New York State Department of Environmental Conservation

File TRANSMITTAL MEMO

John P. Cahill
Commissioner

TO: Distribution
FROM: J. Andrew Fleck, Environmental Engineer, Technical Support Section
Bureau of Western Remedial Action, Division of Environmental Remediation

DATE: December 19, 1997

RE: **Site Name:** Bausch & Lomb, Frame Center
Site No.: 8-28-016
County: Monroe

Attached for yor file, please find the following document related to the above referenced site:

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- ☐ Work Plan
- ☐ Health and Safety Plan and Community Relations Plan
- ☐ QA/QC Plan
- ☐ CP Plan
- ☐ Temporary Use and Occupancy Agreement
- ☐ Remedial Investigation
- ☐ Feasibility Study
- ☐ Design Documents
- ☒ Other: **PRAP**

If you have any questions, please call me at (518) 457-5636.

Attachment(s)

Distribution: w/ Attachment(s)
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Bausch & Lomb
Frame Center
Inactive Hazardous Waste Site

Chili, Monroe County, New York
Site No. 08-28-061

PROPOSED REMEDIAL ACTION PLAN

December 1997

Prepared by:

Division of Environmental Remediation
New York State Department of Environmental Conservation

PROPOSED REMEDIAL ACTION PLAN

Bausch & Lomb, Frame Center
Chili, Monroe County, New York
Site No. 8-28-061
December 1997

SECTION 1: PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health (NYSDOH) and the Monroe County Health Department (MCHD) is proposing Mass Reduction and Natural Attenuation for the Bausch & Lomb, Frame Center Site. This remedy is proposed to address the threat to human health and the environment created by the presence of volatile organic compounds (VOCs) in groundwater at the site.

This Proposed Remedial Action Plan (PRAP) identifies the preferred remedy, summarizes the other alternatives considered, and discusses the rationale for this preference. The NYSDEC will select a final remedy for the site only after careful consideration of all comments submitted during the public comment period.

The NYSDEC has issued this PRAP as a component of the citizen participation plan developed pursuant to the New York State Environmental Conservation Law (ECL) and 6 NYCRR Part 375. This document summarizes the information that can be found in greater detail in the Remedial Investigation (RI) Report, dated January 1993, revised October 1993, the Remedial Investigation Addendum Report, dated September 1994, revised June 1995, the Remedial Investigation Addendum Supplement Report, dated February 1996, Source Area Delineation Program Report and Feasibility Study (FS) Report, dated October 1997 available at the document repositories.

The NYSDEC may modify the preferred alternative or select another alternative based on new information or public comments. Therefore, the public is encouraged to review and comment on all of the alternatives identified here.

To better understand the site, and the alternatives evaluated, the public is encouraged to review the project documents which are available at the following repositories:

NYSDEC Central Office
50 Wolf Road
Albany, NY 12233-7010
(518) 457-5636
Contact: J. Andrew Fleck (Project Manager)
Hours: Mon. - Fri., 8:30 a.m. - 4:45 p.m.

NYSDEC Region 8 Office
6274 Avon-Lima Road
Avon, NY 14414
(716) 226-2466
Contact: Meaghan Boice-Green
Hours: Mon. - Fri., 8:30 a.m. - 4:45 p.m.

Chili Public Library
3235 Chili Avenue
Rochester, NY 14624
(716) 889-2200
Contact: William Peniston
Hours: Mon. - Fri., 10:00 a.m. - 8:30 p.m.
Sat., 10:00 a.m. - 5:00 p.m.

Written comments on the PRAP can be submitted to Mr. Fleck at the above address.

DATES TO REMEMBER:

December 22, 1997 - January 23, 1998: Public comment period on RI/FS Report, PRAP, and preferred alternative.

January 8, 1997, 7:30 p.m. Public meeting at the Paul Road School - Library
571 Paul Road
Rochester, NY 14624

SECTION 2: SITE LOCATION AND DESCRIPTION

The Bausch & Lomb Frame Center is an 89 acre industrial facility located south of Paul Road in Chili, New York (see Figure 1). This site is currently listed as a class 2 site on the New York State Registry of Inactive Hazardous Waste Sites.

The Frame Center facility is comprised of one main building (Building 40) located in the northern portion of the property and a smaller building (Building 41) located adjacent to and south of Building 40 (see Figure 2). Building 40 is approximately 354,000 square feet in size and houses the production area, along with office, cafeteria and other associated facilities.

Portions of the site not covered by buildings, parking areas or roadways are generally well vegetated. The area immediately north of Building 40 and south of Paul Rd. is grassed covered with landscape vegetation, and the area immediately south of Building 40 and east of Building 41 is lawn.

Based on topography, the surface water flow at the property is dominated by two general flow patterns. The storm drains and surface water discharge system dominate the surface water flow in the northern and western portions of the property, while the southeastern portion of the property appears to drain to the east. Water from building roof drains, surface water from the paved areas of the site and the facilities permitted non-contact cooling water is discharged under a NYSDEC State Pollution Discharge Elimination System (SPDES) permit to the SPDES Streambed Area (SSA) (see Figure 2).

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

The Frame Center was constructed in 1961 and enlarged in approximately 1966. Operations at the facility include production of plastic and metal eyeglass frames. A variety of materials including solvents and plating metals have been used and are still used at the facility in connection with the production of frames.

At the time of the construction of the original facility in 1966 until approximately 1980, solvent and acid storage vaults were used at the facility. These vaults were used for storage of solvents, oils, caustics and acid. The vaults had floor drains that discharged to a dry well located south and outside of the southern margin of the original facility. The floor drains were sealed with concrete in 1980.

The SPDES Streambed Area (SSA) is a prominent site drainage feature and was constructed concurrent with the Frame Center to accommodate storm water runoff and plating rinse waters from the facility. From 1961 until approximately 1973, plating rinse waters from the on-site metal plating operations were discharged to the SSA. Since approximately 1973, the rinse waters have been treated and discharged to the municipal sanitary sewer. Storm water runoff and non-contact cooling water continue to be discharged to the SSA under a NYSDEC SPDES permit. In 1982, a No. 6 fuel oil release to the SSA was reported to have occurred by way of the storm drain system. The release resulted from a leak in the heating and condensation lines in the fuel oil tank.

3.2: Remedial History

In 1981 Bausch & Lomb retained Aware, Inc. to conduct a preliminary groundwater quality investigation. This investigation was completed to evaluate whether groundwater or soil at the site had been impacted from potential releases from the dry well. Three groundwater monitoring wells were installed at the site. At that time, no indication of a release to the subsurface was observed. During follow-up sampling in August 1984 and 1985, chlorinated solvents were detected in two of the three wells.

The Bausch & Lomb Frame Center was listed on the NYS Registry of Inactive Hazardous Waste Sites as a class 2 site after sampling in September 1982, January 1983 and November 1983 indicated elevated levels of heavy metals and oil and grease in sediment associated with the SSA. The SSA sediment/soil showed elevated concentrations of chromium, copper, iron, nickel, lead and zinc. The dry well area was added to the class 2 listing after the August 1984 and 1985 sampling detected chlorinated solvents in groundwater.

SECTION 4: CURRENT STATUS

In response to a determination that the presence of hazardous waste at the Site presents a significant threat to human health and the environment, Bausch & Lomb recently completed a Remedial Investigation/Feasibility Study (RI/FS).

4.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature (type) and extent (location) of any contamination resulting from previous activities at the site.

The RI was conducted in five (5) phases:

- Phase I: September 1990 - July 1991
- Phase II: February 1992 - May 1992
- Phase III: February 1994 - July 1994
- Phase IV: April 1995 - July 1995
- Phase V: December 1996 - February 1997

The following reports have been prepared describing the field activities and findings of these phases of the RI:

- Remedial Investigation Report , Bausch & Lomb, Frame Center, Chili, New York dated January 1993, revised October 1993
- Remedial Investigation Addendum Report, Bausch & Lomb, Frame Center, Chili, New York dated September 1994, revised June 1995
- Remedial Investigation Addendum Supplement Report, Bausch & Lomb, Frame Center, Chili, New York dated February 1996
- Source Area Delineation Program, Bausch & Lomb, Frame Center, Chili, New York dated May 1997

The RI included the following activities:

- Magnetometer survey to identify buried metal or magnetic anomalies.
- Ground-Penetrating Radar survey to determine the presence of buried objects in the area of magnetic anomalies.
- Soil gas survey to identify potential source areas (a soil gas survey samples the air trapped between soil particles and analyzes the air for contaminants).
- Excavation and sampling of test pits to evaluate magnetometer and soil gas anomalies.
- Installation of soil borings and monitoring wells for analysis of soil and groundwater as well as to determine physical properties of soil and hydro-geologic conditions.

- Videotaping the storm drain to evaluate a ground water depression identified in the Phase I RI.

- Collection of sediment/soil samples from the SSA.

- Collection of soil samples to evaluate potential source areas.

- Collection (using a Geoprobe) and on-site analysis of groundwater samples to identify potential source areas of contamination.

To determine which media (soil, groundwater, etc.) contain contamination at levels of concern, the RI analytical data were compared to environmental Standards, Criteria, and Guidance (SCGs). Groundwater, drinking water and surface water SCGs identified for the Bausch & Lomb, Frame Center site were based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of NYS Sanitary Code. Soil SCGs identified for site were developed from NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 "Determination of Soil Cleanup Objectives and Cleanup Levels" using guidelines for the protection of groundwater, background conditions, and risk-based remediation criteria. The Division of Fish and Wildlife Technical Guidance for Screening Contaminated Sediments was used for surface water sediments.

Based upon the results of the remedial investigation in comparison to the SCGs and potential public health and environmental exposure routes, certain areas and media of the site require remediation. Sediments in the SSA were of concern, but were already removed by Bausch & Lomb (See Section 4.2). There are also three discrete areas of groundwater that are of concern and that warrant remediation. These are summarized below. More complete information can be found in the RI reports.

Chemical concentrations are reported in parts per billion (ppb) or parts per million (ppm). For comparison purposes, SCGs are given for each medium.

Site Geology and Hydrogeology:

The site is underlain by siltstone of the Silurian Vernon Formation. The siltstone is overlain in most areas by glaciolacustrine sediments. These sediments, composed predominantly of silt and clay, were deposited in glacial lakes present along the retreating ice margin. With continued glacial retreat, the lakes changed in shape and size as lower lake outlets became ice-free. The lakes eventually drained as the remaining ice unblocked the preglacial drainage pathways to the northeast.

Numerous re-advances of the ice front have been documented in areas west of the site. Based on the boring logs obtained during this investigation, re-advances may have also occurred in the site area. This is indicated by multiple units of till, separated by lacustrine sediments. The general compact nature of the lacustrine sediments also suggest that they may have been overridden and compacted by the re-advancing glacier.

Groundwater flow is generally from the north to the south, across the site towards Black Creek. Flow patterns, however, deviate in various areas within the site.

4.1.1 Nature of Contamination:

As described in the RI Reports, many soil, groundwater and sediment samples were collected at the Site to characterize the nature and extent of contamination.

The primary sediment contaminants found in the SSA were metals such as cadmium, chromium, lead, mercury, nickel, silver and zinc. Metals are widely used in industry as part of electroplating operations. Many metals are quite toxic including cadmium, chromium and nickel, which are known

or suspected carcinogens. In addition to metals, polycyclic aromatic hydrocarbons (PAHs) such as acenapthene, phenanthrene, fluoranthene were also found in the sediment of the SSA. PAHs are a group of chemicals that are derived from oil, are a major component of asphalt and often form through the incomplete combustion of coal, oil and gas, garbage or other organic substances. Phenanthrene is a known carcinogen.

The primary groundwater contaminants are chlorinated solvents such as Trichloroethene (TCE), 1,1,1 Trichloroethane, cis-1,2 Dichloroethene, and Vinyl Chloride. Many chlorinated solvents are widely used in industry for degreasing and cleaning. They are typically clear colorless liquids which are heavier than water. Vinyl Chloride is a known carcinogen.

4.1.2 Extent of Contamination

Tables 1, 2 and 3 summarizes the extent of contamination for the contaminants of concern in sediment and compares the data with the proposed remedial action levels for the Site. Tables 4 and 5 summarizes the extent of contamination for the contaminants of concern in groundwater and compares the data with the proposed remedial action levels for the Site. The following is a summary of the findings of the investigation.

Sediments

Twenty sediment samples were collected from the on-site (on Bausch & Lomb's property) SSA prior to the IRM (See Section 4.2). The constituents of concern for the SSA included: cadmium, chromium, lead, mercury, nickel, silver, zinc and PAHs. The results from these samples indicated that metals and PAH concentrations were above NYSDEC Division of Fish and Wildlife sediment screening levels. Sediment containing PAHs and metals concentrations above NYSDEC Division of Fish and Wildlife sediment screening levels were removed from the on-site SSA by Bausch & Lomb through an IRM (See Section 4.2). Pre-removal and post-removal concentrations of contaminants in the on-site SSA and a comparison to NYSDEC sediment screening levels can be found in Tables 1 and 2.

Eleven sediment samples were collected from a combination of Black Creek and the off-site (down stream of Bausch & Lomb's property) SSA (two samples from Black Creek and 9 samples from the off-site SSA). Zinc was detected in both samples from Black Creek at concentrations above NYSDEC Division of Fish and Wildlife sediment Lowest Effect Level (LEL) screening levels. However, the zinc concentration in Black Creek's sediment upstream of Black Creek's junction with the SSA was greater than the zinc concentration downstream of Black Creek's junction with the SSA. Therefore the zinc concentrations in Black Creek sediment cannot be attributed to the SSA. Only chromium, nickel and zinc were detected in the off-site SSA at concentrations above NYSDEC Division of Fish and Wildlife sediment Lowest Effect Level (LEL) screening levels: of these nickel and chromium were found above Severe Effect Level (SEL) in one sample located approximately 1000 feet south of the Bausch & Lomb property line. Concentrations of contaminants in the off-site SSA and Black Creek and a comparison to NYSDEC sediment screening levels can be found in Table 3.

The IRM (See Section 4.2) effectively addressed the impacted soil/sediment within the on-site SSA, thereby eliminating the potential for future migration of contaminants of concern above NYSDEC approved cleanup goals into the off-site SSA. No-further remedial action (RA) for the SSA will be considered in this PRAP.

Groundwater

Thirty two (32) monitoring wells are currently installed on-site. Twenty (20) of the monitoring wells are used to monitor the shallow overburden (soil above bedrock) groundwater and the other twelve monitoring wells are used to monitor the

base of overburden/top of bedrock interface zone groundwater.

Sample results from these monitoring wells (See Tables 4 and 5) show that VOCs concentrations are above NYS Class GA Groundwater Standards in both the shallow overburden and the base of overburden/top of bedrock interface zones.

To further define the groundwater contamination present at the site a Geoprobe investigation was performed. A total of 366 groundwater and/or ponded surface water samples were collected and analyzed on-site.

Results from these samples indicated that there are shallow overburden and base of overburden/top of bedrock interface groundwater contaminant plumes on-site (the relative locations of these plumes are shown on Figure 3). Source areas have been identified for each of the plumes. The three source areas are: the BL-16S source area (130,000 parts per billion (ppb) TCE), the BL-9S source area (200,000 ppb TCE) and the BL-11D source area (110,000 ppb TCE). Given the elevated dissolved concentrations of VOCs measured in these source zones, it is believed that VOCs are present in the form of residual pockets of dense non-aqueous phase liquid (DNAPL) in the subsurface at these locations. Furthermore it is believed that residual DNAPL represents an on-going long-term source of groundwater contamination.

4.2 Interim Remedial Measures:

Interim Remedial Measures (IRMs) are conducted at sites when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS.

Based on the SSA RI results, an IRM was performed in November 1995. The IRM consisted of the removal and off-site disposal of sediment/soil from the on-site SSA which contained concentrations of contaminants in excess of the NYSDEC Division of Fish and Wildlife sediment screening levels. Approximately 1,175 cubic yards of material were removed from the on-site SSA.

Upon completion of the initial excavation, verification samples were collected and analyzed. If the verification samples' results were above SCGs, additional sediment/soil was excavated and additional confirmatory samples were collected and analyzed. This sequence was repeated until the verification samples' results were below SCGs with one exception (See Table 2). One sample contained concentrations of nickel above NYSDEC Division of Fish and Wildlife sediment screening levels (Sample IRM-12: 22.3 parts per million (ppm) nickel exceeded the low effect level (LEL) of 16 ppm). As this sample was collected from approximately 42 inches below the original ground surface, its nickel concentration was only slightly elevated compared to LEL, its nickel concentration was below the severe effect level (SEL) and its nickel concentration was below site background concentrations, it was determined that no additional excavation was necessary.

To prevent erosion and sedimentation, the on-site SSA was restored. Rip-rap was placed in the area of the excavation within the on-site SSA to match adjacent grades and to restore the profile of the SSA to pre-IRM conditions. Additional information about the IRM can be found in the Final Engineering Report On-Site Interim Remedial Measure, dated January 1996.

The PAHs and metals present in the on-site SSA were addressed through the IRM. No-further RA for the SSA will be considered in this PRAP based on the following:

- The concentrations of PAHs and metals detected in the off-site SSA were orders of magnitude lower than those detected in the on-site SSA.
- The concentrations, of PAHs and metals, detected in the off-site SSA (with the

exception of one sample (see Table 3)) were below the Severe Effect Level presented in the NYSDEC Division of Fish and Wildlife Technical Guidance for Screening Contaminated Sediments.

- No metals or PAHs concentrations were detected above background concentrations (levels found in the surrounding area) in either the furthest downstream SSA sample location or in samples from Black Creek (the SSA drains into Black Creek).

- The IRM effectively addressed the impacted soil/sediment within the on-site SSA, thereby eliminating the potential for future migration of contaminants of concern above NYSDEC approved cleanup goals into the off-site SSA.

4.3 Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the health risks can be found in Section 7.2 of the RI Report and Section 6.0 of the RI Addendum Report.

An exposure pathway is how an individual may come into contact with a contaminant. The five elements of an exposure pathway are 1) the source of contamination; 2) the environmental media and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

Completed or potential pathways which are known to or may exist at the site include:

- Potential exposure of on-site workers to volatile organics and fugitive dust emissions during possible future construction activities.

- Potential future exposure of residents to volatile organics in groundwater due to inhalation, ingestion or dermal contact. Such exposure could occur 3 ways:

  1. If contaminated groundwater migrates off-site towards the basements of homes;

  2. If local residents install and use a shallow well (e.g., for drinking water, gardens, etc.); and

  3. If residences are built on the site at some point in the future with a shallow well or a basement.

The human health risk assessment completed as part of the RI found that no unacceptable risks were estimated to occur at the site under present conditions for workers, nearby residents, recreationists or hunters/trespassers who might come in contact with on-site soils or streambed sediments in the SSA or Black Creek. In addition the risk assessment addendum conducted as part of the RI Addendum estimated no unacceptable chronic risks for a hypothetical future excavation worker at the site. The risk assessment addendum did indicate the possibility for adverse health effects or elevated potential for carcinogenic effects for hypothetical future residential exposure to groundwater at the site. This estimation is extremely conservative and assumes that shallow overburden groundwater would be utilized as a residential supply well, even though the area is served by a municipal supply.

4.4 Summary of Environmental Exposure Pathways:

This section summarizes the types of environmental exposures which may be presented by the site. The Fish and Wildlife Impact

Assessment included in the RI presents a more detailed discussion of the potential impacts from the site to fish and wildlife resources. The following pathway for environmental exposure has been identified:

- Ongoing contamination of Class GA groundwater at the site.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The NYSDEC and the Bausch & Lomb entered into a Consent Order on September 10, 1990. The Order obligates the responsible parties to implement a RI/FS remedial program. This Order was amended on June 5, 1995 to allow Bausch & Lomb to propose the interim remedial measure (IRM). Upon issuance of the Record of Decision the NYSDEC will approach the PRPs to implement the selected remedy under an Order on Consent.

The consent order is referenced as follows:

Date: 9/10/90 as amended 6/5/95

Index No.: B8-0173-87-02

Subject of Order: In the Matter of the Development and Implementation of a Remedial Investigation and Feasibility Study for an Inactive Hazardous Waste Disposal Site Under Article 27, Title 13 of the Environmental Conservation Law of the State of New York (the "ECL") by Bausch & Lomb Incorporated.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. The overall remedial goal is to meet all Standards, Criteria, and Guidance (SCGs) and be protective of human health and the environment.

At a minimum, the remedy selected should eliminate or mitigate all significant threats to the public health and to the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The goals selected for this site are:

- Reduce the mass of contaminants of concern present in the on-site shallow overburden and overburden/bedrock interface ground-water flow zones to the extent practicable; and

- Mitigate the potential migration of groundwater that contains contaminants of concern in excess of the New York State Class GA Ground-Water Quality Standards.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy should be protective of human health and the environment, be cost effective, comply with other statutory laws and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the Bausch & Lomb, Frame Center site were identified, screened and evaluated in a Feasibility Study. This evaluation is presented in the report entitled Feasibility Study Report, Bausch & Lomb Frame Center, dated October, 1997.

A summary of the detailed analysis follows. As used in the following text, the time to implement reflects only the time required to implement the remedy, and does not include the time required to

design the remedy, procure contracts for design and construction or to negotiate with responsible parties for implementation of the remedy.

7.1: Description of Alternatives

The potential remedies are intended to address the contaminated groundwater and soil at the site.

Alternative 1 - No Action

The no action alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Present Worth:	$ 0
Capital Cost:	$ 0
Annual O&M:	$ 0
Time to Implement	No time required

Alternative 2 - Natural Attenuation and Groundwater Monitoring

This alternative includes groundwater monitoring of five existing monitoring wells along with the installation and monitoring of four new monitoring wells. Samples collected during the long term monitoring would be submitted for laboratory analysis of VOCs. These sample results would be used to:

- Determine whether the VOCs, at concentrations greater than New York State Class GA Groundwater Quality Standards, are approaching the downgradient site boundary; and
- Monitor the degradation and natural attenuation of VOCs contaminants of concern in the areas where they have been previously encountered.

If it is determined that VOCs concentrations greater than SCGs are approaching the downgradient site boundary, hydraulic control or groundwater extraction and treatment technologies would be implemented. These contingencies would be implemented to insure that VOCs concentrations, above SCGs, would not migrate of site. The need for the implementation of institutional controls would be evaluated prior to the site being considered for reclassification or deed transfer.

Present Worth:	$ 610,000
Capital Cost:	$ 123,000
Annual O&M: (years 1-30)	$ 39,120
Time to Implement	6 months - 1 year

Alternative 3 - Groundwater Removal and Treatment

This alternative consists of the long term extraction of contaminated groundwater and then either discharging the groundwater to the sanitary sewer for off-site treatment at the publicly owned treatment works (POTW) or treating the groundwater on-site as necessary prior to discharge to a nearby surface water (e.g., the on-site SSA). Under this alternative, overburden and/or overburden/bedrock interface extraction wells were assumed to be the groundwater removal technology implemented. The actual technology may be either withdrawal trenches or extraction wells (or a combination thereof) and would be determined based on the results of a pumping test. The need for the implementation of institutional controls would be evaluated prior to the site being considered for reclassification or deed transfer.

Present Worth:	$ 1,260,000
Capital Cost:	$ 331,765
Annual O&M: (years 1-30)	$ 75,000
Time to Implement	6 months - 1 year

Alternative 4 - Mass Reduction and Natural Attenuation

This alternative consists of VOCs mass removal in the three areas of elevated groundwater concentrations, combined with natural attenuation of the associated VOCs plume. The VOCs mass reduction technology would be source area soil excavation and off-site disposal at a permitted landfill and/or ex-situ treatment by biological degradation and/or soil vapor extraction. Prior to the implementation of this alternative, a pre-design field investigation would be implemented to address limited data gaps and provide additional VOCs data necessary to confirm the limits of the source areas requiring excavation. In addition the pre-design field work would help to determine whether the excavated soil would be disposed of off-site or treated on-site. If the results of the pre-design field investigation indicate that on-site treatment of the excavated soil is the best option to deal with the excavated soil, a treatability study would be completed to support the most effective design for the soil treatment.

Based on current data, this alternative consists of excavating approximately 3,850 cubic yards of soil from the identified source areas where the highest concentrations of VOCs have been observed.

Ground water encountered during impacted soils excavation activities will be pumped from the excavation and treated, as necessary, prior to discharge to either the sanitary sewer for off-site treatment at the POTW or to a nearby surface water. The need for the implementation of institutional controls would be evaluated prior to the site being considered for reclassification or deed transfer.

Present Worth:	$ 1,630,000*
Capital Cost:	$ 1,105,000
Annual O&M:	Ex-Situ Soil Bio Remediation
(years 1-3)	$60,000
	Ground Water Monitoring
(years 1-15)	$39,120
Time to Implement	6 months - 1 year

* The estimated present worth assumes ex-situ anaerobic/aerobic biodegradation, this cost should be the maximum cost and may be reduced if off-site disposal or ex-situ aerobic biodegradation and vapor extraction is found to be appropriate during the pre-design work.

7.2 Evaluation of Remedial Alternatives

The criteria used to compare the potential remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6 NYCRR Part 375). For each of the criteria, a brief description is provided followed by an evaluation of the alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is contained in the Feasibility Study.

The first two evaluation criteria are termed threshold criteria and must be satisfied in order for an alternative to be considered for selection.

1. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance.

The main SCG that has been identified for this site is New York State Class GA Groundwater Quality Standards (6 NYCRR Parts 700-705).

Alternative 1 would not comply with New York State Class GA Groundwater Quality Standards. Because this alternative does not include any remedial action associated with site groundwater, this alternative would not mitigate the potential for migration of VOCs at concentrations in excess groundwater quality standards. In addition, the time frame for the groundwater at the site to meet New York State Class GA Groundwater Quality Standards, is expected to be very long.

Alternative 2 would not comply with New York State Class GA Groundwater Quality Standards. Because this alternative does not include any active remedial action associated with site groundwater, this alternative would not mitigate the potential for migration of VOCs at concentrations in excess groundwater quality standards. The time frame for the groundwater at the site to meet groundwater quality standards, with this alternative is expected to be 30 years or greater.

Alternative 3 would be effective in meeting New York State Class GA Groundwater Quality Standards. The contaminants of concern in groundwater would be hydraulically controlled and their concentrations eventually reduced, through the withdrawal and treatment of groundwater. The time frame for the groundwater at the site to meet groundwater quality standards, with this alternative is expected to be significantly less than Alternative 2. However, given the uncertainties associated with possible residual DNAPL contamination at the site 30 years was used a conservative estimate for costing purposes.

Alternative 4 would be effective in meeting New York State Class GA Groundwater Quality Standards. The VOCs concentrations in groundwater would be reduced in two ways by this alternative. First, contaminants of concern in soil would be excavated and treated. This would remove the continuing source of VOCs to groundwater. In addition, groundwater that is encountered during the excavation would be removed from the excavation, as necessary and treated and/or stored and used to aid in the treatment of the soil portion of this remedy and/or disposed of off-site. Given the dual treatment in this alternative it is assumed that groundwater standards will be met site-wide within 15 years and much sooner for the areas subject to excavation.

2. <u>Protection of Human Health and the Environment</u>. This criterion is an overall evaluation of the health and environmental impacts to assess whether each alternative is protective.

Alternative 1 would not be protective of the environment. Because this alternative does not contain, actively treat or destroy contaminants in the groundwater at the site, presently uncontaminated groundwater at the site would continue to be contaminated by contaminants of concern.

Alternative 2 would not be protective of human health and the environment. As with Alternative 1, this alternative would not contain, actively treat or destroy contaminants in the groundwater at the site and presently uncontaminated groundwater at the site would continue to be contaminated by contaminants of concern.

Alternative 3 would be protective of human health and the environment over the long term. This alternative would provide for the hydraulic control of the contaminants of concern within the on-site shallow overburden and at the overburden/bedrock interface. In addition, the use of institutional controls would be evaluated, once this alternative is in place, to insure protection of human health.

Alternative 4 would be fully protective of human health and the environment and would achieve this status significantly sooner than would Alternative 3. The soil excavation and treatment and the groundwater removal and treatment components of this alternative would significantly reduce the mass of VOCs at the site. After this mass reduction, natural attenuation would further decrease the VOCs concentrations at the site. This alternative would also include long term monitoring to ensure protection of human health and the environment and the contingency for the institution of hydraulic controls if the contamination approaches the downgradient property boundary.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. <u>Short-term Effectiveness</u>. The potential short-term adverse impacts of the remedial action

upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

Alternative 1: Because no remedial actions are associated with this alternative, there would be no short-term impacts to the community or the environment.

Alternative 2: There would be very little short-term environmental impacts or risks posed to the community by installing, developing or sampling wells.

Alternative 3: This alternative would include some short-term impacts to the environment or risks to the community. These impacts and risks would be associated with the installation of groundwater extraction wells and would be very minor and easily controlled.

Alternative 4: This alternative would include some short-term impacts to the environment or risks to the community. These impacts and risks would be associated with the excavation and soil treatment activities, and potential air emissions from the soil and groundwater treatment systems. OSHA regulations regarding construction practices, training requirements and safety procedures to be followed during work associated with hazardous waste operations would apply to excavation, construction, maintenance, and monitoring well installation and sampling activities. In addition, if the off-site disposal option is chosen, to deal with the excavated soil, approximately 200 twenty (20) yd^3 dump trucks would have to leave the site and travel to the landfill.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the controls intended to limit the risk, and 3) the reliability of these controls.

Alternative 1: This alternative would have no long-term effectiveness. Under this alternative, the contaminants of concern in the groundwater would not be addressed. As such, the long-term effectiveness and reliability of this alternative are low.

Alternative 2: This alternative would include no active treatment of the VOCs in groundwater, however the contingencies for hydraulic controls or groundwater removal and treatment would insure that the contamination does not migrate off-site. As such, the long-term effectiveness and reliability of this alternative are moderate.

Alternative 3: This alternative would be considered a permanent remedy. The system would continue to operate for as long as constituents of concern persist in groundwater at concentrations above NYS Class GA Groundwater Quality Standards. In addition this alternative would mitigate the potential for off-site migration of contaminated groundwater. As such, the long-term effectiveness and reliability of this alternative are high. An assessment of potential air emissions associated with possible on-site treatment would need to be performed as part of this alternative and if necessary an air pollution control system would need to be installed to insure compliance with applicable air emission standards.

Alternative 4: This alternative would be considered effective in the long-term for the following reasons: 1. The excavation and treatment of saturated soils from the identified source areas would remove the areas with the highest VOCs concentrations, 2. Natural Attenuation would continue to reduce the concentrations of residual VOCs present in the groundwater after the source excavation activities have been completed. In addition long term monitoring and contingencies

would insure that contaminated groundwater does not migrate off-site. As such, the long-term effectiveness and reliability of this alternative are high. An assessment of potential air emissions associated with the treatment systems would need to be performed as part of this alternative and if necessary an air pollution control system would be installed to insure compliance with applicable air emission standards.

5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

Alternative 1: This alternative would not actively treat the impacted groundwater, therefore there would be no reduction in the toxicity, mobility or volume of the constituents of concern in the near term.

Alternative 2: This alternative would not include implementation of an active groundwater treatment process and would rely on naturally occurring physical, chemical and biological processes to decrease the toxicity and volume of the contaminants of concern. There would be no significant reduction in the mobility of contaminants in the near term with this alternative.

Alternative 3: This alternative would slowly reduce the mass of VOCs in the groundwater beneath the site by extracting and treating contaminated groundwater. In addition, this alternative would reduce the mobility of VOCs in the groundwater beneath the site by hydraulically controlling the migration of the contaminants.

Alternative 4: This alternative would quickly reduce the mass of VOCs in the groundwater beneath the site by excavating and treating contaminated soil (the continuing source of groundwater contamination) along with the removal and treatment of groundwater encountered during the soil excavation. Although the mass of contamination would be greatly reduced, there would be no significant reduction in the mobility of the residual contaminants in the near term with this alternative.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction and the ability to monitor the effectiveness of the remedy. For administrative feasibility, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc..

Alternative 1: This alternative would not require the implementation of any remedial activities. Therefore, this alternative is technically feasible and could be easily implemented at this site.

Alternative 2: The installation of groundwater monitoring wells and the collection of groundwater samples are common monitoring techniques, therefore, this alternative is technically feasible and could be easily implemented at this site.

Alternative 3: Groundwater extraction and treatment is a fully developed remedial alternative and is used at many sites throughout the U.S.. Although this alternative requires some construction, implementation would be easily accomplished at the site.

Alternative 4: This alternative would be more difficult to implement than any of the other alternatives. There would be several issues associated with the implementation of the excavation portion of this alternative. Specifically, the volatilization of VOCs during excavation and material handling, the potential spreading of VOCs and, potential health and safety issues during excavation activities. These concerns would be addressed in the RA Workplan and could be effectively controlled using readily available construction techniques and due diligence.

7. Cost. Capital and operation and maintenance costs are estimated for each alternative and compared on a present worth basis. Although cost is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, cost effectiveness can be used as the basis for the final decision. The costs for each alternative are presented in Table 2.

Alternative 1 would cost nothing.

Capital costs for *Alternative 2* are estimated at $123,000. Annual O&M would be $39,120. Thirty years of O&M would bring the O&M present worth to $485,440. The total present worth of this alternative is estimated to be $610,000.

Capital costs for *Alternative 3* are estimated at $331,765. Annual O&M would be $75,000. Thirty years of O&M would bring the O&M present worth to $930,675. The total present worth of this alternative is estimated to be $1,260,000.

Capital costs for *Alternative 4* are estimated at $1,105,000. Annual O&M for the Ex-Situ Bio-Remediation would be $60,000. Three years of O&M would bring the Ex-Situ Bio-Remediation O&M present worth to $157,000. Annual Groundwater Monitoring O&M would be $39,120. Fifteen years of O&M would bring the Groundwater Monitoring O&M present worth to $356,305. The total present worth of this alternative is estimated to be $1,630,000. (The estimated present worth assumes ex-situ anaerobic/aerobic biodegradation, this cost should be the maximum cost and may be reduced if off-site disposal or ex-situ aerobic biodegradation and vapor extraction is found to be a more effective treatment.)

This final criterion is considered a modifying criterion and is taken into account after evaluating those above. It is focused upon after public comments on the Proposed Remedial Action Plan have been received.

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan will be evaluated. A "Responsiveness Summary" will be prepared that describes public comments received and how the Department will address the concerns raised. If the final remedy selected differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

SECTION 8: SUMMARY OF THE PREFERRED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 7, the NYSDEC is proposing Alternative 4 Mass Reduction and Natural Attenuation as the remedy for this site.

This proposal is based upon the following: Alternatives 1 and 2 would not meet SCGs nor would they be protective of human health or the environment. Alternatives 3 and 4 would both meet threshold criteria, however Alternative 4 would meet SCGs sooner than Alternative 3. Alternatives 3 and 4 would be equally effective and protective in the long term, and would be readily implementable. Alternatives 3 would have minor short-term impacts associated with the installation of the groundwater extraction wells. Alternative 4 would have more complex short-term impacts associated with the soil excavation and treatment activities and potential air emissions from the soil and groundwater treatment systems. Short term impacts associated with both of these alternative would be easily mitigated. Both Alternatives 3 and 4 would reduce the mass of VOCs in ground water at the site, however Alternative 4 would remove significantly more contamination by directly addressing the source areas. Alternative 3 would be lower in cost than Alternative 4. However, it is anticipated the time required to meet SCGs with Alternative 4 would be greatly

reduced, and since it equally satisfies the other criteria, including the threshold criteria, it is the preferred alternative.

The estimated present worth cost to implement the remedy is $1,630,000. The cost to construct the remedy is estimated to be $1,105,000 and the estimated average annual Ex-Situ Bio-Remediation operation and maintenance cost for three (3) years would be $60,000. In addition, the estimated average annual Groundwater Monitoring operations and maintenance for fifteen (15) years would be $39,120.

The elements of the selected remedy are as follows:

1. Prior to implementation of this alternative a pre-design field investigation would be implemented to address limited data gaps, provide additional VOCs data necessary to confirm the limits of the source areas requiring excavation and determine whether off-site disposal or on-site treatment is appropriate to deal with the excavated soil.

2. If on-site treatment is found to be appropriate based on the results of the pre-design field work, a treatability study would be performed to identify the most effective application of bio-remediation technologies in degrading the VOCs present in site soil and groundwater would be performed. In addition, this treatability study would evaluate ways to enhance in-situ bio-degradation of the contamination remaining in place at the site. The actual scope of the treatability study would be determined during the pre-design phase of the project in conjunction with the NYSDEC.

3. Soil from the three source areas that have been identified would be excavated and treated on site. Approximately 3,850 yds.^{3} of contaminated soil would be excavated for treatment from three areas on-site. Approximately 1,900 yds.^{3} of soil would be removed for treatment from the BL-9S source area (the limits of this excavation are shown on figure 4). Approximately 1,150 yds.^{3} of soil would be removed for treatment from the BL-16S source area (the limits of this excavation are shown on figure 5). Approximately 800 yds.^{3} of soil would be removed for treatment from the BL-11D source area (the limits of this excavation are shown on figure 6). The excavations would be backfilled with clean fill material that is already available on-site. If on-site treatment is selected, once the concentrations of VOCs, in the treated soil, has reached cleanup numbers the soil may be spread over the previously excavated areas and other areas of the site.

4. Groundwater encountered during excavation activities would be removed. This groundwater would either be pre-treated on-site (as necessary) and discharged to the POTW or treated on-site prior to discharge to a surface water body.

5. Monitoring wells would be installed at the site at least 200 ft. upgradient of the site southern and eastern downgradient property boundary and 100 ft. from the western downgradient property boundary. These monitoring wells would allow for sufficient time to implement contingency plans if groundwater monitoring indicates that VOCs are present at these locations and migrating off-site.

6. The need for the implementation of institutional controls would be evaluated prior to the site being considered for reclassification or deed transfer.

7. Since the remedy may result in small quantities of untreated hazardous waste remaining at the site, a long term monitoring program would be instituted. This program would assess biological conditions to provide information about the natural attenuation of VOCs at the site. In addition, this program would provide information about the effectiveness of the selected remedy.

Table 1
Bausch & Lomb, Frame Center
Proposed Remedial Action Plan (PRAP)
Nature and Extent of Contamination

Pre-IRM On-Site Sediment

CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ppm)	FREQUENCY of SAMPLE RESULTS EXCEEDING SCGs	SCG (ppm)
Metals	Cadmium	.45 to 12	7 of 20	.6*
	Chromium	9.53 to 9,600	13 of 20	26*
	Lead	.06 to 968	10 of 20	31*
	Mercury	.11 to 12.3	9 of 20	.15*
	Nickel	7.41 to 2,290	14 of 20	16*
	Silver	.25 to 45.4	11 of 20	1*
	Zinc	23.3 to 1,510	9 of 20	120*
Polycyclic Aromatic Hydrocarbons (PAHs)	Acenapthene	.062 to 30	7 of 17	.7***
	Phenanthrene	.1 to 230	10 of 17	.6***
	Fluoranthene	.1 to 290	9 of 17	5.1***

ppm - Parts Per Million
SCGs - Standards, Criteria, and Guidance
* Concentration presented is the Lowest Effect Level.
*** Concentration presented is the chronic toxicity sediment criteria for protection of benthetic aquatic life, normalized using an estimated total organic carbon content of 5,000 ppm.

Table 2
Bausch & Lomb, Frame Center
Proposed Remedial Action Plan (PRAP)
Nature and Extent of Contamination

Post IRM On-Site Sediment

CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ppm)	FREQUENCY of SAMPLE RESULTS EXCEEDING SCGs	SCG (ppm)
Metals	Cadmium	ND	0 of 10	.6*
	Chromium	5.2 to 21.9	0 of 8	26*
	Lead	3.4 to 15.2	0 of 8	31*
	Mercury	ND	0 of 8	.15*
	Nickel	4.4 to 22.3	1 of 8	16*
			0 of 8	50**
	Silver	ND	0 of 8	1*
	Zinc	18.9 to 74	0 of 8	120*
Polycyclic Aromatic Hydrocarbons (PAHs)	Total Petroleum Hydrocarbons	ND	0 of 9	10

ppm - Parts Per Million
SCGs - Standards, Criteria, and Guidance
ND - Compound not detected
* Concentration presented is the Lowest Effect Level.
** Concentration presented is the Severe Effect Level.

Table 3
Bausch & Lomb, Frame Center
Proposed Remedial Action Plan (PRAP)
Nature and Extent of Contamination

Off -Site Sediment

CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ppm)	FREQUENCY of SAMPLE RESULTS EXCEEDING SCGs	SCG (ppm)
Metals	Cadmium	ND to .49	0 of 11	.6*
	Chromium	10.6 to 434	6 of 11	26*
			1 of 11	110**
	Lead	.03 to 12.7	0 of 11	31*
	Mercury	ND	0 of 11	.15*
	Nickel	10.4 to 174	7 of 11	16*
			1 of 11	50**
	Silver	ND	0 of 11	1*
	Zinc	41.2 to 230	4 of 11	120*
			0 of 11	270**
Polycyclic Aromatic Hydrocarbons (PAHs)	Acenapthene	ND	0 of 9	.7***
	Phenanthrene	ND to .17	0 of 9	.6***
	Fluoranthene	ND to .51	0 of 9	5.1***

ppm - Parts Per Million
SCGs - Standards, Criteria, and Guidance
ND - Compound not detected
* Concentration presented is the Lowest Effect Level.
** Concentration presented is the Severe Effect Level.
*** Concentration presented is the chronic toxicity sediment criteria for protection of benthetic aquatic life, normalized using an estimated total organic carbon content of 5,000 ppm.

Table 4
Bausch & Lomb, Frame Center
Proposed Remedial Action Plan (PRAP)
Nature and Extent of Contamination

Shallow Overburden Groundwater

CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ppb)	FREQUENCY of SAMPLE RESULTS EXCEEDING SCGs	SCG (ppb)
Volatile Organic Compounds (VOCs)	Benzene	ND to 92	10 of 70	0.7
	1,1-Dichloroethane	ND to 9	2 of 70	5
	1,2-Dichloroethylene	ND to 26,000	10 of 70	5
	Tetrachloroethylene	ND to 460	2 of 66	5
	1,1,1-Trichloroethane	ND to 11,000	15 of 70	5
	Trichloroethylene	ND to 62,000	22 of 70	5
	Vinyl Chloride	ND to 3,600	4 of 70	2
	Freon 113	ND to 980	9 of 50	5

ppb - Parts Per Billion
SCGs - Standards, Criteria, and Guidance
ND - Compound not detected

Table 5
Bausch & Lomb, Frame Center
Proposed Remedial Action Plan (PRAP)
Nature and Extent of Contamination

Overburden/Bedrock Interface Groundwater

CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ppb)	FREQUENCY of SAMPLE RESULTS EXCEEDING SCGs	SCG (ppb)
Volatile Organic Compounds (VOCs)	Benzene	ND to 1	1 of 31	0.7
	1,1-Dichloroethane	ND to 23	1 of 31	5
	1,2-Dichloroethylene	ND to 1,200	5 of 31	5
	1,1,1-Trichloroethane	ND to 2,600	2 of 31	5
	Trichloroethylene	ND to 7,900	5 of 31	5
	Freon 113	ND to 1,100	3 of 29	5

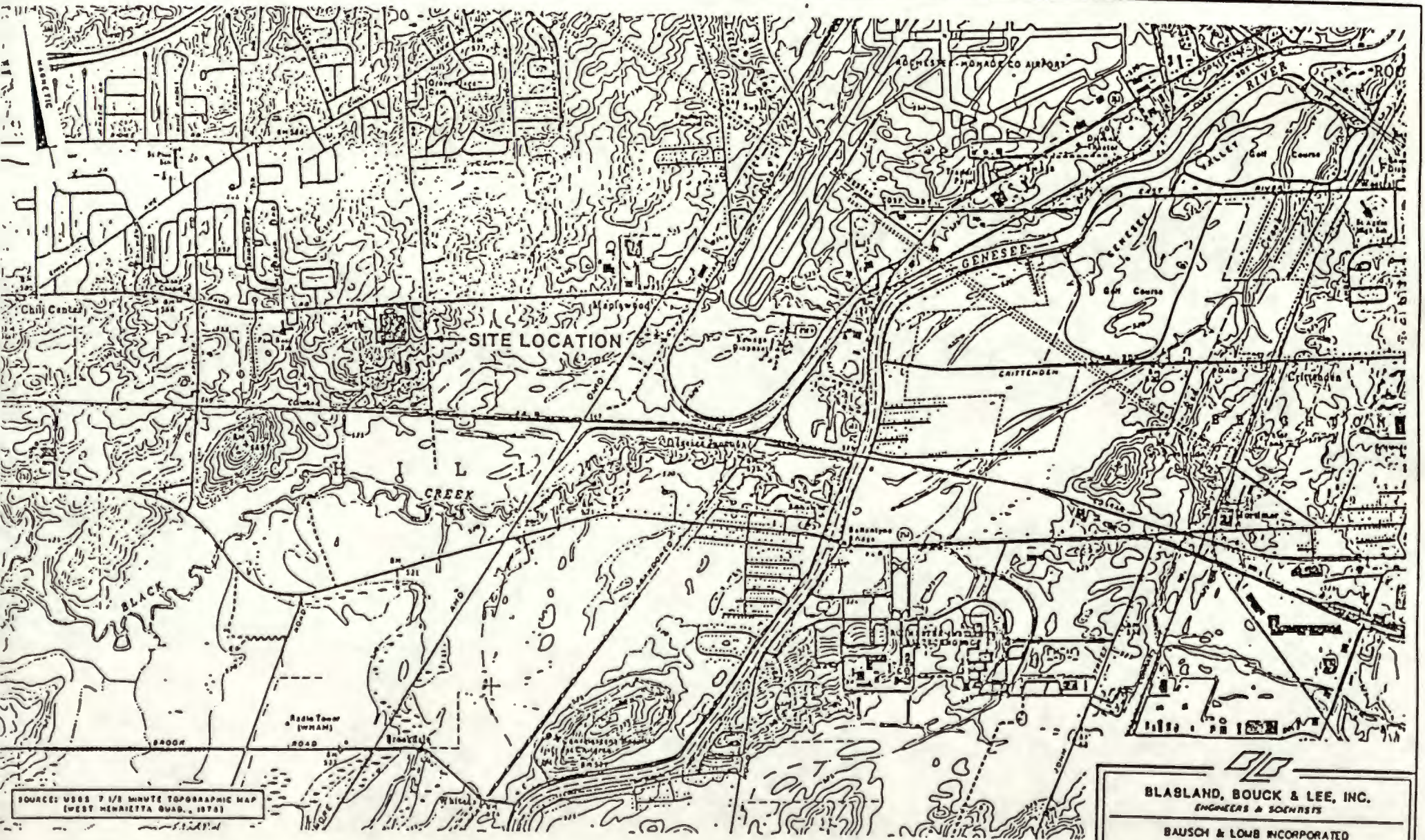
ppb - Parts Per Billion
SCGs - Standards, Criteria, and Guidance
ND - Compound not detected

Table 6
Bausch & Lomb, Frame Center
Proposed Remedial Action Plan (PRAP)

Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual O&M	Total Present Worth
Alternative 1 - No Action	$0	$0	$0
Alternative 2 - Natural Attenuation and Ground Water Monitoring	$123,000	$39,120	$610,000
Alternative 3 - Ground Water Removal and Treatment	$331,765	$75,000	$1,260,000
Alternative 4 - Mass Reduction and Natural Attenuation	$1,105,000	Ex-Situ Soil Bio Remediation O&M (years 1-3) . . . . . $60,000 Ground Water Monitoring O&M (years 1-15) $39,120	$1,630,000*

*The estimated present worth assumes ex-situ anaerobic/aerobic biodegradation, this cost should be the maximum cost and may be reduced if off-site disposal or ex-situ aerobic biodegradation and vapor extraction is found to be appropriate during the pre-design work.



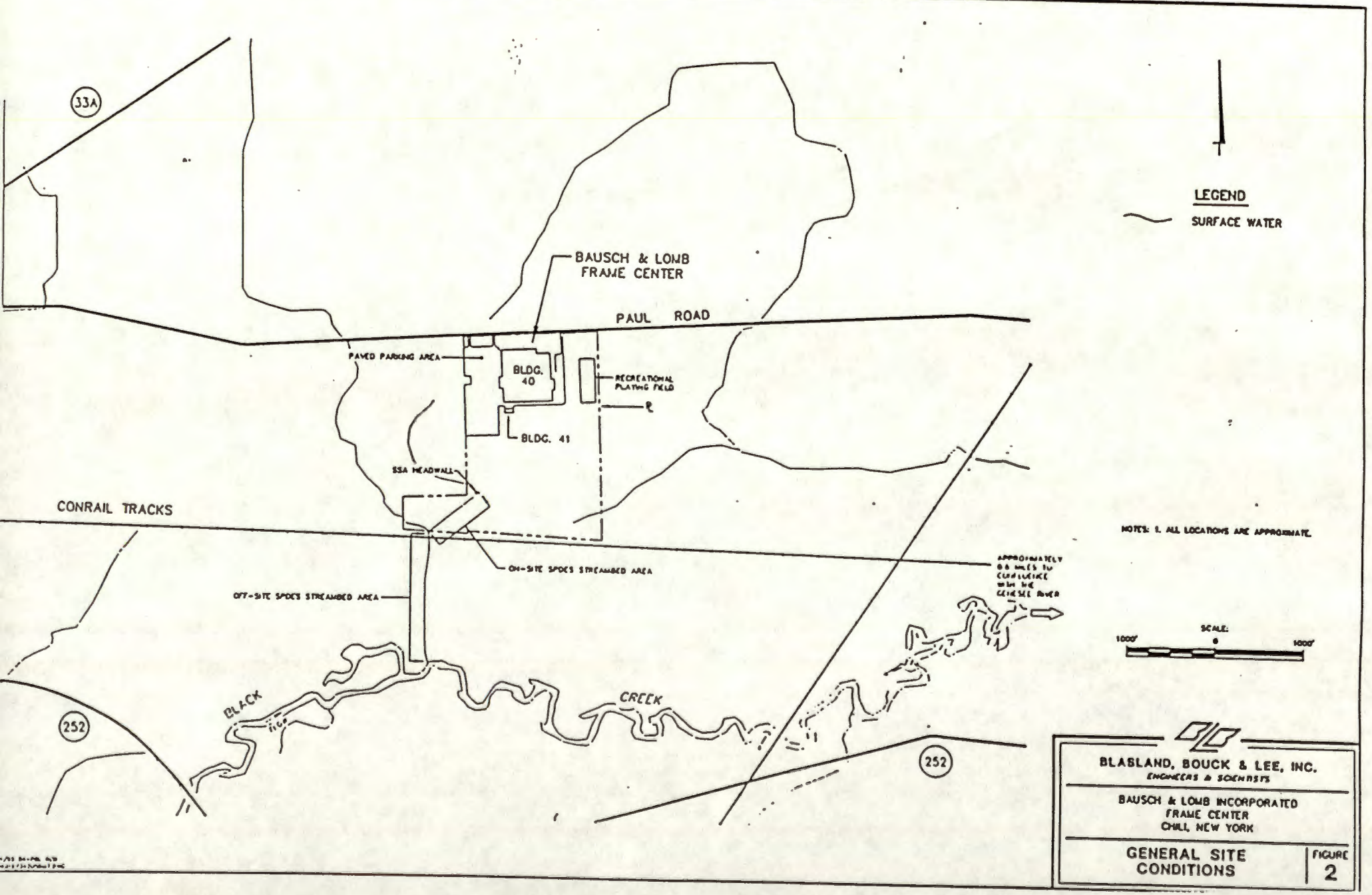
SOURCE: USGS 7 1/2 MINUTE TOPOGRAPHIC MAP (WEST HENRIETTA QUAD., 1978)

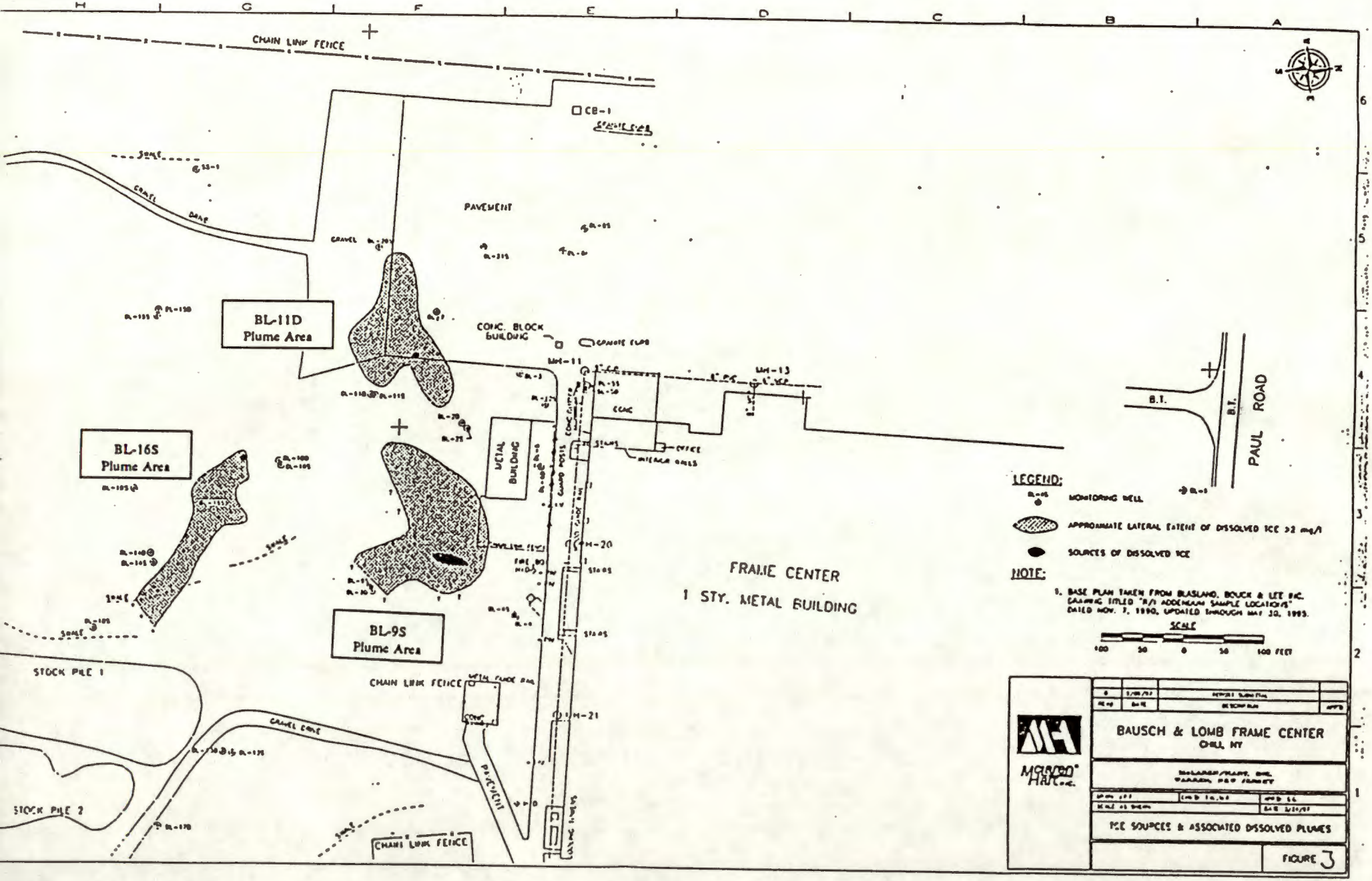
BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

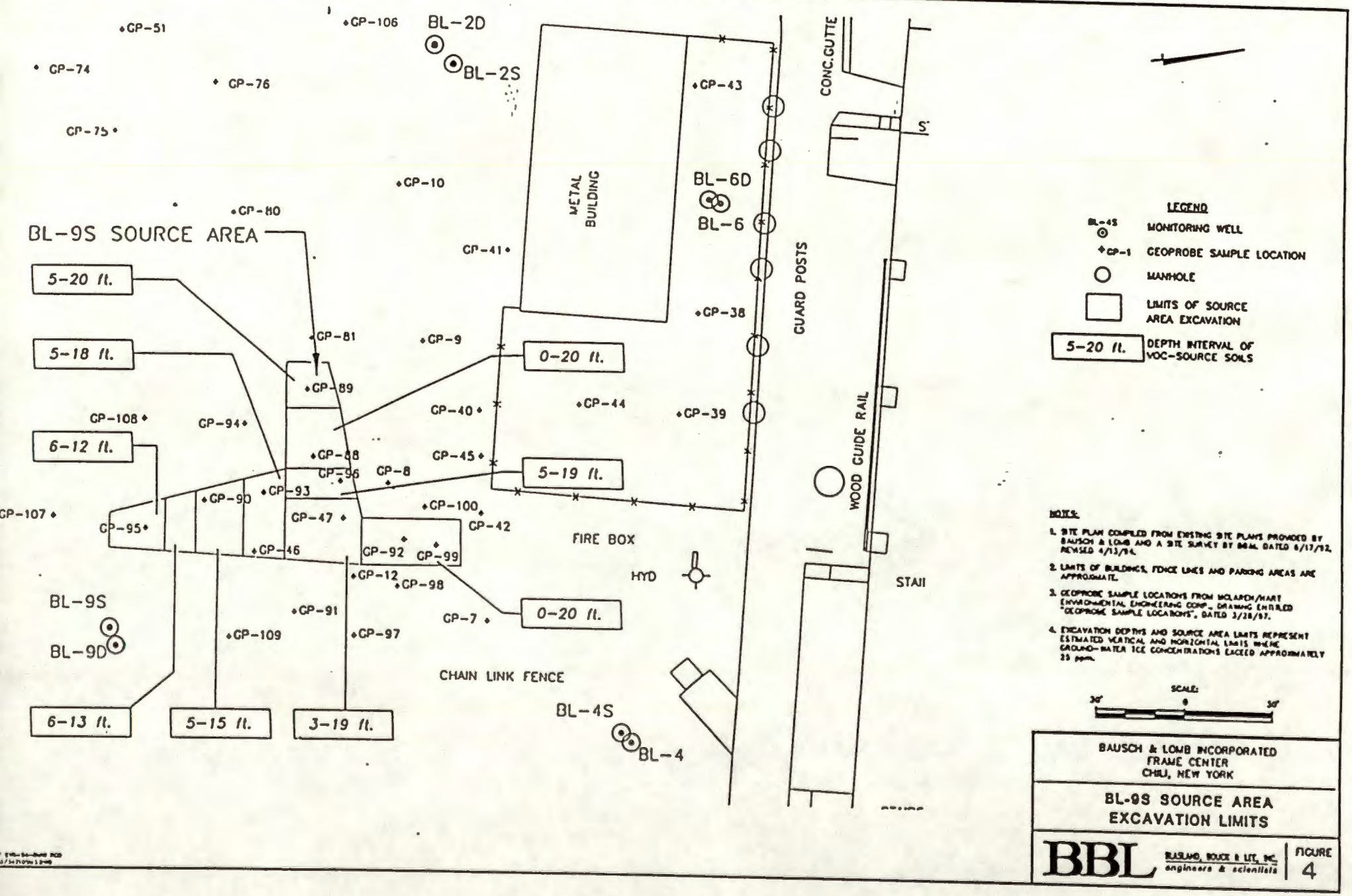
BAUSCH & LOMB INCORPORATED
FRAME CENTER
CHILI, NEW YORK

SITE LOCATION MAP

FIGURE 1


33A
BAUSCH & LOMB
FRAME CENTER
PAUL ROAD
PAVED PARKING AREA
BLDG.
40
RECREATIONAL
PLAYING FIELD
BLDG. 41
SSA HEADWALL
CONRAIL TRACKS
ON-SITE SPDES STREAMBED AREA
OFF-SITE SPDES STREAMBED AREA
APPROXIMATELY
0.8 MILES TO
CONFLUENCE
WITH THE
GENESEE RIVER
BLACK
CREEK
252
252
LEGEND
SURFACE WATER
NOTES: 1. ALL LOCATIONS ARE APPROXIMATE.
SCALE:
1000'
0
1000'
BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS
BAUSCH & LOMB INCORPORATED
FRAME CENTER
CHILI, NEW YORK
GENERAL SITE
CONDITIONS
FIGURE
2


CHAIN LINK FENCE
CB-1
PAVEMENT
BL-11D
Plume Area
CONC. BLOCK
BUILDING
MH-11
MH-13
BL-16S
Plume Area
METAL
BUILDING
OFFICE
MH-20
MH-21
BL-9S
Plume Area
FRAME CENTER
1 STY. METAL BUILDING
STOCK PILE 1
STOCK PILE 2
CHAIN LINK FENCE
CHAIN LINK FENCE
PAVEMENT
PAUL ROAD
B.T.
B.T.
LEGEND:
MONITORING WELL
APPROXIMATE LATERAL EXTENT OF DISSOLVED ICE >2 mg/l
SOURCES OF DISSOLVED ICE
NOTE:
1. BASE PLAN TAKEN FROM BLASLAND, BOUCK & LEE INC. DRAWING TITLED "B/L ADDENDUM SAMPLE LOCATIONS" DATED NOV. 7, 1990, UPDATED THROUGH MAY 30, 1995.
SCALE
100 50 0 50 100 FEET
BAUSCH & LOMB FRAME CENTER
CHILI, NY
ICE SOURCES & ASSOCIATED DISSOLVED PLUMES
FIGURE 3

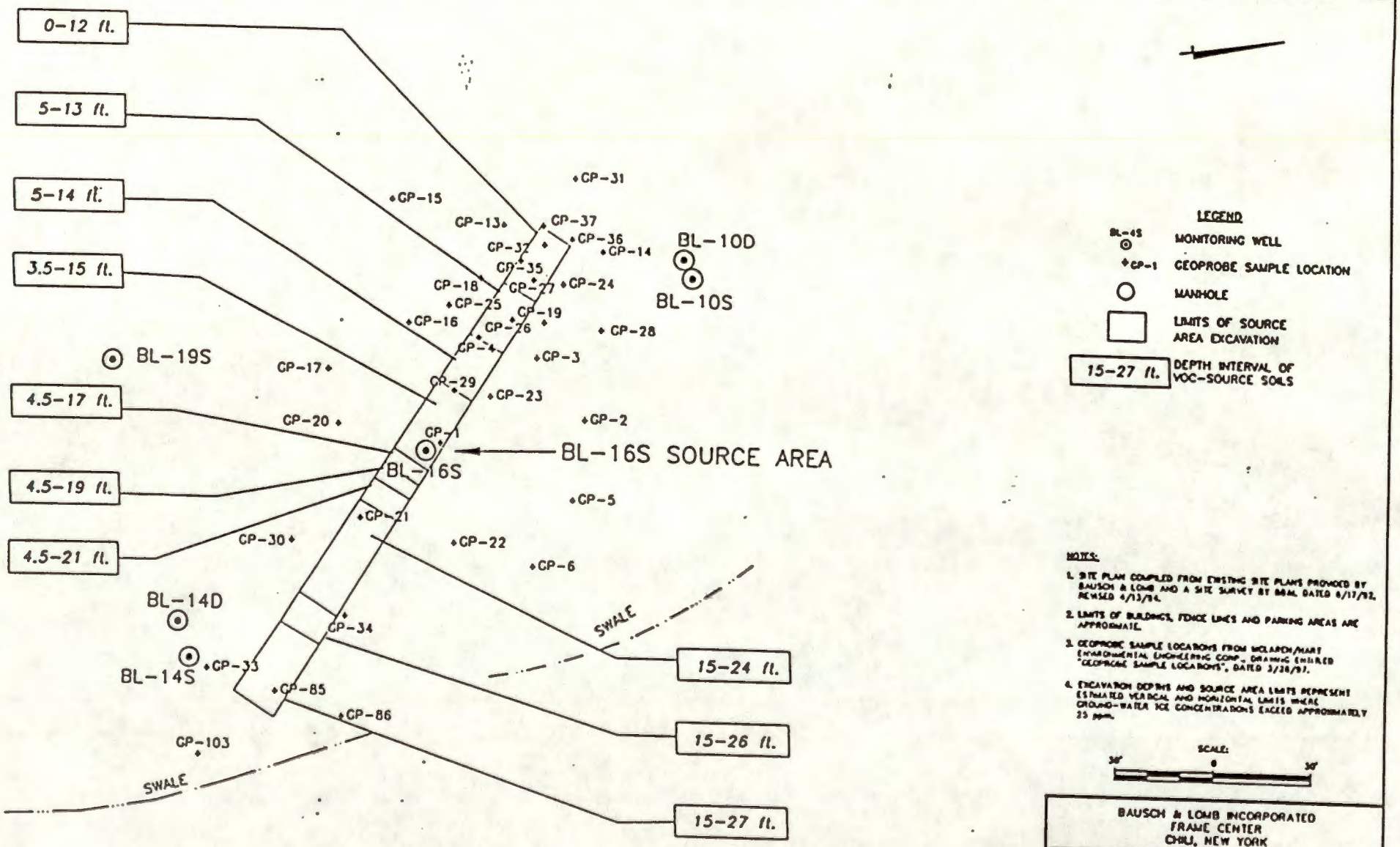


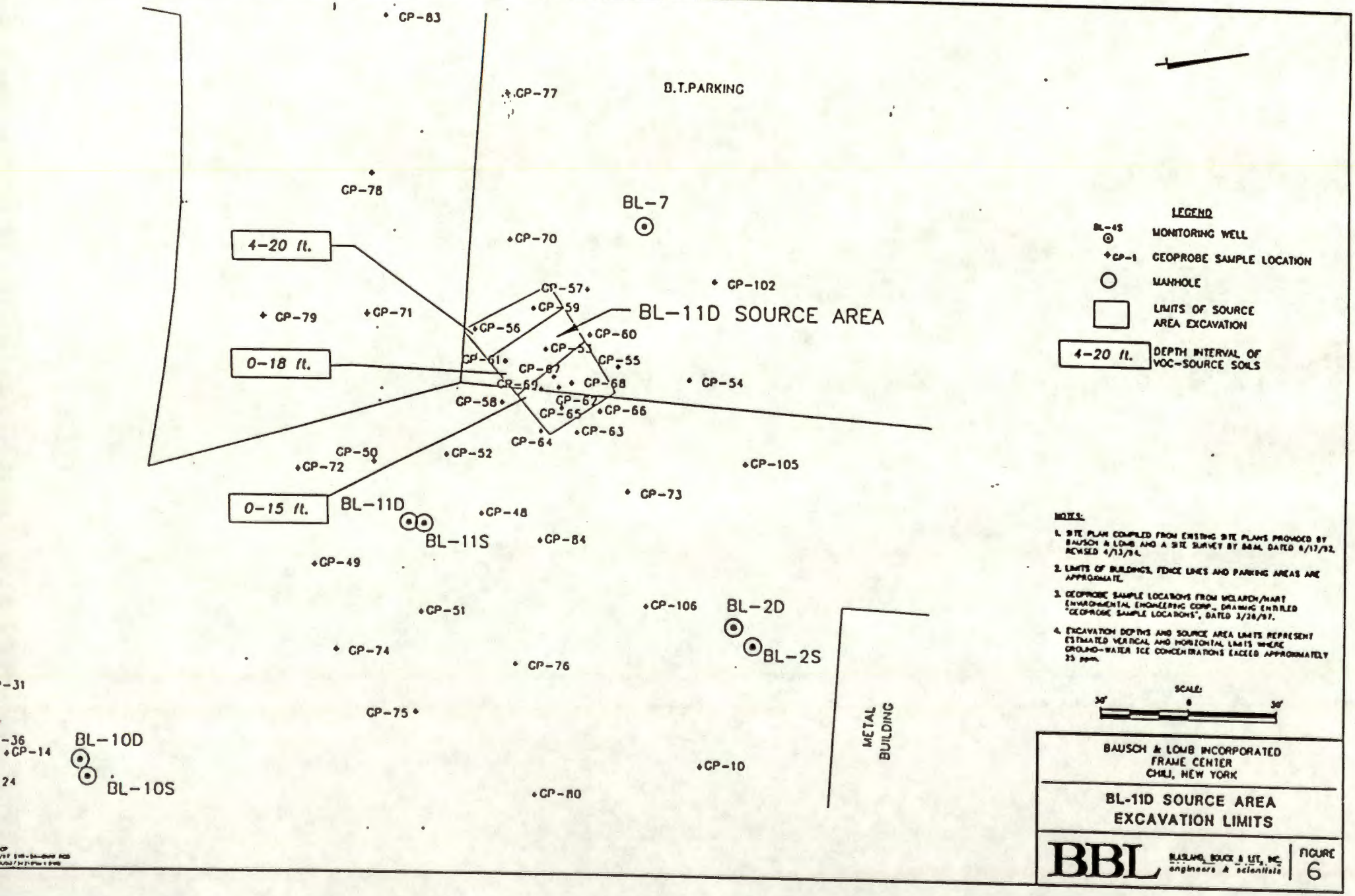
BAUSCH & LOMB INCORPORATED
FRAME CENTER
CHILI, NEW YORK

BL-9S SOURCE AREA EXCAVATION LIMITS

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 4


0–12 ft.
5–13 ft.
5–14 ft.
3.5–15 ft.
4.5–17 ft.
4.5–19 ft.
4.5–21 ft.
BL–19S
BL–14D
BL–14S
BL–10D
BL–10S
BL–16S
BL–16S SOURCE AREA
CP–1
CP–2
CP–3
CP–4
CP–5
CP–6
CP–13
CP–14
CP–15
CP–16
CP–17
CP–18
CP–19
CP–20
CP–21
CP–22
CP–23
CP–24
CP–25
CP–26
CP–27
CP–28
CP–29
CP–30
CP–31
CP–32
CP–33
CP–34
CP–35
CP–36
CP–37
CP–85
CP–86
CP–103
SWALE
SWALE
15–24 ft.
15–26 ft.
15–27 ft.
LEGEND
MONITORING WELL
GEOPROBE SAMPLE LOCATION
MANHOLE
LIMITS OF SOURCE AREA EXCAVATION
15–27 ft.
DEPTH INTERVAL OF VOC–SOURCE SOILS
NOTES:
1. SITE PLAN COMPILED FROM EXISTING SITE PLANS PROVIDED BY BAUSCH & LOMB AND A SITE SURVEY BY B&M, DATED 6/17/92, REVISED 4/13/94.
2. LIMITS OF BUILDINGS, FENCE LINES AND PARKING AREAS ARE APPROXIMATE.
3. GEOPROBE SAMPLE LOCATIONS FROM MCLAREN/HART ENVIRONMENTAL ENGINEERING CORP., DRAWING ENTITLED "GEOPROBE SAMPLE LOCATIONS", DATED 3/28/97.
4. EXCAVATION DEPTHS AND SOURCE AREA LIMITS REPRESENT ESTIMATED VERTICAL AND HORIZONTAL LIMITS WHERE GROUND–WATER VOC CONCENTRATIONS EXCEED APPROXIMATELY 25 ppm.
SCALE:
30'
0
30'
BAUSCH & LOMB INCORPORATED
FRAME CENTER
CHILI, NEW YORK
BL-16S SOURCE AREA
EXCAVATION LIMITS
BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists
FIGURE
5



BAUSCH & LOMB INCORPORATED
FRAME CENTER
CHILI, NEW YORK

BL-11D SOURCE AREA EXCAVATION LIMITS

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 6