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James A. Ives
Manager, Permits and Compliance
Kuparuk/Cook Inlet

March 22, 1991

Mr. Everett Robinson Wilson
U.S. Fish and Wildlife Service
1011 E. Tudor Rd.
Anchorage, AK 99503

Re: Addendum to Amendment Number Five to The Order By Consent
Mitigation Plan - Swanson River Oil Field, Kenai National Wildlife Refuge

Dear Mr. Wilson:

Enclosed you will find the three fully executed copies of Amendment Number 5 to the Order By Consent, Mitigation Plan - Swanson River Oil Field. We have retained one executed original for our files. This amendment addresses the remediation of aromatic hydrocarbon contaminated soils and groundwater at the Pipe and Supply (P&S) Yard.

In addition, this letter is provided by ARCO Alaska, Inc. (AAI) to address the concerns about benzene contaminated groundwater discussed at the remediation project presentation to EPA, ADEC, BLM and USFWS at the U.S. Fish and Wildlife Service facility March 14, 1991.

The BTXE Site Investigation Data Presentation Report mentioned benzene in the groundwater, but Amendment Five does not reflect any such cleanup standard in the groundwater remediation requirements, paragraph 1. However, groundwater sampling for benzene is required in the amendment, paragraph 1b. AAI intends to monitor for benzene in addition to the other contaminants listed in Amendment 5, and will ensure that should benzene be present, the contaminate levels will meet MCL criteria before discharge water is allowed to be released down gradient of the collection gallery.

Should you have any questions in this matter, please contact me.

Sincerely,

J. A. Ives, C.E.P.

Enclosure:

**AMENDMENT NUMBER FIVE (5)
TO THE
ORDER BY CONSENT
MITIGATION PLAN-SWANSON RIVER OIL FIELD
KENAI NATIONAL WILDLIFE REFUGE**

This amendment to the above named ORDER BY CONSENT (hereinafter referred to as ORDER) directs ARCO Alaska Inc. (hereinafter referred to as RESPONDENT) and any successors and assignees to remediate, by air stripping technology, aromatic hydrocarbon contaminated soils and groundwater at the Pipe and Supply Yard, Swanson River Oil Field, Kenai National Wildlife Refuge (Figure 1).

MANDATORY REQUIREMENTS

1. Remediation of contaminated groundwater, as described in Ecology and Environment, Inc.'s report "Recommended Alternative for Groundwater Remediation," shall continue until the groundwater from the seeps located at the terminus of the east drainage meets the following criteria within a 90 percent confidence interval (Figure 2):

Contaminant	Cleanup Concentration (mg/l)
Toluene	0.50
Ethylbenzene	0.48
Xylene	0.20

a. Water samples will be taken using U.S. Environmental Protection Agency approved methods for purgeable aromatic hydrocarbons.

b. Water samples will be analyzed for benzene, toluene, ethylbenzene and xylene using U.S. Environmental Protection Agency Method 5030 (Purge and Trap)/8020 - Aromatic Volatile Organics (GC/PID).

2. Remediation of contaminated soil shall continue until the soil samples from all areas of the Pipe and Supply Yard and the east drainage meet the following criteria within a 90 percent confidence interval:

Contaminant	Cleanup Concentration (mg/kg)
Benzene	2.0
Toluene	4.5
Ethylbenzene	15.0
Xylene	1.5

a. Soil samples, used to determine when final remediation is completed, shall be taken in the Vadose Zone, and at the soil-groundwater interface.

b. Soil samples shall be taken from the grid system established by Environment and Ecology Inc. in 1989, and identified in "BTXE Site Investigation Data Presentation Report, Swanson River Oil Field, Kenai Peninsula, Alaska, March 1989." ~~Samples taken shall be adequate to~~

ensure that the remediated soil meets the criteria for Benzene, toluene, ethylbenzene and xylene established in this amendment to the ORDER. The proposed sampling scheme shall be presented to the Agencies for approval before it is executed.

c. Soil samples shall be analyzed for benzene, ethylbenzene, toluene and xylene using U.S. Environmental Protection Agency Method 5030 (Purge and Trap)/8020 - Aromatic Volatile Organics (GC/PID).

3. Air quality in the area surrounding the air stripping unit shall meet the standards established in the following table:

Compound	8-Hr. Time-Weighted ¹ Average Concentration	Ceiling ² Concentration	Agency
Benzene	0.1 ppm	1 ppm	NIOSH
Ethylbenzene	100 ppm	N/A ³	OSHA
Toluene	100 ppm	200 ppm	NIOSH
Xylene	100 ppm	200 ppm	NIOSH/OSHA

1. Samples taken over an 8-hour period may exceed this concentration, but the average time-weighted concentration for an 8-hour time period may not exceed the concentration.

2. No sample during the monitoring period may exceed this concentration.

3. "Not Available."

Air quality shall be monitored for benzene, ethylbenzene, toluene and xylene in an area determined by the U.S. Environmental Protection Agency Model PTPLU2, to have the maximum concentration of the constituents.

The air quality shall be monitored at three different times during the first year of operation. Monitoring shall take place:

1. Within one month of startup of the unit, but after stable operating conditions are established.
2. Six months after the initial sample.
3. One year after the initial sample.

If the established criteria are not exceeded during any of the sampling periods, further monitoring shall be waived. If any of the criteria are exceeded, the monitoring shall continue on a quarterly basis, until four consecutive monitoring periods are within the established criteria, after which the monitoring provision shall be waived.

4. A representative from the Kenai National Wildlife Refuge will be given the opportunity to be present or to designate an alternative agency representative to be present during final verification of water and soil sampling. The Refuge representative may, for good cause, at his/her discretion, require additional samples to be taken and/or other areas to be sampled.

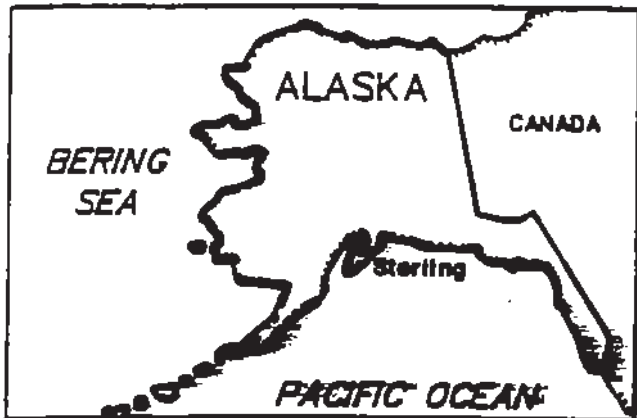
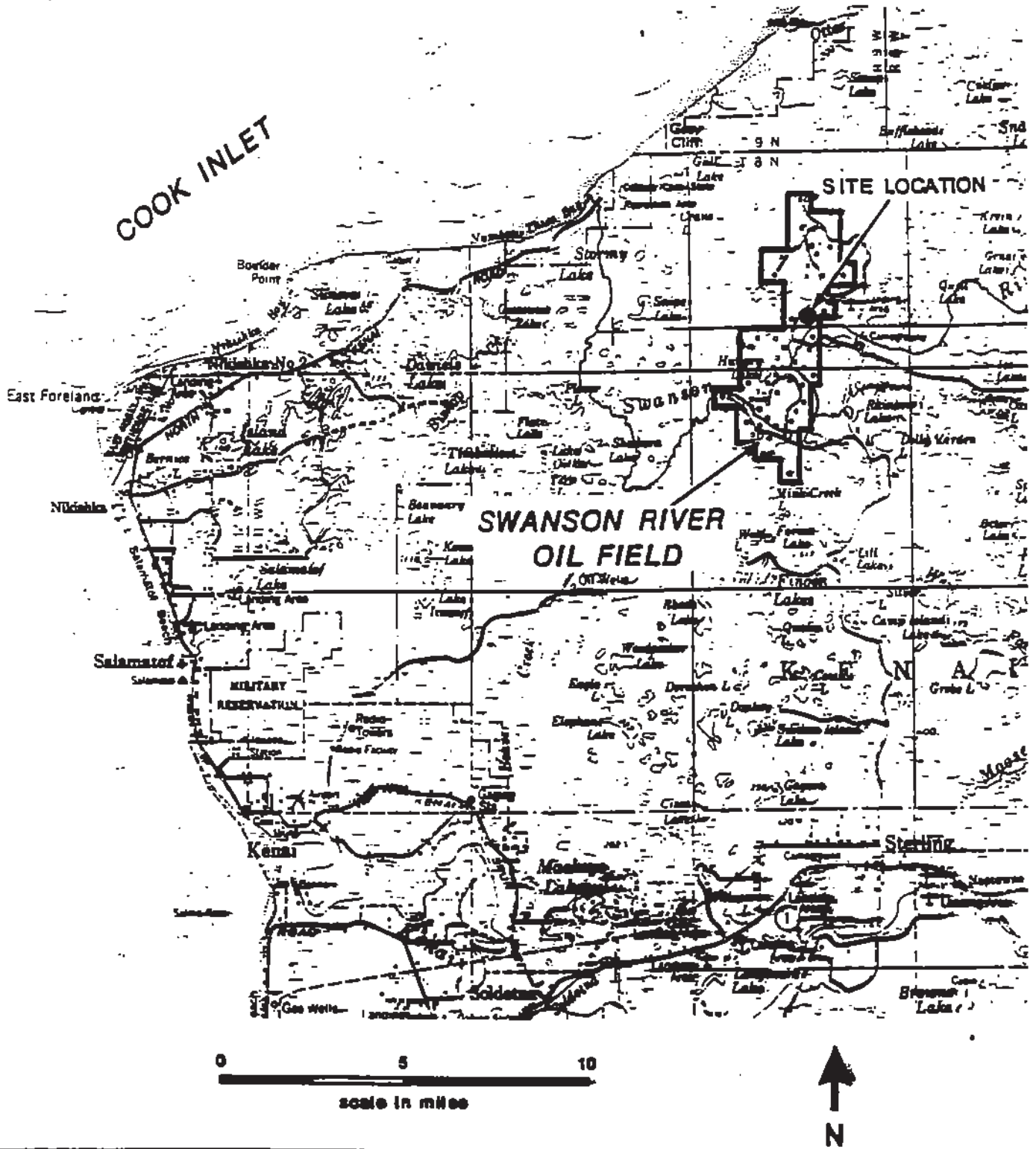
5. The provisions of this amendment shall be binding upon the RESPONDENT and all successors and assignees of the RESPONDENT. If the RESPONDENT transfers, sells, assigns, or leases the Swanson River Oil Field prior to its fulfillment of the provisions of this amendment to the ORDER, the RESPONDENT must incorporate a copy of this amendment to the ORDER into the documents of transfer, sale, assignment or lease, and must establish as a condition to the facility's transfer, sale or lease in those documents that the new owners or lessees will accede to the conditions of this amendment to the ORDER.

6. The RESPONDANT will obtain a State of Alaska industrial wastewater discharge permit for discharge of water from the groundwater remediation process.

7. Upon the RESPONDANT'S notification of completion of the remediation project and agency review of final verification sampling results, the concurring agencies will certify, in writing, the completion of this project and satisfaction of this portion of the amended ORDER.

Figure 1.

Location of the Swanson River Oil Field and the Pipe and Supply Yard Within the Field. Map taken from "BTXE Site Investigation Data Presentation Report Swanson River Oil Field Kenai Peninsula, Alaska", March, 1989. Ecology and Environment, Inc.

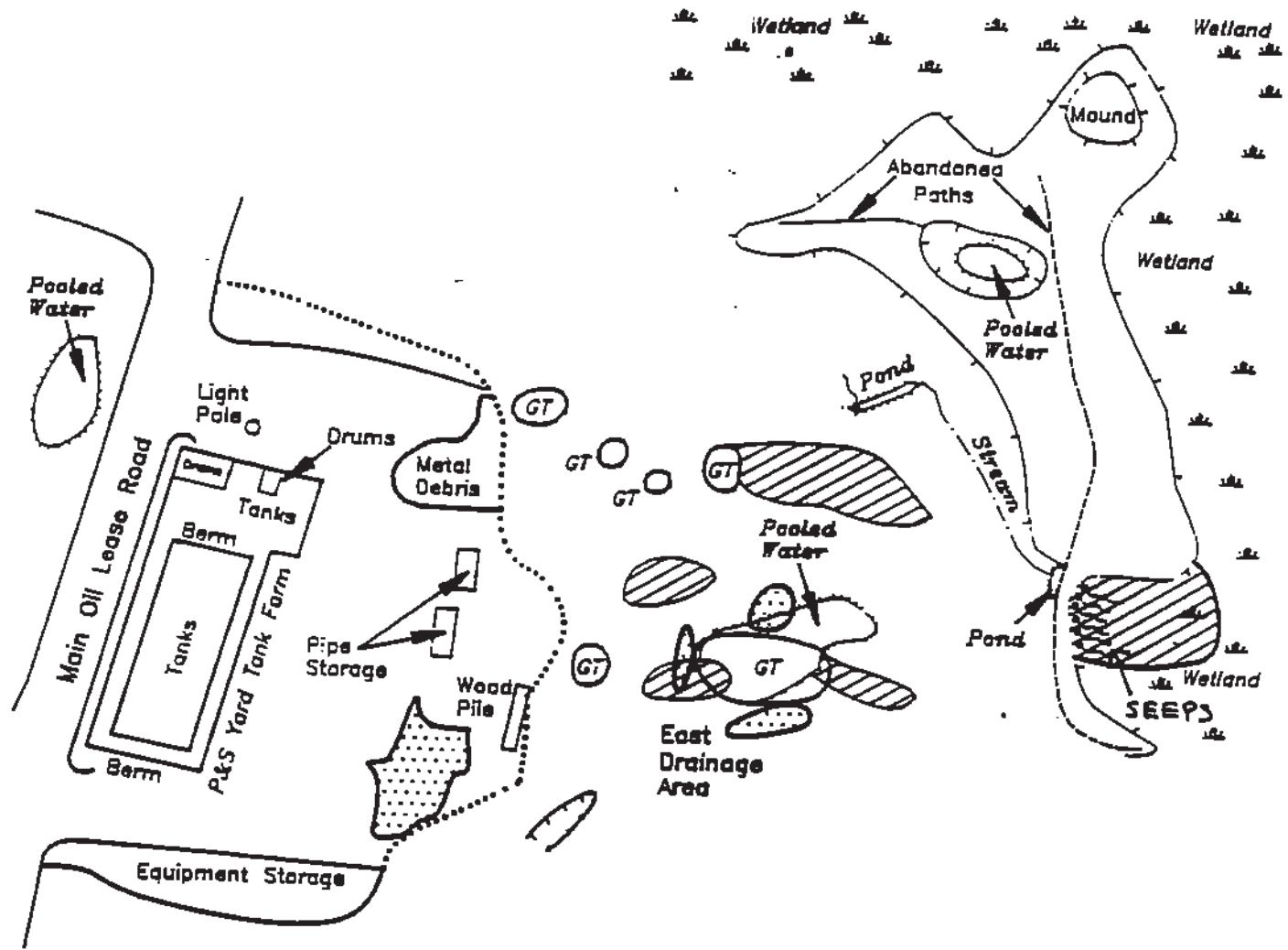


ecology & environment, inc.	
Job: AC 5088	BTXE STUDY
Drawn by: B.T.	Date: Jan. 9, 1980








FIGURE 1
LOCATION MAP
SWANSON RIVER OIL FIELD
Sterling, AK

Figure 2.

Location of important features within the Pipe and Supply Yard Study Area. Map taken from "BTXE Site Investigation Data Presentation Report Swanson River Oil Field Kenai Peninsula, Alaska" March, 1989. Ecology and Environment Inc.



LEGEND

-  Stressed vegetation
-  PCB contaminated area
-  Depressed area
-  Rise in slope
-  Geophysical target
-  P&S Yard gravel pad boundary
-  Groundwater seep

ecology & environment, inc.	
Job: AC 5095	BTXE STUDY
Drawn by: D. P.	Date: Feb. 22, 1989

FIGURE 2
P&S YARD STUDY AREA
SIMPSON RIVER OIL FIELD
Stedding, AK.

Concur: *Phu G. Thompson*
Regional Director, U.S. Fish and Wildlife
Service, Region 7

2/13/91
Date

Concur: *J. J. Lauer*
State Director, Bureau of Land Management

2/8/91
Date

Concur: *Richard B. Smith*
Alaska Department of Environmental
Conservation

3/7/91
Date

Concur: *John J. ...*
Senior Vice President, ARCO Alaska, Inc. *DMM*

3/25/91
Date