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Superfund Record of Decision:

Mottolo Pig Farm, NH

50272-101

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15. Supplementary Notes

16. Abstract (Limit: 200 words)

The 50-acre Mottolo Pig Farm site is in Raymond, New Hampshire. Surrounding land is primarily rural residential and undeveloped. The site includes a wooded area, an inactive piggery area comprised of several structures, a building drum disposal area, and wetlands. An onsite brook (Brook A) originating in the wetlands discharges into the Exeter River. Prior to 1975, a piggery operation was located onsite. From 1975 to 1979, the owner disposed of 1,600 drums and pails containing hazardous wastes in a disposal area north of the piggery building, and subsequently filled in the area. In 1979, the State identified onsite buried drums some of which were crushed and leaking. Consequently in 1980, EPA began excavation and staging of these drums. From 1981 to 1982, EPA removed and characterized drummed waste, then transported the waste offsite along with 160 cubic yards of contaminated soil, drum parts, and plastic sheeting. The area was then regraded and seeded. This Record of Decision (ROD) addresses contaminated onsite soil, debris, and the associated ground water plume. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs including TCE, toluene, vinyl chloride, and xylenes; and metals including arsenic.

(See Attached Page)

17. Document Analysis a. Descriptors

Record of Decision - Mottolo Pig Farm, NH
First Remedial Action - Final
Contaminated Media: soil, debris, gw
Key Contaminants: VOCs (TCE, toluene, xylenes, vinyl chloride), metals (arsenic)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 152
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Mottolo Pig Farm, NH
First Remedial Action - Final

Abstract (Continued)

The selected remedial action for this site includes installing a ground water interceptor trench upgradient of the former drum disposal area to reduce migration of contaminants and facilitate treatment of contaminated soil; capping the the drum disposal and southern boundary areas with temporary waterproof caps to improve treatment efficiency; treating approximately 3,400-4,000 cubic yards of VOC-contaminated soil at these areas using in-situ vacuum extraction and activated carbon to control off-gases, followed by onsite or offsite carbon regeneration and disposal; allowing the contaminated ground water plume to be restored through natural attenuation; monitoring ground water and surface water; and implementing institutional controls including deed and ground water use restrictions, and site access restrictions such as fencing. The present worth cost for this remedial action is $690,000, which includes a present worth O&M cost of $280,000.

PERFORMANCE STANDARDS OR GOALS: Soil cleanup levels were established to protect ground water from soil leachate. Ground water interim cleanup levels were based on Federal SDWA MCLs and MCLGs, or State Health Advisory Levels. The estimated time frame for the restoration of the overburdened ground water affected by the drum disposal area soil and the bedrock ground water affected by the southern boundary soil to acceptable levels by natural attenuation is 6 years and 2 years, respectively.

DECLARATION FOR THE RECORD OF DECISION

Mottolo Superfund Site
Raymond, New Hampshire

STATEMENT OF PURPOSE

This Decision Document presents the selected remedial action for the Mottolo Superfund Site in Raymond, New Hampshire, developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), the National Oil and Hazardous Substances Contingency Plan (NCP), and 40 CFR Part 300 et seq., as amended. The Region I Administrator has been delegated the authority to approve this Record of Decision (ROD).

The State of New Hampshire concurs with the selected remedy.

STATEMENT OF BASIS

This decision is based on the Administrative Record which has been developed in accordance with Section 113(k) of CERCLA and which is available for public review at the Dudley-Tucker Public Library in Raymond, New Hampshire, and at the Region I Waste Management Division Records Center at 90 Canal Street, Boston, Massachusetts. The Administrative Record Index (Appendix E to the ROD) identifies the items which comprise the Administrative Record upon which the selection of the remedial action is based.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to the public health or welfare or to the environment.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy for the Mottolo Superfund Site includes both source control and management of migration components to obtain a comprehensive remedy.

The source control remedial measures include:

- Installation of a groundwater interceptor trench upgradient of the former disposal area. Lowering of the upgradient overburden water table in this area will significantly reduce groundwater flow through contaminated soils and, accordingly, migration of contaminants from the former drum disposal area. Dewatering will facilitate VES treatment of that portion of contaminated soils that is currently saturated by groundwater, significantly increasing the

effectiveness of source control. No dewatering will be required for the southern boundary area since the overburden soils remain unsaturated for most of the year.

- Sealing the ground surface in both the former drum disposal area and the southern boundary area with temporary caps consisting of four or six-mil thick visqueen sheeting covered with a six inch layer of seeded loam. This will improve the operational efficiency of the VES by limiting short-circuit air flow from the ground surface to the extraction wells and significantly reducing precipitation infiltration. The caps will remain in place and be effective for the expected operational period of the VES, but they will not be designed to maintain their integrity on a permanent basis.

- Installation and operation of a vacuum extraction system (VES) to remove air and vapor phase VOCs present in the soil pore space (soil gas) in the former drum disposal and southern boundary areas. VOCs sorbed onto soils will partition from the soils into the replacement air and be removed by the vacuum system.

The management of migration remedial measures include:

- Natural attenuation of contaminated groundwater to lower contaminant concentrations through physical, chemical and biological processes until groundwater cleanup levels are met. After completion of source remediation at each of the two areas, no further contamination will be added to the groundwater at levels which would prevent attainment of the groundwater cleanup levels. It has been estimated that overburden groundwater which has been affected by the former drum disposal area soils will clean itself to the groundwater cleanup levels within approximately six years after completion of source remediation. Bedrock groundwater should attain groundwater cleanup levels earlier. For the bedrock groundwater affected by the southern boundary area soil contamination (no appreciable overburden groundwater was found in this area), approximately two years will be needed to achieve groundwater cleanup levels.

Additional measures include:

- A security fence consisting of approximately 1,300 linear feet of galvanized chain link fence, ten feet high, to be installed to control access to the former drum disposal and southern boundary areas and to provide security for the vacuum extraction system.

- Groundwater and surface water monitoring initiated during remedial design and continuing for three years after attaining groundwater cleanup levels to assess the effectiveness of remediation and to confirm that contaminant concentrations in groundwater attain cleanup levels.

- Institutional controls to be implemented which would restrict the use of contaminated groundwater and prevent disturbance of on-going remedial actions. The objectives of the institutional controls shall be to ensure that no activities take place at the Site or in proximity to the Site which would either affect implementation of the selected remedy or cause exposures to hazardous substances. Examples of acceptable institutional controls include use restrictions imposed on deeds and zoning ordinances, among others.

DECLARATION

The selected remedy is protective of the human health and the environment, attains federal and state requirements that are applicable or relevant and appropriate for this remedial action, and is cost-effective. This remedy satisfies the statutory preference for remedies that utilize treatment as a principal element to reduce the toxicity, mobility, or volume of hazardous substances. In addition, this remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

March 29 1991
Date

Julie Belaga
Regional Administrator
U.S. EPA, Region I

MOTTOLO SUPERFUND SITE

ROD DECISION SUMMARY

March 29, 1991

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MOTTOLO SUPERFUND SITE
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I. SITE NAME, LOCATION AND DESCRIPTION

The Mottolo Superfund Site (Mottolo Site or Site) is located on Blueberry Hill Road in southeastern Raymond, New Hampshire, approximately two and one-half miles from the intersection of State Routes 101, 102 and 107. See Figure 1.

The Mottolo property is bounded on the north by a rural residential neighborhood, on the south and east by properties planned for residential development, and on the west by several residences and undeveloped land. The nearest residence is approximately 600 feet to the west. The Mottolo property includes approximately fifty acres of primarily undeveloped, wooded land, divided approximately in half by a brook which originates beyond the southern property boundary and flows north through the property, eventually discharging to the Exeter River. The brook is hereinafter referred to as "Brook A." Approximately two acres of the property remain cleared from the former piggery which operated on-site. The cleared area is divided by a drainage swale which flows from west to east, discharging to Brook A. The former piggery is located within the southern portion of the two-acre cleared area and was comprised of several structures. The first structure, located along the site access road, is an abandoned, one-story, wood and sheet metal shed which houses a dug well and a boiler. The second structure is an abandoned, one-story, wooden-frame building on a concrete slab, formerly used as the main piggery building. The remaining structures are two concrete slabs, located to the west and southwest of the main piggery building; these slabs were presumably the foundations for former one-story, wooden-frame buildings that were used in the piggery operations. See Figure 2.

The Mottolo Site is located within the Exeter River drainage basin. The Exeter River nearly circumscribes the Mottolo Site. The river is approximately 2,000 feet northwest of the Site at its closest point. Based upon topographic and hydrologic information, regional surface water and groundwater are ultimately expected to discharge to the Exeter River. Brook A is a perennial stream that flows across the Mottolo property, draining approximately 285 acres at its confluence with the Exeter River nearly a mile north of the Site. The headwaters of Brook A originate in wetlands located immediately south and southeast of the Mottolo Site. A total of three acres of wetlands were identified in the Brook A valley with approximately 50% of these found on the Mottolo property. The brook (and wetland areas along it) is the discharge zone for local overburden groundwater and for local bedrock groundwater, as well.

At the base of the former disposal area, an ephemeral stream is located in a swale which drains approximately four acres of the undeveloped woodland between the cleared site area and Blueberry Hill Road. The swale also receives surface water runoff from the cleared areas to the north and south. The stream flows easterly across the Site into Brook A. Drainage patterns in the site vicinity suggest that surface water drainage is generally toward Brook A on either side of the brook.

Overburden deposits in the upland site area consist primarily of fine to coarse sand with pockets of gravel and generally range from zero to fifteen feet in thickness with the thickest deposits found at the base of the former disposal area south of the drainage swale. These deposits are underlain by metamorphic and igneous bedrock of the Merrimack Group. The shallow bedrock appears to be only slightly weathered. The first five feet of bedrock is typically more fractured than the next five feet. However, some significant fracture zones may exist at depth.

A more complete description of the Site can be found in the Remedial Investigation (RI) Report at pages 1-4 through 1-17 and 3-1 through 3-36.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. Land Use and Response History

Prior to disposal of hazardous substances, the Site was the location of a piggery operation. From 1975 through 1979, the property owner disposed of approximately 1,600 fifty-five-gallon drums and five-gallon pails containing wastes into an approximately one-quarter acre depression located immediately north of the main piggery building, hereinafter termed the former drum disposal area. After dumping the containers from the back of a truck, a bulldozer was used to cover them with fill.

The Site was discovered in April of 1979, and studies were commenced by the New Hampshire Water Supply and Pollution Control Commission [now the Department of Environmental Services (NHDES)] which brought it to the attention of EPA. In September 1980, EPA prepared the Site for exhumation, staging, and removal of the buried drums. In 1979, the area north of the drainage swale was cleared and graded to construct temporary staging areas for the excavated wastes and a berm constructed along the toe of the disposal area. As the containers of waste were excavated, they were staged on-site for characterization. Staging areas are shown on Figure 2. Most of the drums appeared to be dented or partially crushed and eighty-three fifty-five-gallon drums and seven five-gallon pails were completely empty when

exhumed. Analyses for numerous compounds including PCBs and pesticides were conducted on samples from each container. Toluene, xylene, and other hydrocarbons, methyl ethyl ketone, alcohols, acetates, chromates, lead, zinc, lacquers, turpentine, animal fats, chlorinated compounds, and packaged laboratory chemicals were identified in drums and pails removed from the Site. No evidence of pesticides, herbicides, PCBs, or oils was detected.

EPA did not receive funds for removal of the exhumed wastes from the Site until November 1981. Waste removal began approximately one month later, on December 14, 1981, and was completed on February 4, 1982. Many of the containers were repacked into eighty-gallon recovery drums prior to transportation off site.

Approximately 160 cubic yards of contaminated soil, drum parts, and plastic sheeting used in the staging areas were also transported off-site for disposal. The former disposal area was regraded and seeded.

In January, 1985, the Site was reviewed by the EPA Field Investigation Team (FIT) Contractor and evaluated, using the Hazard Ranking System, for possible listing on the National Priorities List (NPL) of sites eligible for cleanup under the Superfund program. EPA proposed to add the Site to the NPL on April 10, 1985 (50 FR 14115), and the Site was finally added to the NPL on July 22, 1987 (52 FR 27620).

B. Enforcement History

Enforcement activities were commenced shortly after discovery of the Site. The New Hampshire Attorney General filed suit in Rockingham Superior Court (No. E-952-79) on May 31, 1979, against Richard A. Mottolo, K.J. Quinn & Company, Inc. (Quinn) and Lewis Chemical Company (Lewis Chemical) for costs related to site responses. The U.S. Department of Justice filed a complaint on September 8, 1983, against those same three defendants, as well as, Service Pumping and Drain Company, Inc. (SPDC), the transporter owned by Mottolo; and Carl Sutera, owner of Lewis Chemical. The purpose of the United States' complaint was to recover response costs resulting from EPA's removal action as provided for by Section 107(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. §9607(a). In 1985, the original complaints were amended to include declaratory relief for future costs of remedial actions incurred under CERCLA. A partial summary judgement assigning joint and several liability to Mottolo, Quinn, and SPDC for both past response and future remedial costs was issued by the Court on August 28, 1988. The United States'

and the State of New Hampshire's subsequent negotiations with Quinn have resulted in settlements of that firm's liability for costs associated with the 1980 - 1982 removal action, as well as, certain other response costs incurred prior to May 1, 1988.

With respect to actions related to the current cleanup of the Site, on December 29, 1987, and December 31, 1987, EPA notified the five parties who either owned or operated the facility, generated wastes that were shipped to the facility, arranged for the disposal of wastes at the facility, or transported wastes to the facility of their potential liability with respect to the Site and of EPA's intent to begin the Remedial Investigation/Feasibility Study (RI/FS) for the Site. Negotiations commenced with one of these potentially responsible parties (PRPs), Quinn, on January 15, 1988, regarding the settlement of Quinn's liability at the Site, including Quinn's interest in conducting the RI/FS. Substantial negotiations took place. These negotiations resulted in the execution of an Administrative Order by Consent between Quinn and EPA providing for the development of the RI/FS for the Site by a consultant under contract to Quinn.

The PRPs have not been active in the remedy selection process for this Site with the exception of Quinn and Mr. Mottolo. Comments which were received in writing from Quinn and Mr. Mottolo during the public comment period are included in the Site's Administrative Record.

III. COMMUNITY PARTICIPATION

Throughout the Site's history, community concern and involvement has been moderate. EPA has kept the community and other interested parties apprised of the Site activities through phone conversations, progress reports, informational meetings, fact sheets, press releases, and public meetings.

In October, 1988, EPA released a community relations plan which outlined a program to address community concerns and keep citizens informed about and involved in activities during remedial activities. On September 7, 1988, EPA held an informational meeting in the Raymond Middle School Media Center, Raymond, New Hampshire, to describe the plans for the RI/FS. On October 25, 1990, EPA held an informational meeting in the Raymond Middle School Media Center, Raymond, New Hampshire, to discuss the results of the RI.

On February 13, 1991, EPA made the Administrative Record available for public review at EPA's offices in Boston and at the Dudley-Tucker Library in Raymond, New Hampshire.

EPA published a notice and brief analysis of the Proposed Plan in the Raymond Times on February 2, 1991, and made the plan available to the public at the Dudley-Tucker Public Library, Raymond, New Hampshire. On February 13, 1991, EPA held an informational meeting to discuss the results of the RI and the cleanup alternatives presented in the FS and to present the Agency's Proposed Plan. Also during this meeting, the Agency answered questions from the public.

From February 14, 1991 through March 16, 1991, the Agency held a thirty-day public comment period to accept public comment on the alternatives presented in the FS and the Proposed Plan and on any other documents previously released to the public. On March 6, 1991, the Agency held an informal public hearing to discuss the Proposed Plan and to accept any oral comments. A transcript of this meeting is included in the attached responsiveness summary, Appendix D.

IV. SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION

The selected remedy was developed by combining components of different source control and management of migration alternatives to obtain a comprehensive approach for Site remediation. In summary, the remedy provides for the following: fencing of a portion of the Site; construction of a groundwater interceptor trench and cap to isolate and dewater contaminated soils; construction and operation of a vacuum extraction system (VES) for treatment of contaminated soils; natural flushing of groundwater currently contaminated by chemicals being leached from soils; groundwater monitoring; and institutional controls to prevent use of contaminated groundwater. This remedial action will address the following principal threats to human health and the environment posed by the Site: threat of contamination of a potential water supply aquifer resulting from source area soils; and overall threat resulting from a contaminated potential drinking water supply.

V. SUMMARY OF SITE CHARACTERISTICS

Chapter 2 of the FS contains an overview of the RI. The significant findings of the RI are summarized below.

A. Soil

The RI determined that there are two areas of VOC-contaminated soils which are adversely affecting the Site's groundwater. These two areas, the former drum disposal area and the southern boundary area, are described below.

Based upon site history and observations made during the EPA drum removal program, the most significant releases to the environment appear to have been from liquid wastes,

primarily containing volatile organic compounds (VOCs) which leaked from buried drums and pails in the former drum disposal area during 1975 to 1979. The drums were excavated during 1980, at which time releases to the area soils ceased. Additional VOC releases may have occurred in the vicinity of the large concrete pad west of the piggery building (southern boundary area).

The vertical extent of soil contamination in the former drum disposal area typically extends from two to four feet below the ground surface to approximately the bedrock surface, with the most contaminated soil being found near the water table. The extent of soil contamination in the southern boundary area is less well defined and has been arrived at by inference from interpretation of groundwater and soil gas data as mentioned below. The volumes of contaminated soil within the former drum disposal area and within the southern boundary area are estimated to be in the range of 1,400 to 1,800 cubic yards and 2,000 to 2,200 cubic yards, respectively.

Since the removal of the drums, the compounds representing the source of the contamination in the former drum disposal area and the southern boundary area have been, and at the current time are, VOCs which have been adsorbed onto soil. Since 1980, these two contaminated soils source areas have been subjected to environmental decay. Primary soil contamination decay mechanisms at the Mottolo Site are groundwater flow (which dissolves and transports contaminants from the contaminated soils), percolation (which dissolves contaminants and transports them to groundwater), and, to a lesser extent, volatilization (which results in some fraction of VOCs forming a vapor phase in unsaturated soil pore space and ultimately migrating to the atmosphere). Because each of these decay processes result in the reduction of contaminant mass in the source areas, both the extent and magnitude of impacts associated with these source areas have declined since removal of the drummed wastes from the Site, and are expected to continue to decline in the future.

The VOCs identified in site soils include the chlorinated aliphatic compounds, methylene chloride, 1,1,1-trichloroethane, trichloroethene, and tetrachloroethene; the aromatic compounds, toluene, ethylbenzene, and xylenes; and acetone, a ketone. Some VOCs not detected in the soils but detected at significant concentrations in groundwater include: vinyl chloride, 1,1-dichloroethane, 1,2-dichloroethene and tetrahydrofuran. However, because releases from the previously buried drums likely affected only localized areas of soils, it is probable that the soil borings advanced in the former

disposal area did not identify each affected zone in the area. Additionally, some of the VOCs not observed in soil samples but found in groundwater could be the by-products of degradation of VOCs which are known to be present on-site.

Based upon soil quality data for the former drum disposal area, it appears that the most highly contaminated soils are in the vicinity of the water table. The saturated volume of contaminated soils will vary due to seasonal fluctuations which were observed to be as much as five feet during the course of the RI monitoring program. This fluctuation is currently believed to have a significant effect on the release of contaminants from soils to groundwater, the greatest release occurring in the spring when the water table is highest and groundwater is in contact with a larger volume of contaminated soils. This occurrence is supported by the analytical data for groundwater samples collected from the two overburden monitoring wells located closest to and downgradient of the former drum disposal area.

The source area responsible for the presence of VOCs in groundwater in the southern boundary area is inferred to be in overburden in the vicinity of the large concrete pad located west of the piggery building. Having found higher VOC concentrations in the bedrock monitoring well than in the overburden well, it appears that the VOC source is in overburden soils in close proximity to the bedrock surface. However, borings advanced into the soil around the pad did not confirm any contaminated soils. Due to the upland location of the concrete pad and the thin layer of overburden in this area, groundwater is not present in the overburden in some areas during at least part of the year. During these periods, VOC releases from source area soils would occur as a result of either soil gas migration or surface water infiltration through the soils.

B. Groundwater

Two plumes of VOC-contaminated groundwater were identified during the RI. One is the result of contamination migrating from soils in the former drum disposal area. The other is beneath the southern boundary area. Each is described below.

VOCs were the group of compounds most often reported present in groundwater samples analyzed during the RI. The VOCs most commonly reported at elevated concentrations and the maximum detected concentrations include aromatic compounds (toluene - 9200 ppb, ethylbenzene - 1700 ppb and xylenes - 4700 ppb), chlorinated hydrocarbons (vinyl chloride - 360 ppb, 1,1-dichloroethane - 1300 ppb, 1,2-dichloroethene - 4700 ppb, trichloroethene - 2400 ppb and 1,1,1-

trichloroethane - 2100 ppb), and tetrahydrofuran - 1600 ppb (see Tables 2-17 and 4-1 of the RI). Elevated arsenic concentrations (maximum detected concentration - 570 ppb) were found in those wells with the highest VOC concentrations.

The groundwater flow directions in overburden in the former drum disposal area are generally northeasterly from the former disposal area to the drainage swale and then easterly to Brook A. Groundwater in shallow bedrock in the former disposal area flows generally in an easterly direction to Brook A and then northerly along the brook, although a limited northeasterly component of flow in this zone was observed. Shallow bedrock monitoring wells demonstrate a hydraulic connection between overburden and shallow bedrock in the site area. Bedrock is recharged by groundwater in the overburden in the vicinity of the former disposal area. However, bedrock groundwater in the Brook A valley discharges to the overburden.

Contaminants migrate in overburden and bedrock groundwater from the former disposal area to the east along the general path of the drainage swale to Brook A and then northerly along the west side of the brook. VOCs and other contaminants were not detected in groundwater samples collected from overburden wells located east of Brook A, consistent with data suggesting that the brook is the discharge zone for overburden groundwater. Levels of total VOCs observed in shallow bedrock groundwater samples downgradient of the former disposal area were generally lower than or similar to those observed in overburden groundwater samples, which is consistent with recharge of bedrock from the overburden in the former disposal area and recharge of overburden from the shallow bedrock in the Brook A valley.

In general, detected concentrations of VOCs in groundwater samples collected from monitoring wells on-site during the RI were observed to be lower than those observed in groundwater samples collected and analyzed in prior investigations performed during and immediately following the EPA removal action. Levels of total VOCs (TVOCs) observed during the RI were lower than those observed in prior investigations by factors of three to twenty. This observation is consistent with the expected decline in VOC levels in groundwater since the removal action as a result of source removal and attenuation of residual VOC levels. The extent of the VOC plume in groundwater was observed to have decreased, which is also consistent with the anticipated decline in groundwater concentrations. The observed decrease in extent and levels of VOCs in site groundwater, the local and regional groundwater flow

patterns, and the results of analyses of groundwater samples from off-site monitoring and residential water supply wells, are consistent with the belief that off-site groundwater was not and is not now being affected by on-site conditions.

Groundwater data from wells in the southern boundary area, indicated the presence of a different, more limited suite of VOCs than was observed in groundwater samples from wells monitoring the former drum disposal area and areas downgradient. This information, coupled with groundwater flow data and reports of past activities in the area, indicated the presence of another source of VOCs in soils in the vicinity of the concrete pad. Based upon the levels of VOCs detected in groundwater and lack of detectable levels of VOCs obtained from the soil gas survey and from borings in the area, the source appears to be relatively small and highly localized.

Observations of bedrock core samples collected during the RI monitoring well installation program in the vicinity of the southern boundary area were similar to those in the former drum disposal area and did not indicate significant fracturing of shallow bedrock below a relatively thin weathered zone. Indications of infilling of fractures by sediment particles, which could serve as a possible VOC source, also were not observed. Observed rates of recovery during bedrock well purging and sampling in this area were extremely slow (on the order of several hours to several days) suggesting that fractures in the zones monitored by these wells were relatively narrow and unlikely to be large enough to collect significant amounts of sediment. Accordingly, it appeared to be unlikely that a source of VOCs was present within shallow bedrock in this area, and that the source of VOCs observed in bedrock groundwater was most likely VOC-affected overburden and overburden groundwater.

Localized groundwater flow in the overburden and shallow bedrock in the southern boundary area was observed to be generally southerly or southeasterly. Information regarding the local hydrogeologic system suggests that groundwater in this area eventually flows to the Brook A valley as does groundwater in the former drum disposal area. Available potentiometric data indicate that the overburden in the vicinity of the concrete pad is largely unsaturated during portions of the year; these data, which, when considered with the topography and the presence of a bedrock outcrop north and west of the area, also suggest that overburden groundwater flow from recharge areas to the west of the Mottolo Site does not contribute to overburden groundwater in the southern boundary area. Accordingly, it appears that overburden groundwater in this area is derived primarily

from precipitation recharge and, furthermore, that percolating precipitation directly recharges shallow bedrock during portions of the year. Similar temporal changes in groundwater potentiometric heads in overburden and shallow bedrock monitoring wells in this area suggest a hydraulic connection between overburden and shallow bedrock. Vertical gradient data from wells in the southern boundary area indicate that groundwater in the overburden, when present, recharges bedrock in this area.

In general, analytical data obtained from groundwater samples collected from overburden and bedrock wells were consistent with the conceptual hydrogeologic model developed in the RI from potentiometric data for the southern boundary area. The detection of relatively lower levels of VOCs in one overburden groundwater well than were observed in bedrock and the absence of VOCs in other overburden wells downgradient of the inferred source area indicated that VOC transport by overburden groundwater flow is relatively limited.

C. Surface Water

Low levels of VOCs were found only in on-site surface waters during the RI. No VOCs were detected in any surface waters off-site.

Analytical results of surface water samples collected during the RI indicate that surface water in the immediate area of the lower drainage swale and its confluence with Brook A contains low concentrations of VOCs. Significant concentrations of contaminants related to drum disposal activities were not reported in samples collected during the RI in upstream reaches of the drainage swale, Brook A, and the piggery waste drainageway, nor in downstream reaches of Brook A beyond the site area boundary, nor in the Exeter River.

The primary identified source of the VOCs detected in surface water is groundwater originating from the former drum disposal area and discharging to the lower drainage swale and Brook A. Highest TVOC concentrations detected in surface water samples were found in the drainage swale near its confluence with Brook A. These compounds included 1,1-dichloroethane, 1,2-dichloroethene, 1,1,1-trichloroethane, toluene and trichloroethene. The compound detected at the highest concentration was 1,1-dichloroethane which was detected at 41 ppb and 19 ppb. The remaining VOCs were reported at concentrations less than 15 ppb. Low or non-detectable levels of total VOCs (14 ppb, non-detected and 7 ppb) were reported in the three samples collected in Brook A approximately sixty feet downstream of its confluence with

the drainage swale. Of the three samples collected from approximately 300 feet farther downstream, two did not contain detectable levels of VOCs and one contained only 2 ppb of 1,1-dichloroethane.

Since the soil berm at the base of the former disposal area limits surface water runoff from this area from directly entering the swale, groundwater discharging to the swale is the likely source of VOCs detected in surface water samples collected from the drainage swale. Contaminated groundwater discharging to Brook A, in addition to surface water discharges from the drainage swale, are the likely sources of VOCs detected in Brook A surface water samples.

D. Sediment

Sediment sample analyses indicated contaminant distribution trends similar to the surface water samples. These trends included the observation of elevated concentrations of VOCs in the lower swale and Brook A in the vicinity of the swale with maximum detected concentrations of 1,1-dichloroethane of 360 ppb and of 1,1,1-trichloroethane of 64 ppb.

E. Air

Air screening conducted throughout the course of outside RI activities did not indicate the presence of detectable levels of VOCs in breathing zone ambient air. Given the low levels of VOCs found in other media at the Site, this is consistent.

A complete discussion of site characteristics can be found in the RI Report in Sections 3.0, 4.0 and 5.0.

VI. SUMMARY OF SITE RISKS

A Risk Assessment was performed to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with the Site. The public health risk assessment followed a four step process: 1) contaminant identification, which identified those hazardous substances which, given the specifics of the Site were of significant concern; 2) exposure assessment, which identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure; 3) toxicity assessment, which considered the types and magnitude of adverse health effects associated with exposure to hazardous substances; and 4) risk characterization, which integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the Site, including carcinogenic and non-carcinogenic risks. The results of the public health risk assessment for the Mottolo Site

are discussed below followed by the conclusions of the environmental risk assessment.

Ten contaminants of concern were selected for evaluation in the Risk Assessment. Selected indicator compounds for the following media included:

- groundwater: arsenic, 1,1-dichloroethane, 1,2-dichloroethene (total), ethylbenzene, tetrahydrofuran, 1,1,1-trichloroethane, toluene, trichloroethene, and vinyl chloride
- surface water: 1,1-dichloroethane and 1,2-dichloroethene (total)
- sediment: 1,1-dichloroethane and 1,1,1-trichloroethane
- soil: ethylbenzene, toluene, and xylene.

These contaminants constitute a representative subset of the more than thirty contaminants identified at the Site during the RI. The ten contaminants of concern were selected to represent potential site related hazards based on toxicity, concentration, frequency of detection, and mobility and persistence in the environment. A summary of the health effects of each of the contaminants of concern can be found on pages 18 through 24 of Chapter 6.0 of the RI (Baseline Risk Assessment), and in Appendix C-8 of the RI.

Potential human health effects associated with exposure to the contaminants of concern were estimated quantitatively through the development of several hypothetical exposure pathways. These pathways were developed to reflect the potential for exposure to hazardous substances based on the present uses, potential future uses, and location of the Site. The following is a brief summary of the exposure pathways evaluated. A more thorough description can be found in the Baseline Risk Assessment, Chapter 6 of the RI.

For contaminated groundwater, potential future residential use of the Site was assumed and exposure scenarios for both bedrock and overburden aquifers were developed for two areas of the Site (namely, the former drum disposal area and the southern boundary area). In each case, a seventy-year lifetime of ingesting two liters of the contaminated groundwater each day was presumed. Since no existing residential wells have been found which are impacted by site contaminants, no <u>current</u> risk analysis was done for ingestion or dermal contact with groundwater. For soils, incidental ingestion and dermal contact scenarios were developed for both current use and potential residential use of the Site. For the current use, incidental ingestion and dermal contact was evaluated for children aged six through fifteen who may contact

soils at the Site an average of five days per year or a reasonable maximum of ten days per year. For potential future residential use, incidental ingestion and dermal contact were evaluated over a seventy-year lifetime for average exposures of seventy-eight times per year and for maximum exposures of 160 times per year. For each pathway evaluated, an average and a reasonable maximum exposure estimate was generated corresponding to exposure to the average and the maximum concentration of contaminants detected in that particular medium.

Excess lifetime cancer risks were determined for each exposure pathway by multiplying the exposure level with the chemical-specific cancer potency factor. Cancer potency factors have been developed by EPA from epidemiological or animal studies to reflect a conservative "upper bound" of the risk posed by potentially carcinogenic compounds. That is, the true risk is very unlikely to be greater than the risk predicted. The resulting risk estimates are expressed in scientific notation as a probability (e.g. 1×10^{-6} or 1/1,000,000) and indicate (using this example), that an individual is not likely to have greater than a one in a million chance of developing cancer over seventy years as a result of site-related exposure to the compound, as defined, at the stated concentration. Current EPA practice considers carcinogenic risks to be additive when assessing exposure to a mixture of hazardous substances.

The hazard index was also calculated for each pathway as EPA's measure of the potential for non-carcinogenic health effects. The hazard index is calculated by dividing the exposure level by the reference dose (RfD) or other suitable benchmark for non-carcinogenic health effects. Reference doses have been developed by EPA to protect sensitive individuals over the course of a lifetime and they reflect a daily exposure level that is likely to be without an appreciable risk of an adverse health effect. RfDs are derived from epidemiological or animal studies and incorporate uncertainty factors to help ensure that adverse health effects will not occur. The hazard index is often expressed as a single value (e.g. 0.3) indicating the ratio of the stated exposure as defined to the reference dose value (in this example, the exposure as characterized is three-tenths of the acceptable exposure level for the given compound). The hazard index is only considered additive for compounds that have the same or similar toxic endpoints (for example: the hazard index for a compound known to produce liver damage should not be added to a second whose toxic endpoint is kidney damage).

Table 1 depicts the carcinogenic and non-carcinogenic risk summary corresponding to the average and the reasonable maximum exposure scenarios for the contaminants of concern in soil, sediment and surface water evaluated to reflect present ingestion and dermal contact exposure pathways. Table 2 depicts the carcinogenic and non-carcinogenic risk summary corresponding to

the average and the reasonable maximum exposure scenarios for the contaminants of concern in groundwater, soil, sediment and surface water evaluated to reflect future ingestion and dermal contact exposure pathways. The groundwater risks are presented for exposures to overburden or bedrock groundwater in area 1 (downgradient of the former drum disposal area) and for exposures to overburden or bedrock groundwater in area 2 (downgradient of the southern boundary area).

Cumulative potential cancer risks associated with current and future scenarios for ingestion and dermal contact with on-site sediment, soil and surface water did not exceed EPA's target cancer risk range of 10^{-4} to 10^{-6}. Similarly, cumulative hazard indices as a measure of the potential for non-carcinogenic effects for each of the above exposure pathways did not exceed unity (1.0).

Based on the findings in the Baseline Risk Assessment, EPA has concluded that the risk posed by the future ingestion of groundwater from wells installed within the former drum disposal area will exceed the acceptable risk range of 10^{-4} to 10^{-6}. The principal contributors to carcinogenic risk from the ingestion of groundwater are arsenic, vinyl chloride and trichloroethylene. The maximum concentrations of arsenic detected on-site, 570 ppb, exceeded the Maximum Contaminant Level (MCL) of 50 ppb promulgated under the Safe Drinking Water Act. Vinyl chloride and trichloroethene were also found at high concentrations with maximum concentrations of 360 ppb and 2400 ppb, respectively. The MCL established in the Safe Drinking Water Act for vinyl chloride is 2 ppb and for trichloroethene is 5 ppb.

The hazard index exceeds unity for the future ingestion of ground water from the former drum disposal area for both the average and maximum cases. Total 1,2-dichloroethene is the major contributor for the noncarcinogenic effects with a hazard index of 7, as well as, tetrahydrofuran with a hazard index of 3.

With respect to potential environmental impacts posed by site contamination, neither current nor future significant adverse impacts were identified.

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health and welfare. Specifically, consumption of overburden and/or bedrock groundwater would result in unacceptable lifetime cancer risks, as well as, unacceptable noncarcinogenic risks due to the levels of arsenic and VOCs detected in the groundwater. Overburden and bedrock groundwater near the former drum disposal area and the southern boundary area will be the focus of remedial actions.

VII. DEVELOPMENT AND SCREENING OF ALTERNATIVES

A. Statutory Requirements/Response Objectives

Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences, including: a requirement that EPA's remedial action, when complete, must comply with all federal and more stringent state environmental standards, requirements, criteria or limitations, unless a waiver is invoked; a requirement that EPA select a remedial action that is cost-effective and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and a preference for remedies in which treatment that permanently and significantly reduces the volume, toxicity or mobility of the hazardous substances is a principal element over remedies not involving such treatment. Response alternatives were developed to be consistent with these Congressional mandates.

Based on preliminary information relating to types of contaminants, environmental media of concern, and potential exposure pathways, remedial action objectives were developed to aid in the development and screening of alternatives. These remedial action objectives were developed to mitigate existing and future potential threats to public health and the environment. These response objectives were:

- To eliminate or minimize the threat posed to the public health, welfare, and environment by the current extent of contamination of groundwater and soils;
- To eliminate or minimize the migration of contaminants from the soils into the groundwater; and
- To meet federal and state Applicable or Relevant and Appropriate Requirements (ARARs).

B. Technology and Alternative Development and Screening

CERCLA and the National Contingency Plan (NCP) set forth the process by which remedial actions are evaluated and selected. In accordance with these requirements, a range of alternatives were developed for the Site.

With respect to source control, the RI/FS developed a range of alternatives in which treatment that reduces the toxicity, mobility, or volume of the hazardous substances is a principal element. This range included an alternative that removes or destroys hazardous substances to the maximum extent feasible, eliminating or minimizing to the degree possible the need for long term management. This range also included alternatives that treat the principal threats posed by the Site, but vary in the degree of treatment employed and the quantities and characteristics of the treatment residuals and untreated waste that must be managed; alternatives that involve little or no treatment, but provide protection through engineering or institutional controls; and a no action alternative.

With respect to groundwater response action, the RI/FS developed a limited number of remedial alternatives that attain site specific remediation levels within different timeframes using different technologies; and a no action alternative.

As discussed in Chapter 2 of the FS, the RI/FS identified, assessed and screened technologies based on implementability, effectiveness, and cost. The purpose of the initial screening was to narrow the number of potential remedial actions for further detailed analysis while preserving a range of options. The technologies which remained after screening were combined into source control and management of migration alternatives. Chapter 3 of the FS presented the remedial alternatives developed by combining the technologies identified in the previous screening process in the categories identified in 40 CFR Section 300.430(e)(3) of the NCP. Each alternative was then evaluated and screened in Chapter 3 of the FS.

Of the nine source control and four management of migration remedial alternatives screened in Chapter 3, eight comprehensive alternatives (using combinations of seven source control and three management of migration alternatives) were developed and retained for detailed analysis in Chapter 4. Table 3 identifies the alternatives that were retained through the screening process and the comprehensive alternatives developed, as well as, those source control and management of migration alternatives that were eliminated from further consideration.

VIII. DESCRIPTION OF ALTERNATIVES

This Section provides a narrative summary of each alternative evaluated. The comprehensive alternatives analyzed for the Site include: no action (Alternative 1); groundwater interceptor trench and capping (Alternative 2); in-situ vapor extraction (Alternative 3); above-ground vapor extraction (Alternative 4); chemical fixation (Alternative 5); on-site low temperature thermal stripping (Alternative 6); off-site incineration (Alternative 7); and in-situ vapor extraction with collection and treatment of groundwater (Alternative 8). Alternatives 1 through 7 all rely on natural attenuation of groundwater contamination as the management of migration component. A detailed tabular assessment of each alternative can be found in Table 5-1 of the FS.

A. Alternative 1: No action

Under this alternative no treatment of groundwater contamination would occur and no effort would be made to restrict potential exposure to groundwater contaminants. Contaminated soil would continue to release VOCs to site groundwater. Eventually, the natural flushing of the soil by groundwater and rainwater would carry the contaminants into Brook A where they would volatilize. The exact length of time it would take to meet these levels cannot be accurately estimated, however, at least several decades of this natural flushing would be required. Monitoring of groundwater and surface water at the Site would be conducted for approximately thirty years. Since contaminants would be left on-site, site conditions would be reviewed every five years to determine if further actions were needed.

ESTIMATED TIME FOR DESIGN AND CONSTRUCTION:	N/A
ESTIMATED TIME FOR OPERATION:	several decades
ESTIMATED CAPITAL COST:	$ 10,000
ESTIMATED O&M (Present Worth):	290,000
ESTIMATED TOTAL COST (Present Worth):	$ 300,000

B. Alternative 2: Groundwater interceptor trench and capping with natural attenuation of groundwater contamination

This alternative would use a groundwater interceptor trench to reduce the flow of groundwater through the contaminated soils in the former drum disposal area. Contaminated soils from the southern boundary area (estimated at 2000 to 2200 cubic yards) would be excavated to bedrock and placed in the former drum disposal area prior to placement of a waterproof cap over all the contaminated soils to prevent the infiltration of rainwater and snowmelt. Excavation of the southern boundary area soils would be done during a dry

period which would make dewatering unnecessary. All soils to be capped would be graded and compacted to limit post-construction settling. The cap would be composed of two polyethylene membranes separated by a layer of sand for drainage. This would be placed on a bedding layer of sand to minimize the potential for damage to the cap during construction. A layer of fill and topsoil would be placed on top and seeded to prevent erosion. The total thickness of the cap would be between five and six feet. The cap and trench together would greatly decrease the leaching of contaminants into the groundwater and would isolate the contaminated soils from possible human contact.

This alternative would also include a thirty-year surface water and groundwater monitoring program and institutional controls to prevent disturbance of the cap and monitoring wells, and to prevent use of the contaminated groundwater. A ten-foot high chain link fence would be installed around the contaminated soil area. The fence would have barbed wire along the top and locked gates. Since contaminants would be left on-site, site conditions would be reviewed every five years to determine if further action were needed.

ESTIMATED TIME FOR DESIGN AND CONSTRUCTION: 3-6 months
ESTIMATED TIME FOR OPERATION: approximately 1 year to dewater and up to 6 additional years to achieve groundwater cleanup levels

ESTIMATED CAPITAL COST:	$ 440,000
ESTIMATED O&M (Present Worth):	350,000
ESTIMATED TOTAL COST (Present Worth):	$ 790,000

C. Alternative 3: In-situ vapor extraction system (VES) with natural attenuation of contaminated groundwater

This is the preferred alternative and is described in Section X., The Selected Remedy.

D. Alternative 4: Above-ground vapor extraction system (VES) with natural attenuation of contaminated groundwater

This on-site remedial alternative includes installation of an upgradient groundwater interceptor trench to lower the water table in the former drum disposal area, excavation of soil in the former disposal and southern boundary areas (approximately 3400 to 4000 cubic yards), and treatment in an above-ground VES. Excavation of the southern boundary area soils would be done during a dry period which would make dewatering unnecessary.

The VES system would consist of two lined treatment cells each approximately 100 feet square by six to eight feet high, constructed with pre-cast concrete barriers, perforated or slotted PVC extraction pipes laid horizontally in each treatment soil pile, an intake manifold pipe connecting the extraction piping from each cell to a vacuum pump, and vapor phase activated carbon filters for off-gas treatment. A water trap would be installed in the manifold piping system ahead of the vacuum blower. The source area soils would be placed on the bottom liner (forty-mil polyethylene) in lifts of approximately three feet with the extraction pipes placed at appropriate depth intervals to ensure effective treatment. A twenty-mil polyethylene cap with air injection points would be placed over the pile to limit air emissions and short circuiting air inflow. Operation of the vacuum blower would extract air and VOCs in the vapor phase from soil pore spaces. VOCs sorbed onto the soils would partition into air that replaces the pore space air removed. This process would continue until soil remedial action objectives are attained. The carbon air filters on the treatment system would be regenerated with steam on-site or the spent carbon filters would be transferred to off-site regeneration or disposal after completion of remedial operations. If regenerated on-site, steam condensate would contain VOCs previously sorbed onto the carbon and would be collected and transferred off-site for treatment or disposal. When treatment was complete, the soils would be replaced in the excavations from which they were removed and an earthen cap placed over them.

This alternative would require additional site clearing and access drive improvements to allow construction of the treatment cells. Fencing, construction of the groundwater interceptor trench, and institutional controls would be carried out as in Alternative 2. Groundwater and surface water monitoring would continue for ten years after completion of soil remediation to ensure the effectiveness of the source remediation and the attainment of groundwater cleanup levels.

ESTIMATED TIME FOR DESIGN AND CONSTRUCTION:	6-12 months
ESTIMATED TIME FOR OPERATION:	1-2 years for dewatering and VES and up to 6 additional years to achieve groundwater cleanup levels
ESTIMATED CAPITAL COST:	$ 700,000
ESTIMATED O&M (Present Worth):	300,000
ESTIMATED TOTAL COST (Present Worth):	$1,000,000

E. Alternative 5: Chemical fixation with natural attenuation of contaminated groundwater

This alternative would excavate all of the contaminated soils from both the former drum disposal area and the southern boundary area (3400 to 4000 cubic yards), chemically bind the contaminants and soils together, and then replace the soils on-site into a secure, capped cell in the former drum disposal area.

Prior to excavation, dewatering of the former drum disposal area would be accomplished by using the interceptor trench described in Alternative 2. Excavation of the southern boundary area soils would be done during a dry period which would make dewatering unnecessary. Former drum disposal area soils would be placed on a 100 feet square, lined cell constructed similar to those described in Alternative 4 while the secure cell was under construction. Soils would be screened to remove boulders, cobbles, and other material not compatible with the fixation process, and be transported to the fixation treatment plant constructed on-site. There, batches of soil would be mixed with chemical binding agents, water, and cement to form a concrete-like material. A pilot study would be required prior to the start of treatment. Prior to the pilot study, a treatability study would be performed at an off-site laboratory to determine appropriate fixation reagent types and proportions for contaminated soils from the former disposal and southern boundary areas. Soil samples for treatability and pilot testing would be collected by excavating test pits in the source areas. The results of the treatability study would be used to develop a fixation formula to be tested in the pilot scale study. The pilot study would be performed on-site using at least two batches of soil from each area. The test would include sampling and analysis of untreated and treated soils to evaluate the performance of the selected mixture of reagent binders in fixing contaminants present in site soils. The tested soil batches would be allowed to cure for at least fourteen days prior to testing using appropriate Toxicity Characteristic Leaching Procedure (TCLP) methods. If TCLP testing results are not satisfactory, another site-wide alternative fixation process would be tested. Soils from unsatisfactory tests would be re-processed during full-scale operations.

After the fixation process was complete, each batch of soil would be placed in a secure cell constructed in the former drum disposal area. The cell would be constructed to maintain the treated soil at least six feet above the seasonal high water table. The cell would have impermeable top, bottom, and side walls constructed similarly to the cap described in Alternative 2, above.

This alternative would require site clearing and access drive improvements similar to those required for Alternative 4. Fencing, construction of a groundwater interceptor trench, groundwater and surface water monitoring, and institutional controls would be carried out as for Alternative 2. Since contaminants would be left on-site, conditions would be reviewed every five years to determine if further actions were needed.

ESTIMATED TIME FOR DESIGN AND CONSTRUCTION: 6-12 months
ESTIMATED TIME FOR OPERATION: 1-2 years for dewatering and chemical fixation and up to 6 additional years to achieve groundwater cleanup levels

ESTIMATED CAPITAL COST:	$1,600,000
ESTIMATED O&M (Present Worth):	300,000
ESTIMATED TOTAL COST (Present Worth):	$1,900,000

F. Alternative 6: On-Site Low Temperature Thermal Stripping (LTTS) with natural attenuation of contaminated groundwater

This on-site remedial alternative includes installation of an upgradient groundwater interceptor trench to lower the water table in the former disposal area, excavation of soil in the former drum disposal and southern boundary areas, transfer of the soil to an on-site low temperature thermal stripping (LTTS) unit to remove VOCs, followed by replacement of the treated soil, and construction of a soil cap over treated soils.

Prior to excavation, dewatering of the former drum disposal area would be accomplished by using the interceptor trench described in Alternative 2. Excavation of the southern boundary area soils would be done during a dry period which would make dewatering unnecessary. Soils would be screened to remove boulders, cobbles, and other material not compatible with the LTTS system. Soils would be stockpiled or placed directly into the hopper of the LTTS. Soil would then be fed into a rotating dryer where 300°F to 600°F air volatilizes the VOCs. The treated soil would then be cooled with water to control dust and be placed into a stockpile. Each twenty-ton batch of soil would be then tested for VOCs. Soils that would meet soil cleanup levels would be returned to the excavation areas and covered with an earthen cap. If soils could not meet cleanup levels they would be reprocessed. The exhaust gases from the dryer would contain VOCs, dust, and a small amount of acid vapor. The LTTS system would utilize carbon filters to remove VOCs, cyclone and baghouse filters to remove dust, and scrubbers to remove acid vapors. The activated carbon would either be

regenerated on-site during treatment operations or the carbon would be sent to a facility for off-site regeneration at the conclusion of treatment operations, as appropriate, depending upon the mass of VOCs to be removed and the capacity of the carbon beds. The dust collected in the filters would be reprocessed, or tested for hazardous materials and disposed of off-site in compliance with Federal and State requirements. Wastewater from the scrubbers would be sent off-site for treatment and disposal.

This alternative would require site clearing, fencing, access drive improvements, and institutional controls similar to those required for Alternative 4, above. Long-term monitoring of ground and surface water quality would be conducted for up to ten years after completion of source remediation to assess the effects of remediation and confirm improvement of groundwater quality as in Alternative 4.

ESTIMATED TIME FOR DESIGN AND CONSTRUCTION: 6-12 months
ESTIMATED TIME FOR OPERATION: 1-2 years for dewatering and LTTS and up to 6 additional years to achieve groundwater cleanup levels
ESTIMATED CAPITAL COST: $2,100,000
ESTIMATED O&M (Present Worth): 300,000
ESTIMATED TOTAL COST (Present Worth): $2,400,000

G. Alternative 7: Off-Site Incineration with natural attenuation of contaminated groundwater

This off-site remedial alternative includes installation of an upgradient groundwater interceptor trench to lower the water table in the former disposal area, excavation of soil in the former disposal and southern boundary areas approximately 3400 to 4000 cubic yards), transfer of the soil to an off-site incinerator to remove VOCs, followed by backfilling of the excavated areas with clean, granular material.

Prior to excavation, dewatering of the former drum disposal area would be accomplished by using the interceptor trench described in Alternative 2. Excavation of the southern boundary area soils would be done during a dry period which would make dewatering unnecessary. Excavated soils would be loaded directly into lined trucks, covered to reduce air emissions, and prepared for transport to a licensed hazardous waste incinerator for incineration and disposal. Approximately twenty trucks per week would leave the Site. Backfilling would be performed immediately following completion of soil excavation. Backfill material would be placed and graded as necessary to ensure positive drainage of precipitation runoff. Backfill would consist of select

fill and would be compacted to minimize the potential for future settlement. The disturbed area would ultimately be covered with topsoil, and vegetation would be reestablished.

This alternative would require site clearing, fencing, and institutional controls similar to that required for Alternative 2. Long-term monitoring of groundwater and surface water would be conducted for up to ten years after completion of source remediation to assess the effectiveness of remediation and confirm attainment of groundwater cleanup levels as in Alternative 4.

ESTIMATED TIME FOR DESIGN AND CONSTRUCTION: 6-12 months
ESTIMATED TIME FOR OPERATION: up to 1½ years to dewater and remove soils and up to 6 additional years to achieve groundwater cleanup levels

ESTIMATED CAPITAL COST:	$9,500,000
ESTIMATED O&M (Present Worth):	200,000
ESTIMATED TOTAL COST (Present Worth):	$9,700,000

H. Alternative 8: In-Situ Vapor Extraction System (VES) treatment of soils with collection and treatment of groundwater

This alternative involves the installation of a groundwater interceptor trench upgradient of the former disposal area, in-situ vapor extraction of VOC source soil areas, and collection and treatment of contaminated groundwater. The groundwater treatment system would include metals removal (to reduce air stripper fouling) through precipitation and removal of VOCs through air stripping and carbon adsorption. Treated groundwater would be discharged to the Brook A valley.

This alternative would involve construction of a groundwater interceptor trench and in-situ VES as in the preferred alternative, but would also include the extraction and on-site treatment of contaminated groundwater. A 100-foot long trench would be used to collect both overburden and bedrock groundwater downgradient from the former drum disposal area. This trench would be similar in construction to the interceptor trench described in Alternative 2, but located just west of Brook A. The pumping of this trench would draw both overburden and bedrock groundwater. It would also dewater the wetlands next to Brook A and reduce the flow in Brook A itself. In addition, overburden groundwater would be extracted by approximately twelve wells located between the extraction trench and the former drum disposal area. To enhance removal of contaminants, the wells would pump in cycles.

Wells would be used to collect bedrock groundwater in the southern boundary area and any small amounts of overburden groundwater that may exist.

The groundwater treatment plant which would receive the extracted groundwater from both the former drum disposal area and the southern boundary area would be located on the concrete pad where the piggery now stands. Removal of VOCs would be accomplished by an air stripper. The exhaust air containing the VOCs would be sent to carbon filters to remove the contaminants and then vented to the atmosphere. The treated water would be discharged into Brook A. Because site groundwater contains levels of iron and manganese that might foul the air stripping system, the water will be pretreated to remove these metals prior to air stripping. The sludges from the pretreatment would be dewatered, analyzed, and disposed of off-site in compliance with Federal and State requirements.

Site clearing and institutional controls similar to Alternative 2 and approximately 1300 feet of ten feet high chain link fencing would be required. Groundwater and surface water would be monitored for up to ten years after completion of the VES treatment to confirm that levels of contaminants in the groundwater meet cleanup levels.

ESTIMATED TIME FOR DESIGN AND CONSTRUCTION:	12 months
ESTIMATED TIME FOR OPERATION:	1-2 years for dewatering and VES and up to 3 additional years to achieve groundwater cleanup levels
ESTIMATED CAPITAL COST:	$1,100,000
ESTIMATED O&M (Present Worth):	1,000,000
ESTIMATED TOTAL COST (Present Worth):	$2,100,000

IX. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

Section 121(b)(1) of CERCLA presents several factors that, at a minimum, EPA is required to consider in its assessment of alternatives. Building upon these specific statutory mandates, the National Contingency Plan articulates nine evaluation criteria to be used in assessing the individual remedial alternatives.

A detailed analysis was performed on the alternatives using the nine evaluation criteria in order to select a site remedy. The following is a summary of the comparison of each alternative's strength and weakness with respect to the nine evaluation criteria. These criteria and their definitions are as follows:

Threshold Criteria

The two threshold criteria described below must be met in order for the alternatives to be eligible for selection in accordance with the NCP.

1. **Overall protection of human health and the environment** addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced or controlled through treatment, engineering controls, or institutional controls.

2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** addresses whether or not a remedy will meet all of the ARARs of other Federal and State environmental laws and/or provide grounds for invoking a waiver.

Primary Balancing Criteria

The following five criteria are utilized to compare and evaluate the elements of one alternative to another that meet the threshold criteria.

3. **Long-term effectiveness and permanence** addresses the criteria that are utilized to assess alternatives for the long-term effectiveness and permanence they afford, along with the degree of certainty that they will prove successful.

4. **Reduction of toxicity, mobility, or volume through treatment** addresses the degree to which alternatives employ recycling or treatment that reduces toxicity, mobility, or volume, including how treatment is used to address the principal threats posed by the Site.

5. **Short term effectiveness** addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until cleanup goals are achieved.

6. **Implementability** addresses the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

7. **Cost** includes estimated capital and Operation and Maintenance (O&M) costs, as well as present-worth costs.

Modifying Criteria

The modifying criteria are used on the final evaluation of remedial alternatives generally after EPA has received public comment on the RI/FS and Proposed Plan.

8. **State acceptance** addresses the State's position and key concerns related to the preferred alternative and other alternatives, and the State's comments on ARARs or the proposed use of waivers.

9. **Community acceptance** addresses the public's general response to the alternatives described in the Proposed Plan and RI/FS report.

A detailed tabular assessment of each alternative according to the seven criteria (all but the Modifying Criteria) can be found in Table 5-1 of the FS. Following the detailed analysis of each individual alternative, a comparative analysis, focusing on the relative performance of each alternative against the seven criteria, was conducted. This comparative analysis can be found in Figure 5-1 of the FS.

The section below presents the nine criteria and a brief narrative summary of the alternatives and the strengths and weaknesses according to the detailed and comparative analysis.

1. Overall protection of human health and the environment

With the exception of Alternative 1, the site-wide alternatives evaluated in Section 4.0 of the FS report are considered protective of human health and the environment. Alternative 1, no action, cannot prevent exposure to contaminated groundwater which would not attain cleanup standards for decades. Alternative 2 provides protection through engineering controls (the groundwater interceptor trench and capping) which prevent continuing contaminant releases to the groundwater allowing cleanup levels to be attained through natural attenuation. The use of institutional controls will prevent use of the groundwater until groundwater cleanup levels are met.

The remaining alternatives provide protectiveness through engineering controls (each employing the groundwater interceptor trench and capping), treatment to prevent releases of contaminants from soils to levels which would allow groundwater to attain cleanup levels through natural attenuation, and the use of institutional controls to prevent the use of groundwater until groundwater cleanup levels are met. Alternative 8 employs treatment of groundwater, in lieu of natural attenuation, to achieve protectiveness.

2. Compliance with ARARs

Each alternative was evaluated for compliance with ARARs, including chemical-specific, action-specific and location-specific ARARs. This evaluation is presented in tabular form in Table 4. All alternatives, with the exception of Alternative 1, no action, would comply with ARARs. With the exception of Alternative 1, the remedial alternatives would attain the cleanup levels in groundwater, which were based upon protective chemical-specific ARARs and to-be-considered standards (TBCs), for the nine groundwater indicator constituents. Alternative 1, the no action alternative, would not comply with these chemical-specific ARARs in the short term, i.e. less than decades. Alternative 2 would attain ARARs more rapidly than would Alternative 1 through reduction in VOC releases to, and mobility, in groundwater, but could become less effective over time.

Mitigation and restoration measures will be required to limit potential impacts in disturbed wetland areas and to meet wetlands ARARs for Alternatives 2 through 8. With the exception of Alternative 8, however, the wetland areas that would be disturbed are of low diversity and were significantly altered by prior disposal and removal activities. These disturbances would be of relatively short duration. Alternative 8 would involve much more extensive disturbance and possible destruction of more diverse wetlands in the Brook A valley as a consequence of construction and operation of a groundwater collection system in this area. In addition, Alternative 8 would require the construction of semi-permanent roads through wetland areas, which would reduce the overall size of the wetland area.

Alternative 8 may, also, have some difficulty with meeting the State's anti-degradation provisions of the Water Quality Standards. Extensive treatment and discharge limitations would likely be imposed in order to comply.

3. Long-term effectiveness and permanence

In practical terms, the long-term effectiveness of the eight alternatives in reducing residual risk is substantially the same. The primary differences among alternatives are the degree of certainty of their ability to attain soil and groundwater cleanup levels and the degree of reliability of the technologies employed.

The long-term effectiveness of Alternative 1 would depend exclusively on naturally occurring attenuation processes such as volatilization, dispersion, and biodegradation to reduce VOC levels. These processes require the greatest

amount of time to attain cleanup levels and reduce potential future risks to within an acceptable range and the degree of certainty associated with the estimate of the time to attain those levels is lowest; this alternative, therefore, ranks lowest among the alternatives in long-term effectiveness. Alternative 2 offers an additional level of protection due to the reduction in VOC mobility offered by the cap system and groundwater interceptor trench. However, this reduction in mobility, and therefore, long-term protectiveness, would depend on the continued integrity and performance of the cap and trench systems, which would need continuing maintenance or replacement to ensure their reliability. Use of these systems may also inhibit some of the natural attenuative mechanisms that would reduce VOC levels in soil and groundwater, such as dispersion and dilution through groundwater flushing and volatilization.

Alternatives 3 through 8 offer a greater degree of long-term effectiveness than Alternatives 1 and 2, because levels of VOCs in soil and groundwater would be reduced through treatment or fixation, resulting in more efficient and rapid attainment of cleanup levels. Of these six alternatives, those that involve treatment of VOCs in soil on-site or off-site (Alternatives 3, 4, 6, 7, and 8) would be most reliable in the long-term. Alternative 5 would employ fixation to reduce the mobility of VOCs in soil, but would not reduce VOC volume or toxicity. The fixation process could allow the release of contaminants over time, so that treated soils could be subject to leaching of VOCs. Use of a secure cell for disposal of treated soils in conjunction with this alternative would mitigate the potential for release, although the degree of mitigation is dependent upon the continued maintenance of the secure cell. Accordingly, the long-term effectiveness of Alternative 5 is less than that of the other treatment alternatives because of the somewhat lower reliability of the treatment technique employed. It is estimated that groundwater cleanup levels could be attained in groundwater within approximately six years after soil remediation using these alternatives, with the exception of Alternative 8 in which it is estimated that cleanup levels would be attained within approximately three years.

4. Reduction of toxicity, mobility, or volume through treatment

Alternatives 1 and 2 would provide no reduction in VOC toxicity or mobility nor in the volume of VOCs through treatment, although levels of VOCs would decline to protective levels over time through the natural attenuation mechanisms operating at the Site. Alternatives 3, 4, 6, 7, and 8 involve treatment of VOC-contaminated soil from the

two source areas. The soil treatment represents a significant, irreversible reduction in VOC volume and toxicity in each of these alternatives. Alternative 5 also includes remedial action for soil VOC contamination. However, the fixation process, which is the major treatment component of this alternative, provides only reduction in mobility of VOCs in soil. The contaminants are not removed or destroyed by fixation except for incidental VOC emissions released during soil excavation, handling, and mixing. The fixation process could allow the release of contaminants bound to the soil particles to be leached out by infiltrating precipitation or fluctuating groundwater tables. Mitigation of this potential leaching is offered by placement of treated soils in a secure cell, and by the groundwater interceptor trench. However, this protection depends on the continued integrity and performance of the trench and secure cell.

5. Short-term effectiveness

Comparison of short-term effectiveness for the alternatives included consideration of the length of time needed to achieve cleanup levels as well as consideration of any adverse impacts posed during the construction and implementation period. Alternative 1, the no action alternative, offers no short-term effectiveness since thirty years or more would pass before cleanup levels would be achieved. Alternative 2 provides short-term effectiveness through installation of a groundwater trench and consolidation of all contaminated soils beneath a multimedia cap. Alternative 5 is similar, but the soils would be chemically fixed prior to placement beneath the cap. For each alternative, these actions would prevent leaching of VOCs to the groundwater and allow natural attenuation to occur, resulting in attainment of cleanup standards within six years. Alternatives 3, 4, 6, and 7 provide similar short-term effectiveness principally through treatment of VOC-contaminated soil and the associated decrease in the mass of VOCs released to groundwater. This treatment would allow natural attenuation to occur, also resulting in attainment of cleanup standards within six years. Alternative 8 would provide short-term effectiveness through treatment of the VOC-contaminated soils and additionally extract and treat the contaminated groundwater, resulting in the shortest predicted time to attain cleanup levels, approximately three years.

With the exception of Alternative 1, remedial construction will result in potential short-term, adverse impacts to human health and the environment. Remedial construction would involve handling of VOC-contaminated soils in Alternatives 2 through 8. Alternative 3 would involve the least disturbance of contaminated soil, with exposures limited primarily to drilling cuttings from installation of vapor extraction wells. If necessary to comply with air quality ARARs, air emissions from installation of the vacuum extraction wells could be easily controlled and treated. This alternative, therefore, would present the lowest incremental, short-term risk associated with remedial construction and operations. Risks associated with remedial construction and operations are similar for Alternatives 2, 4, 5, 6, and 7 which involve excavation and above-ground handling of VOC-contaminated soils. These operations may result in exposure of on-site workers to airborne VOCs in vapor form and sorbed to particulates. Off-site populations may also be exposed to airborne emissions from these operations, although these potential exposures would be significantly mitigated by the expected low levels released, distance from the Site to potential receptor populations and attendant dilution. These short-term risks posed by Alternative 2 would be somewhat less than those for the other alternatives that involve soil excavation because a lesser volume of soil would be excavated and handling would be less extensive than for aboveground treatment alternatives. Air emissions associated with treatment operations in Alternatives 4 and 6 could, if necessary, be controlled and treated. Short-term risk associated with remedial operations involved in Alternatives 5 and 7 would be slightly greater than that with Alternatives 4 and 6 because operations would be less amenable to control of air emissions. Although similar to Alternative 3 with respect to short-term risk associated with treatment of source soils, Alternative 8 poses significantly greater short-term risk from construction of a groundwater collection system in the Brook A valley. This effort would result in possible direct contact and inhalation exposures to VOCs present in overburden groundwater in this area because the water table is at or just below ground surface. The level and duration of risk would vary depending upon the type of collection system constructed and the construction techniques used.

With the exception of Alternative 8, the eight remedial alternatives would differ slightly in potential short-term impacts. Alternative 1 would involve minimal disturbance of wetlands and indigenous wildlife because no construction activities are associated with this alternative. Alternatives 2 through 7 would provide essentially similar protectiveness of the environment in the short-term, with impacts involving temporary disturbance of a small,

low-diversity wetland area in the vicinity of the former drum disposal area during construction and remedial activities. Construction and site preparation for Alternatives 4, 5, and 6 would also require limited clearing of additional wooded areas at the Site. Alternative 8 would be less protective of the environment in the short-term because of the extensive disruption and destruction of wetlands in the Brook A valley that would be associated with construction and operation of a groundwater collection system in this area.

6. Implementability

Significant limitations in implementability were generally not identified for the eight alternatives in the detailed analysis with the exception of Alternative 8. Implementation of alternatives requiring treatment operations by specialty contractors (Alternatives 4, 5, and 6, and, to a lesser degree, 3 and 8) would depend on contractor qualifications and availability, as well as equipment availability. In addition to contractor and equipment availability, implementation of Alternative 5 would also depend on successful treatability and pilot scale demonstrations of a chemical fixation for VOCs in on-site soils. Implementation of Alternative 7 would depend on the availability of off-site incineration capacity. Implementation of Alternative 8 would be more difficult because of the conditions affecting construction of a groundwater collection system in the Brook A valley wetlands, e.g., travel of heavy equipment over soils with the groundwater table at or near the surface and equipment access down steep slopes that lead to the valley area.

Permitting will not be required for on-site alternatives. Off-site elements of remedial alternatives will comply with applicable federal and state regulatory requirements, including applications for permits. The alternative which would be most affected is Alternative 7, off-site incineration.

7. Cost

The estimated present worth value of each alternative is presented below:

COSTS OF ALTERNATIVES

	Capital Costs	O&M Costs Prsnt Wrth	Total Present Worth
Alternative 1	$ 10,000	$ 290,000	$ 300,000
Alternative 2	440,000	350,000	790,000
Alternative 3	410,000	280,000	690,000
Alternative 4	700,000	300,000	1,000,000
Alternative 5	1,600,000	300,000	1,900,000
Alternative 6	2,100,000	300,000	2,400,000
Alternative 7	9,500,000	200,000	9,700,000
Alternative 8	1,100,000	1,000,000	2,100,000

8. State acceptance

The New Hampshire Department of Environmental Services (NHDES) has been involved with the Site from shortly after its discovery. NHDES has reviewed the various alternatives and has indicated its support for the selected remedy. The State has also reviewed the RI, Risk Assessment and the FS to determine if the selected remedy is in compliance with applicable or relevant and appropriate State Environmental laws and regulations. NHDES concurs with the selected remedy for the Mottolo Superfund Site. A copy of the declaration of concurrence is attached as Appendix A.

9. Community acceptance

The comments received during the public comment period are summarized and included with EPA's responses in the Responsiveness Summary, which is included as Appendix B. No oral comments were made at the Proposed Plan and FS public hearing. In general, the community is supportive of the selected remedy and satisfied by the findings of the RI/FS.

X. THE SELECTED REMEDY

EPA has selected Alternative 3, in-situ vacuum extraction with natural attenuation for contaminated groundwater, as the remedy for the Mottolo Site. It is a comprehensive remedy since the source control component will be designed to ensure cleanup of soils to allow affected groundwater to reach levels which are protective of public health by natural attenuation in a reasonably rapid timeframe.

In order to remediate the contamination at the Site, a groundwater interceptor trench will be constructed to dewater the former drum disposal area soils. No such trench will be needed at the southern boundary area. To reduce precipitation infiltration, waterproof caps will be placed over both areas. Vacuum extraction wells will be installed in each area and both areas' extraction well networks will be connected to a treatment system to be located on the existing piggery building pad. The vacuum extraction system will draw contaminants from the soils in both areas and treat them using carbon canisters to levels which will allow protective groundwater cleanup levels to be attained through natural attenuation. Confirmatory vapor sampling or direct soil sampling and testing will be used to determine when vacuum extraction may be decommissioned. Groundwater monitoring will be utilized throughout the design and operation of the vacuum extraction system to ensure that natural attenuation will attain protective groundwater cleanup levels. Fencing and institutional controls will be implemented which will restrict the use of contaminated groundwater and prevent disturbance of on-going remedial actions.

A. Interim Groundwater Cleanup Levels

Interim cleanup levels have been established in groundwater for all contaminants of concern identified in the Baseline Risk Assessment found to pose an unacceptable risk to either public health or the environment. Interim cleanup levels have been set based on the ARARs (e.g., Drinking Water Maximum Contaminant Level Goals (MCLGs) and MCLs) if available, or other suitable criteria described below. Periodic assessments of the protection afforded by remedial actions will be made as the remedy is being implemented and at the completion of the remedial action. At the time that all the groundwater interim cleanup levels described below have been achieved, a risk assessment shall be performed on the residual groundwater contamination. This risk assessment of the residual groundwater contamination shall follow EPA procedures and will assess the cumulative risks for carcinogens and non-carcinogens posed by consumption of site groundwater. If the risks are not within EPA's risk management goal for carcinogens and non-carcinogens, then the remedial action will continue until protective levels are attained, or the remedy is otherwise deemed protective.

Because the aquifer under the Site is a Class IIB aquifer, which is a potential source of drinking water, MCLs and non-zero MCLGs established under the Safe Drinking Water Act are ARARs.

Interim cleanup levels for known and probable carcinogenic compounds (Class A & B) have been set at the appropriate MCL. The interim cleanup level for 1,1-dichloroethane, a Class C compound (possible carcinogen) has been set at the State drinking water consumption advisory level, since neither a Federal standard (MCL) nor cancer potency factor exists for this compound.

Interim cleanup levels for compounds in groundwater exhibiting non-carcinogenic effects have been set at the MCLG, which for the compounds at this site happen to be the same as the MCL. In the absence of a MCLG, an interim cleanup level for non-carcinogenic effects of tetrahydrofuran was set at a level thought to be without appreciable risk of an adverse effect should exposure occur over a lifetime. The interim cleanup for tetrahydrofuran was based on an interim RfD and risk management factors which taake into account uncertainties in the risk studies done for the compound.

Table 5, below, summarizes the interim cleanup levels for carcinogenic and non-carcinogenic contaminants of concern identified in groundwater.

TABLE 5: GROUNDWATER INTERIM CLEANUP LEVELS

Carcinogenic Contaminants of Concern	Interim Cleanup Level (ug/l)	Basis	Level of Risk
Arsenic[1]	50	MCL/rsk mgmt	$2x10^{-4}$
Trichloroethene	5	MCL	$2x10^{-6}$
Vinyl chloride	2	MCL	$1x10^{-4}$
1,1-Dichloroethane	81	SHA[2]	$2x10^{-4}$
		SUM:	**$5x10^{-4}$**

Non-carcinogenic Contaminants of Concern	Interim Cleanup Level (ug/l)	Basis of Toxicity	Target Endpoint	Hazard Index
Toluene	1,000	MCLG	Liver*	.1
Ethylbenzene	700	MCLG	Liver*	.2
1,2-Dichloroethene(tot.)	70[3]	MCLG	Serum Enzymes	.2
Tetrahydrofuran	700	RfD[4]	Liver*	10
1,1,1-Trichloroethane	200	MCLG	Liver*	.06
			SUM*	10

1 The cleanup level for arsenic has been set at the MCL of 50 ug/l. The carcinogenic risk posed by arsenic at 50 ug/l in ground water will approximate $2x10^{-3}$. However, in light of recent studies indicating that many skin tumors arising from oral exposure to arsenic are non-lethal in nature and in light of the possibility that the dose-response curve for the skin cancers may not be a direct, straight-line relationship (in which case the cancer potency factor used to generate risk estimates will be overstated), it is Agency policy to view these risks as lower by as much as an order of magnitude (x10). As a result, the carcinogenic risks for arsenic at this Site have been treated as if they were $2x10^{-4}$. See EPA memorandum, "Recommended Agency Policy on the Carcinogenicity Risk Associated with the Ingestion of Inorganic Arsenic" dated June 21, 1988.

2 State health advisory, risk estimate based on cancer potency factor of $9.1x10^{-2}$ $(mg/kg/day)^{-1}$ derived by State

3 More restrictive MCLG for cis-1,2-dichloroethene

4 Interim cleanup level based upon interim reference dose and risk management factors which account for uncertainties in the risk studies

* Sum for similar target endpoints

EPA has estimated that these interim cleanup levels will be attained within six years after completion of the source control component.

While these cleanup levels are consistent with ARARs or suitable TBC standard for groundwater, a cumulative risk that could be posed by these compounds may exceed EPA's goals for remedial action. Consequently, these levels are considered to be interim cleanup levels for groundwater. In addition, once all these levels are achieved for each compound, EPA expects that due to different rates of attenuation for each compound, levels of most will be below these interim cleanup levels. Thus, when all of the interim cleanup levels have been attained, a risk assessment will be performed on residual groundwater contamination to determine whether the remedial action is protective. Remedial actions shall continue until protective concentrations of residual contamination have been achieved or until the remedy is otherwise deemed protective. These protective residual levels shall constitute the final cleanup levels for this Record of Decision and shall be considered performance standards for any remedial action.

B. Soils Cleanup Levels

Based upon data developed in the RI and the Baseline Risk Assessment, remedial measures to address risk associated with possible exposure to source soils are not warranted because present and future risks did not exceed a 10^{-4} excess cancer risk or a Hazard Index of one. However, available data indicate that source area soils are continuing to release VOCs to groundwater. This release results in groundwater contamination at concentrations, which, under some exposure scenarios, are associated with potential future risks above acceptable levels. Therefore, cleanup levels for soils were established to protect the aquifer from potential soil leachate. The Summers Model was used to estimate residual soil levels that are not expected to impair future groundwater quality. The interim cleanup levels for groundwater were used as input into the leaching model. Tables 6A and 6B, below, summarize the soil cleanup levels required to protect public health and the aquifer and were developed for the groundwater contaminants of concern detected above the interim groundwater cleanup levels in the former drum disposal area (Area 1) and in the southern boundary area (Area 2).

TABLE 6A: SOIL CLEANUP LEVELS-AREA 1
FOR THE PROTECTION OF HUMAN HEALTH AND THE AQUIFER BASED ON THE SUMMERS MODEL

Carcinogenic Contaminants of Concern	Soil Cleanup Level (mg/kg)	Basis for Model Input	Residual Groundwater Risk
Trichloroethene	.07	MCL	$2x10^{-6}$
Vinyl chloride	.005	MCL	$1x10^{-4}$
1,1-Dichloroethane	.36	SHA[1]	$2x10^{-4}$
		SUM:	$3x10^{-4}$

Non-carcinogenic Contaminants of Concern	Soil Cleanup Level (mg/kg)	Basis for Model Input	Target Endpt of Toxicity	Residual Groundwater Hazard Index
Toluene	14	MCLG	Liver*	.1
Ethylbenzene	17.4	MCLG	Liver*	.2
1,2-Dichloroethene	.46	MCLG	Serum Enzymes	.2
1,1,1-Trichloroethane	2.1	MCLG	Liver*	.06
			SUM*	.4

1 State health advisory, risk estimate based on cancer potency factor of $9.1x10^{-2}$ $(mg/kg/day)^{-1}$ derived by State

* Sum for similar target endpoints

TABLE 6B: SOIL CLEANUP LEVELS-AREA 2
FOR THE PROTECTION OF HUMAN HEALTH AND THE AQUIFER BASED ON THE SUMMERS MODEL

Carcinogenic Contaminants of Concern	Soil Cleanup Level (mg/kg)	Basis for Model Input	Residual Groundwater Risk
Trichloroethene	.004	MCL	$2x10^{-6}$

Non-carcinogenic Contaminants of Concern	Soil Cleanup Level (mg/kg)	Basis for Model Input	Target Endpt of Toxicity	Residual Groundwater Hazard Index
1,2-Dichloroethene	.020	MCLG	Ser. Enz.	.2

These soil cleanup levels must be met at the completion of the remedial action at the points of compliance which are throughout the soil in the areas described below. The soil cleanup levels will be considered to have been attained when: 1) the levels are verified by direct soil sampling and leachability testing; and/or, 2) the soil vapor phase VOCs reach non-detectable levels at each well-head sampling point. Area 1, the former drum disposal area, includes an

area of approximately 4200 square feet at a depth of from nine to twelve feet (1400-1800 cubic yards). Area 2, the southern boundary area, encompasses a less well defined area of approximately 3600 square feet at about fifteen feet deep (2000-2200 cubic yards). Further refinement of each area will be required prior to final design to ensure that the entire volume of soils contributing unacceptable amounts of contaminants to groundwater is remediated.

C. Description of Remedial Components

The selected remedy, Alternative 3, is composed of 7 remedial components: a fence; a groundwater interceptor trench; two temporary caps; an in-situ vacuum extraction system; natural attenuation of contaminated groundwater; environmental monitoring; and institutional controls. Each is described below and illustrated in Figures 3, 4, and 5.

1. Fence

A security fence consisting of approximately 1,300 linear feet of galvanized chain link fence ten feet high will be installed to control access to the former drum disposal and southern boundary areas and to provide security for the vacuum extraction system.

2. Groundwater interceptor trench

A groundwater interceptor trench will be installed upgradient of the former disposal area. Lowering of the upgradient overburden water table in this area will significantly reduce groundwater flow through contaminated soils and, accordingly, migration of contaminants from the drum disposal area. Dewatering will facilitate VES treatment of that portion of contaminated soils that is currently saturated by groundwater, significantly increasing the effectiveness of source control. Based upon a numerical groundwater flow model, it is estimated that a period of approximately three to nine months will be required to dewater soils in the former disposal area; however, installation of the VES can be initiated prior to completion of dewatering. No dewatering will be required for the southern boundary area since the overburden soils remain unsaturated for most of the year.

3. Two temporary caps

The ground surface in both the former drum disposal area and the southern boundary area will be sealed with temporary caps consisting of four or six-mil thick visqueen sheeting covered with a six inch layer of seeded loam. This will improve the operational efficiency of the VES by limiting

short-circuit air flow from the ground surface to the extraction wells and significantly reducing precipitation infiltration. The caps will remain in place and be effective for the expected operational period of the VES, but they will not be designed to maintain their integrity on a permanent basis.

4. In-situ vacuum extraction system

Air and vapor phase VOCs present in the soil pore space (soil gas) in the former drum disposal and southern boundary areas will be removed by inducing a vacuum on extraction wells that extend vertically to the top of bedrock and are screened from bedrock to two to three feet below ground surface (see Figure 6). The soil gas will flow through the soil pore space to the extraction wells and would be replaced by ambient air induced to flow into the soil by the negative pressure or from air injection wells, if found to be necessary during the design phase. VOCs adsorbed onto soils will partition from the soils into the replacement air and be removed by the vacuum system.

The vacuum extraction treatment equipment will be placed in a building on the existing, large piggery building pad. A vacuum pump will transfer the soil gas (from each source area) containing VOCs through a moisture trap, installed at the suction of the vacuum pump, and discharge into vessels containing granular activated carbon beds. Liquid from the moisture trap will be collected, analyzed, and transferred to off-site treatment and/or disposal, based upon the results of the analyses, in compliance with Federal and State requirements. The VOCs in the soil gas will be adsorbed by the carbon beds and the treated air discharged to the atmosphere. See Figure 5. The carbon beds will either be regenerated on-site using steam or sent off-site for regeneration or disposal in compliance with Federal and State requirements. In the case of on-site regeneration, VOCs desorbed from the carbon would be collected with steam condensate and transferred off-site for treatment and/or disposal in compliance with Federal and State requirements.

Pressure monitoring gauges installed on the manifold piping and in the ground at selected locations will provide information regarding performance of the vacuum system. Valves installed in the piping will, if warranted, be used to adjust the vacuum exerted on various parts of the collection systems.

Performance of the VES will be assessed by monitoring vapor quality at the heads of individual collection points and at the effluent air discharge. To optimize VES performance, vacuum exerted at different points in the system might be

adjusted using control valves in response to vapor screening or soil screening results, as previously discussed, or additional extraction wells might be installed. It is estimated that approximately one year will be required to complete source remediation using the VES, although the actual time may vary because of variability in subsurface conditions. This estimate was based upon analysis of site conditions, the estimated mass of VOCs in the soil, anticipated VOC mass transfer rates, and estimated air flow rates. Operation of the VES will continue until VOCs are not detected in air discharged from the VES and in air at the collection point well heads. After VES operation ceases, the vapor will continue to be monitored at the individual well heads to determine if additional volatilization occurs, in which case the VES will be operated again unless direct soil sampling and leachability testing indicate that soil cleanup levels have been met. The VES equipment may be decommissioned and removed if no VOCs are detected for one year after cessation of VES operations and if the rate of groundwater cleanup is proceeding such that the groundwater cleanup levels will be met within six years after VES operation ceases. Appropriate air monitoring methods and frequencies will be established during remedial design to ensure that statistically significant results will be used to determine the appropriate time to cease operations and decommission VES equipment.

When it is finally determined that VES operations have been completed, soils in the source areas will be regraded, if appropriate, and covered with a soil cover of approximately six inches to one foot to provide positive drainage and reduce precipitation infiltration. The cover will be vegetated to limit possible erosion.

5. Natural attenuation of contaminated groundwater

Natural attenuation relies on groundwater attaining lower contaminant concentrations through physical, chemical and biological processes until groundwater cleanup levels are met. After completion of source remediation at each of the two areas, no further contamination will be added to the groundwater at levels which would prevent attainment of the groundwater cleanup levels. Based upon the hydrogeology of the Site, leachability studies conducted, and a simplified mathematical model, it is expected that overburden groundwater which has been affected by the former drum disposal area soils will clean itself to the groundwater cleanup levels within approximately six years after completion of source remediation. Bedrock groundwater, due to higher velocities and fewer opportunities for adsorption/desorption to occur, should attain groundwater

cleanup levels earlier. For the bedrock groundwater affected by the southern boundary area soil contamination (no appreciable overburden groundwater was found in this area), approximately two years will be needed to achieve groundwater cleanup levels.

6. Environmental monitoring

Groundwater and surface water monitoring will be initiated during remedial design and continue for three years after attaining groundwater cleanup levels to assess the effectiveness of remediation and to confirm that contaminant concentrations in groundwater attain cleanup levels. If at any time during the implementation of the remedy an evaluation of the groundwater monitoring data indicates that the groundwater cleanup levels will not be met or are not met within six years after completion of soil remediation for the former drum disposal area or within two years after completion of soil remediation for the southern boundary area, then a detailed re-analysis of the nature and extent of contamination at the Site will be conducted and another remedy proposed, if appropriate.

The groundwater monitoring program will be developed for the following purposes:

- to evaluate the effectiveness of the source remediation measures to allow attainment of the groundwater cleanup levels; and
- to monitor the reduction of contaminant concentrations over time in order to ensure that groundwater cleanup levels will be achieved in the predicted timeframes.

The details of the groundwater monitoring program will be developed during remedial design and tailored to the specifics of the design. Additional groundwater monitoring wells will be installed in order to ensure that the objectives of the monitoring program are achieved. Specifically, additional wells will be installed to define the extent of the southern boundary area plume and to determine the northwesterly edge of the plume emanating from the former drum disposal area. Selected overburden and bedrock wells will be monitored quarterly upon initiation of remedial design until completion of the remediation. Subsequent sampling frequencies will be determined by EPA prior to completion of soils remediation. All samples will be analyzed for Hazardous Substance List VOCs, tetrahydrofuran, and arsenic. Specific wells and analytical parameters may be added or deleted depending on sampling results and observed trends.

A surface monitoring program will be developed to ensure that as the contaminants continue to discharge to Brook A, no adverse environmental impacts result. Three surface water stations, one at the headwaters of Brook A, one upstream and one downstream of the former drum disposal area, will be established and sampled. Sampling would occur concurrently with the groundwater monitoring and samples will be analyzed for Hazardous Substance List VOCs, tetrahydrofuran, and arsenic. Specific analysis parameters may be added or deleted and the frequency of sampling may be adjusted depending on sampling results and observed trends.

All monitoring data will be reviewed and evaluated during the implementation of the remedial action to ensure that response objectives are achieved. Adjustments to the vacuum extraction system will be implemented to optimize treatment. Modifications to the remedial action, including implementation of a new remedy, if appropriate, will be considered if the monitoring program shows that the groundwater will not attain the target levels within the period of time specified in this remedy or that the remedy is not adequately reducing risks to human health and/or the environment that are posed by current or future exposure to site contaminants.

7. Institutional controls

Institutional controls will be implemented which would restrict the use of contaminated groundwater and prevent disturbance of on-going remedial actions. The objectives of the institutional controls shall be to ensure that no activities take place at the Site or in proximity to the Site which would either affect implementation of the selected remedy or cause exposures to hazardous substances. Examples of acceptable institutional controls include use restrictions imposed on deeds and zoning ordinances, among others.

To the extent required by law, EPA will review the Site at least once every five years after the initiation of remedial action at the Site if any hazardous substances, pollutants or contaminants remain at the Site to assure that the remedial action continues to protect human health and the environment. EPA will also evaluate risk posed by the Site at the completion of the remedial action (i.e., before the Site is proposed for deletion from the NPL).

XI. STATUTORY DETERMINATIONS

The remedial action selected for implementation at the Mottolo Site is consistent with CERCLA and, to the extent practicable, the NCP. The selected remedy is protective of human health and the environment, attains ARARs and is cost effective. The selected remedy also satisfies the statutory preference for treatment which permanently and significantly reduces the mobility, toxicity or volume of hazardous substances as a principal element. Additionally, the selected remedy utilizes alternate treatment technologies or resource recovery technologies to the maximum extent practicable.

A. The Selected Remedy is Protective of Human Health and the Environment

The remedy at this Site will permanently reduce the risks posed to human health and the environment by eliminating, reducing or controlling exposures to human and environmental receptors through treatment, engineering controls, and institutional controls; more specifically, VES for treatment of contaminated soils, and restrictions on the use of contaminated groundwater to prevent activities which would result in exposure to contaminated groundwater. Moreover, the selected remedy will result in human exposure levels that are within the 10^{-4} to 10^{-6} incremental cancer risk range, at MCLs, or at health advisories and that are within the hazard index of one or within health advisories for non-carcinogens. More specifically, the final groundwater cleanup levels will be determined as the result of a risk assessment performed on residual groundwater contamination after all interim cleanup levels have been met. Unless the resultant cumulative risk is within the 10^{-4} to 10^{-6} incremental risk range and the cumulative hazard index for similar target endpoints is less than one, remedial actions shall continue until protective levels are attained. Finally, implementation of the selected remedy will not pose unacceptable short-term risks or cross-media impacts; i.e., use of the in-situ VES minimizes exposures to workers and adjacent populations during construction, carbon adsorption will prevent air releases of VOCs, and natural attenuation will result in continually decreasing air emissions (which are currently at non-detectable levels) and attainment of groundwater cleanup levels within a reasonable timeframe.

B. The Selected Remedy Attains ARARs

This remedy will attain all applicable or relevant and appropriate federal and state requirements that pertain to the Site. Environmental laws from which ARARs for the selected remedial action are derived, and the specific ARARs include:

- **Resource Conservation and Recovery Act (RCRA);**
- **Clean Water Act (CWA);**
- **Safe Drinking Water Act (SDWA);**
- **Executive Order 11990 (Protection of Wetlands);**
- **Clean Air Act (CAA);**
- **Occupational Safety and Health Act (OSHA); and**
- **New Hampshire Hazardous Waste Act.**

The following criteria have also been considered under the category of To-Be-Considered (TBCs) during the selection of the remedy:

- **State Drinking Water Criteria and Consumption Advisories.**

A listing of ARARs and TBCs are found in Tables 7, 8 and 9, except for RCRA action-specific regulations, as explained below. These tables (included in Appendix B) provide a brief synopsis of the requirements, what action is necessary to meet the ARAR, and whether the ARAR is applicable, relevant and appropriate, or to-be-considered. A brief narrative summary of the principal ARARs and TBCs follows.

The NCP requires CERCLA remedial actions to attain MCLGs, or MCLs when the MCLG has been set at a level of zero, if the non-zero MCLG or MCL is determined to be relevant and appropriate. The principal chemical-specific ARARs are MCLs for carcinogenic compounds and non-zero MCLGs for non-carcinogenic compounds established in the Safe Drinking Water Act, 40 CFR 141.1 - 141.16 and 40 CFR 141.50 - 141.52, respectively. These have been determined to be relevant and appropriate as in-situ cleanup standards, since the aquifer is considered to be Class IIB, a potential drinking water source. MCLs and MCLGs were used to help set the groundwater cleanup levels, as well as, the soil cleanup levels. The specific MCLs which are ARARs for carcinogenic compounds include: trichloroethene, 5 ug/l; vinyl chloride, 2 ug/l; and arsenic, 50 ug/l. Since no MCL or non-zero MCLG has been promulgated and none proposed for 1,1-dichloroethane, the State of New Hampshire Department of Public Health Service consumption advisories for water supplies, which have been determined to be a TBC, were used for 1,1-dichloroethane in setting site cleanup levels for groundwater and soil. The level to be met for 1,1,-dichloroethane is 81 ug/l in the groundwater. The specific non-zero MCLGs which are ARARs for non-carcinogenic compounds include: 1,1,1-trichloroethane, 200 ug/l; toluene, 2000 ug/l; and ethyl benzene, 700 ug/l. The Proposed MCLG has been determined a TBC for 1,2-dichloroethene (70 ug/l for cis- and 100 ug/l for trans-isomers) since no MCL or MCLG has, as yet, been promulgated for those compounds.

With respect to location-specific ARARs, the Executive Order concerning wetlands and Section 404 of the Clean Water Act are applicable to this Site. No practicable remediation alternative exists to the selected remedy which would have less adverse environmental impact on the Site's wetlands. The no action alternative would have less adverse impacts, but it is not practicable since it cannot attain other ARARs or be protective of public health. All other alternatives involve similar disturbance of the drainage swale wetlands with the exception of Alternative 8 which would, also, adversely affect the wetlands near Brook A. Since there is no practicable alternative, the remedy in the wetlands will be undertaken in such a manner to avoid or minimize the destruction, loss and degradation of site wetlands and to preserve and enhance the natural and beneficial use of wetlands.

The principal action-specific ARARs include New Hampshire Hazardous Waste Rules which incorporate by reference RCRA standards for the treatment, storage, and disposal of hazardous wastes. These State regulations are currently undergoing EPA review. If EPA determines that these State regulations are more stringent than RCRA regulations, then the State regulations shall be ARARs. If not, the comparable RCRA citation presented in the ARAR Table will control. These standards are relevant and appropriate to the design, construction and operation of the vacuum extraction system, since it will be handling, treating and disposing of hazardous waste and hazardous waste constituents sufficiently similar to RCRA regulated wastes to warrant compliance with RCRA standards. Land Disposal Restrictions (LDRs) are not ARARs for this Site because no RCRA wastes have been identified and because no on-site placement of wastes will occur as part of the selected remedy.

All OSHA requirements for worker health and safety during hazardous waste operations and general construction standards are applicable during implementation of this remedy.

C. The Selected Remedial Action is Cost-Effective

In the Agency's judgment, the selected remedy is cost effective, i.e., the remedy affords overall effectiveness proportional to its costs. In selecting this remedy, once EPA identified alternatives that are protective of human health and the environment and that attain ARARs, EPA evaluated the overall effectiveness of each alternative by assessing the relevant three criteria -- long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term

effectiveness, in combination. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs. The costs of this remedial alternative are: estimated capital cost - $410,00; present worth of operation and maintenance cost - $280,000; total present worth cost $690,000. Other than the no action alternative, which does not meet ARARs and is not protective, this is the least expensive alternative. This alternative is more effective in the short-term than any other alternative and is as or more effective than the other alternatives in long-term effectiveness and in reduction of toxicity, mobility, and volume.

D. The Selected Remedy Utilizes Permanent Solutions and Alternative Treatment or Resource Recovery Technologies to the Maximum Extent Practicable

Once the Agency identified those alternatives that attain ARARs and that are protective of human health and the environment, EPA identified which alternative utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. This determination was made by deciding which one of the identified alternatives provides the best balance of trade-offs among alternatives in terms of: 1) long-term effectiveness and permanence; 2) reduction of toxicity, mobility or volume through treatment; 3) short-term effectiveness; 4)implementability; and 5) cost. The balancing test emphasized long-term effectiveness and permanence and the reduction of toxicity, mobility and volume through treatment; and considered the preference for treatment as a principal element, the bias against off-site land disposal of untreated waste, and community and state acceptance. The selected remedy provides the best balance of trade-offs among the alternatives.

Alternatives 1 and 2 do not employ permanent solutions or treatment so that no reduction of toxicity, mobility or volume through treatment is achieved. The remaining alternatives all provide a similar degree of long-term effectiveness through a reduction in toxicity, mobility, and volume through treatment. The selected remedy, however, achieves the same level of long-term effectiveness as any other alternative while being the most effective in the short term at the lowest cost. Its long-term effectiveness relies on two components, one of which is an alternative treatment technology, in-situ VES for soil remediation, and natural attenuation for contaminated groundwater remediation.

The use of in-situ VES has advantages of lower impacts during construction and operation over each of the other alternatives (Alternatives 4,5,6,7) utilizing source control technologies which would require excavation and, thus, a potential for VOC releases. While Alternative 8, also, would use in-situ VES for source control, the use of the groundwater extraction system would have significant adverse impacts on the Site's wetlands without a significant improvement in protectiveness and at a greater cost.

In addition, the selected remedy would be more easily implemented than any of the other alternatives considered, with the exception of Alternatives 1 and 2 (which would not employ treatment).

The long-term effectiveness of the selected remedy is based upon the in-situ VES being as efficient in treating contaminated soils as the source control component of any of the other alternatives and on the natural attenuation of contaminated groundwater being as effective as the groundwater extraction and treatment component in Alternative 8.

Based upon the comments received during the public comment period and the reactions from attendees of public informational meetings, there appears to be community acceptance of the selected remedy. The State acceptance is documented in the declaration of concurrence which is attached as Appendix C.

E. The Selected Remedy Satisfies the Preference for Treatment Which Permanently and Significantly reduces the Toxicity, Mobility or Volume of the Hazardous Substances as a Principal Element

The principal element of the selected remedy is the source control component, an in-situ VES. This element addresses the primary threat at the Site, contamination of groundwater through continuing releases of VOCs from site soils. The selected remedy satisfies the statutory preference for treatment as a principal element by removing VOCs from source area soils (using in-situ vacuum extraction with carbon filtration of the off-gases) to levels which will allow the groundwater to attain cleanup levels in a reasonably rapid timeframe through natural attenuation.

XII. DOCUMENTATION OF NO SIGNIFICANT CHANGES

EPA presented the Proposed Plan (preferred alternative) for remediation of the Site on February 13, 1991. The elements of the preferred alternative included: a fence; a groundwater interceptor trench; two temporary caps; an in-situ vacuum extraction system; natural attenuation of contaminated groundwater; environmental monitoring; and institutional controls.

No significant changes from the Proposed Plan have been made to the selected remedy as detailed in this Record of Decision.

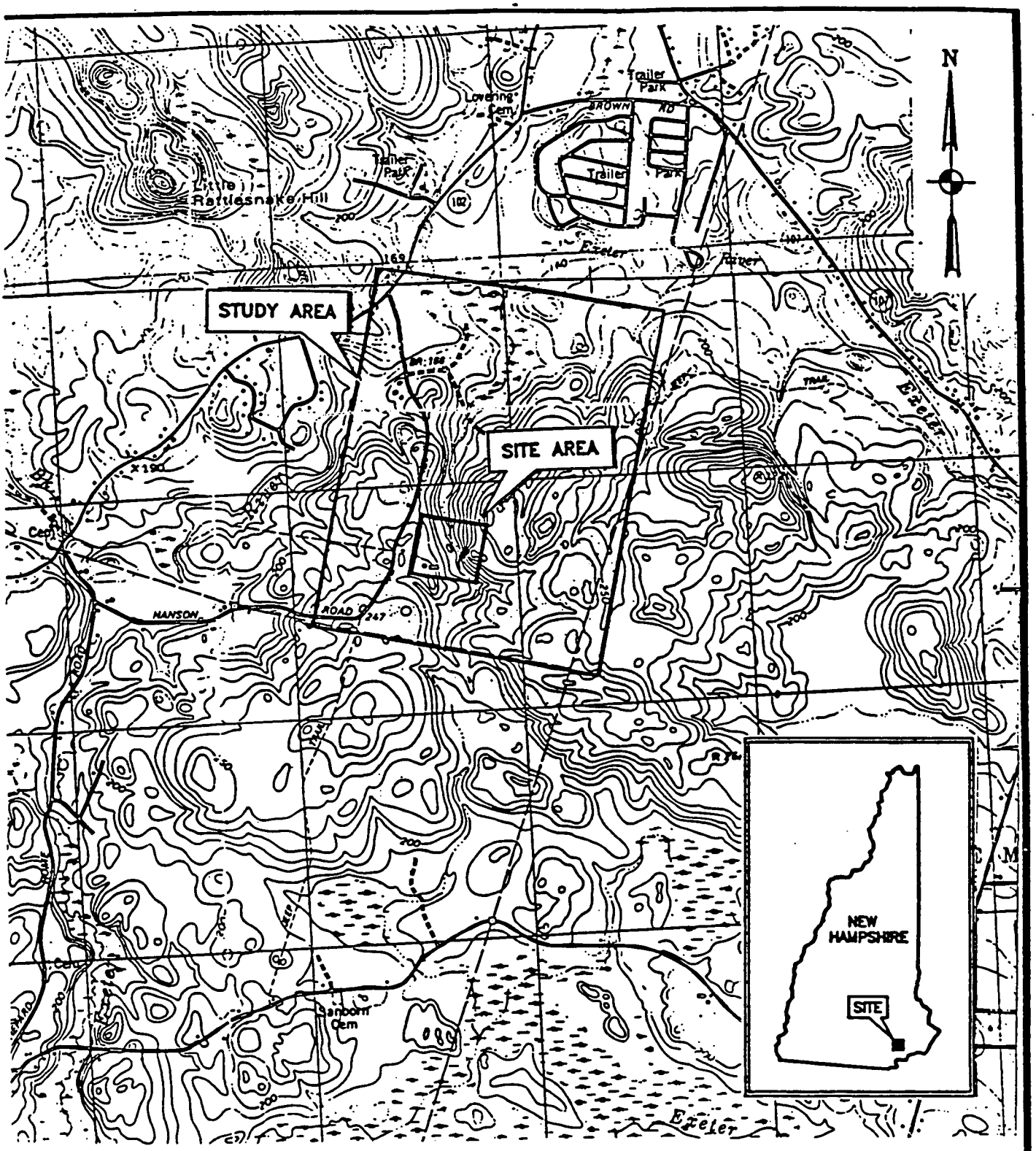
XIII. STATE ROLE

The New Hampshire Department of Environmental Services has reviewed the various alternatives and has indicated its support for the selected remedy. The State has also reviewed the RI, Risk Assessment and FS to determine if the selected remedy is in compliance with applicable or relevant and appropriate State Environmental laws and regulations. The Department of Environmental Services concurs with the selected remedy for the Mottolo Site. A copy of the declaration of concurrence is attached as Appendix C.

APPENDICES

APPENDIX A

Figures



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SCALE (FEET)

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USGS, 1981, MT. PAWTUCKAWAY QUADRANGLE, NEW HAMPSHIRE, US GEOLOGICAL SURVEY 7.5' SERIES (TOPOGRAPHIC), 1981

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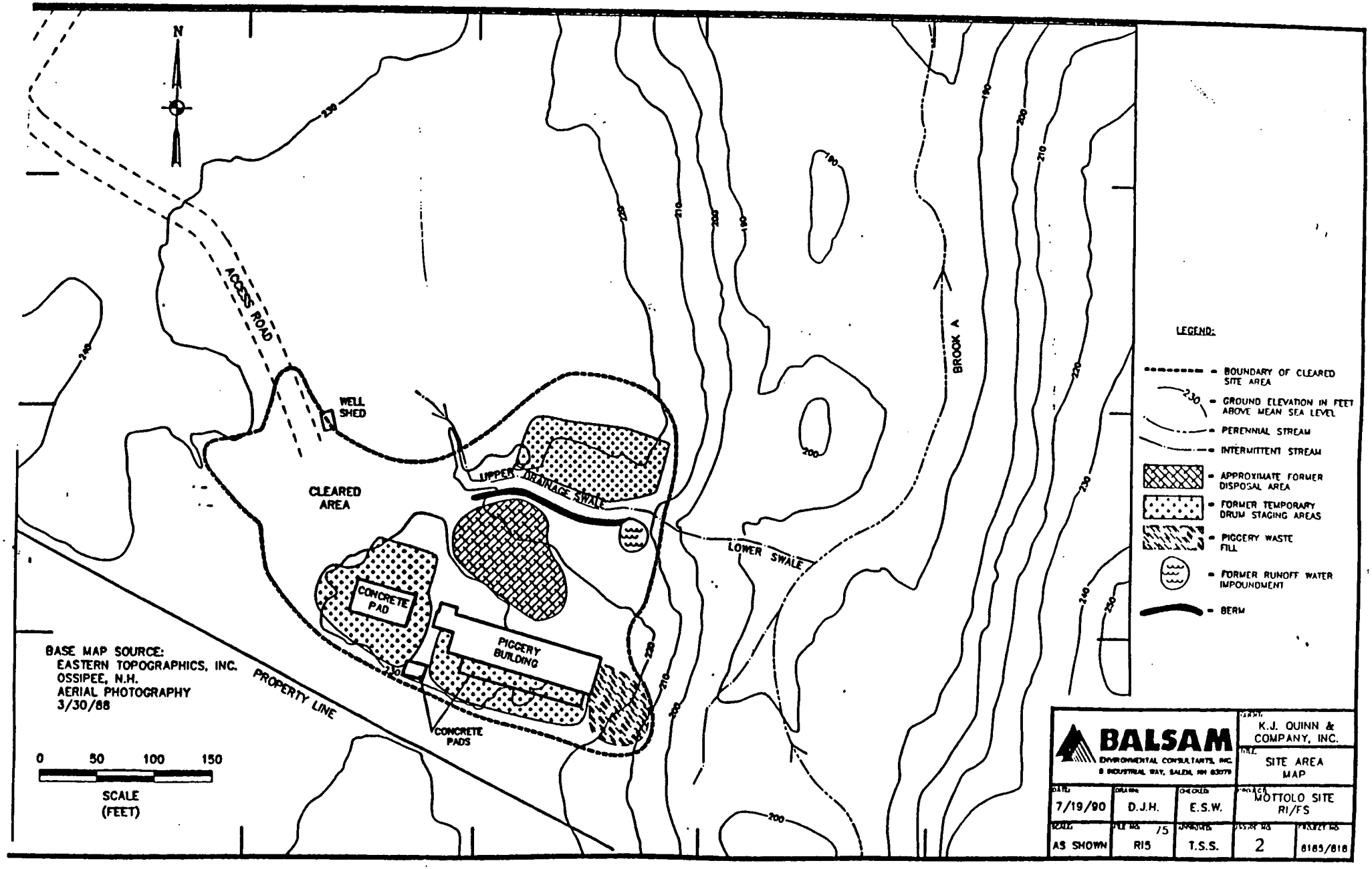
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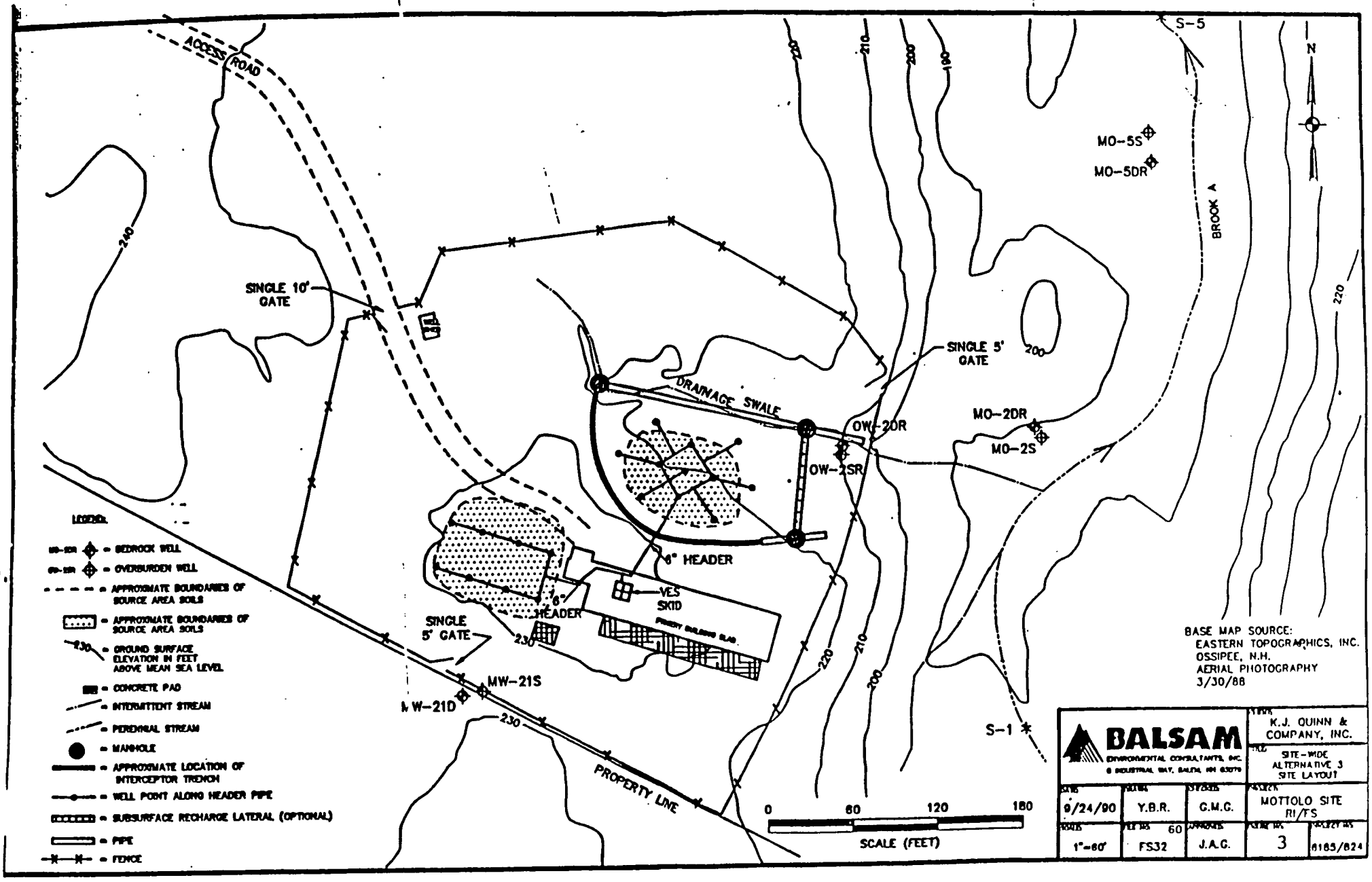
ACCESS ROAD
WELL SHED
CLEARED AREA
UPPER DRAINAGE SWALE
LOWER SWALE
BROOK A
CONCRETE PAD
PIGGERY BUILDING
CONCRETE PADS
PROPERTY LINE
BASE MAP SOURCE:
EASTERN TOPOGRAPHICS, INC.
OSSIPEE, N.H.
AERIAL PHOTOGRAPHY
3/30/88
0 50 100 150
SCALE (FEET)
LEGEND:
BOUNDARY OF CLEARED SITE AREA
GROUND ELEVATION IN FEET ABOVE MEAN SEA LEVEL
PERENNIAL STREAM
INTERMITTENT STREAM
APPROXIMATE FORMER DISPOSAL AREA
FORMER TEMPORARY DRUM STAGING AREAS
PIGGERY WASTE FILL
FORMER RUNOFF WATER IMPOUNDMENT
BERM
BALSAM
ENVIRONMENTAL CONSULTANTS, INC.
8 INDUSTRIAL WAY, SALEM, NH 03079
K.J. QUINN & COMPANY, INC.
SITE AREA MAP
DATE 7/19/90
DRAWN D.J.H.
CHECKED E.S.W.
PROJECT MOTTOLO SITE RI/FS
SCALE AS SHOWN
FILE NO. 15
RI5
APPROVED T.S.S.
DWG. NO. 2
PROJECT NO. 8185/818


ACCESS ROAD
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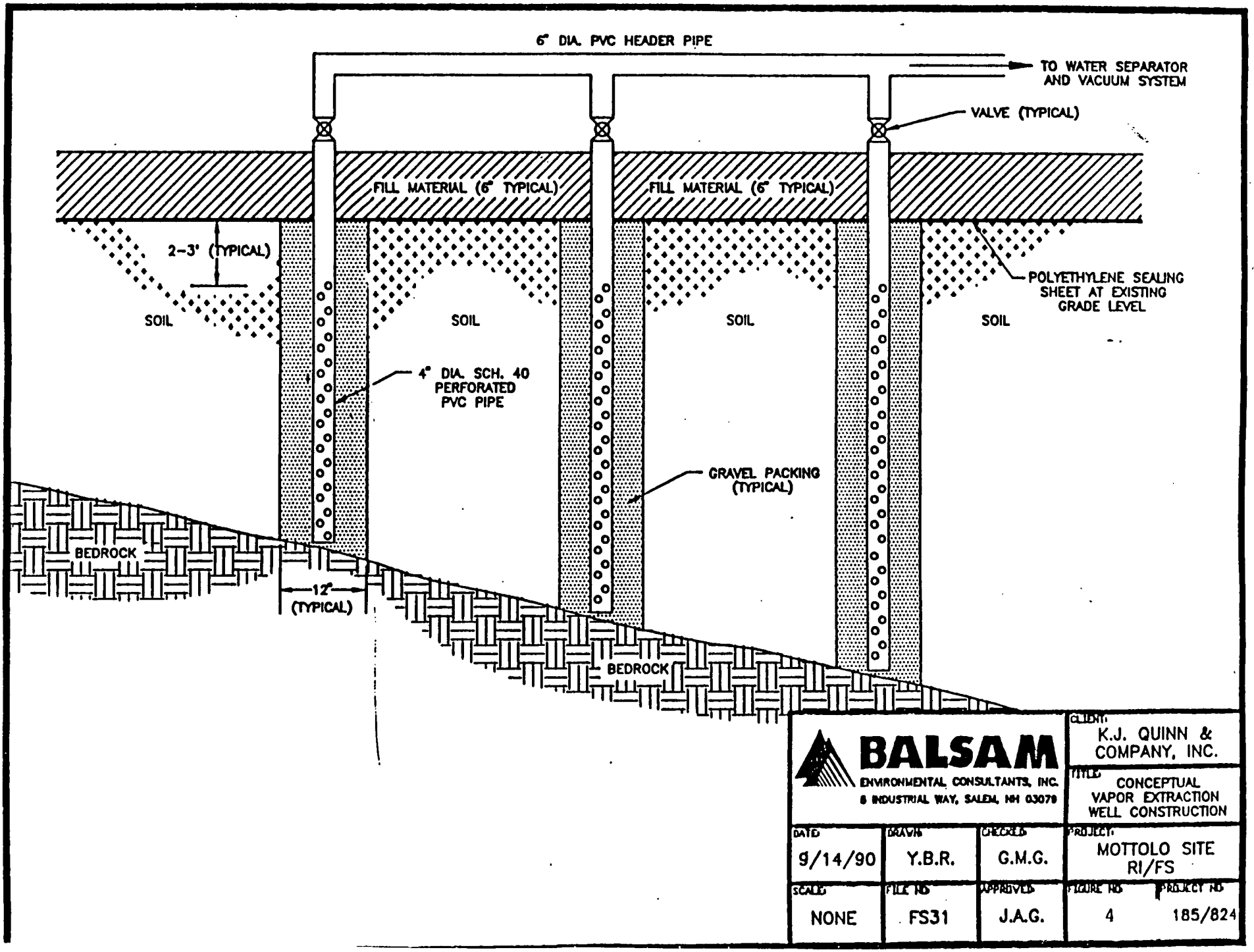
SINGLE 5' GATE
SINGLE 5' GATE
DRAINAGE SWALE
6" HEADER
6" HEADER
VES SKID
MW-21S
MW-21D
PROPERTY LINE
BROOK A
MO-5S
MO-5DR
MO-2DR
MO-2S
OW-2DR
OW-2SR
S-5
S-1
N
240
230
220
210
200
190
180
LEGEND:
= BEDROCK WELL
= OVERBURDEN WELL
= APPROXIMATE BOUNDARIES OF SOURCE AREA SOILS
= APPROXIMATE BOUNDARIES OF SOURCE AREA SOILS
= GROUND SURFACE ELEVATION IN FEET ABOVE MEAN SEA LEVEL
= CONCRETE PAD
= INTERMITTENT STREAM
= PERENNIAL STREAM
= MANHOLE
= APPROXIMATE LOCATION OF INTERCEPTOR TRENCH
= WELL POINT ALONG HEADER PIPE
= SUBSURFACE RECHARGE LATERAL (OPTIONAL)
= PIPE
= FENCE
0 60 120 180
SCALE (FEET)
BASE MAP SOURCE:
EASTERN TOPOGRAPHICS, INC.
OSSIPEE, N.H.
AERIAL PHOTOGRAPHY
3/30/88
BALSAM
ENVIRONMENTAL CONSULTANTS, INC.
8 INDUSTRIAL WAY, SALEM, NH 03079
K.J. QUINN & COMPANY, INC.
SITE-WIDE ALTERNATIVE 3 SITE LAYOUT
9/24/90
Y.B.R.
G.M.C.
MOTTOLO SITE RI/FS
1"=60'
FS32
J.A.G.
3
6185/824


6" DIA. PVC HEADER PIPE
TO WATER SEPARATOR AND VACUUM SYSTEM
VALVE (TYPICAL)
FILL MATERIAL (6" TYPICAL)
FILL MATERIAL (6" TYPICAL)
2-3' (TYPICAL)
SOIL
SOIL
SOIL
SOIL
POLYETHYLENE SEALING SHEET AT EXISTING GRADE LEVEL
4" DIA. SCH. 40 PERFORATED PVC PIPE
GRAVEL PACKING (TYPICAL)
BEDROCK
12" (TYPICAL)
BEDROCK
BALSAM
ENVIRONMENTAL CONSULTANTS, INC.
8 INDUSTRIAL WAY, SALEM, NH 03079
CLIENT: K.J. QUINN & COMPANY, INC.
TITLE: CONCEPTUAL VAPOR EXTRACTION WELL CONSTRUCTION
DATE: 9/14/90
DRAWN: Y.B.R.
CHECKED: G.M.G.
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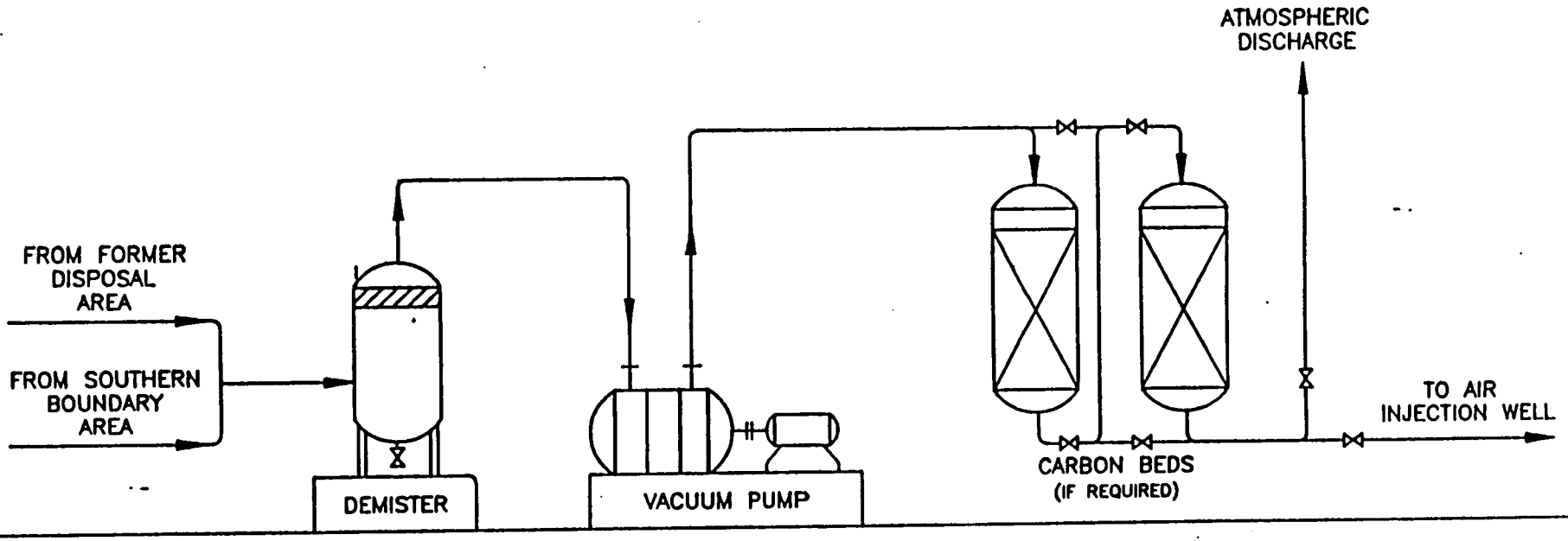
APPROVED: J.A.G.
FIGURE NO: 4
PROJECT NO: 185/824



BALSAM
ENVIRONMENTAL CONSULTANTS, INC.
8 INDUSTRIAL WAY, SALEM, NH 03079

CLIENT: K.J. QUINN & COMPANY, INC.			
TITLE: VES PROCESS SCHEMATIC DIAGRAM			
DATE: 9/24/90	DRAWN BY: Y.B.R.	CHECKED: G.M.G.	PROJECT: MOTTOLO SITE RI/FS
SCALE: N.T.S.	FILE NO.: FS25	APPROVED: JAG	FIGURE NO.: 5 / PROJECT NO.: 6185/824

APPENDIX B

Tables

CURRENT RISK **TABLE 1**

DERMAL CONTACT AND INCIDENTAL INGESTION

SITE SOIL

Nonarcinogenic Risk:

Noncarcinogenic Indicator Compounds	Endpoint of Concern	Oral Ref. Dose (mg/kg/day)	CONCENTRATIONS Average (mg/kg)	CONCENTRATIONS Max. (mg/kg)	HAZARD INDEX Average	HAZARD INDEX Maximum
Ethylbenzene	Liver	1.0×10^{-1}	9.2	140	1.4×10^{-5}	4.5×10^{-4}
Toluene	nerv. sys.	3.0×10^{-1}	4.1	47	* 2.2×10^{-6}	* 5.0×10^{-5}
Total Xylenes	nerv. sys.	2.0	22	270	* 1.8×10^{-6}	* 4.3×10^{-5}
					* SUM 4.0×10^{-6}	9.3×10^{-5}

****

SEDIMENT

Lifetime Cancer Risk:

Potentially Carcinogenic Indicator Compounds	Weight of Evidence	Oral Cancer Potency Fact. (mg/kg/day)-1	CONCENTRATIONS Average (mg/kg)	CONCENTRATIONS Max. (mg/kg)	LIFETIME CANCER RISK Average	LIFETIME CANCER RISK Maximum
1,1-Dichloroethane	C	9.1×10^{-2}	0.068	0.36	2.8×10^{-10}	1.4×10^{-9}

Noncarcinogenic Risk:

Noncarcinogenic Indicator Compounds	Endpoint of Concern	Oral Ref. Dose (mg/kg/day)	CONCENTRATIONS Average (mg/kg)	CONCENTRATIONS Max. (mg/kg)	HAZARD INDEX Average	HAZARD INDEX Maximum
1,1,1-Trichloroethane	Liver	9.0×10^{-2}	0.019	0.064	6.7×10^{-8}	5.7×10^{-7}

****

SURFACE WATER

Lifetime Cancer Risk:

Potentially Carcinogenic Indicator Compounds	Weight of Evidence	Oral Cancer Potency Fact. (mg/kg/day)-1	CONCENTRATIONS Average (mg/l)	CONCENTRATIONS Max. (mg/l)	LIFETIME CANCER RISK Average	LIFETIME CANCER RISK Maximum
1,1-Dichloroethane	C	9.1×10^{-2}	0.007	0.041	1.7×10^{-8}	2.4×10^{-7}

Noncarcinogenic Risk:

Noncarcinogenic Indicator Compounds	Endpoint of Concern	Oral Ref. Dose (mg/kg/day)	CONCENTRATIONS Average (mg/l)	CONCENTRATIONS Max. (mg/l)	HAZARD INDEX Average	HAZARD INDEX Maximum
1,2-Dichloroethene (total)	Serum Enzymes	2.0×10^{-2}	0.003	0.009	2.7×10^{-5}	2.1×10^{-4}

FUTURE RISK TABLE 2A

DERMAL CONTACT AND INCIDENTAL INGESTION

SITE SOIL

Nonarcinogenic Risk:

Noncarcinogenic Indicator Compounds	Endpoint of Concern	Oral Ref. Dose (mg/kg/day)	CONCENTRATIONS Average (mg/kg)	CONCENTRATIONS Max. (mg/kg)	HAZARD INDEX Average	HAZARD INDEX Maximum
Ethylbenzene	Liver	1.0×10^{-1}	9.2	140	1.1×10^{-4}	3.5×10^{-3}
Toluene	Nerv. Sys.	3.0×10^{-1}	4.1	47	* 1.6×10^{-5}	* 4.0×10^{-4}
Total Xylenes	Nerv. Sys.	2.0	22	270	* 1.3×10^{-5}	* 3.4×10^{-4}
					*SUM 2.9×10^{-5}	7.4×10^{-4}

****

SEDIMENT

Lifetime Cancer Risk:

Potentially Carcinogenic Indicator Compounds	Weight of Evidence	Oral Cancer Potency Fact. (mg/kg/day)-1	CONCENTRATIONS Average (mg/kg)	CONCENTRATIONS Max. (mg/kg)	LIFETIME CANCER RISK Average	LIFETIME CANCER RISK Maximum
1,1-Dichloroethane	C	9.0×10^{-2}	0.068	0.36	1.3×10^{-9}	1.7×10^{-8}

Noncarcinogenic Risk:

Noncarcinogenic Indicator Compounds	Endpoint of Concern	Oral Ref. Dose (mg/kg/day)	CONCENTRATIONS Average (mg/kg)	CONCENTRATIONS Max. (mg/kg)	HAZARD INDEX Average	HAZARD INDEX Maximum
1,1,1-Trichloroethane	Liver	9.0×10^{-2}	0.019	0.064	2.0×10^{-7}	1.7×10^{-6}

****

SURFACE WATER

Lifetime Cancer Risk:

Potentially Carcinogenic Indicator Compounds	Weight of Evidence	Oral Cancer Potency Fact. (mg/kg/day)-1	CONCENTRATIONS Average (mg/l)	CONCENTRATIONS Max. (mg/l)	LIFETIME CANCER RISK Average	LIFETIME CANCER RISK Maximum
1,1-Dichloroethane	C	9.1×10^{-2}	0.007	0.041	7.8×10^{-8}	1.1×10^{-6}

Noncarcinogenic Risk:

Noncarcinogenic Indicator Compounds	Endpoint of Concern	Oral Ref. Dose (mg/kg/day)	CONCENTRATIONS Average (mg/l)	CONCENTRATIONS Max. (mg/l)	HAZARD INDEX Average	HAZARD INDEX Maximum
1,2-Dich roethene tal)	Serum Enzymes	2.0×10^{-2}	0.003	0.009	8.5×10^{-5}	6.4×10^{-4}

FUTURE RISK FROM AREA 1 - BEDROCK AND OVERBURDEN — TABLE 2B

INGESTION AND DERMAL CONTACT OF GROUND WATER

BEDROCK

Lifetime Cancer Risk:

Potentially Carcinogenic Indicator Compounds	Weight of Evidence	Oral Cancer Potency Fact. (mg/kg/day)-1	CONCENTRATIONS Average (mg/l)	CONCENTRATIONS Max. (mg/l)	LIFETIME CANCER RISK Average	LIFETIME CANCER RISK Maximum
Arsenic	A	1.8	0.028	0.14	1.4×10^{-3}	7.2×10^{-3}
1,1-Dichloroethane	C	9.1×10^{-2}	0.032	0.22	8.3×10^{-5}	5.7×10^{-4}
Trichloroethene	B2	1.1×10^{-2}	0.032	0.19	1.0×10^{-5}	6.0×10^{-5}
Vinyl Chloride	A	2.3	0.029	0.33	1.9×10^{-3}	2.2×10^{-2}
				SUM:	3.0×10^{-3}	3.0×10^{-2}

Noncarcinogenic Risk:

Noncarcinogenic Indicator Compounds	Endpoint of Concern	Oral Ref. Dose (mg/kg/day)	CONCENTRATIONS Average (mg/l)	CONCENTRATIONS Max. (mg/l)	HAZARD INDEX Average	HAZARD INDEX Maximum
1,2-Dichloroethene (tot.)	Serum Enzymes	2.0×10^{-2}	0.19	1.9	2.7×10^{-1}	2.7
Ethylbenzene	Liver *	1.0×10^{-1}	0.016	0.052	* 4.6×10^{-3}	*1.5×10^{-2}
Tetrahydrofuran	Liver *	2.0×10^{-3}	0.2	1.6	* 2.9	*2.3x10
Toluene	Nerv. Sys.	3.0×10^{-1}	0.033	0.44	3.1×10^{-3}	4.2×10^{-2}
1,1,1-Trichloroethane	Liver *	9.0×10^{-2}	0.003	0.003	* 9.5×10^{-4}	*9.5×10^{-4}
				*SUM:	2.9	2.3x10

****

OVERBURDEN

Lifetime Cancer Risk:

Potentially Carcinogenic Indicator Compounds	Weight of Evidence	Oral Cancer Potency Fact. (mg/kg/day)-1	CONCENTRATIONS Average (mg/l)	CONCENTRATIONS Max. (mg/l)	LIFETIME CANCER RISK Average	LIFETIME CANCER RISK Maximum
Arsenic	A	1.8	0.19	0.57	9.8×10^{-3}	2.9×10^{-2}
1,1-Dichlorethane	C	9.1×10^{-2}	0.25	1.3	6.5×10^{-4}	3.4×10^{-3}
Trichloroethene	B2	1.1×10^{-2}	0.15	2.4	4.7×10^{-5}	7.5×10^{-4}
Vinyl Chloride	A	2.3	0.04	0.36	2.6×10^{-3}	2.4×10^{-2}
				SUM:	1×10^{-2}	6×10^{-2}

Noncarcinogenic Risk:

Noncarcinogenic Indicator Compounds	Endpoint of Concern	Oral Ref. Dose (mg/kg/day)	CONCENTRATIONS Average (mg/l)	CONCENTRATIONS Max. (mg/l)	HAZARD INDEX Average	HAZARD INDEX Maximum
1,2-Dichloroethene (tot.)	Serum Enzymes	2.0×10^{-2}	0.67	4.7	9.6×10^{-1}	6.7
Ethylbenzene	Liver *	1.0×10^{-1}	0.26	1.7	* 7.4×10^{-2}	* 4.9×10^{-1}
Tetrahydrofuran	Liver *	2.0×10^{-3}	0.043	0.22	* 6.2×10^{-1}	* 3.1
Toluene	Nerv. Sys.	3.0×10^{-1}	1.2	9.2	1.1×10^{-1}	8.8×10^{-1}
1,1,1-Trichloroethane	Liver *	9.0×10^{-2}	0.16	2.1	* 5.1×10^{-2}	* 6.7×10^{-1}
				*SUM:	7.4×10^{-1}	4.2

FUTURE RISK FROM AREA 2 - BEDROCK AND OVERBURDEN TABLE 2C
INGESTION AND DERMAL CONTACT OF GROUND WATER

BEDROCK

Lifetime Cancer Risk:

Potentially Carcinogenic Indicator Compounds	Weight of Evidence	Oral Cancer Potency Fact. (mg/kg/day)-1	CONCENTRATIONS Average (mg/l)	CONCENTRATIONS Max. (mg/l)	LIFETIME CANCER RISK Average	LIFETIME CANCER RISK Maximum
Trichloroethene	B2	1.1×10^{-2}	0.3	1.1	9.4×10^{-5}	3.5×10^{-4}

Noncarcinogenic Risk:

Noncarcinogenic Indicator Compounds	Endpoint of Concern	Oral Ref. Dose (mg/kg/day)	CONCENTRATIONS Average (mg/l)	CONCENTRATIONS Max. (mg/l)	HAZARD INDEX Average	HAZARD INDEX Maximum
1,2-Dichloroethene total)	Serum Enzymes	2.0×10^{-2}	0.029	0.11	4.1×10^{-2}	1.6×10^{-1}
Tetrahydrofuran	Liver	2.0×10^{-3}	0.076	0.23	1.1	3.3

OVERBURDEN

Lifetime Cancer Risk:

Potentially Carcinogenic Indicator Compounds	Weight of Evidence	Oral Cancer Potency Fact. (mg/kg/day)-1	CONCENTRATIONS Average (mg/l)	CONCENTRATIONS Max. (mg/l)	LIFETIME CANCER RISK Average	LIFETIME CANCER RISK Maximum
Trichloroethene	B2	1.1×10^{-2}	0.036	0.12	1.1×10^{-5}	3.8×10^{-5}

Noncarcinogenic Risk:

Noncarcinogenic Indicator Compounds	Endpoint of Concern	Oral Ref. Dose (mg/kg/day)	CONCENTRATIONS Average (mg/l)	CONCENTRATIONS Max. (mg/l)	HAZARD INDEX Average	HAZARD INDEX Maximum
1,2-Dichloroethene (total)	Serum Enzymes	2.0×10^{-2}	0.001	0.001	1.4×10^{-3}	1.4×10^{-3}
Tetrahydrofuran	Liver	2.0×10^{-3}	0.005	0.009	7.2×10^{-2}	1.3×10^{-1}

TABLE 3

COMPREHENSIVE ALTERNATIVES

Alternative 1: No Action

SC-1 and MOM-1

Alternative 2: Groundwater interceptor trench and capping with natural attenuation of groundwater contamination

SC-2 and MOM-2

Alternative 3: In-situ vapor extraction system (VES) with natural attenuation of contaminated groundwater

SC-3 and MOM-2

Alternative 4: Above ground vapor extraction system with natural attenuation of contaminated groundwater

SC-4 and MOM-2

Alternative 5: Chemical fixation with natural attenuation of contaminated groundwater

SC-5 and MOM-2

Alternative 6: On-Site Low Temperature Thermal Stripping (LTTS) with natural attenuation of contaminated groundwater

SC-6 and MOM-2

Alternative 7: Off-Site Incineration with natural attenuation of contaminated groundwater

SC-7 and MOM-2

Alternative 8: In-Situ Vapor Extraction System (VES) treatment of soils with collection and treatment of groundwater

SC-8 and MOM-3

SOURCE CONTROL ALTERNATIVE SCREENED OUT

SC-7 On-site thermal destruction

MANAGEMENT OF MIGRATION ALTERNATIVE SCREENED OUT

MOM-4 Collection and off-site treatment of groundwater

TABLE 4

MOTTOLO RECORD OF DECISION

SUMMARY OF ARARs ANALYSIS
MOTTOLO SUPERFUND SITE
RAYMOND, NEW HAMPSHIRE

ARAR	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
FEDERAL								
CHEMICAL-SPECIFIC:								
Trichloroethene	Federal MCL of 5 ppb will not be met in site ground water.	Federal MCL of 5 ppb should be met in ground water within 6 years.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	Federal MCL of 5 ppb should be met in ground water within approximately 3 years.
Vinyl Chloride	Federal MCL of 2 ppb will not be met in site ground water.	Federal MCL of 2 ppb should be met in ground water within 6 years.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	Federal MCL of 2 ppb should be met in ground water within approximately 3 years.
Arsenic	Federal MCL of 50 ppb will not be met in site ground water.	Federal MCL of 50 ppb should be met in ground water within 6 years.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	Federal MCL of 50 ppb should be met in ground water within approximately 3 years.
trans-1,2-Dichloroethene	Federal MCL of 100 ppb will not be met in site ground water.	Federal MCL of 100 ppb should be met in ground water within 6 years.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	Federal MCL of 100 ppb should be met in ground water within approximatel 3 years.
Ethylbenzene	Federal MCL of 700 ppb will not be met in site ground water.	Federal MCL of 700 ppb should be met in ground water within 6 years.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	Federal MCL of 700 ppb should be met in ground water within approximatel 3 years.
Toluene	Federal MCL of 2000 ppb will not be met in site ground water.	Federal MCL of 2000 ppb should be met in ground water within 6 years.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	Federal MCL of 2000 ppb should be met in ground water within approximately 3 years.
1,1,1-Trichloroethane	Federal MCL of 200 ppb will not be in site ground water.	Federal MCL of 200 ppb should be met in ground water within 6 years.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	Federal MCL of 200 ppb should be met in ground water within approximately 3 years.

TABLE 4

MOTTOLO RECORD OF DECISION

ARAR	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
LOCATION-SPECIFIC:								
Executive Order 11988 (Floodplain Management). Evaluate potential effects of action and limit or mitigate avoid adverse impacts.	Not applicable.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.
Executive Order 11990 (Wetland Protection). Evaluate potential impacts and mitigate.	Not applicable.	Minimal impacts to drainage swale wetland; waiver justified to remediate contamination.	Will meet.	See Alternative 2.	Impacts possible to drainage swale wetland; waiver justified to remediate contamination.	See Alternative 5.	See Alternative 5.	Impacts possible to drainage swale and Brook A wetlands; waiver required to implement.
RCRA TSD facility location in 100-year floodplain (40 CFR 264.18)	Not applicable.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.
Location Standards (10-P 1905.08 [d][4][g]).	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.
Residential and Agricultural Zone B (Town of Raymond Article 3, Section 3:2). Limits use of land in site area to these uses.	Will not meet because contaminated ground water will interfere with unrestricted use of site.	Will not meet; waiver justified to remediate site.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.
ACTION-SPECIFIC:								
RCRA TSD Facility Standards (40 CFR 264.14, 264.15, 264.16).* Facility security, inspection, personnel training requirements.	Not applicable.	Will substantively meet relevant and appropriate standards.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.
RCRA TSD Facility Preparedness and Prevention Requirements (40 CFR 264, Subpart C) * Establishes guidelines for safety equipment, spill	Not applicable.	Will substantively meet relevant and appropriate standards.	See Alternative 2.	See Alternative 2.	Not applicable.	Will substantively meet relevant and appropriate standards.	See Alternative 2.	See Alternative 2.

TABLE 4

MOTTOLO RECORD OF DECISION

ARAR	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
RCRA TSD Facility Contingency Plan and Emergency Procedures (40 CFR 264, Subpart D).* Planning requirements for response to fire, explosion, or release of hazardous wastes.	Not applicable.	Not applicable.	Will prepare emergency response plan.	See Alternative 3.	See Alternative 3.	See Alternative 3.	Not applicable.	See Alternative 3.
RCRA Manifest and Record Keeping (40 CFR 264.70 - 264.77).	Not applicable.	Not applicable.	Will meet requirements for off-site transfer of treatment residuals.	See Alternative 3.	Not applicable.	See Alternative 3.	Will meet.	See Alternative 3.
RCRA TSD Facility Clean Closure Requirements (40 CFR 264.111).*	Not applicable.	Will meet in southern boundary area.	Will meet by treatment to cleanup levels.	See Alternative 2.	See Alternative 2.	See Alternative 3.	See Alternative 3.	See Alternative 3.
RCRA TSD Facility Post-Closure Care Requirements (40 CFR 264.310).*	Will not meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.
RCRA Waste Pile Standards (40 CFR 264, Subpart L).*	Not applicable.	Not applicable.	Not applicable.	Will substantively meet relevant and appropriate design standards.	See Alternative 4.	See Alternative 4.	Not applicable.	Not applicable.
RCRA Landfill Standards (40 CFR 264, Subpart N).*	Not applicable.	Not applicable.	Not applicable.	Will substantively meet relevant and appropriate standards.	See Alternative 4.	See Alternative 4.	Not applicable.	Not applicable.
RCRA Standards for Tanks (40 CFR 264, Subpart J).	Not applicable.	Not applicable.	Not applicable.	Not applicable.	Not applicable.	Not applicable.	Not applicable.	Will substantively meet relevant and appropriate standards.
Clean Water Act National Pollutant Discharge Elimination System (NPDES) (40 CFR 122 - 125).	Not applicable.	Permit will be obtained for intercepted ground water flow discharge on site.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	Permit will be obtained for intercepted and treated ground water discharges on site.
OSHA Safety and Health Standards for Construction Sites (29 CFR 1926).	Not applicable.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.
OSHA - Record Keeping, Reporting and Related Regulations (29 CFR Part 1904).	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.
National Environmental Act (40 CFR Part	Will meet.	Will meet.	Will meet.	Will	Will meet.	Will meet.	Will meet.	Mr re waiver duc acts to Broo.. wetlands

TABLE 4

MOTTOLO RECORD OF DECISION

ARAR	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Clean Air Act - National Ambient Air Quality Standards for Total Suspended Particulates. (40 CFR 129.105, 760)	Not applicable.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.
Clean Air Act National Emissions Standards for Air Pollutants (40 CFR 61)	Not applicable.	Not applicable.	Will meet.	Will meet.	Not applicable.	Will meet.	Not applicable	Will meet.
Control of Air Emission from Superfund Air Strippers at Superfund Ground Water Sites (OSWER 9356.0-28)	Not applicable.	Not applicable.	Will meet.	Not applicable.	Not applicable.	Not applicable.	Not applicable.	Will meet.
D.O.T. Rules for the Transportation of Hazardous Materials (49 CFR Parts 107, 171.1 - 171.500).	Not applicable.	Not applicable.	Will meet requirements for transfer off-site of treatment residuals.	See Alternative 3.	Not applicable.	See Alternative 3.	Will meet.	See Alternative 3.
OSHA - General Industry Standards (29 CFR 1910).	Not applicable.	Not applicable.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.
STATE:								
CHEMICAL-SPECIFIC:								
1,1,-Dichloroethane	State TBC of 81 ppb will not be met in ground water.	State TBC of 81 ppb should be met in 6 years.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	State TBC of 81 ppb should be met within approximately 3 years.
Tetrahydrofuran	State TBC of 154 ppb will not be met in ground water, TCL set at 770 ppb will not be met.	TCL of 770 ppb should be met in 6 years.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	TCL of 770 ppb should be met within approximately 3 years.

TABLE 4

MOTTOLO RECORD OF DECISION

ARAR	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
LOCATION-SPECIFIC:								
New Hampshire Hazardous Waste Act (RSA Ch.147-A, NH Admin. Code He-P Ch.1905).	Not applicable.	Will meet relevant and appropriate standards.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.
General Environmental Standards (He-P 1905.08(d)(1)(c) and (d)). Requires compliance with OSHA and worker right to know rules.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.
Transfer of Facility (He-P 1905.08 (d)(6)). Requires that future owners be notified of site use restrictions.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.
Additional Technical Standards for Treatment (He-P 1905.08 (f)(2)(a)).	Not applicable.	Not applicable.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.
Manifesting Requirements (He-P 1905.04).	Not applicable.	Not applicable.	Will meet applicable requirements for transfer off-site of treatment residues.	See Alternative 3.	Not applicable.	See Alternative 3.	Will meet.	See Alternative 3.
Packaging and Labeling Requirements (He-P 1905.05, incorporating by reference N.H. Admin. Code Saf-C-600 and 49 CFR 172, 173, 178 and 179).	Not applicable.	Not applicable	Will meet applicable requirements for transfer off-site of treatment residues.	See Alternative 3.	Not applicable.	See Alternative 3.	Will meet.	See Alternative 3.

TABLE 4

MOTTOLO RECORD OF DECISION

ARAR	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Standards for Generators (He-P 1905.06).	Not applicable.	Not applicable.	Will meet applicable requirements for transfer off-site of treatment residues.	See Alternative 3.	Not applicable.	See Alternative 3.	Will meet.	See Alternative 3.
New Hampshire Solid Waste Facility Rules (He-P 1901.05).	Not applicable.	Not applicable.	Not applicable.	Will meet relevant and appropriate standards.	See Alternative 4.	See Alternative 4.	Not applicable.	See Alternative 3.
Dredging and Control of Run-off; RSA 149:8-a: Dredging Rules (We Ch. 400 Part 415).	Not applicable.	Will meet.	Not applicable.	Will meet.	Will meet.	Will meet.	Will meet.	Will not meet in Brook A wetland: waiver required.
Fill and Dredge in Wetlands, Criteria and Conditions (RSA 483-A, We Ch. 300, and Wt Chapters 100 through 700).	Not applicable.	Will meet in former disposal area.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	Will not meet in former disposal area but not in Brook A wetlands: waiver required.
Antidegradation Policy (We Ch. 400, Part 439).	Will not meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.
New Hampshire Ground Water Protection Regulations (We 410) Ground Water Quality Criteria	Will not meet.	Will meet within 6 years. Ground water discharge permit will be required.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.	See Alternative 2.
New Hampshire Air Regulations Toxic Air Pollutants (Chapter Env-A 1300).	Not Applicable.	Will meet.	Will meet. A permit may be required for air discharge from VES.	Will meet. A permit may be required for air discharge from VES.	Will meet.	Will meet. A permit may be required for air discharge from LTTS.	Will meet.	Will meet. A permit may be required for air discharge from VES and Air Stripper.
Fugitive Dust Emission Control (Env-A Part 1002).	Not applicable.	Will meet.	Not applicable.	Will meet.	Will meet.	Will meet.	Will meet.	Will meet.

TABLE 7
ACTION-SPECIFIC ARARs
MOTTOLO SUPERFUND SITE

REQUIREMENT		STATUS	SYNOPSIS	ACTION TO BE TAKEN TO COMPLY
FEDERAL:				
RCRA:	Miscellaneous Units 40 CFR 264, Subpart X	Relevant and Appropriate	This regulation sets forth design and operation standards for miscellaneous treatment units.	The treatment component of the VES will be designed, constructed, operated, maintained and closed in compliance with this regulation.
Clean Water Act (40 CFR Parts 122 and 125).		Applicable	Regulation 40 CFR Part 122 addresses permitting requirements for discharge into waters of the United States. According to Part 122, waters of the United States include wetlands, bogs, swamps and marshes. Regulation 40 CFR Part 125 establishes criteria and standards for the National Pollutant Discharge Elimination system and references the pretreatment standards established in 40 CFR Parts 401 through 464.	Management of diverted groundwater and construction runoff will comply with this regulation.
OSHA:	Hazardous Waste Operations and Emergency Response (29 CFR 1910.120)	Applicable	This regulation sets forth health and safety procedures for employees conducting hazardous substance response operations under CERCLA. More specifically, it addresses personal protective equipment, hazardous materials handling procedures, fire protection, and medical and first aid preparation procedures.	Personal protective equipment and measures will be employed as required to comply with applicable provisions of this regulation during construction and operation of the VES.
OSHA:	Safety and Health Standards for Construction Sites (29 CFR 1926.652)	Applicable	Specifies the safety precautions and equipment necessary to conduct excavation activities (Subparts C, D, P). Subpart E specifies general safety equipment which must be used by personnel working in dangerous areas or under dangerous conditions.	Appropriate safety equipment will be on site, and safety procedures will be observed. Health and Safety Plans will be developed in compliance with these regulations for design, construction and operation phases. Construction of the groundwater interceptor trench will be done in compliance with this regulation.
Rivers and Harbors Act (33 CFR 320 - 329)		Applicable	This regulation outlines requirements for discharging dredged or fill materials into waters of the United States. Furthermore, this regulation addresses dredge and fill	Activities in the drainage swale and Brook A valley wetland areas will included measures to mitigate potential impacts.

TABLE 7
ACTION-SPECIFIC ARARs
MOTTOLO SUPERFUND SITE

REQUIREMENT	STATUS	SYNOPSIS	ACTION TO BE TAKEN TO COMPLY
		operations with respect to protection of wetlands and floodplains.	
Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR 230)	Applicable	This regulation sets forth guidelines to restore and maintain the chemical and biological integrity of the waters of the United States through the control of discharges of dredged or fill materials.	Mitigative measures, such as erosion and siltation controls will be used during activities in wetland areas to comply with this regulation.
STATE:			
Hazardous Waste Facility Security Requirements Env-Wm 708.08(c) [40 CFR 264.14]	Relevant and Appropriate	This regulation sets forth the responsibilities of owners of hazardous waste facilities.	Access to remedial activities and facilities will be controlled in compliance with this regulation.
Ground Water Protection Env-Wm 708.02(j) [40 CFR 264, Subpart F]	Relevant and Appropriate	This regulation, which incorporates federal RCRA standards and supplements N.H. Admin. Code Ws Ch. 410, establishes additional standards for ground water monitoring and appropriate remediation at hazardous waste facilities. The provision prohibits the discharge of constituents into ground water above federal RCRA limits for such contaminants at the compliance point, which is defined as the boundary of each waste management unit under 40 CFR 264.95.	A ground water monitoring program consistent with the requirements of this regulation will be developed and implemented. The compliance boundary is everywhere under the site.
Closure and Post-closure Env-Wm 708.02(k) [40 CFR 264, Subpart G]	Relevant and Appropriate	This regulation sets forth the specific requirements for closure and post-closure of hazardous waste facilities. These requirements include but are not limited to: closure performance standards, a detailed closure plan, time allowed for closure, disposal or decontamination of equipment, structures and soils, certification of closure, survey plat, post-closure care and use of property, and post-closure notice.	Monitoring and maintenance programs will be implemented in compliance with this regulation. The VES will be decommissioned in compliance with this regulation.

TABLE 7
ACTION-SPECIFIC ARARs
MOTTOLO SUPERFUND SITE

REQUIREMENT	STATUS	SYNOPSIS	ACTION TO BE TAKEN TO COMPLY
Post-Closure Care Requirements Env-Wm 708.03(d)(6) [40 CFR 264, Subpart F - Landfills]	Relevant and Appropriate	This regulation sets forth the specific requirements for closure and post-closure of landfills. These requirements address control of erosion and leachate generation.	After remediation is complete, the former drum disposal area and the southern boundary area will be closed in compliance with this regulation.
Technical Standards for Tanks Env-Wm 708.03(d)(2) [40 CFR 264, Subpart J - Tanks]	Relevant and Appropriate	This regulation incorporates federal RCRA requirements for facilities using tanks to treat or store hazardous wastes.	Management of contaminated liquid in tanks from demister portion of VES will comply with this regulation.
New Hampshire Ground Water Protection Regulations (Ws 410) Ground Water Quality Criteria	Applicable	These regulations establish monitoring and intervention requirements and water quality standards for ground water discharges.	The discharge of water from the interceptor trench and the groundwater monitoring program will comply with this regulation.
New Hampshire Air Regulations Toxic Air Pollutants (Chapter Env-A 1300)	Applicable	These regulations establish ambient air limits for toxic pollutants from new sources.	Emissions from the carbon canisters will be monitored to ensure that limits on specific VOCs are met or additional controls are implemented in compliance with this regulation. (See chemical-specific ARARs for VOCs).
Fugitive Dust Emission Control (N.H. Admin. Code, Air, Part 1002).	Applicable	This regulation requires precautions to prevent, abate and control fugitive dust during construction and excavation activities.	Monitoring and, if warranted, control measures will be employed to ensure compliance with this regulation.

TABLE 8
LOCATION-SPECIFIC ARARs
MOTTOLO SUPERFUND SITE

REQUIREMENT	STATUS	SYNOPSIS	ACTION TO BE TAKEN TO COMPLY
FEDERAL:			
Protection of Wetlands Executive Order 11990	Applicable	Requires Federal Agencies to preserve and enhance natural and beneficial values of wetlands and to minimize the destruction and loss or degradation of wetlands.	The selected remedy avoids wetland impacts to the maximum extent practicable and will include mitigation measures to limit any minor, unavoidable impacts.
Statement of Procedures on Floodplain Management and Wetland Protection (40 CFR part 6, Appendix A)	To-Be-Considered	EPA policy for carrying out the provisions of EO 11990.	Selected remedy was chosen taking into account the provisions of this policy.
Clean Water Act, Section 404 (40 CFR Part 230; 33 CFR Parts 320-330)	Applicable	Prohibit the discharge of dredged or fill material into wetlands without a permit.	Work performed in wetland areas near the drainage swale will comply with this regulation.
State:			
Dredging and Control of Run-off; RSA 149:8-a: Dredging Rules (Ws Ch. 400 Part 415)	Applicable	RSA 149:8-a and Ws Ch. 400 Part 415 establish criteria for conducting any activity in or near state surface waters which significantly alters terrain or may otherwise adversely affect water quality, impede natural runoff or create unnatural runoff. Activities within the scope of these provisions include excavation, dredging, and grading of topsoil in or near wetland areas.	Work performed in wetland areas and in the vicinity of Brook A (discharge trench) will comply with these regulations.
Fill and Dredge in Wetlands, Criteria and Conditions (RSA 483-A, Ws Ch. 300, and Wt Chapters 100 through 700)	Applicable	These regulations govern filling and other activities in or adjacent to wetlands, and establish criteria for the protection of wetlands from adverse impacts on fish, wildlife, commerce and public recreation.	Activities in the drainage swale and near Brook A valley wetland areas will included measures to mitigate potential impacts and comply with applicable criteria.

TABLE 9
CHEMICAL-SPECIFIC ARARs
MOTTOLO SUPERFUND SITE

	REQUIREMENT	STATUS	SYNOPSIS	ACTION TO BE TAKEN TO COMPLY
FEDERAL:				
SDWA:	Maximum Contaminant Levels (MCLs) and Maximum contaminant Level Goals (MCLGs) (40 CFR 141.11-141.16 and 141.50-141.52)	Relevant and Appropriate	SDWA standards for public drinking water supplies.	Groundwater will attain MCLs for carcinogens and MCLGs for noncarcinogens.
SDWA:	Proposed Maximum Contaminant Level Goals (40 CFR 141.50-141.52)	To-Be-Considered	Proposed health goals for public water systems set at levels which would result in no known or anticipated adverse health effects with a margin of safety.	Proposed MCLG for 1,2-dichloroethene will be attained.
RCRA:	Maximum Concentration Limits (MCLs) (40 CFR 264.94)	Relevant and Appropriate	MCLs have been adopted for 14 compounds under RCRA as groundwater protection standards. These are equivalent to SDWA MCLs.	The only compound affected is arsenic whose MCL of 50 ug/l will be met.
CAA:	National Ambient Air Quality Standards (NAAQS) (40 CFR 50.1-50.12)	Applicable	NAAQS defines levels of six primary and secondary air contaminants.	Construction activities will be controlled to ensure that releases of particulates and carbon monoxide do not exceed standards.
STATE:				
Groundwater Protection Standards (ENV-Ws 410.05)		To-Be-Considered	Allowable limits are based upon New Hampshire Public Health Services drinking water consumption advisories and Federal MCLs, MCLGs, and other pertinent standards. Groundwater non-degradation requirements incorporate the surface water quality standards at ENV-Ws 432.	1,1-dichloroethane advisory will be met in groundwater at the Site.
Ambient Air Quality Standards (NH Administrative Code ENV-A:300)		Applicable	Establishes primary and secondary levels for eight air contaminants. All but one, hydrocarbons, are the same as NAAQS.	Construction and operation activities will be controlled to ensure that any hydrocarbon releases do not exceed standards.

TABLE 9
CHEMICAL-SPECIFIC ARARs
MOTTOLO SUPERFUND SITE

REQUIREMENT	STATUS	SYNOPSIS	ACTION TO BE TAKEN TO COMPLY
Toxic Air Pollutants (NH Administrative Code ENV-A 1300)	Applicable	Establishes ambient air limits for 74 compounds.	Air emissions from VES will be controlled to comply with these limits for the following compounds: 1,1,1-trichloroethane; vinyl chloride; trichloroethene; ehtylbenzene; toluene; xylene; and arsenic.

APPENDIX C

New Hampshire Letter of Concurrence

State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES
WASTE MANAGEMENT DIVISION
6 Hazen Drive, Concord, NH 03301-6509
603-271-2900
TTY/TDD 1-800-992-3312 or 225-4033

ROBERT W. VARNEY
COMMISSIONER

PHILIP J. O'BRIEN, Ph.D.
DIRECTOR

MICHAEL A. SILLS, Ph.D., P.E.
CHIEF ENGINEER

March 29, 1991

Mr. Merrill Hohman
Waste Management Division
USEPA, Region I
JFK Federal Bldg.
Boston, MA 02203

Re: RECORD OF DECISION
MOTTOLO SUPERFUND SITE
RAYMOND, NEW HAMPSHIRE

Dear Mr. Hohman:

This office has reviewed the above referenced Record of Decision (ROD) and concurs with the USEPA that the recommended remedy is consistent with the rules and regulations of applicable or relevant and appropriate state standards. Furthermore, if the project utilizes the trust fund, and if state funds are available, the state will provide matching funds and operational support for the project.

Sincerely,

Philip J. O'Brien, Ph.D
Director

Robert W. Varney,
Commissioner

MJR/PJO/RWV/jd/548
cc: Michael A. Sills, Ph.D, P.E., Chief Engineer, NHDES-WMD
Carl W. Baxter, P.E., Administrator, NHDES-WMEB
Anne E. Renner, Esq., NHAGO
Charles Holtman, Esq., NHAGO
Michael J. Robinette, P.G., NHDES-WMEB

APPENDIX D

Responsiveness Summary

United States
Environmental Protection Agency
Region I

SUPERFUND

Responsiveness Summary
Mottolo Site
Raymond, New Hampshire

March 1991

Table of Contents

Preface

The U.S. Environmental Protection Agency (EPA) held a 30-day comment period from February 14, 1991, to March 16, 1991, to provide an opportunity for interested parties to comment on the Feasibility Study (FS) and the Proposed Plan prepared for the Mottolo Superfund site in Raymond, New Hampshire. The FS examined and evaluated various options, called remedial alternatives, to address soil and groundwater contamination at the site. EPA identified its preferred alternative for addressing site contamination in the Proposed Plan dated January 1991.

The purpose of this Responsiveness Summary is to document EPA responses to the questions and comments raised during the public comment period on the FS and Proposed Plan. EPA considered all of these questions and comments before selecting the final remedial alternative to address the groundwater contamination at the Mottolo site.

This Responsiveness Summary is organized in the following sections:

I. ***Overview of Remedial Alternatives Considered in The Feasibility Study, Including the Preferred Alternative***— This section briefly outlines the remedial alternatives evaluated in the FS and the Proposed Plan, including EPA's preferred alternative.

II. ***Background on Community Involvement and Concerns*** — This section provides a brief history of community interests and concerns regarding the site.

III. ***Summary of Comments Received During the Public Comment Period and EPA Responses*** — This section summarizes and provides EPA responses to the oral and written comments received from the public during the public comment period. In Part I, the comments received from citizens are presented. Part II summarizes comments received from the PRPs.

IV. ***Remaining Concerns*** — This section describes issues that may continue to be of concern to the community during the design and implementation of EPA's selected remedy for the site. EPA will address these concerns during the Remedial Design/Remedial Action (RD/RA) phase of the cleanup process.

In addition, two attachments are included in this Responsiveness Summary. Attachment A provides a list of the community participation activities that EPA has conducted to date at the site. Attachment B contains a copy of the transcript from the informal public hearing held on March 6, 1991, in Raymond, N.H.

I. Overview of Remedial Alternatives Considered in the Feasibility Study, including the Preferred Alternative

The cleanup plan selected by EPA (Alternative 3 in the FS) will treat contaminated soil by use of an in-ground vapor extraction system (VES). A network of wells will be installed on the site to pump air from the soil, creating a vacuum and drawing contaminants from the soil. Because a VES is not efficient in wet soil, the ground will be dewatered by a groundwater interceptor trench and a temporary cap installed to prevent groundwater and rainfall from entering contaminated soil. Contaminants extracted by the VES will be captured using activated carbon filters. After the VES treatment is completed, an earthen cover will be constructed over the area of formerly contaminated soil to reduce the amount of water infiltrating the soil. EPA estimates that groundwater target cleanup levels will be met within six years or less after the soil is cleaned. Ground- and surface-water monitoring will be conducted for up to ten years following completion of the VES treatment. The estimated net present worth of the site cleanup is $690,000.

In the FS, EPA evaluated a total of eight potential cleanup alternatives for contamination at the Mottolo site. The seven other alternatives are described briefly below.

Alternative No. 1: No Action: This alternative was evaluated to serve as a baseline for other remedial alternatives under consideration. Under this alternative, no treatment of groundwater or soil contamination would occur. Ground- and surface-water monitoring would be conducted for 30 years, and site conditions would be reviewed every five years to determine if further actions would be needed.

Alternative No. 2: Groundwater Interceptor Trench and Capping: This alternative would use a groundwater interceptor trench to reduce the flow of groundwater into contaminated soils in the former drum disposal area. Contaminated soil from the southern boundary area would be excavated and placed in the former drum disposal area. A waterproof cap would then be placed over the area to reduce the infiltration of rain and snowmelt. Ground- and surface-water would be monitored for thirty years.

Alternative No. 4: Above-Ground Vapor Extraction System: This alternative would involve excavation of all contaminated soil and treatment using an above-ground VES that would be constructed at the site. Ground- and surface-water would be monitored following the cleanup.

Alternative No. 5: Chemical Fixation: This alternative would excavate all contaminated soil, chemically bind (fix) the contaminants to the soil, and replace the soil in a secure capped cell that would be constructed on the site. Ground- and surface-water would be monitored following the cleanup. Because contaminants would be left on-site, site conditions would be reviewed every five years.

Alternative No. 6: On-Site Low Temperature Thermal Stripping (LTTS): In this alternative, contaminated soil would be excavated and treated in a LTTS unit that removes contaminants by heating the soil and causing the contaminants to volatilize. Exhaust gases would be captured using various air pollution technologies. Ground- and surface-water would be monitored following the cleanup.

Alternative No. 7: Off-Site Incineration: This alternative would excavate all contaminated soil and transport it off-site for treatment in a licensed hazardous waste incinerator. Surface- and ground-water monitoring would be conducted for ten years to determine the effectiveness of the excavation in eliminating the source of the groundwater contamination.

Alternative No. 8: In-Ground Vapor Extraction Treatment of Soil with Collection and Treatment of Groundwater: This alternative would treat soil by vapor extraction, as in the preferred alternative, but would also include extraction and on-site treatment of contaminated groundwater. Groundwater would be collected using a system of trenches and wells, and a groundwater treatment plant would be constructed on-site. Surface- and ground-water monitoring would be conducted for ten years after completion of the soil treatment to confirm the effectiveness of the groundwater cleanup.

Additional information on each of the remedial alternatives can be found in the Record of Decision (ROD), copies of which are located in the Dudley-Tucker Library, 6 Epping Street, Raymond, New Hampshire, and the EPA Records Center at 90 Canal Street in Boston, Massachusetts.

II. Background on Community Involvement and Concerns

Site History

The Mottolo Superfund site is located in the southeastern portion of the town of Raymond, New Hampshire, east of Blueberry Hill Road. The site is wooded, except for a two-acre area cleared for a pig farm that operated there until the mid 1970s. The pig farm area includes a one-story wooden building located at the southern edge of the site that was used to house the pigs. To the east of the farm area is a small brook (termed "Brook A") which flows into the Exeter River. A residential neighborhood is located to the north of the Mottolo property, and new residential development is planned for the lands to the east and south.

In 1975, the owner of the property began disposing of chemical manufacturing wastes from K.J. Quinn & Company, Inc. (Quinn) and the Lewis Chemical Corporation in a quarter acre, shallow depression immediately north of the piggery building. In April 1979, a local police officer discovered the dump. State officials investigated the site and observed that some exposed drums were leaking, and that leachate from the dump was flowing down a drainage swale to the north of the dump and into Brook A. Groundwater samples taken from on-site monitoring wells installed by the State were contaminated with volatile organic compounds (VOCs). In the fall of 1979, the State sampled household wells in the vicinity of the site, but found no contamination.

In April 1980, EPA took groundwater and surface water samples and confirmed the VOC contamination. The State also began a more detailed investigation that verified that groundwater in both the bedrock and overburden was contaminated with VOCs, and that the contaminants were flowing with the groundwater toward Brook A.

In September 1980, EPA began an emergency action to remove approximately 1,600 55-gallon drums and 5-gallon pails buried at the site. From 1985 to 1986 the State conducted an investigation that concluded that the site posed a potential, but not immediate, risk to residential water supplies. In 1986 and 1987, very low levels of VOCs were found in samples from recently installed household wells. EPA placed the site on the National Priorities List (NPL) in August 1987, making it eligible for Federal cleanup funds.

In May 1988, EPA signed a legal agreement with Quinn, one of the five parties EPA had identified as potentially responsible for the contamination at the site. Quinn agreed to perform the RI and FS for the site under EPA supervision. Field work on the RI began in the Fall of 1988. In October 1990, the final RI report was completed. The final FS report was completed in February, 1991.

History of Community Activity at the Mottolo Site

Community interest and activity around the site has varied with the amount of activity occurring at the site. Community interest was especially focused from 1979, when a local policeman discovered the dump, through 1982, when the removal action was completed. Community interest increased again in 1987, when State testing of residential wells indicated the presence of contaminants in two wells. A Community Relations Plan prepared for the site in 1988, indicates that community concerns focused on:

- The nature and extent of groundwater contamination and the potential for further spread of contamination;
- Potential risks associated with groundwater contamination;
- The impact of the site on property values; and
- Safety issues surrounding future site cleanup activities.

Community interest in the site during the FS has been relatively low. Community concerns expressed at the October 1990 public meeting, prior to the release of the Proposed Plan, are listed below.

1. Remedial Action Options and Schedule. Residents were interested in how long the site cleanup could take and whether funding for the cleanup was available through EPA.

2. Off-Site Impacts. Concerns focused on potential sources of the trace levels of contamination detected in some nearby residential wells; possible limitations on development of properties near the site; and whether commercial blasting near the site could affect groundwater migration from the site.

3. Property Values. Residents questioned the continuing impact of the site on area residents' abilities to secure local bank financing.

Community interest in the site appears to have continued to decline following EPA's release of the site Remedial Investigation; only four residents attended the FS/Proposed Plan public meeting held by EPA on February 13, 1991. The principal community concerns expressed at that meeting are given below.

1. ***Operations of the Vacuum Extraction System.*** Residents were interested in whether VES has been used elsewhere in New Hampshire; how effective it would be at treating site contaminants; nuisance noises resulting from VES operations; and whether the VES equipment would be removed from the site after the cleanup is complete.

2. ***Funding of the Cleanup.*** Residents were interested in whether the PRPs would pay for the cleanup and what EPA would do if they would not.

III. Summary of Comments Received During the Public Comment Period and EPA Responses

This Responsiveness Summary addresses the comments received by EPA during the public comment period (February 14 to March 16, 1991) concerning the FS and EPA's Proposed Plan for cleanup at the Mottolo site. Three sets of written comments were received during the public comment period: one from a Raymond resident (dated 18 February 1991), one from K.J. Quinn & Company, a PRP (dated 15 March 1991), and one from Richard Mottolo, also a PRP (dated 15 March 1991). No oral comments were provided at the informal public hearing. A copy of the public hearing transcript is included as Attachment B.

Part I — Citizen Comments

Comment 1: A resident stated that EPA should ensure that noise control measures are included in the Remedial Design.

EPA Response: Noise control measures will be addressed during Remedial Design.

Comment 2: A resident stated that EPA should ensure that the carbon bed air pollution control system should include an auto-shutdown mechanism to prevent contaminant release in the event of a breakthrough.

EPA Response: Appropriate controls will be considered during Remedial Design.

Comment 3: A resident stated EPA should consider inclusion of a fire-control system to prevent fire in the carbon beds.

EPA Response: The vacuum extration system facility will be designed, constructed, operated and maintained to minimize the threat of fire or explosion.

Part II — Summary of Potentially Responsible Party Comments

Comments by both K.J. Quinn & Co. (K.J. Quinn) and Richard Mottolo
Comments provided by K.J. Quinn addressed only items presented in Comment 1. Additional PRP comments were provided by Mr. Mottolo and were not addressed by K.J. Quinn.

Comment 1: The PRPs contended that past disposal activities were limited to the area directly north of the piggery building. The PRPs further alleged that contamination in other areas of the site -- adjacent to the concrete pad west of the piggery building, and south of the shed and the piggery building -- was the result of drum handling activities undertaken by EPA and the State of New Hampshire during the removal action. K.J Quinn and Mr. Mottolo deny any liability for contamination found adjacent to the concrete pad west of the piggery building, and south of the shed and the piggery building. K.J. Quinn and Mr. Mottolo assign liability for remediation of that contamination to EPA and the State of New Hampshire.

EPA Response: The issue of liability is not addressed through the RI/FS process. The ROD specifies that additional source identification activities will be implemented prior to use of the VES to identify more conclusively a source of overburden contamination in the southern boundary area. Among the possible causes of this contamination that will be investigated is the possibility that under conditions of fluctuating water levels, a discrete contaminant plume migrated through a bedrock fracture from the former disposal area. RI water level data from this area is not extensive enough to either confirm or refute this possibility.

Comments by Richard Mottolo

Comment 2: Damage to the piggery building is "indicative of very sloppy workmanship" by EPA contractors who used the building for barrel storage.

EPA Response: EPA has no knowledge of damage to the piggery building. Further, EPA does not see damage to the piggery building, if any, as relevant to the remedy selection process.

Comment 3: A modified "no-action" remedial alternative is an appropriate response to site conditions. Preventing site access by fencing would restrict exposure to site contaminants, and allowing a "natural flushing" of groundwater contaminants would, in time, meet site cleanup levels.

EPA Response: Fencing alone will not effectively prevent human contact with contaminants found in groundwater. EPA believes that natural attenuation in the former drum disposal area soils and affected groundwater should result in attainment of groundwater cleanup levels (Safe Drinking Water Act Maximum Contaminant Levels [MCLs] and Maximum Contaminant Level Goals [MCLGs]). However, the length of time necessary to attain these MCLs is on the order of decades. This is not in compliance with EPA's mandate to meet applicable or relevant and appropriate regulations in drinking water aquifers as rapidly as practicable. The full rationale for EPA's choice of a remedial alternative is presented in the detailed evaluation of alternatives in the FS.

Comment 4: The residents of the neighborhood adjacent to the site are minimally concerned about the site, based on their understanding of site conditions.

EPA Response: EPA agrees that, while community concern at present is apparently low, community concerns are important to EPA and community acceptance of remedial alternatives is considered in developing a Record of Decision. In evaluating remedial alternatives, however, EPA must first seek to achieve compliance with ARARs and protection of public health and the environment.

Comment 5: The monies that would be required to implement Alternative 3 should be used instead at other sites where off-site migration of VOCs has occurred.

EPA Response: Alternative 3 is the least costly alternative that will achieve cleanup levels in groundwater both within and outside the site boundaries within a reasonable time. The Site was evaluated and placed on the NPL, thus, EPA must meet pertinent cleanup criteria.

Comment 6: Alternative 3 may require demolition of the piggery building to accommodate construction of VES. There should be compensation for the loss of the building.

EPA Response: The issue of compensation for the demolition of the piggery building is not addressed through the RI/FS process.

Comment 7: Deed restrictions should apply only to those areas that would be within the site fence.

EPA Response: Details concerning the implementation of deed restrictions will be addressed during the design phase of the project. Deed restrictions and/or other institutional controls will be used to prevent use of contaminated groundwater and to ensure that the remedy is not adversely affected by activities that could draw the contaminated groundwater to currently unaffected areas. Accordingly, the location of the fencing will have no bearing on the implementation of institutional controls.

Comment 8: Certain construction and institutional activities associated with implementation of Alternative 3, such as site access road improvements, are "outrageous," and add unnecessary costs to the alternative. These costs also serve to increase the 25% contingency costs included in the cost estimates. The inclusion of a 25% contingency fee on top of the capital costs "compounds the outrageousness" of the cost estimates.

EPA Response: The costs presented in the FS and the ROD have been developed within EPA regulatory guidelines which establish an acceptable range of "study estimate" costs of between +50% to -30%, i.e., the actual costs may be 50% higher or 30% lower. They are developed consistently among alternatives to ensure a balanced evaluation. Actual costs and the necessity for each facet of the cleanup will be carefully evaluated during the design phase.

Comment 9: "Even an unsophisticated aeration operation could effect a far less expensive dissipation of the volatile organic contaminants from contaminated soil." Aerated soils could be used as a site cap.

EPA Response: The evaluation of alternatives conducted in the FS allowed the Agency to select the most efficient, protective, and cost-effective response to site contamination. Many alternatives, including "unsophisticated" procedures, were evaluated and eliminated by the FS process because they would not meet EPA's goals for protection of public health and the environment.

Comment 10: Groundwater cleanup standards established for the site are "unfair." If no groundwater wells are dug within the fenced area, there is no need to make the groundwater safe for drinking.

EPA Response: EPA has determined that the Safe Drinking Water Act MCLs and MCLGs are relevant and appropriate as cleanup standards since the affected aquifer is considered a potential drinking water source. Attainment of these standards throughout the contaminated portions of the aquifer when "no wastes are left in place" is consistent with the National Contingency Plan.

Comment 11: Groundwater sampling costs and parameters are excessive.

EPA Response: The costs will be refined during design. Well locations and sampling parameters may be adjusted to reflect data generated during the monitoring program.

IV. Remaining Concerns

Issues raised during the public comment period that will continue to be of concern as the site moves into the RD/RA phase are listed below. EPA will continue to address these issues as more information becomes available during the RD/RA.

1. Residents would like actions taken to ensure that impacts on the surrounding neighborhood are minimized during construction and implementation of the site cleanup.

Attachment A

Formal Community Relations Activities Conducted To Date at the Mottolo Superfund Site

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14 June 1988:	EPA Press Release on the Consent Order.
August 1988:	EPA Fact Sheet on the commencement of the Remedial Investigation/Feasibility Study process published.
3 September 1988:	EPA Press Release announcing a public meeting on the Remedial Investigation/Feasibility Study process.
September 1988:	EPA released a Community Relations Plan for the site.
7 September 1988:	EPA Public Meeting on the commencement of the Remedial Investigation/Feasibility Study.
October 1990:	EPA Fact Sheet on the results of the Remedial Investigation published.
25 October 1990:	EPA Public Meeting on the Remedial Investigation.
2 February 1991:	EPA advertisement of the Proposed Plan and public comment period published.
1 February 1991:	EPA Proposed Plan published.
13 February 1991:	EPA Public Meeting on the Proposed Plan and Feasibility Study.
14 February 1991 - 16 March 1991:	EPA Public Comment Period.
6 March 1991:	EPA Informal Public Hearing on the Proposed Plan and Feasibility Study.
29 March 1991:	EPA Responsiveness Summary for Record of Decision on site cleanup.

UNITED STATES OF AMERICA

ENVIRONMENTAL PROTECTION AGENCY

BOSTON REGION

In the Matter of:

PUBLIC HEARING ON THE PROPOSED PLAN AND FEASABLITY STUDY FOR THE MOTTOLO SUPERFUND SITE CLEAN-UP

Wednesday
March 6, 1991

Raymond High School
Room 202
Raymond, New Hampshire

The above entitled matter came on for hearing, pursuant to Notice at 7:32 o'clock p.m.

BEFORE: ROGER DUWART
Remedial Project Manager
U.S. Environmental Protection Agency
Region One
JFK Federal Building
Boston, Massachusetts 02203

PROCEEDINGS

7:32 P.M.

MR. DUWART: Welcome. My name is Roger Duwart. I'm EPA's Remedial Project Manager for the Mottolo Superfund Site. And this evening I'll be serving as the Hearing Officer chairing the public hearing on the proposed plan and feasibility study for the Mottolo Superfund Site clean-up. I'm also responsible for the overall management of the project and I'm responsible for ensuring compliance with the federal laws and regulations.

Also with us this evening is Michael Robinette of the New Hampshire Department of Environmental Services.

What I'll do is give you a brief overview tonight of EPA's proposed plans after which I will accept any oral comments that you wish to make for the record. Those of you wishing to comment are asked to sign up on the way in; you can still make comments later, I'll give you another opportunity if you haven't signed up and you still wish to make a comment.

All comments received, both oral and written, will be transcribed and become part of the record. At the conclusion your comments -- of your comments I may ask you a clarifying question or two to make sure we understand your statement, and after all the comments have been heard I will close the hearing. I will, however, then make myself and

others here available to you for questions and on any other aspects of the feasibility study and proposed plan.

As you know, the public comment period is running. It began February 14th and it closes March 16th. If you do wish to make comments on the proposed plan and feasibility study for remedial investigation or risk assessment it must be postmarked by March 16th.

At the conclusion of the meeting please see me if you have any questions about making those written comments; my address is in the proposed plan which you all should have. If you don't have it I will give you my address at the end of the meeting.

All oral comments that are received tonight and with the comments received during the comment period will be responded to in response in the summary which will be included in EPA's record and decision for the clean-up of the site.

Does anybody have any comment about or questions about the way we've been running these?

(No response.)

MR. DUWART: On February 13th we gave a detailed presentation of the proposed plan and feasibility study. At that time EPA's preferred alternative proposed plan was presented. I'll give you just a really quick rundown on what it is. Basically, we will begin by constructing about a 1300

foot, ten foot high chain link fence around the site, primarily to protect the equipment that we'll be installing. We have two sources of contamination to the groundwater, here and here. What we propose to do is install a vacuum extracting system in each area in order to remove the contaminants from the soil. At this source area we will be installing a trench to dewater those soils for a couple of reasons and we'll get to that in a second.

Over here we do not need to put in any sort of a trench to dewater the soil because there is very little groundwater in this area. So we will be able to run the vacuum extraction system without dewatering that area.

This is the trench I had talked about before. What this will do will be lower this water table so that it will be below the contaminated soil. That will do two things for us. It will prevent contamination from continuing to get into the groundwater. It will also make these vacuum extraction wells effective by pulling clean air instead of moisture out of the soil. If there is any moisture pulled out of these areas it will be taken care of by a demister and any contaminants in that liquid train will be sent off-site for disposal if determined to be necessary at a RCRA facility; that's a hazardous waste treatment facility.

This vacuum extraction system will be in a small building on a concrete pad at a piggery building on the site

at its existing concrete pad. You will be receiving from these wells and the former Drum disposal area; also from the southern boundary area, the two areas on the site. The vacuum pump or blower will be pulling this through and putting the air through carbon filters which will essentially result in no discharge of contaminants to the atmosphere. The carbon, if necessary, will be generated probably off-site.

And that in a nutshell is the nuts and bolts of the plan. In addition to this we'll be monitoring the groundwater for upwards of ten years to insure that we are meeting our cleanup levels in the groundwater and to insure that we are meeting our cleanup levels in a timely fashion which is approximately six years after we've gotten the soils cleaned up in the former Drum disposal area. In the southern boundary area, because there's less contamination and overburden and the bedrock should clean itself up much quicker, we're expecting only two years worth of time to pass before we get to the clean up levels in that area.

One last aspect of the proposed plan would be to use institutional controls to make sure that nobody is getting to that groundwater until it is actually cleaned up and suitable for drinking. And those controls will be on site. They are on site now as it is so that no one can touch that groundwater and effect the cleanup.

That is EPA's preferred alternative and that is the subject of this evening's public hearing. Your comments on that alternative, any of the other alternatives that we've discussed and presented in the proposed plan and the feasibility study which is available at the Town Hall. If there is anybody, I know no one has put their name in to speak, but if there is anybody who'd like to make a statement speak now. If you would rather write down comments then you may write down comments and send them to me. If not -- if not we will close the formal portion of the public hearing. (No response.)

MR. DUWART: All right, the public hearing, then, is closed. Let me remind you you have a deadline of March 16th for your comments.

CERTIFICATE OF REPORTER AND TRANSCRIBER

This is to certify that the attached proceedings before: U.S. ENVIRONMENTAL PROTECTION AGENCY in the Matter of:

PUBLIC HEARING RE:
MOTTOLO SUPERFUND SITE

Place: Raymond, New Hampshire

Date: March 6, 1991

were held as herein appears, and that this is the true, accurate and complete transcript prepared from the notes and/or recordings taken of the above entitled proceeding.

Eric S. Pedersen Reporter	03/15/91 Date
Elaine Bartlett Transcriber	03/15/91 Date

APPENDIX E

Administrative Record Index

Mottolo Pig Farm

NPL Site Administrative Record

Index

Compiled: December 11, 1990
Updated: February 13, 1991
ROD Signed: March 29, 1991

Prepared for

Region I
Waste Management Division
U.S. Environmental Protection Agency

With Assistance from

AMERICAN MANAGEMENT SYSTEMS, INC.
One Kendall Square, Suite 2200 • Cambridge, Massachusetts 02139 • (617) 621-7090

Introduction

This document is the Index to the Administrative Record for the March 29, 1991 Record of Decision (ROD) for the Mottolo Pig Farm National Priorities List (NPL) site. Section I of the Index cites site-specific documents and Section II cites guidance documents used by EPA staff in selecting a response action at the site.

The Administrative Record is available for public review at EPA Region I's Office in Boston, Massachusetts and at the Dudley-Tucker Public Library, 6 Epping Street, Raymond, New Hampshire 03077. Supplemental/Addendum volumes may be added to this Administrative Record. Questions concerning the Administrative Record should be addressed to the EPA Region I site manager.

The Administrative Record is required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA).

Section I

Site-Specific Documents

ADMINISTRATIVE RECORD INDEX

for the

Mottolo Pig Farm NPL Site

1.0 Pre-Remedial

1.2 Preliminary Assessment

1. "Potential Hazardous Waste Site: Identification and Preliminary Assessment," EPA Region I and State of New Hampshire (February 13, 1980).
2. "Potential Hazardous Waste Site: Identification and Preliminary Assessment," EPA Region I (February 19, 1980).

1.3 Site Inspection

1. "Potential Hazardous Waste Site: Site Inspection Report," EPA Region I and State of New Hampshire (February 13, 1980).
2. "Potential Hazardous Waste Site: Site Inspection Report," EPA Region I (April 14, 1980).

2.0 Removal Response

2.3 Sampling and Analysis Data

The records cited in entry numbers 1 through 40 may be reviewed, by appointment only, at EPA Region I, in Boston, Massachusetts.

Environmental Protection Agency Region I

1. Water Sampling Sheets and Sampling Tags, EPA Region I (April 16, 1980) with attached pages from New England Regional Laboratory Gas Chromatograph/ Mass Spectrometer Logbook #14.
2. Memorandum from Richard Siscanaw, EPA Region I to Arthur E. Clark, EPA Region I (May 1, 1980). Concerning transmittal of attached volatile organic analysis.
3. Water Sampling Sheets, EPA Region I (May 18, 1980) with attached pages from New England Regional Laboratory Sample Logbook #16, Gas Chromatographic Screening Book #1, and Gas Chromatograph/Mass Spectrometer Log #28.
4. Memorandum from Richard Siscanaw and Arthur E. Clark, EPA Region I to Edward L. Taylor, EPA Region I (December 9, 1980). Concerning transmittal of attached purgeable organic analysis.
5. Memorandum from Arthur E. Clark, Elio Goffi, and Richard Siscanaw, EPA Region I to Edward L. Taylor, EPA Region I (December 30, 1980). Concerning transmittal of attached purgeable organic analysis.
6. Memorandum from Kathleen Polgar, EPA Region I to Edward L. Taylor, EPA Region I (June 9, 1981). Concerning transmittal of attached purgeable organic screening of drinking water.
7. Memorandum from Kathleen Polgar, Arthur E. Clark, and Richard Siscanaw, EPA Region I to Edward L. Taylor, EPA Region I (June 10, 1981). Concerning transmittal of attached purgeable organic analysis of ground water.

2.3 Sampling and Analysis Data (cont'd.)

Energy Resources Co. Inc.

8. "Volatiles Organics by Purge & Trap/GCMS," Energy Resources Co. Inc. for GHR Engineering Associates, Inc. (November 19, 1979).
9. Letter from Nancy Stewart, Energy Resources Co. Inc. for GHR Engineering Associates, Inc. to John J. Gushue, GHR Engineering Associates, Inc. (November 10, 1980). Concerning attached volatile organic analysis by purge-and-trap gas chromatograph/mass spectrometer.

GHR Engineering Associates, Inc.

10. Water Sampling Sheets, GHR Engineering Associates, Inc. (October 9, 1980) with attached pages from New England Regional Laboratory Sample Logbook #15, Sample Logbook #14, and Gas Chromatograph/Mass Spectrometer Log #19.

Goldberg Zoino Associates

11. Water Sampling Sheets, Goldberg Zoino Associates for GHR Engineering Associates, Inc. (December 11, 1980) with attached pages from New England Regional Laboratory Sample Logbook #15 and Gas Chromatograph/Mass Spectrometer Log #6.

Kent Laboratories Inc.

12. Letter Report from Rockwell Kent III, Kent Laboratories Inc. for Marlyn Engineering Company to Marlyn Engineering Company (January 2, 1981). Concerning attached sampling data.

Marlyn Engineering Company

The record cited as entry number 13 may be reviewed, by appointment only, at EPA Region I, Boston, Massachusetts.

13. Lab Data, Marlyn Engineering Company is Attachment ROR-037 to "On-Scene Coordinator Report," EPA Region I.

New Hampshire, State of

14. Laboratory Analysis, State of New Hampshire Water Supply and Pollution Control Commission (March 28, 1978).
15. Laboratory Analysis, State of New Hampshire Water Supply and Pollution Control Commission (April 18, 1978).
16. "Pesticides Laboratory Sampling Information," State of New Hampshire Water Supply and Pollution Control Commission (April 16, 1979).
17. "Pesticides Laboratory Sampling Information," State of New Hampshire Water Supply and Pollution Control Commission (May 2, 1979).
18. "Pesticides Laboratory Sampling Information," State of New Hampshire Water Supply and Pollution Control Commission (May 14, 1979).
19. "Pesticides Laboratory Sampling Information," State of New Hampshire Water Supply and Pollution Control Commission (May 21, 1979).
20. "Pesticides Laboratory Sampling Information," State of New Hampshire Water Supply and Pollution Control Commission (May 29, 1979).
21. Laboratory Analysis, State of New Hampshire Water Supply and Pollution Control Commission (May 29, 1979).

2.3 Sampling and Analysis Data (cont'd.)

22. "Pesticides Laboratory Sampling Information," State of New Hampshire Water Supply and Pollution Control Commission (June 6, 1979).
23. "Pesticides Laboratory Sampling Information," State of New Hampshire Water Supply and Pollution Control Commission (July 18, 1979).
24. Laboratory Analysis, State of New Hampshire Water Supply and Pollution Control Commission (July 18, 1979).
25. "Pesticides Laboratory Sampling Information," State of New Hampshire Water Supply and Pollution Control Commission (August 14, 1979).
26. "Pesticides Laboratory Sampling Information," State of New Hampshire Water Supply and Pollution Control Commission (October 2, 1979).
27. "Residential Well Organics Analyses," State of New Hampshire Water Supply and Pollution Control Commission (May 2, 1979 through October 18, 1979).
28. Well Water Sampling Analyses, State of New Hampshire Water Supply and Pollution Control Commission (May 2, 1979 through November 1, 1979).
29. Organics Analyses, State of New Hampshire Water Supply and Pollution Control Commission (January 16, 1980).
30. Organics Analyses, State of New Hampshire Water Supply and Pollution Control Commission (February 28, 1980).
31. Organics Analyses, State of New Hampshire Water Supply and Pollution Control Commission (July 22, 1980).
32. Memorandum from Steve Mangion, State of New Hampshire Bureau of Solid Waste Management to File (July 25, 1980) with attached location map. Concerning test pit operations.
33. Organics Analyses, State of New Hampshire Water Supply and Pollution Control Commission (October 9, 1980).
34. Letter from Paul J. Cavicci, State of New Hampshire Water Supply and Pollution Control Commission to John J. Gushue, GHR Engineering Associates, Inc. (November 7, 1980). Concerning attached analytical results obtained for round one sampling taken July 22, 1980.
35. Letter from Paul J. Cavicci, State of New Hampshire Water Supply and Pollution Control Commission to John J. Gushue, GHR Engineering Associates, Inc. (November 18, 1980). Concerning attached analytical results obtained for round two sampling taken October 8 to 10, 1980.
36. Organics Analyses, State of New Hampshire Water Supply and Pollution Control Commission (December 11, 1980).
37. "Pesticides Laboratory Sampling Information," State of New Hampshire Water Supply and Pollution Control Commission (February 16, 1982).

SCA Chemical Services

38. "Waste Material Profile Sheet," SCA Chemical Services.
39. Results of PCB Composites, SCA Chemical Services.
40. Laboratory Notebook, SCA Chemical Services.

3.0 Remedial Investigation (RI)

3.1 Correspondence

Well Water Sampling

1. Letter from Michael A. Sills, State of New Hampshire Water Supply and Pollution Control Commission to John Britt (October 16, 1985). Concerning well water sampling on September 6, 1985.

3.1 Correspondence (cont'd.)

2. Letter from Michael A. Sills, State of New Hampshire Water Supply and Pollution Control Commission to Bradley Ciechomsky (October 16, 1985). Concerning well water sampling on September 6, 1985.
3. Letter from Michael A. Sills, State of New Hampshire Water Supply and Pollution Control Commission to Al Jewett (October 16, 1985). Concerning well water sampling on September 6, 1985.
4. Letter from Michael A. Sills, State of New Hampshire Water Supply and Pollution Control Commission to William Robinson (October 16, 1985). Concerning well water sampling on September 6, 1985.
5. Letter from Michael A. Sills, State of New Hampshire Water Supply and Pollution Control Commission to John K. Sayers (October 16, 1985). Concerning well water sampling on September 6, 1985.
6. Letter from Michael A. Sills, State of New Hampshire Water Supply and Pollution Control Commission to Barry Sullivan (October 16, 1985). Concerning well water sampling on September 6, 1985.
7. Letter from Michael A. Sills, State of New Hampshire Water Supply and Pollution Control Commission to Scott Brimicombe (June 6, 1986). Concerning well water sampling on May 15, 1986.
8. Letter from Michael A. Sills, State of New Hampshire Water Supply and Pollution Control Commission to John Britt (June 6, 1986). Concerning well water sampling on May 15, 1986.
9. Letter from Michael A. Sills, State of New Hampshire Water Supply and Pollution Control Commission to James Cadoret (June 6, 1986). Concerning well water sampling on May 15, 1986.
10. Letter from Michael A. Sills, State of New Hampshire Water Supply and Pollution Control Commission to Robert Choumitsky (June 6, 1986). Concerning well water sampling on May 15, 1986.
11. Letter from Michael A. Sills, State of New Hampshire Water Supply and Pollution Control Commission to Susan Clauson (June 6, 1986). Concerning well water sampling on May 15, 1986.
12. Letter from Michael A. Sills, State of New Hampshire Water Supply and Pollution Control Commission to Peter Deflumeri (June 6, 1986). Concerning well water sampling on May 15, 1986.
13. Letter from Michael A. Sills, State of New Hampshire Water Supply and Pollution Control Commission to Ruth Graves (June 6, 1986). Concerning well water sampling on May 15, 1986.
14. Letter from Michael A. Sills, State of New Hampshire Water Supply and Pollution Control Commission to Robert Sensale (June 6, 1986). Concerning well water sampling on May 15, 1986.
15. Letter from Michael A. Sills, State of New Hampshire Water Supply and Pollution Control Commission to Melenda Varney (June 6, 1986). Concerning well water sampling on May 15, 1986.
16. Letter from Michael A. Sills, State of New Hampshire Water Supply and Pollution Control Commission to Leonard Carleton (August 25, 1986). Concerning well water sampling on August 8, 1986.
17. Letter from Michael A. Sills, State of New Hampshire Water Supply and Pollution Control Commission to Robert Castellucci (August 25, 1986). Concerning well water sampling on August 8, 1986.
18. Letter from Michael A. Sills, State of New Hampshire Water Supply and Pollution Control Commission to Robert Iovanni (August 25, 1986). Concerning well water sampling on August 8, 1986.

3.1 Correspondence (cont'd.)

19. Letter from Michael A. Sills, State of New Hampshire Water Supply and Pollution Control Commission to Charles Walsh (August 25, 1986). Concerning well water sampling on August 8, 1986.
20. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to John and Bonnie Britt (April 13, 1987). Concerning well water sampling on March 19, 1987.
21. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Joanne Cocchiaro (April 13, 1987). Concerning well water sampling on March 19, 1987.
22. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Timothy Stewart (April 13, 1987). Concerning well water sampling on March 19, 1987.
23. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Barry Sullivan (April 13, 1987). Concerning well water sampling on March 19, 1987.
24. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Melenda Varney (April 13, 1987). Concerning well water sampling on March 19, 1987.
25. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Dana Kingston, Town of Raymond (April 16, 1987). Concerning well water sampling on March 19, 1987.
26. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Peter Deflumeri (April 22, 1987). Concerning well water sampling on March 15, 1986 and April 26, 1985 with attached:
    A. Letter from Michael A. Sills, State of New Hampshire Water Supply and Pollution Control Commission to Peter Deflumeri (May 17, 1985). Concerning well water sampling on April 26, 1985.
    B. Letter from Michael A. Sills, State of New Hampshire Water Supply and Pollution Control Commission to Peter Deflumeri (June 6, 1986). Concerning well water sampling on May 15, 1986.
27. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Joel Cadoret (May 5, 1987). Concerning well water sampling on April 9, 1987.
28. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to John Cadoret (May 5, 1987). Concerning well water sampling on April 9, 1987.
29. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to James Cadoret (May 5, 1987). Concerning well water sampling on April 9, 1987.
30. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Robert Sensale (May 5, 1987). Concerning well water sampling on April 9, 1987.
31. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Lawrence Tremonti (May 5, 1987). Concerning well water sampling on April 9, 1987.
32. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Charles Walsh (May 5, 1987). Concerning well water sampling on April 9, 1987.
33. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Russell Berube (May 11, 1987). Concerning the results of well water sampling on April 29, 1987 and May 4, 1987.

3.1 Correspondence (cont'd.)

34. Letter from Amy Juchatz, State of New Hampshire Department of Health and Human Services to Russell Berube (May 19, 1987). Concerning the results of well water sampling on April 29, 1987 and May 4, 1987 and recommendations on water usage and future retesting.
35. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Donna Carroll (May 27, 1987). Concerning well water sampling on April 9, 1987 and April 29, 1987.
36. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Leonard and Karen Carleton (June 1, 1987). Concerning well water sampling on May 13, 1987.
37. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Ruth Graves (June 1, 1987). Concerning well water sampling on May 13, 1987.
38. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Stephen McLaughlin (June 1, 1987). Concerning well water sampling on May 13, 1987.
39. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Robert Castellucci (June 9, 1987). Concerning well water sampling on May 28, 1987.
40. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Susan Clauson (June 9, 1987). Concerning well water sampling on May 28, 1987.
41. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Peter Deflumeri (June 9, 1987). Concerning well water sampling on May 28, 1987.
42. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Virginia Fernald (June 9, 1987). Concerning well water sampling on May 28, 1987.
43. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Dana Iverson (June 9, 1987). Concerning well water sampling on May 28, 1987.
44. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Mark Panageotes (June 9, 1987). Concerning well water sampling on May 28, 1987.
45. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Kent Wilkinson (June 9, 1987). Concerning well water sampling on May 28, 1987.
46. Letter from Amy Juchatz, State of New Hampshire Department of Health and Human Services to Cindy Sayers (June 17, 1987). Concerning the results of well water sampling on June 5, 1987 and recommendations on water usage and future retesting.
47. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Scott and Joanne Brimicombe (July 27, 1987). Concerning well water sampling on July 14, 1987.
48. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to James Campbell (July 27, 1987). Concerning well water sampling on July 14, 1987.
49. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Lewis Chesno (July 27, 1987). Concerning well water sampling on July 14, 1987.
50. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to William Warren (July 27, 1987). Concerning well water sampling on July 14, 1987.

3.1 Correspondence (cont'd.)

51. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Kent Wilkinson (July 27, 1987). Concerning well water sampling on July 14, 1987.
52. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Albert Alix (August 11, 1987). Concerning well water sampling on July 10, 1987.
53. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Mr. Cross (August 11, 1987). Concerning well water sampling on July 10, 1987.
54. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Louis Diamtopolos (August 11, 1987). Concerning well water sampling on July 10, 1987.
55. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Stephen Doherty (August 11, 1987). Concerning well water sampling on July 10, 1987.
56. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Mr. Donovan (August 11, 1987). Concerning well water sampling on July 10, 1987.
57. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Kathleen Flibotte (August 11, 1987). Concerning well water sampling on July 10, 1987.
58. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Mr. Robertie (August 11, 1987). Concerning well water sampling on July 10, 1987.
59. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Margaret Santoro (August 11, 1987). Concerning well water sampling on July 10, 1987.
60. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Frederick Sommer (August 11, 1987). Concerning well water sampling on July 10, 1987.
61. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Stephen E. Toohey (August 11, 1987). Concerning well water sampling on July 10, 1987.
62. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Russell Berube (August 12, 1987). Concerning the results of well water sampling on July 23, 1987.
63. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Donna Carroll (August 12, 1987). Concerning well water sampling on July 23, 1987.
64. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to Joanne Cocchiaro (August 12, 1987). Concerning well water sampling on July 23, 1987.
65. Letter from Muriel S. Robinette, State of New Hampshire Department of Environmental Services to William Stine (August 12, 1987). Concerning well water sampling on July 23, 1987.
66. Letter from John M. Regan, State of New Hampshire Department of Environmental Services to Leonard Banagura, Town of Raymond Board of Selectmen (September 9, 1987). Concerning well water sampling on August 7, 1987.
67. Letter from John M. Regan, State of New Hampshire Department of Environmental Services to John Cadoret (September 9, 1987). Concerning well water sampling on August 7, 1987.

3.1 Correspondence (cont'd.)

68. Letter from John M. Regan, State of New Hampshire Department of Environmental Services to James Cadoret (September 9, 1987). Concerning well water sampling on August 7, 1987.
69. Letter from John M. Regan, State of New Hampshire Department of Environmental Services to Joel Cadoret (September 9, 1987). Concerning well water sampling on August 7, 1987.
70. Letter from John M. Regan, State of New Hampshire Department of Environmental Services to Leonard Carleton (September 9, 1987). Concerning well water sampling on August 7, 1987.
71. Letter from John M. Regan, State of New Hampshire Department of Environmental Services to Dana Iverson (September 9, 1987). Concerning well water sampling on August 7, 1987.
72. Letter from John M. Regan, State of New Hampshire Department of Environmental Services to Richard Mailhot, Town of Raymond (September 9, 1987). Concerning well water sampling on August 7, 1987.
73. Letter from John M. Regan, State of New Hampshire Department of Environmental Services to Keith Noyes, Exeter Department of Public Works (September 9, 1987). Concerning well water sampling on August 7, 1987.
74. Letter from John M. Regan, State of New Hampshire Department of Environmental Services to Andrew Perry (September 9, 1987). Concerning well water sampling on August 7, 1987.
75. Letter from Carl W. Baxter, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Steve Cashman (December 22, 1987). Concerning the results of well water sampling on October 1, 1987.
76. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Steve Cashman (December 28, 1987). Concerning the results of well water sampling on November 12, 1987.
77. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Kees Oudekerk (December 28, 1987). Concerning the results of well water sampling on November 16, 1987.
78. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to William Robinson (December 28, 1987). Concerning the results of well water sampling on November 16, 1987.
79. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Leonard and Karen Carleton (January 13, 1988). Concerning well water sampling on December 16, 1987.
80. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Robin Castellucci (January 13, 1988). Concerning well water sampling on December 16, 1987.
81. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Lewis Chesno (January 13, 1988). Concerning well water sampling on December 16, 1987.
82. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Paul Gleske (January 13, 1988). Concerning well water sampling on December 16, 1987.
83. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Ruth Graves (January 13, 1988). Concerning well water sampling on December 16, 1987.
84. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Mr. and Mrs. John Iber (January 13, 1988). Concerning well water sampling on December 16, 1987.

3.1 Correspondence (cont'd.)

85. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Michael Loos (January 13, 1988). Concerning well water sampling on December 16, 1987.
86. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Andrew Perry (January 13, 1988). Concerning well water sampling on December 16, 1987.
87. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Mrs. Stracke-Morrill (January 13, 1988). Concerning well water sampling on December 16, 1987.
88. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Deborah Wilkinson (January 13, 1988). Concerning well water sampling on December 16, 1987.
89. Letter from Amy Juchatz, State of New Hampshire Department of Health and Human Services to Steve Cashman (January 19, 1988). Concerning the results of well water sampling on November 12, 1987.
90. Letter from Amy Juchatz, State of New Hampshire Department of Health and Human Services to Kees Oudekerk (January 19, 1988). Concerning the results of well water sampling on November 16, 1987.
91. Letter from Amy Juchatz, State of New Hampshire Department of Health and Human Services to William Robinson (January 19, 1988). Concerning the results of well water sampling on November 16, 1987.
92. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to John Britt (March 7, 1988). Concerning well water sampling on November 12, 1987.
93. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to James Cadoret (March 7, 1988). Concerning well water sampling on December 3, 1987.
94. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Robert Casoni (March 7, 1988). Concerning well water sampling on November 16, 1987.
95. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Susan Clauson (March 7, 1988). Concerning well water sampling on November 16, 1987.
96. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Peter Deflumeri (March 7, 1988). Concerning well water sampling on December 3, 1987.
97. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to George Demerrit, Len-Kay Campground (March 7, 1988). Concerning well water sampling on October 1, 1987.
98. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Patrice Fredette (March 7, 1988). Concerning well water sampling on November 16, 1987.
99. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to E. Fongeallaz (March 7, 1988). Concerning well water sampling on November 16, 1987.
100. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Dana Iverson (March 7, 1988). Concerning well water sampling on December 3, 1987.
101. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Al Jewett (March 7, 1988). Concerning well water sampling on December 3, 1987.

3.1 Correspondence (cont'd.)

102. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Richard Mailhot, Town of Raymond (March 7, 1988). Concerning well water sampling on November 12, 1987.
103. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Mark Panageotes (March 7, 1988). Concerning well water sampling on December 3, 1987.
104. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Olive Peabody (March 7, 1988). Concerning well water sampling on October 1, 1987.
105. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Robert Sensale (March 7, 1988). Concerning well water sampling on November 16, 1987.
106. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Barry Sullivan (March 7, 1988). Concerning well water sampling on November 16, 1987.
107. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Melenda Varney (March 7, 1988). Concerning well water sampling on November 16, 1987.
108. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to William Warren (March 7, 1988). Concerning well water sampling on December 3, 1987.
109. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Robert Iovanni (March 8, 1988). Concerning well water sampling on December 3, 1987.
110. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Annis (May 9, 1988). Concerning well water sampling on April 14, 1988.
111. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Banarer/Flick (May 9, 1988). Concerning well water sampling on April 20, 1988.
112. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Russell Berube (May 9, 1988). Concerning well water sampling on April 20, 1988.
113. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Blake (May 9, 1988). Concerning well water sampling on April 20, 1988.
114. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Mr. and Mrs. James Campbell (May 9, 1988). Concerning well water sampling on April 20, 1988.
115. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Steve Cashman (May 9, 1988). Concerning well water sampling on April 20, 1988.
116. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Fernald (May 9, 1988). Concerning well water sampling on April 14, 1988.
117. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Mr. and Mrs. James McDermott (May 9, 1988). Concerning well water sampling on April 14, 1988.
118. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Papamichael (May 9, 1988). Concerning well water sampling on April 14, 1988.

3.1 Correspondence (cont'd.)

119. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Robinson (May 9, 1988). Concerning well water sampling on April 20, 1988.
120. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Mr. and Mrs. William Stine (May 9, 1988). Concerning well water sampling on April 20, 1988.
121. Letter from Boyd P. Smith, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Sid Vallet (May 9, 1988). Concerning well water sampling on April 14, 1988.
122. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Robert Banara (October 11, 1988). Concerning well water sampling on September 15, 1988.
123. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Russell Berube (October 11, 1988). Concerning well water sampling on September 14, 1988.
124. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Mr. and Mrs. James Cadoret (October 11, 1988). Concerning well water sampling on September 14, 1988.
125. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Michael Campbell (October 11, 1988). Concerning well water sampling on September 14, 1988.
126. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Donna Carroll (October 11, 1988). Concerning well water sampling on September 14, 1988.
127. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Leonard and Karen Carleton (October 11, 1988). Concerning well water sampling on September 15, 1988.
128. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Cashman (October 11, 1988). Concerning well water sampling on September 15, 1988.
129. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Robert and Robin Castellucci (October 11, 1988). Concerning well water sampling on September 15, 1988.
130. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Ciechomski (October 11, 1988). Concerning of well water sampling on September 15, 1988.
131. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Susan Clauson (October 11, 1988). Concerning well water sampling on September 22, 1988.
132. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Cocchiaro (October 11, 1988). Concerning well water sampling on September 14, 1988.
133. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Linda Dawson (October 11, 1988). Concerning the results of well water sampling on September 14, 1988.
134. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Peter Deflumeri (October 11, 1988). Concerning well water sampling on September 22, 1988.
135. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Virginia Fernald (October 11, 1988). Concerning well water sampling on September 22, 1988.

3.1 Correspondence (cont'd.)

136. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Mr. and Mrs. John Fredette (October 11, 1988). Concerning well water sampling on September 22, 1988.
137. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Ruth Graves (October 11, 1988). Concerning well water sampling on September 22, 1988.
138. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Robert Iovanni (October 11, 1988). Concerning well water sampling on September 14, 1988.
139. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Mr. and Mrs. James McDermott (October 11, 1988). Concerning the results of well water sampling on September 14, 1988.
140. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Kees Oudekerk (October 11, 1988). Concerning the results of well water sampling on September 14, 1988.
141. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Mark Panageotes (October 11, 1988). Concerning well water sampling on September 22, 1988.
142. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Papamichael (October 11, 1988). Concerning well water sampling on September 14, 1988.
143. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Mr. and Mrs. William Robinson (October 11, 1988). Concerning well water sampling on September 14, 1988.
144. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Robert Sensale (October 11, 1988). Concerning well water sampling on September 22, 1988.
145. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Michael Stiling (October 11, 1988). Concerning well water sampling on September 22, 1988.
146. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to William Stine (October 11, 1988). Concerning well water sampling on September 15, 1988.
147. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Charles Stracke (October 11, 1988). Concerning well water sampling on September 22, 1988.
148. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Barry Sullivan (October 11, 1988). Concerning well water sampling on September 22, 1988.
149. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Mr. and Mrs. William Warren (October 11, 1988). Concerning well water sampling on September 14, 1988.
150. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Sag Harbor Builders (October 17, 1988). Concerning well water sampling on September 15, 1988.
151. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Zins (October 17, 1988). Concerning well water sampling on September 15, 1988.
152. Letter from Amy Juchatz, State of New Hampshire Department of Health and Human Services to Linda Dawson (November 4, 1988). Concerning the results of well water sampling on September 14, 1988 and recommendations on water usage and future retesting.

3.1 Correspondence (cont'd.)

153. Letter from Amy Juchatz, State of New Hampshire Department of Health and Human Services to Mr. and Mrs. James McDermott (November 4, 1988). Concerning the results of well water sampling on September 14, 1988 and recommendations on water usage and future retesting.
154. Letter from Amy Juchatz, State of New Hampshire Department of Health and Human Services to Mr. and Mrs. Kees Oudekerk (November 4, 1988). Concerning the results of well water sampling on September 14, 1988 and recommendations on water usage and future retesting.
155. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Leonard and Karen Carleton (March 14, 1989). Concerning well water sampling on February 9, 1989.
156. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Cashman (March 14, 1989). Concerning well water sampling on February 9, 1989.
157. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Dawson (March 14, 1989). Concerning well water sampling on February 9, 1989.
158. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Mr. and Mrs. James McDermott (March 14, 1989). Concerning well water sampling on February 9, 1989.
159. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Kees Oudekerk (March 14, 1989). Concerning well water sampling on February 9, 1989.
160. Letter from Patricia Hannon, State of New Hampshire Department of Environmental Services to Mr. and Mrs. William Robinson (March 14, 1989). Concerning well water sampling on February 9, 1989.
161. Letter from Brook S. Dupee, State of New Hampshire Department of Health and Human Services to Mr. and Mrs. Kees Oudekerk (March 21, 1989). Concerning recommendations following well water sampling on February 9, 1989.
162. Letter from Brook S. Dupee, State of New Hampshire Department of Health and Human Services to Mr. and Mrs. Dawson (March 22, 1989). Concerning recommendations following well water sampling on February 9, 1989.
163. Letter from Brook S. Dupee, State of New Hampshire Department of Health and Human Services to Mr. and Mrs. James McDermott (March 22, 1989). Concerning recommendations following well water sampling on February 9, 1989.
164. Letter from Joseph N. Donovan, State of New Hampshire Department of Environmental Services to Russell Berube (May 25, 1989). Concerning well water sampling on April 20, 1989.
165. Letter from Joseph N. Donovan, State of New Hampshire Department of Environmental Services to James Cadoret (May 25, 1989). Concerning well water sampling on April 20, 1989.
166. Letter from Joseph N. Donovan, State of New Hampshire Department of Environmental Services to John Cadoret (May 25, 1989). Concerning well water sampling on April 20, 1989.
167. Letter from Joseph N. Donovan, State of New Hampshire Department of Environmental Services to Leonard Carleton (May 25, 1989). Concerning well water sampling on April 20, 1989.

3.1 Correspondence (cont'd.)

168. Letter from Joseph N. Donovan, State of New Hampshire Department of Environmental Services to Mr. Cashman (May 25, 1989). Concerning well water sampling on April 20, 1989.
169. Letter from Joseph N. Donovan, State of New Hampshire Department of Environmental Services to Mr. Dawson (May 25, 1989). Concerning well water sampling on April 20, 1989.
170. Letter from Joseph N. Donovan, State of New Hampshire Department of Environmental Services to Virginia Fernald (May 25, 1989). Concerning well water sampling on April 21, 1989.
171. Letter from Joseph N. Donovan, State of New Hampshire Department of Environmental Services to Emery Graves (May 25, 1989). Concerning well water sampling on April 20, 1989.
172. Letter from Joseph N. Donovan, State of New Hampshire Department of Environmental Services to Dana Iverson (May 25, 1989). Concerning well water sampling on April 21, 1989.
173. Letter from Joseph N. Donovan, State of New Hampshire Department of Environmental Services to James McDermott (May 25, 1989). Concerning well water sampling on April 21, 1989.
174. Letter from Joseph N. Donovan, State of New Hampshire Department of Environmental Services to Stephen McLaughlin (May 25, 1989). Concerning well water sampling on April 20, 1989.
175. Letter from Joseph N. Donovan, State of New Hampshire Department of Environmental Services to Kees Oudekerk (May 25, 1989). Concerning well water sampling on April 24, 1989.
176. Letter from Joseph N. Donovan, State of New Hampshire Department of Environmental Services to William Robinson (May 25, 1989). Concerning well water sampling on April 21, 1989.
177. Letter from Joseph N. Donovan, State of New Hampshire Department of Environmental Services to John Scuto (May 25, 1989). Concerning well water sampling on April 20, 1989.
178. Letter from Joseph N. Donovan, State of New Hampshire Department of Environmental Services to Robert Sensale (May 25, 1989). Concerning well water sampling on April 20, 1989.
179. Letter from Joseph N. Donovan, State of New Hampshire Department of Environmental Services to Michael Stiling (May 25, 1989). Concerning well water sampling on April 21, 1989.
180. Letter from Joseph N. Donovan, State of New Hampshire Department of Environmental Services to Charles Stracke (May 25, 1989). Concerning well water sampling on April 21, 1989.
181. Letter from Joseph N. Donovan, State of New Hampshire Department of Environmental Services to Barry Sullivan (May 25, 1989). Concerning well water sampling on April 20, 1989.
182. Letter from Joseph N. Donovan, State of New Hampshire Department of Environmental Services to Sid Vallet (May 25, 1989). Concerning well water sampling on April 20, 1989.
183. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Kent Wilkinson (May 26, 1989). Concerning the results of well water sampling on April 21, 1989.
184. Letter from Amy Juchatz, State of New Hampshire Department of Health and Human Services to Kent Wilkinson (June 2, 1989). Concerning well water sampling on April 21, 1989, a health evaluation, and recommendations on water usage and future retesting.

3.1 Correspondence (cont'd.)

185. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Russell Berube (October 25, 1989). Concerning well water sampling on September 28, 1989.
186. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Scott Brimicombe (October 25, 1989). Concerning well water sampling on September 26, 1989.
187. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to James Cadoret (October 25, 1989). Concerning well water sampling on September 28, 1989.
188. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to John Cadoret (October 25, 1989). Concerning well water sampling #135532 on September 28, 1989.
189. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to John Cadoret (October 25, 1989). Concerning well water sampling #1355533 on September 28, 1989.
190. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Leonard Carleton (October 25, 1989). Concerning well water sampling on September 28, 1989.
191. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Mr. Cashman (October 25, 1989). Concerning well water sampling on September 28, 1989.
192. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Cashman (October 25, 1989). Concerning well water sampling on September 28, 1989.
193. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Mr. Dawson (October 25, 1989). Concerning well water sampling on September 26, 1989.
194. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Virginia Fernald (October 25, 1989). Concerning well water sampling #135527 on September 28, 1989.
195. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Virginia Fernald (October 25, 1989). Concerning well water sampling #135528 on September 28, 1989.
196. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Emery Graves (October 25, 1989). Concerning well water sampling on September 28, 1989.
197. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Dana Iverson (October 25, 1989). Concerning well water sampling on September 26, 1989.
198. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Stephen McLaughlin (October 25, 1989). Concerning well water sampling on September 28, 1989.
199. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Stephen McLaughlin (October 25, 1989). Concerning well water sampling on September 26, 1989.
200. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Kees Oudekerk (October 25, 1989). Concerning well water sampling on September 26, 1989.
201. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to William Robinson (October 25, 1989). Concerning well water sampling on September 26, 1989.

3.1 Correspondence (cont'd.)

202. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to John Scuto (October 25, 1989). Concerning well water sampling on September 28, 1989.
203. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Robert Sensale (October 25, 1989). Concerning well water sampling on September 28, 1989.
204. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Timothy Stewart (October 25, 1989). Concerning well water sampling on September 28, 1989.
205. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Michael Stiling (October 25, 1989). Concerning well water sampling #135415 on September 26, 1989.
206. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Michael Stiling (October 25, 1989). Concerning well water sampling #135416 on September 26, 1989.
207. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Charles Stracke (October 25, 1989). Concerning well water sampling on September 26, 1989.
208. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Barry Sullivan (October 25, 1989). Concerning well water sampling on September 26, 1989.
209. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Sid Vallet (October 25, 1989). Concerning well water sampling on September 28, 1989.
210. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Kent Wilkinson (October 25, 1989). Concerning well water sampling #135406 on September 26, 1989.
211. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Kent Wilkinson (October 25, 1989). Concerning well water sampling #135407 on September 26, 1989.
212. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Mr. and Mrs. James McDermott (October 30, 1989). Concerning well water sampling on September 28, 1989.
213. Letter from Amy Juchatz, State of New Hampshire Department of Health and Human Services to Mr. and Mrs. James McDermott (November 15, 1989). Concerning the results of well water sampling on September 28, 1989 and recommendations on water usage and future retesting.
214. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Russell Berube (January 17, 1990). Concerning well water sampling on December 13, 1989.
215. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Scott and Joanne Brimicombe (January 17, 1990). Concerning well water sampling on December 14, 1989.
216. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to James Cadoret (January 17, 1990). Concerning well water sampling #140200 on December 13, 1989.
217. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to James Cadoret (January 17, 1990). Concerning well water sampling #140201 on December 13, 1989.
218. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to John Cadoret (January 17, 1990). Concerning well water sampling on December 13, 1989.

3.1 Correspondence (cont'd.)

219. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Leonard and Karen Carleton (January 17, 1990). Concerning well water sampling on December 14, 1989.
220. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Cashman (January 17, 1990). Concerning well water sampling on December 13, 1989.
221. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Dawson (January 17, 1990). Concerning well water sampling on December 13, 1989.
222. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Virginia Fernald (January 17, 1990). Concerning well water sampling on December 13, 1989.
223. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Ruth Graves (January 17, 1990). Concerning well water sampling on December 14, 1989.
224. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Dana Iverson (January 17, 1990). Concerning well water sampling on December 14, 1989.
225. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to James McDermott (January 17, 1990). Concerning well water sampling on December 13, 1989.
226. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Kees Oudekerk (January 17, 1990). Concerning well water sampling on December 14, 1989.
227. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to William Robinson (January 17, 1990). Concerning well water sampling on December 13, 1989.
228. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Mr. and Mrs. Scuto (January 17, 1990). Concerning well water sampling on December 14, 1989.
229. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Robert Sensale (January 17, 1990). Concerning well water sampling on December 18, 1989.
230. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Timothy Stewart (January 17, 1990). Concerning well water sampling on December 14, 1989.
231. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Michael Stiling (January 17, 1990). Concerning well water sampling on December 14, 1989.
232. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Charles Stracke (January 17, 1990). Concerning well water sampling on December 13, 1989.
233. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Barry Sullivan (January 17, 1990). Concerning well water sampling on December 13, 1989.
234. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Sid Vallet (January 17, 1990). Concerning well water sampling on December 14, 1989.
235. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Kent Wilkinson (January 17, 1990). Concerning well water sampling on December 13, 1989.

3.1 Correspondence (cont'd.)

236. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Russell Berube (July 26, 1990). Concerning well water sampling on June 28, 1990.
237. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Scott Brimicombe (July 26, 1990). Concerning well water sampling on June 27, 1990.
238. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to James Cadoret (July 26, 1990). Concerning well water sampling on June 28, 1990.
239. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to John Cadoret (July 26, 1990). Concerning well water sampling on June 28, 1990.
240. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Leonard Carleton (July 26, 1990). Concerning well water sampling on June 27, 1990.
241. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Mr. Cashman (July 26, 1990). Concerning well water sampling on June 27, 1990.
242. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Mr. Dawson (July 26, 1990). Concerning well water sampling on June 27, 1990.
243. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Virginia Fernald (July 26, 1990). Concerning well water sampling on June 27, 1990.
244. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Emery Graves (July 26, 1990). Concerning well water sampling on June 28, 1990.
245. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Dana Iverson (July 26, 1990). Concerning well water sampling on June 27, 1990.
246. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Stephen McLaughlin (July 26, 1990). Concerning well water sampling on June 27, 1990.
247. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Mrs. Oudekerk (July 26, 1990). Concerning well water sampling on June 27, 1990.
248. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to William Robinson (July 26, 1990). Concerning well water sampling on June 27, 1990.
249. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to John Scuto (July 26, 1990). Concerning well water sampling on June 27, 1990.
250. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Timothy Stewart (July 26, 1990). Concerning well water sampling on June 27, 1990.
251. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Robert Sensale (July 26, 1990). Concerning well water sampling on June 28, 1990.
252. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Michael Stiling (July 26, 1990). Concerning well water sampling on June 27, 1990.

3.1 Correspondence (cont'd.)

253. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Charles Stracke (July 26, 1990). Concerning well water sampling on June 27, 1990.
254. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Barry Sullivan (July 26, 1990). Concerning well water sampling on June 27, 1990.
255. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Sid Vallet (July 26, 1990). Concerning well water sampling on June 27, 1990.
256. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Kent Wilkinson (July 26, 1990). Concerning well water sampling on June 27, 1990.
257. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to James McDermott (July 30, 1990). Concerning the results of well water sampling on June 27, 1990.

Progress Meetings

258. Letter from Roger Duwart, EPA Region I to John Peltonen, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) (June 14, 1988). Concerning a summary of the June 7, 1988 monthly progress meeting.
259. Letter from Roger Duwart, EPA Region I to John Peltonen, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) (July 29, 1988). Concerning a summary of the July 12, 1988 monthly progress meeting.
260. Letter from Roger Duwart, EPA Region I to John Peltonen, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) (August 24, 1988). Concerning a summary of the August 16, 1988 monthly progress meeting.
261. Letter from Roger Duwart, EPA Region I to John Peltonen, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) (October 6, 1988). Concerning a summary of the September 22, 1988 monthly progress meeting.
262. Letter from Roger Duwart, EPA Region I to John Peltonen, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) (November 10, 1988). Concerning a summary of the October 18, 1988 monthly progress meeting.
263. Letter from Roger Duwart, EPA Region I to John Peltonen, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) (December 7, 1988). Concerning a summary of the December 6, 1988 monthly progress meeting.
264. Letter from Roger Duwart, EPA Region I to John Peltonen, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) (January 25, 1989). Concerning a summary of the January 10, 1989 monthly progress meeting.
265. Letter from Roger Duwart, EPA Region I to John Peltonen, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) (March 2, 1989). Concerning postponement of the February 14, 1989 progress meeting until March 7, 1989.
266. Letter from Roger Duwart, EPA Region I to John Peltonen, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) (March 8, 1989). Concerning a summary of the March 7, 1989 monthly progress meeting.
267. Letter from Roger Duwart, EPA Region I to John Peltonen, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) (April 5, 1989). Concerning a summary of the April 4, 1989 monthly progress meeting.
268. Letter from Roger Duwart, EPA Region I to John Peltonen, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) (May 8, 1989). Concerning postponement of the May 9, 1989 progress meeting until June 6, 1989.

3.1 Correspondence (cont'd.)

269. Letter from Roger Duwart, EPA Region I to John Peltonen, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) (June 13, 1989). Concerning a summary of the June 6, 1989 monthly progress meeting.
270. Letter from Roger Duwart, EPA Region I to John Peltonen, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) (September 25, 1989). Concerning a summary of the August 22, 1989 monthly progress meeting.
271. Letter from Roger Duwart, EPA Region I to John Peltonen, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) (October 26, 1989). Concerning a summary of the October 24, 1989 monthly progress meeting.
272. Letter from Roger Duwart, EPA Region I to John Peltonen, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) (November 28, 1989). Concerning a summary of the November 28, 1989 monthly progress meeting.
273. Letter from Roger Duwart, EPA Region I to John Peltonen, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) (January 30, 1990). Concerning a summary of the January 23, 1990 monthly progress meeting.
274. Letter from Roger Duwart, EPA Region I to John Peltonen, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) (February 26, 1990). Concerning confirmation of upcoming progress meeting on March 12, 1990.
275. Letter from Roger Duwart, EPA Region I to John Peltonen, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) (March 13, 1990). Concerning a summary of the March 12, 1990 monthly progress meeting.
276. Letter from Roger Duwart, EPA Region I to John Peltonen, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) (June 1, 1990). Concerning a summary of the May 22, 1990 monthly progress meeting.

3.2 Sampling and Analysis Data

The records cited in entry numbers 1 through 40 may be reviewed, by appointment only, at EPA Region I, in Boston, Massachusetts.

Aquatec Inc.

1. Analysis of Water Samples, Aquatec Inc. for Balsam Environmental Consultants, Inc. (October 13, 1989) with attached Balsam Environmental Consultants, Inc. "Chain-of-Custody Records."
2. Analysis of Water Samples, Aquatec Inc. for Balsam Environmental Consultants, Inc. (October 20, 1989) with attached Balsam Environmental Consultants, Inc. "Chain-of-Custody Record."
3. Analysis of Water Samples, Aquatec Inc. for Balsam Environmental Consultants, Inc. (October 23, 1989) with attached Balsam Environmental Consultants, Inc. "Chain-of-Custody Record."
4. Analysis of Water Samples by Gas Chromatography/Mass Spectrometry, Aquatec Inc. for Balsam Environmental Consultants, Inc. (January 4, 1990) with attached Balsam Environmental Consultants, Inc. "Chain-of-Custody Records."

3.2 Sampling and Analysis Data (cont'd.)

Balsam Environmental Consultants, Inc.

5. Letter from Timothy S. Stone and Leonard C. Sarapas, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to Roger Duwart, EPA Region I (June 8, 1989). Concerning transmittal of attached:
   A. Memorandum from Stefan C. Sokol and Thomas P. Woodard, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to File (June 7, 1989). Concerning attached validation of Phase I soil borings organic compound analyses.
   B. Memorandum from Stefan C. Sokol and Thomas P. Woodard, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to File (June 8, 1989). Concerning attached validation of Phase I soil borings inorganics analyses.
   C. Memorandum from Stefan C. Sokol and Thomas P. Woodard, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to File (June 8, 1989). Concerning attached validation of Phase II soil borings organic compound analyses.
   D. Memorandum from Stefan C. Sokol and Thomas P. Woodard, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to File (June 2, 1989). Concerning attached validation of Phase II soil borings lead analyses.
6. Letter from Stefan C. Sokol and Timothy S. Stone, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to Roger Duwart, EPA Region I (June 30, 1989). Concerning transmittal of attached lead analytical validation tables for Phase II soil borings.
7. "Draft - Phase I Ground Water Data Summary," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (August 1989) with attached:
   A. "Site Area Monitoring Well & Stream Elevation Locations," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (August 18, 1989).
   B. "Off-Site Monitoring Well Locations," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (August 18, 1989).
   C. "Surface Water/Sediment Sampling & Stream Gauging Locations," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (August 18, 1989).
   D. "Overburden Ground Water Contour Map Site Area," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (August 18, 1989).
   E. "Bedrock Ground Water Contour Map Site Area," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (August 18, 1989).
   F. "Bedrock Contour Map," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (August 18, 1989).
8. Memorandum from Stefan C. Sokol, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to File (November 15, 1989). Concerning attached Phase I ground water, surface water, and sediment sampling data validation of pesticide/PCB organic compound analyses.
9. Memorandum from Stefan C. Sokol and Brian T. Quinlan, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to File (November 16, 1989). Concerning attached Phase I ground water, surface water, and sediment sampling data validation of volatile organic compound analyses.
10. Memorandum from Stefan C. Sokol and Mindi F. Jacobs, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to File (November 21, 1989). Concerning attached Phase I ground water, surface water, and sediment sampling data validation of inorganics analyses.

3.2 Sampling and Analysis Data (cont'd.)

Balsam Environmental Consultants, Inc. (cont'd.)

11. Memorandum from Stefan C. Sokol, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to File (November 30, 1989). Concerning attached Phase I ground water, surface water, and sediment sampling data validation of semivolatile organic compound analyses.
12. Letter from Timothy S. Stone and Leonard C. Sarapas, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to Roger Duwart, EPA Region I (December 4, 1989) with attached "Phase I and Phase II Ground Data Summary." Concerning recommendations for the third round sampling program analytical suite.
13. Memorandum from Mindi F. Jacobs, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to File (February 12, 1990). Concerning attached Phase II ground water sampling data validation of inorganic analyses.
14. Memorandum from Brian T. Quinlan, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to File (February 14, 1990). Concerning attached Phase II ground water and surface water sampling data validation of volatile organic compound analyses, semivolatile organic compound analyses, and pesticide/PCB analyses.
15. "Groundwater Data Summary," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (revised February 23, 1990).
16. Memorandum from Brian T. Quinlan, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to File (March 15, 1990). Concerning attached Phase III ground water sampling data validation of inorganics analyses.
17. "Groundwater Data Summary," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (revised March 19, 1990).
18. Memorandum from Brian T. Quinlan, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to File (March 19, 1990). Concerning attached Phase III ground water and surface water sampling data validation of volatile organic compound analyses.

Cambridge Analytical Associates

19. Letter from Edward A. Lawler, Cambridge Analytical Associates for Balsam Environmental Consultants, Inc. to Stefan C. Sokol, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (December 14, 1988) with attached Balsam Environmental Consultants, Inc. "Chain-of-Custody Record." Concerning transmittal of attached volatiles and ABN data packages for soil samples collected November 1988.
20. Letter from Edward A. Lawler, Cambridge Analytical Associates for Balsam Environmental Consultants, Inc. to Stefan C. Sokol, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (December 20, 1988). Concerning transmittal of attached pesticide/PCB and inorganics data packages for soil samples collected November 1988.

3.2 Sampling and Analysis Data (cont'd.)

Cambridge Analytical Associates (cont'd.)

21. Letter from Edward A. Lawler, Cambridge Analytical Associates for Balsam Environmental Consultants, Inc. to Stefan C. Sokol, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (December 28, 1988). Concerning transmittal of attached data sheets for the methyl-t-butyl (MTBE) and tetrahydrofuran (THF) searches performed on soil samples collected November 1988.
22. Letter from Edward A. Lawler, Cambridge Analytical Associates for Balsam Environmental Consultants, Inc. to Stefan C. Sokol, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (February 8, 1989) with attached Balsam Environmental Consultants, Inc. "Chain-of-Custody Records." Concerning transmittal of attached CLP data packages for samples collected December 1988 through January 1989.

CDM Federal Programs Corporation

23. Letter from Michael Kulbersh, CDM Federal Programs Corporation to Timothy S. Stone, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (January 16, 1989). Concerning Phase I ground water, surface water, and sediment sampling collection and analysis for semi-volatiles, pesticides/PCBs, metals, cyanide, and volatile organics.
24. Letter from Michael Kulbersh, CDM Federal Programs Corporation to Roger Duwart, EPA Region I (April 6, 1989). Concerning collection of split samples for Phase I ground water, surface water, and sediment sampling.
25. Letter from Karen Stone, CDM Federal Programs Corporation to Rose Harvell, EPA Headquarters (April 13, 1989). Concerning transmittal of attached April 13, 1989 "Data Validation Letter Report for Inorganic Case 11170," CDM Federal Programs Corporation.
26. Letter from Karen Stone, CDM Federal Programs Corporation to Rose Harvell, EPA Headquarters (May 31, 1989). Concerning transmittal of attached May 31, 1989 "Data Validation Letter Report for Organics SAS Case #4372A," CDM Federal Programs Corporation.
27. "Data Validation Letter Report for Inorganic Case 11766," CDM Federal Programs Corporation (August 30, 1989).
28. "Data Validation Letter Report for Organic Case SAS4570A," CDM Federal Programs Corporation (September 20, 1989) with attached September 1989 "Sampling Plan."
29. "Data Validation Letter Report for Organic Case 11766," CDM Federal Programs Corporation (November 3, 1989).
30. Letter from John Walker, CDM Federal Programs Corporation to Jack Jojokian, EPA Headquarters (December 27, 1989). Concerning transmittal of attached December 27, 1989 "Data Validation Letter Report for Organic Case 12791," CDM Federal Programs Corporation.
31. Letter from John Walker, CDM Federal Programs Corporation to Jack Jojokian, EPA Headquarters (February 22, 1990). Concerning transmittal of attached February 22, 1989 "Data Validation Letter Report for Inorganic Case 12791, SDG MAL540," CDM Federal Programs Corporation.
32. Letter from John Walker, CDM Federal Programs Corporation to Jack Jojokian, EPA Headquarters (March 2, 1990). Concerning transmittal of attached March 2, 1990 "Data Validation Letter Report for Inorganic Case 13312, SDG MAM101," CDM Federal Programs Corporation.

3.2 Sampling and Analysis Data (cont'd.)

CDM Federal Programs Corporation (cont'd.)

33. Letter from John Walker, CDM Federal Programs Corporation to Jack Jojokian, EPA Headquarters (March 6, 1990). Concerning transmittal of attached March 6, 1990 "Data Validation Letter Report for Organic Case 12791, SDG AQ421," CDM Federal Programs Corporation.
34. Letter from John Walker, CDM Federal Programs Corporation to Jack Jojokian, EPA Headquarters (March 6, 1990). Concerning transmittal of attached March 6, 1990 "Data Validation Letter Report for Organic Case 13312, SDG AQ4141," CDM Federal Programs Corporation.

Enseco Incorporated

35. Letter from Hilton Rivera, Enseco Incorporated for Balsam Environmental Consultants, Inc. to Stefan C. Sokol, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (November 17, 1989). Concerning transmittal of attached water sample analyses and corresponding Balsam Environmental Consultants, Inc. "Chain-of-Custody Record."
36. Letter from Hilton Rivera, Enseco Incorporated for Balsam Environmental Consultants, Inc. to Stefan C. Sokol, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (December 29, 1989). Concerning transmittal of attached water sample analyses and corresponding Balsam Environmental Consultants, Inc. "Chain-of-Custody Record."

Lapuck Laboratories, Inc.

37. Letter from J.L. Lapuck, Lapuck Laboratories, Inc. for Enseco Incorporated to Hilton Rivera, Enseco Incorporated for Balsam Environmental Consultants, Inc. (October 16, 1989). Concerning transmittal of attached water sample analyses.

New Hampshire, State of

38. "Residential Well Sampling Standard Operating Procedure," State of New Hampshire Department of Environmental Services (February 22, 1989).
39. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Timothy S. Stone, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (November 3, 1989). Concerning transmittal of attached second round domestic well sampling analysis.
40. Letter from Michael J. Robinette, State of New Hampshire Department of Environmental Services to Timothy S. Stone, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (January 19, 1990). Concerning transmittal of attached third round domestic well sampling analysis and corresponding Chains-of-Custody Records.

3.4 Interim Deliverables

1. "Volume I of II - Project Operations Plan - Remedial Investigation/Feasibility Study," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (October 4, 1988).
2. "Volume II of II - Project Operations Plan - Remedial Investigation/Feasibility Study," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (October 4, 1988)

3.4 Interim Deliverables (cont'd.)

3. Letter from Timothy S. Stone and John A. Gilbert, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to Roger Duwart, EPA Region I (April 7, 1989). Concerning proposed modification of deep bedrock well purging protocol.
4. Letter Report from Pei-Fung Hurst, EPA Region I to Roger F. Duwart, EPA Region I (May 3, 1990). Concerning RfD computations and an assessment of the toxicity of tetrahydrofuran (THF) for the site based on a study by Katahira.

3.6 Remedial Investigation (RI) Reports

1. "Volume I of VIII - Remedial Investigation Report - Sections 1 through 7," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (September 28, 1990).
2. "Volume II of VIII - Remedial Investigation Report - Tables and Figures," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (September 28, 1990).

The maps associated with the record cited in entry number 3 are oversized and may be reviewed, by appointment only, at EPA Region I, Boston, Massachusetts.

3. "Volume III of VIII - Remedial Investigation Report - Appendix A-1," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (September 28, 1990).
4. "Volume IV of VIII - Remedial Investigation Report - Appendices B-1 through B-2," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (September 28, 1990).
5. "Volume V of VIII - Remedial Investigation Report - Appendices B-3 through B-7," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (September 28, 1990).
6. "Volume VI of VIII - Remedial Investigation Report - Appendices C-1 through C-4," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (September 28, 1990).
7. "Volume VII of VIII - Remedial Investigation Report - Appendices C-5 through C-7," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (September 28, 1990).
8. "Volume VIII of VIII - Remedial Investigation Report - Appendix C-8," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (September 28, 1990).
9. Letter from Leonard C. Sarapas, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to Roger Duwart, EPA Region I (September 28, 1990). Concerning transmittal of the attached responses to the Agency's comments on the Draft "Remedial Investigation Report."

3.7 Work Plans and Progress Reports

1. Cross-Reference: "Work Plan - Remedial Investigation/Feasibility Study," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (May 20, 1988) [Filed and included as Appendix I in entry number 1 in 10.7 EPA Administrative Orders].
2. Progress Report, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (July 7, 1988).
3. Progress Report, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (July 30, 1988).
4. Progress Report, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (September 8, 1988).

3.7 Work Plans and Progress Reports (cont'd.)

5. "Draft - Proposed Monitoring Well Locations," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (October 4, 1988) with attached "Remedial Investigation/Feasibility Study Approach" and "DQO Process."
6. Progress Report, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (October 14, 1988).
7. Progress Report, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (November 18, 1988).
8. Progress Report, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (December 21, 1988).
9. Progress Report, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (January 17, 1989).
10. "Proposed Domestic Well Sampling Program," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (January 1989).
11. Progress Report, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (February 16, 1989) with attached schedules of activities and deliverables.
12. Progress Report, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (March 16, 1989).
13. Progress Report, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (April 17, 1989).
14. Progress Report, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (May 17, 1989).
15. Progress Report, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (June 22, 1989).
16. Progress Report, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (July 24, 1989).
17. Progress Report, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (August 17, 1989).
18. Letter from Timothy S. Stone and Leonard C. Sarapas, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to Roger Duwart, EPA Region I (September 11, 1989). Concerning proposed one day refraction survey, one-day boring program, and installation of two additional monitoring wells.
19. Progress Report, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (September 12, 1989).
20. Letter from Timothy S. Stone and Leonard C. Sarapas, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to Roger Duwart, EPA Region I (September 15, 1989). Concerning recommendations for the second round sampling program analytical suite.
21. Letter from Timothy S. Stone and Leonard C. Sarapas Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to Roger Duwart, EPA Region I (September 25, 1989). Concerning responses to questions related to the recommendations for the second round sampling program analytical suite.
22. Trip Report on a Visit to Mottolo Site, Roger Duwart and Steve Mangion, EPA Region I and Michael Kulbersh and Bill Holden, CDM Federal Programs Corporation (October 10, 1989). Concerning technical oversight of the second round of ground water and surface water sampling and well installation program.
23. Progress Report, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (November 17, 1989).

3.7 Work Plans and Progress Reports (cont'd.)

24. Trip Report on a Visit to Mottolo Site, Michael Kulbersh and Mary Pothier, CDM Federal Programs Corporation and Kim Margolies, State of New Hampshire Department of Environmental Services (December 20, 1989). Concerning technical oversight activities of the second round of ground water and surface water sampling.
25. Progress Report, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (December 28, 1989).
26. Progress Report, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company (February 27, 1990).
27. Progress Report, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (June 12, 1990).
28. Progress Report, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (August 1, 1990).
29. Progress Report, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (March 5, 1991).

3.9 Health Assessments

1. "Preliminary - Health Assessment for Mottolo Hazardous Waste Site," U.S. Department of Health and Human Services Agency for Toxic Substances and Disease Registry (ATSDR) (April 12, 1989).

4.0 Feasibility Study (FS)

4.1 Correspondence

1. Letter from Roger F. Duwart, EPA Region I to John E. Peltonen, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) (November 30, 1990). Concerning a restatement of EPA's position regarding the setting of soil cleanup level at the site.

4.2 Sampling and Analysis Data

The records cited in entry numbers 1 through 4 may be reviewed, by appointment only, at EPA Region I, in Boston, Massachusetts.

Balsam Environmental Consultants, Inc.

1. Letter from John A. Gilbert and Leonard C. Sarapas, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to Roger Duwart, EPA Region I (February 20, 1990). Concerning attached soil leaching study protocol.
2. Letter from Roger Duwart, EPA Region I to John A. Gilbert, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (March 19, 1990). Concerning attached comments on the soil leaching study protocol.
3. Letter from John A. Gilbert and Leonard C. Sarapas, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to Roger Duwart, EPA Region I (May 1, 1990). Concerning revised soil leaching study protocol.
4. Letter from John A. Gilbert and Leonard C. Sarapas, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. to Roger Duwart, EPA Region I (June 15, 1990) with attached analytical reports. Concerning responses to comments on the revised soil leaching study protocol.

4.6 Feasibility Study (FS) Reports

Reports

1. "Draft - Volume I of II - Feasibility Study Report - Sections 1 through 5," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (September 28, 1990).
2. "Draft - Volume II of II - Feasibility Study Report - Appendices," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (September 28, 1990).
3. "Draft - Volume I of II - Feasibility Study Report - Sections 1 through 5," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (December 10, 1990).
4. "Draft - Volume II of II - Feasibility Study Report - Appendices," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (December 10, 1990).
5. "Final - Volume I of II - Feasibility Study Report - Sections 1 through 5," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (February 1, 1991).
6. "Final - Volume II of II - Feasibility Study Report - Appendices," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (February 1, 1991).

Comments

7. Comments Dated November 7, 1990 from Roger F. Duwart, EPA Region I on the September 28, 1990 "Draft - Feasibility Study Report," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc.
8. Comments Dated December 24, 1990 from Roger F. Duwart, EPA Region I on the December 10, 1990 "Draft - Feasibility Study Report," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc.

Response to Comments

9. Response Dated December 13, 1990 from John A. Gilbert and Leonard C. Sarapas, Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. on the November 7, 1990 Comments from Roger F. Duwart, EPA Region I.

4.7 Work Plans and Progress Reports

1. Cross-Reference: "Work Plan - Remedial Investigation/Feasibility Study," Balsam Environmental Consultants, Inc. for K.J. Quinn & Company, Inc. (May 20, 1988) [Filed and included as Appendix I in entry number 1 in 10.7 EPA Administrative Orders].

4.9 Proposed Plans for Selected Remedial Action

1. "EPA Proposes Cleanup Plan for the Mottolo Site," EPA Region I (January 1991). Concerning site history, results of the remedial investigation, summary of the site risks, EPA's preferred alternatives, other alternatives evaluated in the Feasibility Study, and EPA's rationale for proposing the preferred alternative.

5.0 Record of Decision (ROD)

5.3 Responsiveness Summary

1. Cross-Reference: Responsiveness Summary is Appendix D of the Record of Decision [Filed and cited as entry number 1 in 5.4 Record of Decision (ROD)].

The following citations indicate written comments received by EPA Region I during the formal public comment period.

2. Comments Dated February 18, 1991 from Melvil B. Clauson on the "EPA Proposes Cleanup Plan for the Mottolo Site," EPA Region I.
3. Comments Dated March 15, 1991 from Mark Gearreald, Engel & Gearreald (Attorney for Richard A. Mottolo) on the "EPA Proposes Cleanup Plan for the Mottolo Site," EPA Region I.
4. Comments Dated March 15, 1991 from John E. Peltonen, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) concerning comments to be provided by Balsam Environmental Consultants, Inc.
5. Comments Dated March 15, 1991 from John A. Gilbert and Leonard C. Sarapas, Balsam Environmental Consultants, Inc. concerning conditions in the southern portion of the site referred to in the Remedial Investigation and Feasibility Study as the southern boundary area (SBA).

5.4 Record of Decision (ROD)

1. Record of Decision, EPA Region I (March 29, 1991).

10.0 Enforcement

10.7 EPA Administrative Orders

1. Administrative Order, *In the matter of K.J. Quinn & Co., Inc.*, Docket No. I-88-1027 (May 20, 1988).

11.0 Potentially Responsible Party (PRP)

11.9 PRP-Specific Correspondence

K.J. Quinn & Company, Inc.

1. Letter from Rita M. Lavelle, EPA Headquarters to K.J. Quinn & Company, Inc. (February 3, 1983). Concerning notification of potential liability and demand for payment of response costs incurred by EPA.
2. Letter from Merrill S. Hohman, EPA Region I to Rodney L. Stark, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) (July 29, 1987). Concerning the opportunity for K.J. Quinn & Company, Inc. to perform the Remedial Investigation/Feasibility Study.
3. Letter from Merrill S. Hohman, EPA Region I to Rodney L. Stark, Stark & Peltonen (Attorney for K.J. Quinn & Company, Inc.) (December 29, 1987). Concerning formal demand for payment of removal costs and special notice of a period of negotiations to perform the Remedial Investigation/Feasibility Study.

11.9 PRP-Specific Correspondence (cont'd.)

Lewis Chemical Corporation

4. Letter from Rita M. Lavelle, EPA Headquarters to Lewis Chemical Corporation (February 3, 1983). Concerning notification of potential liability and demand for payment of response costs incurred by EPA.
5. Letter from Merrill S. Hohman, EPA Region I to Claudia C. Damon, Sheehan, Phinney, Bass & Green (Attorney for Lewis Chemical Corporation) (July 29, 1987). Concerning the opportunity for Lewis Chemical Corporation to perform the Remedial Investigation/Feasibility Study.
6. Letter from Merrill S. Hohman, EPA Region I to Claudia C. Damon, Sheehan, Phinney, Bass & Green (Attorney for Lewis Chemical Corporation) (December 31, 1987). Concerning EPA's decision not to send Lewis Chemical Corporation a special notice letter.

Richard A. Mottolo

7. Letter from Rita M. Lavelle, EPA Headquarters to Richard A. Mottolo (February 3, 1983). Concerning notification of potential liability and demand for payment of response costs incurred by EPA.
8. Letter from Merrill S. Hohman, EPA Region I to Richard A. Mottolo, Service Pumping & Drain Company, Inc. c/o Lynn D. Morse, Engel and Morse (Attorney for Richard A. Mottolo) (July 29, 1987). Concerning the opportunity for Richard A. Mottolo to perform the Remedial Investigation/Feasibility Study.
9. Letter from Merrill S. Hohman, EPA Region I to Richard A. Mottolo, Service Pumping & Drain Company, Inc. c/o Mark Gearreald, Engel & Gearreald (Attorney for Richard A. Mottolo) (December 31, 1987). Concerning EPA's decision not to send Richard A. Mottolo a special notice letter.

Service Pumping & Drain Company, Inc.

10. Letter from Rita M. Lavelle, EPA Headquarters to Service Pumping & Drain Company, Inc. (February 3, 1983). Concerning notification of potential liability and demand for payment of response costs incurred by EPA.
11. Letter from Merrill S. Hohman, EPA Region I to Lynn D. Morse, Engel and Morse (Attorney for Service Pumping & Drain Company, Inc.) (July 29, 1987). Concerning the opportunity for Service Pumping & Drain Company, Inc. to perform the Remedial Investigation/Feasibility Study.
12. Letter from Merrill S. Hohman, EPA Region I to Mark Gearreald, Engel & Gearreald (Attorney for Service Pumping & Drain Company, Inc.) (December 31, 1987). Concerning EPA's decision not to send Service Pumping & Drain Company, Inc. a special notice letter.

Carl Sutera

13. Letter from Rita M. Lavelle, EPA Headquarters to Carl Sutera, Lewis Chemical Corporation (February 3, 1983). Concerning notification of potential liability and demand for payment of response costs incurred by EPA.
14. Letter from Merrill S. Hohman, EPA Region I to Carl Sutera, Lewis Chemical Corporation (July 29, 1987). Concerning the opportunity for Lewis Chemical Corporation to perform the Remedial Investigation/Feasibility Study.
15. Letter from Merrill S. Hohman, EPA Region I to Carl Sutera, Lewis Chemical Corporation (December 31, 1987). Concerning EPA's decision not to send Carl Sutera a special notice letter.

13.0 Community Relations

13.2 Community Relations Plans

1. "Final Report - Community Relations Plan," Booz Allen & Hamilton, Inc. for CDM Federal Programs Corporation (October 4, 1988).

13.3 News Clippings/Press Releases

News Clippings

1. "More Hazardous Waste in Dumps?" Manchester Union Leader - Manchester, NH (May 19, 1979).
2. "Beginning the Chemical Cleanup," The Boston Globe - Boston, MA (June 8, 1979).
3. "Raymond Chemical Dump Hearing Delay Asked," Manchester Union Leader - Manchester, NH (June 12, 1979).
4. "List of Chemicals Promised: Agreement Reached on Raymond Dump," Manchester Union Leader - Manchester, NH (June 13, 1979).
5. "3 Wells Drilled to Check Raymond Chemical Dump," Manchester Union Leader - Manchester, NH (July 19, 1979).
6. "State Asks Toxic Removal," Foster's Daily Democrat - Dover, NH (October 15, 1979).
7. "Judge Authorizes Dump Cleanup," Manchester Union Leader - Manchester, NH (October 19, 1979).
8. "Dump Ruled Hazardous," Exeter Newsletter - Exeter, NH (October 24, 1979).
9. "Dump Ruled Hazardous," The Raymond Times - Exeter, NH (October 24, 1979).
10. "Gallen Tabs Task Force on Dumps," Manchester Union Leader - Manchester, NH (May 6, 1980).
11. "Ground Water Sampled at Illegal Dump Site," Derry News - Derry, NH (August 7, 1980).
12. "Officials Begin Removing Chemical Barrels in Raymond," Manchester Union Leader - Manchester, NH (September 11, 1980).
13. "Cleanup Starts at Raymond Hazardous Waste Dump," Manchester Union Leader - Manchester, NH (September 16, 1980).
14. "Cleanup Underway at Hazardous Waste Site," Derry News - Derry, NH (September 18, 1980).
15. "Crews Begin Removing Barrels of Toxic Wastes from N.H. Dump," Evening Bulletin - Providence, RI (September 19, 1980).
16. "No Surprises at Illegal Blueberry Hill Dump," The Raymond Times - Exeter, NH (October 8, 1980).
17. "Paint Lacquer Found on Blueberry Hill," Manchester Union Leader - Manchester, NH (October 17, 1980).
18. "EPA Looks for Disposal Site," The Raymond Times - Exeter, NH (December 17, 1980).
19. "EPA Finishes Cleanup of Illegal Waste Dump, Seeks Disposal Site for 1600 Barrels," Derry News - Derry, NH (December 24, 1980).
20. "Funds Gone - Barrels Stay," Pawtuckaway Post - Plaistow, NH (March 4, 1981).
21. "Blueberry Hill Report Released for Inspection," Foster's Daily Democrat - Dover, NH (May 22, 1981).
22. "EPA to Air Cleanup Plans for Mottolo Site," The Raymond Times - Exeter, NH (May 27, 1981).
23. "EPA Asks $500,000 for Blueberry Hill Cleanup," Manchester Union Leader - Manchester, NH (July 28, 1981).

13.3 News Clippings/Press Releases (cont'd.)

News Clippings (cont'd.)

24. "'Superfund' Tapped for Third Dump," Manchester Union Leader - Manchester, NH (October 15, 1981).
25. "Superfund," Granite State News - Wolfeboro, NH (October 21, 1981).
26. "'Superfund' To Be Used To Cleanup Dump Site," The Raymond Times - Exeter, NH (October 21, 1981).
27. "Toxic Waste Site to Receive $500,000 from Superfund," Derry News - Derry, NH (October 22, 1981).
28. "Blueberry Hill Cleanup Should Begin Next Month," The Raymond Times - Exeter, NH (November 18, 1981).
29. "EPA Begins Cleanup of Blueberry Hill Site," The Raymond Times - Exeter, NH (December 2, 1981).
30. "DPHS Completes Risk Assessment," Portsmouth Herald - Portsmouth, NH (June 22, 1987).
31. "Contaminated Landfill Surprises Town Officials," Portsmouth Herald - Portsmouth, NH (July 22, 1987).
32. "Testing Underway to Discover if Drinking Water is Polluted," Exeter Newsletter - Exeter, NH (July 24, 1987).
33. "Raymond Farm Superfund Site," Exeter Newsletter - Exeter, NH (July 24, 1987).
34. "Exeter River Screened for Contaminants," Foster's Daily Democrat - Dover, NH (July 28, 1987).
35. "Mining Plan Near Waste Site Concerns Raymond," Union Leader - Manchester, NH (March 16, 1988).
36. "Mottolo Site Subject of Order," The Raymond Times - Exeter, NH (June 22, 1988).
37. "Raymond's Hazwaste Site Revisited," The Raymond Times - Exeter, NH (June 29, 1988).
38. "No Answers on Spread of Pollutants," The Raymond Times - Exeter, NH (July 6, 1988).
39. "Cleanup Not Always Practical," The Raymond Times - Exeter, NH (July 13, 1988).
40. "EPA to Sponsor Info Meeting on Mottolo Hazwaste Status," The Raymond Times - Exeter, NH (August 31, 1988).
41. "Raymond Residents Briefed on Toxic Dump Cleanup," Foster's Daily Democrat - Dover, NH (September 9, 1988).
42. "Study of Hazwaste Site Begins: EPA Probe to Map Contamination at Former Raymond Pig Farm," The Raymond Times - Exeter, NH (September 13, 1988).
43. "EPA Begins Mottolo Site Study to Determine Hazwaste Spread," The Raymond Times - Exeter, NH (September 14, 1988).

Press Releases

44. Press Release, State of New Hampshire Office of Governor (December 17, 1981). Concerning Governor Hugh Gallen's praise of EPA cleanup efforts.
45. "Environmental News - EPA Announces Consent Order at Mottolo Superfund Site," EPA Region I (June 14, 1988).
46. "Environmental News - Public Meeting to Explain Remedial Investigation/ Feasibility Study Process at Mottolo Superfund Site," EPA Region I (September 3, 1988).

13.4 Public Meetings

1. "Final Report - Public Information Meeting Summary," Booz Allen & Hamilton, Inc. for CDM Federal Programs Corporation (December 1, 1988).
2. "Summary of the Public Informational Meeting on the Remedial Investigation at the Mottolo Superfund Site," EPA Region I (October 25, 1990). Concerning the remedial action options, contamination outside of the site property, and other issues of discussion.
3. "Summary of the Public Informational Meeting on the Proposed Plan and Feasibility Study for the Mottolo Superfund Site," EPA Region I (February 13, 1991). Concerning attendance, presentations, and concerns of the community.
4. Transcript, Public Hearing for Proposed Plan for the Mottolo Superfund Site Clean-up, Apex Reporting (March 6, 1991).

13.5 Fact Sheets

1. "Mottolo Hazardous Waste Site," (June 1987). Concerning the state's involvement at the site including field work, litigation, hydrogeological investigation, and residential well sampling.
2. "Mottolo Superfund Site," EPA Region I (August 1988). Concerning site history and Superfund process background, as well as current clean-up status, public comment period information, and further opportunities for public involvement.
3. "EPA Announces the Results of Remedial Investigation and Risk Assessment Studies," EPA Region I (October 1990). Concerning site description, site history, field activities conducted during the Remedial Investigation, results of the Remedial Investigation, results of the Risk Assessment, and opportunities for public involvement.

16.0 Natural Resource Trustee

16.1 Correspondence

1. Letter from Gordon E. Beckett, U.S. Department of the Interior Fish and Wildlife Service to Daniel J. Coughlin, EPA Region I (July 21, 1987). Concerning receipt of "EPA Trustee Notification Form" and interest in future coordination with EPA in developing and reviewing draft documents and remedial activities.
2. Letter from Kenneth Finkelstein, U.S. Department of Commerce National Oceanic and Atmospheric Administration (NOAA) to Roger Duwart, EPA Region I (September 21, 1987). Concerning thanks for "EPA Trustee Notification Form," an explanation of NOAA's interest in the Mottolo site, and a request for the Remedial Investigation/Feasibility Study upon completion.

17.0 Site Management Records

17.7 Reference Documents

1. "Declaration for the Explanation of Significant Differences - Keefe Environmental Services Superfund Site," EPA Region I (June 8, 1990).

17.8 State and Local Technical Records

1. "Hydrogeological Investigation of the Mottolo Hazardous Waste Site," State of New Hampshire Water Supply and Pollution Control Commission (August 1986).
2. "Final - Health Risk Assessment," State of New Hampshire Division of Public Health Services (May 1987).

Section II

Guidance Documents

GUIDANCE DOCUMENTS

EPA guidance documents may be reviewed at EPA Region I, Boston, Massachusetts.

General EPA Guidance Documents

1. "Protection of Wetlands (Executive Order 11990), Appendix D," Federal Register (Vol. 42), 1977.

2. U.S. Environmental Protection Agency. Guidance Manual for Minimizing Pollution from Waste Disposal Sites (EPA/600/2-78/142), August 1978.

3. U.S. Environmental Protection Agency. Municipal Environmental Research Laboratory. Biodegradation and Treatability of Specific Pollutants (EPA/600/9-79/034), October 1979.

4. U.S. Environmental Protection Agency. Municipal Environmental Research Laboratory. Carbon Adsorption Isotherms for Toxic Organics (EPA/600/8-80/023), April 1, 1980.

5. U.S. Environmental Protection Agency. Office of Water and Waste Management. Evaluating Cover Systems for Solid and Hazardous Waste, 1980.

6. U.S. Environmental Protection Agency. Municipal Environmental Research Laboratory. Costs of Remedial Response Actions at Uncontrolled Hazardous Waste Sites, April 15, 1981.

7. U.S. Environmental Protection Agency. Office of Water and Waste Management. Engineering Handbook for Hazardous Waste Incineration (SW-889, OSWER Directive 9488.00-5), September 1981.

8. U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. Evaluating Cover Systems for Solid and Hazardous Waste (Revised Edition) (SW-867, OSWER Directive 9476.00-1), September 1982.

9. U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. Lining of Waste Impoundment and Disposal Facilities (SW-870, OSWER Directive 9480.00-4), March 1983.

10. U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. Joint Corps/EPA Guidance (OSWER Directive 9295.2-02), June 24, 1983.

11. U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. Guidance Manual for Hazardous Waste Incinerator Permits (EPA SW-966), July 1983.

12. U.S. Environmental Protection Agency. Municipal Environmental Research Laboratory. Handbook for Evaluating Remedial Action Technology Plans (EPA/600/2-83/076), August 1983.

13. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Community Relations in Superfund: A Handbook (Interim Version) (EPA/HW-6), September 1983.

14. U.S. Environmental Protection Agency. Environmental Monitoring Systems Laboratory. Soil Sampling Quality Assurance User's Guide (EPA/600/4-84/043), May 1984.

15. U.S. Environmental Protection Agency. Office of Ground-Water Protection. Ground-Water Protection Strategy (EPA/440/6-84/002), August 1984.

16. U.S. Environmental Protection Agency. Office of Research and Development and Office of Emergency and Remedial Response. Review of In-Place Treatment Techniques for Contaminated Surface Soils - Volume 1: Technical Evaluation (EPA/540/2-84/003a), September 1984.

17. U.S. Environmental Protection Agency. Environmental Criteria and Assessment Office. Health Effects Assessment Documents (58 Chemical Profiles) (EPA/540/1-86/001-058), September 1, 1984.

18. "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; Final Rule and Interim Final Rule and Proposed Rule," Federal Register (Vol. 49, No. 209), October 26, 1984.

19. U.S. Environmental Protection Agency. Hazardous Response Support Division. Standard Operating Safety Guides, November 1984.

20. U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. Field Standard Operating Procedures Manual #4: Site Entry (OSWER Directive 9285.2-01), January 1, 1985.

21. U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. Field Standard Operating Procedures Manual #8: Air Surveillance (OSWER Directive 9285.2-03), January 1, 1985.

22. U.S. Environmental Protection Agency. Office of Health and Environmental Assessment. Development of Statistical Distribution or Ranges Standard Factors Used in Exposure Assessments (EPA OHEA-E-16), March 1985.

23. U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. Field Standard Operating Procedures Manual #6: Work Zones (OSWER Directive 9285.2-04), April 1, 1985.

24. U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. Field Standard Operating Procedures Manual #9: Site Safety Plan (OSWER Directive 9285.2-05), April 1, 1985.

25. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Guidance Document for Cleanup of Surface Tank and Drum Sites (OSWER Directive 9380.0-3), May 28, 1985.

26. U.S. Environmental Protection Agency. Environmental Research Laboratory. EPA Guide for Minimizing the Adverse Environmental Effects of Cleanup of Uncontrolled Hazardous-Waste Sites (EPA/600/8-85/008), June 1985.

27. U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. Guidance on Remedial Investigations under CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) (EPA/540/G-85/002), June 1985.

28. U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. Guidance on Feasibility Studies under CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) (EPA/540/G-85/003), June 1985.

29. U.S. Environmental Protection Agency. Environmental Monitoring Systems Laboratory. Sediment Sampling Quality Assurance User's Guide (EPA/600/4-85/048), July 1985.

30. U.S. Environmental Protection Agency. Office of Waste Programs Enforcement. Endangerment Assessment Handbook, August 1985.

31. Memorandum from William N. Hedeman, Director, U.S. Environmental Protection Agency Office of Emergency and Remedial Response to Toxic and Waste Management Division Directors, Regions I-X (OSWER Directive 9280.0-02), August 1, 1985 (discussing policy on flood plains and wetland assessments for CERCLA Actions).

32. U.S. Environmental Protection Agency. Office of Waste Programs Enforcement. Toxicology Handbook (OSWER Directive 9850.2), August 1, 1985.

33. Memorandum from Gene Lucero, U.S. Environmental Protection Agency Office of Waste Programs Enforcement to Addressees ("Director, Waste Management Division, Regions I, IV, V, VII, and VIII; Director, Emergency and Remedial Response Division, Region II; Director, Hazardous Waste Management Division, Region III; Director, Air and Waste Management Division, Region VI; Director, Toxics and Waste Management Division, Region IX; Director, Hazardous and Waste Division, Region X"), August 28, 1985 (discussing community relations activities at Superfund Enforcement sites).

34. U.S. Environmental Protection Agency. Hazardous Waste Engineering Research Laboratory and Office of Emergency and Remedial Response. Covers for Uncontrolled Hazardous Waste Sites (EPA 540/2-85/002), September 1985.

35. U.S. Environmental Protection Agency. Chemical, Physical, and Biological Properties of Compounds Present at Hazardous Waste Sites (OSWER Directive 9850.3), September 27, 1985.

36. U.S. Department of Health and Human Services. National Institute for Occupational Safety and Health, and Occupational Safety and Health Administration. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, October 1985.

37. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Handbook of Remedial Action at Waste Disposal Sites (EPA/625/6-85/006), October 1985.

38. U.S. Environmental Protection Agency. Hazardous Waste Engineering Research Laboratory. Handbook: Remedial Action at Waste Disposal Sites (Revised) (EPA/625/6-85/006), October 1985.

39. Memorandum from J. Winston Porter, U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response to Addressees ("Regional Administrators, Regions I-X; Directors, Environmental Services Division, Regions I-X; Regional Counsels, Regions I-X, Director, Waste Management Division, Regions I, IV, V, VII, and VIII; Director, Emergency and Remedial Response Division, Region II; Director, Hazardous Waste Management Division, Region III; Director, Air and Waste Management Division, Regions II and VI; Director, Toxics and Waste Management Division, Region IX; Director, Hazardous and Waste Division, Region X") (OSWER Directive 9850.0-1), November 22, 1985 (discussing endangerment assessment guidance).

40. U.S. Environmental Protection Agency. Hazardous Waste Engineering Research Laboratory. Practical Guide - Trial Burns for Hazardous Waster Incinerators (EPA/600/2-86/050), April 1986.

41. U.S. Environmental Protection Agency and Michigan Department of Natural Resources. Field Screening for Organic Contaminants in Samples from Hazardous Waste Sites, April 2, 1986.

42. U.S. Environmental Protection Agency. Hazardous Waste Engineering Research Laboratory. Handbook for Stabilization/Solidification of Hazardous Waste (EPA/540/2-86/001), June 1986.

43. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Superfund Remedial Design and Remedial Action Guidance (OSWER Directive 9355.0-4A), June 1986.

44. Memorandum from Barry L. Johnson, Associate Administrator, ATSDR to U.S. Environmental Protection Agency Regional Superfund Programs, June 16, 1986, (discussing ATSDR health assessments on NPL sites).

45. U.S. Environmental Protection Agency. Hazardous Waste Engineering Research Laboratory. Project Summary: Practical Guide - Trial Burns for Hazardous Waste Incinerators (EPA/600/S2-86/050), July 1986.

46. U.S. Environmental Protection Agency. Center for Environmental Research Information. Handbook: Permit Writer's Guide to Test Burn Data: Hazardous Waste Incineration (EPA/625/6-86/012), September 1986.

47. U.S. Environmental Protection Agency. Hazardous Waste Engineering Research Laboratory. Systems to Accelerate in Situ Stabilization of Waste Deposits (EPA 540/2-86/002), September 1986.

48. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Mobile Treatment Technologies for Superfund Wastes (EPA 540/2-86/003 (f)), September 1986.

49. "Guidelines for the Health Risk Assessment of Chemical Mixtures," Federal Register (Vol. 51, No. 185), September 24, 1986.

50. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Superfund Public Health Evaluation Manual (EPA/540/1-86/060, OSWER Directive 9285.4-1), October 1986.

51. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Draft Guidance on Remedial Actions for Contaminated Groundwater at Superfund Sites (OSWER Directive 9283.1-2), October 1986.

52. U.S. Environmental Protection Agency. Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended October 17, 1986.

53. U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. Test Methods for Evaluating Solid Waste: Laboratory Manual Physical/Chemical Methods, Third Edition (Volumes IA, IB, IC, and II) (SW-846), November 1986.

54. "Hazardous Waste Management Systems; Land Disposal Restrictions; Final Rule," Federal Register (Vol. 51, No. 216), November 7, 1986.

55. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Superfund Glossary (WH/FS-86-007), Winter 1986.

56. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Superfund Federal-Lead Remedial Project Management Handbook (EPA/540/G-87/001, OSWER Directive 9355.1-1), December 1986.

57. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Superfund State-Lead Remedial Project Management Handbook, (EPA/540/G-87/002), December 1986.

58. U.S. Environmental Protection Agency. Office of Ground-Water Protection. Guidelines for Ground-Water Classification under the EPA Ground-Water Protection Strategy, December 1986.

59. U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. Interim Guidance on Superfund Selection of Remedy (OSWER Directive 9355.0-19), December 24, 1986.

60. Memorandum from J. Winston Porter, U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response to Regional Administrators, Regions I-X; Regional Counsels, Regions I-X, Director, Waste Management Division, Regions I, IV, V, VII, and VIII; Director, Emergency and Remedial Response Division, Region II; Director, Hazardous Waste Management Division, Regions III and VI; Director, Toxics and Waste Management Division, Region IX; Director, Hazardous and Waste Division, Region X; Environmental Services Division Directors, Regions I, VI, and VII (OSWER Directive 9355.0-19), December 24, 1986 (discussing interim guidance on Superfund selection of remedy).

61. U.S. Environmental Protection Agency. Hazardous Waste Engineering Research Laboratory. Technology Briefs: Data Requirements for Selecting Remedial Action Technology (EPA/600/2-87/001), January 1987.

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