Carroll + Dubies
337015

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

Victor Cardona
New York State Department of
Environmental Conservation
50 Wolf Road
Albany, NY 12205

Re: Carroll and Dubies Sewage Disposal Inc., Groundwater Operable Unit,
Superfund Site, City of Port Jervis, New York

Dear Mr. Cardona

Enclosed is the Record of Decision (ROD) for the Carroll and Dubies Sewage Disposal Inc., Groundwater Operable Unit (OU2) signed by the U.S. Environmental Protection Agency. The Administrative Record Index or Appendix III of the ROD is being updated and will be sent to you later.

Sincerely yours,

Maria Jon

Maria Jon
Project Manager

Enclosure

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Carroll and Dubies Sewage Disposal, Inc., Superfund Site
Town of Deerpark, Orange County, New York

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the contaminated groundwater at the Carroll and Dubies Superfund Site (the Site), which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision document explains the factual and legal bases for selecting the remedy for the contaminated groundwater at this Site. The information supporting this remedial action decision is contained in the administrative record for this Site. The administrative record index is attached (Please see Appendix III).

The New York State Department of Environmental Conservation (NYSDEC) concurs with the selected remedy as per the attached letter (Appendix IV).

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 Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

This operable unit represents the second of two operable units planned for the Site. It addresses the contaminated groundwater underlying and downgradient of the Carroll and Dubies site. The remedy for the first operable unit (OU1), involving the cleanup of lagoon sludges and contamination in the soil in and around the

lagoons, was selected in a ROD, signed March 31, 1995, and is presently in the design phase.

The major components of the selected remedy include:

- Natural attenuation of organic contaminants in the groundwater to below federal drinking water and State groundwater standards through naturally occurring removal processes. The remediation of the lagoons, which will be implemented under OU1, will minimize any additional contaminant contribution to the groundwater. Groundwater modeling estimated that contaminants would attenuate to these standards within five years of completion of the remedy selected for the lagoons.

- Implementation of institutional controls, such as deed restrictions, contractual agreements, local law or ordinances or other governmental action for the purpose of restricting installation and use of groundwater wells throughout the contaminated groundwater plume.

- Monitoring of the groundwater to evaluate improvement in groundwater quality and ensure the effectiveness of the remedy.

- Sampling in Gold Creek to ensure that site related contaminants do not impact the creek.

STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action and is cost-effective. The selected remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this Site. However, the remedy does not satisfy the statutory preference for treatment as a principal element of the remedy; naturally occurring processes will be relied upon to reduce the mobility, toxicity and volume of the contaminants in the groundwater. Groundwater modeling has predicted that the natural attenuation processes of the selected remedy will achieve drinking water and groundwater standards in approximately the same time frame as active treatment alternatives.

Since contaminants will remain at the Site above levels which allow for unrestricted use and unlimited exposure, this remedy will require five-year reviews to ensure that the remedial action is protective of human health and the environment.

Jeanne M. Fox
Regional Administrator

9/30/96
Date

RECORD OF DECISION
DECISION SUMMARY

Carroll and Dubies Superfund Site
Town of Deerpark
Orange County, New York

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region II
New York, New York

September 1996

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ATTACHMENTS

SITE NAME, LOCATION AND DESCRIPTION

The Carroll & Dubies site (the Site) is located just northeast of the City of Port Jervis, on Canal Street in the Town of Deerpark, Orange County, New York. The Site is approximately 5.5 acres in size (see Figure 1). The Site is occupied by an office building and a garage. The waste disposal areas at the Site include seven lagoons, several automobiles from previous salvage operations that have been abandoned, and numerous portable toilets that are stored on-Site.

The northwest boundary of the Site is formed by the valley wall, which consists of exposed bedrock with talus comprising the base. The southeast boundary and a portion of the northeast boundary of the Site is formed by remnants of the former Delaware and Hudson Canal and towpath. Adjacent to the southern boundary of the Carroll and Dubies property is the City of Port Jervis Landfill and gravel and cement block manufacturing operations. The landfill is no longer active; however, Orange County currently operates a solid waste transfer station on a portion of the landfill property. Approximately 1,500-feet to the east of the Site is Gold Creek and its associated wetlands. The Neversink River is located approximately 2,000-feet beyond Gold Creek. Gold Creek and the Neversink River drain into the Delaware River. The nearest resident located downgradient of the Site is about a quarter of a mile from the Site on the opposite side of Gold Creek (see Figure 2).

The Site ranges from approximately 440 to 520 feet above mean sea level. The materials encountered underlying the Site consist of glacially derived unconsolidated materials underlain by consolidated bedrock. The thickness of the unconsolidated overburden materials ranges from zero feet at the exposed bedrock slope forming the northwestern Site boundary, to over 60 feet along the towpath. The glacially derived materials consist of two distinct units, including a glacial till unit overlain by glacial outwash deposits. The outwash deposit was observed to vary in thickness from 31 feet to 52 feet along the downgradient edge of the Site. The outwash deposits typically consist of sand with some clay, silt and gravel. The glacial till deposits are characterized as dense to very dense dark grey silt with sand and gravel. The glacial till is not continuous beneath the Site, and appears to pinch out toward the northwestern edge of the Site,

adjacent to the exposed bedrock slope. The depth to groundwater from ground surface ranges from approximately 30 to 40 feet along the southeastern boundary of the Site. Groundwater movement is generally towards the southeast.

The major aquifer system used for potable water supply in Orange County is comprised of the bedrock and the sand and gravel deposits in the valley. No residential wells have been found to exist between the Site and Gold Creek. However, approximately 90 residential wells exist downgradient of the Site between Gold Creek and the Neversink River. The nearest residence and residential well is located approximately a quarter of a mile downgradient of the Site.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

From approximately 1970 to 1979, the Site was used for the disposal of septic and municipal sewage sludge and industrial wastes, primarily from the cosmetic industry. The industrial waste was deposited in seven lagoons located at the Site (lagoons 1 through 4 and 6 through 8 are depicted in Figure 2). No industrial wastes were found in lagoon 5. The dimensions of lagoons 1, 2, 3, 4, 6, 7 and 8 are approximately 100 feet by 60 feet, 200 feet by 60 feet, 100 feet by 35 feet, 100 feet by 40 feet, 60 feet by 20 feet, 100 feet by 45 feet, and 150 feet by 40 feet, respectively.

In 1978, lagoon 3 was ignited by the Port Jervis Fire Department in order to practice suppression of chemical fires. After this incident, lagoons 3 and 4 were filled in with soil and the area was revegetated. With the exception of lagoons 1 and 2, all of the lagoons have been covered with soil. Lagoons 1 and 2 were left uncovered and are surrounded by a wooden fence. In June 1979, NYSDEC prohibited the disposal of industrial wastes at the Site. The Site continued to be used for the disposal of septic and municipal sewage wastes until 1989.

In February 1987, NYSDEC issued a Phase II Investigation Report which summarized past investigations and included a Hazard Ranking System (HRS) score for the Site. Based on the HRS score, the Site was proposed for inclusion on the National Priorities List (NPL) in June 1988 and was placed on the NPL in February 1990.

On September 25, 1989, EPA sent "special notice" letters to four potentially responsible parties (PRPs), affording them the opportunity to conduct the RI/FS for the Site. PRPs are companies or individuals who are potentially responsible for contributing to the contamination at the Site and/or are past or present owners of the property. The four PRPs were Carroll and Dubies Sewage Disposal, Inc. (C&D), Kolmar Laboratories, Inc. (Kolmar), Wickhen Products, Inc. (Wickhen) and Reynolds Metals Co., Inc. (Reynolds). The PRPs were given 60 days in which to submit a good faith offer to undertake or finance the RI/FS for the Site.

On November 30, 1989, two PRPs, Kolmar and Wickhen, submitted a good faith offer to perform the RI/FS. An Administrative Order on Consent was signed by the two PRPs and by EPA in February 1990. Kolmar and Wickhen conducted all RI/FS work (addressing both the groundwater and lagoons), pursuant to the RI/FS Order with oversight by EPA. During the RI, EPA learned from the City of Port Jervis that it owned a major portion of the Site property where the lagoons are located. In an April 22, 1993 letter, EPA notified the City that it was also a PRP for the Site.

In March 1995, EPA signed a Record of Decision (ROD) for the first operable unit (OU1) which called for the excavation of approximately 20,000 cubic yards (cy) of contaminated material from the lagoons and soils in the vicinity of the lagoons. Materials exceeding treatment levels will undergo treatment via solidification/stabilization (for inorganic contaminants) and bioslurry (for organic contaminants) or a combination of the two treatment processes. All treated and untreated materials will be placed on-site in a lined and capped cell with leachate collection.

On May 19, 1995, EPA issued "special notice" letters to the PRPs requesting that they submit a good faith offer to perform the Remedial Design/Remedial Action (RD/RA) for OU1. The PRPs and EPA were unable to reach an agreement and thus, on September 29, 1995, EPA issued a Unilateral Administrative Order to C&D, Kolmar and Wickhen ordering them to implement the first operable unit remedy.

On September 29, 1995, EPA entered into a de minimis Settlement in the form of an Order on Consent with Reynolds regarding EPA's past response costs for the Site, and Reynold's share of the OU1 RD/RA Costs. This settlement became effective on July 18, 1996.

After issuance of the ROD for OU2, all non-de minimis PRPs will be offered the opportunity to design and implement the selected OU2 remedy. EPA will offer Reynolds a de minimis settlement for OU2 costs.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The Second Operable Unit RI/FS reports and the Proposed Plan for the contaminated groundwater beneath the Site were released for public comment on August 28, 1996; a notice announcing the availability of these documents was mailed to the Site mailing list. These documents were made available to the public in the administrative record file at the EPA-Region II Document Control Center, 290 Broadway, 18th floor, New York, New York 10007-1866 and at the Deerpark Town Hall, Drawer A, Huguenot, New York. A public newspaper notice announcing the availability of these documents was placed in The Times Herald Record on September 10, 1996. The public comment period was held from August 28, 1996 through September 27, 1996.

During the public comment period, EPA held a public meeting to present the RI/FS reports and the Proposed Plan, answer questions, and accept both oral and written comments. The public meeting was held in the auditorium of the Port Jervis High School, Port Jervis, New York on September 11, 1996. Responses to comments received at the public meeting and to written comments received during the public comment period are included in the Responsiveness Summary (see Appendix V).

SCOPE AND ROLE OF OPERABLE UNIT

Site remediation activities are sometimes segregated into different phases or operable units, so that remediation of different environmental media or areas of a site can proceed separately. This phased approach results in an expeditious remediation of the entire site. EPA has designated two operable units for the Carroll and Dubies site as described below.

▲The first operable unit (OU1) addresses the lagoon sludges and contaminated soils from lagoons 1, 2, 3, 4, 6, 7, and 8, which are contaminated primarily with heavy metals and volatile organic compounds (VOCs). The ROD for OU1 was issued in March 1995 and calls for the excavation of approximately 20,000 cubic yards (cy) of contaminated material from the lagoons and soils in the vicinity of the lagoons. Materials exceeding treatment levels will undergo treatment via solidification/stabilization (for inorganic contaminants) and bioslurry (for organic contaminants) or a combination of the two treatment processes. All treated and untreated materials will be placed on-site in a lined and capped cell with leachate collection. This operable unit is currently in the remedial design phase.

▲Operable Unit 2 (OU2) addresses the contaminated groundwater beneath and downgradient of the Carroll and Dubies site. This is the final operable unit and is the subject of this ROD.

SUMMARY OF SITE CHARACTERISTICS

The nature and extent of groundwater contamination found at the Carroll and Dubies site was assessed through sampling of groundwater, sediment in Gold Creek, residential wells and through groundwater modeling and geophysical surveys. A total of 34 monitoring wells was installed and four groundwater sampling events were conducted during the investigation.

The geology under the Site consists of unconsolidated overburden materials of glacial and glaciofluvial origin, which overlie shale bedrock. The thickness of the unconsolidated overburden materials ranges from zero foot at the exposed bedrock slope forming the northwestern Site boundary, to over 60 feet along the towpath. The glacially derived materials consist of two distinct units, including a glacial till unit overlain by glacial outwash deposits. The outwash deposit, which constitutes an aquifer, ranges in thickness from 31 feet to 52 feet along the downgradient edge of the Site. The glacial till is not continuous beneath the Site, and appears to pinch out toward the northwestern edge of the Site, adjacent to the exposed bedrock slope. The till formation is defined as an aquitard, because it consists of silt and clay, which typically have low permeability.

The till formation is underlain by shale bedrock. Groundwater found in the bedrock can be developed and therefore the bedrock is defined as an aquifer. The depth to groundwater from ground surface ranged from approximately 30 to 40 feet along the southeastern boundary of the Site. Groundwater movement beneath the Site is generally to the southeast, towards Gold Creek, which is located approximately 1,500 feet southeast of the Carroll and Dubies property line (see Figure 2).

Groundwater samples were collected downgradient of the lagoons and analyzed for organic and inorganic compounds. The monitoring wells monitor either the bedrock (well depths ranging from 39 feet to 86 feet below land surface), the glacial till (well depth at 60 feet below land surface), the glacial outwash (well depths ranging from 16 feet to 58 feet below land surface) or both the glacial till and outwash units (well depths ranging from 35 feet to 51 feet below land surface). The analytical results for the groundwater samples for the 1991, 1993, 1994, and 1995 sampling events did not indicate the presence of organic contaminants above federal drinking water or State drinking water or groundwater standards in any of the bedrock or glacial till monitoring wells. No pesticides or PCBs were detected in any of the groundwater samples collected from the Site. The sampling events did show VOCs, semivolatile organic compounds (SVOC), and chlorinated organic compounds at concentrations exceeding federal drinking water and State groundwater and drinking water standards in monitoring wells that are screened in the outwash and across the outwash and till interface (see Table 1). As a result two plumes of total organic compounds exceeding 100 micrograms per liter (µg/L) or parts per billion (ppb) were defined (see Figure 3). One plume originates at lagoons 1 and 2, the other at lagoons 7 and 8. The concentration of organics in the groundwater decreases dramatically further downgradient of the lagoons, which suggests that significant attenuation of contaminants has occurred. This has been simulated through groundwater modeling conducted at the Site. The plumes are of limited extent and have not extended far enough to impact Gold Creek, or to affect groundwater or the residential wells south of Gold Creek.

The discussion below is intended to summarize groundwater results for organic constituents by plume (i.e., results of samples collected from monitoring wells in the plume downgradient from

lagoons 1-4 and results of samples collected from monitoring wells in the plume downgradient of lagoons 6-8). The discussion focuses on the 1994 and 1995 sampling results, as these results indicate the highest concentrations of organic contaminants and during these sampling events all wells in the monitoring network had been installed (the wells had been installed in phases).

Groundwater Downgradient of Lagoons 1-4

During the 1994 sampling event, four organic compounds, benzene, 1,2-dichloroethene, tetrachloroethene and trichloroethene were detected above the federal drinking water and/or State drinking water and groundwater standards in the monitoring wells located downgradient of lagoons 1 through 4. The highest concentrations of the chlorinated organic compounds were observed in shallow outwash well OW-2, located downgradient of lagoon 2. Groundwater samples from monitoring well OW-2 detected 1,2-dichloroethene at 130 ppb, tetrachloroethene at 100 ppb, and trichloroethene at 24 ppb. The federal drinking water and State drinking water standards for tetrachloroethene and trichloroethene are 5 ppb; the State drinking water standard for 1,2-dichloroethene is 5 ppb, which is more stringent than the federal standard. Benzene was observed in shallow outwash well MW-4 at 15 ppb. The State groundwater standard for benzene is 0.7 ppb. The 1995 groundwater results detected organic constituents at similar concentrations as those detected during the 1994 sampling event.

Groundwater Downgradient of Lagoons 6-8

Groundwater data collected in the 1995 sampling event, in the vicinity of lagoons 7 and 8, indicates that benzene is the primary organic contaminant in the plume originating from these lagoons. During the 1995 sampling of monitoring wells located downgradient of lagoons 6, 7 and 8 (OW-9, OW-10, OW-11, OW-12, OW-13), benzene (State groundwater standard of 0.7 ppb) was detected in monitoring well OW-9 at 900 ppb. Monitoring well OW-10, which is located immediately downgradient of lagoon 8, had concentrations of benzene at 2,600 ppb, xylene at 30 ppb (State drinking water standard of 5 ppb), and isophorone at 440 ppb (State drinking water standard of 10 ppb). Monitoring well OW-11 had concentrations of benzene at 970 ppb, ethylbenzene at 30 ppb (State drinking water standard of 5 ppb), xylene at 51 ppb, and naphthalene at 17 ppb (State drinking water standard of 10 ppb).

Benzene and phenol (State drinking water standard of 1 ppb) were detected at 2,400 ppb and 55 ppb, respectively, in monitoring well OW-12. Monitoring well OW-13 had concentrations of 1,2-dichloroethene at 20 ppb, benzene at 350 ppb, and vinyl chloride at 34 ppb (State drinking water standard of 2 ppb). The 1994 groundwater results detected organic constituents at similar concentrations as those detected during the 1995 sampling event.

As previously stated, the concentrations of organics in groundwater in the outwash aquifer decreased dramatically downgradient from the lagoons in the 1994 and 1995 sampling rounds. In 1995, sampling data from the furthest downgradient wells from the lagoons (OW-17, OW-18, OW-19, and OW-23) only indicated three organic compounds above the State drinking water standards. Benzene was detected at 12 ppb, chlorobenzene at 10 ppb and xylene at 29 ppb in monitoring well OW-18. Benzene and chlorobenzene were detected at 6 ppb and 8 ppb, respectively in monitoring well OW-19. No organic compounds were detected in monitoring wells OW-17 and OW-23.

The discussion below is intended to summarize groundwater results for inorganic constituents. The discussion focuses on the 1994, 1995 and 1996 sampling results.

Inorganic sampling results for the September 1994 and April 1995 sampling events were contradictory, leading EPA to conduct another round of groundwater samples in July 1996. Groundwater samples collected in the 1994 sampling event were non-filtered inorganic samples. Although the results of the 1994 analyses indicated the presence of inorganic compounds, very few samples indicated concentrations above federal drinking water and State drinking water and groundwater standards. Monitoring well OW-19 detected arsenic at 28.9 ppb (State groundwater standard of 25 ppb), chromium was found in monitoring well OW-9 at 123 ppb (State groundwater standard of 50 ppb), antimony was found at 65 ppb (State groundwater standard of 3 ppb) in monitoring well OW-23. For each of the inorganic compounds that exceeded their respective criteria (arsenic, chromium and antimony) exceedances occurred in only one sample out of the 32 samples collected.

Groundwater samples collected in the 1995 sampling event were highly turbid. These samples were filtered in the field. The results of the 1995 inorganic analyses indicated the presence of

various inorganic constituents in the groundwater downgradient of the lagoons above background concentrations. Several inorganic constituents were detected at concentrations that exceeded the federal drinking water and/or State drinking water and groundwater standards. Monitoring well OW-10 detected antimony at 15 ppb (State groundwater standard of 3 ppb) and nickel at 425 ppb (there is no drinking water standard for nickel at this time), arsenic was detected at 105 ppb (State groundwater standard of 25 ppb) in monitoring well OW-20, chromium was detected at 669 ppb (State groundwater standard of 50 ppb) in monitoring well OW-13, and lead was detected at 283 ppb (federal drinking water action level of 15 ppb) in monitoring well OW-9.

Due to the inconsistency between the 1994 and 1995 sampling results for inorganic constituents, EPA conducted another sampling event for inorganic constituents in July 1996. It was suspected that the high concentrations of inorganics detected in 1995 may have been an artifact of highly turbid samples resulting from the sampling protocols used at that time. Because of this, the July 1996 groundwater samples were collected via a low-flow pump, and these samples were not filtered. Also, during sample collection, the presence of high turbidity in some of the samples was observed, an indication that the filter pack around the screen zone had become filled with fine particles from the geologic formation. Therefore some monitoring wells were re-developed prior to collecting the groundwater samples. The results of this sampling event only indicated the presence of inorganic compounds in three samples. Chromium was detected in monitoring well OW-9 at 70 ppb (State groundwater standard of 50 ppb), arsenic was detected at 43 ppb and 37 ppb (State groundwater standard of 25 ppb) in monitoring wells OW-19 and OW-18, respectively.

The levels of inorganics detected in the 1995 samples tend to directly depend on the amount of suspended sediment (turbidity) in the samples. Since the excessive turbidity present in the 1995 groundwater samples is believed to be both an artifact of sampling and clogging of the filter pack in the wells, these higher levels are not representative of true Site conditions in the aquifer. Therefore, the results of the groundwater data suggests that the inorganic compounds found in the groundwater beneath the Site are likely present at naturally occurring levels. As the potential for inorganic compounds to be present

in groundwater at concentrations above naturally occurring levels due to leaching from the lagoon sediments is low, the potential for these inorganic compounds to subsequently discharge with groundwater to Gold Creek is also low. It should be noted that the results from the 1994 sampling event for inorganic constituents were included in the risk assessment (see Summary of Site Risks below).

Sediment samples were collected from two locations in Gold Creek south of the Site. These samples were collected in September 1994 and analyzed for organic and inorganic compounds. The analytical results of the sampling indicate that Site related contaminants have not impacted Gold Creek.

As part of the RI, groundwater modeling was conducted to determine whether the organic contaminant patterns found in the groundwater beneath the Site have stabilized due to intrinsic biodegradation and to estimate future concentrations of contaminants at potential off-site locations. The results of the groundwater modeling indicate that the organic contaminants in the groundwater are not migrating to Gold Creek and that the concentration patterns observed at the Site have stabilized or are not expected to change in the future. Thus, contaminants in the groundwater beneath the Site are not expected to reach Gold Creek or off-site residences in the future.

Also, as part of the RI, limited data was collected to evaluate the extent of biodegradation at the Site. This limited evaluation included the collection of dissolved oxygen and the presence of microorganisms in the groundwater capable of degrading volatile organic compounds under expected Site conditions. The dissolved oxygen levels in the benzene plume indicated the potential for biodegradation to be occurring; the degrading microorganisms population was in the range of 10^5 to 10^6, indicating a healthy and robust community of degraders present in the aquifer. Therefore, the limited field data combined with the groundwater modeling projections demonstrate the potential for biodegradation of organic contaminants at the Site. The groundwater modeling results estimated that contaminants will attenuate to levels below State and Federal drinking water standards within five years after completion of the OU1 remedy.

The City of Port Jervis is served by a municipal water supply that relies on three hydraulically-upgradient reservoirs as water sources. Outside of the City limits, private supply wells provide drinking water. It should be noted that the New York State Department of Health (NYSDOH) sampled several wells located downgradient of the Site while the RI/FS was being conducted. Several private wells were sampled in 1991 and again in 1993 for organic and inorganic constituents. Organic constituents were not detected in the groundwater from these wells, and inorganic constituents were detected below drinking water standards. Subsequently, in September 1994 and March 1995, NYSDOH sampled and analyzed a total of ten private wells in the area for volatile organic compounds. The wells were located along Andrew Drive, Evergreen Lane, Mark Drive, Michael Drive, Van Avenue, and NY Route 209. The results indicate that no volatile organic compounds were detected in any of the wells sampled.

SUMMARY OF SITE RISKS

EPA conducted a baseline risk assessment to evaluate the potential risks to human health and the environment associated with the Site groundwater under current and future conditions. The Risk Assessment focused on contaminants in the groundwater at the Site, which are likely to pose significant risks to human health and the environment, if no remedial action were taken.

Human Health Risk Assessment

As part of the baseline risk assessment, the following four-step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario: *Hazard Identification*--identifies the contaminants of concern at the site based on several factors such as toxicity, frequency of occurrence, and concentration. *Exposure Assessment*--estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathway (e.g, ingesting contaminated well-water) by which humans are potentially exposed. *Toxicity Assessment*--determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response). *Risk Characterization*--summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative (e.g., one-in-a-million

excess cancer risk) assessment of site-related risks.

The baseline risk assessment began with the selection of contaminants of concern. A summary of the contaminants of concern detected in the groundwater is provided in Table 2. These contaminants included the organic contaminants benzene, chloroform, 1,2-dichlorobenzene, tetrachloroethene, toluene, vinyl chloride, xylene, phenol, and the inorganic contaminants arsenic, antimony, barium, chromium, lead, and zinc. The organic contaminants were present in monitoring wells close to the lagoons at levels which exceeded State and Federal drinking water standards and State groundwater standards.

EPA's baseline risk assessment addressed the potential risks to human health by identifying several potential exposure pathways by which the public may be exposed to contaminant releases at the Site under current and future land-use conditions. Table 3 provides the potential exposure pathways for current and future land-use scenarios evaluated in the risk assessment.

There are no current on-site groundwater users at the Site, therefore there are no potential current receptors at the Site. Potential off-site receptors included residents to the east and southeast of Gold Creek who use groundwater as drinking water and recreational users of Gold Creek. Groundwater modeling, in conjunction with measured groundwater concentrations, sediment data from Gold Creek and groundwater concentrations from off-site residential wells, indicates that the plumes have stabilized and that contaminants have not migrated either to Gold Creek or to off-site residences on the other side of Gold Creek, nor are they expected to migrate to or beyond Gold Creek in the future. Thus, current exposures to either off-site residents or recreational users of Gold Creek are not occurring and are not expected to occur in the future. These exposure pathways therefore, were not quantitatively evaluated in the risk assessment.

The Site and land immediately adjacent to the Site are currently zoned exclusively for industrial land use; the Site is surrounded by a sheer rock cliff, the City of Port Jervis Landfill and gravel and cement block manufacturing operations. Therefore, future residential or commercial use of the Site is not expected to occur and industrial use of the Site was the only use evaluated in the risk assessment.

EPA was concerned that industrial workers at the Site could be exposed to contaminants in the groundwater and evaluated these potential exposures in the risk assessment. The baseline risk assessment considered the potential health effects for industrial workers that could result from incidental ingestion of contaminated groundwater from the on-site aquifer.

Under current EPA guidelines, the likelihood of carcinogenic (cancer-causing) and non-carcinogenic health effects due to exposure to Site chemicals are considered separately. It was assumed that the toxic effects of the Site-related chemicals would be additive. Thus, carcinogenic risks and non-carcinogenic health effects associated with exposures to individual compounds of concern were summed to indicate the potential risks associated with mixtures of potential carcinogens and non-carcinogens, respectively.

Potential carcinogenic risks were evaluated using the cancer slope factors developed by EPA for the contaminants of concern. Cancer slope factors (SFs) have been developed by EPA's Carcinogenic Risk Assessment Verification Endeavor (an Inter-agency workgroup of scientists with expertise in carcinogens) for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. SFs, which are expressed in units of $(mg/kg\text{-}day)^{-1}$, are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to generate an upper-bound estimate of the excess lifetime cancer risk associated with exposure to the compound at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the SF. Use of this approach makes the underestimation of the risk highly unlikely. The SF for the compounds of concern are presented in Table 4 (see column identified as cancer slope factor).

For known or suspected carcinogens, EPA considers excess upper-bound individual lifetime cancer risks in the range of 10^{-4} to 10^{-6} to be acceptable. This level indicates that an individual has not greater than a one in ten thousand to one in a million chance of developing cancer as a result of Site-related exposure to a carcinogen over a 70-year period under specific exposure conditions at the Site. As noted above, under the current Site

conditions, there are no current on-site groundwater users at the Site, therefore there are no potential current receptors at the Site. Evaluation of risks to potential future industrial workers was 1.4×10^{-4} (approximately one-in-ten thousand) which is considered to be within the U.S. EPA target risk range of 10^{-4} to 10^{-6}. The main contributors to the total cancer risk were arsenic, vinyl chloride, and benzene through ingestion of groundwater. A summary of the carcinogenic risks associated with the chemicals for a potential future industrial worker drinking contaminated groundwater is found in Table 5.

Non-carcinogenic health effects were assessed using a hazard index (HI) approach, based on a comparison of expected contaminant intakes and safe levels of intake (Reference Doses). Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects. RfDs, which are expressed in units of milligrams/kilogram-day (mg/kg-day), are estimates of daily exposure levels for humans which are thought to be safe over a lifetime (including sensitive individuals). Estimated intakes of chemicals from environmental media (the amount of a chemical ingested from contaminated drinking water) are compared to the RfD to derive the hazard quotient for the contaminant in the particular medium. The HI is obtained by adding the hazard quotients for all compounds across all media that impact a particular receptor population.

An HI greater than 1.0 indicates that the potential exists for non-carcinogenic health effects to occur as a result of site-related exposures. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media. The reference doses for the compounds of concern at the Site are presented in Table 4.

The calculated HI value, which reflects non-carcinogenic effects, was estimated to be 0.55 which is below the acceptable level of 1.0 indicating no adverse health effects to future industrial workers. The main contributor to the total noncancer risk was arsenic through ingestion of drinking water. A summary of the non-carcinogenic risks associated with the chemicals for a potential future industrial worker drinking contaminated groundwater is found in Table 5.

Ecological Risk Assessment

There are no impacts to ecological receptors in Gold Creek, since contaminants in groundwater have not migrated to Gold Creek and are not anticipated to migrate there in the future.

Uncertainties

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis
- environmental parameter measurement
- fate and transport modeling
- exposure parameter estimation
- toxicological data.

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources including the errors inherent in the analytical methods and characteristics of the matrix being sampled.

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the chemicals of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the chemicals of concern at the point of exposure.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals and the availability of toxicity data for all chemicals of concern. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the Risk Assessment provides upper-bound estimates of the risks to populations near the Site, and is highly unlikely to

underestimate actual risks related to the Site.

More specific information concerning public health risks, including a quantitative evaluation of the degree of risk associated with various exposure pathways, is presented in the Risk Assessment Report.
Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in the ROD, may present an imminent and substantial endangerment to the public health, welfare, or the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives are specific goals to protect human health and the environment. These objectives are based on available information and standards such as applicable or relevant and appropriate requirements (ARARs) and risk-based levels established in the risk assessment.

The remedial action objective for the groundwater beneath the Site is to reduce or eliminate potential health risks associated with ingestion of Site contaminated groundwater by potential future industrial workers and to reduce the concentration of contaminants in the groundwater to drinking water standards.

DESCRIPTION OF REMEDIAL ALTERNATIVES

CERCLA requires that each selected site remedy be protective of human health and the environment, be cost effective, comply with federal and state requirements that are legally applicable or relevant and appropriate, and utilize permanent solutions and alternative technologies and resource recovery alternatives to the maximum extent practicable. In addition, the statute includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

This ROD evaluates in detail four remedial alternatives for addressing the contaminated groundwater beneath the Carroll and Dubies Sewage Disposal Inc., Site. Since each alternative would still result in contaminants remaining at the Site above levels which allow for unrestricted use and unlimited exposure, each alternative would require five-year reviews to ensure that the

remedial action is protective of human health and the environment. Five-year reviews are currently required as part of OU1. As used in the following text, the time to implement a remedial alternative reflects only the time required to construct or implement the remedy and does not include the time required to design the remedy, negotiate with the responsible parties, or procure contracts for design and construction, or conduct operation and maintenance at the Site.

Alternative 1: No Action

Capital Cost:	$ 0
O & M/yr Cost:	$ 0
Present Worth:	$ 0
Time to Implement:	0 months

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with other alternatives. As demonstrated through the results of the groundwater modeling study, naturally occurring processes for reducing the concentration of contaminants in the groundwater are at work at the Site. Under this alternative, no action would be taken to address the contaminated groundwater. There would be no monitoring of these naturally occurring processes in the groundwater to evaluate the rate and extent of the reduction and mobilization of contaminants in the groundwater beneath the Site. The period for the groundwater to reach federal drinking water and State drinking and groundwater standards was projected through the groundwater modeling to be approximately five years after the implementation of the OU1 remedy. The remediation of the lagoons, which will be implemented under OU1, would minimize any additional contaminant contribution to the groundwater.

Alternative 2: Natural Attenuation with Institutional Controls and Monitoring

Capital cost:	$ 0
O & M/yr Cost:	$ 58,000
Present Worth:	$ 284,000
Time to Implement:	6 months

Similar to Alternative 1, Alternative 2 would also rely on natural attenuation, with intrinsic biodegradation as a principal

mechanism, to reduce contaminants in the groundwater to drinking water standards. The remediation of the lagoons and the contaminated soils, which will be implemented under OU1, would minimize any additional contaminant contribution to the groundwater. This alternative includes the implementation of institutional controls, such as deed restrictions, contractual agreements, local law or ordinances or other governmental action for the purpose of restricting installation and use of groundwater wells throughout the contaminated groundwater plume. These restrictions would complement any restrictions implemented as part of the OU1 remedy. Institutional controls restricting the use of Site groundwater would be required until the groundwater has been demonstrated to meet federal drinking water and State groundwater and drinking water standards. Groundwater modeling projected that intrinsic biodegradation and flushing mechanisms would reduce the concentration of contaminants in the groundwater to levels below drinking water standards within five years of the completion of the OU1 remediation. Once these levels have been demonstrated to be met, the restrictions on groundwater use would no longer be required. Groundwater monitoring at the Site and sampling in Gold Creek would also be conducted.

This alternative includes a component of initial assessment of the groundwater parameters which favor natural attenuation and a groundwater monitoring requirement to evaluate the rate and extent of reduction of the organic contaminants in the groundwater. The initial assessment would include an evaluation for the presence of constituent-degrading microorganisms, pH, oxygen or other electron acceptors, elemental nitrogen, phosphorous and other parameters necessary to evaluate the progress of natural attenuation. Groundwater monitoring would be conducted on a semiannual basis.

Alternative 3: Groundwater Pump and Treat via Precipitation, Filtration and Carbon Adsorption

Capital Cost:	$ 1,070,000
O & M/yr Cost:	$ 287,200
Present Worth:	$ 2,105,000
Time to Implement:	9 months

This alternative would consist of a series of recovery wells used

to capture contaminated groundwater immediately downgradient of the source areas or the lagoons. The recovery wells would capture the most concentrated portion of the contaminant plume emanating from the source areas. Any impacted groundwater that would not be captured by the recovery wells would be naturally attenuated. This alternative would eliminate the potential for migration of organic contaminants off site. The recovery wells would be located in that portion of the outwash aquifer located downgradient of the towpath. Beneath the lagoons, a saturated outwash unit does not exist.

The preliminary configuration of the treatment system assumes that approximately six wells would be used to pump groundwater at controlled rates to capture the impacted groundwater. Two sets of three pumping wells, each pumping at a rate of 5 gallons per minute (gpm), would be used. The total pumping rate of the six wells is 30 gpm. One set of wells would be located between 100 feet to 150 feet downgradient of lagoon 8. This set of three wells would be designed to capture impacted groundwater passing beneath lagoons 6, 7, and 8. One set of wells would be located between 100 feet to 125 feet downgradient of lagoons 1 and 2. This set of three wells would be designed to capture impacted groundwater passing beneath lagoons 1 and 2. The recovered groundwater would be treated on-site through a series of treatment processes. Conceptually, the treatment system would consist of iron and suspended solids removal via precipitation followed by filtration and carbon adsorption. Following treatment, the groundwater would be discharged to Cold Creek in accordance with the State Pollutant Discharge Elimination System (SPDES) requirements. Residuals generated from the treatment processes would be managed in accordance with the Resource Conservation and Recovery Act (RCRA) regulations.

This alternative would also include groundwater monitoring to measure the effectiveness of the pump-and-treat system, as well as the institutional controls specified in Alternative 2. The treatment system would be operated until contaminant levels in the groundwater reach federal drinking water and State drinking water and groundwater standards, which has been estimated to be approximately five years after implementation of the remedy for the lagoons.

Alternative 4: In Situ Groundwater Treatment

Capital Cost:	$ 1,017,000
O & M/yr Cost:	$ 248,000
Present Worth:	$ 1,912,787
Time to Implement:	12 months

This alternative involves the injection of air into the saturated zone (i.e., below the water table), via a series of wells, to reduce the volatile constituents dissolved in groundwater. These wells would be located in the same general vicinity as the pumping wells outlined in Alternative 3, thus allowing treatment of the most concentrated portion of the groundwater plumes. Any impacted groundwater that would not be captured by the in situ groundwater treatment system would be naturally attenuated. The levels of organic constituents would be decreased in the saturated zone during aquifer aeration via mass transfer of the chemicals from the water phase to the gaseous phase. If the levels of organic compounds exceed air quality guidelines, then a soil venting system would be installed in the subsurface to collect the air emissions. The exhaust air from the vapor extraction system would be discharged to a treatment system. The gaseous treatment system for this alternative would be an activated carbon filter. Groundwater monitoring would also be conducted as part of this alternative to evaluate the effectiveness of the air sparging system. A reduction in the levels of organics may also take place in the saturated zone through the enhancement of biodegradation due to the increase in oxygen. With this alternative, air sparging may be used in conjunction with vacuum extraction and/or enhanced bioremediation with the addition of nutrients.

A preliminary configuration of the aquifer aeration system would consist of approximately 30 air sparging wells. This alternative would include the same monitoring program and institutional controls described in Alternative 3. Treatment of the groundwater would continue until contaminant levels in the groundwater achieve federal drinking water and State drinking water and groundwater standards. This alternative would achieve groundwater remediation goals within about five years after implementation of the remedy for the lagoons.

SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative was assessed utilizing nine evaluation criteria as set forth in the National Contingency Plan, 40 C.F.R. §300.430(e)(9)(iii) and the Office of Solid Waste and Emergency Response (OSWER) Directive 9355.3-01. These criteria were developed to address the requirements of Section 121 of CERCLA, 42 U.S.C. §9621 to ensure all important considerations are factored into remedy selection decisions.

The following "threshold" criteria are the most important, and must be satisfied by any alternative in order to be eligible for selection:

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 exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. Compliance with Applicable or Relevant and Appropriate Requirements addresses whether or not a remedy would meet all of the applicable, or relevant and appropriate requirements of federal and state statutes and requirements or provide grounds for invoking a waiver.

The following "primary balancing" criteria are used to make comparisons and to identify the major trade-offs between alternatives:

3. Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

4. Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of a remedial technology, with respect to these parameters, that a remedy may employ.

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 periods until cleanup goals are achieved.

6. Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed.

7. Cost includes estimated capital and operation and maintenance costs, and the present worth costs.

The following "modifying" criteria are considered fully after the formal public comment period on the Proposed Plan is complete:

8. State acceptance indicates whether, based on its review of the RI/FS and the Proposed Plan, the State supports, opposes, and/or has identified any reservations with the preferred alternative.

9. Community acceptance refers to the public's general response to the alternatives described in the Proposed Plan and the RI/FS reports. Factors of community acceptance to be discussed include support, reservation, and opposition by the community.

A comparative analysis of the remedial alternatives based upon the above evaluation criteria follows.

Overall Protection of Human Health and the Environment

For No Action (Alternative 1) and Natural Attenuation with Institutional Controls and Monitoring (Alternative 2), the concentration of contaminants in the groundwater would be reduced due to natural attenuation of contaminants until federal drinking water and State drinking and groundwater standards are met. This period has been estimated to be approximately five years from implementation of the OU1 remedy. The No Action alternative would present a slightly greater risk to human health and the environment than Alternatives 2, 3, and 4 in the short-term because the potential would exist that an on-site worker could come in contact with the contaminated groundwater. Under

Alternative 2, protection of human health would be enhanced with the implementation of institutional controls, preventing the use of the contaminated groundwater.

For the Pump-and-Treat (Alternative 3) and *In Situ* Groundwater Treatment (Alternative 4) scenarios, the potential risks to human health from potential exposure to impacted groundwater would be reduced by removal and treatment of contaminants in the groundwater captured by the remedial systems. These alternatives would achieve groundwater remedial goals within about five years of the implementation of OU1. Institutional controls preventing the use of Site groundwater would eliminate the potential exposure to contaminated groundwater while the groundwater is being remediated. The contaminants would continue to migrate until attenuated under Alternatives 1 and 2. However, impacts are expected to be minimal since, as noted in the risk assessment section, the levels of contaminants in the groundwater present no significant human health risk under current or future uses. Furthermore, impacts to ecological receptors in Gold Creek from the implementation of all the remedial alternatives would be unlikely since contaminants in groundwater have not migrated to Gold Creek and are not anticipated to migrate there in the future.

Compliance with ARARs

Actions taken at any Superfund site must meet all ARARs of federal and state law or provide grounds for waiving these requirements. All of the alternatives have been designed to achieve or comply with the ARARs.

Since the groundwater at the Site is a future potential source of drinking water, federal drinking water standards (Maximum Contaminant Levels [MCLs]) and New York State Drinking Water Standards and New York State Groundwater Quality Standards are ARARs. For No Action (Alternative 1) and Natural Attenuation with Institutional Controls and Monitoring (Alternative 2), federal drinking water and State drinking water and groundwater standards would be achieved over time through natural biodegradation of organic contaminants in the groundwater. The period for the groundwater to reach federal drinking water and State drinking and groundwater standards was projected through groundwater modeling to be approximately five years from

implementation of the OU1 remedy. For the Pump-and-Treat (Alternative 3) and *In Situ* Groundwater Treatment (Alternative 4) scenarios, groundwater standards would be met by removal and treatment of contaminants in the groundwater. The discharge of treated groundwater to Gold Creek during implementation of Alternative 3 would comply with the Federal Clean Water Act and State Pollutant Discharge Elimination System (SPDES) regulations. The residual sludges from the treatment system under Alternative 3 would be treated or disposed of off-site in accordance with RCRA regulations. The spent carbon generated from the groundwater treatment system under Alternative 3 and the gas treatment system under Alternative 4 would either be regenerated off-site or sent off-site for treatment and disposal in accordance with RCRA regulations. As with Alternatives 1 and 2, federal drinking water and State drinking water and groundwater standards are expected to be achieved with Alternatives 3 and 4 within slightly less than five years after implementation of the OU1 remedy.

Long-Term Effectiveness and Permanence

With all four alternatives, within approximately five years of the implementation of OU1 remedy, the concentrations of contaminants in the groundwater are expected to be permanently reduced to levels below ARARs. Implementation of Alternatives 3 and 4 might result in a slightly reduced time frame to achieve ARARs downgradient of the lagoons. Therefore, all alternatives are relatively similar in terms of this criterion.

Reduction of Toxicity, Mobility, and Volume through Treatment

Alternatives 1 and 2 rely solely on naturally occurring mechanisms to reduce the toxicity and volume of contaminants in the groundwater, and therefore do not satisfy the CERCLA preference for treatment to reduce toxicity, mobility, and volume of contaminants. Under Alternatives 3 and 4, treatment to reduce contaminants in the groundwater would be achieved by extraction of the contaminants and subsequent treatment. Alternatives 3 and 4 are similar in their abilities to reduce toxicity, mobility and volume and would provide reduction of toxicity, mobility and volume somewhat more rapidly than Alternatives 1 and 2.

Short-Term Effectiveness

Alternatives 1 and 2 would have no adverse effects at all on the community, site workers, or the environment since there would be no potential exposure to any of the contaminants because no construction activities would occur. Alternative 2 includes Institutional controls preventing the use of Site groundwater, which would minimized impacts during implementation until cleanup goals are achieved. However, Alternatives 3 and 4 would present greater impacts than Alternatives 1 and 2, due to construction activities. For example, the construction of extraction wells and piping to transport the treated groundwater to Gold Creek would have minor negative impacts on residents and workers in the area. These impacts would be associated with the disruption of traffic, excavation on public and private land, and noise and fugitive dust emissions. Appropriate measures, however, would be implemented to minimize these impacts.

Implementability

Alternative 1 - No Action is clearly the most implementable. Alternative 2 would require groundwater-use restrictions to prevent the use of groundwater wells throughout the contaminated aquifer; although sometimes difficult to obtain, these restrictions are being used at numerous sites. Alternative 2 would also require additional geochemical and intrinsic biodegradation studies and monitoring. These studies and monitoring requirements are being implemented at numerous sites. Alternatives 3 and 4 would be more difficult to implement due to construction requirements. Additionally, Alternative 3 would require that access be obtained to construct the piping to transport the treated groundwater to Gold Creek; authorization to discharge treated water to Gold Creek would add to the complexity of implementing this remedy. Nonetheless, these are successfully proven technologies at the field scale and considered to be readily implementable.

Cost

There is no cost associated with the No Action alternative. Alternative 2, Natural Attenuation with Institutional Controls and Monitoring, is the next lowest cost alternative with a

present worth of $284,000; there is no capital cost associated with this alternative. Alternative 3, Groundwater Pump and Treat, has the highest cost with a present worth and capital cost of $2,105,000 and $1,070,000, respectively. Alternative 4, *In Situ* Groundwater Treatment, with a present worth and capital cost of $1,912,787 and $1,017,000, respectively, is slightly less than Alternative 3.

State Acceptance

The State of New York, through the NYSDEC, concurs with EPA's selected remedy. The NYSDEC's letter of concurrence is attached as Appendix IV.

Community Acceptance

Community acceptance of the preferred remedy has been assessed in the Responsiveness Summary portion of this ROD following review of all public comments received on the RI/FS report and the Proposed Plan. All comments submitted during the public comment period were evaluated and are addressed in the attached Responsiveness Summary (Appendix V). In general, the public is supportive of EPA's preferred remedy.

SELECTED REMEDY

EPA has determined, after reviewing the alternatives and public comments, that Alternative 2 is the appropriate remedy for the groundwater beneath and downgradient of the Site, because it best satisfies the requirements of CERCLA and the NCP's nine evaluation criteria for remedial alternatives.

The major components of the selected remedy are as follows:

- Natural attenuation of organic contaminants in the groundwater to below federal drinking water and State groundwater standards through naturally occurring removal processes. The remediation of the lagoons, which will be implemented under OU1, will minimize any additional contaminant contribution to the groundwater. Groundwater modeling estimated that contaminants would attenuate to these standards within five years of completion of the remedy selected for OU1.

- Implementation of institutional controls, such as deed restrictions, contractual agreements, local law or ordinances or other governmental action for the purpose of restricting installation and use of groundwater wells throughout the contaminated groundwater plume.

- Monitoring of the groundwater to evaluate improvement in groundwater quality and ensure the effectiveness of the remedy.

- Sampling in Gold Creek to ensure that site related contaminants do not impact the creek.

STATUTORY DETERMINATIONS

Under Section 121 of CERCLA, EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment, and complies with federal and State requirements that are legally applicable or relevant and appropriate unless a statutory waiver is justified. The selected remedy also must be cost-effective and utilize permanent solutions and alternative treatment technologies or resource-recovery technologies to the maximum extent practicable. Finally, the statute includes a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous substances. The following sections discuss whether and how the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

The selected remedy is protective of human health and the environment. The concentration of contaminants in the groundwater will be reduced to federal drinking water and State drinking and groundwater standards via natural attenuation. It has been estimated that these levels will be met approximately five years after implementation of the OU1 remedy. Under this remedy, protection of human health would be enhanced with the implementation of institutional controls, preventing the use of the contaminated groundwater.

Compliance with ARARs

Alternative 2 remedy will comply with all ARARs for the groundwater. These ARARs include the Federal Safe Drinking Water Act Maximum Contaminant Levels (MCLs) (40 CFR Part 141.11-141.16 and Part 141.60-141.63), the New York Public Water Supply Regulations (NYCRR Title 10, Part 5-1), and New York State Water Classifications and Quality Standards for Class GA Ground Water (NYCRR, Title 6, Parts 701-703). It has been estimated that these levels would be met approximately five years after implementation of the OU1 remedy.

Cost-Effectiveness

The selected remedy is cost-effective because it has been demonstrated to provide overall effectiveness proportional to its costs. The selected remedy is technically and administratively implementable and represents the lowest cost of the alternatives considered while achieving cleanup objectives in approximately the same time-frame. The present worth of the selected alternative is $284,000. There are no capital costs associated with this remedial action.

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The selected remedy addresses all of the media of concern and utilizes permanent solutions and treatment technologies to the maximum extent practicable. In addition, the selected remedy provides the best balance of trade-offs among the alternatives evaluated with respect to the evaluation criteria.

Preference for Treatment as a Principal Element

Alternative 2 relies solely on naturally occurring mechanisms to reduce the toxicity, mobility and volume of contaminants in the groundwater. Groundwater modeling has predicted that Alternative 2 will attain ARARs in approximately the same time frame, five years after the implementation of the OU1 remedy, as the other alternatives. This remedy is the most practical choice to address the contamination of the groundwater underlying and downgradient of the Carroll and Dubies site, even though it does not satisfy the CERCLA preference for treatment.

DOCUMENTATION OF SIGNIFICANT CHANGES

There are no significant changes from the preferred alternative, as presented in the Proposed Plan.

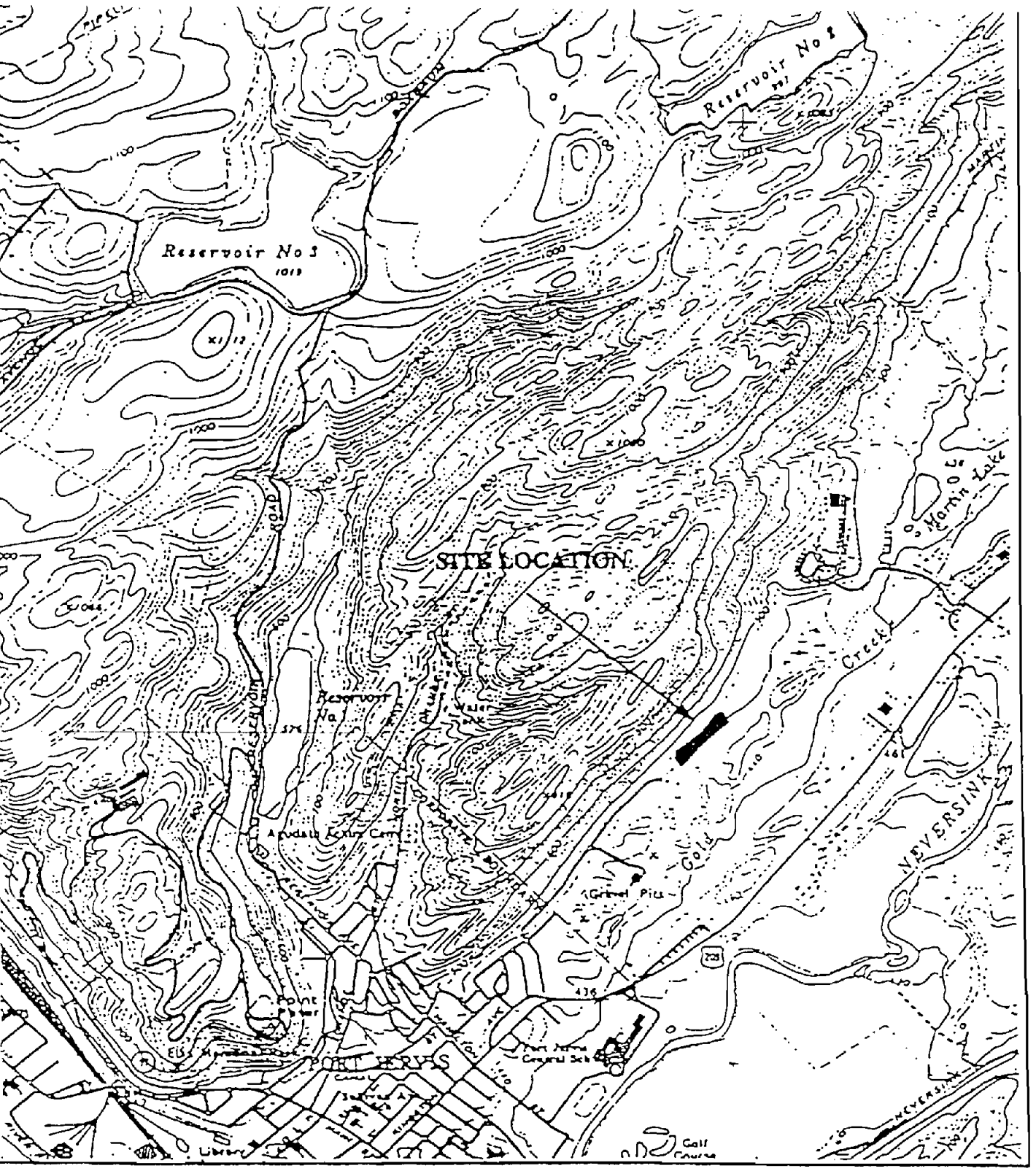
APPENDIX I

FIGURES

Figure 1 - Site Location Map

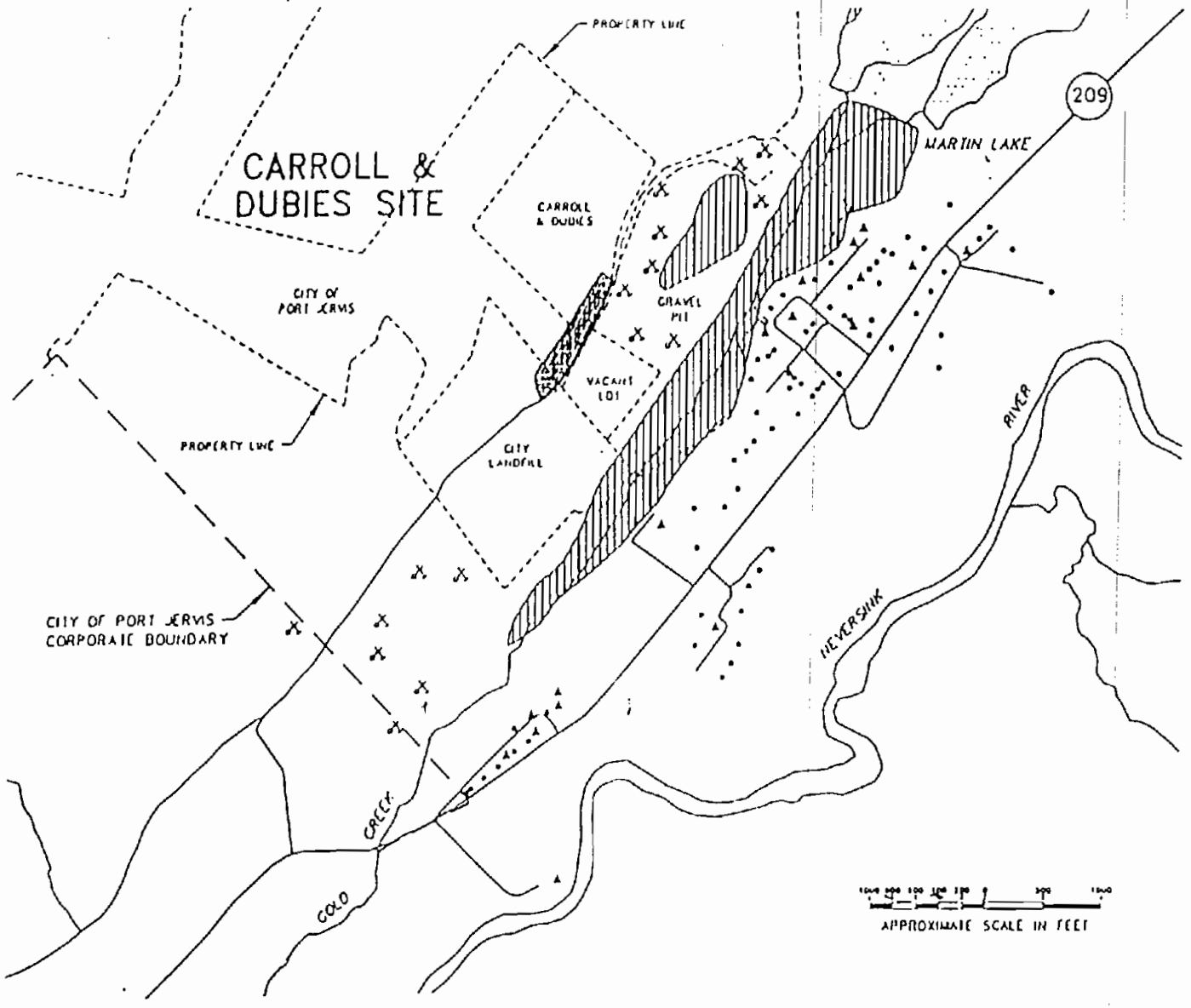
Figure 2 - Site Layout Map

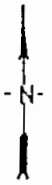
Figure 3 - Isoconcentration Contours of Total Organics in the Outwash Formation



Carroll and Dubies Site, Port Jervis, New York

Source: USGS 7½ MIN. Topographic Quad.
Port Jervis North, NY-PA 1969





GRAVEL PIT

SURFACE WATER

WETLANDS

RESIDENTIAL WELL (ASSUMED LOCATION)

RESIDENTIAL WELL (CONFIRMED LOCATION)

NOTES: 1. LOCATIONS ARE APPROXIMATE.

SOURCES: 1. USGS 7.5 MIN TOPOGRAPHIC QUADRANGLE MAP, PORT JERVIS NORTH, NY-PA (1955)

2. NYSDOT 7.5 MIN SERIES QUADRANGLE MAPS, GOSHEN, NY (1991), PORT JERVIS NORTH, NY-PA, (1991), PORT JERVIS SOUTH, NJ-NY-PA, (1991)

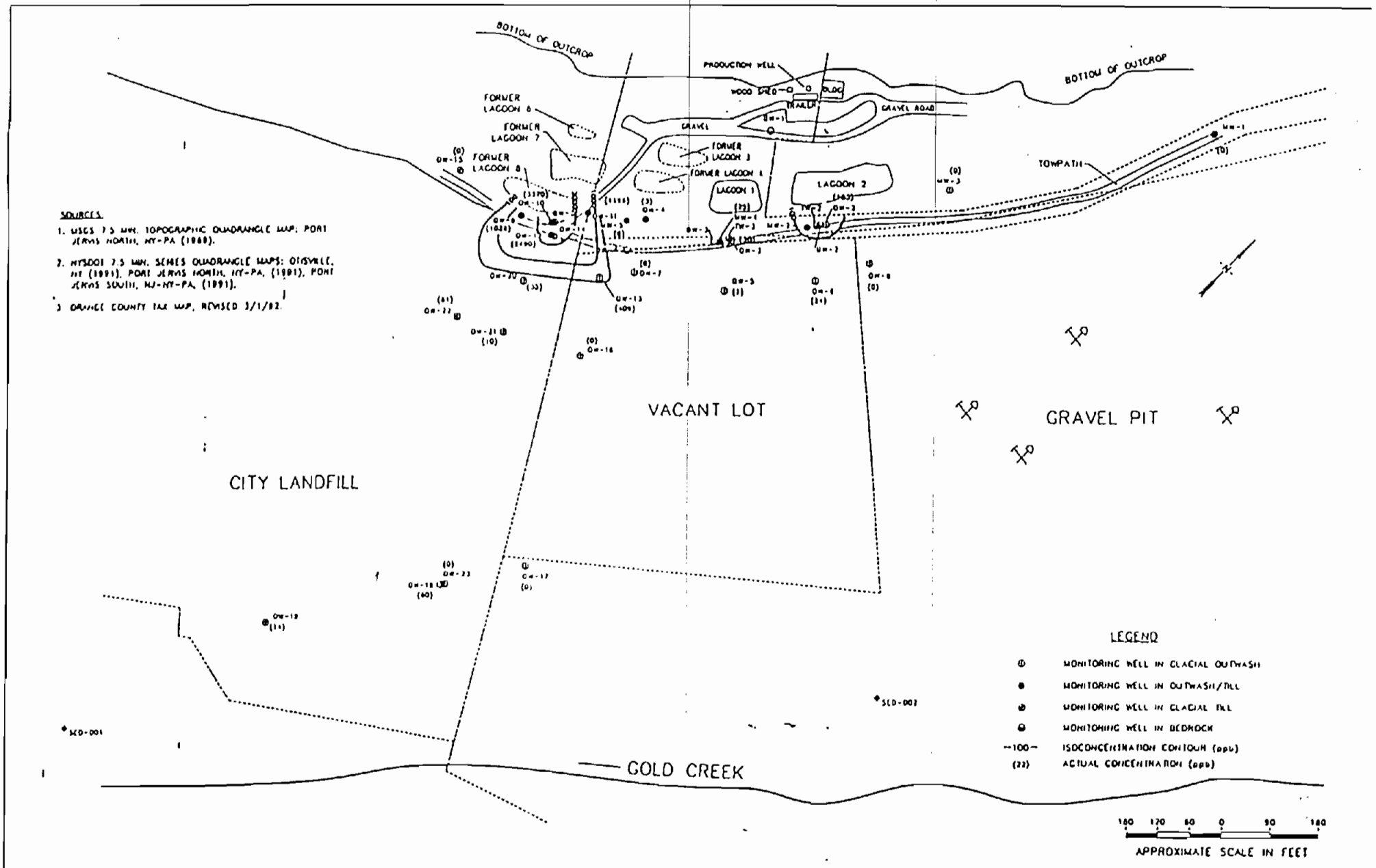
3. ORANGE COUNTY TAX MAP, REVISED 3/1/93.

CARROLL AND DUBIES
DEER PARK, NEW YORK
3-1844-430

Site Layout Map

SUPERFUND SITE
PORT JERVIS, NEW YORK

FIGURE 2



CARROLL AND DUBIES
DEER PARK, NEW YORK
3-1614-225

ISOCONCENTRATION CONTOURS OF TOTAL ORGANICS IN OUTWASH FORMATION
APRIL, 1995
SUPERFUND SITE
PORT JERVIS, NEW YORK

RETEC

FIGURE 3

APPENDIX II

TABLES

TABLE 1 (Continued)

VOLATILE ORGANIC COMPOUNDS
EXCEEDANCES FOUND IN GROUNDWATER SAMPLES

CARROLL & DUBIES SUPERFUND SITE
PORT JERVIS, NEW YORK

Well Number	OW-2		OW-3		OW-4		OW-5		OW-6		OW-7		OW-8		OW-9		OW-9		Federal	NYSDEC
Sampling Date:	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	MCL	SGV
VOLATILES (ug/L)																				
Chloromethane																			NA	NA
Bromomethane																			NA	5 (G)
Vinyl Chloride															4			5	2	2 (S)
Chloroethane																			NA	5 (S)
Methylene Chloride																			5	5 (S)
Acetone																			NA	50 (G)
Carbon Disulfide																			NA	NA
1,1-Dichloroethene																			7	5 (S)
1,1-Dichloroethane																			NA	5 (S)
1,2-Dichloroethene(total)	130	85					19	7											70	5 (S)
Chloroform																			100	7 (S)
1,2-Dichloroethane																			5	5 (S)
2-Butanone																			NA	50 (G)
1,1,1-Trichloroethane																			200	5 (S)
Carbon Tetrachloride																			5	5 (G)
Bromodichloromethane																			100	50 (G)
1,2-Dichloropropane																			5	5 (S)
cis-1,3-Dichloropropene																			NA	5 (S)
Trichloroethene	24	22							6										5	5 (S)
Dibromochloromethane																			NA	50 (G)
1,1,2-Trichloroethane																			5	5 (S)
Benzene			15								8				530	900		780	5	0.7 (S)
Trans-1,3-Dichloropropene																			NA	5 (S)
Bromoform																			100	50 (G)
4-Methyl-2-Pentanone																			NA	NA
2-Hexanone																			NA	50 (G)
Tetrachloroethene	100	76							17	19									5	5 (S)
Toluene																			1,000	5 (S)
1,1,2,2-Tetrachloroethane																			NA	5 (S)
Chlorobenzene																			NA	5 (S)
Ethylbenzene																			700	5 (S)
Styrene																			100	5 (S)
Total Xylenes																			10,000	5 (S)

Notes:
Analysis performed by method 8240.
Data for wells OW-12 and OW-14 have been corrected for this table.
MCL - Federal Maximum Contaminant Level.
SGV - NYSDEC Ambient Water Quality Standards (S) and Guidance (G) Values.
NA - Not applicable/no value available.

U Compound not detected above the sample quantitation limit.
J Reported value is estimated based on data validation.
E Concentration exceeded calibration range of instrument.
D Diluted sample.
B Compound was found in blank.

TABLE 2 (Continued)

VOLATILE ORGANIC COMPOUNDS
EXCEEDANCES FOUND IN GROUNDWATER SAMPLES

CARROLL & DUBIES SUPERFUND SITE
PORT JERVIS, NEW YORK

Well Number	OW-10		OW-10		OW-11		OW-14		OW-13		OW-13		OW-12		OW-15		OW-16		Federal	NYSDEC
Sampling Date:	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	MCL	SGV
VOLATILES (ug/L)																				
Chloromethane																			NA	NA
Bromomethane																			NA	5 (G)
Vinyl Chloride									9	34			4						2	2 (S)
Chloroethane																			NA	5 (S)
Methylene Chloride																			5	5 (S)
Acetone	68						51												NA	50 (G)
Carbon Disulfide																			NA	NA
1,1-Dichloroethene																			7	5 (S)
1,1-Dichloroethane																			NA	5 (S)
1,2-Dichloroethene(total)					8				6	20									70	5 (S)
Chloroform																			100	7 (S)
1,2-Dichloroethane					8														5	5 (S)
2-Butanone																			NA	50 (G)
1,1,1-Trichloroethane																			200	5 (S)
Carbon Tetrachloride																			5	5 (G)
Bromodichloromethane																			100	50 (G)
1,2-Dichloropropane																			5	5 (S)
cis-1,3-Dichloropropene																			NA	5 (S)
Trichloroethene																			5	5 (S)
Dibromochloromethane																			NA	50 (G)
1,1,2-Trichloroethane																			5	5 (S)
Benzene	1100	2600		2900	550	970			40	390		350	1100	2400					5	0.7 (S)
Trans-1,3-Dichloropropene																			NA	5 (S)
Bromoform																			100	50 (G)
4-Methyl-2-Pentanone																			NA	NA
2-Hexanone																			NA	50 (G)
Tetrachloroethene																			5	5 (S)
Toluene	8												18						1,000	5 (S)
1,1,2,2-Tetrachloroethane																			NA	5 (S)
Chlorobenzene													9						NA	5 (S)
Ethylbenzene	9				20	30							12						700	5 (S)
Styrene																			100	5 (S)
Total Xylenes	53	30			62	51							50						10,000	5 (S)

Notes:
Analysis performed by method 8240.
Data for wells OW-12 and OW-14 have been corrected for this table.
MCL - Federal Maximum Contaminant Level.
SGV - NYSDEC Ambient Water Quality Standards (S) and Guidance (G) Values.
NA - Not applicable/no value available.

U Compound not detected above the sample quantitation limit.
J Reported value is estimated based on data validation.
E Concentration exceeded calibration range of instrument.
D Diluted sample.
B Compound was found in blank.

TABLE 1 (Continued)

VOLATILE ORGANIC COMPOUNDS
EXCEEDANCES FOUND IN GROUNDWATER SAMPLES

CARROLL & DUBIES SUPERFUND SITE
PORT JERVIS, NEW YORK

Well Number	OW-17		OW-18		OW-19		OW-20		OW-21		OW-22		OW-23		TW-2		TW-3		Federal	NYSDEC
Sampling Date:	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	MCL	SGV
VOLATILES (ug/L)																				
Chloromethane																			NA	NA
Bromomethane																			NA	5 (G)
Vinyl Chloride							9												2	2 (S)
Chloroethane					15														NA	5 (S)
Methylene Chloride																			5	5 (S)
Acetone																			NA	50 (G)
Carbon Disulfide																			NA	NA
1,1-Dichloroethene																			7	5 (S)
1,1-Dichloroethane																			NA	5 (S)
1,2-Dichloroethene(total)																			70	5 (S)
Chloroform									10										100	7 (S)
1,2-Dichloroethane																			5	5 (S)
2-Butanone																			NA	50 (G)
1,1,1-Trichloroethane																			200	5 (S)
Carbon Tetrachloride																			5	5 (G)
Bromodichloromethane																			100	50 (G)
1,2-Dichloropropane																			5	5 (S)
cis-1,3-Dichloropropene																			NA	5 (S)
Trichloroethene																			5	5 (S)
Dibromochloromethane																			NA	50 (G)
1,1,2-Trichloroethane																			5	5 (S)
Benzene			12		10	8	130	30	5	8	100	48							5	0.7 (S)
Trans-1,3-Dichloropropene																			NA	5 (S)
Bromoform																			100	50 (G)
4-Methyl-2-Pentanone																			NA	NA
2-Hexanone																			NA	50 (G)
Tetrachloroethene																			5	5 (S)
Toluene																			1,000	5 (S)
1,1,2,2-Tetrachloroethane																			NA	5 (S)
Chlorobenzene			10		5	6	6	5			9	10							NA	5 (S)
Ethylbenzene																			700	5 (S)
Styrene																			100	5 (S)
Total Xylenes			29																10,000	5 (S)

Notes:
Analysis performed by method 8240.
Data for wells OW-12 and OW-14 have been corrected for this table.
MCL - Federal Maximum Contaminant Level.
SGV - NYSDEC Ambient Water Quality Standards (S) and Guidance (G) Values.
NA - Not applicable/no value available.

U Compound not detected above the sample quantitation limit.
J Reported value is estimated based on data validation.
E Concentration exceeded calibration range of instrument.
D Diluted sample.
B Compound was found in blank.

TABLE 1 (continued)

SEMI-VOLATILE ORGANIC COMPOUNDS
EXCEEDANCES FOUND IN GROUNDWATER SAMPLES

CARROLL & DUBIES SUPERFUND SITE
PORT JERVIS, NEW YORK

Well Number	OW-2		OW-3		OW-4		OW-5		OW-6		OW-7		OW-8		OW-9		OW-10		Federal	NYSDEC
Sampling Date:	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	MCL	SVG
SEMI-VOLATILES (µg/L)																				
Phenol			4												71	48	27		NA	1 (S)
Bis(2-Chloroethyl)Ether																			NA	1 (S)
2-Chlorophenol																			NA	NA
1,3-Dichlorobenzene																			600	5 (S)
1,4-Dichlorobenzene																			75	4.7 (S)
1,2-Dichlorobenzene																			600	4.7 (S)
2-Methylphenol																			NA	50 (G)
2,2'-Oxybis(1-Chloropropane)																			NA	NA
4-Methylphenol																			NA	50 (G)
N-Nitrosodi-N-Propylamine																			NA	NA
Hexachloroethane																			NA	NA
Nitrobenzene																			NA	5 (S)
Isophorone																		440	NA	50 (G)
2-Nitrophenol																			NA	NA
2,4-Dimethylphenol																			NA	NA
Bis(2-Chloroethoxy) Methane																			NA	NA
2,4-Dichlorophenol																			NA	1 (S)
1,2,4-Trichlorobenzene																			70	5 (S)
Naphthalene																			NA	10 (S)
4-Chloroaniline																			NA	NA
Hexachlorobutadiene																			NA	5 (S)
4-Chloro-3-Methylphenol																			NA	NA
2-Methylnaphthalene																			NA	NA
Hexachlorocyclopentadiene																			50	5 (S)
2,4,6-Trichlorophenol																			NA	NA
2,4,5-Trichlorophenol																			NA	NA
2-Chloronaphthalene																			NA	10 (S)
2-Nitroaniline																			NA	NA
Dimethylphthalate																			NA	50 (G)
Acenaphthylene																			NA	NA
2,6-Dinitrotoluene																			NA	5 (S)
3-Nitroaniline																			NA	NA

Notes:
Analysis performed by method 8240.
Data for wells OW-12 and OW-14 have been corrected for this table.
MCL - Federal Maximum Contaminant Level.
SGV - NYSDEC Ambient Water Quality Standards (S) and Guidance (G) Values.
NA - Not applicable/no value availble.

U Compound not detected above the sample quantitation limit.
J Reported value is estimated based on data validation.
E Concentration exceeded calibration range of instrument.
B Compound was found in blank.
R Data is rejected based on data validation.

TABLE - (Continued)

SEMI-VOLATILE ORGANIC COMPOUNDS
EXCEEDANCES FOUND IN GROUNDWATER SAMPLES

CARROLL & DUBIES SUPERFUND SITE
PORT JERVIS, NEW YORK

Well Number	OW-11		OW-14		OW-13		OW-12		OW-15		OW-16		OW-17		OW-18		OW-19		Federal	NYSDEC
Sampling Date:	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	MCL	SVG
SEMI-VOLATILES (µg/L)																				
Phenol	24				2		11	55											NA	1 (S)
Bis(2-Chloroethyl)Ether																			NA	1 (S)
2-Chlorophenol																			NA	NA
1,3-Dichlorobenzene																			600	5 (S)
1,4-Dichlorobenzene																			75	4.7 (S)
1,2-Dichlorobenzene																			600	4.7 (S)
2-Methylphenol																			NA	50 (G)
2,2'-Oxybis(1-Chloropropane)																			NA	NA
4-Methylphenol																			NA	50 (G)
N-Nitrosodi-N-Propylamine																			NA	NA
Hexachloroethane																			NA	NA
Nitrobenzene																			NA	5 (S)
Isophorone																			NA	50 (G)
2-Nitrophenol																			NA	NA
2,4-Dimethylphenol																			NA	NA
Bis(2-Chloroethoxy) Methane																			NA	NA
2,4-Dichlorophenol																			NA	1 (S)
1,2,4-Trichlorobenzene																			70	5 (S)
Naphthalene	21	17																	NA	10 (S)
4-Chloroaniline																			NA	NA
Hexachlorobutadiene																			NA	5 (S)
4-Chloro-3-Methylphenol																			NA	NA
2-Methylnaphthalene		4																	NA	NA
Hexachlorocyclopentadiene																			50	5 (S)
2,4,6-Trichlorophenol																			NA	NA
2,4,5-Trichlorophenol																			NA	NA
2-Chloronaphthalene																			NA	10 (S)
2-Nitroaniline																			NA	NA
Dimethylphthalate																			NA	50 (G)
Acenaphthylene																			NA	NA
2,6-Dinitrotoluene																			NA	5 (S)
3-Nitroaniline																			NA	NA

Notes:
Analysis performed by method 8240.
Data for wells OW-12 and OW-14 have been corrected for this table.
MCL - Federal Maximum Contaminant Level.
SGV - NYSDEC Ambient Water Quality Standards (S) and Guidance (G) Values.
NA - Not applicable/no value availble.

U Compound not detected above the sample quantitation limit.
J Reported value is estimated based on data validation.
E Concentration exceeded calibration range of instrument.
B Compound was found in blank.
R Data is rejected based on data validation.

TABLE 2 (Continued)

SEMI-VOLATILE ORGANIC COMPOUNDS
EXCEEDANCES FOUND IN GROUNDWATER SAMPLES

CARROLL & DUBIES SUPERFUND SITE
PORT JERVIS, NEW YORK

Well Number	OW-11		OW-14		OW-13		OW-12		OW-15		OW-16		OW-17		OW-18		OW-19		Federal	NYSDEC
Sampling Date:	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95	MCL	SVG
SEMI-VOLATILES (µg/L)																				
Acenaphthene																			NA	20 (S)
2,4-Dinitrophenol																			NA	NA
4-Nitrophenol																			NA	NA
Dibenzofuran																			NA	NA
2,4-Dinitrotoluene																			NA	5 (S)
Diethylphthalate	57																		NA	50 (G)
4-Chlorophenyl-Phenyl Ether																			NA	NA
Fluorene																			NA	50 (G)
4-Nitroaniline																			NA	NA
4,6-Dinitro-2-Methylphenol																			NA	NA
N-Nitrosodiphenylamine																			NA	50 (G)
4-Bromophenyl-Phenylether																			NA	NA
Hexachlorobenzene																			1	0.35 (S)
Pentachlorophenol																			1	1 (S)
Phenanthrene																			NA	50 (G)
Anthracene																			NA	50 (G)
Carbazole																			NA	NA
Di-N-Butylphthalate																			NA	NA
Fluoranthene																			NA	50 (G)
Pyrene																			NA	50 (G)
Butylbenzylphthalate																			NA	50 (G)
3,3'-Dichlorobenzidine																			NA	NA
Benzo(A)Anthracene																			NA	0.002 (S)
Chrysene																			NA	0.002 (S)
Bis(2-Ethylhexyl)Phthalate																			6	50 (S)
Di-N-Octylphthalate																			NA	NA
Benzo(B)Fluoranthene																			NA	0.002 (S)
Benzo(K)Fluoranthene																			NA	0.002 (S)
Benzo(A)Pyrene																			2	ND
Indeno(1,2,3-Cd)Pyrene																			NA	0.002 (S)
Dibenz(A,H)Anthracene																			NA	NA
Benzo(G,H,I)Perylene																			NA	NA

Notes:
Analysis performed by method 8240.
Data for wells OW-12 and OW-14 have been corrected for this table.
MCL - Federal Maximum Contaminant Level.
SGV - NYSDEC Ambient Water Quality Standards (S) and Guidance (G) Values.
NA - Not applicable/no value availble.

U Compound not detected above the sample quantitation limit.
J Reported value is estimated based on data validation.
E Concentration exceeded calibration range of instrument.
B Compound was found in blank.
R Data is rejected based on data validation.

TABLE 1

ANALYTE LIST METALS
HITS FOUND IN GROUNDWATER SAMPLES

CARROLL & DUBIES SUPERFUND SITE
PORT JERVIS, NEW YORK

Well Number	Federal	NYSDEC	MW-1			MW-3			MW-4			MW-5	MW-10
Sampling Date:	MCLs	SGVs	9/94	4/95	7/96	9/94	4/95	7/96	9/94	4/95	7/96	4/95	7/96
METALS (µg/L)													
Aluminum	200	100 (S)				160	1980		172	1400		2850	
Antimony	6	3 (G)											
Arsenic	50	25 (S)					180						
Barium	2,000	1,000 (S)											
Beryllium	4	3 (G)											
Cadmium	5	10 (S)											
Chromium	100	50 (S)											
Copper	1,000	200 (S)					935						
Iron	NA	300 (S)	304			3250	51900		17700	18200	12500	6710	26600
Lead	NA	25 (S)					54.3						
Magnesium	NA	35,000 (G)											
Manganese	50	300 (S)	6060	5640	5850	3360	4230	4520	7850	6380	5880	355	4640
Mercury	2	2 (S)											
Selenium	50	10 (S)											
Silver	100	50 (S)											
Sodium	NA	20,000 (S)	38600	33100	28000				257000	264000	205000		
Thallium	2	4 (G)								4.2			
Zinc	NA	300 (S)					620						
Cyanide	200	100 (S)											

Notes:

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SGV - NYSDEC Ambient Water Quality Standards (S) and Guidance (G) Values.
NA - Not applicable/no value available.

TABLE 1

ANALYTE LIST METALS
HITS FOUND IN GROUNDWATER SAMPLES

CARROLL & DUBIES SUPERFUND SITE
PORT JERVIS, NEW YORK

Well Number	Federal	NYSDEC	OW-6		OW-7			OW-8		
Sampling Date:	MCLs	SGVs	9/94	4/95	9/94	4/95	7/96	9/94	4/95	7/96
METALS (µg/L)										
Aluminum	200	100 (S)	924	28200	601	43200		1170	12100	
Antimony	6	3 (G)		3.3						
Arsenic	50	25 (S)		28.8		31.2			26.8	
Barium	2,000	1,000 (S)								
Beryllium	4	3 (G)				3.4				
Cadmium	5	10 (S)								
Chromium	100	50 (S)				455				
Copper	1,000	200 (S)								
Iron	NA	300 (S)	3930	61700	715	66800		12100	31800	9740
Lead	NA	25 (S)		58.9		79.9			35.3	
Magnesium	NA	35,000 (G)	3780							
Manganese	50	300 (S)		5940		4260		3850	4560	4790
Mercury	2	2 (S)								
Selenium	50	10 (S)								
Silver	100	50 (S)								
Sodium	NA	20,000 (S)								
Thallium	2	4 (G)								
Zinc	NA	300 (S)								
Cyanide	200	100 (S)								

Notes:

MCL - Federal Maximum Contaminant Level.
SGV - NYSDEC Ambient Water Quality Standards (S) and Guidance (G) Values.
NA - Not applicable/no value available.

TABLE 1

ANALYTE LIST METALS
HITS FOUND IN GROUNDWATER SAMPLES

CARROLL & DUBIES SUPERFUND SITE
PORT JERVIS, NEW YORK

Well Number	Federal	NYSDEC	OW-9			OW-10			OW-11		
Sampling Date:	MCLs	SGVs	9/94	4/95	7/96	9/94	4/95	7/96	9/94	4/95	7/96
METALS (µg/L)											
Aluminum	200	100 (S)	10300	14700		4310	137000	677	2000	37100	
Antimony	6	3 (G)		8.1			15			4.4	
Arsenic	50	25 (S)					69			41.2	
Barium	2,000	1,000 (S)									
Beryllium	4	3 (G)					7.2			3.5	
Cadmium	5	10 (S)									
Chromium	100	50 (S)	123	155	70		555			275	
Copper	1,000	200 (S)					333			265	
Iron	NA	300 (S)	90400	72400	53800	20900	346000	41400	47000	140000	26800
Lead	NA	25 (S)		283			127			58.1	
Magnesium	NA	35,000 (G)					64700				
Manganese	50	300 (S)	6030	5240	8600	4180	10600	6180	6190	7980	5660
Mercury	2	2 (S)									
Selenium	50	10 (S)									
Silver	100	50 (S)									
Sodium	NA	20,000 (S)				30500	37900		30500		
Thallium	2	4 (G)								6.2	
Zinc	[1]NA	300 (S)					742			557	
Cyanide	200	100 (S)									

Notes:

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SGV - NYSDEC Ambient Water Quality Standards (S) and Guidance (G) Values.
NA - Not applicable/no value available.

TABLE 1

ANALYTE LIST METALS
HITS FOUND IN GROUNDWATER SAMPLES

CARROLL & DUBIES SUPERFUND SITE
PORT JERVIS, NEW YORK

Well Number	Federal	NYSDEC	OW- 12			OW- 13			OW- 14	
Sampling Date:	MCLs	SGVs	9/94	4/95	7/96	9/94	4/95	7/96	9/94	4/95
METALS (µg/L)										
Aluminum	200	100 (S)	1750	8440		931	54200		7540	19800
Antimony	6	3 (G)		4.2			3.2			
Arsenic	50	25 (S)					39			
Barium	2,000	1,000 (S)								
Beryllium	4	3 (G)					3.3			
Cadmium	5	10 (S)								
Chromium	100	50 (S)					669			
Copper	1,000	200 (S)					236			
Iron	NA	300 (S)	53200	68100	69800	2320	73300	19200	17700	35800
Lead	NA	25 (S)					61			
Magnesium	NA	35,000 (G)								
Manganese	50	300 (S)	5420	6780	8690	1680	6010	7960	1990	2580
Mercury	2	2 (S)								
Selenium	50	10 (S)								
Silver	100	50 (S)								
Sodium	NA	20,000 (S)							22500	
Thallium	2	4 (G)								
Zinc	NA	300 (S)					1010			
Cyanide	200	100 (S)								

Notes:

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NA - Not applicable/no value available.

TABLE 1

ANALYTE LIST METALS
HITS FOUND IN GROUNDWATER SAMPLES

CARROLL & DUBIES SUPERFUND SITE
PORT JERVIS, NEW YORK

Well Number	Federal	NYSDEC	OW- 15		OW - 16		OW-16D	OW-16S	OW- 17		
Sampling Date:	MCLs	SGVs	9/94	4/95	9/94	4/95	7/96	7/96	9/94	4/95	7/96
METALS (µg/L)											
Aluminum	200	100 (S)	671	353	2610	26700			2290	20300	
Antimony	6	3 (G)								3.3	
Arsenic	50	25 (S)									
Barium	2,000	1,000 (S)									
Beryllium	4	3 (G)									
Cadmium	5	10 (S)									
Chromium	100	50 (S)				81.1					
Copper	1,000	200 (S)									
Iron	NA	300 (S)	28800	25700	2720	65500	978		4920	39100	
Lead	NA	25 (S)				49.5				29.4	
Magnesium	NA	35,000 (G)									
Manganese	50	300 (S)	6980	5750	2430	2130	2640	2650	8890	7860	8440
Mercury	2	2 (S)									
Selenium	50	10 (S)									
Silver	100	50 (S)									
Sodium	NA	20,000 (S)			25200	22100		31000			
Thallium	2	4 (G)		6.8		5.8					
Zinc	NA [1]	300 (S)									
Cyanide	200	100 (S)									

Notes:

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NA - Not applicable/no value available.

TABLE 1

ANALYTE LIST METALS
HITS FOUND IN GROUNDWATER SAMPLES

CARROLL & DUBIES SUPERFUND SITE
PORT JERVIS, NEW YORK

Well Number	Federal	NYSDEC	OW- 18			OW- 19			OW- 20		
Sampling Date:	MCLs	SGVs	9/94	4/95	7/96	9/94	4/95	7/96	9/94	4/95	7/96
METALS (µg/L)											
Aluminum	200	100 (S)	7250	19900		1220	22700			38000	
Antimony	6	3 (G)		5.7			3.5			4.5	
Arsenic	50	25 (S)		70.9	37.7	28.9	78.6	43.1		105	
Barium	2,000	1,000 (S)									
Beryllium	4	3 (G)									
Cadmium	5	10 (S)									
Chromium	100	50 (S)								375	
Copper	1,000	200 (S)									
Iron	NA	300 (S)	24300	98600	54000	58800	92800	67200	51800	121000	29000
Lead	NA	25 (S)					46.9			78.6	
Magnesium	NA	35,000 (G)									
Manganese	50	300 (S)	7570	5090	1480	3190	3640	5060	3520	6560	2440
Mercury	2	2 (S)									
Selenium	50	10 (S)									
Silver	100	50 (S)									
Sodium	NA	20,000 (S)		21900		31000	25700	24000			
Thallium	2	4 (G)									
Zinc	NA[1]	300 (S)								364	
Cyanide	200	100 (S)									

Notes:

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SGV - NYSDEC Ambient Water Quality Standards (S) and Guidance (G) Values.
NA - Not applicable/no value available.

TABLE 1

ANALYTE LIST METALS
HITS FOUND IN GROUNDWATER SAMPLES

CARROLL & DUBIES SUPERFUND SITE
PORT JERVIS, NEW YORK

Well Number	Federal	NYSDEC	OW- 21			OW- 22			OW- 23		
Sampling Date:	MCLs	SGVs	9/94	4/95	7/96	9/94	4/95	7/96	9/94	4/95	7/96
METALS (µg/L)											
Aluminum	200	100 (S)	6370	453		926	142		669		
Antimony	6	3 (G)					3.4				
Arsenic	50	25 (S)						35			
Barium	2,000	1,000 (S)									
Beryllium	4	3 (G)									
Cadmium	5	10 (S)									
Chromium	100	50 (S)									
Copper	1,000	200 (S)									
Iron	NA	300 (S)	40900	30100	27000	62900	58000	52000	15700	11000	26300
Lead	NA	25 (S)									
Magnesium	NA	35,000 (G)									
Manganese	50	300 (S)	4960	4720	4700	3000	2720	2450	2180	1080	1830
Mercury	2	2 (S)									
Selenium	50	10 (S)									
Silver	100	50 (S)									
Sodium	NA	20,000 (S)	25400	24400		24600	23500	42000	44100	31600	57000
Thallium	2	4 (G)									
Zinc	NA [1]	300 (S)									
Cyanide	200	100 (S)									

Notes:

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SGV - NYSDEC Ambient Water Quality Standards (S) and Guidance (G) Values.
NA - Not applicable/no value available.

TABLE 1

ANALYTE LIST METALS
HITS FOUND IN GROUNDWATER SAMPLES

CARROLL & DUBIES SUPERFUND SITE
PORT JERVIS, NEW YORK

Well Number	Federal	NYSDEC	BW - 1		BW-2		BW-3		BW-4	
Sampling Date:	MCLs	SGVs	9/94	4/95	9/94	4/95	9/94	4/95	9/94	4/95
METALS (µg/L)										
Aluminum	200	100 (S)	1470	336		231	643	201	3640	237
Antimony	6	3 (G)								
Arsenic	50	25 (S)								
Barium	2,000	1,000 (S)								
Beryllium	4	3 (G)								
Cadmium	5	10 (S)								
Chromium	100	50 (S)								
Copper	1,000	200 (S)								
Iron	NA	300 (S)	1170	344		451			5570	399
Lead	NA	25 (S)							39.2	
Magnesium	NA	35,000 (G)								
Manganese	50	300 (S)							399	308
Mercury	2	2 (S)								
Selenium	50	10 (S)								
Silver	100	50 (S)								
Sodium	NA	20,000 (S)					38900	32300	30400	34700
Thallium	2	4 (G)		6.9				4.7		5.1
Zinc	NA	300 (S)								
Cyanide	200	100 (S)								

Notes:

MCL - Federal Maximum Contaminant Level.
SGV - NYSDEC Ambient Water Quality Standards (S) and Guidance (G) Values.
NA - Not applicable/no value available.

TABLE 1

ANALYTE LIST METALS
HITS FOUND IN GROUNDWATER SAMPLES

CARROLL & DUBIES SUPERFUND SITE
PORT JERVIS, NEW YORK

Well Number	Federal	NYSDEC	BW-5		TW-2		TW-3		XW - 2	XW - 14
Sampling Dat	MCLs	SGVs	9/94	4/95	9/94	4/95	9/94	4/95	4/95	4/95
METALS (µg/L)										
Aluminum	200	100 (S)	558	2100	989	1890	123	554	11900	18900
Antimony	6	3 (G)								
Arsenic	50	25 (S)								
Barium	2,000	1,000 (S)								
Beryllium	4	3 (G)								
Cadmium	5	10 (S)								
Chromium	100	50 (S)								
Copper	1,000	200 (S)								
Iron	NA	300 (S)	4640	7830	1410	5190		935	20300	36200
Lead	NA	25 (S)								
Magnesium	NA	35,000 (G)								
Manganese	50	300 (S)	3440	3390				6910	2610	2540
Mercury	2	2 (S)								
Selenium	50	10 (S)								
Silver	100	50 (S)								
Sodium	NA	20,000 (S)	22100				28600	25100		
Thallium	2	4 (G)				5		4.7		4.7
Zinc	NA	300 (S)								
Cyanide	200	100 (S)								

Notes:

MCL - Federal Maximum Contaminant Level.
SGV - NYSDEC Ambient Water Quality Standards (S) and Guidance (G) Values.
NA - Not applicable/no value available.

TABLE 1

TARGET ANALYTE LIST METALS FOUND IN GROUNDWATER SAMPLES

CARROLL & DUBIES SUPERFUND SITE PORT JERVIS, NEW YORK

Well Number	MW-1		MW-3		MW-4		MW-10		MW-20		MW-30		OW-2		Federal	NYSDEC
Sampling Date:	07/23/96		07/24/96		07/18/96		07/17/96		07/18/96		07/24/96		07/18/96		MCLs	SGVs
METALS (µg/L)																
Aluminum	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	100 (S)
Antimony	60	U	60	U	60	U	60	U	60	U	60	U	60	U	6	3 (G)
Arsenic	10	U	10	U	10	U	10.7		10	U	10	U	10	U	50	25 (S)
Barium	200	U	200	U	200	U	200	U	200	U	200	U	200	U	2,000	1,000 (S)
Beryllium	5	U	5	U	5	U	5	U	5	U	5	U	5	U	4	3 (G)
Cadmium	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	10 (S)
Calcium	23000		19000		108000		76000		112000		19000		56000		NA	NA
Chromium	12	J	10	U	10	U	10	U	18		10	J	10	J	100	50 (S)
Cobalt	50	U	50	U	50	U	50	U	50	U	50	U	50	U	NA	NA
Copper	25	U	25	U	25	U	25	U	25	U	25	U	25	U	1,000	200 (S)
Iron	100	U	300		12500		26600		12500		338		100	U	NA	300 (S)
Lead	3	U	3	U	4.1		3	U	3	U	3	U	3	U	NA	25 (S)
Magnesium	8000		5000		14000		7000		15000		5000		7000		NA	35,000 (G)
Manganese	5850		4520		5880		4640		5890		4470		171		50	300 (S)
Mercury					0.2	U	0.2	U	0.2	U			0.2	U	2	2 (S)
Nickel	40	U	40	U	40	U	40	U	40	U	40	U	40	U	NA	NA
Potassium	5000	U	5000	U	6000		5000	U	6000		5000	U	5	U	NA	NA
Selenium					7		5	U	6.3				5	U	50	10 (S)
Silver	10	U	10	U	10	U	10	U	10	U	10	U	10	U	100	50 (S)
Sodium	28000		6000		205000		18000		204000		6000		10000		NA	20,000 (S)
Thallium					10	U	10	U	10	U			10	U	2	4 (G)
Vanadium	50	U	50	U	50	U	50	U	50	U	50	U	50	U	NA	NA
Zinc	20	U	20	U	20	U	20	U	20	U	20	U	20	U	NA	300 (S)

Notes:

U Not detected.
J Value is estimated.

MCL - Federal Maximum Contaminant Level.
SGV - NYSDEC Ambient Water Quality Standards (S) and Guidance (G) Values.
NA - Not applicable/no value available.

TABLE 1

TARGET ANALYTE LIST METALS FOUND IN GROUNDWATER SAMPLES

CARROLL & DUBIES SUPERFUND SITE PORT JERVIS, NEW YORK

Well Number	MW-1		MW-3		MW-4		MW-10		MW-20		MW-30		OW-2		Federal	NYSDEC
Sampling Date:	07/23/96		07/24/96		07/18/96		07/17/96		07/18/96		07/24/96		07/18/96		MCLs	SGVs
METALS (µg/L)																
Aluminum	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	100 (S)
Antimony	60	U	60	U	60	U	60	U	60	U	60	U	60	U	6	3 (G)
Arsenic	10	U	10	U	10	U	10.7		10	U	10	U	10	U	50	25 (S)
Barium	200	U	200	U	200	U	200	U	200	U	200	U	200	U	2,000	1,000 (S)
Beryllium	5	U	5	U	5	U	5	U	5	U	5	U	5	U	4	3 (G)
Cadmium	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	10 (S)
Calcium	23000		19000		108000		76000		112000		19000		5600(		NA	NA
Chromium	12	J	10	U	10	U	10	U	18		10	J	10	J	100	50 (S)
Cobalt	50	U	50	U	50	U	50	U	50	U	50	U	50	U	NA	NA
Copper	25	U	25	U	25	U	25	U	25	U	25	U	25	U	1,000	200 (S)
Iron	100	U	300		12500		26600		12500		338		100	U	NA	300 (S)
Lead	3	U	3	U	4.1		3	U	3	U	3	U	3	U	NA	25 (S)
Magnesium	8000		5000		14000		7000		15000		5000		7000		NA	35,000 (G)
Manganese	5850		4520		5880		4640		5890		4470		171		50	300 (S)
Mercury					0.2	U	0.2	U	0.2	U			0.2	U	2	2 (S)
Nickel	40	U	40	U	40	U	40	U	40	U	40	U	40	U	NA	NA
Potassium	5000	U	5000	U	6000		5000	U	6000		5000	U	5	U	NA	NA
Selenium					7		5	U	6.3				5	U	50	10 (S)
Silver	10	U	10	U	10	U	10	U	10	U	10	U	10	U	100	50 (S)
Sodium	28000		6000		205000		18000		204000		6000		1000(		NA	20,000 (S)
Thallium					10	U	10	U	10	U			10	U	2	4 (G)
Vanadium	50	U	50	U	50	U	50	U	50	U	50	U	50	U	NA	NA
Zinc	20	U	20	U	20	U	20	U	20	U	20	U	20	U	NA	300 (S)

Notes:

MCL - Federal Maximum Contaminant Level.

SGV - NYSDEC Ambient Water Quality Standards (S) and Guidance (G) Values.

NA - Not applicable/no value available.

U Not detected.

J Value is estimated.

TABLE 1 (Continued)

TARGET ANALYTE LIST METALS
FOUND IN GROUNDWATER SAMPLES

CARROLL & DUBIES SUPERFUND SITE
PORT JERVIS, NEW YORK

Well Number	OW- 5		OW- 7		OW- 8		OW- 9		OW- 10		OW- 11		OW- 12		Federal	NYSDEC
Sampling Date	07/22/96		07/22/96		07/18/96		07/16/96		07/23/96		07/24/96		07/16/96		MCLs	SGVs
METALS (µg/L)																
Aluminum	200	U	200	U	200	U	200	U	677		200	U	200	U	200	100 (S)
Antimony	60	U	60	U	60	U	60	U	60	U	60	U	60	U	6	3 (G)
Arsenic	10	U	10	U	17.5		10	U	10	U	10	U	10	U	50	25 (S)
Barium	200	U	200	U	200	U	200	U	200	U	200	U	200	U	2,000	1,000 (S)
Beryllium	5	U	5	U	5	U	5	U	5	U	5	U	5	U	4	3 (G)
Cadmium	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	10 (S)
Calcium	31000		119000		12000		95000		128000		163000		134000		NA	NA
Chromium	10	U	14		14		70		24		10	U	29		100	50 (S)
Cobalt	50	U	50	U	50	U	50	U	50	U	50	U	50	U	NA	NA
Copper	25	U	25	U	25	U	25	U	25	U	25	U	25	U	1,000	200 (S)
Iron	5710		100	U	9740		53800		41400		26800		69800		NA	300 (S)
Lead	3	U	3	U	3	U	4.6		3	U	3	U	3	U	NA	25 (S)
Magnesium	5000	U	6000		5000	U	9000		9000		9000		10000		NA	35,000 (G)
Manganese	3440		38		4790		8600		6180		5660		8690		50	300 (S)
Mercury					0.2	U	0.2	U					0.2	U	2	2 (S)
Nickel	40	U	40	U	40	U	48		40	U	40	U	40	U	NA	NA
Potassium	5000	U	5000	U	5000	U	5000	U	5000		5000	U	5000	U	NA	NA
Selenium					5	U	5	U					5	U	50	10 (S)
Silver	10	U	10	U	10	U	10	U	10	U	10	U	10	U	100	50 (S)
Sodium	75000		7000		13000		11000		12000		9000		17000		NA	20,000 (S)
Thallium					10	U	10	U					10	U	2	4 (G)
Vanadium	50	U	50	U	50	U	50	U	50	U	50	U	50	U	NA	NA
Zinc	20	U	20	U	20	U	25		20	U	20	U	20	U	NA	300 (S)

Notes:

MCL - Federal Maximum Contaminant Level.
SGV - NYSDEC Ambient Water Quality Standards (S) and Guidance (G) Values.
NA - Not applicable/no value available.

U Not detected.
J Value is estimated.

TABLE 1 (Continued)

TARGET ANALYTE LIST METALS FOUND IN GROUNDWATER SAMPLES

CARROLL & DUBIES SUPERFUND SITE PORT JERVIS, NEW YORK

Well Number	OW-5		OW-7		OW-8		OW-9		OW-10		OW-11		OW-12		Federal	NYSDEC
Sampling Date	07/22/96		07/22/96		07/18/96		07/16/96		07/23/96		07/24/96		07/16/96		MCLs	SGVs
METALS (µg/L)																
Aluminum	200	U	200	U	200	U	200	U	677		200	U	200	U	200	100 (S)
Antimony	60	U	60	U	60	U	60	U	60	U	60	U	60	U	6	3 (G)
Arsenic	10	U	10	U	17.5		10	U	10	U	10	U	10	U	50	25 (S)
Barium	200	U	200	U	200	U	200	U	200	U	200	U	200	U	2,000	1,000 (S)
Beryllium	5	U	5	U	5	U	5	U	5	U	5	U	5	U	4	3 (G)
Cadmium	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	10 (S)
Calcium	31000		119000		12000		95000		128000		163000		13400(		NA	NA
Chromium	10	U	14		14		70		24		10	U	29		100	50 (S)
Cobalt	50	U	50	U	50	U	50	U	50	U	50	U	50	U	NA	NA
Copper	25	U	25	U	25	U	25	U	25	U	25	U	25	U	1,000	200 (S)
Iron	5710		100	U	9740		53800		41400		26800		69800		NA	300 (S)
Lead	3	U	3	U	3	U	4.6		3	U	3	U	3	U	NA	25 (S)
Magnesium	5000	U	6000		5000	U	9000		9000		9000		10000		NA	35,000 (G)
Manganese	3440		38		4790		8600		6180		5660		8690		50	300 (S)
Mercury					0.2	U	0.2	U					0.2	U	2	2 (S)
Nickel	40	U	40	U	40	U	48		40	U	40	U	40	U	NA	NA
Potassium	5000	U	5000	U	5000	U	5000	U	5000		5000	U	5000	U	NA	NA
Selenium					5	U	5	U					5	U	50	10 (S)
Silver	10	U	10	U	10	U	10	U	10	U	10	U	10	U	100	50 (S)
Sodium	75000		7000		13000		11000		12000		9000		17000		NA	20,000 (S)
Thallium					10	U	10	U					10	U	2	4 (G)
Vanadium	50	U	50	U	50	U	50	U	50	U	50	U	50	U	NA	NA
Zinc	20	U	20	U	20	U	25		20	U	20	U	20	U	NA	300 (S)

Notes:

MCL - Federal Maximum Contaminant Level.
SGV - NYSDEC Ambient Water Quality Standards (S) and Guidance (G) Values.
NA - Not applicable/no value available.

U Not detected.
J Value is estimated.

TABLE 1 (Continued)

TARGET ANALYTE LIST METALS
FOUND IN GROUNDWATER SAMPLES

CARROLL & DUBIES SUPERFUND SITE
PORT JERVIS, NEW YORK

Well Number	OW-21		OW-22		OW-23		EQB #1		EB # 3		EQB #2		Federal	NYSDEC
Sampling Date	07/17/96		07/17/96		07/24/96		07/19/96		07/24/96		07/19/96		MCLs	SGVs
METALS (µg/L)														
Aluminum	200	U	200	U	200	U	200	U	200	U	200	U	200	100 (S)
Antimony	60	U	60	U	60	U	60	U	60	U	60	U	6	3 (G)
Arsenic	10	U	35		12.3		10	U	10	U	10	U	50	25 (S)
Barium	200	U	200	U	381		200	U	200	U	200	U	2,000	1,000 (S)
Beryllium	5	U	5	U	5	U	5	U	5	U	5	B	4	3 (G)
Cadmium	5	U	5	U	5	U	5	U	5	U	5	U	5	10 (S)
Calcium	78000		73000		155000		5000	U	5000	U	5000	U	NA	NA
Chromium	10	U	10	U	10	U	10	U	10	U	29		100	50 (S)
Cobalt	50	U	50	U	50	U	50	U	50	U	50	U	NA	NA
Copper	25	U	25	U	25	U	25	U	25	U	25	U	1,000	200 (S)
Iron	27000		52000		26300		100	U	100	U	130		NA	300 (S)
Lead	3	U	3	U	3	U	3	U	3	U	3	U	NA	25 (S)
Magnesium	8000		16000		15000		5000	U	5000	U	5000	U	NA	5,000 (G
Manganese	4700		2450		1830		15	U	15	U	15	U	50	300 (S)
Mercury	0.2	U	0.2	U			0.2	U			0.2	U	2	2 (S)
Nickel	40	U	40	U	40	U	40	U	40	U	40	U	NA	NA
Potassium	5000	U	27000		9000		5000	U	5000	U	5000	U	NA	NA
Selenium	5		8				5	U			5	U	50	10 (S)
Silver	10	U	10	U	10	U	10	U	10	U	10	U	100	50 (S)
Sodium	18000		42000		57000		5000	U	5000	U	5000	U	NA	20,000 (S)
Thallium	10	U	10	U			10	U			10	U	2	4 (G)
Vanadium	50	U	50	U	50	U	50	U	50	U	50	U	NA	NA
Zinc	20	U	20	U	20	U	20	U	20	U	20	U	NA	300 (S)

Notes:

U Not detected
J Value is estimated.

MCL - Federal Maximum Contaminant Level.
SGV - NYSDEC Ambient Water Quality Standards (S) and Guidance (G) Values.
NA - Not applicable/no value available.

TABLE 1 (Continued)

TARGET ANALYTE LIST METALS FOUND IN GROUNDWATER SAMPLES

CARROLL & DUBIES SUPERFUND SITE PORT JERVIS, NEW YORK

Well Number	OW-13		OW-16D		OW-16S		OW-17		OW-18		OW-19		OW-20		Federal	NYSDEC
Sampling Date	07/22/96		07/22/96		07/22/96		07/27/96		07/24/96		07/24/96		07/17/96		MCLs	SGVs
METALS (µg/L)																
Aluminum	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	100 (S)
Antimony	60	U	60	U	60	U	60	U	60	U	60	U	60	U	6	3 (G)
Arsenic	10	U	10	U	10	U	10	U	37.7		43.1		10	U	50	25 (S)
Barium	200	U	200	U	200	U	200	U	200	U	261		200	U	2,000	1,000 (S)
Beryllium	5	U	5	U	5	U	5	U	5	U	5	U	5	U	4	3 (G)
Cadmium	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	10 (S)
Calcium	148000		18000		36000		52000		62000		85000		58000		NA	NA
Chromium	10	U	10	U	23	J	10	U	10	U	10	U	10	U	100	50 (S)
Cobalt	50	U	50	U	50	U	50	U	50	U	50	U	50	U	NA	NA
Copper	25	U	25	U	25	U	25	U	25	U	25	U	25	U	1,000	200 (S)
Iron	19200		978		194		100	U	54000		67200		29000		NA	300 (S)
Lead	3		5.1		4.1		3	U	3	U	3	U	3	U	NA	25 (S)
Magnesium	10000		5000	U	6000		6000		8000		12000		5000		NA	35,000 (G)
Manganese	7960		2640		2650		8440		1480		5060		2440		50	300 (S)
Mercury													0.2	U	2	2 (S)
Nickel	40	U	40	U	40	U	40	U	40	U	40	U	40	U	NA	NA
Potassium	5000	U	5000	U	5000	U	5000	U	25000		18000		5000	U	NA	NA
Selenium													5	U	50	10 (S)
Silver	10	U	10	U	10	U	10	U	10	U	10	U	10	U	100	50 (S)
Sodium	17000		7000		31000		15000		17000		24000		8000		NA	20,000 (S)
Thallium													10	U	2	4 (G)
Vanadium	50	U	50	U	50	U	50	U	50	U	50	U	50	U	NA	NA
Zinc	20	U	20	U	20	U	20	U	20	U	20	U	20	U	NA	300 (S)

Notes:

OW-16S - Represents readings taken at a depth of 26.0

MCL - Federal Maximum Contaminant Level.

SGV - NYSDEC Ambient Water Quality Standards (S) and Guidance (G) Values.

NA - Not applicable/no value available.

OW-16S - Represents readings taken at a depth of 43.5

U Not detected.

J Value is estimated.

TABLE 2
EXPOSURE POINT CONCENTRATIONS
GROUNDWATER IN OUTWASH, TILL, AND BEDROCK AQUIFERS
CARROLL & DUBIES SUPERFUND SITE
PORT JERVIS, NEW YORK

Chemicals of Concern	Number of Samples	Number of Detects	Number of Nondetects	Maximum Detected Concentration	Geometric Mean	Geometric Standard Deviation	One Tail H-Statistic at 95%	Log-normal Upper 95% Confidence Limit	Exposure Point Concentration
Volatile Organic Compounds (µg/L)									
Vinyl Chloride	61	6	55	34	5.78	1.71	1.867	7.60	7.60
Chloroethane	61	1	60	15	5.64	1.63	1.806	7.13	7.13
1,2-Dichloroethene(total)	61	10	51	130	6.4	2.11	2.012	10.3	10.3
Chloroform	61	1	60	10 J	5.6	1.62	1.806	7.03	7.03
Trichloroethene	61	4	57	24	5.84	1.71	1.867	7.68	7.68
Benzene	61	23	38	2,600	14.7	6.74	3.353	207	207
Tetrachloroethene	61	4	57	100	6.34	2.04	2.012	9.82	9.82
Toluene	61	5	56	18	5.38	1.8	1.867	7.39	7.39
Chlorobenzene	61	10	51	10 J	5.74	1.65	1.867	7.34	7.34
Ethylbenzene	61	5	56	30 J	5.75	1.72	1.867	7.55	7.55
Total Xylenes	61	8	53	62	6.48	2.12	2.012	10.4	10.4
Semi-Volatile Organic Compounds (µg/L)									
Phenol	59	11	48	71	6.15	2.04	2.015	9.36	9.36
1,4-Dichlorobenzene	59	2	57	2 J	5.04	1.49	1.757	5.98	2.00
1,2-Dichlorobenzene	59	2	57	2 J	5.04	1.49	1.757	5.98	2.00
2-Methylphenol	59	2	57	1 J	4.98	1.54	1.807	5.07	1.00
4-Methylphenol	59	5	54	4 J	4.79	1.63	1.807	6.05	4.00
Isophorone	59	1	58	440	5.46	1.8	1.869	7.5	7.5
Naphthalene	59	4	55	21	5.57	1.48	1.757	6.58	6.58
2-Methylnaphthalene	59	6	53	27	5.69	1.58	1.807	7.03	7.03
Diethylphthalate	59	24	35	57	4.69	2.24	2.100	8.13	8.13
Di-n-butylphthalate	59	11	48	10 J	4.57	1.66	1.869	5.87	5.87
Di-n-octylphthalate	59	3	54	3 J	4.9	1.49	1.807	5.85	3.00
Metal (µg/L)									
Aluminum	30	30	0	10,300	1,180	3.60	2.756	5,170	5,170
Arsenic	30	19	11	29	3.16	3.26	2.565	11.2	11.2
Barium	30	30	0	284	69.3	2.24	2.213	134	134
Beryllium	30	23	7	1 B	0.145	2.07	2.111	0.25	0.25
Chromium	30	23	7	123	6.35	2.94	2.437	18.5	18.5
Copper	30	26	4	51	5.75	3.20	2.565	19.7	19.7
Lead	30	25	5	39.1	1.64	3.21	2.565	5.64	5.64
Selenium	30	2	28	1.5 B	0.574	1.31	1.7449	0.65	0.65
Silver	30	3	27	7.9 B	2.44	1.38	1.797	2.85	2.85
Vanadium	30	27	3	26.7 B	5.38	2.09	2.111	9.41	9.41
Zinc	30	30	0	170	36.2	2.45	2.213	78.4	78.4

Notes:

One half the detection limit used in statistics

Exposure point concentration is the 95% UCL assuming a lognormal distribution or the maximum concentration, whichever is smaller.

TABLE 3-
POTENTIAL EXPOSURE PATHWAYS FOR
CURRENT AND FUTURE LAND USE SCENARIOS
CARROLL & DUBIES SUPERFUND SITE
PORT JERVIS, NEW YORK

Exposure Setting	Receptor	Source Media	Exposure Medium	Intake Route	Retained For Evaluation? (Yes/No)	Rationale For Elimination
Current						
	Off-site Residential Groundwater User	Groundwater	Groundwater	Ingestion	No	Incomplete exposure pathways.
				Dermal Contact	No	Groundwater plume has not reached
			Shower Air	Inhalation While Showering	No	domestic wells.
	Off-site Recreational User of Gold Creek	Groundwater	Surface Water	Ingestion	No	Incomplete exposure pathways.
				Dermal Contact	No	Groundwater plume has not reached surface water.
Future						
	On-site Industrial Worker	Groundwater	Groundwater	Ingestion	Yes	
			Shower Air	Dermal Contact	No	Dermal contact and inhalation of
				Inhalation While Showering	No	volatiles during showering seems unlikely at the site.
	On-site Residential Groundwater User	Groundwater	Groundwater	Ingestion	No	Implausible scenario.
				Dermal Contact	No	Site is expected to remain industrial
			Shower Air	Inhalation While Showering	No	in the future.
	Off-site Residential Groundwater User	Groundwater	Groundwater	Ingestion	No	Incomplete exposure pathways.
				Dermal Contact	No	Groundwater plume is not expected
			Shower Air	Inhalation While Showering	No	to migrate to offsite domestic wells.
	Off-site Recreational User of Gold Creek	Groundwater	Surface Water	Ingestion	No	Incomplete exposure pathways.
				Dermal Contact	No	Groundwater plume is not expected to migrate to surface water.

TABLE 4
CANCER SLOPE FACTORS AND REFERENCE DOSES
FOR CHEMICALS-OF-CONCERN
CARROLL & DUBIES SUPERFUND SITE
PORT JERVIS, NEW YORK

Chemical-of-Concern	Chronic Reference Dose Oral (mg/Kg/day)	Cancer Slope Factor Oral (mg/Kg/day)-1	Weight of Evidence
Volatile Organic Compounds			
Vinyl Chloride	–	1.9 H	A
Chloroethane	0.4 N	0.0029 N	C-B2
1,2-Dichloroethene	0.009 H	–	–
Chloroform	0.01 I	0.0061 I	B2
Trichloroethene	0.006 N	0.011 N	C-B2
Benzene	–	0.029 I	A
Tetrachloroethene	0.01 I	0.052 N	C-B2
Toluene	0.2 I	–	D
Chlorobenzene	0.02 I	–	D
Ethylbenzene	0.1 I	–	D
Total Xylenes	2 I	–	D
Semi-Volatiles Organic Compounds			
Phenol	0.6 I	–	D
1,2-Dichlorobenzene	0.09 I	–	D
1,4-Dichlorobenzene	–	0.024 H	C
2-Methylphenol	0.05 I	–	C
4-Methylphenol	0.005 H	–	C
Isophorone	0.2 I	0.00095 I	C
Naphthalene	0.04 N	–	D
2-Methylnaphthalene	–	–	–
Di-n-butylphthalate	0.1 I	–	D
Diethylphthalate	0.8 I	–	D
Di-n-octylphthalate	0.02 H	–	–
Metals			
Aluminum	1 N	–	–
Arsenic	0.0003 I	1.5 I	A
Barium	0.07 I	–	–
Beryllium	0.005 I	4.3 I	B2
Chromium (1)	0.005 I	–	A
Copper	0.037 H	–	D
Lead	–	–	B2
Selenium	0.005 I	–	D
Silver	0.005 I	–	D
Vanadium	0.007 H	–	–
Zinc	0.3 I	–	D

Notes:

– - Indicates that no criteria is available.

I - Integrated Risk Information System (IRIS), January 1996.

H - Health Effects Assessment Summary Tables (HEAST), FY-1995, Annual and Supplement No. 1.

N - National Center for Environmental Assessment (NCEA).

(1)- Values presented are for Chromium VI.

TABLE 5

SUMMARY OF CANCER RISKS AND HAZARD INDICES FOR
INDUSTRIAL WORKERS EXPOSED TO
GROUNDWATER FROM OUTWASH , TILL, AND BEDROCK AQUIFERS
CARROLL & DUBIES SUPERFUND SITE
PORT JERVIS, NEW YORK

Chemical-of-Concern	Cancer Risk	Percent Cancer Risk	Chronic Hazard Index	Percent Chronic Hazard Index
VOCs				
Vinyl Chloride	5.0E-05	37.00%	NA	NA
Chloroethane	7.2E-08	0.05%	1.7E-04	0.03%
1,2-Dichloroethene(total)	NA	NA	1.1E-02	2.01%
Chloroform	1.5E-07	0.11%	6.9E-03	1.24%
Trichloroethene	3.0E-07	0.22%	1.3E-02	2.25%
Benzene	2.1E-05	15.38%	NA	NA
Tetrachloroethene	1.8E-06	1.31%	9.6E-03	1.73%
Toluene	NA	NA	3.6E-04	0.06%
Chlorobenzene	NA	NA	3.6E-03	0.65%
Ethylbenzene	NA	NA	7.4E-04	0.13%
Total Xylenes	NA	NA	5.1E-05	0.01%
Total VOCs	7.4E-05	54.06%	4.5E-02	8.11%
Semi-VOCs				
Phenol	NA	NA	1.6E-04	0.03%
1,2-Dichlorobenzene	NA	NA	2.2E-04	0.04%
1,4-Dichlorobenzene	1.7E-07	0.12%	NA	NA
2-Methylphenol	NA	NA	2.0E-04	0.04%
4-Methylphenol	NA	NA	7.8E-03	1.41%
Isophorone	2.5E-08	0.02%	3.7E-04	0.07%
Naphthalene	NA	NA	1.6E-03	0.29%
2-Methylnaphthalene	NA	NA	NA	NA
Di-n-butylphthalate	NA	NA	5.7E-04	0.10%
Diethylphthalate	NA	NA	9.9E-05	0.02%
Di-n-octylphthalate	NA	NA	1.5E-03	0.26%
Total Semi-VOCs	1.9E-07	0.14%	1.3E-02	2.25%
Metals				
Aluminum	NA	NA	5.1E-02	9.09%
Arsenic	5.9E-05	43.04%	3.7E-01	65.62%
Barium	NA	NA	1.9E-02	3.36%
Beryllium	3.8E-06	2.75%	4.9E-04	0.09%
Chromium	NA	NA	3.6E-02	6.50%
Copper	NA	NA	5.2E-03	0.94%
Lead	NA	NA	NA	NA
Selenium	NA	NA	1.3E-03	0.23%
Silver	NA	NA	5.6E-03	1.00%
Vanadium	NA	NA	1.3E-02	2.36%
Zinc	NA	NA	2.6E-03	0.46%
Total Metals	6.2E-05	45.80%	5.0E-01	89.65%
TOTAL	1.4E-04	100%	0.56	100%

Notes:
NA - Not applicable, no toxicity indices are available for chemical-of-concern.

TABLE 6
CAPITAL AND O&M COST ESTIMATE FOR ALTERNATIVE 2
INTRINSIC BIODEGRADATION WITH INSTITUTIONAL CONTROLS

Task	Quantity	Units	Unit Cost	Total Cost	Notes
1. Initial Laboratory Study					
Sample Collection	1	LS	$5,000	$5,000	One time event for the collection of groundwater samples
Study	1	LS	$35,000	$35,000	Laboratory evaluation
Report	1	LS	$10,000	$10,000	
Subtotal				$50,000	
2. Legal Costs for Land- and and Groundwater-Use Restrictions					
Legal and Filing Fees	1	LS	$25,000	$25,000	Establishing restrictions beyond those necessary for OU 1
Subtotal				$25,000	
	Subtotal - One-Time Expenditure			$75,000	
3. Environmental Sampling					
Groundwater Sampling and Analysis	28	wells	$1,000	$28,000	Organic analysis of 2 upgradient and 12 downgradient wells
Subtotal				$28,000	
3. Reporting					
Annual Summary reports	1	LS	$30,000	$30,000	Annual cost for annual reporting to summarize above analytical results
Subtotal				$30,000	
	Subtotal (Annual O&M)			$58,000	
	Total Net Present Value (@ 12% ROR)			$284,077	

APPENDIX III

ADMINISTRATIVE RECORD INDEX

APPENDIX IV

STATE LETTER OF CONCURRENCE

New York State Department of Environmental Conservation
Wolf Road, Albany, New York 12233

Michael D. Zagata
Commissioner

SEP 30 1996

Mr. Richard Caspe
Director
Emergency & Remedial Response Division
U.S. Environmental Protection Agency
Region II
290 Broadway
New York, NY 10007-1866

Dear Mr. Caspe:

Re: Carroll & Dubies, OU2, ID No. 336015
Record of Decision (ROD)

The New York State Department of Environmental Conservation has reviewed the ROD for the above-referenced site and finds it acceptable. It is understood to include the following provisions:

1. Natural attenuation of the groundwater to below NYS groundwater standards for organics.

2. Institutional controls restricting the use of groundwater in the area of the groundwater plume.

3. Monitoring of the groundwater to ensure improvement in groundwater quality.

4. Sediment sampling to ensure contaminants do not reach Gold Creek.

Please contact Sal Ervolina at (518) 457-7924 if you have any questions.

Sincerely,

for Michael J. O'Toole, Jr.
Director
Division of Environmental Remediation

cc: D. Garbarini/M. Jon, USEPA-Region II

APPENDIX V

RESPONSIVENESS SUMMARY

APPENDIX V

RESPONSIVENESS SUMMARY

CARROLL AND DUBIES SEWAGE DISPOSAL, INC.,
SUPERFUND SITE
GROUNDWATER OPERABLE UNIT

INTRODUCTION

A responsiveness summary is required by the National Contingency Plan (NCP) at 40 CFR §300.430(f)(3)(F). It provides a summary of citizens' comments and concerns received during the public comment period, and the United States Environmental Protection Agency's (EPA's) and the New York State Department of Environmental Conservation's (NYSDEC's) responses to those comments and concerns. All comments summarized in this document have been considered in EPA's and NYSDEC's final decision for the selected remedy for the Carroll and Dubies Sewage Disposal site groundwater operable unit (OU2).

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

Community involvement at the Site has been relatively strong. EPA has served as the lead Agency for community relations and remedial activities at the Site.

The Proposed Plan for the groundwater contamination beneath and downgradient of the Carroll and Dubies Site was released to the public for comment on August 28, 1996. This document, together with the Remedial Investigation report, the Baseline Risk Assessment and other reports, were made available to the public in the Administrative Record file at the EPA-Docket Room in Region II, New York, and in the information repository at the Deerpark Town Hall, Drawer A, Huguenot, New York and the Port Jervis Public Library, 138 Pike Street, Port Jervis, New York. The notice of availability for the above referenced documents was published in the Times Herald Record on September 10, 1996. A similar notice was sent to the site mailing list on August 28, 1996. The public comment period on these documents was open from August 28, 1996 to September 27, 1996.

On September 11, 1996, EPA conducted a public meeting at the Port Jervis High School, Port Jervis, New York to discuss the Proposed Plan for Operable Unit Two and to provide an opportunity for the interested parties to present oral comments and questions to EPA.

Attached to the Responsiveness Summary are the following Appendices:

Appendix A - Proposed Plan

Appendix B - Public Notice

Appendix C - September 11, 1996 Public Meeting Attendance Sheets

Appendix D - September 11, 1996 Public Meeting Transcript

Appendix E - Letters Submitted During the Public Comment Period

SUMMARY OF COMMENTS AND RESPONSES

Comments expressed at the September 11, 1996 public meeting and written comments received during the public comment period have been categorized as follows:

A. Operable Unit Two (OU-2) Remedy Selection Issues

B. Operable Unit One (OU -1) Remedy

C. Extent of Groundwater Contamination

D. Residential Wells

E. Risk and Health Assessment

F. Other/miscellaneous

A summary of the comments and EPA's responses to the comments is provided below.

A. Operable Unit Two Remedy Selection Issues

Comment #1: Some commenters inquired about the use of natural attenuation for the remediation of contaminated groundwater at other Superfund sites and whether there are any documented successes.

EPA's Response:

Within the Superfund program, natural attenuation has been selected as the remedy to address groundwater contamination at 73 sites. Some of these sites include municipal and industrial landfills, refineries, and recyclers. Natural attenuation is also being used to remediate many petroleum-contaminated underground storage tank sites across the country.

At the Allied Signal Brake Systems Superfund site in St. Joseph, Michigan, microorganism are effectively removing TCE and other chlorinated solvents from groundwater. Scientists studied the underground movement of TCE-contaminated groundwater from its origin at the Superfund site to where it entered Lake Michigan about half a mile away. At the site itself, they measured TCE concentrations greater than 200,000 parts per billion (ppb), but by the time the plume reached the shore of Lake Michigan, the TCE was one thousand times less-only 200 ppb. About 300 feet offshore in Lake Michigan concentrations were below EPA's allowable levels. In fact, microorganisms were destroying about 600 pounds of TCE a year at no cost to taxpayers. EPA determined that nature adequately remediated the TCE plume in St. Joseph while avoiding significant costs which might have been spent on conventional treatment without additional significant human health or environmental benefit.

Comment #2: One commenter was concerned that the time frames to implement Alternatives 3 (Groundwater Pump and Treat) and 4 (In situ Groundwater Treatment) were shorter periods than the estimated time frame for the groundwater to reach drinking water standards through natural attenuation.

EPA's Response:

The time frame to implement a remedial alternative as provided in the Proposed Plan, reflects only the time needed to construct the

components of the remedial system. This time frame excludes the time required for the design of the remedy, negotiations with the responsible parties, or award of contracts, and the time needed to operate the remedial system to achieve the remedial goals. The estimated time frames to implement Alternatives 3 and 4 are 9 months and 12 months, respectively.

The estimated time frame for the contaminants in the groundwater to meet drinking water standards is approximately five years after implementation of the lagoon remedy is completed. This time was estimated through a groundwater modeling study. In order to restore the aquifer to drinking water standards, the lagoons, which are the sources of groundwater contaminants at the Site, would have to be removed. Therefore, all the alternatives that were considered to address the contaminated groundwater beneath the Site rely on the implementation of the lagoon remedy before contaminant levels in the groundwater could reach drinking water standards. For all of the alternatives that were evaluated, the concentrations of organic contaminants in the groundwater are expected to meet drinking water standards approximately five years after implementation of the lagoon remedy. Therefore, all the alternatives are relatively similar in terms of the time frame to achieve drinking water standards.

Comment #3: One commenter inquired about the timetable for implementation of Operable Units 1 and 2 remedies.

EPA's Response:

Operable unit one is currently in the remedial design phase. Excavation and treatment of the wastes have not yet begun. Construction of the remedy is expected to begin in 1998, and it is anticipated that it would take another year to cleanup the sludges and soils in and around the lagoons utilizing ex-situ vapor extraction, bioslurry, and solidification/stabilization.

After the ROD for OU2 is signed, EPA will send out special notice letters to the PRPs (with the exception of Reynolds, which is considered a de-minimis PRP) providing them with an opportunity to implement the selected remedy under EPA supervision or to fund the remediation. From the time notice letters are delivered to the PRPs it usually takes approximately four to six months to initiate and complete negotiations with PRPs. If the PRPs decide

not to fund the cleanup of the site, EPA can either order them to do it or pay for the cleanup itself and later seek to recover the cost from the PRPs. In either case, the design of the remedy would be initiated shortly after the conclusion of negotiations. The period from signing the ROD to completing the remedial design, which would entail development of a monitoring plan and selecting the appropriate institutional control(s) to be implemented, would be less than one year.

Comment #4: One commenter expressed concern about the ability of the preferred remedy (natural attenuation with institutional controls and monitoring) to meet drinking water standards at the Site. Another commenter asked whether the groundwater modeling conducted at the Site is reliable to estimate concentration patterns in the groundwater.

EPA's Response:

As part of the remedial investigation, limited data was collected to evaluate the extent of biodegradation at the Site. This limited evaluation included the collection of data on dissolved oxygen levels and the presence of microorganisms in the groundwater capable of degrading volatile organic compounds under expected Site conditions. The dissolved oxygen levels in the benzene plume indicated the potential for biodegradation to be occurring. The degrading microorganisms population was in the range of 10^5 to 10^6, indicating the presence of a healthy and robust community of degraders present in the aquifer.

Groundwater modeling was conducted at the Site to determine whether the organic contaminant patterns found in the groundwater beneath the Site have stabilized due to intrinsic biodegradation and to estimate future concentrations of contaminants at potential off-site locations. The results of the groundwater modeling indicate that the organic contaminants in the groundwater are not migrating to Gold Creek and residences south of Gold Creek, and that the concentration patterns observed at the Site have stabilized or are not expected to change in the future.

Therefore, groundwater data combined with the limited biodegradation field data and with the groundwater modeling projections demonstrate the potential for biodegradation of

organic contaminants at the Site.

Both the potential for biodegradation and the groundwater modeling studies conducted at the Site were evaluated by scientists and experts in the field of computer modeling and biodegradation at EPA's Office of Research and Development in Ada, Oklahoma. Based on their review and approval of the modeling efforts, and the fact that monitoring will be conducted to verify the modeling predictions, EPA is confident that the selected remedy will be protective of human health and the environment. If the monitoring indicates that the model predictions are not reasonable accurate, EPA will evaluate the need to modify the remedy.

Comment #5: One commenter suggested that the No Action remedy, with no cost, should be selected for the groundwater operable unit, since the wastes were placed in the lagoons 17 years ago and the most downgradient monitoring wells have not detected any levels of concern in the groundwater. The commenter suggested that selection of Alternative 2 would be a waste of $284,000.

EPA's Response:

EPA evaluates the remedial alternatives against nine criteria, only one of which is cost. Based on a detailed evaluation, EPA selects a remedy based on all nine criteria, which are: 1)Overall protection of human health and the environment, 2)Compliance with Applicable or Relevant and Appropriate Requirements, 3)Long-term effectiveness and permanence, 4)Reduction of toxicity, mobility, or volume through treatment 5)Short-term effectiveness, 6) Implementability, 7)Cost, 8) State acceptance, and 9) Community acceptance.

Alternative 2 includes groundwater monitoring to evaluate the rate of reduction of contaminants in the groundwater, institutional controls to prevent the future use of the contaminated groundwater, and sediment sampling in Gold Creek to ensure that Site-related contaminants do not impact Gold Creek. These measures are necessary to ensure that the remedy is protective of the public and the environment. A detailed cost estimate of Alternative 2 is presented in Table 6 of the Record of Decision. Although $284,000 is a significant amount of money, it is a reasonable amount to fulfill EPA's responsibility to

ensure that the remedy continues to be protective of human health and the environment, while alleviating community concerns about the effectiveness of the remedy to protect the drinking water. Some commenters indicated that they wanted additional monitoring due to concerns about their drinking water wells. Please see comment number 9.

B. Operable Unit One (OU-1) Remedy

Comment #6: One commenter inquired about the treatment technologies that will be used to treat the organic and inorganic contaminants in the lagoons and what type of materials would be used to stabilize the inorganic contaminants. Another commenter inquired if any excavation and treatment of the wastes had begun.

EPA's Response:

In March 1995, EPA signed a Record of Decision for the lagoons. The remedy requires the excavation of approximately 20,000 cubic yards of contaminated material from the lagoons and soils in the vicinity of the lagoons. Materials exceeding treatment levels will undergo stabilization via solidification/stabilization (for inorganic contaminants) and bioslurry (for organic contaminants) or a combination of the two treatment processes. All materials will be placed on-site in a lined and capped cell with leachate collection.

Solidification/stabilization has been effectively used at several Superfund sites to bind inorganic contaminants into an inert, nonleaching mass that can be disposed of as a nonhazardous waste. Different stabilization agents, such as cement-based, pozzolaic-based, asphalt-based, and organic-polymer-based, are commercially available. The specific stabilizing agent or agents that will be used at the Carroll and Dubies site have not been selected at this time, they will be selected during the remedial action phase of the remedy.

Bioslurry has also been used effectively at Superfund sites to treat organic contaminants, specifically semi-volatile organic compounds. In bioslurry treatment, the contaminated soil/sludges is mixed with water to form a slurry which is fed to a bioreactor. Air and nutrients are added to the bioreactor to promote aerobic microbial activity. Microorganisms digest organic

substances for nutrients and energy thereby breaking down hazardous substances into less toxic or nontoxic substances. Residual contaminants in the treated soil and sludge will be contained in the capped cell to provide an extra margin of safety against the continued migration of contaminants in the soil to the groundwater.

Although the use of the bioslurry process to treat lagoon 7 materials appears to be a promising means of treating the semi-volatile organics, further treatability studies are necessary to demonstrate that this process can reduce the complex mix of constituents in lagoon 7 to remediation goals. Because of the existing uncertainty, a contingency remedy will be implemented if treatability study results indicate that bioslurry will not be effective in reducing the levels of contaminants in lagoon 7 materials, particularly semi-volatile contaminants, to remediation goals. The major components of the contingency remedy are identical to those of the selected remedy with the following exception:

Excavation and off-Site treatment (as necessary) and disposal of lagoon 7 materials at a Resource Conservation and Recovery Act (RCRA) permitted hazardous waste treatment, storage and disposal facility; it is assumed that thermal treatment, i.e., incineration or low temperature thermal treatment, will be necessary to reduce the contaminants to appropriate Land Disposal Restriction (LDR) levels.

This operable unit is currently in the remedial design phase. Excavation and treatment of the wastes have not yet begun. Excavation and treatment of the lagoons is expected to begin in 1998.

Comment #7: One commenter inquired about the design of the containment cell and cover for the treated materials from the lagoons.

EPA's Response:

The treated and untreated soils/sludges will be placed in a lined and capped cell consistent with modified requirements of New York Code of Rules and Regulations Part 360 (NYCRR Part 360 Solid Waste Management Facilities regulations). The regulations

require that the base and cover of the disposal facility meet the minimum permeability requirements. Although the final design of the cover has not been completed, it is envisioned that the base of the cell will consist of a high density polyethylene (HDPE) liner and a sand drainage layer; that the cell will be sloped to a leachate collection system; and that the cover will consist of a low-permeability clay layer, an HDPE membrane, a sand drainage layer and a topsoil layer.

C. Extent of Groundwater Contamination

Comment #8: One commenter inquired when the most recent sampling of the furthest downgradient wells was conducted. Another commenter inquired about the concentrations of organic contaminants in these wells and their corresponding drinking water standards.

EPA's Response:

Groundwater samples were collected from these downgradient wells in September 1994 and April 1995 and analyzed for both organic and inorganic compounds. In July 1996, groundwater samples were also collected from these wells and analyzed for inorganic compounds only.

Groundwater data collected in the 1995 sampling event, in the vicinity of lagoons 7 and 8, indicates that benzene is the primary organic contaminant in the plume originating from these lagoons. The 1995 sampling data of monitoring wells located downgradient and closest to lagoons 7 and 8 (OW-9, OW-10, OW-11, OW-12, OW-13), indicated various concentrations of organic compounds. For example, monitoring well OW-10, which is located immediately downgradient of lagoon 8, had the highest concentrations of organic compounds, with concentrations of benzene at 2,600 ppb (State groundwater standard of 0.7 parts per billion or ppb), xylene at 30 ppb (State drinking water standard of 5 ppb), and isophorone at 440 ppb (State drinking water standard of 10 ppb).

However, the concentrations of organics in groundwater in the aquifer decreased dramatically downgradient from the lagoons (this was also the case for the 1994 sampling event). In 1995, sampling data from the furthest downgradient wells from the

lagoons (OW-17, OW-18, OW-19 and OW-23) only indicated three site-related organic compounds above the State drinking water and groundwater standards. Benzene was detected at 12 ppb (State groundwater standard of 0.7 ppb), chlorobenzene at 10 ppb (State drinking water standard of 5 ppb), and xylene at 29 ppb (State drinking water standard of 5 ppb) in monitoring well OW-18. Benzene and chlorobenzene were detected at 6 ppb and 8 ppb, respectively, in monitoring well OW-19. No organic compounds were detected in monitoring well OW-17. A comparison of the 1994 and 1995 sampling data for organic compounds indicates that only 2 of the 4 furthest downgradient monitoring wells had any organic contaminants (benzene, chlorobenzene and xylene); the contaminants were present at low levels in both sampling events. The concentrations detected were low levels. No trends from 1994 to 1995 could be established.

D. **Residential Wells**

Comment #9: Some commenters asked about the residential well sampling results, the dates that the sampling was conducted, whether they could have their wells sampled, and the date of sediment sampling in Gold Creek. One commenter requested that the New York State Department of Health (NYSDOH) sample the private wells and that the results of that sampling be considered in EPA's determination of the final remedy for the Site.

EPA's Response:

The NYSDOH sampled several private wells located downgradient of the Site in 1991 and 1993 for organic and inorganic constituents. Organic constituents were not detected in the groundwater from these wells; inorganic constituents were detected below drinking water standards, indicating their presence are at naturally occurring levels. In September 1994 and March 1995, NYSDOH sampled and analyzed a total of ten private wells in the area for volatile organic compounds. The wells were located along Andrew Drive, Evergreen Lane, Mark Drive, Michael Drive, Van Avenue, and NY Route 209. The results indicate that no volatile organic compounds were detected in any of the wells sampled. Mr. Tim Vickerson of the NYSDOH indicated at the public meeting that any concerned citizen who wants their private wells to be tested for contaminants may contact him at 1-800 458-1158 ext. 305.

Although the results of wells to be sampled by NYSDOH would provide additional information to be utilized in EPA's determination of the remedy for the Site, there is no reason to believe that these results will be any different from previous residential well sampling results. Additionally, EPA believes that the results of groundwater monitoring, sediment sampling, and groundwater modeling alone provide more than adequate support for the selection of Alternative 2. In any case, EPA and NYSDOH will evaluate the results of the future residential well sampling, as well as results from the groundwater monitoring program to ensure that the remedy remains protective of human health and the environment.

In September 1994, sediment samples were collected in Gold Creek. Analytical results indicate that Site related contaminants have not impacted the sediments in Gold Creek.

E. Risk and Health Assessment

Comment #10: One commenter inquired about the risk posed by the contaminated groundwater and EPA's acceptable risk range. Another commenter questioned if EPA took into account all contaminants in the groundwater in the risk assessment calculation.

EPA's Response:

The baseline risk assessment addressed the potential risk to human health by identifying potential exposure pathways by which the public might be exposed to contaminant releases at the Site under current and future land-use conditions. There are no current on-site groundwater users at the Site, therefore there are no potential current receptors at the Site. EPA evaluated whether residents to the east and southeast of Gold Creek that use groundwater as drinking water and recreational users of Gold Creek should be included as off-site receptors. Groundwater modeling, in conjunction with measured groundwater concentrations, sediment data from Gold Creek and groundwater concentrations from off-site residential wells, indicates that the plumes have stabilized and that contaminants have not migrated either to Gold Creek or to off-site residences on the other side of Gold Creek. Groundwater modeling results indicate that contaminants are not expected to migrate to or beyond Gold

Creek. Thus, current exposures to either off-site residents or recreational users of Gold Creek are not occurring and are not expected to occur in the future. These exposure pathways therefore, were not quantitatively evaluated in the risk assessment.

The exposure pathway evaluated under the potential future land-use scenario included the exposure of industrial workers to the on-site contaminated groundwater through ingestion. Because the Site and land immediately adjacent to the Site are currently zoned and used exclusively for industrial land use, future residential or commercial use of the Site is not expected to occur and therefore, only industrial use of the Site was evaluated in the risk assessment. For purposes of conducting the risk assessment it was assumed that a future industrial worker would drink 1 liter of water per day from an on-site well for 5 days a week for 50 weeks a year (250 days/year with about 2 weeks vacation) for 25 years out of a 70 year lifetime.

Groundwater data were evaluated to identify chemicals-of-concern for the risk assessment analysis. All organic chemicals that were detected in at least one sample were retained for evaluation in the risk assessment with the exception of acetone and bis(2-ethylhexyl)phthalate, which were determined to be laboratory contaminants based on laboratory blank data. Since inorganic contaminants are naturally occurring in groundwater, they were evaluated to determine if they were present at the Site above background concentrations. As a result of this evaluation eleven (11) inorganic compounds were retained for evaluation in the risk assessment. A list of all the contaminants of concern detected in the groundwater that were used for the risk assessment analysis is provided in Table 2 of the ROD. These contaminants included benzene, chloroform, 1,2-dichlorobenzene, tetrachloroethene, toluene, vinyl chloride, xylene, phenol, arsenic, antimony, barium, chromium, lead, and zinc.

EPA's acceptable cancer risk range is 10^{-4} to 10^{-6} which can be interpreted to mean that an individual may have a one in ten thousand to a one in a million increased chance of developing cancer as a result of a site-related exposure to a carcinogen over a 70-year lifetime under the specific exposure conditions at a site.

Evaluation of risks to potential future industrial workers was 1.4×10^{-4} (approximately one-in-ten thousand). For this scenario, the risk was determined to be within EPA's acceptable risk range.

To assess the overall potential for noncarcinogenic effects posed by the groundwater contaminants at the Site, EPA has developed the hazard index (HI). An HI value of greater than 1 is considered to pose a potential noncarcinogenic risk. The calculated HI value was 0.55 which is below the acceptable level of 1.0 indicating no adverse health effects to future industrial workers.

F. Other/miscellaneous

Comment #11: A commenter asked for the meaning of natural attenuation.

EPA's Response:

Natural attenuation is an approach for treating underground pollutants that makes use of natural processes to contain the spread of contamination and reduce the concentration of contaminants in order to restore soil or groundwater quality at contaminated sites. Examples of these natural processes are intrinsic biodegradation, dilution, dispersion, and adsorption.

Comment #12: A commenter asked what institutional controls are and how they would be implemented?

EPA's Response:

Institutional controls are non-engineering measures that prevent or limit exposure to hazardous substances, pollutants or contaminants. They usually take the form of land and/or water use restrictions. There are primarily two general categories of institutional controls and several types within each category. Governmental Controls are generally implemented through State or local authorities that restrict activities or property, such as zoning laws which control land use, and laws regarding well drilling or water usage, including licensing or permitting authorities. Proprietary controls are controls placed upon real property that restrict the use of that property. Examples

include covenants, easements, agreements or notices prohibiting a specific land use or preventing activities that may negatively impact specific remedial measures. Proprietary controls in the form of deed restrictions (e.g. easements or covenants) are property interests that an owner conveys to another. These deed restrictions can "run with the land" which means they are binding on future title holders.

Institutional controls will be implemented at the Carroll and Dubies Site to restrict installation and use of groundwater wells throughout the contaminated groundwater plume. The institutional controls will be required until the groundwater has been ~~demonstrated to~~ meet federal drinking water and State groundwater and drinking water standards. To date, EPA has not determined which type or types of institutional controls will be the most effective and the easiest to implement for this Site. This decision will, in all likelihood, be made during negotiations with the PRPs regarding performance of the remedy, or during the remedial design phase of this operable unit.

Comment #13: One commenter questioned whether EPA would implement and pay for the remedy in the event the PRPs do not agree to do so.

EPA's Response:

Following the selection of a remedy, EPA issues special notice letters to the potentially responsible parties (PRPs) requesting that they implement and fund the design and remediation of the site. If the PRPs are not willing to pay for or implement the cleanup of the site, then EPA can order them to perform the remedial action, or EPA can use Superfund money to perform the work. When the Agency uses its money for a response action at a site where there are financially viable PRPs, it is authorized to take an enforcement action against those PRPs to recover its costs. EPA can ultimately recover these costs through administrative settlements, judicial settlements or litigation.

Comment #14: One commenter inquired about whether the Superfund program is an after the fact agency. This commenter was concerned that efforts were not being made to prevent Superfund sites from being created.

EPA's Response:

Years ago, people did not understand how certain wastes might affect people's health and the environment. Many wastes were dumped on the ground, in rivers or left out in the open. As a result, thousands of uncontrolled or abandoned hazardous wastes sites were created. Some common hazardous waste sites include abandoned warehouses, manufacturing facilities, processing plants and landfills. In response to growing concern over health and environmental risks posed by hazardous waste sites, Congress established the Superfund program in December 1980 to provide EPA with a powerful means of responding to cases of environmental contamination. The Superfund remedial program is generally retroactive in nature, addressing previously-contaminated sites, as well as chemical emergency situations. Superfund personnel are on call to respond at a moment's notice to chemical emergencies, accidents or releases. Typical chemical emergencies may include train derailments, truck accidents, and incidents at chemical plants where there is a chemical release or threat of a release to the environment. On the other hand, the Resource Conservation and Recovery Act ("RCRA"), enacted in 1976, (implementing regulations effective November 1980) regulates hazardous waste from cradle (generation) to grave (disposal/treatment) thereby minimizing the potential for future Superfund sites. RCRA regulations also require owners and operators of RCRA regulated facilities to properly "close" facilities and to maintain financial assurance in amounts sufficient to cover the cost of "closing" the facility and thus avoiding the need for a Superfund clean up.

Comment #15: One commenter inquired about the potentially responsible parties to the Consent Order.

EPA's Response:

There are four categories of PRPs: (1) Parties who conducted operations at the site, which caused the site to become contaminated, known as "operators"; (2)parties that transported wastes to the site, known as "transporters"; (3) parties that generated wastes that were disposed of at the site, known as "generators"; and (4) past or present owners of the site, known as "owners".

The five PRPs at this Site are Carroll and Dubies Sewage Disposal, Inc. (C&D), which is considered to be owner, operator and transporter; Kolmar Laboratories, Inc. (Kolmar), Wickhen Products, Inc. (Wickhen) and Reynolds Metals Co., Inc. (Reynolds), all considered to be generators; and the City of Port Jervis, also considered to be an owner.

Two PRPs, Kolmar and Wickhen, signed an Administrative Order on Consent in February 1990 for the performance of the remedial investigation and feasibility studies (RI/FSs). During the OU1 RI, EPA learned from the City of Port Jervis that it owned a major portion of the Site property where the lagoons are located. In an April 22, 1993 letter, EPA notified the City that it was also a PRP for the Site.

On May 19, 1995, EPA issued "special notice" letters to the PRPs requesting that they submit a good faith offer to perform the Remedial Design/Remedial Action (RD/RA) for OU1. The PRPs and EPA were unable to reach an agreement and thus, on September 29, 1995, EPA issued a Unilateral Administrative Order to Carroll & Dubies, Kolmar and Wickhen ordering them to implement the first operable unit remedy.

On September 29, 1995, EPA entered into a de minimis Settlement with Reynolds regarding EPA's past response costs for the Site and remedial design/remedial action costs for OU1. Reynolds was considered de minimis party because it contributed a very small percentage of the waste to the Site, approximately 0.32 percent, and this waste was neither more toxic nor of greater hazardous effect than the other hazardous substances at the Site. This settlement became effective on July 18, 1996.

After issuance of the ROD for OU2, all non de minimis PRPs will be offered the opportunity to design and implement the selected OU2 remedy. EPA will offer Reynolds a de minimis settlement for OU2 costs.

Comment #16: One commenter expressed concern that the Port Jervis landfill property, in which several of the Carroll and Dubies lagoons are located, is the major contributor to the overall contamination at the Site. The commenter believes that in addition to the wastes disposed of in the lagoons, a great deal of other Carroll & Dubies wastes were also disposed of in the

Port Jervis Landfill. The commenter indicated that the cost to clean up the landfill will be much greater than the cost to clean up the Carroll and Dubies Site, and that EPA should be addressing the Port Jervis landfill.

EPA's Response:

This ROD addresses only the groundwater beneath and downgradient of the Carroll and Dubies Site. The landfill is not being considered part of the Site, and therefore, is not being investigated at this time. However, if specific information regarding the location, methods and types of Carroll & Dubies Sewage Disposal waste disposed of in the Port Jervis landfill is provided to EPA, EPA will perform further investigation as appropriate.

It should be noted that landfills are subject to New York State regulations for the management of solid waste facilities (Part 360 of the New York Code of Rules and Regulations). These regulations include landfill closure requirements which include installing a landfill cover. To date, the City of Port Jervis landfill has not yet been properly capped. Since the landfill is not part of the Superfund investigation conducted to date, there are no costs available for remediating the landfill. Typically, landfills are addressed by installing a multi-layered cover over the landfill to prevent the percolation of snow melt and rainwater through the landfill waste, thereby reducing the migration of contaminants from the landfill to the groundwater. Given the size of landfills, it is not practical to excavate and treat the landfill waste. It is probable that the proper closure of the landfill would be a multi-million dollar effort. The Port Jervis landfill will be closed (including capping) as required by the New York Code of Rules and Regulations (6 NYCRR Part 360) requirements for Solid Waste Management Facilities. The NYSDEC has not yet developed a schedule for the closure of the landfill. However, NYSDEC has requested that any questions regarding the closure of the landfill be directed to:

Mr. Victor Cardona
Federal Projects Section
Bureau of Eastern Remedial Action
Division of Hazardous Waste Remediation

New York State Department of
Environmental Conservation
50 Wolf Road
Albany, New York, 12233-7010
Telephone # (518) 457-3976

Comment # 17: Several commenters requested that the water and sediments of Gold Creek be sampled immediately and at frequent intervals during the remediation of the lagoons. The Creek is adjacent to the Port Jervis High School and Elementary School and their playing fields. The commenters indicated that students have had to enter the Creek to retrieve balls on more than one occasion and that this may present a possible human exposure to Site contaminants.

EPA's Response:

Sediment samples were collected from two locations in Gold Creek south of the Site. These samples were collected in September 1994 and analyzed for organic and inorganic compounds. The analytical results of the sampling indicate that Site related contaminants have not impacted Gold Creek. This is further supported by the groundwater sampling results which show that contaminants were detected at low levels in monitoring wells located close to the Creek. In addition, EPA's risk assessment indicates that there is no risk associated with the sediments. The contaminants in the groundwater at the Site have not migrated to Gold Creek and are not anticipated to migrate there in the future.

The selected remedy requires sediment sampling in Gold Creek to ensure that Site related contaminants do not impact the Creek in the future. With respect to surface water sampling, EPA has determined that it will require sampling of the Creek water during the first year of the monitoring program to support the results of the sediment sampling.

Comment #18: One commenter indicated that the responsibility for establishing the institutional controls should be placed on the City of Port Jervis.

EPA's Response:

EPA will determine the appropriate institutional control or controls to be implemented during negotiations with the PRPs regarding performance of the remedy, or during the remedial design phase of this operable unit. After issuance of this ROD, EPA will send "special notice letters" to all non-de minimis PRPs; this includes the City of Port Jervis. The special notice letter will invite the PRPs, including the City, to submit a good faith offer to either implement the remedy themselves or fund EPA's implementation of the remedy. If EPA determines that the City is the most appropriate entity to implement the required institutional controls, and the City does not agree to do so, EPA could issue a unilateral order to the City, ordering them to perform the remedy.

Comment #19: One commenter stated that no additional monitoring, beyond what is required for OU1, is necessary.

EPA's Response:

The selected remedy for OU2 includes a groundwater monitoring program. This monitoring program will include an initial study of the groundwater parameters which favor natural attenuation and periodic groundwater sampling to evaluate the rate and extent of reduction of the organic contaminants in the groundwater.

The initial study will include an evaluation for the presence of constituent-degrading microorganisms, pH, oxygen or other electron acceptors, elemental nitrogen, phosphorous and other parameters that are necessary to evaluate the progress of natural attenuation. The results of the groundwater sampling and analysis will be summarized to establish trends and/or reassess further remedial actions that may be required.

The OU1 remedy includes groundwater monitoring only to ensure that the containment cell for the treated lagoon sludges and soil is functioning appropriately. The purpose of this monitoring is to detect any potential releases to the groundwater that may occur in the future. The OU1 groundwater monitoring program was to be coordinated with monitoring expected to be conducted pursuant to the OU2 remedy.

Comment #20: One commenter expressed concern that the time period presented in the Proposed Plan, for the groundwater to reach drinking water standards, was of greater time duration than that indicated by the groundwater model. The commenter indicated that the groundwater modeling results predict that the contaminant plumes will attenuate over a much shorter time than the five year time period specified by EPA.

EPA's Response:

The groundwater model was used to predict concentrations in the future for the following three different scenarios: (1) the remedy for OU1 is not implemented. Under scenario 1 the extent of the benzene and perchloroethylene (PCE) contaminant plumes would remain constant for the foreseeable future. (2) The OU1 remedy is implemented and no residual contaminants remain in soil beneath the lagoons. Under scenario 2 the benzene contaminant plume would retract to the lagoons within approximately five years, while the PCE plume would retract to the lagoons within approximately one year. (3) The OU1 remedy is implemented and residual contaminants remain in soil beneath the lagoons. Under scenario 3 the benzene and PCE plumes would retract to the lagoons within approximately five years. The five year time period specified by EPA assumes that all contaminants in the groundwater at the Site will attenuate to drinking water standards following implementation of the OU1 remedy. EPA believes that this is an accurate and appropriate representation of the groundwater modeling results.

Comment #21: The Town Board of Deerpark requested that Alternative 3 (Groundwater Pump and Treat via Precipitation, Filtration and Carbon Adsorption) be the selected remedy to address the groundwater contamination at the Site. The Town Board believes that this alternative provides a better containment and control of the contaminated groundwater than Alternative 2. Another commenter requested that Alternative 4 (In Situ Groundwater Treatment) be the selected remedy.

EPA's Response:

EPA and NYSDEC believe that Alternative 2 provides the best balance and trade offs with respect to the evaluation criteria.

There are no current users of groundwater at the Site, therefore no one is exposed to the contaminants present in the groundwater.. Sampling of the groundwater indicates that the levels of contamination in the groundwater decrease dramatically from the wells nearest the lagoons to those wells furthest downgradient of the lagoons and closest to Gold Creek; sediment sampling indicates that the Creek has not been impacted by contaminants from the Site. This data and other data generated during the RI were input into a groundwater model which predicted that contaminants would not reach Gold Creek in the future. The groundwater modeling also predicted that Alternative 2 will attain drinking water standards in approximately the same time frame, five years after the implementation of the OU1 remedy, as Alternatives 3 and 4. Natural attenuation in combination with institutional controls and groundwater monitoring will ensure that the remedy is fully protective of human health and the environment.

Given the fact that the remedy will be fully protective of human health and the environment, and that it will achieve drinking water standards in approximately the same time frame as more costly alternatives, EPA and NYSDEC believe that Alternative 2 is the most practical choice to address the groundwater contamination at the Carroll and Dubies site.

Appendix A

Proposed Plan

Superfund Proposed Plan

Carroll and Dubies Sewage Disposal Inc.

Town of Deerpark
Orange County, New York

EPA Region 2 | August 28, 1996 | NYSDEC

PURPOSE OF PROPOSED PLAN

This Proposed Plan describes the remedial alternatives considered for the contaminated groundwater at the Carroll and Dubies Sewage Disposal (C&D) Superfund site (the Site) and identifies the preferred remedial alternative for the contaminated groundwater with the rationale for this preference. The Proposed Plan was developed by the U.S. Environmental Protection Agency (EPA), as lead agency, with support from the New York State Department of Environmental Conservation (NYSDEC). EPA is issuing the Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, 42 U.S.C. §9617(a), and the National Contingency Plan (NCP), 40 C.F.R. §300.430(f). The alternatives summarized here are described in the Remedial Investigation and Feasibility Study (RI/FS) reports which should be consulted for a more detailed description of all the alternatives. As part of the Administrative Record for the Site, the RI/FS can be found in the public repositories listed on page 2.

This Proposed Plan is being provided as a supplement to the RI/FS reports to inform the public of EPA's and NYSDEC's preferred remedy and to solicit public comments pertaining to all of the remedial alternatives evaluated, as well as the preferred alternative.

The remedy described in this Proposed Plan is the preferred remedy for the second operable unit (OU2) at the Site, involving the contaminated groundwater at the Site. (The selected remedy for the first operable unit (OU1), involving the clean-up of sludges and contamination in the soil in and around the lagoons, was announced in a Record of Decision (ROD) dated March 31, 1995, and is presently in the design phase.) Changes to the preferred remedy or a change from the preferred remedy to another remedy may be made, if public comments or additional data indicate that such a change will result in a more appropriate remedial action. The final decision regarding the selected remedy will be made after EPA has

taken into consideration all public comments. We are soliciting public comment on all of the alternatives considered in the detailed analysis of the RI/FS because EPA and NYSDEC may select a remedy other than the preferred remedy.

COMMUNITY ROLE IN SELECTION PROCESS

EPA and NYSDEC rely on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the RI/FS reports, Proposed Plan, and supporting documentation have been made available to the public for a public comment period, which begins on August 28, 1996 and concludes on September 27, 1996.

A public meeting will be held during the public comment period at the auditorium of the Port Jervis High School, Route 209, Port Jervis, New York on Wednesday, September 11, 1996 at 7:00 p.m. to present the conclusions of the RI/FS, to elaborate further on the reasons for recommending the preferred remedial alternative, and to receive public comments.

Comments received at the public meeting, as well as written comments, will be documented in the Responsiveness Summary Section of the Record of Decision (ROD), the document which formalizes the selection of the remedy.

MARK YOUR CALENDAR

August 28, 1996 to September 27, 1996
Public comment period on RI /FS report, Proposed Plan, and remedy considered.

Wednesday, September 11, 1996
Public meeting to be held at 7:00 p.m. in the auditorium of the Port Jervis High

Written comments should be addressed to
Maria Jon
Project Manager
U.S. Environmental Protection Agency
290 Broadway, 20th floor
New York, New York 10007-1866
(212) 637-3967

Copies of the RI/FS reports, Proposed Plan and supporting documentation are available at the following locations:

Town Hall
Drawer A
Huguenot, New York 12746
Tel. (914) 856-2210
Hours: 8:00 a.m. - 4:00 p.m. (Mon. - Fri.)

EPA Document Control Center
290 Broadway, 18th floor
New York, New York 10007-1866

SITE BACKGROUND

The Carroll & Dubies site is located just northeast of the City of Port Jervis, on Canal Street in the Town of Deerpark, Orange County, New York. The Site is approximately 5.5 acres in size (see Figure 1). The northwest boundary of the Site is formed by the valley wall, which consists of exposed bedrock with talus comprising the

base. The southeast boundary and a portion of the northeast boundary of the Site is formed by remnants of the former Delaware and Hudson Canal and towpath. Adjacent to the southern boundary of the Site is the City of Port Jervis Landfill. The landfill is no longer active; however, Orange County currently operates a solid waste transfer station on a portion of the landfill property. Approximately 1,500-feet to the east of the Site is Gold Creek. The nearest resident located downgradient of the Site is about a quarter of a mile from the Site.

From approximately 1970 to 1979, the Site was used for the disposal of septic and municipal sewage sludge and industrial wastes, primarily from the cosmetic industry. The industrial waste was deposited in one or more of the seven lagoons located at the Site (lagoons 1 through 4 and 6 through 8 are depicted in Figure 2). Lagoon 5 contains tires; no industrial waste was found.

In 1978, lagoon 3 was ignited by the Port Jervis Fire Department in order to practice suppression of chemical fires. After this incident, lagoons 3 and 4 were filled in with soil and the area was revegetated. With the exception of lagoons 1 and 2, all of the lagoons have been covered with soil. Lagoons 1 and 2 were left uncovered and are surrounded by a wooden fence. In June 1979, NYSDEC prohibited the disposal of industrial wastes at the Site. The Site continued to be used for the disposal of septic and municipal sewage wastes until 1989.

In February 1987, NYSDEC issued a Phase II Investigation Report which summarized past investigations and included a Hazard Ranking System (HRS) score for the Site. Based on the HRS score, the Site was proposed for inclusion on the National Priorities List (NPL) in June 1988 and was placed on the NPL in February 1990.

On September 25, 1989, EPA sent "special notice" letters to four potentially responsible parties (PRPs), affording them the opportunity to conduct the RI/FS for the Site. PRPs are companies or individuals who are potentially responsible for contributing to the contamination at the Site and/or are past or present owners of the property. The four PRPs were Carroll and Dubies Sewage Disposal, Inc. (C&D), Kolmar Laboratories, Inc. (Kolmar), Wickhen Products, Inc. (Wickhen) and Reynolds Metals Co., Inc. (Reynolds). The PRPs were given 60 days in which to submit a good faith offer to undertake or finance the RI/FS for the Site.

On November 30, 1989, two PRPs, Kolmar and Wickhen, submitted a good faith offer to perform the RI/FS. An Administrative Order on Consent was signed by the two PRPs and by EPA in February 1990. Kolmar and Wickhen conducted all RI/FS work, pursuant to the RI/FS Order with oversight by EPA. During the RI, EPA learned from the City of Port Jervis that it owned a major portion of the Site property where the lagoons are located. In an April 22, 1993 letter, EPA notified the City that it was also a PRP for the Site.

In March 1995, EPA signed a ROD for the first operable unit which called for the excavation of approximately 20,000 cubic yards (cy) of contaminated material from the lagoons and soils in the vicinity of the lagoons. Materials exceeding treatment

levels will undergo treatment via solidification/stabilization (for inorganic contaminants) and bioslurry (for organic contaminants) or a combination of the two treatment processes. All materials will be placed on-site in a lined and capped cell with leachate collection.

On May 19, 1995, EPA issued "special notice" letters to the PRPs requesting that they submit a good faith offer to perform the Remedial Design/Remedial Action (RD/RA) for OU1. The PRPs and EPA were unable to reach an agreement and thus, on September 29, 1995, EPA issued a Unilateral Administrative Order to C&D, Kolmar and Wickhen ordering them to implement the first operable unit remedy.

On September 29, 1995, EPA entered into a De Minimis Settlement with Reynolds regarding past costs for OU1. This settlement became effective on July 18, 1996.

After issuance of the ROD for OU2, all the PRPs will be offered the opportunity to design and implement the selected OU2 remedial alternative.

SCOPE AND ROLE OF ACTION

Site remediation activities are sometimes segregated into different phases or operable units, so that remediation of different environmental media or areas of a site can proceed separately. This phased approach results in an expeditious remediation of the entire site. EPA has designated two operable units for the Carroll and Dubies site as described below.

- The first operable unit (OU1) includes the materials and contaminated soils from lagoons 1, 2, 3, 4, 6, 7, and 8, which are contaminated primarily with heavy metals and volatile organic compounds (VOCs). This operable unit is currently in the remedial design phase.

- Operable Unit 2 (OU2) addresses the contaminated groundwater beneath and downgradient of the Carroll and Dubies property. This is the final operable unit and is the subject of this Proposed Plan.

REMEDIAL INVESTIGATION SUMMARY

The nature and extent of groundwater contamination found at the Carroll and Dubies site was assessed through sampling of groundwater, sediment in Gold Creek, residential wells and through groundwater modeling and geophysical surveys. A total of 34 monitoring wells was installed and four groundwater sampling events were conducted during the investigation.

The geology under the Site consists of unconsolidated overburden materials of glacial and glaciofluvial origin, which overlie shale bedrock. The thickness of the unconsolidated overburden materials ranges from zero foot at the exposed bedrock slope forming the northwestern Site boundary, to over 60 feet along the towpath. The glacially derived materials consist of two distinct units, including a glacial till unit overlain by glacial outwash deposits. The outwash deposit, which constitutes an aquifer, ranges in thickness from 31 feet to 52 feet along the downgradient edge of the Site. The glacial till is not continuous beneath the Site, and appears to pinch out

toward the northwestern edge of the Site, adjacent to the exposed bedrock slope. The till formation is defined as an aquitard, because it consists of silt and clay, which typically have low permeability. The till formation is underlain by shale bedrock. Groundwater found in the bedrock can be developed and therefore the bedrock is defined as an aquifer. The depth to groundwater from ground surface ranged from approximately 30 to 40 feet along the southeastern boundary of the Site. Groundwater movement beneath the Site is generally to the southeast, towards Gold Creek, which is located approximately 1,500 feet southeast of the Carroll and Dubies property line.

Groundwater samples were collected downgradient of the lagoons and analyzed for organic and inorganic compounds. The monitoring wells monitor either the bedrock (well depths ranging from 39 feet to 86 feet below land surface), the glacial till (well depth at 60 feet below land surface), the glacial outwash (well depths ranging from 16 feet to 58 feet below land surface) or both the glacial till and outwash units (well depths ranging from 35 feet to 51 feet below land surface). The analytical results for the groundwater samples for the 1991, 1993, 1994, and 1995 sampling events did not indicate the presence of organic contaminants above federal drinking water or State drinking water or groundwater standards in any of the bedrock or glacial till monitoring wells. The sampling events did show VOCs, semivolatile organic compounds (SVOC), and chlorinated organic compounds at concentrations exceeding federal drinking water and State groundwater and drinking water standards in monitoring wells that are screened in the outwash and across the outwash and till interface. As a result two plumes of total organic compounds exceeding 100 µg/L (micrograms per liter) or parts per billion (ppb) were defined. One plume originates at lagoons 1 and 2, the other at lagoons 7 and 8. The concentration of organics in the groundwater decreases dramatically further downgradient of the lagoons, which suggests that significant attenuation of contaminants has occurred. This has been demonstrated through groundwater modeling conducted at the Site. The plumes are of limited extent and have not extended far enough to impact Gold Creek, or to affect groundwater or the residential wells south of Gold Creek.

The discussion below is intended to summarize groundwater results for organic constituents by plume (i.e., results of samples collected from monitoring wells in the plume downgradient from lagoons 1-4 and results of samples collected from monitoring wells in the plume downgradient of lagoons 6-8). The discussion focuses on the 1994 and 1995 sampling results, as these results indicate the highest concentrations of organic contaminants and during these sampling events all wells in the monitoring network had been installed (the wells had been installed in phases).

Groundwater Downgradient of Lagoons 1-4

During the 1994 sampling event, four organic compounds, benzene, 1,2-dichloroethene, tetrachloroethene and trichloroethene were detected above the federal drinking water and/or State drinking water and groundwater standards in the monitoring wells located downgradient of lagoons 1 through 4. The highest concentrations of the chlorinated organic

compounds were observed in shallow outwash well OW-2, located downgradient of lagoon 2. Groundwater samples from monitoring well OW-2 detected 1,2-dichloroethene at 130 ppb, tetrachloroethene at 100 ppb, and trichloroethene at 24 ppb. The federal drinking water and State drinking water standards for tetrachloroethene and trichloroethene are 5 ppb; the State drinking water standard for 1,2-dichloroethene is 5 ppb, which is more stringent than the federal standard. Benzene was observed in shallow outwash well MW-4 at 15 ppb. The State drinking water standard for benzene is 0.7 ppb. The 1995 groundwater results detected organic constituents at similar concentrations as those detected during the 1994 sampling event.

Groundwater Downgradient of Lagoons 6-8

Groundwater data collected in the 1995 sampling event, in the vicinity of lagoons 7 and 8, indicates that benzene is the primary organic contaminant in the plume originating from these lagoons. During the 1995 sampling of monitoring wells located downgradient of lagoons 6, 7 and 8 (OW-9, OW-10, OW-11, OW-12, OW-13), benzene (State drinking water standard of 0.7 ppb) was detected in monitoring well OW-9 at 900 ppb. Monitoring well OW-10, which is located immediately downgradient of lagoon 8, had concentrations of benzene at 2,600 ppb, xylene at 30 ppb (drinking water standard of 5 ppb), and isophorone at 440 ppb (drinking water standard of 10 ppb). Monitoring well OW-11 had concentrations of benzene at 970 ppb, ethylbenzene at 30 ppb (drinking water standard of 5 ppb), xylene at 51 ppb, and naphthalene at 17 ppb (drinking water standard of 10 ppb). Benzene and phenol (drinking water standard of 1 ppb) were detected at 2,400 ppb and 55 ppb, respectively, in monitoring well OW-12. Monitoring well OW-13 had concentrations of 1,2-dichloroethene at 20 ppb, benzene at 350 ppb, and vinyl chloride at 34 ppb (drinking water standard of 2 ppb). The 1994 groundwater results detected organic constituents at similar concentrations as those detected during the 1995 sampling event.

As previously stated, the concentrations of organics in groundwater in the outwash aquifer decreased dramatically downgradient from the lagoons in the 1994 and 1995 sampling rounds. In 1995, sampling data from the furthest downgradient wells from the lagoons (OW-17, OW-18, and OW-19) only indicated three organic compounds above the State drinking water standards. Benzene was detected at 12 ppb, chlorobenzene at 10 ppb and xylene at 29 ppb in monitoring well OW-18. Benzene and chlorobenzene were detected at 6 ppb and 8 ppb, respectively in monitoring well OW-19. No organic compounds were detected in monitoring well OW-17.

In September 1994, April 1995 and July 1996, groundwater samples were collected and analyzed for inorganic compounds. Groundwater samples collected in the 1994 sampling event were non-filtered inorganic samples. Although the results of the 1994 analyses indicated the presence of inorganic compounds, very few samples indicated concentrations above federal drinking water and State drinking water and groundwater standards. Arsenic was detected at 28.9 ppb (drinking water standard of 25 ppb), chromium was found in one sample at 123 ppb (drinking water standard of 50 ppb),

antimony was found at 65 ppb (drinking water standard of 3 ppb) and lead was found in one sample at 39.2 ppb (drinking water action level of 15 ppb). For each of the inorganic compounds that exceeded their respective criteria (arsenic, chromium, lead and antimony) exceedances occurred in only one sample out of the 32 samples collected.

Groundwater samples collected in the 1995 sampling event were highly turbid. These samples were also filtered in the field. The results of the 1995 inorganic analyses indicated the presence of various inorganic constituents in the groundwater downgradient of the lagoons above background concentrations. Several inorganic constituents were detected at concentrations that exceeded the federal drinking water and/or State drinking water and groundwater standards. Antimony was detected at 15 ppb (drinking water standard of 3 ppb), arsenic was detected at 105 ppb (drinking water standard of 25 ppb), beryllium was detected at 7.2 ppb (drinking water standard of 3 ppb), chromium was detected at 669 ppb (drinking water standard of 50 ppb), lead was detected at 283 ppb (drinking water action level of 15 ppb), and nickel was detected at 425 ppb (there is no drinking water standard for nickel at this time).

Due to the inconsistency between the 1994 and 1995 sampling results for inorganic constituents, EPA conducted another sampling event for inorganic constituents in July 1996. It was suspected that the high concentrations of inorganics detected in 1995 may have been an artifact of highly turbid samples resulting from the sampling protocols used at that time. Because of this, the July 1996 groundwater samples were collected via a low-flow pump, and these samples were not filtered. Also, during sample collection, the presence of high turbidity in some of the samples was observed, therefore some monitoring wells were re-developed prior to collecting the groundwater samples. The results of this sampling event indicated the presence of inorganic compounds. Only three samples indicated concentrations above State groundwater standards. Chromium was detected in monitoring well OW-9 at 70 ppb, arsenic was detected at 43 ppb and 37 ppb in monitoring wells OW-19 and OW-18, respectively.

The levels of inorganics detected in the 1995 samples tend to directly depend on the amount of suspended sediment (turbidity) in the samples. Since the excessive turbidity present in the 1995 groundwater samples is believed to be an artifact of sampling, these higher levels are not representative of true site conditions in the aquifer. So, the results of the groundwater data suggests that the inorganic compounds found in the groundwater beneath the Site are most likely present at naturally occurring levels. Thus, the potential for inorganic compounds to be present in groundwater at concentrations above naturally occurring levels due to leaching from the lagoon sediments is low and the potential for these inorganic compounds to subsequently discharge with groundwater to Gold Creek is also low. It should be noted that the results from the 1994 sampling event for inorganic constituents were included in the risk assessment (see Summary of Site Risks below). No pesticides or PCBs were detected in any of the groundwater samples collected from this Site.

Sediment samples were collected in Gold Creek. Analytical results indicate that Site related contaminants have not impacted the sediments in Gold Creek.

As part of the RI, groundwater modeling was conducted to determine whether the organic contaminant patterns found in the groundwater beneath the Site have stabilized due to intrinsic biodegradation and to estimate future concentrations of contaminants at potential off-site locations. The results of the groundwater modeling indicate that the organic contaminants in the groundwater are not migrating off-site and that the concentration patterns observed at the Site have stabilized or are not expected to change in the future. Thus, contaminants in the groundwater beneath the Site are not expected to reach Gold Creek or off-site residences in the future.

Also, as part of the RI, limited data was collected to evaluate the extent of biodegradation at the Site. This limited evaluation included the collection of dissolved oxygen and the presence of microorganisms in the groundwater capable of degrading volatile organic compounds under expected Site conditions. The results of this evaluation indicated that at the Carroll and Dubies site the dissolved oxygen levels in the benzene plume indicated the potential for biodegradation to be occurring, and the degrading microorganisms population was in the range of 10^5 to 10^6, indicating a healthy and robust community of degraders present in the aquifer. Therefore, the limited field data combined with the groundwater modeling projections demonstrate the potential for biodegradation of organic contaminants at the Site. The groundwater modeling results estimated that contaminants will attenuate in five years after completion of the remedy selected for the lagoons. Since the groundwater modeling results indicated the potential for intrinsic biodegradation to be occurring in the aquifer, this potential is evaluated in the analysis of remedial alternatives.

The City of Port Jervis is served by a municipal water supply that relies on three hydraulically-upgradient reservoirs as water sources. Outside of the City limits, private supply wells provide drinking water. It should be noted that the New York State Department of Health (NYSDOH) sampled several wells located downgradient of the Site while the RI/FS was being conducted . Several private wells were sampled in 1991 and again in 1993 for organic and inorganic constituents. Organic constituents were not detected in the groundwater from these wells, and inorganic constituents were detected below drinking water standards. Subsequently, in September 1994 and March 1995, NYSDOH sampled and analyzed a total of ten private wells in the area for volatile organic compounds. The wells were located along Andrew Drive, Evergreen Lane, Mark Drive, Michael Drive, Van Avenue, and NY Route 209. The results indicate that no volatile organic compounds were detected in any of the wells sampled.

SUMMARY OF SITE RISKS

Based upon the results of the RI for the groundwater operable unit, a baseline risk assessment was conducted to estimate the risks associated with current and future Site conditions. The baseline risk assessment estimates the human health and ecological

risk which could result from the contamination at the Site, if no remedial action were taken.

As part of the baseline risk assessment, the following four-step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario: *Hazard Identification*--identifies the contaminants of concern at the site based on several factors such as toxicity, frequency of occurrence, and concentration. *Exposure Assessment*--estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathway (e.g, ingesting contaminated well-water) by which humans are potentially exposed. *Toxicity Assessment*--determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response). *Risk Characterization*--summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative (e.g., one-in-a-million excess cancer risk) assessment of site-related risks.

The baseline risk assessment began with selecting contaminants of concern which would be representative of the risks posed by the groundwater underlying the Site. These contaminants included benzene, 1,2-dichlorobenzene, chloroform, tetrachloroethene, toluene, vinyl chloride, xylene, phenol, arsenic, antimony, barium, chromium, lead, and zinc.

The baseline risk assessment addressed the potential risk to human health by identifying potential exposure pathways by which the public might be exposed to contaminant releases at the Site under current and future land-use conditions. There are no current on-site groundwater users at the Site, therefore there are no potential current receptors at the Site. Potential off-site receptors included residents to the east and southeast of Gold Creek that use groundwater as drinking water and recreational users of Gold Creek. Groundwater modeling, in conjunction with measured groundwater concentrations, sediment data from Gold Creek and groundwater concentrations from off-site residential wells, indicates that the plumes have stabilized and that contaminants have not migrated either to Gold Creek or to off-site residences on the other side of Gold Creek. Groundwater modeling results indicate that contaminants are not expected to migrate to or beyond Gold Creek. Thus, current exposures to either off-site residents or recreational users of Gold Creek are not occurring and are not expected to occur in the future. These exposure pathways therefore, were not quantitatively evaluated in the risk assessment.

The exposure pathway evaluated under the potential future land-use scenario included the exposure of industrial workers to the on-site contaminated groundwater through ingestion. Because the Site and land immediately adjacent to the Site are currently zoned exclusively for industrial land use, future residential or commercial use of the Site is not expected to occur and therefore, only industrial use of the Site was evaluated in the risk assessment. For purposes of conducting the risk assessment it was assumed that a future industrial worker would drink 1 liter of water per day from an on-site well for 5 days a week for 50 weeks a year (250 days/year with about 2

weeks vacation) for 25 years out of a 70 year lifetime.
EPA's acceptable cancer risk range is 10^{-4} to 10^{-6} which can be interpreted to mean that an individual may have a one in ten thousand to a one in a million increased chance of developing cancer as a result of a site-related exposure to a carcinogen over a 70-year lifetime under the specific exposure conditions at a site.

The results of the baseline risk assessment indicated that the groundwater underlying the Site poses no unacceptable carcinogenic risk to industrial workers exposed to the groundwater at the Site. The sum of the current cancer risks for industrial workers was 1.4×10^{-4} (approximately one-in-ten thousand) which is considered to be within the U.S. EPA target risk range of 10^{-4} to 10^{-6}. The main contributors to the total cancer risk were arsenic, vinyl chloride, and benzene.

To assess the overall potential for noncarcinogenic effects posed by the groundwater contaminants at the Site, EPA has developed the hazard index (HI). An HI value of greater than 1 is considered to pose a potential noncarcinogenic risk. The calculated HI value was 0.55 which is below the acceptable level of 1.0 indicating no adverse health effects to future industrial workers. The main contributor to the total noncancer risk was arsenic.

There are no impacts to ecological receptors in Gold Creek, since contaminants in groundwater have not migrated to Gold Creek and are not anticipated to migrate there in the future.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives are specific goals to protect human health and the environment. These objectives are based on available information and standards such as applicable or relevant and appropriate requirements (ARARs) and risk-based levels established in the risk assessment.

The remedial action objective for the groundwater beneath the Site is to reduce or eliminate potential health risks associated with ingestion of Site contaminated groundwater by potential future industrial workers and to reduce the concentration of contaminants in the groundwater to drinking water standards.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA at Section 121, 42 U.S.C. §9621 requires that each selected site remedy be protective of human health and the environment, be cost effective, comply with other statutory laws, and utilize permanent solutions and alternative technologies and resource recovery alternatives to the maximum extent practicable. In addition, the statute includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

This Proposed Plan evaluates in detail four remedial alternatives for addressing the contaminated groundwater beneath the Carroll and Dubies Sewage Disposal Inc., Site. Since contaminants will remain at the Site above levels which allow for unrestricted use and unlimited exposure, each alternative would require five-year

reviews to ensure that the remedial action is protective of human health and the environment. Five-year reviews are currently required as part of OU1. As used in the following text, the time to implement a remedial alternative reflects only the time required to construct or implement the remedy and does not include the time required to design the remedy, negotiate with the responsible parties, or procure contracts for design and construction, or conduct operation and maintenance at the Site.

Alternative 1: No Action

Capital Cost:	$ 0
O & M/yr Cost:	$ 0
Present Worth:	$ 0
Time to Implement:	0 month

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with other alternatives. As demonstrated through the results of the groundwater modeling study, naturally occurring processes for reducing the concentration of contaminants in the groundwater are at work at the Site. Under this alternative, no action would be taken to address the contaminated groundwater. There would be no monitoring of these naturally occurring processes in the groundwater to evaluate the rate and extent of the reduction and mobilization of contaminants in the groundwater beneath the Site. The period for the groundwater to reach federal drinking water and State drinking and groundwater standards was projected through the groundwater modeling to be approximately five years. The remediation of the lagoons, which will be implemented under OU1, would minimize any additional contaminant contribution to the groundwater.

Alternative 2: Natural Attenuation with Institutional Controls and Monitoring

Capital cost:	$ 0
O & M/yr Cost:	$ 58,000
Present Worth:	$ 284,000
Time to Implement:	6 months

Similar to Alternative 1, Alternative 2 would also rely on natural attenuation, with intrinsic biodegradation as the principal mechanism, to reduce contaminants in the groundwater to drinking water standards. The remediation of the lagoons, which will be implemented under OU1, would minimize any additional contaminant contribution to the groundwater. This alternative includes the implementation of institutional controls, such as deed restrictions, contractual agreements, local law or ordinances or other governmental action for the purpose of restricting installation and use of groundwater wells throughout the contaminated groundwater plume. Groundwater monitoring at the Site and sediment sampling in Gold Creek would also be conducted. These restrictions would complement any restrictions implemented as part of the OU1 remedy. Institutional controls restricting the use of Site groundwater would be required until the groundwater has been demonstrated to meet federal drinking water and State groundwater and drinking water standards. This period was projected through the groundwater modeling to be a five year period necessary for the intrinsic biodegradation and flushing mechanisms to reduce the concentration of contaminants in the groundwater to levels below drinking

water standards. Once these levels have been demonstrated to be met, the restrictions on groundwater use would no longer be required.

As predicted by the groundwater modeling results, the organic contaminants in the groundwater would meet drinking and groundwater standards within a period of approximately five years after the implementation of the OU1 remedy. This alternative includes a component of initial assessment of the groundwater parameters which favor natural attenuation and a groundwater monitoring requirement to evaluate the rate and extent of reduction of the organic contaminants in the groundwater. The initial assessment would include an evaluation for the presence of constituent-degrading microorganisms, pH, oxygen or other electron acceptors, elemental nitrogen, phosphorous and other parameters necessary to evaluate the progress of natural attenuation. Groundwater monitoring would be conducted on a semiannual basis.

Alternative 3: Groundwater Pump and Treat via Precipitation, Filtration and Carbon Adsorption

Capital Cost:	$ 1,070,000
O & M/yr Cost:	$ 287,200
Present Worth:	$ 2,105,000
Time to Implement:	9 months

This alternative would consist of a series of recovery wells used to capture contaminated groundwater immediately downgradient of the source areas or the lagoons. The recovery wells would capture the most concentrated portion of the contaminant plume emanating from the source areas. Any impacted groundwater that would not be captured by the recovery wells would be naturally attenuated. This alternative would eliminate the potential for migration of organic contaminants off site. The recovery wells would be located in that portion of the outwash aquifer located downgradient of the towpath. Beneath the lagoons, a saturated outwash unit does not exist.

The preliminary configuration of the treatment system assumes that approximately six wells would be used to pump groundwater at controlled rates to capture the impacted groundwater. Two sets of three pumping wells, each pumping at a rate of 5 gallons per minute (gpm), would be used. The total pumping rate of the six wells is 30 gpm. One set of wells would be located between 100 feet to 150 feet downgradient of lagoon 8. This set of three wells would be designed to capture impacted groundwater passing beneath lagoons 6, 7, and 8. One set of wells would be located between 100 feet to 125 feet downgradient of lagoons 1 and 2. This set of three wells would be designed to capture impacted groundwater passing beneath lagoons 1 and 2. The recovered groundwater would be treated on-site through a series of treatment processes. Conceptually, the treatment system would consist of iron and suspended solids removal via precipitation followed by filtration and carbon adsorption. Following treatment, the groundwater would be discharged to Gold Creek in accordance with the State Pollutant Discharge Elimination System (SPDES) requirements. Residuals generated from the treatment processes would be managed in accordance with the Resource Conservation and Recovery Act (RCRA) regulations.

This alternative would also include groundwater monitoring to measure the effectiveness of the pump-and-treat system, as well as the institutional controls specified in Alternative 2. The treatment system would be operated until contaminant levels in the groundwater reach federal drinking water and State drinking water and groundwater standards, which has been estimated to be approximately five years.

Alternative 4: In Situ Groundwater Treatment

Capital Cost:	$ 1,017,000
O & M/yr Cost:	$ 248,000
Present Worth:	$ 1,912,787
Time to Implement:	12 months

This alternative involves the injection of air into the saturated zone (i.e., below the water table), via a series of wells, to reduce the volatile constituents dissolved in groundwater. These wells would be located in the same general vicinity as the pumping wells outlined in Alternative 3, thus allowing treatment of the most concentrated groundwater plume. Any impacted groundwater that would not be captured by the in situ groundwater treatment system would be naturally attenuated. The levels of organic constituents would be decreased in the saturated zone during aquifer aeration via mass transfer of the chemicals from the water phase to the gaseous phase. If the levels of organic compounds exceed air quality guidelines, then a soil venting system would be installed in the subsurface to collect the air emissions. The exhaust air from the vapor extraction system would be discharged to a treatment system. The gaseous treatment system for this alternative would be an activated carbon filter.

Groundwater monitoring would also be conducted as part of this alternative to evaluate the effectiveness of the air sparing system. A reduction in the levels of organics may also take place in the saturated zone through the enhancement of biodegradation due to the increase in oxygen. With this alternative, air sparging may be used in conjunction with vacuum extraction and/or enhanced bioremediation with the addition of nutrients.

A preliminary configuration of the aquifer aeration system would consist of approximately 30 air sparging wells. This alternative would include the same monitoring program and institutional controls described in Alternative 3. Treatment of the groundwater would continue until contaminant levels in the groundwater achieve federal drinking water and State drinking water and groundwater standards. This alternative would achieve groundwater remediation goals within about five years .

EVALUATION OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria, namely, overall protection of human health and the environment; compliance with applicable and relevant and appropriate requirements (ARARs); long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; cost; and community and state acceptance. For a more detailed explanation, see the comparative analysis contained in the FS.

Glossary of Evaluation Criteria

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

▲ Compliance with ARARs addresses whether or not a remedy will meet all of the applicable or relevant and appropriate requirements and/or provide grounds for invoking a waiver.

▲ Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

▲ Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies a remedy may employ.

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

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

▲ Cost includes both estimated capital and operation and maintenance costs, and net present worth costs.

▲ State acceptance indicates whether, based on its review of the RI/FS report and Proposed Plan, the State concurs with, opposes, or has no comment on the preferred alternative.

▲ Community acceptance will be assessed in the ROD and refers to the public's general response to the alternatives described in the RI/FS report and the Proposed Plan.

A comparative analysis of the remedial alternatives based upon the evaluation criteria noted above follows.

Overall Protection of Human Health and the Environment

For No Action (Alternative 1) and Natural Attenuation with Institutional Controls and Monitoring (Alternative 2), the concentration of contaminants in the groundwater would be reduced due to natural attenuation of contaminants until federal drinking water and State drinking and groundwater standards are met. This period has been estimated to be approximately five years from implementation of the OU1 remedy. The No Action alternative would present a slightly greater risk to human health and the environment than Alternatives 2, 3, and 4 in the short-term because the potential would exist that an on-site worker could come in contact with the contaminated groundwater. Under Alternative 2, protection of human health would be enhanced with the implementation of institutional controls, preventing the use of the contaminated

groundwater.

For the Pump-and-Treat (Alternative 3) and *In Situ* Groundwater Treatment (Alternative 4) scenarios, the potential risks to human health from potential exposure to impacted groundwater would be reduced by removal and treatment of contaminants in the groundwater captured by the remedial systems. These alternatives would achieve groundwater remedial goals within about five years. Institutional controls preventing the use of Site groundwater would eliminate the potential exposure to contaminated groundwater while the groundwater is being remediated. The contaminants would continue to migrate until attenuated under Alternatives 1 and 2. However, impacts are expected to be minimal since, as noted in the risk assessment section, the levels of contaminants in the groundwater present no significant human health risk under current or future uses. Furthermore, impacts to ecological receptors in Gold Creek from the implementation of Alternatives 1 and 2 would be unlikely since contaminants in groundwater have not migrated to Gold Creek and are not anticipated to migrate there in the future.

Compliance with ARARs

Actions taken at any Superfund site must meet all ARARs of federal and state law or provide grounds for waiving these requirements. All of the alternatives have been designed to achieve or comply with the ARARs.

Since the groundwater at the Site is a future potential source of drinking water, federal drinking water standards (Maximum Contaminant Levels [MCLs]) and New York State Drinking Water Standards and New York State Groundwater Quality Standards are ARARs. For No Action (Alternative 1) and Natural Attenuation with Institutional Controls and Monitoring (Alternative 2), federal drinking water and State drinking water and groundwater standards would be achieved over time through natural biodegradation of organic contaminants in the groundwater. The period for the groundwater to reach federal drinking water and State drinking and groundwater standards was projected through groundwater modeling to be approximately five years. For the Pump-and-Treat (Alternative 3) and *In Situ* Groundwater Treatment (Alternative 4) scenarios, groundwater standards would be met by removal and treatment of contaminants in the groundwater. The discharge of treated groundwater to Gold Creek during implementation of Alternative 3 would comply with the Federal Clean Water Act and State Pollutant Discharge Elimination System (SPDES) regulations. The residual sludges from the treatment system under Alternative 3 would be treated or disposed of off-site in accordance with RCRA regulations. The spent carbon generated from the groundwater treatment system under Alternative 3 and the gas treatment system under Alternative 4 would either be regenerated off-site or sent off-site for treatment and disposal in accordance with RCRA regulations.

Long-Term Effectiveness and Permanence

With all four alternatives, after approximately five years, the concentrations of contaminants in the groundwater are expected to be permanently reduced to

levels below ARARs. Implementation of Alternatives 3 and 4 might result in a slightly reduced time frame to achieve ARARs downgradient of the lagoons. Therefore, all alternatives are relatively similar in terms of this criterion.

Reduction of Toxicity, Mobility, and Volume through Treatment

Alternatives 1 and 2 rely solely on naturally occurring mechanisms to reduce the toxicity and volume of contaminants in the groundwater. Although CERCLA has a preference for treatment to reduce contaminants, Alternatives 1 and 2 would reduce the contaminants in the groundwater by natural attenuation process. Alternatives 3 and 4 are similar in their abilities to reduce toxicity, mobility and volume and would provide reduction of toxicity, mobility and volume somewhat more rapidly than Alternatives 1 and 2. Under Alternatives 3 and 4, treatment to reduce contaminants in the groundwater would be achieved by extraction of the contaminants and subsequent treatment.

Short-Term Effectiveness

Alternatives 1 and 2 would have no adverse effects at all on the community, site workers, or the environment since there would be no potential exposure to any of the contaminants because no construction activities would occur. Alternatives 3 and 4, with potentially shorter time periods to meet ARARs, rank highest in terms of this criterion to meet the response objectives. However, Alternatives 3 and 4 would present greater impacts than Alternatives 1 and 2, due to construction activities. For example, the construction of extraction wells and piping to transport the treated groundwater to Gold Creek would have minor negative impacts on residents in the area. These impacts would be associated with the disruption of traffic, excavation on public and private land, and noise and fugitive dust emissions. Appropriate measures, however, would be implemented to minimize these impacts.

Implementability

Alternative 1 - No Action is clearly the most implementable. Alternative 2 would require groundwater-use restrictions to prevent the use of groundwater wells throughout the contaminated aquifer; although sometimes difficult to obtain, these restrictions are being used at numerous sites. Alternative 2 would also require additional geochemical and intrinsic biodegradation studies and monitoring. These studies and monitoring requirements are being implemented at numerous sites. Alternatives 3 and 4 would be more difficult to implement due to construction requirements. Additionally, Alternative 3 would require that access be obtained to construct the piping to transport the treated groundwater to Gold Creek; authorization to discharge treated water to Gold Creek would add to the complexity of implementing this remedy. Nonetheless, these are successfully proven technologies at the field scale and considered to be readily implementable.

Cost

There is no cost associated with the No Action alternative. Alternative 2, Natural Attenuation with Institutional Controls and Monitoring, is the lowest cost alternative with a present worth of $284,000.

Alternative 3, Groundwater Pump and Treat, has the highest cost with a present worth of $2,105,000. Alternative 4, *In Situ* Groundwater Treatment, with a present worth of $1,912,787, is slightly less than Alternative 3.

Community Acceptance

Community acceptance of the preferred alternative will be assessed in the ROD following a review of the public comments received on the RI/FS report and the Proposed Plan. A response to comments will be included in a Responsiveness Summary, which will be attached to the ROD.

State Acceptance

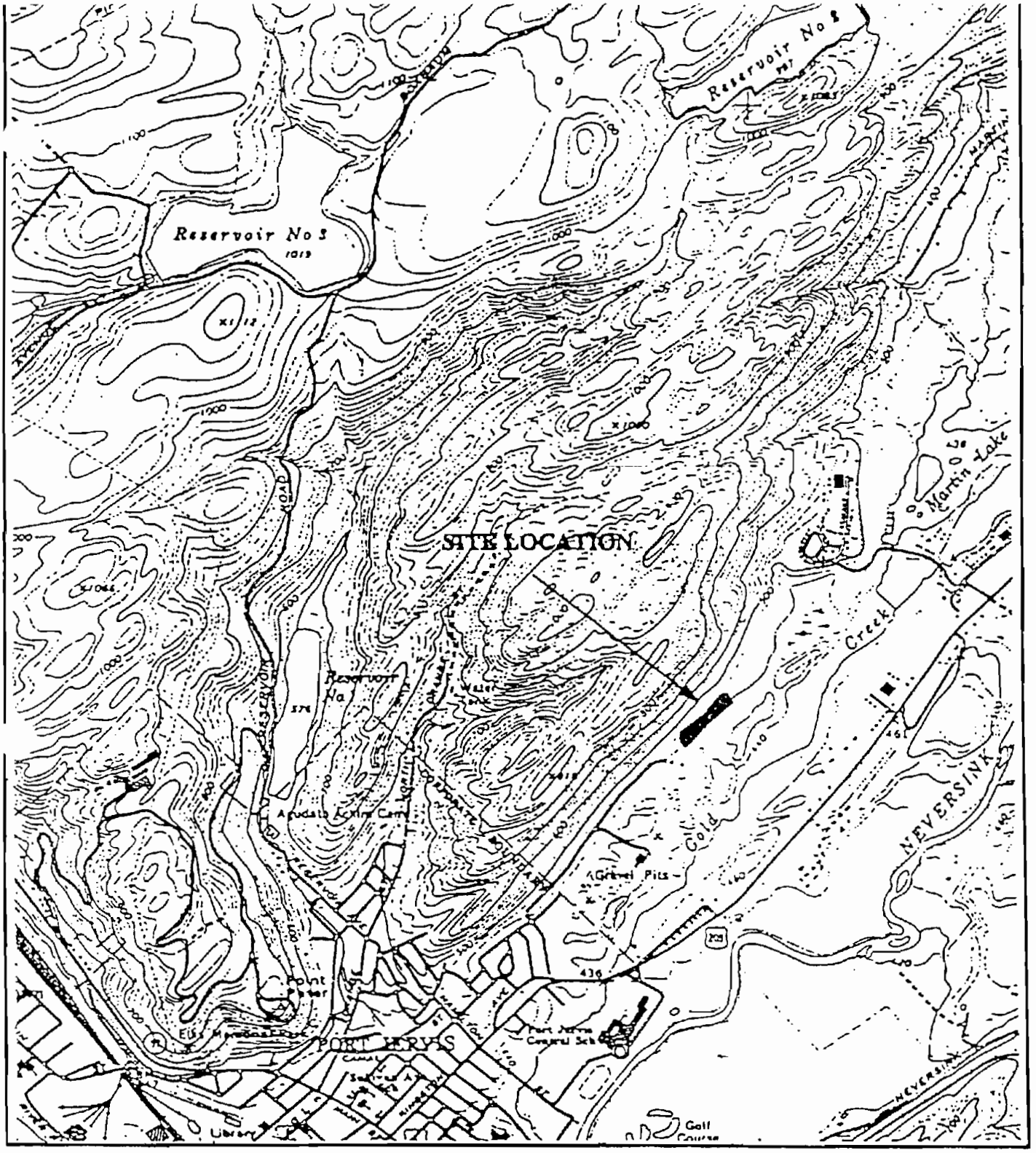
The State of New York concurs with the preferred alternative

PREFERRED ALTERNATIVE

Based upon an evaluation of the various alternatives, EPA and NYSDEC recommend Alternative 2, Natural Attenuation with Institutional Controls. Long-term protection under this alternative would be afforded by the reduction in the concentration of contaminants in the groundwater below the ARARs through naturally occurring removal processes. This alternative includes the implementation of institutional controls, such as deed restrictions, contractual agreements, local law or ordinances or other governmental action for the purpose of restricting installation and use of groundwater wells throughout the contaminated groundwater plume, monitoring of the groundwater to measure improvement in groundwater quality and sediment sampling in Gold Creek to ensure that contaminants have not reached Gold Creek.

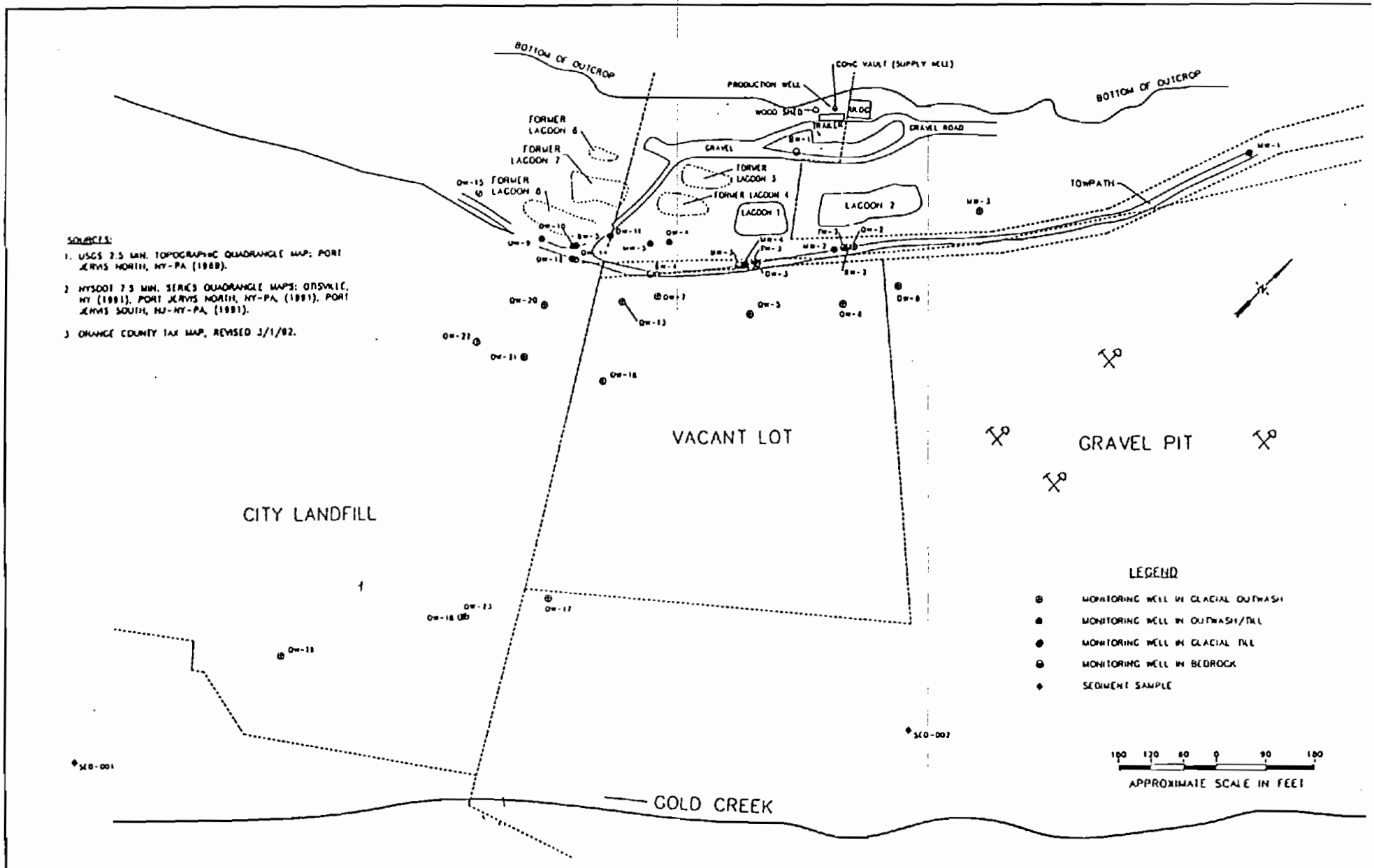
Since contaminants will remain on Site, EPA will review the Site at least once every five years to ensure that the remedy selected continues to be protective of human health and the environment. If the natural attenuation of contaminants in the groundwater at the Site has not improved groundwater quality to federal drinking water and State drinking water and groundwater standards, EPA and NYSDEC will determine the need for a program to evaluate and implement contingency alternatives for groundwater remediation at the Site.

Alternative 2 addresses all of the media of concern and provides the best balance of trade-offs among the alternatives with respect to the evaluation criteria. EPA and NYSDEC believe that the preferred alternative will be protective of human health and the environment, comply with ARARs, be cost-effective, and utilize permanent solutions to the maximum extent practicable.



Carroll and Dubies Site, Port Jervis, New York

Source: USGS 7½ MIN. Topographic Quad.
Port Jervis North, NY-PA 1969



CARROLL AND DUBIES
DEER PARK, NEW YORK
3-1844-410

CURRENT MONITORING WELL LOCATIONS

SUPERFUND SITE
PORT JERVIS, NEW YORK

REI

FIGURE

Appendix B

Public Notice

PUBLIC NOTICE

U.S. Environmental Protection Agency

Announces Public Meeting and Comment Period on the Proposed Plan for the CARROLL AND DUBIES SEWAGE DISPOSAL SUPERFUND SITE Port Jervis, New York

6-8-0895-NASA

The United States Environmental Protection Agency (EPA) invites public comment on its Proposed Plan for remediating contaminated groundwater at the Carroll and Dubies Sewage Disposal (C&D) Superfund Site in Port Jervis, New York. EPA will accept comments during a public comment period which begins on August 27, 1996 and ends September 26, 1996. A public meeting will be held on Wednesday, September 11, 1996 at 7:00 PM at the Port Jervis High School auditorium.

Complete analyses of the alternatives listed below are presented in the Remedial Investigation/Feasibility Study and Proposed Plan, along with other documents used by EPA in the decision-making process for this Site. These documents are available for public review at the following locations:

Deerpark Town Hall
Route 209N
Drawer A
Hugenot, NY 12746

Port Jervis Public Library
138 Pike Street
Port Jervis, NY 12271

The Proposed Plan evaluates four remedial alternatives for addressing the contaminated groundwater beneath the Carroll and Dubies Sewage Disposal Inc. Site:

Alternative 1: No Action

Alternative 2: Natural Attenuation with Institutional Controls and Monitoring

Alternative 3: Groundwater Pump and Treat via Precipitation, Filtration and Carbon Adsorption

Alternative 4: In Situ Groundwater Treatment

Based upon evaluation of the various alternatives, EPA recommends Alternative 2, Natural Attenuation with Institutional Controls and Monitoring. This alternative would rely on natural attenuation, with intrinsic biodegradation as the principal mechanism, to reduce contaminants in the groundwater to drinking water standards. Groundwater modeling results indicate that a five year period would be necessary for the intrinsic biodegradation and flushing mechanisms to reduce the concentration of organic contaminants in the groundwater to levels below drinking water standards. This alternative includes the implementation of institutional controls for the purpose of restricting installation and use of groundwater wells throughout the contaminated groundwater plume, which is limited to the industrial area north of Gold Creek, in the vicinity of the C&D property. Groundwater monitoring at the Site and sediment sampling in Gold Creek would also be conducted.

Written comments must be postmarked no later than September 26, 1996 and submitted to:

Maria Jon, Project Manager
U.S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, NY 10007-1866
(212) 637-3967

Appendix C

September 11, 1996 Public Meeting Attendance Sheets

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGIC II
PUBLIC MEETING
FOR
Carroll and Dubies Superfund Site
Port Jervis, NY

Wednesday, September 11, 1996
ATTENDEES

(Please Print Clearly)

NAME	STREET	CITY	ZIP	PHONE	REPRESENTING
DAVID PAKEBIANCO	62 Hillside Rd	NY	10918	(914)469-2494	ORANGE Environment
RALPH MASCOLO	AVE C	Goodeffroy Deer Park	12789	754 8236	
Joe Carroll	PO Box 98	Hugenot		856-7013	C & D
TIM VICKERSON		ALBANY	12203	518-458-6305	NYS DOT
Wayne Decker	530 Prospect Hill Rd	Cuddebackville	12729	9147548226	
Frances Hodgson	Hill. Golf	Godeffroy.	12739	914 754 8766	Myself.
Louise Loturi	Vista Beach	Port Jervis	12771	914-858-3319	MYSELF
Robert Gillis	394 Neversink DR	Port Jervis	12771	914-856-5148	Town of Deerpark
Charles Stiffler	21 LANE ST	PORT JERVIS	12771	914 856 3913	
Rich Mayfield	P-O B358	Middletown	10940	914-343-6664	Hon. B. A. Gilman
JACK JARVIS	13 MARK DR	P. J	12771	914-858-8007	SELF
RONALD R. RYERSON	P.O Box 1104	PORT JERVIS	12771	914 858 3212	PORT JERVIS CITY SCHOOL DISTRICT

UNITED STATES ENVIRON[illegible]NTAL PROTECTION AGENCY
REG[illegible]ON II
PUBLIC MEETING
FOR
Carroll and Dubies Superfund Site
Port Jervis, NY

Wednesday, September 11, 1996
ATTENDEES

(Please Print Clearly)

NAME	STREET	CITY	ZIP	PHONE	REPRESENTING
Larry Pinto	P.O Box 283	Wallkill NY	12589	895-2402	CIE
Eleanor Back	5 Mark Dr	Port Jervis	12771	856-7270	MYSELF
Louise Mannarino	1 Mark Dr	Port Jervis	12771	856-2965	" "
Norman Mackenzie	16 Michael Circle	Pt Jervis		856-7941	" "
Arthur Kulik	15 Orchard Ln	Pt. Jervis, NY	12771	856-6029	Self
Cathy Sadahiro	14 Orchard Ln	Pt. Jervis, NY	12771	856-4626	Port Jervis HS PTA
Eric Stein	84 Boxbaum Rd.	Huguenot N.Y.	12746	856-8712	DEERPARK PLANNING BOARD
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UNITED STATES ENVIRON NTAL PROTECTION AGENCY
REG. N II
PUBLIC MEETING
FOR
Carroll and Dubies Superfund Site
Port Jervis, NY

Wednesday, September 11, 1996
ATTENDEES

(Please Print Clearly)

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Appendix D

September 11, 1996 Public Meeting Transcript

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CARROLL and DUBIES

SUPERFUND SITE

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Wednesday,

September 11, 1996

7:05 p.m.

Port Jervis High School

Route 209

Port Jervis, New York

BEFORE:

NATALIE LONEY,
Public Outreach Branch

MARIA JON,
Remedial Project Manager

DOUG GARBARINI,
Chief of the Eastern New York
Remediation Section

LINDA ROSS,
Hydrogeologist

Jacqueline Maloney, CSR
Certified Court Reporter

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Proceedings

MS. LONEY: We're going to get started.

We're going to start by way of introducing all of the participants who are here. My name is Natalie Loney, I'm with the Public Outreach Branch in EPA, and starting from my left is Maria Jon, who is the RPN for the Carroll and Dubies Site, next to her is Doug Garbarini, who is the Chief of the Eastern, New York Remediation Section, and next to Doug is Linda Ross, who is an EPA Hydrogeologist, and she is specializing in groundwater.

I'd like to thank all of you for coming out this evening. We're here to discuss and to present to you the results of the remedial investigation and to present our proposed plan for remediating the Carroll and Dubies Site.

After my brief introduction, Doug Garbarini will be coming before you. He will give you a brief overview of the Superfund Program, followed by Maria Jon, who will give the results of the remedial

investigation, in addition to our proposed plan and an explanation of the plan. That will be followed by questions and answers. I will then come back to the podium and open the floor for questions and we will hopefully provide the answers.

Many of you have received in the mail a copy of the proposed plan and we also had a brief one page flier that was also enclosed in the mailer, which gives a little bit of the detail in terms of what the proposed plan is, in addition, it gives the dates for the opening and closing of the comment period. We're going to present the plan to you and open the floor not only for questions tonight, but we are requesting that you submit comments to us. The person that you would be submitting the comments to is Maria Jon, and her address is on the bottom of the sheet. If you don't have one, there are some of the handouts at the end. The closing date for the comment period is in

fact September 27, 1996, so we're requesting that all formal written comments be submitted to our office by that date.

In addition, we have Tim Vickerson, from the New York State Department of Health, here who can answer some questions for you as well.

So without further adieu, let me bring up Doug Garbarini and we're going to open the meeting. Thank you.

MR. GARBARINI: Thank you, Natalie.

First of all, I'd like to thank all of you for coming out tonight. I see a lot of familiar faces. I've been out for a couple of other public meetings over the last few years. The last time I was out here was about two years ago when we came out to discuss the remediation of the source areas for the lagoons at the Carroll and Dubies Site.

And as you're all probably very well aware, we did select a remedy, a rather complex remedy, which called for treating

the lagoons, materials in the lagoons, and the soils around those lagoons, and that remedy was selected last year.

Tonight we're here to discuss the remedy for the groundwater at the Site. So we've basically partitioned the Site off into two separate, well, as we call them, operable units that allowed us to move forward with the project in a more expedited fashion. We are already in the middle -- but not in the middle, but underway with the remedial design for the treatment of the lagoons. So tonight, since we had to collect additional data before we make the decision on the groundwater, we're here tonight to discuss our groundwater investigation and the proposed plan for the groundwater.

What I'm going to do is just give you a brief overview of the Superfund process, in about ten minutes or so, give you an idea how the program came about and where it's headed.

Superfund was passed in 1980.

Superfund Law is also more formally known as Comprehensive Environmental Response, Compensation, and Liability Act, or CERCLA. It was passed in 1980 by Congress. Basically it was passed in response to a number of natural environmental disasters that were occurring in terms -- when I say natural environmental disasters I'm really talking about hazardous -- the uncovering of hazardous waste sites, most notably, I'm sure you all have heard about Love Canal in the past.

At that point in time the Federal Government really didn't have a mechanism for dealing with such sites, with hazardous waste sites, it was really crisis management. There were a number of them springing up across the Country. People were pointing fingers, saying, well, how are we going to get the work done? Who's responsible? Where is the money going to come from? How can we get those that were responsible for the

contamination to take part in the cleanup? And it was a very complex issue that Congress first passed CERCLA or Superfund in 1980, and the idea was to provide a Superfund or pot of money that could be used to address abandoned hazardous waste sites.

Congress at the time we were looking at a two-pronged program. We were looking as those sites that could be studied rather extensively before a decision was made so that we could move forward with an appropriate remedial action, and we were also looking at sites that presented a key health risk, that were real, real problems. Just to give you an example, if you can imagine having a whole load of drums uncovered on a school yard or someplace where children would be playing, perhaps they were leaking or they were exposed to conditions that were hazardous when these drums were revealed. Those sorts of situations would present a key health threat, and EPA has mechanisms

whereby we can go out and take immediate, rather rapid removal actions. And we've conducted more than 3,000 of these across the Country, it's been a very successful portion of our program.

The other side of the program is the remedial side of the program, which we're discussing here tonight, includes sites like the Carroll and Dubies Site, which are on the National Priorities List.

The other thing that CERCLA or Superfund gave us was mechanisms to force those parties that were responsible for the contamination to cleanup the contamination. By responsible parties we refer to them as PRP's or potentially responsible parties. And they are those parties that generate waste that was disposed of at a Superfund site, transported waste that was disposed of at a Superfund site, that operated a waste disposal processes at the site or that are current or were formerly owners of the site during times of waste disposal. And

it gave us some real, real clout which we did not have before, which allowed us basically to request that the PRP's do work on consent, and it also gave us the ability to order them to do the work. And if those two mechanisms were not successful, it gave us an approach whereby we could go back after the responsible parties, once we had completed the cleanup at the site, and try and recover costs from them at that point in time.

You might ask, well, how does a site like the Carroll and Dubies Site or any other sites in New York become a National Priorities List Site? It's a rather complicated process, but the first step of the process is for the site to be listed on a Preliminary List, or what we call our Surplus List, and there are more than 30,000 of these types of sites that have been evaluated across the Country. There are more than 1,700 of these that were located in New York State.

And we go through a process where we

do preliminary assessments and site inspections, if necessary, to try and determine whether the sites should be included on the National Priorities List.

As you can see here, we've really done a pretty thorough job of looking at almost all the sites. There are about 130 that have not been evaluated to date, but most of them have either been dealt with and are being deleted, they no longer need to be on the National Priorities List, or there's a big bunch here that we're still trying to decide whether they should be put on the list or not.

As you can see, there are 89 sites that are on the National Priorities List in the State of New York. I'd say approximately a quarter of those are located in Long Island, if you want to get a feel for the density of sites across the State.

So most of those 89 sites have had remedies selected for them and are -- you know, we've completed our investigation,

we've decided what sort of remedies need to take place at these sites.

Okay. Once we've gotten through the preremedial phase, as we call it, we've discovered the site, we've ranked it, placed it the National Priorities List, as I discussed before, we are also able to conduct immediate removal actions at these sites or other sites requiring immediate response.

We then get into the remedial studies phase, and we start off with a remedial investigation. We go out and we sample the soils, the groundwater, the air, whatever streams nearby, whatever might be necessary to try and determine, you know, how extensive the contamination is, what type of contamination you have; do you have volatile organic compounds, solvents, do you have heavy metals. We then move forward and utilize this information and try and discern what sort of risk these contaminants pose to people or to the environment, ecological receptors. If

these risks are deemed to be unacceptable, we then have to look at means for reducing the risk to acceptable levels, and we do that in what's call a feasibility study. A feasibility study lays out different alternatives for reducing the risks to acceptable levels. When we're doing the feasibility study we evaluate each of these alternatives against nine criteria. And the two most important of those are overall protection of human health and the environment, and compliance with all environmental regulations.

In doing this comparison we then come out with what we feel is the best alternative using these nine criteria, and we put that alternative forward in what's called a proposed plan, which is what we're here to discus tonight, and we open up a public comment period, we take comments at the public meeting, we'll also, as Natalie said, take comments in writing. We'll go back to our offices and review all these comments and make

modifications to the remedy, if necessary, but these responses are all put forward in a document called the Responsiveness Summary, which becomes part of a larger document, which is called the Record of Decision. This Record is Decision is signed by the highest ranking official in our regional office, the Regional Administrator.

This remedy is -- this Record of Decision lays out a conceptual remedy for cleaning up the site. We then go into the construction phase. The first step there is the remedial design. As I mentioned before, we are currently in the remedial design phase for treating the lagoon sediments, but a remedy has already been selected there, as I mentioned. The remedial design phase is the nuts and bolts. If you're going to have to build the groundwater treatment system, you decide where you want to place the wells, what sort of pipe you're going to have, if it's going to be housed in a building, you

decide how the building is going to be built, how large it's going to be, where the doors are going to be, the typical design type issues like if you're just building your own home.

Then we go out and do the remedial action. This is where we actually get in and move the earth, if earth needs to be moved, build our treatment systems, if they need to be built, and start the actual cleanup of the site. Subsequently we move then to monitoring, if necessary, and we start closeout procedures for the site, and then we go through a deletion process, whereby the site is deleted from the National Priorities List.

As I mentioned earlier, there are approximately 89 -- well, there are 89 sites on the NPL, National Priorities List, in New York State. There are about 1,200 that have been included on the list across the Country.

There really isn't any typical Superfund site per se. As I think I've

probably mentioned to some of you in the past, we've got all sorts of sites with different types of contamination. We have half acre -- sites as small as a half acre down in Long Island. We've got, you know, landfills that approach 100 acres or more. We've got sites out West that are old mine sites that might even be as large as 200 square miles.

The cost for cleaning up a site also ranges, you know, very widely. On average, a Superfund site costs about 25 to 30 million dollars to cleanup. Obviously, some of those may run into the hundreds of millions of dollars, others maybe not, just be in the hundreds of thousands or not cost the State anything at all in terms of the remedial action at the site.

In terms of time frame, it is a very long and complex process. It takes, on average, about ten years to move from the investigation phase to the cleanup phase. So it's not a quick process. It's not

like our removal program, but it is a very thorough process, to say the least.

Just to give you an idea of the sort of expenditures we've made in New York State. As you can see here, this is a chart that shows expenditures and settlements in New York State through 1995. The total is approximately 1.3 billion dollars. Remedial expenditures, i.e., the funds, money that came out of the funds of Superfund that has not been replaced is 400 million. We've had settlements in the amount of over 800 million dollars. So the enforcement program has been quite successful and we've been able to get a lot of money in for the State -- for cleanups in the State of New York.

As I stated before, the program is a very complex one. I think when Congress originally passed the Law in 1980 there was a feeling that we needed to put something together quickly, that this was not going to be a long-lived program,

might last in the order of a decade. I think they felt the cleanups were going to be a little bit easier, maybe they'd be more contained and we might just go in and put some soil over or cap over sites and you might be removing a bunch of drums and things like that, but the program has become much more complex. We're really just getting a better feel for it these days. I think in 19 -- the Law was first passed in 1980 in the amount of 1.6 billion dollars for a five year period. It was reauthorized in 1986 at a run of about 8.6 billion. So you're looking at close to 1.6 billion a year. So Congress realized how complex the program was, and we're trying to work out the kinks of the program now. We have a bunch of administrative reforms that are helping us move along in the process at this point.

And I think that's pretty much all I had to say. I'll turn it over to Maria now, she'll discuss the second operable unit, the groundwater remedy with you, get

into the details of the sampling analysis and various alternatives that we evaluated at the Site.

MS. JON: Thank you, Doug.

I'm going to begin by giving you a presentation on the background of the Site, the findings of the remedial investigation, the result of the risk assessment, the feasibility study, and then I will discuss and describe all the alternatives that we evaluated and the preferred alternative.

Site background. The Carroll and Dubies Superfund Site is located on Canal Street in the City of Port Jervis.

This is a map of the Site and the surrounding land. So the shaded area right here represents the Carroll and Dubies Sewage Disposal Site. The Site, as well as the land surrounding the property, is being used for industrial purposes. It's currently being used for that purpose. The City of Port Jervis Landfill is located on the southern portion of the

Carroll and Dubies Site. The landfill is currently inactive; however, it's been used for the -- as a solid waste transfer station. We also have a gravel operation right here. Gold Creek is located 1,500 feet downgradient from the Site. The closest groundwater treatment wells downgradient from the Site are located south of Gold Creek. These dots here represent the drinking water wells that we have identified during the investigation. The Neversink River is right here.

The Carroll and Dubies Site was used for the disposal of septic and municipal and industrial waste from 1970 to 1979. The waste was disposed of into several unlined lagoons on the Site. The waste which contained hazardous substances were placed on these lagoons on the property.

Lagoon one is located here, two, three, four. Five was never used for the disposal of industrial waste. Six and seven and eight are located here. This is a close-up of the Site. And to locate

you, this is the City of Port Jervis Landfill, this is Gold Creek, and the Sewage Disposal Site is up here.

EPA placed the Carroll and Dubies Sewage Disposal Superfund Site on the Superfund National Priorities List in February 1990 because hazardous substances were released from the facility. A Consent Order was signed by EPA and the potentially responsible parties in February 1990. The Consent Order required the responsible parties to complete a remedial investigation to determine the nature and the extent of the contamination at the site and to complete the feasibility study to evaluate cleanup alternatives. Both the remedial investigation and the feasibility study have been completed by the responsible parties.

Site remediation activities at Superfund sites are sometimes segregated into different phases or operable units so that remediation of different

environmental media can proceed separately. So at this Site EPA has designated two operable units. Operable Unit One, or OU1, addresses the contaminated materials and surrounding soil from Lagoons 1, 2, 3, 4, 6, 7 and 8.

Operable Unit Two, or OU2, addresses the contaminated groundwater beneath and downgradient of the Carroll and Dubies Property.

Operable Unit 1, which represents the lagoons, are contaminated with heavy metals and organic compounds. A Record of Decision was issued by EPA on March 31, 1995. The Record of Decision requires excavation and on-site treatment of approximately 20,000 cubic yards of contaminated materials and soils. The treated material is going to be placed in a lined cell which is going to be built on-site and then it would be capped. The disposal cell will have a leachate collection system, as well as groundwater monitoring.

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The remedy for the lagoon is currently in the design phase. We expect implementation of the remedy in 1998.

Operable Unit Number 2, which addresses the contaminated groundwater beneath and downgradient of the Carroll and Dubies Site, is going to be the subject of my presentation.

The nature and the extent of the groundwater contamination found beneath the Site was assessed through sampling of the groundwater, sediments in Gold Creek, residential wells nearby and through groundwater modeling.

The groundwater modeling is like a computer monitor that was used to determine the fate and transport of the groundwater contaminants found at the Site.

The groundwater investigation conducted at the Site have identified two aquifers, the shallow and the bedrock aquifer or a deep aquifer.

Groundwater beneath the Site flows to

the southeast, in this direction, to Gold Creek.

The shallow aquifer is contaminated with organic compounds, mainly volatile organic compounds, chlorinated hydrocarbons. The contaminants that were found include benzene, dichloroethene and tetrachloroethene. These compounds are known to degrade in the environment or in the groundwater under certain conditions, they decompose from toxic to less toxic compounds due to natural occurring microorganisms in the groundwater. The deep aquifer is not contaminated. The highest concentrations in the groundwater were found near the lagoons. These are the lagoons.

Two plumes of organic compounds were identified in the groundwater. One plume is emanating from Lagoons 1 and 2, and the other plume is emanating from Lagoon Number 8.

The groundwater investigation conducted at the Site have identified at

the highest levels found near the lagoons and that the concentrations further downgradient from the lagoons have significantly decreased. So the levels found down here are very low compared to the levels that were found near the lagoons, which would give you an indication that there is some attenuation or biodegradation of contaminants in the groundwater.

The sediment sampling conducted in Gold Creek, the analysis indicates that the sediments in Gold Creek have not been impacted by contaminants from the Carroll and Dubies Site.

The private and residential wells that are located south of Gold Creek were also analyzed by the New York State Department of Health, and the results show that those wells have not been impacted by the Site contaminants.

The groundwater modeling conducted as part of the investigation was to determine whether the organic contaminants in the

groundwater have stabilized due to biodegradation and also was conducted to estimate the future migration of those contaminants and also the future concentration of those contaminants in the groundwater. The results of the groundwater modeling indicates that there is potential -- there is a potential for the organic contaminants to biodegrade in the groundwater, that the contaminants have not reached Gold Creek, and they are not expected to reach Gold Creek. And also, the modeling results indicate that contaminants in the groundwater would reach drinking water standards five years after the remediation of the lagoons.

The risks posed by the Site groundwater. Based upon the groundwater investigation conducted at the Site, a risk assessment was conducted by EPA to estimate the risks associated with current and future Site conditions. The risk assessment estimates the human health and ecological risk posed or that could pose

by the contaminants in the groundwater if no remediation were taken. So because this Site and the land immediately adjacent to this Site has been zoned exclusively for industrial use, and future residential and commercial use of the property is not expected to occur, we in the risk assessment, we only assume industrial use of the property. So on the current industrial use there is no -- there are no current groundwater users at this Site, therefore, no current human health risks associated with the contaminated groundwater at the Site. However, there is a future risk for an on-site industrial worker who could drink contaminated at the Site if the groundwater drinking water well would be installed on the property and the risk was estimated to be one in 10,000. Which is within EPA's acceptable risk range. There are some assumptions that were used to estimate the future risk for an industrial worker drinking contaminated groundwater

were the following: That a future industrial worker would drink one liter a day of contaminated water for five days a week, for 50 weeks a year, for 25 years out of a 70 year lifetime.

The risk assessment also concluded that there is no risk to ecological receptors in Gold Creek, because the contaminants have not reached Gold Creek and they're not expected to reach Gold Creek.

Remedial Action Objectives. Remedial action objectives are goals to protect human health and the environment. The goals for cleaning up the Site are to minimize or eliminate potential health risks posed by drinking contaminated groundwater by a potential future industrial worker, and to reduce the concentration of contaminants in the groundwater to drinking water standards.

Four cleanup alternatives were evaluated in the feasibility study to meet the remedial objectives that have been

previously described. These alternatives are Alternative 1, which is no action; Alternative 2, which is natural attenuation; Alternative 3, which is groundwater pump and treat; Alternative 4, which is in situ groundwater treatment. I will briefly discuss each one of these.

For Alternatives 2, 3 and 4 institutional controls and groundwater monitoring will be required for these three alternatives. For all the alternatives a review every five years would be required by EPA so that that would assure that the remedy that would be selected for the Site continues to be protective.

So under the Alternative 1, no action, the Superfund Program requires that the no action alternative be considered as a baseline for comparison with other alternatives. Under this alternative no action will be taken to address the contaminated groundwater. Although groundwater monitoring as

indicated the contaminants in the groundwater will reach drinking water standards due to natural biodegradation of the contaminants in the groundwater, there would be no monitoring of the groundwater to measure the rate of reduction of these organic contaminants in the groundwater and there would be no institutional controls to prevent the use of the contaminated groundwater. There is no cost associated with Alternative Number 1.

Alternative Number 2 is natural attenuation. Alternative Number 2 would rely solely on natural attenuation to reduce the organic contaminants in the groundwater to drinking water standards. The groundwater monitoring results indicate that after remediation of the lagoons, the levels in the groundwater would reach drinking water standards in approximately five years after remediation of the lagoons. The remediation of the lagoons will remove the sources of the

groundwater contamination and will eliminate any additional contribution of contaminants in the groundwater. Groundwater monitoring will be conducted under this alternative to measure improvements in groundwater quality. Institutional controls to prevent the installation of groundwater wells and the use of contaminated groundwater throughout the entire Site would be required, as well as sediment sampling in Gold Creek. The estimated cost associated under -- with Alternative 2 is approximately $284,000, and it will take about six months to implement.

Alternative Number 3, which is groundwater pump and treat. This alternative consists of using recovery wells to extract contaminated groundwater. Approximately six recovery wells will be placed on the Site, they will be placed immediately downgradient of the lagoons. These are the approximate locations. Three under Lagoons 1 and 2

and 3 downgradient of Lagoon Number 8. At this location the recovery wells will capture the most contaminated portion of the groundwater. The portion of the contaminated groundwater that's not going to be captured by these recovery wells will be left to attenuate naturally. This alternative includes groundwater monitoring to measure or to evaluate effectiveness of the groundwater system and also institutional controls similar to those that I have discussed under Alternative Number 2. The groundwater pump and treat system would continue to operate until the levels of organic contaminants in the groundwater reached drinking water standards, and from the groundwater modeling that was conducted at the Site that to reach drinking water standards was estimated to be approximately five years.

Under Alternative 3, the estimated cost is 2.1 million dollars and it would take nine months to implement.

Alternative Number 4, which is in situ or in place groundwater treatment. This alternative consists of injecting air into the contaminated groundwater through a series of injection wells. Approximately 30 injection wells would be used to treat the contaminants in the groundwater, they would be placed immediately downgradient of the lagoons. These circles represent clusters of air injection wells. These wells would treat the most contaminated portion of the plume, and the portion of the plume that's not going to be captured or treated by the air treatment system would be left -- would be attenuated naturally. The organic contaminants in the groundwater would be reduced by transferring contaminants from the groundwater to the air. A soil air venting system would be installed in the subsurface to capture any air emissions and the air emissions would be treated on-site. Groundwater monitoring would be required in order to

measure the effectiveness of the air treatment system. Institutional controls similar to those I have discussed on the Alternatives 2 and 3, as well as the groundwater monitoring, would be required under Alternative 4. The estimated cost for Alternative Number 4 would be 1.9 million dollars, and it would take about 12 months to implement.

Regarding Alternative Number 3, the groundwater pump and treat system remedy, the extracted groundwater that would be collected from the recovery wells would be treated on-site and then would be discharged to Gold Creek in accordance with the State and Federal Requirements, which I forget to mention before.

There are nine criteria that we use to evaluate remedial alternatives. These criteria are divided into three different sets, and they are the threshold criteria, which includes the overall protection of human health and the environment, and compliance with environmental

regulations.

The second set, which are the primary balancing criteria, are long-term effectiveness and permanence, reduction of toxicity, mobility or volume through treatment, short-term effectiveness, implementability, and cost.

And the last set is the modifying criteria; State acceptance and community acceptance.

Based upon these evaluation criteria, EPA's preferred alternative is Alternative Number 2, which is natural attenuation with institutional controls and groundwater monitoring.

Alternative 2 consists of several actions to address the groundwater contamination beneath and downgradient of the Carroll and Dubies Sewage Disposal Site. This remedy relies on natural attenuation of the organic contaminants to reduce the contaminants in the groundwater to levels below drinking water standards.

The length of time that was estimated

that the groundwater would reach drinking water standards, it's about -- it was to be about five years, following implementation of the lagoon remedy. The lagoon remedy would remove the source of the groundwater contamination at the Site, therefore, they would -- there's not going to be any contaminant contribution from the lagoons to the groundwater.

So as far as this remedy, groundwater monitoring would be required to measure improvement in groundwater quality, institutional controls to prevent the installation of groundwater wells, and the use of the contaminated groundwater throughout the entire plume would be required, sediment sampling in Gold Creek to ensure that contaminants have not reached Gold Creek would be implemented. Also, since the contaminants would remain on the Site, EPA would review the remedy within five years to ensure that the remedy continues to be protected. If the monitoring data shows that there is not

improvement in groundwater quality within the five year period, EPA will determine the need to implement or evaluate cleanup alternatives for groundwater remediation at the Site.

The rationale for proposing Alternative 2 as the preferred alternative are it reduces risk to human health and environment, it minimizes impact of remedial activities on community, uses permanent solutions, and it is cost-effective.

This concludes my presentation. What I have just discussed is just an overview of the results of the remedial investigation, the feasibility study, EPA preferred alternative, and the rationale for selecting the preferred alternative.

The proposed plan, which we provided here, provides a more detailed description of the preferred alternative.

The Deerpark Town Hall has copies of the Feasibility Study and the Remedial Investigation Reports for your review if

you would like to see -- to find out more information about the findings of all the studies and investigation that have been conducted at the Site.

The comment period extends through September 27th, all written comments should be provided to EPA to the address that's presented in the proposed plan.

We are open for questions and any comments.

MS. LONEY: I'm going to request that you step forward so you can speak in the microphone clearly and that the stenographer can get it clear and can hear your question clearly. I'm also going to ask that you state your name prior to asking your question, so the stenographer can also keep a record of who asked what. Yes?

MS. HODSON: I'm Frances Hodson.

When I first read this report, there's language in it that I thought was difficult if this is for the general public. Say the word attenuation, would

you please describe what attenuation means.

MS. ROSS: Natural attenuation -- there's a glossary on the back of the handout that you have. I'm just going to read it first and then I'll describe it. Natural attenuation is a process where groundwater is cleaned up by relying on natural processes. Examples of these natural processes are; intrinsic biodegradation, dilution (dispersion), and adsorption. There are several other processes, but they're real minor in this case.

So intrinsic biodegradation is one that was discussed in this instance, and I'll read again my glossary. It's soil and groundwater contain many naturally occurring microorganisms, such as bacteria, which can use the contaminants as a food source, naturally decreasing the contamination and forming simpler compounds, eventually leading to carbon dioxide and water.

MS. HODSON: Thank you.

MS. LONEY: Does it answer your question?

MS. HODSON: Yes, it does. I looked it up in the dictionary, but you don't get as good a description, and I'm a very ordinary citizen, I'm not a scientist, so I needed that.

Now, institutional controls. What institution is going to be doing the controlling?

MR. GARBARINI: When you get into institutional controls, it's a very difficult thing to try and explain, but there are a number of different mechanisms that you can use. And as far as who would be implementing those institutional controls, typically what we try and do is get the responsible parties, as I mentioned earlier, potentially responsible parties, responsible for the contamination at the Site to implement those institutional controls. And typically what we try and do is lay that out with a

consent order with them and ask them to follow-up, often it requires -- if you go off the property and the responsible parties no longer own the property, it requires some coordination with town officials and with the property owners.

So, for instance, in this case we're not saying exactly how we would implement the institutional controls, but we would probably restrict use of groundwater at the Site perhaps with some sort of deed restrictions, and EPA also has mechanisms whereby we can -- it's very, very legal, you get into real estate law and other things whereby we can actually try and enforce some of these institutional controls. What we do, we can give you a more detailed answer in your Responsiveness Summary. We have an attorney actually write up a more detailed response to your question.

MS. HUDSON: All right. Thank you.

MR. GARBARINI: You're welcome.

MS. LONEY: I'm going to ask that

anyone and everyone who has any questions, you can just lineup here, that way you can kind of expedite it rather quickly.

MR. MAYFIELD: Hi. My name is Richard Mayfield from Congressman Gilman's office.

I'd like to thank the EPA for this opportunity for this public comment period and recognizing the relative infancy of environmental science and every site being unique of course.

Can you point to some sites for us or some past history that this proposal that you're doing will be successful, so five years down the road we don't have to come back and revisit this and say, gee, fellows, we spent "X" amount of dollars and we're no better off than we were five years ago? Thank you.

MR. GARBARINI: Thank you. I guess a major portion of this remedy really relies on the remedy that we selected for the lagoons last year and the effectiveness of that remedy, but there are a number of

other sites out there where we have actually gone out and cleaned up sources and sources of contamination. So as soon as you remove that source of contamination to the groundwater, you will see some improvements in the groundwater.

And the other alternative really is to try and aggressively cleanup the groundwater, go out there with a pump and treat system, which is not necessarily a very efficient system.

At this Site here we are seeing that the level of contamination dropped dramatically from just below the lagoons further downgradient of the Site just before Gold Creek. So we are very confident that once we get the source out of there, we'll start to see some significant improvements in groundwater quality. We had our -- our experts out in Oklahoma, folks that actually are very good with groundwater modeling and looking at biodegradation and things like that, they reviewed all the modeling here and

data that we had for the Site and they also felt confident that some biodegradation was going on and that the modeling results, as predicted -- there's always -- when you're dealing with modeling, you never know exactly how things are going to turn out, but they were pretty confident with the effort that was conducted here.

MR. DECKER: Wayne Decker.

You mentioned that the contaminants are significantly decreasing in the monitoring wells as the wells are further from the lagoon sites. On those wells that are furthest from the lagoon sites, are the levels approaching safe levels? Are they still considered hazardous levels that are found there now? Do you have any numbers on that? And besides just giving me numbers, I don't know what the numbers mean unless I know what the ranges are, unless you can sort of indicate.

MS. ROSS: Just in general, right near the lagoons our chief contaminant is

benzene, and benzene is in the thousands of ppb right adjacent to the lagoon, and at our furthest downgradient wells, which are just north of Gold Creek, the benzene is either non-detect or about approximately 10 ppb. So we're seeing two orders of magnitude decrease in that 1,500 feet. So they're either at or below mcl's or just above mcl's in that area.

MS. LONEY: What's ppb?

MS. ROSS: Oh, ppb is parts per billion.

MR. DECKER: What's allowable in drinking water?

MS. ROSS: 0.7 is the State standard. Federal standard is 5.

MR. DECKER: Five what was that?

MS. ROSS: Five ppb's below standard.

MR. GARBARINI: Just to add to that, so if people were actually drinking that water, I mean no one is currently drinking the water and we don't anticipate that people will be drinking it in the near future, but as an added measure of safety

you would have the institutional controls also just to make sure it didn't happen.

MR. DECKER: While I'm trying to figure out numbers, we've got this mythical industrial worker who's drinking water five days a week, and I believe you said the risk is 1 in 10,000 and that is within the acceptable range. Again, what is the acceptable range if it's 1 in 10,001 I'm not too happy about that, if it's 1 and not much more than 10,000, is it significant?

MR. GARBARINI: Yeah, the acceptable risk range -- there was a little bit of discussion of what is acceptable in the proposed plan, but for carcinogens it is 1 in 10,000 to 1 in 10,000,000. That's our acceptable risk range. So what we saw here was 1 in 10,000, so we were right at the acceptable risk range. Again, the assumptions are that someone would be exposed to the water for twenty-five years, five days a week, drinking a liter a day, which are some pretty conservative

assumptions.

MR. DECKER: I guess my comment would be that it seems like this approach is conservative along with the rest of your thinking there. And what concerns me is that since it is related to the success of the lagoons being cleaned up in a timely manner, that if in fact we see any delays in that process, this five year window, which begins upon the completion of the lagoons, is going be to stretching out further and further, and a couple of the other alternatives that were mentioned seemed to have much shorter periods of time for effectiveness, unless I wasn't understanding those numbers right.

MR. GARBARINI: That's a little confusing actually. If I could respond.

MR. DECKER: Sure.

MR. GARBARINI: I think you might be talking about the time to implement, Maria had mentioned some time frames before; nine months, twelve months.

MR. DECKER: Right. Right.

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MR. GARBARINI: That doesn't include such things as negotiating with potentially responsible parties to do the work, the design phase of the process, actually going out and bidding or trying to get a contractor on board to do the construction work. That really looks at, okay, we've got a contractor on board, now you need to go back out and construct the unit. So in one instance, say the groundwater pump and treat would take us 12 months to go out there and lay all the pipe work, construct the unit, start operating it, shake is down, make sure it's operating effectively, and then after that, the model projects that it can still be about five years before -- after the cleanup, until you achieve the same levels, but obviously if you're taking an aggressive approach, you'll probably going to clean it up a little bit quicker, but the modeling is showing that it wouldn't be that much quicker.

MR. DECKER: Thank you. These people

have all gotten mad at me before, so...

Just my last one is that you mentioned that there were no site-related contaminants found in any of the test wells and any of the neighboring water wells and the stream. And I'm just wondering if there were any non-site-related contaminants that we ought to be aware of.

MR. GARBARINI: Actually, I think I'm going to pass that question along to Tim Vickerson of the Department of Health. DOH actually conducted the sampling of those wells.

MR. VICKERSON: Yeah, my name is Tim Vickerson, New York State Health Department.

My agency has been involved in sampling a few of those residential wells in that area as of a couple years ago. Bottom line is I don't recall seeing any non-site related contaminants, as well as any site-related contaminants in those wells. I don't have the results with me

tonight, but as far as I recall, I don't remember seeing anything else in there.

MR. DECKER: Thank you.

MR. PINES: Larry Pines.

I was wondering why no mention was made of EPA's own invention by John Wilson of biodegradation, what you call co-metabolism, the use of oxygen in a foam medium made of surfactant and purified water pumped into the ground to increase the activity of the bio-organisms.

And I'm also wondering, on another issue, that the lagoon, as you talk about in your information here, that you got 20,000 cubic yards got to be contained, I guess that means it's gonna be --

MR. GARBARINI: Treated.

MR. PINES: Treated?

MR. GARBARINI: Treated and contained.

MR. PINES: Treated as in how; water?

MR. GARBARINI: I guess I'll take your second question and respond to that,

since it's fresh in my mind and before I forget.

The Operable Unit 1 remedy that was selected last March called for basically the handling of 20,000 cubic yards of material, some of those are contaminated with inorganic compounds, they would have to be stabilized prior to being placed in a Part 360 or cell, the cell that was Maria was talking about, others have or organic contamination. We think we're going to be treating those via a bioslurry, using bugs basically. And other materials will be below our treatment levels that were specified so they would not have to be treated via either mechanism, but they're high enough that they would have to go into the cell.

MR. PINES: What about the heavy metals you talked about?

MR. GARBARINI: The heavy metals would be stabilized if they exceed the --

MR. PINES: How?

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MR. GARBARINI: The actual types of materials that would be used for the stabilization process? Those have not been selected yet, but there are a number of different types that are out there.

MR. PINES: Yeah, I know.

MR. GARBARINI: If you're interested, when we start approaching the phase where we're going to be -- a lot of those are proprietary too, so it gets touchy, but we can keep you up-to-date on where we think we're headed on that.

MR. PINES: It's just that I know of a person at Ohio State or Penn State who developed a system by taking phosphates to so call stabilize lead in the soil to make it say non-hazardous if consumed, that the body -- won't be absorbed into the blood stream, and also work done by somebody, I don't know if it's EPA or whose it is, but there's some work down at Liberty State Park in New Jersey where they use sunflowers and actual mustard plant to absorb chromium and lead out of the soil

and it stays inside the root system, which can be disposed whichever way you want, but it leaves the soil clean apparently.

MR. GARBARINI: Yes, I've heard of the latter. I know it's been used in some of the Eastern block countries too, it's been quite effective. I think typically, like you said, to use a foam medium to try and absorb the contaminants, but we'll take note of your comments here and Maria will be handling the design, so I'm sure she'll keep it in mind.

MR. PINES: Okay. Thanks.

MS. ROSS: About the co-metabolism, you had said --

MR. PINES: Yes.

MS. ROSS: -- why we're using the intrinsic bioremediation, just using the natural biological population, and not adding to it, not adding surgots or any additional things, but that is another technique that's used. But John Wilson of the U.S. EPA Lab Ada endorses intrinsic bioremediation.

And I'm just going to add this, do you feel that you need that to achieve your goal? Right now we believe the Site conditions are such that we can do this without adding anything at this time.

MR. PINES: Are these the same people at Ada that told me when I was in Oklahoma City that the high levels of chemicals in the water system at Norman were not a danger?

MS. ROSS: Probably not.

MR. PINES: I ended up in the hospital and I lost my job with the postal service because of it. I'm just wondering if those were the same people that say it's relatively safe.

MS. ROSS: Probably not.

MR. PINES: I hope not.

MR. STEIN: Thank you for your presentation so far. My name is Eric Stein. I represent the Deerpark Planning Board.

And I'd like to get a little bit clearer line on your time line, basically

for the public. You've got the OU1 system, which is the containment and the treatment of the tanks for the lagoons, and you've got the OU2, which is the groundwater section. Now, you keep referring to five years of OU2 before it's drinkable and that's, I'm assuming, after the lagoons have been completely treated and contained; right?

And I'd like to know approximately how long or what kind of an estimate you expect that it would take from, you know, working it out with the PRP's, finding out the resolutions, determining the chemicals you expect to use for treating the heavy metals, containing the lagoons and then adding five years? Can you give me a time line, effective time line? Saying that we started working it out with the PRP's today.

MR. GARBARINI: Okay. Actually, we're a little bit ahead of that because we signed the Record of Decision for the source control last March.

MR. STEIN: Right.

MR. GARBARINI: And we had negotiations with the responsible parties, with a couple of the responsible parties, last year. We were not able to come to terms on consent and we did issue them an Order at the end of September of last year and they complied with the Order and they have submitted a work plan to us for the remedial design, which Maria has already taken a look at and commented on, as has the State of New York and other entities within EPA. So --

MR. STEIN: So we have a year or so into it already?

MR. GARBARINI: Yeah. We're already into the process.

MR. STEIN: But we haven't started any treatment or building?

MR. GARBARINI: That's correct. So basically what we have is we have a work plan that will allow us to now start to proceed with the design and the remedy, and there probably will be some testing

that goes on before we actually figure out exactly what types of materials we're going to be using, what kind of slurry is going to work. But the long and short of it is, is that we should have that design complete by the end of 1997, beginning part of '98.

MR. STEIN: Okay.

MR. GARBARINI: And then I'd say it would probably take a year.

MR. STEIN: Okay. So at the end of '98 you said?

MR. GARBARINI: Beginning of 19 -- yes, end of '98 say for the --

MR. STEIN: The end of '98 you'd be ready to implement the actual treatment and construction activities?

MR. GARBARINI: The beginning of '98 we probably will be ready to implement, and it would take a year from there I would say.

MR. STEIN: A year after that OU1 would be complete?

MR. GARBARINI: Yes. In the

meantime, what we'd probably -- we'd probably be excavating and staging material as they're being treated and whatnot. So taking them -- hopefully we'll be taking them out as we're building the cells. Some of the materials are going to have to go because we have to build a new cell for them, so they're going to have to be staged in certain areas and things like that. So hopefully the impacts to the groundwater will be elevated to a certain extent before we actually finish all the treatment and place the materials in the cell and capping the cell.

MR. STEIN: So we've got '98, '99 for the finish of the lagoon section?

MR. GARBARINI: I would say hopefully -- hopefully we get the work done in the construction season of 1998 and be done by the end of 1998. That would be my hope.

MR. STEIN: Optimum scenario.

MR. GARBARINI: Yes, if we don't have

any problems, that's right.

MR. STEIN: And then another additional five years after that. So we're talking 2004, 2005 for --

MR. GARBARINI: 2004, 2005, yes. But you have to remember that the modeling shows that you really need to get in there and remove the source before any of the remedies that we looked at are going to do much good.

MR. STEIN: Yes, of course. It's very understandable why OU1 and OU2 are connected and correlated.

I had another question about the actual retainment, the actual treatment and the containment for the materials from the lagoons. Could you briefly explain what that's going to be.

MR. GARBARINI: Okay. It's going to be consistent with New York State Part 360, the 360 Landfill Requirements, which include clay and probably some synthetic liner, leachate collection. And I don't know, Maria, do you have anymore details

that you can add to that?

It would be consistent with the current landfill requirements for the State of New York Part 360.

MS. JON: Right, it's going to be a composite layer of clay, soil, compacted soil at the bottom and then a high density polyethylene liner will be placed beneath, before the true material gets placed on the cell, and it's going to have a leachate collective system and will collect any liquid that might possibly be generated overtime and then a cap is going to be placed, also made of composite layer of clay and soil and gravel. This is going to be about three feet -- thickness of three feet the cover's going to be, so that would be consistent with the State Regulations.

MR. STEIN: And these are the guidelines of the landfill State Law 360?

MS. JON: That's correct, for solid waste landfills.

MR. GARBARINI: Yes. And the Law

also allows for some variation in terms of the materials that you use, but it would be consistent. You know, typically the materials that Maria was describing are the types of material that are typically used.

MR. STEIN: Landfills are a favorite subject around here.

MR. GARBARINI: I can imagine.

MR. STEIN: Thank you very much.

MR. GARBARINI: You're welcome. Thank you.

MR. BERKMAN: I'm Jeffrey Berkman. I'm here representing Assemblyman Jake Gunther, and thank you for the presentation.

I have a question of process. If there's a disagreement by the possible responsible parties, does EPA go ahead and do the work and then discuss how it's going to be paid for later or do you wait to have that all lined up first before you do the work?

MR. GARBARINI: Typically what we do,

the process that we use in most cases, at least when we get to the design phase, is we'll issue letters to the responsible parties requesting that they perform the cleanup or pay for the cleanup. We then ask them to give us a good faith offer, if they're willing to do that, if they want to do that, they'll give us a good faith offer and we'll sit down and negotiate terms of the agreement with us and then they would implement the remedy.

If they decide that they don't want to negotiate with us or if they negotiate with us and then say, listen, we don't have a deal here, what we can do is issue an Order to them, order them to timely do the work. They can chose to comply with the Order or not comply with the Order. If they don't comply with the Order, we would actually fund the additional work and then go after them later on for the cost of the cleanup.

In the case of the first, the operable unit with the lagoon remedy, the

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PRP's are implementing that remedy.

MR. BERKMAN: They agreed?

MR. GARBARINI: They sat down and negotiated with us and we were unable to reach an agreement on consent, but we did issue them an Order and they choose to comply with it, and they have been conducting the work in good faith. They also did the remedial investigation under Administrative Order on Consent. So they consented to do all this study work.

MR. BERKMAN: I'm not sure how many documents you dropped off at Town Hall, Deerpark Town Hall. Is it like one of those large books there?

A VOICE: It's one of these.

MR. BERKMAN: It is just one of these documents that I have?

MR. GARBARINI: This should also be in the repository, but that provides a summary of everything that's been done.

MR. BECKMAN: I was going to suggest at least this, I don't know about those, but some of these copies you might

consider dropping them off in the Port Jervis Free Library, which also is part of Deerpark, part of their library district, and it might be convenient for people that live in Deerpark, if they work in Port Jervis, they might have the opportunity to review the documents in Port Jervis and also might be interested for people in Port Jervis and Middletown and other people who might be interested as well, so if you have two sites for information, it might be helpful.

MR. GARBARINI: Okay. Yes, we'll do that.

MR. BECKMAN: Thank you. And lastly, I was hoping the State Official, after you review the documents, I was hoping you could write a letter to Senator Gunther stating that it's your belief that none of the wells in the vicinity have any contaminants. I think that's what you said. I don't want to put words in your mouth. But could you please write a letter on that, so that when we get

constituents asking about that, we can always refer to your letter.

MR. VICKERSON: I will.

MS. LONEY: I just want to make sure I understand, you're requesting that there be an additional repository? We have two existing repositories; one at Deerpark Town Hall and the other at the Port Jervis Public Library.

MR. BECKMAN: You do have the Public Library?

MS. LONEY: Yes, there are two.

MR. BECKMAN: I didn't hear him state that in the beginning.

MS. LONEY: There's a copy of it there, if you need copies of this document. This was handed out and mailed out. It should, in fact, I believe, in that document it may in fact list the repositories where they're located.

MR. BECKMAN: If you have it at the Port Jervis Library, that's great.

MS. LONEY: Yes.

MR. BECKMAN: Thank you.

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MS. LATINI: I'm Louise Latini. I live at Vans Beach in the Town of Deerpark, Port Jervis, New York.

I was here two years ago for this meeting. What is the condition of the situation up there now since two years ago? Has there been testing at those points to see if anything has decreased naturally?

MS. LONEY: When you say points, what do you mean?

MS. LATINI: Up there at the -- at the dump.

MS. LONEY: Okay. You mean the specific wells that they were testing?

MS. LATINI: Yes, were they tested since two years ago, and I want to know what the results are.

MR. GARBARINI: Okay. I'll respond to that, and Linda can correct me or Maria can correct me if I'm not accurate with what I'm saying.

As I mentioned before, we really aren't going to see any real significant

results until we remove the source, but in terms of what we have seen, the groundwater testing that was done up there was sort of done in phases; we went out with one stream of wells, then we went out further with another stream of wells, and then further with another stream of wells, and so the first couple of runs of sampling didn't include the furthest wells, so we can't really compare or say the first round of sampling -- we can't compare four rounds of sampling to wells that are further off. But the wells from the lagoon, the results were pretty similar from round to round. When we start to move away from the lagoons we see a very big decrease in the level of contamination and we don't think that the contaminants are really migrating all that far before they're naturally attenuating, being eaten by the bugs that are out there, so to speak. So we haven't really been able to document a real decrease say in one given well of contamination, but we

expect to see that once we remove the source.

MS. LATINI: Okay. I have another question. Two years ago when I was here I requested to have my well checked by the State. They did come down on September 12th, 1994. I received the report November 22, 1994. There was a man here asking if the wells are contaminated. I do have some in mine. They say it's under the New York State Regulations, but it is in my water. Says it's okay to drink, but it's there. You can't say that they're free. This gentleman here signed this letter that I got. Everything is written here, the amounts and what they are, in three pages that I have. I do not understand it. All I know is what they're telling me, is that it's below the standards. What I'm asking for tonight, I already spoke to him. I want another test done. I cannot afford to go to Orange County Department of Health. I have my water checked for

several things once a year, but not all these chemicals because I couldn't afford it. So I feel that I want to ask tonight again to have this test done, and I will match them up what I had two years ago to see if there's any changes, then I will know myself if the natural way is the best way to go. As far as I was told years ago, the sand does not take out these chemicals, you have to use something to get rid of 'em, they're just not going to go naturally. That's why I asked you what the difference was in two year's time, what was found two years ago and now two years later or one year, however you test them, there should be a change. And I'm very much interested in getting this done again on my water so that I can see for myself how the tests are coming. If it's decreasing, fine. If it's increasing then it's not too good.

MR. VICKERSON: Yeah, I'd just like to say that most of those samples, nearly all of them were metals, we tested for

metals, and there were -- can't call them contaminants, but they're naturally occurring elements, that if you go test the gravel you're going to find naturally occurring metals. You know, in some areas of New York State you find them at higher levels than others, but they're not really contaminants, they're naturally occurring in the ground.

I'd like to elaborate a little bit on what Doug said about the outer stream of monitoring wells that you have coming out of the Site. Those wells will be acting as a sort of a sentinel or guard, if you will, for contaminants that have the potential to migrate in the direction of residential wells which are even further, so if we start to see any trends or if we even start to see any detection at all on those wells, that would be an indication to me to get out there and get some more private well samples.

And I encourage anybody else, if you live out in that area, Maria had a map up

that showed all those tiny little triangles, there's quite a few of them out there, if you're really concerned about it and you're really lost, get us out there and get a sample, so let me know. I guess this is a good opportunity, I'll give you my 800 number: 1-800-458-1158, Extension 305. And I'll give that again, it's 1-800-458-1158, Extension 305. Thank you.

MR. GARBARINI: Yes, I'd just like to reiterate what Tim had said, I have public water from my town and I have a lot of iron magnesium in mine, it stains the bathtub and it's a pain to scrub off, but those are naturally occurring. Metals are naturally occurring, so you would expect to see some of those in your water.

MS. LATINI: What's in mine is metals plus these contaminants. You can look at this.

MR. GARBARINI: I'm sure Tim will.

MS. LATINI: Not natural.

MR. VICKERSON: See me after.

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MR. GARBARINI: Sounds like he's willing to get another sample for you. Maybe you can see Tim after.

MS. SADANIANI: Kathy Sadaniani.

My question is very similar to Louise's. I was just wondering what was the date say of the last sampling of the sediment sampling of Gold Creek or of the last -- this last band of contingency wells? If anybody knows, what was your last date. Are you the one who does --

MR. VICKERSON: I guess I could answer part of that. The last sample I got was March of '95.

As far as the groundwater wells, I'm not sure, so I'll leave it to Doug.

MR. GARBARINI: I think, if you do not mind, we'll take a little bit of time and look through our document and get back to you later on in the meeting about when things were last sampled. EPA actually went out there with our own staff in July to sample some of the monitoring wells.

MS. SADANIANI: This July?

MR. GARBARINI: This July, this year, to take a look at some of the inorganic contaminants there. Before that, in terms of groundwater, I think our last sampling that was done was spring of '95.

MS. JON: September '95.

MR. GARBARINI: Was it September? That might be when we had the results come in.

MS. JON: Yes, you're right.

MR. GARBARINI: Sometime between the spring and September of 1995. So spring or summer.

The Creek sediment sampling, we're going to take a look at the documents and see if we can get that information for you. That probably was done I think in '94. I'm not sure, but we'll try and figure it out for you.

MS. SADANIANI: And if it doesn't get to the Creek, then the people on the south of that are clear; is that correct? So the Creek would be your way of saying, and that has not been done since '94,

supposedly?

MR. GARBARINI: Well, the Creek, as well -- we're really more concerned about what's showing up in the monitoring wells then the Creek. I think the Creek provides us with the indication that it's a good sign that nothing has shown up in the Creek and it's worthwhile to continue to monitor that, but what we're really concerned about is the monitoring wells themselves.

MS. SADANIANI: Okay. But it's over a year since they were done, the last band, but that was negligible?

MR. GARBARINI: That's right.

MS. SADANIANI: A year ago.

MR. GARBARINI: That's right.

MS. SADANIANI: Over a year ago.

MR. GARBARINI: Yeah, sometime between spring and summer of last year, aside from the wells we sampled this summer for inorganic chemicals.

MS. SADANIANI: So you have no idea of what the situation is in that last band

of wells right now?

MR. GARBARINI: No, I think --

MS. SADANIANI: You know, I'm bringing this up because we live south of the Creek. There's three cancer cases in ten houses. That to me is a hell of a lot of cancer in ten houses, that I'm shocked to see the map to see where we live. I'm shocked.

MR. GARBARINI: Have you had your well tested by the Department of Health?

MS. SADANIANI: No, we were not, none of us were tested.

MR. GARBARINI: I can understand your concern. It's hard not to be concerned about it.

MS. SADANIANI: It blew our mind tonight.

MR. GARBARINI: Right. But yet you have to understand, we look at the history of the disposal at the Site, we look at the wells, how it's confined in the wells, I mean, the sort of nasty stuff, if you recall, that was disposed of a number of

years ago, probably in the '70's, so you would expect if that was migrating off-site, you would expect probably to see something in that last string of wells.

MS. SADANIANI: Right.

MR. GARBARINI: And we haven't seen anything over the last few years in those wells, so we really believe that these natural processes are taking care of things.

MS. SADANIANI: Taking care of things.

MR. GARBARINI: But we will continue to monitor. We have semiannual monitoring in the remedy. But in the meantime, just to put yourself at a little bit more ease, I suggest that you call Tim and try and get your well sampled.

MS. JON: Just to give you an idea, the most -- the most furthest monitoring wells are located here. This is the Site, and Gold Creek is right here. So the levels that we found in the monitoring wells around here were either at the

drinking water standards or slightly, slightly, above the drinking water standards.

MR. PEILL: Arthur Peill.

I'd just be grateful if somebody on the panel here could remind us of who the responsible parties to the Consent Order are.

MR. GARBARINI: Okay. We have a series of PRP's at the Site. Some of them had signed on to do work or given us notice of intent to comply and others were noticed and are not preforming the work. I'm just going to read from the list right here. We have, first of all, Carroll and Dubies Sewage Disposal, the owners of the property, and we have Kolmar Laboratories and Wickhen Products. They were both companies that had waste that were provided to disposers or transporters that were eventually dumped at the Site. We also had Reynolds Metals. EPA signed a settlement, what's called a De Minimis Settlement, with Reynolds last year and it

was finalized this year. Basically what that says is they were a small contributor to the contamination at the Site and because of that they played, so to speak, a much more -- a much smaller role, a minor role than the other PRP's, therefore we signed a De Minimus Settlement with them. So they basically signed off, paid us some money and they're out of the picture unless we find some additional contamination or evidence in the future that said they were a larger player in the contamination of the Site. And we have one other party, that is the City of Port Jervis. Now, Kolmar and Wickhens, they both signed an Administrative Order on Consent to conduct the remedial investigation, and they were also the responsible parties that gave us notice of intent to comply with our order to perform the remedial action.

MR. PEILL: Thank you.

MR. GARBARINI: You're welcome.

MR. CARROLL: My name is Carroll,

Carroll and Dubies.

In the paper this morning I read where you're concerned about two and-a-half acres of land adjoining the landfill, the Port Jervis Landfill. Who owns those two and-a-half acres?

MR. GARBARINI: What was the reference again? I'm not sure of the reference you're speaking of.

MR. CARROLL: In the paper today it was stated that you're concerned about two and-a-half acres of land adjoining the Port Jervis Landfill, two and-a-half acres joining the Port Jervis landfill. Who owns those two and-a-half acres?

MR. GARBARINI: Is the question you're trying to get out is who owns the land under which the lagoons --

MR. CARROLL: Who owns -- you're concerned with two and-a-half acres.

MR. GARBARINI: I'm not sure of the reference that you're talking about that we're concerned with two and-a-half acres, but we are concerned about the property

that you own, the property that the City of Port Jervis owns.

MR. CARROLL: I want to clarify.

MR. GARBARINI: I'd have to see the article before I can respond to your question. I'm not sure what context that two and-a-half acres was placed in.

MR. CARROLL: Look, I say that the land that you're referring to is contaminated ground is the City of Port Jervis Landfill, not Carroll and Dubies. We paid the City of Port Jervis to dump in the Port Jervis Landfill. And something that's not used anymore, common sense, we have 32 acres and we have stuff to dump, where would you dump it? Would you dump it on your own land or would you dump it in the Port Jervis Landfill? You're talking about five to ten percent of contaminated ground. I know where the other 90 is, right in the center of the Port Jervis Landfill, and I know because I was there.

MR. GARBARINI: Well, all I can tell

you right now is that the center of our attention, as we described over the last years, is the lagoons, that's what we're focusing on cleaning up.

MR. CARROLL: Yeah, I know, but --

MR. GARBARINI: Some of those lagoons are located on the City of Port Jervis property, I agree with you.

MR. CARROLL: Those that you are really concerned with are a part of Port Jervis Landfill, in fact the whole thing is. Our land hasn't been touched. Our land is pristine.

MR. GARBARINI: I guess that's debateable, but I don't want to debate you about it right at this point in time.

MR. CARROLL: You know why, I'll tell you what you would do, you know, clarify the ownership. Who owns it?

MR. GARBARINI: The City of Port Jervis owns some of the property in which the lagoons are located and you own some of the property also.

MR. CARROLL: No, no. The City of

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Port Jervis owns it all.

MR. GARBARINI: I'll go back and check with our attorneys.

MR. CARROLL: All right. All right. Check it out.

MR. GARBARINI: But regardless, as I mentioned earlier in my discussion, we had four different types of potentially responsible parties, and one of those are operators of a facility where waste was disposed, another is a transporter of waste, so in either instance you are still --

MR. CARROLL: Absolutely.

MR. GARBARINI: -- considered to be a responsible party.

MR. CARROLL: You know what, I'm willing to come here and tell you that you're concerned about ten percent, we dumped 90 percent on the City of Port Jervis Landfill, right in the middle.

MR. GARBARINI: We're not responsible for the City of Port Jervis Landfill.

MR. CARROLL: If you can get the

price up to six or seven million on two and-a-half acres, what are you going to do with the City of Port Jervis Landfill. That will run into the billions.

MR. GARBARINI: From what I understand, that needs to be closed properly under the New York State Municipal Landfill Closure, --

MR. CARROLL: What you should do --

MR. GARBARINI: -- and that's where it's being handled.

MR. CARROLL: What you should do first is find out who owns what. And Carroll and Dubies does not own the land that you're concerned about. You can check that out.

MR. GARBARINI: Thank you.

MR. JARVIES: My name is Jack Jarvies. I live in Huguenot. I have a couple questions.

First of all, the last of the material that was dumped in there was in '79, it's now 17 years old. The material hasn't reached your test wells, your

farthest wells.

You also state here if no action is taken there, within five more years the groundwater should meet the State drinking standards. I don't understand why you picked option two if after 17 years that material hasn't reached the wells, and if it's not there now with the material naturally degrading, the logic is that it's never going to reach there. So now we're going to spend taxpayer dollars for $284,000 for what purpose? Why do you recommend number two? What's the difference or what is your projection, because even under number two you'll say it takes five years to meet the groundwater standards. It doesn't -- your whole presentation here doesn't make sense, whether it's no action, Alternative 2 or 3, and four I don't see a number on. Thank you.

MR. GARBARINI: I have to agree with your description, the very reason why we did go with Alternative Number 2, the

waste has been there for at least 17 years. We aren't seeing it in that last string of wells in any significant quantities, that is a good sign, it's telling us that in fact the material that has gotten into the groundwater is probably naturally degrading, but we've got a number of other people in the audience that are concerned that the contamination might somehow spread. So what we need to do, to be responsible public officials, is to actually sample the wells to make sure this isn't in fact happening and nothing unusual happens in the next few years. It's not necessarily going to be a taxpayer dollars, we're hoping that the responsible parties will pickup the tab. And providing people with the level of comfort is something we need to give them.

MR. JARVIES: I don't care what company pays for it, the insurance company pays for it. It's eventually coming out of our pocket, increased cost.

The other item is your logic doesn't follow. If you already have those wells, if you continue to monitor them and nothing happens, why spend money? I know you're just paying for your existence. This is one of my problems with DEC. For example, if you go to Alternative 2, it might be two years before you even start any action, by the time you draw up all your plans, that's two of the five years it's going to take to happen naturally. I do not understand your reasoning. Thank you.

MR. GARBARINI: Part of what you're mentioning there, in fact we do have these monitor wells in place, we're going to be monitoring them anyway, the $284,000 includes those costs in monitoring.

MR. JARVIES: But not in Option 2.

MR. GARBARINI: In Option 2 it does include those costs, it also includes some other costs that probably are not quite as significant as those monitoring costs, and those are costs related to other types of

monitoring that we may not typically do, like looking at the number of bugs, so to speak, or bacteria that are in the groundwater, things like that we wouldn't typically do in a monitoring program. And the only other thing that might be related to it would be some small costs associated with institutional controls.

Just to reiterate, it is a significant amount of money, but it's not significant when it brings the level of comfort that's going to be required here.

MS. HODSON: And I'm just asking these questions because I only have a little knowledge of things.

I see these three organic compounds, and is this whole thing just about these three organic compounds, all this, because there's pages and pages of chemicals that were in this dump and so there's so many parts per billion of this, so many parts per billion of that, but don't they all add up to something harmful to the people? I do not understand why you're

just talking about these three organic compounds alone.

MR. GARBARINI: You're right, there were a whole lot of different types of chemicals that were found in the lagoons. Basically when we go through our process, we look at all those different compounds and we pick the ones out that are the most significant, either in terms of concentration or risk or the two put together, in coming up --

MS. HODSON: You know, add them all up.

MR. GARBARINI: Those are all added up when we do the risk assessment. What we're trying to say is that in the proposed plan, this little plan that we have here, we're really just focused on three or four contaminants because those are the big factors, in this case they're the most toxic and also found in the highest levels. If we want to include everything, we'd have to go back to this large document that we were pointing out

before. So we simmer the information down. It doesn't mean that it isn't all factored into our risk assessment in all this.

MS. HODSON: Thank you.

MS. SOMARELLI: My name is Viola Somarelli. I have just one question.

Does the -- is the EPA an after the fact agency with the Superfund and so forth? I mean, do you monitor these places, all these polluters, any time at all or just after the fact? Thank you.

MR. GARBARINI: Thank you. That's a good question.

Back around the time when a lot of these different hazardous waste sites were popping up, obviously it became known that there is a greater need to control what was being disposed of out in the environment, and there is another law, which isn't the Superfund Law, but it's closely associated with it, which is called the Resource Conservation and Recovery Act. And basically what this Act

was intended to do was to basically trap waste from the time they were generated to the time they were ultimately disposed, treated, whatnot, basically the term that's used is from cradle to grave. So there's a whole lot of manifesting that goes on when someone wants to manufacture. Operating under this Law if he wants to dispose of some waste, he needs to have a transporter that manifests the waste being taken from his site and then brought ultimately to a licensed or permitted facility that's able to handle these types of wastes. That manufacturer then signs when the wastes are dropped off and these facilities are inspected and whatnot.

MS. SOMARELLI: Well, one note to that is that there's a hazardous -- well, hazardous material, benzene, was in the soil, and it's adjacent to our home, the plant. They have been now -- we were told, by the people who owned it at that time, big business, of course, that in six

months -- they were running this big vacuum machine taking the benzene out of the soil, running it on their property. They said in six months we'll have it all cleaned up, that's five years ago and they're still running it, so how long is this going to take.

MR. GARBARINI: I'm not sure whether they actually removed the source of contamination there, but if they didn't, that could be why it's taking so long.

MS. SOMARELLI: It's taking so long.

MR. GARBARINI: Where is this located?

MS. SOMARELLI: Pardon?

MR. GARBARINI: Where was this? This is in another town.

MS. SOMARELLI: No, it's right in Deerpark.

MR. GARBARINI: Oh, it's in Deerpark.

MS. SOMARELLI: And right now -- it was the Dow Chemical Company, before that it was the Wickhen Company. Now it's Summit Research, which I'm sure is a

branch of Dow Corning.

MR. GARBARINI: Right. Well, when it comes to groundwater remediation it's a very complex field, and I think the key here for us is to get the materials out of the ground and treat them.

MS. SOMARELLI: I hope it doesn't take as long as they did with that small spill or whatever it was.

MR. GARBARINI: I hope not either.

MS. JON: I just wanted to add that the regulations that Doug just discussed about that all generators have to manifest the waste from where they originate to where they're disposed of, that regulation came up to prevent sites like the Superfund sites to be created again. So those regulations are there to prevent sites like this to occur.

MR. LATINI: My name is Louis M. Latini. I live in Vans Beach, Port Jervis, New York.

You could almost hit a golf ball close to where I live to the Port Jervis

School District. You put up a map or an overlay before of the local wetlands, peoples' wells. Could you put that up and then overlay this map over the map of it, please.

MS. LONEY: It won't work. They're two different --

MR. LATINI: Put the local map up also. Now, the Site is on this side right here; correct?

MS. JON: The immediate area, right, that's where the lagoons are.

MR. LATINI: Okay. So you basically tested all the wells from like Evergreen Lane, Orchard Lane, just north of us, by the Illet School?

MS. LONEY: This is where they were. Here's Gold Creek.

MR. LATINI: All right.

MS. LONEY: Okay.

MR. LATINI: Here, Gold Creek goes through there. That's there. That's Gold Creek.

MS. LONEY: They're two different --

you can see they're two different scales, it won't work.

And this is Gold Creek.

MR. LATINI: And basically, the last time these wells were tested is basically 1995 or 1994?

MR. VICKERSON: That's correct.

MR. LATINI: 1994.

MR. VICKERSON: 1994. Saw them in 1995.

MR. LATINI: And the last time these wells were tested was when?

MS. JON: April '95.

MR. LATINI: And that was it?

MS. JON: April '95 for the organic compounds. For the metals, the last time they were tested was July, July '96.

MR. LATINI: July '96.

MS. JON: For metals.

MR. LATINI: Is there any way I can get a photocopy of this?

MS. LONEY: It will be in the repository.

MS. JON: Let me see if I have it.

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MR. LATINI: I would appreciate it, if possible. Thank you.

MS. LONEY: What we'll do is the handouts that were given out this evening will be -- photocopies will be made available and they will be placed in both repositories, so you can take a look at not only the handouts that were given, but the presentation as well.

Are there any other questions?

MS. HODSON: You referred to institutional controls, all these very interesting words. The perpetrators of the crime, like Carroll and Dubies, Wickhen, Dow Corning and all the others, maybe not Carroll and Dubies, but certainly the big firms knew what they were doing and what chemicals they were letting go and go into the ground. Now, this whole area, I have a list of 25 companies, all along 209 for about five miles, that are all polluting companies. They're all gasoline, metals, all kinds of contaminations. There's lagoons where

only septic waste is to be put, but of course the local gossip is that the sanitation company has stock pills of sludge, so they'll make a little cocktail. I called the DEC and I cannot get them to check one of the trucks going through.

Now, the DEC also gave a permit to the Sky Dime Corporation. They're located right on the Delaware River. They are permitted to put I believe it's either chromium or cadmium -- I believe it's chromium -- into the sewage system, but the allowance they received wasn't enough for them, so they cheated a little and put plenty more, and they were setup for a $250,000 fine. Do you think they paid it? Can I find out? Because as that gentleman says, it all ends up in the end with the consumer, the local resident, footing the bills for these things, and not only that, that chromium was going into the Port Jervis Sewage Treatment Plant. The local people here, we have our

own systems, they're on-site, our wells and our septics. The Port Jervis Sewage System is owned by the City of New York. Now, they're permitting people to dump that stuff into the sewer system, it's not cleaned as tox -- it's not a third -- a tertiary sewage treatment plant, it goes right into the Delaware, their drinking water. That they don't bother with, but they just made a lovely agreement that they're going to pull more water out of this area to satisfy the needs of New York City.

I live on the Neversink River. I can walk across that river and not get my knees wet, and that was once a famous trout stream until they put the damn up in 1955. It's ruined as a food source. It's being ruined as a recreation source. What are we being left with?

And institutional controls do not exist, even the DEC is guilty of giving anyone a license to put that kind of stuff into a sewage treatment plant.

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MS. LONEY: I'm not sure what exactly your question is for the panel, ma'am.

MS. HODSON: Well, when you describe removing toxic chemicals and heavy metals with biodegradable bacteria, considering how old the earth is, I wonder how come there's any lead left. How come there's any mercury left. Wouldn't they have gobbled it up in all these ages, in the ions of the earth's existence? I don't know. I can't -- I can't accept that.

MR. GARBARINI: Now, just to put it simply in terms of the bugs, so to speak, bacteria and all that, what it comes to what the bugs like to eat, they're just like the rest of it, you know, if you're growing plants or whatever, you have to have the right conditions in order for the plants to consume the food correctly and for us to consume the food correctly, so it really does depend upon the conditions that the bacteria face.

You have raised a number of other issues that are concerns you have there

regarding things that were sort of outside the scope of this meeting, but if you have some additional concerns and you'd like the EPA to take a look into them, feel free to put them in writing and we'll respond to them in the appropriate division, if they're able to.

MS. LATINI: I have one final question.

This plan that you're going to put into implement here in this Site, has this been used any place in the United States?

MR. GARBARINI: Yes.

MS. LATINI: When and how and did it cleanup what it was supposed to do and how long did it take?

MR. GARBARINI: I'm not sure whether you're referring to the Operable Unit 1 or Operable Unit 2.

MS. LATINI: The one that you have already planned to put into effect.

MR. GARBARINI: For the treatment of the soils and lagoon materials?

MS. LATINI: The number two plan.

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MR. GARBARINI: The one that we're discussing tonight about the groundwater?

MS. LATINI: Yes.

MR. GARBARINI: Yes, that has been chosen at a number of different Superfund sites as a remedy, and we can give you details as to the names of those sites and things like that when we put our Responsiveness Summary together.

MS. LATINI: It has been implemented and it's proven that it cleared these chemicals up out of the Site?

MR. GARBARINI: Yes. Again, it depends upon the level of contamination that you're looking at, but it has been proven effective in different sites around the Country.

MS. LATINI: And they've checked them now after a couple years to see if there's anything left there? That's what I want to know. When they did it, if they did it ten years ago, and if they're doing checks now and it's still there, then it didn't do its job.

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MR. GARBARINI: Yes, there are a lot of -- when you're talking about these things, everything is very, very site specific when you're talking about biodegradation, but if you want, we can give you a list of other sites where it's been implemented, both Superfund sites and sites that aren't Superfund sites that have had other similar contaminants.

MS. LATINI: Because if it doesn't work, it's just a waste of money and time.

MR. GARBARINI: That's right. Let me pass this over to Linda who has got a lot more background in this area.

MS. ROSS: One of the previous speakers talked about John Wilson, and John Wilson's an expert in this particular field of bacteria, of degrading compounds and cleaning up sites. And when this first started there was a lot of jet fuel spilled on actual military bases, and he focused his study on that, and it really does cleanup benzene quite remarkably under the right conditions and it's proven

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and is very well documented. We will provide more references on that with the Responsiveness Summary.

MS. LATINI: Thank you.

MS. LONEY: Are there any further questions?

(No response given.)

MS. LONEY: All right then. I just want to encourage all of you who may have additional questions, you can contact Maria Jon, she's the Remedial Project Manager, and we also are encouraging you to submit written comments to us.

The closing date, again, for submission of your comments is September 27th. So you get your written comments in to us. They are taken quite seriously and read and taken into consideration. So I'm going to thank all of you once again for coming out, and I wish you all a safe trip home. Thank you so much.

oOo

THE FOREGOING IS CERTIFIED to be a true and correct transcription of the original stenographic minutes to the best of my ability.

Jacqueline Maloney, CSR

Jacqueline Maloney, CSR

LAWYER'S NOTES

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Appendix E

Letters Submitted During the Public Comment Period

Frances J. Hodson
HCR 60B Ave. B
Godeffroy, New York 12739

September 25, 1996

Maria Jon, Project Manager
U.S. Environmental Protection Agency
200 Broadway, 20th Floor
New York, New York 10007-1866

Re: Carroll & Dubies

Dear Ms. Jon:

I moved to Godeffroy from Nassau County in 1983. I have lived in Nassau over 30 years and contaminated water fupplies necessitated the closing of 33 wells on Long Island. Naturally the public became very conscious of the importance of a clean water supply. When I read about the Carroll & Dubies Site I recognized it as a big problem.

When I read the announcement about the Public Meeting on September 11th, and read the report I took out my file to review the past public hearings. My first shock was EPA's Alternative #1, which was to do nothing. How could you, as professionals, even suggest leaving a community with no remedial action to protect us, your fellow Americans? Only a few thousand feet downgrade if the Port Jervis School Complex which has over 1,000 students, as well as a bus garage, custodial, maintenance, groundsmen, cafeterias workers Plus the professional staff - probably 600 people. The school was built in 1968. In 1994 lead was in the drinking water and it was blamed on pipes. Adjacent to the school are junkyards, retail auto salesrooms with repair shops on the southside. On the upriver side is a milk farm and the smell of cow manure drifted over to the bus garage.. This is just a little description of the school site and environs.

As for the people of our area. We are a low income area. Wages go from the minimum to about $8.00 at the acid battery plant. You can check with the Department of Health for cancer and resperitory illnesses. You should check on birth defects too. You, as a federal agency can also get the figures on the mentally deficient and physically handicapped children in the schools and medical facilities in Orange County.

I was shocked that the Mayor of Port Jervis was absent and that there was no representative present with a statement. I was also shocked that our Supervisor, Mr. Robert Cunningham, was absent but a Councilman, Mr. Robert Zeller, was present as an observor to report back to the Town Board.

Our very beautiful valley has many hidden dangers in addition to the toxics released into the Neversink, streams and ground.

We have a heavy inversion each morning which rises and then is dispersed. Naturally, the toxins in the air rise up and are part of the air we breathe. Respiratory problems are common. A foul environment produces a sick population.

I love this valley for its beauty. I am 78 years old and will be content to end my days here. However, I was lucky and enjoyed good health. I I was very concerned with a healthy lifestyle and my two daughters, my seven grandchildren and two great grandchildren are fine healthy people who can enjoy living a full life. A foul environment will preclude raising healthy children.

Please take all these considerations into your decision making process. The Town of Deerpark and the City of Port Jervis need the best possible remediation. The burden our residents carry must be lightened.

:ou are trained as environmentalists and I urge you to do the right thing and select #4 as the alternative remedy for the sad state of affairs this area is in.

Sincerely yours,

Frances Hodson

Frances Hodson

HCR 60 B
Godeffroy, New York ~~12739~~

754-8711

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-0001

Henry G. Williams
Commissioner

August 8, 1984

Ms. Francis Hodson
HCR Box 60 B
Godeffroy, New York 12739

Dear Ms. Hodson:

Governor Cuomo has requested that this Department reply to your letter of July 9, 1984.

The State of New York does have a long standing active program for controlling the injection of contaminants into our groundwaters. The State Pollutant Discharge Elimination System (SPDES) has regulated discharges to ground and surface waters of New York State since the system became law on September 1, 1973.

Under the SPDES system all discharges of industrial type waste to groundwaters are required to have a SPDES permit. Standards for such discharges are provided by Part 703 of New York State's official compliation of codes, rules, and regulations. The water quality standards and discharge standards contained in Part 703 (attached) are quite restrictive in controlling a wide variety of toxic pollutants.

Currently, about 300 industries that discharge to groundwater are regulated under SPDES permits. For most of these facilities, pollution abatement systems have long since been in place. Thus, much has been done to prevent further contamination of our groundwater resources by industrial discharges.

However, despite the successful implementation of the SPDES program as it relates to groundwater dischargers, the protection of our groundwater supplies from toxic chemicals still presents a major challenge for the following reasons:

1. An effective surveillience and enforcement program for such discharges requires a great deal of time and manpower and resources:

    a. The overwhelming majority of industrial groundwater dischargers are in Nassau and Suffolk Counties and the majority of these consist of small operations. Our experience has been that the list of industrial groundwater

dischargers changes by an astonishing 25% per year due to new industries coming into existence, existing industries moving or going out of business, and facilities which change ownership.

Thus, administrative tracking of these dischargers alone is a complicated and demanding task.

b. A subsurface discharge by its very nature is invisible. Thus, spills, whether accidental or otherwise, may go unnoticed or unreported. Only frequent inspections and sampling by the Department can serve as an effective check on the data which industries are required to report by their permits.

2. The SPDES permit program does not apply to toxics leaching out of old landfills and other abandoned waste disposal sites. These sites must be investigated and cleaned up through appropriate enforcement action.

From the forgoing one can see that the protection of groundwater from toxic industrial chemicals is a difficult and demanding task. However, this Department has provided strong and effective controls for industrial discharges to the extent possible with the resources available.

Thank you for your interest in this matter, if there are any further questions or information needed please contact this office directly at (518) 457-1067.

Very truly yours,

Anthony F. Adamczyk, P.E.
Director
Bureau of Wastewater Facilities Design

cc: Commissioner Williams

Sewage Sludge...A Dangerous Fertilizer

By Stephen Lester, CCHW Science Director

The land application of municipal wastewater sludge is fast becoming a major toxics issue. Hundreds of mostly rural communities are suddenly being targeted for "land farming" of sludge. In some communities like Wise County, Virginia, authorities want to reclaim strip mined land by filling it with sludge. Other communities such as those in the Texas panhandle, those in Prowers and Kiowa counties in Colorado, and those in eastern Pennsylvania have become targeted for sludge generated in New York City.

What is spurring this latest craze? Its simple. A ban on ocean dumping went into effect on July 1, 1992 sending many coastal cities like New York scrambling to find a way to get rid of their sludge. But sludge is also generated by every community that operates a wastewater treatment plant. Sludge is the end product of "cleaning" waste water and disposal of this sludge is extremely complicated and difficult.

The theory behind the land farming of sludge is to spread the sludge over farm land to allow the chemicals in the sludge to either dilute into local groundwaters and/or evaporate into the air. This method does little more than transfer the chemicals in the sludge to groundwater and into the air and, therefore, is an inappropriate and poor method of "disposal" for sludge that contains toxic and hazardous chemicals.

Twenty years ago, when EPA first considered the idea of land farming sludge, there was some merit to the concept primarily because the constituents in sludge were mostly heavy metals. One could make the argument that some of these substances could serve as "nutrients" or fertilizer in some instances. In some circles, support for this idea has grown to the point where some believe that land farming is the ideal solution, "an environmentalist's dream come true—waste becomes a resource."

Unfortunately this view is naive and unrealistic. While in theory, if there were few or no toxic substances present in sludge, it would be possible to land farm it safely. But as a practical matter this situation simply does not exist. All sludge contains large amounts of organic chemicals, heavy metals and pathogens.

This toxicity is the result of many small (and some large) businesses that dump their toxic waste into municipal sewage lines. Every study that has tested for organic chemicals in sludge has found them, lots of them. One landmark study by the American Society of Civil Engineers clearly identified a significant number of toxic organic chemicals that are typically found in sewage sludge including PCBs, pesticides and many chlorinated compounds (see What's in Sludge, p. 9).

Dr. Donald Lisk from Cornell University's College of Agriculture and Life Sciences estimates that typically 100-200 companies will flush their waste into a single treatment plant and that literally thousands of chemicals may be present in a single sludge sample. In addition, newly formed toxic substances are created as waste products break down in sludge.

Dr. Stanford Tackett of Indiana University of Pennsylvania describes sludge as being "closer to the definition of a toxic waste than it is to fertilizer." In testimony before the Pennsylvania House of Representatives, Dr. Tackett, who has studied the effects of lead on soil and groundwater for 25 years, warned that "one application of sludge adds more lead to the soil than did 50 years of using leaded gasoline" and that once sludge is applied, the soil can never be recovered.

Land farming sludge poses a number of threats. The most prominent risk is to groundwater that passes through the sludge. As rain falls on sludge, many organic chemicals are pulled into the groundwater as are heavy metals. According to Dr. Tackett, "All lead does not stay immobilized in soil as claimed." Some of it always moves from the soil to groundwater "relatively quickly." People depending on this groundwater for drinking or for livestock use and to water crops are at increased risk of exposure to toxic chemicals.

Another threat is air emissions. Air pollutants are generated when volatile chemicals evaporate from sludge and when sludge-treated soil dries out and is carried away as dust. These pollutants pose health risks to people living downwind.

The most common concern raised about the land farming of sludge is the impact on crops grown on the sludge-treated soil. EPA has set standards that limit the amount of heavy metals and PCBs that can be applied to soil. These standards address the ability of crops to absorb chemicals when sludge is used as a nutrient or fertilizer. They do not address sludge as a disposal alternative and the potential health and environmental impacts of groundwater contamination, air emissions or the ingestion of contaminated soil by cattle or other grazing animals. The absorption of chemicals by crops is important but it is not the only issue needing attention and regulation.

A critical issue that has received little attention is the presence of organic chemicals in sludge. Few studies address the health risks these components pose and there is little test data on the extent of these contaminants in the sludge. Federal regulations also fail to address their impact. Unless sludge is tested for these substances, the health and environmental risks will remain unknown. Make sure any sludge coming into your community is tested for organic chemicals.

Con't on next page

Another concern that cannot be ignored is the track record of land farming sludge. Th ; little long-term experience. There are success stories and horror stories. For example, EPA originally allowed sludge with over 100 mg cadmium per kg soil to be given to farmers and gardeners. These sludges had high zinc to cadmium ratios causing high crop uptake of cadmium. EPA was unaware of this factor until it was too late. Now crops grown in these areas cannot be used and the soil needs to be cleaned up.

In Oklahoma, nine horses died and 113 others developed liver problems eating hay grown on land fertilized with sewage sludge and in Bloomington, Indiana, PCB-rich sludge was mistakenly given to gardeners and farmers. Problems like these prompted the Del Monte and Heinz corporations to ban the use of sludge on any land used for growing their food crops. EPA has been very slow to address this issue and is reluctant to even identify sludge treated sites that need to be cleaned up.

D ite these realities, some environmenta oups, including the Environmental Defense Fund, believe there can be "beneficial" uses of sludge. They argue that if toxic substances are minimized or, better still, eliminated from the waste stream, then sludge would be "clean" and could be used as nutrient or fertilizer.

Theoretically, it's possible to create "cleaner" sludge by passing toxic use reduction laws to limit chemicals discharged into sewage lines and to pretreat sludge to reduce contaminants. Some day this may be achieved, and we should strive towards this, but at this time, let's be clear, there is no such thing as "clean sludge."

Dr. Lisk agrees. He commented, "The concept of 'well engineered' sludge is a myth. There is no sound scientific basis for limiting levels of potential toxicants in sludge since we do not know the identity of most of them. Even if both of these problems didn't exist, it is extremely unlikely that any feasible monitoring and enforcement program could ensure that application regulations are met."

In the end, whether a community wants to land farm sludge is a local decision that should be made by the people who will be directly affected. No one has the right to say that land farming sludge is good for another community. The impacted community must be given both sides of the story, so they can decide for themselves what risks they are willing to accept. How can community people be expected to accept land farming sludge if the expert's can't agree if sludge is safe?

Resources:

"Land Farming Sludge: A Fact Pack," CCHW, 1992. A compilation of newsclips, articles and scientific papers on what's in sludge and how communities have been dealing with this issue. Available from CCHW for $5.95.

"Land Application of Wastewater," A Report of the Land Application Committee of the American Society of Civil Engineers, 1987. (ASCE, 1987).

"National Survey of Elements and Other Constituents in Municipal Sewage Sludges," Ralph O. Mumma et al. Archives of Environmental Contamination and Toxicology, *Vol 13, 75-83, 1984, (Mumma, 1984).*

"Organic Toxicants and Pathogens in Sewage Sludge and Their Environmental Effects," JG Babish, DJ Lisk, GS Stoewsand and C Wilkinson, A Special Report of the Subcommittee on Organics in Sludge, Cornell University, College of Agriculture and Life Sciences, December, 1981 (Lisk, 1981).

What's In Sludge

According to researchers at Cornell University and a report of the American Society of Civil Engineers, the following substances are typically found in sludge:

- Polychlorinated Biphenyls (PCBs)
- Chlorinated pesticides — DDT, dieldrin, aldrin, endrin, chlordane, heptachlor, lindane, mirex, kepone, 2,4,5-T, 2,4-D.
- Chlorinated compounds — dioxin (TCDD) dichlorobenzene, trichlorobenzene, tetrachlorobenzene, chloroaniline, dichloroaniline, dichloronaphthalene, tetrachloronaphthalene, trichlorophenol, pentachlorophenol, chlorobiphenyl.
- Polynuclear aromatic hydrocarbons - chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a) pyrene, perylene, dibenzo(a,j)anthracene, indo(1,2,3,c,d) pryene.
- Heavy metals — antimony, arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, thorium, uranium, vanadium and zinc.
- Bacteria, Viruses, Protozoa, Parasitic worms, Fungi.

Miscellaneous — flame retardants (asbestos), petroleum products, industrial solvents, iron, gold, nitrogen, phosphorus, potassium, calcium.

Sources: ASCE, 1987; Lisk, 1981; and Mumma, 1984.

New York State Department of Environmental Conservation
21 South Putt Corners Road, New Paltz, New York 12561
914-255-5453

Thomas C. Jorling
Commissioner

December 21, 1987

Frances Hodson
HCR 60B
Godeffray
New York 12739

Dear Mr. Hodson:

In response to your letter of October 15, 1987, a study of the Carrol and Dubies waste disposal site in Port Jervis, New York, has just recently been completed and it has been determined that this operation has caused contamination of the groundwater.

The Department is currently pursuing measures to further study and define the extent of the contamination, as well as control and remediate this situation.

If you have any further questions, please feel free to call me.

Yours truly,

Sandra L. White
Assistant Sanitary Engineer
Region 3

SLW:zl

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
26 FEDERAL PLAZA
NEW YORK, NEW YORK 10278

NOV 21 1988

Ms. Frances Hodson
P.O. Box 60B
Godeffroy, New York 12739

Dear Ms. Hodson:

Your October 18, 1988 letter to Mr. Richard T. Dewling, former Regional Administrator of Region II, concerning the Carroll & Dubies Landfill has been referred to me for response. The Carroll & Dubies site, now referred to as Carroll & Dubies Sewage Disposal, was proposed for inclusion on the National Priorities List (NPL) in the June 24, 1988 Federal Register. This means that it is now eligible for funding under EPA's Superfund program.

I must advise you, however, that prior to the expenditure of Federal funds, EPA must attempt to locate those parties potentially responsible for the contamination at the site in an effort to have those parties fund the response action (cleanup). I can assure you that the enforcement process, i.e. the search for and negotiation with potentially responsible parties will begin by the end of this calendar year. It may take several months to conclude this effort. Based on the results of the enforcement process for this site and several others in the same situation, we will make a determination as to which sites will be funded by EPA for further action under the Superfund program. Thereafter, the process to study the extent of contamination at a site like the Carroll & Dubies Sewage Disposal site typically takes about 18 months. The study process would then be followed by a period of time to develop an engineering design for the site remedy and, after completing the design, the remediation (cleanup) of the site.

I hope that I have addressed your concerns satisfactorily. For continued site updates please contact Mr. George Pavlou of my staff at (212) 264-0106. Mr. Pavlou can keep you apprised of our enforcement efforts and our future funding plans.

Sincerely yours,

Stephen D. Luftig

Stephen D. Luftig, Director
Emergency and Remedial Response Division

cc: Michael O'Toole, Director
Division of Solid & Hazardous Waste

2 months - mail of years

Cortese clean-up continues

10/13/95

By TOM KANE
Record Correspondent

NARROWSBURG — The Cortese landfill toxic removal project began two weeks ago and will be completed by mid-December.

During the next few weeks, workers will be excavating sediment from two seepage lagoons that contain toxic waste deposited there years ago. Samples will be taken of the seepage and, according to the results, the seepage will be taken to a toxic waste site or a non-toxic site.

"We will also construct a storm water channel which will divert rain water away from the contaminated area," said David Moreira, project manager of Waste Management Inc. of Massachusetts, the company contracted to oversee the removal action.

Moreira is acting on behalf of the Town of Tusten.

OHM Inc of Trenton, N.J., is the company doing the excavating.

The landfill, which was used in the 1950s, 1960s and 1970s, is south of the Hamlet of Narrowsburg along the Delaware River and next to the Erie Railroad line.

The second phase, which will begin next spring, will see the removal of barrels of toxic chemicals that were also buried years ago.

The cost for the entire project is about $1 million.

"It won't cost the town anything," said Supervisor George Burkle.

The money for the project comes from the federal Evironmental Protection Administration Superfund and from the companies and individuals responsible for the contamination.

More than 20 years ago, the EPA closed the landfill because toxic effluent was in danger of seeping into the nearby Delaware River.

The town owns about 1½ acres of the 4½-acre site. The remaining three acres are owned by John Cortese, Moreira said.

It took years of negotiations and court cases to have the landfill cleaned up.

"It's finally going to be done and over with," Burkle said.

J. TALBOTT/The Record

Workers in protective gear move buried waste yesterday at the Cortese landfill in Narrowsburg. This portion of the clean-up is expected to be complete by mid-December. Another phase will begin in the spring.

Tests show soil, water still tainted

But RSR site no threat to area, DEC official says

By MARIE SZANISZLO
Staff Writer

CRYSTAL RUN — About two years after a state agency ordered Revere Smelting and Refining Corp. to monitor the soil and water around its plant, samples of both continue to show high levels of arsenic and other contaminants.

However, a Department of Environmental Conservation official says there is no imminent threat to either the public's health or the environment.

In a recent memorandum, the Town of Wallkill's consulting engineer, Richard McGoey, said ground water on the south side of the Ballard Road plant showed elevated levels of arsenic, antimony, cadmium and chromium.

The company's first quarterly report for 1996 also indicated that a nearby pond and stream, as well as soil samples on the plant's boundary, also showed high levels of arsenic and lead, McGoey said.

The findings are of particular concern to residents who have been monitoring the battery-recycling company because the state DEC geologist most familiar with RSR is one of several employees who are losing their jobs because of budget cuts.

"I would like to see that (the findings) don't fall into the cracks," said Harry Ross, chairman of the community advisory committee overseeing the company's efforts to bring its plant into compliance with state and federal regulations. "To fire the one expert you have working on this to save money doesn't make sense."

Ellen Stoutenburgh, a DEC spokeswoman, said it was unclear how James Yuchniewicz's workload would be handled after his June 14 departure.

"There are other geologists that work for the department," Stoutenburgh said. "... Any time someone with experience leaves, however, it always takes time to bring someone else up to speed."

The levels found in the soil and water samples were consistent with previous findings, she said, and posed no "imminent threat to human health or the environment."

"We think the contamination could be contained to the RSR property," said Aida Potter, an environmental engineer for the DEC.

To bring its plant into compliance, the company began excavating lead-contaminated soil at the site last July, and was to build and begin operating by July of this year a separate facility designed to reduce sulfur dioxide emissions odors at the plant.

RSR had asked for an extension until May 10, 1997, Dumas said, because its engineers are looking at different ways to reduce the sulfur dioxide emissions.

The DEC has agreed to give the company until Sept. 7 to finish the building and begin reducing emissions.

Lead linked to crime

By LEE BOWMAN
Scripps Howard News Service

2/7/94

Lead contamination not only impedes brain development and learning in children, but also makes them more aggressive and likely to engage in delinquent acts, a new study published Wednesday concludes.

A four-year study of 301 Pittsburgh public schoolboys found those with elevated levels of lead in their bones were reported by parents and teachers — and themselves — to be more aggressive and more likely to steal, fight and vandalize than low-lead counterparts.

The results were reported by Dr. Herbert Needleman and colleagues at the University of Pittsburgh in The Journal of the American Medical Association.

"I think we've demonstrated something that people have been talking about for years, that lead exposure is associated with attention deficit and bad behavior," said Needleman, a professor of psychiatry and pediatrics who has been researching the health effects of lead for decades.

The researchers used several psychological tools, including a widely accepted Child Behavior Checklist, plus interviews with parents, teachers and the boys themselves to evaluate behavior changes over a four-year period.

Brown probe

Hodson
HCR 80 B
Godeffroy, NY 12739

Law to protect area reservoirs

By MICHAEL MELLO
Ottaway News Service

8/7/96

WASHINGTON — President Clinton yesterday signed into law a bill that could provide New York state with $112 million over the next few years to help protect New York City's upstate reservoirs from pollution.

Congress must approve a separate request to actually spend the money, however. That makes it unclear whether federal aid will reach the city or upstate communities in the reservoirs' watershed next year.

Rep. Sherwood Boehlert, R-New Hartford, says he is confident that it will. He'll have to move quickly to make it happen. When Congress returns from the summer recess after Labor Day, lawmakers will have only three weeks to wrap up legislative business before they adjourn for the fall elections.

Boehlert, along with the state's senators, championed the effort to win federal aid to help protect New York City's water supply.

Under an agreement with the federal Environmental Protection Agency, the city would widen the buffer of land it owns around the reservoirs in Delaware, Ulster and Sullivan counties, and restrict development and some farming practices in the area that could pollute their waters.

Communities in the region would have to upgrade their sewer and storm water systems to prevent runoff into the reservoirs, potentially forcing residents to pay some of the expensive construction costs.

Federal money would help pay part of what could be up to $1 billion in project-related costs. If the city does not act, Washington would force it to build a filtration system that could cost more than $2 billion.

Last week, the House approved another measure sponsored by Boehlert seeking $25 million for watershed protection in upstate New York. But that plan, in which Washington would award grants to communities to help them meet the new watershed protection requirements, must still be approved by the Senate.

4. Provide for the care, custody, and control of the forest preserve.

5. Provide for the protection and management of marine and coastal resources and of wetlands, estuaries and shorelines.

6. Foster and promote sound practices for the use of agricultural land, river valleys, open land, and other areas of unique value.

7. Encourage industrial, commercial, residential and community development which provides the best usage of land areas, maximizes environmental benefits and minimizes the effects of less desirable environmental conditions.

8. Assure the preservation and enhancement of natural beauty and man-made scenic qualities.

9. Provide for prevention and abatement of all water, land and air pollution including but not limited to that related to particulates, gases, dust, vapors, noise, radiation, odor, nutrients and heated liquids.

10. Promote control of pests and regulate the use, storage and disposal of pesticides and other chemicals which may be harmful to man, animals, plant life, or natural resources.

11. Promote control of weeds and aquatic growth, develop methods of prevention and eradication, and regulate herbicides.

12. Provide and recommend methods for disposal of solid wastes, including domestic and industrial refuse, junk cars, litter and debris consistent with sound health, scenic, environmental quality, and land use practices.

13. Prevent pollution through the regulation of the storage, handling and transport of solids, liquids and gases which may cause or contribute to pollution.

14. Promote restoration and reclamation of degraded or despoiled areas and natural resources.

15. Encourage recycling and reuse of products to conserve resources and reduce waste products.

16. Administer properties having unique natural beauty, wilderness character, or geological, ecological or historical significance dedicated by law to the state nature and historical preserve.

17. Formulate guides for measuring presently unquantified environmental values and relationships so they may be given appropriate consideration along with social, economic, and technical considerations in decision-making.

18. Encourage and undertake scientific investigation and research on the ecological process, pollution prevention and abatement, recycling and reuse of resources, and other areas essential to understanding and achievement of the environmental policy.

19. Assess new and changing technology and development patterns to identify long-range implications for the environment and encourage alternatives which minimize adverse impact.

20. Monitor the environment to afford more effective and efficient control practices, to identify changes and conditions in ecological systems and to warn of emergency conditions.

Public Notice 93-53
Date: August 11, 1993
Notice of proposed administrative penalty assessment and opportunity to comment
Agency: Environmental Protection Agency (EPA)
Action: Notice of proposed administrative penalty assessment and opportunity to comment
Summary: EPA is providing notice of proposed administrative penalty assessment for alleged violations of the clean water act. EPA is also providing notice of opportunity to comment on the proposed penalty assessment.
Under 33 U.S.C. §1319(G), EPA is authorized to issue orders assessing civil penalties for various violations of the act. EPA may issue such orders after the commencement of a Class II penalty proceeding. EPA provides public notice of the proposed assessment pursuant to 33 U.S.C. §1319(G)(4)(A).
Class II proceedings are conducted under EPA's consolidated rules of practice governing the administrative assessment of civil penalties or the revocation and suspension or permits, pursuant to 40CFR part 22. The procedures through which the public may submit written comment on a proposed class II order or participate in a class II proceeding, and the procedures by which a respondent may request a hearing, are set forth in the consolidated rules. The deadline for submitting public comment on a proposed class II order is thirty (30) days after issuance of public notice.
On the date identified below, EPA commenced the following class II proceeding for the assessment of penalties:
In the matter of AAR Corporation (Skydyne, a division of AAR Brooks & Perkins Corporation), 21 River Road, Port Jervis, New York 12771. Docket No.
EPA-CWA-II-93-50; filed on July 28, 1993 with regional hearing clerk Karen Maples, U.S. EPA, Region II, 26 Federal Plaza, Room 437, New York, New York 10278, (212) 264-9880; proposed penalty: $100,000, for failure to comply with the section 307 of the Clean Water Act and the categorical pretreatment regulations found at 40 C.F.R. §433.
For further information: persons wishing to receive a copy of EPA's consolidated rules, review the complaint or other documents filed in this proceeding, comment upon the proposed assessment, or otherwise participate in any of the proceeding should contact the regional hearing clerk identified above. Unless otherwise noted, the administrative record for the proceeding is located in the EPA regional office identified above, and the file will be open for public inspection during normal business hours. All information submitted by the respondent is available as part of the administrative record, subject to provisions of law restricting public disclosure of confidential information. In order to provide opportunity for public comment, EPA will issue no final order assessing a penalty in this proceeding prior to thirty (30) days from the date specified below.
Dated: August 11, 1993
Richard L. Caspe, P.E.,
Director
Water Management
Division

EPA may fine Skydyne $10

By DAVID GORDON
Staff Reporter

PORT JERVIS — The federal Environmental Protection Agency is seeking a $100,000 fine against Skydyne Corp. for alleged dumping of excess chromium into the city's treatment plant.

Skydyne's general manager Jay R. Benson said today the company has redesigned its production processes to eliminate the problem. The proposed fine is not final, and the company is seeking a hearing, he said.

Skydyne manufactures cases for gauges and instruments, and metal containers.

The alleged violations occurred between January 1989 and December 1982, according to a complaint filed by the EPA. Wastewater from the plant exceeded the maximum monthly average limits for chromium in eight months during the period. On one day, Dec. 8, 1992, the wastewater contained more than the daily maximum of chromium.

According to the EPA complaint, industries are required to pretreat wastewater going into a public treatment plant to reduce or eliminate heavy metals and other hazardous substances.

Wastewater entering the Port Jervis sewage treatment plant, which is owned by New York City, must contain no more than 2.77 milligrams of chromium per on any given day. The monthly average must not exceed 1.71 milligrams per liter.

The amounts of chromium found in the EPA's review varied from 1.72 milligrams per liter to 3.45. Most results were in the 2.2 to 2.68 range, with one reading of 3.45.

The EPA complaint also charges that Skydyne failed to maintain water samples to be tested for cyanide on July 8, 1992, at the required 4 degrees centigrade during transport from the plant to the laboratory.

Benson has been Skydyne's general manager since last August. He received the first notice from the EPA on the violations in December, he said.

"We were in total compliance in January," he said. "We've changed the process, we've invested the money, and we're within all the limits."

45 Cents

0,000

264-9982

EPA officials could not comment on whether the company is currently in compliance, but John Dolinar, EPA assistant regional counsel, said the fine would be levied on previous noncompliance.

"We would expect them to be in compliance, especially after we notified them that we were aware of the noncompliance," he said. "It's nice that they are now complying and being responsible, but the fines are for the past violations.

★(See EPA, back page)

The rest of the story

★EPA

(Continued from page 1)

Before the fine is levied, a hearing will be held to determine whether the amount is appropriate. Members of the public may contact EPA Hearing Clerk Karen Maples at the Region II office, 26 Federal Plaza, Room 437, New York, N.Y. 10278 to submit written comments.

Did you (EPA) fine Did they PAY? Wastewater goes into Neversink River (ie "Protected River"

Public Notice 93-53
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Dated: August 11, 1993
Richard L. Caspe, P.E.,
Director
Water Management
Division

Deerpark, N.Y. 12729

Letter re Carroll & Dubies Fences

INDUSTRY ALONG ROUTE 209
DEERPARK, N.Y.

1. Marcy South Power Line
2. M & S lagoons for septic waste.

. . . . . .

hauling it to this site.

3. Pete's Auto Service Westbrookville
4. Lafarge-Sullivan - next to Basha Kill
5. Brim Recycling - auto crushing, batteries, etc. Basha Kill
6. Westbrookville Auto Body
7. Tenke's - Auto repair and junkyard (CASLO)
8. Lewis's Convenience store - gas pumps
9. Firehouse
10. C & D Battery
11. Town Hall and Maintenance Sheds for Road Equipment
12. Deerpark Auto Sales - repairs and painting
13. Deerpark Equestrian Farm - Han Corp.
14. Peenpack Sand and Gravel and Cement Plant off Peenpack Trail about ½ mile from 209
15. Summit Labaratories (formerly Dow Chemical, and before that Wickham. Tons of contaminated soil removed by Dow and furnace to burn off toxic fumes from underground. Development on this site has caused water problems to neighbors, low pressure from wells and flooding of their soil.
16. Port Jervis School District. Transportation garage and sewer system
17. Monk and Tony and Delaware Valley Sand and Cement Block. Recently rezoned Rural Residential Area. Monk and Tony had 6 acres "Industrial". Industrial zone is now 350 acres.
18. Port Jervis landfill
19. Carroll & Dubies toxic landfill
20. Trovei Junkyard
21. S & K Vehicle - Battery repair and tire yard with 30,000 tires.
22. Columbia Gas - gas line and station on 209. Line crosses from west to east

In addition we have many gravel pits scattered along 209. There are several power lines crossing over the river. Numerous auto mechanics operating on their homesite.

Also - 20 years of contamination from the Monticello Landfill by the Town of Thompson & Monticello

TOWN OF DEERPARK TOWN CLERK OFFICE
DRAWER A, ROUTE 209 N.
HUGUENOT, N.Y. 12746
SHIRLEY ZELLER,TOWN CLERK
TELE.NO. (914) 856-5705

September 23, 1996

PROJECT;CARROLL AND DUBIES SEWAGE
DISPOSAL INC.
TOWN OF DEERPARK, ORANGE CO.
NEW YORK

U.S. Envrionmental Protection Agency
Attention: Maria Jon, Project Manager
290 Broadway, 20th Floor
New York, New York 10007-1866

Councilman Robert Zeller, attended your public hearing representing the Town Board and reported the information that was presented to the public by your agency, with the board taking the following action, regarding the several plans submitted for the clean up of the area.

The Town Board requests the Agency be informed they wished the Alternative proposal 3-Groundwater Pump and Treat via Precipitation, Filtration and Carbon Adsorption, be the plan used in handling the clean up of this area.

It is felt this is a better control plan and containment of any contaminated ground water that may be on the location of the site.

Very truly yours,

Shirley Zeller

Shirley Zeller
Town Clerk

Dr. and Mrs. Hassan Sadaghiani
14 Orchard Lane • Port Jervis, NY 12771

Sept. 23, 1996

Dear Ms. Jon,

I am writing this on behalf of myself, my husband, my children, and my neighbors. We are requesting the Department of Health to test our private wells, due to their close propinity to the Carroll and Dubies' contaminated site. We further ask that you take any information received from that testing into consideration when making your final determination regarding the site.

Sincerely,

Catherine M. Sadaghiani

Catherine M. Sadaghiani

PJHS Parent Teacher Student Association
Route 209
Port Jervis, New York 12771

September 13, 1996

Maria Jon, Project Manager
U.S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, NY 10007-1866

Dear Ms. Jon:

Because of a prior commitment to a mandatory meeting, the majority of our membership were unable to attend your public hearing in Port Jervis on September 11. We do not wish this to be misconstrued as disinterest in the problem of a Superfund Site in such close proximity to our High School/Elementary School complex.

Rather, we, the Port Jervis High School PTSA, would like to go on public record encouraging the prompt and complete clean-up of the Carroll and Dubies Sewage Disposal Site, Canal Street, Port Jervis/Deerpark, New York. We strongly urge you to proceed quickly with the completion of your recommended action on Operable Unit 1. It was upsetting to hear that may be as far away as 1999. We currently have more than 1000 students in our high school, close to 900 in the contiguous elementary school, and the number is continually rising. Since the school district is using Port Jervis City water, contamination of groundwater used for drinking is not a concern for our student population. We do have a major concern with the possible contamination of Cold Brook (given the name Gold Creek on your maps). This stream runs within 1,500 feet of the contaminated lagoons on the Carroll and Dubies property and is downgradient of them. It is adjacent to our playing fields and our students have had to enter it to retrieve balls on more than one occasion.

Out of concern for the health of our students and possible exposure to

deleterious material, we urge that you do repeat testing of the waters of Cold Brook (Gold Creek) and its sediment **immediately** and at frequent intervals until completion of your planned excavation, onsite treatment of contaminated materials, and containment and capping of the lagoons. We had a lot of snow last winter and heavy rains since which have most likely caused flooding of the lagoons on site and escape of probable contaminated material through the wooden fence surrounding Lagoons 1 and 2, as well as seepage through groundwater from the other soil-covered lagoons. We have approached our Superintendent to ask the School Board's permission to conduct independent studies which can be compared with your results.

Our children are too precious to us. We, as parents, and you as agents of our government must do all in our power to protect them from harm. We trust you will do your part, as we will do ours.

Sincerely yours,

Janine LaFemina, PTSA President

Irene Intranuovo, Vice-President

Erin Cunningham, Vice-President

Deborah Cunningham, Secretary

Catherine Sadaghiani, Treasurer

jl/hf
cc: Patrick Hamill, Superintendent of Schools

September 19, 1996

Miss Eleanor Back
5 Mark Dr
Port Jervis, NY 12771

Maria Jon, Project Manager
U.S. Environmental Protection Agency
290 Broadway, 20th floor
New York, New York 10007-1866

Dear Ms. Jon:

Enclosed is a copy of my letter to the Editor of the Tri-State Gazette.

I have struggled through the EPA report presented at the Public Hearing on the Carroll and Dubies Toxic Dump.

1. Because of the inconsistency between 1994 and 1995 sampling results, you did another test in 1996. The report stated turbidity caused the high concentrations of inorganizs. The cause was the pump used and that the samples were not filtered. The report stated that some monitoring wells were re-developed and some monitoring wells now have lower levels in the samples. I can's help but wonder if turbidity is not a normal condition underground during heavy rainfalls or flooding. If filtering removese harmful chemicals, can an ordinary sink filter do the same?

2. I refer to the statement that ground water modelling is an indication that concentration patterns have been stabilized. I s this water modelling a foolproof system?

I have no confidence in the plans 1 and 2 and do not understand the mechanics/engineering of the other systems. I believe the public should have a clearer explanation of this whole situation.

I will appreciate your considering these questions and will appreciate hearing from you before the end of the comment period, September 27th.

Thank you for your kind attention.

Sincerely yours,

Eleanor Back

Eleanor Back

·k 12771

Miss Eleanor Back
5 Mark Dr
Port Jervis, NY 12771

Letter to the Editor - September 1...

Dear Editor:

I am a newcomer to this area - only three years. It is lovely here . I I enjoy it greatly, but it is so sad to hear of the careless selfish acts of those who have dumped their toxic wastes on poor, pretty Deerpark.

The E.P.A. held a public hearing on September 11th, 1996 to inform us of their plans to clean up "some of the lagoons and surrounding soil" polluted by Reynolds Metals, Wickham and Kolmar.

This particular site opened in 1970 and closed in 1979. It is now almost 1997. This site was on the "National Priority List."

The E.P.A. has four alternative plans for clean-up and each takes five years. Alternative one is to do nothing and the second is similar except that it requires monitoring. The third and fourth require great effort and more expense. The E.P.A. prefers Plan #2.

The original polluters are required to help pay for or take care of the problems with E.P.A. supervision by removing 20,000 cubic yards yards of contaminated soil from the area. The remaining ontamination would be treated, placed on-site in a lined capped cell with leachate collection. This leachate should be monitored. The whole area should be monitored. This seems unlikely since no elected official was at this meeting in an official capacity to show concern for the citizens of Deerpark.

The final result in five years would be the area could be used as an industrial site. Who knows how that would turn out.

The E.P.A, Federal, State or Local governments have failed to protect our environment and our health. I have a very cynical feeling that they will continue to fail to protect our environment and our health.

Very truly yours,

Eleanor Back

Eleanor Back

Port Jervis, New York

THEODORE J CARLSON
WILLIAM P REILLY
GEORGE J WALSH III
JOHN E. GOULD
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September 26, 1996

By-Hand

Ms. Maria Jon
Project Manager
U.S. Environmental Protection Agency
Region II
290 Broadway, 20th Floor
New York, New York 10007-1866

Re: Carroll & Dubies Sewage Disposal Superfund Site
Port Jervis, New York

Dear Ms. Jon:

This letter presents the comments of Kolmar Laboratories, Inc. and Wickhen Products, Inc. concerning the proposed Remedial Action Plan dated August 28, 1996 for the Second Operable Unit (OU2) at the above-referenced site. Kolmar and Wickhen believe that the proposed Plan generally presents an appropriate recommendation for adoption of alternative 2, natural attenuation with institutional controls and monitoring, subject to the following qualifications.

First, the responsibility for establishing institutional controls should be placed on the City of Port Jervis. The land on which a majority of the site exists is owned by the City of Port Jervis and it is appropriate that the Agency establish any required institutional controls with the landowner. The City of Port Jervis has been the owner of this site for many years and it clearly knew of the activities being carried on on its property. Furthermore, the City controlled access to the Site through controlling access to the general area of the Site's Municipal Landfill/County Transfer Station.

Second, with regard to monitoring the proposed Plan is unclear. The Agency will require monitoring as part of the resolution of the First Operable Unit (OU1) and it remains unclear as to whether any additional monitoring is contemplated for OU2. Kolmar and Wickhen believe that no additional monitoring should be required, based upon the indications previously provided to them concerning monitoring requirements in connection with OU1.

The presentation made by the Agency at the Public Meeting held on September 11, 1996 at the Port Jervis High School Auditorium generally described the attenuation of the plumes that will occur upon removal of the source area.

It should be noted, however, that the existing plumes are static and are not expanding. The existence of a steady state condition at this time is significant because it shows that the source areas do not presently threaten any off-site receptors, and upon removal of the source areas, the plume will contract over a very short period of time. The time periods presented by the Agency at the Public Meeting were the more conservative values (i.e., of greater time duration) indicated by the groundwater modelling. In fact, the groundwater modelling results suggest that the plumes will attenuate over a much shorter time than the five year period suggested by the Agency at the Public Meeting. It appears that a number of the comments presented at the Public Meeting are traceable to the fact that the full extent of the groundwater modelling results were not described by the Agency in its presentation at the Public Meeting. In reality, the concerns of many of those at the Public Meeting that a significant time period will be required for remediation have already been addressed by the groundwater modelling studies indicating that natural attenuation will be accomplished rapidly upon source removal.

The presentation made by the Agency at the Public Meeting did indicated the relative costs for the various alternatives. However, in fact, from a time line standpoint alone, alternative 2 will accomplish the desired results over a time period as short or shorter than could be accomplished by alternatives 3 or 4. When the much greater costs of alternatives 3 or 4 are considered, the Agency's proposal to adopt alternative 2 clearly becomes the only reasonable choice, subject to the concerns noted at the beginning

of this letter. We hope that these comments will be of assistance to the Agency in the presentation of the record of decision and request that they be included in the public record of this matter.

Respectfully submitted,

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RJG:cw
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cc: Sharon E. Kivowitz, Esq.

Carroll + Dubies 336018

Explanation of Significant Differences

CARROLL & DUBIES SEWAGE DISPOSAL SITE
Town of Deerpark Orange County, New York

EPA
Region 2

Draft May 1998

INTRODUCTION

In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 117(c), and Section 300.435(c)(2)(i) of the National Oil and Hazardous Substances Contingency Plan, if after the Environmental Protection Agency (EPA) selects a remedial action, there is a significant change with respect to that action, an explanation of the significant differences and the reasons such changes were made must be published.

This Explanation of Significant Differences (ESD) describes proposed changes to the March 31, 1995 Record of Decision (ROD) for the lagoons and surrounding impacted soils located at the Carroll and Dubies Sewage Disposal Superfund Site (the Site). This ESD was developed by EPA, as lead agency, with support from the New York State Department of Environmental Conservation (NYSDEC). The changes summarized herein are described in the Technical Memorandum Expanded Contingency Remedy and the Sampling and Analysis reports, which should be consulted for a more detailed description of the proposed changes to the selected remedy for the lagoons and surrounding impacted soils.

This ESD is being provided as a supplement to those reports, to inform the public of EPA's and NYSDEC's proposed changes to the selected remedy for the lagoons and impacted soils, and to solicit public comment on the changes.

This proposed ESD will become part of the Administrative Record file for the Site. The entire Administrative Record for the Site, which includes, among other things, the ROD, the Technical Memorandum Expanded Contingency Remedy, the Sampling and Analysis Report, and other relevant documents are available to the public for a public comment period, which begins on Month day, 1998 and concludes on month day, 1998. These documents are available for public review at the following location:

Town Hall
Drawer A
Huguenot, New York 12746
Tel. (914) 856-2210
Hours: 8:00 a.m. - 4:00 p.m. (Mon. - Fri.)

The Administrative Record file and other relevant reports and documents are also available for public review at the EPA Region II office at the following location:

U.S. Environmental Protection Agency
290 Broadway, 18th floor
New York, New York 10007

Hours: 9:00 am - 5:00 pm (Monday - Friday)

The proposed modification to the selected remedy presented by this ESD is not considered by EPA or NYSDEC to be a fundamental alteration of the remedy selected in the March 1995 ROD.

SUMMARY OF SITE HISTORY, CONTAMINATION PROBLEMS, AND SELECTED REMEDY

The Carroll and Dubies Superfund Site (the Site) occupies approximately 3 acres in the Neversink Valley, just northeast of the City of Port Jervis on Canal Street in the Town of Deerpark, Orange County, New York. From approximately 1970 to 1979, the Site was used for the disposal of septic and municipal sewage sludge and industrial wastes, primarily from the cosmetic industry. The industrial waste was deposited in seven unlined lagoons located at the Site (These lagoons have been identified as lagoons 1 through 4 and 6 through 8, no industrial waste was found in lagoon 5).

In 1978 lagoon 3 was ignited by the Port Jervis Fire Department in order to practice suppression of chemical fires. After this incident, lagoons 3 and 4 were filled in with soil and the area was revegetated. With the exception of lagoons 1 and 2, all of the lagoons have been covered with soil. Lagoons 1 and 2 were left uncovered and are surrounded by a wooden fence. In June 1979, NYSDEC prohibited the disposal of industrial wastes at the Site. The Site continued to be used for the disposal of septic and municipal sewage wastes until 1989. The predominant contaminants of concern in the lagoons are benzene, tetrachloroethene, toluene, trichloroethene, di-n-butyl phthalate, naphthalene, chromium.

The Site was proposed for inclusion on the National Priorities List (NPL) in June 1988 and was placed on the NPL in February 1990.

The Site is being addressed in two operable units or OUs. The first operable unit (OU1) addresses the lagoons and impacted soils; EPA signed a ROD for OU1 in March 1995 which is the subject of this document and is described in detail below. The second operable unit (OU2) addresses the groundwater contamination at and from the Site.

In September 1996, EPA also signed a Record of Decision (ROD) for the OU2 unit, which selected natural attenuation of organic contaminants in the groundwater to below federal drinking water standards and New York State groundwater standards through naturally occurring removal processes, implementation of institutional controls for the purpose of restricting installation and use of groundwater wells at the Site, monitoring of the groundwater and sampling in Gold Creek. This ESD does not alter the remedy selected by the second operable unit ROD.

The March 1995 ROD for OU1 primarily called for the treatment and long-term containment of contaminated lagoon materials on site with a contingency remedy that would require some of those wastes to be treated and disposed off-site. The major components of this ROD include:

- Excavation of all contaminated materials from lagoons 1, 2, 3, 4, 6, 7 and 8, as well as the soils in the vicinity of those lagoons.
- Treatment of excavated soil/sludges which contain organic constituents above the treatment levels specified in the ROD via on-Site ex-situ vapor extraction.
- Additional treatment of lagoon 7 soils/sludges via on-Site ex-situ bioslurry (treatment targeted primarily for semi-volatile contaminants).
- Stabilization/solidification of soils/sludges which fail the Resource Conservation and Recovery Act's Toxicity Characteristic Leaching Procedure (TCLP) for inorganic constituents.
- Placement of treated and untreated

soil/sludge in a lined and capped cell consistent with modified requirements of New York Code of Rules and Regulations Part 360. The base of the cell was to have consisted of a high density polyethylene (HDPE) liner and a sand drainage layer. The cell was to be sloped to a leachate collection system. The cap was to have consisted of a low-permeability clay layer, an HDPE membrane, a sand drainage layer and a topsoil cover layer.

- Recommendations that deed and well restrictions be imposed to protect the integrity of the cap.

The ROD also states that further treatability studies were necessary to demonstrate that the bioslurry process could reduce the complex mix of organic chemical constituents in lagoon 7 to remediation goals. Because of this uncertainty, the ROD also included a contingency remedy for lagoon 7 to be implemented if treatability study results indicate that bioslurry would not be effective in reducing the levels of contaminants in the lagoon 7 materials, particularly semi-volatile contaminants, to remediation goals. The contingency remedy includes excavation, off-site treatment and off-site disposal of lagoon 7 materials at a licensed hazardous waste treatment, storage and disposal facility.

Supplemental sampling activities were conducted in March 1997. These supplemental sampling activities consisted of waste and subsurface soil sampling, air monitoring and sampling, and the collection of one surface water sample from lagoon 2. Twenty-four trenches were excavated in specific areas of the lagoons, 18 waste samples were collected from within the lagoons, and 25 soil samples were collected from below the waste. While the results confirmed the findings of the RI regarding the types of wastes and contaminants present in the lagoons, it provided new information regarding the ability to segregate these wastes and refined the estimated volume of waste present. The results of the investigation indicate that the industrial organic waste disposed of in the lagoons has a very distinct color and plastic-like texture. The industrial waste has the tendency to bond together and separate from the surrounding solid waste in one mass. Based on these physical properties, and properties of other wastes present, it was determined that the waste in and surrounding each lagoon can be segregated into specific waste streams based on physical characteristics. Four waste types were identified and are defined as follows:

- Solid waste - This waste consists of material such as construction debris, household refuse, and bagged garbage.

- Municipal Sludge/Septage Waste - Municipal sludges are the waste product that results from waste water treatment. Septage wastes represent waste water sludges taken directly from household septic tanks and portable toilets.

- Industrial waste - This waste is generated from an industrial process. It is multi-colored plastic to greasy in texture, quickly dries and cracks when exposed.

- Interbedded waste - This waste is generally material or sandy soils chemically impacted by the industrial waste.

In addition, the information obtained from the additional sampling activities has also been used to refine the volume of material in each lagoon. The new volume of material that will require excavation is approximately 13,324 cubic yards as opposed to 20,300 cubic yards, as originally anticipated and set forth in the 1995 ROD.

With the ability to segregate the wastes to a higher degree than previously anticipated, and given the refined volumes of the specific waste, it was deemed to be more effective to segregate this highly contaminated sludge material and address it via the contingency remedy, therefore the

lagoon 7 bioslurry treatability study was not conducted. A soil vapor extraction (SVE) pilot study was conducted on the interbedded waste material. The interbedded waste material is generally found in the lagoons that were used for industrial waste disposal. The material is generally interbedded with other waste types or sandy soil, are visually impacted and contain elevated levels of volatile organic compounds, such as benzene. The recent pilot testing of the interbedded wastes indicates that the material is amenable to SVE treatment to reduce volatile organic compounds.

The discussion below focuses on the March 1997 sampling results and is intended to summarize the different materials found in the lagoons. The lagoons with similar profiles have been grouped together.

Lagoons 1,2 and 4

Municipal sewage sludge and septage waste with similar characteristics were encountered in Lagoons 1, 2 and 4. The material in Lagoon 4 contained a strong raw sewage odor, which may be a result of the lagoon being covered, not allowing for rapid decomposition of the material. The sludge samples collected from these lagoons contain similar chemical constituents. No industrial waste was encountered in these Lagoons. The sludge samples indicated levels of organic contaminants in excess of the remediation levels.

Lagoon 6

The waste in Lagoon 6 was identified as solid and sewage waste. No industrial waste was encountered in this lagoon. Lagoon 6 is primarily filled with solid waste, which include materials such as plastic and glass containers, household refuse, construction/wood debris and automobile tires. Visual and field characteristics indicate that the septage and municipal sewage sludge is similar to Lagoons 1,2 and 4 sludge. All analytical results were non-detect for organic compounds, and did not exceed excavation levels for inorganic compounds.

Lagoons 3, 7 and 8

Multi-colored industrial waste was encountered in discrete areas of Lagoons 3, 7 and 8. The colors include pink, green, turquoise, white gray and tan. The waste was disposed in localized layers that range from less than 1 inch to 2 feet in thickness. In addition to being very distinct in color, the waste has very similar physical properties that distinguishes it from the other waste disposed in the lagoons. The waste is highly plastic and greasy in texture. Analysis from the industrial waste in Lagoons 3 and 7 indicate the presence of volatile organic compounds (VOCs) above the remediation levels. These VOCs include benzene, tetrachloroethane, and toluene, and the semi-volatile organic compound, di-n-butylphthalate. The industrial waste in Lagoons 3 and 7 did not contain inorganic compounds in excess of the excavation levels.

Lagoon 8 contains industrial waste with VOCs similar to Lagoons 3 and 7. However, benzene, tetrachloroethane, and toluene levels are significantly lower than the concentrations identified in Lagoons 3 and 7. The Lagoon 8 industrial waste contain elevated levels of chromium.

The industrial waste in Lagoons 3,7 and 8 is mixed with municipal sewage sludge, septage waste, and solid waste. The sewage and solid waste material is layered between and around the industrial waste. Based on the data collected from the additional sampling activity, the sewage and solid wastes have been impacted by the disposal of industrial waste.

The subsurface soil below the areas that contain industrial waste in Lagoons 3, 7 and 8 have been impacted by contaminants identified in the industrial waste disposed in the respective lagoons. The impact to the subsurface soil in Lagoon 3 appears to be within three feet below the industrial waste. The subsurface soil will require

excavation and removal.

In Lagoon 7, excavation levels were exceeded in the subsurface soil for tetrachloroethene and di-n-butylphthalate down to a depth of 12 feet (approximately four feet below the bottom of the lagoon waste). The subsurface soil will require excavation and removal.

Subsurface soil below the bottom of Lagoon 8 waste exceeded the excavation level for chromium. The vertical extent of the chromium impact is approximately 20 to 23 feet below the ground surface in Lagoon 8. It is not expected that chromium impacted soil will be deeper in this lagoon. However in the event that excavation of impacted soil is found to be deeper, excavation will stop at the water table, which has been encountered at approximately 30 to 31 feet below surface in the vicinity of Lagoon 8.

DESCRIPTION OF SIGNIFICANT DIFFERENCES AND THE REASONS FOR THOSE DIFFERENCES

Because the waste is easily segregable and the volume of waste to be excavated is less than originally anticipated, EPA has determined that a modification of the remedy is justified. By this notice, EPA is proposing to modify the remedy selected in the 1995 first operable unit ROD. The modified remedy expands the off-site treatment and disposal component of the contingency remedy; more of the waste will be treated off-site and no waste will require containment on-site. The modified remedy will include the following components:

- Excavation of all the sewage sludge and municipal solid waste with disposal to a permitted off-site solid waste facility.
- Excavation, treatment and disposal of all the industrial waste and contaminated solid waste and soil at a permitted off-site hazardous waste facility.
- Excavation, treatment by stabilization/solidification and disposal of soil and sludge which fail the RCRA TCLP at a permitted off-site hazardous waste facility.
- Treatment of selected excavated soil and interbedded wastes which contain volatile organic constituents by ex-situ soil vapor extraction, followed by disposal at a permitted off-site hazardous waste facility.
- Treatment of contaminated deep soil by in-situ soil vapor extraction.
- Backfilling and regrading of excavated areas with clean soil.
- Development of an air-monitoring system and installation of air pollution control equipment to ensure compliance with air pollution control regulations.

This proposed change to the remedy will eliminate the on-site waste cell and the associated long-term maintenance of the cell since all of the waste material will be disposed of off-site. The modified remedy will also accelerate the remediation of the contaminated groundwater, or the second operable unit, because the removal of all the contaminated wastes from and surrounding the lagoons will be accelerated.

SUPPORT AGENCY COMMENTS

NYSDEC supports the change to the remedy due to its environmental, public health, and technical advantages over the remedy selected in the March 1995 ROD.

AFFIRMATION OF STATUTORY DETERMINATIONS

Considering the new information that has been developed, EPA and NYSDEC believe that the modified remedy is protective of human health and the environment, increases the cost-effectiveness of the action, and complies with federal and state requirements that are applicable or relevant and appropriate to this remedial action. In addition, the

modified remedy continues to utilize permanent solutions and alternative treatment technologies to the maximum extent practicable for this site.

PUBLIC PARTICIPATION ACTIVITIES

EPA and NYSDEC rely on public input to ensure that the concerns of the community are considered. Towards this end, EPA invites comments or questions related to this ESD. This document and supporting information are available to the public through their inclusion in the Administrative Record for the Site located at the addresses listed above. The public comment period begins on _____ and continues until _____. All comments or questions should be directed to:

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