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6. Author
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7. Abstract

This document describes the planned interim stabilization activities and alternatives for work at 107-C, 107-KE, 107-KW, and 107-F Retention Basins.

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ALTERNATIVE EVALUATION FOR THE 107-KE, 107-KW, 107-C, AND 107-F RETENTION BASINS DECONTAMINATION AND INTERIM STABILIZATION

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September 1993

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ALTERNATIVE EVALUATION FOR THE 107-KE, 107-KW, 107-C, AND 107-F RETENTION BASINS DECONTAMINATION AND INTERIM STABILIZATION

1. PURPOSE

This document describes alternatives and selects a course of action for decontamination and interim stabilization work at the 107-KE, 107-KW, 107-C, and 107-F retention basins.

These sites are scheduled for corrective action based partially on their relative rankings in WHC-EP-0489-2, *Hanford Site Surface Soil Radioactive Contamination Control Plan* (WHC 1993).

2. SITE DESCRIPTIONS

2.1. 107-C RETENTION BASINS

The 107-C retention basins are located north of the 105-B and 105-C Reactors in the 100 Area of the Hanford Site. There are two basins associated with the 105-C Reactor. A common surface contamination zone of approximately 10 hectares (25 acres) is shared with the 107-B retention basins. The basins received effluent from the both the 105-B and 105-C Reactors from 1952 to 1969.

The 107-C basins are identical in construction. Each consists of an open top tank made of carbon steel. The walls are built of two separate thickness of steel, with the bottom portion being 2.4 m (8 ft) tall and 3.2 cm (1.25 in.) thick, and the top portion also being 2.4 m (8 ft) tall but 1.7 cm (0.686 in.) thick. The basins are 99 m (330 ft) in diameter. Effluent was routed to the basins via buried 1.65-m (66-in.) diameter pipelines, and exited the basins via buried 1.5-m (60-in.) lines. The basin floors are 0.95 cm (0.375 in.) carbon steel resting on a concrete and compacted crushed gravel foundation. A total of 80.4 m^3 (2679 ft^3) of steel is above grade.

In the mid 1980's the 107-B and 107-C basins were partially decommissioned and interim stabilized. This entailed knocking the contaminated concrete walls of 107-B down into the bottom the trench, and backfilling the trench and surrounding area with uncontaminated soil and rock. Since 107-C are abovegrade basins, only the bottom of the basins was interim stabilized with uncontaminated soil, leaving the steel walls exposed. Because of the carbon steel construction, the basins were heavily corroded from their 17 year operational life. The rust was contaminated with radioactive material. A sealant was used in an effort to minimize transport of the radionuclides to the surrounding area; however, it was only partially effective. It has since worn completely off, once again leaving the contaminated steel exposed.

Since the whole 10 hectares (25 acres) was interim stabilized, there should be no surface contamination associated with the area. However, due to the exposed metal at 107-C, improper posting, and the presence of contaminated deep-rooted vegetation, the entire area is controlled as a surface contamination area.

2.2. 107-KE AND 107-KW RETENTION BASINS

The 107-KE and 107-KW basins are located north of the 105-KE and 105-KW Reactors respectively. There are three basins associated with each reactor. Each set of basins are contained in a separate surface contamination zone of approximately 4 hectares (10 acres). The basins received effluent from the 105-KE and 105-KW Reactors.

All six basins are nearly identical in construction, with the only difference being associated with the length of the inlet pipe exposed above grade. Each basin is an open top carbon steel tank. The walls of the basin are made up of four different thickness of steel. The bottom portion is 2 m (79 in.) tall and 3.6 cm (1.4 in.) thick. The second section is 1.8 m (72.1 in.) tall and 2.7 cm (1.059 in.) thick. The third section is 2.1 m (84.9 in.) inches tall and 0.19 cm (0.075 in.) thick, and the top section is 1.5 m (60.9 in.) tall and 0.95 cm (0.375 in.) thick. Each basin is 7.8 m (25 ft) tall and 75-m (250-ft) diameter. Each basin inlet line is 1.8 m (72 in.) diameter and above grade. The basins are drained by 1.8 m (72 in.) diameter belowgrade lines. At the inlet point is a large flume that guided flow into the basins. There is also a steel overflow box associated with each basin. The basin floors are made of 0.95 cm (0.375 in.) carbon steel plate set on a concrete foundation. A total of 56.5 m^3 (1,384 ft^3) of steel is located above grade for each tank, or 339 m^3 (11,304 ft^3) of steel for all six basins.

In the mid 1980's the basins were partially stabilized. This entailed interim stabilization of the bottom of the basin and approximately 4 hectares (10 acres) of surrounding area. Each basin became heavily corroded over the 20 year operational history. This rust was contaminated with radioactive material. A sealant was used in an effort to minimize transport of radioactive material to the surrounding area. However, the sealant has since worn off, and the metal is once again exposed. This has partially contributed to the recontamination of the interim stabilized surface and is a potential source of contamination spread to areas outside the basins. Other causes include deep-rooted vegetation and well construction.

2.3. 107-F RETENTION BASIN

The 107-F retention basin is similar in construction to the 107-B retention basin, with the only difference being that the effluent pipe was above grade. The basins consisted of two concrete lined trenches. During the decommissioning and interim stabilization of 107-F, the concrete walls were demolished and placed in the bottom of the trenches. The entire area was then interim stabilized. The effluent pipe was sectioned and placed in one of the backfilled trenches. Each pipe was capped. There are approximately 60 pieces of pipe, which equates to approximately 33.5 m^3 (1,115 ft^3) of steel.

3. OBJECTIVE AND CONSTRAINT

The primary objective of interim stabilization is to bring inactive waste disposal facilities into compliance with the requirements of WHC-CM-7-5, *Environmental Compliance* (WHC 1988), and subsequently maintain it in that condition until final remediation activities commence. Based on the requirements of WHC-CM-7-5, Part L, "Inactive Radioactive Waste Sites," the 107-C, 107-KE, 107-KW, and 107-F retention basins do not have an adequate barrier over them to prevent migration, and contamination of the soil surface is higher than allowed.

4. ALTERNATIVES

The following alternatives are available for implementation:

1. No action.
2. Removal and burial as low level waste with full interim stabilization.
3. Removal and onsite storage with partial interim stabilization.
4. Decontamination and salvage of steel with full interim stabilization.

The option of dismantlement, decontamination, and disposal as nonradioactive waste at Central Landfill was considered, but later disregarded.

4.1. NO ACTION ALTERNATIVE

4.1.1. 107-C Retention Basins

No action would leave the site as it is today until large scale excavation of the area occurs in 1997. This alternative is unacceptable for several reasons. First, the site has surface contamination and is a potential source of contamination to the surrounding area. The basins are currently surrounded by a large surface contamination area, a separate but related project is assessing the possibility of downposting a large portion of the area. Second, it is necessary to remove the abovegrade portions of the basins in support of large scale remediation in 1997. This would be the least costly alternative right now, but the cost of dismantlement will increase in the future.

4.1.2. 107-KE and 107-KW Retention Basins

No action would mean that no activity beyond routine surveillance would occur. This is unacceptable for several reasons. First, the site is surface contamination and is a potential source of contamination to the surrounding

area. This area is currently surrounded by a large surface contamination area. A separate but related project is accessing the possibility of downposting a good portion of the surrounding area. Eliminating the basins as a potential source of contamination is important to this effort. Second, these basins have to be removed in support of large scale remediation. Third, the equipment and personnel are available to do this work. This would be the least costly alternative right now, but the cost of dismantlement will increase in the future.

4.1.3. 107-F Retention Basins

No action would continue storing the segmented effluent pipe in the basin. The 107-F basin is being assessed for downposting; however, the area occupied by the pipelines cannot be downposted until the pipelines are removed. This would be the least costly alternative.

4.2. REMOVAL AND BURIAL AS LOW-LEVEL WASTE

4.2.1. 107-C Retention Basins

Removal of the 107-C basins will occur in several steps. The first step will be interim stabilization or surveying and downposting of the surrounding area. This provides an uncontaminated working surface. The next step is to dismantle the abovegrade portion of the tanks. The tank bottom would stay in place as this can be easily handled during the large scale remediation. The contaminated pieces of steel would be shipped to the 200 Area burial grounds. After the abovegrade portion of the steal is removed, the interior area of the basins will be interim stabilized. The area will then be sprayed with nonselective herbicide with the goal of minimizing the occurrence of deep-rooted vegetation. This alternative would cost approximately $390,000. The cost of this alternative includes removal, burial, and equipment charges.

4.2.2. 107-KE and 107-KW Retention Basins

Removal of the 107-KW and 107-KE basins will occur in several steps. The first step will be interim stabilization or surveying and downposting. This provides an uncontaminated working surface. The next step will be to dismantle the abovegrade portion of the basins. The tank bottom would stay in place as this can be easily handled during large scale remediation. The contaminated pieces of steel would be shipped to the 200 Area burial grounds. After the abovegrade portions of the steel is removed, the interior of the basins will be interim stabilized. The area will then be treated with a soil sterilant with the goal of minimizing deep-rooted vegetation. This alternative would cost approximately $993,000. This cost includes equipment charges, removal, and burial.

4.2.3. 107-F Pipe

Removal will occur in several steps. The area surrounding the pipes will be surveyed and downposted or interim stabilized and downposted. The pipes will then be cut lengthwise, nested inside one another, and shipped for burial. Cost associated with this alternative are $279,800. This cost includes equipment charges, removal, and burial.

4.3. DISMANTLEMENT AND ONSITE STORAGE

4.3.1. 107-C, 107-KE, and 107-KW Retention Basins

Dismantlement would occur in a similar manner as previously described. However, instead of sending the steel to burial, it would be stored contaminated side down at the site. The steel would not be stacked, but would be as closely grouped as possible. This alternative assumes that a better option will be available in the future. The steel would have to be addressed during the large scale remediation at this area. This alternative would result in a greatly reduced surface contamination area, and would also minimize the possibility for migration of contamination from the site. The cost of this work at 107-C would be $255,000. The cost at 107-KW and 107-KE would be $484,300.

4.3.2. 107-F Pipe

Since the pipe is already partially dismantled and is consolidated in as small of area as possible, this option is similar to the no action alternative. Some interim stabilization of the area may be required to minimize the size of the surface contamination area. Potential cost of this alternative is $36,000.

4.4. DISMANTLEMENT, DECONTAMINATION, AND RECYCLE

4.4.1. 107-C, 107-KE, and 107-KW Retention Basins

Dismantlement of these basins will occur as previously described, with the possible exception that the interiors of the retention basins may be partially interim stabilized prior to beginning decontamination. Decontamination will involve wet sandblasting the interior and portions of the exterior of the basins. All rust will be removed. The sandblast medium will be left on the bottom of the tank, then interim stabilized with uncontaminated soil. After a section of steel has been cleaned, it will be surveyed and downposted as possible. Depending on the dismantlement technique, decontamination will occur before or after dismantlement. The decontaminated steel will be available for recycling at $45 per ton, which equates to $154,000. The cost of this work at 107-C, 107-KE, and 107-KW is estimated at $825,700. If the value of the scrap steel is taken into account, the total cost is reduced to $672,000.

4.4.2. 107-F Pipe

Each section of pipes would have to cut open lengthwise and decontaminated. Decontamination would consist of wet sandblasting the interior and exterior of the pipes. The sandblast medium would be left in the basins. After the pipes have been decontaminated, each piece will be surveyed and potentially released. The area where the pipes where lying in the basin will be interim stabilized. The cost of this work is $115,200. Scrap value of the steel is estimated at $12,000.

5. ALTERNATIVES DISCUSSION

5.1. NO ACTION ALTERNATIVE

This alternative is unacceptable for several reasons. First, these sites are out of compliance with WHC-CM-7-5 (WHC 1988). Corrective action is required to minimize contamination migration to the surrounding area. Second, funding and personnel are available next fiscal year to complete this work. Finally, these sites will need to have the steel removed prior to final remediation. Large volumes of soil are potential contaminated below each basin. Final remediation strategies in the 100 Area revolve around large scale excavation of contaminated soil. If this is to occur, the steel will have to be removed. Doing this now is less expensive than in the future.

5.2. REMOVAL AND BURIAL AS LOW-LEVEL WASTE

This alternative is unacceptable due to the cost of burial associated with a large amount of debris, and the emphasis to minimize the generation of waste. Note that there will be a small amount of radioactive waste generated.

5.3. REMOVAL AND ONSITE STORAGE

This alternative has several positive aspects. By dismantling the steel and storing contaminated side down, the chance for radioactive contamination migration is minimized. The amount of surface contaminated area is reduced from current dimensions. The steel then could be decontaminated or left in place until final remediation is implemented. It is preferred that the steel be decontaminated. Onsite storage also allows operational flexibility. If decontamination cannot be accomplished in the same time frame as dismantlement, the project can still proceed. Decontamination could occur at a later date.

5.4. DECONTAMINATION AND SALVAGE

This alternative is the preferred approach. Decontamination would be accomplished by wet sandblasting. The sandblast media would be interim stabilized onsite. Sandblasting would occur before or after dismantlement depending on how the basin is dismantled. Interim stabilization of the area would occur as needed to support dismantlement and sandblasting. It is acceptable to interim stabilize the sandblast media onsite for several reasons. First, radioactive contamination is presently exposed and available for migration. Removing and interim stabilizing this contamination minimizes this possibility. Second, interim stabilizing radioactive contamination removed from the steel, allows it to be handled in a more cost-effective manner in the future. Large scale remediation relies on the fact that it will be more cost-effective to handle radioactive contamination with heavy equipment rather than with smaller equipment or tools. Also, the site will be interim stabilized with 30.5 to 61 cm (12 to 24 in.) of uncontaminated soil. The volume of sandblast media generated from decontamination of one tank is

45.6 m^3 (60 yd^3). Approximately 2660 m^3 (3500 yd^3) will be required to interim stabilize the area. These are small volumes when compared to the amount of contaminated soil that will be generated when large scale excavation occurs. Past sampling of the 107-KE and 107-KW basins indicates that there may be a 6-m (20-ft) deep column of contaminated soil below the area.

6. CONCLUSIONS

6.1. 107-F PIPELINES

If decontamination efficiency is low, the effluent pipe may be buried as low-level waste. However, there is a significant volume of steel that can be decontaminated. This decision will be based on operational considerations.

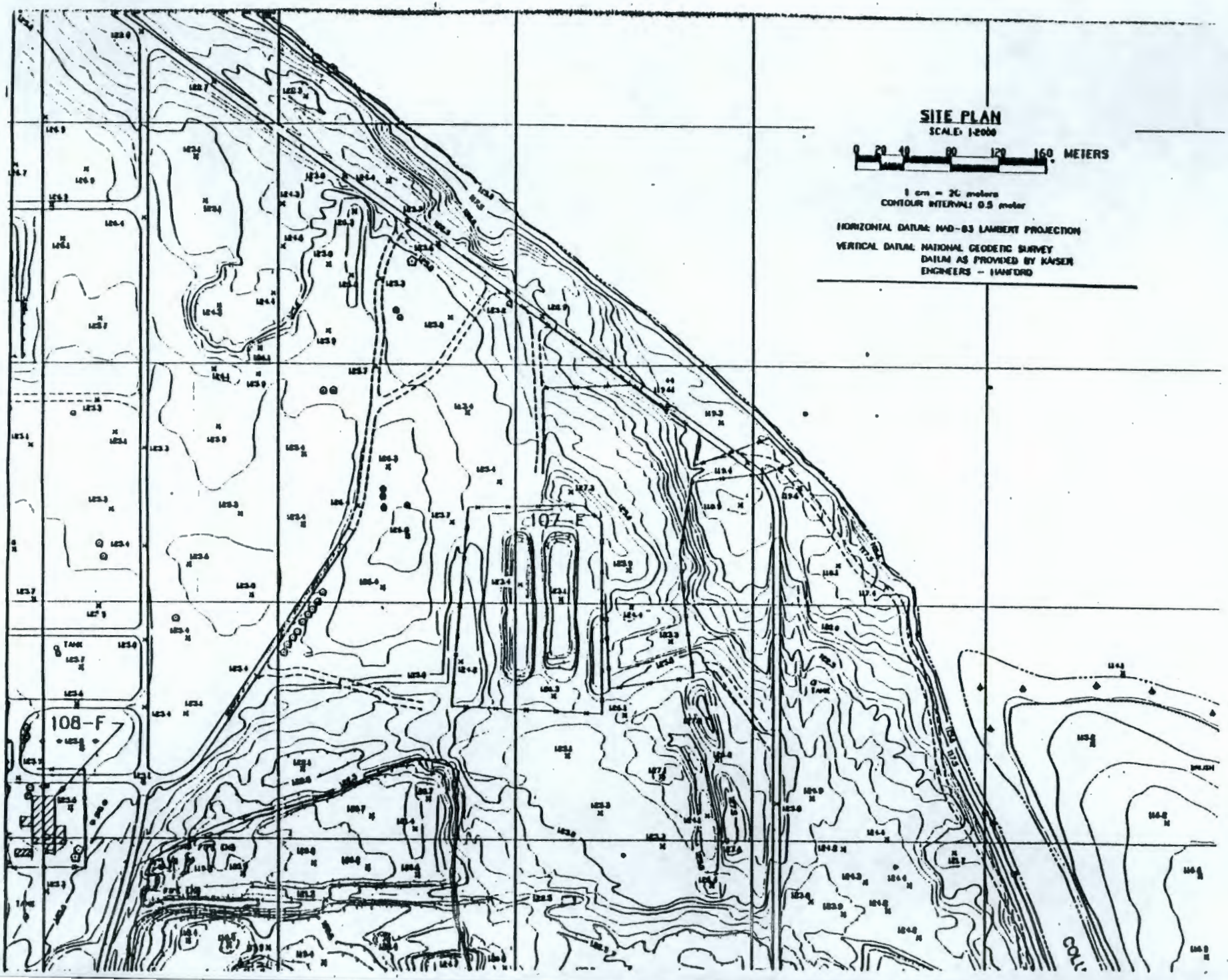
6.2. 107-C, 107-KE, AND 107-KW RETENTION BASINS

The best approach is to decontaminate steel and auxiliary structures before dismantlement occurs. However, if decontamination is not possible, or is only possible for some of the steel initially then on site storage will be utilized.

7. REFERENCES

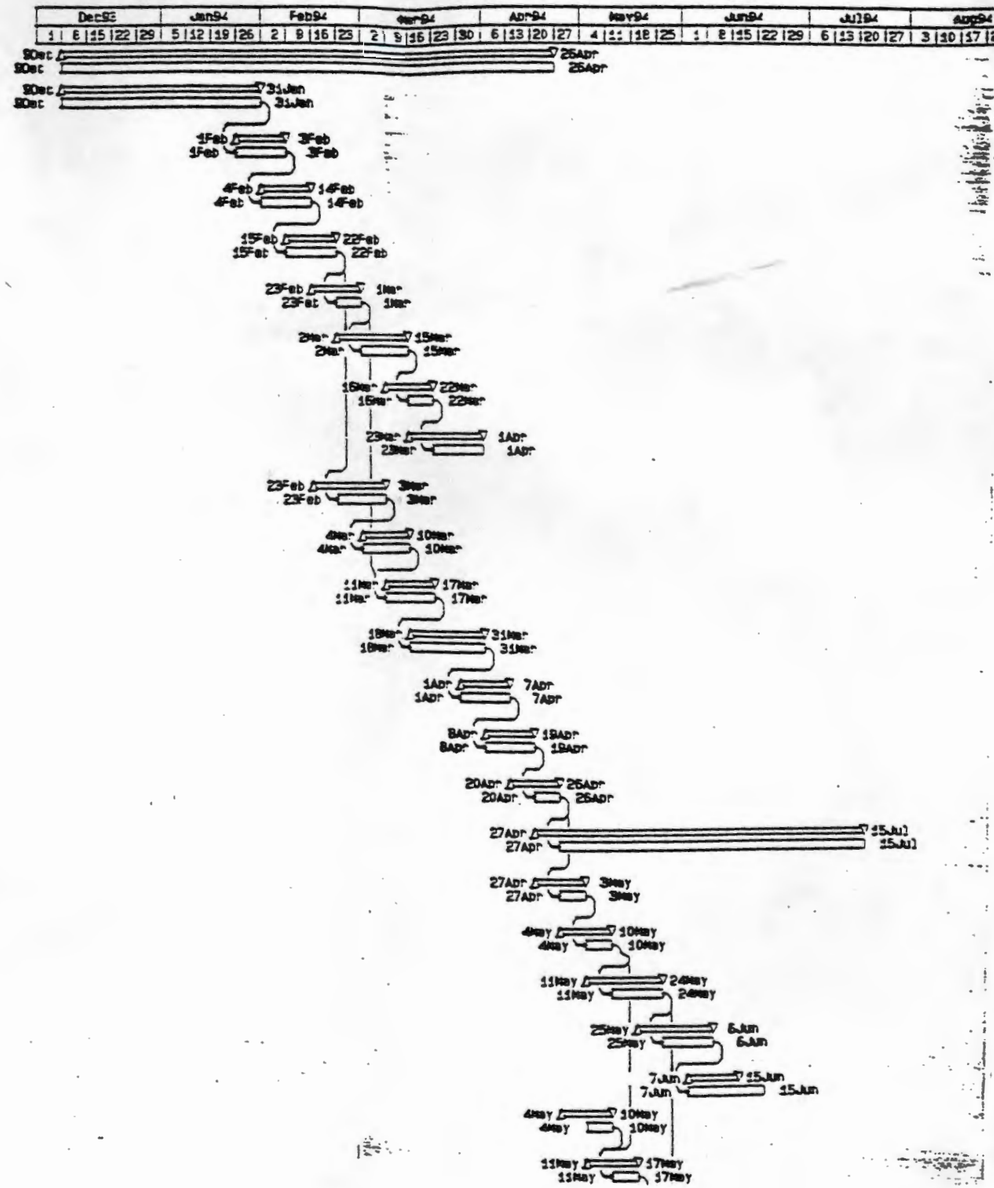
WHC, 1988, *Environmental Compliance*, WHC-CM-7-5, September 1988, Westinghouse Hanford Company, Richland, Washington.

WHC, 1993, *Hanford Site Surface Soil Radioactive Contamination Control Plan*, WHC-EP-0489-2, April 13, 1993, Westinghouse Hanford Company, Richland, Washington.


SITE PLAN
SCALE: 1:2000
0 20 40 80 120 160 METERS
1 cm = 20 meters
CONTOUR INTERVAL: 0.5 meter
HORIZONTAL DATUM: NAD-83 LAMBERT PROJECTION
VERTICAL DATUM: NATIONAL GEODETIC SURVEY
DATUM AS PROVIDED BY KAISER
ENGINEERS - HANFORD
107-F
108-F

ENVIRONMENTAL RESTORATION OPERATIONS

1PJ121C1.032	107-C RETENTION BASINS INTERIM STABILIZATION	95.000
1PJ121C1.032.01	ENGINEERING OF 107-C, 107-KE & 107-KW	35.000
1PJ121C1.032.02	107-C TANK #1 EQUIPMENT MOBILIZATION	3.000
1PJ121C1.032.03	107-C TANK #1 HEAVY EQUIPMENT WORK	7.000
1PJ121C1.032.04	107-C TANK #1 REMOVE SOIL FROM TANK TO GRADE	5.000
1PJ121C1.032.05	107-C TANK #1 SANDBLAST METAL	5.000
1PJ121C1.032.06	107-C #1 TANK CUT AND RIG PIPE AND STEEL	10.000
1PJ121C1.032.07	107-C TANK #1 HPT SURVEY STEEL	5.000
1PJ121C1.032.08	107-C TANK #1 BACKFILL AREA	8.000
1PJ121C1.032.09	107-C TANK #2 HEAVY EQUIPMENT WORK	7.000
1PJ121C1.032.10	107-C TANK #2 REMOVE SOIL FROM TANK TO GRADE	5.000
1PJ121C1.032.11	107-C TANK #2 SANDBLAST METAL	5.000
1PJ121C1.032.12	107-C TANK #2 CUT AND RIG PIPE AND STEEL	10.000
1PJ121C1.032.13	107-C TANK #2 HPT SURVEY METAL	5.000
1PJ121C1.032.14	107-C TANK #2 BACKFILL	8.000
1PJ121C1.032.15	107-C TANK #2 DEMOBILIZATION TO 107-K	5.000
1PJ121C1.033	107-KE RETENTION BASINS INTERIM STABILIZATION	55.000
1PJ121C1.033.01	107-KE TANK #1 SITE PREP	5.000
1PJ121C1.033.02	107-KE TANK #1 SANDBLAST METAL	5.000
1PJ121C1.033.03	107-KE TANK #1 CUT AND RIG PIPE AND STEEL	10.000
1PJ121C1.033.04	107-KE TANK #1 HPT SURVEY METAL	8.000
1PJ121C1.033.05	107-KE TANK #1 HEAVY EQUIPMENT WORK	7.000
1PJ121C1.033.06	107-KE TANK #2 SITE PREP	5.000
1PJ121C1.033.07	107-KE TANK #2 SANDBLAST METAL	5.000



1PJ121C1.033.06	107-KE TANK #2, CUT AND RIG PIPE AND STEEL	10.000
1PJ121C1.033.09	107-KE TANK #2, HPT SURVEY METAL	5.000
1PJ121C1.033.10	107-KE TANK #2, HEAVY EQUIPMENT WORK	7.000
1PJ121C1.033.11	107-KE TANK #3, SITE PREP	5.000
1PJ121C1.033.12	107-KE TANK #3, SANDBLAST METAL	5.000
1PJ121C1.033.13	107-KE TANK #3, CUT AND RIG PIPE AND STEEL	10.000
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1PJ121C1.034	107-KW RETENTION BASINS INTERIM STABILIZATION	45.000
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1PJ121C1.034.02	107-KW TANK #1, SANDBLAST METAL	5.000
1PJ121C1.034.03	107-KW TANK #1, CUT AND RIG PIPE AND STEEL	10.000
1PJ121C1.034.04	107-KW TANK #1, HPT SURVEY METAL	5.000
1PJ121C1.034.05	107-KW TANK #1, HEAVY EQUIPMENT WORK	7.000
1PJ121C1.034.06	107-KW TANK #2, SITE PREP	5.000
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1PJ121C1.034.10	107-KW TANK #2, HEAVY EQUIPMENT WORK	10.000
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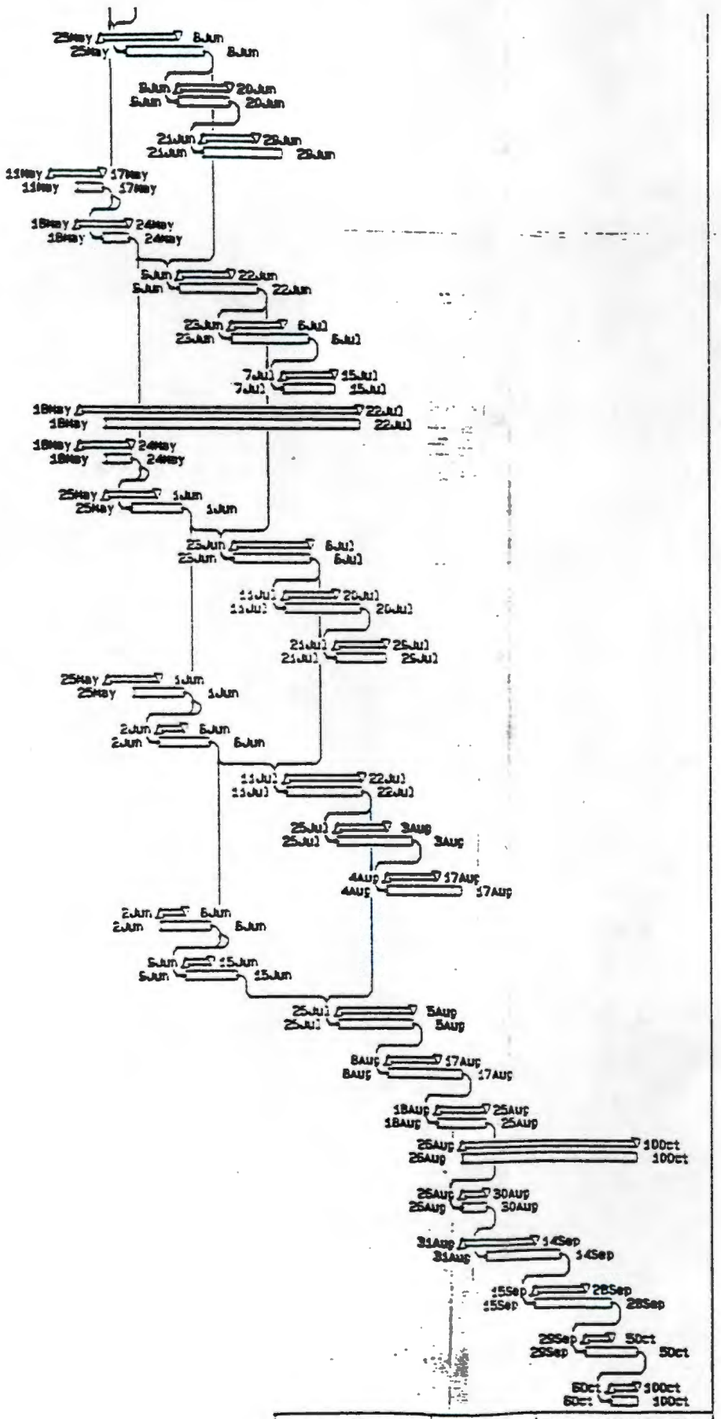
1PJ121C1.034.12	107-KW TANK #3, SANDBLAST METAL	5.000
1PJ121C1.034.13	107-KW TANK #3, CUT AND RIG PIPE AND STEEL	10.000
1PJ121C1.034.14	107-KW TANK #3, HPT SURVEY METAL	5.000
1PJ121C1.034.15	107-KW TANK #3, HEAVY EQUIPMENT WORK	6.000
1PJ121C1.035	107-F EFFLUENT PIPING, DECONTAMINATION & REMOVAL	31.000
1PJ121C1.035.01	107-F EFFLUENT PIPING, MOBILIZATION	3.000
1PJ121C1.035.02	107-F EFFLUENT PIPING, SANDBLAST METAL	10.000
1PJ121C1.035.03	107-F EFFLUENT PIPING, CUT PIPE	10.000
1PJ121C1.035.04	107-F EFFLUENT PIPING, HPT SURVEY METAL	5.000
1PJ121C1.035.05	107-F EFFLUENT PIPING, DEMOBILIZATION	3.000

Legend
Target :
Early Dte



Project: IFSH9394	107RET	Date: 80ct93 11:02
ENVIRONMENTAL RESTORATION OPERATIONS SCHEDULE		
Page: 1	Drawn by SWIKNET Graphics	

85100-93-WMH-033
Attachment 3
Total Pages 2

85100-93-WMH-033
Attachment 4
Total Pages 2

Westinghouse Hanford Company

Internal Memo

From: Environmental Compliance Support 88430-93-087
Phone: 373-4949 XO-21
Date: October 27, 1993
Subject: IMPACT TO BALD EAGLES FROM STABILIZATION OF 107-C, -KE, -KW, AND -F

To: M. A. Mihalic R2-77

cc: J. J. Dorian H6-30
W. M. Hayward R2-77
T. F. Johnson XO-21
A. R. Johnson H6-30
D. S. Landeen H4-14
D. L. Smith R2-77
S. G. Weiss H6-02

The Retention Basins at C, KE, and KW were visited on October 11, 1993, to evaluate any potential impact to roosting bald eagles from the stabilization activities planned during the next year. The draft Bald Eagle Site Management Plan, WHC-EP-0510, recommends that activities that could disturb the eagles be restricted to no closer than 800 meters from night roosting sites. This recommendation is in effect from October 15, to April 1. Among the sites visited, there is one night roosting site that was identified in the Bald Eagle Management Plan. It is located just upstream (west) of the K Area perimeter fence and is within 800 meters of the 107-KW Retention Basins. Therefore the stabilization activities planned for the 107-KW basins should be scheduled to occur outside the time frame mentioned above.

According to the current schedule, stabilization activities are planned to begin at 107-KW in mid May and finish by the end of July. As long as this project is completed before October 15, the intent of the Bald Eagle Management Plan will be met. The 107-KE retention Basins are outside the 800 meter buffer zone and no special scheduling should be required for stabilization there. There is no eagle roosting habitat near the 107-C retention basins so no special scheduling is necessary there either.

Although the 107-F retention basins were not visited on this tour, an aerial photograph of the area was reviewed for eagle roosting habitat. Again, this area is greater than 800 meters from the nearest roosting areas and no special scheduling to protect eagles should be necessary.

These projects should have no impact on other special status animals such as the Aleutian Canada Goose, the American White Pelican, or the Peregrine Falcon that are occasionally seen at the Hanford Site. These species are not dependent upon islands of specialized habitat like the roosting sites the bald eagles use.

If you have any questions or would like to discuss this issue further, please call.

K A Gano

K. A. Gano
Manager

kam

85100-93-WMH-033
Attachment 5
Total Pages 1

Battelle
Pacific Northwest Laboratories
Battelle Boulevard
P.O. Box 999
Richland, Washington 99352
Telephone (509)
372-1791

September 8, 1993

No Known Historic Properties

Mr. D. L. Smith
Westinghouse Hanford Company
Restoration and Remediation
P. O. Box 1970/R2-77
Richland, WA 99352

CULTURAL RESOURCES REVIEW OF THE DECONTAMINATION OF THE 107KE, KW, AND C BASINS PROJECT. HCRC #93-100-070.

Dear David:

In response to your requests received August 26, 1993, staff of the Hanford Cultural Resources Laboratory (HCRL) conducted a cultural resources review of the subject project, located in the 100 Area of the Hanford Site. According to the information that you supplied, the project entails dismantling the 107KE, KW and C Basins followed by stabilizing them on an interim basis. The depth of excavation required for the project is less than four feet.

Our literature and records review shows that the project areas lie within 400 meters of the Columbia River and are therefore in culturally sensitive locations. However, the project areas have been highly disturbed by the original installation of the basins. It is unlikely that any intact cultural materials would exist in such disturbed ground. Survey and monitoring by an archaeologist are not necessary.

It is the finding of the HCRL staff that there are no known cultural resources or historic properties within the proposed project area. The workers, however, must be directed to watch for cultural materials (e.g., bones, artifacts) during excavations. If any are encountered, work in the vicinity of the discovery must stop until an HCRL archaeologist has been notified, assessed the significance of the find, and, if necessary, arranged for mitigation of the impacts to the find. This is a Class III case, defined as a project which involves new construction in a disturbed, low-sensitivity area. Please notify us if any changes to project location or scope are anticipated.

A copy of this letter has been sent to Charles Pasternak, DOE, Richland Operations Office, as official documentation. If you have any questions, please call me at 372-1791. Please use the HCRC# above for any future correspondence concerning this project.

Very truly yours,

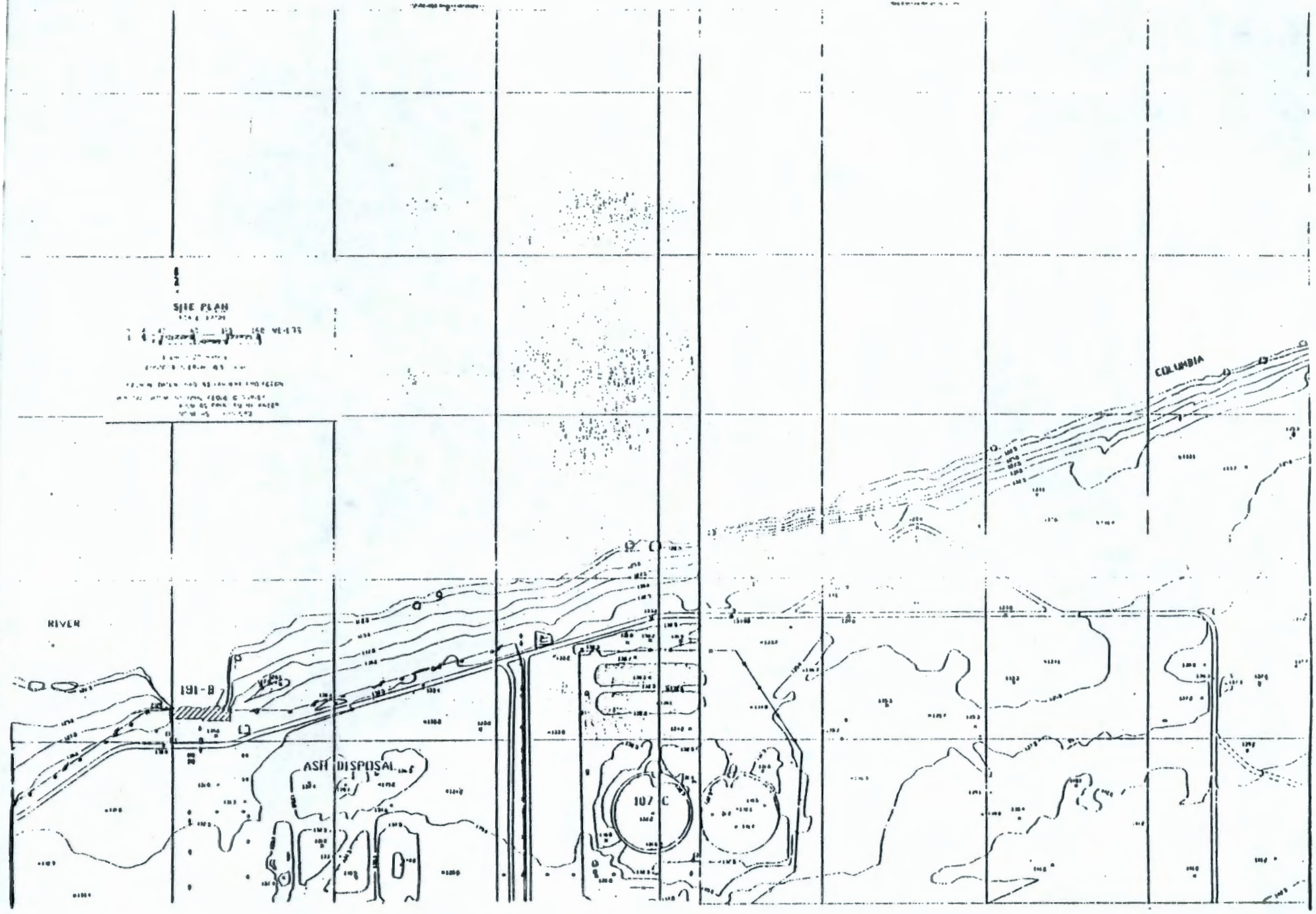
M. E. Crist

M. E. Crist
Technical Specialist
Cultural Resources Project

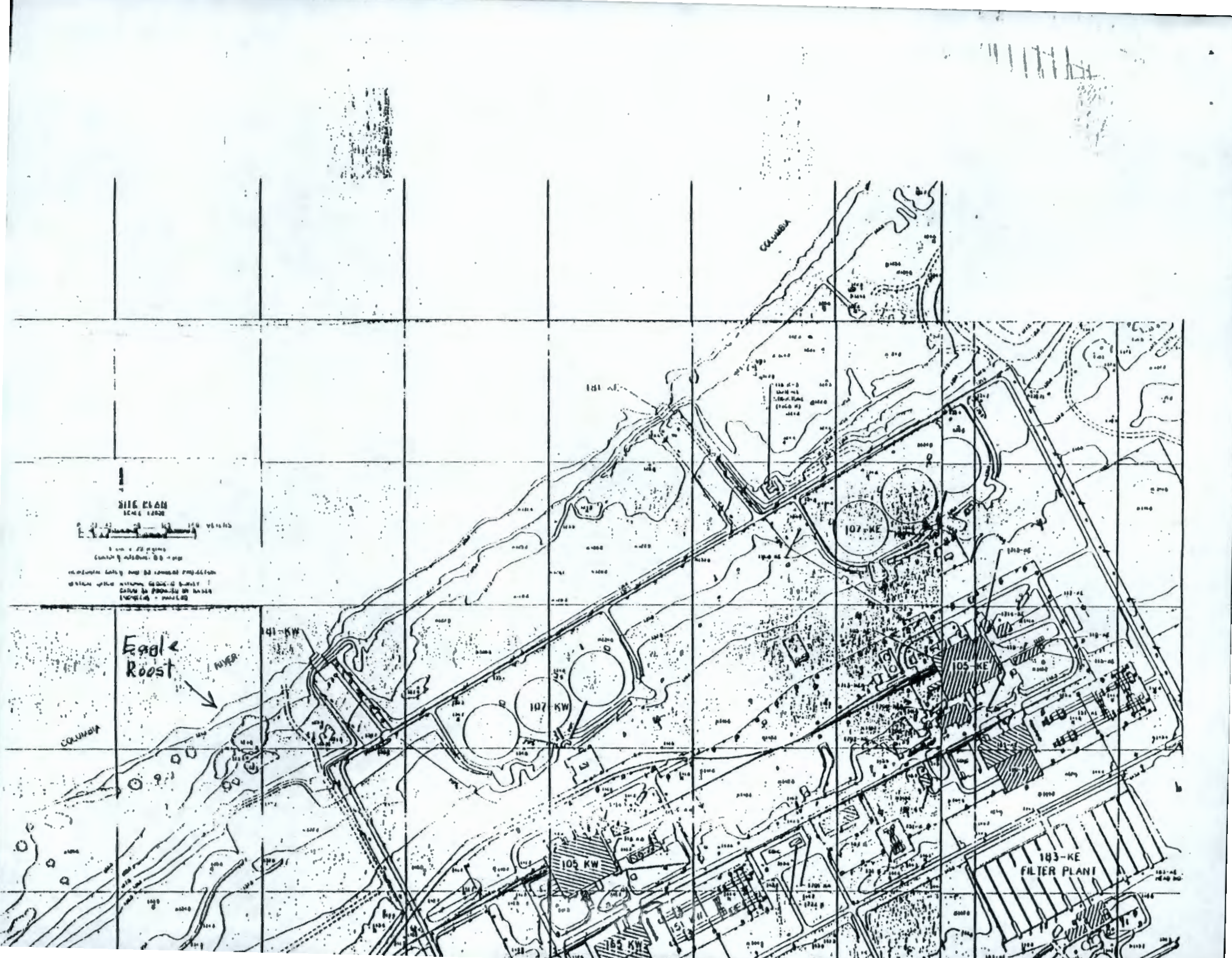
Concurrence: M. K. Wright
M. K. Wright, Scientist
Cultural Resources Project

cc: C. R. Pasternak, RL (2)
File/LB

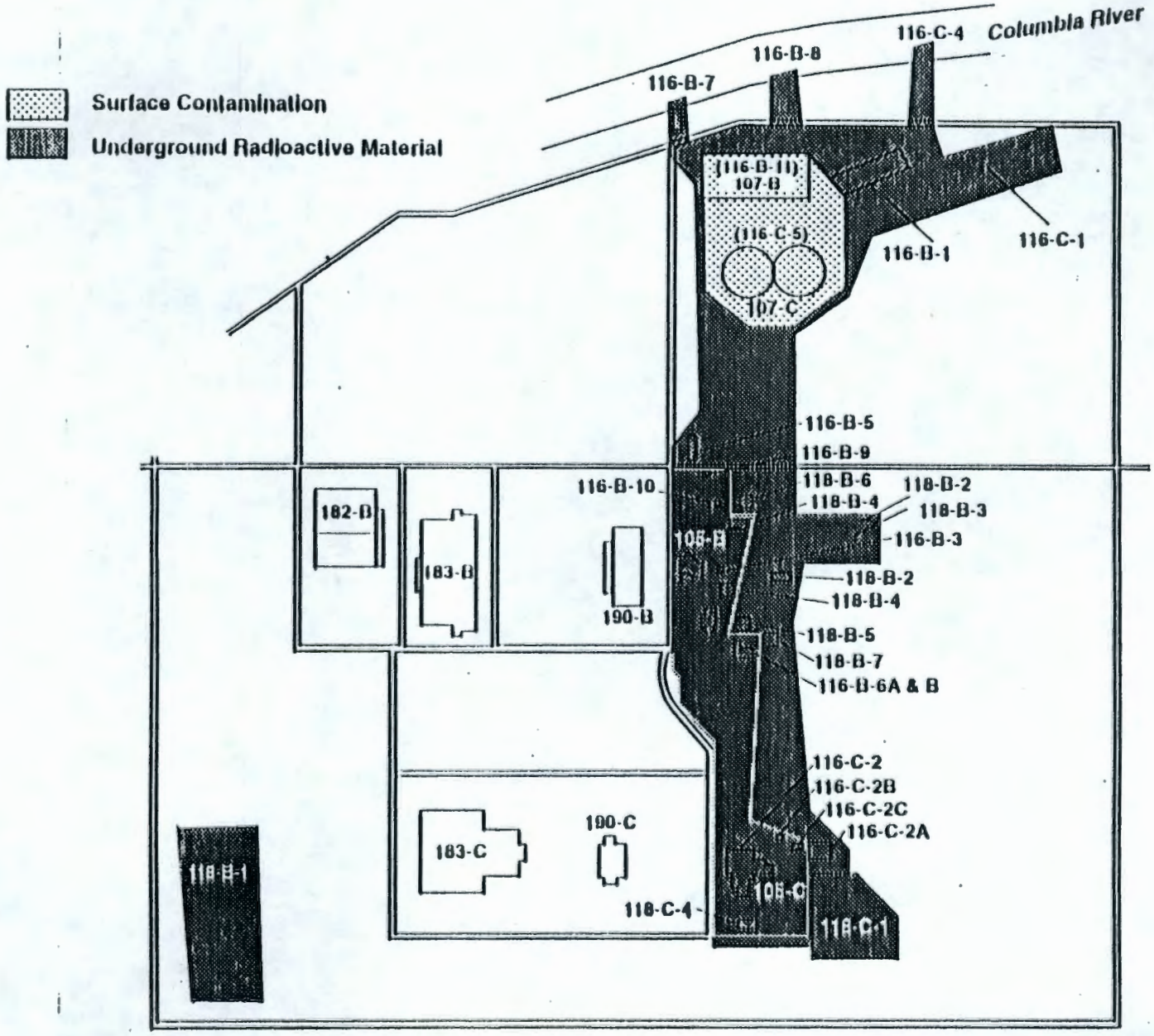
85100-93-WMH-033
Attachment 6
Total Pages 3

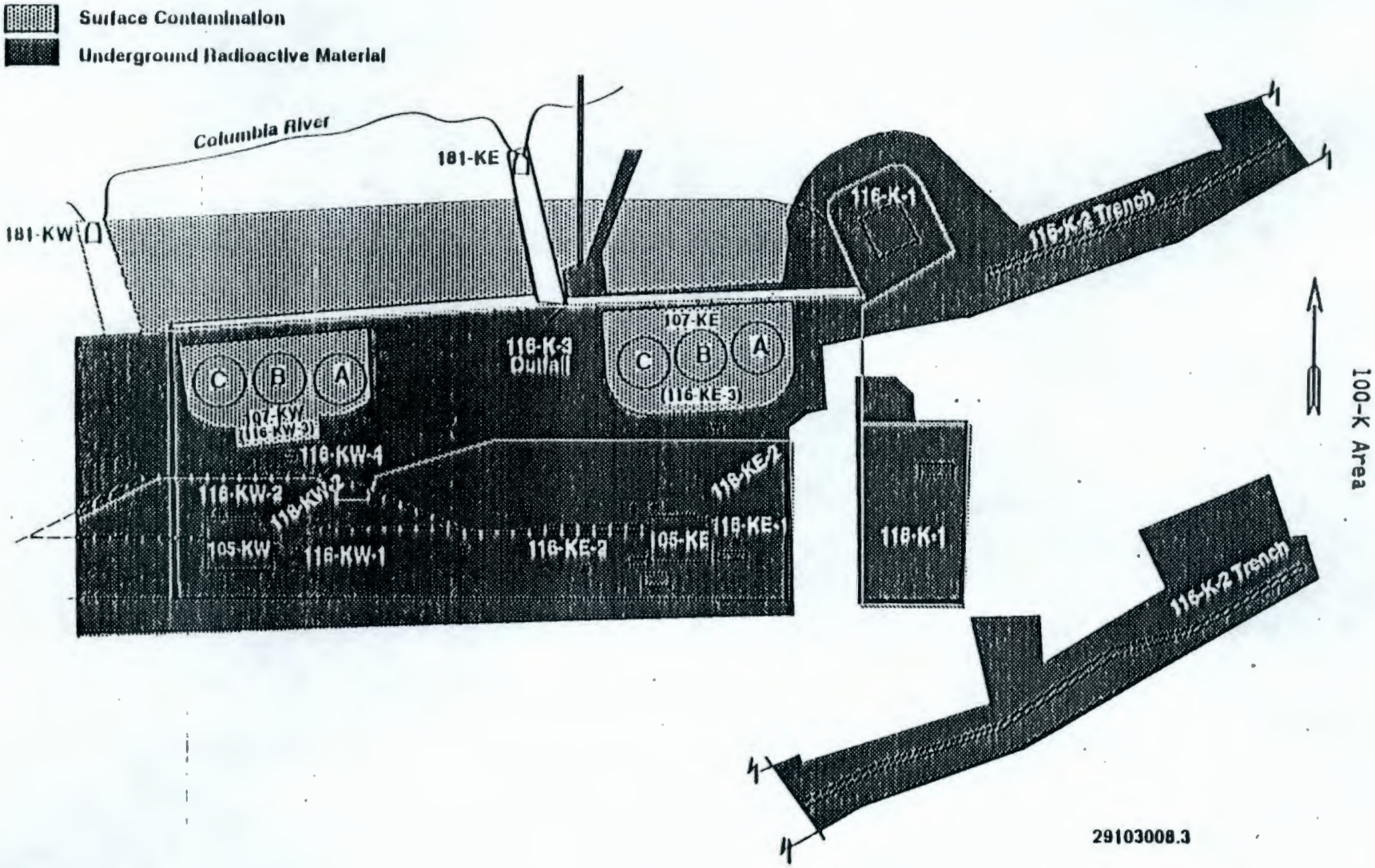


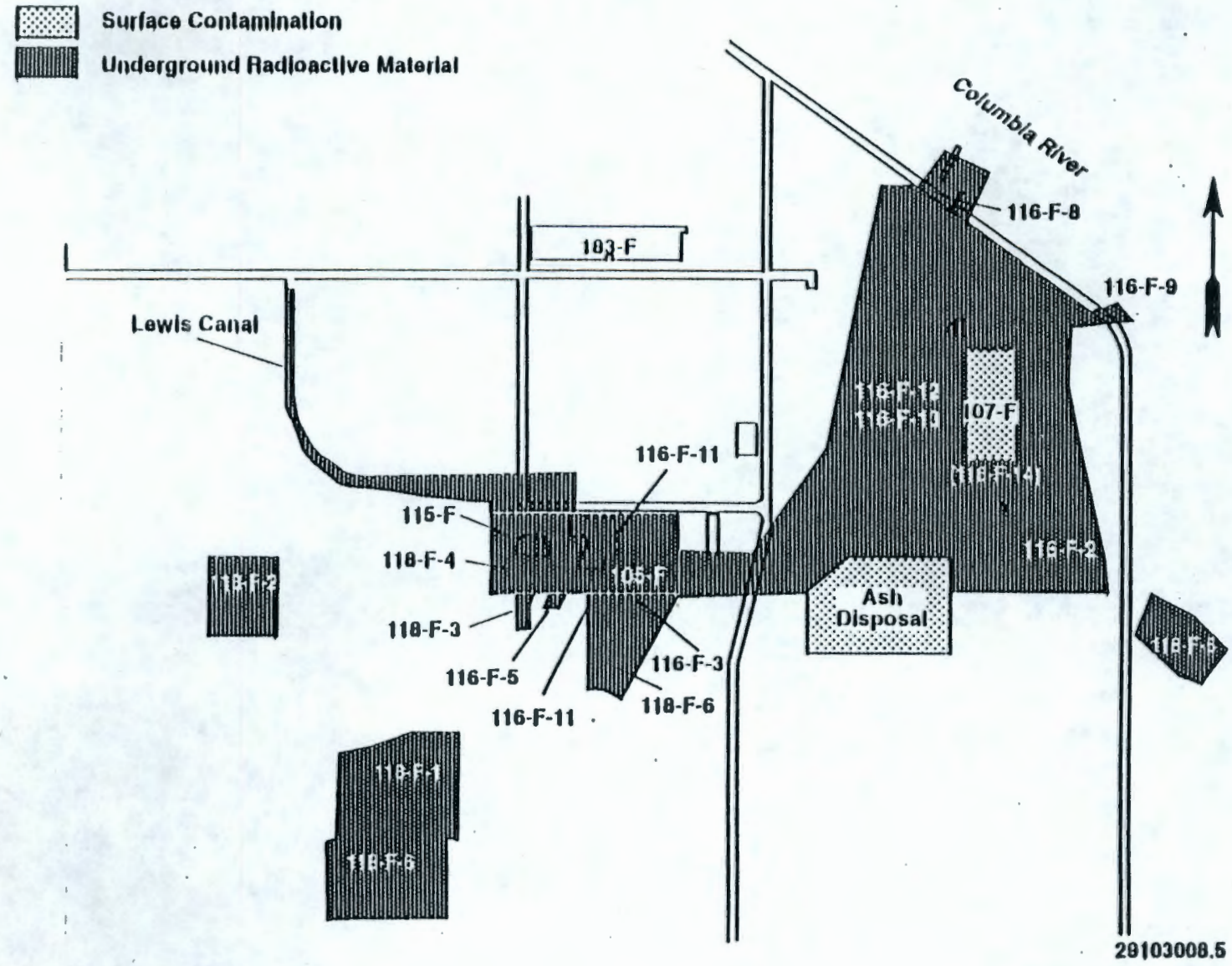
107-C Area


SITE PLAN
Eagle Roost
COLUMBIA
181
107-KE
105-KE
183-KE
FILTER PLANT
141-KW
107-KW
105 KW
184 KW

85100-93-WMH-033
Attachment 7
Total Pages 3


Surface Contamination
Underground Radioactive Material
Columbia River
116-C-4
116-B-8
116-B-7
(116-B-11)
107-B
(116-C-5)
107-C
116-B-1
116-C-1
116-B-5
116-B-9
116-B-10
118-B-6
118-B-2
118-B-4
118-B-3
116-B-3
105-B
182-B
183-B
190-B
118-B-2
118-B-4
118-B-5
118-B-7
116-B-6A & B
116-C-2
116-C-2B
116-C-2C
116-C-2A
190-C
183-C
118-B-1
118-C-4
105-C
118-C-1
100-B and C Area
29103008.2


Surface Contamination
Underground Radioactive Material
Columbia River
181-KE
181-KW
116-K-1
116-K-2 Trench
107-KE
116-K-3
Outfall
C
B
A
(116-KE-3)
107-KW
(116-KW-3)
116-KW-4
116-KW-2
116-KW-3
116-KE-4
105-KW
116-KW-1
116-KE-2
105-KE
116-KE-1
118-K-1
116-K-2 Trench
100-K Area
29103008.3


Surface Contamination
Underground Radioactive Material
Columbia River
116-F-8
103-F
116-F-9
Lewis Canal
116-F-12
116-F-10
107-F
116-F-14
116-F-11
115-F
118-F-4
105-F
116-F-2
118-F-2
Ash Disposal
118-F-3
116-F-3
116-F-5
118-F-6
116-F-11
118-F-1
118-F-5
118-F-7
100-F Area
29103008.5