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OIL SPILL PREVENTION, CONTROL, AND COUNTERMEASURES PLAN

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I. D. Jacques

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SM-5100-184 (3-81)

OIL SPILL PREVENTION, CONTROL, AND COUNTERMEASURES PLAN

Revised by: I. Duane Jacques Date: 11/1/85
I. D. Jacques
Associate Environmental Engineer

Reviewed by: Eric M. Greager Date: 11/1/85
E. M. Greager, Manager
Environmental Protection

Approved by: J. J. Dorian Date: 11/4/85
J. J. Dorian, Manager
Environmental and Emergency Preparedness

To satisfy the requirements of 40 CFR Part 112.3(d), the Oil Spill Prevention, Control, and Countermeasures Plan must be reviewed and certified by a registered professional engineer. By means of this certification the engineer, having examined the facility, shall attest that the plan has been prepared in accordance with good engineering practices.

Certified by: R. L. Olsen Date: 11-4-85
R. L. Olsen
Registered Professional Engineer
State of Washington
Certificate No. 7861, dated October 2, 1961

SUMMARY

Environmental Protection Agency regulations 40 CFR Part 112, "Oil Pollution Prevention", include requirements for a written Oil Spill Prevention, Control, and Countermeasures (SPCC) Plan. This document provides such an SPCC Plan for UNC facilities at 100-N Area.

Bulk quantities of oil are stored at 100-N Area (1,445,000 gallons total capacity of Bunker C oil and 472,000 gallons total capacity of diesel oil). The oil is distributed through underground transfer piping. Bunker C oil leaked to the ground would congeal in the soil and become immobile. Large amounts of diesel oil leaked to the ground would percolate to the water table and migrate to the river with ground water.

Equipment to detect, control, and clean up oil spills is used at 100-N Area. Eleven ground-water wells were installed in 1981 to help detect diesel oil leaks. Oil sorbent material and an oil spill containment boom (designed for river and stream use) are permanently stored at 100-N to clean up oil reaching the river shoreline.

Should an oil spill occur at 100-N Area, the following actions should be followed:

- stop the flow of oil,
- contain the oil spill in order to prevent it from reaching the river, and
- notify Environmental Protection.

Environmental Protection will assess the oil spill and determine if remedial action is necessary. If needed, an oil spill response team will deploy oil spill control and clean-up equipment at the river shoreline to remove any oil that enters the river.

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1.0 INTRODUCTION

The Environmental Protection Agency (EPA) has issued regulations which are designed to prevent a hazardous quantity of oil from reaching the navigable waterways of the United States. As defined in 40 CFR Part 110, "Discharge of Oil", a spilled quantity of oil is determined hazardous if it would:

"(a) Violate applicable water quality standards, or

(b) Cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines."

A facility which could reasonably be expected to discharge a hazardous quantity of oil into or upon the navigable waters or adjoining shorelines of the United States must comply with the requirements found in 40 CFR Part 112, "Oil Pollution Prevention".

One of the requirements of 40 CFR Part 112 is to prepare an Oil Spill Prevention, Control, and Countermeasures Plan (referred to as an SPCC Plan). The SPCC Plan must be a written plan that includes the information specified in the regulation.

Bulk quantities of (1,445,000 gallons total capacity of Bunker C oil and 472,000 gallons total capacity of diesel oil) are stored at 100-N Area within approximately 800 feet of the Columbia River. Regulations therefore require that UNC Nuclear Industries prepare an SPCC Plan. This SPCC Plan will help prevent oil spills and will identify the appropriate spill control countermeasures necessary to provide adequate environmental protection.

2.0 OIL SYSTEMS AT 100-N AREA

Grade No. 6 (Bunker C) fuel oil and Grade No. 2 (diesel) oil are used at 100-N Area. Bunker C oil is used as fuel for the 184-N boilers. Diesel oil is used to fire the ignitors in the boilers and to fuel the diesel driven emergency low lift, high lift, and fog spray pumps.

Bunker C fuel oil is unloaded at the 1900-N unloading station and transferred through pumps in the 166-N building to the appropriate storage tank.

Bunker C fuel oil is stored in one 1,375,000 gallon capacity aboveground storage tank. This is the largest storage tank at 100-N Area. The tank is surrounded by an earthen berm capable of retaining approximately 2,300,000 gallons. Bunker C oil is transferred through underground lines to the two 184-N fuel oil day tanks. Each day tank has a capacity of 35,000 gallons. The tanks are surrounded by a cement retaining wall capable of containing the contents of both tanks. The fuel oil storage and transfer system is shown on Figure 2.1.

Diesel oil is unloaded at the 166-N unloading station and transferred through pumps in the 166-N building to the appropriate storage tank.

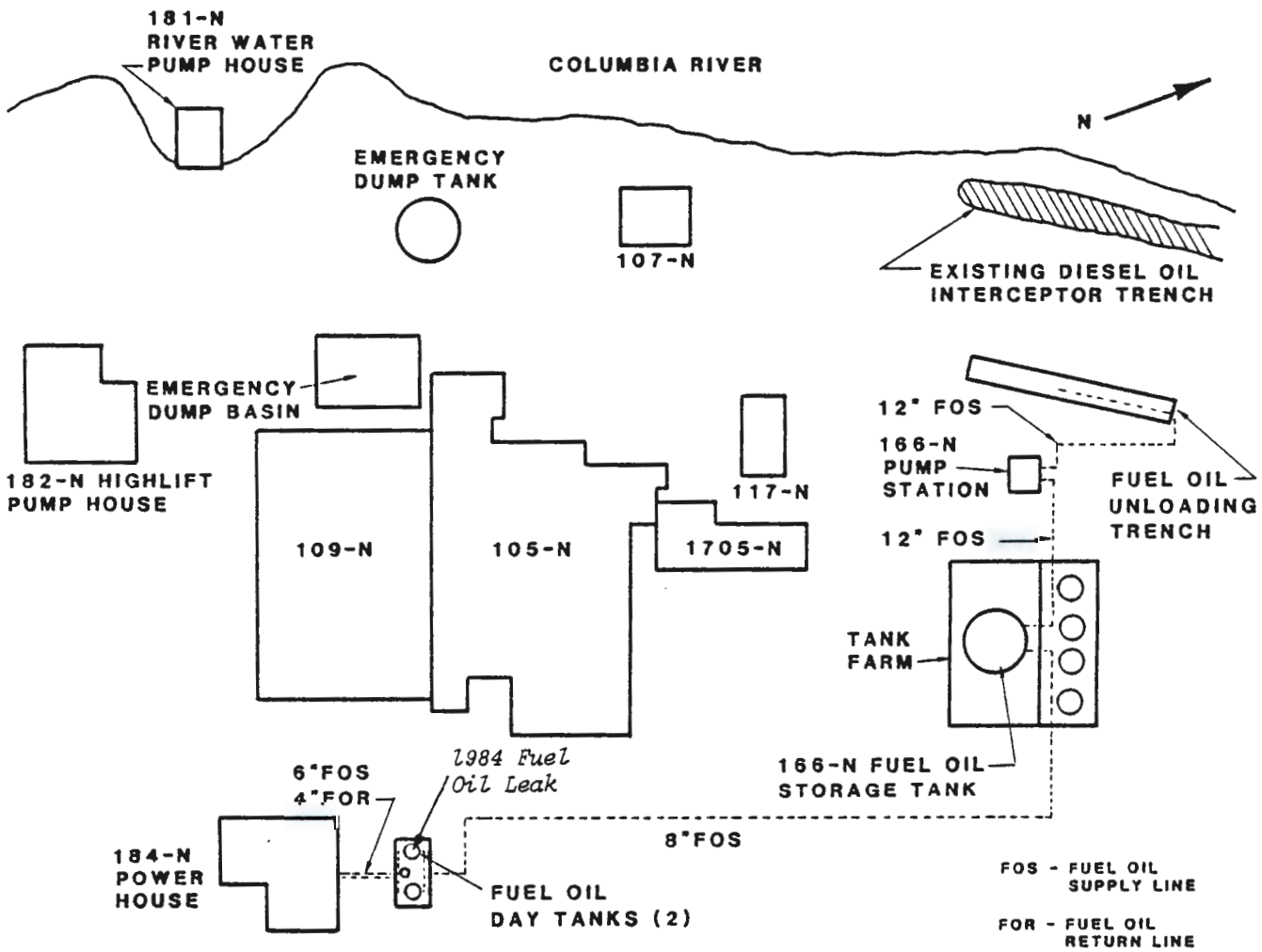

Figure 2.1 Fuel Oil Storage Tanks, Day Tanks, and Transfer Piping at 100-N Area

Diesel oil is stored in four aboveground storage tanks, each with a capacity of 105,000 gallons. The four storage tanks are located within an earthen berm capable of holding about 730,000 gallons.

Diesel oil is pumped or gravity fed through a four-inch underground supply line from the 166-N storage tanks to a 7,000 gallon capacity day tank outside of the 184-N building. The day tank is located adjacent to the fuel oil day tanks within the concrete retaining walls.

Diesel oil from the 166-N storage tanks is also transferred by gravity flow through two-inch and four-inch underground supply lines to three day tanks located outside of the 182-N building. Each 182-N underground day tank has a capacity of 15,000 gallons and supplies both the 182-N and 181-N diesel oil systems. The diesel oil storage and transfer system is shown on Figure 2.2.

UNC Process Standard B-215, "Emergency Cooling", requires that a minimum of 100,000 gallons of diesel oil is available to the 182-N day tanks. To accomplish this, the day tanks are maintained near capacity and two 166-N storage tanks are continuously kept on line to the day tanks.

All underground oil transfer piping is protected against corrosion. The transfer piping between the 1900-N unloading station and the 182-N/181-N diesel oil system is wrapped in tar and mastik ("coal tar enamel"). The remaining diesel oil transfer piping is encased in Gilsulate (asphalt based material) or Z-Crete (low density concrete). The four-inch fuel oil transfer lines are enclosed with a steam tracer line within PVC pipe.

Appendix B contains a summary of the oil systems at 100-N Area. The table also shows provisions UNC has taken to prevent and control accidental oil spills.

3.0 OIL SPILLS AT 100-N AREA

3.1 Diesel Oil Leak History

There have been three documented diesel oil leaks at 100-N Area, each having occurred in transfer piping. The worst leak occurred during 1966 in the four-inch supply line between the No. 4 diesel oil storage tank and the west dike enclosing the tanks. Corrosion from the outside of the pipe caused the pipe failure. The leak was detected when the discrepancy in the diesel oil inventory was discovered. By that time approximately 80,000 gallons of diesel oil had been spilled.

The diesel oil drained through the soil to ground water where it migrated to the Columbia River. A trench was excavated along the riverbank (see Figure 2.2) to intercept the oil before it could reach the river. Oil trapped in the trench was ignited and

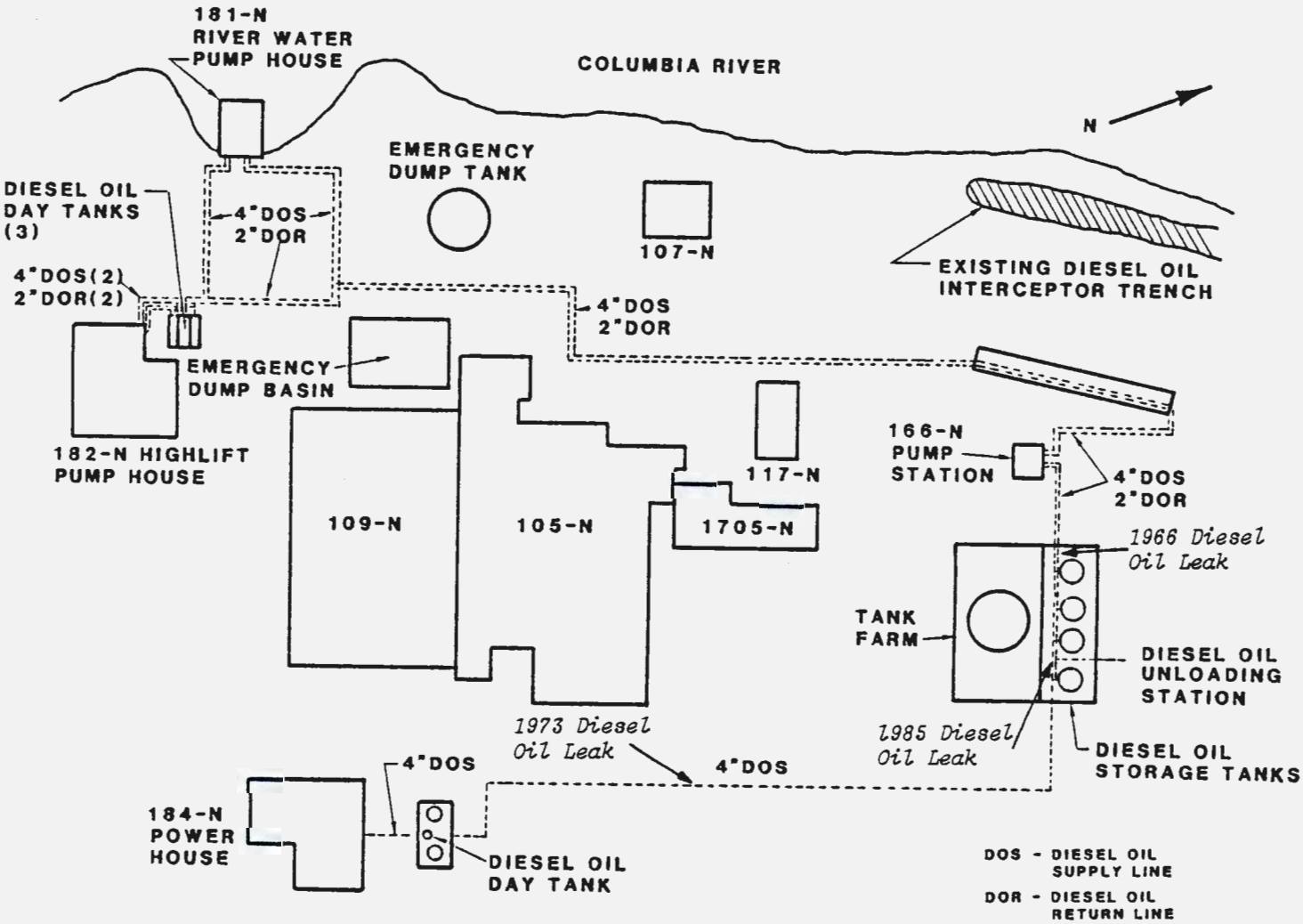

Figure 2.2 Diesel Oil Storage Tanks, Day Tanks, and Transfer Piping at 100-N Area

burned. A significant portion of the oil was thus removed before it could reach the river.

The other two diesel oil spills were minor by comparison. In 1973, a leak occurred in the four-inch supply line between the 166-N diesel oil storage tanks and the diesel oil day tank at 184-N. The leak was detected by a pressure test after approximately 200 gallons of diesel oil had been lost. Such a small amount of oil would absorb into the soil and be degraded by microbes.

In June, 1985, a leak was detected in the two-inch return line between the #1 and #2 diesel oil storage tanks. The leak was isolated and repaired the same day. Approximately 200 gallons of diesel oil were lost to the ground. Diesel oil was not detected in ground-water samples drawn from wells N-17, N-18, and N-19 (see figure 4.1). Again a small amount of oil such as this would be absorbed and degraded in the soil. As a result of this oil leak other portions of the two-inch return line will be inspected for integrity.

In addition to the three leaks discussed, small amounts of diesel oil are periodically spilled at the 166-N diesel oil loadout station. The spills (1 to 2 gallons each) occur when the tank-truck fill hoses are disconnected from the diesel oil receiving line. During February 1984, oil and grease concentrations in well N-17 (Figure 4.1), reached 17 parts per million. Catch basins were located at the facility and the oil and grease concentrations in N-17 returned to less than detectable levels (less than 1 ppm). Small amounts (less than 1 gallon) of diesel oil are still occassionally spilled to the ground in spite of the efforts taken to contain the oil.

3.2 Fuel Oil Leak History

During April 1984, approximately 2,000 gallons of No. 6 fuel oil were spilled outside of the 184-N building. The spill occurred when the 184-N fuel oil day tanks were over filled during oil transfer. The spill was caused by operator error. All of the fuel oil was contained within the surrounding retaining walls and did not penetrate the hard-packed sand bottom of the containment structure. The waste oil was immediately removed and disposed of.

Small amounts (2 to 3 gallons) of the No. 6 fuel oil are also occassionally spilled at the 1900-N fuel oil loadout station. These spills occur when the tank-truck fill hoses are disconnected from the loadout facility. Catch basins are being used to minimize the amount of oil spilled to the ground.

3.3 Drainage Around Oil Storage Facilities

Drainage around an oil storage tank is very important. Oil may either move over the surface (runoff) or percolate through the soil and move with ground-water flow.

There is little potential for oil at 100-N Area to reach the Columbia River by surface runoff. All oil storage tanks and day tanks are either located within adequately sized diked areas or are buried underground.

Oil spills at 100-N would instead absorb into the subsoil. Large amounts of diesel oil leaked to the ground would migrate through ground-water flow to the river as it did during the 1966 accident. It should be noted that a spill of that magnitude is probably no longer possible. Tank inventories are checked every two hours and the diesel oil inventory is calculated on a daily basis. Appropriate corrective actions would be initiated promptly if an inventory discrepancy was discovered.

Bunker C fuel oil leaked to the ground would congeal in the soil and become immobile.

3.4 Postulated Accidents Between the 166-N Storage Tanks and the 184-N Day Tank

The oil level in the 184-N diesel oil day tank is monitored by instruments located in the 184-N Control Room. The level instruments are equipped with annunciators that are set to alarm at a high level to prevent overfilling the tank and at a low level to indicate that refilling is necessary.

Postulated accidents that would result in the greatest loss of diesel oil between the 166-N diesel oil storage tanks and the 184-N day tank include the following: (1) Rupture of the 184-N day tank shortly after refilling, with total loss of the tank's contents, and (2) a complete break in the four-inch diesel oil supply line to the 184-N day tank during oil transfer.

Rupture of the 184-N day tank would result in a spill of approximately 7,000 gallons. The diesel oil would be contained within the surrounding retaining walls and would seep into the ground.

The second postulated accident would result in a spill oil of less than 7,000 gallons. Operators transfering oil between 166-N and 184-N check that the oil being pumped from the 166-N storage tank is received at the 184-N day tank. If the 184-N day tank is not receiving the oil the procedure would be terminated until the problem is located. Oil leaking from this second accident would also go directly to ground. Over a period of time, a major leak from either accident would seep through the soil column to the water table and travel to the river.

3.5 Postulated Accidents Between the 166-N Storage Tanks and 182-N Day Tanks

The postulated worst case accidents between the 166-N diesel oil storage tanks and 182-N day tanks include: (1) rupture of one storage tank with complete loss of contents, (2) a complete break in

the four-inch diesel oil supply line between the 166-N storage tanks and the 182-N day tanks, and (3) rupture of one day tank with complete loss of contents.

Rupture of one of the 166-N storage tanks would cause the contents to spill onto the ground within the confines of the surrounding earthen berm. The oil would seep into the ground and travel to the river with the ground water. This could result in a spill of 105,000 gallons, although the storage tanks are generally not filled to capacity.

A complete break in the four-inch diesel oil supply line between the 166-N storage tanks and the 182-N day tanks could result in a spill of the total required inventory. UNC Process Standard B-215 requires that 100,000 gallons of diesel oil must be available to the 182-N/181-N emergency diesel engines at all times.

A diesel oil spill of 100,000 gallons is unlikely. The combined capacity of the 182-N day tanks is 45,000 gallons. Since the supply lines enter the 182-N day tanks at the top, a pipe break would not drain the contents of the tanks. A complete break in the four-inch supply line could therefore spill all or part of the contents of the 166-N storage tanks on line at the time. This would probably be no more than 55,000 gallons.

Rupture of one of the 182-N day tanks could conceivably result in a spill of 70,000 gallons. A total loss of the contents of one 182-N day tank would result in a spill of 15,000 gallons. Since the day tanks are kept on line with the 166-N storage tanks, all or part of the contents of the storage tank(s) on line could also be spilled. The leaked oil would percolate to the water table and travel with ground-water to the river.

The most probable cause of a complete break in a oil pipeline would be by excavating near the underground line. Although this type of accident is possible, it is unlikely. All construction is extensively reviewed before an excavation permit is issued in order to avoid disturbing underground lines. Should an oil pipeline be broken, the operators performing the work should be able to detect the oil leak and take steps to isolate the oil line. In addition, a pipe severed in this manner usually is crimped on the broken end, further restricting the flow. The total loss of oil from an oil line broken in this manner should not be large.

Complete loss of storage tank and day tank inventories should also be unlikely. Tank inventories are checked every two hours. In order to lose the maximum amount of oil, a pipe break or tank rupture would have to occur immediately after an inventory check. It is unlikely that a pipe break or tank leak would totally drain a storage tank before the next inventory was taken.

4.0 OIL DETECTION AND SPILL CONTROL

4.1 Oil Detection Equipment

UNC investigated the movement of diesel oil through soil and ground water in 1980. The results of the investigation are documented in UNI-1523, "Geohydrologic Behavior of Oil Related to the Use of Ground-Water Wells for Diesel Oil Detection." The study showed that oil reaching the water table will migrate with ground water either on the surface or above it in an area called the "capillary fringe." Ground water will always seek a region of lowest water pressure (potential) and will therefore accumulate in any void in the soil. A well drilled into the subsoil will create such a void. Oil traveling with the ground water will also accumulate in a ground-water well. The study included a computer model of N-Area ground-water characteristics. It was concluded that oil detector wells would be a reliable method of monitoring diesel oil concentrations in N-Area ground water. The ground-water flow paths and travel times calculated by the study are shown in Appendix A.

Diesel oil detector wells were drilled at 100-N Area in 1981. The wells are spaced approximately 150 feet apart. The average depth to the water table at 100-N Area is about 60 feet. Figure 4.1 shows the oil detector well locations.

The detector wells are routinely sampled using a "surface sampler" manufactured by Oil Recovery Systems, Inc. The surface sampler consists of a plexiglass tube with a ball float-valve at the bottom designed to obtain a surface profile sample of the ground water.

The sampling schedule of the detector wells is shown below.

biweekly	monthly	bimonthly
N-24, N-25	N-17, N-18, N-19 N-20, N-21, N-22 N-23, N-26	N-16

A one-quart sample from each scheduled well is collected in a glass container and analyzed for oil and grease concentrations. The results of these analyses are documented and tracked.

The diesel oil detector wells have proven to be very reliable in monitoring even small quantities of oil spilled to the ground. The oil spills occurring during oil unloading discussed in Section 3.1 were first discovered using these analyses.

Several drainage sumps in the 184-N, 109-N, and 105-N buildings discharge directly to the Columbia River. Sump oil detectors have been installed in order to monitor oil levels. The oil can then

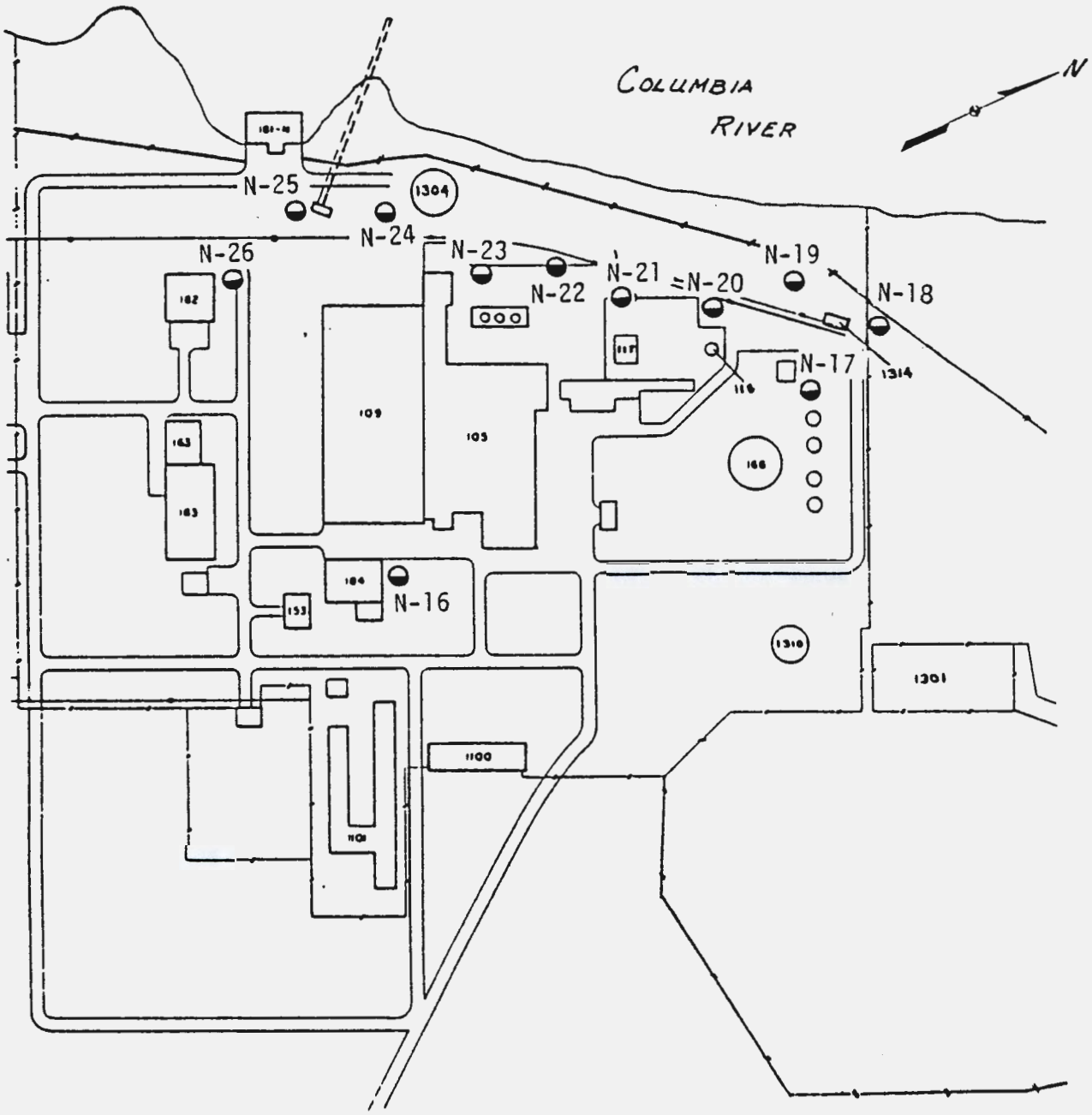

Figure 4.1 Location of Diesel Oil Detector Wells at 100-N Area

be removed from the sump before it reaches the river. Sump oil detectors are located in the following sumps:

- - 16 foot level, 109-N, drainage sumps No. 7, 8, 9,
- - 16 foot level, 109-N, gravity sump in the No. 6 drive turbine area,
- 0 foot level, 184-N, drainage sump, and
- 105-N lift station sump.

The sump oil detectors float on the surface of the water. Two electrodes are positioned on the buoyant detector. An electric current passes through the sump water between the two electrodes and holds a relay closed. Oil entering the sump would decrease the conductivity, opening the relay and causing the detector to annunciate. The same results occur if the floats stick and the electrodes become exposed to air.

The sump oil detectors in the 109-N building annunciate at Turbine Bay Panels 1, 2, and 3. The lift station detector annunciates in the 105-N control room and the 184-N sump oil detector annunciates in the 184-N control room.

The drainage sumps are also equipped with oil sorbent pillows. The sorbent pillows are left floating in the sumps to absorb any oil that might inadvertently enter the sump. These sorbent pillows are also used to remove excess amounts of oil indicated by the oil level detectors and annunciators.

4.2 Spill Control Equipment

To control and remove an oil spill entering the Columbia River, the following equipment is stored at 100-N Area:

- 150 foot oil spill containment boom,
- oil sorbent pads, and
- oil sorbent sheets.

The oil spill containment boom is equipped with a net skirt which is weighted at the bottom. This design allows stability of the boom when it is placed perpendicular to the flow of the river. Oil on the water surface will collect on the upstream side of the boom. The oil sorbent material will be used to selectively absorb and remove the oil without sorbing water. This material is capable of sorbing 13-25 times its weight of oil.

The oil clean-up equipment stored at 100-N Area is adequate as a response to small oil spills at the riverbank or for the first phase of cleaning up major oil spills. If a major spill of diesel oil occured at 100-N Area, outside agencies such as private oil

pollution clean-up companies and/or the United States Coast Guard would be brought in to remove the oil from the river.

4.3 Equipment Maintenance Standards

The Equipment Maintenance Standards (EMS) program provides testing and inspection procedures in order to maintain critical equipment at a level of operational reliability. The EMS system safeguards against accidents, preserves the life of the equipment, and helps to avoid major interruptions to production. EMS procedures are included where applicable in the description of specific oil systems in Appendix B and are listed in Appendix C.

5.0 UNC RESPONSE TO OIL SPILLS

Should an oil spill occur at 100-N Area, the following is a summary of actions that should be followed.

First Action - If possible, the first action should always be to stop the flow of oil.

Second Action - The second action should be to contain the oil spill to prevent oil from reaching the river.

Third Action - The Environmental Protection subsection should be immediately notified of the spill.

Fourth Action - Environmental Protection will assess the oil spill and determine if remedial action is necessary.

Fifth Action - If necessary, an oil spill response team (led by Environmental Protection) will deploy oil spill containment and clean-up equipment at the river shoreline in order to contain and remove oil that enters the river.

5.1 Stop the Flow of Oil

Stopping the flow of oil during an accidental spill may involve closing a valve to isolate an underground oil line, shutting off a pump to stop oil transfer, or some other similar action. The first line supervisor associated with the facility should decide upon the appropriate corrective action needed to stop the oil flow and should implement that action immediately.

5.2 Contain the Oil Spill

Containing oil spilling from storage tanks or day tanks at 100-N Area should be fairly simple as these tanks are either surrounded by secondary containment devices (retaining walls, berms) or are buried underground. However, certain situations may arise, such as an oil spill near the 181-N building, where oil could flow over the ground surface and into the river. Constructing temporary dikes, pits, or

similar actions is appropriate and should be implemented in order to prevent oil from draining directly to the river.

The environmental impact of oil sorbing into the soil and subsoil is minor compared to the impact of oil directly entering the Columbia River. For this reason it is always preferable to divert an oil spill to the ground rather than to the river. Oil spilled to ground may reach the water table (if the oil volume is large enough) and enter the river along the shoreline. Such a spill would normally take at least two weeks (see Appendix A) to reach the river, allowing UNC adequate time to deploy oil spill clean-up equipment at the riverbank and remove the oil as it entered the river.

5.3 Notify Environmental Protection

After appropriate actions have been taken to stop the flow of oil and contain the spill, the 100-N shift manager shall be promptly notified. As described in Process Standard D-405, "Oil Spill Prevention and Control", if an oil spill has entered the Columbia River the shift manager shall immediately notify the Environmental Protection subsection or the management representative during off shift hours.

In addition, Environmental Protection shall be notified immediately of any oil spill to ground of over 1,000 gallons. If the oil spill does not enter the river or is less than 1,000 gallons to the ground, Environmental Protection shall be notified during work hours. If appropriate, the notifications prescribed in Guide J, "Significant Environmental Release" or UNI-M-2, Volume 2, "Emergency Response Guides" should be made.

5.4 Assessing the Severity of the Oil Spill

After being notified of an oil spill, Environmental Protection will assess the severity of the spill and determine what remedial actions, if any, are appropriate. Small amounts of oil would be trapped in the soil column and degraded to an innocuous state by soil microbes. As demonstrated by the major oil spill in 1966, large amounts of diesel oil will percolate to the water table and migrate to the river.

5.5 Cleaning Up the Oil Spill

In the event of a major oil spill, it may be necessary to remove oil from the river along the shoreline. Environmental Protection would form an oil spill response team to control the spill and clean up the oil. The oil spill response team would be supervised by the environmental engineer responsible for UNC oil spill control programs. The team would also consist of three or four personnel from the N Plant Operations and/or N Plant Maintenance sections.

The oil spill response team would be responsible for deploying the containment boom in the river in an effort to trap oil against the shoreline. After trapping the oil the response team would remove

the oil from the river by using oil-selective absorbent materials. After the oil is removed from the river, a portion of the shoreline may be contaminated with oil. The contaminated areas of shoreline would then be removed by the reponse team.

The oil spill reponse equipment (boom and oil absorbent materials) would only be effective for removing small amounts of oil from the river. Should a major oil spill occur, help from outside agencies would be needed to clean up the oil. The Coast Guard could provide this help. Crowley Environmental Services, a company that specializes in cleaning up of oil spills, has a branch office in Pasco, Washington (Crowley Maritime Corporation) and could also be notified to provide special services. Most of the equipment that would be needed to control and clean up oil in the river near 100-N Area is located at the Pasco office.

5.6 Follow-up Actions

After an oil spill has been cleaned up by an oil spill response team and/or an outside agency, Environmental Protection will document the extent and impact of the spill. The description will include the cause of the spill, the procedure used to clean up the spill, an assessment of the environmental impact resulting from the spill, and corrective actions aimed at preventing similar spills.

APPENDIX A

100-N AREA GROUND-WATER FLOW PATHS AND TRAVEL TIMES

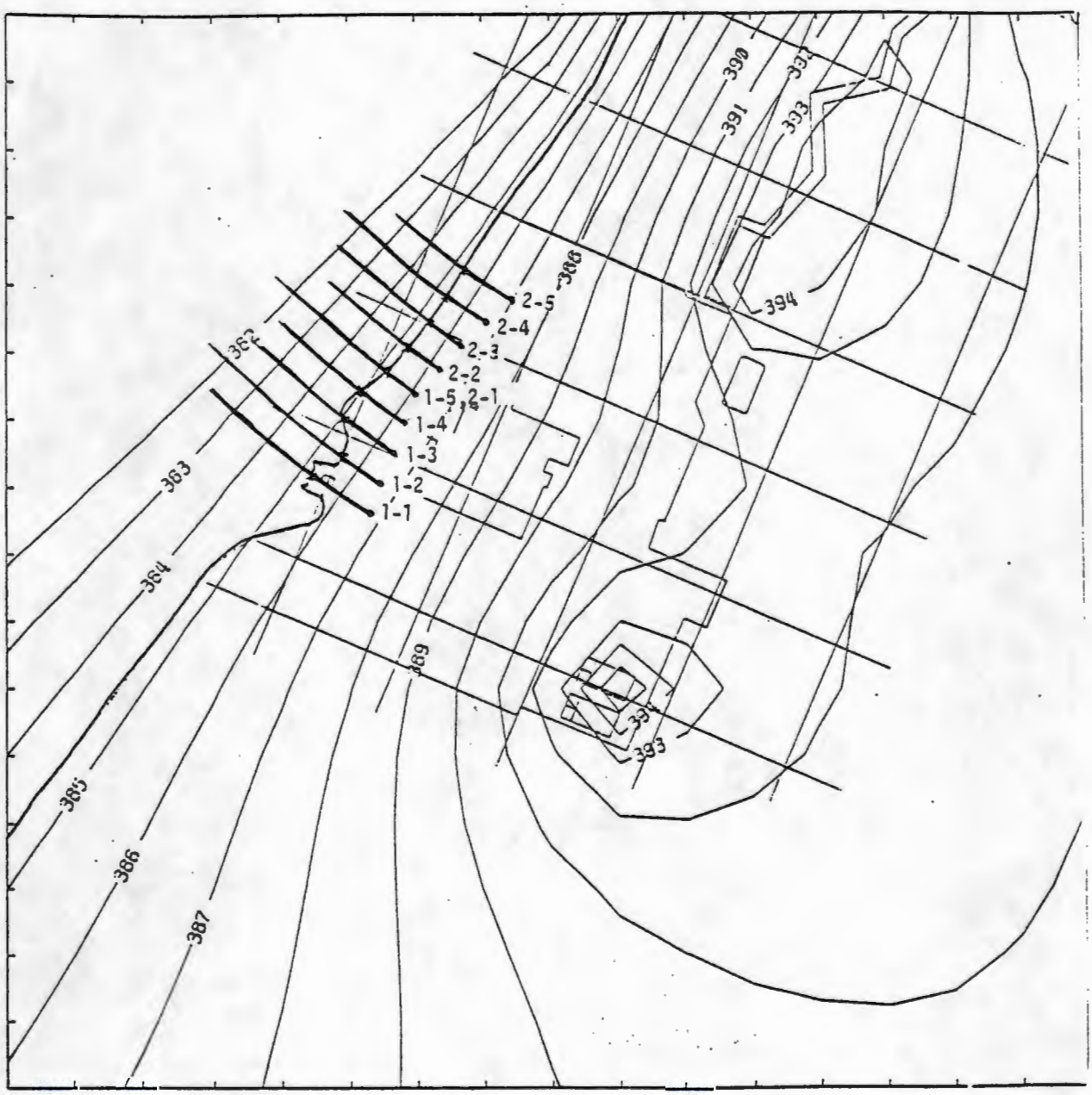

FIGURE 1. Predicted Surface and Ground-Water Flow Paths for Streamlines Starting Near the 182-N Diesel Oil Day Tanks and Transfer Lines.

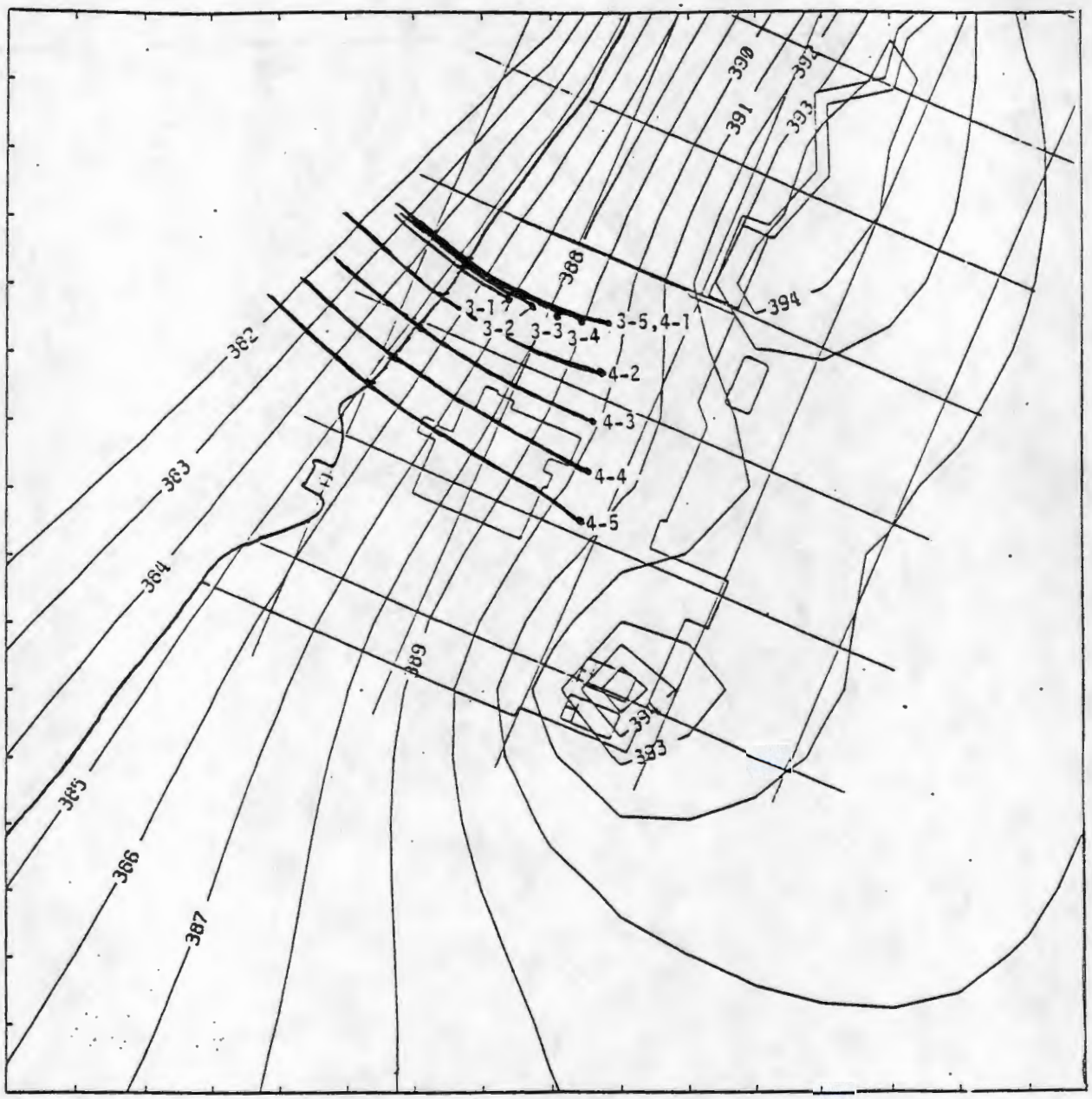

FIGURE 2. Predicted Surface and Ground-Water Flow Paths for Streamlines Starting Near the 166-N Diesel Oil Storage Tanks and Transfer Lines.

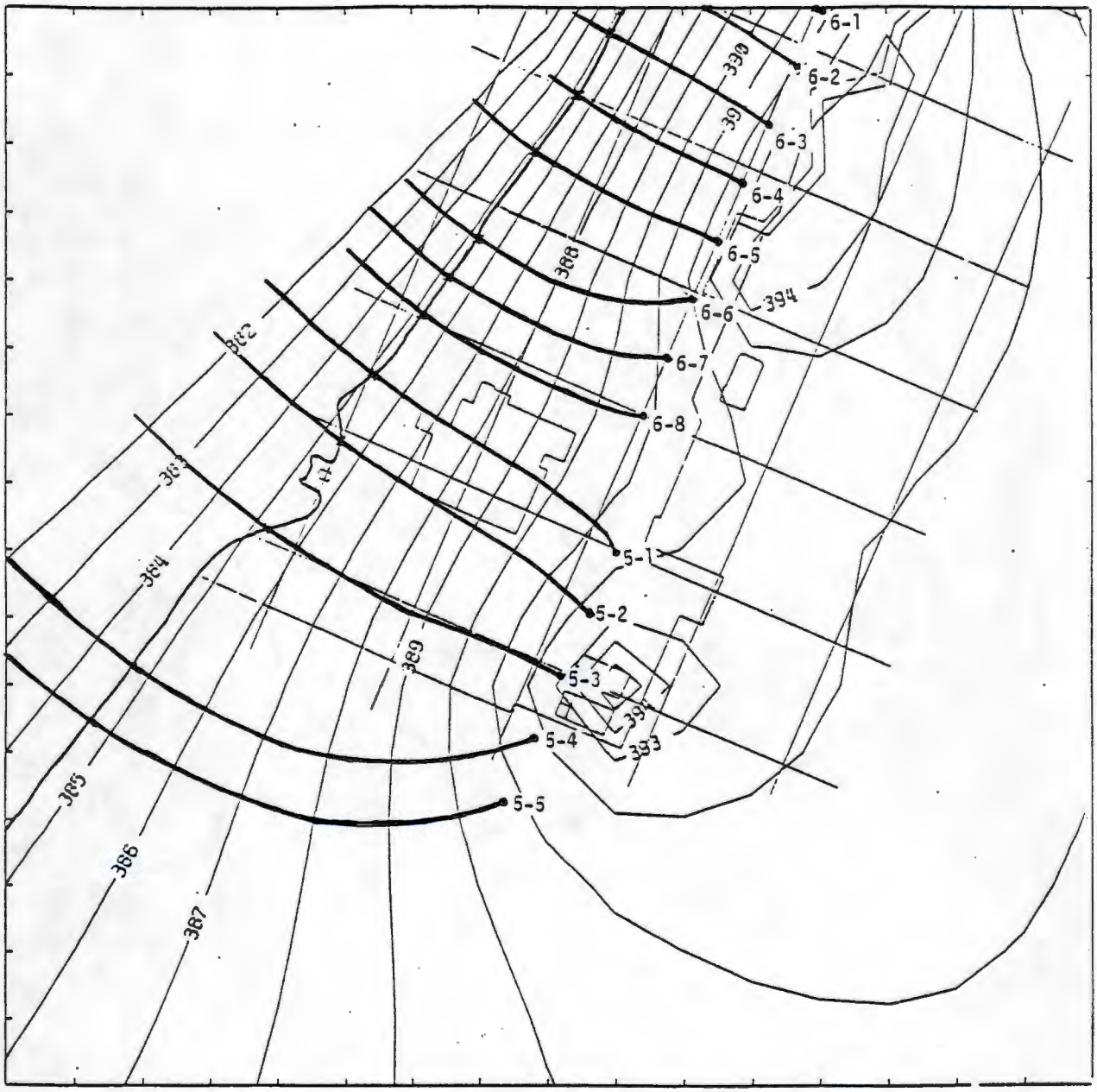

FIGURE 3. Predicted Surface and Ground-Water Flow Paths for Streamlines Starting Near the 100-N Area Liquid Waste Disposal Facilities.

TABLE 1.A. Approximate Streamline Distances and Travel Times to the Columbia River

Streamline Number	Distance (feet)	Travel Time (days)
1-1	200	17
1-2	200	16
1-3	250	19
1-4	200	15
1-5, 2-1	125	8
2-2, 2-3	150	9
2-4	185	10
2-5, 3-1	200	10
3-2	250	19
3-3	325	23
3-4	475	26
3-5, 4-1	625	34
4-2	650	38
4-3	725	50
4-4	800	63
4-5	925	76
5-1	1125	84
5-2	1100	83
5-3	1225	114
5-4	1575	243
5-5	1625	295
6-3	675	18
6-4	700	23
6-5	750	26
6-6	890	43
6-7	875	57
6-8	900	69

APPENDIX B

100-N AREA OIL SYSTEMS

Oil storage system or facility	Spills in the past 3 years	Predicted direction of spill, rate of flow, and probable spill quantity	Spill containment or detection capabilities	Conformance to guidelines in 40 CFR 112.7	
1900-N Fuel Oil Unloading Station	Occasional spills during loadout-2-3 gallons.	Spill would flow into concrete trench. Overflow would spill to the surrounding soil. Rate of flow and spill quantity depends on type of leak.	Lines at the unloading station are contained in a concrete trench. Catch bucket for transfer hose spills.	Routine inspections at 2 hour intervals. Unloading lines are leak checked at least 3 times per year. Operator on duty when unloading fuel oil.	Visual inspection of uncovered portion of trench when unloading oil. This system has been backflow checked in both directions and all unused unloading stations have been capped oil tight.
166-N Diesel Oil Unloading Station	Occasional spills during loadout-1-2 gallons.	Spill would flow into catch basin. Overflow would spill to the surrounding soil.	Unloading line is capped and drained after use. Catch bucket for transfer hose spills.	Routine inspections at 2 hour intervals. Unloading lines are leak checked at least 3 times per year. Operator on duty when unloading diesel oil.	
100-N Underground Fuel Oil and Diesel Oil Transfer Lines	One - 1985. Estimated 200 gallons to ground.	Fuel oil would congeal and be held up in the soil column. Diesel oil would flow down into the subsoil. Rate of flow and spill quantity depends on type of leak.	Major spill to ground would be detected by diesel oil detector wells.	Annual pressure testing. Diesel oil daily inventory analysis. Routine inspection at 2 hour intervals.	Pressure testing and visual inspection of the 166-N Diesel Oil Return lines.
166-N No. 6 Oil Storage Tank. (One above-ground tank with 1,375,000 gallon capacity)	None	Spill would flow into subsoil where the heavy fuel oil would congeal and become trapped in the soil column. Rate of flow depends on type of leak. Maximum probable spill: 1,000,000 gallons.	Tank surrounded by 2,300,000 gallon capacity earthen berm.	Routine inspection at 2 hour intervals. Fuel oil daily inventory analysis. Drain valves locked closed. Operator on duty when receiving oil or transferring oil.	Pump house locked. Open drip valves are installed in the steam heating valve trap system to indicate minor leaks in the heat exchanger system. Tank oil pressure is higher than the steam pressure allowing quick detection of minor oil leaks 3 month inspection of level indicator and tank.

100-N AREA OIL SYSTEMS (cont.)

Oil storage system or facility	Spills in the past 3 years	Predicted direction of spill, rate of flow, and probable spill quantity	Spill containment or detection capabilities	Conformance to guidelines in 40 CFR 112.7	
166-N Diesel Oil Storage Tanks. (Four above-ground tanks with 105,000 gallon capacity each)	None	Spill would flow down into subsoil. Rate of flow depends on type of leak. Maximum probable spill: 100,000 gallons.	All tanks surrounded by a 730,000 gallon capacity earthen berm. Major spill to ground would be detected by diesel oil detector wells.	Routine inspections at 2 hour intervals. Tank level recorded at 2 hour intervals. Diesel oil daily inventory analysis. Drain valves locked closed. 5 year internal inspection.	Operator on duty when receiving or transferring oil. Pump house locked.
184-N Fuel Oil Day Tanks. (Two tanks above ground with 35,000 gallon capacity each)	One-1984 Estimated 2,000 gallons were contained and removed.	Spill flows down into subsoil where it would congeal. Rate of flow depends on type of leak. Maximum probable spill: 25,000 gallons.	Tanks surrounded by concrete retainer. Compacted subsoil under tanks.	Routine inspection at 2 hour intervals. Tank levels are recorded by 184-N Control Room Operator at 2 hour intervals. Fuel oil daily inventory analysis. Annual inspection of level indicators.	Operator on duty when transferring oil to day tanks. Open drip valves are installed on steam heating coil trap system.
184-N Diesel Oil Day Tank. (One above-ground tank with 7,000 gallon capacity)	None	Spill would flow down into subsoil. Rate of flow depends on type of leak. Maximum probable spill: 6,500 gallons.	Tanks surrounded by concrete retainer. Compacted subsoil under tanks. Major spill to ground would be detected by diesel oil detector wells.	Routine inspection at 2 hour intervals. Tank level recorded by 184-N Control Room Operator at 2 hour intervals. Diesel oil daily inventory analysis.	Communications with pump house operator during transfer. 5 year internal inspection.
182-N Diesel Oil Day Tanks (Three underground tanks with 15,000 gallon capacity each)	None	Spill would flow into subsoil. Rate of flow depends on type of leak. Maximum probable spill: 15,000 gallons.	Major spill to ground would be detected by diesel oil detector wells.	Routine inspection at 2 hour intervals. Tank level recorded at 2 hour intervals. Diesel oil daily inventory analysis. Remote tank level indicators and annunciators are located in 182-N control room.	5 year internal inspection.

100-N AREA OIL SYSTMES (cont.)

Oil storage system or facility	Spills in the past 3 years	Predicted direction of spill, rate of flow, and probable spill quantity	Spill containment or detection capabilities	Conformance to guidelines in 40 CFR 112.7
182-N Fire System & Diesel Generator Day Tanks. (Two tanks at ground level with 360 gallon capacity each)	None	Spill would flow down into subsoil. Rate of flow depends on type of leak. Maximum probable spill: 360 gallons.	Major spill to ground would be detected by diesel oil detector wells.	Routine inspection at 2 hour intervals. Tanks included in the daily inventory analysis. Operator on duty when transferring oil to tanks.
Lift Station Diesel Oil Storage Tank. (One 5,000 gallon capacity underground storage tank)	None	Spill would flow down into subsoil. Rate of flow depends on type of leak. Maximum probable spill: 2,500 gallons.	Major spill to ground would be detected by diesel oil detector wells.	Routine inspections twice per shift. Monthly inspection of diesel oil storage tank.
153-N 10 MVA Transformers. (Two transformers with 1,730 gallon capacity each)	None	Spill would collect in the soil adjacent to the transformers. Rate of flow depends on type of leak. Maximum probable spill: 1,600 gallons	Major spill to ground would be detected by diesel oil detector wells.	Routine inspections at 2 hour intervals. High temperature or low oil level conditions will annunciate in the 184-N control room. Transformers enclosed in locked area.
Hydraulic Oil Power Pack Reservoirs for the HPV-201 & HPV-6261 valves. (8 reservoirs @ 75 gallons each and 8 reservoirs @ 100 gallons each- total capacity approximately 1,400 gallons)	None	Spills would collect on 109-N roof and flow to a roof drain header that routes effluent to 66-inch line that discharges to the river. Rate of flow depends on type of leak. Maximum probable spill: 75 gallons.	Absorbent material placed on 109-N roof around drains and under leaking reservoirs.	Routine inspection at least once per shift. 6 month inspection of HPV-201 and HPV-6261.

100-N AREA OIL SYSTEMS (cont.)

Oil storage system or facility	Spills in the past 3 years	Predicted direction of spill, rate of flow, and probable spill quantity	Spill containment or detection capabilities	Conformance to guidelines in 40 CFR 112.7
Waste Oil Collection System. (Tank No. 1 - 550 gallon capacity tank at 182-N) (Tank No. 2 - 280 gallon capacity at 182-N)	None	Spill at tank 1 would congeal in subsoil. Rate of flow depends on type of leak. Maximum probable spill: 500 gallons	Tank 2 is on a curbed concrete catch basin.	Routine inspections at 2 hour intervals. Dipstick level indicators.
105-N Room 7, Hydraulic Oil Power Pack Reservoir for the R Elevator. (Reservoir has 500 gallon capacity.)	None	Spill would be collected in floor drains and routed to lift station via drain system No. 13. Rate of flow depends on type of leak. Maximum probable spill: 400 gallons.	Lift station equipped with sump oil detector and annunciator. Oil in lift station removed with oil-selective absorbent.	Routine inspection of Room 7 twice per shift. Reservoir and power pack inspected weekly. Reservoir equipped with level indicator. Oil sump indicator annunciates in 105-N control room.
Confinement Valve Hydraulic Oil Power Packs. (1- 105N, Rm.30 2- 109N, 24 ft level 60 gallon capacity each)	None	105-N: Spill would collect on floor or in the room 30 sump. 109-N: No floor drains in vicinity of power packs. Spill would collect on floor. Rate of flow depends on type of leak. Maximum probable spill: 60 gallons.	Spills would be contained within the 105N and 109N buildings.	Routine inspections twice per shift. Monthly inspection of hydraulic power packs.
105-N, Room 30 Soluble Oil Tank with 225 gallon capacity.	None	Spill would collect on floor or in the room 30 sump. Rate of flow depends on type of leak. Maximum probable spill: 200 gallons.	Collection sump and drip pans in room 30. Spill confined to room 30.	Routine inspections twice per shift. All floor drains plugged. Level indicator at the tank.

100-N AREA OIL SYSTEMS (cont.)

Oil storage system or facility	Spills in the past 3 years	Predicted direction of spill, rate of flow, and probable spill quantity	Spill containment or detection capabilities		Conformance to guidelines in 40 CFR 112.7
105-N, Room 30 Hydraulic Oil Power Packs for C, D, and W Platforms. (Two 3,000 gallon capacity reservoirs and two 1,580 gallon capacity reservoirs)	None	Spill would collect on floor or in room 30 sump. Rate of flow depends on type of leak. Maximum probable spill: 2,500 gallons.	Room 30 sump has 1,700 gallon capacity. Spill confined to room 30.	Routine inspections twice per shift. All floor drains plugged. All reservoirs equipped with level indicators.	Annual inspection of C, D, and W platform power packs.
Control Rod Hydraulic Oil Power Pack Reservoirs. (One 180 gallon capacity reservoir in each outer rod room)	None	Spill would collect in catch basin, on floor, or enter drain system No. 14 and be routed to the lift station. Rate of flow depends on type of leak. Maximum probable spill: 50 gallons.	Curbing around hydraulic oil pumps and reservoirs in outer rod rooms. Lift station equipped with sump oil detector and annunciator.	Routine inspections twice per shift. Outer rod room doors locked. Trouble in the oil systems in the outer rod rooms will annunciate locally and in the 105-N control room.	Annual leak check of hydraulic oil power packs.
105-N, Room 51 Hydraulic Oil Power Pack Reservoir for F Elevator. (Reservoir with 500 gallon capacity.)	None	Spill would collect in elevator pit. Rate of flow depends on type of leak. Maximum probable spill: 400 gallons.	Spills confined to elevator pit.	Reservoir and power pack inspected weekly. Reservoir equipped with level indicator.	No drains installed in elevator pit.
105-N Hydraulic Oil Power Pack Reservoir for S Elevator. (Reservoir with 1,110 gallon capacity)	None	Spill would collect in room 30 sump. Rate of flow depends on type of leak. Maximum probable spill: 1,000 gallons.	Oil spills confined to room 30.	Reservoir and power pack inspected weekly. Reservoir equipped with level indicator.	
109-N Drive Turbine Lube Oil Storage. (Two tanks with 500 gallon capacity each)	None	Spill would be collected by floor drains and routed to drainage sumps. Sumps discharge to river. Rate of flow depends on type of spill. Maximum probable spill: 500 gallons.	109-N sumps are equipped with sump oil detectors and annunciators. Oil removed from sumps with oil-selective absorbent.	Routine inspection of tanks at least once per shift. Tanks are equipped with level indicators. Sump oil detectors annunciate at Turbine Bay Annunciator Panels.	6 month inspection of drive turbine lubricating oil system.

100-N AREA OIL SYSTEMS (cont.)

Oil storage system or facility	Spills in the past 3 years	Predicted direction of spill, rate of flow, and probable spill quantity	Spill containment or detection capabilities	Conformance to guidelines in 40 CFR 112.7	
109-N Drive Turbine Hydraulic and Lube Oil System Reservoirs. (Six tanks with 500 gallon capacity each)	None	Spill would be collected by floor drains and routed to drainage sumps. Sumps discharge to river. Rate of flow depends on type of leak. Maximum probable spill: 500 gallons.	109-N sumps are equipped with sump oil detectors and annunciators. Oil removed from sumps with oil-selective absorbent.	Routine inspection of tanks at least once per shift. Tanks are equipped with level indicators. Sump oil detectors annunciate at Turbine Bay Annunciator Panels.	6 month inspection of drive turbine lubricating oil system.
109-N Freight Elevator Hydraulic Oil Power Pack Reservoir. (Reservoir with 273 gallon capacity)	None	Spill would collect on floor around the power pack and in the elevator pit. Rate of flow depends on type of leak. Maximum probable spill: 200 gallons.	Oil spills would be confined to elevator pit and floor area.	Routine inspection at least once per shift. No drains installed in elevator pit. Reservoir equipped with level indicator.	
117-N Hydraulic Oil Power Pack for Back-up to the Filter Cell Gates. (Reservoir with 200 gallon capacity)	None	Spill would collect in floor drains and route to 1325N Liquid Waste Facility. Rate of flow depends on type of leak. Maximum probable spill: 175 gallons.	1325-N crib is isolated from the river. Major spill would be detected by diesel oil detector wells.	Routine inspections twice per shift.	Monthly inspection of hydraulic power packs.
184-N Turbine Generator Hydraulic and Lube Oil Reservoir & Storage Tank. (1200 gallon capacity)	None	Spill would flow into floor drains which discharge to drainage collection sump. Sump discharges to river. Rate of flow depends on type of leak. Maximum probable spill: 1,200 gallons.	Dike around tanks. Sump equipped with sump oil detector and annunciator. Oil removed from sump with oil-selective absorbent.	Routine inspection at 2 hour intervals. Low and high level indicator and annunciation on the reservoir. Drain valves are locked closed. Sump oil detector annunciates in 184-N control room.	

100-N AREA OIL SYSTEMS (cont.)

Oil storage system or facility	Spills in the past 3 years	Predicted direction of spill, rate of flow, and probable spill quantity	Spill containment or detection capabilities	Conformance to guidelines in 40 CFR 112.7
Diesel Lube Oil Storage Tanks. (One 80 gallon capacity tank at 182-N, one 80 gallon capacity tank at 181-N)	None	182-N: Spill would flow into catch pans. Overflow would enter pipe trench and be discharged to river. 181-N: Spill would flow onto floor, be collected by floor drains, and be routed to a drywell. Rate of flow depends on type of leak. Maximum probable spill: 60 gallons.	182-N: Catch pans 181-N: Floor drains diverted to drywell north of the pumphouse.	Routine inspections at 2 hour intervals. 181-N doors kept locked. Level indicators at both tanks.
1734-N Lube Oil Storage. (Estimated 3,000 gallon capacity stored in 55 gallon drums)	None	Spill would collect on pad. Rate of flow depends on type of leak. Maximum probable spill: 55 gallons.	Curbing around the concrete pad. Drains are plugged.	Routine inspections once per shift.
CRW Pump Discharge Valve Hydraulic Oil Power Packs outside 181-N. (Two oil storage reservoirs @ 110 gallons each)	None	Spill would flow into basin around power packs. Rate of flow depends on type of leak. Maximum probable spill: 55 gallons.	Oil would collect around power packs.	Routine inspection at 2 hour intervals. 181-N doors kept locked.
Elevator Plunger Seal Leakage Tank. (5000 gallon capacity tank)	None	Spill would collect on floor and in the lift station. Rate of flow depends on type of leak. Maximum probable spill: 5000 gallons.	Lift station equipped with sump oil detector and annunciator. Oil removed from lift station with oil-selective absorbent.	Routine inspections twice per shift. Oil sump detector in lift station annunciates in 105-N control room.

100-N AREA OIL SYSTEMS (cont.)

Oil storage system or facility	Spills in the past 3 years	Predicted direction of spill, rate of flow, and probable spill quantity	Spill containment or detection capabilities	Conformance to guidelines in 40 CFR 112.7
Turbine Oil Leakage Drain Tanks. (Six tanks @ 55 gallons each)	None	Spill would be routed to the 1325-N Liquid Waste Facility. Rate of flow depends on type of leak. Maximum probable spill: 55 gallons.	1325-N is isolated from the river. Major spill would be detected by diesel oil detector wells.	Routine inspections twice per shift.
190-B Waste Oil Storage. (450 drums of waste oil awaiting disposal - total of 24,750 gallons)	None	Spills would collect on the floor of the 190-B building. Rate of flow depends on type of leak. Probable spill quantity: less than 55 gallons.	Storage rooms at 190-B have been diked and sealed. This facility is being used as temporary storage only.	Curbing has been sealed from the inside. Routine inspections.

APPENDIX C

EQUIPMENT MAINTENANCE STANDARDS

The following is a list of Equipment Maintenance Standards (EMS) associated with the oil systems at 100-N Area.

EMS Number	TITLE
N119M-3M-4	Annual Inspection of Hydraulic Power Supply Units.
N201M-5Y-1	5 Year Internal Inspection of 166-N Diesel Oil Storage Tanks.
N201M-5Y-2	5 Year Internal Inspection of 182-N Diesel Oil Day Tanks.
N206M-6M-3	6 Month Inspection of Drive Turbine Lubricating Oil System.
N208M-6M-5	6 Month Inspection of HPV-201.
N208M-6M-6	6 Month Inspection of HPV-6261.
N209I-3M-4	3 Month Inspection of 166-N No. 6 Fuel Oil Tank Level Indicator.
N209I-1Y-10	Annual Inspection of Remote Tank Level Indicators.
N601M-1Y-4	Annual Inspection of C, D, and W Platform Power Packs.
N603M-1M-2	Monthly Inspection of Hydraulic Power Packs.
N621M-3M-1	Monthly Inspection of Lift Station Diesel Engines and Diesel Oil Storage Tank.

APPENDIX D

OIL HANDLING PROCEDURES

The following is a list of procedures associated with oil handling at 100-N Area. These procedures are formally issued and controlled by the Training and Procedures Section of UNC.

Procedure Number	TITLE
II-17-1	Operate 184-N Ignition Oil System.
II-17-2	Isolate and Drain Diesel Oil Storage Tank for Inspection or Maintenance.
II-17-3	Unload Diesel Oil to Storage Tanks via 166-N.
I-17-4	Test Underground Diesel Oil Lines for Leaks.
II-17-7	Transfer Diesel Oil from Storage Tanks to 184-N Ignition Oil Day Tank via Booster/Transfer Pump Piping.
II-17-8	Unload Diesel Oil to Storage Tanks via DOSV-700.
II-17-9	Transfer Diesel Oil from Storage Tanks to 184-N Ignition Oil Day Tank via 166-N Pumps and Piping.
17-10	Isolate, Drain, and Return to Normal Diesel Oil Day Tanks.
II-17-11	Isolate and Return to Service Diesel Oil Day Tank Outlet Filters.
II-17-12	Isolate and Return to Service Ignition Oil Pump.
I-26-1	Isolate 184-N Fuel Oil Pump and Return to Service.
II-26-2	Unload No. 6 Fuel Oil.
II-26-3	Fill Fuel Oil Day Tanks.
II-26-6	Isolate, Blow Out Fuel Oil and Return to Service Fuel Oil Lines at 166-N.
II-26-7	Isolate, Drain, and Return to Service 184-N Fuel Oil Day Tank.

OIL HANDLING PROCEDURES (cont.)

Procedure Number	TITLE
II-26-10	Change and Clean Fuel Oil Screens.
II-26-11	Isolate and Return to Service 184-N Fuel Oil Cooler.
II-26-12	Test Fuel Oil Underground Header for Leakage.
II-26-14	Flush No. 6 Fuel Oil Lines at 184-N and Return to Normal.
II-26-16	Isolate No. 6 Fuel Oil Storage Tank for Maintenance and Return to Service.
II-26-18	Isolate and Return to Service Fuel Oil Moisture Monitor.
II-26-19	Isolate 184-N fuel Oil Heater and Return to Standby Service.
II-26-20	Isolate Cuno Filter on Fuel Oil System and Return to Service.
II-26-21	Clean Duplex Strainer on Fuel Oil System.
II-26-22	Isolate and Return to Service Fuel Oil Heater in 184-N Annex.
II-37-51	Transfer Oil from Storage Tanks to Drive Turbine Oil Reservoir.
II-37-73	Isolate, Drain, and Return to Normal Drive Turbine Oil System.
III-43-610	Obtain Samples from Diesel Oil Detection Wells.
II-46-2	Prepare Contaminated Oil for Burial.
II-46-11	Filter Contaminated Oil.
II-46-12	Disposal of Oil Sorbent Pillows.
II-48-33	Remove Oil Spill from 109-N Building Sumps.
II-48-73	Remove Oil Spill from Building Sumps in Auxiliary Buildings.
II-48-74	Remove Oil Spill from Building Sumps in 105-N.

APPENDIX E

EMERGENCY CALL LIST FOR NOTIFICATION OF OIL SPILLS

Refer to Section 5.3 for the situations that require immediate notification. Start at the top of the list and work downward until someone is reached.

Person/Title	Home Phone No.	Work Phone No.
Duane Jacques Associate Environmental Engineer	967-2346	3-4301
George Duffield Environmental Engineer	976-5263	3-4432
Eric Greager, Manager Environmental Protection	586-9767	3-4947
Larry Diediker, Manager Radioactive Effluent Control	375-1932	3-1925
John Dorian, Manager Environmental & Emergency Preparedness	627-2408	3-4932