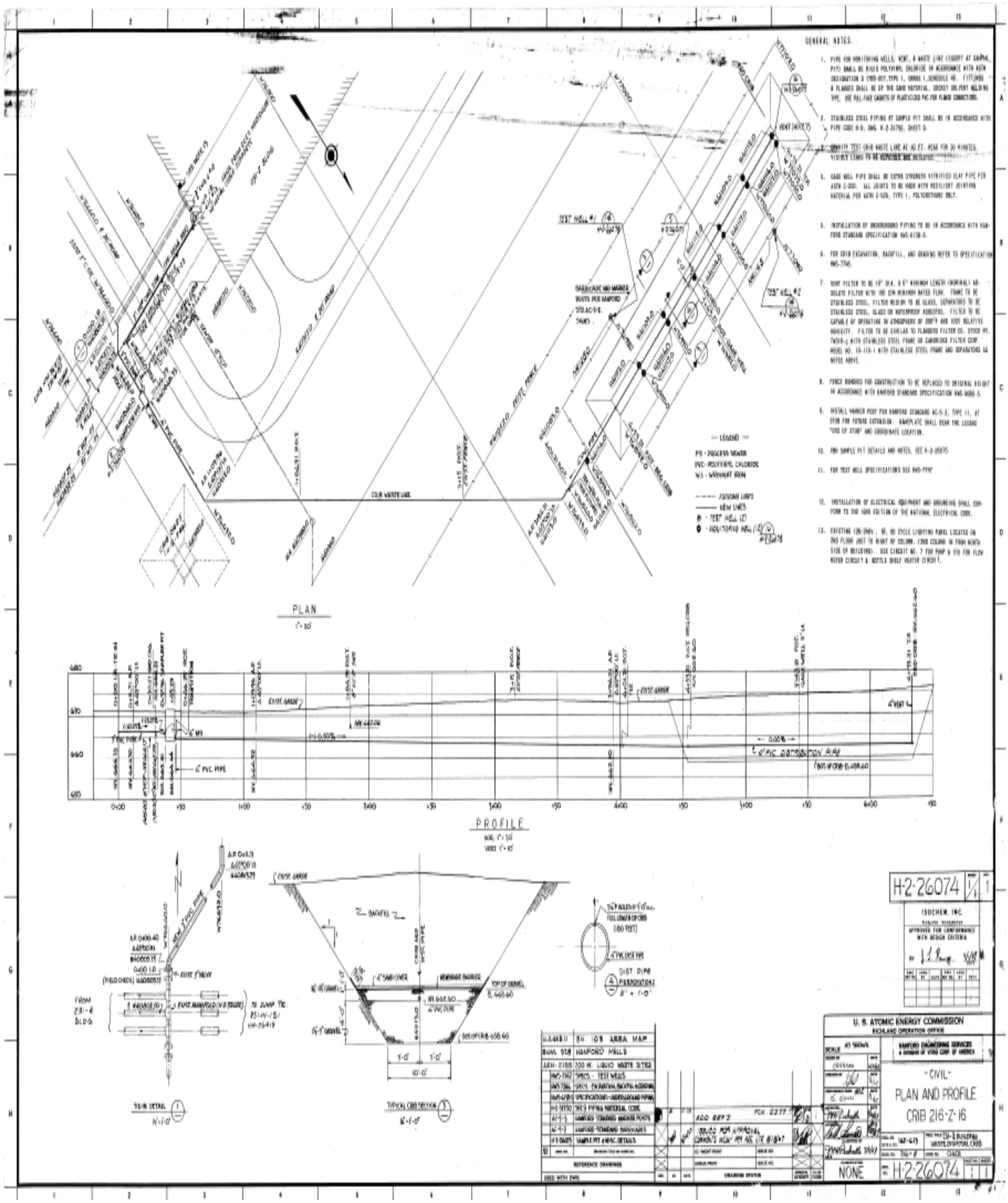
Non-Radioactive: Not Specified.

Figure 2. ArcMap Image

Figure 3. Insert Site Map

Figure not available

Figure 4. H-2-26074 Sheet1 Rev1 Plan View of the 216-Z-16 Crib.



Site Description

Site ID: 216-Z-17, 216-Z-17 Ditch
Site Type: Trench
Facility/Geographic Area: Z-Plant (PFP Area)
Current OU Assignment: 200-MG-1
Former OU Assignment: 200-LW-2
Service Dates: 1967 to 1968
Volume/Mass Discharged: 3.7E+07 L (9.8E+06 gal) of liquid laboratory waste

Waste Site Location and Physical Description: Site 216-Z-17 is located east of the 231-Z Building, and is east of and adjacent to the 216-Z-6 Crib (See Figure 2. per QMap). The 216-Z-17 trench is within an inactive waste management unit that has been deactivated and backfilled. When it was active, the site was an open trench excavated lengthwise, with sloped sides. A carbon steel effluent discharge pipe was connected to a metering box that deposited waste into the trench (Figure 3. H-2-32682 Sheet1 Rev1). Approximately 2.4 m (8.0 ft) of backfill cover the trench.

Waste Site Coordinates:

Lon-566603.43750 Lat-135862.59380

Site Dimensions:

Site Length: 61.0 m (200.0 ft)
Site Width: 3.0 m (10.0 ft)
Site Area: Not Specified
Site Depth: 2.4 m (8.0 ft)
Cover Thickness: Not Specified
Overburden Depth: 2.4 m (8.0 ft)

Note: These are bottom dimensions for the trench.

Release Summary: The 216-Z-17 Trench was excavated for use as a subsurface disposal site for liquid laboratory waste generated within the 231-Z Building. The Trench was deactivated in 1968 when it was determined the volume of waste being sent to the site surpassed the trench's infiltration capacity. The Trench received an estimated 3.7E+07 L (9.8E+06 gal) of waste during its operational lifetime. The waste was neutral to basic in character, and contained an estimated 0.05 kg (0.11 lbs) of plutonium.

Related Site Structure(s): Structures associated with the 216-Z-17 Trench include the 231-W-151 Sump Tank, waste transfer lines, the metering box, and the effluent discharge pipe that conveyed waste to the site. The pipeline that fed into the site is sitecode 200-W-201-PL.

Site Posting: The posting for 216-Z-17 is not specified.

Site Characterization Summary: The site was deactivated by capping the pipeline at the trench and valving out the line west of the 231-W-151 Sump Tank. The site was backfilled in 1975. The metering box may have been removed before the trench was backfilled. It is not specified where the waste was redirected following the site's retirement.

Surface stabilization work occurred in 1990. While no routine monitoring or sampling occurs at this site, there is a solitary monitoring well west of the trench.

Potential Contaminants:

Radioactive: 0.05 kg (0.11 lbs) of plutonium.

Non-Radioactive: 3.7E+07 L (9.8E+06 gal) of liquid laboratory waste.

Figure 1. ArcMap Image

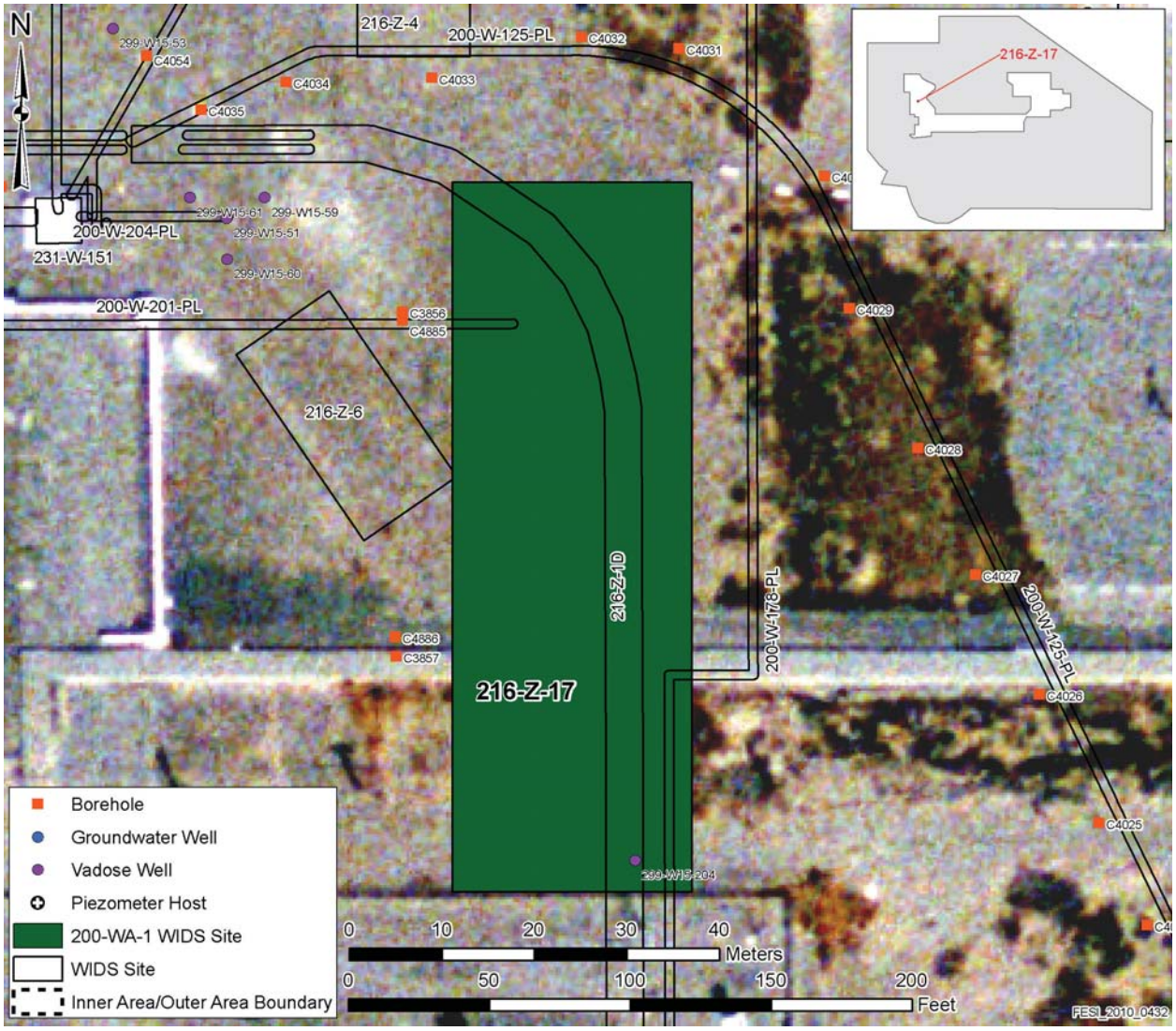
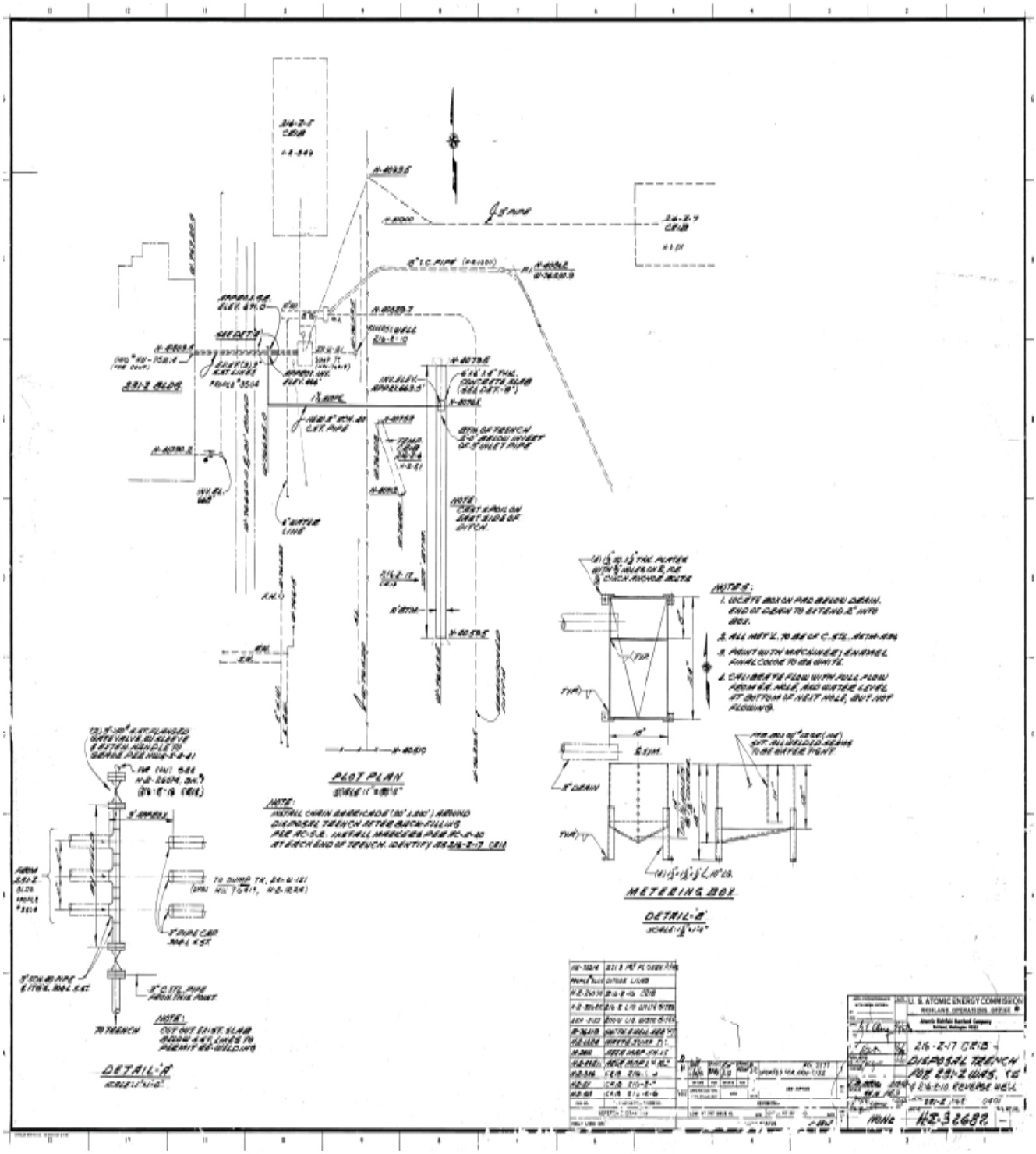
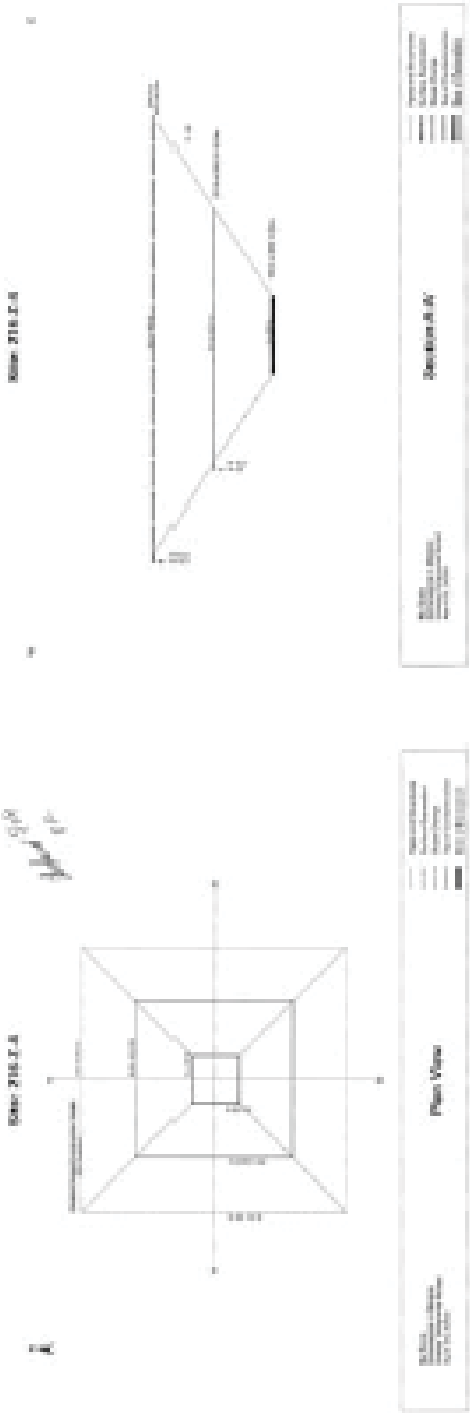


Figure 2. Insert Site Map

Figure not available

Figure 3. H-2-32682 Sheet1 Rev1 Plan View of the 216-Z-17 Trench.




Plan View
Sections A-A'

Site Description

Site ID: 216-Z-4, 231-W-3 Pit 231-W-3 Sump, 231-W-3 Crib, 216-Z-3, 216-Z-4 Crib
Site Type: Trench
Facility/Geographic Area: Z-Plant (PFP Area)
Current OU Assignment: 200-MG-1
Former OU Assignment: 200-PW-6
Service Dates: June 1945 to July 1945
Volume/Mass Discharged: 11,000 L (2,906 gal)

Waste Site Location and Physical Description: Site 216-Z-4 is located east of 231-Z and north of the 216-Z-17 Crib (See Figure 2. per QMap).The 216-Z-4 trench is a large, unlined excavation located in an inactive waste management unit (See Figure 3. Reference Drawing of 216-Z-4 Crib Plot Plan). It is believed an above ground pipeline conveyed waste to the site from the 231-Z Building for disposal. Between 0.3 to 0.6 m (1-2 ft) of backfill cover the trench.

Waste Site Coordinates:

Lon-566586.28125 Lat-135920.69525

Site Dimensions:

Site Length: 3.1 m (10.0 ft)
Site Width: 3.1 m (10.0 ft)
Site Area: 9.1m2 (100 ft2)
Site Depth: 4.6 m (15.0 ft)
Cover Thickness: 0.3-0.6 m (1-2 ft)

Release Summary: The 216-Z-4 trench was excavated in June 1945 for use as a temporary disposal site for liquid laboratory waste from the 231-Z Building. The trench was active for a one month period, and received an estimated 11,000 L (2,906 gal) of liquid laboratory waste during its operational lifetime. The waste was neutral to basic in character. The trench was deactivated in July 1945, when it was determined the volume of waste being sent to the site exceeded the trench's infiltration capacity.

Related Site Structure(s): Site 216-Z-4 is associated with the 216-Z-6 Crib, the pipeline that ran from the 231-Z Building to the Site's trench, and with the 231-W-151 Vault sump.

Site Posting: The posting for the site is not specified. Underground radiological contamination is present; however the risk of release is low.

Site Characterization Summary: The site was deactivated by backfilling the trench and capping the pipeline west of the 231-W-151 Vault. The waste was redirected to the 216-Z-6 Crib.

Interim stabilization occurred in February 1990. However, no routine monitoring is preformed. There are no monitoring wells located near the trench.

Potential Contaminants:

Radioactive: Am-241, Cs-137, Co-60, Sr-90. H3

Non-Radioactive: PCB Aroclor-1254, Se

Figure 1. ArcMap Image

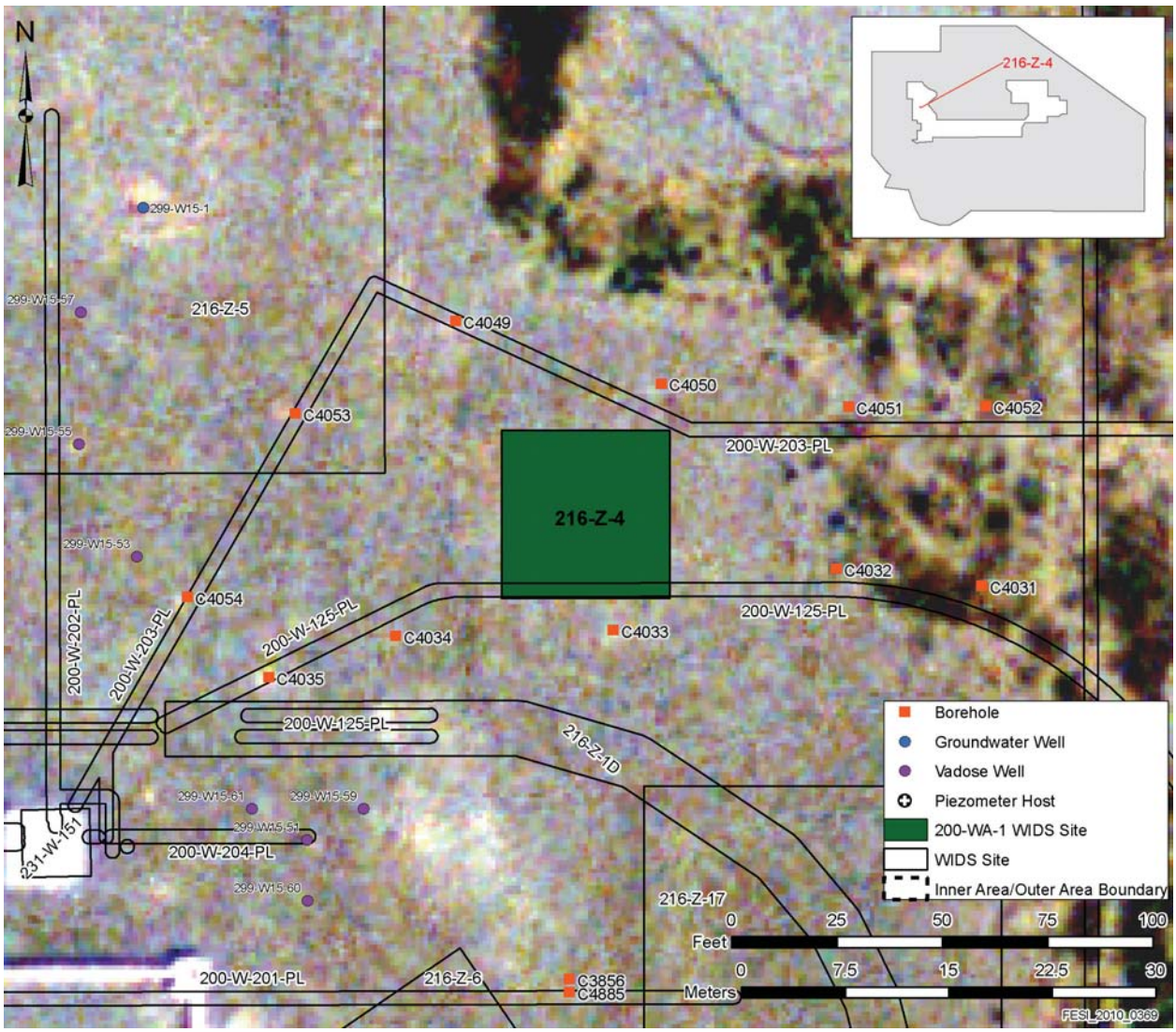


Figure 2. Insert Site Map

Figure not available.

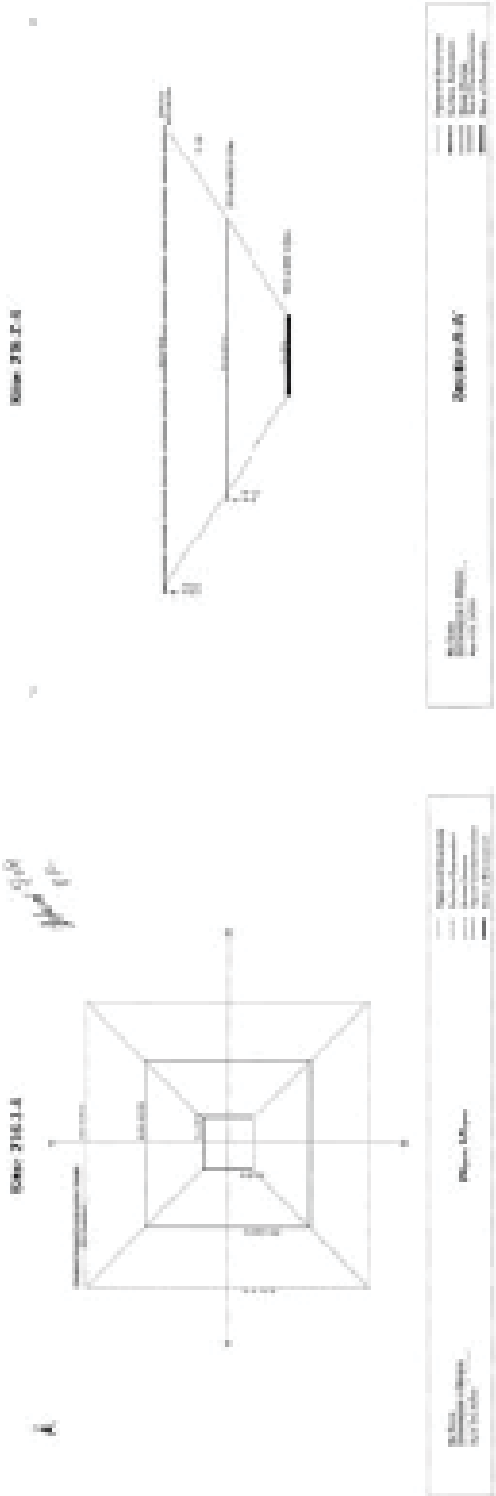


Figure 3. Plan View of the 216-Z-4 Crib.

Site Description

Site ID: 216-Z-6, 231-W-4 Crib 231-Z-6, 216-W-4, 231-W-Crib, 216-Z-4, 216-Z-6 & 6A Crib
Site Type: Trench
Facility/Geographic Area: Z-Plant (PFP Area)
Current OU Assignment: 200-MG-1
Former OU Assignment: 200-PW-6
Service Dates: 1945 to 1945
Volume/Mass Discharged: 98,000 L (25,889 gal)

Waste Site Location and Physical Description: Site 216-Z-6 is located east of 231-Z and north of Nineteenth Street (See Figure 2. per QMap).The 216-Z-6 trench is a rectangular, wooden box set in the bottom of an excavation. The Trench received 231-Z Building process waste via an above ground pipeline, from the 231-W-151 Sump. The trench is located in an inactive waste management unit (See Figure 3. Reference Drawing of 216-Z-6 Crib Plot Plan). Between 0.3 to 0.6 m (1-2 ft) of backfill cover the trench.

Waste Site Coordinates:

Lon-566579.05313 Lat-135875.76359

Site Dimensions:

Site Length: 15.9 m (52.0 ft)
Site Width: 2.6 m (8.6 ft)
Site Area: 208.3m2 (2244.8 ft2)
Site Depth: 2.4 m (8.0 ft)
Cover Thickness: 0.3-0.6 m (1.0-2.0 ft)
Overburden depth: 1.8m (6.0 ft)

Release Summary: The 216-Z-6Trench was brought online in 1945 for use as a subsurface disposal site for liquid process waste from the 231-Z Building. The waste was sent to the Trench via an above ground pipeline from the 231-W-151 Sump. The Trench was active for a one month period, and received an estimated 98,000 L (25,889 gal) of liquid waste during its operational lifetime. The Trench was deactivated due to process sludge and precipitates clogging the surrounding soil and reducing the Site's infiltration ability.

Related Site Structure(s): Site 216-Z-6 is associated with the pipeline that ran from the 231-Z Building to the Site's trench, the 216-Z-4 Crib, and with the 231-W-151 Vault sump.

Site Posting: The radiological posting for the site is not specified. Underground radiological contamination is present; however the risk of release is low. The site was posted with Cave-In Potential signs on July 22, 1998.

Site Characterization Summary: The site was deactivated by capping the transfer line west of the 231-Z-151 Sump, and removing the over ground piping. The location the waste was redirected to is not specified.

Interim surface stabilization occurred in February 1990. Routine radiological surveys are performed; however no specific chemical data is available for this Crib. Several monitoring wells are located around the 216-Z-5, 216-Z-6 and 216-Z-7 Cribs. Site sampling indicates radionuclides are present in the vadose zone. The potential for release to the surface is low, and the site is currently not rated as a high priority. The site has a history of cave-in's, and there is a possibility the site will continue to collapse.

Potential Contaminants:

Radioactive: Am-241, Cs-137, Co-60, Sr-90, H3

Non-Radioactive: PCB Aroclor-1254, Se

Figure 1. ArcMap Image

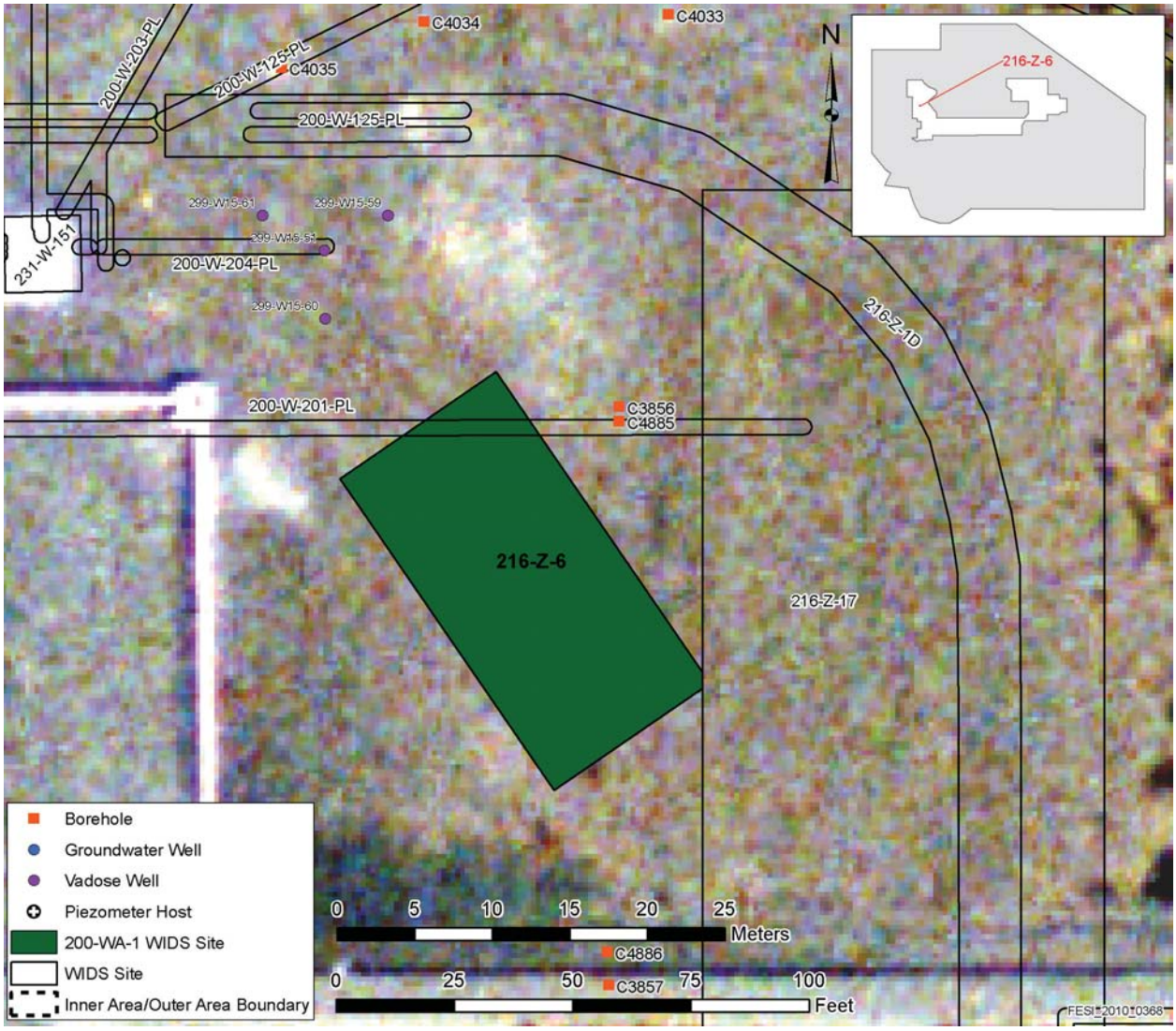


Figure 2. Insert Site Map

Figure not available.

Figure 3. Plan View of the 216-Z-6 Crib.

Site Description

Site ID: 216-Z-7, 231-W Crib 216-Z-6, 231-W Trench
Site Type: Trench
Facility/Geographic Area: Z-Plant (PFP Area)
Current OU Assignment: 200-MG-1
Former OU Assignment: 200-LW-2
Service Dates: 1947 to 1967
Volume/Mass Discharged: 8.0E+07 L (2.1E+ 07gal)

Waste Site Location and Physical Description: Site 216-Z-7 is located east of 231-Z and north of Nineteenth Street (See Figure 2. per QMap).The 216-Z-7 trench is an inactive, below grade waste management unit. The Site consists of a crib trench constructed of two parallel wooden boxes, set in two shallow parallel trenches in a single terraced trench. Within each box are three tiers, with a perforated distribution box running the length of the second tier (See Figure 3. Reference Drawing of 216-Z-6 Crib Plot Cross Section and Figure 4. 216-Z-7 Crib Drawing). The inner trenches are backfilled and covered with wooden planks.

Waste Site Coordinates:

Lon-566700.53125 Lat-135926.88280

Site Dimensions:

Site Length: 64.0 m (210.0 ft)
Site Width: 13.4 m (8.6 ft)
Site Area: Not Specified
Site Depth: 2.1 m (7.0 ft)
Cover Thickness: Not Specified
Overburden depth: 1.5m (5.0 ft)

Release Summary: The 216-Z-7Crib was built to replace the 216-Z-5 Trench. From 1947 to 1953, the Crib was used as a subsurface disposal site for liquid processing waste from the 231-Z Building. The waste from the 231-Z Building was sent to the 216-Z-7 Crib via the 231-W-151 Sump. From 1953 to 1965, the Crib was used for the disposal of Hanford laboratory waste from the 231-Z Building.

From 1965 to 1967, the site received waste from two sources; laboratory waste generated by the Pacific Northwest Laboratory from within the 231-Z Building, and waste transported from the 340 Building via tanker truck. The tanker trucks delivered the waste to the riser on the west side of the Crib for disposal.

Related Site Structure(s): Site 216-Z-7 is associated with the 231-Z-151 Sump and distribution piping (sitecode 200-W-203-PL). In addition, other features associated with this Site include four vent boxes and vent risers, transfer pipes, and two waste unloading stations west of the center line of the Crib.

Site Posting: The radiological posting for the site is not specified. Underground radiological contamination is present; however the risk of release is low. The site was posted with Cave-In Potential signs on July 22, 1998.

Site Characterization Summary: The site was deactivated in 1967 by blanking the pipeline west of the 231-Z-151 Sump, and backfilling the pit the Crib sits in. The location the waste was redirected to is not specified. Interim surface stabilization occurred in 1990.

Site 216-Z-7 ranks as a high priority site, as there is a high release risk. The site is monitored by six characterization cone penetrometer push holes (C4177, C4178, C4179, C4180, C4181, C4192) and one characterization borehole (C4183), which were drilled through the Crib in January, February, and March 2005. Monitoring results from these seven wells indicate there is possible radionuclide contamination within the vadose zone. The samples taken during the drilling of borehole C4183 were submitted to the HEIS database.

Potential Contaminants:

Radioactive: Not Specified

Non-Radioactive: Not Specified

Figure 1. ArcMap Image

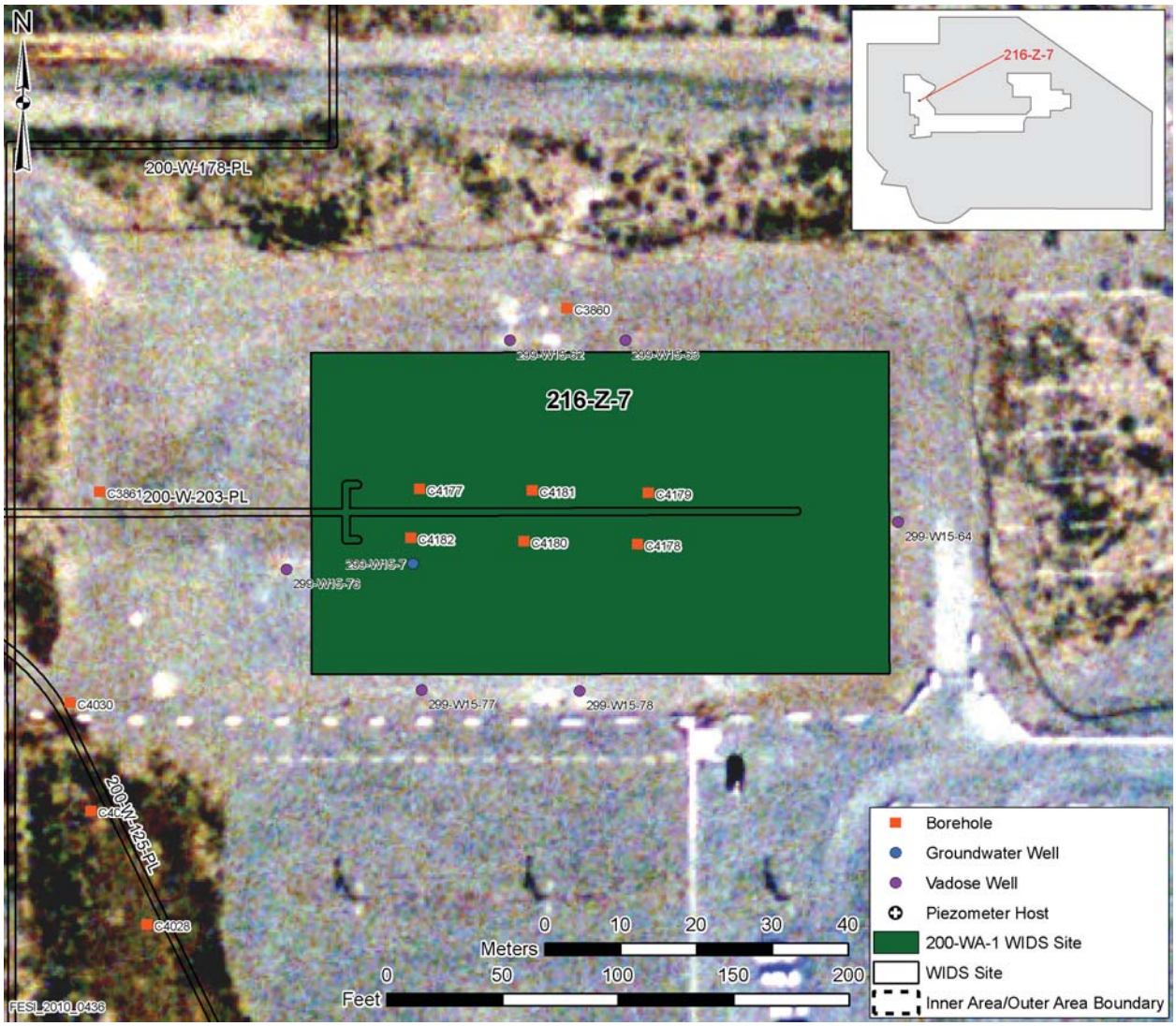


Figure 2. Insert Site Map

Figure not available.

Figure 3. Cross SectionView of the 216-Z-7 Crib.

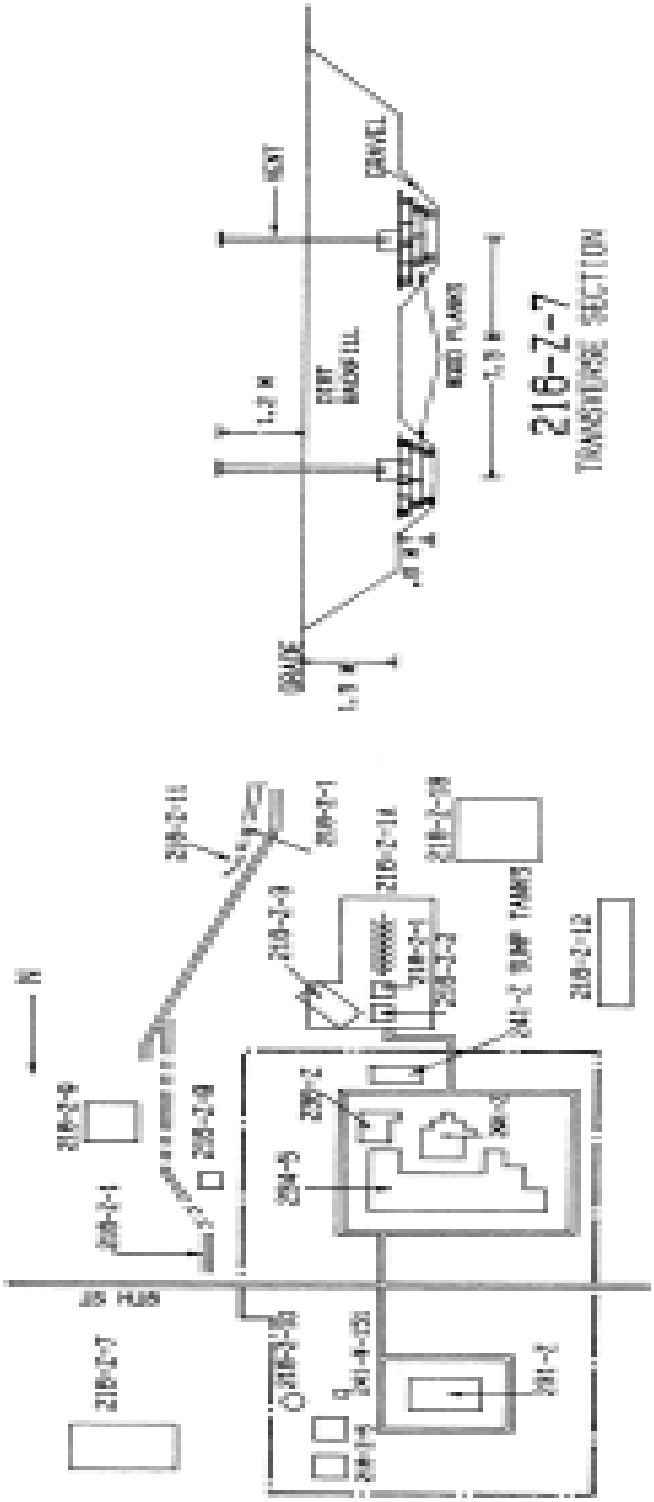
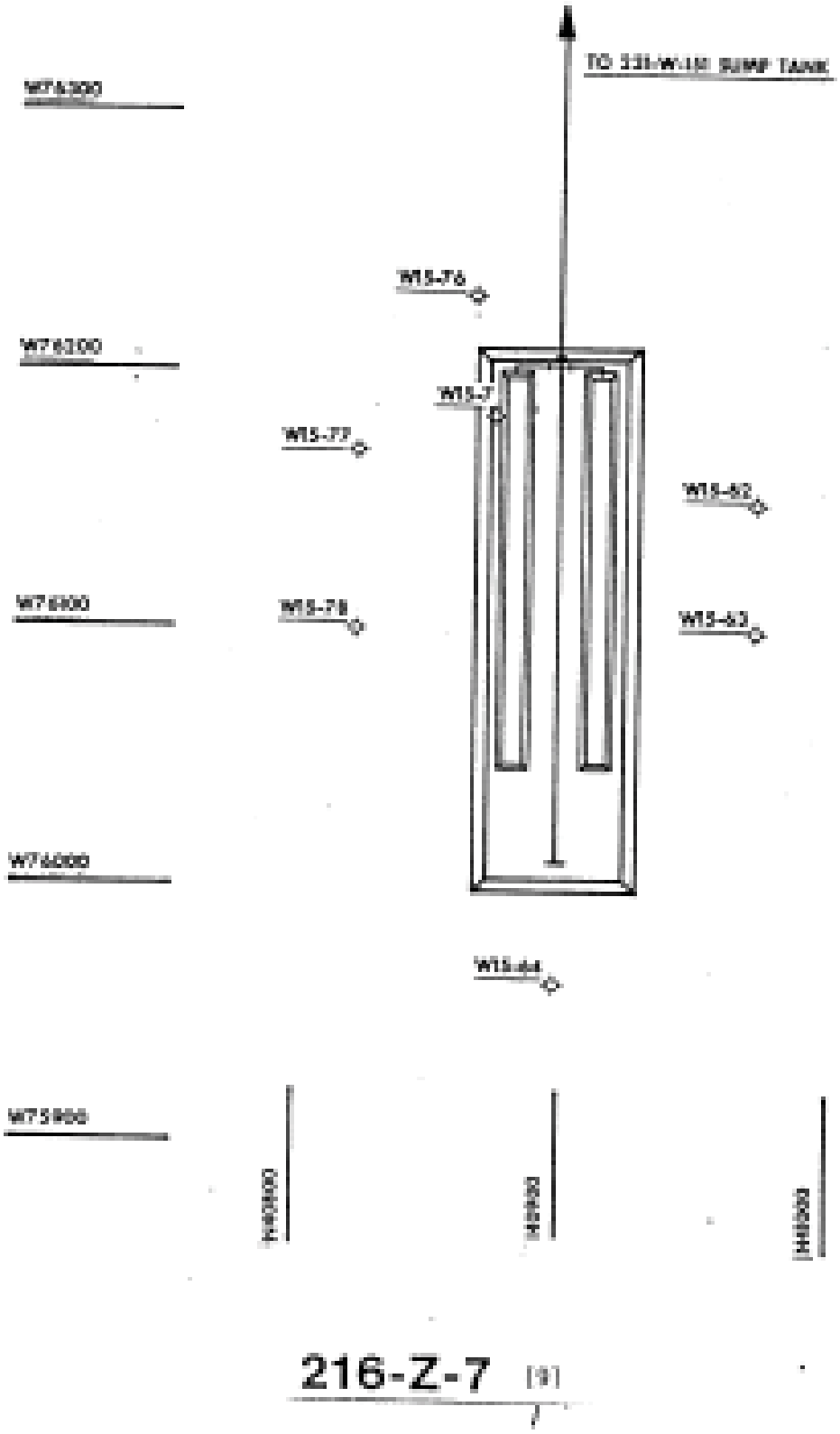


Figure 4. 216-Z-7 Crib



Site Description

Site ID: 218-W-8
Site Type: Burial Vault
Facility/Geographic Area: 200 Inner Area West
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-1
Service Dates: 1945 to 1952
Volume/Mass Discharged: 68 m^3 (89 yd^3)

Waste Site Location and Physical Description: The 218-W-8 Vaults are located southeast of the 222-T Building. Three underground vaults are contained at the site. The two original vaults are 3 m by 3m by 3.7 m (10 ft by 10 ft by 12 ft), made of 5.1 cm by 30.5 cm (2 in by 12 in) wooden planking, with the top 1.5 m (5 ft) below grade. The third replacement vault is concrete culvert pipe encasement 2.4 m (8 ft) diameter and 7.6 m (25 ft) long and 1 m (3.2 ft) below grade. The top of the encasement is a 23 cm (9 in) precast concrete cover ant the bottom is a 30.5 cm (12 in) thick concrete floor. The disposal chutes for the wooden vault were removed.

Waste Site Coordinates:

E-567637.65625 N-136775.28122

Site Dimensions:

Site Length: 24.6 m (80.7 ft) (bottom dimension)
Site Width: 13.2 m (43.1 ft) (bottom dimension)
Site Area: 324.7 m^2 (3,478 ft^2)
Site Diameter: 2.4 meters (8 ft)
Cover Thickness: Unspecified

* The diameter is the dimension of one of the three vaults. The length and width are surface dimensions for the area that includes all three vaults. The length and width were calculated from an Arcview image.

Release Summary: 218-W-8 Burial Vault received 68 m^3 (89 cubic yd) of laboratory process sample waste from the 222-T Building. The waste was categorized as miscellaneous solid trash and debris.

Related Site Structure(s): The Vault is associated with the 222-T Building.

Site Posting: Markings identifying the Burial Vault are not specified.

Site Characterization Summary: In 1975, 11.5 m^3 (15 yd^3) of soil was added to the surface of the radiation zone to fill in sink holes that had settled around the vault openings. A site investigation was performed in 1996. Excavations were made to a depth of 3 m (10 ft). Based on the excavations, it was determined the two wooded structures had previously filled in with dirt. The concrete structure was not investigated. The site was regraded and surface stabilized. The "Cave-in Potential" posting was removed.

A surface radiological survey is performed annually.

Potential Contaminants:

Radioactive: Unspecified

Non-Radioactive: Unspecified

References:

WIDS General Summary Report for site 218-W-8.
QMap.
ArcMap.
H-2-1938 Sheet 1 Rev. 4.

Figure 1. ArcMap Image

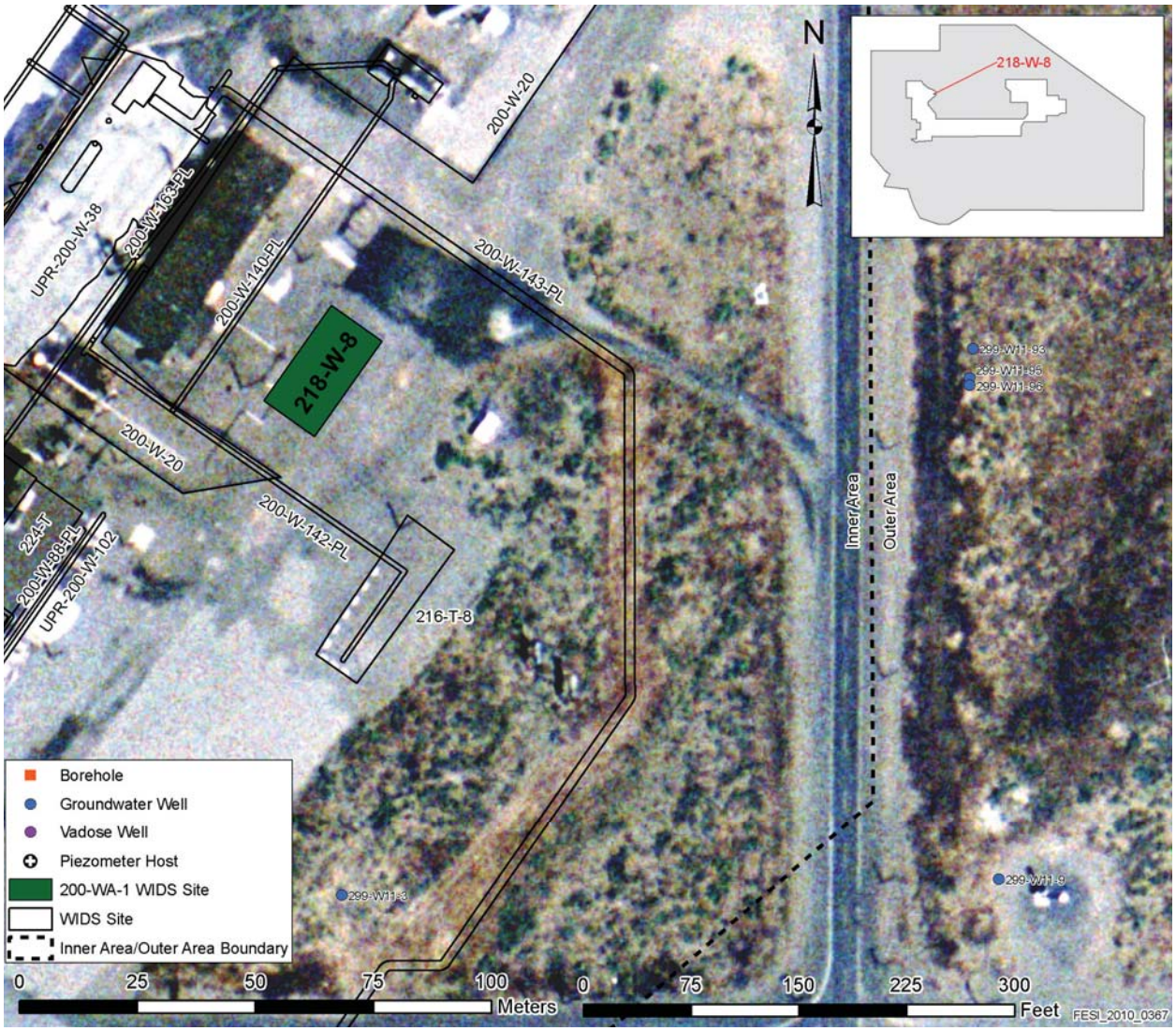
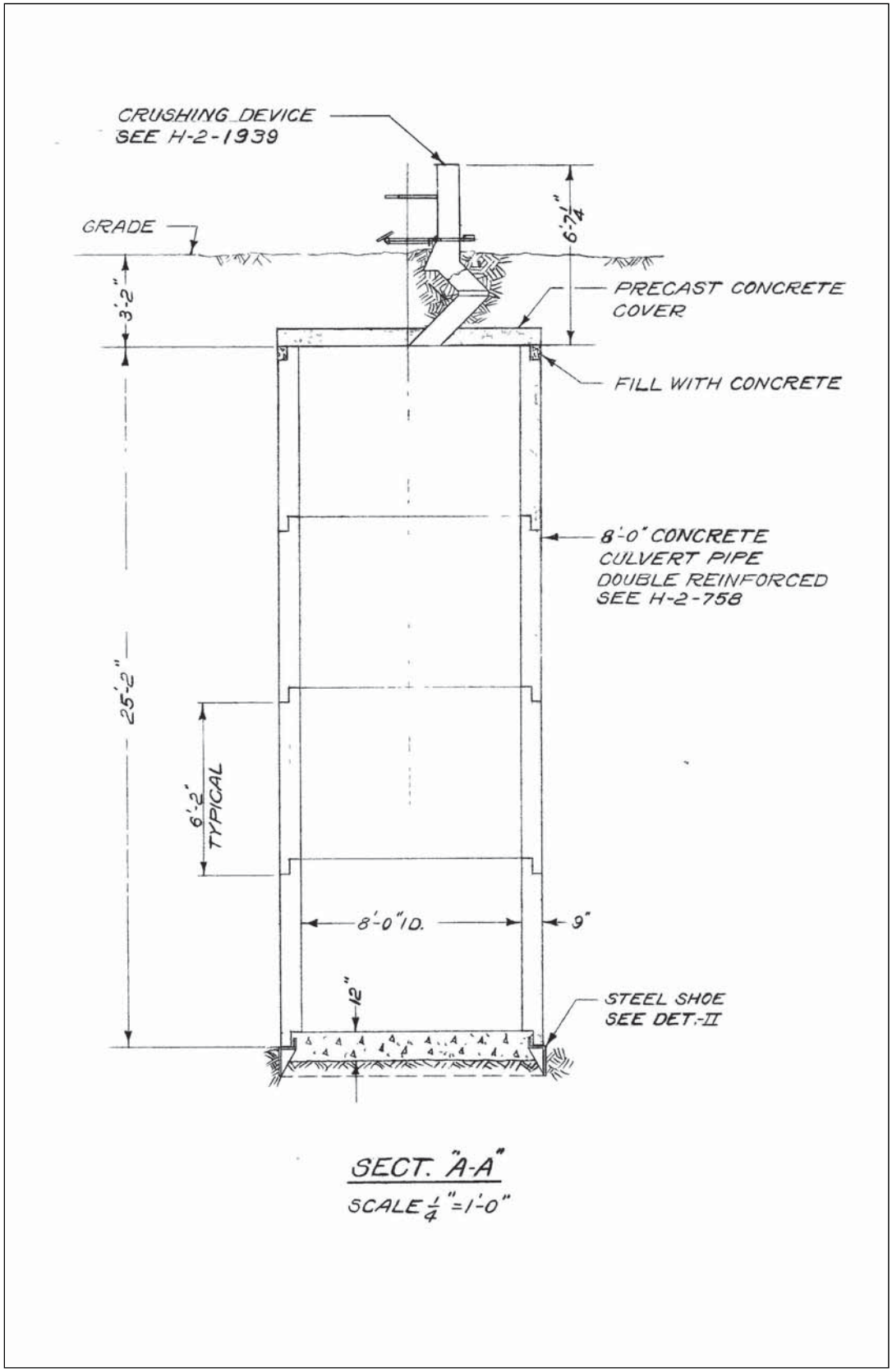


Figure 2. Burial Vault Detail Reference Drawing H-2-1938 Sheet 1 Rev. 4



Site Description

Site ID: 218-W-9 Dry Waste Burial Ground No. 9, Non-TRU Dry Waste No. 009
Site Type: Burial Ground and Unplanned Release
Facility/Geographic Area: S-Plant Area
Current OU Assignment: 200-MG-1
Former OU Assignment: Not Specified
Service Dates: 1954 to 1954
Volume/Mass Discharged: Unknown

Waste Site Location and Physical Description: The 218-W-9 burial ground is located northwest of the 202-S Building and north of the 216-S-7 Crib (See Figure 2. per QMap). The 200-W-139-PL pipeline runs beneath the eastern edge of the 218-W-9 posted area (See Figure 3. H-2-44511 Sheet30 Rev6 and Figure 4. H-2-44511 Sheet 37). Interim stabilization activities in 1991 covered the site with 45 to 60 cm (18 to 24 in) of clean backfill.

Waste Site Coordinates:

Lon-567188.55106 Lat-134306.61817

Site Dimensions:

Site Length: 42.7 m (140.0 ft)
Site Width: 29.9 m (98.0 ft)
Site Area: 1,274.6 m2 (13,719.9 ft2)
Site Depth: Not Specified
Cover Thickness: 0.45 to 0.6 m (1.5 to 2.0 ft)

Release Summary: No estimated release volume is presented for this waste site for either the burial ground or the unplanned release from the waste line by the 216-S-9 Crib in 1969. The 1969 leak occurred while repairing a buckled section of the 200-W-139-PL waste line near the 216-S-9 Crib. A pressure test indicated a second leak had sprung in the line. Additional hydrostatic testing forced the water to bubble to the surface, emerging within the radiation zone for 218-W-9.

In addition, the site contains an unspecified amount of sheet metal scrap, including the 211-S Tank taken from the REDOX Facility. The waste contains less than 0.1 Curie total beta activity. The material may be contaminated with ruthenium-106.

Related Site Structure(s): 218-W-9 is associated with the 200-W-139-PL pipeline, UPR-200-W-109, and the 216-S-9 Crib.

Site Posting: The posting for site 218-W-9 is not specified.

Site Characterization Summary: After repairing the buckled portions of the waste line near the 216-S-9 Crib, a pressure test indicated a second leak existed in the line. Additional hydrostatic testing finally forced the water to bubble to the surface inside the 218-W-9 radiation zone. Radiological readings detected dose rates up to 450 mR/hr at the point of emergence; however dose rates dropped to 20 mR/hr as the water was absorbed into the soil. Excavation of the liquid bubble site disclosed a vertical buckle in the pipeline with a sizeable break in the line at that point.

Site 218-W-9 was interim stabilized in 1991. Interim stabilization included covering the site with clean backfill material. The ground surface is radiologically surveyed on an annual basis.

Potential Contaminants:

Radioactive: An unspecified amount of sheet metal scrap is present, containing less than 0.1 Curie total beta activity. The material may be contaminated with ruthenium-106.

Non-Radioactive: Not Specified.

Figure 1. ArcMap Image

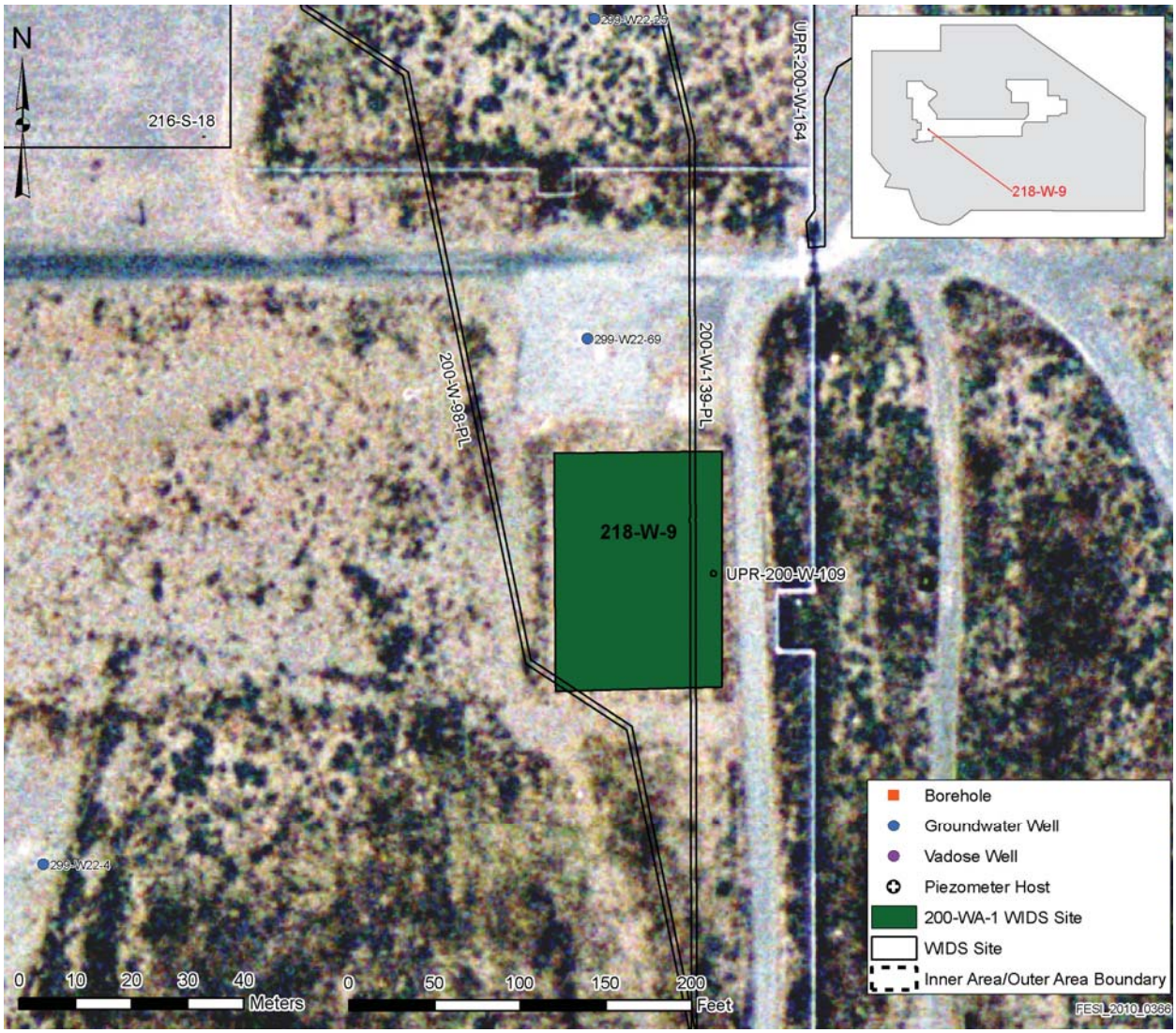


Figure 2. Insert Site Map

Figure not available.

Figure 3. Reference Drawing H-2-44511 Sheet30 Rev6

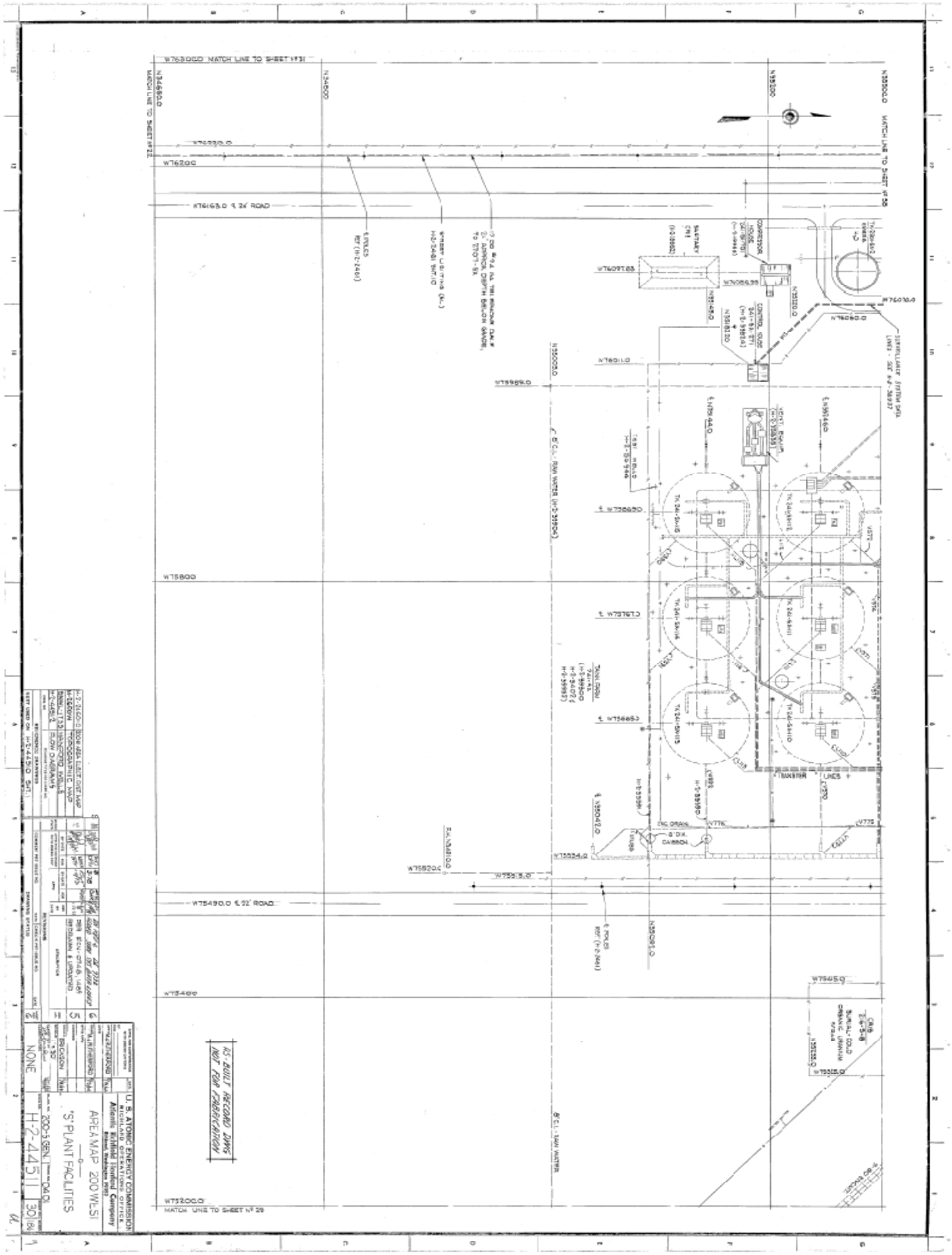
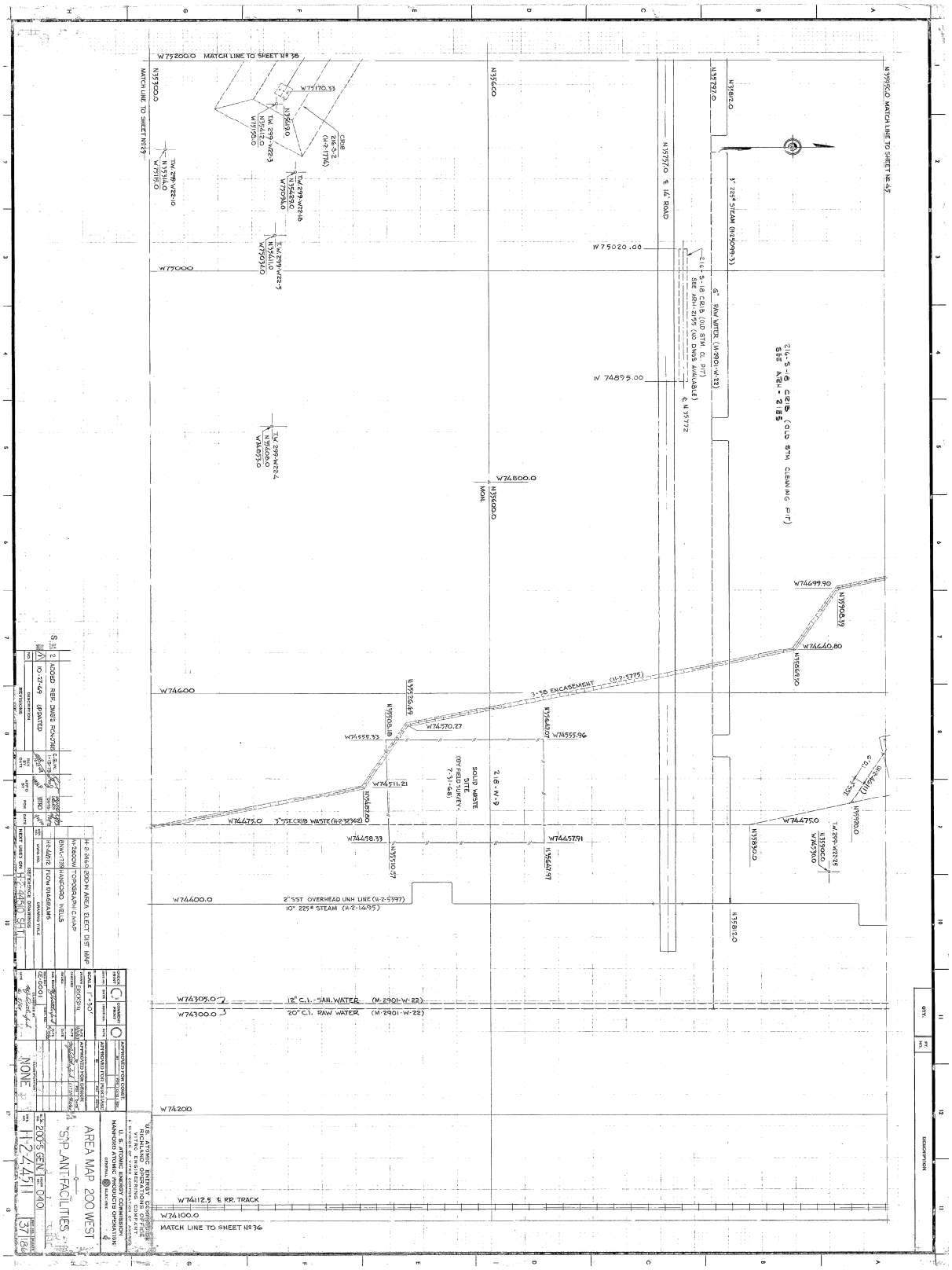


Figure 4. Reference Drawing H-2-44511 Sheet 37



Site Description

Site ID: 231-W-151, 231-W-151, 231-W-151 Vault, 231-W-151-001 (Tank), 231-W-151-002 (Tank), 231-W-151 Sump, 231-Z-151 Sumo, IMUST, Inactive Miscellaneous Underground Storage Tank (see Subsites).
Site Type: Receiving Vault
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-MG-1
Former OU Assignment: 200-UR-1
Service Dates: 1948 to 1974
Volume/Mass Discharged:

Waste Site Location and Physical Description: Site 231-W-151is located approximately 36.6 m (120 ft) east of 231-Z Building (See Figure 2. per QMap). The site consists of a concrete vault with two inner tanks. A portion of the vault structure is buried below ground. Three steel risers and one vent structure extend above the surface from holes in the vault's ceiling. The site is posted with "Contamination Area/Radiation Area", "Restricted Access Unsafe Structure. Confined Space", and IMUST signs.

The vault contains two tanks; tank 231-W-151-001 and tank 231-W-151-002 (See Figure 3. Reference Drawing_H-2-508 Sheet 1 Rev.2 and Figure 4. Reference Drawing_H-2-32528 Sheet 1 Rev.6). Both tanks area situated inside the 231-W-151 Vault and received drainage from the 231-Z Building floor drains prior to disposal into associated Cribs. Tank 231-W-151-001 is a 15,140 L (4000 gal) stainless steel tank, while 231-W-151-002 is a 1 3,596 L (950 gal) stainless steel tank. The inlet pipelines leading to the tanks have been blanked off.

Waste Site Coordinates:

Lon-566547.96877 Lat-135896.88277

Site Dimensions:

Site Length: 5.2 m (17.00 ft)
Site Width: 5.2 m (17.00 ft)
Site Area: Not Specified
Site Depth: 4.0 m (13.0 ft)
Cover Thickness: Not Specified

Dimensions of the cement vault.

Site Length: 2.7 m (9.00 ft) Diameter: 2.7 m (9.0 ft)

Dimensions of the 231-W-151-001.

Site Length: 2.1 m (7.00 ft) Diameter: 1.5 m (5.0 ft)

Dimensions of the 231-W-151-002.

Release Summary: The 231-W-151 vault tanks were constructed to collect drainage from approximately 75 floor drains in Building 231-Z. The 231-Z Building drainage was conveyed to the 231-W-151-002 Tank, which overflowed to the 231-W-151-001 Tank when filled. Solids in the floor drainage would settle out, leaving behind sludge and sediment particles on the tank floor. Waste was transferred to the 216-Z-5, 216-Z-6, 216-Z-7 Cribs and the 216-Z-10 Reverse Well through this vault.

The tanks were used to defuse 231-Z Building wastes before conveyance to a Crib. As the 231-Z Building was used to finish plutonium, any wastes or chemicals produced or used in the process may have potentially been added to the 231-W-151 vault tanks.

In addition, on January 20, 1967 an unplanned release consisting of contaminated soil was discovered during efforts to uncover a waste line adjacent to the 231-W-151 Diversion Box. The soil next to the waste line was found to contain 40,000 dpm alpha contamination, and 150 millirem per hour beta/gamma contamination. The unplanned release was the result of a leaking flange. The dose rate on the waste line was 1.5 rad per hour.

It is unclear when the release occurred that resulted in the smear contamination. The volume of wastes released is not specified. Therefore, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site 200-W-9 is associated with the 231-Z Building and waste sites 216-Z-5, 216-Z-6, 216-Z-7, 216-Z-10, and UPR-200-W-130. The pipelines from 231-Z to the 231-W-141 Vault are labeled as sitecode 200-W-199-PL. The pipeline from the vault to the 216-Z is sitecode 200-W-202-PL. The pipeline from the vault to 216-Z-7 is sitecode 200-W-203-PL. The pipeline from the vault to 216-Z-10 is 200-W-204-PL.

Site Posting: Site-231-W-151 is posted as a “Contamination Area/Radiation Area”, “Restricted Access Unsafe Structure. Confined Space”, and IMUST signs.

Site Characterization Summary: The site was operable from 1948 to 1974. The specific date the site was deactivated is not clear. However, the inlet pipelines that fed the tanks were blanked off prior to 1974. The risk for hydrogen concentration, organic salts, vapor releases, radiological risk, and heat creation was deemed low to minimal for 231-W-151-001. The rating was similar for 231-W-151-002, except radiological risk was determined to be moderate, as over 15 curies of transuranics were identified in the sludge. In addition, tank 231-W-151-001 was found to contain 5,413 L (1430 gal) of supernate with (0.001 g) of plutonium, no sludge, and little or no ferrocyanides. Tank 231-W-152-002 was found to contain 3,615 L (955 gal) of supernate with less than 0.001 g of plutonium in the supernate, and 45 L (12 gal) of sludge with 228 grams of plutonium in the sludge.

Analyses of water samples taken on May 9, 1974 showed Cs-137, Sr-89, Sr-90, and Uranium in the 231-W-151-001 sample. Analysis of the water sample taken from 231-W-002 on May 9, 1974 showed Cs-137, Sr-89/Sr-90, Uranium, plutonium-238, plutoniu,-239, plutonium-240, and americium-241.

In September 2002, alpha contamination was detected on the concrete vault’s surface, near the riser. Contamination levels up to 210,000 dpm with 420 dpm removable were detected. In September 2003, the vault was covered with a foam seal to stop intrusion and inhibit the possible spread of contamination.

Investigations stated that in 1974, no evidence of leaks were reported during liquid sampling. The sludge and sediment were determined to not be corrosive. However, due to the extended operational life of the tanks, there is some risk of leakage. In addition, information is presented regarding a leaking flange that created a contamination spread during an excavation in 1967.

It is not specified if any surface stabilization work has occurred at 231-W-151 It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided for the site. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Tank 231-W-151-001 was found to contain 5,413 L (1430 gal) of supernate with (0.001 g) of plutonium. Tank 231-W-152-002 was found to contain 3,615 L (955 gal) of supernate with less than 0.001 g of plutonium in the supernate, and 45 L (12 gal) of sludge with 228 grams of plutonium in the sludge. In addition, Cs-137, Sr-89, Sr-90, and Uranium were detected in the 231-W-151-001 sample, while Cs-137, Sr-89/Sr-90, Uranium, plutonium-238, plutoniu,-239, plutonium-240, and americium-241 were detected in the 231-W-151 sample.

Non-Radioactive: Not Specified.

Figure 1. ArcMap Image

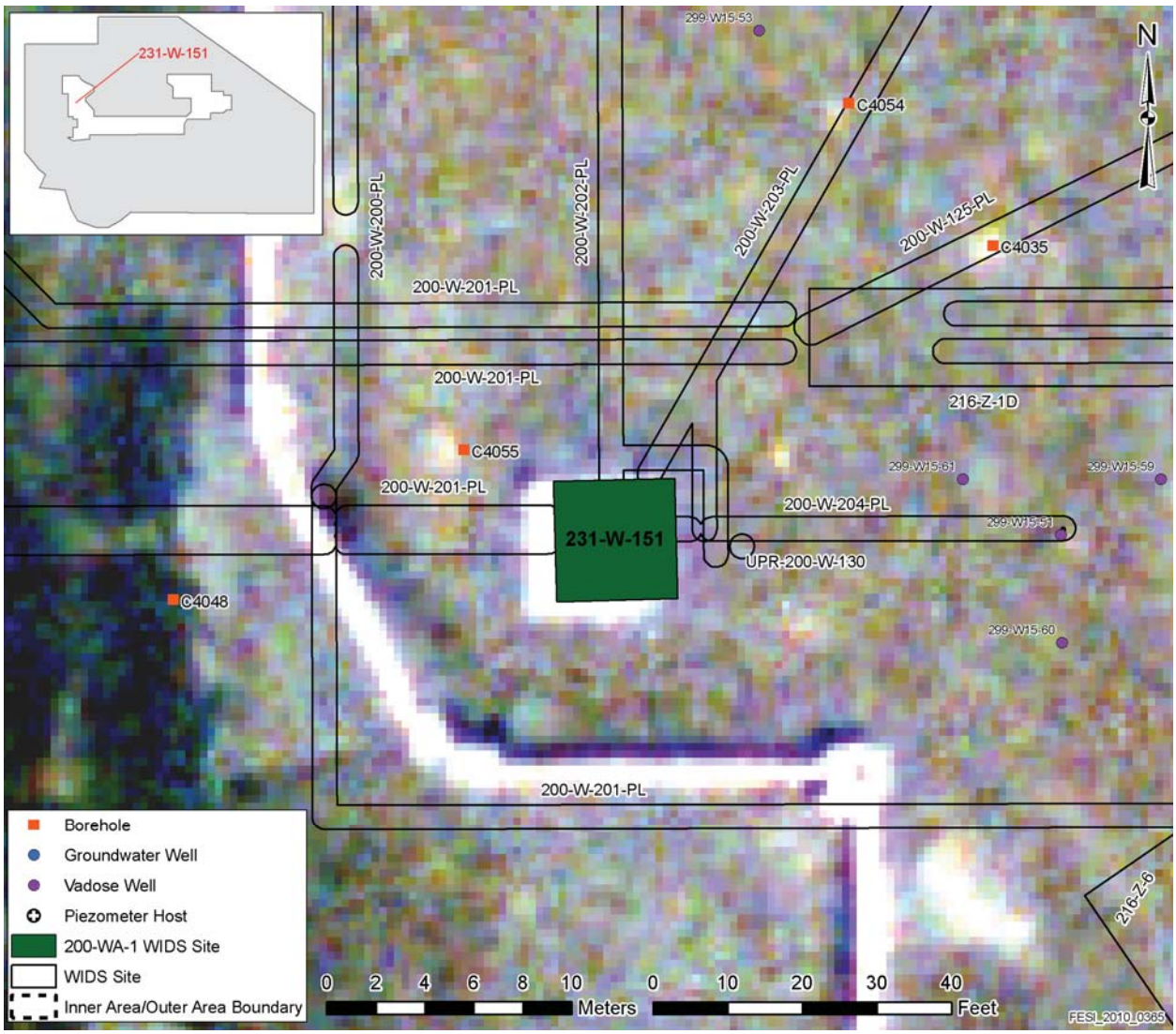


Figure 2. Insert Site Map

Figure not available.

Figure 3. Reference Drawing H-2-508 Sheet 1 Rev.2.

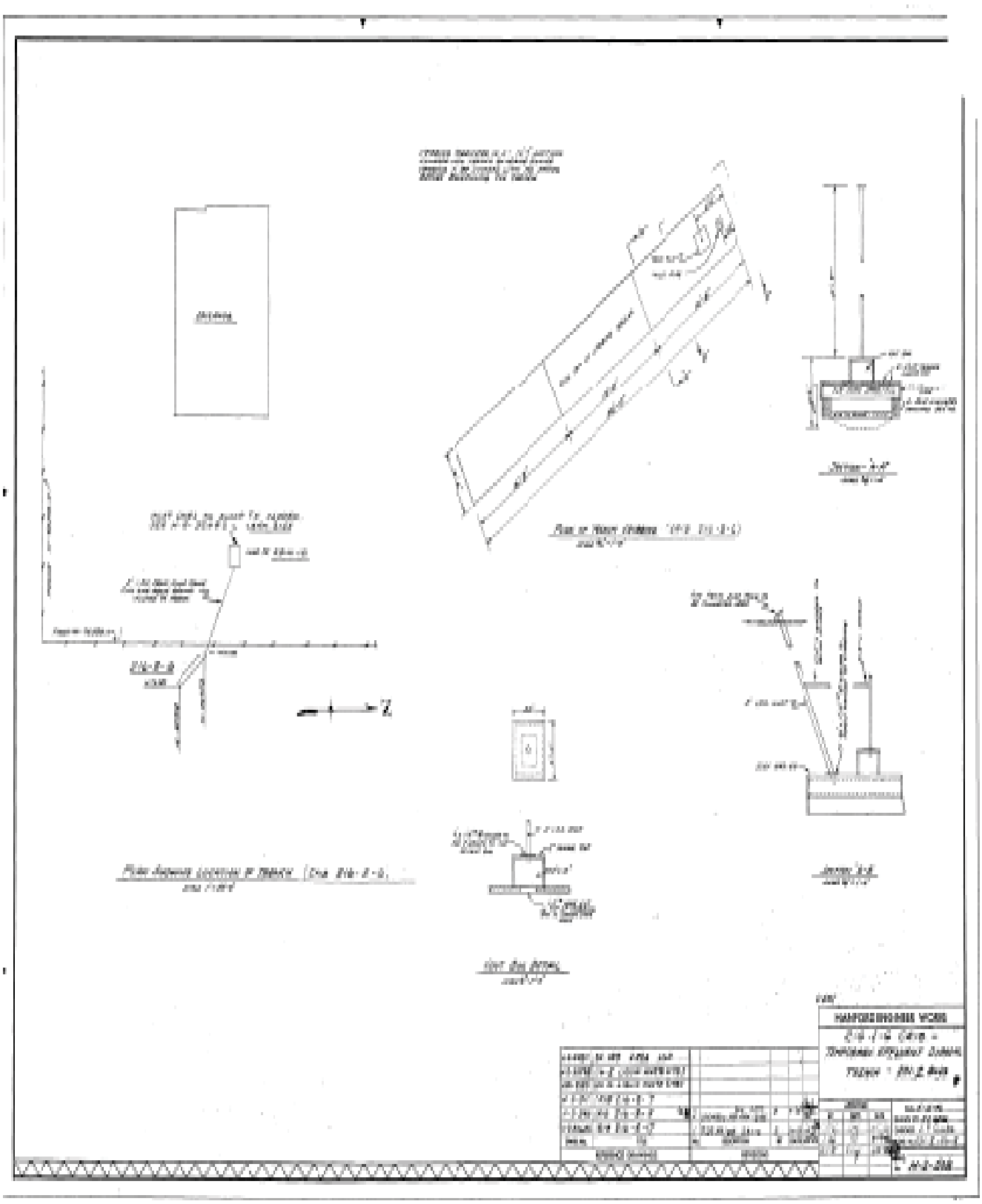
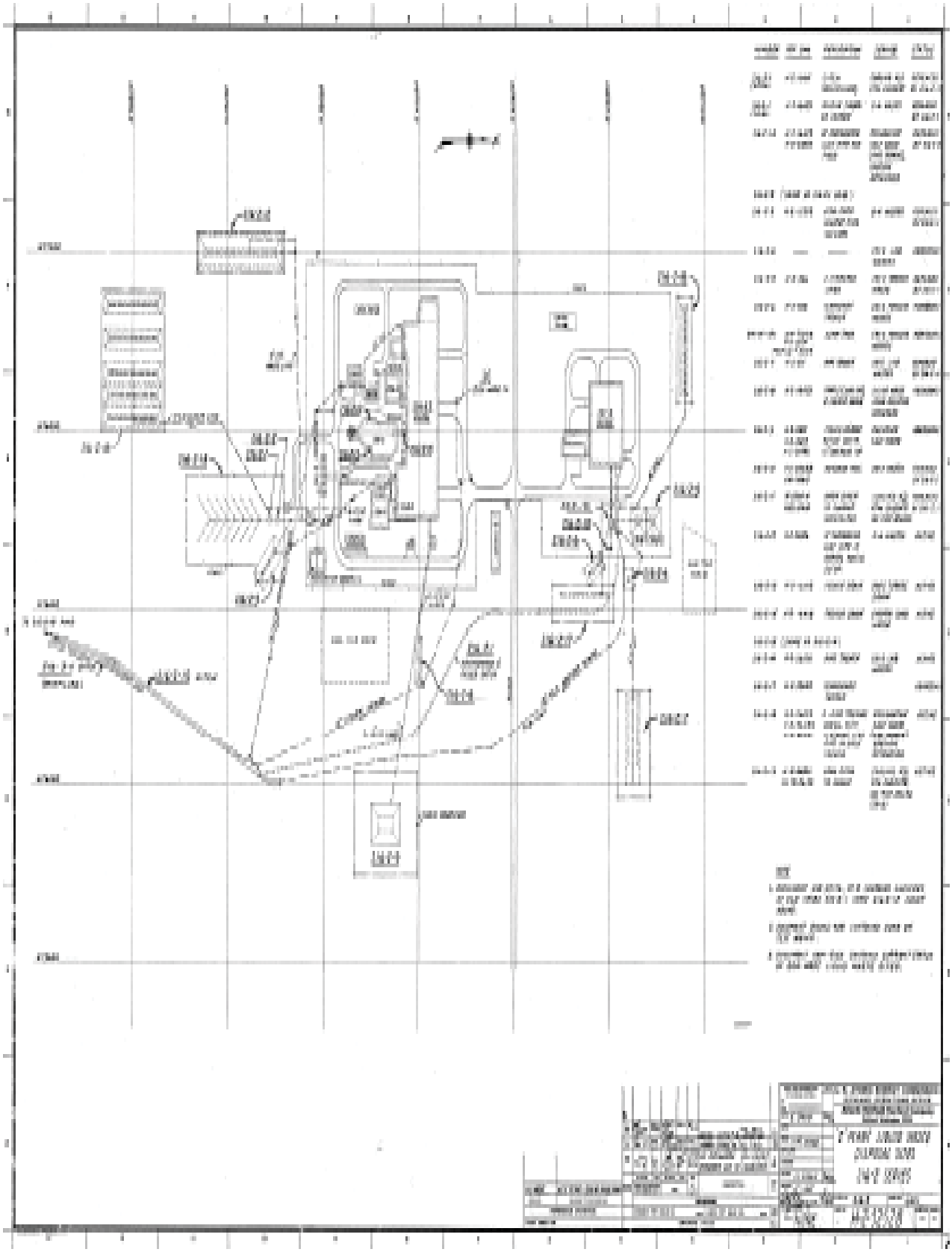


Figure 4. Reference Drawing H-2-32528 Sheet 1 Rev.6.



Site Description

Site ID: 241-T-361
Site Type: Settling Tank
Facility/Geographic Area: 200 Inner Area West
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-TW-2
Service Dates: 1946 to June 1951
Volume/Mass Discharged: 10.6E+4 L (2.8E+4 gal)

Waste Site Location and Physical Description: The settling tank is located southwest of the 221-T Building and north of 23rd Street (See Figure 1. ArcMap Image and Figure 2. Settling Tank Location Reference Drawing H-2-71641). It is adjacent to the 216-T-6 Cribs. The tank is cylindrical and made of reinforced, pre-stressed concrete (See Figure 3. Settling Tank Plan View Reference Drawing H-2-71676). The tank is located underground for shielding purposes. The capacity of the tank was 13.6 E+4 L (3.6E+4 gal).

Waste Site Coordinates:

E-567279.99762 N-136665.16797

Site Dimensions:

Tank Height: 7.6 m (25 ft) Site Diameter: 6.1 meters (20 ft)
Site Area: 29.21 m^2 (314 ft^2) Overburden Depth: 1.83 m (6 ft)

Release Summary: The settling tank received 10.6E+4 L (2.8E+4 gal) of radioactive contaminated liquid waste from the 221-T and 224-T Buildings. The tank discharged to the 216-T-3 Reverse Well during 1945 and 1946. When the reverse well was abandoned, the settling tank discharge was directed to the 216-T-6 Cribs. The settling tank was deactivated in June 1951.

$PV_{released}$ = 10.6E+4 L/ (131 square m*79 m*0.3*1000 Liters/m^3) = 0.03

Therefore, the settling tank is assumed to exhibit no deep vadose effects.

Related Site Structure(s): The settling tank is associated with the 216-T-3 Reverse Well, 216-T-6 Cribs and the 221-T and 224-T facilities. The pipeline from 224-T that fed the reverse well via the 241-T-361 tank is sitecode 200-W-226-PL.

Site Posting: The settling tank is enclosed with light post and chain and concrete AC-540 markers. The underground tank is posted with Inactive Miscellaneous Underground Storage Tank and Underground Radioactive Material (URM) signs.

Site Characterization Summary: In 1974, the contents of the tank were measured and sampled. Sludge 1.5 m (5.2 ft) deep was covered with 2.3 m (7.4 ft) of yellow liquid. The liquid was pumped out in 1985. After pumping, 45.6E+3 L (12E+3 gal) of sludge and 41.8E+3 L (11E+3 gal) of liquid were left in the tank. The settling tank was isolated in 1985.

A sludge sample form the tank was analyzed in 1976. It was described as being black and the consistency of axle grease. The 2.7 gram sample was dissolved in acid. It contained 23 micrograms of plutonium, 12 microcuries per gram of strontium-90 and 67.6 microcuries per

gram of cesium-137. The liquid supernate contained 3.71 microcuries per gallon of cesium-137 and 14.5 milligrams per gallon of plutonium.

The above ground piping was removed, all sink holes were filled, and the ground surface was decontaminated and leveled in August 1975. The 241-T-361 Settling Tank and the 216-T-3 Reverse Well were surface stabilized in 1993. The radiological posting was changed from Surface Contamination to URM.

Annual radiation surveys and visual inspection are performed. A site walkdown was performed in October 1999.

Potential Contaminants:

Radioactive: The Sludge samples contained Plutonium (23 micrograms), Stronium-90 (12 microcuries per gram), and Cesium-137 (67.6 microcuries per gram). The liquid supernate contained Cesium-137 (3.71 microcuries per gallon), and Plutonium (14.5 miligrams per gallon).

Non-Radioactive: Unspecified

References:

WIDS General Summary Report for site 241-T-361.
ArcMap.
QMap.
H-2-71641
H-2-71676

Figure 1. ArcMap Image

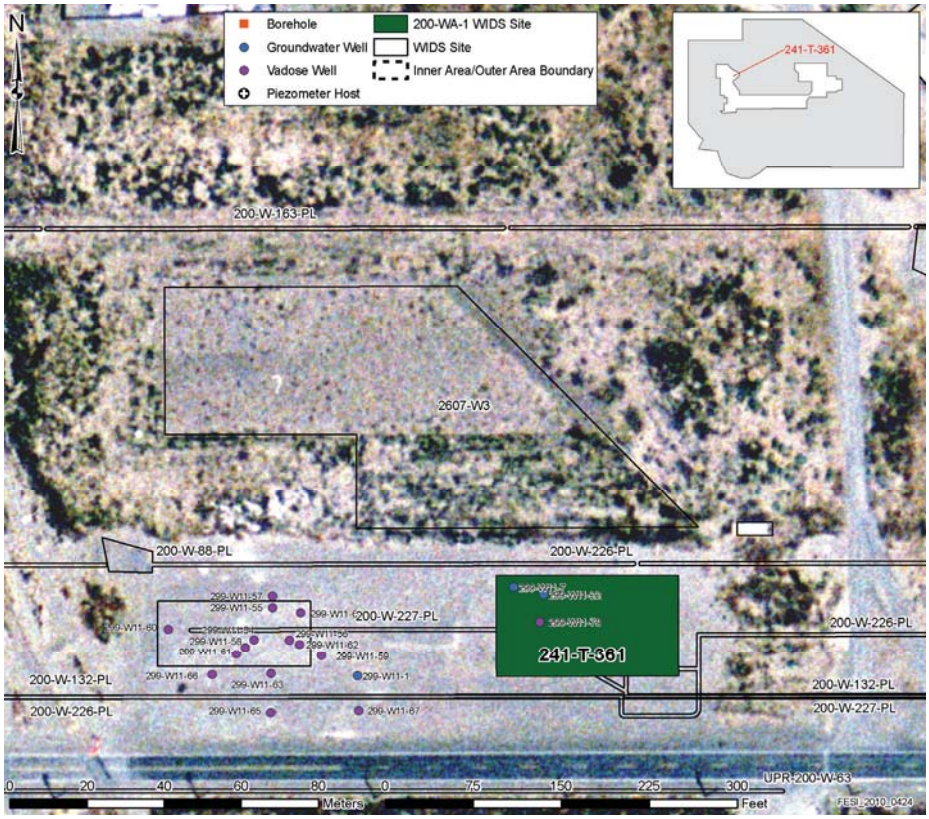


Figure 2. Settling Tank Location Reference Drawing H-2-71641

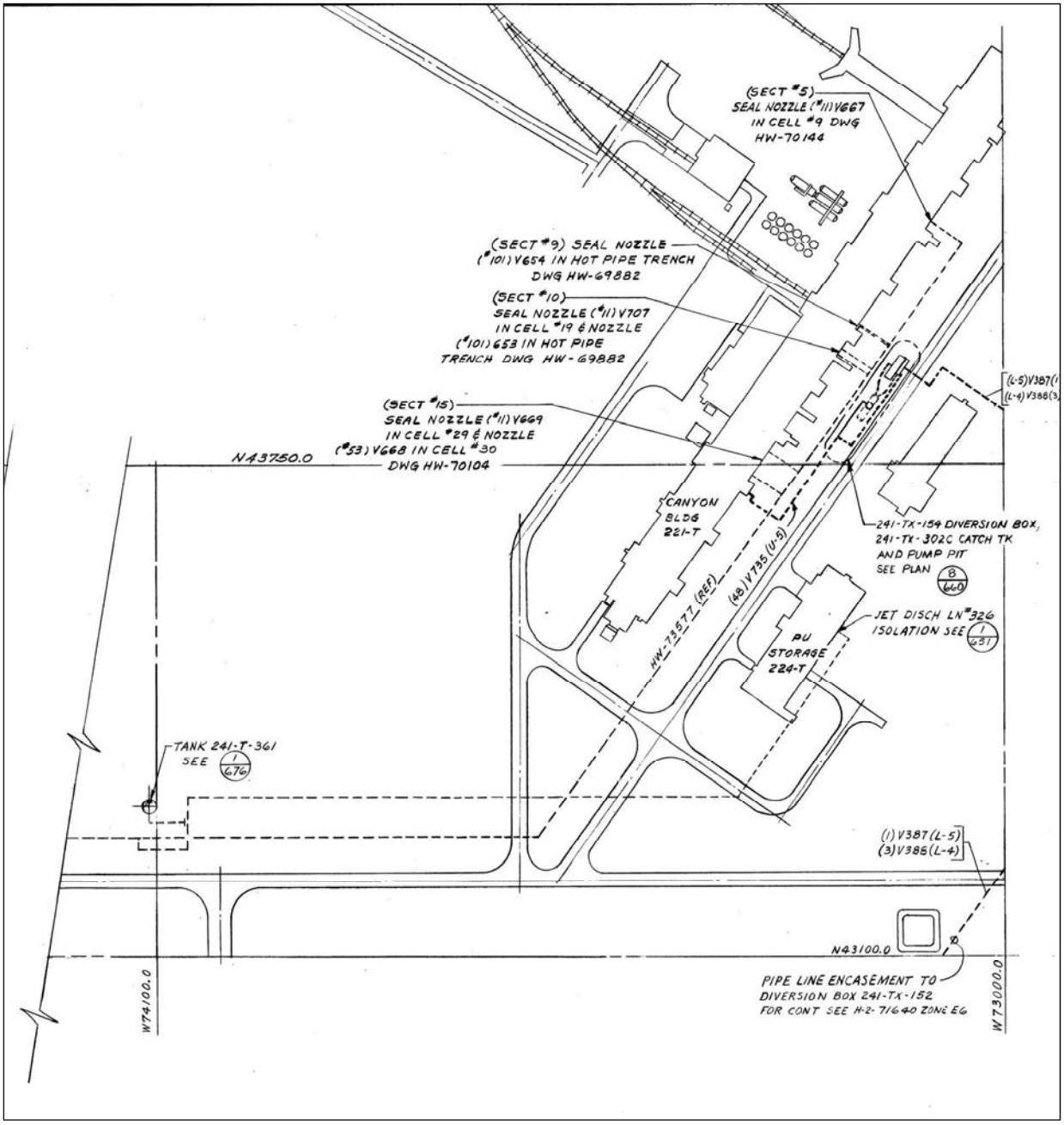
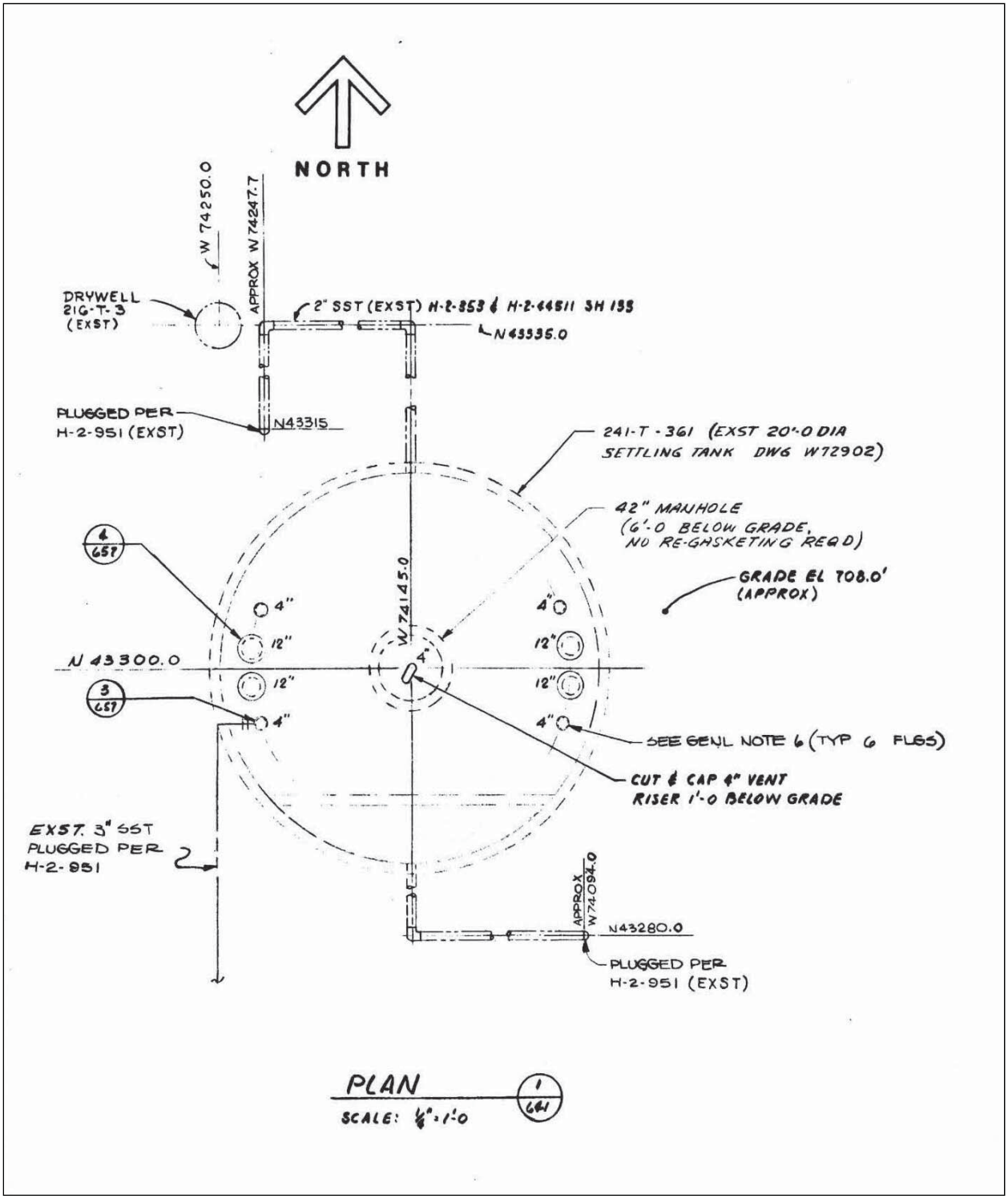


Figure 3. Settling Tank Plan View Reference Drawing H-2-71676



Site Description

Site ID: 241-U-361
Site Type: Settling Tank
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1
Service Dates: 1951 to 1967
Volume/Mass Discharged: 1.04E+05 L (2.75E+04 gal)

Waste Site Location and Physical Description: The 241-U-361 Settling Tank is located southwest of 221-U, north of 16th Street (Figure 1. ArcMap Image). The 241-U-361 Settling Tank is an underground settling tank constructed of reinforced concrete from 1944-1945. The settling tank was originally constructed with overflow piping connected to reverse well 299-W19-9, located adjacent to the 241-U-361 tank. The reverse well never received waste and the waste line was extended from the 241-U-361 tank to the 216-U-1 and 216-U-2 Cribs. Due to the 1953 unplanned release (UPR-200-W-19), the surface surrounding the settling tank has been covered with shotcrete. In 1985, the manual tape was removed and the tank was interim stabilized.

The 216-U-1 & 2 Cribs and the 241-U-361 Settling Tank are located within a common radiologically controlled area. In 1992, the area was surface stabilized by scraping the contaminated surface soil and consolidating it near the 241-U-361 Tank. The contaminated soil was covered with 45 to 61 cm (18 to 24 in) of clean backfill.

Waste Site Coordinates:

E-567295.95953 N-135010.48085

Site Dimensions:

Site Diameter: 6.1 m (20 ft) Site Depth: 7.62 meters (25 ft)
Site Area: 29.2 m^2 (314 ft^2) Cover Thickness: N/A

Release Summary: The tank received cell drainage from the 5-6 tank in the 221-U Building and waste from the 224-U building until the Uranium Recovery operations shut down in 1957. From July 1957 through May 1967, the 216-U-1&2 Crib system received waste from the 224-U facility and equipment decontamination waste and reclamation waste from the 221-U canyon via the 241-U-361 tank. The waste flowed through the 241-U-361 settling tank and then to the 216-U-1 and 2 cribs, located 26 m (85 ft) west, via an underground pipe. The 241-U-361 Settling Tank also received organic waste and cell drainage from the 221-U building during an unplanned release (UPR-200-W-19) in 1953. The contaminated area was subsequently backfilled. Limited information is available to estimate the process effluent volume.

Related Site Structure(s): This unit is associated with the 221-U building, UPR-200-W-19 and the 216-U-1 and 216-U-2 Cribs. The pipeline to the tank is 200-W-193-PL. The pipeline from the tank to the 216-U-1 and 2 cribs is sitecode 200-W-194-PL.

Site Posting: It is posted with Underground Radioactive Material signs and Inactive Miscellaneous Underground Storage Tank (IMUST) signs.

Site Characterization Summary: Annual radiation surveys and visual inspections are performed. Sample data collected in 1976 estimated the tank contained 760 curies of strontium-90, 1365 curies of cesium-137, 69,000 kg of uranium and less than one gram of plutonium. A Limited Field Investigation drilled three characterization boreholes (299-W19-95, 299-W19-96, 299-W19-97) and conducted an in-pipe camera survey of the pipeline to the 241-U-361 tank. In December 2006, vapor samples were collected from the tank and a video camera was lowered through a riser. Dose rates inside the tank were less than 150 millirad per hour. The void space in the tank is only approximately 0.6 m (2 ft). In August and September 2007, the settling tank was sampled. Two supernate samples were collected along with a seven segment core sample of the sludge. It is presently estimated to contain 104,100 L (27,500 gal) of sludge with an unknown plutonium content.

Potential Contaminants:

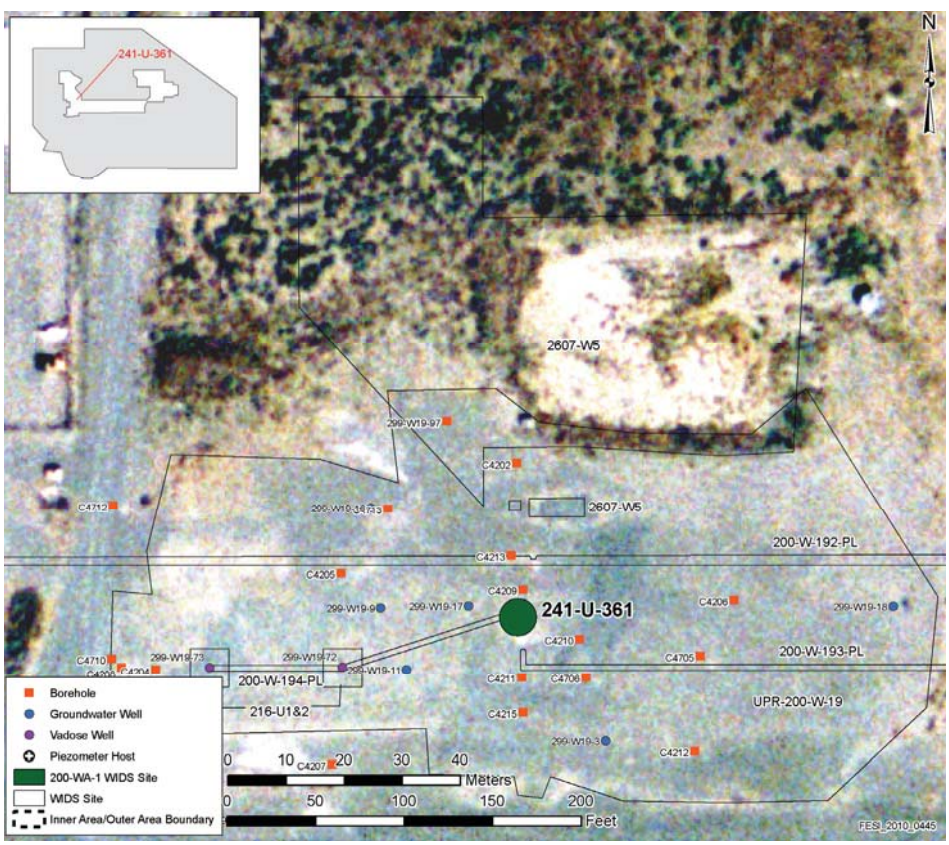
Radioactive: Strontium-90 (760 curies), Cesium-137 (1365 curies), Uranium (69,000 kg), Plutonium (less than one gram).

Non-Radioactive: Not specified

References:

WIDS General Summary Report for site 241-U-361.
QMap.
ArcMap.

Figure 1. ArcMap Image



Site Description

Site ID: 2607-W8
Site Type: Septic Tank
Facility/Geographic Area: Z-Plant (PFP Area)
Current OU Assignment: 200-MG-1
Former OU Assignment: 200-ST-1
Service Dates: 1944to 1998
Volume/Mass Discharged:

Waste Site Location and Physical Description: Site 2607-W8 is located northeast of the 2231-Z Building, and east of the 216-Z-16 Crib (See Figure 2. QMAP Location). The posted radiation zone containing the 216-Z-5 and Z-4 Cribs is adjacent and to the south of the 2607-W8 System. The 2607-W8 System consists of a septic tank and an associated tile field (See Figure 3. Reference Drawing_H-2-44511 Sheet 103 Rev5_Z Plant Facilities).

The Septic Tank is made of reinforced concrete and has one chamber. A dosing siphon is connected to the single tank chamber. Three manholes on the surface of the tank gave employees access. The site is marked with a sign that reads "Septic Tank – 2607-W8."

Waste Site Coordinates:

Lon-566582.18405 Lat-136010.75849

Site Dimensions:

Site Length: 5.9 m (19.6 ft)
Site Width: 1.8 m (6.0 ft)
Site Area: 140.3 m2 (150.0 ft2)
Site Depth: 3.7 m (12.0 ft)
Cover Thickness: Not Specified
Capacity: 19,190 L (5,070 gal)

Dimensions of the septic tank.

Release Summary: The 2607-W8 Septic Tank and Tile Field were built in 1944 for the treatment of nondangerous and nonradioactive sanitary sewer effluent from the 231-Z Building.

The 231-Z Building was associated with the plutonium product finishing process.

Despite the site being associated with the 231-Z Building, it is stated that no radionuclides or hazardous chemicals are associated with this System.

The 2607-W8 Septic Tank was constructed with a 19,190 L (5,070 gal) per day holding capacity. The System received sanitary sewer effluent at an estimated rate of 5,015 L (1,325 gal) per day in 1992. The estimated rate was 5.45 cubic meters (192 cubic ft) per day in 1987.

Related Site Structure(s): The 2607-W8 Septic Tank and Tile Field are associated with the 231-Z Building.

Site Posting: No site posting is specified for 2607-W8. The site is located outside the posted Radiation Area for the 216-Z-4 and 216-Z-5 Cribs.

Site Characterization Summary: The Septic System was deactivated following established Washington Administrative Code guidelines in 1998. All waste inside the tank was removed and

the empty tank was filled to eliminate void space. No sampling records from the deactivation period are available.

A site walkdown on July 3, 2000 verified that the 2607-W8 Septic Tank and Tile Field are not inside the posted radiation area of the 216-Z-4 and 216-Z-5 Cribs as previously thought. Instead, they are located just north of the Cribs.

No site characterization information is presented for 2607-W8. The site is not routinely surveyed or monitored.

Potential Contaminants:

Radioactive: Not Specified

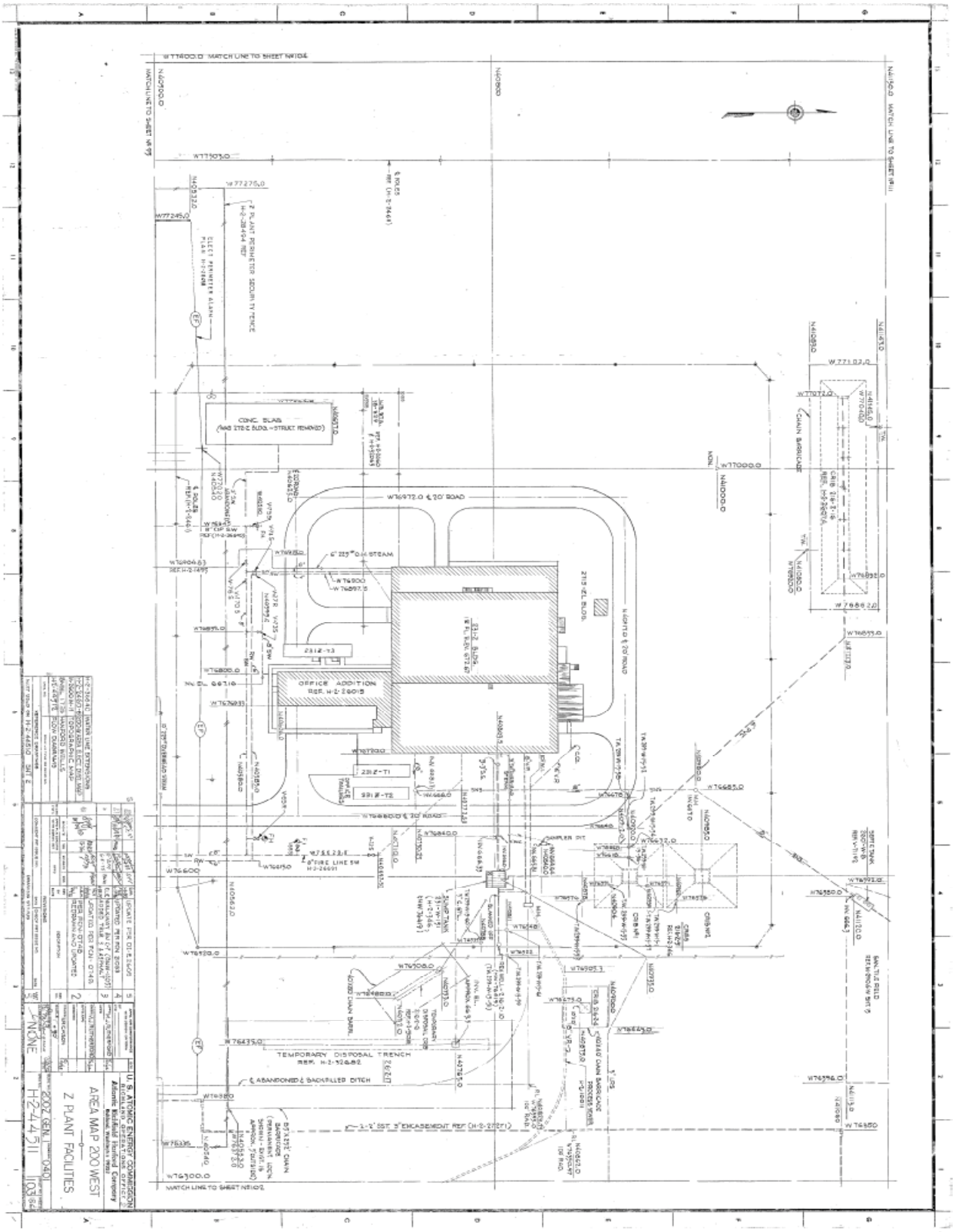
Non-Radioactive: Not Specified

Figure 1. ArcMap Image

Figure 2. Insert Site Map

Figure not available.

Figure 3. Reference Drawing H-2-44511 Sheet 103 Rev5 Z Plant Facilities



Site Description

Site ID: 270-W
Site Type: Neutralization Tank
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-PW-2
Service Dates: 1952 to 1960
Volume/Mass Discharged: N/A

Waste Site Location and Physical Description: The unit is located under the northeast end of 2715-UA building, inside the 224-U facility fence (Figure 2). There is no visual evidence for this tank. The tank is located beneath the cement foundation of the 2715-UA building. The tank was abandoned and blanked off in 1970. The 2715-UA building was removed in August 2005, leaving the foundation slab in place. The 270-W tank risers are protected with a cement block. The 270-W consists of an underground, stainless steel tank that is 2.7 meters (9 feet) tall and 2.7 meters (9 feet) in diameter. The nominal capacity of the tank is 14,300 L (3,780 gal). The tank was filled with limestone and used to neutralize acidic process condensate generated from the 224-U building. Following the pH adjustment, the waste was released to the 216-U-8 crib via a 15 cm (6 in) VCP line.

Waste Site Coordinates:

Site Dimensions:

Site Length: 2.74 m (9 ft)
Site Area: 7.51 m^2 (81 ft^2)
Site Diameter: 2.74 m (9 ft)
Cover Thickness: N/A

Release Summary: The unit was filled with limestone and used to neutralize acidic 224-U process condensate from the UO3 plant operation. Contributors to the process condensate included feed UNH concentrator offgas, calciner offgas, phosphoric acid, and potassium hydroxide. Limited information on the discharge volume is available and therefore it is not known if the discharge affected the deep vadose.

Related Site Structure(s): The tank is associated with the 224-U facility and pipeline site 200-W-42.

Site Posting: N/A

Site Characterization Summary: Analyses of process condensate samples have revealed trace amounts of hydrogen fluoride, mercury, acetone, 1-butanol, 2-butanone, and n-nitrosodiumethylamine. Analysis of the last liquid to flow through the tank revealed beta emitters, uranium, and plutonium. The tank contains an unknown amount of spent limestone sludge. No analyses were found of this sludge, but it could contain uranium, uranium oxides, and other wastes.

Potential Contaminants:

Radioactive: Not specified

Non-Radioactive: Hydrogen fluoride, mercury, acetone, 1-buanol, 2-butanone, n-nitrosodiummethylamine

References:

All information from WIDS Summary Report unless otherwise noted.

Figure 1. ArcMap Image

Figure 2. Insert Site Map from Qmap

Figure not available.

Site Description

Site ID: 600-70
Site Type: Dumping Area
Facility/Geographic Area: S-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-1
Service Dates: 1950
Volume/Mass Discharged: N/A

Waste Site Location and Physical Description: The site is located 360 m (1,181 ft) east of REDOX, outside the 200-W Area perimeter fence (Figure 1). In early 1950, the United States Government began construction of the REDOX plant in the south portion of the 200-West Area. A construction storage, heavy equipment vehicle parking and maintenance, concrete truck washdown area, and a waste disposal area associated with the REDOX plant construction were at this site. The site is located on relatively flat terrain except for natural depressions and evidence that trenches may have been dug. Large amounts of construction materials such as concrete, wood, metal, cans, barrels and transite are visible. Numerous areas of burned materials were also observed.

Waste Site Coordinates:

E-568065.81447 N-133989.50648

Site Dimensions:

Site Length: 425 m (1,394 ft)
Site Width: 280 m (919 ft)
Site Area: 104,179 m^2 (1,121,337 ft^2)
Site Depth: N/A
Cover Thickness: N/A

Release Summary: The site contains large areas of metal and concrete debris. There are large numbers of barrels and cans and several areas with evidence of burning. In addition, miscellaneous trash such as glass, lumber and tar, and both friable and non-friable types of asbestos were also associated with the site. Likely waste disposal during the 2-year construction period included trash burning, acid "pickling" (metal preparation) wastes, cooling water from heliarc welding operations (into a french drain), and sandblasting wastes. Other possible contaminants disposed of in this area include gasoline, oil, other lubricants, anti-freeze, and other vehicle-related fluids. The exact locations of the french drain and other disposal units are unknown.

Related Site Structure(s): N/A

Site Posting: N/A

Site Characterization Summary: There are six groundwater monitoring wells within the 365 hectares (900 acres) of state-leased land and six other wells near the tract (two belong to US Ecology). At least one or more of the six on-site wells shows regulatory exceedances of carbon tetrachloride, iodine-124, tritium, coliform bacteria, and iron. Nitrate and technetium-99 plumes also lie below the tract. These plumes have migrated from the 200 West Area and are not associated with sources within the tract. There is no surface water flowing through or adjacent to the 365-hectare (900-acre) tract.

Potential Contaminants:

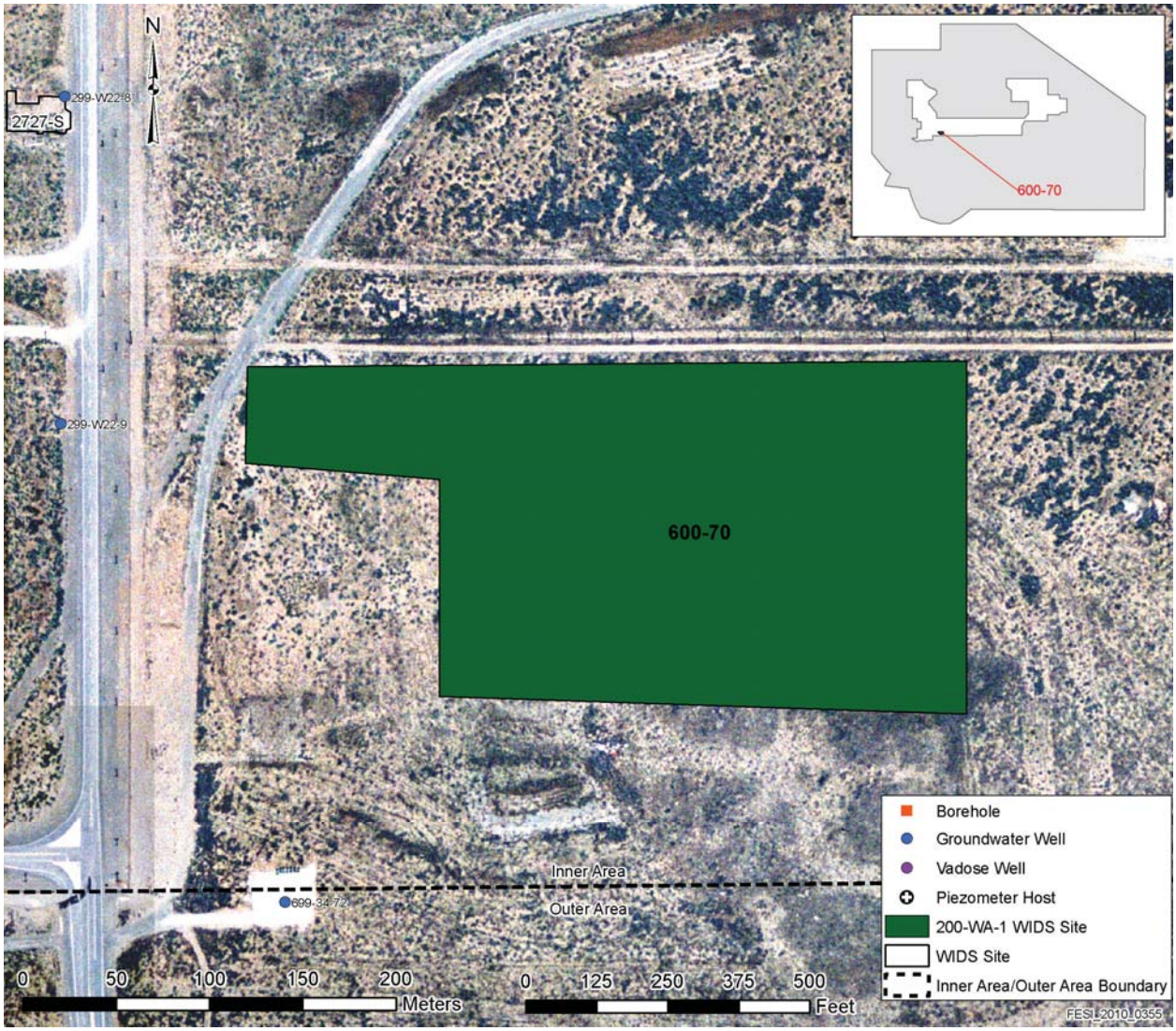
Radioactive: Not specified

Non-Radioactive: Not specified

References:

WIDS General Summary Report for site 600-70.
QMap.
ArcMap.

Figure 1. ArcMap Image



Site Description

Site ID: UPR-200-W-101
Site Type: Unplanned Release
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-1
Service Dates: 1957
Volume/Mass Discharged: N/A

Waste Site Location and Physical Description: UPR-200-W-101 occurred at the northeast end of the 221-U Building (sections R-1 through R-9) in the 200 West Area (see Figure 1). The contaminated area of approximately 19.8 m (65 ft) by 27.5 m (90 ft) was covered with 3 inches of sand and gravel after the occurrence.

A larger contaminated area on the east side of 221-U was surface stabilized in 1998 (UPR-200-W-162). In 1998, the contaminated areas on the rear side of 221-U were covered with clean backfill material. The area around the 241-UX-154 Diversion Box was not covered with backfill material.

In 1967, a Radiation Monitoring Management Report stated that approximately 1900 m^2 (20,000 ft^2) of ground surface at the rear of the 221-U Building was resealed. The original tar surface over an old radioactive spill area had decomposed and allowed weeds to grow and bring contamination to the surface. The resealed area extended from section R-1 through section R-9 and out to the road east of the building. All weeds were removed, soil sterilizing agent was then sprayed over the ground, a hot tar base was applied, and this was capped with fine mesh chipped gravel.

Waste Site Coordinates:

E-567617.84347 N-135224.20283

Site Dimensions:

Site Length: 27.43 m (90 ft) Cover Thickness: N/A
Site Width: 19.81 m (65 ft) Site Depth: 0.91m (3 ft)

Release Summary Reclaimed acid was distributed via overhead pipelines between 224-U and 211-U. UPR-200-W-101 occurred in March 1957, when reclaimed acid was spilled onto the ground at the northeast end of the 221-U Building. Approximately 1 curie of fission products was released. At the time of discharge, the reclaimed acid contained approximately one curie of strontium-90.

Related Site Structure(s): UPR-200-W-101 was associated with sections R-1 through R-9 of the 221-U Building and UPR-200-W-162.

Site Posting: The release site was posted with "Surface Contamination" warning signs. This unplanned release area was located within the UPR-200-W-162 posted area. After being covered with clean material, the posting was changed to Underground Radioactive material. UPR-200-W-101 is not separately marked or posted within the area.

Site Characterization Summary: During a radiological survey in September 1976, surface contamination to 300 counts per minute was detected.

Potential Contaminants:

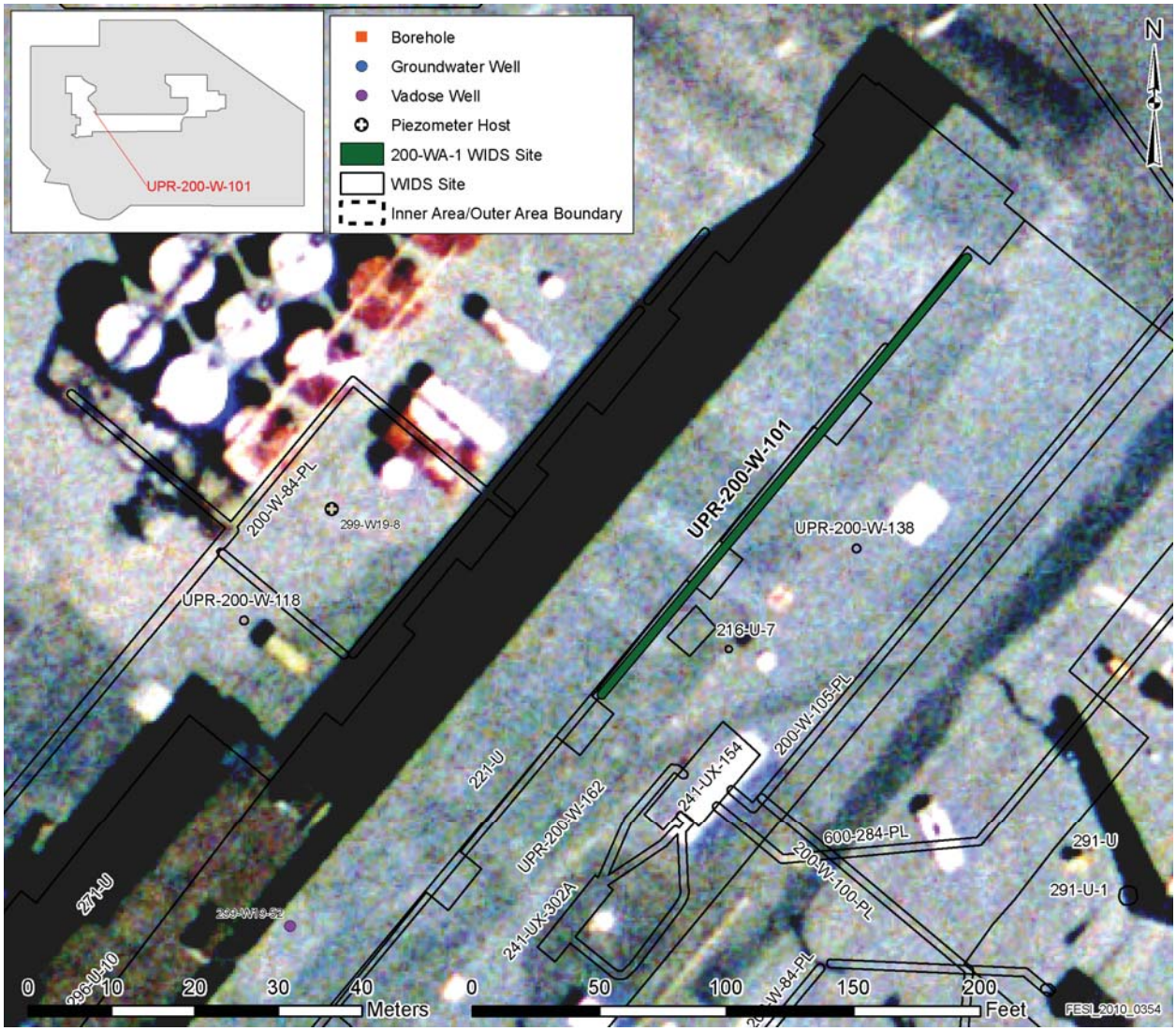
Radioactive: Sr-90

Non-Radioactive: Not specified

References:

WIDS General Summary Report for site UPR-200-W-101
ArcMap
QMap

Figure 1. ArcMap Image



Site Description

Site ID: UPR-200-W-103, UN-216-W-13, 216-Z-18 Line Break, UN-326-W-13, UN-200-W-103, Pipe Line Leak.
Site Type: Unplanned Release
Facility/Geographic Area: Z-Plant (PFP Area)
Current OU Assignment: 200-MG-2
Former OU Assignment: 200-PW-1
Service Dates: April 1971
Volume/Mass Discharged:

Waste Site Location and Physical Description: Site UPR-200-W-103 was an unplanned release (UPR) in April 1971 inside the Z Plant exclusion area. The UPR is approximately 1.8 m (6 ft) south and 3.7 m (12 ft) west of the southwest corner of the 236-Z Building (See Figure 2. per QMap). The UPR occurred when the 216-Z-18 Crib pipeline broke near the southwest corner of the 236-Z Building. An excavation of the area led to the discovery of a 7.6 m (25 ft) long and 1.8 m (6 ft) wide contaminated area of soil. The site is covered by an unspecified amount of clean backfill. No reference drawings are available for this site, as it is an unplanned release.

Waste Site Coordinates:

Lon-566527.18743 Lat-135589.32818

Site Dimensions:

Site Length: 7.6 m (25.0 ft)
Site Width: 1.8 m (6.0 ft)
Site Area: 16.0 m (150.0 ft2)
Site Depth: 2.1 m (7.0 ft)
Cover Thickness: Not Specified

Release Summary: The pipeline break released an estimated 10 g of plutonium in liquid form, with gross alpha contamination in excess of 6 million dpm. A 2.1 m (7 ft) area was excavated around the line break, and approximately one hundred 55-gallon barrels of contaminated soil were removed and buried in the 200 West Area Plutonium “Storage for Recovery” Burial Ground. The site was covered with an unspecified amount of clean backfill following cleanup activities. However, a significant portion of the contaminated soil was left behind in the excavation after the site was backfilled.

Related Site Structure(s): UPR-200-W-103 is associated with the 216-Z-18 Crib line (sitecode 200-W-174-PL), the 234-5 Building, and the 236-Z Building

Site Posting: The UPR site is posted with Underground Radioactive Material (URM) warning signs. Contamination still remains beneath the clean backfill. A WIDS number sign inside the posted URM area marks the estimated release point.

Site Characterization Summary: No site characterization information is presented for this UPR.

Potential Contaminants:

Radioactive: 10 g of plutonium with gross alpha contamination measured greater than 6 million dpm, based on April 1979 readings.

Non-Radioactive: Not Specified

Figure 1. ArcMap Image

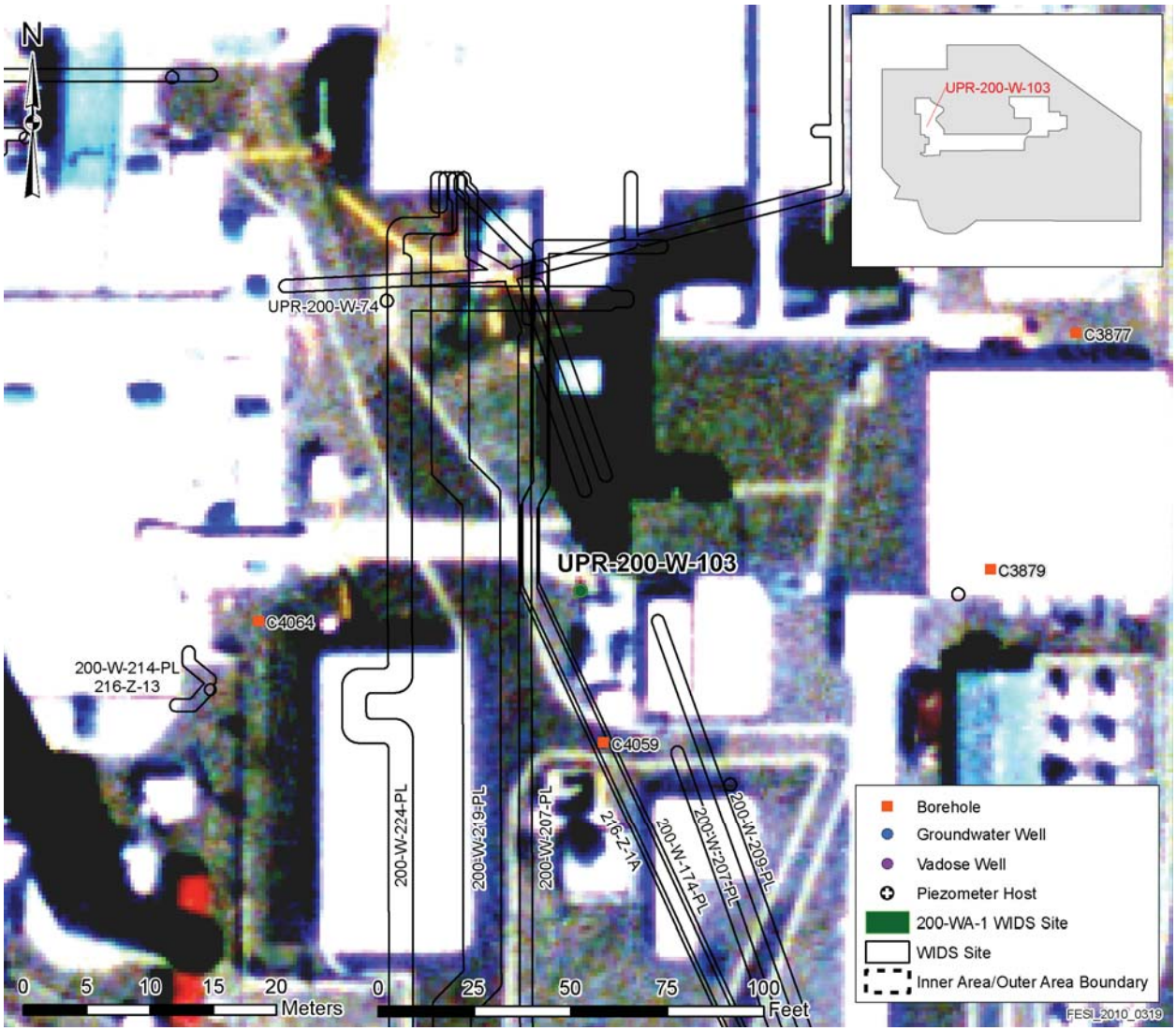
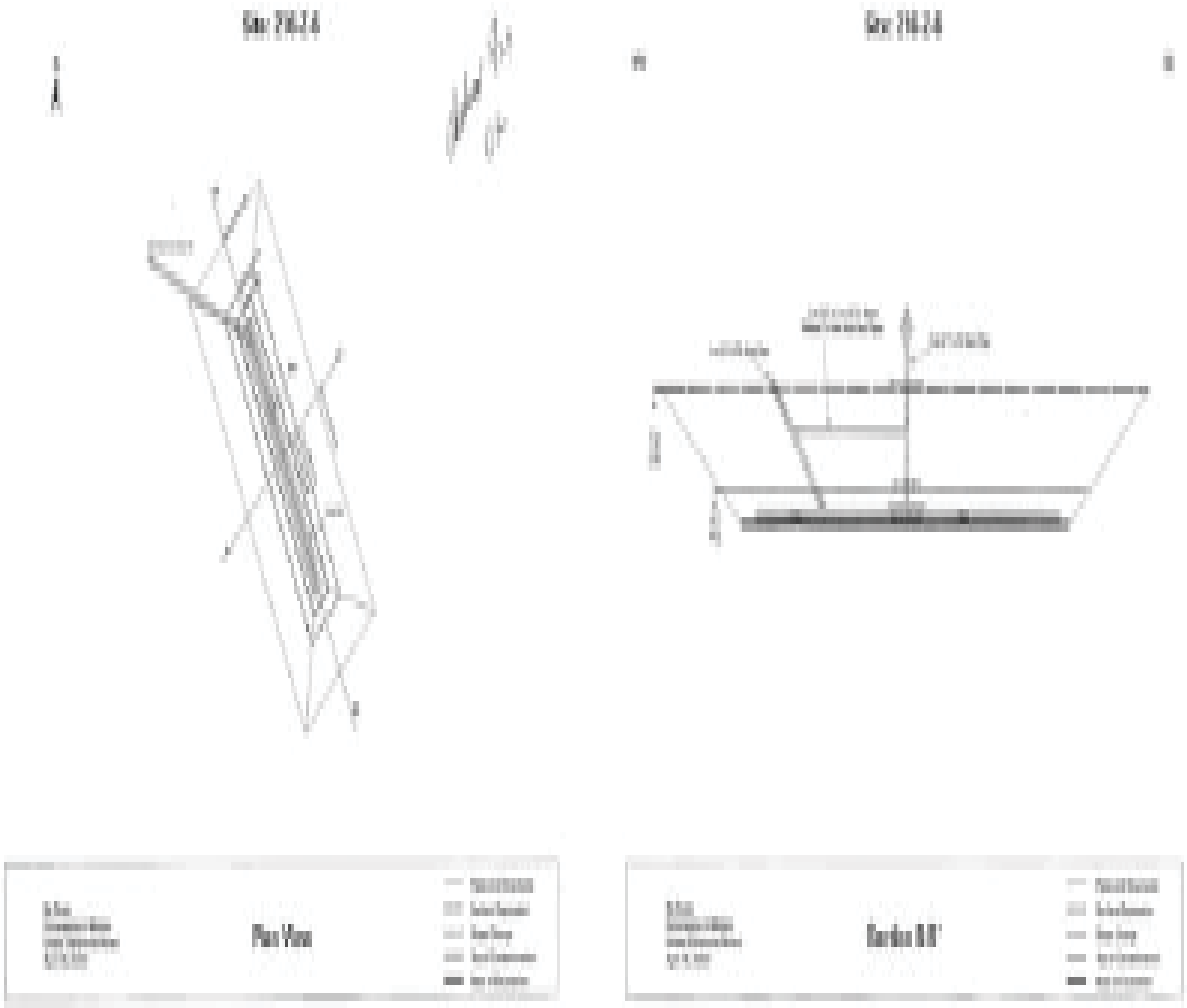


Figure 2. Insert Site Map

Figure not available.

Figure 3. Plan View of the 216-Z-7 Crib.



Site Description

Site ID: UPR-200-W-111, Sludge Trench at 207-U, UN-216-W-21
Site Type: Unplanned Release
Facility/Geographic Area: U-Plant
Current OU Assignment: 200-MG-2
Former OU Assignment: Not Specified
Service Dates: Not Specified
Volume/Mass Discharged: 21 cubic meters (27 cubic yards) of sludge

Waste Site Location and Physical Description: Site UPR-200-W-111 was an unplanned release (UPR) into a disposal trench roughly 3 m (10 ft) from the concrete wall on the south side of the 207-U South Retention Basin in the 200 West Area (See Figure 2. per QMap and Figure 3. 207-Retention Basin Map). The site was posted with "Surface Contamination" (SCA) warning signs until 1997; when contaminated soils in the area surrounding the 207-U Retention Basin were scraped and compiled along the basin boundary. The consolidated piles were covered with a layer of clean backfill, and the posting was changed to "Underground Radioactive Material" (URM) area. No reference drawings are available for this site.

Waste Site Coordinates:

Lon-566972.24999 Lat-134984.20318

Site Dimensions:

Site Length: 12.2 m (40.0 ft)
Site Width: 4.6 m (15.0 ft)
Site Area: Not Specified
Site Depth: 3.1 m (10.0 ft)
Cover Thickness: 1.2 m (4.0 ft)

Release Summary: It is believed site UPR-200-W-111 was constructed in the 1960's as a single use disposal trench. The trench received an estimated 21 cubic meters (27 cubic yards) of sludge from the 207-U South Retention Basin. Until 1972, the Retention Basin received steam condensate and cooling water from the 224-U Building and chemical sewer waste from the 221-U Building. The exact date the trench was excavated is unknown.

Related Site Structure(s): Site UPR-200-W-111 was associated with the 207-U South Retention Basin.

Site Posting: Site UPR-200-W-111 was originally posted as a SCA. Currently, the site is posted as a URM area following surface stabilization work in 1997.

Site Characterization Summary: On an unspecified date, sludge was scraped from the floor of the South 207-U Retention Basin and deposited into the UPR-200-W-111trench. The trench is next to the south basin wall. After deposition, the sludge was buried beneath 1.2 m (4.0 ft) of clean backfill material. The trench was provided an UPR label, despite the sludge removal being a planned activity. The exact date the contaminated soil was scraped and consolidated is uncertain.

In 1997, the area was surface stabilized by scraping and consolidated areas of contamination surrounding the 207-U Retention Basin. Once the contamination was consolidated, a layer of clean soil was placed over the site. The site was downposted from a SCA to an URM area

following the stabilization work. A site walkdown for surveillance purposes occurred on February 25, 1998, however the results of the survey are not presented.

A Global Positioning System (GPS) survey mapped a significant portion of the outer boundary of the 207-U Retention Basin from October 25 to November 14, 1995. However, the southern boundary edge was not mapped due to a loss of lock by the GPS unit. In addition, the boundaries between UPR-200-24 and UPR-200-W-111 were not mapped due to access issues. When surveyed, UPR-200-W-111's perimeter was determined based on signs posted around its boundary. In March 1998, it was discovered that the site may have been labeled incorrectly.

Additional GPS mapping surveys occurred from February 13 to February 15, 1996, and on September 12, 1997. The 1996 survey mapped the southern portion of the site. On September 12, 1997, the GPS survey mapped the perimeter of the post-stabilization area. In addition, the long boundary that UPR-200-W-111 shares with UPR-200-W-24 was mapped. As with the initial fall 1995 survey, the boundaries for UPR-200-W-111 were based on existing postings at the site; thus the site may have been labeled incorrectly.

No radiological survey information is presented for the site. Thus, it is unclear what the radiological conditions are within the site. It is also unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: an estimated 21 cubic meters (27 cubic yards) of sludge from the 207-U South Retention Basin.

Figure 1. ArcMap Image

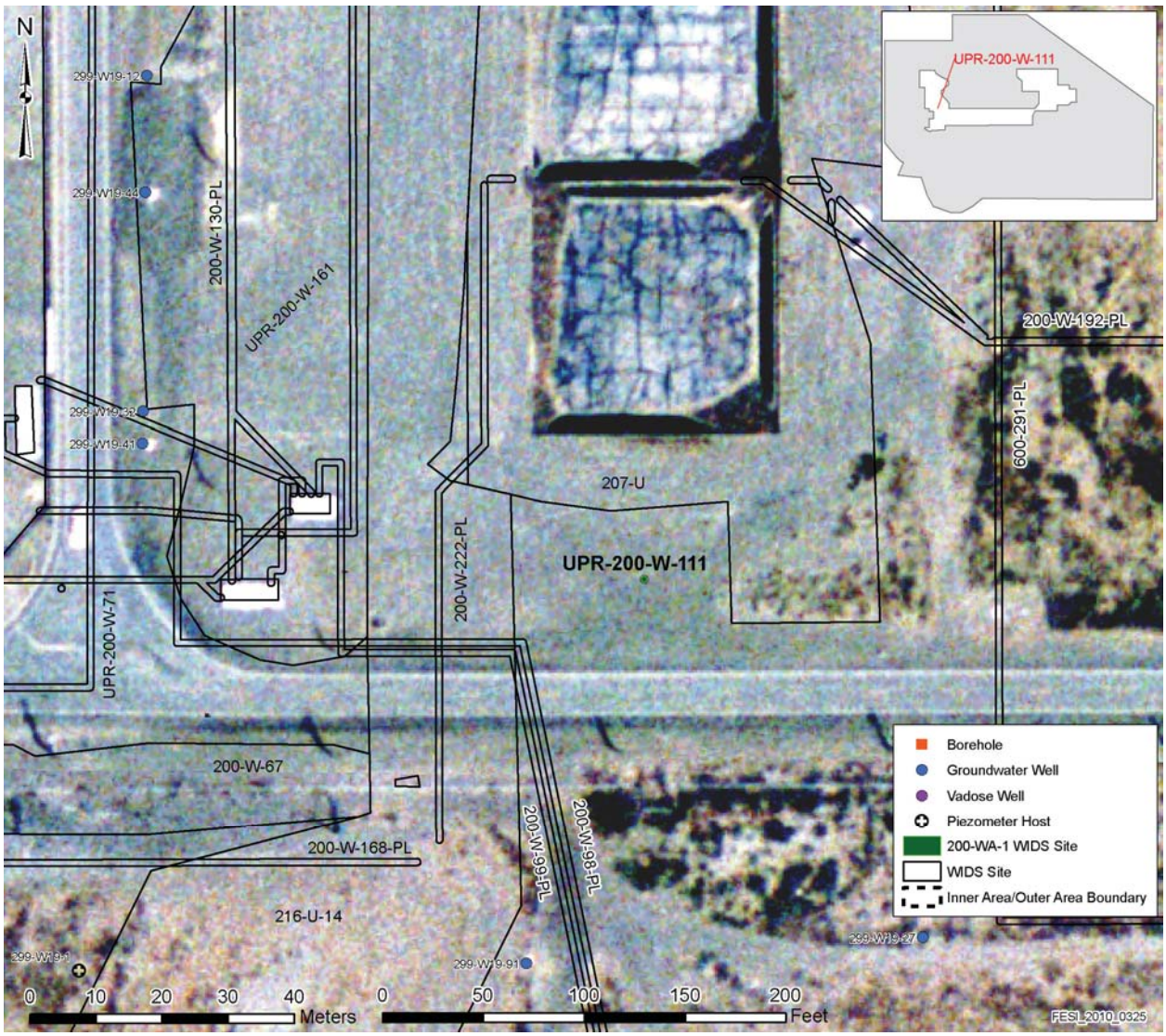


Figure 2. Insert Site Map

Figure not available.

Figure 3. 207-Retention Basin Map

Site Description

Site ID: UPR-200-W-112, Sludge Trench at 207-U, UN-216-W-22
Site Type: Unplanned Release
Facility/Geographic Area: U-Plant
Current OU Assignment: 200-MG-2
Former OU Assignment: Not Specified
Service Dates: Not Specified
Volume/Mass Discharged: 21 cubic meters (27 cubic yards) of sludge

Waste Site Location and Physical Description: Site UPR-200-W-112 is an unplanned release (UPR) into a disposal trench roughly 3 m (10 ft) from the concrete wall on the north side of the 207-U North Retention Basin (See Figure 1. ArcMap Image and Figure 2. U-Plant Area Map). The site was posted with "Surface Contamination" (SCA) warning signs until 1997, when the contaminated area was scraped and consolidated. The site was then covered with a layer of clean soil and downposted to an "Underground Radioactive Material" (URM) area. No reference drawings are available for this site.

Waste Site Coordinates:

E-566970.93750 N-135087.86715

Site Dimensions:

Site Length: 12.2 m (40.0 ft)
Site Width: 4.6 m (15.0 ft)
Site Area: Not Specified
Site Depth: 3.05 m (10.0 ft.)
Cover Thickness: 1.2 m (4.0 ft)

Release Summary: It is believed site UPR-200-W-112 was constructed in the 1960's as a single use disposal trench. The trench received an estimated 21 cubic meters (27 cubic yards) of sludge from the 207-U North Retention Basin. Until 1972, the Retention Basin received steam condensate and cooling water from the 224-U Building and chemical sewer waste from the 221-U Building. The exact date the trench was excavated is unknown.

Related Site Structure(s): Site UPR-200-W-112 was associated with the 207-U North Retention Basin.

Site Posting: Site UPR-200-W-112 was originally posted as a SCA. Currently, the site is posted as a URM area following surface stabilization work in 1997.

Site Characterization Summary: On an unspecified date, sludge was scraped from the floor of the North 207-U Retention Basin and deposited into the UPR-200-W-112 trench, which is located next to the north basin wall. After deposition, the sludge was buried beneath 1.2 m (4.0 ft) of clean soil. The trench was provided an UPR label, despite the sludge disposal being a planned activity. The exact date the contaminated soil was scraped and consolidated is uncertain.

In 1997, the area was surface stabilized by scraping and consolidated areas of contamination. Once the contamination was consolidated, a layer of clean soil was placed over the site. The site was downposted from a SCA to an URM area following stabilization work.

A site walkdown for surveillance purposes occurred on February 25, 1998, however the results of the survey are not presented. In addition, no radiological survey or site characterization

information is presented for the site. Thus, it is unclear what the radiological conditions are within the site. It is also unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: an estimated 21 cubic meters (27 cubic yards) of sludge.

Figure 1. ArcMap Image

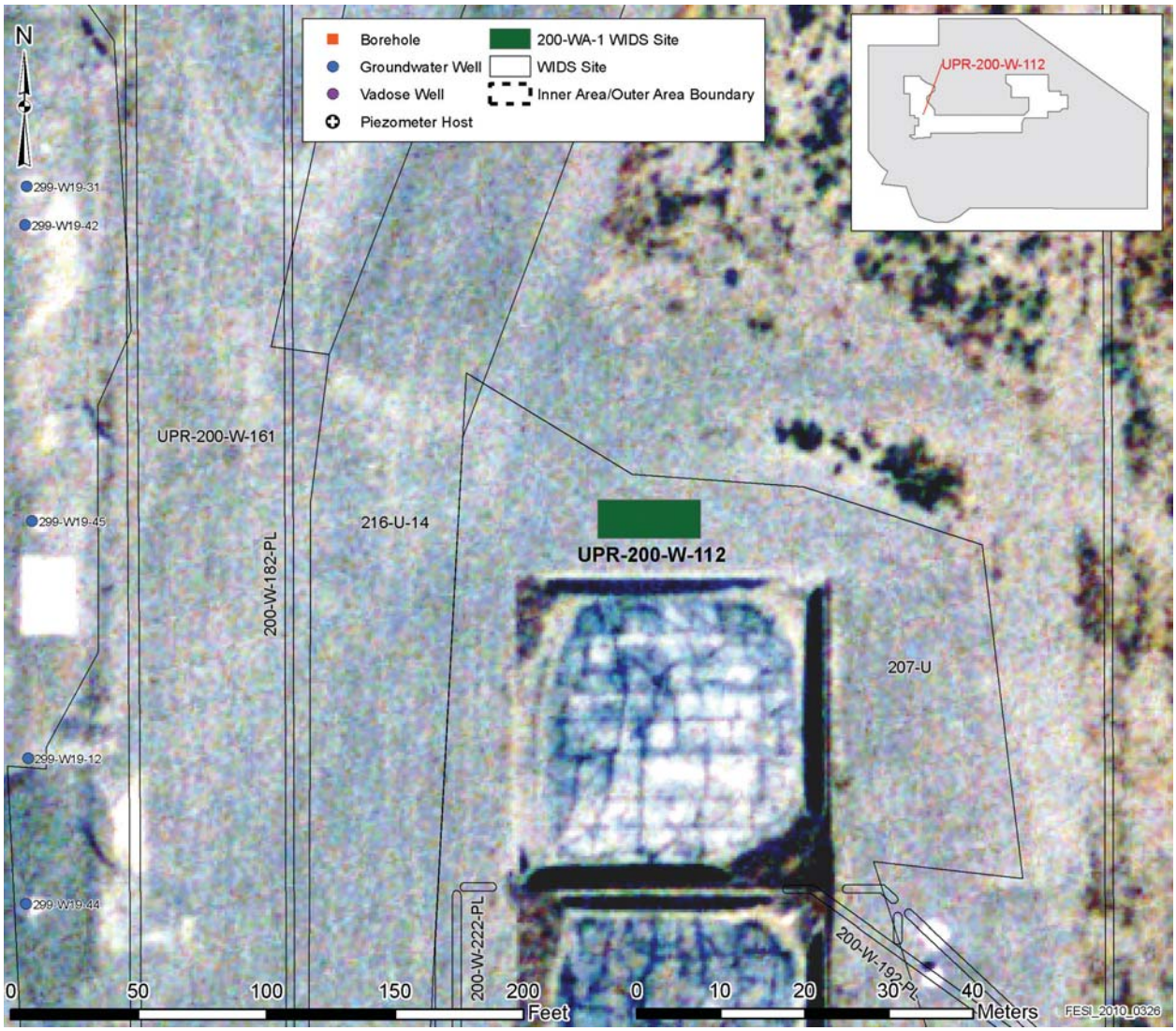
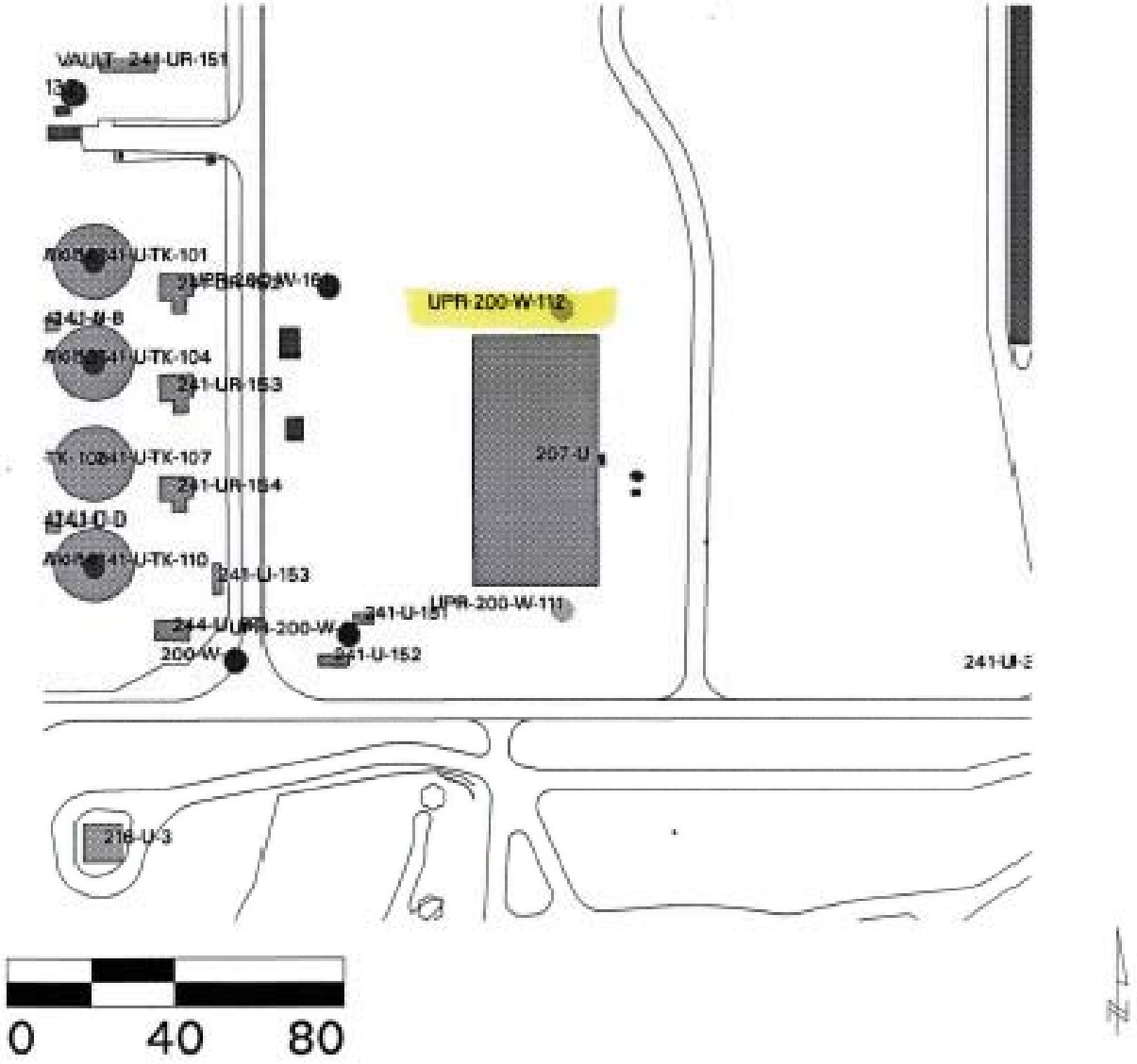


Figure 2. U Plant area map

UPR-200-W-111, UPR-200-W-112

10/22/96



Site Description

Site ID: UPR-200-W-116
Site Type: Unplanned Release
Facility/Geographic Area: S-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-1
Service Dates: 1968 to 1981
Volume/Mass Discharged: N/A

Waste Site Location and Physical Description: The release affected an area east of the 204-S Unloading Station, north of the 202-S Building and west of the REDOX railroad cut (see Figure 1. ArcMap Image). The area was bladed into windrows in 1974. In 1993, the area was interim stabilized. The contaminated soil was scraped and pushed eastward, consolidating it next to the REDOX railroad cut soil berm. A portion of the chemical spur railroad tracks and a section along the western perimeter of the posted area was interim stabilized with 46 to 61 cm (18 to 24 in) of uncontaminated soil. The site currently has a light chain barricade.

Waste Site Coordinates:

E-567389.98362 N-134113.20959

Site Dimensions:

Site Length: 66 m (217 ft) Site Depth: N/A
Site Width: 36 m (118 ft) Cover Thickness: 46 to 61 cm (18 to 24 in)

Release Summary: The area designated as UPR-200-W-116 in 1980 was contaminated with particulates spreading by wind from the 204-S Waste Storage Tank exhaust and the related Railroad Tanker Waste Unloading Station. Radioactive particulates traveled eastward and affected an area approximately 0.8 hectares (2 acres) in size. In 1974, ground contamination, with radioactive levels up to 20,000 counts per minute, was identified. It is possible that UPR-200-W-69 (a 1973 contamination spread from a contaminated drain pit) also contributed to the contamination at this location.

Related Site Structure(s): UPR-200-W-116 was associated with the 204-S Waste Storage Tank, the 204-S Railroad Tanker Waste Unloading Station, and 200-W-22.

Site Posting: The site is posted with Underground Radioactive Material signs.

Site Characterization Summary: Routine surface radiological surveys are done annually. Specifically, the September 10, 1981 survey found many specks ranging from 200 to 3,000 cpm.

Potential Contaminants:

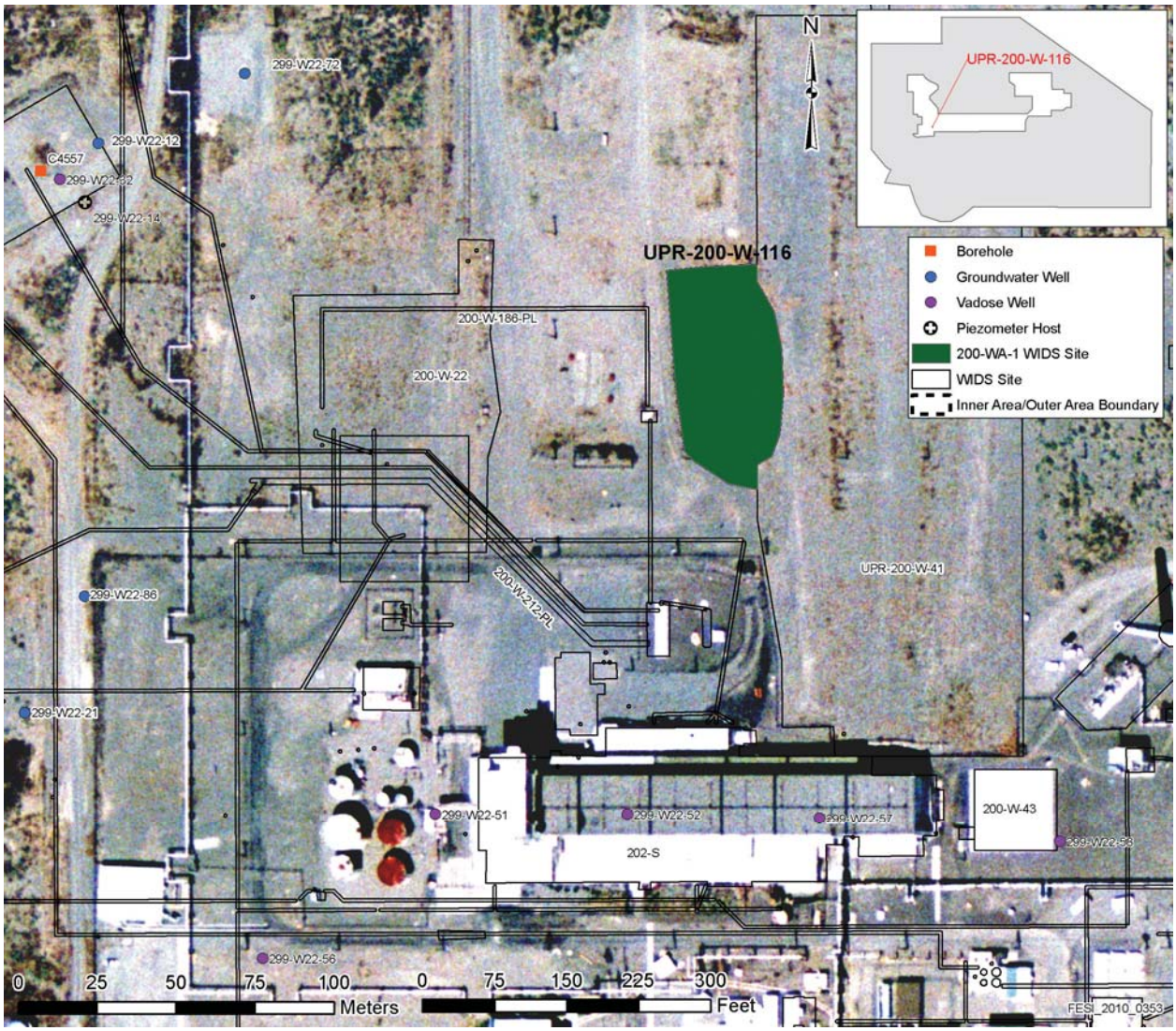
Radioactive: Not specified

Non-Radioactive: Not specified

References:

WIDS General Summary Report for site UPR-200-W-116
ArcMap
QMap

Figure 1. ArcMap Image



Site Description

Site ID: UPR-200-W-117
Site Type: Unplanned Release
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1
Service Dates: N/A
Volume/Mass Discharged: N/A

Waste Site Location and Physical Description: The release site was the ground around the railroad cut northwest of the 221-U Building in the 200 West Area (Figure 1). In 2001, the posted area was graded and covered with a minimum of 30 cm (12 in) of clean gravel.

Waste Site Coordinates:

Lon-567502.74618 Lat-135357.67996

Site Dimensions:

Site Length: 250 m (820 ft) Site Depth: N/A
Site Width: 80 m (262 ft) Cover Thickness: N/A

Release Summary: This site is the result of contaminated liquid and particulate matter dropping from railroad cars moving equipment and waste into and out of the 221-U Facility over time. The contamination was primarily fission products and uranium from chemical processing operations.

Related Site Structure(s): UPR-200-W-117 was associated with the 221-U Building and the railroad cars servicing that facility.

Site Posting: This site is posted as an Underground Radioactive Material area.

Site Characterization Summary: It is documented that it was later released because contamination had decayed to background levels.

Potential Contaminants:

Radioactive: fission products and uranium

Non-Radioactive: Not specified

References:

All information from WIDS Summary Report unless otherwise noted.

Figure 1. ArcMap Image

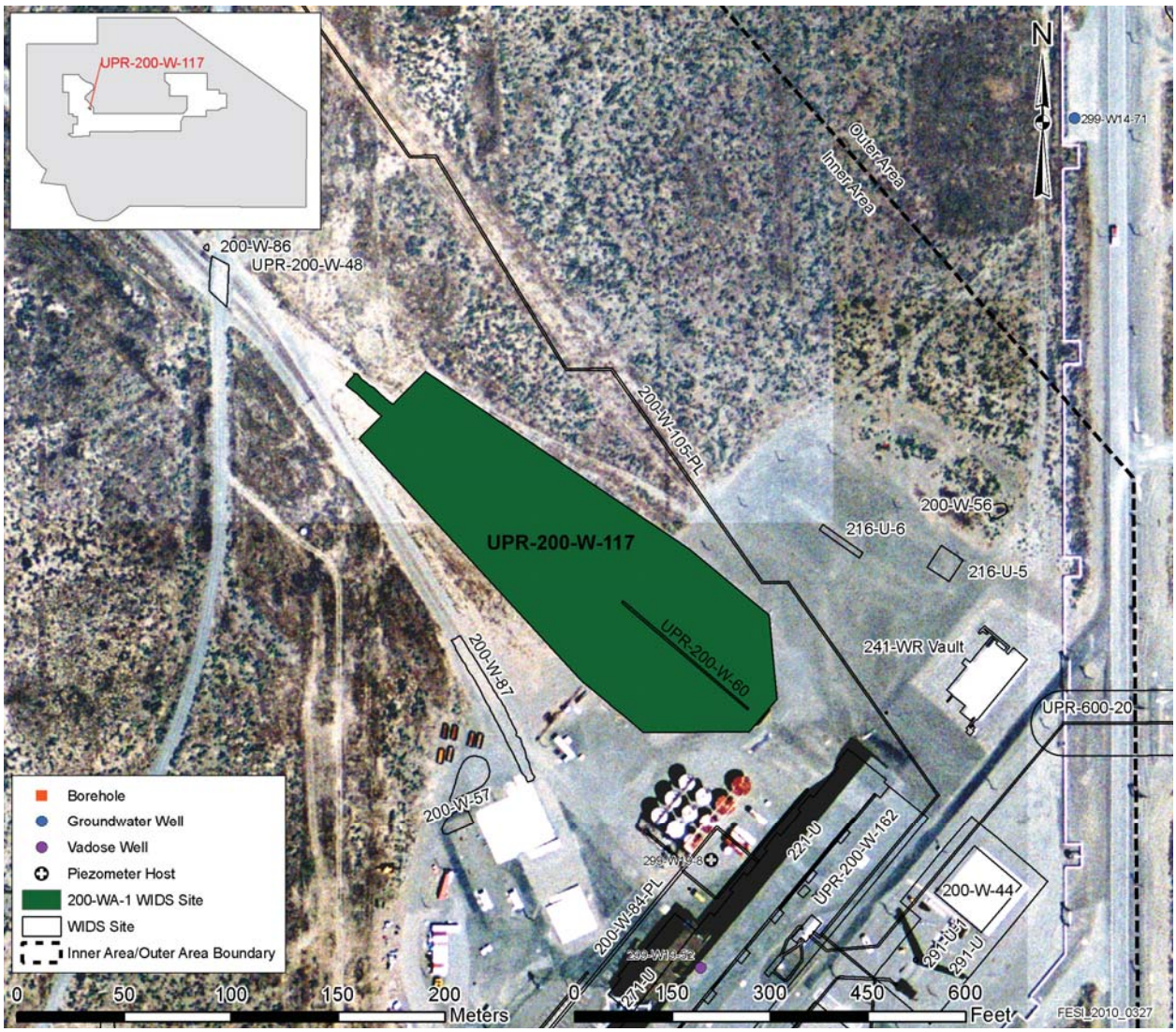


Figure 2. Insert Site Map from QMAP

Figure not available.

Site Description

Site ID: UPR-200-W-118
Site Type: Unplanned Release
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1
Service Dates: 1960 to 1972
Volume/Mass Discharged: N/A

Waste Site Location and Physical Description: UPR-200-W-118 was located on the railroad spur northwest of the 221-U Building, adjacent to the 211-U Chemical Tank Farm (Figure 1. ArcMap Image). The release site consisted of the ground outside the concrete unloading station at the 211-U Tank Farm. The area around the 211-U tanks and railroad spur has been stabilized with gravel and is posted as an Underground Radioactive Material area. The 211-U area was decontaminated and decommissioned in May 1998 and 2002. In 1998, the pump pit and lines were flushed and cleaned. The chemical rail car unloading station was removed and the section of railroad track near 221-U was covered with gravel.

Waste Site Coordinates:

E-567553.12499 N-135206.92189

Site Dimensions:

Site Length: N/A
Site Width: N/A
Site Area: N/A
Site Depth: N/A
Cover Thickness: N/A

Release Summary: The Uranium Recovery Process at 224-U received uranyl nitrate from REDOX and PUREX. After the uranium was removed, the reclaimed nitric acid was stored in the 211-UA tanks. It was transferred from 224-U to 211-UA via overhead lines. The slightly radioactive nitric acid was recycled back to REDOX and PUREX. In the 1960's and 1970's it was returned to the separations facilities in railcars. It was pumped out of the 211-UA tanks into the railcars via underground lines and a pump pit. Some leakage was associated with the pumping process and caused low level radioactive contamination around the area.

The reclaimed nitric acid storage was moved from 211-UA to a holding tank within the 224-U facility in the 1980's and the railcar unloading platform was abandoned. Some residual acid and waste water, contaminated above crib release limits, continued to be stored in the 211-UA tanks. All the acid and waste water was removed from the tanks prior to being transitioned to the new Environmental Restoration Contractor in 1994. Although the tanks were emptied, the acid pump pit and underground lines had not been flushed. Leaking valves and seals and residual contamination in the pump pit caused low level radioactive contamination to spread around the tanks and railcar unloading platform. The area was posted as a Contamination Area again in the early 1990's. The lines and pump pit were flushed in 1998 and the surface contamination was covered with gravel. The area was changed to an Underground Radioactive Material area.

Wind-borne particulate matter spread to the ground surface outside the concrete unloading station, contaminating approximately 0.4 hectares (1 acre) of ground. The waste consisted of radioactive reclaimed nitric acid that spilled to the soil.

Related Site Structure(s): UPR-200-W-118 is associated with the 211-U and 211-UA Chemical Tank Farms.

Site Posting: The site is posted as an Underground Radioactive Material area.

Site Characterization Summary: A site walkdown was conducted on August 8th, 1981for the purpose of status verification. It is noted that the ground around the concrete unloading platform was posted with Surface Contamination Area signs.

On August 20th, 1982 , a routine survey of the railroad track north of 211-U in 1982 found only one speck of contamination reading 80,000 counts per minute. No other detectable contamination was found on the track. It was also reported that there were no Radiation Zone signs.

On February 25th, 1998, another site walkdown was conducted for surveillance purposes.

On November 15th, 2000, a site walkdown was conducted and it was reported that the area is covered with gravel and posted with Underground Radioactive Material signs. The railcar unloading platform has been removed, and it is also noted that the area was stabilized with gravel and posted as URM in May 1998.

Potential Contaminants:

Radioactive: Nitric Acid

Non-Radioactive: Not specified

References:

WIDS General Summary Report for site UPR-200-W-118.QMap.
ArcMap.

Figure 1. ArcMap Image

Site Description

Site ID: UPR-200-W-138
Site Type: Unplanned Release
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-2
Service Dates: 1953
Volume/Mass Discharged: N/A

Waste Site Location and Physical Description: UPR-200-W-138 occurred at the northwest corner of the 221-U Building, near the R-3 entrance. It is located inside the larger, surface stabilized area, UPR-200-W-162. The site was described as the ground near the R-3 entrance to the 221-U Building. The unplanned release is not separately marked or posted, In 1998, the contaminated areas on the east side of 221-U were covered with clean backfill material (see UPR-200-W-162). The area around the 241-UX-154 Diversion Box was not covered with backfill material.

Waste Site Coordinates:

E-567626.49997 N-135215.54691

Site Dimensions:

Site Length: N/A
Site Width: N/A
Site Area: N/A
Site Depth: N/A
Cover Thickness: N/A

Release Summary: It should be assumed that 136 kg (300 lbs) of uranium nitrate hexahydrate (UNH) solution, containing 14 kg (30 lbs) of uranium, were introduced to the soil through the 216-U-7 French Drain. The information for this release is vague. Some documentation indicates the French drain involved was the 216-U-7, but drawing reviews indicate the blower pit is located north of 216-U-7. The blower pit drained to the 241-WR vault. If the event involved surface liquid being released, it is possible it flowed southward and could have affected the 216-U-7 drain.

Related Site Structure(s): UPR-200-W-138 was associated with the 221-U Building Vessel Vent Blower Pit and the larger surface stabilized area UPR-200-W-162. It may also be associated with the 216-U-7 French drain.

Site Posting: The site is located within an area posted as an "Underground Radioactive Material" area.

Site Characterization Summary: A radiation survey done in September 1976 detected surface contamination up to 300 counts per minute in this area. From February 1st to February 15th, 1998 a ground penetrating radar (GPR) survey was conducted prior to surface stabilization activities for the purpose of characterization. On February 25th, 1998, a site walkdown was performed for surveillance purposes.

Potential Contaminants:

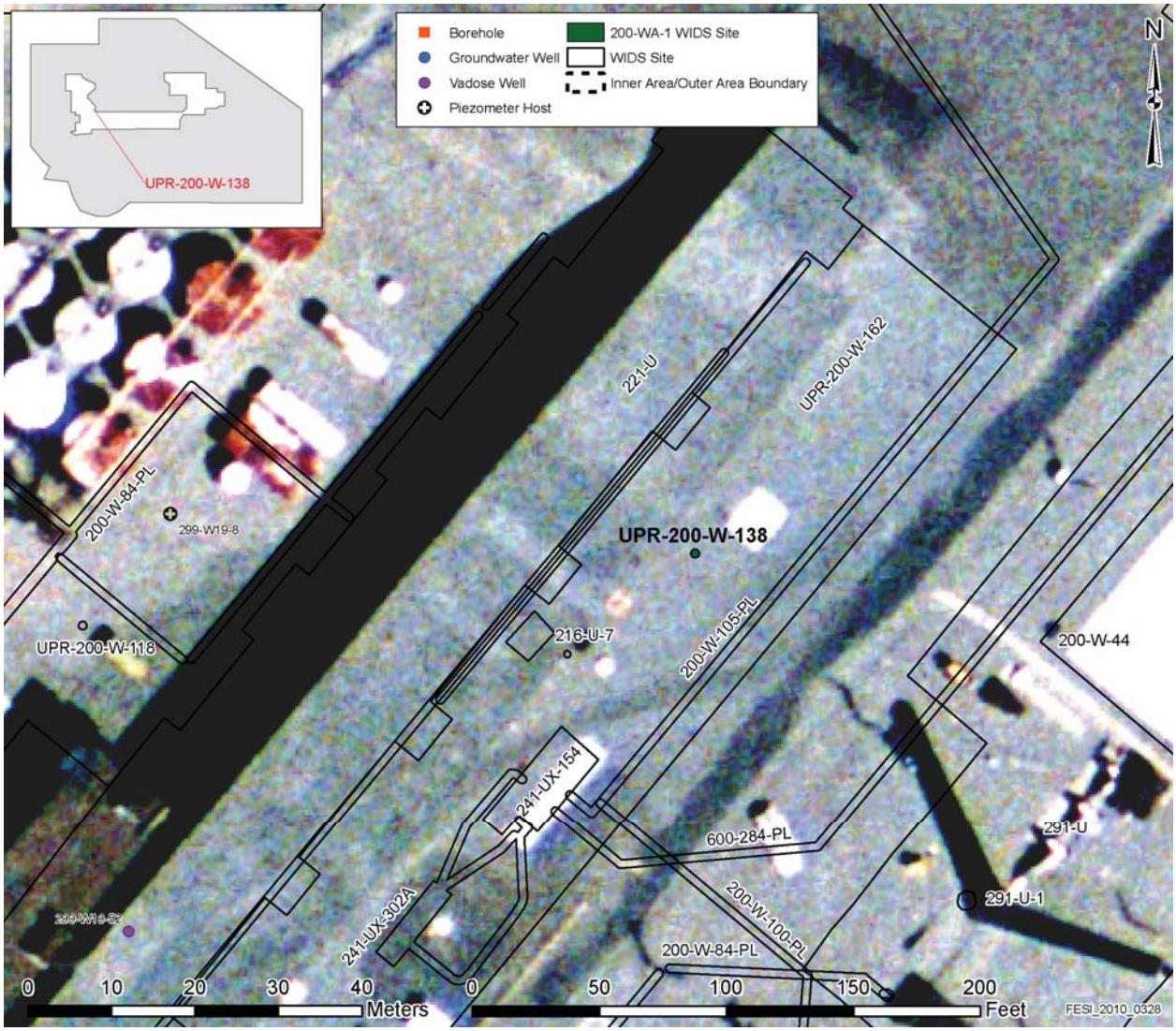
Radioactive: Uranium nitrate hexahydrate (136 kg. or 300 lbs)

Non-Radioactive: Not specified

References:

WIDS General Summary Report for site UPR-200-W-138.
QMap.
ArcMap.

Figure 1. ArcMap Image



Site Description

Site ID: UPR-200-W-14
Site Type: Unplanned Release
Facility/Geographic Area: 200 Inner Area West
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UR-1
Occurrence Date: 1952
Volume/Mass Discharged: Unspecified

Waste Site Location and Physical Description: The unplanned release site exact location is not documented although it is estimated to lie between the 242-T Evaporator and the 207-T Retention Basin along a pipeline running north to south along the east side of the 241-TY Tank Farm, parallel to an encased waste transfer line. A hand drawn sketch in document HW-60807 places the release location near the 241-TY east fence, although this cannot be verified. Coordinates for the unplanned release have been estimated.

Waste Site Coordinates:

E-566938.24999 N-136540.31249

Site Dimensions:

Site Area: Unspecified Cover Thickness: ~30.5 cm (12 in)

Release Summary: In October 1952, a steam coil in the 242-T waste evaporator tank caused ground contamination along the surface above the leaking cast iron pipe which carried cooling water and steam condensate from the waste evaporator building to the 207-T Retention Basin.

Contaminants were not identified, but since 242-T was the source of the stream, the material probably had a similar composition to the liquid discharged to the cribs.

Related Site Structure(s): The unplanned release is associated with the 242-T Evaporator, 207-T Basin and pipelines 200-W-78-PL, 200-W-166-PL and 200-W-167-PL.

Site Posting: The area was formerly posted at intervals with "Underground Radioactive Material" (URM) signs. A WIDS sign has been placed at the approximate location of the release.

Site Characterization Summary: The leak in the pipeline was repaired in 1952 and the contaminated areas were covered with approximately 30.5 cm (12 in) of clean soil and gravel.

In 1999, 2000 and 2001 the Dyncorp Integrated Soil, Vegetation and Animal Control group made an effort to mark all underground lines in the 200 West Area. Many areas of contamination were identified above the underground lines being marked. The Contamination Area were posted and later stabilized and changed to URM areas. It is possible one of the areas is in the same location as UPR-200-W-14.

Potential Contaminants:

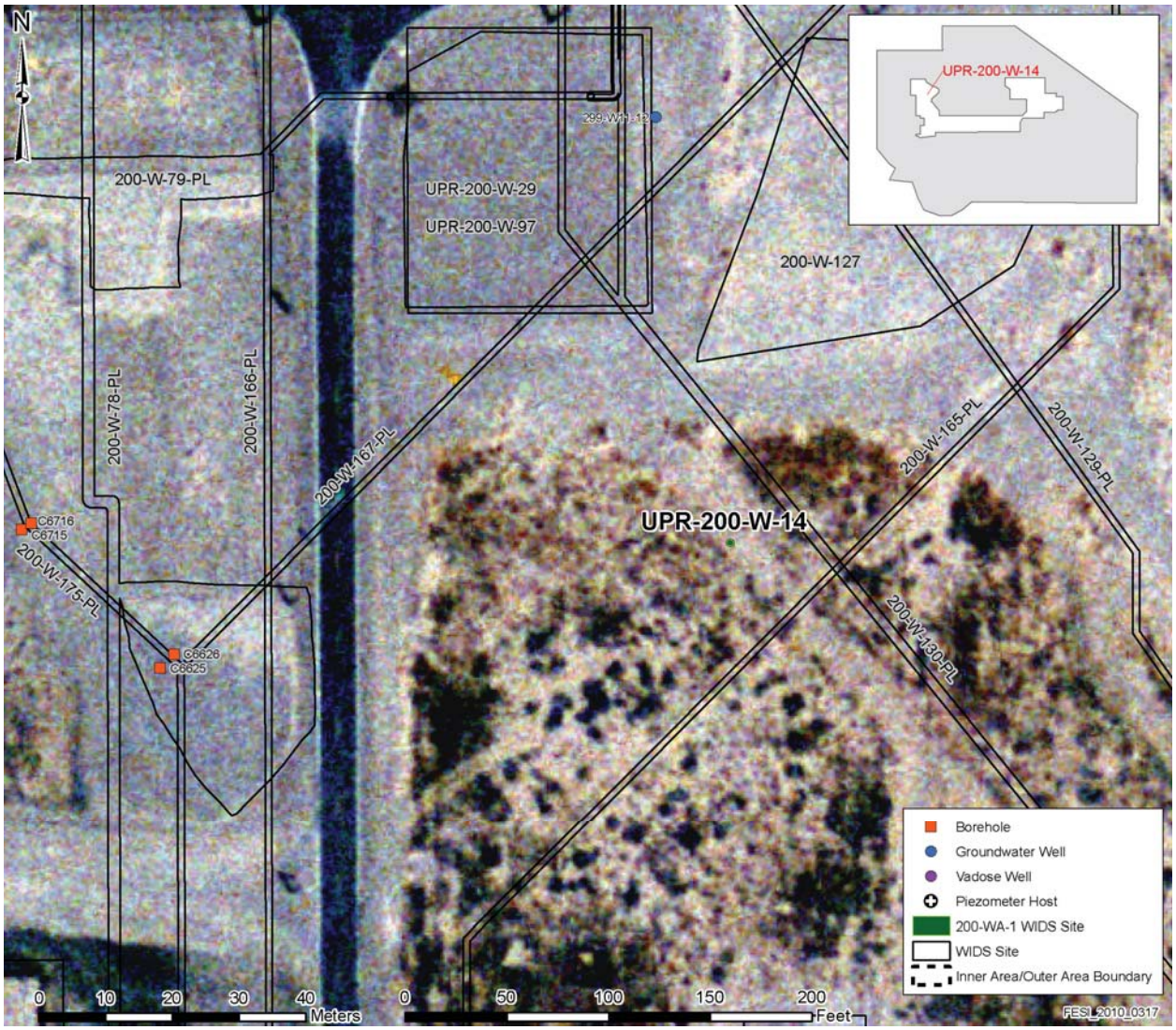
Radioactive: Unspecified

Non-Radioactive: Unspecified

References:

WIDS General Summary Report for site UPR-200-W-14
QMap
ArcMap

Figure 1. ArcMap Image



Site Description

Site ID: UPR-200-W-162
Site Type: Unplanned Release
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UR-1
Service Dates: 1991
Volume/Mass Discharged: N/A

Waste Site Location and Physical Description: The release site is the area adjacent to and east of the 221-U Canyon Building from Section R-1 to R-19 in the 200 West Area (Figure 1). The area has been backfilled with clean material from the 200 Area Ash Pit. The new Unplanned Release site encompasses two previously identified spill areas (UPR-200-W-101 and UPR-200-W-138), the 216-U-7 French Drain and the 241-UX-154 diversion Box. Some contamination was removed (using buckets and shovels) by tank farm operations in March and October 1991. In 1998, the area was surface stabilized with material from the 200 Area Ash Pit.

Waste Site Coordinates:

E-567571.34756 N-135148.77131

Site Dimensions:

Site Length: 260 m (853 ft)
Site Width: 25 m (82.02 ft)
Site Area: 3716 m^2 (40,000 ft^2)
Site Depth: N/A
Cover Thickness: N/A

Release Summary: The site consists of surface radiological speck contamination.

Related Site Structure(s): UPR-200-W-162 was associated with the 221-U Canyon Building. UPR-200-W-101 and UPR-200-138 are located inside this larger Underground Radioactive Material Area.

Site Posting: The site is posted as an "Underground Radioactive Material" area.

Site Characterization Summary: In 1991 a radiological survey identified contamination specks extending from section R-1 to R-19 on the east side of 221-U. This survey resulted in the radiologically posted area being enlarged and a request for a new waste site number for the larger Surface Contamination area. The site requires quarterly surveillance, annual radiological surveys, annual herbicide applications, removal of deep-rooted vegetation, and occasional corrective action for small areas of surface contamination that may appear.

Potential Contaminants:

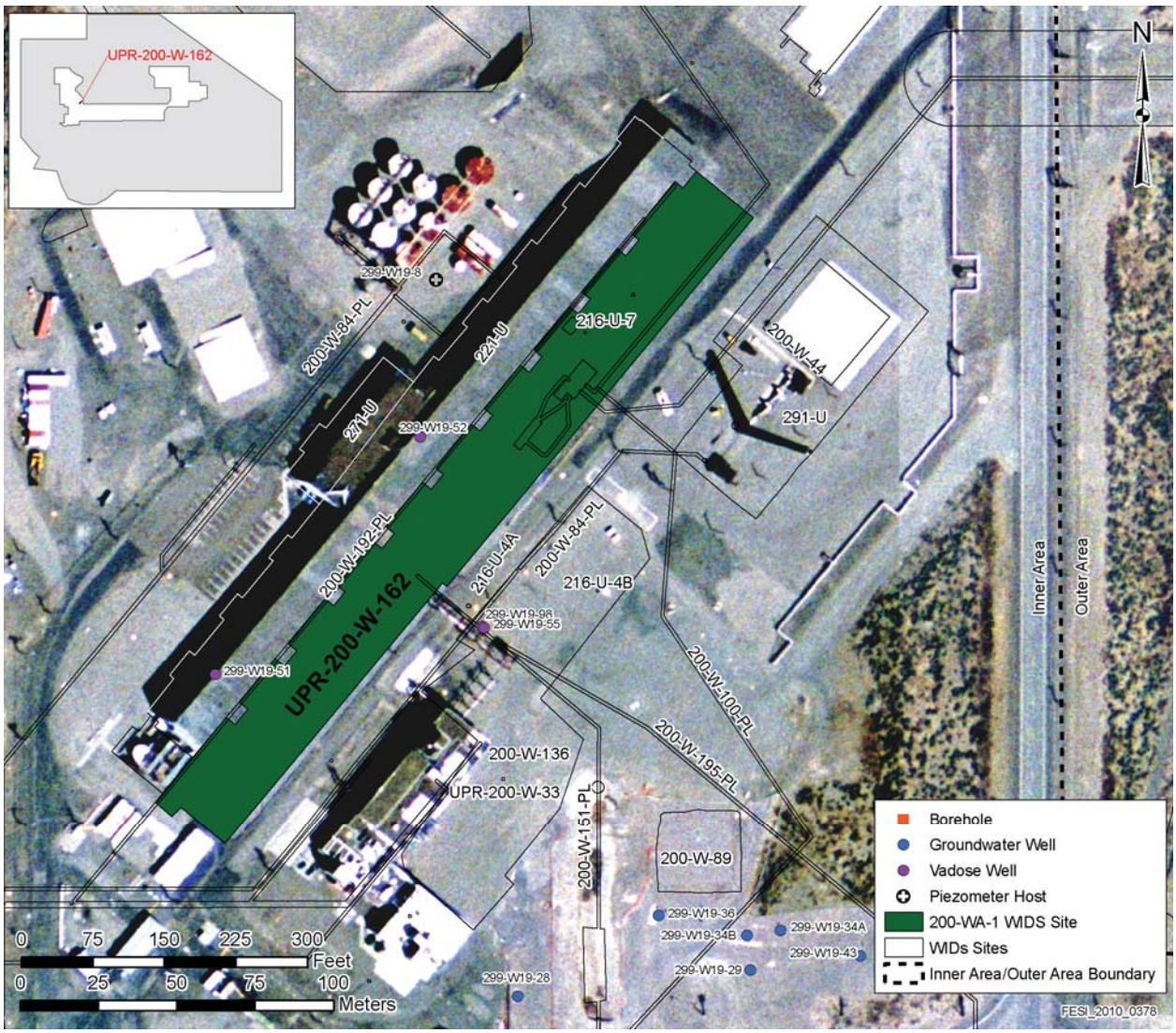
Radioactive: Not specified

Non-Radioactive: Not specified

References:

WIDS General Summary Report for site UPR-200-W-162
QMap
ArcMap
Arcview.

Figure 1. ArcMap Image



Site Description

Site ID: UPR-200-W-166
Site Type: Unplanned Release
Facility/Geographic Area: 200 Inner Area West
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UR-1
Occurrence Date: Unspecified
Volume/Mass Discharged: 25.7E+3 m^2 (276.6 E+3 $ft.^2$)

Waste Site Location and Physical Description: In 1985, the unplanned release site was originally a large, irregularly shaped area of surface contamination located north and east of the 241-T Tank Farm, west of the 216-T-14 through 216-T-17 Trenches and surrounding the 207-T Retention Basin. In 1996, additional contamination was found east of the 207-T Retention Basin and was also considered to be UPR-200-W-166.

Waste Site Coordinates:

E-566923.02618 N-136841.12779

Site Dimensions:

Site Area: 25.7E+3 m^2 (276.6E+3 $ft.^2$) Cover Thickness: Unspecified

* This is the approximate size of the original surface contamination area that was removed.

Release Summary: Contamination in the soil surrounding the exterior of the 241-T Tank Farm and the 207-T Retention Basin ranged from 25,000 to 250,000 disintegrations per minute. The source of the contamination is suspected to be years of operating activities in the tank farm and dried particles blowing out of the retention basin.

Related Site Structure(s): The unplanned release was associated with the 216-T-14 through 216-T-17 Trenches, 241-T Tank Farm, the 207-T Retention Basin and 200-W-53.

Site Posting: The unplanned release area is not marked or posted.

Site Characterization Summary: In 1991, the contaminated interior fenced area of the 241-T Tank Farm was decontaminated and covered by a layer of clean gravel. In 1992, the Radiation Area Removal Action (RARA) group scraped the contaminated soil and consolidated it on the west slope of the 216-T-14 through 216-T-17 Trenches. The slope and the trenches were covered with a layer of clean dirt and posted as an Underground Radioactive Material (URM) area. The scraped area was radiologically surveyed, sampled and released from radiological posting.

In 1994 an additional area of surface soil contamination was identified east of the 207-T Retention Basin. It was assumed that the contamination had also spread with the wind from the 241-T Tank Farm; the area was also called UPR-200-W-166. This area of contamination was scraped and placed into the 207-T Retention Basin in 1996. Reference to the contamination found east of the 207-T Retention Basin is known as 200-W-53.

Annual radiological surveys and annual herbicide applications are performed on the 216-T-14 through 216-T-17 Trenches.

Potential Contaminants:

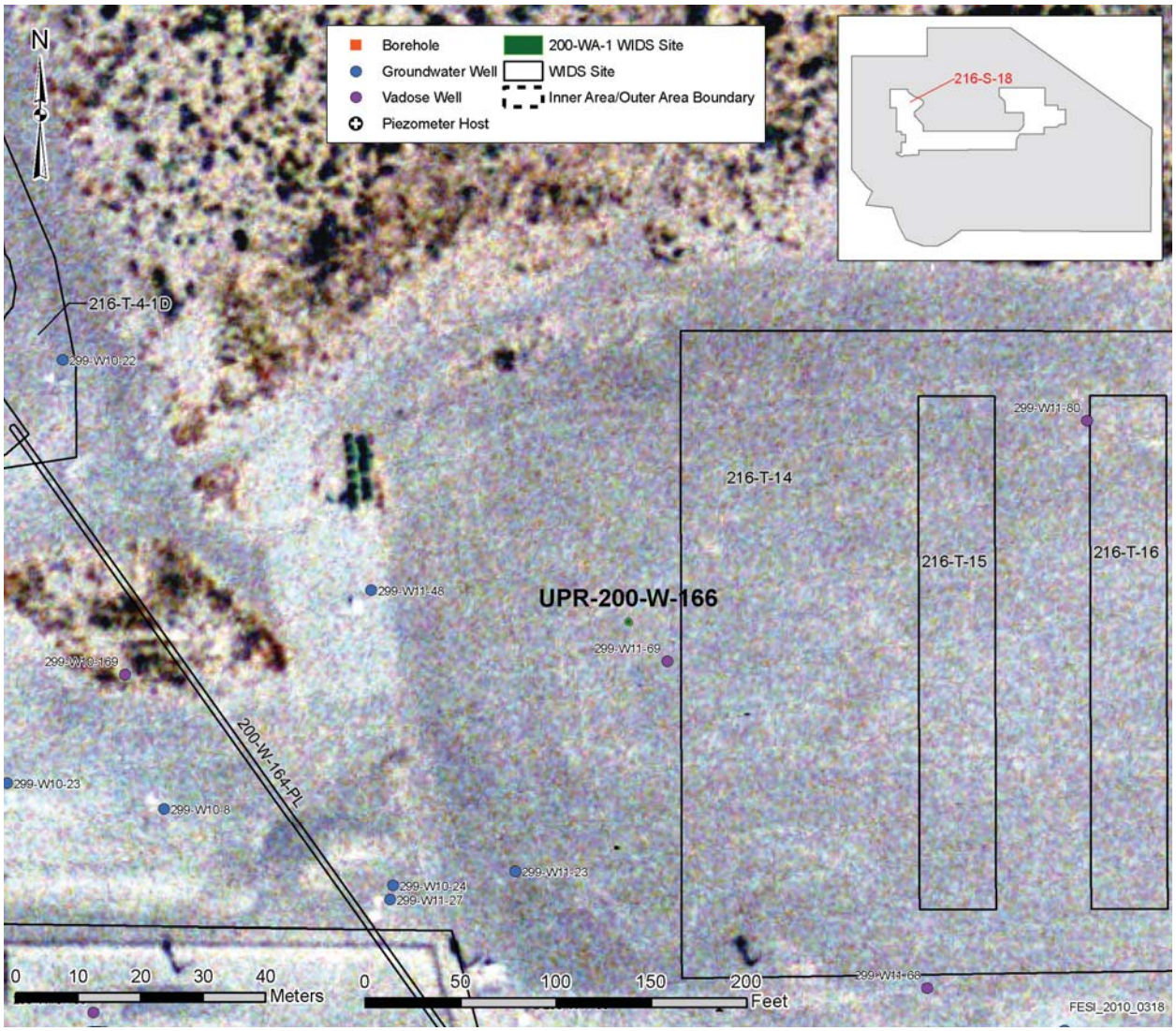
Radioactive: Unspecified

Non-Radioactive: Unspecified

References:

WIDS General Summary Report for site UPR-200-W-166.QMap.
ArcMap.

Figure 1. ArcMap Image



Site Description

Site ID: UPR-200-W-19
Site Type: Unplanned Release
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1
Service Dates: 1953
Volume/Mass Discharged: N/A

Waste Site Location and Physical Description: The release occurred north of 16th Street, near the 361-U Settling Tank and the 216-U-1&2 Cribs (Figure 1). The area where the release occurred is currently marked as a "Underground Radioactive Material" (URM) area that also contains the 216-U-1 Crib, 216-U-2 Crib, the 241-U-361 Settling Tank. A portion of the 2607-W5 tile field is also included in the URM area. In 1953, decontamination was attempted, the area was backfilled and delineated by a wooden fence, and posted with “Radiation Zone” signs. In 1992, contaminated soil in the vicinity of the 216-U-1&2 Cribs was scraped and consolidated near the 241-U-361 Tank. In addition, the surface surrounding the 241-U-361 Tank was surface stabilized with shotcrete.

Waste Site Coordinates:

E-567299.82733 N-135012.63585

Site Dimensions (original release area):

Site Length: N/A
Site Width: N/A
Site Area: 4.65 m^2 (50 ft^2)
Site Depth: N/A
Cover Thickness: N/A

Release Summary: In the spring of 1953, an unknown quantity of organic wastes and cell drainage from the Tributyl Phosphate (TBP) process in 221-U and waste from 224-U (UO3) overflowed to the ground by way of the tank (241-U-361) and crib vents (216-U-1 and 216-U-2). Contamination readings of 11.5 rads per hour at a distance of 7.6 cm (3 in) were reported over the unplanned release site area.

Related Site Structure(s): The release is associated with the 221-U, 224-U, 241-U-361 tank and the 216-U-1&2 Cribs.

Site Posting: The area is posted as an Underground Radioactive Material area.

Site Characterization Summary: In 1995, a Limited Field Investigation (LFI) was done of the 200-UP-2 Operable Unit. The 216-U-1&2 Cribs and the 241-U-361 Tank were included in the field investigation. A radiological survey the area was done with the ultrasonic ranging and data system (USRADS). At the time of the survey (1995), the 216-U-1&2 Cribs were posted as a Surface Contamination Area (SCA). The 241-U-361 Settling Tank was posted as an Underground Radioactive Material (URM) area. The 2607-W5 Septic Tank and Drain Field had no radiological posting. Due to borehole drilling activities at the 216-U-1&2 Cribs, a portion of the crib surface had been stabilized with gravel. Roughly 25,000 square meters of surface area was surveyed. The highest concentration of contamination points above established radiological background levels were located in the northwest and northeast corners of the survey area. Other

high concentrations were identified along the eastern border of the 2607-W5 Septic Tank and Drain Field, in the area adjacent to the 216-U-1 and 216-U-2 Cribs, and in the vicinity of the 241-U-361 Settling Tank. As a result of this and other radiological surveys, the radiologically posted area was increased.

A visual inspection is done tri-annually and a routine radiological survey is done annually.

Potential Contaminants:

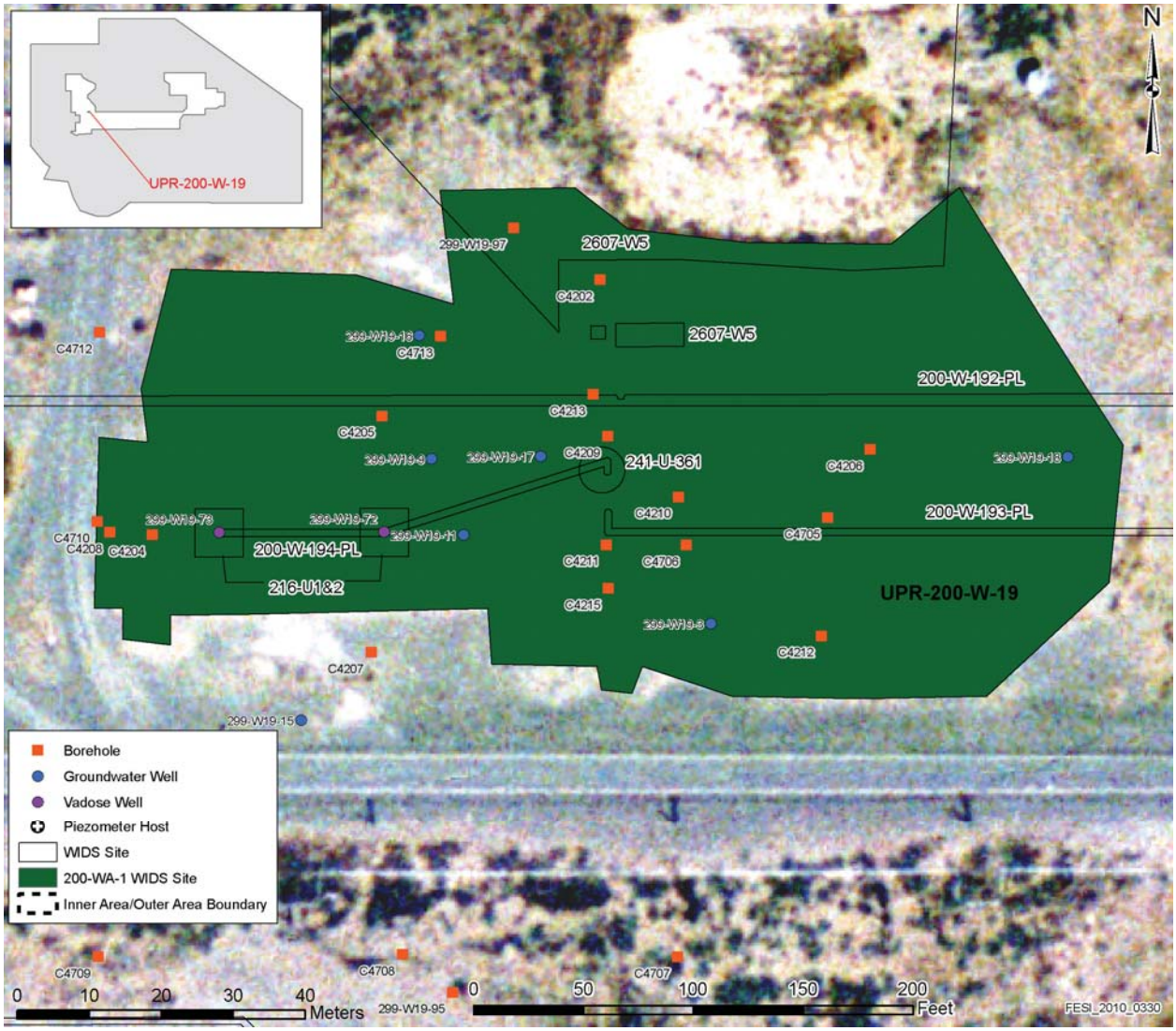
Radioactive: Not specified

Non-Radioactive: Not specified

References:

WIDS General Summary Report for site UPR-200-W-19.QMap
ArcMap

Figure 1. ArcMap Image



Site Description

Site ID: UPR-200-W-20, UN-200-W-20, Spread of Contamination from a Diversion Box
Site Type: Unplanned Release
Facility/Geographic Area: S-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-IS-1
Service Dates: N/A
Volume/Mass Discharged: Unknown

Waste Site Location and Physical Description: There is a discrepancy in the reference documentation of where the release occurred. Diversion Box 241-S-151 is located in the southeast portion of 241-S Tank Farm. The 240-S-151 Diversion Box is located north of the 202-S Building (REDOX). Reference HW-60807 states the release occurred at the 240-S-151 Diversion Box. The Associated sketch shows the area north of 202-S, but labels the diversion box as 241-S-151. ARH-2014 and ARH-2757 both state the release occurred at the 240-S-151 Diversion Box, behind REDOX. However, newer references (PNL-6456 and BHI-00176) indicate the release is associated with the 241-S-151 Diversion Box and the 241-S Tank Farm.

Due to discrepancies in reference documentation, it is not possible to be certain where this release occurs. For the RI/FS work planning purpose, it is assumed that the site is located adjacent to the 241-S-151 Diversion Box because the area surrounding the 240-S-151 Diversion Box is covered under the UPR-200-W-82 site. The location of the 241-S-151 Diversion Box is shown on Figure 2 and the release impacted area is sketched in Figure 3.

Waste Site Coordinates:

E-566914 (m) N-134315 (m)

Site Dimensions:

Site Length: N/A
Site Width: N/A
Site Area: 92.90 m^2 (1,000.00 ft^2)
Site Depth: N/A
Cover Thickness: 0.15 m (0.50 ft)

Release Summary: In January and February 1953, work being done inside the 241-S-151 Diversion Box resulted in extensive spread of contamination to the ground. The 241-S-151 Diversion Box was used to redirect waste solutions from processing and decontamination operations. Waste quantities were variable depending on the specific plant operations.

Related Site Structure(s): The 241-S-151 Diversion Box interconnects with the 240-S-151, 241-SX-151, and the 241-S Tank Farm. Leak detection and air monitoring are performed continuously with the 241-S Tank Farm.

Site Posting: A WIDS sign is placed at the approximate location of the release.

Site Characterization Summary: An area of about 93 square meters (1000 square feet) around the diversion box was covered with six inches of clean gravel. This area was roped off and posted with radiation zone signs in 1953. The area was removed from radiation zone status based on the sampling conducted in 1970.

Potential Contaminants:

Radioactive: unknown beta/gamma

Non-Radioactive: N/A

References:

All information from WIDS Summary Report unless otherwise noted.

Figure 1. ArcMap Image

Figure not available.

Figure 2. Site UPR-200-W-20 Location Map

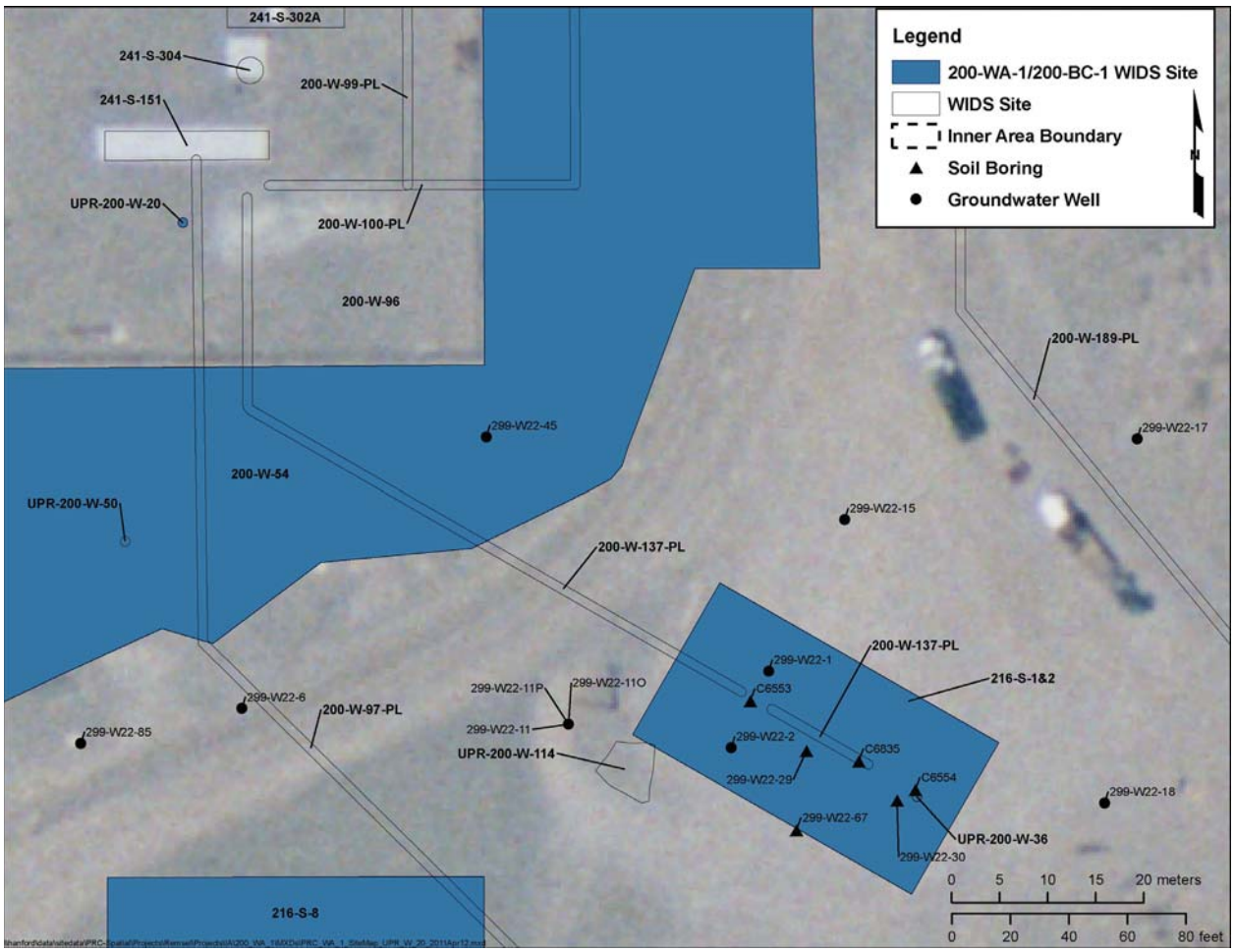


Figure 3. Site UPR-200-W-20 Location Sketch

-53

Type: Ground

Date:

Location: 200 WEST AREA : S / Approximately 1000 square feet around the 241-S-151 Diversion Box.

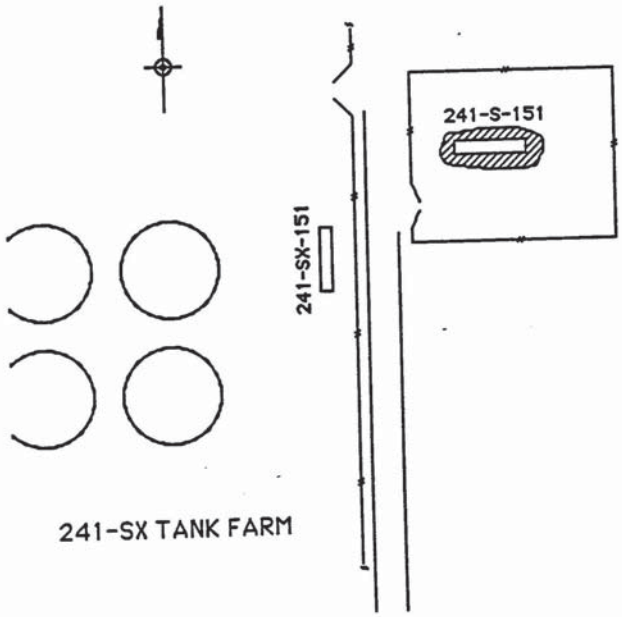
Source Term: 241-S-151 Diversion Box

Contaminants involved: Unknown beta/gamma

Status: The contamination was covered with 1000 sq. ft. of gravel. The area was removed from radiation zone status in January of 1971.

References: ARH-2015 part 4 and ARH-2757 part 4

Comments: January through February.



Site Description

Site ID: UPR-200-W-3
Site Type: Unplanned Release
Facility/Geographic Area: 200 Inner Area West
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-1
Occurrence Date: 1949
Volume/Mass Discharged: 3.2 square m (36 square ft)

Waste Site Location and Physical Description: The unplanned release is located on the T Plant railroad cut track, northwest of the 221-T Canyon Building (See Figure 1 and Figure 2) The railroad cut is a posted Contamination Area from the tunnel door westward to a chain link gate. The area is approximately 6 m (20 ft) west of the T-Plant chain link fence that crosses the railroad cut track and encloses the T-Plant facility.

Waste Site Coordinates:

E-567360.53445 N-137114.21026

Site Dimensions:

Site Area: 3.2 square m (36 square ft) Cover Thickness: Unspecified

Release Summary: On several occasions in 1949, contaminated equipment being hauled to the 200 West Burial Ground from T Plant contaminated the ground near the railroad. The contamination type released was undefined radioactive contamination.

In 1990 a rail mounted monitor survey identified an area west of T-Plant, near the 2706 branch, with 3 separate spots of contamination. One spot read 4 mr/hr, one spot was 1,000 counts per minute and one spot was 300 counts per minute.

Related Site Structure(s): There are no related structures for this unplanned release site.

Site Posting: No markers or signs of stabilization are apparent. A 1.8 m by 1.8 m (6 ft by 6 ft) area is posted Contamination Area.

Site Characterization Summary: In spring of 1950 railroad track contamination was covered with approximately 25 cm (10 in) of clean gravel.

The small posted Contamination Area was photographed and surveyed with Global Positioning equipment to map its location in February 1998 and September 2000.

Potential Contaminants:

Radioactive: Unspecified

Non-Radioactive: Unspecified

References:

WIDS General Summary Report for site UPR-200-W-3
QMap
ArcMap

Figure 1. ArcMap Image

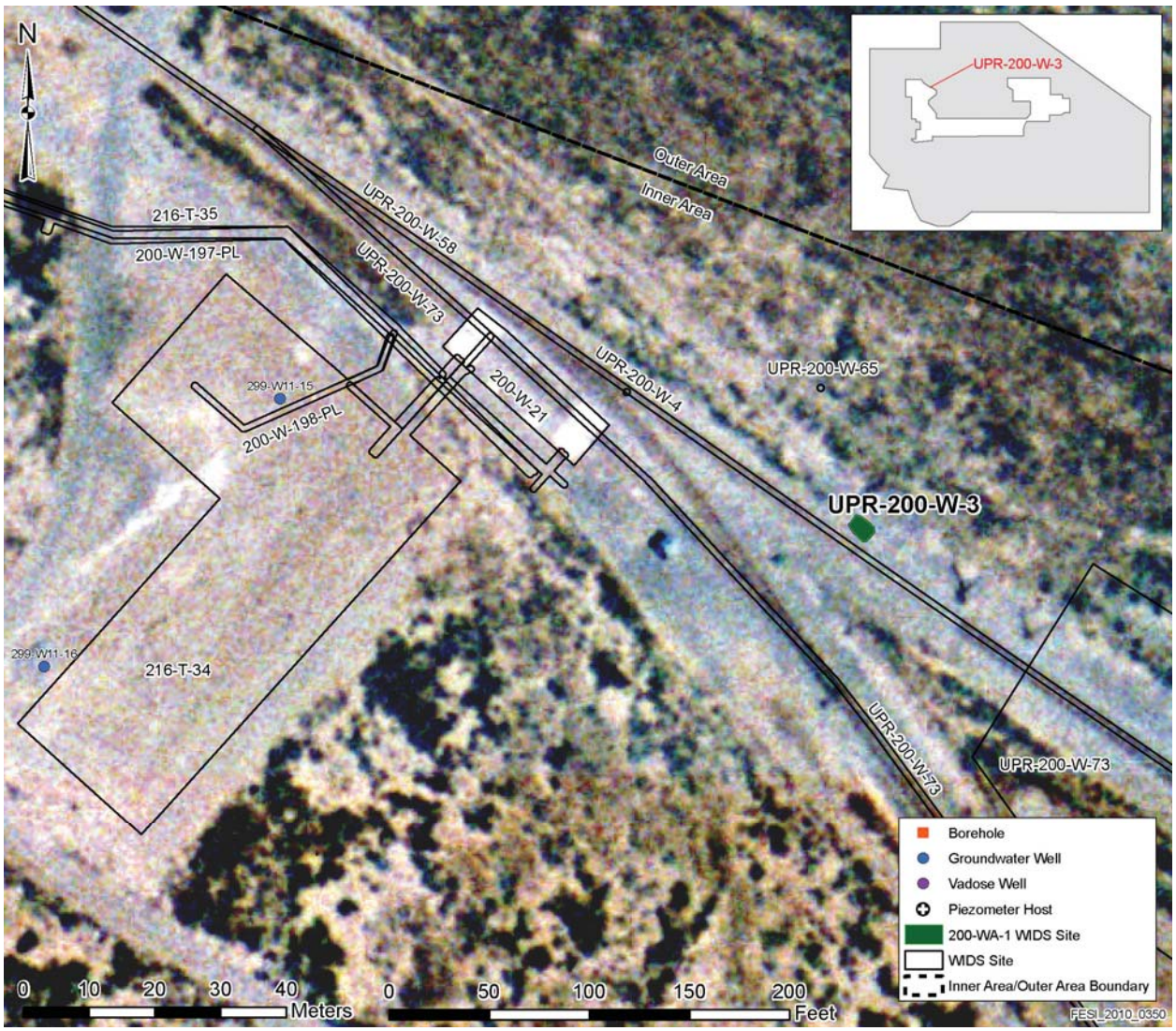
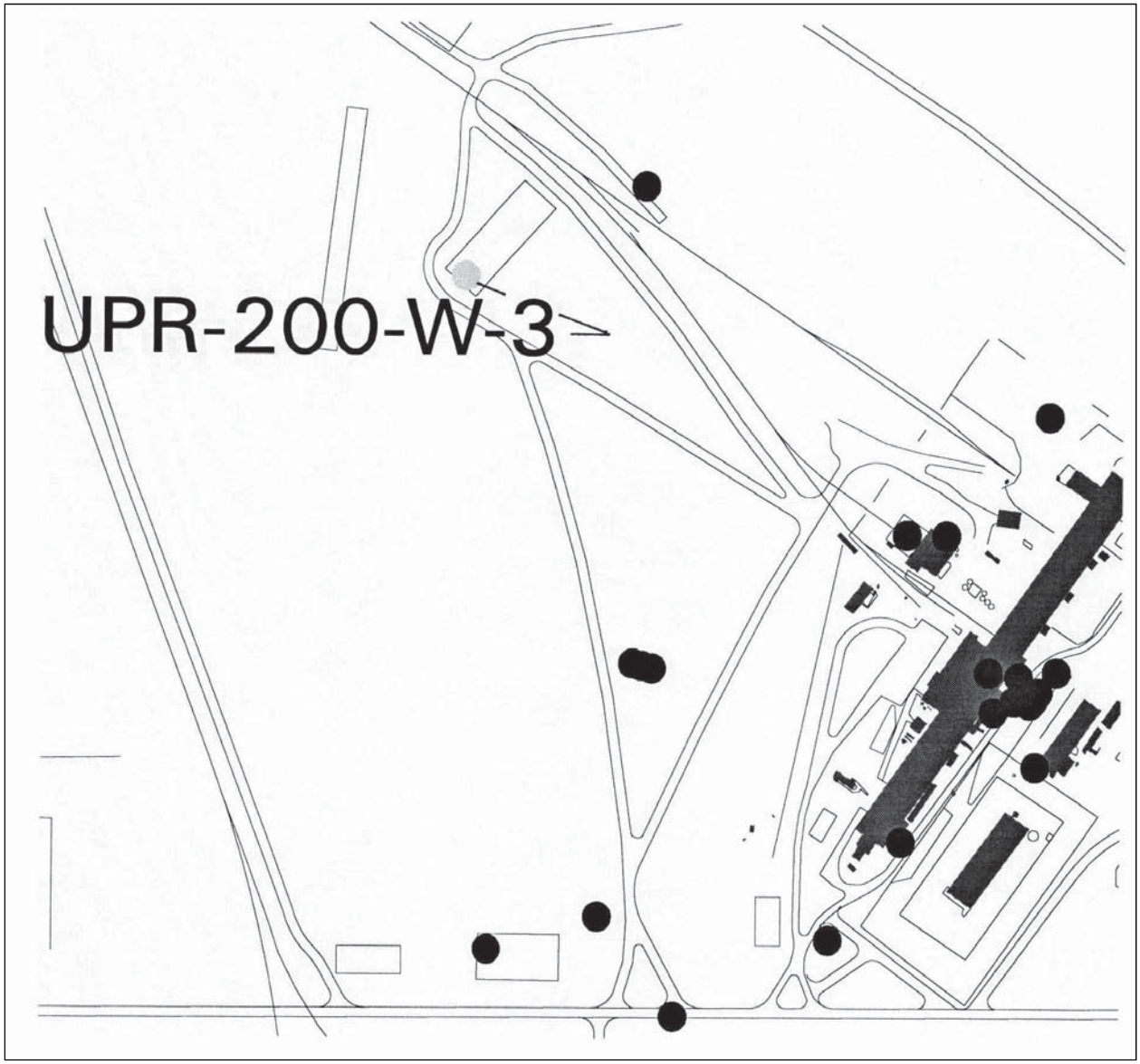


Figure 2. Site Location Map



Site Description

Site ID: UPR-200-W-33
Site Type: Unplanned Release
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1
Service Dates: 1955
Volume/Mass Discharged: N/A

Waste Site Location and Physical Description: The site is located approximately 28 m (90 ft) east of the 224-U Building (Figure 1). The release site occurred inside the fenced 224-U facility boundary. In 1955, the top 0.1 m (4 in) of contaminated dirt was removed and new dirt was used to fill in the excavation.

Waste Site Coordinates:

E-567584.93748 N-135060.76560

Site Dimensions:

Site Length: 0.91 m (3 ft)
Site Width: 0.91 m (3 ft)
Site Area: 0.84 m^2 (9 ft^2)
Site Depth: N/A
Cover Thickness: N/A

Release Summary: In March 1955, a leaking flange of the C-5 Condensate Line from the 224-U Building caused a small area 3 by 4.5 m (10 by 15 ft) of ground to become contaminated. The radiation zone surrounding the contamination measured 10 ft by 15 ft.

Related Site Structure(s): The release is associated with the Uranium Recovery process at the 224-U facility.

Site Posting: N/A

Site Characterization Summary: No visible evidence of the release was observed during the site walkdown conducted in February 1998. A Ground Penetrating Radar scan was done of the area in March 2005.

Potential Contaminants:

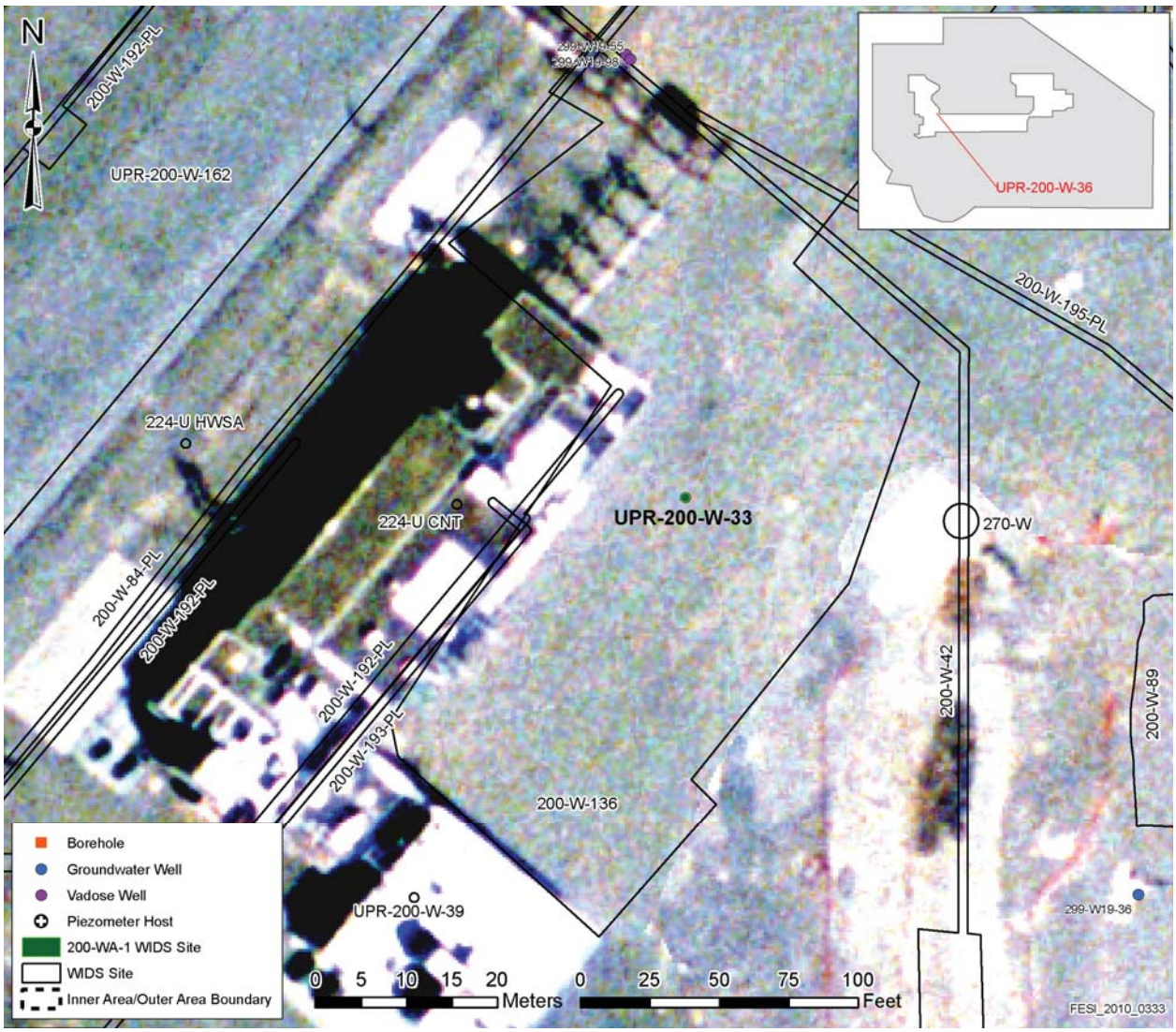
Radioactive: Not specified

Non-Radioactive: Not specified

References:

WIDS General Summary Report for site UPR-200-W-33
QMap
ArcMap

Figure 1. ArcMap Image



Site Description

Site ID: UPR-200-W-36
Site Type: Unplanned Release
Facility/Geographic Area: S-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-PW-1
Service Dates: 1955
Volume/Mass Discharged: N/A

Waste Site Location and Physical Description: The unplanned release is groundwater contamination occurred at a well (299-W22-3) located near the east end of 216-S-1 & 2 cribs, east of the 241-SX Tank Farm (See Figure 1). The test well originally consisted of a 20.3 cm (8 in) steel casing driven to a depth of 45.7 m (150 ft). In January of 1955, the well was extended an additional 50 m (163 ft), beneath the groundwater table which was at a depth of about 65.5 m (215 ft) in 1955. Although the current well database states well 299-W22-3 is listed as "in use", the As-Built drawing shows it was filled with sand. The 216-S-1 & 2 cribs are currently bare ground, marked by concrete posts and a light chain posted with “Underground Radioactive Material” area and “Cave-in Potential” signs, and the well is painted yellow and marked 299-W22-3.

Waste Site Coordinates:

E-566989.99999 N-134255.03120

Site Dimensions (estimated dimension for the posted Underground Radiation Material area):

Site Length: 30 m (98.43 ft)
Site Width: 15 m (49.21 ft)
Site Area: 450 m^2 (4,844 ft^2)
Site Depth: N/A
Cover Thickness: N/A

Release Summary: Between June 9 and August 4, 1955, approximately 7,500,000 liters (1,900,000 gallons) of cell drainage from the D-1 Receiver Tank and redistilled condensate from the D-2 Receiver Tank in the 202-S Canyon Building was discharged to the 216-S-1 & 2 cribs, containing an estimated 7,500 curies of beta/ gamma contamination and 40 grams of plutonium. It is possible that a significant amount of this waste could have been transported directly to the groundwater via the cracked well casing for well 299-W22-3, hence the unplanned release (UPR-200-W-36). No surface contamination was involved with this release because the waste discharged to the cribs through a subsurface distribution system.

On August 2, 1955, process vapors were smelled near the 216-S-1 & 2 cribs. A Radiation Monitor investigated the area and found the well cap on test well 207-S-11 (alias 299-W22-3) to have a dose rate of 4 rad per hour on the well cap. A water sample was collected from the well on August 4, 1955 that resulted in a personnel contamination incident. The sampler also reported a gurgling sound coming from the well. It was concluded that the well casing had failed or ruptured. The rupture was apparently allowing process waste to bypass the crib soil column and flow directly into the groundwater. After the discovery was confirmed, the well was promptly backfilled with sand.

Related Site Structure(s): The release is associated with the 216-S-1 & 2 cribs and well 299-W22-3.

Site Posting: The site was posted as a "Radiation Zone".

Site Characterization Summary: Well 299-W22-3 had been sampled on June 9, 1955 and showed no unusual radioactivity. In 1955, additional wells were drilled around this site to evaluate and monitor groundwater conditions. The inorganics found at the site include: aluminum, nitrate, nitric acid, and sodium. The radionuclides found at this site are: cobalt-60, americium-241, cesium-137, uranium, and plutonium.

Potential Contaminants:

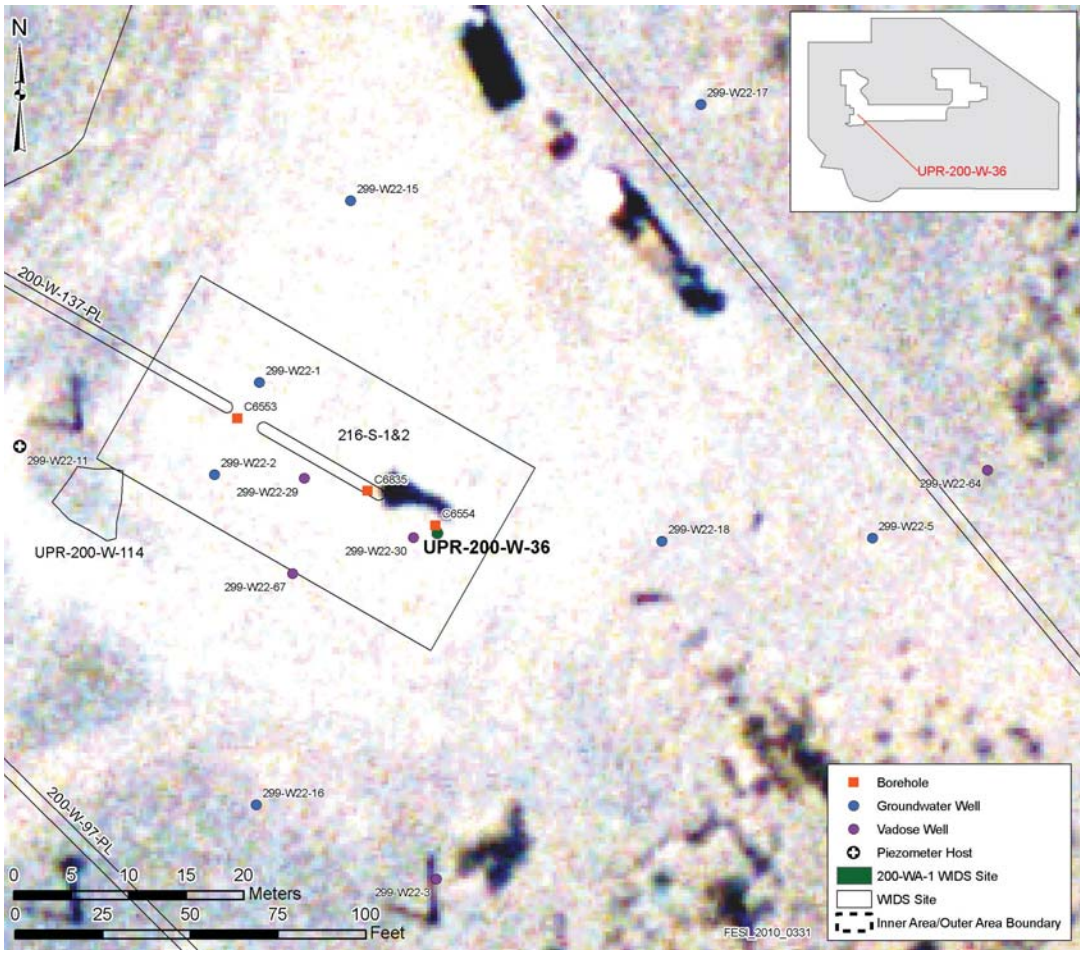
Radioactive: Cobalt-60, Americium-241, Cesium-137, Uranium, and Plutonium.

Non-Radioactive: Aluminum, Nitrate, Nitric acid, and Sodium.

References:

WIDS General Summary Report for site UPR-200-W-36
QMap
ArcMap

Figure 1. ArcMap Image



Site Description

Site ID: UPR-200-W-39
Site Type: Unplanned Release
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-1
Service Dates: 1954
Volume/Mass Discharged: N/A

Waste Site Location and Physical Description: The unplanned release occurred on the southeast side of the 224-U building (Figure 1. ArcMap Image). The soil affected by the release was moved to a nearby trench and covered with 1.9 m (3 ft) of clean soil. The disposal trench is now covered by the 224-UA (Calciner Building) addition.

Waste Site Coordinates:

E-567555.12499 N-135016.71876

Site Dimensions:

Site Length: 15.24 m (50 ft)
Site Width: 3.05 m (10.00 ft)
Site Area: 46.5 m^2 (500 ft^2)
Site Depth: N/A
Cover Thickness: N/A

Release Summary: During May 1954, an unknown quantity of waste was leaked from the 224-U Building to an area southeast of the 224-U Building. The contamination was placed in a trench that measured 3.05 m (10 ft) wide by 15.2 m (50 ft) long. The contamination was covered with 0.9 m (3 ft) of clean soil. In a later reference the contamination is described as Uranium, less than 10 nanocuries/gram. No volume estimate is provided, the release potential is probably very minor until the 224-UA Calciner Building is removed.

Related Site Structure(s): The release is associated with the 224-U Facility.

Site Posting: The release site is not marked because the 224-UA Building was built over the release location.

Site Characterization Summary: The site was removed from radiation zone status in June 1972. A site walk was conducted in February 1998 and there is no visible evidence of the release.

Potential Contaminants:

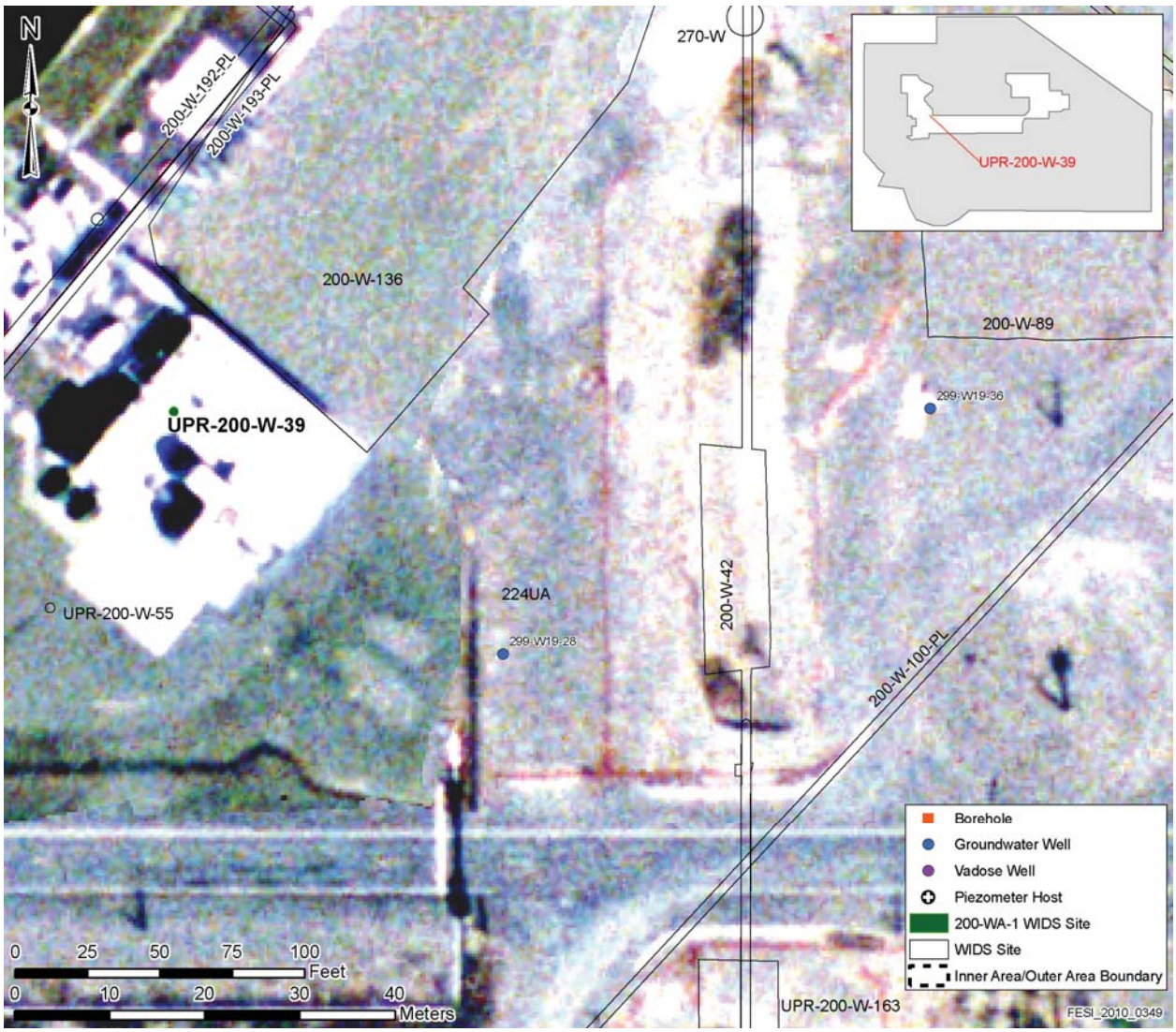
Radioactive: Uranium (<10 nanocuries/gram)

Non-Radioactive: Not specified

References:

WIDS Summary References for site UPR-200-W-39
QMap
ArcMap

Figure 1. ArcMap Image



Site Description

Site ID: UPR-200-W-4
Site Type: Unplanned Release
Facility/Geographic Area: 200 Inner Area West
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-1
Occurrence Date: 1949
Volume/Mass Discharged: Unspecified

Waste Site Location and Physical Description: The unplanned release was located on the railroad tracks extending from the 221-T Canyon Building Tunnel to the Heavy Equipment Burial Ground (See Figure 1. ArcMap Image, and Figure 2. Site Location Diagram).

Waste Site Coordinates:

E-567324.74993 N-137134.93751

Site Dimensions:

Site Area: Unspecified Cover Thickness: Unspecified

Release Summary: The contamination resulted from a burial box that had been transported from the 221-T Canyon Building to the Heavy Equipment Burial Ground. After the box was buried, the bulldozer used to cover the trench was found to be contaminated with dust which had readings of up to 10,000 counts/minute. Contamination specks along the railroad track had an average reading of 7 millirem/hour.

Related Site Structure(s): The 218-W-1A Burial Ground is known to contain large pieces of contaminated equipment and is likely to be the Heavy Equipment Burial Ground.

Site Posting: The unplanned release area is not physically marked or posted.

Site Characterization Summary: A complete survey was made from the Canyon Building to the Heavy Equipment Burial Ground, which revealed a spread of contaminated particles. The most contamination was found in the vicinity northeast of the burial ground.

Decontamination of the area was initiated in 1949.

A site walkdown was performed in February 1998.

Potential Contaminants:

Radioactive: Unspecified

Non-Radioactive: Unspecified

References:

WIDS General Summary Report for site UPR-200-W-4
QMap
ArcMap

Figure 1. ArcMap Image

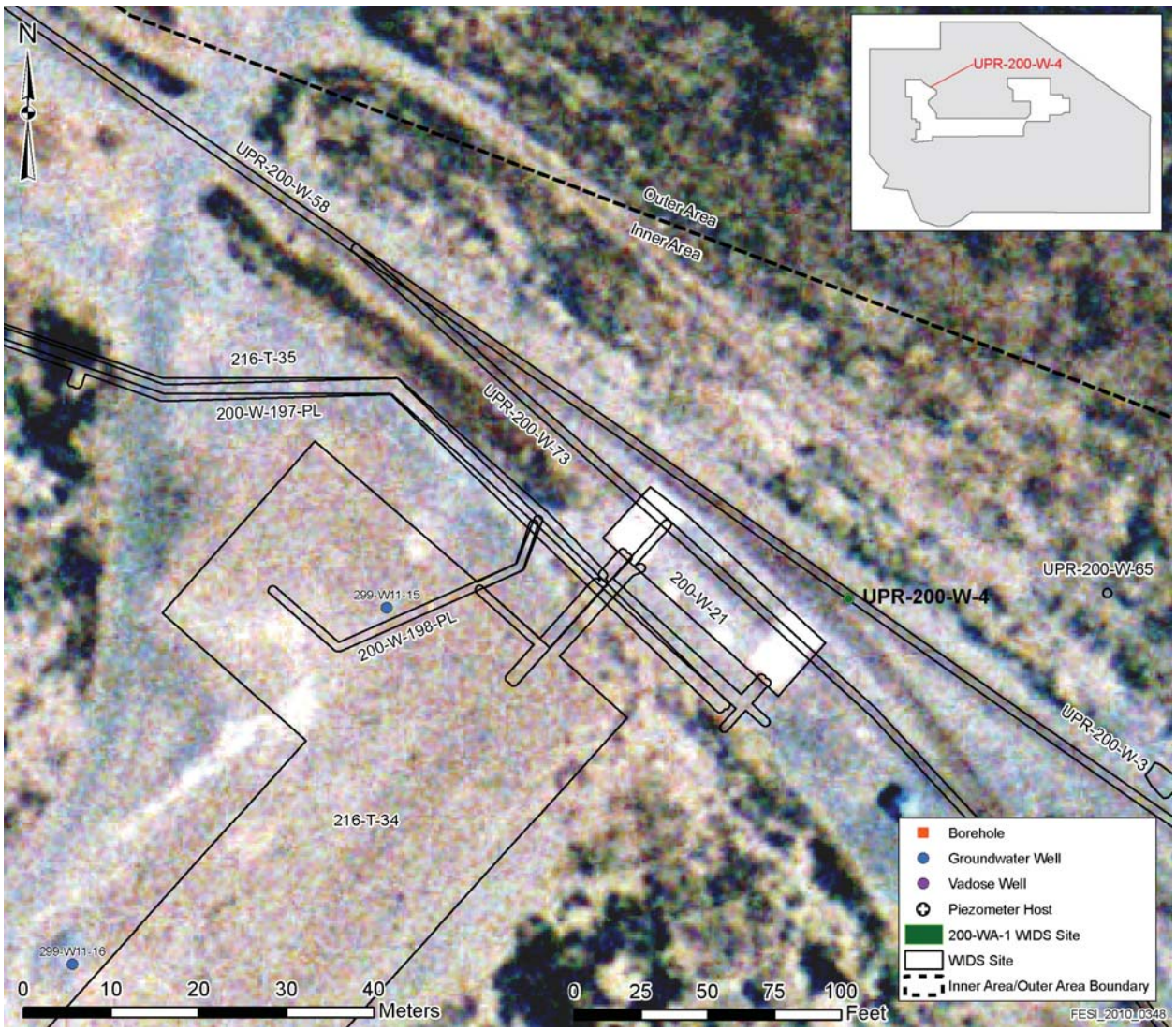
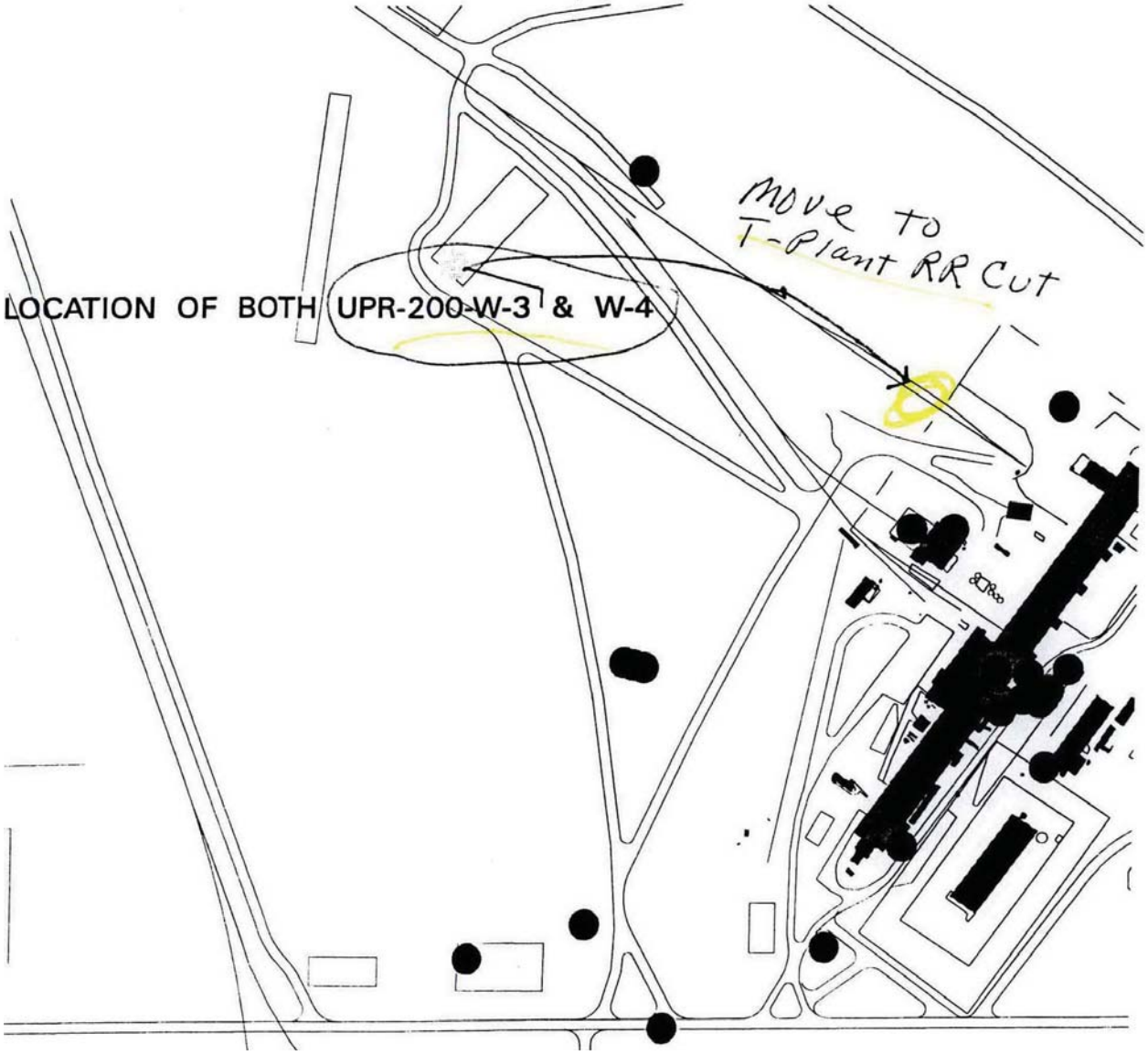


Figure 2. Site Location Diagram



Site Description

Site ID: UPR-200-W-41
Site Type: Unplanned Release
Facility/Geographic Area: 200 Inner Area West
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-1
Occurrence Date: July 7, 1956
Volume/Mass Discharged: Unspecified

Waste Site Location and Physical Description: The unplanned release occurred on the railroad right-of-way from the 202-S Railroad cut to the burial ground (see Figure 1. ArcMap Image, and Figure 2. Diagram of sites).

Waste Site Coordinates:

E-567434.51512 N-134156.21826

Site Dimensions:

Site Area: Unspecified Cover Thickness: 0.6 m (2 ft)

Release Summary: Radiologically contaminated fuel rods were transported to the REDOX facility for processing by rail car. Contaminated material and equipment were transported to the burial grounds on the same rail road track. Over time the railroad track became contaminated. On July 7, 1956, contamination was spread along the right-of-way presumably from liquid contained in a box transporting the J-5 Filter and miscellaneous equipment.

Related Site Structure(s): The site is associated with 202-S and UPR-200-W-42.

Site Posting: Berms on the sides of the railroad cut have been pushed in and posted as an Underground Radioactive Material (URM) area.

Site Characterization Summary: During the transit of the box containing the J-5 Filter and miscellaneous equipment from the 202-S Building Canyon, spotty contamination up to 1,000 millirads/hour at the surface was spread along the right-of-way from the 202-S Building railroad cut to the burial ground. Six spots of 1,000 millirads/hour were found on the east side of the track on the blacktop at the 16th Avenue crossing. The area was immediately roped off and eventually decontaminated to less than 1,000 counts per minute. Initial surveys indicated spotty contamination from 100 to 500 millirads/hour along the east site of the right-of-way diminishing in frequency from 19th Avenue to the burial ground. A check of the flat car used for the burial showed low level contamination on all horizontal surfaces of 10,000 to 20,000 counts per minute at several areas on the paper in the southeast corner of the fat car to 3,000 millirads/hour at surface. Special fiberglass deposition filters placed along the tracks did not indicate a general contamination spread.

In the mid-1980's, the section of railroad track from the 202-S Tunnel to the REDOX facility fence was backfilled and stabilized to contain the contamination and prevent parking of railroad cars. In 1997, the section of railroad track extending northwest from the facility boundary fence to the intersection of the track with the first gravel road was backfilled with 0.6 m (2 ft) of clean

soil. In 2000, the berms on the sides of the railroad cut were pushed in and the remainder of the railroad cut was stabilized.

A site surveillance walkdown was performed on March 4, 1998.

Potential Contaminants:

Radioactive: Unspecified

Non-Radioactive: Unspecified

References:

WIDS General Summary Report for site UPR-200-W-41.
QMap.
ArcMap.

Figure 1. ArcMap Image

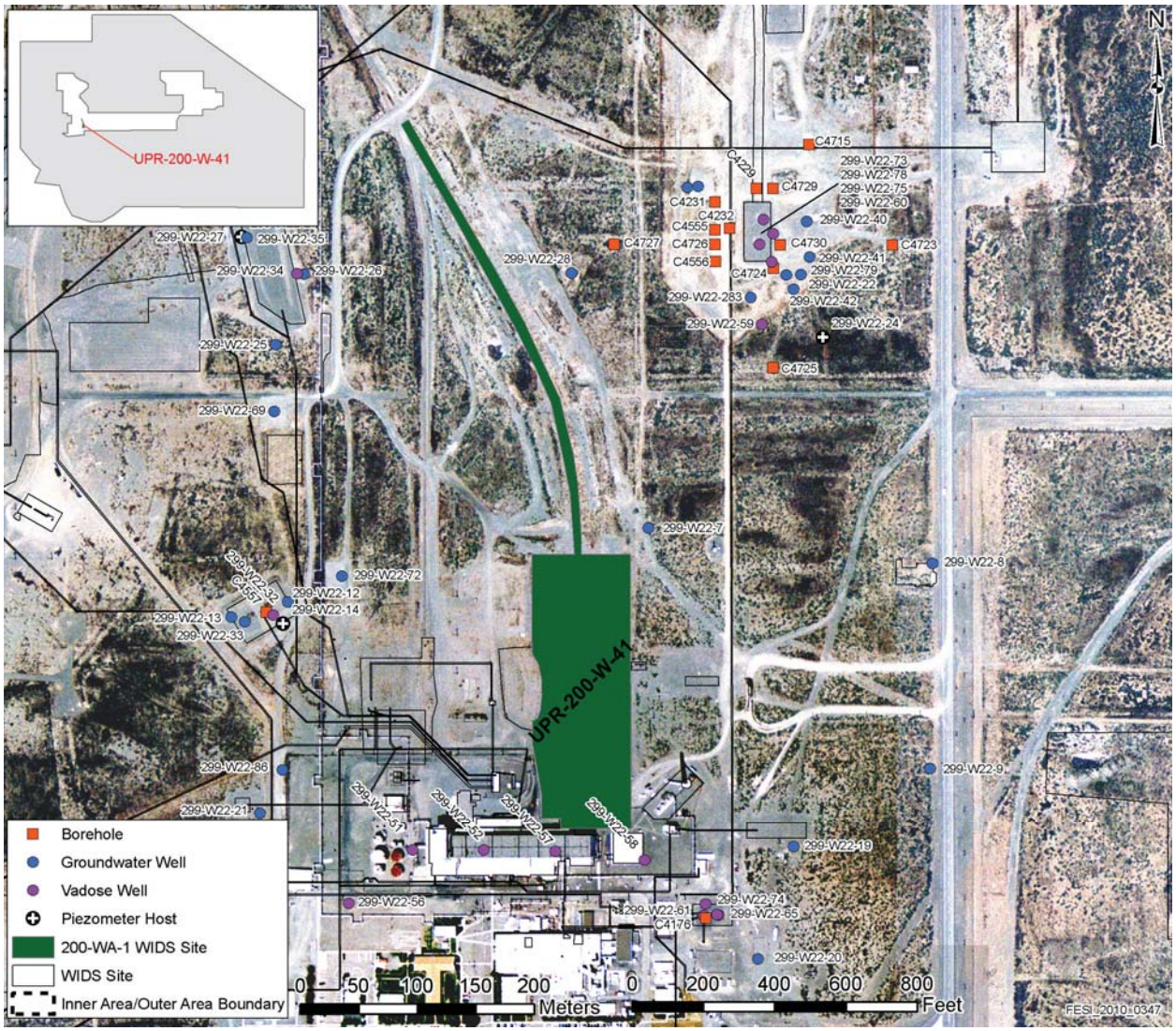
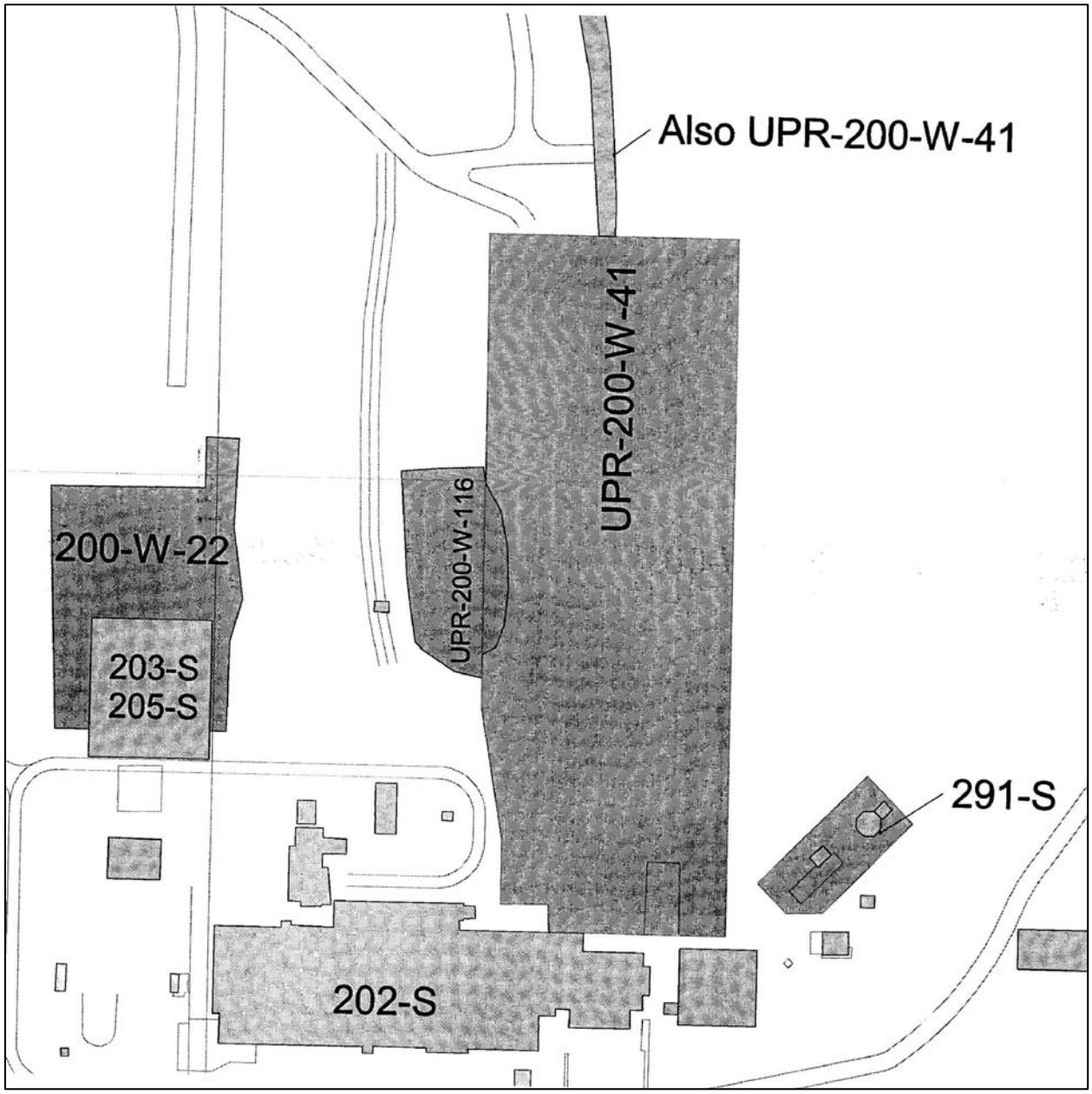


Figure 2. Diagram of Sites



Site Description

Site ID: UPR-200-W-46
Site Type: Unplanned Release
Facility/Geographic Area: 200 Inner Area West
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-1
Occurrence Date: December 30, 1957
Volume/Mass Discharged: Unspecified

Waste Site Location and Physical Description: The unplanned release occurred during burial operation of a contaminated centrifuge, spotty contamination resulted in the REDOX, 234-5Z, and 224-U Plant areas (See Figure 2. Site Location and Figure 3. Diagram of UPR-200-W-46). Contamination was also found along the railroad right-of-way to the burial ground.

Waste Site Coordinates:

E-567389.43757 N-134421.70308

Site Dimensions:

Site Area: Unspecified Cover Thickness: 0.6 m (2 ft)

Release Summary: The H-2 Centrifuge was ruthenium contaminated. The centrifuge was placed in a burial box in the REDOX Railroad Tunnel on December 30, 1957. Shortly after placement, fumes were observed coming from the centrifuge. Corrective measures to control the escape of fumes were attempted, but generally unsuccessful. After about four hours, fumes escaped the tunnel and circulated throughout the REDOX Building via the ventilation system. By 4:30 am, December 31, 1957, respiratory protection was required for the north side of REDOX (233-S Building), respiratory protection was extended to the south operating areas of REDOX. Considerable surface contamination was deposited in and around REDOX, including construction work areas outside the building. The centrifuge was transported by train to the burial ground. The burial box was observed to be “puffing” slightly as it proceeded to the burial site but no contamination was observed along the railroad right-of-way. The centrifuge was buried at about 10:00 am on December 31, 1957. Dose rates related to the burial were documented as 185 millirads/hour at 177 m (580 ft), and about 2 millirads/hour at 0.8 km (0.5 mi). Radiation field averaging 1 rad/hour during backfilling of the centrifuge box in the burial ground prevented the box from being completely buried in one day. Two employees received face and nostril contamination during the backfill operation. Two days later, radiation surveys revealed a general low level smearable contamination along the railroad right-of-way.

Related Site Structure(s): Unspecified

Site Posting: The railroad cut located inside the REDOX facility fence is posted as a “Contamination Area”. The section of covered track form the fence to the first gravel road intersection is posted as an “Underground Radioactive Material” (URM) area.

Site Characterization Summary: In the mid-1980’s, the section of railroad track from the 202-S Tunnel to the REDOX facility fence was backfilled and stabilized to contain the contamination and prevent parking of railroad cars. In 1997, the section of railroad track

extending northwest from the facility boundary fence to the intersection of the track with the first gravel road was backfilled with 0.6 m (2 ft) of clean soil.

The REDOX crane was decontaminated.

A site surveillance walkdown was performed on February 25, 1998.

Potential Contaminants:

Radioactive: Ruthenium

Non-Radioactive: Unspecified

References:

WIDS General Summary Report for site UPR-200-W-46.
ArcMap
QMap

Figure 1. ArcMap Image

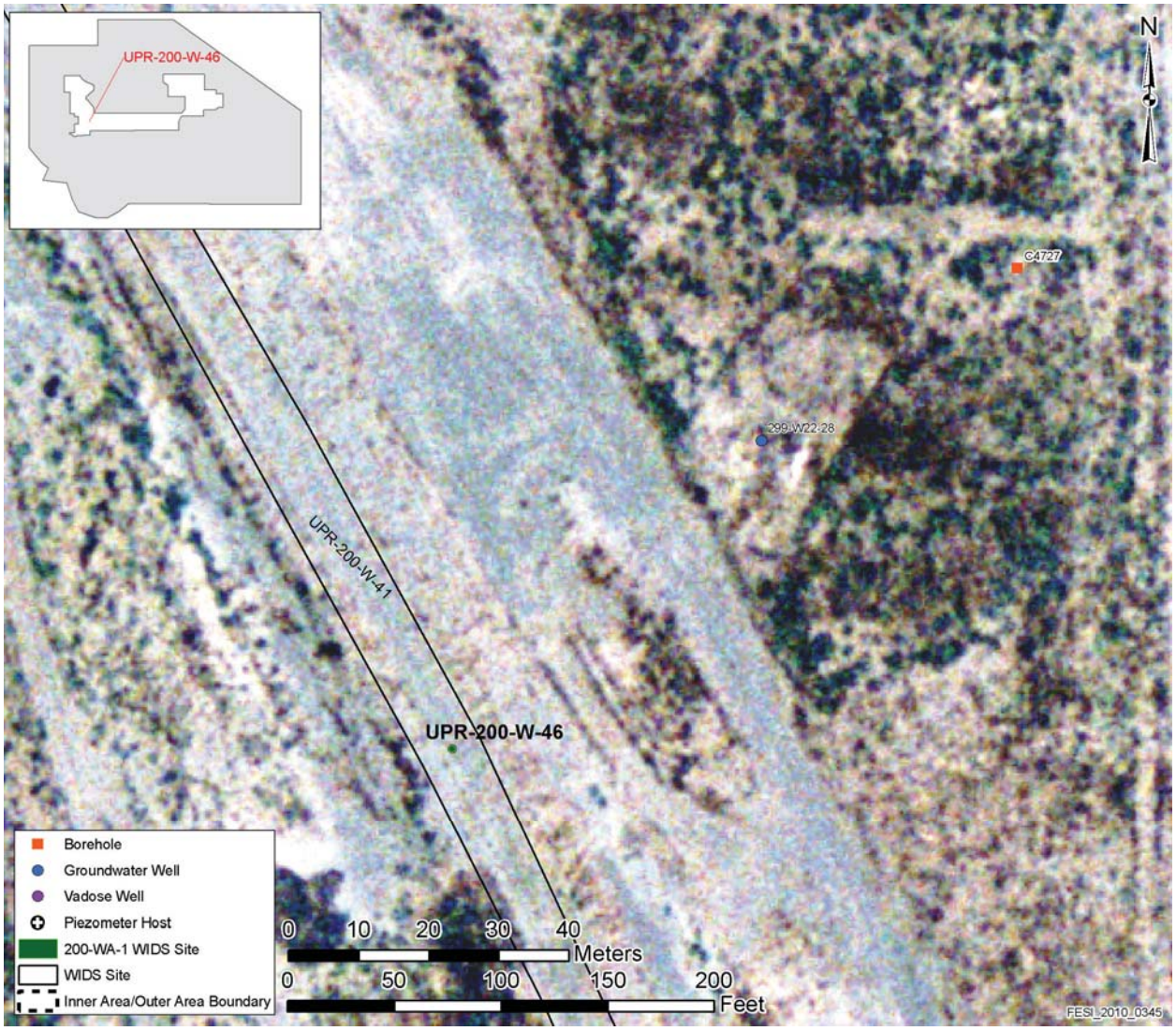
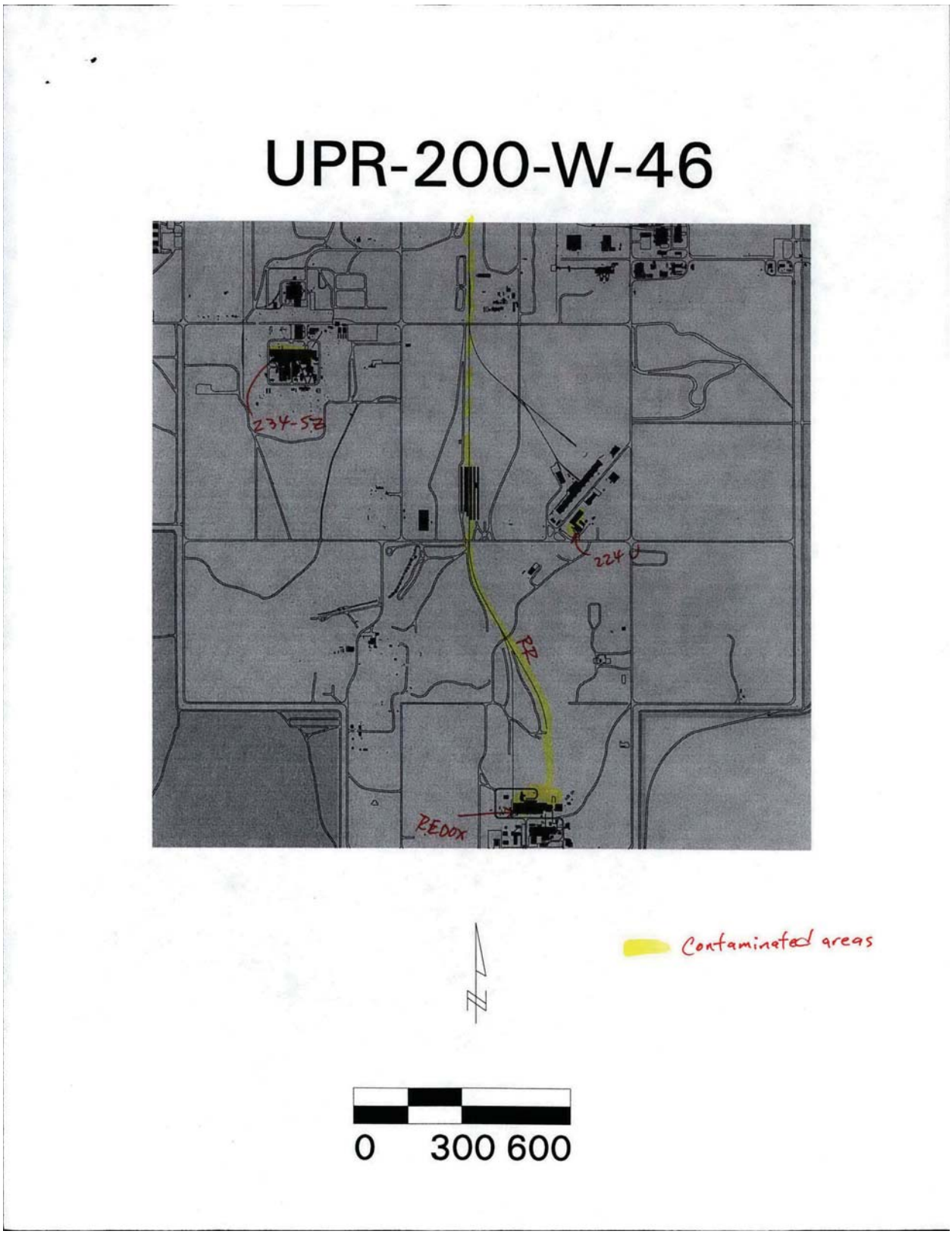


Figure 2. Insert Site Location

Figure not available.

Figure 3. Diagram of UPR-200-W-46



Site Description

Site ID: UPR-200-W-51
Site Type: Unplanned Release
Facility/Geographic Area: 200 Inner Area West
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-1
Occurrence Date: September 12, 1958
Volume/Mass Discharged: 47,775 square m (516,600 square ft) area of contamination

Waste Site Location and Physical Description: The unplanned release spread southward from the 241-S-151 Diversion Box (inside the 241-S tank farm) to approximately 30 m (100 ft) beyond the 200 West Area fence. The plume was approximately 100 m (300 ft) wide. The area where this unplanned release was located is near an area that was surface stabilized in 1992 and known as UPR-200-W-165.

Waste Site Coordinates:

E-566864.87499 N-134257.24996

Site Dimensions:

Site Length: 525 m (1,722 ft) Cover Thickness: Unspecified
Site Width: 91.4 m (300 ft)

Site Area: 47,775 square m (516,600 square ft)

Release Summary: On September 12, 1958, high pressure steam was applied to the D-8 line of the 241-S Diversion box in an attempt to unplug it. The pressure bled back into the diversion box and caused a release of contamination. A follow up survey showed contamination readings up to 1 rad/hour immediately around the box. Contamination levels 30 m (100 ft) south of the diversion box were 50 millirad/hour. A narrow strip of contamination extended southward, across Tenth Street, with contamination levels of 4,000 counts per minute. The contamination continued southward approximately 91.4 m (300 ft) beyond the 200 West Area fence. The particles outside of the 200 West Area fence read on the order of 5,000 counts per minute. The contaminated areas were posted and the gross contamination was flushed with water.

Related Site Structure(s): The unplanned release is associated with the 241-S-151- Diversion Box, UPR-200-W-52, UPR-200-W-114 and the unplanned release affected a portion of the area known as UPR-200-W-165.

Site Posting: The unplanned release area is not marked or posted.

Site Characterization Summary: Immediately following the unplanned release, the contaminated areas were zoned off and the gross contamination was flushed with water. In 1992, two large soil contamination areas (UPR-200-W-165 and UPR-200-W-114), located northeast and east of the 241-SX Tank Farm, were scraped and consolidated onto other existing nearby waste sites and into the 207-S Retention Basin. After collecting soil samples of the scraped areas, the areas were removed from radiological control. Some residual contamination from this unplanned release may have contributed to the contaminated soil in these areas.

Potential Contaminants:

Radioactive: Unspecified

Non-Radioactive: Unspecified

References:

WIDS General Summary Report for site UPR-200-W-51
QMap
ArcMap

Figure 1. ArcMap Image

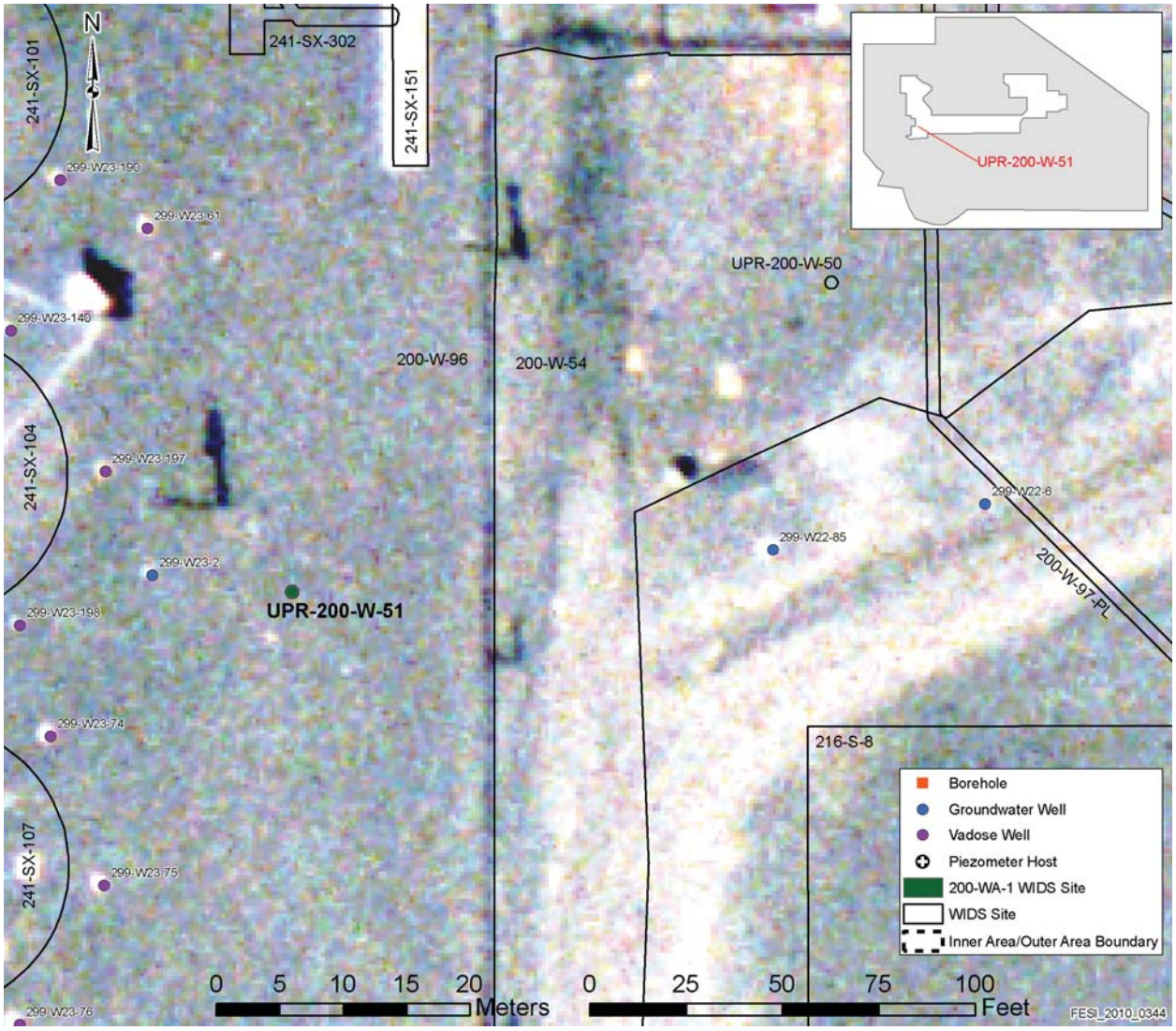


Figure 2. Site Location Map

Figure not available.

Site Description

Site ID: UPR-200-W-60
Site Type: Unplanned Release
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1
Service Dates: 1966
Volume/Mass Discharged: N/A

Waste Site Location and Physical Description: The Release site consists of spotty contamination extending from the 221-U tunnel door along the railroad tracks (Figure 2. Site Location). The U Plant Railroad had been surrounded with soil berms on the north and south sides of the track and posted with Contamination Area signs. The area (including the UPR-200-W-60 area) was surface stabilized in 2001. The entire area, including the railroad tracks, is now covered with clean dirt.

Waste Site Coordinates:

E-567551.28126 N-135316.32030

Site Dimensions:

Site Length: 68.58 m (225 ft)
Site Width: 6.1 m (20.00 ft)
Site Area: N/A
Site Depth: N/A
Cover Thickness: N/A

Release Summary: On February 25, 1966, PUREX equipment was transferred to the U Plant in a rail car filled with water (for shielding). Contaminated water dripped from a hole in the bottom of the PUREX equipment transfer box as the box was being pulled from the 221-U Building tunnel. The release affected approximately 69 m (225 ft) of rail road track. The box was returned to the tunnel. Radiation monitoring conducted at the site following the release indicates radioactivity along the railroad track ranged from a few thousand counts per minute to a maximum of 1 rad/hour.

Related Site Structure(s): The site is associated with the 221-U building and UPR-200-W-117.

Site Posting: The site is posted with Underground Radioactive Material Area signs.

Site Characterization Summary: In 1966, the contamination was isolated and cleaned. In 2001, the U Plant Railroad Cut was stabilized by covering the contamination with clean dirt.

Potential Contaminants:

Radioactive: Not specified

Non-Radioactive: Not specified

References:

WIDS General Summary Report for site UPR-200-W-60
QMap.
ArcMap.

Figure 1. ArcMap Image

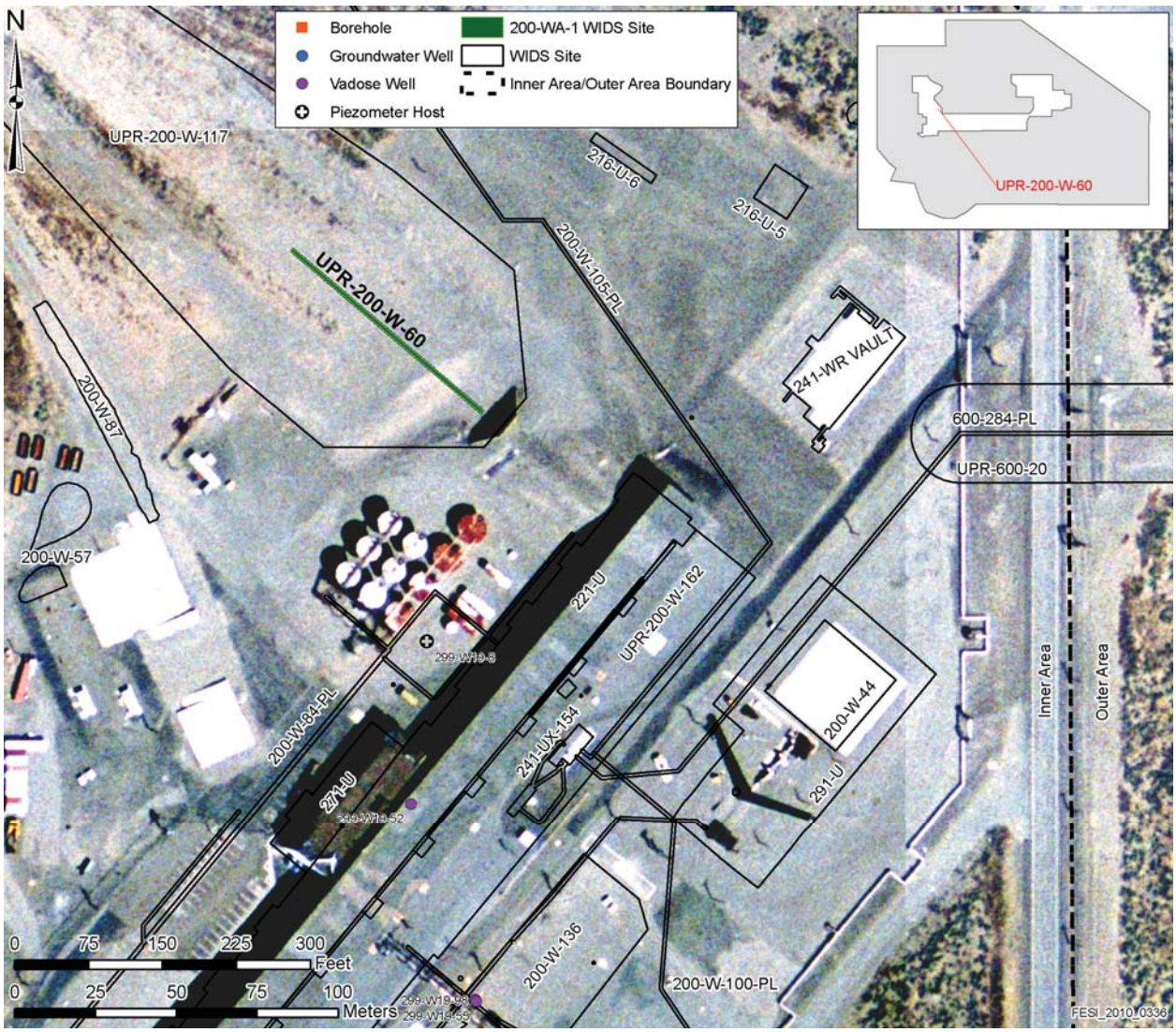


Figure 2. Insert Site Location

Figure not available.

Site Description

Site ID: UPR-200-W-63
Site Type: Unplanned Release
Facility/Geographic Area: 200 Inner Area West
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-1
Occurrence Date: September 1966
Volume/Mass Discharged:

Waste Site Location and Physical Description: The unplanned release site affected the road surface of 23rd Street in the 200 West Area. The contamination was spread west of the west railroad crossing on 23rd Street and extended eastward to the intersection of Bridgeport and 23rd Street along the south shoulder of 23rd Street[1]

Waste Site Coordinates:

E-567150.06251 N-136622.28130

Site Dimensions:

Site Length: 152.4 m (500 ft) length of contamination along roadway
Site Area: Unspecified

Release Summary: On September 21, 1966, strontium-90 in the form of particulate matter spread from a used diversion box jumper as it was being transported from the 200 Dry Waste Burial Ground to the 221-T Canyon. The jumper had just previously been removed from the 241-TX-153 Diversion Box.

Related Site Structure(s): It is possible the unplanned release is associated with the radiologically posted area 200-W-90.

Site Posting: The unplanned release site is not marked.

Site Characterization Summary: The contamination was in the form of strontium-90 with an activity of approximately 1 Ci. Spotty contamination with a maximum of 500 millirads/hour on the 23rd Street was found along the road and shoulder. Speck contamination approximated one per square yard of ground surface along the shoulder of 23rd Street. The contamination on the road was removed, the contamination on the shoulder of the road and in the borrow pit was covered with 15.2 cm (6 in) of soil. The area was removed from radiation zone status in November 1972. In September 1991 there were no visible site markers or signs of stabilization in the area.

Potential Contaminants:

Radioactive: Strontium-90

Non-Radioactive: Unspecified

References:

WIDS General Summary Report for site UPR-200-W-63
[1] Figure provided by CHPRC GIS
ArcMap

Figure 1. ArcMap Image

Figure not available.

Figure 2. Unplanned Release Location

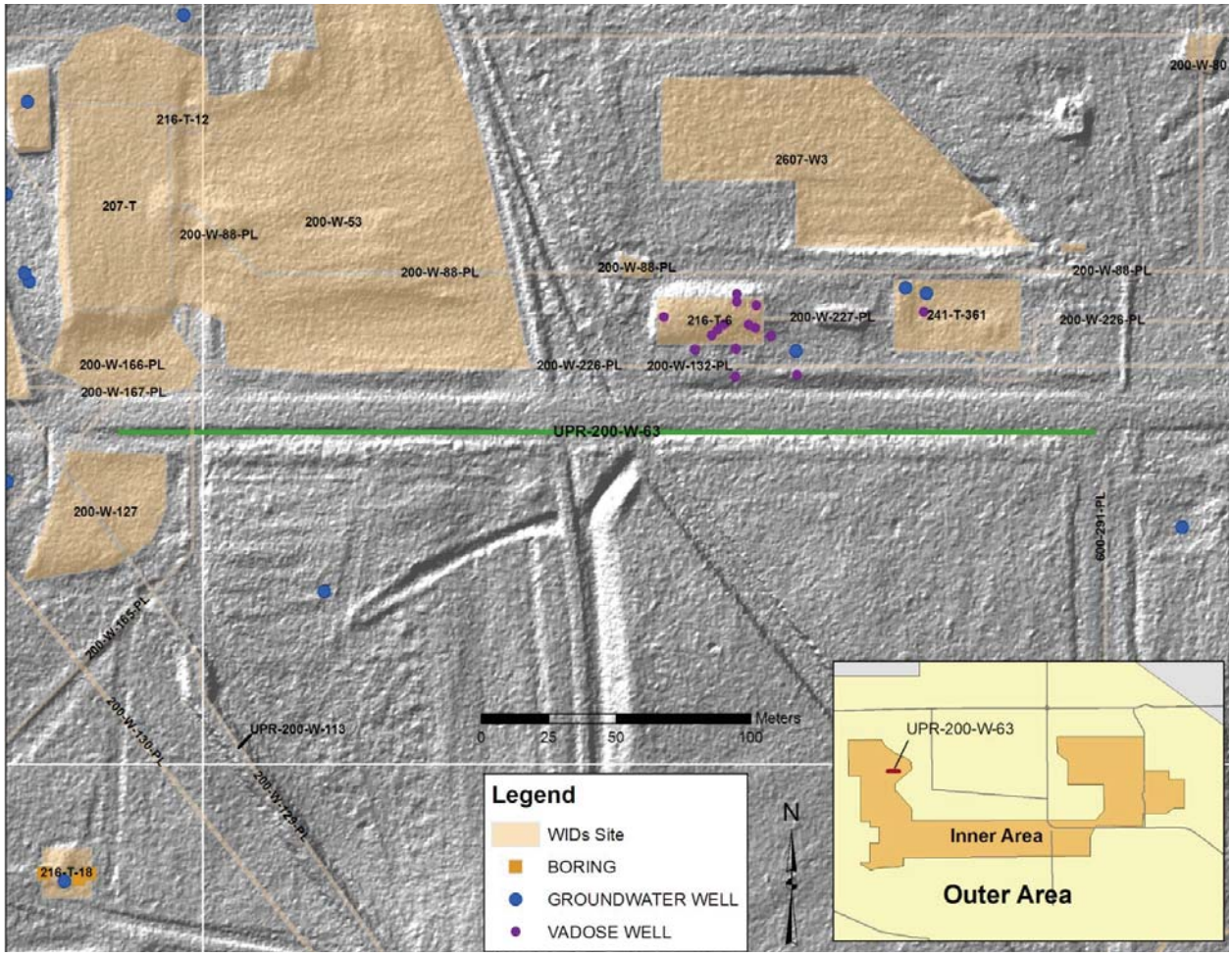
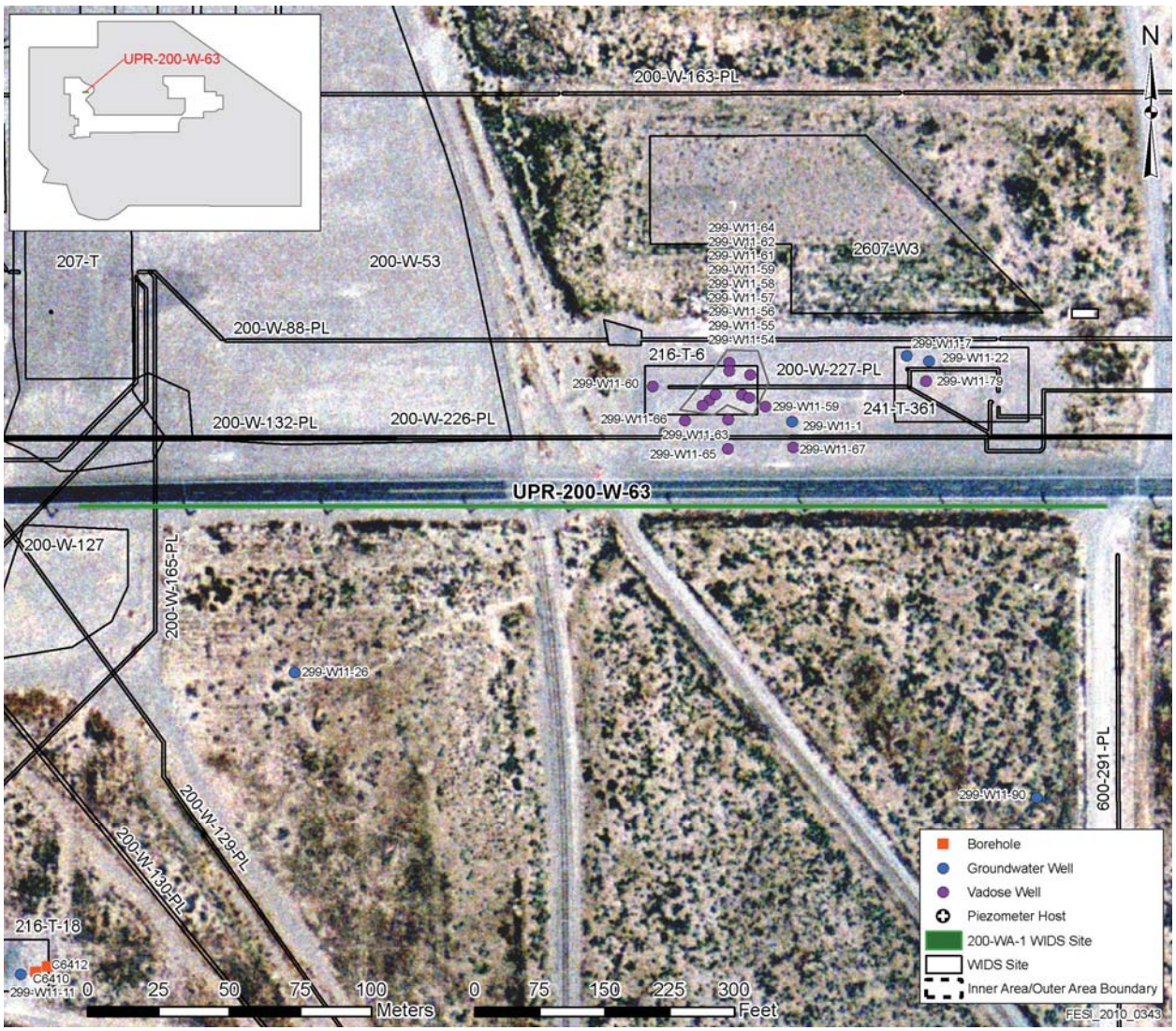


Figure 3. Site Location



Site Description

Site ID: UPR-200-W-65
Site Type: Unplanned Release
Facility/Geographic Area: T-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-1
Service Dates: 1969
Volume/Mass Discharged: N/A

Waste Site Location and Physical Description: The contamination was found in the T Plant railroad cut, which is located on the west side of the 221-T facility adjacent to the railroad tunnel (Figure 2. Site Location). The railroad cut is currently posted as a Contamination Area, extending from the tunnel door westward to a chain link gate and fence. In 1969, the areas described in the occurrence report were decontaminated.

Waste Site Coordinates:

E-567354.24999 N-137135.57814

Site Dimensions:

Site Length: 114 m (374.02 ft)
Site Width: 1.0 m (3.28 ft)
Site Area: N/A
Site Depth: N/A
Cover Thickness: N/A

Release Summary: Contaminated equipment was sent to T Plant on railcars for repair and decontamination. On October 27, 1969, contamination was found during a routine survey of the 221-T Plant railroad cut. Spots of contamination from 5,000 counts per minute to 150 milirads/hour were found between the rails of the spur line and adjacent to the spur line. One area, about 45.72 m (50 yd) from the tunnel door, was generally contaminated over an area measuring 0.9 m (3 ft) by 3 m (10 ft). From this area west, the contamination spots were spaced a few inches to a few feet until approximately 114.3 m (125 yd) from the tunnel door, where the contamination was non-detectable. The exact source of the contamination is unknown, but the location limits the cause to a rail car carrying radioactive material which was not effectively contained.

Related Site Structure(s): N/A

Site Posting: The railroad cut is currently posted as a Contamination Area.

Site Characterization Summary: Characterization information is not available for the site.

Potential Contaminants:

Radioactive: Not specified

Non-Radioactive: Not specified

References:

WIDS General Summary Report for site UPR-200-W-65
QMap
ArcMap

Figure 1. ArcMap Image

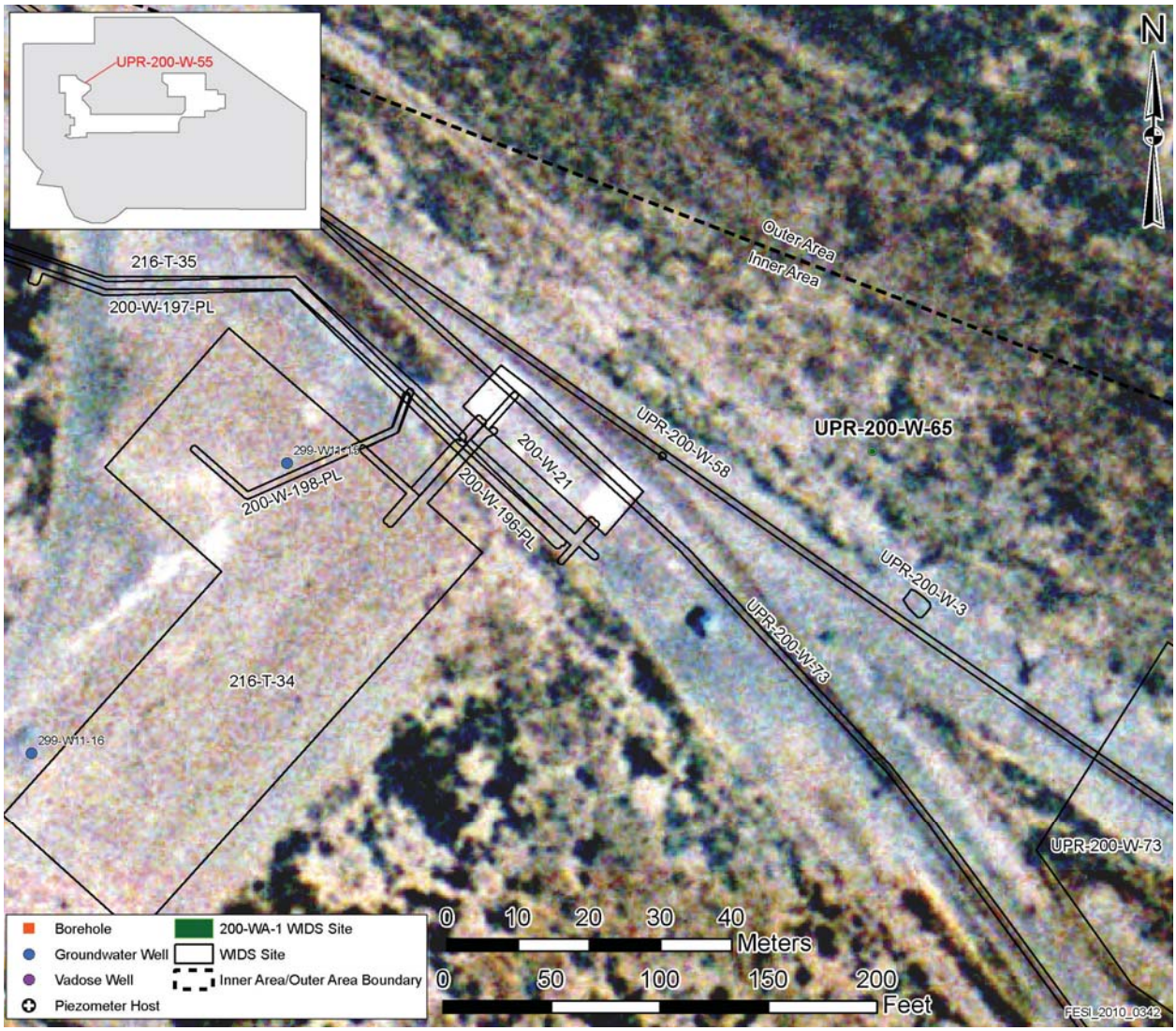


Figure 2. Site Location

Figure not available.

Site Description

Site ID: UPR-200-W-67
Site Type: Unplanned Release
Facility/Geographic Area: T-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-1
Service Dates: 1970
Volume/Mass Discharged: N/A

Waste Site Location and Physical Description: The contamination was located on the north side of 2706-T Building adjacent to the MO433 trailer (Figure 2. Site Location). The unplanned release site is marked with a single post with a WIDS site number sign. The sign is adjacent to the MO433 trailer. A site visit in October 1991 found a fence surrounding the 2706-T Building on the south, west, and north sides extending about 100 ft (30.48 m) from the building. The north side of the building is paved with gravel and is used for equipment storage. No mention of any action concerning cleanup has been found.

Waste Site Coordinates:

E-567536.49997 N-136923.39061

Site Dimensions:

Site Length: 7.32 m (24 ft)
Site Width: 0.91 m (3.0 ft)
Site Area: N/A
Site Depth: N/A
Cover Thickness: N/A

Release Summary: The 2706-T building is a vehicle and equipment decontamination facility. On August 5, 1970, a contaminated electric lift from the 221-B Plant was parked outside a radiation zone on the north side of the 2706-T building. Contamination from the vehicle affected the ground beneath the vehicle to a maximum of 20,000 counts per minute and the contaminated electric lift read as high as 500 millirads/hour.

Related Site Structure(s): N/A

Site Posting: N/A

Site Characterization Summary: Characterization information is not available for this site.

Potential Contaminants:

Radioactive: Not specified

Non-Radioactive: Not specified

References:

WIDS General Summary Report for site UPR-200-W-67.QMap
ArcMap

Figure 1. ArcMap Image

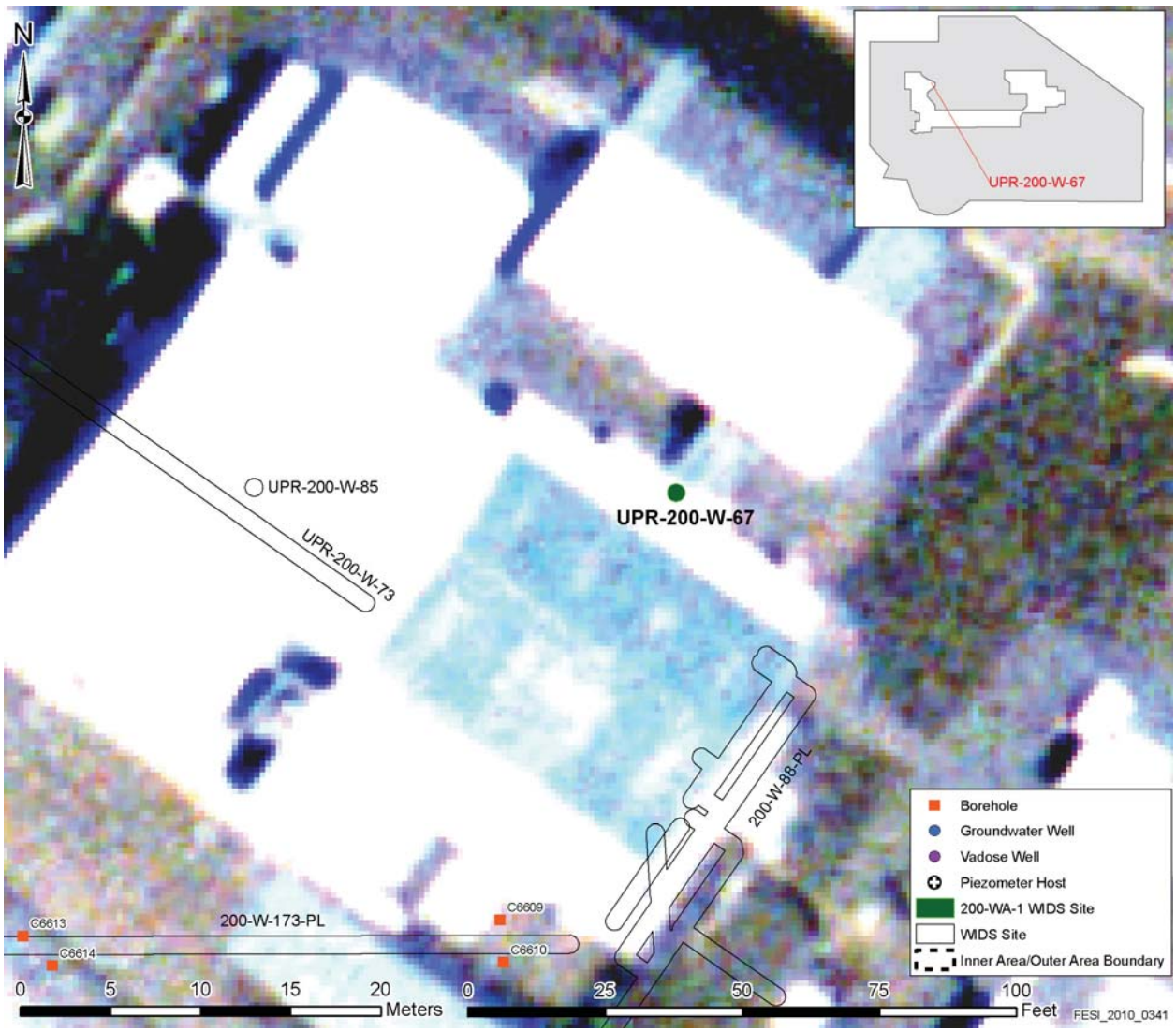


Figure 2. Site Location

Figure not available.

Site Description

Site ID: UPR-200-W-71, UN-200-W-71, Contamination Spread along 16th Street to Dayton Ave.
Site Type: Unplanned Release
Facility/Geographic Area: Z-Plant (PFP Area/200 W Ponds Area/ WM Area)
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UR-1, 200-MG-1
Service Dates: January 24, 1974
Volume/Mass Discharged: No volume specified for the waste released.

Waste Site Location and Physical Description: Site UPR-200-W-71 was an unplanned release (UPR) on January 24, 1974 that spread onto the road from the 241-U Tank Farm to the 200 West Burial Grounds (See Figure 2. Site Location, and Figure 3. Location Sketch for UPR-200-W-71). Dayton Avenue and 16th Street were also affected by the contamination spread. The spill occurred while employees were moving a heel-jet from the 241-U-102 Tank in the 241-U Farm, to the Burial Grounds via truck for disposal. Contamination was discovered on the truck after the heel-jet was removed and deposited in the burial trench. Upon further investigation, additional contamination was discovered along the route the truck had driven to the Burial Ground.

The dimensions of the UPR are unknown. The available information does not include the burial ground site number. As there are several burial grounds located along Dayton Avenue, it is not possible to determine the exact dimensions of the contaminated area. No reference drawings are available for this site.

Waste Site Coordinates:

E-566256.33791 N-135486.12173

Site Dimensions:

Site Length: Irregular m (Irregular ft)
Site Width: Irregular m (Irregular ft)
Site Area: 7808.0 m2 (84056.0 ft2)
Site Depth: Not Specified
Cover Thickness: None

Release Summary: The equipment dripped contaminated liquid residue along the route of transport. The release occurred as a result of the transported item not being securely wrapped and covered, inadequate monitoring during the loading and transport of the item, and moving the item in the rain, which increased the difficulty of transporting and monitoring the item.

After contamination was detected on the truck, a radiological investigation began along the truck route. Radiological readings taken at the 241-U Farm exit and along 16th Street discovered additional spots of contamination with Beta-gamma levels up to 600mRads/hr. In addition, multiple patches of contamination with readings from 20,000 to 100,000 cpm were located along 16th Street, to the intersection of 16th Street and Dayton Avenue, and from Dayton Avenue to the Burial Ground.

Related Site Structure(s): UPR-200-W-71 is associated with the 200-West Burial Ground, Dayton Avenue, 16th Street, and the 241-U-102 Tank in the 241-U Tank Farm.

Site Posting: The UPR site is no longer marked or posted. The roadways were released from posting in 1974 following the cleanup along the roadways.

Site Characterization Summary: Following the release, extensive cleaning efforts were made along the impacted roadways and the truck was decontaminated.

Routine surveys are performed on the roadways inside the 200 East and 200 West Areas using road monitoring equipment. The frequency these surveys monitor the roads associated with this UPR is not specified.

Potential Contaminants:

Radioactive: Not Specified

Non-Radioactive: Not Specified

References:

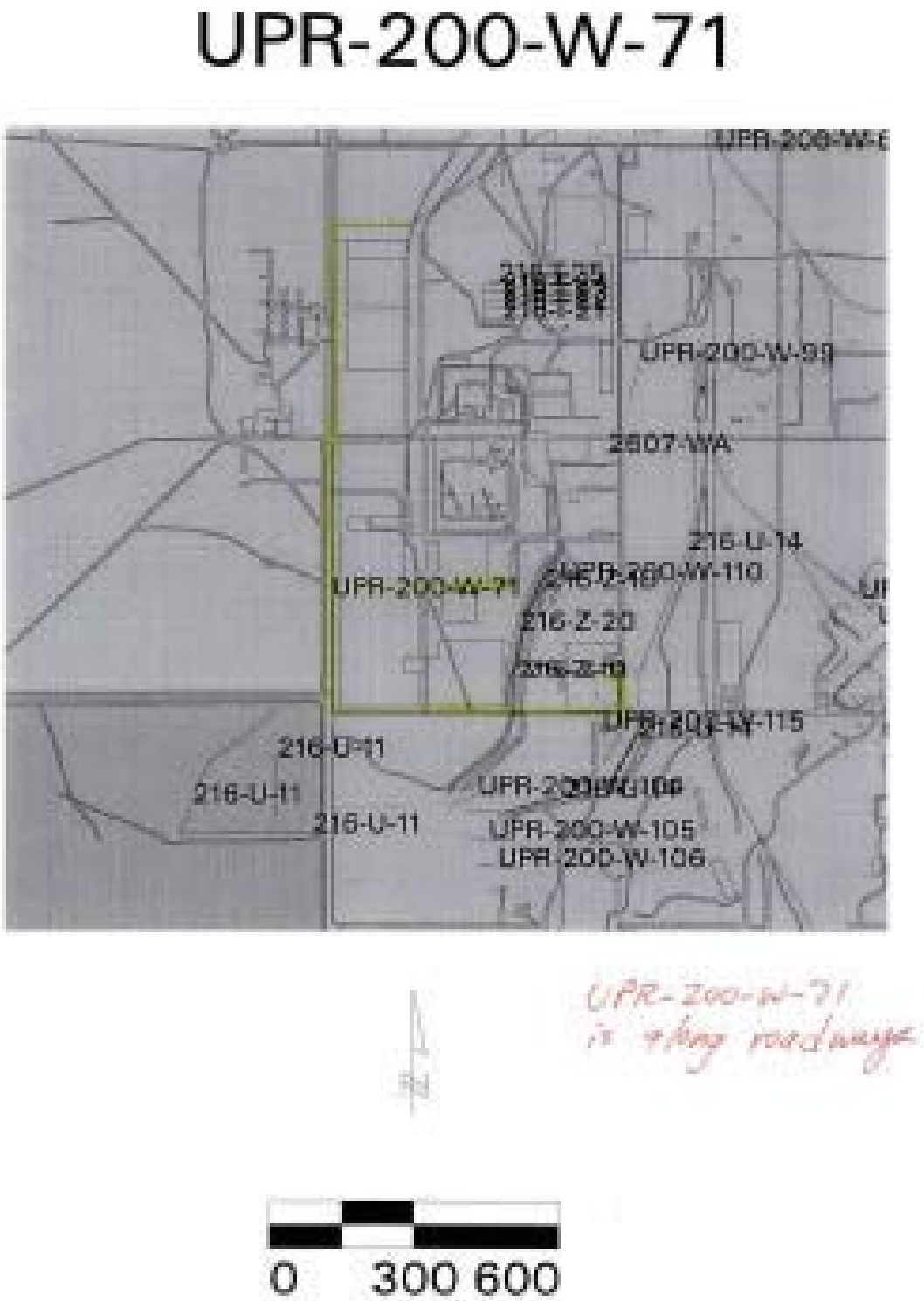
WIDS General Summary Report for site UPR-200-W-71
QMap
ArcMap

Figure 1. ArcMap Image

Figure 2. Site Location

Figure not available.

Figure 3. Location Sketch for UPR-200-W-71.



Site Description

Site ID: UPR-200-W-73, Contaminated Railroad Track at 221-T, UN-200-W-73
Site Type: Unplanned Release
Facility/Geographic Area: T-Plant
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-MG-1
Service Dates: 1974
Volume/Mass Discharged: Not Specified

Waste Site Location and Physical Description: Site UPR-200-W-73 was an unplanned release (UPR) of contaminated waste on a rail road cut adjacent to the 221-T Tunnel. The release occurred on the track section that connects the 221-T Building Tunnel to the 2706-T Building (See Figure 2. Site Location and Figure 3. Site Location_UPR-200-W-73). The UPR and the rail spur leading into 2706-T facility are not posted. No engineering reference drawings are available for this site.

Waste Site Coordinates:

E-567487.37194 N-137022.82227

Site Dimensions:

Site Length: 366.0 (1,200 ft)
Site Width: 6.1 m (20.0 ft)
Site Area: Not Specified
Site Depth: Not Specified
Cover Thickness: Not Specified

Release Summary: Site UPR- 200-W-73 is located on railroad tracks that were used to transfer contaminated equipment to and from the T-Plant for repairs and decontamination. This waste site consists of several spots of ground contamination that were created as a result of a multi-purpose transfer box rail car leaking decontamination solution onto the railroad tracks and ground. The releases occurred through a hair-line crack in a weld of the outer shell of the transfer box. Decontamination solution seeped through the crack, and then subsequently leaked onto the rail track while the transfer box was in motion.

The total volume of waste released via the leak in the transfer box is not known. Therefore, no volume estimates can be ascertained for this site.

Related Site Structure(s): Site UPR-200-W-73 is associated with the 2607-T and 221-T Buildings.

Site Posting: The posting for Site UPR-200-W-73 is not specified.

Site Characterization Summary: On October 14, 1974, contamination levels up to 3,800 millirads/hr were detected on the bed of the multi-purpose transfer box railroad car. The rail car was scheduled for decontamination the following day. During the decontamination, a hair-line crack was observed in a weld of the outer shell of the transfer box. On October 16, 1974, detectable radiation levels on the transfer box had been reduced to 350 millirads/hr and 600 cpm smearable. Following the decontamination effort, the railcar was moved to the2706-T Building for repairs. The railcar was investigated a second time at 2706-T, and readings suggested that further contamination had leaked from the rail car. Radiation readings on the rail car had

increased from 600 cpm smearable to 50,000 cpm smearable. A subsequent investigation occurred for an estimated 366.0 m (400 yds) of railroad track located between the 221-T Building Tunnel and the 2706-T Building. During the survey, several patches of soil contamination were located with beta/gamma readings up to 40 millirads/hour. It is not specified what, if any, surface stabilization efforts occurred following the discovery of the ground and rail track contamination. No occurrence reports have been presented that discuss cleanup efforts along the rail line or on the ground.

The only survey information that is presented after the 1974 incident occurred on March 7, 2000. On that date, a site walkdown occurred for verification purposes. The survey confirmed that the spur leading to the 2706-T Building was not radiologically posted.

It is not specified if any surface stabilization work has occurred at 200-W-73. It is unclear if the site is routinely surveyed or monitored, as no survey results or sample data analyses are provided for the site. If surveys do occur, their frequency is not specified.

Potential Contaminants:

Radioactive: Not Specified.

Non-Radioactive: Not Specified.

References:

WIDS General Summary Report for site UPR-200-W-73
QMap
ArcMap

Figure 1. ArcMap Image

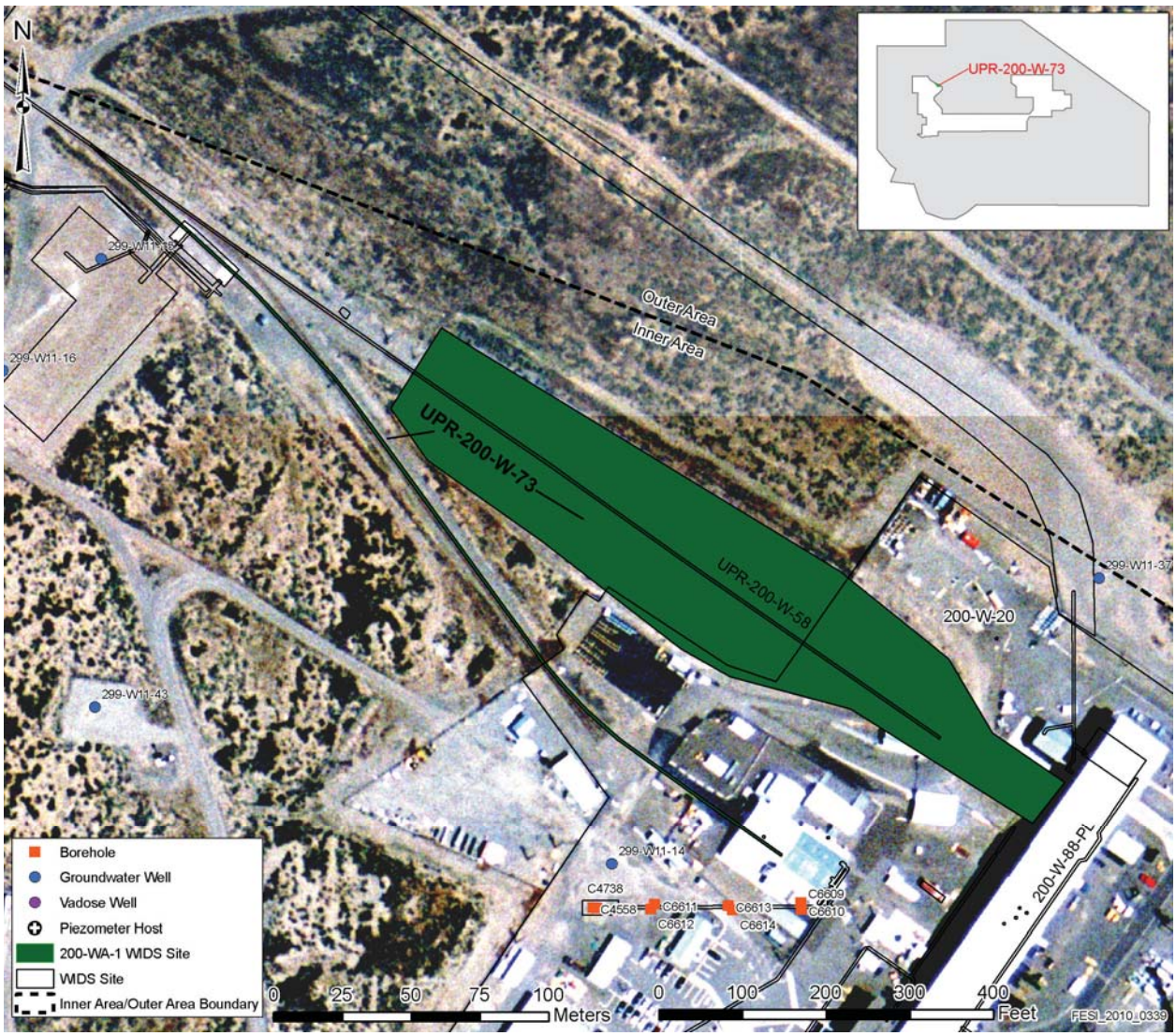


Figure 2. Site Location

Figure not available.

Figure 3. Site Location UPR-200-W-73

Figure not available.

Site Description

Site ID: UPR-200-W-76, Un-200-W-76, Contamination Found at 241-TX-155
Site Type: Unplanned Release
Facility/Geographic Area: S-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-IS-1
Service Dates: NA
Volume/Mass Discharged: Unknown

Waste Site Location and Physical Description: The site is located east of Camden Avenue at an area surrounding the 241-TX-152 Diversion Box, 241-TX-155 Diversion Box, and 241-TX-302B Catch Tank. The area around the 241-TX-152 Diversion Box is surrounded with posts and chain. A black and white site number sign reading "WIDS UPR-200-W-76" is hanging on the chain. There are power poles and an electrical box inside the posted area along with the 241-TX-152 Diversion Box.

Waste Site Coordinates:

E-567121 (m) N-136133 (m)

Site Dimensions:

Site Length: 91.44 m (300.00 ft)
Site Width: 45.72 m (150.00 ft)
Site Area: 29.73 m^2 (320 ft^2)
Site Depth: N/A
Cover Thickness: 0.15 m (0.5 ft)

Release Summary: On August 24, 1977, contaminated rabbit fecal pellets were found around the 241-TX-155 Diversion Box. A more extensive survey revealed contaminated pellets with readings as high as 100 millirads/hour scattered in an area of about 50 yards (45.72 meters) by 100 yards (91.44 meters) around the diversion box. Two Pellets were analyzed for radiological contaminants and found to contain mostly cesium-137. Subsequent surveys found additional spotty contamination extending in a 152 meter (500 foot) radius around the 241-TX-155 diversion box. The source of the contamination was traced to leaks from the 241-TX-155 Diversion Box. The east side of the diversion box had been partially excavated in 1976. The excavation was left open for more than a year, allowing access for animal intrusion.

Related Site Structure(s): The site is associated with 241-TX-155 and 241-TX 152 Diversion Boxes, and 241-TX-302B Catch Tank.

Site Posting: The site is posted with Bio-Barrier and Underground Radioactive Material signs. A single white sign with black letters reading "WIDS UPR-200-W-76" is hanging on the chain near the south side of the 241-TX-152 Diversion Box.

Site Characterization Summary: Radioisotopic analyses on two individual rabbit pellets revealed: 18.6 µCi Cs-137 per gram of sample, 0.044 µCi Cs-134 per gram of sample, 0.093 µCi Eu-55 per gram of sample, 0.026 µCi Eu-54 per gram of sample, and 2.63 µCi Sr-90 per gram of sample. Beta-gamma readings up to 100 millirads/hour were found. Subsequent surveys found additional contamination reading from 500 to 100,000 in small spots within a 152 meter (500 foot) radius around the 241-TX-155 Diversion Box.

In 1977, an area approximately 91 m by 45 m (300 by 150 feet) around the diversion box was cleaned up and the contaminated rabbit droppings and soil were taken to dry waste burial. Contaminated soil was removed from the excavation hole to the extent possible and buried. Clean soil was used to replace the removed soil and cover the remaining contaminated soil.

In August 2000, the radiologically posted area around the 241-TX-155 and 241-TX 152 Diversion Boxes was covered with a layer of gravel and posted with Bio-Barrier signs.

Potential Contaminants:

Radioactive: N/A

Non-Radioactive: Cs-137, Cs-134, Eu-55, Eu-54, and Sr-90

References:

All information from WIDS Summary Report unless otherwise noted.

Figure 1. ArcMap Image

Figure not available.

Figure 2. Site UPR-200-W-76 Location Map

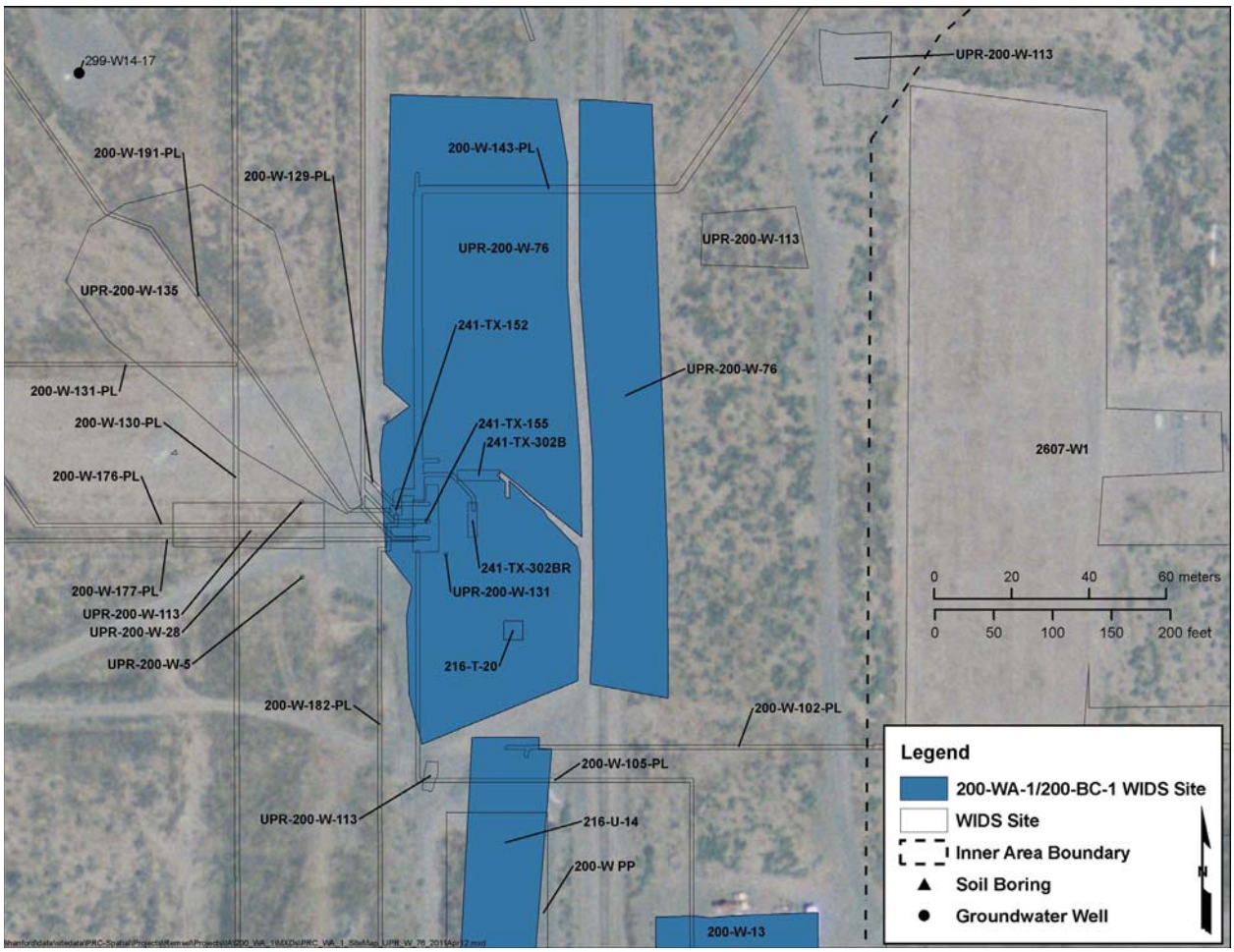
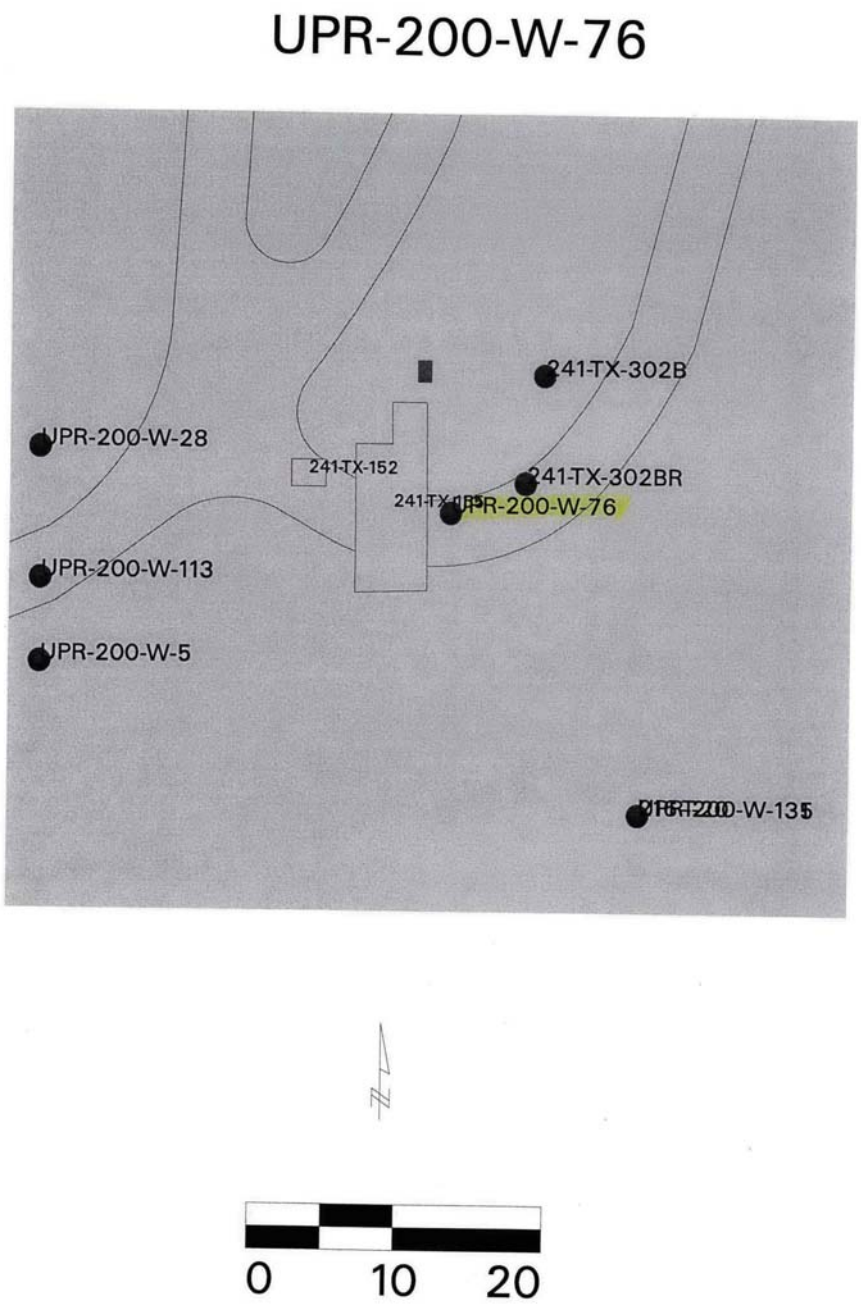


Figure 3. Site UPR-200-W-76 Location Map



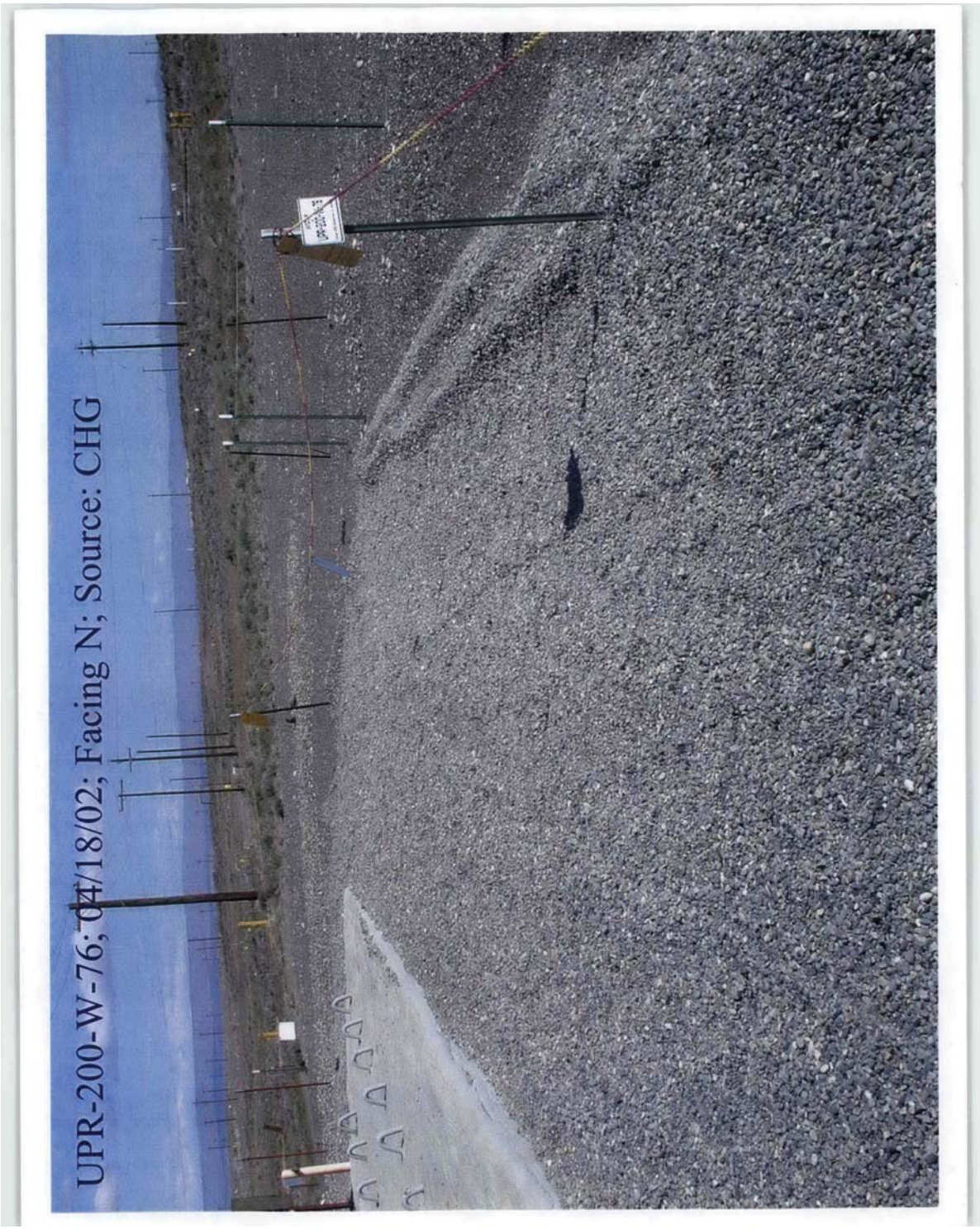


Figure 4. Site UPR-200-W-76 Photo

Site Description

Site ID: UPR-200-W-78
Site Type: Unplanned Release
Facility/Geographic Area: U-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UW-1
Service Dates: 1970
Volume/Mass Discharged: N/A

Waste Site Location and Physical Description: The release caused an area, located 36 m (118.11 ft.) south of the Uranium trioxide barrel storage area, to become contaminated (Figure 2. QMAP image). An operator was immediately dispatched with a bucket and shovel to pick up the contaminated dirt. No other contamination was detected.

Waste Site Coordinates:

E-567478.43749 N-134999.56252

Site Dimensions:

Site Length: N/A
Site Width: N/A
Site Area: 3.72 m^2 (40.0 ft^2)
Site Depth: N/A
Cover Thickness: N/A

Release Summary: On August 21, 1970, a radiation survey was conducted with a truck mounted road monitor. The equipment detected an area measuring approximately 3.72 m^2 (40 ft^2) contaminated with levels up to 20,000 counts/minute. It is assumed that some uranium powder spilled prior to March 1969, when the last pallets were moved from 224-U.

Related Site Structure(s): N/A

Site Posting: The site is no longer marked or posted.

Site Characterization Summary: With the exception of the radiological survey conducted immediately following the site discovery, no additional characterization information is available for this site.

Potential Contaminants:

Radioactive: Uranium trioxide powder (20,000 counts per minute)

Non-Radioactive: Not specified

References:

WIDS General Summary Report for site UPR-200-W-78
QMap
ArcMap

Figure 1. ArcMap Image

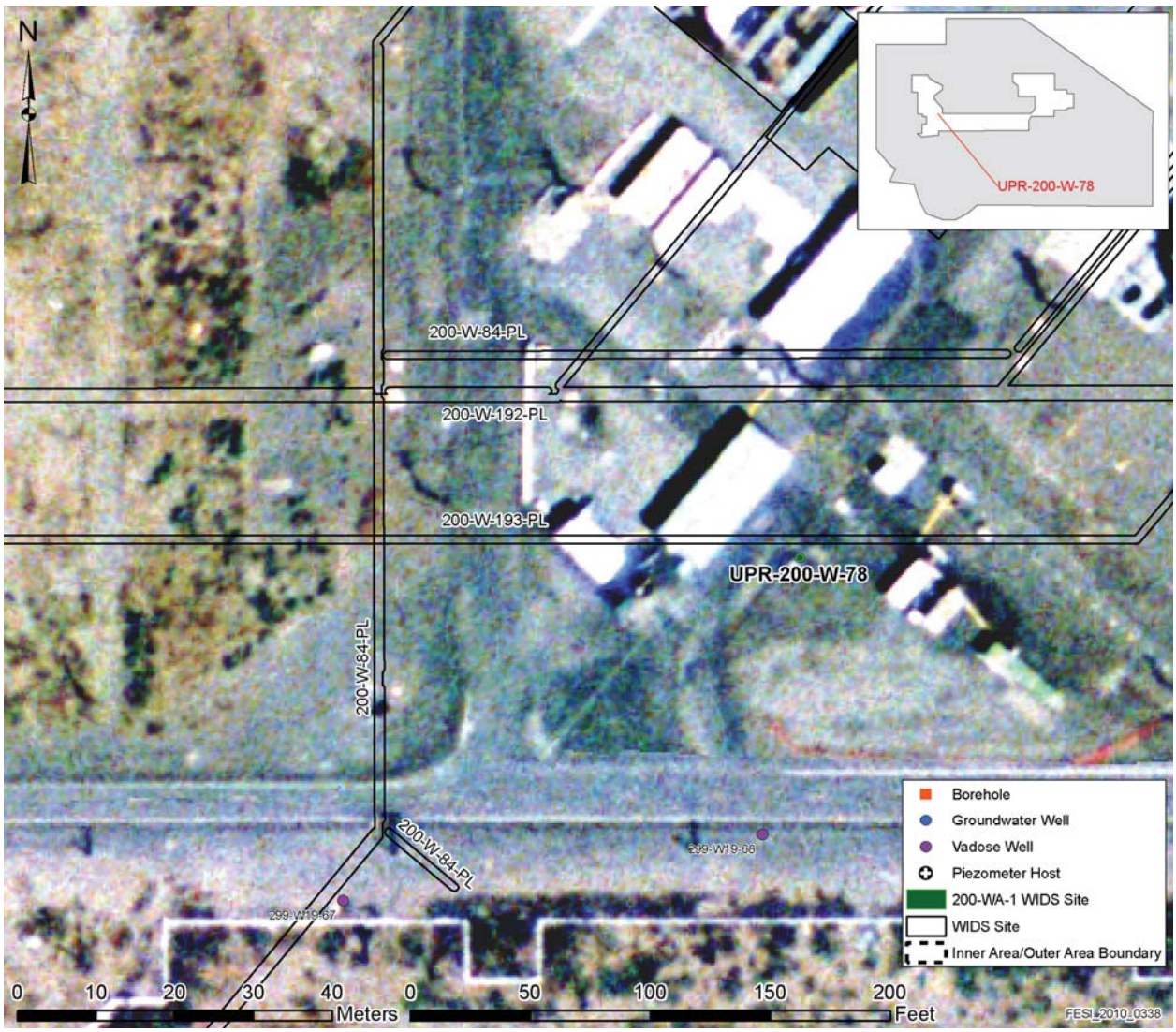


Figure 2. Site Location

Figure not available.

Site Description

Site ID: UPR-200-W-82, UN-200-W-82, Contamination Spread at 240-S-151
Site Type: Unplanned Release
Facility/Geographic Area: S-Plant Area
Current OU Assignment: 200-WA-1
Former OU Assignment: N/A
Service Dates: N/A
Volume/Mass Discharged: Unknown

Waste Site Location and Physical Description: The site is a contamination spread occurred in the soil at the north and east side of the 240-S-151 Diversion Box and the 240-S-302 Catch Tank, on the north side of the REDOX facility (202-S) (see Figure 2).

Waste Site Coordinates:

E-567376 (m) N-134038 (m)

Site Dimensions:

Site Length: 18.29 m (60.00 ft)
Site Width: 10.67 m (35.00 ft)
Site Area: 195.10 m^2 (2,100 ft^2)
Site Depth: N/A
Cover Thickness: N/A

Release Summary: A piece of equipment moved in for the 240-S-151 Diversion Box installation, was caught under the late snow cover. Moisture from the melting snow and rain penetrated the plastic wrap, and ran off toward the catch tank area spreading contamination over the areas of run-off. Traffic from daily routine surveillance of the catch tank liquid levels apparently tracked some contamination to the chain boundary and step-off area. The release consisted of beta/gamma particulates spread with readings up to 80,000 counts per minutes found outside the radiation zone.

Related Site Structure(s): The site is associated with the 240-S-151 Diversion Box and the 240-S-302 Catch Tank.

Site Posting: The 240-S-151 Diversion Box is posted with radiological warning signs. A WIDS sign has been placed at the approximate location of the release.

Site Characterization Summary: A radiation monitor survey done in January 1980 detected high levels of contamination ranging from 40,000 to 60,000 disintegration per minute inside the radiation zone. The maximum reading outside the radiation zone was 80, 000 counts per minute.

Due to the size of the contaminated area, manual clean up was impractical. In 1980, the area around the diversion box was covered with Fabro Film. Some specks beyond the radiation zone were removed and taken to a burial ground.

Potential Contaminants:

Radioactive: beta/gamma particulates

Non-Radioactive: N/A

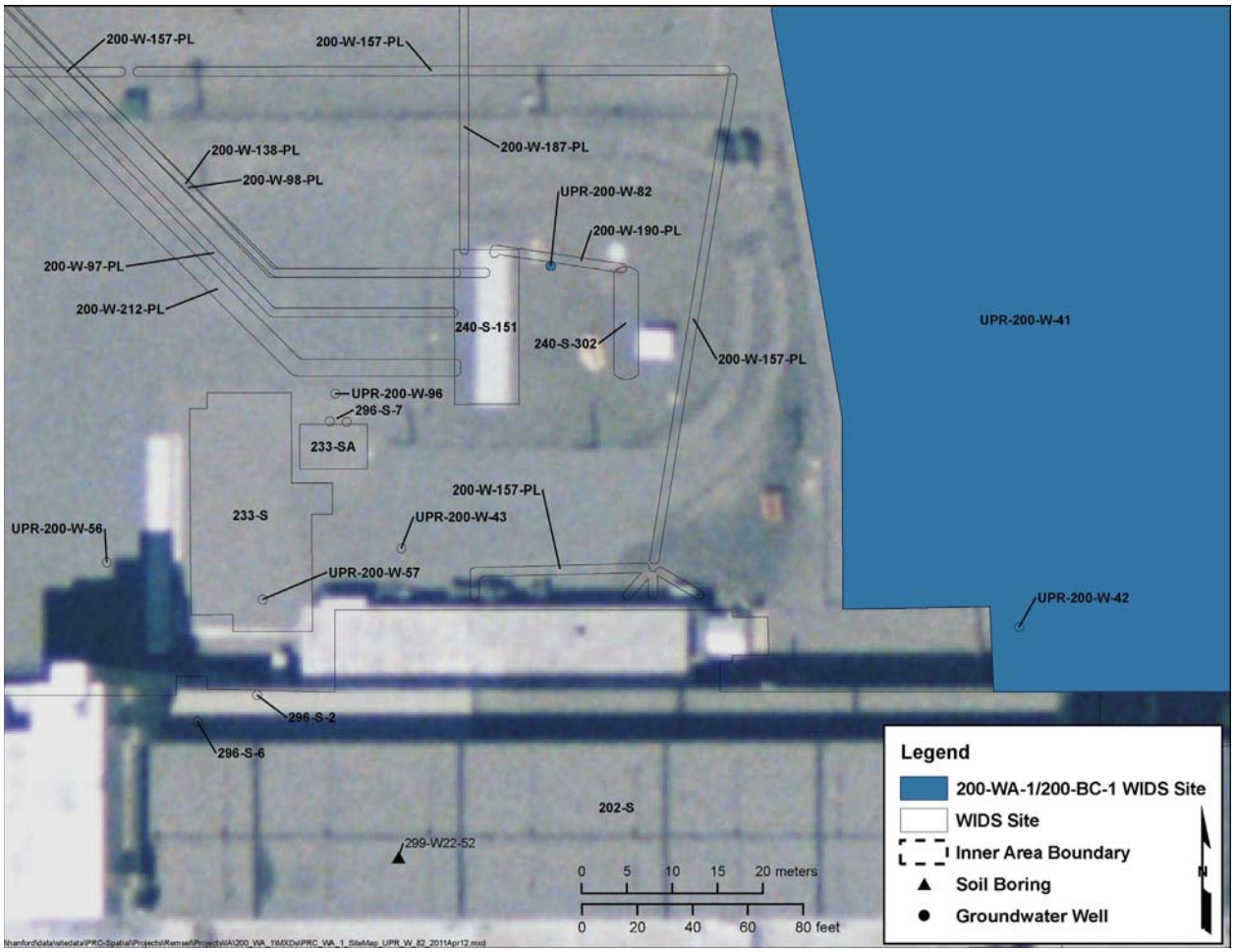
References:

All information from WIDS Summary Report unless otherwise noted.

Figure 1. ArcMap Image

Figure not available.

Figure 2. Site UPR-200-W-82 Location Map



Site Description

Site ID: UPR-200-W-99
Site Type: Unplanned Release
Facility/Geographic Area: 200 Inner Area West
Current OU Assignment: 200-WA-1
Former OU Assignment: 200-UR-1
Occurrence Date: September 21, 1966
Volume/Mass Discharged: Unspecified

Waste Site Location and Physical Description: The unplanned release occurred on the east side of Camden Ave., east of the 241-TX Tank Farm, extending approximately 69 m to 91 m (226.37ft to 298.55 ft) east of Camden Ave[1].

Waste Site Coordinates:

E-566911.97283 N-136176.40384

Site Dimensions:

Release Area Dimensions

Site Length: 228.6 m (750 ft) Site Width: 91 m (300 ft)
Site Area: 20,930 square m (225,000 square ft)

Stabilized Area Dimensions

Site Length: ~228 m (750 ft) Cover Thickness: Unspecified
Site Width: 44 m (144 ft) Site Area: 10,120 square m (108,000 square ft)

Release Summary: Two plumes of airborne contamination from the 241-TX-153 Diversion Box floated northeast and southeast. The releases contaminated the ground and road on both sides of Camden Avenue. The maximum contamination found around the diversion box was 700 millirads per hour and the airborne particles contained approximately 1 curie of strontium-90.

Related Site Structure(s): The unplanned release is associated with the 241-TX-153 Diversion Box and Camden Ave.

Site Posting: The unplanned release is marked with "Underground Radioactive Material" (URM) signs.

Site Characterization Summary: In 1966 the road contamination was covered with a new tar mat and the sides of the road were fixed with tar. In 1976, a road grader on the east side of Camden Ave. pushed the contamination into windrows. Test plots revealed the presence of a thin layer of strontium-90 particles. This area on the east side of Camden Ave. was stabilized in 1990 with clean soil and grass, surrounded with URM signs and maintained by Bechtel Hanford, Inc.

The area on the west side of Camden Ave., adjacent to the tank farm fence, was covered with gravel, but was re-contaminated by windblown particles from the 241-TX Tank Farm in 1993. In 2001, the area on the west side of Camden Ave. was no longer marked or posted.

Potential Contaminants:

Radioactive: Strontium-90

Non-Radioactive: Unspecified

References:

WIDS General Summary Report for site UPR-200-W-99
QMap
ArcMap
[1] Site Location Map Page 1

Figure 1. ArcMap Image

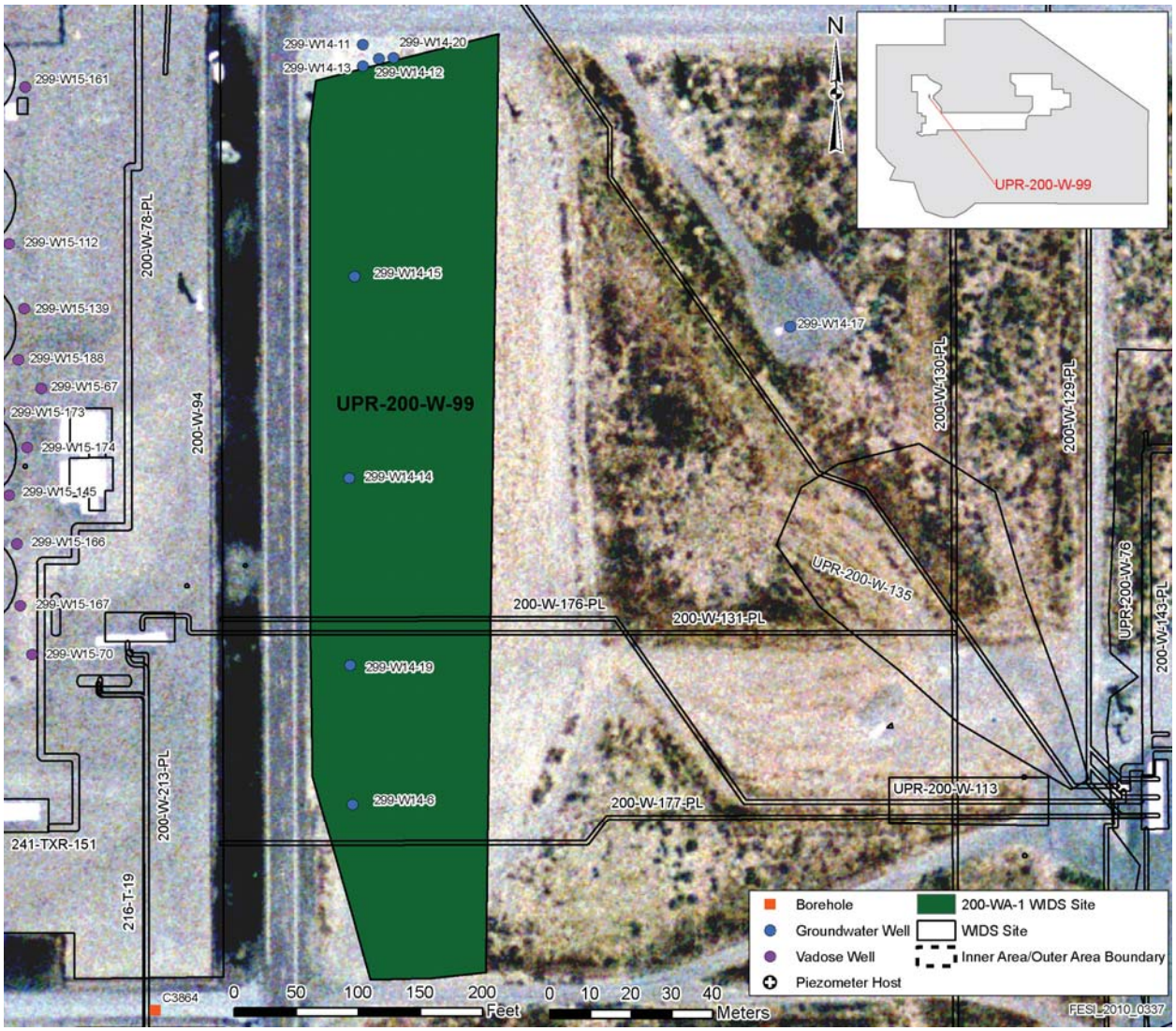
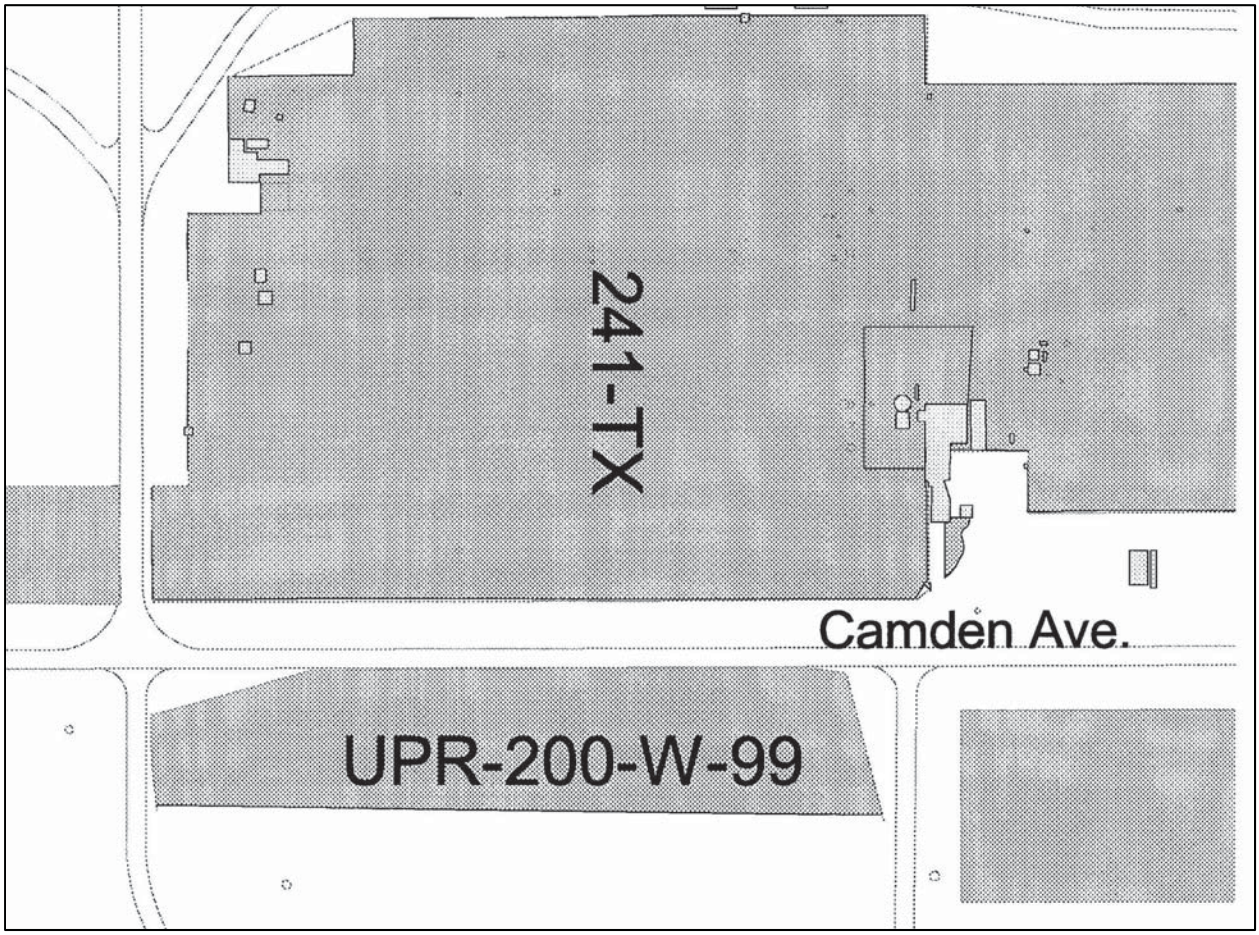



Figure 2. Site Location Map Page 1