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STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

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May 6, 1993

93202922

Mr. Steve Wisness
U.S. Department of Energy, MSIN A5-15
P.O. Box 550
Richland, WA 99352

Dear Mr. Wisness:

Re: Request of Variance from WAC 173-160 in Construction of Approximately 80 Cone Penetrometer Boreholes in Support of the 200 West Carbon Tetrachloride Expedited Response Action (ERA) and 200 UP-2 Projects

Roger Stanley has asked that I answer the letter logged as 93-ERB-145. U.S. Department of Energy, Richland Field Office (RL) has requested variance from WAC 173-160 to construct approximately 80 cone penetrometer (CPT) vadose zone boreholes during fiscal years 1993 and 1994. These boreholes will support the 200 West Carbon Tetrachloride ERA as extraction/monitoring points and for characterization for the 200 UP-2 workplan. The 1.75 in. ID carbon steel CPT rods will penetrate to depths of approximately 150 feet and will be left in the ground for four years. The water table in the area of construction is at approximately 210 feet below land surface. Because the casing (rods) will remain in place for a period of four years, the CPT boreholes will be considered to be cased geotechnical test borings. Ordinarily, a cased geotechnical test boring would meet all the WAC 173-160 general and water resource protection well construction/abandonment requirements. However, since the boreholes do not penetrate to ground water, certain requirements can be waived.

The planned construction varies from WAC 173-160 requirements in a number of instances, e.g., sealing of the annular space as in the general requirements of WAC 173-160-075 and WAC 173-160-540 and -550 "Design and Construction" (Resource Protection Wells). It is also anticipated that well abandonment may vary from requirements in WAC 173-160-560, "Abandonment of Resource Protection Wells". RL has requested variance from WAC 173-160-325, "Special Standards for Driven or Jetted Wells" and from parts of WAC 173-160-055, "Well Construction Notification (Start Card)." WAC 173-160-325 is appropriate to CPT type work, but it is specific to water supply wells. Generally, those requirements that apply to "Water Supply Wells" will not necessarily apply to the vadose zone boreholes that are to be drilled for vapor extraction. WAC 173-160-055 is a section of the generic requirements and is applicable to CPT construction. The start cards are required for this work and should be sent to the Ecology Kennewick office in advance of construction, but because the hole is completed in the vadose zone and not below the water table, there is no requirement for including a Washington State-licensed driller to operate the cone penetrometer.

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The most significant construction discrepancies that must be considered for variance are those that pertain to the annular and surface seals. Because the construction of the CPT boreholes does not provide for a borehole diameter at least 4-inch greater than the well casing, this will not meet the requirements of either WAC 173-160-075, "Design and Construction -Sealing of Casing- General" nor of WAC 173-160-540, -550 "Design and Construction" (with a reference to Figure 7). The nature of CPT construction precludes the borehole diameter being at least 4-inches greater than the well casing (rod). RL has proposed that once the injection/extraction boreholes are installed a two feet deep by six inch hole be hand excavated around each rod. The excavated hole will then be filled with a two percent bentonite slurry in order to "safe guard the ground water and remove the threat of cross-contamination." Since the CPT boreholes do not penetrate to ground water, the two foot excavations and bentonite slurry should provide adequate protection from the influx of surface contamination. Posts and pads should be constructed as provided by the surface protective measures in WAC 173-160-510, "Design and Construction- Surface Protective Measures".

The proposed method of construction should minimize the potential for generating waste, reduce the risk of exposure to site workers, and protect the ground water from surface contamination moving along the CPT rods. Based on the information provided, the requested variances are granted with certain stipulations. If construction methods are changed or the CPT boreholes are pushed to ground water, further variances would be required. Please keep us informed concerning the completion of these boreholes by providing new information as it is available. If you have any questions, please call me at (206) 438-7556.

Sincerely,

Charles S. Cline

Charles S. Cline
Hydrogeologist
Nuclear and Mixed Waste Management Program

CC:lj

Enclosure

cc: Julie K. Erickson, DOE-RL
Paul Pak, DOE-RL
June M. Hennig, DOE-RL
Bruce R. Cassem, WHC
Don Moak, WHC
Doug Sherwood, EPA
Rick D. Wojtasek, WHC

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STATE OF WASHINGTON DEPARTMENT OF ECOLOGY
VARIANCE REQUEST INFORMATION

1.	Date:	March 11, 1993
2.	Cognizant Engineer: Phone: Organization:	M. J. Galgoul, WHC (509) 376-2038 Environmental Division
	Cognizant Engineer: Phone: Organization:	M. C. Hagood, WHC (509) 376-9664 Environmental Division
3.	RL Contact: Address: Phone:	P. M. Pak MSIN A5-19 (509) 376-4798
4.	Operators Name: Address: Phone:	TBD by contractor Applied Research Associates, Inc. 4300 San Mateo Blvd., NE, Suite A-220 Albuquerque, New Mexico 87110 (505) 883-3636
5.	Project Name: Location: Purpose:	200 West Carbon Tetrachloride, 200-UP-2 200 West Area Site Characterization
6.	Reason for Variance:	See Attached Letter
7.	Regulatory Oversight: Contact: Phone:	State of Washington Department of Ecology C. S. Cline (206) 438-7756
8.	Number of Wells:	Approximately 80
9.	Estimated Well Life:	Four years
10.	Site Map:	See Exhibit 1
11.	Ground Water Data:	NA (Vadose Zone)
12.	Ground Water Depth:	210 Feet
13.	Proposed Well Const.:	See Exhibit 2
14.	Placement of Materials:	Bentonite crumbles will be poured in from the surface after probe placement.
15.	Soil, Geologic Logs:	See Exhibit 3

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16. Proposed Abandonment Procedure: Abandonment will be completed per WAC 173-160 requirements.

17. Additional Information: Exhibit 1; Site Map
Exhibit 2; Proposed Construction
Exhibit 3; Geologic Logs

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Exhibit 1

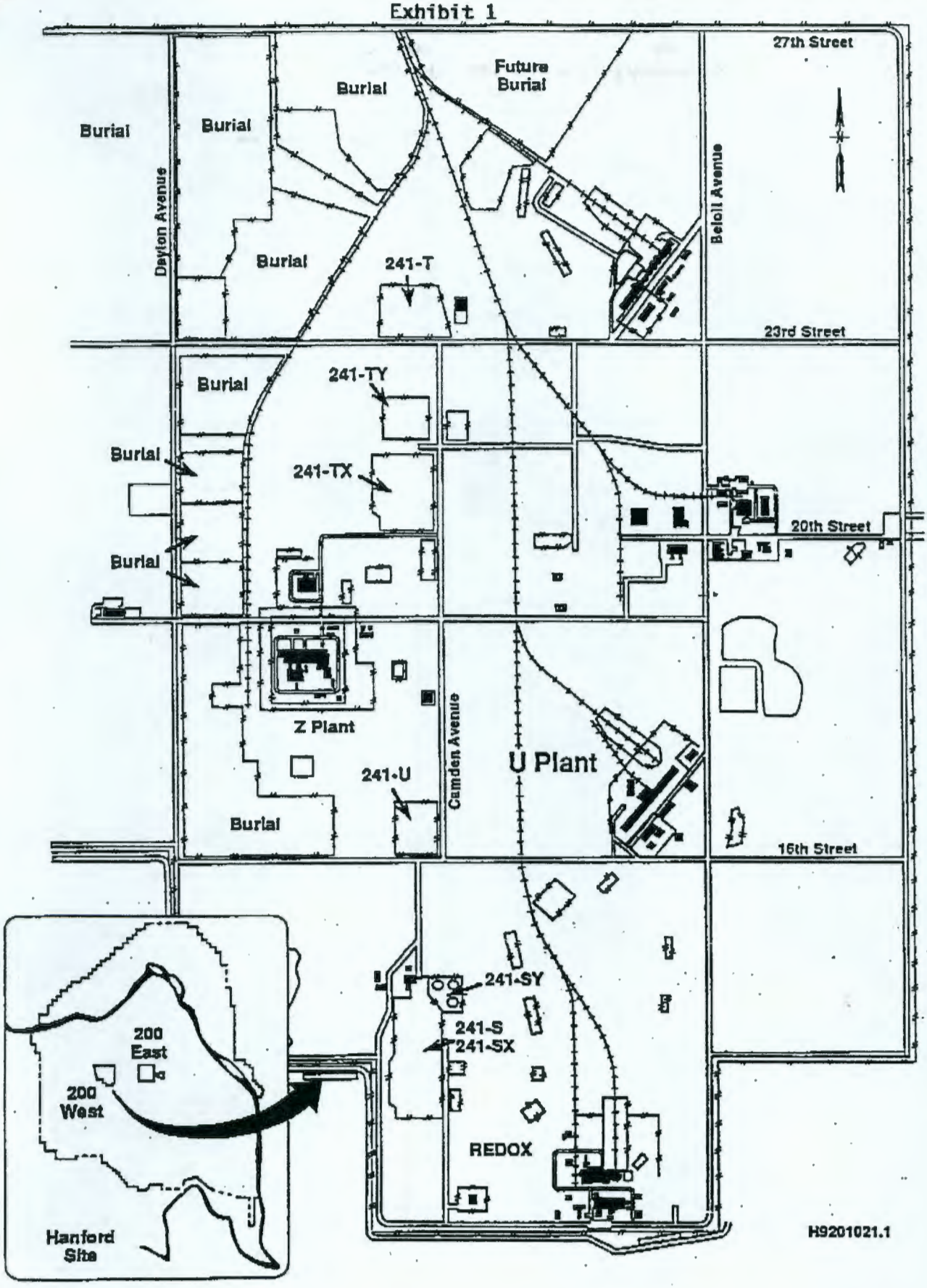

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Exhibit 2

PROPOSED CPT EXTRACTION/INJECTION WELL DESIGN

Proposed Drilling Method: CPT System	Sample Method: Vapor extraction	WELL NUMBER: TBD	TEMPORARY WELL NO: TBD
Drilling Fluid To Be Used: None	Allowable Additives: NA	Hanford Coordinates: N/S: Hanford Site 200W Area	E/W: 200W Area
Driller's Name: TBD	WA State Lic Nr: NA	State Coordinates: N: TBD	E: TBD
Drilling Company: TBD	Company Location: TBD	Start Card #: TBD	T___ R___ S___
Proposed Start Date: TBD	Proposed Date Complete: TBD	Elevation Ground surface: TBD	

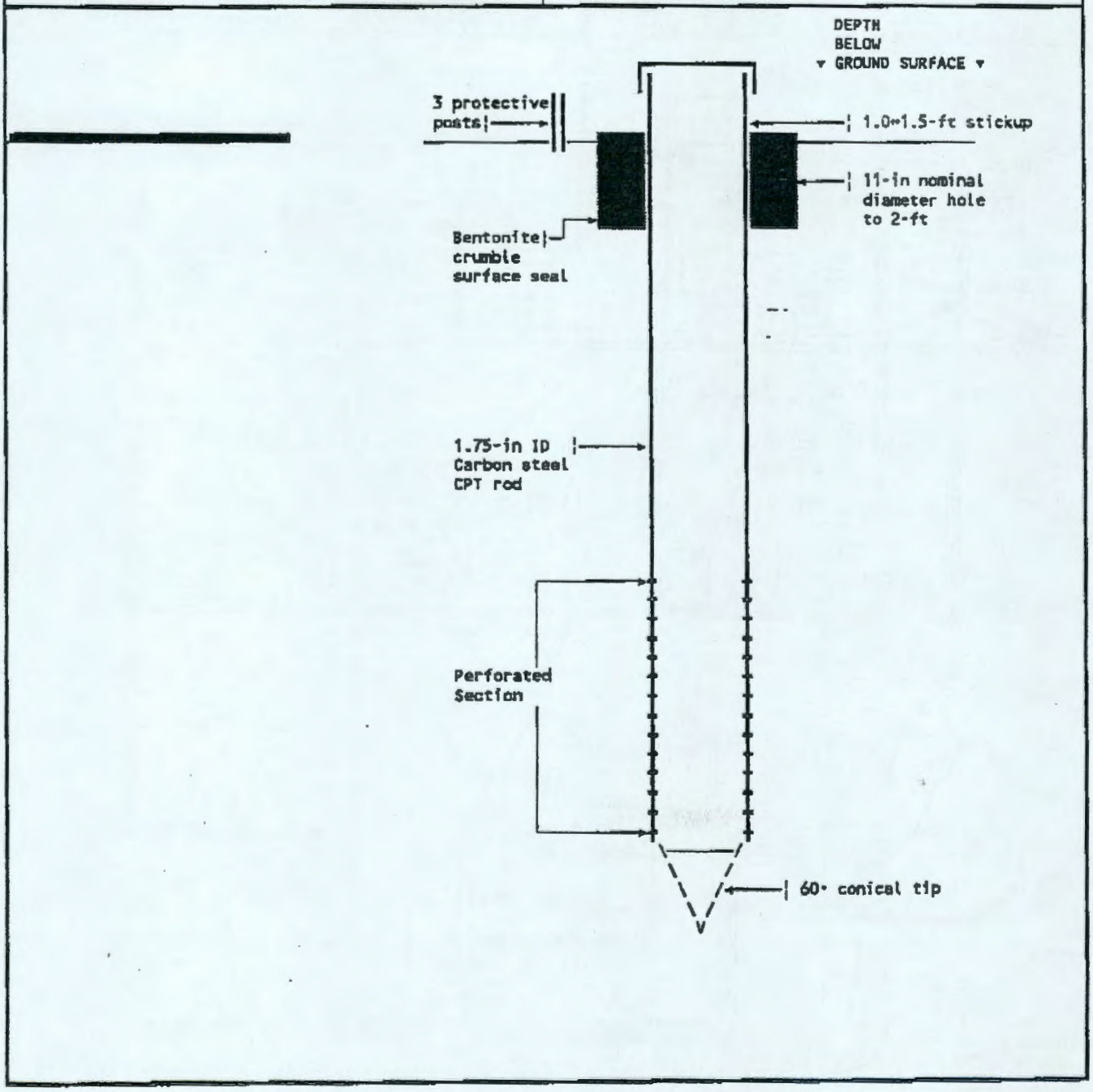

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Exhibit 3

WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool
Drilling Fluid Used: Not documented
Driller's Name: Hatch
Drilling Company: Hatch Drilling Co
Date Started: 05Aug69

Sample Drive barrel Method: Hard tool
Additives Used: Not documented
WA State Lic Nr: Not documented
Company Location: Pasco, WA
Date Complete: 21Aug69

WELL NUMBER: 299-W18-86
TEMPORARY WELL NO:
Hanford Coordinates: N/S N 39,106 E/W W 76,742
State Coordinates: N 444,211 E 2,218,483
Start Card #: Not documented T___ R___ S___
Elevation Ground surface (ft): Not documented

Depth to water: Not applicable

GENERALIZED STRATIGRAPHY — Driller's Log

0-5: Coarse SAND & SILT
5-15: SAND & SILT, moist
15-25: SAND & GRAVEL to 2 in
25-41: SILT & SAND, coarse
41-50: SAND & GRAVEL to 5 in
50-60: Coarse SAND & 2 in GRAVEL
60-105: SAND & SILT
105-110: SAND & SILT, GRAVEL
110-135; SAND & SILT, GRAVEL to 3-4 in
135-140: SAND & SILT, small GRAVEL
140-150: Soft, brown CLAY
150- : Brown CLAY, BASALT chunks (Possible BASALT BOULDER)

DRILLER'S NOTES:
- Odor at 44 ft
- Odor real strong all day (43-54 ft)
- Odor from 54-63 ft
- Strong odor again at 80 to 86 ft, slight odor at 100 ft
- Odor strong 111-116 ft
- Odor real strong all day (116-130 ft)
- Faint odor all day (130-149 ft)
- Unusual odor on completion (150 ft)

Elevation of reference point: (top of casing) [683.49 ft]
Height of reference point above ground surface [~ 3 ft]
Depth of surface seal [ND]
Type of surface seal: None documented
I.D. of surface casing (If present) [ND]
I.D. of riser pipe: [6-in]
Type of riser pipe: Carbon steel
Diameter of borehole: [7-in nom]
Type of filler: Not documented
Elevation/depth top of seal
Type of seal: Not documented
No perforations documented:
Depth bottom of casing
Depth bottom of borehole: [150 ft]

Drawing By: RKL/2#W18#86.ASB Date: 05Dec90
Reference:

9313020.0697

Exhibit 3

WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool
Drilling Fluid Used: Not documented
Driller's Name: Bigham
Drilling Company: Hatch Drilling Co
Date Started: 22Feb72

Sample Method: Drive barrel
Additives Used: Not documented
WA State Lic Nr: Not documented
Company Location: Pasco, WA
Date Complete: 24Feb72

WELL NUMBER: 299-W18-97
TEMPORARY WELL NO:
Hanford Coordinates: N/S N 38,745 E/W W 76,790
State Coordinates: N 443,850 E 2,218,436
Start Card #: Not documented T___ R___ S___
Elevation Ground surface (ft): Not documented

Depth to water: Not applicable

GENERALIZED STRATIGRAPHY — Driller's Log

0-5: Not documented
5-9: Med SAND
9-25: Very coarse SAND, GRAVEL
26-34: Very coarse SAND (wet)
34-50: SAND-GRAVEL, some COBBLES
50-55: SAND & GRAVEL
55-57: Med SAND
57-60: Fine SAND & SILT
60-72: Med SAND (dry)
72-85: Fine SAND, some SILT (dry)

DRILLER'S NOTE:
- (24Feb72)
Very little moisture in this well
No odors

Elevation of reference point: (top of casing) [665.00 ft]
Height of reference point above ground surface [~ 3 ft]
Depth of surface seal [ND]
Type of surface seal: None documented
I.D. of surface casing (If present) [ND]
I.D. of riser pipe: [6-in]
Type of riser pipe: Carbon steel
Diameter of borehole: [7-in nom]
Type of filler: Not documented
Elevation/depth top of seal
Type of seal: Not documented
No perforations documented:
Depth bottom of casing
Depth bottom of borehole: [85 ft]

Drawing By: RKL/2#W18#97.ASB Date: 06Dec90
Reference:

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Exhibit 3

WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool
Drilling Fluid Used: None
Driller's Name: Baker
Drilling Company: Not documented
Date Started: 29Mar77

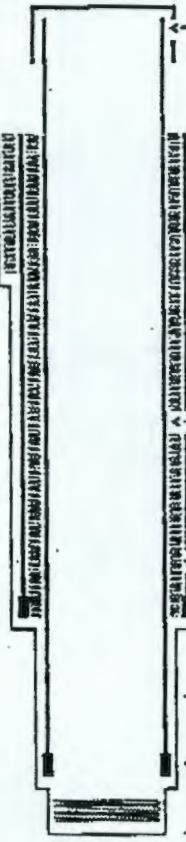
Sample Split and Method: Drive barrel
Additives Used: Not documented
WA State Lic Nr: Not documented
Company Location: ND
Date Complete: 14Apr77

WELL NUMBER: 299-W18-166
TEMPORARY WELL NO:
Hanford Coordinates: N/S N 39,108 E/W W 76,650
State Coordinates: N 444,213 E 2,218,575
Start Card #: Not documented T R S
Elevation Ground surface (ft): Not documented

Depth to water: Not applicable

GENERALIZED STRATIGRAPHY — Geologist's Log

0-15: Backfill & GRAVEL
15-20: Coarse SAND, sparse GRAVEL
20-25: Med SAND, some fine SAND
25-35: Very coarse-coarse SAND
35-40.5: Very coarse SAND, GRAVEL & COBBLES
40.5-44.5: Med to coarse SAND, PEBBLES, GRAVEL
44.5-50: Very fine SAND to SAND
50-55: Fine-med SAND
55-60: Not documented
60-62: Slightly silty, fine-med SAND
62-65: Silty, fine-med SAND
65-66: SILT, med & coarse SAND
66-67: SILT layer
67-73: Fine-med SAND, SILT
73-79: SILT, fine-coarse SAND
79-83: Fine SAND
83-89: Fine & med to coarse SAND
89-94: Fine, med SAND
94-98: SILT
98-100: SILT & fine SAND
100-102: SILT layer
102-103: SILT, fine SAND
103-107: Fine, med SAND
107-110: Pea GRAVEL & SAND, COBBLES
110-114.5: Med SAND, small to large GRAVEL
114.5-117: Coarse-med SAND, GRAVEL
117-119.5: Med-very fine silty SAND
119.5-125: Fine-very fine silty SAND
125-132: SILT
132-135: SILT, some fine SAND
135-137: CALICHE



Elevation of reference point: (top of casing) [671.11 ft]
Height of reference point above ground surface [ND]
Depth of surface seal [20 ft]
Type of surface seal: Cement grout
I.D. of surface casing (If present) 10 in 0-20 ft [10 in]
I.D. of riser pipe: [6 & 8 in]
Type of riser pipe: Carbon steel
Diameter of borehole, 20-113 ft [9-in nom]
Type of filler: Cement grout
8 in casing 0-113 ft
Diameter of borehole, 113-137 ft [7 in nom]
Depth bottom of 6 in casing [130 ft]
Depth bottom of borehole: [137 ft]

GEOLOGIST'S NOTES:
Contamination encountered:
93 ft = 40,000 dp/m, 8,000 c/m;
94 ft = 20,000 dp/m, 3,000 c/m;
94.5 ft = <500 dp/m;
99 ft = 5,000 dp/m;
100 ft = 20,000 dp/m
102 ft = <500 dp/m
CCl_4 odor encountered:
114.5 ft = odor
116 ft = odor

Drawing By: RKL/2W18-166.ASB Date: 10Dec90
Reference:

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To Chuck Cline	From Paul Pak
Co. Ecology	Co. RL
Dept.	Phone #
Fax # 206-459-6859	Fax #

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CORRESPONDENCE DISTRIBUTION COVERSHEET

Author	Addressee	Correspondence No.
C. S. Cline, Ecology	S. Wisness, RL	Incoming 9302922

Subject: REQUEST OF VARIANCE FROM WAC 173-160 IN CONSTRUCTION OF APPROXIMATELY 80 CONE PENETROMETER BOREHOLES IN SUPPORT OF THE 200 WEST CARBON TETRACHLORIDE EXPEDITED RESPONSE ACTION (ERA) AND 200 UP-2 PROJECTS

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