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Mr. Paul T. Day
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U.S. Environmental Protection Agency
Region 10
712 Swift Boulevard, Suite 5
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Mr. Timothy L. Nord
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Olympia, Washington 98504-8711

Dear Messrs. Day and Nord:

REPORT ON THE EXCAVATION AND INVENTORY OF TRENCH 19N AT THE NONRADIOACTIVE DANGEROUS WASTE LANDFILL, HANFORD SITE

The enclosed report and Chemical Waste Inventory are being forwarded to the U.S. Environmental Protection Agency and the State of Washington Department of Ecology, in accordance with agreements made at the February 14, 1991, Unit Managers' Meeting.

If you have questions regarding these documents, please contact Ms. S. L. Trine of the U.S. Department of Energy, Richland Operations Office on (509) 376-6943, or Ms. C. J. Geier of the Westinghouse Hanford Company on (509) 376-2237.

Sincerely,

E A Bracken

E. A. Bracken, Director
Environmental Restoration Division
Richland Operations Office

ERD:SLT

R E Lerch

R. E. Lerch, Manager
Environmental Division
Westinghouse Hanford Company

Enclosure:
Excavation Report/Chemical Waste Inventory

cc w/o encl.:
D. L. Duncan, EPA
R. E. Lerch, WHC
P. Stasch, Ecology, w/encl.

REPORT ON THE EXCAVATION AND INVENTORY OF TRENCH 19N AT THE NONRADIOACTIVE DANGEROUS WASTE LANDFILL, HANFORD SITE

INTRODUCTION

The Nonradioactive Dangerous Waste Landfill (NRDWL) is an isolated, operationally closed, land disposal unit located near the geographic center of the Hanford Site in the 600 Area. The landfill received nonradioactive dangerous chemicals regulated under WAC 173-303 in six trenches from 1975 through May 1985. On November 8, 1985, one of the six chemical trenches (Figure 1), designated 19N, was excavated to retrieve several drums containing regulated dangerous waste.

The purpose of this paper is to document the November 8, 1985 Trench 19N excavation activity in response to an action item identified during the January 15, 1991 Unit Managers Meeting for the NRDWL. Specifically, this paper describes the excavation process and conditions encountered during the retrieval process, and reconciles pre- and post-excavation inventories. Information concerning the excavation process was acquired from interviews with Hanford Site personnel that were directly involved with the activity.

DESCRIPTION OF THE TRENCH 19N EXCAVATION ACTIVITY

Background Information

A 150-foot section of Trench 19N was opened in March 1984 to dispose of oxidizer chemicals. The trench was approximately 14 feet deep and 16 feet wide at the base. An access ramp on the south end of the trench allowed transfer vehicles to access the working face. An 8- to 12-inch layer of cobble/gravel was placed over the bottom of the trench to form a temporary roadbed. A representative cross section of the trench is shown in Figure 2.

Trench 19N received its first shipment of waste in April 1984 consisting of nonregulated empty containers. The first receipt of chemical waste occurred in June 1984. A total of 4 shipments of chemical waste where placed in Trench 19N, the last of which was received in May 1985. The trench also received 7 shipments of empty containers not regulated under WAC 173-303. Each shipment of waste was catalogued using a disposal request number. All containers disposed of in Trench 19N were covered by an approximately 10-foot thick operational cover consisting of local sand.

On November 8, 1985, Trench 19N was excavated to retrieve drums containing sodium nitrite which had been mistakenly disposed of in the trench. Sodium nitrite which is designated as an extremely hazardous waste was prohibited from being disposed of in the NRDWL. In the process of retrieving the sodium nitrite drums, all other waste containers that were disposed of in Trench 19N also were removed. Approximately 120 feet of available trench space had been filled prior to the Trench 19N excavation activity.

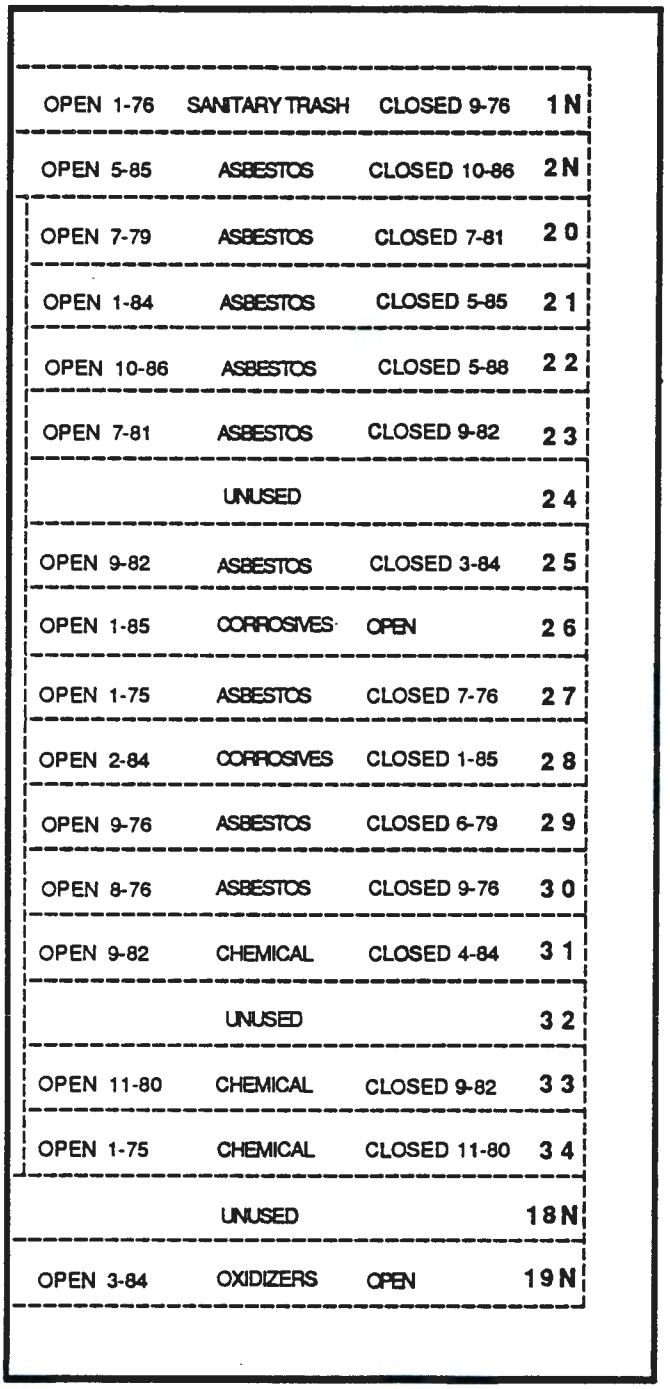

Figure 1. Nonradioactive Dangerous Waste Landfill Trench Plan.

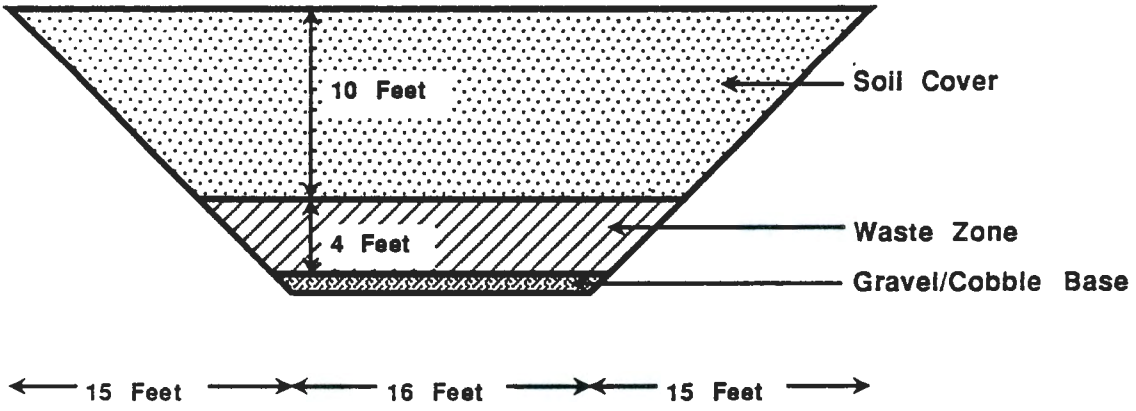

Figure 2. Representative Cross Section of a Nonradioactive Dangerous Waste Landfill Chemical Trench.

Excavation Methodology

The excavation of Trench 19N and retrieval of drums was performed by NRDWL landfill operating personnel including a work supervisor, a heavy equipment operator, and two laborers. Equipment used included a front end wheel loader and hand shovels. No written work plan was prepared.

The excavation activity began by scraping off a portion of the operational cover using a front wheel loader to decrease the amount of overburden. The depth of material removed in this manner was limited to a few feet to prevent damaging the underlying containers. Cover material that was removed was piled along the sides of the trench.

After the upper portion of the cover was removed, the front end loader was then used to locate the buried containers. Working in the bottom of the trench, the loader operator carefully exposed containers by driving the loader bucket into the base of the waste layer and then tilting or lifting the bucket. By following the coarse gravel/cobble layer (Figure 2), which defined the base of the waste layer, the operator was successful in positioning the bucket beneath the containers. Excavated soil was piled along the edges of the trench.

After a container was located with the front end loader, laborers would complete the excavation using hand shovels and place the container in the loader bucket. The container would then be transported out of the trench. Retrieved containers were segregated by shipment (i.e. disposal request number) and staged along the east side of the trench. The method of excavation was considered to be effective in finding and retrieving containers without damage.

The retrieval process started on the south side (open side) of the Trench 19N and progressed in manner opposite to the original disposal sequence. The activity took two days to complete at a cost of approximately $2,000. Thirty metal drums containing regulated waste, and numerous empty containers were retrieved. No leaking containers or evidence of soil contamination was observed. The metal drums containing regulated waste were found to be in good shape with no damage from the excavation process. Container labels; however, were often illegible, which added some uncertainty to the identification process. This was further complicated by the finding that a number of shipments, which were thought to have been placed in Trench 19N were actually not present. The matching of containers to a particular disposal request number was often based on the arrangement in which they were found in the trench.

On November 11, 1985 containers with regulated waste were either loaded onto a flat-bed for transportation to the 2727S Nonradioactive Dangerous Waste Storage Facility or returned back to Trench 19N and covered. No attempt was made to open retrieved containers at the NRDWL to verify their contents. No waste or soil sampling was performed. Empty containers which were not regulated under WAC 173-303 were transferred to the adjacent Solid Waste Landfill for disposal as sanitary waste.

WASTE DESCRIPTION AND INVENTORY

Three distinct inventory lists for Trench 19N have been provided in RCRA regulatory documents. The first inventory list was provided in Appendix D-1 of the 1985 Part B Permit Application for the Nonradioactive Dangerous Landfill and Storage Facility. In August 1990, a closure and postclosure plan was prepared for the NRDWL (DOE/RL-90-17) that contained two other lists including a revision of 1985 inventory (Appendix 4C) and a post-excavation inventory (Appendix 4A). The following discussion explains the differences between these three inventory lists.

Appendix D-1 contained in the 1985 Part B permit Application was compiled before November 1985, and did not take into account the findings and results of the November 8, 1985 excavation activity. During the excavation of Trench 19N, several shipments that were thought to have been placed in Trench 19N were not found. It was deduced that the missing containers had actually been disposed of in another NRDWL trench (28 or 26) which happened to be open at the same time as Trench 19N. Appendix D-1 was revised accordingly and issued as an appendix (4C) in the closure/postclosure plan. Several discrepancies with the original records were also corrected in Appendix 4C. The inventory for Trench 19N was then revised a second time (Appendix 4A) to reflect the containers that where removed during the excavation activity and transferred elsewhere (e.g. 2727S Facility).

Table 1 summarizes the differences in the three inventory lists, and provides specific comments governing why changes were made to the inventory. In addition, Table 1 identifies several remaining errors. These errors have been corrected in the attached inventory lists for Trench 19N and 28. Effected inventory lists in the NRDWL Closure/Postclosure Plan will also be revised accordingly in the next revision of the document.

TABLE 1. CHEMICAL WASTE INVENTORIES FOR NONRADIOACTIVE DANGEROUS WASTE LANDFILL TRENCH 19N

1985 Part B Permit Application Inventory (Appendix D-1)			Disposal Request #	Comments/Disposition	1990 Closure/PostClosure Plan (DOE/RL-90-17)	
Date	Quantity	Chemical			Pre-Excavation Inventory (Appendix 4C)	Post-Excavation Inventory (Appendix 4A)
04-17-84	10 gal 20 gal 55 gal 55 gal 55 gal 30 gal 5 gal 5 gal 5 gal	Ferric nitrate Lithium nitrate Ferric phosphate Neodymium nitrate Aluminum nitrate Rare earth nitrate Magnesium nitrate Kesel Manganese nitrate	5-17	•Original record indicates that all containers were empty •Empty containers were transferred to SWL	•Deleted	•Deleted
06-13-84	2 lb 20 lb	Sodium nitrate Sodium nitrate	9-33	•Original record indicates that the total quantity should read 20 lbs not 22 lbs •Returned to Trench 19N following excavation	•Included	•Included
07-05-84	100 lb 25 lb 13 gal 225 lb	Versene EDTA Thiourea Ethylene glycol Ammonium persulfate	9-41	•Not found during excavation of Trench 19N •Assumed to be disposed of in corrosive Trench 28	•Deleted	•Deleted, but not added to Trench 28 inventory
07-19-84	18 drums 10 drums	Sodium nitrite Nickel, hydrated	6-9	•18 drums sodium nitrite transferred to 2727S •1 drum nickel transferred to 2727S; 9 other drums nickel were not found during excavation of Trench 19N •Assumed that 9 drums nickel are disposed of in corrosive Trench 28	•Included; however quantity is incorrect	•Deleted and added to Trench 28 inventory, but quantity is incorrect
09-05-84	400 lb	Metal alloy - 40% Al and 60% Ca	10-9	•Not found during excavation of Trench 19N •Assumed to be disposed of in corrosive Trench 28	•Deleted	•Deleted, but not added to Trench 28 inventory
09-24-84	10 gal	Dioctyl sebacate	10-43	•Nonregulated Waste •Not found during excavation of Trench 19N	•Deleted	•Deleted
11-09-84	75 gal	Paint related material	11-39B	•Original record indicates that waste was actually placed in corrosive Trench 28	•Deleted	•Deleted, but not added to Trench 28 inventory

TABLE 1. CHEMICAL WASTE INVENTORIES FOR NONRADIOACTIVE DANGEROUS WASTE LANDFILL TRENCH 19N

1985 Part B Permit Application Inventory (Appendix D-1)			Disposal Request #	Comments/Disposition	1990 Closure/PostClosure Plan (DOE/RL-90-17)	
Date	Quantity	Chemical			Pre-Excavation Inventory (Appendix 4C)	Post-Excavation Inventory (Appendix 4A)
12-05-84	1 lb 1 lb 1 lb 5 lb 1 pt 1 pt 1 qt 1 gal 1 lb 1 lb 1 qt 2 qt	Potassium permanganate Sodium nitrate Sodium chromate Sodium hydroxide Ethyl acetate Methanol Isopropanol Naphtha Ammonium nitrate Ammonium chloride Ammonium hydroxide Ammonium oxalate	12-158	•Returned to Trench 19N following excavation	•Included	•Included; however several additional chemicals were mistakenly added
12-20-84	69 mL 230 mL	Refill CQC for Fyrite Oxygen Indicator Methanol	10-23	•Original record indicates that waste was actually placed in corrosive Trench 28	•Deleted	•Deleted, but not added to Trench 28 inventory
01-11-85	13 drums	Salt cake	5-31	•Not found during excavation of Trench 19N •Assumed to be disposed of in corrosive Trench 26; however, corrosive Trench 28 may have been used, because it was also open during this period	•Included, but should have been deleted	•Deleted and added to Trench 26 inventory
05-14-85	3 drums 1 drum	Calcium nitrate Sodium nitrate	7-23	•Returned to Trench 19N following excavation	•Included	•Included

ATTACHMENT 1

REVISED INVENTORY LISTS FOR TRENCH 19N AND 28

APPENDIX 4A
CHEMICAL WASTE INVENTORY FOR THE NONRADIOACTIVE DANGEROUS WASTE LANDFILL

Trench #19N

Date	Quantity	Chemical
11-08-85	3 drums, 55 gal	Waste calcium nitrate
11-11-85	1 drum, 55 gal	Waste sodium nitrate
	~~22~~ 20 lb	Sodium nitrate
	1 pt	Ethyl acetate
	~~8 pt~~	~~Toluene~~
	~~1 pt~~	~~Xylene~~
	~~3~~ 1 pt	Methyl alcohol
	~~5 pt~~	~~Benzene~~
	~~2~~ 1 qt	Isopropanol
	1 lb	Potassium permanganate
	1 lb	Ammonium nitrate
	~~3~~ 1 lb	Sodium nitrate
	1 lb	Ammonium chloride
	1 lb	Sodium chromate
	~~1 qt~~	~~1 1 1 Trichloroethane~~
	~~2~~ 1 qt	Ammonium hydroxide
	~~1 pt~~	~~37% Formaldehyde solution~~
	5 lb	Sodium hydroxide, dry solid
	1 gal	Naphtha
	2 qt	Ammonium oxalate (TURCO 4521*)

APPENDIX 4A
CHEMICAL WASTE INVENTORY FOR THE NONRADIOACTIVE DANGEROUS WASTE LANDFILL

Trench #28

Date	Quantity	Chemical
02-03-84	6 lb	Sodium hydrogen sulfide
	1 lb	Sodium chromate
	1 lb	Sodium bichromate
	0.5 lb	Potassium chromate
	10 oz	1-Ethylquinelinium iodide
	1 lb	Sodium metabisulfite
	1 lb	Ferrous sulfate
	0.5 lb	Nickel chloride
	1 kg	Calgon*
	1 lb	Gelatine powder
	1 pt	Flexible collodion
	1 L	Polyelectrolytes
	1 lb	Ammonium sulfate
	1 lb	Aluminum oxide
	32 oz	Glycenyl triacetate
	800 g	Weldon 28 component C
	32 oz	Ammonium sulfide
	250 mL	Castor oil
	1 pt	Photo-flo 200
	100 g	Creosote
02-09-84	110 gal	Anhydrous borax
	255 gal	Sodium nitrate
	170 gal	Boric acid
	240 gal	Sodium nitrite
	145 gal	Sodium nitrite, borax, frit, sand, gravel
	22 gal	Boric acid, frit, soda ash, silica, and warehouse sweepings
	120 gal	Boric acid, anhydrous borax, brown sand
	175 gal	Boric acid, borax, potassium nitrate
	165 gal	Boric acid, sand, fine frit, borax, sodium nitrate
	220 gal	Boric acid, frit, borax, sodium nitrate
	195 gal	Borax, sand, frit, empty chemical bags
	55 gal	Low sodium nitrate sludge
	55 gal	Normal sodium nitrate sludge
	275 gal	Sodium carbonate sludge spiked
02-22-84	18 gal	Ammonium hydroxide
03-16-84	200 mL	Butyl alcohol
	1 pt	2-Propanol

APPENDIX 4A
CHEMICAL WASTE INVENTORY FOR THE NONRADIOACTIVE DANGEROUS WASTE LANDFILL

Trench #28

Date	Quantity	Chemical
03-16-84 (cont)	0.5 pt	Butyl ether
	1 L	Amyl alcohol
	0.5 kg	n-Octylalcohol
	0.5 pt	Normal paraffin hydrocarbon
	1,000 mL	Plexiglass* cement
	1 pt	Iodobenzene
	2/3 pt	Combustible liquid, n.o.s.
	0.5 L	Phosphenylchloride, dichlorophenyl phosphine
	500 mL	Indene
	1/8 pt	Diazald
	1 L	Tris (hydroxymethyl) amino-methane
	1 pt	Hypophosphorus acid
	250 g	Antimonypentachloride
	1 L	Bromine
	1 pt	Hydriodic acid
	1 pt	Dinoylnapthalenesulfonic acid
	450 g	Benzoyl peroxide
	1 L	2,2-$A_2$0-bis-2-Methyl propionitrile
	315 kg	Ceric oxide
	54 ft^3	Cerous oxalate
	1 pt	Butyl ether
	11 qt	Sulfurous acid
	250 lb	Magnesium nitrate
	100 lb	Bismuth nitrate
	75 lb	Sodium nitrate
	950 lb	Sodium nitrite
	75 lb	Disodium phosphate
	96 lb	Cesium carbonate
	25 lb	Soda ash
	5 gal	Kaowool* cement
	100 lb	Activated aluminum
	30 lb	Sodium fluoride
05-01-84	2 gal	Urethane component A
	1 pt	Urethane component B
	2 gal	Concentrated chemical A/B
05-23-84	20 gal	Waste corrosive liquid, n.o.s. (Picrolonic acid, formic acid, and vanadous formate all absorbed)
06-13-84	10 lb	Sodium hydroxide

APPENDIX 4A
CHEMICAL WASTE INVENTORY FOR THE NONRADIOACTIVE DANGEROUS WASTE LANDFILL

Trench #28

Date	Quantity	Chemical
06-14-84	17 gal	Ammonium hydroxide
06-20-84	0.5 kg	Zirconium hydride
06-22-84	1,140 gal	Lanthanum nitrate
	825 gal	Trichloroethane
07-05-84	100 lb	Versene EDTA
	25 lb	Thiourea
	13 gal	Ethylene glycol
	225 lb	Ammonium persulfate
07-19-84	~~90 lb~~ 9 drums, 55 gal	Nickel, hydrated
08-23-84	1 pt	Ammonium sulfide
	1 pt	Ethylacetate
	0.5 gal	Hexone
	6 pt	Butyl alcohol
	1 qt	Hexone
	1 qt	Collodion
	1 pt	Amyl acetate
	1 pt	Ethyl acetate
	3 kg	Methyl ethyl ketone
	1 pt	Hexone
	1 qt	Tetrahydrofuran
	1 pt	Perchloric acid (70%)
	1 pt	Hydrogen peroxide (30%)
	5 gal	Dichloromethane
	1 qt	Bis(2-ethylhexyl)2-hexylphosphonate
	1 qt	Mono-2-ethyl hexylacid orthophosphate
	1 pt	Glycerine
	1 kg	Octyl alcohol
	5 L	Isopentyl alcohol
	1 qt	Acetyl acetone
	1 gal	Dimethyl formamide
	1 L	Hexanol
	5 lb	Lactic acid
	1 qt	Diisopropyl ketone
	1 gal	Sulfuric acid (93%)
09-05-84	400 lb	Metal alloy - 40% Al and 60% Ca

APPENDIX 4A
CHEMICAL WASTE INVENTORY FOR THE NONRADIOACTIVE DANGEROUS WASTE LANDFILL

Trench #28

Date	Quantity	Chemical
11-09-84	75 gal	Paint related material
12-20-84	69 mL 230 mL	Refill for CQC for fyrite oxygen indicator Methanol
01-11-85	520 gal	Dry salt cake: $NaNO_3$, $NaNO_2$, NaOH

APPENDIX 4C

PRE-NOVEMBER 1985 CHEMICAL WASTE INVENTORY FOR THE NONRADIOACTIVE DANGEROUS WASTE LANDFILL

Trench #19N

Date	Quantity	Chemical
06-13-84	~~2 lb~~	~~Sodium nitrate~~
	20 lb	Sodium nitrate
07-19-84	~~990 gal~~ 18 drums, 55 gal	Sodium nitrite
	~~550 gal~~ 1 drum, 55 gal	Nickel, hydrated
12-05-84	1 lb	Potassium permanganate
	1 lb	Sodium nitrate
	1 lb	Sodium chromate
	5 lb	Sodium hydroxide
	1 pt	Ethyl acetate
	1 pt	Methanol
	1 qt	Isopropanol
	1 gal	Naphtha
	1 lb	Ammonium nitrate
	1 lb	Ammonium chloride
	1 qt	Ammonium hydroxide
	2 qt	Ammonium oxalate
~~01-11-85~~	~~13 drums, 55 gal~~	~~Salt cake~~
05-14-85	3 drums, 55 gal	Waste calcium nitrate
	1 drum, 55 gal	Waste sodium nitrate

CORRESPONDENCE DISTRIBUTION COVERSHEET

Author	Addressee	Correspondence No.
W. G. Cox, 6-1978 D. J. Hoff, 6-2606	P. T. Day, EPA T. L. Nord, Ecology	Incoming: 9101752 Reference #9005000 R3

Subject: REPORT ON THE EXCAVATION AND INVENTORY OF TRENCH 19N AT THE NONRADIOACTIVE DANGEROUS WASTE LANDFILL, HANFORD SITE

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Attachment same as
Letter Number 9005000 R3