DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name: Lederle Labs (Wyeth-Ayerst)
Facility Address: 401 North Middletown Road, Pearl River , Rockland Co. New York 10965
Facility EPA ID #: NYD054065909

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   _X_ If yes - check here and continue with #2 below.

   _____ If no - re-evaluate existing data, or

   _____ if data are not available skip to #6 and enter"IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, (GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	X			Groundwater monitoring: Volatile & Semi Volatile Organic Contaminants (VOCs & SVOCs).
Air (indoors)[2]		X		No VOCs & SVOCs in subsurface soils by buildings.
Surface Soil (e.g., <2 ft)	X			Soil sampling: SVOCs & VOCs but covered.
Surface Water		X		No impact from facility releases.
Sediment		X		No impact from facility releases.
Subsurf. Soil (e.g., >2 ft)	X			Soil sampling: VOCs & SVOCs.
Air (outdoors)		X		No impact from facility releases.

_____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

__X__ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

_____ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s)

Facility and Release Sources

This large pharmaceutical plant is located in Pearl River on a 580-acre site. The site was first used as a dairy farm prior to being purchased by Lederle in 1907, with the subsequent erection of a plant for the manufacture of serums and other pharmaceutical antitoxins. The site straddles the border between the towns of Clarkstown and Orangetown in Rockland County, New York. The facility is located approximately 1.5 miles north of the New Jersey state border and is 20 miles northwest of New York City. The facility is situated to the west of Route 304 and approximately 5 miles east of the Garden State Parkway extension into New York State. It is bounded by Middletown Road on the East, Crooked Hill Road to the south, and forested and residential areas to the west and north. The landfill area is in the western portion of the facility adjacent to Muddy Creek, a stream which runs though the site. Figure 1 shows the facility and its surroundings. Figure 2 shows the condition of the vegetative cover of the area.

Over the past 93 years many more buildings and process facilities (for the fermentation processes required for the production of antibiotics in the 1950s) were constructed on this site to support the production of more pharmaceutical products and to conduct medical and pharmaceutical research. American Cyanamid Company purchased this facility in 1930. Wyeth-Ayerst purchased it in 1995. Hazardous wastes are generated at the facility including: laboratory chemicals, spent mixed solvents, alcohol liquors, aqueous mercury wastes and scintillation vials. Figures 3S and 3N show the current layout of the facility which has a New York State Department of Environmental Conservation (NYSDEC) Part 373 RCRA Permit addressing the operation and maintenance of its

hazardous waste storage areas and site wide RCRA corrective action.

A total of 29 solid waste management units (SWMUs) were identified at this facility with potential releases of hazardous constituents. RCRA investigations detected no releases at 22 of the SWMUs, but did detect releases to the environment in the vicinity of seven (7) units. Two (2) of the three closed landfills released volatile organic constituents (VOCs) to the surrounding groundwater. Also contributing to the VOC groundwater contamination were solvent releases from the closed Solvent Burning Pit SWMU. Spills at the abandoned Spent Combined Acid Filtrate (SCAF) tank area, SWMU, contaminated surrounding soils and structures with methyl iosbutyl ketone (MIBK). The underground sewer system, SWMU, conveying industrial wastewater containing highly diluted VOCs leaked these constituents to the subsurface, but at insignificant concentrations. Very low concentrations of polycyclic aromatic hydrocarbons (PAHs), also known as semi-volatile organic constituents (SVOCs), were found in the deep soil during the excavation of sewer pipe (SWMU) at the Building 137 demolition site. There the probable source was tar materials used to coat the foundation and roof of that building. A seventh SWMU was identified as a mercury spill area.

Geology and Surface Water Hydrology

The Lederle facility is underlain by 15 to 80 feet of sandy-silty-gravely soil, which is underlaid with bedrock consisting mostly of sandstone with some shale and conglomerate located 19 to 52 feet below the surface on the west side of Muddy Creek where the landfills and burn pit can be found. In the vicinity of Pearl Brook, also known as Muddy Creek, the overburden topography forms a valley. The soils are thickest on the western side of the valley and thinnest along the valley floor and composed primarily of sand and clay silt. The uppermost soils also contain minor to significant amounts of gravel. The grain-size distribution of most of the site soils is consistent with that of till, although some soils within the till appear to have been reworked and sorted. A geological cross sections of the site are presented in Figures 4, 5, 6 & 7.

Muddy Creek is a Class C stream that may be used for fishing and recreation. The Creek can be a gaining stream in the spring and a losing stream in the winter and summer depending on the overburden groundwater levels. This observation is based upon estimated groundwater discharge measurements and groundwater flows to and from the Creek. Approximately 50% of groundwater discharges to the Creek and that represents approximately 1% of the Creek's flow. Based upon the hydraulic gradients, approximately 0.9% of the flow in the Creek is gained from groundwater east of the Creek and approximately 0.1% of the flow in the Creek is gained from groundwater west of the Creek. Other surface water bodies at the facility include Reed and Finlay Ponds. Both Ponds collect surface water from the site, and non-contact cooling water from the facility is discharged to Reed Pond. The two ponds eventually discharge to Muddy Creek with Reed Pond being the main source of water to the Creek.

Groundwater Hydrogeology

Groundwater flow in the overburden is primarily controlled by, and follows, the topography of the site as shown by the groundwater contours on Figure 8 & 9. This groundwater flow converges from the east and west into the valley located to the east of Landfill 1 where it then flows south. On the east side of the valley groundwater flows from the facility's research and production area south-southwest towards the valley floor at an average hydraulic gradient of 0.075. Groundwater flow on the west side of the valley flows from the closed landfills and burn pit south-southeast towards the valley floor at an average hydraulic gradient of 0.01. Hydraulic gradients are shallower on the east side of the valley due to the shallower topography. The average groundwater flow rate in the overburden on the east side of the valley is 1.9 feet per day and 0.25 feet per day on the west side of the valley. Groundwater flow directions in the bedrock is assumed to be southerly, generally following the topography. Local bedrock groundwater flow is influenced by production wells drilled some 400 feet deep to the valley floor. Flow is upward into the overburden when the wells operate under normal conditions.

Contamination And Corrective Action

Landfills (SWMUs 47 & 48) Soil And Waste Contamination And Closure

There are four Sanitary Landfills (1, 2, 2A and 3A) located to the west of Muddy Creek as shown on Figure 4. All but one, Landfill 3A, have been closed prior to the promulgation of the RCRA corrective action program and covered with 2 to 3 feet of low permeability "fine" compacted compost material. Landfill 3A, a 4.5 acre unit operating with a NYSDEC Part 360 Solid Waste Management Permit, is the first stage of a 40.0 acre planned landfill for the facility. It was designed with a compacted compost liner having a permeability of 1x10-6 cm/sec and a leachate collection system. This landfill receives rubbish, incinerator ash, asbestos, glass, and construction and demolition debris generated by the facility. Landfill 3A will close in accordance with the approved closure plan requiring an impermeable cover. Landfill 2A, a unlined unit with leachate collection by underground piping, received facility trash and construction debris but no hazardous constituents prior to closure. The other two landfills had received incinerator ash, glass, debris, plant trash and rubbish, vitamins, wastewater treatment plant sludge, fermentation cake, animal remains, and small quantities of laboratory chemicals. The thickness of the variable fill in the landfills and surrounding area ranges from 0.5 to 34 feet. No seeps were observed on or near the landfalls, and the soil samples taken at the units indicate very low residual concentrations of VOCs to be present. The table below identifies the higher concentrations of VOCs that were detected within the center of the landfills. These low residual VOC concentrations indicate that the landfills are not significant sources of VOC contamination to the underlying groundwater.

Constituent	Concentration Range-mg/k
Benzene	Non-detect to 0.1
2-Butanone	Non-detect to 0.82
Chlorobenzene	Non-detect to 2.2
Ethylbenzene	Non-detect to 0.58
Methylene Chloride	Non-detect to 0.16
Toluene	Non-detect to 3.3
Xylene	Non-detect to 1.7

Soil samples taken within the landfills show that heavy metal contamination is at background levels. However, several PAHs were detected in both surficial and deeper soil samples taken at the landfills. Some of the more ubiquitous PAHs having the highest concentrations are listed in the table below. The PAHs detected in the landfill not very soluble in water and do not partition readily from soil to water. Therefore, the landfills are not considered a source of PAH contamination for the underlying groundwater.

Constituent	Concentration Range-mg/kg
Benzo(b)fluoranthene	Non-detect to 4.5
Benzo(k)fluoranthene	Non-detect to 3.9
Chrysene	Non-detect to 3.5
Fluoranthene	Non-detect to 6.7
Phenanthrene	Non-detect to 5.0
Pyrene	Non-detect to 6.7

Because the landfills are not considered significant sources of either VOC or PAH contamination to the underlying groundwater, no further corrective action will be required at these SWMUs.

Solvent Burn Pit (SWMU 64) Soil Contamination

The former Solvent Burn Pit, located to the northwest of Sanitary Landfill 1 on Figure 4 was used to burn liquid solvent wastes in the past. It was then partially filled with limestone chips and used to neutralize acidic waste. Some of the material in the pit was removed and the excavation backfilled with 0.2 to 1.0 feet of fine compost materials prior to the implementation of the RCRA corrective action program. Up to 8 feet of reworked native soil, burnt and/or partially burnt debris remains under the cover which became heavily vegetated. Confirmation sampling was implemented to assess the residual soil contamination under the compost cover was conducted as part of the RFA/RFI. Five VOCs were detected in the soil samples: acetone, benzene, chloroform, methylene chloride and toluene. The latter two VOCs were detected most frequently and had the highest concentrations of 0.042 and 0.0036 mg/kg. Also, there were infrequent detections of PAHs; Phenanthrene at 0.150 mg/kg and Fluoranthene at 0.210 mg./kg, and other SVOCs; Bis(2-ethlyhexal0 Phthalate at 0.330 mg/kg and Butylbenzylphthalate at 0.180 mg/kg. Residual heavy metal concentrations were detected at or near background levels. In 1999 the toxicity characteristic leaching procedure (TCLP) test was carried-out on the residual ash. TCLP results indicated that the regulatory levels for metals, SVOCs and VOCs were not exceeded and therefore, the ash was not considered to exhibit a hazardous waste characteristic. The low residual PAH, SVOC and VOC concentrations detected at this unit meet cleanup objectives considered to be protective of human health and would not be considered a continuing source for groundwater contamination. Therefore, no further corrective action will be required at this SWMU.

Spent Combined Acid Filtrate (SCAF) Tanks , Soil Contamination And Corrective Action

Two abandoned Spent Combined Acid Filtrate (SCAF) tanks containing liquid methyl isobutyl ketone (MIBK) and calcium sludge released MIBK to the surrounding soils. This contamination was confined to a depth of 8 feet below the grade of the diked area which was 6 feet above the surrounding area. The MIBK concentrations ranged from Non Detect to 80.6 mg/kg within the stained soil and from Non Detect 0.023 mg/kg outside of the stained soil layers. The average concentration was 2.3 mg/kg. During 1996, 97 and 98 an interim corrective measures (ICM) removal action was implemented at the two abandoned SCAF tanks. Each tank had a capacity of 100,000 gallons and contained liquid MIBK and sludge made-up of calcium compounds. These tanks were located in a diked area on concrete pads. When the tanks were removed, 400 tons of solidified sludge form the bottom of the tanks was removed and disposed of as a non hazardous waste. The tanks were disposed of as scrap metal. Some of the concrete and soil under the tanks were found to be stained. Tests revealed that the staining was due to the presence of MIBK. Approximately 600 cubic yards of contaminated concrete and soil was removed and sent off site for disposal to CWM in Model City. Confirmation soil sampling indicated that residual concentrations of MIBK were mostly Non Detect with the highest being 0.023mg/kg and met cleanup objectives considered protective of human health and the environment. This testing demonstrated that no further corrective action was needed.

Mercury Spill Area Debris, Soil Contamination And Corrective Action

One small area of 5 by 20 feet adjacent to Building 100 was discovered to have visible free mercury at the bottom of a gravelly excavation between the building and a sidewalk. It is thought that someone spilled mercury form equipment many years ago and it traveled though the gravel (which supports the sidewalk), and came to rest atop the native soil abut 5 feet below grade. Since the mercury was visible no sampling was necessary prior to the removal action. An ICM removal action was implemented at this SWMU in April 1998. After the free (elemental) mercury was removed, confirmation tests indicated that there was no detectable mercury left in the area of the spill (building 100). The soil at the bottom of the gravel layer was excavated till no more mercury was visible, and then soil making-up the walls and floor of the excavation was sampled to confirm that all the mercury had indeed been removed. Sampling results for the excavated area indicated "Non-detect" for residual levels of mercury. The excavated soil, six cubic yards, was sent off-site to a hazardous waste landfill. No further Action is recommended for this area.

Sewer Investigations, Soil Contamination And Corrective Action

The facility generates 1.5 MGD of mixed sanitary, industrial wastewater which is conveyed to and treated by the on-site wastewater treatment plant. The large, complex, and old sewage infrastructure consists of about 8 miles of industrial and sanitary sewers as depicted in Figure 10. The sewer pipelines range from 4 to 18 inches in diameter and are laid at depths ranging from 5 to 20 feet. Sewer piping materials include vitrified clay tile (VCT), cast iron, fibercast, transite, and PVC, with VCT being the most common. A RCRA Facility Assessment (RFA) and ICM, reference 5, was implemented for the underground sewer system which was divided into four segments:

1. Segment 1; 4,200 feet of sewer at the Biochemical Production Area conveying between 200,000 and 300,000 gallons per day of sanitary and highly diluted industrial wastewater containing acetone, acetonitrile, alcohols, MIBK, acids, and ammonia with concentrations in the pipeline ranging from 0.0007% to 0.0470%.
2. Segment 2; 5,000 feet of sewer at the Minocycline Production Area, Pharmaceutical Production Area and Research Pilot Plants conveying between 700,000 and 800,000 gallons per day of sanitary and industrial wastewater containing acetone, acetonitrile, and alcohols with concentrations ranging from 0.0008% to 0.0064%.
3. Segment 3; 25,000 feet of sewer at Research and Development Areas, Facility Support Operations and Administrative Offices conveying between 600,000 and 700,000 gallons per day of primarily sanitary wastewater with insignificant no detectable hazardous constituents.
4. Segment 4; 9,500 feet of abandoned sewers located within Segments 1 through 3.

In addition to providing the aforementioned information about the sewers the RFA employed closed circuit television to assess the integrity of the sewers in Segments 1 and 2, involved a visual inspection of the active sanitary manhole structures and flow-proportioned characterization sampling of Segment 3 sewers. The latter analytical results indicated hazardous constituents were not present in Segment 3 wastewater. The RFA resulted in the implementation of several ICMs at Segments 1 and 2:

1. Rehabilitation of 21individual locations where structural integrity was in question either by replacement or in-line curing technique.
2. At Building 130 a new concrete diversion vault was installed, the line under tank Farm No.1 was permanently sealed and a gravity overflow line was installed to assure the sewer does not overflow during peak flows.
3. Lining the sewers with high-density polyethylene and cured-in-place polyester for chemical resistence at normal temperatures and with cured-in-place pipe epoxy for elevated temperature chemical resistence.

Following the sewer rehabilitation program 35 borings were drilled from the surface down 2 to 5 feet into the groundwater table in the vicinity of the sewer breaks. Soil samples were screened for VOCs with a flame ionization detector and one sample with the highest reading at a depth equivalent to or greater then the elevation of the sewer bottom (5 to 12 feet) was sent to the lab for analysis along with a groundwater sample. Groundwater was encountered at ten (10) locations at depths ranging from 12 to 18feet. Total VOCs were detected in the soil only at two locations and at very low concentrations of 9.0 and 4.0 ug/kg. VOCs were Non-detect in the remaining forty three samples. Alcohol/ketone VOCs were not detected in any of the soil samples. These sample results indicate there is no need for any soil remediation in the vicinity of the sewers. The Finding practically no VOCs absorbed onto the highly carbonaceous unsaturated soil lying above the groundwater table indicates that no significant transport of these contaminants is occurring from the groundwater to the surface and that there is no need to conduct indoor investigations in any of the surrounding buildings.

Building 137 Demolition And Corrective Action

Subsurface contaminated soil was encountered during demolition of the building and excavation of the subsurface. Over 200 cubic yards of soil was excavated in an effort to remove sections of abandoned sewers from under the remains of Building 137. A large volume of this soil contained polycyclic aromatic hydrocarbons (PAHs) at total concentrations that ranged from just above detection limits to just over 40 mg/kg. Some carcinogenic PAHs identified in the table below were detected in several soil samples at concentrations exceeding their respective USEPA health-based ingestion concentrations for residential use. Since the source of these organic contaminants

was tar products used on footings and/or the roof of the former building the soil was not considered to be contaminated by a listed hazardous waste and did not have to be managed as such. Excavated soil containing carcinogenic PAHs not exceeding ingestion concentrations was backfilled or use as cover material without restriction Other excavated soils with a total concentration of carcinogenic PAHs less than 10 mg/kg were also backfilled, but the area must be kept covered to prevent any direct human contact and noticed in the deed to the property with appropriate restrictions.

Groundwater Contamination And Corrective Action

The RFA/RFI carried-out between July 1995 and November 1996, reported in reference 4, evaluated groundwater quality by monitoring groundwater in overburden wells and bedrock production wells. Most of this monitoring occurred on the west side of Muddy Creek within and down-gradient from the closed Landfills 1 and 2and the Solvent Burn Pit since prior monitoring data suggested possible impacts by these SWMUs. On the east side of Muddy Creek groundwater monitoring was focused down-gradient of the closed hazardous waste container storage area (SWMU 55) and the wastewater treatment plant (WWTP) (SWMU 34). Subsequently in 1996 and in 1999 additional groundwater monitoring occurred as part of the Sewer Removal/Rehabilitation program, reference 5, and the evaluation of natural attenuation for the former Solvent Burn Pit, reference 6.

Overburden groundwater contamination was detected during the RFA/RFI above NYS GA Groundwater Quality Standards protective of drinking water at monitoring well 82-12 located down-gradient from closed SWMU 55. There were two contaminants detected significantly above their standard of 5.0 ug/l: (1) Chloroform ranging from 55.0 to 110.0 ug/l in all five samples; and (2) 1,1,1-Trichloroethane ranging from Non-detect to 158.0 ug/l in five samples. This contaminated groundwater from the research and production part of the facility travels under Muddy Creek to the subsurface valley floor. Here the overburden groundwater flowing from the west and east sides of the Creek merge and then flow south. On the west side of the Creek quarterly monitoring of overburden groundwater occurred during the RFA/RFI around Landfills 1 and 2 and at the Solvent Burn Pit. Some of the more significant SVOC and VOC contaminants detected in the overburden wells are listed in the table below with their range of detected concentrations.

Constituent & Standard-ug/l	Landfill Area-ug/l	Solvent Burn Pit-ug/l
Acetone	6.0 to 12.0	31.0
Benzene -0.7	1.01 to 51.2	6.0 to 8.9
Bis(2-ethylhexyl-phthalate) -50.0	3.7 to 108.0	None
Chloroform -5.0	1.3 to 18.6	2.0
1,1-Dichloroethane -5.0	2.06 to 27.0	36.0 to 85.0
Methylene Chloride -5.0	1.74 to 17.0	8.0
Tetrachloroethene -5.0	2.8 to 3.8	4.1 to 67.0
Toluene -5.0	1.2 to 50.0	None
1,1,1-Trichloroethane	1.6	11.0
Trichloroethene -5.0	1.1 to 37.1	1.9 to 3.2
Vinyl Chloride -2.0	None	4.2 to 77.0

The vast majority of the overburden groundwater monitoring results for these SWMUs were Non-detect. The table above illustrates the range of concentrations detected with only infrequent detections above standards. To assess

natural attenuation of the contaminants south of SWMU 64-Solvent Burn Pit and to confirm the results of the BIOSCREEN Model, an additional investigation was implemented in 1999 that included the installation and monitoring of new down-gradient overburden wells along the centerline of the plume defined by geoprobe data. MW-99A was installed at the edge of the property and MW-99B was installed where the highest concentrations were detected during the initial screening for well locations down-gradient from SWMU 64. Additional groundwater monitoring data will need to be collected in order to evaluate natural attenuation as the final remedy for the overburden groundwater contamination.

Following the sewer removal/rehabilitation program overburden groundwater samples were taken at 12 locations. The primary VOC detected in the groundwater was acetone at concentrations ranging from 3.0 to 62.0 ug/l in 8 groundwater samples and Non-detect in four samples. Most on the detected contamination was found at breaks in Segment 2 with the average acetone concentration being 35.7 ug/l. This average concentration is below the NYS Standard of 50.0 ug/l for acetone. No alcohols, other ketones or BTEX compounds were detected. Only chloroform was detected at 12.0 ug/l in one sample taken at a Segment 2 break. Because the concentrations of contaminants detected in the groundwater along the sewer breaks were very low and will naturally attenuate no groundwater remediation will be implemented at these locations.

During the RFI bedrock groundwater quality was assessed by monitoring two deep wells, including the production well located up-gradient from operating Landfill 3A. Trichloroethene was detected at 11.0 ug/l in well 66B. Chlorinated ethenes also have been detected in regional water supply wells located up-gradient and distant from the facility.

Surface Water And Sediment Contamination

There are no exposed contaminated soil surfaces contributing contaminated surface run-off to Muddy Creek. Contaminated groundwater entering the Creek from the east in the vicinity of monitoring wells 82-12 and 14 is considered the principal source of contamination. However, during the seasons when the Creek is gaining groundwater, the volume of groundwater entering the Creek from the east is only 0.9% of the Creek's flow. Using maximum stream flow conditions and the highest average contaminant concentration (i.e., 85.0 ug/l for chloroform) detected in well 82-12, calculations indicate that in-stream contaminant concentrations to be less than 1.0 ug/l and protective of the Creek's Class C water quality.

References

1. Hydrogeologic Investigation of Stage III and Stage II A landfill expansion Areas-January 1981
2. Groundwater Monitoring Activities at Pearl River-April 1996
3. Groundwater Monitoring activities at Pearl River-April 1996
4. RFA/ RFI Report SWMUs 34 (WWTP), 47, 48 (Landfill 1&2) and 62 (Former Solvent Burning Pit)-April 1997
5. Industrial Sewer Assessment Report-September 1997
6. Natural Attenuation Evaluation SWMU 62 -Former Solvent Burning Pit-November 2000
7. Remedial Actions report for SCAF Tank received April 4, 1998 and dated October 1997

Footnotes:

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater	NO	NO	NO	NO	NO	NO	NO
~~Air (indoors)~~							
Soil (surface, e.g., <2 ft)	NO	NO	NO	NO	NO	NO	NO
~~Surface Water~~							
~~Sediment~~							
Soil (subsurface e.g., >2 ft)	NO	NO	NO	NO	NO	NO	NO
~~Air (outdoors)~~							

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated") as identified in #2 above.
2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

__X__ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

_____ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

Rationale and Reference(s)

Groundwater

The contaminated groundwater in the overburden is not used at the site. This contaminant plume which flows to the south is attenuating naturally and migration beyond the facility property is not expected to occur. Although a large percentage of the contaminated overburden groundwater can enter Muddy Creek during periods of high rainfall and snow melt the very low contaminant concentrations in the groundwater are assimilated by the larger volume of Creek water resulting in very low contaminant levels and no violation of the Creek's water quality standards. Therefore, no human exposure route exists for the contaminated overburden groundwater. Bedrock groundwater does contain elevated levels of chlorinated ethenes, but it is not used as a source of drinking water on-site. Its

primary use is for non-contact cooling water. Therefore, no human exposure route exits bedrock groundwater.

Deep And Surface Soils

Surficial and deep soil contamination exists at the closed Landfills and Solvent Burn Pit, but there is no direct human exposure route since the units are covered and access to the facility is restricted by fencing. Some deep soil PAH contamination was kept on-site following sewer removals in the vicinity of Building 137. The soil is located some 20 feet below the surface, covered with clean fill and precludes any direct human contact. The location of this contamination will be noticed in the property deed along with a provision addressing notification and safety requirements for its removal. There are no other known locations where either surficial or deep contamination exists.

References

Refer to the information and references listed under paragraph 2 for details.

Footnotes:

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

4 Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

____ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s)

Footnotes:

4. If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

5 Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

_____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

_____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s)

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

_X_ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the **Lederle Labs (Wyeth-Ayerst)** facility, **EPA ID #: NYD054065909** , located at **401 North Middletown Road, Pearl River , Rockland Co. New York 10965** under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

____ NO - "Current Human Exposures" are NOT "Under Control."

___ IN - More information is needed to make a determination.

Completed by: Date: May 25, 2001

Paul Patel
Environmental Engineer I
New York State Department of Environmental Conservation (NYSDEC)

And

Date: May 25, 2001

Steve Kaminski
Chief, Eastern Engineering Section
NYSDEC

Supervisor: Date: May 25, 2001

Paul J. Merges
Director, Bureau of Radiation and Hazardous Site Management
NYSDEC

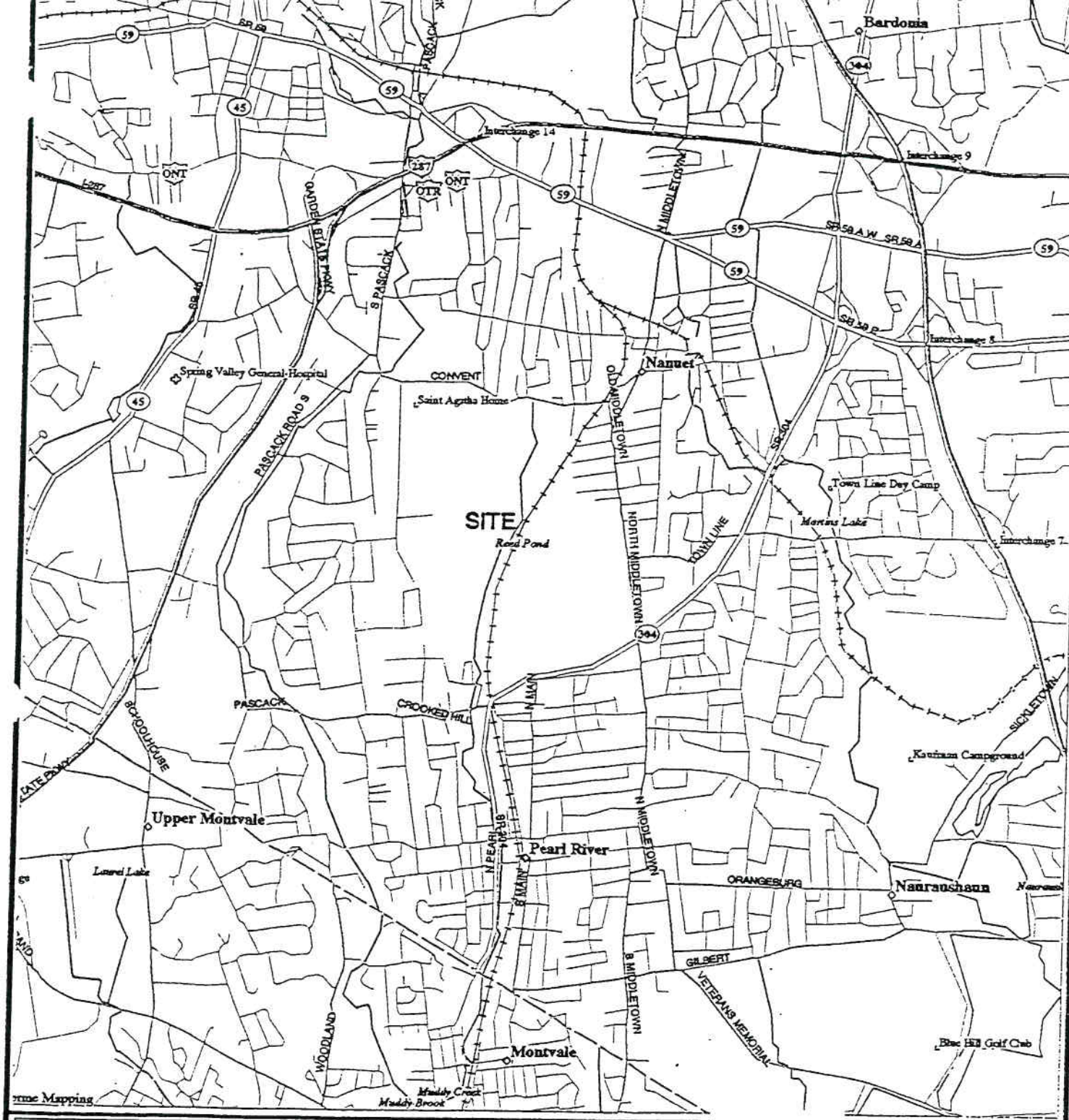
Locations where References may be found:

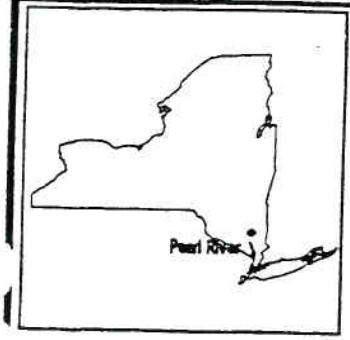
NYSDEC
Division of Solid and Hazardous Materials
625 Broadway
Albany, NY 12233-7252

Contact telephone and e-mail numbers

Paul Patel (518) 402-8602 E-Mail: appatel@gw.dec.state.ny.us

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.





NEW YORK
QUADRANGLE LOCATION

LATITUDE: N41° 04' 38"
LONGITUDE: W74° 01' 27"

Scale 1:37,500 (at center)

2000 Feet

1000 Meters

Figure 1

WYETH-AYERST
LEDERLE LABORATORIES
401 N. MIDDLETOWN ROAD
PEARL RIVER, NEW YORK 10965

SITE LOCATION MAP

PARSONS ENGINEERING SCIENCE, INC.

DESIGN • RESEARCH • PLANNING

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