PB93-963802
EPA/ROD/R02-92/172
June 1992

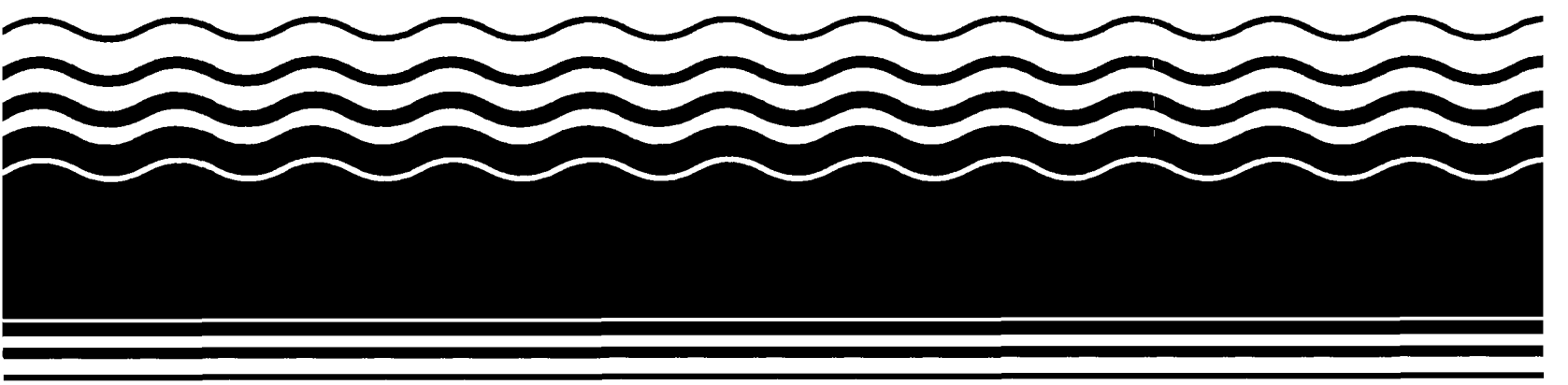
United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA

Superfund Record of Decision:

Action Anodizing & Plating, NY



NOTICE

The appendices listed in the index that are not found in this document have been removed at the request of the issuing agency. They contain material which supplement, but adds no further applicable information to the content of the document. All supplemental material is, however, contained in the administrative record for this site.

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. EPA/ROD/R02-92/172	2.	3. Recipient's Accession No.

4. Title and Subtitle
SUPERFUND RECORD OF DECISION
Action Anodizing and Plating, NY
First Remedial Action - Final

5. Report Date
06/30/92

6.

7. Author(s)

8. Performing Organization Rept. No.

9. Performing Orgainization Name and Address

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G)

12. Sponsoring Organization Name and Address
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

13. Type of Report & Period Covered
800/000

14.

15. Supplementary Notes
PB93-963802

16. Abstract (Limit: 200 words)
The 1-acre Action Anodizing Plating and Polishing (AAPP) site is an active metal finishing shop located in Babylon, Suffolk County, New York. Land use in the area is primarily residential and commercial. An estimated 1 million residents use public wells within 3 miles of the site for their drinking water supply. From 1938 to 1968, a commercial laundry facility operated onsite; subsequently, AAPP has operated at the site as a small metal-finishing plant. Site features include the AAPP operating facility, an adjacent storage area, and a residence. Onsite operations involve sulfuric acid anodizing of aluminum parts for the electronics industry, cadmium plating, chromate conversion coatings, metal dyeing, and vapor degreasing. Liquid wastes from these operations include rinses of spent caustic and acidic solutions contaminated with cadmium, chromium, zinc, and sodium cyanide. Prior to 1980, these spent solutions and rinses flowed from a concrete waste-holding trough to a septic tank and several leaching pits for tank overflow. In 1980, the county identified elevated levels of several metals--notably, cadmium, chromium, and nickel--in the onsite leaching pits. That same year at the direction of the county, AAPP removed the contaminated substances from the leaching pits, backfilled and closed the pits. This ROD addresses

(See Attached Page)

17. Document Analysis a. Descriptors
Record of Decision - Action Anodizing and Plating, NY
First Remedial Action - Final
Contaminated Media: None
Key Contaminants: None

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 42
	20. Security Class (This Page) None	22. Price

(See ANSI-Z39.18) *See Instructions on Reverse*

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

Abstract (Continued)

OU1, which includes the whole site. Samples of ground water, soil, and sediment taken from onsite and offsite areas during the RI showed that contaminant levels were generally well below state and federal standards and risk levels. Therefore, there are no unacceptable risks to human health or the environment posed by the AAPP site.

The selected remedial action for this site includes no further action because no significant levels of contaminants exist at the site. The 1980 remediation of the leaching pits removed the most significant contamination known to exist at the site. Sampling results indicate the majority of contaminants do not exceed MCLs in the ground water, or background levels in the soil and air. A 1-year ground water monitoring program will be established to ensure that the remedy is protective of human health and the environment.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

RECORD OF DECISION

ACTION ANODIZING PLATING AND POLISHING SITE
TOWN OF BABYLON
SUFFOLK COUNTY, NEW YORK

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION II

NEW YORK

ROD FACT SHEET

SITE

Name:	Action Anodizing Plating and Polishing
Location/State:	Town of Babylon, Suffolk County, N.Y.
EPA Region:	II
HRS Score (date):	36.61
NPL Rank (date):	Group 11 (proposed June, 1988; listed March, 1989)

ROD

Date Signed:	June 30, 1992
	Selected Remedy- No remedial action, including a 1 year groundwater monitoring program.
Capital Cost:	$0
O and M:	$0
Present Worth:	$0

LEAD

Remedial, EPA	
Primary contact:	Julia Allen- (212) 264-8476
Secondary Contact:	Douglas Garbarini- (212) 264-0109

WASTE

Type and media:	Not applicable
Origin:	Not applicable

DECLARATION FOR THE RECORD OF DECISION

Site Name and Location

Action Anodizing Plating and Polishing, Town of Babylon, Suffolk County, New York

Statement of Basis and Purpose

This decision document presents the selected remedial action for the Action Anodizing Plating and Polishing ("AAPP") site ("the Site"), located in the Town of Babylon, Suffolk County, New York, which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"), 42 U.S.C. §§ 9601-9675, as amended, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"), 40 CFR Part 300. This decision document explains the factual and legal basis for selecting the remedy for the Site. The information supporting this remedial action decision is contained in the administrative record for the Site. The administrative record index is attached (Appendix III).

The New York State Department of Environmental Conservation ("NYSDEC") concurs with the selected remedy (Appendix IV).

Description of the Selected Remedy: No Further Action

The United States Environmental Protection Agency ("EPA") in consultation with the State of New York has determined that the AAPP site does not pose a significant threat to human health or the environment and, therefore, remediation is not appropriate. This determination is based on previous cleanup activities conducted at the Site in 1980 and the remedial investigation activities conducted by EPA from March 1989 through March 1992. Thus, "No Action" is the selected remedy for the Site. A one-year monitoring program will be established to ensure that the remedy is protective of human health and the environment.

Declaration

In accordance with the requirements of CERCLA, as amended, and the NCP, it has been determined that no remedial action is necessary to protect human health and the environment at the Action Anodizing Plating and Polishing site. Previous cleanup activities conducted in response to Suffolk County Department of Health Services enforcement actions have remediated the significant contamination present at the Site. However, a program to monitor the groundwater beneath the Site will be implemented. Because this remedy will not result in hazardous substances remaining on-site above health-based levels, the five-year review will not apply to this action.

EPA has determined that no further remedial action is necessary at this site. Therefore, the site now qualifies for inclusion in the "sites awaiting deletion" subcategory of the Construction Completion category of the National Priorities List.

Constantine Sidamon-Eristoff
Regional Administrator

6/30/92
Date

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DECISION SUMMARY
ACTION ANODIZING PLATING AND POLISHING SITE

TOWN OF BABYLON
SUFFOLK COUNTY, NEW YORK

United States Environmental Protection Agency

Region II

New York

SITE NAME, LOCATION AND DESCRIPTION

The Action Anodizing Plating and Polishing (AAPP) site is located at 33 Dixon Avenue in the Hamlet of Copiague in the Town of Babylon, Suffolk County, New York. It is approximately one acre in size and is one mile east of the Nassau-Suffolk County line and one-half mile south of Sunrise Highway (see Figure 1).

The population of the Town of Babylon is estimated to be 203,483 (Bureau of the Census, 1980). The area that surrounds the AAPP site is comprised predominantly of light industrial and single family residential units. The Town of Babylon zoning map (May 1986) designates the area as GA-Industry (GA-Industry is defined as light manufacturing, warehouse, storage, offices and retail facilities) and Residential (with typical lot sizes of 7,500 square feet). Public supply wells are the primary source of drinking water in the area and approximately one million residents of Suffolk and Nassau Counties obtain drinking water from public wells within three miles of the Site.

The AAPP facility occupies approximately one-half of the subject property on the corner of Galvani Street and Dixon Avenue (see Figure 2). The operating facility is approximately 3000 square feet in area with an additional 2000 square feet of office space. Attached to the operating facility is an approximate 7500 square foot equipment storage area addition which was built in 1984. The Site is accessed by two unpaved driveways. One driveway enters the southern end of the property from Dixon Avenue and the other driveway enters the eastern side from Galvani Street. On the northern side of the facility, a dirt area, approximately 20 feet wide, separates the building from a heavily vegetated area which extends to the property's northern border. Vegetation in this area consists primarily of ragweed and young black locust trees. A two-story house occupies a lot along the eastern side of the property with frontage on Galvani Street. There does not appear to be any significant wildlife habitat on the property.

The Site is at an approximate elevation of 30 feet above mean sea level. The ground surface of the Site slopes down about one-half foot from the north to the south. The shallowest groundwater in the region, the Upper Glacial Aquifer, occurs approximately 10 feet below ground level at the Site. The thickness of the saturated upper Pleistocene deposits under the Site is estimated to be approximately 75 feet. The Upper Pleistocene deposits and Mattawan/Magothy Aquifers form a thick sequence of sand with varying amounts of silt and clay. The stratification of these silt and clay layers impedes vertical groundwater movement. The groundwater flows approximately one foot/day and is generally towards the south, to the Great South Bay, but local variations in the direction of movement occur. Amityville Creek and Woods Creek, the nearest downgradient surface water bodies to the Site, are located approximately one-half mile south of the Site (see

Figure 1). Residential development abuts both creeks which eventually feed into the Great South Bay. Wildlife observed in these areas include Canada goose, snowy egret, mockingbird, song sparrow and purple finch. Other birds and small mammals common to the area are also likely to utilize these habitats.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

For approximately thirty years prior to 1968, a commercial laundry facility operated on the Site's premises. Since 1968, AAPP has operated at the Site as a small metal-finishing shop.

AAPP's operations primarily involve sulfuric acid anodizing of aluminum parts for the electronics industry, cadmium plating, chromate conversion coatings, metal dyeing and vapor degreasing. Liquid wastes from these operations include rinses of spent caustic and acidic solutions contaminated with cadmium, chromium, zinc and sodium cyanide. Prior to 1980, rinse water was reportedly stored in a concrete waste holding trough in the floor of the facility from which it was pumped into a low pressure steam boiler. The steam was condensed and reused as process make-up water. The solids from the rinse water were allowed to build up in the boiler tubes until the tubes became plugged, at which time, the boiler would be replaced with a new unit.

The concrete trough had previously been used by the commercial laundry as part of its drainage system. The trough was connected to a septic tank on the north side of the building. Tank overflow fed into a series of six leaching pits on the east side of the building. The bottoms of the pits were reportedly several feet below ground.

During an inspection of the Site by the Suffolk County Department of Health Services (SCDHS) in January 1980, it was discovered that rinse water from AAPP's operation was discharging to the leaching pits rather than the low pressure steam boiler. SCDHS sampled the leaching pits, process tanks, surface soils, and septic tank on the Site. The results showed elevated levels of several metals, notably cadmium, chromium and nickel in the leaching pits. AAPP was told by SCDHS to cease discharge to the leaching pits immediately and remove the soils and sediments of the entire leaching system.

In the spring of 1980, AAPP contracted with the Patterson Chemical Company for the cleanup and closing of the leaching system. This work was supervised and approved by SCDHS. In September 1980, SCDHS notified AAPP that the leaching pits could be back-filled with clean sand and gravel. The 7,500 foot equipment storage area, built in 1984, lies directly on top of the former leaching pits. AAPP reports that its industrial waste is currently hauled off-site for disposal.

In January 1986, the New York State Department of Environmental Conservation (NYSDEC) issued a Phase 1 Investigation Report which summarized past investigations and included a Hazard Ranking System (HRS) score for the Site. Based on the HRS score, the Site was proposed for inclusion on the National Priorities List (NPL) in June 1988 and was placed on the NPL in March 1989.

On March 7, 1989, EPA sent "general notice" letters to two potentially responsible parties (PRPs), affording them the opportunity to conduct the Remedial Investigation and Feasibility Study (RI/FS) for the Site. PRPs are companies or individuals who are potentially responsible for contributing to the contamination at the Site and/or are past or present owners of the property. EPA did not receive any good faith proposals from the PRPs to undertake or finance the RI/FS. Therefore, beginning in July 1989, the necessary work was performed by EPA's contractor, Malcolm Pirnie, Inc., using Superfund monies.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The RI report and the Proposed Plan for the Site were released for public comment on April 3, 1992. These documents were made available to the public in the administrative record file at the EPA Docket Room in Region II, New York and the information repositories at the NYSDEC, Albany, New York, the Town of Babylon Department of Environmental Control, Babylon, New York and the Copiague Memorial Library, Copiague, New York. A press release announcing the availability of these documents was issued on April 3, 1992. Originally, the public comment period was set by EPA to end on May 2, 1992. At the community's request, an extension to the public comment period was granted until June 8, 1992.

A public participation meeting was conducted by EPA on April 22, 1992 at the Babylon Town Library, Babylon, New York to discuss the RI report and to provide an opportunity for interested parties to present oral comments and questions to EPA. Due to community interest, a follow-up public availability session was held in coordination with the Suffolk County Department of Health Services and the Town of Babylon Department of Environmental Control on May 4, 1992 at the Copiague Junior High School, Copiague, New York. At the community's request, a second public meeting was held on June 2, 1992 at the Copiague Junior High School, Copiague, New York.

A summary of the significant comments relating to the selection of the remedy received during the public meetings and public comment period and EPA's responses to these comments are presented in the Responsiveness Summary (see Appendix V).

SCOPE AND ROLE OF RESPONSE ACTION

This is the first and only planned operable unit for the Site. The primary objective of this operable unit is to determine the nature and extent of contamination at the Site and to take measures, as appropriate, to ensure protection of human health and the environment.

The specific objectives of the RI for the AAPP site were the following:

- to identify all potential source areas of contamination;
- to characterize the nature and extent of possible contamination in environmental media on-site;
- to determine the hydrogeologic characteristics of the Site to assess potential present or future impacts on downgradient receptors; and,
- to assess the present and future potential risks to public health and the environment caused by site contamination in the absence of any remedial action.

SUMMARY OF SITE CHARACTERISTICS

Previous investigations (SCDHS, 1980) showed that there were discharges of untreated process wastewater to leaching pits prior to 1980. Under the direction of EPA, Malcolm Pirnie, Inc. conducted an RI from July 1989 to April 1992 to characterize the geology, groundwater hydrology and chemical quality of the soil and groundwater at the Site. The investigation consisted of drilling borings and constructing monitoring wells, collecting soil and groundwater samples, a geophysical survey and an air-monitoring survey. In addition, a soil-gas survey was performed by EPA in September 1989. The results of the RI are summarized below.

Groundwater

In February 1991, ten wells were installed at the Site. Two wells were drilled upgradient of the Site's operations, four wells were drilled on-site and four wells were drilled downgradient of the Site. The wells were installed and screened in both shallow (20-25 feet below surface) and deep (60-70 feet below surface) portions of the Upper Glacial Aquifer. In March and July 1991, filtered and unfiltered groundwater samples were taken from the ten monitoring wells and analyzed for organic and inorganic constituents.

Table 1 lists the contaminants detected in the groundwater at the Site, as well as the frequency and range of detection. In the first round of groundwater samples, two organic compounds, toluene and xylenes (total), were detected in one on-site well, at 39 and 46 parts per billion (ppb), respectively, and one downgradient well, at 14 and 20 ppb, respectively. These levels exceed the State drinking water standard of 5 ppb for both contaminants, but are well below the Federal standards of 1000 ppb for toluene and 10,000 ppb for xylenes (total). State and Federal primary drinking water standards are often referred to as maximum contaminant levels, or MCLs. Toluene and xylenes (total) were not detected in the second round of groundwater samples. No other volatile organic compounds exceeded their respective MCLs.

With the exception of the chromium analyses, results of the first two rounds of unfiltered groundwater samples indicated relatively low levels of inorganic contamination. In the first round, chromium was detected in the deep upgradient well at 555 ppb, which is significantly higher than the State and Federal MCLs of 50 and 100 ppb, respectively. This level was also significantly higher than the highest level (11.7 ppb in a deep well) detected on-site, where levels did not exceed MCLs, and downgradient where chromium was detected in a deep well at 96.5 ppb. In the second round, chromium exceeded both State and Federal MCLs in the deep upgradient well (130 ppb) and the State MCL in one shallow on-site well (67 ppb) and a deep downgradient well (90 ppb). The highest level of chromium (130 ppb) was detected in the same upgradient well as in round one. Chromium was not detected in any of the filtered samples.

A third round of groundwater samples was taken in January 1992 and analyzed for total chromium only. Chromium was not detected at levels exceeding MCLs in any of the samples collected in the January sampling effort. Given that the highest levels of chromium were detected in an upgradient well, and that the levels decreased significantly from March 1991 to January 1992, it is likely the chromium contamination originated from a source upgradient of the Site or that the elevated chromium results were due to suspended solids present in the samples.

Lead was also detected in the groundwater at levels which exceeded its applicable standards. Lead was detected in one on-site well at 26 ppb, which is slightly higher than the Federal action level of 15 ppb and the New York State water quality standard of 25 ppb. All other samples contained levels of lead which were below the Federal action level. No other inorganic constituents exceeded MCLs.

Both iron and manganese were detected in the groundwater at levels which exceed the Federal secondary drinking water standards. However, these standards are based on aesthetic qualities rather than health concerns.

In February 1992, SCDHS sampled the residential well of the private residence adjacent to the Site to determine drinking-water quality. Results of the sampling indicated that contaminants were not present above State or Federal MCLs. This is believed to be the only residential well used as a potable water supply in the vicinity of the Site. A homeowner residing diagonally across from the Site on Galvani Street has a well limited to outdoor use. This well was sampled in July 1991 and results showed no contaminants exceeding State or Federal MCLs.

Surface/Subsurface Soils

Soil borings were drilled at the Site in order to obtain information on Site geology and to determine the extent of subsurface contamination. The locations of the indoor and outdoor soil borings and surface soil samples are identified on Figure 3. Results of the subsurface soil samplings from indoor and outdoor test borings did not indicate the presence of inorganic constituents at elevated levels. Similarly, although the results of the analyses for organic constituents indicated the presence of a limited number of organic compounds in both the indoor and outdoor borings, the compounds were not present in any significant concentration or in any consistent pattern.

Surface soil samples were collected from the top six-inch strata at twenty locations across the AAPP site. Table 2 provides a comparison of the surface soil contaminants detected at the Site with the background range reported in the literature for inorganics in surface soils in the United States and typical sandy soils. Of the metals detected in these samples, only cadmium was detected above both the background range for surface soils in the United States (0.01 - 2 mg/kg) and typical sandy soils (0.07 - 1.1 mg/kg) (see Table 2). The highest level of cadmium detected in on-site surface soils was 29.4 mg/kg. All other metals detected on-site were either within or close to reported background ranges. Some semi-volatiles were detected, mostly compounds which are by-products of fossil fuel combustion and are typical of what is found near road surfaces. Two volatile organic compounds were detected in two samples at relatively low levels.

Sediment samples were also taken from two on-site drainage systems. A clam shell sampler was used to take two samples from each pool for a total of eight samples from each drainage system. The samples were composited and then analyzed for inorganic and organic compounds and cyanide (amenable to oxidation). Two organic compounds were detected in trace amounts. Inorganic contaminants were detected at relatively low levels. Results indicate that industrial materials were not being discharged to the drainage systems from site-related operations.

In February 1992, the New York State Department of Health sampled soils in the adjacent resident's backyard to determine whether elevated levels of metals were present. Of the metals detected in the surface soils, two metals, lead and arsenic, were detected at levels much higher on the residential property than on the Site property. These results were confirmed through SCDHS testing of the soils in April 1992. The contaminants are not the result of site-related plating and polishing operations. The possible application of a lead arsenate pesticide on the property is one explanation for the high levels of lead and arsenic. As lead arsenate does not degrade once applied, it will always remain in the soil as lead and arsenic metals regardless of when it was applied to the soil, unless the soil itself is removed from the area. Cadmium was found at levels generally below those detected on-site. No other metals were detected above background levels. SCDHS will continue to perform additional sampling and monitoring of the metal contamination at the adjacent homeowner's property. SCDHS has informed EPA that, since the contaminants found at the residence are not site-related, SCDHS will be responsible for implementing any appropriate follow-up measures.

Air Monitoring and Geophysical Surveys

Air monitoring and geophysical surveys were conducted at the Site. The air monitoring data collected at the Site are indicative of typical urban conditions. No unusual metallic subsurface objects, such as buried drums, were identified by the geophysical survey.

Soil-Gas Survey

In September 1989, EPA conducted a soil-gas survey at the Site, the results of which are presented in Table 3. Soil gas contaminated by volatile organic compounds (VOCs) is not widespread throughout the Site. The highest levels of VOCs detected were in soil gas collected from the periphery of on-site structures and paved surfaces. Subsurface soil samples and groundwater samples collected during the RI were relatively free of VOC contamination. Therefore, long-term release of VOCs in the soil gas to the atmosphere is unlikely.

SUMMARY OF SITE RISKS

EPA conducted a baseline risk assessment to evaluate the potential risks to human health and the environment associated with the AAPP Site in its current state. The baseline risk assessment focused on contaminants in the groundwater and surface soils which are likely to pose significant risks to human health and the environment. The summary of the contaminants of concern in sampled matrices is listed in Table 4.

The baseline risk assessment evaluated the health effects, which could result from exposure to contamination at the Site, under current and future land-use scenarios. The potential exposure pathways of concern for current land uses include ingestion of chemicals in the soil, and dermal contact with chemicals in the soil. The potential exposure pathways of concern for future land use include those for current land use as well as the following: ingestion of chemicals in groundwater, dermal contact with chemicals in groundwater and inhalation of airborne chemicals in groundwater.

A summary of the complete exposure pathways at the Site evaluated as part of the risk assessment is provided in Table 5. Based on current land uses, workers may be exposed to contaminants at the Site through incidental ingestion and dermal contact with soils during their designated work activities. Similarly, those who trespass onto the Site may be exposed to the contaminants on-site by dermal contact with soils and by incidental ingestion of the soil. If the upper aquifer serves as a drinking water source for the area in the future, the potential would exist for residents and workers to be exposed to chemicals in groundwater through ingestion of drinking water. Future on-site residents might also be exposed to contaminants in groundwater through dermal contact and inhalation of VOCs during showering or bathing.

Under current EPA guidelines, the likelihood of carcinogenic (cancer causing) and noncarcinogenic effects due to exposure to site chemicals are considered separately. Noncarcinogenic risks were assessed using a hazard index (HI) approach, based on a comparison of expected contaminant intakes and safe levels of intake (Reference doses, or RfDs). RfDs have been developed by EPA for indicating the potential for adverse health effects. RfDs, which are expressed in units of mg/kg-day, are estimates of daily exposure levels for humans which are thought to be safe over a lifetime (including sensitive individuals). Estimated intakes of chemicals from environmental media (e.g., the amount of a chemical ingested from contaminated drinking water) are compared with the RfD to derive the hazard quotient (HQ) for the contaminant in the particular medium. The HQ's are then summed to give a pathway HI. When the HI, or sum of subthreshold exposures (HQs) exceeds one, there may be concern for potential noncarcinogenic health effects, if the contaminants in question are believed to cause a similar toxic effect. The reference doses for the compounds of concern at the AAPP site and a summary of the noncarcinogenic risks associated with these chemicals across various exposure pathways under both current and future land use scenarios is found in Table 6.

The results of the baseline risk assessment indicate that under the current-use scenarios, noncarcinogenic health effects are not likely based on the potential exposure pathways and routes evaluated for workers and trespassers. The calculated HQs for

these scenarios, as well as the total exposure HIs, are significantly less than one. Under the future-use scenarios, noncarcinogenic health effects are unlikely based on the potential exposure pathways and routes evaluated for workers, trespassers and residents. As with the results of the current-use scenarios, all calculated pathway specific HQs are less than one. The highest calculated HQ is 0.7, which is the HQ for ingestion of arsenic in groundwater by children in the event of future residential development on the Site. When the pathway HIs for this future land-use scenario are combined, the total exposure HI exceeds 1; however, the critical effects of the two contributing contaminants, i.e., arsenic (skin disorder) and cadmium (kidney damage), are different. Consequently, the simultaneous subthreshold exposure to these two elements would not be expected to result in adverse health effects.

Potential carcinogenic risks were evaluated using the cancer potency factors developed by EPA for the compounds of concern. Cancer slope factors (SFs) have been developed by EPA's Carcinogenic Risk Assessment Verification Endeavor for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. SFs, which are expressed in units of $(mg/kg\text{-}day)^{-1}$, are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to generate an upper-bound estimate of the excess lifetime cancer risk associated with exposure to the compound at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the SF. Use of this approach makes the underestimation of the risk highly unlikely. The SFs for the compounds of concern are presented in Table 7.

For known or suspected carcinogens, EPA considers excess upper bound individual lifetime cancer risks of between 10^{-4} to 10^{-6} to be allowable. This can be interpreted to mean that an individual may have a one in ten thousand to a one in a million increased chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year lifetime under the specific exposure conditions at the Site.

Under current land-use scenarios, estimated carcinogenic risks are within or less than EPA's allowable cancer risk range based on the potential exposure pathways and routes evaluated for workers and trespassers, respectively. The exposure pathway with the greatest risk (1.17×10^{-6}) is for ingestion of and dermal contact with chemicals in the soil by workers at the Site. None of the fifteen exposure pathways evaluated under the future land-use scenarios have estimated carcinogenic risks which are greater than EPA's allowable cancer risk range; six of these pathways have risks within the range; the estimated carcinogenic risk for the remaining pathways are less than the range. The exposure pathway with the greatest risk (7.25×10^{-5}) is for the future ingestion of chemicals in the groundwater by an adult. This as-

sumes that the aquifer beneath the Site would be utilized as an untreated source of drinking water.

In summary, none of the current or future risks to human health posed by carcinogenic and noncarcinogenic contaminants from the various pathways considered exceeded EPA's allowable levels.

Uncertainties

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

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

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry analysis error can stem from several sources including the errors inherent in the analytical methods and characteristics of the matrix being sampled. Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the chemicals of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the chemicals of concern at the point of exposure. Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the Risk Assessment provides upper bound estimates of the risks to populations near the Site, and is highly unlikely to underestimate actual risks related to the Site.

Ecological Risk Assessment

The ecological risk assessment evaluated potential exposure routes of terrestrial wildlife and aquatic life to Site contamination. Sampling results from Site soils and groundwater were utilized to conduct this assessment. Cadmium was chosen as the chemical of potential concern for surface soils at the Site because it was detected at levels greater than typical background soil concentrations. However, the overall risk to wildlife in the general vicinity of the Site from exposure to contaminated soils is considered to be low, due to the small size of the

contaminated area and the limited habitat potential of the Site. The chemicals of potential concern chosen for assessing environmental risk due to exposure to contaminants in the groundwater at the Site are: aluminum, chromium, copper, lead, nickel and zinc, since the detected levels of these compounds exceeded State and/or Federal Ambient Water Quality Criteria for marine and/or fresh water. Groundwater from the Site may ultimately discharge into Amityville Creek and Woods Creek, both located approximately 1/2 mile south of the Site, and the Great South Bay, located 2 miles south of the Site. The potential risk to aquatic life inhabiting these surface water bodies, however, is considered low. This is due to the natural dilution of any low levels of groundwater contamination that may be associated with the Site. Furthermore, the streams in the Babylon area of Long Island are only partially fed by groundwater and unlikely to receive a large input of groundwater flowing from the Site.

State Acceptance

The State of New York, through the NYSDEC, concurs with EPA's selected remedy. See Appendix IV.

Community Acceptance

Following a substantial community outreach effort by EPA to explain the "no action" remedy selected for the Site, the community in general concurs with the selected remedy. The community outreach effort included three meetings during the public comment period. The first was held at the Babylon Town Library, Babylon, New York on April 22, 1992. Due to community interest, a follow-up public availability session was held in coordination with the SCDHS and the Town of Babylon Department of Environmental Control on May 4, 1992 at the Copiague Junior High School, Copiague, New York. At the May 4, 1992 availability session, the community formally requested, through a signed petition, an extension to the public comment period as well as another public meeting. The community was granted an extension to the public comment period until June 8, 1992. A second public meeting was held on June 2, 1992 at the Copiague Junior High School, Copiague, New York.

DESCRIPTION OF THE "NO ACTION" REMEDY

The risk assessment indicates that the levels of contaminants present in the soil, air and groundwater at the Site present risks which fall within or below the Superfund remediation range. In addition, sampling results indicate the majority of contaminants do not exceed MCLs in the groundwater, or background levels in the soil and air. The 1980 SCDHS-ordered remediation of the

leaching pits removed the most significant contamination known to exist at the Site.

Based upon the findings of the RI performed at the Site, the EPA, in consultation with the State, has determined that the Site does not pose a significant threat to human health and the environment. The EPA, therefore, has selected a no action remedy for the Site. A one-year monitoring program will be established to ensure that the remedy is protective of human health and the environment. Because this remedy will not result in hazardous substances remaining on-site above health-based levels, the five-year review will not apply to this action.

DOCUMENTATION OF SIGNIFICANT CHANGES

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

APPENDIX I

FIGURES

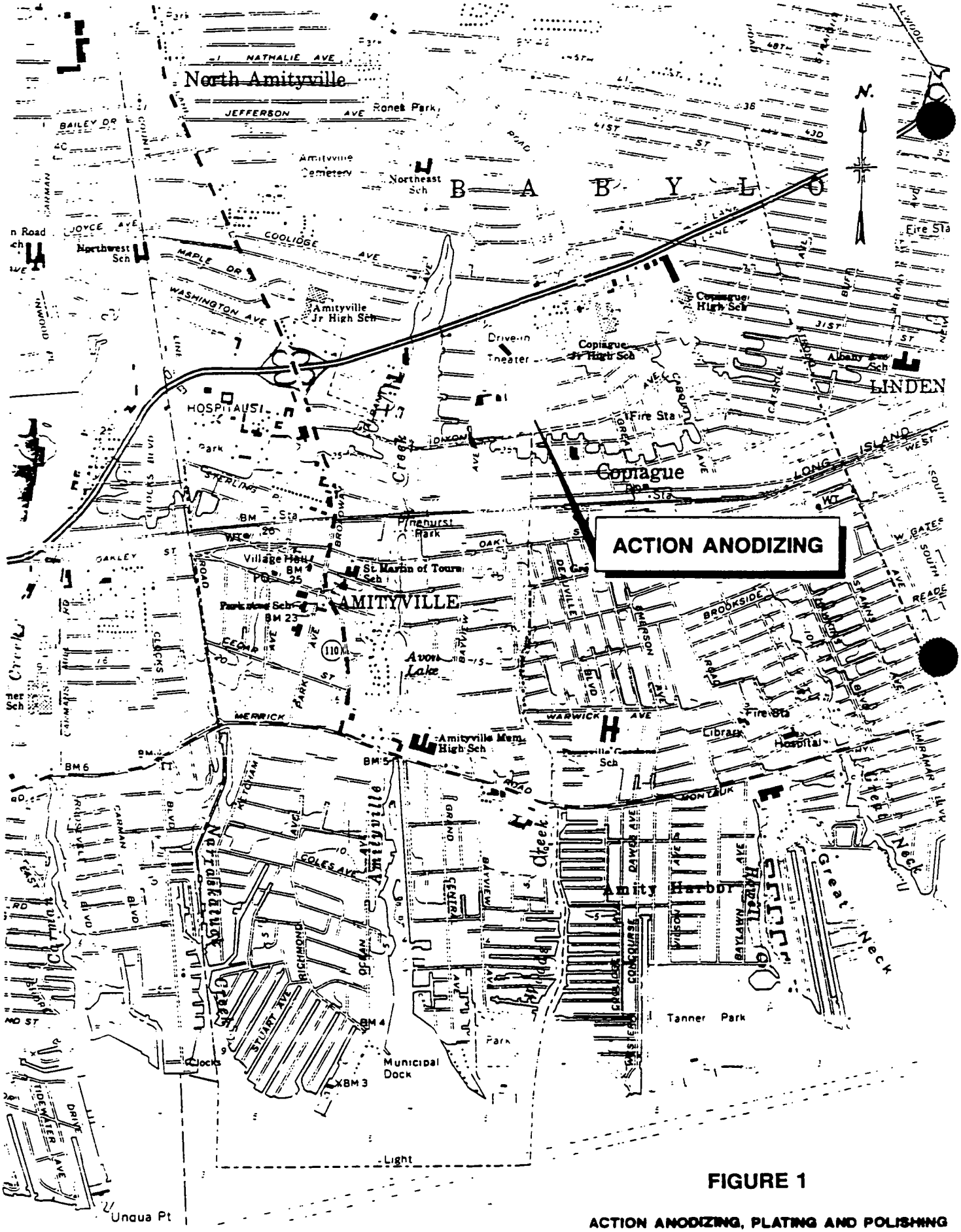

FIGURE 1

ACTION ANODIZING, PLATING AND POLISHING

SITE LOCATION MAP

SCALE: 1" = 2000'

MALCOLM PIRNIE

SOURCE: USGS AMITYVILLE QUADRANGLE

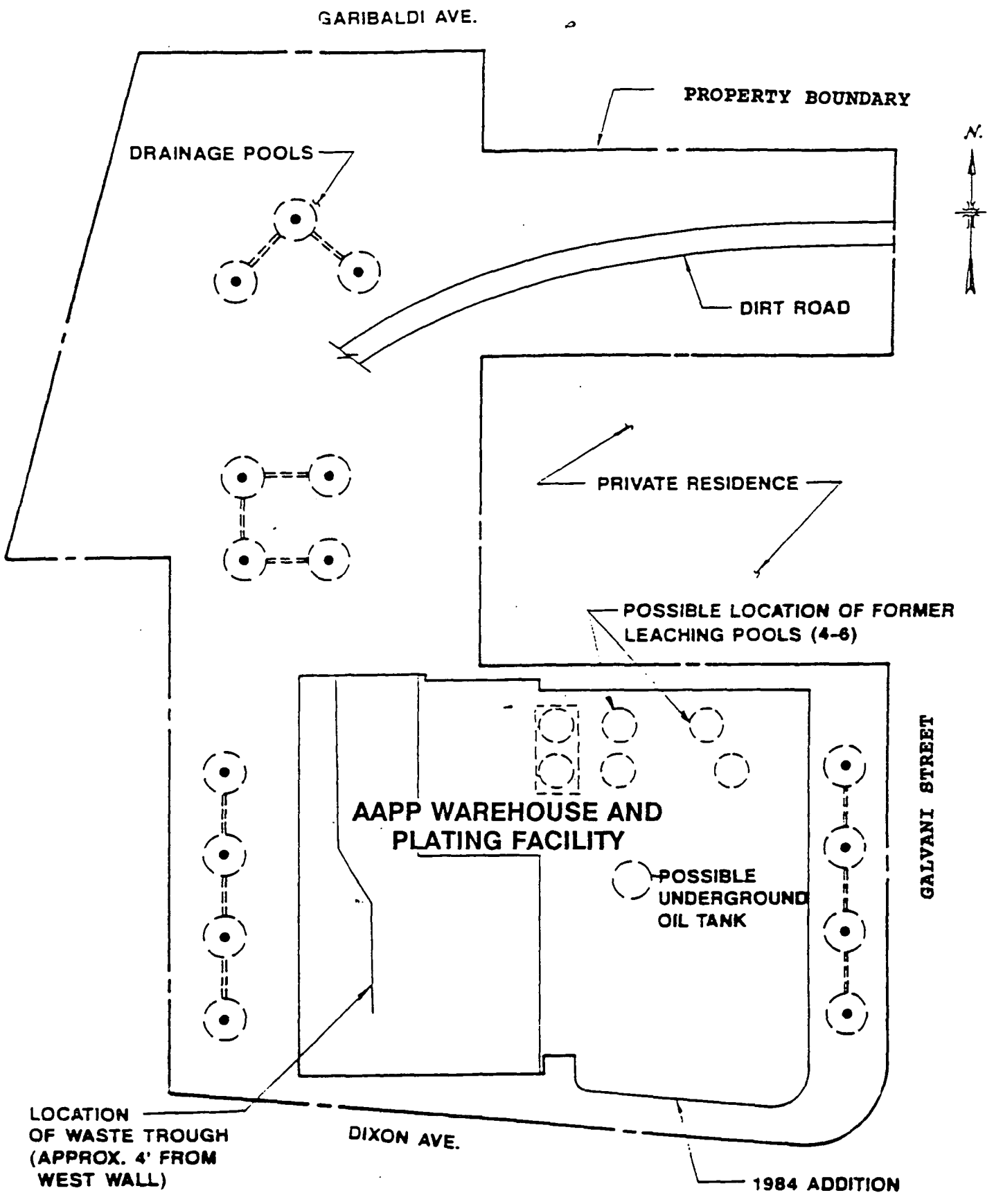

FIGURE 2

ACTION ANODIZING, PLATING AND POLISHIN

EXISTING SITE PLAN 1989

APPROXIMATE SCALE: 1"=33'

MALCOLM PIRNIE

LEGEND

- • SS-14 — SURFACE SOIL SAMPLE LOCATIONS
- ⊕ MW-3 — MONITORING WELL LOCATIONS
- ∘1 — INDOOR SOIL BORING LOCATIONS
- + DP-2 — DRAINAGE POOL SAMPLE LOCATIONS

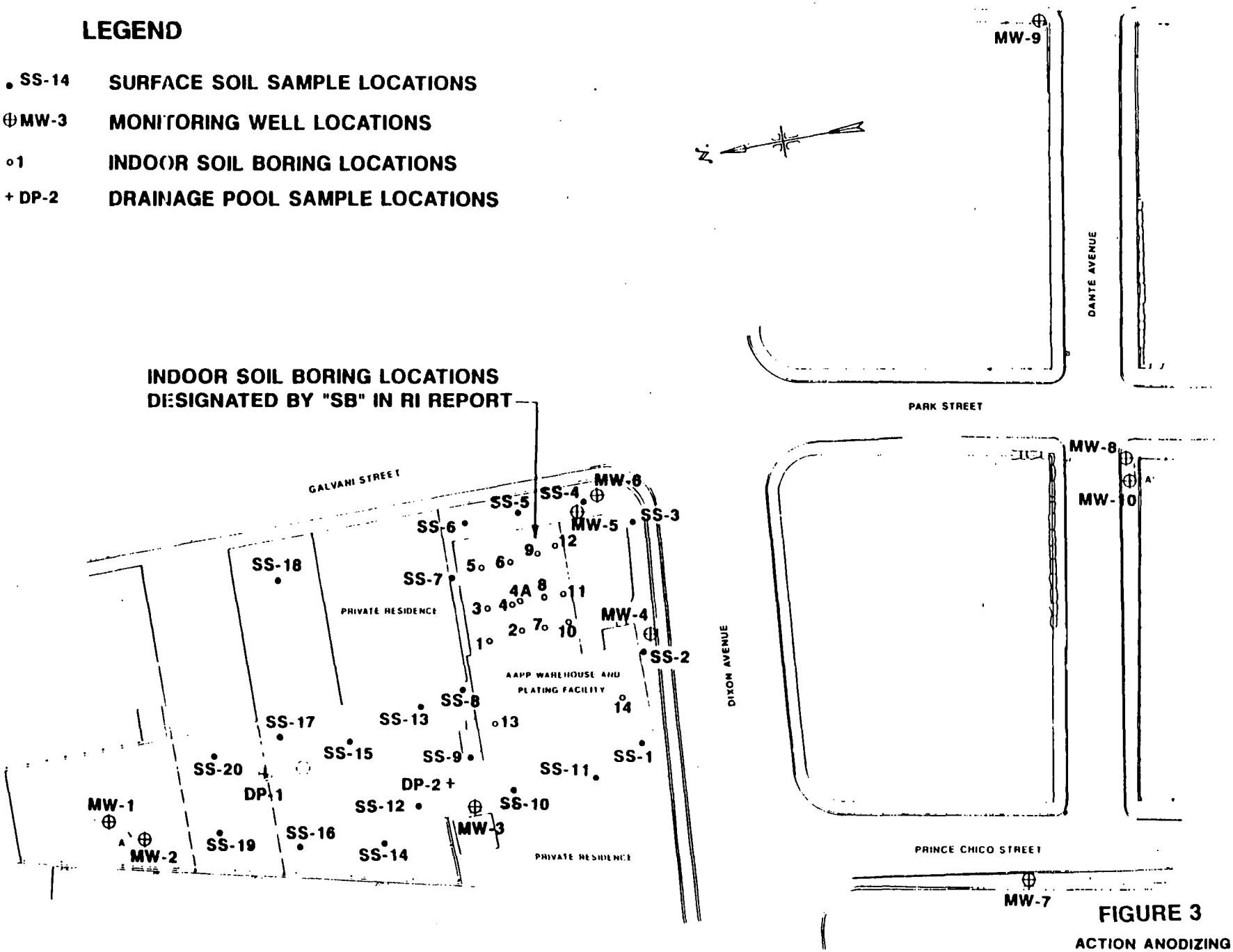

FIGURE 3

ACTION ANODIZING

SAMPLING LOCATIONS

NOT TO SCALE

MALCOLM PIRNIE

APPENDIX II

TABLES

TABLE 1

GROUND WATER DATA
ACTION ANODIZING PLATING & POLISHING

CHEMICAL	FREQUENCY and RANGE of DETECTION						ARARs			OTHER CRITERIA	CARCINOGEN CLASS	POTENTIAL CONCERN
	Up-site		On-site		Down-site		USEPA MCLs	USEPA pMCLs	NYSDOH MCLs	NYSDEC GWQS		
	Frequency	Range (µg/L)	Frequency	Range (µg/L)	Frequency	Range (µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(ORAL)	
VOLATILE ORGANICS												
Acetone	0/4		2/8	4J - 5	2/8	3J			50		D	YES
Benzene	0/4		1/8	2J	0/8		5	5	5	0.7	A	YES
2-Butanone	0/4		1/8	15	0/8				50		D	YES
Carbon Disulfide	1/4	44	1/8	1J	1/8	12			50			YES
1,1-Dichloroethane	0/4		1/8	2J	0/8				5	5	C	YES
Ethylbenzene	0/4		1/8	8J	1/8	4J	700	700	5	5	D	YES
Tetrachloroethene	0/4		2/8	1J	0/8				5		B2	YES
Toluene	0/4		1/8	39	1/8	14	1000	2000	5	5	D	YES
1,1,1-Trichloroethane	1/4	2J	4/8	1J - 4J	4/8	1J - 2J	200	200	5	5	D	YES
Xylenes (total)	0/4		1/8	46	1/8	20	10000	10000	5	5	D	YES
SEMI-VOLATILES												
Bis(2-ethylhexyl)phthalate	0/4		2/8	2J - 1400	2/8	3.6J - 5.4J			50	50	B2	
PESTICIDES												
Heptachlor	0/2		1/8	0.042J	1/8	0.046J	0.4	0.4	5		B2	
INORGANICS												
Aluminum	4/4	1270 - 3050	8/8	458 - 25800	8/8	496 - 9770						
Arsenic	0/4		2/8	5.4J - 6.6J	2/8	2.1J - 3J	50	10/5	50	25	A	YES
Barium	4/4	24.6J - 64.3J	8/8	18.2 - 106J	8/8	10J - 74.2J	1000(2000)*		1000	1000		
Cadmium	1/4	2J	3/8	2.3J - 4.1J	0/8		10	5	10	10		
Calcium	4/4	14900 - 3320	8/8	13300 - 5840	8/8	11200 - 40400						
Chromium	4/4	11.4 - 555	8/8	3.1J - 67.5	8/8	3.2J - 96.5	50(100)**		50	50		YES
Cobalt	4/4	4.5J - 9J	5/8	5.9J - 47J	1/8	13.7J						
Copper	4/4	13.3J - 47.1	6/8	7J - 27.5	6/8	5.2J - 42.5	1300	1300	1000(s)	200	D	

TABLE 1 (CONT'D)

GROUND WATER DATA

ACTION ANODIZING PLATING & POLISHING

CHEMICAL	FREQUENCY and RANGE of DETECTION						ARARs			OTHER CRITERIA	CARCINOGEN CLASS	POTENTIAL CONCERN
	Up-site		On-site		Down-site		USEPA	USEPA	NYSDOH	NYSDEC		
	Frequency	Range (µg/L)	Frequency	Range (µg/L)	Frequency	Range (µg/L)	MCLs (µg/L)	pMCLs (µg/L)	MCLs (µg/L)	GWQS (µg/L)	(ORAL)	
Iron	4/4	1940 - 4090	8/8	586 - 26200	8/8	1040 - 19800	300(s)			300		
Lead	3/3	4.4 - 12.2	5/5	2.2J - 26.2	8/8	3.9 - 13.2	50(15)***		50	25	B2	YES
Magnesium	4/4	2790 - 7390	8/8	2510J - 9550	8/8	2250J - 4900J				300		
Manganese	4/4	318 - 1340	8/8	105 - 1780	8/8	133 - 2210	50(s)	100	90(s)	300	D	
Nickel	3/4	24.9J - 489	8/8	6.6J - 54.4	5/8	7.1J - 76.7		100			D	
Potassium	4/4	2500J - 5380	8/8	2410J - 11600	8/8	1770J - 7300				20000		
Silver	0/4		0/8		1/8	61.3	50			50	D	
Sodium	4/4	6460 - 31700	8/8	8750 - 35100	8/8	7400 - 42000				20000		
Thallium	0/4		0/8		1/8	2.2J		2/1			D	
Vanadium	2/4	4.4J - 6.1J	5/8	5J - 45.3J	4/8	3.6J - 23.2J		200				
Zinc	2/2	31.4 - 57.9	7/7	14.2J - 1130	5/5	17J - 109	5000 (s)		5000(s)	300	D	

NOTES:

ARARs = Applicable or relevant and appropriate requirements

USEPA MCL = Federal Safe Drinking Water Act Maximum Contaminant Level

NYSDOH MCL = State Safe Drinking Water Act Maximum Contaminant Level

NYSDEC GWQS = State Water Quality Standards for Ground Water, Class 6A

J = estimated value; compound present below CRDL but above IDL

p = proposed criteria

s = secondary criteria

* Federal MCL for barium, 2000 ug/L, effective 12/7/92

** Federal MCL for chromium, 50 ug/L, effective 7/30/92

*** Federal MCL for lead, 15 ug/L, effective 12/7/92

WEIGHT OF EVIDENCE CLASSIFICATION

A = human carcinogen

B1 = probable human carcinogen, limited human data

B2 = probable human carcinogen, sufficient evidence in animals or no evidence in humans

C = possible human carcinogen

D = not classified as to carcinogenicity

ND = Not determined

- UP-SITE wells include MW1 and MW2
- ON-SITE wells include MW3, MW4, MW5 and MW6
- DOWN-SITE wells include MW7, MW8, MW9 and MW10

TABLE 2

SURFACE SOILS DATA
ACTION ANODIZING PLATING & POLISHING

CHEMICAL	FREQUENCY OF DETECTION	RANGE OF DETECTED FREQUENCY (mg/kg)	OTHER CRITERIA			USEPA CARCINOGEN CLASS (ORAL)	POTENTIAL CONCERN
			USEPA (1) (mg/kg)	BACKGROUND COMPOSITION OF U.S. SOILS			
				TYPICAL (2) (mg/kg)	SANDY (3) (mg/kg)		
PESTICIDES							
4,4 DDD	7/20	0.018 - 0.160	3			B2	
4,4 DDE	3/20	0.054 - 0.150	2			B2	
4,4 DDT	15/20	0.019 - 0.460	2			B2	
Alpha-Chlordane	1/20	0.470J					
Gamma-Chlordane	1/20	0.530J					
INORGANICS							
Aluminum	20/20	3900 - 6600		10000 - 300000	0.45 - 10		
Arsenic	20/20	1.5J - 3.7	80	0.1 - 40	0.1 - 30	A	YES
Barium	20/20	21.6J - 97.1	4000	100 - 3000	20 - 1500		
Beryllium	5/20	0.21J - 0.47J	0.2	0.01 - 40	1 - 3	B2	
Cadmium	18/20	0.79J - 29.4	40	0.01 - 2			YES
Calcium	20/20	385J - 19300		700 - 500000			
Chromium	20/20	7.1 - 74.8	400	5 - 1500	3 - 200		
Cobalt	20/20	1.3J - 3.3J		0.05 - 0.65	0.4 - 20		
Copper	20/20	8.4 - 63.6		2 - 250	1 - 70	D	
Iron	20/20	5880 - 11100		2000 - 550000			
Lead	18/18	29.7 - 235	500 - 1000(4)	2 - 300	<10 - 70	B2	
Magnesium	20/20	582J - 1920		400 - 9000			
Manganese	20/20	39.1 - 109		20 - 10000	7 - 2000	D	
Mercury	14/20	0.09 - 0.57	20	0.01 - 0.5	0.01 - 0.54		
Nickel	20/20	3.6J - 16.2	2000	2 - 750	5 - 70		
Potassium	20/20	209J - 641J		8G - 37000			

TABLE 2 (CONT'D)

SURFACE SOILS DATA

ACTION ANODIZING PLATING & POLISHING

CHEMICAL	FREQUENCY OF DETECTION	RANGE OF DETECTED FREQUENCY (mg/kg)	OTHER CRITERIA			USEPA CARCINOGEN CLASS (ORAL)	POTENTIAL CONCERN
			USEPA (1) (mg/kg)	BACKGROUND COMPOSITION OF U.S. SOILS			
				TYPICAL (2) (mg/kg)	SANDY (3) (mg/kg)		
PESTICIDES							
4,4 DDD	7/20	0.018 - 0.160	3			B2	
4,4 DDE	3/20	0.054 - 0.150	2			B2	
4,4 DDT	15/20	0.019 - 0.460	2			B2	
Alpha-Chlordane	1/20	0.470J					
Gamma-Chlordane	1/20	0.530J					
INORGANICS							
Aluminum	20/20	3900 - 6600		10000 - 300000	0.45 - 10		
Arsenic	20/20	1.5J - 3.7	80	0.1 - 40	0.1 - 30	A	YES
Barium	20/20	21.6J - 97.1	4000	100 - 3000	20 - 1500		
Beryllium	5/20	0.21J - 0.47J	0.2	0.01 - 40	1 - 3	B2	
Cadmium	18/20	0.79J - 29.4	40	0.01 - 2			YES
Calcium	20/20	385J - 19300		700 - 500000			
Chromium	20/20	7.1 - 74.8	400	5 - 1500	3 - 200		
Cobalt	20/20	1.3J - 3.3J		0.05 - 0.65	0.4 - 20		
Copper	20/20	8.4 - 63.6		2 - 250	1 - 70	D	
Iron	20/20	5880 - 11100		2000 - 550000			
Lead	18/18	29.7 - 235	500 - 1000(4)	2 - 300	<10 - 70	B2	
Magnesium	20/20	582J - 1920		400 - 9000			
Manganese	20/20	39.1 - 109		20 - 10000	7 - 2000	D	
Mercury	14/20	0.09 - 0.57	20	0.01 - 0.5	0.01 - 0.54		
Nickel	20/20	3.6J - 16.2	2000	2 - 750	5 - 70		
Potassium	20/20	209J - 641J		80 - 37000			

TABLE 2 (CONT'D)

SURFACE SOILS DATA
ACTION ANODIZING PLATING & POLISHING

CHEMICAL	FREQUENCY OF DETECTION	RANGE OF DETECTED FREQUENCY (mg/kg)	OTHER CRITERIA			USEPA CARCINOGEN CLASS (ORAL)	POTENTIAL CONCERN
			USEPA (1) (mg/kg)	BACKGROUND COMPOSITION OF U.S. SOILS			
				TYPICAL (2) (mg/kg)	SANDY (3) (mg/kg)		
Selenium	3/20	0.76J - 1.6		0.1 - 2.0	0.005 - 3.5		
Sodium	20/20	40.4J - 114J		150 - 25000			
Vanadium	20/20	8.5J - 17.9		3 - 500	7 - 150		
Zinc	2/2	73 - 186		1 - 900		D	
Cyanide	2/20	1.4 - 2.4				D	

NOTES:

J - estimated value; compound present below CRDL but above IDL

WEIGHT OF EVIDENCE CLASSIFICATION

A = human carcinogen

B1 = probable human carcinogen, limited human data

B2 = probable human carcinogen, sufficient evidence in animals or no evidence in humans

C = possible human carcinogen

D = not classified as to carcinogenicity

(1) USEPA proposed Corrective Action Level, 1990

(2) Bodek et al., 1988

(3) Kabata-Pendias and Pendias, 1984

TABLE 3

ACTION ANODIZING SITE - LONG ISLAND
PHOTOVAC GC/PID EPA/ERT SOIL GAS SURVEY RESULTS
SEPTEMBER 11, 1989
CONCENTRATION PPBv

Sample ID	Location	Run #	VC (1)	1,1-DCE (2)	t-1,2-DCE (3)	TCE (4)	PCE (5)	Benzene	Toluene	Total Organics
0801	SG-10	153	ND	ND	ND	1.45*	28.93	ND	ND	70.67
1202	SG-01	155	I	ND	ND	ND	379.39	ND	ND	450.00
1203	SG-2	149	ND	ND	ND	3.19*	12.31	ND	ND	78.67
1204	SG-3	144	ND	8.23*	30.0	ND	21.97	ND	1.49*	49.39
1205	SG-4	142	ND	ND	ND	54.8	3.50*	9.83*	1.67*	72.98
1206	SG-5	148	ND	ND	19.0	72.46	750.68	2.11*	2.11*	582.52
1207	SG-6	147	I	ND	ND	ND	362.3	ND	ND	448.67
1207 DUP	SG-6	157	I	ND	ND	ND	350.83	ND	ND	418.33
1208	SG-7	159	18.1	34.38	ND	ND	86.27	ND	ND	198.67
1209	AMB> AIR	151	ND	ND	ND	ND	ND	ND	ND	30.1
1210	SG-9	153	ND	ND	ND	13.40	320.4	ND	ND	42.,94

ND: *Not Detected*
BMDL: Below Method Detection Limit (10 PPBv) Total Organics quantitated as benzene.
I: Interference with resolution and quantitation of target compounds due to possible coelution of other materials.
*: Numbers are below MDL (10 PPBv) and are provided for comparison reasons.
(1): Vinyl Chloride
(2): 1,1-Dichlorothylene
(3): Trans 1,2-Dichloroethylene
(4): Trichloroethylene
(5): Tetrachloroethylene

TABLE 4

SUMMARY OF CHEMICALS OF POTENTIAL CONCERN
IN ALL MEDIA SAMPLED

ACTION ANODIZING PLATING & POLISHING

Chemical	*Range of Concentrations* Surface Soil (mg/kg)	Ground Water (ug/l)
VOLATILE ORGANICS		
Acetone		3J - 5
Benzene		2J
2-Butanone		1J
Carbon Disulfide		1J - 12
1,1-Dichloroethane		2J
Ethylbenzene		4J - 8J
Tetrachloroethene		1J
Toluene		14 - 39
1,1,1-Trichloroethane		1J - 4J
Xylenes (total)		20 - 46
INORGANICS		
Arsenic	1.5J - 3.7	2.1J - 6.6J
Cadmium	0.79J - 29.4	2.3J - 4.1J
Chromium		3.1J - 96.5
Lead		2.2J - 26.2

J = estimated value; compound present below contract-required detection limit but above instrument detection limit

TABLE 5

SUMMARY OF COMPLETE EXPOSURE PATHWAYS

ACTION ANODIZING PLATING & POLISHING

Potentially Exposed Population	Exposure Route, Medium and Exposure Point	Pathway Selected for Evaluation?	Reason for Selection or Exclusion
Current Uses			
Workers	Ingestion of and dermal contact with chemicals of potential concern in soil.	Yes	Contaminated soil is in an area potentially used by workers.
Trespassers	Ingestion of and dermal contact with chemicals of potential concern in soil.	Yes	Contaminated soil may be encountered by trespassers.
Future Uses			
Workers	Ingestion of chemicals of potential concern in ground water.	Yes	Ground water could be used as a source for the public water supply.
Workers	Dermal contact with and inhalation of chemicals from ground water.	No	Uncertain exposure parameters.
Residents	Ingestion of and dermal contact with chemicals of potential concern in soil	Yes	Site could be developed in the future as a residential area.
Residents	Ingestion of, dermal contact with and inhalation of chemicals of potential concern in ground water	Yes	Chemicals of potential concern have been identified in ground water.

TABLE 6

SUMMARY OF CHRONIC NONCARCINOGENIC HAZARD INDEX ESTIMATES

ACTION ANODIZING PLATING & POLISHING

	Chemical	CDI (mg/kg-day)	CDI Adjusted for Absorption	RfD (mg/kg-day)	Hazard Quotient	Pathway Hazard Index
CURRENT LAND USE SCENARIO						
WORKERS: Ingestion of and dermal contact with chemicals in soil						
Ingestion	Arsenic	1.43E-06	NO	3.00E-04	4.77E-03	
	Cadmium	9.49E-06	NO	1.00E-03	9.49E-03	1.43E-02
Dermal contact	Arsenic	3.41E-07	YES	2.85E-04	1.20E-03	
	Cadmium	2.26E-07	YES	2.50E-05	9.04E-03	1.02E-02
TOTAL EXPOSURE HAZARD INDEX FOR WORKERS						2.45E-02
TRESPASSERS: Ingestion of and dermal contact with chemicals in soil						
Ingestion	Arsenic	1.33E-06	NO	3.00E-04	4.43E-03	
	Cadmium	8.15E-06	NO	1.00E-03	8.15E-03	1.26E-02
Dermal contact	Arsenic	1.59E-06	YES	2.85E-04	5.58E-03	
	Cadmium	9.74E-07	YES	2.50E-05	3.90E-02	4.45E-02
TOTAL EXPOSURE HAZARD INDEX FOR TRESPASSERS						5.71E-02

Reference Dose (RfD) - Ref.: Integrated Risk Information System (IRIS, 1991b)
Health Effects Assessment Summary Tables (HEAST, 1991a)

TABLE 6 (CONT'D)

SUMMARY OF CHRONIC NONCARCINOGENIC HAZARD INDEX ESTIMATES

ACTION ANODIZING PLATING & POLISHING

	Chemical	CDI (mg/kg-day)	CDI Adjusted for Absorption	RfD (mg/kg-day)	Hazard Quotient	Pathway Hazard Index
FUTURE LAND USE SCENARIO						
ADULT RESIDENT: Ingestion of chemicals in ground water						
	Acetone	1.37E-04	NO	1.00E-01	1.37E-03	
	Benzene	5.48E-05	NO	NA	—	
	2-Butanone	1.73E-04	NO	5.00E-02	3.46E-03	
	Carbon Disulfide	1.00E-04	NO	1.00E-01	1.00E-03	
	1,1-Dichloroethane	5.48E-05	NO	1.00E-01	5.48E-04	
	Ethylbenzene	9.81E-05	NO	1.00E-01	9.81E-04	
	Tetrachloroethene	2.74E-05	NO	1.00E-02	2.74E-03	
	Toluene	2.21E-04	NO	2.00E-01	1.11E-03	
	1,1,1-Trichloroethane	8.14E-05	NO	9.00E-02	9.04E-04	
	Xylenes (total)	2.60E-04	NO	2.00E+00	1.30E-04	
	Arsenic	9.21E-05	NO	3.00E-04	3.07E-01	
	Chromium	1.78E-03	NO	1.00E+00	1.78E-03	5.21E-01
ADULT RESIDENT: Dermal contact with chemicals in ground water						
	Acetone	3.99E-07	YES	1.00E-01	3.99E-06	
	Benzene	7.12E-06	YES	NA	—	
	2-Butanone	2.26E-06	YES	5.00E-02	4.52E-05	
	Carbon Disulfide	1.33E-05	YES	1.00E-01	1.33E-04	
	1,1-Dichloroethane	3.11E-06	YES	1.00E-01	3.11E-05	
	Ethylbenzene	3.43E-04	YES	1.00E-01	3.43E-03	
	Tetrachloroethene	1.91E-07	YES	1.00E-02	1.91E-05	
	Toluene	6.42E-04	YES	2.00E-01	3.21E-03	
	1,1,1-Trichloroethane	2.31E-05	YES	9.00E-02	2.57E-04	
	Xylenes (total)	2.39E-04	YES	2.00E+00	1.20E-04	
	Arsenic	1.34E-07	YES	2.85E-04	4.70E-04	
	Chromium	2.60E-06	YES	1.00E-02	2.60E-04	7.98E-03
ADULT RESIDENT: Inhalation of chemicals in ground water						
	Acetone	5.48E-05	NO	1.00E-01	5.48E-04	
	Benzene	2.19E-05	NO	NA	—	
	2-Butanone	6.90E-05	NO	9.00E-02	7.67E-04	
	Carbon Disulfide	4.00E-05	NO	2.90E-03	1.38E-02	
	1,1-Dichloroethane	2.19E-05	NO	1.00E-01	2.19E-04	
	Ethylbenzene	3.92E-05	NO	2.90E-01	1.35E-04	
	Tetrachloroethene	1.10E-05	NO	7.00E-02	1.57E-04	
	Toluene	8.82E-05	NO	5.70E-01	1.55E-04	
	1,1,1-Trichloroethane	3.25E-05	NO	3.00E-01	1.08E-04	
	Xylenes (total)	1.04E-04	NO	8.60E-02	1.21E-03	1.71E-02
ADULT RESIDENTS: Ingestion of and dermal contact with chemicals in soil						
Ingestion	Arsenic	5.75E-06	NO	3.00E-04	1.92E-02	
	Cadmium	5.73E-05	NO	1.00E-03	5.73E-02	7.65E-02
Dermal contact	Arsenic	9.00E-07	YES	2.85E-04	3.16E-03	
	Cadmium	8.97E-07	YES	2.50E-05	3.59E-02	3.90E-02
TOTAL EXPOSURE HAZARD INDEX FOR RESIDENTS - ADULT						4.62E-01

TABLE 6 (CONT'D)

SUMMARY OF CHRONIC NONCARCINOGENIC HAZARD INDEX ESTIMATES

ACTION ANODIZING PLATING & POLISHING

	Chemical	CDI (mg/kg-day)	CDI Adjusted for Absorption	RfD (mg/kg-day)	Hazard Quotient	Pathway Hazard Index
FUTURE LAND USE SCENARIO						
CHILD RESIDENT:	Ingestion of chemicals in ground water					
	Acetone	3.20E-04	NO	1.00E-01	3.20E-03	
	Benzene	1.28E-04	NO	NA	—	
	2-Butanone	4.03E-04	NO	5.00E-02	8.06E-03	
	Carbon Disulfide	2.33E-04	NO	1.00E-01	2.33E-03	
	1,1-Dichloroethane	1.28E-04	NO	1.00E-01	1.28E-03	
	Ethylbenzene	2.29E-04	NO	1.00E-01	2.29E-03	
	Tetrachloroethene	6.39E-05	NO	1.00E-02	6.39E-03	
	Toluene	5.15E-04	NO	2.00E-01	2.58E-03	
	1,1,1-Trichloroethane	1.90E-04	NO	9.00E-02	2.11E-03	
	Xylenes (total)	6.06E-04	NO	2.00E+00	3.03E-04	
	Arsenic	2.15E-04	NO	3.00E-04	7.17E-01	
	Chromium	4.16E-03	NO	1.00E+00	4.16E-03	7.49E-01
CHILD RESIDENT:	Dermal contact with chemicals in ground water					
	Acetone	6.69E-07	YES	1.00E-01	6.69E-06	
	Benzene	1.20E-05	YES	NA	—	
	2-Butanone	3.80E-06	YES	5.00E-02	7.60E-05	
	Carbon Disulfide	2.23E-05	YES	1.00E-01	2.23E-04	
	1,1-Dichloroethane	5.22E-06	YES	1.00E-01	5.22E-05	
	Ethylbenzene	5.75E-04	YES	1.00E-01	5.75E-03	
	Tetrachloroethene	3.21E-07	YES	1.00E-02	3.21E-05	
	Toluene	1.08E-03	YES	2.00E-01	5.40E-03	
	1,1,1-Trichloroethane	3.89E-05	YES	9.00E-02	4.32E-04	
	Xylenes (total)	4.01E-04	YES	2.00E+00	2.01E-04	
	Arsenic	2.25E-07	YES	2.85E-04	7.89E-04	
	Chromium	4.36E-06	YES	1.00E-02	4.36E-04	1.34E-02
CHILD RESIDENT:	Inhalation of chemicals in ground water					
	Acetone	3.41E-04	NO	1.00E-01	3.41E-03	
	Benzene	1.36E-04	NO	NA	—	
	2-Butanone	4.30E-04	NO	9.00E-02	4.78E-03	
	Carbon Disulfide	2.49E-04	NO	2.90E-03	8.59E-02	
	1,1-Dichloroethane	1.36E-04	NO	1.00E-01	1.36E-03	
	Ethylbenzene	2.44E-04	NO	2.90E-01	8.41E-04	
	Tetrachloroethene	6.82E-05	NO	7.00E-02	9.74E-04	
	Toluene	5.49E-04	NO	5.70E-01	9.63E-04	
	1,1,1-Trichloroethane	2.03E-04	NO	3.00E-01	6.77E-04	
	Xylenes (total)	6.46E-04	NO	8.60E-02	7.51E-03	1.06E-01
CHILD RESIDENT:	Ingestion of and dermal contact with chemicals in surface soils					
Ingestion	Arsenic	3.77E-05	NO	3.00E-04	1.26E-01	
	Cadmium	3.76E-04	NO	1.00E-03	3.76E-01	5.02E-01
Dermal contact	Arsenic	8.72E-06	YES	2.85E-04	3.06E-02	
	Cadmium	8.69E-06	YES	2.50E-05	3.48E-01	3.78E-01
TOTAL EXPOSURE HAZARD INDEX FOR RESIDENTS - CHILD						1.75E+00

TABLE 6 (CONT'D)

SUMMARY OF CHRONIC NONCARCINOGENIC HAZARD INDEX ESTIMATES

ACTION ANODIZING PLATING & POLISHING

	Chemical	CDI (mg/kg-day)	CDI Adjusted for Absorption	RfD (mg/kg-day)	Hazard Quotient	Pathway Hazard Index
FUTURE LAND USE SCENARIO						
WORKER: Ingestion of chemicals in ground water						
	Acetone	4.89E-05	NO	1.00E-01	4.89E-04	
	Benzene	1.96E-05	NO	NA	—	
	2-Butanone	6.16E-05	NO	5.00E-02	1.23E-03	
	Carbon Disulfide	3.57E-05	NO	1.00E-01	3.57E-04	
	1,1-Dichloroethane	1.96E-05	NO	1.00E-01	1.96E-04	
	Ethylbenzene	3.50E-05	NO	1.00E-01	3.50E-04	
	Tetrachloroethene	9.78E-06	NO	1.00E-02	9.78E-04	
	Toluene	7.88E-05	NO	2.00E-01	3.94E-04	
	1,1,1-Trichloroethane	2.91E-05	NO	9.00E-02	3.23E-04	
	Xylenes (total)	9.28E-05	NO	2.00E+00	4.64E-05	
	Arsenic	3.29E-05	NO	3.00E-04	1.10E-01	
	Chromium	6.37E-04	NO	1.00E+00	6.37E-04	1.15E-01
WORKER: Ingestion of and dermal contact with chemicals in soil						
Ingestion	Arsenic	1.43E-06	NO	3.00E-04	4.77E-03	
	Cadmium	9.49E-06	NO	1.00E-03	9.49E-03	1.43E-02
Dermal contact	Arsenic	3.41E-07	YES	2.85E-04	1.20E-03	
	Cadmium	2.26E-07	YES	2.50E-05	9.04E-03	1.02E-02
TOTAL EXPOSURE HAZARD INDEX FOR WORKERS						1.39E-01

NOTE: RfD for dermal exposure pathways are adjusted for absorption as follows:

RfD * ABS = AdjRfD

Where ABS = 0.95 for arsenic (ATSDR, 1989)
0.025 for dietary intake of cadmium (USEPA, 1992b)
0.05 for chromium (III) (Carson et al., 1986)
1.00 for volatile organic chemicals (default)

NA = Not available

TABLE 7

SUMMARY OF CANCER RISK ESTIMATES

ACTION ANODIZING PLATING & POLISHING

	Chemical	CDI (mg/kg-day)	CDI Adjusted for Absorption	Slope Factor (mg/kg-day)-1	Chemical Specific Risk	Total Pathway Risk
CURRENT LAND USE SCENARIO						
WORKERS: Ingestion of and dermal contact with chemicals in soil						
Ingestion	Arsenic	5.12E-07	NO	1.80E+00	9.22E-07	9.22E-07
Dermal contact	Arsenic	1.22E-07	YES	1.89E+00	2.31E-07	2.31E-07
TOTAL EXPOSURE RISK FOR WORKERS						1.15E-06
TRESPASSERS: Ingestion of and dermal contact with chemicals in soil						
Ingestion	Arsenic	1.14E-07	NO	1.80E+00	2.05E-07	2.05E-07
Dermal contact	Arsenic	1.37E-07	YES	1.89E+00	2.59E-07	2.59E-07
TOTAL EXPOSURE RISK FOR TRESPASSERS						4.64E-07

NOTE: Slope factors (SF) for dermal exposure pathways are adjusted for absorption as follows:

SF/ABS = AdjSF

Where AB = 0.95 for arsenic (ATSDR, 1989)
= 1.00 for volatile organic chemicals (default)

NA = Not available

Slope Factor (SF) - Ref.: Integrated Risk Information System (IRIS, 1991b)
Health Effects Assessment Summary Tables (HEAST, 1991a)

TABLE 7 (CONT'D)

SUMMARY OF CANCER RISK ESTIMATES

ACTION ANODIZING PLATING & POLISHING

	Chemical	CDI (mg/kg-day)	CDI Adjusted for Absorption	Slope Factor (mg/kg-day)-1	Chemical Specific Risk	Total Pathway Risk
FUTURE LAND USE SCENARIO						
ADULT RESIDENT: Ingestion of chemicals in ground water						
	Benzene	2.35E-05	NO	2.90E-02	6.82E-07	
	1,1-Dichloroethane	2.35E-05	NO	NA	—	
	Tetrachloroethene	1.17E-05	NO	5.10E-02	5.97E-07	
	Arsenic	3.95E-05	NO	1.80E+00	7.11E-05	7.24E-05
ADULT RESIDENT: Dermal contact with chemicals in ground water						
	Benzene	3.05E-06	YES	2.90E-02	8.85E-08	
	1,1-Dichloroethane	1.33E-06	YES	NA	—	
	Tetrachloroethene	8.20E-08	YES	5.10E-02	4.18E-09	
	Arsenic	5.74E-08	YES	1.89E+00	1.08E-07	2.01E-07
ADULT RESIDENT: Inhalation of chemicals in ground water						
	Benzene	9.39E-06	NO	2.90E-02	2.72E-07	
	1,1-Dichloroethane	9.39E-06	NO	NA	—	
	Tetrachloroethene	4.70E-06	NO	1.80E-03	8.46E-09	2.81E-07
ADULT RESIDENTS: Ingestion of and dermal contact with chemicals in soil						
Ingestion	Arsenic	2.47E-06	NO	1.80E+00	4.45E-06	4.45E-06
Contact	Arsenic	3.86E-07	YES	1.89E+00	7.30E-07	7.30E-07
TOTAL EXPOSURE RISK FOR RESIDENTS - ADULTS						7.80E-05

NOTE: Slope factors (SF) for dermal exposure pathways are adjusted for absorption as follows:

SF/ABS = AdjSF

Where AB = 0.95 for arsenic (ATSDR, 1989)
= 1.00 for volatile organic chemicals (default)

NA = Not available

TABLE 7 (CONT'D)

SUMMARY OF CANCER RISK ESTIMATES

ACTION ANODIZING PLATING & POLISHING

	Chemical	CDI (mg/kg-day)	CDI Adjusted for Absorption	Slope Factor (mg/kg-day)-1	Chemical Specific Risk	Total Pathway Risk
FUTURE LAND USE SCENARIO						
CHILD RESIDENT:	Ingestion of chemicals in ground water					
	Benzene	1.10E-05	NO	2.90E-02	3.19E-07	
	1,1-Dichloroethane	1.10E-05	NO	NA	—	
	Tetrachloroethene	5.48E-06	NO	5.10E-02	2.79E-07	
	Arsenic	1.84E-05	NO	1.80E+00	3.31E-05	3.37E-05
CHILD RESIDENT:	Dermal contact with chemicals in ground water					
	Benzene	1.03E-06	YES	2.90E-02	2.99E-08	
	1,1-Dichloroethane	4.47E-07	YES	NA	—	
	Tetrachloroethene	2.75E-08	YES	5.10E-02	1.40E-09	
	Arsenic	1.93E-08	YES	1.89E+00	3.65E-08	6.77E-08
CHILD RESIDENT:	Inhalation of chemicals in ground water					
	Benzene	1.17E-05	NO	2.90E-02	3.39E-07	
	1,1-Dichloroethane	1.17E-05	NO	NA	—	
	Tetrachloroethene	5.84E-06	NO	1.80E-03	1.05E-08	3.50E-07
CHILD RESIDENTS:	Ingestion of and dermal contact with chemicals in surface soils					
Ingestion	Arsenic	3.23E-06	NO	1.80E+00	5.81E-06	5.81E-06
Dermal contact	Arsenic	7.48E-07	YES	1.89E+00	1.41E-06	1.41E-06
TOTAL EXPOSURE RISK FOR RESIDENTS - CHILD						4.14E-05

NOTE: Slope factors (SF) for dermal exposure pathways are adjusted for absorption as follows:

SF/ABS = AdjSF

Where AB = 0.95 for arsenic (ATSDR, 1989)
= 1.00 for volatile organic chemicals (default)

NA = Not available

TABLE 7 (CONT'D)

SUMMARY OF CANCER RISK ESTIMATES

ACTION ANODIZING PLATING & POLISHING

	Chemical	CDI (mg/kg-day)	CDI Adjusted for Absorption	Slope Factor (mg/kg-day)-1	Chemical Specific Risk	Total Pathway Risk
FUTURE LAND USE SCENARIO						
WORKER: Ingestion of chemicals in ground water						
	Benzene	6.99E-06	NO	2.90E-02	2.03E-07	
	1,1-Dichloroethane	6.99E-06	NO	NA	—	
	Tetrachloroethene	3.49E-06	NO	5.10E-02	1.78E-07	
	Arsenic	1.17E-05	NO	1.80E+00	2.11E-05	2.14E-05
WORKERS: Ingestion of and dermal contact with chemicals in soil						
Ingestion	Arsenic	5.12E-07	NO	1.80E+00	9.22E-07	9.22E-07
Dermal contact	Arsenic	1.22E-07	YES	1.89E+00	2.31E-07	2.31E-07
TOTAL EXPOSURE RISK FOR WORKERS						2.26E-05

NOTE: Slope factors (SF) for dermal exposure pathways are adjusted for absorption as follows:

SF/ABS = AdjSF

Where AB = 0.95 for arsenic (ATSDR, 1989)
= 1.00 for volatile organic chemicals (default)

NA = Not available

APPENDIX IV

NYSDEC LETTER OF CONCURRENCE

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233 -7010

Thomas C. Jorling
Commissioner

JUN 19 1992

Ms. Kathleen C. Callahan
Director
Office of Emergency and Remedial
Response
U.S. Environmental Protection Agency
Region II
26 Federal Plaza
New York, NY 10278

Dear Ms. Callahan:

Re: Action Anodizing ROD
Site ID #152037

We have reviewed the Draft Record of Decision for the Action Anodizing site and concur with the no-action alternative. We will require that the groundwater monitoring referred to in the ROD include volatile organics and metal analysis, and that it will be performed twice within the next year on monitoring wells 2, 4, 6 and 10.

If you have any questions regarding this matter, please contact Michael J. O'Toole, Jr., at (518) 457-5861.

Sincerely,

David Markell
Acting Deputy Commissioner