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ROD DECISION SUMMARY

YORK OIL COMPANY SITE

NEW YORK

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 2
New York

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ROD DECISION SUMMARY
YORK OIL COMPANY SITE
NEW YORK

This summary addresses the site proper operable unit, which involves addressing the source of contamination to prevent further contaminant migration from the site, and to eliminate the direct contact threat posed by the site (1). A subsequent operable unit remedial investigation/feasibility study (RI/FS) is in progress to further define the extent of the contaminant migration from the site.

SITE LOCATION AND DESCRIPTION

The York Oil site was placed on the National Priorities List of known or threatened releases in July 1982. The 17-acre site proper, is located in a rural area in northeastern New York State, approximately one mile northwest of the Hamlet of Moira in Franklin County, New York (see Figure 1). It was formerly used as a waste oil recycling facility, and eventually the site became a tank and lagoon storage facility for PCB-laden waste oil. The site is bounded on the north and east by private homes, and on the west and south by wetlands and woodlands.

Wetlands and woodlands are the principal land use in the vicinity of the York Oil site. Residences exist along the main roads interspersed with active/inactive agricultural and pasture land. Although the area is rural, there are an estimated 1,700 inhabitants within a three mile radius of the site. There are thirteen residences, housing approximately forty persons, located within one half-mile of the site, with the nearest being approximately 300 feet from the eastern boundary of the site. Private wells serve as the sole drinking water supply for area residents.

The Town of Moira's Highway Department garage and sand/salt/ gravel stockpile is located on North Lawrence Road adjacent to the site to the northwest, and employs approximately ten persons. Adjacent to the site to the southeast exists an abandoned milk plant. An abandoned railroad embankment, running east/west, is the southern boundary of the site. This track provides access to the woodlands and wetlands around the site for hunters, hikers, and recreational vehicles.

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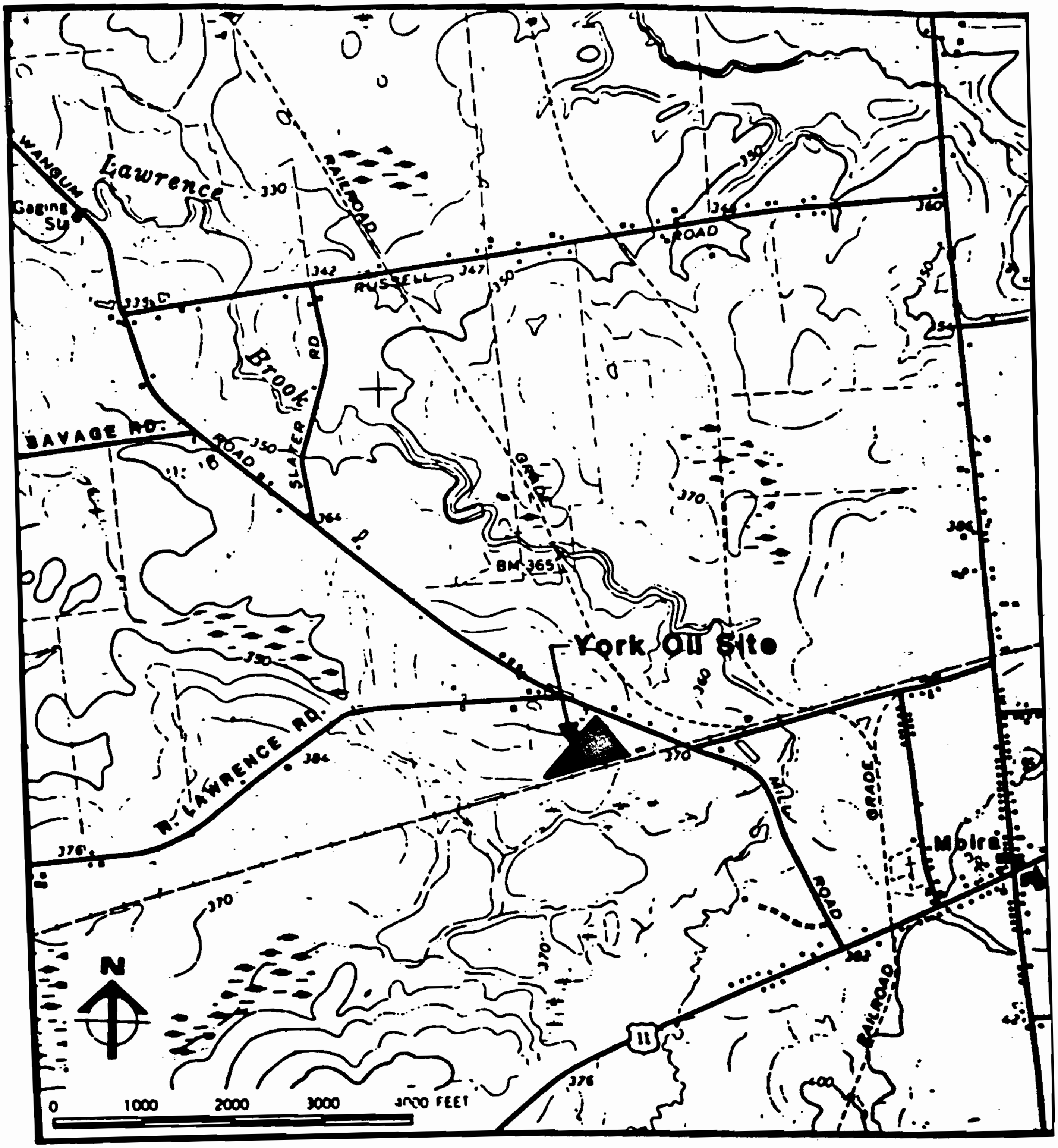
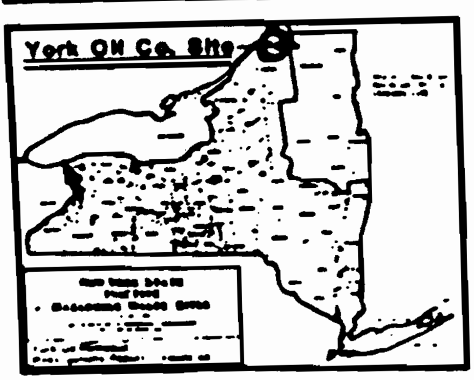
(1) The site proper is defined as all York Oil Company lands, including the fenced portion of the site, and the 1000 ft. by 200 ft. strip of land located to the west of the fenced area (see Figure 2).

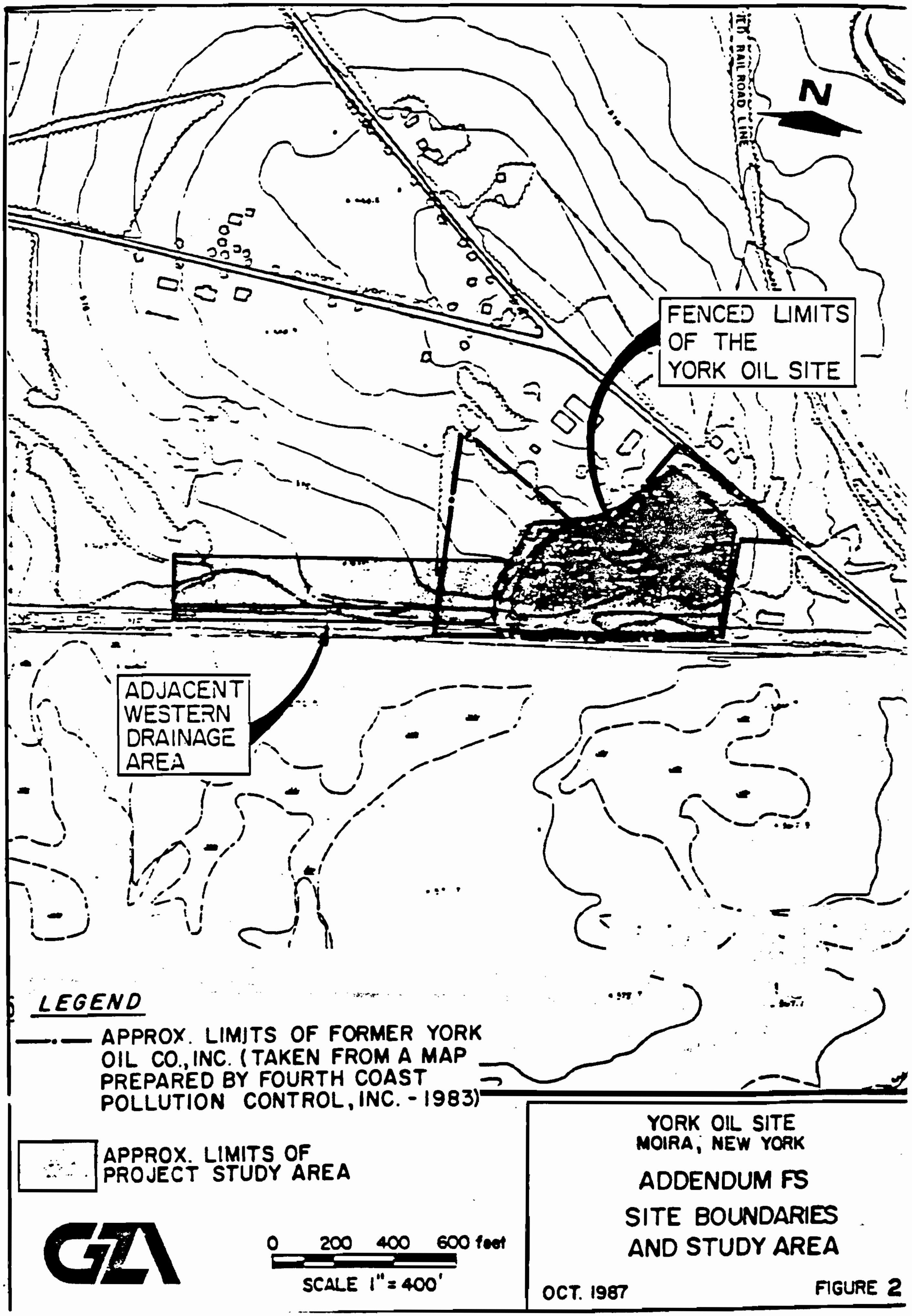




York Oil Remedial Investigations Report

LOCUS PLAN

FIGURE NO. 1



YORK OIL SITE
MOIRA, NEW YORK

ADDENDUM FS

SITE BOUNDARIES AND STUDY AREA

OCT. 1987

FIGURE 2

The York Oil site is located within the Lawrence Brook watershed, which drains portions of northwestern Franklin County and northeastern St. Lawrence County. Two major tributaries, Alburg Brook and Joy Brook flow north merging to form Lawrence Brook. Lawrence Brook flows north, turning northwest near the site and the closest point is about 1250 feet from the site. Approximately six miles downstream of the site, Lawrence Brook flows into Deer River. Deer River flows into the St. Regis River and ultimately into the St. Lawrence River.

The site is situated on the side of a glaciated hill that slopes from the northwest to the southwest. Lawrence Brook meanders around the glaciated hill to the east. The ground surface away from the site decreases gradually to a drainage trench along the abandoned railroad grade (see Figure 3). This trench connects to a poorly defined drainage pathway flowing northwesterly through a series of wetlands and ultimately to Lawrence Brook. South of the railroad grade is a wetland area where surface waters flow to the south into Lawrence Brook, and to the north towards a culvert under the railroad grade, which finally drains into the western wetlands.

The site drainage is influenced by a man-made interceptor trench located west of the consolidated lagoon areas, that has been constructed on the site during remedial work in 1980 and 1981. The interceptor trench channels runoff from part of Area A toward the southern portion of the site and into a drainage ditch which runs parallel and adjacent to the north side of the railroad embankment (see Figure 4). This drainage ditch also picks up the remainder of Area A runoff not flowing into the interceptor trench. It then carries flow toward the wetlands to the west and northwest of the project site. This runoff flows to a larger wetland area six miles north of the site. The direction of flow beyond the wetlands include Lawrence Brook, the Deer River and terminating with the St. Lawrence River.

The runoff from Area B is toward the south-southeast. Near the southern corner of the site, a divided flow condition exists at the drainage trench with a slight easterly flow under high flow conditions. East of the abandoned milk plant, there exists a ditch approximately 250 feet long that provides some retention capacity for this flow. When this capacity is exceeded, the water then flows through an 18-inch diameter culvert beneath the abandoned railroad tracks near the intersection of Mill Road and North Lawrence Road.

Runoff from Area C which includes the Moira Town garage property, flows onto the York Oil site. Approximately half of this runoff enters Area A and is channeled into the drainage ditch which

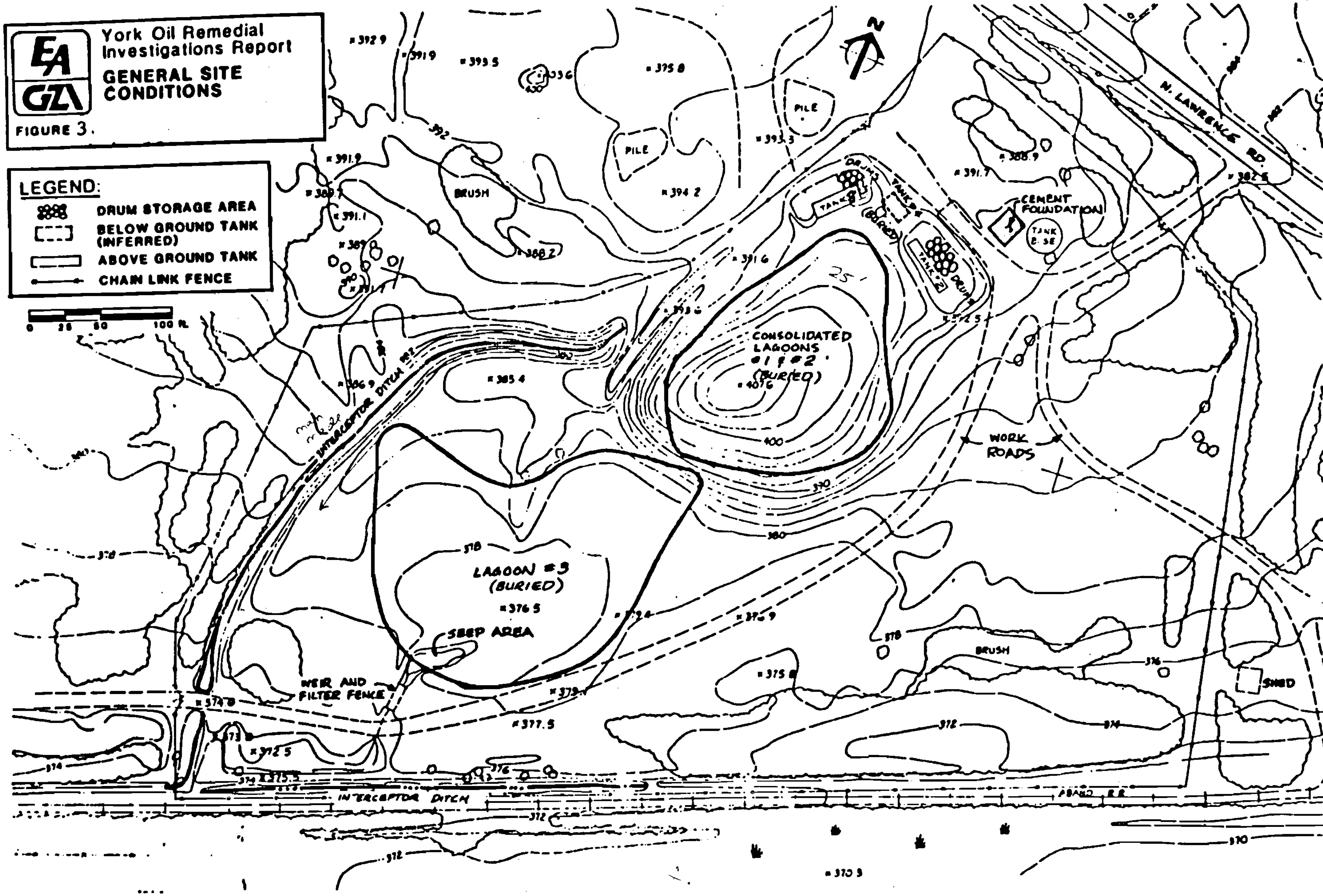
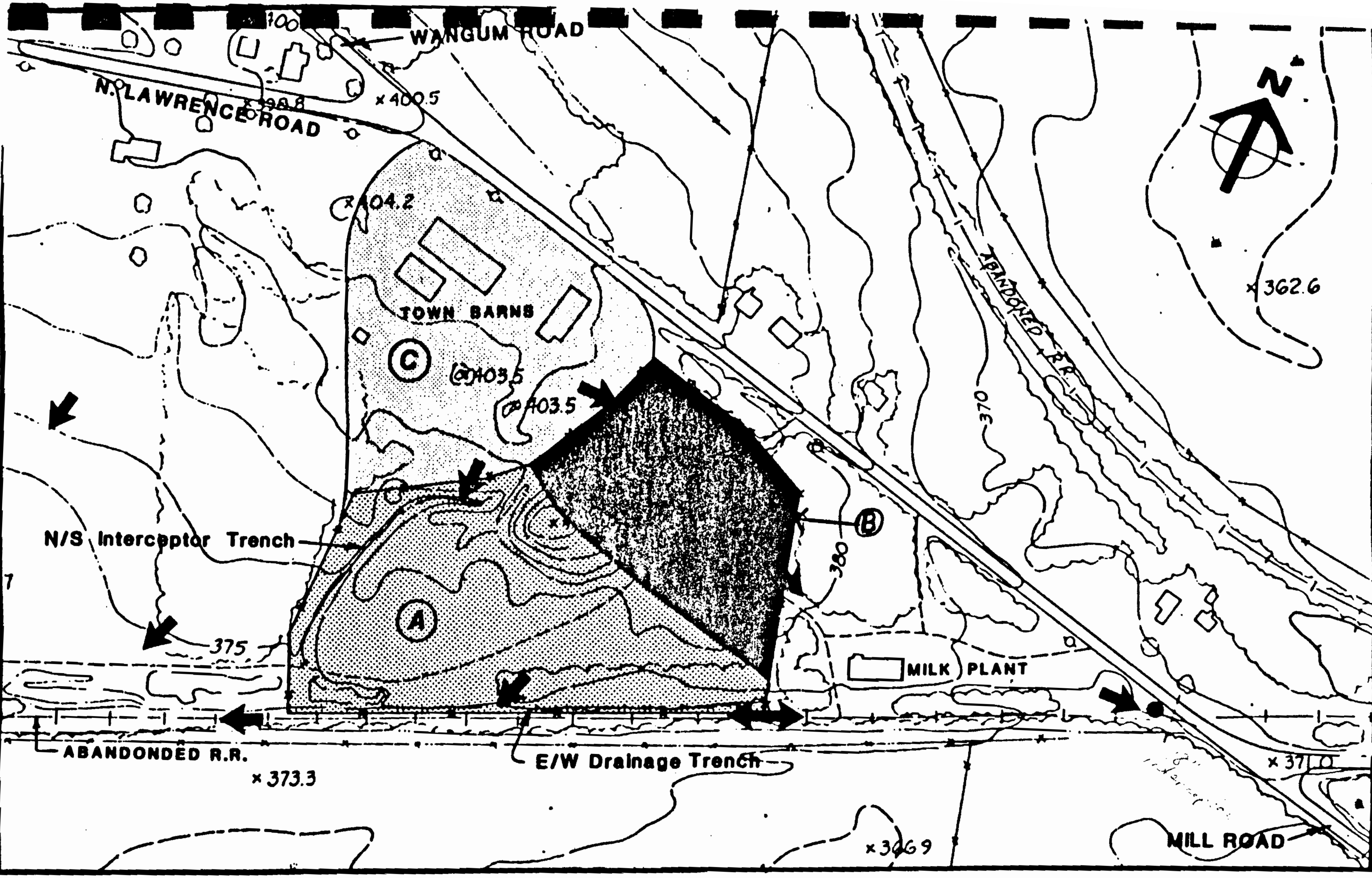


FIGURE 3. York Oil Remedial Investigations Report — GENERAL SITE CONDITIONS



EA ERDMAN ANTHONY ASSOCIATES

York Oil Remedial Investigations Report

SITE DRAINAGE AREAS

SCALE in FEET 100' 0 200'

FIGURE 4

flows toward the western wetlands. The portion entering Area B flows toward the 18-inch diameter culvert previously described.

The Lawrence Brook 100 year storm flood zone is not within the site proper boundaries. Areas adjacent to the site experience periodic flooding as a result of high intensity storms and rapid snow melt, but are not affected by the Lawrence Brook 100 year floodway.

RI activities indicate that subsurface conditions at the site generally consist of glacial overburden deposits that overlie sedimentary bedrock. While the thickness of the overburden varies, it is about forty feet thick within the fenced boundaries of the site.

The overburden and bedrock occur in layers of more permeable and less permeable materials that are capable of producing and/or transmitting ground water, or are barriers to groundwater flow, respectively. Five soil deposits have been identified with respect to groundwater flow.

A significant geohydrologic factor which exists throughout the site overburden is the presence of a glacial till layer ranging in thickness from five to twenty feet. This confining till layer overlying bedrock has an average hydraulic conductivity of approximately $3x10^{-4}$ ft/day and is a barrier to groundwater flow. This hydraulic characteristic is very important for the York Oil Company site since it protects residential wells that are screened in the bedrock, from contamination emanating from the site. Another factor which affects groundwater flow is the cobble and boulder layer which may potentially be the prominent water bearing zone.

The bedrock, particularly along discontinuities and fracture zones, is a transmissive zone capable of producing and carrying groundwater. The majority of the nearby residents obtain potable water from the bedrock at depths of approximately 100 feet. The bedrock groundwater contours reveal a divide located immediately north of the site. Thus, groundwater flow in the bedrock at the site is to the south.

Regional groundwater flow directions in the overburden deposits indicate a mound within the glaciated hill beneath the site. The flow from this mound is generally radial and thus, the flow generally enters the site from the north. Overburden groundwater flows are altered by several localized on-site features, including drainage trenches and the mounded fill covering the former lagoons. Groundwater flow off the mound is generally southward, and a divergence was observed in this area, with flows to both the southeast and southwest. The groundwater divergence appears to be related to the more permeable cobble and nested boulder layer.

On-site groundwater and oil either mix with the regional groundwater flow and continue southward, or discharge to surface locations. The surface discharge locations include the wetlands south of the site, the east-west trending drainage channel along the railroad grade or the north-south trending drainage channel.

Overburden groundwater levels revealed seasonal variations during the RI activities that range from approximately 2 to 5 feet. The observed seasonal variations do not, however, alter groundwater flow directions.

The quantity of water, including incoming groundwater and infiltration, is difficult to estimate as the thickness and lateral extent of the cobble and boulder layer is variable. Based on explorations, however, it is estimated that the average water quantity may range from 10 to 15 gal/min, averaged over an entire year.

A six foot high chain link fence surrounds the York Oil site which was intended to limit access during remedial activities. This fence does not, however, limit access to the adjacent strip of land and the wetlands. The dominant surface feature at the site is an approximately twenty-five foot high mound of sandy materials covering former lagoons #1 and #2 (see Figure 3). This mound represents materials (i.e., contaminated oil sludges and soils) collected during previous site clean-up activity, and then temporarily consolidated with kiln dust and sand. West of the mound, sand covers former lagoon #3. This area is relatively flat and contains PCB-contaminated soils.

North of the former lagoons exists two, 25,000 gallon above ground horizontal steel storage tanks, designated as tank No. 2 and No. 3. They contain a combined total capacity of approximately 25,000 gallons of contaminated oil, and sludge, which was pumped into them during past clean-up efforts. One empty subsurface horizontal steel storage tank, with a volume estimated to be 5,000 to 10,000 gallons, also remains on-site. Within the bermed areas near Tank 2 and 3, approximately ninety 55 gallon drums containing site cleanup equipment, are stored, awaiting future disposal.

SITE HISTORY

The now dissolved York Oil Company, Inc. of Waltham, Massachusetts operated a waste oil recycling facility in Moira, New York from approximately 1964 to 1977. Crankcase industrial oils, some containing PCBs, were collected from sources throughout New England and New York, then stored and/or processed at the site proper in eight above-ground storage tanks, a series of three earthern-dammed settling lagoons, and at least one below-ground storage tank. The recycled PCB-contaminated oil was either sold as No. 2 fuel oil or was used in dust control for the unpaved roads in the vicinity of the site.

During heavy rains and spring thaw, the oil-water emulsion from the lagoons would often overflow onto the surrounding lands. In lieu of paying damages to adjacent farm-owners, in 1964 the York Oil Company purchased land in the area of the spills.

The York Oil site contamination was first discovered in 1979 by a road crew of the New York State Department of Transportation, who then notified the New York State Department of Environmental Conservation (NYSDEC). The site was then an abandoned oil tank farm and ownership of the property was confirmed as belonging to Kenneth Peirce. Initial government response to oil spills at the site was performed under the the State of New York Oil Spill Compensation Fund, and involved various surveys, inspections, and limited cleanup and containment work. Analysis taken at this time indicated that the site presented a PCB-contamination problem.

Because the PCB-contaminated oils were being washed from the site with the surface runoff, the U.S. Environmental Protection Agency (USEPA) was notified by the NYSDEC and subsequently undertook several emergency actions at the site since 1979. As part of the USEPA emergency action, the lagoons were drained and PCB-contaminated oil was transferred to the above-ground storage tanks (see Figure 2); the contaminated soils from the adjacent western strip of land were temporarily consolidated in lagoons 1 and 2 with kiln dust and sand, and lagoon 3 was graded with soil and sand; oil seepage control operations were initiated utilizing drainage and interceptor trenches, weir/inverted pipe arrangements, sorbent pads and oil booms; and a six foot chain link fence was erected around the site to reduce the direct contact threat during remedial activities.

In 1980, the site property was transferred from Kenneth Peirce to Steven Wood and Charles Lawrence, residents of Moira.

Current response actions being funded by the USEPA to prevent PCB-contaminated oil from entering the wetlands area involve, periodic collection of contaminated surface oil in the drainage trench at the site proper and the changing of oil sorbent pads.

CURRENT SITE STATUS

Through a Coopertive Agreement with the USEPA, the NYSDEC completed an RI/FS for the York Oil site through its contractor, Erdman, Anthony, Associates (EAA), and it was released for public comment in August 1985. Based upon the finding's presented in the RI/FS, a ROD was prepared, recommending source containment (i.e., perimeter leachate collection, deep groundwater drawdown wells, on-site leachate treatment and installation of a cap in accordance with RCRA). The ROD signing was postponed, however, due to a change in EPA policy which now requires pursuit of response actions that permanently destroy, treat or recycle wastes, rather than just contain them, and the failure of the RI/FS to adequately assess the extent of contamination at the site proper.

Following delays which were due to liability insurance problems in New York State, an addendum FS to further define the extent of contamination at the site proper and to evaluate alternatives that utilize permanent solutions and treatment technologies to the maximum extent practicable was initiated in December 1986. The addendum FS was completed by EAA and released for public comment in November 1987. The following is a brief summary of the types and concentrations of contaminants detected at the site.

The site presently consists of two above-ground steel storage tanks containing approximately 25,000 gallons of PCB-contaminated oil, one empty subsurface steel storage tank, one graded unlined lagoon, and two consolidated unlined lagoons forming a mound approximately twenty-five feet high, containing PCB-contaminated soils and sludges, temporarily capped with kiln dust and sand. Approximately 30,000 cubic yards of contaminated soil are present at the site and this volume is based on a cleanup level of 10 ppm for PCBs in soils. This level is derived based on the current New York State goal to cleanup uncontrolled PCB sites in residential areas to a level less than 10 ppm and on the USEPA Toxic Substances Control Act (TSCA) PCB Spill Clean-Up Policy which states that PCB spills in residential areas be cleaned-up to 10 ppm.

The RI/FS indicates that the primary contaminants at the site are PCBs (maximum concentration of 230 ppm), heavy metals, including copper, lead (maximum concentration of 16,000 ppm) and zinc, volatile organics and total phenolics. These contaminants have been detected in oils in tanks, soils/sediments, surface waters and groundwater monitoring wells. A list of compounds detected in groundwater monitoring wells and surface water at the site proper that exceed their respective applicable or relevant and appropriate requirements (ARARs) and/or other criteria/ guidance to be considered are listed in Tables 1 and 2, respectively. Residential wells currently in use have not been impacted by the site. Table 3 lists the range of concentrations of compounds detected in soils/ sediments along with their frequency of detection.

Air quality monitoring conducted during the RI/FS was performed to assess baseline concentrations of hazardous materials in the air, to characterize air-borne contaminants released during drilling activities, and to assess requirements for worker health and safety. The analytical results reveal no elevated background concentrations of hazardous materials in the air. It is, therefore, unlikely that airborne contamination is a primary machanism for migration of contaminants.

The contaminant pathways from the site are primarily through surface water as overland flow to drainage paths and low lying areas, and through the groundwater, either as dissolved or floating contaminants, depending on their chemical nature. The extent surface water contamination, based upon oil and sediment analysis for PCBs, is widespread. Oil was observed floating in a drainage trench over two miles downstream of the site. Sediments from these locations have measureable PCB concentrations indicating the liklihood that oil from the site migrated in these surface waters for long distances, and have probably discharged to Lawrence Brook. The contamination pathway RI/FS will more accurately define the contamination in these areas.

PCBs tend to be in higher concentrations in lower lagoon #3, in the floating oil layer beneath the mound (lagoon #1 and #2) and in oils that have migrated via overland flow from the site. The highest level of PCBs in soil/ sediments is located in the adjacent 1000 ft x 200 ft strip of land west of the site at 210 ppm. Even though this area has been previously cleaned, migration of PCBs from

Table 1

GROUNDWATER MONITORING WELL COMPOUNDS EXCEEDING ARARS AND/OR OTHER CRITERIA/GUIDANCE TO BE CONSIDERED

Compound	Freq.(1)	Range of Concen. in Detected Samples (ppb)	Standard/Guideline (ppb)	Source(2)
Arsenic	9/16	2-110	25/0	703.5/CWA
Benzene	1/20	68	ND/0	703.5/RMCL
Cadmium	1/16	14	10/0	MCL/CWA
Chromium	4/16	70-950	50/50	MCL/CWA
Copper	9/16	28-920	200/1000	170.4/703.5
2,4 Dimethyl phenol	1/9	260	1/50 & 100(3)	703.5/*
Lead	9/16	66-15,000	25/50	703.5/CWA
Nickel	9/16	42-940	-/15.4	-/CWA
Phenol	1/9	2,000	1/50 & 100(3)	703.5/*
Total Phenolics	7/9	7-3,420	1/50 & 100(3)	703.5/*
Polychlorinated Biphenyl (PCB)	10/27	1-26,900(4)	.1/0	703.5/CWA
Trans- 1-2 Dichloroethene	6/20	90-2,000	-/50 & 100	-/*
Xylene	1/20	210	-/50 & 100	-/*
Zinc	16/16	68-2,500	300/5,000	170.4/CWA

(1) Frequency is the number of positive observations divided by the number of samples analyzed. Does not include duplicates, blanks or matrix spikes.

(2) Sources for enforceable standards are as follows:
- 703.5- NYS Water Quality Regulations- Standards for groundwater
- 170.4- NYS Sources of Water Supply- Standards of raw water quality
- MCL- EPA National Primary Drinking Water Regulations- Maximum Contaminant Levels

Sources for the guidelines are as follows:
- CWA- Clean Water Act Water Quality Criteria
- RMCL- EPA Recommended Maximum Contaminant Levels
- 143.3- EPA National Secondary Drinking Water Regulations- Secondary MCLs

* -The NYS ambient water quality guideline is 50 ppb for any single organic compound or 100 ppb for the total of designated organic compounds.

(3) The New York State groundwater standard for phenols is 1 ppb, however, this is a secondary standard for aesthetic purposes only. For this site, the NYSDOH has advised that the NYS ambient water quality guideline of 50/100 ppb be utilized.

(4) PCBs are concentrated in the floating oil layer in the shallow water table, however, they are reported here as being present in the groundwater.

Table 2

SURFACE WATER COMPOUNDS EXCEEDING ARARS AND/OR OTHER CRITERIA/GUIDANCE TO BE CONSIDERED

Compound	Frequency (%) (1)	Maximum Concen. in Detected Samples (ppb)	Criteria (2) (ppb)
Arsenic	100	4	0
Lead	100	5,900	50
Nickel	100	430	15.4
Polychlorinated Biphenyls (PCB)	100	120,000	.013

(1) Frequency is the number of positive observations divided by the number of samples analyzed times 100. Does not include duplicates, blanks or matrix spikes.

(2) Water Quality Criteria (WQC)- Established under the Clean Water Act as non-regulatory criteria to protect human health from exposure to contaminated water, fish, and fish products, as well as to protect aquatic life.

ND - Analyzed but not detected.

TABLE 3

SUMMARY OF SOIL /SEDIMENT DATA

Compound	Frequency	Range of Concentrations in Detected Samples (ppm)
Acenaphthylene	2/10	1.25 - 2.0
Acetone	1/13	1.6*
Arsenic	7/11	2.5 - 8.2
Barium	1/6	2.2*
Benzene	4/13	0.70 - 9.4
Bis (2-ethylhexyl) Phthalate	2/10	7.0 - 25
Cadmium	4/11	0.28 - 22
Chloroform	1/13	1.5*
Chromium	10/11	2.4 - 79
Copper	9/11	3.7 - 290
Dibromochloromethane	1/13	1.9*
1,2 Dichlorobenzene	3/10	0.82 - 6.5
Ethylbenzene	5/13	0.85 - 74
Fluorene	4/10	1.5 - 3.4
Lead	10/11	4.8 - 16,300
Mercury	7/11	0.004 - 0.064
Methyl ethyl ketone	1/13	8.3*
2-methyl napthalene	3/5	18 - 62
4-methyl-2-pentanone	1/13	3.5*
Methylene Chloride	5/13	0.096 - 26
Naphthalene	5/16	7.7 - 64
Nickel	8/11	3.5 - 18
Pentachlorophenol	2/10	5.4 - 7.1
Phenanthrene	4/10	3.3 - 8.8
Phenol	2/10	2.7 - 3.2
Polychlorinated Biphenyls (PCBs)	46/106	0.1 - 210
Pyrene	1/10	1.1*
Silver	1/11	0.52*
Tetrachroroethylene	7/13	0.0093 - 84
Toluene	5/13	1.2 - 180
Trans-1,2 dichloroethene	3/13	0.33 - 6.2
1,1,1 Trichloroethane	2/13	0.44 - 1.1
Trichloroethylene	8/13	0.13 - 150
Xylene	6/13	0.026 - 510
Zinc	11/11	3.8 - 2,520

* - One sample with compound detected.

Frequency: Number of positive observations divided by the number of samples analyzed. Does not include duplicates, blanks or matrix spikes.

the site into this area continues to occur. Of the total estimated 30,000 cubic yards of contaminated soils/sediments, approximately 8,000 cubic yards is attributible to this area.

The second primary contaminant pathway from the site is through the groundwater. Soluble and insoluble contaminants at the site are migrating through the groundwater. Insoluble or floating contaminants (PCB-laden oil and volatile organics) were detected in the shallow water table monitoring wells and well points. The contaminant plume is concentrated around former lagoon #3 and is moving and spreading southwards towards the drainage trench along the abandoned railroad grade and the southern wetlands. As noted in Table 1, PCBs are reported as being present in the groundwater, however, they are concentrated in the floating oil layer in the shallow water table. PCBs were not detected in the deep monitoring wells screened in bedrock.

The water soluble contaminants (total phenolics) are migrating southward. As they migrate, they tend to sink into the deeper groundwater sources. The phenolics plume is the only deep plume exceeding an ARAR. The New York State groundwater standard for phenols is 1 ppb, however, this is a secondary standard for aesthetic purposes only. For this site, the New York State Department of Health (NYSDOH) has advised that for phenols, the NYS ambient water quality quideline of 50 ppb for any single phenolic compound or 100 ppb for the total of phenolic compounds be utilized.

RISK ASSESSMENT

The health risk assessment conducted in the FS evaluates potential risks associated with threatened or actual exposure at the York Oil site. This baseline risk assessment evaluates the possible impacts of site conditions on human health under baseline conditions of a projected no-action remedial alternative.

Since there is a contamination pathway RI/FS underway at the site to evaluate the potential contaminant pathway impacts, the following risk assessment is based upon site proper environmental data only. Using maximum concentrations observed for each environmental media (i.e., groundwater, surface water and soils), the risks associated with a "worst case" scenario are presented. The findings of the contamination pathway RI will permit the computation of a more likely scenario based on actual contaminant concentrations at the point of exposure.

The health risk assessment for the York Oil site has identified and analyzed potential health risks posed by the presence of hazardous chemicals at the site. A brief summary of the process used in this anaysis is presented below.

A characterization of contaminant sources was prepared based on both the data collected in the field study portion of the current study and on the results of past studies. A selection process was then developed and implemented to choose indicator compounds for the detailed toxicological and risk evaluations. Indicator compounds were chosen using criteria which eliminated from consideration those chemicals whose presence at the site did not significantly contribute to the hazard posed.

Potential receptor populations were identified, where possible, and screened based on assumed exposure pathways. Exposure levels for pathways which passed the screening process were estimated for the most sensitive identified receptors. Exposure levels were calculated using a number of assumptions regarding the absorption of the contaminant and the frequency of exposures. Risk levels were then calculated for each exposure pathway under the worst case scenario. The scenario chosen was conservative in nature, and it was developed using assumptions which may overestimate risks.

Risks Under Present Conditions

Risk calculations were undertaken for each of the screened exposure pathways considered possible under current conditions.

All evaluated site pathways were identified as potentially posing risks under a "worst case" scenario. Based on estimated non-carcinogenic hazard indices and cancer risk estimates, the relative significance of impacts of pathways is as follows:

- groundwater consumption as drinking water;
- direct contact with surface water;
- accidental ingestion of soils;
- accidental ingestion of surface water; and
- direct contact with soils.

In summary, this indicates that PCBs and lead pose the greatest hazard associated with soils and surface water ingestion and dermal absorption. The major hazard associated with ingesting groundwater is due to the presence of PCBs, cadmium, lead, arsenic and benzene. Therefore, contamination leaving the site proper in its present condition would not provide adequate protection of human health and the environment.

Response Requirements

Based on the results of the health risk assessment, in order to provide site control, the following actions should be addressed:

1. Surface water infiltration should be reduced.

2. Contaminated surface-water runoff should be eliminated.

3. Contaminated waste oils contained in the tanks, and oil migrating to the south on top of the water table should be collected and detoxified.

4. On-site contaminated soils and sludge should be collected and detoxified.

5. Deeper plumes of phenols migrating to the south should be collected and detoxified.

6. Contaminated surface sediments and soils in the 1000 ft x 200 ft strip of land should be collected and detoxified.

ENFORCEMENT

The USEPA has idetified three potentially responsible parties (PRPs) for the York Oil site at this time. These PRPs were sent notice letters prior to the initiation of the 1985 RI/FS. Following negotiations, the PRPs were not willing to conduct the required work. On December 9, 1983, the United States brought a civil action under Section 104 and 107 of CERCLA, seeking recovery of past and future monies expended for response activities at the site. The suit was filed against Kenneth Peirce (former owner of the York Oil Company), the Aluminum Company of America (ALCOA), and the Reynolds Metals Company. Upon the completion of the 1985 RI/FS, the PRPs were sent notice letters informing them of, among other things, their potential liability at the site, the availability of the 1985 RI/FS report and the close of the public comment period.

In November 1987, the USEPA provided the PRPs with the addendum FS and notified them of the preferred remedial action for the site as well as the close of the public comment period.

The USEPA intends to send notice to the PRPs upon approval of the ROD.

COMMUNITY RELATIONS

Various public informational meetings have been conducted and fact sheets have been distributed throughout the site's NPL history to inform the community of the remediation process. The draft 1985 RI/FS was made available for public review and comment on August 22, 1985, at the following locations: Moira Town Hall, the NYSDEC Region 5 Office, and the Franklin County Office of Emergency Preparedness. The public was notified of the RI/FS availability by public notice which were mailed to thirteen homeowners in the immediate area, and by press releases which appeared in the Watertown Daily Times and the Massena Observer. Following a request for extension of the twenty-one day public comment period by the PRPs, the comment period was extended an additional 30 days to October 11, 1985. A public meeting was held on August 28, 1985 at the Moira Town Hall which was attended by the NYSDEC, USEPA, Association of Concerned Citizens of Moira, elected officials, the press, and area residents.

Following USEPA's decision to conduct an addendum FS to further evaluate permanent remedies and better define the extent of contamination, local citizens were notified by mail of this proposed additional investigation and the concurrent investigations that would be conducted for the contamination pathways. The draft addendum FS was released for public comment on November 27, 1987, followed by the release of the proposed remedial action plan for the site. The public was notified of the addendum FS availability by public notice which were mailed to the thrirteen homeowners and by press release which appeared in the Malone Telegram.

The public repositories for the Administrative Record, which includes the addendum FS, are the Moira Town Hall, the NYSDEC Region 5 Office in Ray Brook, New York and the USEPA Region 2 Office in New York City. The NYSDEC and USEPA held a public meeting on December 16, 1987 to discuss the addendum FS and the proposed plans. The comment period was scheduled to end on December 18, 1987, however, in response to a request by the PRPs, the comment period was extended until January 15, 1988.

A summary of the comments raised concerning the RI/FS and public meeting are contained in the attached responsiveness summary. The local community prefers a permanent remedy for the site. The responsiveness summary also includes a copy of the press release announcing the meeting and an attendance list for the public meeting.

A transcript of the public meeting was kept in accordance with Section 117(a)(2) of CERCLA and is available to the public at the above-mentioned Administrative Record repositories.

ALTERNATIVES EVALUATION

The remedial alternatives for the York Oil site were developed and evaluated using CERCLA as amended, the NCP 40 CFR §300.68, "Guidance on Feasibility Studies Under CERCLA" and EPA's Interim Guidance on Selection of Remedy (December 24, 1986 and July 24, 1987) as guidance.

The major objective of the FS is to evaluate remedial alternatives using a cost-effective approach consistent with the goals and objectives of CERCLA. According to Section 121 of CERCLA, the recommended remedial alternative should protect human health and the environment, should be cost-effective, and should utilize permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable. The proposed remedy must also attain ARARs that have been identified for the site. Section 300.68(e) of the NCP and Section 121(b)(1)(A-G) of CERCLA outline procedures and criteria which were used in evaluating and selecting the appropriate remedy for the site.

A five step process was developed and used to meet the FS objectives. The following is a summary of that process.

The first step is to evaluate human health and environmental effects associated with releases and threatened releases of hazardous substances from the site. Criteria to be considered are outlined in Section 300.68(e) of the NCP and include such factors as actual or potential direct contact with hazardous material, degree of contamination of drinking water, and extent of isolation and/or migration of the contaminants.

The next step is to develop a range of potential available remedial technologies that could be used to remediate the site. Section 121(b) of CERCLA requires that remedial technologies in which treatment permanently and significantly reduces the toxicity, mobility or volume of the hazardous substances as a principal element, are to be preferred over remedial technologies not involving such treatment. These technologies are initially screened on a technical basis. Based on the screening, a list of individual remedial technologies appropriate to site conditions and consistent with the remedial action objectives is developed.

The site-appropriate remedial technologies are then combined into a number of preliminary remedial alternatives. The basis for the various combinations are: the technical and logical interrelationship between separate technologies; NCP Section 300.68(f) requirements that generel categories of alternatives must be considered and CERCLA Section 121 provisions regarding the preference for remedial actions that utilize permanent solutions and alternative treatment or resource recovery technologies. USEPA is in the process of revising the NCP to reflect these new provisions added by CERCLA. USEPA's "Interim Guidance on Superfund Selection of Remedy" (December 24, 1986 and July 24, 1987) is intended to aid the Agency in the selection of remedial actions pending USEPA's upcoming revisions of the NCP. This summary reflects that guidance. USEPA's interim guidance requires analysis of alternatives involving: 1)treatment options with different degrees of long-term management; 2)containment of waste option with little or no treatment, but providing protection of human health and the environment primarily by preventing exposure or reducing the mobility of the waste and 3)the no-action alternative. In most circumstances, these three categories of alternatives must be carried through the detailed evaluation process, and should not be eliminated during previous screening processes.

The fourth step in the process is to provide an initial screening of these alternatives as delineated in Section 300.68(g) of the NCP. The three broad criteria that should be utilized in the screening are: the relative effectiveness in minimizing threats; the engineering feasibility and implementability of the alternatives and the cost of implementing the remedial action. This general screening is intended primarily to reduce the number of remedial alternatives which will subsequently be evaluated in detail.

The final step as outlined in Section 300.68(h) of the NCP is to conduct a detailed analysis of the limited number of alternatives that remain after the initial screening. In most circumstances, a range of treatment alternatives, a containment and no-action alternative should be included in this analysis. These alternatives are then evaluated using evaluation criteria derived from the NCP and CERCLA. These criteria relate directly to factors mandated by CERCLA in Section 121 including Section 121(b)(1)(A-G) and EPA's Interim Guidance on Selection of Remedy (December 24, 1986 and July 24, 1987). The criteria are as follows:

- Compliance with legally applicable or relevant and appropriate requirements (ARARs)
- Reduction of toxicity, mobility or volume
- Short-term effectiveness
- Long-term effectiveness and permanence
- Implementability
- Cost
- State acceptance
- Community acceptance
- Protection of human health and the environment

DEVELOPMENT OF ALTERNATIVES AND INITIAL SCREENING

Source control remedial responses for the York Oil site will address contamination of the site proper. A further definition of the extent of contaminant migration from the site is currently being assessed in a contamination pathway RI/FS.

The objective of the proposed source control remedial action is to prevent further contaminant migration from the site and thus minimize the threat to human health and the environment. Criteria established to obtain this objective are:

- Eliminate the potential for human/animal direct contact with site wastes;
- Eliminate the migration of PCB-contaminated oils and other contaminants through surface and groundwaters; and
- Eliminate the potential for precipitation/infiltration with the wastes.

Source control technologies that are not considered appropriate for utilization at the York Oil site and a brief discussion of the reasons for their exclusion are lsited in Table 4.

Table 5 lists and briefly describes the technically appropriate remedial technologies for the York Oil site. These technologies were accepted on the basis that they are compatible with the specific site conditions and the remedial action objectives for this operable unit. These technologies were then combined into source control alternatives. As a result, nine remedial action alternatives were developed for evaluation.

Table 4

INAPPROPRIATE REMEDIAL TECHNOLOGIES

- Grout injection - Best suited for sealing voids in rocks, rather than for containing groundwater flow in unconsolidated materials around the site. The compatibility of most grouts with hazardous waste and leachate has not been determined. Slurry walls are less costly and have lower permeabilities than grouted barriers. In addition, the variability of the permeabilites of the soils at the site are not considered suitable for grouting.

- Steel or wood piling cut-off wall - Wood is an ineffective groundwater barrier, and steel barriers are rejected as a containment response on the basis that the pilings cannot be driven into rocky soil with boulders. The boulders encountered within the overburden and the boulder/cobble layer at the York Oil site would damage the piles, rendering the cut-off wall ineffective.

- In-situ solidification - Varying permeabilities at the site limit complete interaction of the fixation additives and the contaminants in the soil.

- Soil flushing - Flushing the soil with solvents or surfactants will create problems with surfactant recovery. Steam enhanced oil recovery is ineffective since the confining pressures of the site overburden is not great enough to contain the steam.

- Oxidation - Inappropriate due to violent reactions between oxidant (e.g., ozone) and metals, oxidation of non-target compounds which may lead to changes in soil hydraulic conductivity, and partial oxidation of target compounds resulting in more mobile and/or more toxic by-products.

- In-situ chemical dechlorination - Due to the non-uniform distribution of PCBs in the soils, complete mixing of the reagents and PCBs utilizing in-situ treatment would not occur. It is also limited due to the higher moisture content in the soil/sludge layer.

Table 5
APPROPRIATE REMEDIAL TECHNOLOGIES

- Slurry wall - Would be keyed into the intact glacial till layer at a depth of about 35 feet, and would physically contain the site. The slurry wall would be installed around the site perimeter to prevent the entry of clean groundwater into a leachate collection drain.

- French drain - It is designed to collect contaminated groundwater and oil in the overburden and transport it to a treatment facility. The inclusion of a hydraulic barrier on the outer portion of the drain is intended to reduce the amount of clean groundwater entering the drain.

- Drawdown wells - Shallow wells would collect contaminants in the overburden and oil layer and deeper wells would collect the phenolics plume. The collected groundwater would be piped to a treatment facility at the site.

- On-site storage tanks - During remedial response, temporary storage tanks could be utilized for storage of oil and soils and permanent tanks could be utilized for a proposed water treatment facility at the site.

- Water treatment system - It is essential for the cleanup of contaminants in the groundwater. Groundwater would first pass through an oil/water separator whereby oils would be set aside for PCB-treatment. The water could then be treated with an activated carbon filter to remove organics and a deionizer to remove heavy metals.

- Surface sealing - If the site is contained, surface sealing utilizing clays, bentonite, cement and membrane liners helps to prevent direct contact and reduces infiltration and leachate generation. If hazardous wastes are left on-site, the surface seal must comply with Section 264.310 requirements of RCRA.

- Excavation of wastes - Would remove all source contaminants, (approximately 30,000 cubic yards of soil) except the deep phenolics plume, thus eliminating further migration from the site. A shallow well dewatering system would be required to control groundwater in the mound during excavation.

- Off-site disposal of wastes - Aside from the fact that landfills do not reduce the toxicity or volume of the contaminants and the future fate of these wastes are not certain, off-site disposal in a PCB-permitted landfill is a technically feasible technology.

Table 5 - continued

- Chemical dechlorination - Dechlorination of PCB-contaminated soils and oils in an off-site facility and in a slurry mode following excavation, is a feasibile technology, however, volatile organics and metals would still be present in the waste.

- Biological treatment - It is a viable treatment method for the contaminated wastes at the site and could only be performed in a slurry mode, following excavation. The microorganisms are sensitive to low temperatures, however, covered and heated tanks could provide optimal conditions. Most microbes identified are not capable of degrading highly chlorinated PCBs.

- Solidification - Following excavation, on-site slurry mode solidification provides permanent immobilization of the soils at the site. The toxicity and mobility of the wastes is reduced resulting in a non-leachable solidified soil matrix.

- Thermal treatment - The waste would be excavated, then thermally treated on-site. This process would destroy both PCBs and organics, however, the fate of the metals is questionable. Further treatment of the ash may, therefore, be required. Thermal treatment must comply with RCRA Section 264 Subpart O and TSCA Section 761.70 incineration requirements.

The nine remedial alternatives have been subjected to an initial screening consistent with 40 CFR Section 300.68(g)(1), (2) and (3) of the NCP to narrow the list of potential remedial actions for further detailed analysis. This screening concluded that the excavation and off-site disposal option of the wastes in a PCB-permitted landfill is not as effective in minimizing threats to human health and the environment as containing the wastes on-site. On-site containment does not require excavation and transport of the wastes thereby providing significantly fewer environmental risks than off-site landfilling. Also the implementability difficulties and significantly higher cost for landfilling is a major factor in eliminating this option from further consideration.

The other remedial option that is eliminatd from further evaluation is the excavation of the soils followed by either on-site or off-site chemical dechlorination of these soils and oils in a slurry mode. The public health and environmental problems with the excavation and transport of the soils has been discussed above. In addition, dechlorination (either on-site or off-site) only addresses the PCBs and would not affect the volatile organics and heavy metals. This would only result in some reduction of the toxicity of the waste, however, there would be no change in either the mobility or volume of wastes. Other treatment options (solidification, thermal and biological treatment) provide better effectiveness in minimizing threats.

DETAILED EVALUATION OF ALTERNATIVES

As a result of the screening process, a total of seven remedial action alternatives were developed for detailed comparative evaluation at the York Oil site. Three containment options, three treatment options and the no-action alternative were carried through to this step. These seven feasible remedial alternatives, and their associated capital costs, operation and maintenance present worth costs and total present worth costs are provided in Table 6. This table also provides the estimated time to implement each remedial alternative from the completion of the ROD, and the time it takes until full protection is achieved.

Description of Alternatives

This section provides a brief description of the seven feasible remedial alternatives. A more detailed description of the alternatives can be found in the addendum FS.

Table 6

Remedial Alternatives Summary

Alternative Number	Components	Total Costs ($ x 10^6) Capital	O & M	Present Worth	Time to Implement from ROD	Time Until Full Protect. Is Achieved	Comments
1	No Action with Site Monitoring	0.3	1.1	1.3	6 mo.	Undetermined	Will not protect human health and environment.
CONTAINMENT OPTIONS							
2	Perimeter Slurry Wall, Interior Perimeter Drain, Lateral Drains Extending into Fill, Treatment of Collected Groundwater, Off-Site Thermal Treatment of Tank Oils, Cleaning and Demolition of Tanks, and an Impermeable Cap in Accordance with RCRA	5.1	1.7	6.8	3 yrs.	15 yrs.	Physically contains the site but does not capture deep plume (Doesn't meet ARARs). Boulders limit excav.
3	French Drain with Hydraulic Barrier Around the Site Except for Northwest Portion, Lateral Drains Extending into Fill, Deep Drawdown Wells, Treatment of Collected Groundwater, Off-Site Thermal Treatment of Tank Oils, Cleaning and Demolition of Tanks, and an Impermeable Cap in Accordance with RCRA	4.2	1.9	6.1	3 yrs.	15 yrs.	Hydraulically contains the site, however, drain provides limited oil recovery. High long-term O&M requirements.
4	Shallow and Deep Drawdown Well System, Treatment of Collected Groundwater, Off-Site Thermal Treatment of Tank Oils, Cleaning and Demolition of Tanks and an Impermeable Cap in Accordance with RCRA	2.3	1.8	4.1	3 yrs.	15 yrs.	Hydraulically contains shallow & deep plumes. Pumps collect excess amounts of clean water O&M intensive.
TREATMENT OPTIONS							
5A	Soil Excavation, On-Site Thermal Treatment of Soils and Tank Oils, Deep Drawdown Wells, Treatment of Collected Groundwater, Cleaning and Demolition of Tanks, On-Site Disposal of Residual Ash, and Surface Grading	15.0	0.5	15.5	3 yrs.	5 yrs.	Reduces toxicity and mobility. Destroys PCB and organics. Metals may inhibit process. Further treatment of ash may be required.
5B	Soil Excavation, On-Site Biological Degradation of Soils and Tank Oils, Deep Drawdown Wells, Treatment of Collected Groundwater, Cleaning and Demolition of Tanks, On-Site Disposal of Treated Soil, and Surface Grading	13.0	0.5	13.5	3 yrs.	5 yrs.	Degrades most PCBs and organics but ineffective in degrading high chlorinated biphenyls.
5C*	Soil Excavation, On-Site Solidification of Soils, Thermal Treatment of Oils, Deep Drawdown Wells, Treatment of Contaminated Groundwater, Cleaning and Demolition of Tanks, On-Site Disposal of Solidified Soil and Surface Grading	6.5	0.5	7.0	3 yrs.	5 yrs.	Reduces toxicity and mobility. Permanently immobilizes the waste. Protects human health & environment. Low O&M

* Preferred Remedial Alternative.

Alternative 1 - No-Action with Site Monitoring - This alternative consists of allowing the site to remain in its existing condition and maintaining the current containment system. The present containment system consists of an interceptor ditch that runs along the northwest border of the site and a filter fence located in a seep area south of the lagoon #3. The existing containment system and existing conditions were previously shown on Figure 2. The ditch collects surface runoff and intercepts groundwater during periods of high groundwater. The filter fence collects oils migrating southwards from lagoon #3.

A long-term groundwater monitoring program would be initiated with the no-action alternative and each of the other six options, to allow periodic reassessment of human health and environmental risks posed by the site. The monitoring would incorporate the installation of approximately 15 wells at five locations. Each well cluster would consist of at least 3 points, screened in the overburden, cobble layer and bedrock. The exact location of the wells would be a function of the selected alternative. In general, 2 to 3 well clusters would be located downgradient along the south side of the site and 1 to 2 well clusters would be located upgradient in the northwest and northeast corners of the site. The sampling would occur on a quarterly basis and would include groundwater, surface sediments in the wetlands, and for the no-action alternative, oils collected in the interceptor ditch. Table 7 summarizes the proposed long-term monitoring program at the site.

Alternative 2 - Slurry Wall with Interior Drain, Groundwater Treatment, Thermal Treatment of Oils, and an Impermeable Cap

The perimeter slurry wall would be keyed 5 feet into the intact glacial till layer at a depth of about 35 feet, and would physically contain the on-site contaminants. An interior drain would be placed around the site perimeter inside the slurry wall at a depth of approximately six to seven feet with lateral drains extending into the fill. This drain system would partially protect the slurry wall from migrating oils which could possibly erode the wall, reduce the occurrence of oil and groundwater overtopping the slurry wall by draining the groundwater mound into a sump, and provide the necessary inward groundwater gradient. The drainage would then be pumped into an oil/water separator and water treatment system along with oils collected from the on-site storage tanks.

Table 7 - Long-Term Monitoring Program

Groundwater Monitoring

Existing Wells:
Y01R
Y06
Y07(S)
Y07(D)
Y09
Y09A
Y012 (3 clusters)
Y014 (3 clusters)
Y027(D)

Proposed Wells:
Y0101 (3 clusters)
Y0102 (3 clusters)
Y0103 (3 clusters)
Y0104 (3 clusters)
Y0105 (3 clusters)

Parameters:
phenolics
volatile organics
PCBs
oil and grease
zinc
lead

Wetland's Monitoring

3 sediment samples in drainage swale

Parameters:
PCBs

Oils collected from the on-site tanks and groundwater would be thermally treated off-site. The contaminated water would be treated by carbon adsorption and deionizer units and discharged into the surrounding wetlands or injected into the ground. The PCB-laden sediments would be collected from the adjacent strip of land and placed on-site within the slurry wall for containment. An impermeable RCRA cap would be constructed over the contaminated on-site area as a component of this alternative. The monitoring program outlined for Alternative No. 1 would also be incorporated with this alternative, in addition to cleaning and demolition of the on-site tanks.

Alternative 3 - French Drain with Hydraulic Barrier, Deep Drawdown Wells, Groundwater Treatment, Thermal Treatment of Oils, and an Impermeable Cap

With this alternative, a french drain would encircle the site, with lateral drains extending into the fill. The proposed drain, which would lower the water table and collect migrating oils, would be placed at a depth of approximately 15 to 20 feet in the down-gradient (southern) area of the site. The north, or up-gradient drain would be placed approximately 3 to 5 feet below the ground to control the level of the water table. The hydraulic barrier, on the outside of the french drain serves to limit the amount of clean groundwater entering the system, thus reducing treatment quantities and costs. The barrier would also prevent migration of any contaminants through the drain.

Another component of this alternative is the addition of approximately 20 deep drawdown wells places along the south, east, and west sides of the site. These wells would be pumped for three years to collect the phenolics within the weathered till and cobble/boulder layer located beneath the french drain. If, after three years, the phenolic plume is cleaned-up to a level tht satisfies the ARARs (50 ppb for any single phenolic compound and 100 ppb for total phenolics), the deep wells would then be used for monitoring only.

Groundwater and oil collected in the french drain and wells would be stored, treated, and disposed of using the oil/water separator, water treatment system, and off-site thermal treatment as outlined under Alternative No. 2. The tanks would be cleaned and demolished as discussed in the previous option.

The PCB-laden sediments would be collectd from the 1000 ft. x 200 ft. strip of land and placed on-site within the limits of the french drain for containment. An impermeable RCRA cap would be constructed over the contaminated on-site areas.

Alternative 4 - Drawdown Well System, Groundwater Treatment, Thermal Treatment of Oils, and an Impermeable Cap

The system of drawdown wells would consist of 29 shallow wells and 23 deep wells set above the till layer. The shallow wells would be installed up to twenty feet deep and would be constructed of 2-inch diameter stainless steel. This system of wells would be connected to a manifold and would be pumped by a series of 3 suction pumps. The deep wells would be set on top of or extend up to 5 feet into the till layer, which is approximately 35-40 feet deep. Each deep well would be constructed of 6-inch diameter stainless steel and each would have an individual submersible pump. As with the french drain alternative, the deep wells would be pumped for the first three years to collect the phenolics plume, and then used for monitoring.

As with the slurry wall and french drain alternatives, this system would be coupled with an oil/water separator and water treatment system. Recovered oil would be treated off-site using thermal treatment as outlined in Alternative #2 and 3. The contaminated sediments would be collected from the strip of land and placed on-site within the drawdown well zone of influence for containment. An impermeable cap would be constructed in accordance with RCRA over the on-site contaminated area. The long-term groundwater monitoring program would also be incorporated with this alternative. The PCB-laden sediments would be collected from the 1000 ft x 200 ft strip of land and placed on-site within the limits of the french drain for containment. An impermeable RCRA cap would be constructed over the contaminated on-site area.

Alternative 5A - Soil Excavation, On-Site Thermal Treatment of Soils and Tank Oils, Deep Drawdown Wells, Groundwater Treatment, On-Site Disposal of Ash and Surface Grading

For this alternative, an estimated 30,000 cubic yards of contaminated soils and sludges would have to be excavated from the site. This volume would include approximately 8,000 cubic yards of material from the 1000 ft x 200 ft strip of land west of the site. All the excavated material in addition to the contaminated oils would be treated using an on-site thermal treatment unit. The mobile unit would destroy PCBs and organics and achieve 99.9999% destruction and removal efficiency. The aim of thermal treatment would be to render the treated soils into a non-hazardous form. The treated material would then be disposed of on-site, and graded. Due to the metal- contamination in the soil, the residuals from thermal treatment may need to be solidified/stabilized before disposal on-site. A test burn would be preformed as a pilot test to determine the characteristics for thermal treatment applications.

For three years, deep drawdown wells would be pumped to collect the phenolics plume, and after that time they would be used for monitoring purposes. Temporary shallow drawdown wells would be utilized to collect migrating pollutants in addition to dewatering the mound to allow efficient excavation.

As is the case with all the alternatives, the collected groundwater would be treated and the tanks would be cleaned and demolished.

Alternative 5B - Soil Excavation, On-Site Biological Treatment of Soils and Oils, Deep Drawdown Wells, Groundwater Treatment, On-Site Disposal of Treated Soil and Surface Grading

As with Alternative 5A, under Alternative 5B, all contaminated soils would be excavated. However, Alternative 5B would then involve biological treatment of the soils in an on-site treatment unit. This process could not be applied in-situ due to the inability to assure complete mixing of the biological organisms and the contaminated media.

The biological treatment would be done in mixing tanks or lagoons constructed on-site. The microorganisms would be added to the excavated soils and nutrients and catalysts would be added as required to aid in the reaction. After treatment and testing, the detoxified soils would be returned to the site and graded. Oil within the storage tanks would be treated separately or added to the excavated soil for treatment.

During the remedial design, a treatability study would be conducted to determine the appropriate nutrients, catalysts, and reaction conditions. In addition, laboratory testing would be required to evaluate the leachability of metals from the treated soils.

A series of shallow wells would also be included during construction with this alternative to collect floating oils and to allow efficient excavation. Deep drawdown wells would also be necessary to collect the phenolics plume in the deeper groundwater zone.

As discussed previously, the groundwater would be treated in-site and the tanks would be cleaned and demolished.

Alternative 5C - Soil Excavation, On-Site Solidification of Soils, Thermal Treatment of Oils, Deep Drawdown Wells, Groundwater Treatment, On-Site Disposal of Solidified Soils and Surface Grading

Alternative 5C involves the solidification/fixation of contaminated soils and sludges. The contaminated soil and sludge in the 1000 ft by 200 ft strip of land as well as the contaminated soils within the fenced area would be excavated and dewatered prior to treatment. In-situ treatment is not feasible because of the highly permeable soils, therefore, resulting in incomplete mixing.

The solidification treatment would be performed in a mobile unit located on-site. The mobile unit would mix the fixing agents/additives, and would blend the waste in mixing tanks with the fixing additives, thereby permanently immobilizing the waste. The stabilized material would be tested to verify its non-leachability, followed by on-site disposal and grading.

A series of shallow wells would also be included with this alternative during construction to collect floating oils and to allow efficient excavation. The oils collected during excavation as well as the tank oils would be thermally treated off-site. Deep drawdown wells are also necessary to collect the groundwater plume within the boulder zone. The collected groundwater would be subsequently treated.

A treatability study during the design phase is recommended to determine the effectiveness of the fixing agents to permanently immobilize the entire waste stream.

Detailed Evaluation and Comparison of Alternatives

A detailed evaluation of each of the seven alternatives remaining after the initial screening was conducted consistent with 40 CFR Section 300.68(h) of the NCP. A comparative discussion of the seven alternatives using the evaluation criteria listed previously is summarized below.

- Compliance with Applicable or Relevant and Appropriate Requirements

Section 121(d) of CERCLA requires that remedial actions comply with all applicable or relevant and appropriate Federal and State requirements (ARARs) to the extent that hazardous substances are present on-site.

Each of the seven alternatives would comply with ARARs, with the exception of the no-action. If the no-action alternative is selected, both surface and groundwater at the site would continue to exceed federal and state standards. The slurry wall option (Alternative 2) does not meet the State groundwater ARAR for phenols (i.e., 50 ppb for any single phenolic compound and 100 ppb for total phenolics), since the deep groundwater extraction wells are absent from this option. However, this alternative does comply with RCRA Part 264.310 requirements which specify certain thickness and composition for final covers at hazardous waste sites.

While permits are not required for on-site remedial actions at Superfund sites, any on-site action must meet the substantive technical requirements of the permit process. Thermal treatment of the oils at the site would comply with all the applicable federal requirements of Part 264 Subpart O of RCRA (Subpart O specifies design requirements for operation of hazardous waste incinerators) and Part 761.70 of TSCA which specifies requirements for incineration of PCBs. Specifically, operation of an on-site thermal treatment unit would require that the transportable unit undergo waste specific trial or demonstration burns to demonstrate satisfactory destruction of the toxic components of the waste. The trial or demonstration burn must show that the unit achieves 99.9999% destruction and removal efficiency (six 9s DRE), and controls air emissions of products of incomplete combustion, acid gases and particulates to specified levels.

Containment Alternatives 3 and 4 include deep pumping to collect the migrating phenolics plume and these options comply with the RCRA provisions regarding final covers.

The three treatment alternatives will comply with state and federal PCB-cleanup policies, requiring PCB cleanup in soils in residential areas to 10 ppm. (Even though these cleanup policies are not promulgated ARARs, they are consistently ulilized when developing cleanup levels for PCBs in residential areas.) These options also mitigate both the shallow and deep groundwater quality problems. Thermal and biological treatment and solidification are also consistent with the proposed NCP as permanent treatment remedies. The treatment options would comply with all federal and state requirements concerning potential air emissions (particulates and volatiles) during the excavation of contaminated soils and sludges.

The applicable New York State air requirements for excavation include Part 257 and Part 373, which regulate ambient air standards, and control of particulates from waste piles, respectively. The federal requirements to be complied with during excavation include 40 CFR Part 50 and Part 264.25(f), which control ambient air standards and control of particulates from waste piles, respectively.

The State applicable requirements include compliance with Part 212 which controls air emissions of contaminants to the outdoor atmosphere, Part 373-2.15 regulating operating standards for hazardous waste incineration and the State Air Guide-1 Guidance. All alternatives utilizing thermal treatment of oils would also comply with these requirements. However, if an off-site, out-of-state treatment facility is used for the oils, then the thermal treatment alternatiaves would comply with the applicable State requirements where the unit is located.

Each of the treatment options (Alternatives 5A, 5B, and 5C), which include the incorporation of deep wells, will meet the State groundwater standard for phenols.

Discharge of the treated groundwater into the wetlands would comply with the New York State Pollutant Discharge Elimination System requirements.

Consistent with CERCLA Section 121 requirements, the continued effectiveness of containment options 2, 3 and 4 would have to be evaluated at least every 5 years to assure continued protection of human health and the environment. The treatment options would also have to be evaluated every five years since this material would remain on-site.

°<u>Reduction of Toxicity, Mobility or Volume</u>

This evaluation criteria relates to the performance of a remedial alternative in terms of eliminating or controlling risks posed by the toxicity, mobility or volume of hazardous substances.

Solidification would permanently immobilize the soil/waste matrix, thereby eliminating any associated toxicity due to the contaminants. Any future leaching of contaminants from the solidified soil would also be eliminated by this option. Thermal and biological treatment of the soils would destroy the PCBs and organics, however, the toxicity associated with the heavy metals would remain unchanged.

The no-action alternative would not result in a reduction of either the toxicity, mobility or volume of the waste since the site would be left as is. The containment options (Alternative

2, 3 and 4) would result in some toxicity and mobility reduction due to the groundwater collection and treatment system, however, the volume of waste material would not be reduced. The volume of waste material would not be affecated by either thermal or biological treatment. With solidification, however, due to the addition of the fixation agents, the volume of waste material would likely increase, but not substantially.

°Short-Term Effectiveness

Short-term effectiveness measures how well an alternative is expected to perform, the time to implement the action, and the potential adverse impacts of its implementation.

The implementation of the no-action alternative causes no adverse impacts over the short-term, since the only short-term construction activities associated with this alternative is the installation of additional groundwater monitoring wells for long-term site monitoring. The estimated time to implement the no-action alternative is six months from the signing of the ROD.

Alternatives 2 and 3 require limited excavation of the soils, and the installation of a slurry wall and french drain, respectively. Excavation could result in short-term air emissions and installation difficulties due to large boulders at the site. Both alternatives provide limited recovery of contaminated oils due to the low porosity of the soils.

Alternative 4 provides a greater degree of protection over the short-term than Alternative 2 and 3 since only deep and shallow drawdown wells would be installed, thereby not requiring soil excavation. However, excessive amounts of clean groundwater would be collected and oil recovery via the pumping system would be limited. Installation of an impermeable cap (Alternatives 2, 3 and 4) would increase the short-term air emissions due to the necessity of grading the mound at the site.

The three treatment options (Alternatives 5A, 5B and 5C) require excavation, thereby increasing the short-term risk from air emissions. Thermal treatment may result in air emissions, however, as noted above, strict measures would be implemented to ensure that such emissions would not be harmful to human health and the environment. Alternative 5A may also require additional materials handling on-site, such as pretreatment (e.g., shredding and crushing) of the contaminated soils prior to feeding to the thermal treatment unit.

The time to implement each remedial option, except for the no-action, is approximately three years from the signing of the ROD.

°Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence addresses the long-term protection and reliability of an alternative.

Over the long-term, the on-site treatment options provide essentially equivalent protection to the local communtiy, since the residuals are not expected to pose a hazard from a health and environmental perspective. However, the long-term effectiveness of thermal treatment to destroy the organics and to fuse the high concentration of lead into the residual ash in a non-hazardous form is questionable at this time. Further treatment of the residual ash may, therefore, be required.

The residuals following thermal, biological and solidification treatment processes would be anlayzed to determine the effectiveness each treatment procedure has in rendering the material into a non-hazardous form. In addition, tests would be conducted to ensure that the residuals pose no direct contact risk.

Each alternative, except the no-action and slurry wall options, is designed to clean-up the deep phenolics groundwater contamination within three year of pumping.

The treatment options achieve full protection of human health and the environment, with minimal O&M, within five years from the signing of the ROD, while the containment options require a high degree of O&M and take approximately fifteen years to achieve full protection. Alternatives 2, 3 and 4 only contain the wastes while Alternatives 5A, 5B and 5C treat the wastes, resulting in a permanent remedy for the site. It is believed that Alternative 5C, solidification, would provide a higher degree of long-term effectiveness than biological treatment since solidification would permanently immobilize the waste. Biological treatment is not effective in degrading the highly chlorinded PCBs and metals. As mentioned above, further treatment of the residual ash following thermal destruction may be needed.

The containment options, once implemented, need to be evaluated every five years to ensure their continued effectiveness. This evaluation would determine the effectiveness of these options to lower the groundwater mound at the site and determine the continued effectiveness of the cap to reduce the direct contact threat.

The no-action alternative provides minimal long-term effectiveness since the wastes would remain at the site without any containment or treatment.

°Implementability

Implementability addresses how easy or difficult it would be to carry out a given alternative. This covers implementation from design through construction and O&M.

The implementability of the alternatives is evaluated in terms of technical and administrative feasibility, and availability of needed goods and services.

Each alternative evaluated here is technically feasible, however, each treatment option (Alternative 5A, 5B, and 5C) would require a treatability study to determine the optimal conditions to render the residuals into a non-hazaradous form. The treatability study would be conducted during the remedial design.

Full-scale operation of transportable thermal treatment units at hazardous waste sites has been limited. Units have also experienced extended periods of downtime, therefore, it is likely that operation of a unit at the York Oil site would also result in some extended downtime periods. However, in all situations, transportable units have been repairable and have been brought back up to full-scale operation.

The effectiveness of thermal treatment to fuse the metals in the residual ash without further treatment of this material has not been demonstrated at this time. Frequent monitoring of residuals during full-scale operations would be needed to ensure the systems's effectiveness and reliability.

Transportable units for thermal, biological and solidification are currently available for use at hazardous waste sites and could be used at York Oil. Sufficient area exist on-site to set-up these mobile treatment units for operation and there is ample land area available on-site for disposl of the treated soil.

Due to the severe and elongated winters in this area, the construction season for each alternative would be limited. These conditions might also result in hampered maintenance operations, especially with the groundwater collection component (pumps, drains) of the containment options. Due to the decreased winter temperatures, both solidification and biological treatment may require additional precautions (heated tanks) to maintain optimal reaction rates.

°Cost

Costs are evaluated in terms of capital, O&M and present worth.

In comparing treatment Alternatives 5A, 5B and 5C which result in the same degree of remediation (i.e., final end-product which does not pose a threat to human health and the environment), solidification of the soils has been identified as a cost-effective alternative. The present worth cost for these three options ranges from approximately $7 million for solidification to $15 million for thermal treatment. For thermal treatment of soils (Alternative 5A), if it is determined during the treatability study that further treatmeant of the residual ash is needed, an estimated additional $2 million could be required. The three treatmeant options include costs for excavation and treatment of approximately 30,000 cubic yards of contaminated soils.

The total present worth cost for the containment options (Alternatives 2, 3 and 4) vary from approximately $4 million to $7 million, but do not meet the preference for treatment. They do, however, reduce the exposure to the contaminants.

As mentioned previously, Table 6 provides a summary of the capital, O&M and total present worth cost for each of the seven alternatives. A more detailed breakdown of these costs are provided within the addendum FS.

°State Acceptance

This section addresses any concerns and degree of support the State has expressed regarding the remedial alternatives being evaluated.

The States supports a permanent solution for the York Oil site. Its preference is on-site thermal treatment of the contaminated soils and oils (Alternative 5A). The State's primary concern with this option is the ability or inability of the thermal treatment unit to render the high concentration of metals in the residual ash in a non-leachable form.

Alternative 5C includes on-site solidification of the soils and off-site thermal treatment of the oils. This option would permanently destroys the contaminants in the oils through thermal treatment and would immobilize the contaminated soils at the site. The State's concern regarding this option is whether the contaminants in the solidified soil would leach, therefore, not providing a permanent solution.

Prior to implementation of either of these options, a treatability study would be performed to answer the concerns mentioned above.

°Community Acceptance

This evaluation criteria addresses the degree to which members of the local community suport the remedial alternatives being evaluated.

Both the DEC's preferred option (Alternative 5A) and EPA's proposed remedial action plan (Alternative 5C) were made available during the public comment period and were presented at the public meeting. In general, the community indicated a preference for a permanent remedy at the site. Some residents expressed concern that solidification only contains the wastes and is not a permanent technology.

Concerns were also raised regarding the quality of the residential wells and the need for a residential water supply in the area of the site. Since all residential wells are free of any contamination attributable to the York Oil site, and the potential for future impact of residential wells is minimal due to the nature and movement of groundwater in the area, a residential water supply is not justified at this site.

Detailed responses to the community concerns are contained in the attached responsiveness summary.

°Protection of Human Health and the Environment

Protection of human health and the environment is the central mandate of CERCLA. Protection is achieved primarily by reducing health and environmental threats to acceptable levels and taking appropriate action to ensure that there will be no unacceptable risks to hemah health and the environment through any exposure pathways.

Except for the no-action alternative, all of the alternatives evaluated here are protective of human health and the environment to some degree. However, options 2, 3 and 4 only physically or hydraulically contain the contaminants at the site, thereby resulting in the potential for some continued migration of PCBs and other contaminants into the groundwater and surface water. Thermal treatment of the soils by itself (Alternative 5A) would not address the health risks associated with leaving heavy metal contamination in the residual ash, however, it would destroy the organic contaminants in the soils.

Appropriate measures would need to be taken during site excavation (Options 5A, 5B and 5C) to protect workers and the community. In addition, prior to implementing treatment under Alternatives 5A, 5B and 5C, measures would have to be taken to assure that implementation of these treatment processes does not pose a threat to human health or the environment. A few of the potential problems are outlined below.

Workers would be protected through measures outlined in project specific health and safety plans and through contractor adherence to Occupational Safety and Health Act (OSHA) regulations.

An on-site transportable thermal treatment unit and/or associated air pollution control equipment, materials handling equipment, or materials pretreatment equipment may generate noise during routine operation. However, proprietors of these units have indicated a willingness to house or insulate any noisy pieces of equipment or take any other measures necessary to eliminate the generation of noise.

Both solidification and biological treatment would not generate substantial noise during actual operations. However, noise from excavation equipment and any potential materials pretreatment would be generated. Again, measures could be taken to minimize noise generation.

Dust and particulate matter could be generated during materials handling pretreatment. The potential for air releases of products of incomplete combustion during thermal treatment, also exists. Measuares would be taken to reduce these potential hazards prior to full-scale operation.

Of the treatment options, solidification (Alternative 5C) permanently immobilizes the soils and eliminates any future leaching of both organic and inorganic contaminants. All threats associated with soils ingestion and dermal contact, and surface water runoff, would be eliminated. The contaminated oils at the site would be thermally treated in an off-site facility, therefore, eliminating any future toxicity of these wastes.

SELECTED REMEDY

Based upon CERCLA, the detailed evaluation of the alternatives, and public comments, the EPA has determined that Alternative 5C, excavation and on-site solidification is the most cost-effective, environmentally sound remedy for this source control operable unit. This remedy consists of the following components:

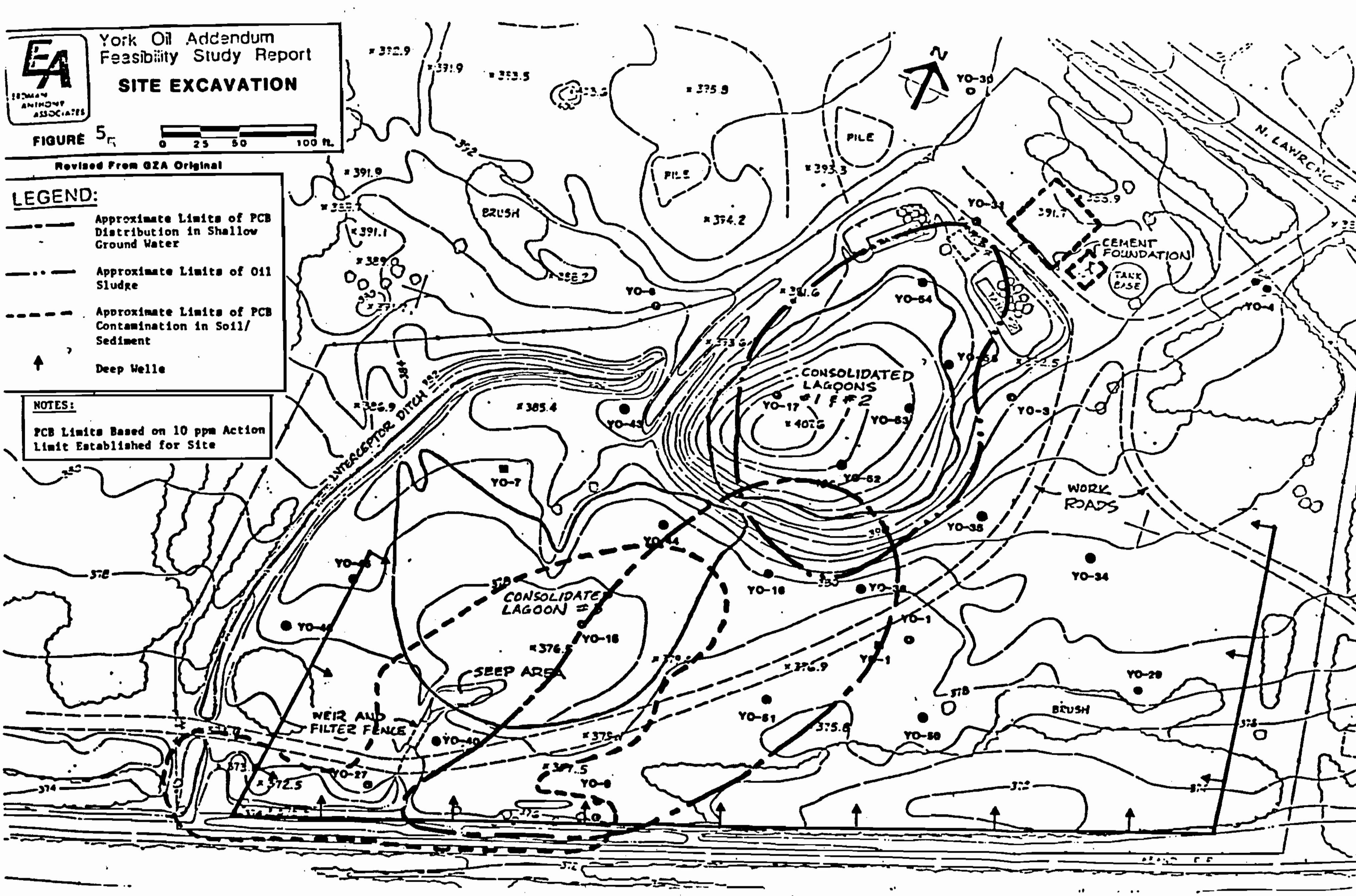
1. Excavation of approximately 30,000 cubic yards of contaminated soils followed by on-site solidification of this material. (Figures 5 and 6 indicate the contaminated areas to be excavated.) This volume includes excavation of approximately 8,000 cubic yards of contaminated sediments from the adjacent strip of land west of the site. On-site analytical testing of the soil would be performed, to screen the soils to help determine the required excavation limits. The treated soils would be returned to the same waste management unit from where they were removed, and then graded. Since the solidified soil will remain on-site, the remedy will be reviewed every five years to assure that human health and the environment are being protected.

2. Installation of thirteen deep groundwater drawdown wells along the southern and western perimeter of the site to collect the sinking phenolics contaminant plume (see Figure 5), and installation of shallow dewatering wells to collect contaminated groundwater and oil during excavation. The deep wells would be screened at the top of the underlying till layer.

3. On-site treatment of the collected contaminated groundwater with subsequent discharge of the treated groundwater in accordance with New York SPDES permit requirements. The proposed treatment system would consist of an oil skimmer and oil/water separator that would concentrate the PCB-laden oils floating on the groundwater. Water from the separator would be discharged into a modular water treatment unit. The collected oils would be thermally treated off-site.

4. Off-site thermal treatment of approximately 25,000 gallons of contaminated tank oils in addition to other oils collected at the site, in accordance with the RCRA 40 CFR §264 Subpart O and the TSCA 40 CFR §761.70 requirements. The empty storage tanks would be cleaned and demolished.

5. Treatability studies would be conducted during the remedial design to determine the effectiveness of the solidification process and to determine the optimal treatment system for the contaminated groundwater. Should the treatability study


York Oil Addendum
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SITE EXCAVATION
FIGURE 5
0 25 50 100 ft.
Revised From GZA Original
LEGEND:
Approximate Limits of PCB Distribution in Shallow Ground Water
Approximate Limits of Oil Sludge
Approximate Limits of PCB Contamination in Soil/ Sediment
Deep Wells
NOTES:
PCB Limits Based on 10 ppm Action Limit Established for Site
N. LAWRENCE RD
CEMENT FOUNDATION
TANK BASE
PILE
PILE
BRUSH
BRUSH
CONSOLIDATED LAGOONS #1 & #2
CONSOLIDATED LAGOON #3
SEEP AREA
WORK ROADS
INTERCEPTOR DITCH
WEIR AND FILTER FENCE
YO-30
YO-34
YO-64
YO-3
YO-4
YO-17
YO-63
YO-62
YO-43
YO-7
YO-6
YO-35
YO-34
YO-18
YO-1
YO-29
YO-61
YO-50
YO-40
YO-27
YO-9
YO-16
YO-46
385.4
376.5
375.6
372.5

LEGEND:

— — — APPROXIMATE TRANSITIONS BETWEEN SOIL TYPES

NOTE:

1. SCHEMATIC ILLUSTRATES CONCEPTUAL DESIGN-NOT INTENDED FOR FINAL DESIGN.
2. SUBSURFACE PROFILE ADAPTED FROM SUBSURFACE INFORMATION PROVIDED BY GZA

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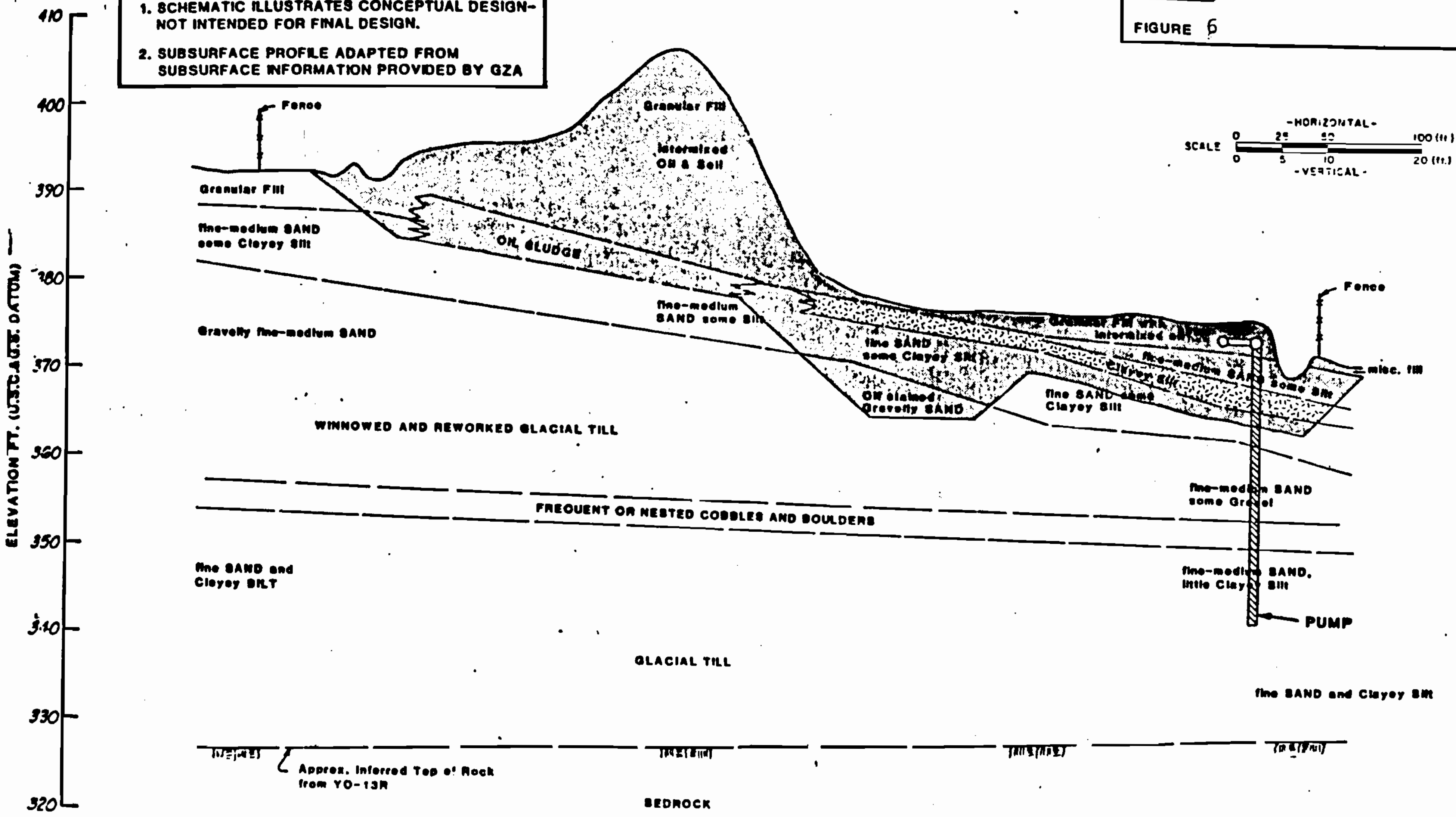
SITE EXCAVATION

FIGURE 6



determine that solidification would not provide the desired degree of treatment, then a treatability study would be performed to determine the effectiveness of thermally treating the soils at the site.

6. An additional operable unit RI/FS for the contamination pathways is in progress to further define the extent of the contamination migration from the site. If remedial actions are determined to be necessary to address the contamination pathways, a subsequent ROD will be prepared.

Cost estimates for the selected remedial action are listed in Table 8.

Table 8 Cost Estimate
Alternative 5C - Site Excavation with Solidification/Fixation

ITEM	PRESENT WORTH
Remedial Action - Short Term Operations	
Common Remedial Action Operations (See Table 6-5)	$ 1,904,935
Excavation & On Site Solidification/Fixation	2,746,800
Dewatering & Deep Wells	99,950
Mobilization (3%)	142,551
Contingency (25%)	1,187,921
Sub-Total Short Term Operations	$ 6,082,157
Remedial Action - Long Term Operations (1 yr,10% i)	
On Site Treatment System O & M	$ 1,050
Shallow Well System O & M	4,400
Water Treatment Unit O & M	7,450
Sub-Total Long Term Operations	$ 12,900
Remedial Action - Long Term Operations (3 yr,10% i)	
Deep Well System O & M	$ 14,950
Sub-Total Long Term Operations	$ 14,950
Total Remedial Action	$ 6,110,007
Post Closure Operations (10 yr,10% i)	
Site Maintenance	$ 102,700
Site Monitoring	397,000
Monitoring Well Maintenance	28,550
Total Post Closure Operations	$ 528,250
TOTAL PRESENT WORTH - ALTERNATIVE 5C	$ 6,638,257

Table 8 (cont'd) Capital Cost Estimate Common Remedial Action

ITEM	COSTS Alt. 5C
Hydrogeologic Study	$ 120,000
Install. of Monitoring Equip.	
Air	61,900
Groundwater	48,000
Site Work (grading, elec. service. topsoil, seeding, etc.)	281,540
Oil Disposal From Existing On Site Tanks	
Off Site Destruction	115,605
Impervious Cap	-----
Leachate Pumping System	-----
On Site Treatment System (skimmers, O/W separators, & holding tanks)	81,720
Water Treatment Unit	88,000
Personnel Protection	160,575
Wetlands Remediation (strip of land)	1,043,200
TOTAL	1,904,935

STATUTORY DETERMINATIONS

The selected remedy satisfies the nine evaluation criteria to the greatest extent of any of the alternatives evaluated.

The solidification alternative would comply with federal and state clean-up levels for PCBs, all groundwater ARARs, and surface water discharge requirements (New York SPDES). The contaminated oils would be thermally treated off-site in accordance with RCRA Section 264 Subpart O and TSCA Section 761.70 requirements. In addition, the wastes in the solidified soil would be permanently immobilized in a non-leachable form. The treated soil would undergo the extraction procedure toxicity test and/or the proposed toxicity characteristics leaching procedure test to ensure the permanance of the treatment.

The selected remedy involves placement and treatment of soils and debris wastes. Placement of wastes or treated residuals is prohibited under RCRA Land Disposal Restrictions (LDR) unless certain treatment standards are met. LDR standards have not been promulgated for soil and debris wastes, but when published, the standards may be applicable or relevant and appropriate. Despite the absence of specific treatment standards, the treatment method employed as part of this remedial action satisfies the statutory requirement to substantially diminish the toxicity of the waste or substantially reduce the likelihood of migration of hazardous constituents from the waste so that short-term and long-term threats to human health and the environment are minimized.

EPA believes that soils solidification is an availabe and reliable technology for the treatment of wastes types identified at the York Oil site. The treatability study would ensure the site-specific technical feasibility and operational reliability of the solidification process.

The selected remedy satisfies CERCLA Section 121 requirements for utilizing a remedy that permanently immobilizes and reduces the toxicity and mobility of the waste at the site. Solidification of the soils provides the same degree of protection to human health and the environment as the other treatment options, but at a lower cost.

To summarize, EPA's selection of on-site solidification of soils, off-site thermal treatment of oils and deep drawdown wells (Alternative 5C) is protective of human health and the environment, will attain all ARARs, and is cost-effective. Since this option utilizes solidification and thermal treatment to eliminate the principal threat at the site, this alternative would also satisfy CERCLA preference for remedies which employ treatment, as their principal element to reduce toxicity, mobility or volume of the contaminants at the site.

Operation and Maintenance

O&M are those costs required to operate and maintain the remedial action throughout its lifetime. These activities ensure the lifetime effectiveness of the remedial alternative selected.

The selected alternative involves the installation of deep wells to collect the phenolics plume with subsequent treatment of the contaminated groundwater in a water treatment system. It is estimated that thirteen deep drawdown wells would be installed along the southern, eastern, and western perimeter of the site. These wells would be screened at the top of the underlying till layer and are anticipated to consist of six inch diameter stainless steel wells with 25 gallon/minute pumps.

The recommended water treatment system is anticipated to consist of an oil/water separator followed by a modular water treatment unit. The oils would be thermally treated and the contaminated groundwater would be treated and discharged to the wetlands in conformance with New York SPDES permit requirements. A treatability study would determine the optimum water treatment system.

The O&M associated with the first three years of deep well pumping is part of the proposed remedial action, since it is currently projected that it would take three years to restore the quality of the aquifer and cleanup the deep groundwater phenolics plume to a health-based level of 50 ppb for any single phenolic compound and 100 ppb for total phenolics. Therefore, the related O&M costs during those three years would be cost-shared with the State. Subsequent to three years, any additional O&M pumping costs would be incurred utilizing State funds.

As part of the remedial action, a 30-year groundwater sampling program is included to monitor changes in the nature and extent of contamination at the site to determine the effectiveness of the operation.

One hundred percent of the remedial design will be funded by EPA. Cost sharing for construction of the remedy is 90% Federal and 10% State.

SCHEDULE*

Activity	Date
° Public Meeting	December 16, 1987
° Regional Administrator Signs Record of Decision	January 29, 1988
° PRP Negotiations	December 1987 to February 1988
If no PRP pick-up, then:	
° Contractor Procurement Process for Remedial Design	February 1988 to May 1988
° Treatability Study and Remedial Design Begins	June 1988
° Potential PRP Negotiations Completion	December 1988
° Contractor Procurement Process for Construction	December 1988 to March 1989
° Implement Remedy	April 1989
° Construction Complete	October 1990

* This is a projected schedule for this site and it is, therefore, subject to future modification.

FUTURE ACTIONS

This ROD addresses the source control operable unit for the York Oil site. An additional operable unit RI/FS for the contamination pathways is in progress to further define the extent of the contamination migration from the site. Further evaluation of the groundwater quality, the extent of contamination in the wetlands and Lawrence Brook, and the potential impact of wildlife and aquatic life such as bioaccumulation in the food chain is being conducted during this study. If additional remedial actions are determined to be necessary, a subsequent ROD will be prepared.

Residential wells currently in use have not been impacted by the site. It is also unlikely that these residential bedrock wells will become contaminated once the remedy has been implemented. The glacial till layer above the bedrock is also a low permeable confining layer. Continued monitoring of the groundwater would be conducted, however, to assure the quality of the groundwater.

The area around the York Oil site has a high sensitivity for the discovery of cultural resources. Accordingly, under the National Historic Preservation Act, a cultural resources survey would be performed during the remedial design phase of the source control operable unit to determine if any historical landmarks or additional cultural resources exist within the undisturbed portions of the York Oil site area.

Because of the similarity of the cultural resource issues associated with the entire area, both the contamination pathways and source control cultural surveys would be conducted concurrently.