Site Management Plan for DSA-1

Appendix E, the Record of Decision and Appendix F, AsBuiltRecord Drawings are not included

| | |
|---|---|
| **From:** | "David Curtis" <David_Curtis@thruway.state.ny.us> |
| **To:** | jtspellm@gw.dec.state.ny.us |
| **CC:** | elizabeth_novak@thruway.state.ny.us; Cathy_Sheridan@thruway.state.ny.us |
| **Date:** | 9/9/2010 4:13 PM |
| **Subject:** | Re: DSA-1, Soil Management Plan, Utica Harbor (Appendix C and D) |
| **Attachments:** | Appendix C - Remedial Investigation Report.pdf; Appendix D - Pre-Design Investigation Report.pdf |

Here are Appendices C and D (Remedial Investigation and Pre-Design Reports for Utica Harbor DSA-1).

STATE OF NEW YORK: DEPARTMENT OF ENVIRONMENTAL CONSERVATION

| | |
|---|---|
| In the Matter of the Development and Implementation of the NMPC Harbor Point Former MGP Site Investigation and Remediation Program by | ORDER ON CONSENT Index # D6-0001-9210 |

Niagara Mohawk Power Corporation
Respondent

WHEREAS:

1. On September 28, 1989, Niagara Mohawk Power Corporation ("Respondent") consented to the issuance of an Order of the New York State Department of Environmental Conservation (the "Department") that requires Respondent to undertake a Supplemental Remedial Investigation/Feasibility Study of its property at Harbor Point in the City of Utica, Oneida County, New York (the "Site") (Index No. A6-0201-89-05; the "1989 Order"). In addition, on July 3, 1990, Respondent consented to the issuance of an Interim Order on Consent, Index # A6-0208-89-09, ("Interim Order") that required Respondent to undertake an Interim Remedial Measures ("IRM") Program at that property. On June 11, 1991, Respondent consented to the issuance of an amendment to the Interim Order, Index #A6-0260-91-04 ("Amendment One").

2. The Department's authority to issue the 1989 Order, the Interim Order, and Amendment One, and to issue amendments thereto, includes its varied authority, to require abatement and remediation of releases of, <u>inter alia</u>, hazardous substances as that term is defined in 42 U.S.C. 9601(14), including former manufactured gas plant wastes consisting of coal tar and associated hazardous substances ("MGP wastes"), that are in violation of law or that exceed State environmental quality standards (as those set forth in 6 NYCRR Part 703) ("hazardous substances"), which authority includes, but is not limited to, ECL 1-0101, 3-0301, 71-1929, 71-2703, and 71-2705; its power, <u>inter alia</u>, to provide for the prevention and abatement of all water, land, and air pollution caused by, <u>inter alia</u>, the release of hazardous substances into the environment [ECL 3-0301.1.i]; and its authority to require abatement and remediation of significant threats to the public health or the environment caused by threatened releases of hazardous substances that are hazardous wastes as that term is defined in ECL 27-1301.

3. (a) Respondent acknowledges the need to remediate the Site and to remediate the area around the Site contaminated with MGP wastes, to the extent the Department determines necessary to

protect the public health and the environment.

(b) By means of the 1989 Order, the Interim Order, and Amendment One, Respondent has begun the on-Site and off-Site remedial process by undertaking a Supplemental Remedial Investigation/Feasibility Study of the Site and its environs and by implementing an IRM Program. By this Order (which, for purposes of distinguishing it from the other Department Orders pertaining to the Site, shall be referred to as the "Blanket Amendment"), Respondent shall undertake to complete the remedial process, including undertaking a pilot study of innovative remedial alternatives for potential use at and around the Site (the "Pilot Study").

(c) The Department agrees with Respondent that the data generated during the course of the Pilot Study will be beneficial to both Respondent and the Department. However, the Department cannot fund the oversight of the activities necessary to undertake the Pilot Study. Respondent, desirous of carrying out the Pilot Study as expeditiously as practicable, is willing to pay the Department in advance the expenses the State of New York shall incur after the effective date of this Blanket Amendment in reviewing and revising submittals made pursuant to the 1989 Order, overseeing activities conducted pursuant to that Order, and collecting and analyzing samples.

(d) Hence, the Department and Respondent acknowledge that the goals of this Blanket Amendment are for Respondent: (i) to continue to investigate the area on and around the Site pursuant to the provisions of the 1989 Order as amended by this Blanket Amendment (which amendment shall include Respondent's undertaking of the Pilot Study); (ii) to evaluate alternative methods, including those addressed during the course of the Pilot Study, to remediate MGP waste contamination found off-Site attributable to Respondent's predecessor company, Utica Gas and Electric, and remediate on-Site contamination attributable to activities of Respondent and/or its predecessor company, Utica Gas and Electric; (iii) to implement a former MGP sites investigation and remediation program for the Site and for the areas off-Site determined to be contaminated with MGP wastes that shall include design and implementation of the selected remedial alternative, and operation, maintenance and monitoring of the selected remedial alternative ("Remedial Program"); (iv) to implement an IRM Program at and in the vicinity of the Site in accordance with the terms of the Interim Order, Amendment One, and this Blanket Amendment ("Supplemental IRM Program"); and (v) pay for the State's administrative and oversight costs associated with implementation of the 1989 Order, the Interim Order, Amendment One, and this Blanket Amendment.

(e) In order to implement the goals of this Blanket Amendment set forth in Subparagraph 3(d), the Department and

Respondent have agreed upon a three-part plan to address on-Site and off-Site contamination. The first part of the plan requires Respondent to implement certain prescribed Interim Remedial Measures; the second part requires Respondent to develop and implement measures to address off-Site migration of contaminants and to conduct the Pilot Study; and the third part requires Respondent to develop and implement measures to address comprehensive remediation, on-Site and off-Site, caused by hazardous substances attributable to Respondent or to its predecessor company, Utica Gas and Electric, in the context of which the results of the Pilot Study will be evaluated.

4. Respondent, having waived its right to a hearing herein as provided by law, and having consented to the issuance and entry of this Order, agrees to be bound by its terms. Respondent consents to and agrees not to contest the authority or jurisdiction of the Department to issue or enforce this Order; and agrees not to contest the validity of this Order or its terms.

NOW, having considered this matter and being duly advised, IT IS ORDERED THAT:

I. Amendment to the Interim Order and Amendment One

A. Except where specifically amended or modified in this Paragraph I and except as provided in Subparagraph III.D, the terms, conditions, obligations, and rights reserved under the Interim Order and Amendment One hereby remain unchanged and in full force and effect. Where Interim Order Paragraphs VI, VII, and VIII refer to an "IRM Program," they shall be deemed to refer to the Supplemental IRM Program when read in the context of the obligations to be carried out under this Paragraph I.

B. A Paragraph XXIV is hereby added to the Interim Order and Amendment One to read as follows:

> Within 15 days after the effective date of the Blanket Amendment, Respondent shall submit to the Department a Supplemental IRM Work Plan, the activities covered by which shall mitigate and/or control environmental exposures and releases at the Site and shall include the following IRMs:
>
> A. fencing off access to the Site and the Water Gas Plant property and Utica Terminal Harbor;
>
> B. placing signs and inspecting open areas to maintain security;
>
> C. eliminating or minimizing to the greatest extent practicable, exposures to people occupying or working on the Site and/or the Water Gas Plant by, *inter alia*,

remediating surface soils in and around the Niagara Mohawk Power Corporation equipment storage area, and developing a Health and Safety Program for all Niagara Mohawk Power Corporation and other utility personnel which may be excavating in areas of the Site; and

D. establishing deed restrictions requiring the continued maintenance of any remedial facilities by any transferee of affected portions of the Site and any portions of the Site not currently ownd by Respondent but as to which title is subsequently acquired.

The Supplemental IRM Work Plan shall be developed in accordance with the requirements of Paragraph III of the Interim Order and shall include a time schedule for all Supplemental IRM Program activities, including start and completion dates for each IRM activity.

C. A Paragraph XXV is hereby added to the Interim Order and Amendment One to read as follows:

The Department shall notify Respondent, in writing, of its approval or disapproval of the Supplemental IRM Work Plan. If the Department approves the Supplemental IRM Work Plan, Respondent shall perform the Supplemental IRM Program in accordance with it and the terms of the Interim Order, Amendment One, and Paragraph I of the Blanket Amendment.

If the Department disapproves the Supplemental IRM Work Plan, the Department shall notify Respondent in writing of the Department's objections. Within 45 days after receipt of the notice of disapproval, Respondent shall revise the Supplemental IRM Work Plan in accordance with the Department's specific comments and shall submit to the Department a revised Supplemental IRM Work Plan.

The Department shall notify Respondent in writing of its approval or disapproval of the revised Supplemental IRM Work Plan. If the Department approves the revised Supplemental IRM Work Plan, Respondent shall perform the Supplemental IRM Program in accordance with the Supplemental IRM Work Plan and the provisions of Paragraph I of the Blanket Amendment.

If the Department disapproves the revised Supplemental IRM Work Plan and the Department and Respondent cannot agree to the terms, conditions, and provisions of the revised Supplemental IRM Work Plan, Respondent shall be in violation of the Interim Order, Amendment One, and the Blanket Amendment unless it has invoked, within 10 days of receipt of the disapproval, the dispute resolution mechanism set forth in Paragraph IX of the Interim Order. If the procedure set forth in Paragraph IX is invoked, Respondent shall comply with the final determination of the Commissioner, failing which it shall be in violation of the Interim Order, Amendment One, and the Blanket Amendment. In such event, the Department shall pursue whatever remedies may be available to it at law or in equity.

The approved Supplemental IRM Work Plan shall be attached hereto and incorporated into this Order.

D. Paragraph X is hereby amended to read as follows:

Respondent shall pay for the State's expenses (including, but not limited to, direct labor and fringe benefits, overhead, travel, analytical costs, and contractor costs) incurred by the State of New York for funding of environmental monitors to oversee work associated with the Site to date, reviewing and revising submittals made pursuant to this Order, overseeing activities conducted pursuant to this Order, collecting and analyzing samples, and administering the requirements of this Order, in accordance with Paragraph XII of an Order of the Department issued in the matter of the Development and Implementation of a Former Manufactured Gas Plant (MGP) Sites Investigation and Remediation Program by Niagara Mohawk Power Corporation, Department Order Index No. D0-0001-9210.

## II. Amendment of the 1989 Order

A. Effective on the date of execution of this Blanket Amendment, Paragraph XI of the 1989 Order is hereby revised to read as follows:

### XI. Payment of State Costs

Respondent shall pay for the State's expenses (including, but not limited to, direct labor and fringe benefits, overhead, travel, analytical costs, and contractor costs) incurred by the State of New York for funding of environmental monitors to oversee work associated with the Site to date, reviewing and revising submittals made pursuant to this Order, overseeing activities conducted pursuant to this Order, collecting and analyzing samples, and administering the requirements of this Order, in accordance with Paragraph XII of an Order of the Department issued in the matter of the Development and Implementation of a Former Manufactured Gas Plant (MGP) Sites Investigation and Remediation Program by Niagara Mohawk Power Corporation, Department Order Index No. D0-0001-9210.

B. In implementing the Pilot Study, Respondent shall be exempt from the requirement to obtain any permit issuable by the Department for an activity that is conducted on the Site. For purposes of this Blanket Amendment, an activity is on the Site:

1. if it is conducted on the same premises as the Site, or

2. if it is conducted on different premises that are under common control; or that are contiguous to or physically connected with the Site; or that otherwise contain MGP wastes or other hazardous substances released from the Site that are attributable to Respondent, and the activity manages exclusively hazardous substances for which Respondent is liable; and

3. the activity satisfies all substantive technical requirements applicable to like activity conducted pursuant to a permit as determined by the Department.

C. Respondent's obligation to undertake and develop a Remedial Investigation and Feasibility Study is hereby revised to encompass all areas, whether on-Site or off-Site, where there are found MGP wastes and other hazardous substances attributable to Respondent or to its predecessor, Utica Gas and Electric. To implement this requirement, no later than 90 days after the effective date of this Blanket Amendment, Respondent shall submit a workplan to undertake the remedial investigation of off-Site areas not previously addressed under the 1989 Order (hereinafter called the "expanded Remedial Investigation"). The expanded Remedial Investigation's workplan shall address all elements of a Remedial Investigation/Feasibility Study as described in Paragraph III of the 1989 Order, and the Department shall review and approve it in accordance with the procedures set forth in Paragraph IV of the 1989 Order. In accordance with the schedule contained in the Department-approved expanded Remedial Investigation workplan, Respondent shall commence that expanded Remedial Investigation and shall perform the expanded Remedial Investigation in accordance with the Department-approved expanded Remedial Investigation workplan. During the performance of the expanded Remedial Investigation, Respondent shall have at the area that is the subject of the expanded Remedial Investigation a full-time representative who is qualified to supervise the work done. Respondent's designated representative may be a qualified employee of a consultant or contractor. In accordance with the schedule contained in the Department-approved expanded Remedial Investigation workplan, Respondent shall prepare a Remedial Investigation Report pertaining to that Site that shall address all areas, whether on-Site or off-Site, where there is found MGP wastes and other hazardous substances attributable to Respondent or to its predecessor, Utica Gas and Electric and that shall:

1. include all data generated and all other information obtained during the remedial investigation;

2. identify any additional data that must be collected; and

3. provide all of the assessments and evaluations set forth in the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 ("CERCLA") [42 U.S.C. 9601 et seq.], as amended; the National Contingency Plan ("NCP") of March 8, 1990 [40 CFR Part 300]; the USEPA guidance document entitled "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA," dated October 1988 and any subsequent revisions to that guidance document in effect at the time the RI/FS workplan is submitted; and

4. include a certification by the individual or firm with primary responsibility for the day to day performance of the expanded Remedial Investigation that all activities that comprised the expanded Remedial Investigation were performed in full accordance with the Department-approved expanded Remedial Investigation workplan.

D. No later than 120 days after completion of the Pilot Study or expanded Remedial Investigation, whichever is later, Respondent shall submit a Feasibility Study pertaining to on-Site and off-Site remediation not addressed in the engineering and evaluation report described in Subparagraph II.E of this Blanket Amendment. Review of such Feasibility Study shall be undertaken in accordance with Subparagraph III.E of this Blanket Amendment.

E. No later than 180 days after the effective date of this Blanket Amendment and based upon the information contained in the draft document entitled, "Supplemental Remedial Investigation Report," dated December 30, 1991 submitted by Respondent through its consultant, Atlantic Environmental Services, Inc., Respondent shall submit to the Department an engineering and evaluation report pertaining to interim remedial measures to minimize release of contamination off-Site to the Mohawk River and Utica Terminal Harbor from surface soil, groundwater, and surface water contaminated with MGP wastes or other hazardous substances attributable to Respondent or its predecessor, Utica Gas and Electric. Review of such report shall be undertaken in accordance with Subparagraph III.E of this Blanket Amendment, and Respondent shall undertake interim remedial measures in accordance with the time schedule contained in the Department-approved engineering and evaluation report.

F. All other terms, conditions, obligations, and rights reserved under the 1989 Order shall remain unchanged and in full force and effect.

## III. Remedial Program

### A. Public Participation

Within 30 days after the Department's approval of the Feasibility Study described in Subparagraph II.D of this Blanket Amendment, Respondent shall cooperate and assist the Department in soliciting public comment on the RI/FS and the proposed remedial action plan identified therein, and in preparing responses to comments received, in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 ("CERCLA") [42 U.S.C. 9601 et seq.], as amended; the National Contingency Plan ("NCP") of March 8, 1990 [40 CFR Part 300]; the USEPA guidance document entitled "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA," dated October 1988 and any subsequent revisions to that guidance document in effect at the time the RI/FS workplan is submitted; and appropriate USEPA and Department policy and guidance documents in effect at the time the public comment period is initiated. After the close of the public comment period, the Department shall select a final remedial alternative in a Record of Decision ("ROD"). The ROD shall be incorporated into and become an enforceable part of this Order.

### B. Remedial Design

1. Unless the ROD selects the "no action" alternative for a component, within 60 days after the ROD is signed, Respondent shall submit to the Department a remedial design workplan, containing a schedule for implementation of the remedial design workplan, in accordance with Interim Final Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties (April 1990), to implement the remedial alternative selected by the Department in that ROD. The remedial design workplan shall include a schedule for development and submission to the Department of a Remedial Design that is consistent with the remedial alternative selected by the Department in that ROD. The Remedial Design workplan, and the Remedial Design, shall be prepared by a professional engineer who shall certify under signature and seal that it was prepared in accordance with this Blanket Amendment.

2. The Remedial Design shall include the following:

a. A detailed description of the remedial objectives and the means by which each essential element of the selected remedial alternative will be implemented to achieve those objectives, including, but not limited to:

i. the construction and operation of any structures;

ii. the collection, destruction, treatment, and/or disposal of hazardous wastes and substances and their constituents and degradation products, and of any soil or other materials contaminated thereby;

iii. the collection, destruction, treatment, and/or disposal of contaminated surface water, groundwater, leachate, and air;

iv. physical security and posting of the Site;

v. health and safety of persons living and/or working at or in the vicinity of the Site;

vi. quality control and quality assurance procedures and protocols to be applied during implementation of the Remedial Design; and

vii. monitoring which integrates needs which are present on-Site and off-Site during implementation of the Department-selected remedial alternative and for a specified number of years after construction of the Remedial Design has been approved by the Department, including a schedule for periodic sampling of on-Site and off-Site groundwater monitoring wells;

b. "Biddable Quality" documents for the Remedial Design including, but not limited to, documents and specifications prepared, signed, and sealed by a professional engineer. These plans shall satisfy all applicable local, state and federal laws, rules and regulations;

c. A time schedule to implement the Remedial Design;

d. A construction Quality Control/Quality Assurance Plan developed in accordance with EPA Technical Guidance Document: Construction Quality Assurance for Hazardous Waste Land Disposal Facilities (October 1986), and as approved by the Department;

e. A detailed post-remedial operation and maintenance plan ("O&M plan") prepared, signed, and sealed by a professional engineer, to be undertaken after the construction of the Remedial Design, including provision for the number of years during which such activities will be performed;

f. The parameters, conditions, procedures, and protocols to determine the effectiveness of the Remedial Design;

g. A contingency plan to be implemented if any element of the Remedial Design fails to achieve any of its objectives or otherwise fails to protect human health or the environment;

h. A health and safety plan for the protection of persons at and in the vicinity of the Site during construction and after completion of construction. This plan shall be prepared in accordance with 29 CFR 1910 by a certified health and safety professional;

i. A citizen participation plan which incorporates appropriate activities outlined in the Department's publication, "New York State Inactive Hazardous Waste Citizen Participation Plan," dated August 30, 1988, and any subsequent revisions thereto; and

j. A mobilization and demobilization plan that addresses Site security, Site access control, decontamination procedures, and health and safety.

C. Remedial Design Construction

1. Within 45 days after the Department's approval of the Remedial Design, Respondent shall submit a Remedial Action workplan, prepared in accordance with Interim Final Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties (April 1990) to implement the remedial alternative selected by the Department in that ROD; and shall commence construction of the Remedial Design in accordance with the time schedule contained in the Department-approved Remedial Design.

2. Respondent shall implement the Department-approved Remedial Design.

3. During implementation of all construction activities identified in the Department-approved Remedial Design, Respondent shall have on-Site a full-time representative who is qualified to supervise the work done. Respondent's designated representative may be a qualified employee of a consultant or contractor. Respondent must obtain written Departmental approval before deviating from the Department-approved Remedial Design in any way. Respondent shall not commence construction until the Department approves the actual Site control measures instituted at the Site as specified in the mobilization plans.

4. Within 90 days after completion of the construction activities identified in the Remedial Design, Respondent shall submit to the Department "as-built" drawings and a final engineering report (each including all changes made to the Remedial Design during construction); and a certification by a professional engineer that the Remedial Design was implemented and all construction activities were completed in accordance with

the Department-approved Remedial Design. The "as built" drawings, final engineering report, and certification must be prepared, signed, and sealed by a professional engineer.

5. After receipt of the "as-built" drawings, final engineering report, and certification, the Department shall notify Respondent in writing whether the Department is satisfied that all construction activities have been completed in compliance with the Department-approved Remedial Design.

6. If the Department concludes that any element of the Remedial Program fails to achieve its objectives or otherwise fails to protect human health or the environment, Respondent shall take whatever action the Department determines necessary to achieve those objectives or to ensure that the Remedial Program otherwise protects human health and the environment.

7. Respondent shall:

i. operate, maintain, and monitor all elements of the Remedial Program for no less than 30 years;

ii. implement the contingency plan contained in the Department-approved Remedial Design in the event any element of the Remedial Program fails before or after completion or otherwise fails to protect human health or the environment;

iii. implement the health and safety plan contained in the Department-approved Remedial Design after completion;

iv. implement the O&M plan in accordance with the requirements of the Department-approved O&M plan; and

v. promptly submit to the Department reports and thorough summaries of any and all analytical data generated during the duration of the construction and implementation of the Remedial Design, including post-remedy actions, either directly or indirectly, whether undertaken as a result of the Department-approved Remedial Deisgn or conducted independently by Respondent.

## D. Progress Reports

1. Respondent shall submit to the parties identified in Subparagraph III.L.2 in the numbers specified therein copies of written monthly progress reports that: (i) describe the actions which have been taken toward achieving compliance with this Blanket Amendment during the previous month; (ii) include all results of sampling and tests and all other data received or generated by Respondent or Respondent's contractors or agents in the previous month, including quality assurance/quality control

i. Monthly summary
ii. Data received
iii. Schedule [illegible]
iv. Next month activities
v. [illegible] delays [illegible]
vi. Mod of [illegible]
vii. Citizen Part.

information, whether conducted pursuant to this Blanket Amendment or conducted independently by Respondent; (iii) identify all workplans, reports, and other deliverables required by this Blanket Amendment that were completed and submitted during the previous month; (iv) describe all actions, including, but not limited to, data collection and implementation of workplans, that are scheduled for the next month and provide other information relating to the progress at the Site; (v) include information regarding percentage of completion, unresolved delays encountered or anticipated that may affect the future schedule for implementation of Respondent's obligations under this Blanket Amendment, and efforts made to mitigate those delays or anticipated delays; (vi) include any modifications to any workplans that Respondent has proposed to the Department or that the Department has approved; and (vii) describe all activities undertaken in support of the Citizen Participation Plan during the previous month and those to be undertaken in the next month. Respondent shall submit these progress reports to the Department by the tenth day of every month following the effective date of this Blanket Amendment.

2. Respondent shall allow the Department to attend, and shall provide the Department at least seven days advance notice of the occurrence of, any of the following: prebid and preconstruction meetings, job progress meetings, substantial completion meeting and inspection, and final inspection and meeting.

E. <u>Review of Submittals</u>

1. a. The Department shall review each of the submittals Respondent makes pursuant to Subparagraphs II.D and .E and Paragraph III of this Blanket Amendment to determine whether it was prepared, and whether the work done to generate the data and other information in the submittal was done, in accordance with this Blanket Amendment and generally accepted technical and scientific principles. The Department shall notify Respondent in writing of its approval or disapproval of the submittal, except for the submittal discussed in Subparagraph III.B.2.g. All Department-approved submittals shall be incorporated into and become an enforceable part of this Blanket Amendment.

b. i. If the Department disapproves a submittal, it shall so notify Respondent in writing and shall specify the reasons for its disapproval. Within 30 days after receiving written notice that Respondent's submittal has been disapproved, Respondent shall make a revised submittal to the Department that addresses and resolves all of the Department's stated reasons for disapproving the first submittal.

ii. After receipt of the revised submittal, the Department shall notify Respondent in writing of its approval or disapproval. If the Department disapproves the revised submittal, Respondent shall be in violation of this Blanket Amendment and the Department may take any action or pursue whatever rights it has pursuant to any provision of statutory or common law. If the Department approves the revised submittal, it shall be incorporated into and become an enforceable part of this Blanket Amendment.

2. The Department may require Respondent to modify and/or amplify and expand a submittal if the Department determines, as a result of reviewing data generated by an activity required under this Blanket Amendment or as a result of reviewing any other data or facts, that further work is necessary.

F. Penalties

1. a. Respondent's failure to comply with any term of this Blanket Amendment constitutes a violation of this Blanket Amendment and the ECL.

b. Respondent shall be liable for payment to the Department of the sums set forth below as stipulated penalties for each day or part thereof that Respondent is in violation of any term of this Blanket Amendment. Stipulated penalties shall be due and payable pursuant to the following schedule:

| Period of Non-Compliance | Penalty Per Day |
|---|---|
| First through 15th day | $ 1,000 |
| 16th through 30th day | $ 2,000 |
| 31st day and thereafter | $ 4,000 |

All penalties begin to accrue on the first day Respondent is in violation of the terms of this Blanket Amendment and continue to accrue through the final day of correction of any violation. Such sums shall be due and payable within 15 days after receipt of notification from the Department assessing the penalties. If such payment is not received within 15 days after Respondent receives such notification from the Department, interest shall be payable at the annual rate of nine per centum on the overdue amount from the day on which it was due through, and including, date of payment. Penalties shall be paid by certified check or money order, made payable to "New York State Department of Environmental Conservation" and shall be delivered personally or by certified mail, return receipt requested, to the Director, Division of Environmental Enforcement, N.Y.S.D.E.C., 50 Wolf Road, Albany, New York 12233-5500. Payment of the penalties shall not in any way alter Respondent's obligation to complete performance under the terms of this Blanket Amendment.

2. Respondent shall not suffer any penalty under this Blanket Amendment or be subject to any proceeding or action for

enforcement of this Blanket Amendment if it cannot comply with any requirement hereof because of war, riot, or an unforeseeable disaster arising exclusively from natural causes which the exercise of ordinary human prudence could not have prevented. Respondent shall, within five days of when it obtains knowledge of any such condition, notify the Department in writing. Respondent shall include in such notice the measures taken and to be taken by Respondent to prevent or minimize any delays and shall request an appropriate extension or modification of this Blanket Amendment. Failure to give such notice within such five-day period constitutes a waiver of any claim that a delay is not subject to penalties. Respondent shall have the burden of proving that an event is a defense to compliance with this Blanket Amendment.

### G. Entry upon Site

Respondent hereby consents to the entry upon the Site or areas in the vicinity of the Site which may be under Respondent's control by any duly designated employee, consultant, contractor, or agent of the Department or any State agency for purposes of inspection, sampling, and testing and to ensure Respondent's compliance with this Blanket Amendment. During implementation of the Remedial Design for a component, Respondent shall provide the Department with suitable office space at the Site, including access to a telephone, and shall permit the Department full access to all records relating to matters addressed by this Order and job meetings.

Respondent shall use best efforts to obtain all permits, easements, rights-of-way, rights-of-entry, approvals, or authorizations necessary to perform Respondent's obligations under this Blanket Amendment. For purposes of this Paragraph with respect to areas off-Site, "best efforts" includes the payment of reasonable sums of money in consideration. If any access required to perform this Blanket Amendment is not obtained despite best efforts, Respondent shall promptly notify the Department and shall include in that notification a summary of the steps Respondent has taken to attempt to obtain access. The Department may, as it deems appropriate and consistent with its legal authority, assist Respondent in obtaining such access as Respondent is unable to obtain, in which event the Department shall grant Respondent an extension of time to perform those obligations under this Order not carried out by reason of inability to obtain access for a period equal to the length of the delay or period of nonperformance. Respondent shall reimburse the State, in accordance with the procedures in Subparagraph III.H of this Blanket Amendment, for all costs incurred by the State in obtaining access, including, but not limited to, attorneys fees.

enforcement of this Blanket Amendment if it cannot comply with any requirement hereof because of war, riot, or an unforeseeable disaster arising exclusively from natural causes which the exercise of ordinary human prudence could not have prevented. Respondent shall, within five days of when it obtains knowledge of any such condition, notify the Department in writing. Respondent shall include in such notice the measures taken and to be taken by Respondent to prevent or minimize any delays and shall request an appropriate extension or modification of this Blanket Amendment. Failure to give such notice within such five-day period constitutes a waiver of any claim that a delay is not subject to penalties. Respondent shall have the burden of proving that an event is a defense to compliance with this Blanket Amendment.

### G. Entry upon Site

Respondent hereby consents to the entry upon the Site or areas in the vicinity of the Site which may be under Respondent's control by any duly designated employee, consultant, contractor, or agent of the Department or any State agency for purposes of inspection, sampling, and testing and to ensure Respondent's compliance with this Blanket Amendment. During implementation of the Remedial Design for a component, Respondent shall provide the Department with suitable office space at the Site, including access to a telephone, and shall permit the Department full access to all records relating to matters addressed by this Order and job meetings.

Respondent shall use best efforts to obtain all permits, easements, rights-of-way, rights-of-entry, approvals, or authorizations necessary to perform Respondent's obligations under this Blanket Amendment. For purposes of this Paragraph with respect to areas off-Site, "best efforts" includes the payment of reasonable sums of money in consideration. If any access required to perform this Blanket Amendment is not obtained despite best efforts, Respondent shall promptly notify the Department and shall include in that notification a summary of the steps Respondent has taken to attempt to obtain access. The Department may, as it deems appropriate and consistent with its legal authority, assist Respondent in obtaining such access as Respondent is unable to obtain, in which event the Department shall grant Respondent an extension of time to perform those obligations under this Order not carried out by reason of inability to obtain access for a period equal to the length of the delay or period of nonperformance. Respondent shall reimburse the State, in accordance with the procedures in Subparagraph III.H of this Blanket Amendment, for all costs incurred by the State in obtaining access, including, but not limited to, attorneys fees.

H. Payment of State Costs

Respondent shall pay for the State's expenses (including, but not limited to, direct labor and fringe benefits, overhead, travel, analytical costs, and contractor costs) incurred by the State of New York for funding of environmental monitors to oversee work associated with the Site to date, reviewing and revising submittals made pursuant to this Blanket Amendment, overseeing activities conducted pursuant to this Blanket Amendment, collecting and analyzing samples, and administering the requirements of this Blanket Amendment, in accordance with Paragraph XII of an Order of the Department issued in the matter of the Development and Implementation of a Former Manufactured Gas Plant (MGP) Sites Investigation and Remediation Program by Niagara Mohawk Power Corporation, Department Order Index No. D0-0001-9210.

I. Department Reservation of Rights

1. Nothing contained in this Blanket Amendment shall be construed as barring, diminishing, adjudicating, or in any way affecting any of the Department's rights.

2. Nothing contained in this Order shall be construed to prohibit the Commissioner or his duly authorized representative from exercising any summary abatement powers.

J. Indemnification

Respondent shall indemnify and hold the Department, the State of New York, and their representatives and employees harmless for all claims, suits, actions, damages, and costs of every name and description arising out of or resulting from the fulfillment or attempted fulfillment of this Blanket Amendment by Respondent and/or any of Respondent's directors, officers, employees, servants, agents, successors, and assigns, provided, however, that Respondent does not assume any liability arising from the negligent or intentionally tortious acts or omissions of the Department, the State of New York, and their representatives and employees during the course of any activities conducted pursuant to this Blanket Amendment.

K. Public Notice

1. Within 30 days after the effective date of this Blanket Amendment, Respondent shall file a Declaration of Covenants and Restrictions with the Oneida County Clerk to give all parties who may acquire any interest in the Site notice of this Blanket Amendment.

2. If Respondent proposes to convey the whole or any part of Respondent's ownership interest in the Site, Respondent

shall, not fewer than 60 days before the date of conveyance, notify the Department in writing of the identity of the transferee and of the nature and proposed date of the conveyance and shall notify the transferee in writing, with a copy to the Department, of the applicability of this Blanket Amendment.

L. Communications

1. All written communications required by this Blanket Amendment shall be transmitted by United States Postal Service, by private courier service, or hand delivered as follows:

Communication from Respondent shall be sent to:

(1) Charles N. Goddard, P.E.
Assistant Director
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233-7010

(2) G. Anders Carlson, Director
Bureau of Environmental Exposure Investigation
New York State Department of Health
2 University Place
Albany, New York 12203

(3) Thomas Brown, Regional Director
New York State Department of Environmental Conservation
State Office Building
Watertown, New York 13601

(4) Charles E. Sullivan, Jr.
Division of Environmental Enforcement
New York State Department of Environmental Conservation
50 Wolf Road, Rm. 609
Albany, New York 12233-5500

2. Copies of workplans and reports shall be submitted as follows:

(1) Four copies (one unbound) to Mr. Goddard

(2) Two copies to the Director, Bureau of Environmental Exposure Investigation

(3) Two copies to Mr. Brown

(4) One copy to Mr. Sullivan

3. Within 30 days of the Department's approval of any report submitted pursuant to this Blanket Amendment, Respondent shall submit to Mr. Goddard a computer readable magnetic media copy of the approved report in American Standard Code for Information Interchange (ASCII) format.

4. Communication to be made from the Department to Respondent shall be sent to:

Michael W. Sherman
Supervisor of Environmental Programs
Environmental Affairs Department, C-1
Niagara Mohawk Power Corporation
300 Erie Boulevard West
Syracuse, New York 13202

5. The Department and Respondent reserve the right to designate additional or different addressees for communication or written notice to the other.

M. Miscellaneous

1. All activities and submittals required by this Blanket Amendment shall address both on-Site and off-Site contamination resulting from the disposal of hazardous substances at the Site; subject, however, to the limitation that Respondent is not hereby required to remediate hazardous substances on property over which Respondent has no control that are not MGP wastes or hazardous substances attributable to Respondent or its predecessor company, Utica Gas and Electric, and that are not intermingled with MGP wastes or hazardous substances attributable to Respondent or its predecessor company, Utica Gas and Electric.

2. Respondent shall retain professional consultants, contractors, laboratories, quality assurance/quality control personnel, and data validators acceptable to the Department to perform the technical, engineering, and analytical obligations required by this Blanket Amendment. A summary of the experience, capabilities, and qualifications of the firms or individuals selected by Respondent shall be submitted to the Department within 30 days after completion of Respondent's bidding process. The Department's approval of these firms or individuals shall be obtained before the start of any activities for which Respondent and such firms or individuals will be responsible. The responsibility for the performance of the professionals retained by Respondent shall rest solely with Respondent.

3. The Department shall have the right to obtain split samples, duplicate samples, or both, of all substances and

materials sampled by Respondent, and the Department also shall have the right to take its own samples. Respondent shall make available to the Department the results of all sampling and/or tests or other data generated by Respondent with respect to implementation of this Blanket Amendment and shall submit these results in the progress reports required by this Blanket Amendment.

4. Respondent shall notify the Department at least 10 working days in advance of any field activities to be conducted pursuant to this Blanket Amendment.

5. Respondent and Respondent's officers, directors, agents, servants, employees, successors, and assigns shall be bound by this Blanket Amendment. Any change in ownership or corporate status of Respondent including, but not limited to, any transfer of assets or real or personal property shall in no way alter Respondent's responsibilities under this Blanket Amendment. Respondent's officers, directors, employees, servants, and agents shall be obliged to comply with the relevant provisions of this Blanket Amendment in the performance of their designated duties on behalf of Respondent.

6. Respondent shall provide a copy of this Blanket Amendment to each contractor hired to perform work required by this Blanket Amendment and to each person representing Respondent with respect to the Site and shall condition all contracts entered into in order to carry out the obligations identified in this Blanket Amendment upon performance in conformity with the terms of this Blanket Amendment. Respondent or Respondent's contractors shall provide written notice of this Blanket Amendment to all subcontractors hired to perform any portion of the work required by this Blanket Amendment. Respondent shall nonetheless be responsible for ensuring that Respondent's contractors and subcontractors perform the work in satisfaction of the requirements of this Blanket Amendment.

7. All references to "professional engineer" in this Blanket Amendment are to an individual registered as a professional engineer in accordance with Article 145 of the New York State Education Law.

8. All references to "days" in this Blanket Amendment are to calendar days unless otherwise specified.

9. The section headings set forth in this Blanket Amendment are included for convenience of reference only and shall be disregarded in the construction and interpretation of any of the provisions of this Blanket Amendment.

10. a. The terms of this Blanket Amendment shall constitute the complete and entire Order between Respondent and

the Department concerning the Site pertaining to the matters covered herein. No term, condition, understanding, or agreement purporting to modify or vary any term of this Blanket Amendment shall be binding unless made in writing and subscribed by the party to be bound. No informal advice, guidance, suggestion, or comment by the Department regarding any report, proposal, plan, specification, schedule, or any other submittal shall be construed as relieving Respondent of Respondent's obligation to obtain such formal approvals as may be required by this Blanket Amendment.

b. If Respondent desires that any provision of this Blanket Amendment be changed, Respondent shall make timely written application, signed by Respondent, to the Commissioner setting forth reasonable grounds for the relief sought. Copies of such written application shall be delivered or mailed to Mr. Sullivan and to Mr. Goddard.

11. The effective date of this Order shall be the date it is signed by the Commissioner or his designee.

DATED: Albany, New York
Dec 17, 1992

THOMAS C. JORLING
Commissioner
New York State Department
of Environmental Conservation

## CONSENT BY RESPONDENT

Respondent hereby waives its right to a hearing herein as provided by law; consents to the issuance and entry of this Order; and agrees to be bound by its terms, not to contest the authority or jurisdiction of the Department to issue or enforce this Order, and not to contest the validity of this Order or its terms.

NIAGARA MOHAWK POWER CORPORATION

by: TRFair

Typed name of signer: Thomas R. Fair

(Seal of Niagara Mohawk Power Corp.)

Title of signer: Vice President - Environmental Affairs

Date signed: November 25, 1992

STATE OF NEW YORK )
) ss:
COUNTY OF Onondaga )

On this 25th day of November, 1992, before me personally appeared Thomas R. Fair, to me known, who, being duly sworn, did depose and say that he resides in Pompey, New York; that he is Vice President - Environmental Affairs of Niagara Mohawk Power Corporation; that he executed the aforegoing instrument on behalf of the Niagara Mohawk Power Corporation; that he knew the seal of said corporation; that the seal affixed to said instrument was such corporate seal; that it was so affixed by order of the Board of Directors of said corporation; and that he signed his name thereto by like order.

William C Weiss

Notary Public State of New York
Registration number: ____________
My commission expires: ____________

WILLIAM C. WEISS
Notary Public, State of New York
No. 4719925
Qualified in Onondaga County
My Commission Expires October 31, 1994

# SETTLEMENT AGREEMENT BETWEEN NIAGARA MOHAWK POWER CORPORATION AND NEW YORK STATE THRUWAY AUTHORITY AND NEW YORK STATE CANAL CORPORATION

THIS AGREEMENT is made and entered into as of this 30th day of January, 2001, by and between Niagara Mohawk Power Corporation ("Niagara Mohawk") and the New York State Thruway Authority and the New York State Canal Corporation (referred to collectively hereinafter as "TA/CC") and their respective officers, employees and agents.

WHEREAS, the Harbor Point Site (the "Site") is located at Harbor Point, in Utica, New York; and

WHEREAS, the Site includes a portion of the New York State Canal, the Utica Harbor (the "Harbor"), three nearby Dredge Spoil Areas ("DSAs"), all of the above either currently or formerly owned and/or operated by TA/CC or its predecessors, the Mohawk River (the "River"), property owned by Niagara Mohawk, and certain other adjacent properties, including the Mohawk Valley Oil parcel, the Texaco parcel, the Jones Chemicals parcel, the former New York Tar and Emulsions parcel (n/k/a the Suit-Kote parcel) and groundwater and adjacent sewers; and

WHEREAS, Niagara Mohawk has performed certain investigatory studies both on its own property and on other locations at the Site, including the Canal, Harbor and DSAs, pursuant to Consent Orders with the New York State Department of Environmental Conservation ("DEC"); and

WHEREAS, the investigatory studies documented the presence, in soils, sediments and groundwater at the Site, of constituents defined as "hazardous substances" under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); and

WHEREAS, Niagara Mohawk is organized and incorporated under the laws of the State of New York and its principal place of business is located in Syracuse, New York; and

WHEREAS, the New York State Thruway Authority ("NYSTA") is a public corporation established pursuant to Section 352 of the New York Public Authorities Law ("NYPAL") and the New York State Canal Corporation is a public corporation established pursuant to Section 382 of the NYPAL and under the auspices of the NYSTA; and

WHEREAS, Niagara Mohawk has filed a Complaint against TA/CC and other potentially responsible parties ("PRPs") at the Site encaptioned Niagara Mohawk Power Corporation v. Jones Chemicals, Inc., et al., Case No. 95-CV-717-FJS, in the United States District Court for the Northern District of New York (the "Litigation") to recover costs incurred by Niagara Mohawk in responding to conditions at the Site pursuant to Sections 107 and 113 of CERCLA, 42 U.S.C. § 9607 and 9613 and relevant state statutes; and

WHEREAS, TA/CC and other defendants have filed counterclaims and various crossclaims; and

WHEREAS, Niagara Mohawk and TA/CC deny any and all legal or equitable liability under any federal or state statute, regulation or common law for any damages and/or response, removal or remedial action costs ("Response Costs") (as defined under Section 101 of CERCLA, 42 U.S.C. § 9601(23), (24) and (25)); and

WHEREAS, Niagara Mohawk and TA/CC, acting in good faith, desire to avoid expensive and protracted litigation, and to settle and resolve all claims by and between themselves as set forth herein;

NOW, THEREFORE, in consideration of the foregoing and the mutual covenants set forth herein, and for good and valuable consideration from each party to the other, receipt of which is hereby acknowledged from one party to the other, Niagara Mohawk and TA/CC agree as follows:

1. With respect to remediation in the Harbor, Canal and DSAs (see Exhibit 1), TA/CC shall take the responsibility for funding, implementing and managing the following items:

   a. dredging the neck of Utica Harbor to accommodate a "draft" of 13 feet and the terminal end of the Utica Harbor to accommodate a "draft" of 14 feet (the "draft" being a final draft after capping, where required, is complete);
   b. monitoring the return water resulting from the dredging activities;
   c. purchasing the land currently underlying DSA 1;
   d. providing pre-dredge grid samples for DSA 1;
   e. pursuant to the results of pre-dredge sampling conducted following issuance of a ROD by DEC, sediments dredged from the neck of the Harbor or the terminal end of the Harbor containing less than 35 ppm PAHs shall be disposed at DSA 1. Sediments dredged from those areas in the Harbor containing greater than 35 ppm PAHs shall be pumped directly to an approved location on Niagara Mohawk property at the Harbor Point site for treatment (if required) and disposal by Niagara Mohawk. If efficient dredging operations are better achieved through pumping of Harbor sediments containing less than 35 ppm PAHs directly to an

approved location on Niagara Mohawk property at the Harbor Point Site, then the TA/CC may do so with the concurrence of Niagara Mohawk, which will not be unreasonably withheld;

f. excavating and transporting to Niagara Mohawk's Harbor Point property soils from DSA 1 that have concentrations greater than 1000 ppm for PAHs, and screening such soils using screens with an opening no greater than four inches;

g. designing and reconstructing DSA 1 so it can be used as a disposal site for dredged sediments from the Harbor Neck;

h. conducting post-use grid sampling at DSA 1 if such sampling is required by DEC;

i. capping DSA 2 and performing long term maintenance, as required by DEC, on the cap;

j. placing deed restrictions as required by DEC on the future use of DSAs 1, 2 and 3.

Except for the task set forth in subsection (c) above, all tasks performed by TA/CC shall be pursuant to DEC permits, conditions and requirements.

2. In addition to the tasks enumerated in Paragraph 1 above, TA/CC agrees to bear responsibility for repairs of damage to any cap placed in the Harbor resulting from TA/CC operations provided that: (a) Niagara Mohawk provides TA/CC the opportunity to review the work plan and the schedule for the design of the cap and to approve the design of the cap to insure that the cap does not interfere with TA/CC operations, (b) Niagara Mohawk performs

bathymetry soundings (following cap installation) and provides the results of such soundings to TA/CC to assure that the Harbor bottom is uniform and that the depth is at least 14 feet, and (c) damage to the cap is not due to erosion from flooding events, other natural causes (including but not limited to consolidation or subsidence of the Harbor bottom, and/or fatigue or failure of the cover system) or any other cause other than TA/CC operations. For purposes of this Paragraph, TA/CC operations shall include third party vessels (other than those belonging to or under contract to Niagara Mohawk) operating in the Harbor or Canal. Should DEC express reservations following TA/CC approval of the cap design pursuant to (a) above, Niagara Mohawk and TA/CC will jointly approach DEC seeking resolution of the cap design.

3. If Niagara Mohawk, with DEC approval, deems it appropriate to use sand from Sylvan Beach as part of the cap in the Harbor, then the TA/CC shall supply, without expense to TA/CC, sand from its Sylvan Beach upland disposal site for use by Niagara Mohawk as a portion of the Utica Harbor cap. TA/CC shall excavate and transport the sand to Utica Harbor. Niagara Mohawk shall be responsible for grading the sand on the Harbor floor, once the TA/CC has transported and deposited the sand in the Harbor. Prior to the excavation and transportation, Niagara Mohawk and TA/CC will execute a contract to reimburse TA/CC for the costs associated with excavation and transportation of the sand.

4. With respect to groundwater monitoring at the DSAs, the parties agree as follows: The TA/CC and Niagara Mohawk jointly will discuss with DEC the need for long term groundwater monitoring of DSAs 2 and 3. DSAs 1, 2 and 3 have been used as dredge spoil areas. The TA/CC intends to continue such use as the primary use for these parcels. Pursuant to the provisions of this paragraph, Niagara Mohawk will be responsible for providing long term

groundwater monitoring for each of the DSAs 1, 2 and 3, if such is required by DEC, so long as the TA/CC's actions do not change the use of the affected DSA. If TA/CC actions do change the use of any of DSAs 1, 2 or 3, then TA/CC shall assume responsibility for long term groundwater monitoring of that DSA. If the TA/CC uses DSA 1 for placement of materials from outside the vicinity of the Harbor and neck, then the TA/CC shall assume responsibility for long term groundwater monitoring of DSA 1. The TA/CC will test any sediments deposited on DSAs 2 or 3 that are dredged from locations other than the vicinity of Utica Harbor and the neck, in accordance with appropriate DEC standards. If the materials tested do not conform to DEC standards, then TA/CC will, at its discretion, decide whether or not to deposit the spoils. Should the TA/CC elect to deposit such non-conforming tested materials in either DSA 2 or 3, then the TA/CC shall assume responsibility for groundwater monitoring and any other additional response actions that may be required at the affected DSA.

5. In addition to those tasks enumerated above, Niagara Mohawk and the remaining defendants in the Litigation will be responsible for additional remedial actions required by DEC at the Site, not related to TA/CC activities, including the following:

a. capping those areas of the Harbor where necessary and placing an armoring layer of stone in areas likely to be subject to heavy boat traffic or other scouring forces, as determined by TA/CC and Niagara Mohawk and as approved by DEC;

b. remediating the Washington Street sewer and closure of private sewer systems on the Harbor Point peninsula in accordance with DEC's approvals;

c. treating, if necessary, soils over 1000 ppm of PAHs excavated by the TA/CC at DSA 1;

d. treating, if necessary, and disposing any sediments dredged from the Harbor that are over 35 ppm of PAHs;

e. conducting pre-dredge sampling of the Harbor and post-dredge sampling if required; and

f. monitoring and inspecting the Harbor cap.

The work outlined above shall be performed under the direction of DEC.

6. Niagara Mohawk and TA/CC covenant and agree to fully cooperate and coordinate all efforts relating to the remedial effort at the Harbor Point Site. Niagara Mohawk and TA/CC also will cooperate in devising remedial plans for their respective responsibilities.

7. Niagara Mohawk and TA/CC agree that during the performance of any remedial action associated with the Harbor, Canal or DSAs they will provide to the other (at the same time they are submitted to DEC) work plans and reports.

8. Prior to performing any work on lands under the jurisdiction of the TA/CC, Niagara Mohawk will apply for a permit from the TA/CC in accordance with the rules and regulations of the TA/CC. The TA/CC agrees to provide timely consideration and response to the permit application, which shall not exceed seven business days from the date the permit application is received in the TA/CC's offices.

9. Except as set forth herein, nothing in this Agreement shall be construed or deemed to place any responsibility or liability on Niagara Mohawk or TA/CC for any response costs, damages, or response, removal or remedial actions at the Site, nor as an admission of same.

10. Except as set forth in this Agreement, in consideration of the mutual covenants and agreements set forth in this Agreement, Niagara Mohawk and TA/CC, and their present and former officers, directors, trustees, shareholders, parents, subsidiaries, affiliates, assigns, heirs, executors, administrators and successors agree to release and covenant not to sue each other for any claims or causes of action, in law or equity, under any federal or state statute, regulation or common law, relating to costs of Response (as that term is defined in CERCLA 42 U.S.C. § 9601 (et seq.)) that have been, or will be, incurred at the Site. Notwithstanding the foregoing, Niagara Mohawk and TA/CC mutually seek any and all contribution protection available under any federal, state or local statute or regulation or common law related in any way to the matters referred to herein.

11. Niagara Mohawk and TA/CC, through their counsel, shall enter into a stipulation to dismiss the pending litigation with prejudice pursuant to Federal Rule of Civil Procedure 41 as to plaintiff Niagara Mohawk and defendants TA/CC. Each party to this agreement shall bear its own attorneys' fees, costs of litigation, costs of court and otherwise provide for the entry of such dismissal with prejudice. The parties will cause such stipulation to be filed with the court as soon as possible after the execution of this Agreement and shall take further actions as may reasonably be necessary to secure entry of an order providing for such dismissal with prejudice.

12. Anything to the contrary notwithstanding, if either party herein fails to perform under the terms of this Agreement, the other party herein may proceed in equity to enforce its rights hereunder and to enforce the terms of this Agreement, or, in lieu thereof, elect to proceed at law to obtain damages for breach or failure to perform under the terms of this Agreement. The prevailing party in such actions shall be entitled to actual attorneys' fees (including all appeals)

and actual costs incurred in such actions. Nothing in this Paragraph shall preclude the use of alternative dispute resolution upon mutual agreement of the parties.

13. Any disputes between the parties hereto as to the interpretation of this Agreement or the implementation thereof shall be submitted to the other party hereto in writing (the "Written Submittal"), after which the parties hereto shall negotiate in good faith for a resolution of any disputes for a period of thirty (30) days, after which any such disputes may be submitted to judicial resolution upon the action of either party in any action for enforcement of this Agreement. Alternatively, if the parties agree, binding arbitration may be used instead of judicial enforcement. An agreement would have to be reached by the parties as to the terms and conditions governing the arbitration. If no mutual agreement about arbitration terms and conditions can be reached within forty-five (45) days of receipt of the Written Submittal, then either party may resort to judicial enforcement.

14. This Agreement is for the exclusive benefit of the parties hereto and shall not be deemed to give any legal or equitable right, remedy or claims to any other entity or person. This Agreement shall not discharge any person or entity not a party to this Agreement from liability to the undersigned parties for contribution or for any other claim that may be asserted by the undersigned parties with respect to the Litigation.

15. The parties hereto represent and warrant that they are the respective owner of the actual or alleged claims, demands, rights, causes of action and other matters which are herein released; that the same have not been assigned, transferred or disposed of in fact, by operation of law or in any manner whatsoever; and that each has the full right and power to grant, execute and deliver its respective releases and agreements herein contained.

16. Niagara Mohawk and TA/CC agree to cooperate fully and to jointly make application for and execute any and all supplementary documents and take all additional actions that may be necessary or appropriate to give full force and effect to the terms and intent of this Agreement.

17. The validity, interpretation and performance of this Agreement shall be governed by the laws of the State of New York, except that any and all questions arising pursuant to CERCLA shall be interpreted in accordance with CERCLA and other applicable laws. The parties herein agree that the United States District Court for the Northern District of New York has jurisdiction over the subject matter of this Agreement, as well as personal jurisdiction over each of the parties herein.

18. This Agreement shall apply to and be binding upon the signatories, their heirs, successors and assigns.

19. This Agreement shall become effective upon its execution by both parties and entry of dismissal of TA/CC from the Litigation and dismissal of TA/CC's counterclaims against Niagara Mohawk.

20. Each party herein shall be responsible for its own legal fees incurred in connection with the investigation of the matters within the scope of this Agreement and for the costs of arriving at this Agreement.

21. Any notice required or given under this Agreement shall be effective if in writing and mailed by United States mail, postage prepaid, or mailed by overnight courier service, or received by actual delivery in person or by facsimile, to the representatives of the respective party at the addresses set forth below. The contact persons for each party are as follows:

FOR NIAGARA MOHAWK POWER CORPORATION:

Jerome C. Muys, Jr., Esq.
Julie A. Weisman, Esq.
SWIDLER BERLIN SHEREFF FRIEDMAN, LLP
3000 K Street, N.W.
Suite 300
Washington, D.C. 20007
Telephone: (202) 424-7500

John T. Parkinson, Esq.
NIAGARA MOHAWK POWER CORPORATION
300 Erie Boulevard West
Syracuse, New York 13202
Telephone: (315) 428-5032

Director of SIR
Environmental Affairs Department
Niagara Mohawk Power Corporation
300 Erie Boulevard West
Syracuse, New York 13202
Telephone: (315) 428-6624

FOR TA/CC:

Sharon P. O'Conor, Esq.
General Counsel
New York State Thruway Authority
200 Southern Boulevard
Albany, New York 12209
Telephone: (518) 436-2840

Robert A. Brooks, Director
New York State Canal Corporation
200 Southern Boulevard
Albany, New York 12209
Telephone: (518) 436-3055

David A. Munro, Esq.
Lisa S. Kwong, Esq.
New York State Department of Law
Justice Building
Empire State Plaza
Albany, New York 12224-0341
Telephone: (518) 474-8481

22. No party hereto, or representative or counsel for any party, has acted as counsel for any other party with respect to such party entering into this Agreement, except as expressly engaged by such party with respect to this Agreement, and each party represents that it has sought and obtained any appropriate legal advice it deems necessary prior to entering into this Agreement. Nothing herein shall be deemed to create a partnership or joint venture and/or principal and agent relationship between the parties hereto.

23. No modification or amendment may be made to this Agreement except in writing signed by both parties hereto.

24. Agreement of the parties hereto with respect to the subject matter hereof, and all prior discussions, drafts and writings specifically related to this Agreement are superseded by this Agreement and may not be used by any party to vary or contest the terms of this Agreement.

25. Each undersigned representative of the settling party certifies that he or she is fully authorized to enter into this Agreement and to execute and legally bind such party to the terms and conditions of this Agreement.

Executed this 30th day of January, 2001.

FOR NIAGARA MOHAWK POWER
CORPORATION

Richard H. Ryczek
Vice President – Environmental Affairs and
Property Management

FOR NEW YORK STATE THRUWAY
AUTHORITY

John Platt

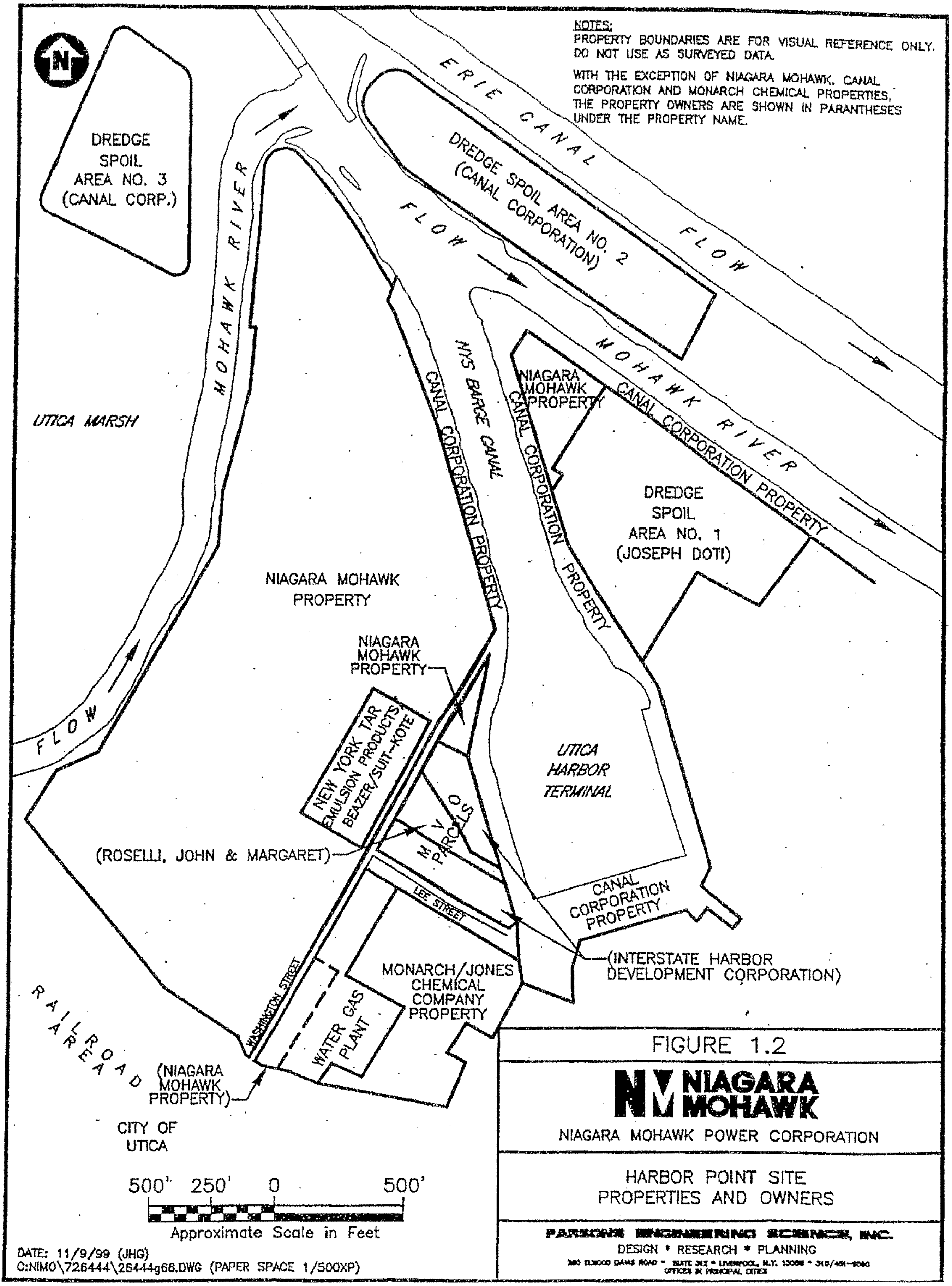
John Platt
Executive Director

FOR NEW YORK STATE CANAL
CORPORATION

John Platt

John Platt
Executive Director

EXHIBIT 1



NOTES:
PROPERTY BOUNDARIES ARE FOR VISUAL REFERENCE ONLY. DO NOT USE AS SURVEYED DATA.

WITH THE EXCEPTION OF NIAGARA MOHAWK, CANAL CORPORATION AND MONARCH CHEMICAL PROPERTIES, THE PROPERTY OWNERS ARE SHOWN IN PARANTHESES UNDER THE PROPERTY NAME.

DATE: 11/9/99 (JHG)
C:NIMO\726444\26444g66.DWG (PAPER SPACE 1/500XP)

FIGURE 1.2

NIAGARA MOHAWK

NIAGARA MOHAWK POWER CORPORATION

HARBOR POINT SITE
PROPERTIES AND OWNERS

PARSONS ENGINEERING SCIENCE, INC.
DESIGN * RESEARCH * PLANNING
290 ELWOOD DAVIS ROAD * SUITE 312 * LIVERPOOL, N.Y. 13088 * 315/451-9560
OFFICES IN PRINCIPAL CITIES

nationalgrid

April 5, 2007

Michael R. Fleischer
Executive Director
New York State Thruway Authority
200 Southern Boulevard
Albany, NY 12209

Carmella R. Mantello
Director
New York State Canal Corporation
200 Southern Boulevard
Albany, NY 12209

RE: NMPC v. Jones Chemicals, et al. – Modifications to Settlement Agreement
(Case No. 95-CV-727 FJS-DS)

Dear Mr. Fleischer and Ms. Mantello:

This letter is a follow-up to a meeting with Thruway Authority and Canal Corporation (collectively "TA/CC") staff, specifically Peter Casper, David Curtis, Gary Johnston and Catherine Sheridan, in July 2006 with regard to the need to amend specific terms of the January, 2001 Settlement Agreement between Niagara Mohawk Power Corporation ("NMPC") and TA/CC (hereinafter "Agreement") for claims associated with the Utica Harbor site. The purpose of the amendment is to specifically respond to the New York State Department of Environmental Conservation's ("NYSDEC") decision precluding the use of the on-site storage area for acceptance of the DSA 1 soils. As a result of the NYSDEC decision not to approve the onsite location for storage/processing of the dredge spoils, it is now necessary to transport the DSA 1 soils to an off-site location. As such, as indicated below, TA/CC and NMPC agreed at the meeting to modify the Settlement Agreement, pending appropriate internal approvals. NMPC and TA/CC agreed to amend the agreement by a mutually signed letter, to address the increased costs associated with transportation to an off-site authorized facility, along with the insurance and indemnification issues associated with the off-site disposal. The principal revisions are to Paragraph 1(f) and 5(c), and new paragraphs 10(b) and 10(c) have been added to address the indemnification and insurance issues that we discussed.

Assuming that the TA/CC agrees with the terms that are set forth herein amending the Agreement, I am sending you 3 signed originals and ask that you please sign the letter, keep two originals for yourself and return one original to me.

## MODIFICATION TO SETTLEMENT AGREEMENT DATED JANUARY 30, 2001

The modifications agreed to by Niagara Mohawk and TA/CC are as follows:

(a) The beginning of Paragraph 1 shall be revised to read: "Except as otherwise provided in subsection (f) of this paragraph, with respect to remediation in the Harbor, Canal and DSAs (see Exhibit 1), TA/CC shall take the responsibility for funding, implementing and managing the following items:";

(b) Paragraph 1(f) shall be revised to read: "sampling, characterizing, profiling, excavating, handling, staging, stabilizing, loading, transporting and disposing of soils from DSA 1 that have concentrations greater than 1000 ppm for PAHs or greater than 0.2 ppm benzene at a NYS DEC permitted facility(ies) pre-approved by Niagara Mohawk. The parties agree to work cooperatively to select the permitted facilities that are most appropriate for the project. Niagara Mohawk shall reimburse TA/CC for the cost of transporting and disposing of those soils over 1000 ppm of PAHs or greater than 0.2 ppm benzene excavated by TA/CC at DSA 1. TA/CC shall promptly submit pertinent, detailed invoices for such reimbursable transportation and disposal costs to Niagara Mohawk for review. Niagara Mohawk may reasonably request additional information prior to approving an invoice and, in such event, TA/CC agrees to promptly provide the requested information to Niagara Mohawk. All invoices for reimbursable costs shall be paid by Niagara Mohawk within 30 days following receipt and approval of the invoice. NMPC shall not unreasonably delay the approval of any such invoice. In the event Niagara Mohawk does not accept an invoice or a portion thereof for payment, Niagara Mohawk will provide TA/CC with written notice of such disapproval. The written notice will provide a detailed explanation of its non-acceptance. In addition, Niagara Mohawk shall also meet with TA/CC to review the basis for its disapproval." TA/CC shall use permitted transporters/haulers to transport the materials and TA/CC agrees to share its Request for Proposals for the project with NMPC for review and comment. NMPC will review and comment on any such RFP within 10 business days.

TA/CC shall promptly provide NMPC with copies of the transportation documentation (i.e., bills of lading or manifests) and certificates of disposal.

(c) Paragraph 5(c) shall be revised to read: "as provided in paragraph 1(f) above, reimbursing TA/CC for the cost of transporting and disposing of soils over 1000 ppm of PAHs or greater than 0.2 ppm benzene excavated by the TA/CC at DSA 1 and transported for disposal at a NYS DEC permitted facility(ies) pre-approved by Niagara Mohawk."

(d) Paragraph 10 will be changed to have the existing language numbered as 10.(a), and a new 10(b) and 10(c) will be added as follows:

10.(b) Indemnification:

NMPC shall indemnify and hold TA/CC and their respective officers, directors, representatives, agents, beneficiaries and employees (hereinafter collectively referred to as "TA/CC's Indemnitees") harmless for all third-party claims, suits, actions, damages, and costs of every name and description (hereinafter "claims"), to the extent that such claims result from the transportation and/or disposal of the DSA 1 soils as required by this Modification to the Settlement Agreement, except to the extent that any such claims arise from willful, wanton, or malicious acts or omissions, or acts or omissions constituting gross negligence or criminal behavior by the TA/CC, its directors, employees, agents and/or their representatives during the course of any activities conducted pursuant to this Settlement Agreement.

If TA/CC intends to assert a claim for indemnification against NMPC, the following procedures shall apply:

(i) TA/CC shall provide written notice to NMPC in accordance with Paragraph 21 of the Agreement within 15 days of receiving notice or having actual knowledge of an event giving rise to a claim; provided that no undue delay or failure in giving any such written notice shall release NMPC of its indemnification obligations or otherwise impair the rights of TA/CC or any TA/CC Indemnitees to indemnification hereunder, except to the extent, if any, that such failure or delay by TA/CC or any TA/CC Indemnitees prevents, impedes or otherwise prejudices in any material respect NMPC's ability to defend against such claim, and TA/CC shall provide NMPC as soon as practicable thereafter all reasonably available information and documentation with regard to the claim;

(ii) NMPC, within 30 days after its receipt of notification, may, at its sole discretion, assume, in the name of TA/CC, the defense of the claim with counsel selected by NMPC, or advise TA/CC that TA/CC may defend the matter with TA/CC counsel,;

(iii) TA/CC shall not offer to settle or compromise any claim, or settle or compromise such claim, if it intends to seek indemnification from NMPC for any such settlement or compromise without NMPC's prior written approval. TA/CC shall provide NMPC with a written explanation as to the basis for why it is reasonable or justified that the claim should be compromised or settled, or offered to be compromised or settled as proposed. If NMPC does not agree that the settlement is reasonable or justified, it may disapprove the settlement and continue with its defense obligation.

In the event that NMPC refuses to defend and/or indemnify TA/CC as provided herein, TA/CC may commence an action to compel NMPC to carry out its obligations. In the event of such an action, TA/CC shall provide NMPC with written notice in accordance with Paragraph 21 of the Agreement no less than thirty (30) days prior to commencing a lawsuit seeking indemnification pursuant to this Paragraph.

10.(c) Insurance:

At all times during the terms of this Settlement Agreement and Modification, TA/CC shall require that its contractors and subcontractors, including but not limited to the transporter retained to transport the DSA 1 soils to the permitted disposal facility(s) maintain and pay for liability insurance covering all risks arising directly or indirectly out of TA/CC's and its contractors' and subcontractors' activities, including the transportation of the DSA 1 soils, and shall name both TA/CC and NMPC as additional

> insureds on such policies. Such coverage shall have a minimum combined occurrence and annual limitation of One Million Dollars ($1,000,000).

My signature below constitutes Niagara Mohawk's agreement to such amendment of the Settlement Agreement. Thus, pursuant to Paragraph 23 of the Settlement Agreement, these modifications will become part of the Agreement upon your execution of this letter in the space designated below.

Sincerely,

NIAGARA MOHAWK POWER
CORPORATION

By:
Title: SVP Dist. Network Svs.
Date: 4/9/07

JTP:vp

**AGREED TO BY:**

New York State Thruway Authority

By:
Title: Executive Director
Date: 5/11/07

New York State Canal Corporation

By:
Title: Director
Date: 5/11/07

MALCOLM PIRNIE

DRAFT

# PRE-DESIGN INVESTIGATION REPORT

## DREDGE SPOILS AREA DSA-1
## NIAGARA MOHAWK HARBOR POINT SITE
## UTICA, NEW YORK

## NYSDEC SITE NO. 6-33-021

**New York State Canal Corporation**
**Albany, New York**

Prepared by:

**Malcolm Pirnie, Inc.**
15 Cornell Road
Latham, New York 12110

March 2003
4098003

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# 1.0 INTRODUCTION

In accordance with the New York State Department of Environmental Conservation (NYSDEC) Record of Decision (ROD) for the Niagara Mohawk Harbor Point Site - Operable Unit 3: Utica Harbor Sediments and Dredge Disposal Areas, Utica, Oneida County, New York, dated March 2001, and the NYSDEC-approved Pre-Design Investigation Work Plan, dated October 2002 (Work Plan), the New York State Canal Corporation (NYSCC) has conducted a pre-design subsurface soil investigation at Dredge Spoil Area No. 1 (DSA-1), located adjacent to Utica Harbor in the City of Utica, Oneida County, New York (Figure 1-1). The objective of the investigation was to collect sufficient data to delineate the extent of polycyclic aromatic hydrocarbons (PAHs) and benzene in soil at DSA-1 at concentrations greater than the ROD-specified cleanup objectives. Malcolm Pirnie, Inc. (Malcolm Pirnie) conducted the investigation on behalf of the NYSCC.

This report summarizes field activities conducted during the pre-design subsurface investigation at DSA-1 and the analytical results from pre-design soil sampling. In accordance with the remedial goals set forth in the ROD, the analytical data has been used to delineate proposed excavation limits and estimate the volume of dredge spoils to be removed from DSA-1.

# 2.0 SITE DESCRIPTION AND BACKGROUND

## 2.1 SITE LOCATION AND DESCRIPTION

As shown on Figure 1-1, DSA-1 is located on a triangular-shaped peninsula bordered to the west by Utica Harbor and the to east by the Mohawk River. The southern portion of DSA-1 is surrounded by berms approximately 10 feet high, and covers an area of approximately 10 acres. The berms were constructed from natural soils on the site and dredged material, which was placed in the cell when it was first used for maintenance dredging. The northern portion of DSA-1, which covers an area of approximately six acres, is surrounded by remnants of former berms. The site is characterized by hummocky topography. Internal berms are present in some areas of the DSA-1 cell. Both the northern and southern portions of the cell are heavily overgrown with vegetation including brush and trees up to 8 inches in diameter. Based on the results of the Remedial Investigation (RI) conducted by Parsons Engineering Science, Inc. (Parsons) (Parsons, 1996), and surveying completed during the pre-design investigation, the average surface elevation across the cell is approximately 410 feet above mean sea level (amsl, [USGS NGVD]). Elevations ranged from 404.9 to 412.4 feet amsl at locations surveyed during the pre-design investigation.

## 2.2 GEOLOGY/HYDROGEOLOGY

The RI showed that DSA-1 contains fill material composed of the spoils from the original construction of the Mohawk River diversion and former dredging operations in the Utica Terminal Harbor, Barge Canal, and Mohawk River. The spoils material is highly variable, ranging from silt and clay to very coarse and well-sorted sand and fine gravels. Three major sedimentary units were identified by the RI: a dredge spoil and upper fluvial unit, a lower fluvial unit, and a glacial lacustrine unit. Diamict layers are present within these units. An upper saturated zone is composed of the dredge material and upper fluvial sediments. Within the upper fluvial sediments are peat beds, silts and clays, which constitute an upper (shallow) aquitard. The upper aquitard is underlain by the lower fluvial sand and gravel, which is the intermediate aquifer. The lower fluvial sediments are underlain by glacial lacustrine sediments consisting of light-gray, pink-hued silt with very fine sand and a trace of clay. This glacial lacustrine silt bed is underlain by laminated gray fine sand and silt with discontinuous clay and gravel layers.

Groundwater flow in DSA-1 is generally radial toward the nearest water body. Groundwater elevations in soil borings drilled inside the bermed area at DSA-1 during the pre-design investigation ranged from approximately 404-399 feet amsl (USGS NGVD). The estimated depth to groundwater ranged from approximately 5 to 13 feet below ground surface (bgs), depending on location within the cell and the texture of subsurface materials. Based on the RI, the average hydraulic conductivity in dredge materials at DSA-1 ranged from 1.45 feet per day (ft/day) to 0.15 ft/day ($5.12 \times 10^{-4}$ centimeters per second (cm/sec) to $5.3 \times 10^{-5}$ cm/sec) in upper fluvial sediments.

## 2.3 PREVIOUS INVESTIGATION RESULTS

In 1996, an RI was conducted by Parsons on behalf of the Niagara Mohawk Power Corporation (NMPC) at the three Dredge Spoil Areas, designated DSA-1, DSA-2, and DSA-3, located adjacent to Utica Harbor (Parsons, 1996). The RI evaluated the presence, nature, and extent of chemical constituents associated with manufactured gas plant (MGP) residuals in the surface soils, subsurface soils, sediments, and surface water at the site. The results of the RI indicate that PAHs and benzene are present in the surface and subsurface dredge spoils at DSA-1 at concentrations greater than the cleanup goals specified in the ROD.

### 2.3.1 PAHs

As discussed in the RI, PAHs were present in surface soils (defined in the RI as 0.5 to 1.0 foot below ground surface) throughout DSA-1. Total PAH concentrations in surface soil within the bermed area ranged from 9.7 milligrams per kilogram (mg/kg) to 1,105 mg/kg. The highest PAH concentrations in surface soils were present in samples collected from the southern portion of DSA-1.

Total PAH concentrations in subsurface soils inside the bermed area ranged from not detected to 1,725 mg/kg. The highest PAH concentrations in subsurface soils were in samples collected from the south-central portion of DSA-1. An isolated area of elevated subsurface total PAH concentration was also in the northern portion of the cell, adjacent to the northern berm.

### 2.3.2 Benzene

Benzene was detected in subsurface soil samples collected within the bermed area at concentrations ranging from not detected to 5.6 mg/kg. The highest benzene concentrations were detected in subsurface soil samples collected from the central area of the DSA-1 cell. Benzene was not detected in surface soil samples collected and analyzed during the RI.

### 2.3.3 Non-Aqueous Phase Liquids (NAPL)

NAPL was observed in subsurface soil samples collected in the center of DSA-1, and in a localized area northwest of the berms. The NAPL was not present in a distinct layer or zone, but was observed adsorbed to the soil in some borings in scattered, discontinuous, areas. Stained soils, sheens and organic odors were also observed in some subsurface soil samples.

# 3.0 SITE INVESTIGATION

The objective of the investigation was to delineate the horizontal and vertical extent of dredge spoils containing total PAHs and benzene at concentrations greater than the ROD-specified cleanup objectives for DSA-1. Vertical delineation was limited by the ROD-specified vertical limit of 398 feet amsl. Data from the borings was used to evaluate the proposed limits of soil to be removed from DSA-1 in accordance with the ROD for the site. The work completed during the investigation included: site survey, soil borings, and soil sampling.

## 3.1 CLEANUP OBJECTIVES

The ROD-specified soil cleanup objectives for total PAHs and benzene at DSA-1 are 1,000 mg/kg and 0.2 mg/kg, respectively. Soil containing PAHs and/or benzene at concentrations greater than the cleanup objectives will be excavated and removed from DSA-1 to a minimum elevation of 398 feet amsl (USGS NGVD). Total PAHs, as defined in the ROD, consist of the summation of the following compounds:

- acenaphthene
- acenaphthylene
- anthracene
- benzo(a)anthracene
- benzo(a)pyrene
- benzo(b)fluoranthene
- benzo(g,h,i)perylene
- benzo(k)fluoranthene
- dibenzo(a,h)anthracene
- chrysene
- fluoranthene
- fluorene
- ideno(1,2,3-cd)pyrene
- 2-methylnaphthalene
- naphthalene
- phenanthrene
- pyrene

## 3.2 SITE SURVEY

Figure 3-1 shows the locations of the soil borings drilled during the pre-design investigation. Historical soil borings and monitoring wells drilled during the RI are also shown on Figure 3-1. Prior to sampling, the horizontal position of the soil borings and the ground surface elevation amsl at each boring location were established by a field survey conducted by Lu Engineering and Land Surveying of Rochester, New York, a New York

State licensed surveyor. Soil boring locations were marked with stakes during the survey. Ground surface elevation data were used to establish elevation-dependent sampling depths at selected soil boring locations.

## 3.3 SOIL BORINGS

As shown on Figure 3-1, 35 soil borings were advanced from ground surface to an elevation of 398 feet amsl (USGS NGVD), using a direct-push drilling rig (i.e., Geoprobe®). Continuous soil cores (MacroCore) were collected from ground surface to the final depth of each boring. As presented in the Work Plan, the locations of the soil borings were based on the distribution of total PAHs and benzene in the samples collected during the 1996 RI. Soil borings were described and sampled in accordance with the NYSDEC-approved Work Plan. Mr. R. Scott Deyette of the NYSDEC observed the drilling and sampling of all soil borings.

Thirty-two soil borings were initially proposed at the site. However, to further delineate the horizontal extent of the PAHs and benzene at concentrations greater than the ROD-specified cleanup objectives, three additional borings (SB-D1, SB-E0, SB-H8) were drilled at grid locations adjacent to borings where visual and olfactory observations indicated the presence of petroleum compounds at the boundaries of the investigation. Mr. R. Scott Deyette of the NYSDEC concurred with the location of additional borings.

Samples were collected at the depth intervals outlined in Table 3-1. "Shallow" soil samples were collected from 2 to 4 feet bgs at each boring and "deep" soil samples were collected from 400 to 398 feet amsl. All samples were sent to SciLab, Inc. of Weymouth, Massachusetts (the NYSCC's contract analytical laboratory) for analysis of total PAHs and benzene by USEPA Methods 8270C and 8260B, respectively. SciLab is a New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP) and a NYSDEC Analytical Services Protocol (ASP)-certified analytical laboratory. Two field duplicate quality assurance/quality control (QA/QC) samples were also collected. Soil borings were backfilled upon completion with soil cuttings.

## 3.4 AIR MONITORING

Ambient air monitoring was performed during all ground-intrusive activities in accordance with the NYSDEC-approved Community Health and Safety Plan.

# 4.0 INVESTIGATION RESULTS

## 4.1 SOIL BORINGS

Soil borings were drilled to total depths ranging from 4 to 16 feet bgs. Within DSA-1, borings were easily advanced to total depth with little resistance due to tight soil layers and no refusal due to gravel or cobbles. The average depth to water in the borings was approximately 9 feet bgs and at an average elevation of 401 feet. Soil observed in the soil cores were generally composed of silty clays and silty sands with very little density. Color was generally brown near the surface and changed to gray at varying depths. Thin zones of organic material were common at varying depth intervals in several borings. Bands of sand and silt were noted in many soil cores, which did not appear to correlate between adjacent borings, likely due the methods by which the material was deposited.

Evidence of petroleum compounds was observed in the soil from a number of borings and tended to be the greatest near the bottom of the borings. Visual and olfactory evidence of petroleum-affected soil was generally not observed above 4 feet bgs. However, field screening with a photoionization detector (PID) did not detect any volatile vapors emitted from the soil due to extremely cold weather conditions on the sampling dates (-1 to 22° F). Hydrocarbon sheens and light non-aqueous phase liquid (LNAPL) were observed in some borings, generally around or below 8 feet bgs. Soil boring logs are included in Appendix A.

## 4.2 PAHs

Table 4-1 presents concentrations of each PAH analyte and calculations of total PAHs for each soil sample collected during the pre-design investigation. As noted in the table, analytes that were not detected were conservatively assigned a value of one half the laboratory quantitation limit when calculating total PAH concentrations.

Total PAH concentrations in shallow soil samples ranged from below quantitation limits in soil borings SB-D1 and SB-E0, to 560,100 g/kg in soil boring SB-A4. No shallow soil samples exceeded the ROD-specified cleanup objectives for PAHs. On average, naphthalene was present in shallow soil samples at higher concentrations than other analytes. Shallow samples with the highest concentrations of PAHs were generally collected from the south and southwest portion of DSA-1.

Concentrations of total PAHs in deep soil samples exceeded ROD-specified cleanup objectives in samples from five soil borings (SB-C7, SB-D2, SB-D4, SB-E1, SB-F6). Concentrations ranged from below quantitation limits in soil borings SB-B5, SB-D1, SB-E0, and SB-G1, to 6,413,000 g/kg in SB-F6. The highest concentrations of PAHs concentrations in deep soil samples were from borings located at the southern and central portions of DSA-1. Consistent with shallow samples, naphthalene was present in deep soil samples at higher concentrations than other analytes.

Overall, PAH concentrations were higher in deep soil samples than in shallow samples. The geometric means for deep and shallow soil samples were 110,661 and 44,621 g/kg, respectively. In borings where both shallow and deep samples were collected, deep samples contained higher concentrations of PAHs than shallow samples in 66 percent of the borings. In areas where shallow samples contained higher PAH concentrations, such as southwest corner of DSA-1, deep samples were collected in firm clay or firm silty clay and total PAH concentrations were relatively low. Furthermore, high PAH concentrations in shallow soil samples from locations adjacent to areas previously identified as being above ROD-specified cleanup objectives.

In borings where deep PAH sample concentrations exceeded ROD-specified cleanup objectives, petroleum odors, hydrocarbon sheens, and LNAPL were observed. However, indications of petroleum compounds were not observed in these borings at depths less than 7 feet bgs. These data indicate that PAHs are at higher concentrations in deeper intervals in these areas, rather than evenly distributed throughout the profile or gradually increasing with depth.

The concentrations and distribution of PAHs in soil samples collected during the pre-design investigation were consistent with the 1996 RI, which identified the southern and central portion of DSA-1 as the most affected area for deep soil samples and the southern portion of DSA-1 as the most affected area for shallow soil samples.

## 4.3 BENZENE

Benzene was present at concentrations greater than the detection limits in only one shallow soil sample (SB-H2). However, the benzene concentration in this sample was below the ROD-specified cleanup objective. Benzene concentrations in deep samples ranged from not detectable in 50 percent of the borings, to 21,000 µg/kg in soil boring SB-E7. The ROD-specified cleanup objective (200 µg/kg) was exceeded in the deep soil samples collected from soil borings SB-D2, SB-D8, SB-E1, SB-E7, SB-F10, and SB-G9.

The RI (Parsons 1996) also found elevated concentrations of benzene in the deeper samples and in areas consistent with the pre-design investigation. Generally, benzene exceeded cleanup objectives in deep soil samples in three areas of DSA-1. Benzene concentrations exceeded cleanup objectives at the southern end of the bermed area at borings (SB-D2, and SB-E1), which also exceeded cleanup objectives for PAHs. In the center of the property, two samples (SB-D8, and SB-E7) exceeded cleanup objectives for benzene, however these borings contained concentrations of PAHs below ROD-specified cleanup objectives. Benzene was also present at concentrations greater than ROD-specified cleanup objectives in the northeastern corner of the bermed area at soil borings SB-G9 and SB-F10. Parsons also identified this area as containing elevated benzene concentrations during the 1996 RI.

## 4.4 DISTRIBUTION OF ROD-SPECIFIED COMPOUNDS

The locations of samples that exceeded ROD-specified cleanup objectives for total PAH and benzene are shown on Figure 4-1. Shallow exceedances for total PAHs were generally located in the southwestern portion of the bermed area. No shallow samples exceeded cleanup objectives for benzene during either investigation.

Deep samples that exceeded cleanup objectives for total PAHs and/or benzene were located throughout the central portion of DSA-1, beginning in the south adjacent to the dike and continuing to the approximate center of DSA-1. An area that exceeded cleanup objectives for benzene was also identified in the northeastern section of DSA-1.

# 5.0 EXCAVATION OF CONTAMINATED SOIL

## 5.1 REQUIREMENTS OF ROD

The ROD requires the excavation and removal from DSA-1 of soils found at or above elevation 398 feet amsl that contain total PAHs at concentrations of 1,000 mg/kg and/or benzene at concentrations of 0.20 mg/kg or higher. Soils meeting or exceeding these concentrations that are located below elevation 398 feet amsl will be left in place. The Canal Corporation will excavate the contaminated soil and transport it to a temporary storage area on lands controlled by the Niagara Mohawk Power Company (Niagara Mohawk) immediately west of Utica Harbor. Niagara Mohawk is responsible for designing the temporary storage pad and for treatment and final disposal of the soil. Following removal of the contaminated soil from DSA-1, the Canal Corporation will prepare this site to receive material dredged from the Harbor and Harbor neck.

## 5.2 IDENTIFICATION OF SOILS EXCEEDING TARGET CLEANUP CONCENTRATIONS

The locations of the soil samples that exceed the target remediation concentrations are shown in Figure 4-1, while the elevations at which these samples were taken and whether the exceedance was for total PAHs or Benzene are shown in Table 5-1. As noted in Table 5-1, only two surface samples, SS-101 and SS-107, exceeded a total PAH concentration of 1,000 mg/kg. No surface samples contained benzene in excess of 0.20 mg/kg. Six samples collected from the strata between elevation 398 and 400 amsl exhibited total PAHs in excess of 1,000 mg/kg, while benzene levels in excess of 0.20 mg/kg were found in seven samples from this strata. Two samples collected during the 1996 RI Report investigation, SB-115D and SB-114C identified total PAHs in excess of 1,000 mg/kg at elevations between 401 and 406 amsl.

Although not shown in Table 5-1, none of the samples collected from the 2- to 4-foot depth during the December 2002 sampling program exceeded the target clean-up levels. This depth generally corresponds to elevations from about 405 to 409 amsl, depending upon the ground surface elevation at each boring. With the exception of the two samples collected during the 1996 RI that found high total PAHs at the 0 to 6-inch depth and one location where no laboratory data are available for the shallow soils, the concentrations of total PAHs and benzene in the top 4 feet of soil in DSA-1 are considerably below those requiring remediation (see Table 4-1). Therefore, at least 4 feet of material can be removed from most areas before commencing the excavation and removal of soil which must be treated prior to disposal.

In order to further characterize the potential for encountering PAH and/or benzene contamination above target cleanup levels in soil strata where no samples were collected for laboratory analysis, all boring logs were reviewed to identify the depths at which visual or other observations of contamination were noted. In a number of instances, the soil boring inspector(s) made notes of the presence of strong, petroleum-type odors, visible droplets of NAPL material, and similar indications of contamination. These notes were correlated with the soil samples exceeding targeted cleanup concentrations to identify other locations and strata on the site where the soil may require removal and treatment. As shown in Table 5-1, the inspectors' notes indicate that, in select areas, only the soil between elevation 402 and 398 contains contamination above the target cleanup level, while in other areas only the soil between elevation 400 and 398 appears to be contaminated above the ROD specified values. In these areas, the soil above the noted elevations does not require remediation and can be relocated to another area within the site. The underlying, contaminated soil will then be excavated and trucked to the stockpile area at the treatment facility.

The information presented in Table 5-1 was used to establish proposed excavation limits for both the relatively clean soil to be relocated within the site and that which is contaminated above the target cleanup levels and must be removed to the treatment facility. Figure 5-1 shows these limits while Figure 5-2 provides typical sections for excavation. The total volumes for excavation and remediation are identified in Table 5-2.

## 5.3 DEWATERING DURING EXCAVATION

Measurements of the depth to groundwater, made during the December, 2002 sampling program, indicate that the surface of the groundwater table ranges from about elevation 398 to 403.5 amsl, with most measurements falling in the 400 to 402 elevation range. Although excavation and removal of dredge spoils to elevation 398 without dewatering is a possibility, it is likely that the fine sands and silts that make up most of the dredge spoils will be unstable below the water table and will flow into the excavation. This would make the sides of the excavation unstable and result in the need to remove much more material than would be the case if the water table were to be lowered and the excavation conducted in the dry. Furthermore, if excavation were to be done below the water table, the soil would have to be temporarily stockpiled to permit it to drain before loading it on trucks and hauling it to the storage pad on Niagara Mohawk property. To avoid the potential problems associated with digging below the water table, it is recommended that the water table be lowered to at least 1 foot below the bottom of the excavation.

Inasmuch as benzene has been found in the soils below the water table and is relatively soluble in water, water from dewatering operations should not be pumped directly into the Mohawk or the Canal. Six water samples collected during the RI/FS showed benzene and xylene concentrations up to 3 parts per billion (ppb) in the groundwater, with four of the six exceeding the NYS drinking water standards of 1.0 ppb. A number of options are available for handling this water, as follows:

1. Construct a temporary, on-site water treatment system for treatment of the water prior to discharging it to the River or Canal,
2. Store water from dewatering operations on-site in large tanks and return it to the pits upon completion of excavation,
3. Construct infiltration basins on a portion of the site as far as possible from the area being excavated to recycle the water back to the groundwater table.

In order to evaluate the feasibility of these options, an estimate has been made of the pumping rate and volume necessary to dewater the excavation. This estimate is based on data developed during the RI/FS and indicates that pumping rates of from 100 to 200 gallons per minute (gpm) are likely to be needed during the initial stages of a dewatering operation to lower the water table to or slightly below elevation 397.

The excavation limits for areas A and C are above the water table and little, if any dewatering is anticipated in these areas. However, it is estimated that approximately 600,000 gallons of water will have to be removed from the saturated zone in Area B and 360,000 gallons in Area D to effect initial dewatering assuming that these areas are treated as separate excavations for construction purposes. Following initial dewatering, the pumping rate required to maintain the water table below the bottom of the excavation is estimated at less than 10 gpm for each area.

For evaluation purposes, it has been assumed that the contractor will remove the soil above the water table prior to beginning dewatering operations. Once the water table has been reached in an area, sumps consisting of perforated pipe surrounded by stone will be installed with their bottom elevations at approximately 390 feet amsl. Submersible pumps will be installed in these sumps and will discharge through hose laid over the ground to the discharge point. Assuming that a 200 gpm pumping rate can be achieved in sumps installed in Area B, it will take about 60 hours of pumping to remove the water present in the prism of soil to be excavated and to lower the water table to around elevation 397 amsl. Once this initial dewatering has been completed, the pumping rate will be reduced to that necessary to keep the water table from recovering.

Excavation will resume as the water table is lowered, and the soil will be trucked to the stockpile at the treatment location on Niagara Mohawk property or spread elsewhere in DSA-1, as appropriate. When excavation has been completed to the design grades, "clean" soil from the upper levels of Area D and some of the "clean" soil removed during the initial excavation of Area B will be placed in the pit to raise its grade to elevation 402, the approximate water table elevation under static conditions. At that point, the pumps will be shut down and relocated to Area D.

Area B will also be backfilled, after completing the soil removal work. This will eliminate the possibility of creating a permanent area of ponded water which could result in increased volatilization of volatile organic contaminates in the underlying soil and become a breeding ground for mosquitoes.

In view of the relatively large volume of water which will be removed during initial dewatering, approximately 600,000 gallons in Area B and 360,000 gallons in Area D, it is not considered practical to install modular tanks to contain this water. Similarly, the need to pump at a relatively high rate during initial dewatering makes the installation of a temporary water treatment system utilizing air stripper and carbon filters unreasonably expensive. The most economical and practical method of handling the water from the dewatering operations will be to construct one or two infiltration basins within the confines of the site to receive this water and permit it to percolate down into the ground and return to the groundwater regime. A basin or basins with 600,000 gallons of capacity, large enough to handle all of the initial dewatering from Area B, would cover an area about 200 feet long by 140 feet wide and would be filled to a depth of 3 feet. Areas large enough for this are located in the north and east corners of DSA-1. The basins would be constructed by bulldozing soil to form a 4-foot high berm around the basin(s). The water pumped into such a basin would percolate slowly into the soil and eventually dry up following completion of the work.

# 6.0 ESTIMATED COST OF REMEDIATION

An opinion of the probable cost of removing the contaminated soil from DSA-1 and stockpiling it at the proposed treatment location on Niagara Mohawk land adjacent to the site, is shown in Table 6-1. This cost does not include the cost of treating the soil once it has been removed, as the treatment method and costs are not the responsibility of the NYSCC. As noted in Table 6-1 below, the probable total cost of the work is approximately $608,437.

**Table 6-1**
**Opinion of Probable Construction Cost**
**DSA-1 Pre-Design Investigation**
**Removal of Soil to Niagara Mohawk Site**

| **Description** | **Quantity** | **Units** | **Unit Cost** | **Total** |
|---|---|---|---|---|
| Site Clearing | | | | $ - |
| Cut and Chip Trees/Brush | 9 | Acres | $ 2,150.00 | $ 19,350 |
| Grub Stumps, Bury on Site | 9 | Acres | $ 1,150.00 | $ 10,350 |
| Dewatering | 2 | Month | $15,000.00 | $ 30,000 |
| Excavate and Spread Overburden | | | | $ - |
| Excavate | 27,020 | C.Y. | $ 1.47 | $ 39,719 |
| Haul | 27,020 | C.Y. | $ 2.32 | $ 62,686 |
| Grade | 27,020 | C.Y. | $ 1.16 | $ 31,343 |
| Excavate and Haul Soil for Remediation | | | | $ - |
| Excavate | 27,020 | C.Y. | $ 1.60 | $ 43,232 |
| Haul | 27,020 | C.Y. | $ 3.00 | $ 81,060 |
| Grade | 27,020 | C.Y. | $ 1.20 | $ 32,424 |
| Partially Backfill Excavations | 10,000 | C.Y. | $ 1.20 | $ 12,000 |
| **Subtotal** | | | | **$ 362,165** |
| 20% Contractor Overhead and Profit | | | | $ 72,433 |
| **Construction Subtotal** | | | | **$ 434,598** |
| 20% Contingency | | | | 86,919.60 |
| 20% Engineering, Legal & Administration | | | | 86,919.60 |
| **Probable Construction Cost** | | | | **$ 608,437** |

# TABLES

## Table 3-1
## Soil Boring Sample Intervals
## DSA-1 Pre-Design Investigation
## Niagara Mohawk Harbor Point Site, Utica, New York

| Boring ID | Surface Elevation USGS (feet NGVD) | Shallow Sample Interval (feet bgs) | | Deep Sample Interval (El. 400-398 feet NGVD) (feet bgs) | | Depth to Groundwater (feet bgs) | Groundwater Elevation (feet NGVD) |
|---|---|---|---|---|---|---|---|
| | | Top | Bottom | Top | Bottom | | |
| SB A-4 | 408.58 | 2 | 4 | 8.6 | 10.6 | 7.0 | 401.6 |
| SB B-3 | 406.52 | 2 | 4 | 6.5 | 8.5 | 6.0 | 400.5 |
| SB B-5 | 409.33 | 2 | 4 | 9.3 | 11.3 | 8.0 | 401.3 |
| SB B-6 | 410.97 | 2 | 4 | 11.0 | 13.0 | 9.0 | 402.0 |
| SB B-8 | 411.79 | 2 | 4 | 11.8 | 13.8 | 11.0 | 400.8 |
| SB C-3 | 409.54 | 2 | 4 | 9.5 | 11.5 | 8.5 | 401.0 |
| SB C-5 | 411.39 | 2 | 4 | 11.4 | 13.4 | 12.0 | 399.4 |
| SB C-7 | 411.49 | 2 | 4 | 11.5 | 13.5 | 10.0 | 401.5 |
| SB C-9 | 412.35 | 2 | 4 | 12.4 | 14.4 | 13.5 | 398.9 |
| SB D-1 | Not surveyed | 2 | 4 | 6.0 | 8.0 | CLAY | -- |
| SB D-2 | 408.75 | 2 | 4 | 8.8 | 10.8 | CLAY | -- |
| SB D-4 | 411.47 | 2 | 4 | 11.5 | 13.5 | 10.0 | 401.5 |
| SB D-6 | 410.41 | 2 | 4 | 10.4 | 12.4 | CLAY | -- |
| SB D-8 | 411.01 | 2 | 4 | 11.0 | 13.0 | 9.5 | 401.5 |
| SB E-0 | Not surveyed | 2 | 4 | 6.0 | 8.0 | CLAY | -- |
| SB E-1 | 409.06 | 2 | 4 | 9.1 | 11.1 | 8.0 | 401.1 |
| SB E-3 | 408.54 | 2 | 4 | 8.5 | 10.5 | 5.0 | 403.5 |
| SB E-5 | 409.69 | 2 | 4 | 9.7 | 11.7 | 8.5 | 401.2 |
| SB E-7 | 410.42 | 2 | 4 | 10.4 | 12.4 | 8.0 | 402.4 |
| SB F-2 | 407.47 | 2 | 4 | 7.5 | 9.5 | CLAY | -- |
| SB F-6 | 410.43 | 2 | 4 | 10.4 | 12.4 | CLAY | -- |
| SB F-10 | 410.77 | 2 | 4 | 10.8 | 12.8 | 10.0 | 400.8 |
| SB G-1 | 404.89 | 2 | 4 | 4.9 | 6.9 | 11.0 | 393.9 |
| SB G-3 | 408.84 | 2 | 4 | 8.8 | 10.8 | 8.0 | 400.8 |
| SB G-9 | 410.00 | 2 | 4 | 10.0 | 12.0 | 8.0 | 402.0 |
| SB G-11 | 410.23 | 2 | 4 | 10.2 | 12.2 | 8.0 | 402.2 |
| SB H-2 | 407.08 | 2 | 4 | 7.1 | 9.1 | 7.0 | 400.1 |
| SB H-8 | Not surveyed | 2 | 4 | 10.0 | 12.0 | 8.0 | -- |
| SB H-10 | 410.06 | 2 | 4 | 10.1 | 12.1 | 8.0 | 402.1 |
| SB-103 | 407.7 | 2 | 4 | Previously sampled | | ND | -- |
| SB-104 | 410.6 | 2 | 4 | Previously sampled | | ND | -- |
| SB-112 | Not surveyed | 2 | 4 | Previously sampled | | ND | -- |
| SB-114 | 410.7 | Previously sampled | | 10.7 | 12.7 | 8.5 | 402.2 |
| SB-116 | 412.0 | 2 | 4 | Previously sampled | | ND | -- |
| SB-123 | 411.0 | 2 | 4 | Previously sampled | | ND | -- |

Previously sampled - Interval was sampled during the previous RI (Parsons, 1996)
ND - Not determined - Groundwater not encountered in soil boring.

F:\P\4098003\D\Pre-Design IR\Table 3-1.xls [All Samples]

# TABLE 4-1
# SOIL SAMPLING RESULTS
# NIAGRA MOHAWK HARBOR: DSA-1
# DECEMBER 2002

| **Analysis** | **SB-A4** | | **SB-B3** | | **SB-B5** | |
|---|---|---|---|---|---|---|
| Analyte | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) |
| **ASP B SEMIVOLATILES** | | | | | | |
| Naphthalene | 50,000 | 6,000 | 1,700 | 680 | 79,000 | 215 |
| 2-Methyl Naphthalene | 5,100 | 2,100 | 610 | 1,200 | 9,900 | 215 |
| Acenaphthylene | 4,000 | 12,000 | 930 | 1,200 | 2,500 | 215 |
| Acenapthene | 8,100 | 10,000 | 270 | 2,000 | 3,200 | 215 |
| Fluorene | 5,800 | 20,000 | 260 | 740 | 2,000 | 215 |
| Phenanthrene | 36,000 | 76,000 | 1,300 J | 1,200 | 9,800 | 215 |
| Anthracene | 31,000 | 27,000 | 520 J | 1,200 | 5,200 | 215 |
| Fluoranthene | 64,000 | 27,000 | 1,500 J | 1,200 | 16,000 | 215 |
| Pyrene | 52,000 | 34,000 | 2,600 J | 1,200 | 17,000 J | 215 |
| Benzo(a)anthracene | 51,000 | 17,000 | 1,600 J | 1,200 | 13,000 J | 215 |
| Chrysene | 54,000 | 16,000 | 1,800 J | 1,200 | 13,000 J | 215 |
| Indeno (1,2,3-cd)Pyrene | 35,000 | 6,000 | 1,600 J | 1,200 | 14,000 | 215 |
| Benzo(b)fluoranthene | 71,000 | 11,000 | 2,400 J | 1,200 | 25,000 | 215 |
| Benzo(k)fluoranthene | 6,000 | 6,000 | 470 J | 1,200 | 2,200 | 215 |
| Benzo(a)pyrene | 50,000 | 12,000 | 2,000 J | 1,200 | 19,000 | 215 |
| Dibenzo(a,h)Anthracene | 2,100 | 6,000 | 610 J | 1,200 | 4,700 | 215 |
| Benzo (g,h,i) perylene | 35,000 | 5,500 | 2,200 J | 1,200 | 15,000 | 215 |
| | | | | | | |
| Total PAHs | 560,100 | 293,600 | 22,370 | 20,220 | 250,500 | 3,655 |
| | | | | | | |
| **ASP B VOLATILES** | | | | | | |
| Benzene | <13 J | <15 J | <15 J | <15 J | <14 J | <13 |

☐ - Concentration exceeds cleanup objective
▨ - Concentration half of the quantitation limit
J - estimated
bgs - below ground surface
NGVD - National Geodetic Vertical Datum (1929)

F\P\4098003\F\Soil Results (ND)\Table 4-1 (Report)

# TABLE 4-1
# SOIL SAMPLING RESULTS
# NIAGRA MOHAWK HARBOR: DSA-1
# DECEMBER 2002

| **Analysis** | SB-B6 | | SB-B8 | | SB-C3 | | SB-C5 | |
|---|---|---|---|---|---|---|---|---|
| Analyte | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) |
| **ASP B SEMIVOLATILES** | | | | | | | | |
| Naphthalene | 21,000 | 28,000 | 2,200 | 3,400 | 140,000 | 14,000 | 12,000 | 16,000 |
| 2-Methyl Naphthalene | 2,600 | 11,000 | 740 | 3,700 | 17,000 | 4,700 | 1,800 | 4,300 |
| Acenaphthylene | 2,200 | 9,900 | 690 | 5,800 | 3,400 | 3,000 | 5,500 | 12,000 |
| Acenapthene | 1,100 | 8,200 | 660 | 1,700 | 9,100 | 3,700 | 1,000 | 6,600 |
| Fluorene | 710 | 8,500 | 660 | 3,900 | 5,500 | 2,200 | 790 | 13,000 |
| Phenanthrene | 4,400 | 26,000 | 3,900 | 10,000 | 30,000 J | 4,700 | 3,500 | 46,000 |
| Anthracene | 1,700 | 7,100 | 1,200 | 3,600 | 12,000 J | 1,600 | 2,000 | 15,000 |
| Fluoranthene | 5,000 | 6,900 | 4,500 | 3,600 | 29,000 J | 1,200 | 5,000 | 12,000 |
| Pyrene | 4,200 | 9,800 | 3,700 | 4,900 | 37,000 J | 2,000 | 3,800 J | 16,000 |
| Benzo(a)anthracene | 3,600 | 4,500 | 2,700 | 3,300 | 25,000 J | 760 | 3,300 | 7,900 |
| Chrysene | 4,000 | 4,500 | 2,800 | 3,800 | 26,000 J | 710 | 3,600 | 7,200 |
| Indeno (1,2,3-cd)Pyrene | 4,200 | 1,300 | 2,300 | 2,500 | 27,000 J | 1,150 | 2,200 | 1,800 |
| Benzo(b)fluoranthene | 6,700 | 3,300 | 4,400 | 5,200 | 51,000 J | 470 | 4,900 | 5,700 |
| Benzo(k)fluoranthene | 2,200 | 2,350 | 1,150 | 1,150 | 5,500 J | 1,150 | 1,100 | 5,500 |
| Benzo(a)pyrene | 5,300 | 3,600 | 3,100 | 6,200 | 39,000 J | 500 | 3,600 | 3,200 |
| Dibenzo(a,h)Anthracene | 1,400 | 2,350 | 880 | 1,200 | 10,000 J | 1,150 | 320 | 5,500 |
| Benzo (g,h,i) perylene | 4,800 | 1,700 | 2,700 | 3,100 | 31,000 J | 1,150 | 2,300 | 5,500 |
| | | | | | | | | |
| Total PAHs | 75,110 | 139,000 | 38,280 | 67,050 | 497,500 | 44,140 | 56,710 | 183,200 |
| | | | | | | | | |
| **ASP B VOLATILES** | | | | | | | | |
| Benzene | <13 | <14 | <14 | 2 J | <14 J | 66 J | <13 | 7 |

☐ - Concentration exceeds cleanup objective
▨ - Concentration half of the quantitation limit
J - estimated
bgs - below ground surface
NGVD - National Geodetic Vertical Datum (1929)

# TABLE 4-1
# SOIL SAMPLING RESULTS
# NIAGRA MOHAWK HARBOR: DSA-1
# DECEMBER 2002

| **Analysis** | SC-C7 | | SB-C9 | | SB-D1 | | SB-D2 | |
|---|---|---|---|---|---|---|---|---|
| Analyte | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) |
| **ASP B SEMIVOLATILES** | | | | | | | | |
| Naphthalene | 1,500 | 610,000 | 630 | 76,000 | 215 | 240 | 57,000 | 1,100,000 |
| 2-Methyl Naphthalene | 1,100 | 400,000 | 1,000 | 44,000 | 215 | 240 | 6,500 | 540,000 |
| Acenaphthylene | 690 | 280,000 | 340 | 29,000 | 215 | 240 | 6,000 | 270,000 |
| Acenapthene | 1,100 | 43,000 | 300 | 35,000 | 215 | 240 | 2,200 | 140,000 |
| Fluorene | 1,100 | 190,000 | 400 | 33,000 | 215 | 240 | 6,000 | 190,000 |
| Phenanthrene | 2,900 | 510,000 | 2,800 | 100,000 | 215 | 240 | 7,100 | 470,000 |
| Anthracene | 860 | 150,000 | 840 | 31,000 | 215 | 240 | 2,900 | 150,000 |
| Fluoranthene | 3,700 | 120,000 | 3,300 | 34,000 | 215 | 240 | 8,900 | 110,000 |
| Pyrene | 3,300 J | 140,000 J | 2,400 | 45,000 | 215 | 240 | 8,900 | 180,000 |
| Benzo(a)anthracene | 2,500 | 75,000 | 1,700 | 22,000 | 215 | 240 | 7,700 | 73,000 |
| Chrysene | 2,600 | 71,000 | 1,700 | 20,000 | 215 | 240 | 7,500 | 73,000 |
| Indeno (1,2,3-cd)Pyrene | 2,000 | 70,000 | 1,300 | 5,500 | 215 | 240 | 9,500 | 170,000 |
| Benzo(b)fluoranthene | 3,800 | 48,000 | 2,600 | 15,000 | 215 | 240 | 15,000 | 170,000 |
| Benzo(k)fluoranthene | 1,100 | 70,000 | 1,000 | 5,500 | 215 | 240 | 6,000 | 170,000 |
| Benzo(a)pyrene | 2,700 | 56,000 | 1,800 | 18,000 | 215 | 240 | 10,000 | 170,000 |
| Dibenzo(a,h)Anthracene | 670 | 70,000 | 380 | 2,500 | 215 | 240 | 6,000 | 170,000 |
| Benzo (g,h,i) perylene | 2,500 | 70,000 | 1,400 | 7,100 | 215 | 240 | 10,000 | 170,000 |
| | | | | | | | | |
| Total PAHs | 34,120 | 2,973,000 | 23,890 | 522,600 | 3,655 | 4,080 | 177,200 | 4,316,000 |
| | | | | | | | | |
| **ASP B VOLATILES** | | | | | | | | |
| Benzene | <14 | 9 J | <12 | <14 | <14 | <14 | <14 J | 2,600 |

🟨 - Concentration exceeds cleanup objective

▨ - Concentration half of the quantitation limit

J - estimated

bgs - below ground surface

NGVD - National Geodetic Vertical Datum (1929)

# TABLE 4-1
# SOIL SAMPLING RESULTS
# NIAGRA MOHAWK HARBOR: DSA-1
# DECEMBER 2002

| **Analysis** | SB-D4 | | SB-D6 | | SB-D8 | | SB-E0 | |
|---|---|---|---|---|---|---|---|---|
| Analyte | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) |
| **ASP B SEMIVOLATILES** | | | | | | | | |
| Naphthalene | 8,300 | 1,400,000 | 6,000 | 170 | 7,200 J | 76,000 | 210 | 210 |
| 2-Methyl Naphthalene | 1,700 | 720,000 | 2,000 | 670 | 5,500 J | 45,000 | 210 | 210 |
| Acenaphthylene | 690 | 450,000 | 1,200 | 225 | 5,500 J | 24,000 | 210 | 210 |
| Acenapthene | 790 | 180,000 | 760 | 225 | 5,500 J | 12,000 | 210 | 210 |
| Fluorene | 1,050 | 300,000 | 1,300 | 225 | 5,500 J | 18,000 | 210 | 210 |
| Phenanthrene | 3,800 | 710,000 | 6,100 | 225 | 17,000 J | 48,000 | 210 | 210 |
| Anthracene | 1,300 | 270,000 | 1,700 | 225 | 5,700 J | 15,000 | 210 | 210 |
| Fluoranthene | 4,300 | 190,000 | 6,700 | 225 | 24,000 J | 11,000 | 210 | 210 |
| Pyrene | 3,500 J | 290,000 J | 5,700 | 225 | 18,000 J | 16,000 J | 210 | 210 |
| Benzo(a)anthracene | 2,900 | 120,000 | 4,100 | 225 | 15,000 J | 7,900 | 210 | 210 |
| Chrysene | 3,200 | 110,000 | 3,900 | 225 | 14,000 J | 6,900 | 210 | 210 |
| Indeno (1,2,3-cd)Pyrene | 2,400 | 26,000 | 2,500 | 225 | 9,400 J | 13,500 | 210 | 210 |
| Benzo(b)fluoranthene | 4,700 | 74,000 | 6,600 | 225 | 22,000 J | 4,600 | 210 | 210 |
| Benzo(k)fluoranthene | 1,050 | 35,000 | 1,150 | 225 | 55,00 J | 5,500 | 210 | 210 |
| Benzo(a)pyrene | 3,300 | 83,000 | 4,300 | 225 | 14,000 J | 5,500 | 210 | 210 |
| Dibenzo(a,h)Anthracene | 1,050 | 35,000 | 1,150 | 225 | 5,500 J | 13,500 | 210 | 210 |
| Benzo (g,h,i) perylene | 2,500 | 35,000 | 1,150 | 225 | 10,000 J | 13,500 | 210 | 210 |
| | | | | | | | | |
| Total PAHs | 46,530 | 5,028,000 | 56,310 | 4,215 | 189,300 | 335,900 | 3,570 | 3,570 |
| | | | | | | | | |
| **ASP B VOLATILES** | | | | | | | | |
| Benzene | <13 | 67 J | <14 J | <14 | <13 | 1,900 J | <13 | <13 |

🟨 - Concentration exceeds cleanup objective

🟦 - Concentration half of the quantitation limit

J - estimated

bgs - below ground surface

NGVD - National Geodetic Vertical Datum (1929)

# TABLE 4-1
# SOIL SAMPLING RESULTS
# NIAGRA MOHAWK HARBOR: DSA-1
# DECEMBER 2002

| **Analysis** | SB-E1 | | SB-E3 | | SB-E5 | | SB-E7 | |
|---|---|---|---|---|---|---|---|---|
| Analyte | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) |
| **ASP B SEMIVOLATILES** | | | | | | | | |
| Naphthalene | 45,000 | 920,000 | 43,000 | 120,000 | 6,300 | 160,000 | 2,400 | 100,000 |
| 2-Methyl Naphthalene | 5,800 | 460,000 | 5,800 | 64,000 | 1,300 | 100,000 | 1,300 | 59,000 |
| Acenaphthylene | 5,500 | 450,000 | 1,200 | 43,000 | 760 | 60,000 | 1,100 | 25,000 |
| Acenapthene | 1,700 | 66,000 | 2,300 | 6,400 | 1,200 | 16,000 | 540 | 23,000 |
| Fluorene | 5,500 | 250,000 | 1,500 | 24,000 | 1,200 | 41,000 | 750 | 24,000 |
| Phenanthrene | 6,200 | 470,000 | 6,600 | 58,000 | 2,200 | 100,000 | 3,000 | 62,000 |
| Anthracene | 2,700 | 210,000 | 2,700 | 19,000 | 720 | 32,000 | 870 | 19,000 |
| Fluoranthene | 7,000 | 150,000 | 8,400 | 14,000 | 2,400 | 25,000 | 2,700 | 15,000 |
| Pyrene | 11,000 | 230,000 | 7,600 | 19,000 J | 2,300 | 33,000 J | 2,600 J | 21,000 J |
| Benzo(a)anthracene | 7,100 | 96,000 | 6,200 | 8,900 | 1,800 | 16,000 | 1,800 | 9,400 |
| Chrysene | 7,100 | 94,000 | 6,100 | 8,100 | 1,800 | 14,000 | 2,100 | 8,500 |
| Indeno (1,2,3-cd)Pyrene | 9,500 | 23,000 | 4,800 | 11,000 | 1,300 | 14,000 | 1,700 | 8,000 |
| Benzo(b)fluoranthene | 14,000 | 59,000 | 12,000 | 11,000 | 3,100 | 8,900 | 3,300 | 5,700 |
| Benzo(k)fluoranthene | 5,500 | 33,500 | 1,150 | 3,600 | 1,200 | 14,000 | 1,250 | 8,000 |
| Benzo(a)pyrene | 11,000 | 71,000 | 8,000 | 6,100 | 2,100 | 10,000 | 2,200 | 6,400 |
| Dibenzo(a,h)Anthracene | 3,500 | 11,000 | 1,150 | 11,000 | 1,200 | 14,000 | 1,250 | 8,000 |
| Benzo (g,h,i) perylene | 12,000 | 26,000 | 4,600 | 11,000 | 1,400 | 14,000 | 2,000 | 8,000 |
| | | | | | | | | |
| Total PAHs | 160,100 | 3,619,500 | 123,100 | 438,100 | 32,280 | 671,900 | 30,860 | 410,000 |
| | | | | | | | | |
| **ASP B VOLATILES** | | | | | | | | |
| Benzene | <13 J | 1,000 | <15 | 53 | <15 | 610 J | <14 | 21,000 J |

🟨 - Concentration exceeds cleanup objective

▨ - Concentration half of the quantitation limit

J - estimated

bgs - below ground surface

NGVD - National Geodetic Vertical Datum (1929)

F\P\4098003\F\Soil Results (ND)\Table 4-1 (Report)

# TABLE 4-1
# SOIL SAMPLING RESULTS
# NIAGRA MOHAWK HARBOR: DSA-1
# DECEMBER 2002

| Analysis | SB-F2 | | SB-F6 | | SB-F10 | | SB-G1 | |
|---|---|---|---|---|---|---|---|---|
| Analyte | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) |
| **ASP B SEMIVOLATILES** | | | | | | | | |
| Naphthalene | 14,000 | 2,300 | 1,400 | 1,600,000 J | 1,400 | 34,000 | 390 | 235 |
| 2-Methyl Naphthalene | 2,400 | 450 | 410 | 860,000 J | 630 | 26,000 | 120 | 235 |
| Acenaphthylene | 830 | 180 | 640 | 640,000 J | 620 | 14,000 | 110 | 235 |
| Acenapthene | 1,200 | 160 | 465 | 180,000 J | 600 | 9,200 | 220 | 235 |
| Fluorene | 1,200 | 225 | 465 | 340,000 J | 580 | 13,000 | 220 | 235 |
| Phenanthrene | 2,100 | 620 | 790 | 860,000 J | 3,100 | 39,000 | 150 | 235 |
| Anthracene | 890 | 250 | 290 | 290,000 J | 900 | 11,000 | 220 | 235 |
| Fluoranthene | 3,000 | 710 | 1,400 | 220,000 J | 3,400 | 8,900 | 140 | 235 |
| Pyrene | 3,500 | 750 | 1,600 | 270,000 J | 2,700 | 14,000 | 290 J | 235 |
| Benzo(a)anthracene | 2,800 | 580 | 1,400 | 140,000 J | 2,200 | 6,000 | 180 J | 235 |
| Chrysene | 2,900 | 610 | 1,600 | 120,000 J | 2,300 | 5,500 | 200 J | 235 |
| Indeno (1,2,3-cd)Pyrene | 2,500 | 510 | 1,200 | 180,000 J | 1,800 | 1,400 | 190 J | 235 |
| Benzo(b)fluoranthene | 5,300 | 1,100 | 2,300 | 83,000 J | 3,700 | 3,900 | 290 J | 235 |
| Benzo(k)fluoranthene | 1,200 | 225 | 465 | 180,000 J | 1,150 | 2,250 | 220 J | 235 |
| Benzo(a)pyrene | 3,800 | 780 | 1,800 | 90,000 J | 2,600 | 4,200 | 230 J | 235 |
| Dibenzo(a,h)Anthracene | 1,200 | 225 | 490 | 180,000 J | 480 | 2,250 | 220 J | 235 |
| Benzo (g,h,i) perylene | 2,600 | 570 | 1,600 | 180,000 J | 2,000 | 1,700 | 230 J | 235 |
| | | | | | | | | |
| Total PAHs | 51,420 | 10,245 | 18,315 | 6,413,000 | 30,160 | 196,300 | 3,620 | 3,995 |
| | | | | | | | | |
| **ASP B VOLATILES** | | | | | | | | |
| Benzene | <14 | <14 | <14 | 44 J | <15 | 1,400 | <13 J | <14 J |

🟨 - Concentration exceeds cleanup objective

▨ - Concentration half of the quantitation limit

J - estimated

bgs - below ground surface

NGVD - National Geodetic Vertical Datum (1929)

F\P\4098003\F\Soil Results (ND)\Table 4-1 (Report)

# TABLE 4-1
# SOIL SAMPLING RESULTS
# NIAGRA MOHAWK HARBOR: DSA-1
# DECEMBER 2002

| **Analysis**<br>Analyte | SB-G3 |  | SB-G9 |  | SB-G11 |  | SB-H2 |  |
|---|---|---|---|---|---|---|---|---|
|  | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) |
| **ASP B SEMIVOLATILES** |  |  |  |  |  |  |  |  |
| Naphthalene | 9,000 | 550 | 1,800 | 180,000 | 370 | 56,000 | 48,000 | 3,300 |
| 2-Methyl Naphthalene | 2,500 | 260 | 420 | 110,000 | 480 | 37,000 | 7,100 | 750 |
| Acenaphthylene | 1,600 | 230 | 660 | 71,000 | 480 | 6,800 | 1,300 | 1,200 |
| Acenapthene | 1,100 | 225 | 1,150 | 23,000 | 480 | 32,000 | 6,600 | 1,900 |
| Fluorene | 900 | 225 | 1,150 | 48,000 | 480 | 25,000 | 4,200 | 1,500 |
| Phenanthrene | 2,900 | 340 | 630 | 150,000 | 1,300 | 64,000 | 11,000 | 4,500 |
| Anthracene | 1,000 | 225 | 1,150 | 45,000 | 350 | 26,000 | 3,900 | 1,700 |
| Fluoranthene | 3,000 | 230 | 990 | 31,000 | 1,800 | 21,000 | 7,000 | 3,200 |
| Pyrene | 3,100 | 320 | 1,300 | 41,000 | 1,300 | 25,000 | 5,100 | 3,800 |
| Benzo(a)anthracene | 2,600 | 190 | 1,100 | 21,000 | 960 | 12,000 | 3,100 | 1,900 |
| Chrysene | 2,700 | 230 | 1,400 | 19,000 | 950 | 11,000 | 2,900 | 1,700 |
| Indeno (1,2,3-cd)Pyrene | 1,800 | 170 | 1,100 | 4,000 | 800 | 2,800 | 1,100 | 1,200 |
| Benzo(b)fluoranthene | 4,900 | 350 | 1,700 | 14,000 | 1,600 | 7,900 | 3,600 | 1,900 |
| Benzo(k)fluoranthene | 1,100 | 225 | 1,150 | 12,000 | 480 | 2,350 | 1,300 | 1,200 |
| Benzo(a)pyrene | 3,500 | 290 | 1,400 | 16,000 | 1,100 | 8,400 | 2,400 | 1,700 |
| Dibenzo(a,h)Anthracene | 1,100 | 225 | 370 | 12,000 | 480 | 2,350 | 1,300 | 1,200 |
| Benzo (g,h,i) perylene | 1,800 | 240 | 1,400 | 12,000 | 840 | 3,700 | 1,000 | 4,700 |
|  |  |  |  |  |  |  |  |  |
| Total PAHs | 44,600 | 4,525 | 18,870 | 809,000 | 14,250 | 343,300 | 110,900 | 37,350 |
|  |  |  |  |  |  |  |  |  |
| **ASP B VOLATILES** |  |  |  |  |  |  |  |  |
| Benzene | <14 | <14 | <14 J | 2,700 J | <15 | <15 | 8 | <15 |

🟨 - Concentration exceeds cleanup objective
▨ - Concentration half of the quantitation limit
J - estimated
bgs - below ground surface
NGVD - National Geodetic Vertical Datum (1929)

# TABLE 4-1
# SOIL SAMPLING RESULTS
# NIAGRA MOHAWK HARBOR: DSA-1
# DECEMBER 2002

| **Analysis** | **SB-H8** | | **SB-H10** | | **SB-103** | **SB-104** | **SB-112** | **SB-114** | **SB-116** |
|---|---|---|---|---|---|---|---|---|---|
| Analyte | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2'-4' bgs (ug/kg) | 2-4 ft. bgs (ug/kg) | 2-4 ft. bgs (ug/kg) | 400-398 ft. NGVD (ug/kg) | 2-4 ft. bgs (ug/kg) |
| **ASP B SEMIVOLATILES** | | | | | | | | | |
| Naphthalene | 7,000 | 430 | 1,800 | 410 | 17,000 | 13,000 | 3,500 | 180,000 | 23,000 |
| 2-Methyl Naphthalene | 1,000 | 160 | 470 | 170 | 3,800 | 6,600 | 910 | 43,000 | 3,500 |
| Acenaphthylene | 1,500 | 260 | 300 | 350 | 1,100 | 4,600 | 780 | 24,000 | 5,500 |
| Acenapthene | 1,000 | 260 | 220 | 475 | 1,000 | 760 | 910 | 21,000 | 5,500 |
| Fluorene | 920 | 260 | 220 | 475 | 730 | 2,900 | 920 | 23,000 | 5,500 |
| Phenanthrene | 6,000 | 120 | 1,200 | 390 | 3,700 | 7,400 | 6,100 | 72,000 | 6,000 |
| Anthracene | 1,600 | 260 | 350 | 160 | 1,500 | 2,600 | 1,700 | 21,000 | 2,200 |
| Fluoranthene | 7,000 | 260 | 1,500 | 500 | 5,200 | 4,300 | 7,700 | 30,000 | 6,300 |
| Pyrene | 8,800 J | 100 | 1,300 | 710 | 5,100 | 4,400 | 6,300 | 25,000 J | 5,500 |
| Benzo(a)anthracene | 6,600 J | 96 | 880 | 610 | 3,800 | 2,500 | 4,700 | 16,000 | 5,000 |
| Chrysene | 6,600 J | 120 | 960 | 720 | 4,000 | 2,400 | 4,800 | 14,000 | 5,200 |
| Indeno (1,2,3-cd)Pyrene | 4,500 J | 84 | 860 | 630 | 3,600 | 1,100 | 4,200 | 8,000 | 5,900 |
| Benzo(b)fluoranthene | 9,000 J | 140 | 1,500 | 1,000 | 7,900 | 3,300 | 4,400 | 17,000 | 9,300 |
| Benzo(k)fluoranthene | 460 J | 150 | 485 | 475 | 1,150 | 1,250 | 4,100 | 6,000 | 5,500 |
| Benzo(a)pyrene | 6,600 J | 150 | 1,000 | 840 | 5,700 | 2,300 | 1,600 | 12,000 | 7,400 |
| Dibenzo(a,h)Anthracene | 1,800 J | 260 | 250 | 200 | 1,150 | 1,250 | 2,300 | 2,500 | 5,500 |
| Benzo (g,h,i) perylene | 5,300 J | 260 | 900 | 820 | 3,800 | 1,250 | 5,400 | 7,900 | 7,400 |
| | | | | | | | | | |
| Total PAHs | 75,680 | 3,370 | 14,195 | 8,935 | 70,230 | 61,910 | 60,320 | 522,400 | 114,200 |
| | | | | | | | | | |
| **ASP B VOLATILES** | | | | | | | | | |
| Benzene | <14 | <16 | <14 | <14 | <15 | <16 J | <14 J | 23 | <14 |

☐ - Concentration exceeds cleanup objective

▨ - Concentration half of the quantitation limit

J - estimated

bgs - below ground surface

NGVD - National Geodetic Vertical Datum (1929)

F\P\4098003\F\Soil Results (ND)\Table 4-1 (Report)

# TABLE 4-1
# SOIL SAMPLING RESULTS
# NIAGRA MOHAWK HARBOR: DSA-1
# DECEMBER 2002

| **Analysis** | **SB-123** | **SB-XX** | **SB-XY** |
|---|---|---|---|
| Analyte | 2-4 ft. bgs (ug/kg) | dup. (SB-H10, 400-398) (ug/kg) | dup (SB-A4, 400-398) (ug/kg) |
| **ASP B SEMIVOLATILES** | | | |
| Naphthalene | 1,200 | 580 | 6,000 |
| 2-Methyl Naphthalene | 1,200 | 240 | 6,000 |
| Acenaphthylene | 1,200 | 410 | 4,500 |
| Acenapthene | 1,200 | 460 | 3,600 |
| Fluorene | 1,200 | 460 | 7,000 |
| Phenanthrene | 1,200 | 520 | 25,000 |
| Anthracene | 1,200 | 220 | 9,500 |
| Fluoranthene | 1,500 | 700 | 9,400 |
| Pyrene | 1,200 | 890 | 13,000 |
| Benzo(a)anthracene | 890 | 680 | 6,500 |
| Chrysene | 1,000 | 810 | 6,000 |
| Indeno (1,2,3-cd)Pyrene | 890 | 710 | 6,000 |
| Benzo(b)fluoranthene | 1,600 | 1,200 | 4,000 |
| Benzo(k)fluoranthene | 1,200 | 460 | 6,000 |
| Benzo(a)pyrene | 1,100 | 900 | 4,200 |
| Dibenzo(a,h)Anthracene | 1,200 | 250 | 6,000 |
| Benzo (g,h,i) perylene | 1,000 | 830 | 6,000 |
| | | | |
| Total PAHs | 19,980 | 10,320 | 128,700 |
| | | | |
| **ASP B VOLATILES** | | | |
| Benzene | <15 J | <14 | <15 |

☐ - Concentration exceeds cleanup objective

▨ - Concentration half of the quantitation limit

J - estimated

bgs - below ground surface

NGVD - National Geodetic Vertical Datum (1929)

F\P\4098003\F\Soil Results (ND)\Table 4-1 (Report)

# TABLE 5-1
## Samples Identified for Removal

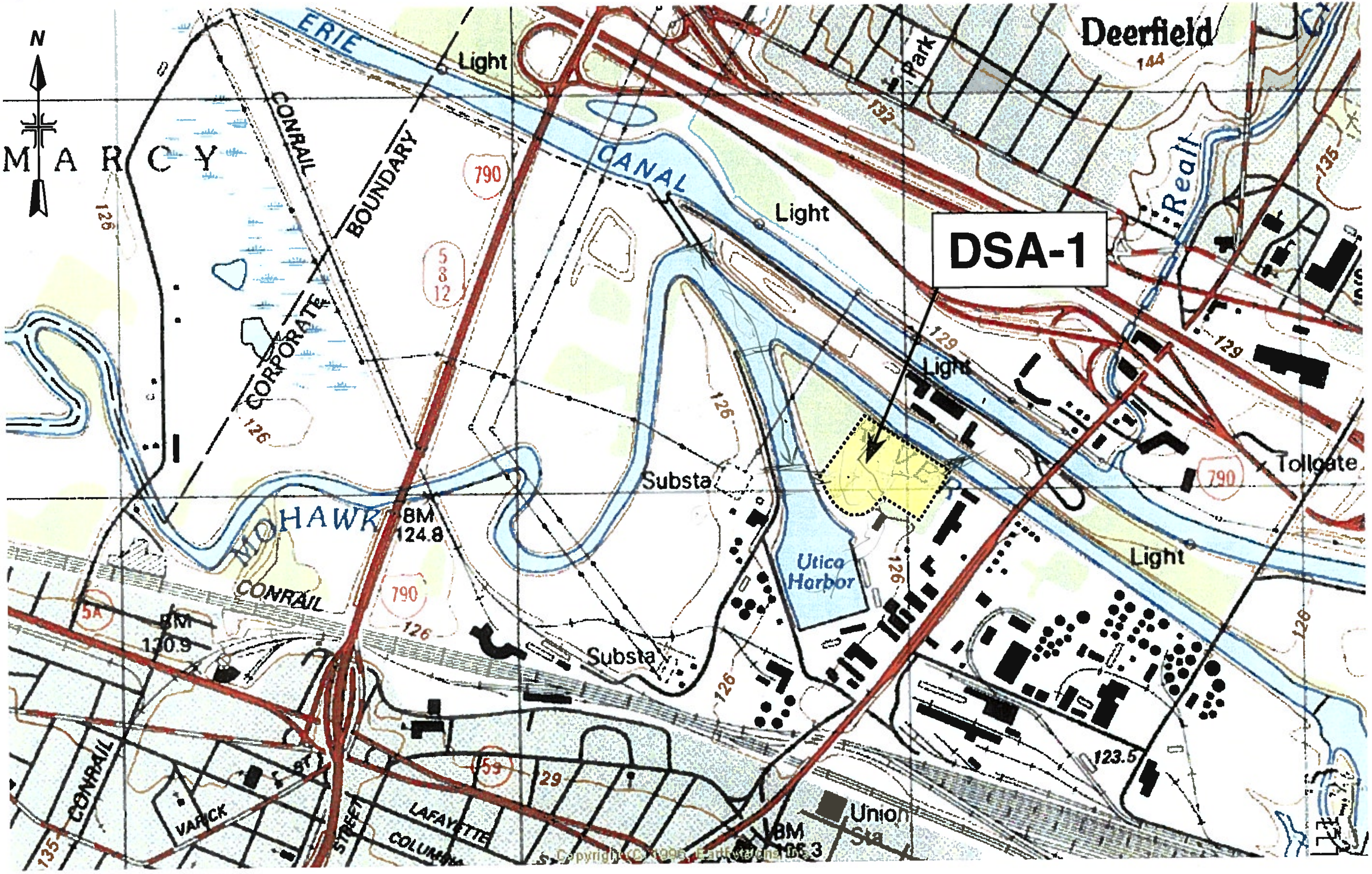
| Sample Identifier | Ground Elevation | Sample Depth | Sample Elevation | Total PAHs (mg/kg) | Benzene (mg/kg) | Comments |
|---|---|---|---|---|---|---|
| SB-115D | 409.6 | 6 – 8’ | 401.6 – 403.6 | 1,725 | - | Oily odor at el. 405 to 403.<br>Sheen at el. 403. |
| SB-114C | 410.6 | 4 – 6’ | 404.7 – 406.7 | 1,536 | - | Strong odor and sheen at el. 400.5.<br>Strong odor, sheen and NAPL at el. 396.7. |
| SS-107 | 410.7 | 0 – 6” | 410.2 – 410.7 | 1,037 | - | - |
| SB-C7 | 411.5 | 11.5 – 13.5 | 398 – 400’ | 2,973 | - | Strong odor, sheen and some NAPL at el. 399.5. |
| SB-112max | 413 | 12 – 18’ | 395 – 401 | 1,227 | - | Sheen, odor and NAPL blobs at el. 399.5. |
| SB-D2 | 408.8 | 8.8 – 10.8’ | 398 – 400 | 4,316 | 2.6 | Strong odor and sheen at el. 401.8.<br>Frequent NAPL and sheen throughout boring.<br>LNAPL at el. 398.8 on top of firm clay. |
| SB-D4 | 411.5 | 11.5 – 13.5’ | 398 – 400 | 5,028 | - | Odor begins at el. 399.5.<br>Odor strengthens and sheen at el. 399. |
| SB-D8 | 411.0 | 11.0 – 13.0’ | 398 – 400 | - | 1.90 | Strong odor, sheen and some NAPL at el. 399.5. |
| SB-E1 | 409.1 | 9.1 – 11.1’ | 398 – 400’ | - | 1.00 | Layer of organics with NAPL at el. 399. |
| SB-103D | 407.7 | 6 – 8’ | 399.7 – 401.7 | 1,457 | - | Sheen and odor at el. 399. |
| SB-E5 | 409.7 | 9.7 – 11.7’ | 398 – 400 | - | 0.61 | Strong odor and some sheen on outside of core at el. 399.7. |
| SB-104D | 410.6 | 10 – 12’ | 398.6 – 400.6 | - | 5.6 | Sheen and odor at el. 398. |
| SB-E7 | 410.4 | 10.4 – 12.4’ | 398 – 400 | - | 21.0 | Strong odor, sheen and product observed at el. 401. |
| SB-130 | 411.0 | - | - | - | - | Odor, sheen and NAPL blobs at el. 398. |
| SB-F6 | 410.4 | 10.4 – 12.4’ | 398 – 400 | 6,413 | - | Staining, sheen and strong odor at el. 403.<br>Odor and staining decreases with depth at el. 400. |
| SB-F10 | 410.8 | 10.8 – 12.8’ | 398 – 400 | - | 1.4 | Strong odor at el. 398. |
| SS-101 | 407.5 | 0 – 6” | 407.0 –407.5 | 1105 | - | - |
| SB-G9 | 410.0 | 10.0 – 12.0’ | 398 – 400 | - | 2.7 | Sheen at el. 398.<br>Odor starts at el. 400. |
| SB-123 | 411.0 | 12.5 – 16.5’ | 394.5 – 398.5 | - | .10 | Sheen and odor at el. 398.<br>NAPL blobs at 395.5 |

## TABLE 5-2
## Volumes of Soil for Remediation and Removal

| Excavation Section | Elevations for Remediation (ft. amsl) | Volume for Remediation* (cubic yds.) | Volume for Excavation* (cubic yds.) |
|---|---|---|---|
| A | GS (Ground Surface) to 401 | 2,430 | 0 |
| B | 402-398 | 6,932 | 21,528 |
| C | GS – 405 | 125 | 0 |
| D | 400-398 | 865 | 5,492 |
| **Totals** | | **10,352** | **27,020** |

* Side slope assumed at 1 vertical to 2 horizontal.

# FIGURES



**MALCOLM PIRNIE**

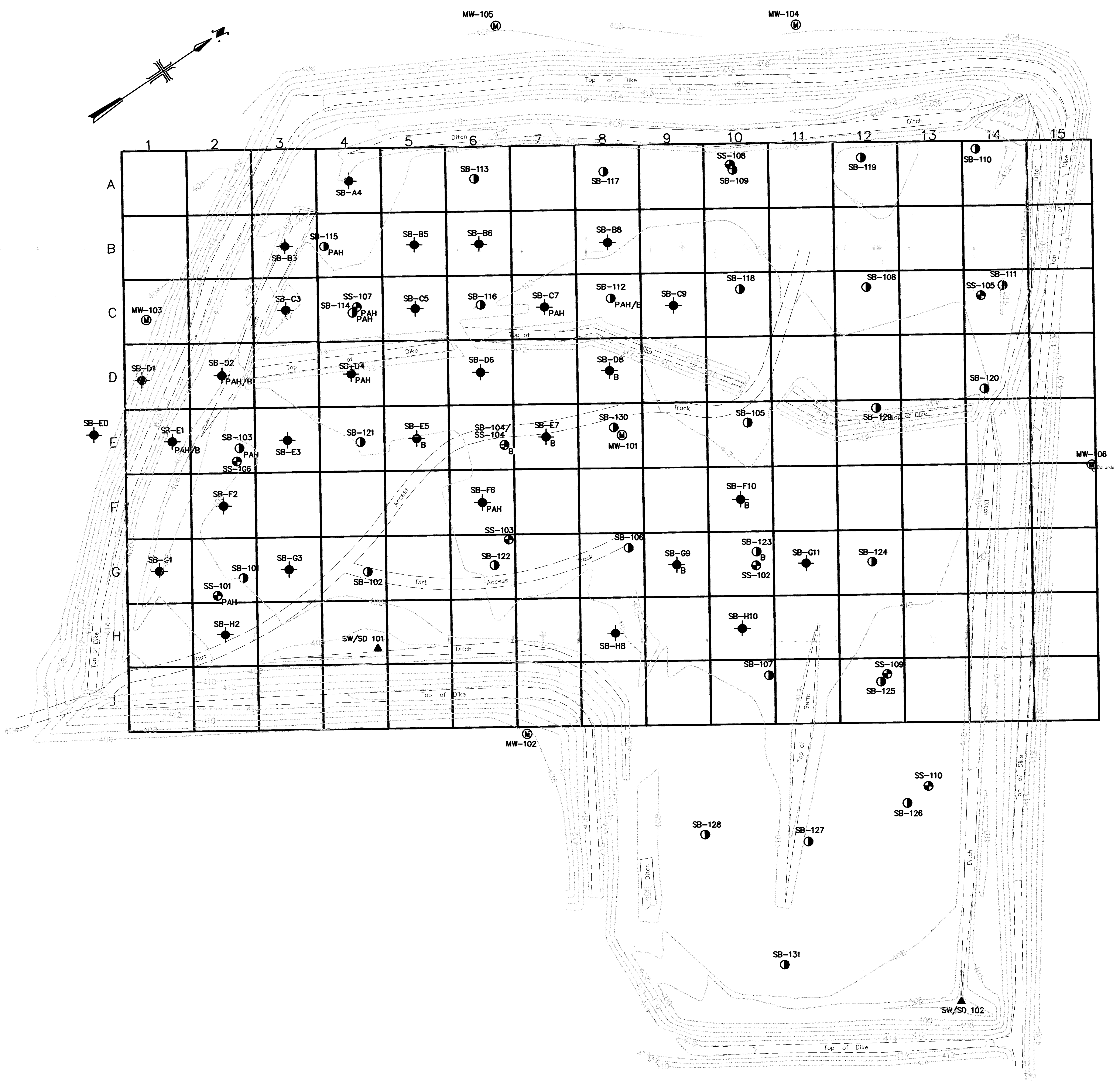
DREDGE SPOILS AREA DSA-1 PRE-DESIGN INVESTIGATION
UTICA, NEW YORK

**SITE LOCATION**

**FIGURE 1-1**

## LEGEND

| | |
|---|---|
| —410— | CONTOUR |
| – – – – – | DIKE |
| —— —— | ACCESS ROAD |
| —— – – | DRAINAGE LINE |
| ✛ | SOIL BORING DRILLED IN DECEMBER 2002 |
| ◑ | SOIL BORING DRILLED IN 1996 |
| ◕ | SURFACE SOIL SAMPLE |



## NOTES:

1. ELEVATIONS SHOWN ARE BASED ON USGS DATUM AS IDENTIFIED BY NIAGARA MOHAWK AND SHOWN ON THE MOHAWK VALLEY OIL SITE MAP AS NIMO TBM : TAP IN BASE OF UTILITY POLE NIMO 7, NYT 7.
2. HORIZONTAL COORDINATE SYSTEM IS BASED ON NEW YORK STATE PLANE COORDINATE SYSTEM.
3. SOURCE OF SITE MAP: CNY LAND SURVEYING (9/15/94).

**MALCOLM PIRNIE**

REVISIONS

| NO. | BY | DATE | REMARKS |
|---|---|---|---|
| | | | |
| | | | |
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| | | | |

DES SRC
DWN MDM
CKD ARV

NEW YORK STATE CANAL CORPORATION
UTICA, NEW YORK

# NIAGARA MOHAWK HARBOR POINT SITE

DREDGE SPOILS AREA 1

# SOIL BORING LOCATIONS

SCALE: 1" = 50'

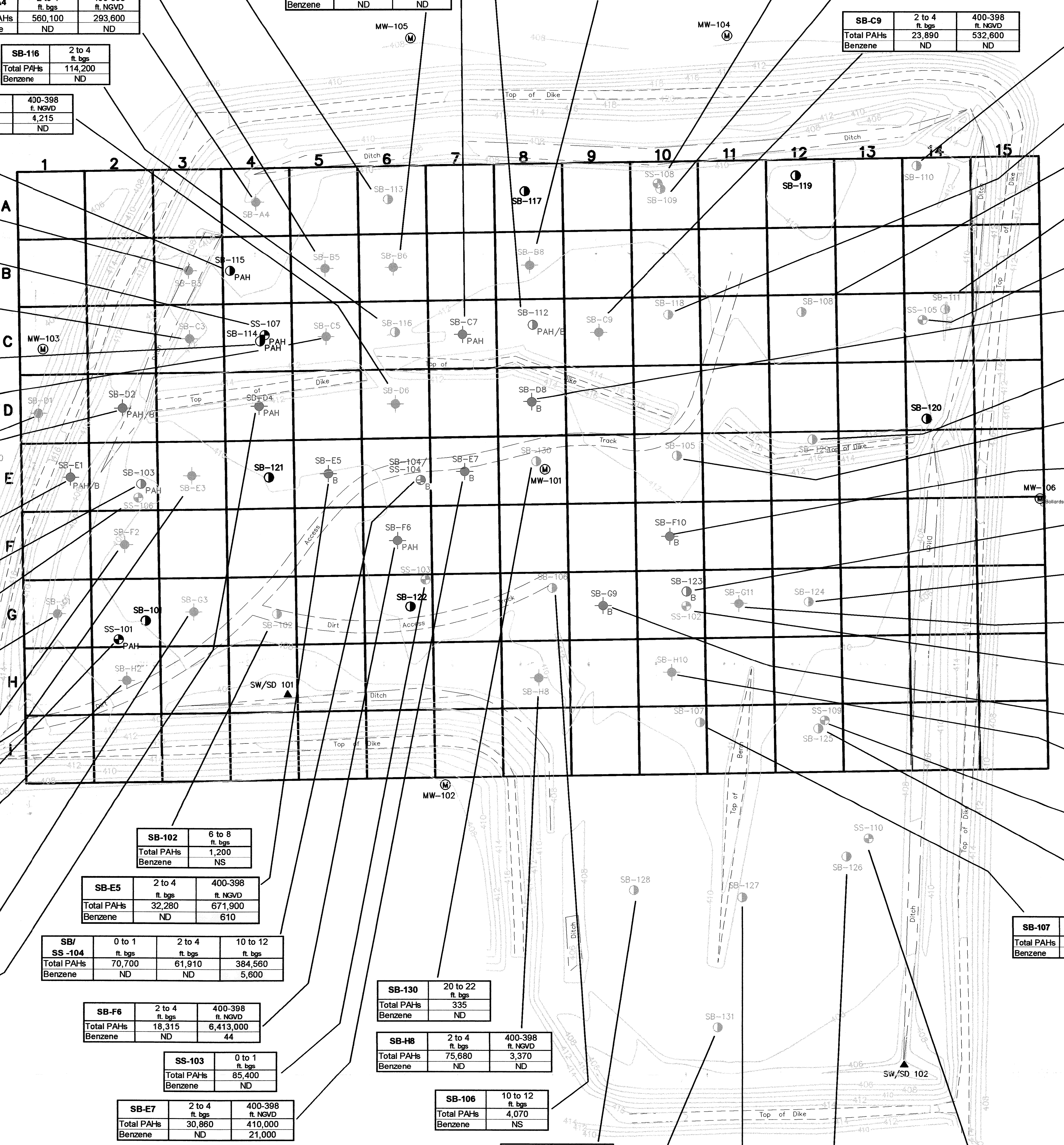
DATE MARCH 2003

FIGURE NO. 3-1

CADD REF. NO. 4098003-05

User:MAHONEY Spec:PIRNIE STANDARD File:I:\ACAD\PROJ\4098\003\contract\4098003-05.DWG Scale:1:1 Date:03/24/2003 Time:15:57 Layout:Layout1

XREFS: XREF



| SB-113 | 16 to 18 ft. bgs |
|---|---|
| Total PAHs | ND |
| Benzene | NS |

| SB-C7 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 34,120 | 2,973,000 |
| Benzene | ND | 9 |

| SB-112 | 2 to 4 ft. bgs | 8 to 10 ft. bgs | 12 to 18 ft. bgs |
|---|---|---|---|
| Total PAHs | 60,320 | 10,580 | 1,227,300 |
| Benzene | ND | ND | 220 |

| SS-108 | 0 to 1 ft. bgs |
|---|---|
| Total PAHs | 347,000 |
| Benzene | ND |

| SB-B5 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 250,500 | 3,655 |
| Benzene | ND | ND |

| SB-B6 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 75,110 | 139,000 |
| Benzene | ND | ND |

| SB-B8 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 38,280 | 67,050 |
| Benzene | ND | 2 |

| SB-109 | 14 to 16 ft. bgs |
|---|---|
| Total PAHs | ND |
| Benzene | NA |

| SB-A4 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 560,100 | 293,600 |
| Benzene | ND | ND |

| SB-C9 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 23,890 | 532,600 |
| Benzene | ND | ND |

| SB-110 | 14 to 16 ft. bgs |
|---|---|
| Total PAHs | 36,300 |
| Benzene | ND |

| SB-116 | 2 to 4 ft. bgs |
|---|---|
| Total PAHs | 114,200 |
| Benzene | ND |

| SB-D6 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 56,310 | 4,215 |
| Benzene | ND | ND |

| SB-118 | 12 to 14 ft. bgs |
|---|---|
| Total PAHs | 7,700 |
| Benzene | ND |

| SB-115 | 6 to 8* ft. bgs | 14 to 16* ft. bgs |
|---|---|---|
| Total PAHs | 1,725,000 | 30,800 |
| Benzene | 4 | NS |

| SB-108 | 10 to 12 ft. bgs |
|---|---|
| Total PAHs | 2,200 |
| Benzene | ND |

| SB-B3 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 22,370 | 20,220 |
| Benzene | ND | ND |

| SB-111 | 10 to 12 ft. bgs |
|---|---|
| Total PAHs | 687,000 |
| Benzene | NA |

| SS-107 | 0 to 1 ft. bgs |
|---|---|
| Total PAHs | 1,037,600 |
| Benzene | ND |

| SS-105 | 0 to 1 ft. bgs |
|---|---|
| Total PAHs | 107,100 |
| Benzene | ND |

| SB-C3 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 497,500 | 44,140 |
| Benzene | ND | 66 |

| SB-D8 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 189,300 | 335,900 |
| Benzene | ND | 1,900 |

| SB-114 | 4 to 6 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 1,536,000 | 522,400 |
| Benzene | NS | 23 |

| SB-129 | 16 to 18 ft. bgs |
|---|---|
| Total PAHs | 59,600 |
| Benzene | 2 |

| SB-C5 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 56,710 | 183,200 |
| Benzene | ND | 7 |

| SB-105 | 14 to 16 ft. bgs |
|---|---|
| Total PAHs | ND |
| Benzene | NA |

| SB-D1 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 3,655 | 4,080 |
| Benzene | ND | ND |

| SB-F10 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 30,160 | 196,300 |
| Benzene | ND | 1,400 |

| SB-D2 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 177,200 | 4,316,000 |
| Benzene | ND | 2,600 |

| SB-123 | 2 to 4 ft. bgs | 14 to 16* ft. bgs |
|---|---|---|
| Total PAHs | 19,980 | 176,200 |
| Benzene | ND | 1,000 |

| SB-E0 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 3,570 | 3,570 |
| Benzene | ND | ND |

| SB-124 | 8 to 10 ft. bgs |
|---|---|
| Total PAHs | 19,200 |
| Benzene | ND |

| SB-E1 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 160,100 | 3,619,500 |
| Benzene | ND | 1,000 |

| SB-G11 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 14,250 | 343,300 |
| Benzene | ND | ND |

| SB-103 | 2 to 4 ft. bgs | 6 to 8* ft. bgs |
|---|---|---|
| Total PAHs | 70,230 | 1,457,000 |
| Benzene | ND | NS |

| SS-102 | 0 to 1 ft. bgs |
|---|---|
| Total PAHs | 229,900 |
| Benzene | ND |

| SS-106 | 0 to 1 ft. bgs |
|---|---|
| Total PAHs | 9,700 |
| Benzene | ND |

| SB-G9 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 18,870 | 809,000 |
| Benzene | ND | 2,700 |

| SB-G1 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 3,620 | 3,995 |
| Benzene | ND | ND |

| SB-H10 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 14,195 | 8,935 |
| Benzene | ND | ND |

| SB-F2 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 51,420 | 10,245 |
| Benzene | ND | ND |

| SS-109 | 0 to 1 ft. bgs |
|---|---|
| Total PAHs | 70,300 |
| Benzene | ND |

| SB-E3 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 123,100 | 438,100 |
| Benzene | ND | 53 |

| SB-125 | 12 to 14 ft. bgs |
|---|---|
| Total PAHs | 56,400 |
| Benzene | ND |

| SS-101 | 0 to 1 ft. bgs |
|---|---|
| Total PAHs | 1,105,000 |
| Benzene | ND |

| SB-102 | 6 to 8 ft. bgs |
|---|---|
| Total PAHs | 1,200 |
| Benzene | NS |

| SB-E5 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 32,280 | 671,900 |
| Benzene | ND | 610 |

| SB-107 | 12 to 14 ft. bgs |
|---|---|
| Total PAHs | 21,800 |
| Benzene | NS |

| SB-H2 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 110,900 | 37,350 |
| Benzene | 8 | ND |

| SB/ SS -104 | 0 to 1 ft. bgs | 2 to 4 ft. bgs | 10 to 12 ft. bgs |
|---|---|---|---|
| Total PAHs | 70,700 | 61,910 | 384,560 |
| Benzene | ND | ND | 5,600 |

| SB-G3 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 44,600 | 4,525 |
| Benzene | ND | ND |

| SB-130 | 20 to 22 ft. bgs |
|---|---|
| Total PAHs | 335 |
| Benzene | ND |

| SB-F6 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 18,315 | 6,413,000 |
| Benzene | ND | 44 |

| SB-H8 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 75,680 | 3,370 |
| Benzene | ND | ND |

| SB-D4 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 46,530 | 5,028,000 |
| Benzene | ND | 67 |

| SS-103 | 0 to 1 ft. bgs |
|---|---|
| Total PAHs | 85,400 |
| Benzene | ND |

| SB-106 | 10 to 12 ft. bgs |
|---|---|
| Total PAHs | 4,070 |
| Benzene | NS |

| SB-E7 | 2 to 4 ft. bgs | 400-398 ft. NGVD |
|---|---|---|
| Total PAHs | 30,860 | 410,000 |
| Benzene | ND | 21,000 |

| SB-128 | 12 to 14 ft. bgs |
|---|---|
| Total PAHs | 6,400 |
| Benzene | ND |

| SS-110 | 0 to 1 ft. bgs |
|---|---|
| Total PAHs | 32,100 |
| Benzene | ND |

| SB-131 | 10 to 12 ft. bgs |
|---|---|
| Total PAHs | ND |
| Benzene | ND |

| SB-126 | 18 to 20 ft. bgs |
|---|---|
| Total PAHs | 50 |
| Benzene | ND |

| SB-127 | 12 to 14 ft. bgs |
|---|---|
| Total PAHs | ND |
| Benzene | ND |

## LEGEND

| | |
|---|---|
| ——410—— | CONTOUR |
| – – – – – – – – | DIKE |
| —— —— —— —— | ACCESS ROAD |
| —— – – —— | DRAINAGE LINE |
| ✦ | SOIL BORING DRILLED IN DECEMBER 2002 |
| ◐ | SOIL BORING DRILLED IN 1996 |
| ⊕ | SURFACE SOIL SAMPLE |
| ● B | DEEP SOIL SAMPLE EXCEEDS ROD–SPECIFIED CLEANUP OBJECTIVE FOR BENZENE |
| ● PAH | DEEP SOIL SAMPLE EXCEEDS ROD–SPECIFIED CLEANUP OBJECTIVE FOR PAH |
| ● B | SHALLOW SOIL SAMPLE EXCEEDS ROD–SPECIFIED CLEANUP OBJECTIVE FOR BENZENE |
| ● PAH | SHALLOW SOIL SAMPLE EXCEEDS ROD–SPECIFIED CLEANUP OBJECTIVE FOR PAH |
| ● | SOIL SAMPLES ARE BELOW ROD–SPECIFIED CLEANUP OBJECTIVES FOR TOTAL PAH AND BENZENE |
| Ⓜ | GROUNDWATER MONITORING WELL |

NOTE: TOTAL PAH AND BENZENE CONCENTRATIONS ARE SHOWN IN ug/kg.

## NOTES:

1. ELEVATIONS SHOWN ARE BASED ON USGS DATUM AS IDENTIFIED BY NIAGARA MOHAWK AND SHOWN ON THE MOHAWK VALLEY OIL SITE MAP AS NIMO TBM : TAP IN BASE OF UTILITY POLE NIMO 7, NYT 7.
2. HORIZONTAL COORDINATE SYSTEM IS BASED ON NEW YORK STATE PLANE COORDINATE SYSTEM.
3. SOURCE OF SITE MAP: CNY LAND SURVEYING (9/15/94).

MALCOLM PIRNIE

REVISIONS

| NO. | BY | DATE | REMARKS |
|---|---|---|---|
| | | | |

DES SRC
DWN JJL
CKD AVM

NEW YORK STATE CANAL CORPORATION
UTICA, NEW YORK
NIAGARA MOHAWK HARBOR POINT SITE
DREDGE SPOILS AREA 1

# SUMMARY OF ANALYTICAL RESULTS FOR SOIL BORING SAMPLES

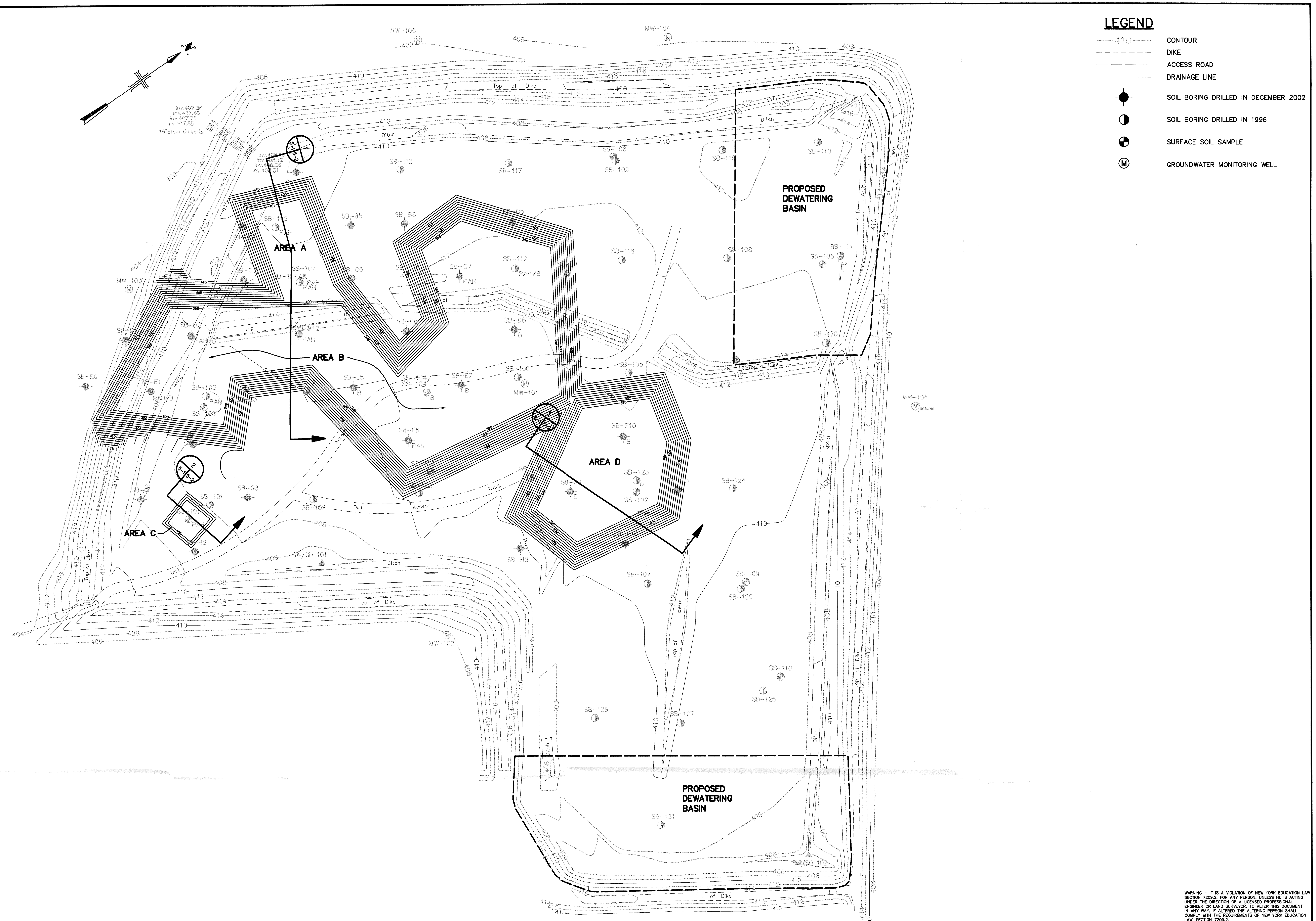
SCALE: 1" = 50'

DATE FEBRUARY 2003

FIGURE NO. 4–1

CADD REF. NO. 4098003–02

User: MAHONEY Spec: PIRNIE STANDARD File: I: \ACAD\PROJ\4098\003\contract\4098003-02.DWG Scale: 1:1 Date: 03/24/2003 Time: 15:30 Layout: Layout1
XREFS: XREF



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MALCOLM PIRNIE

REVISIONS

| NO. | BY | DATE | REMARKS |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
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| | | | |

DES EWS
DWN JJL
CKD JBM

NEW YORK STATE CANAL CORPORATION
UTICA, NEW YORK

# NIAGARA MOHAWK HARBOR POINT SITE

DREDGE SPOILS AREA 1

# PROPOSED EXCAVATION LIMITS

SCALE: 1" = 40'

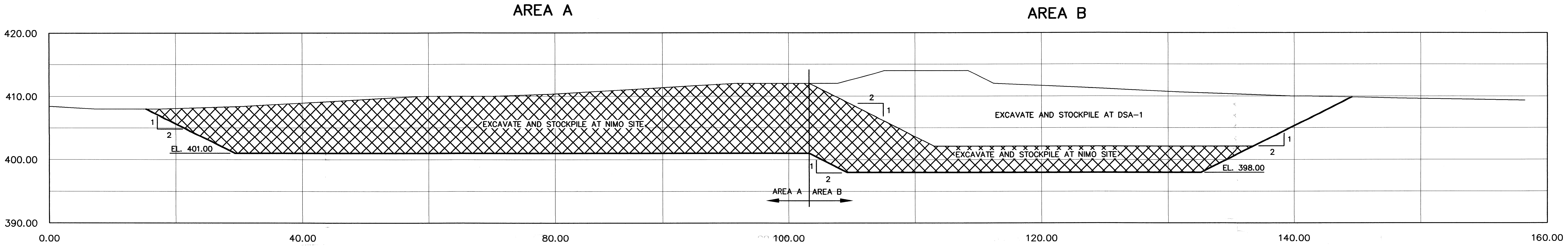
DATE FEBRUARY 2003

FIGURE 5-1

CADD REF. NO. 4098003-03

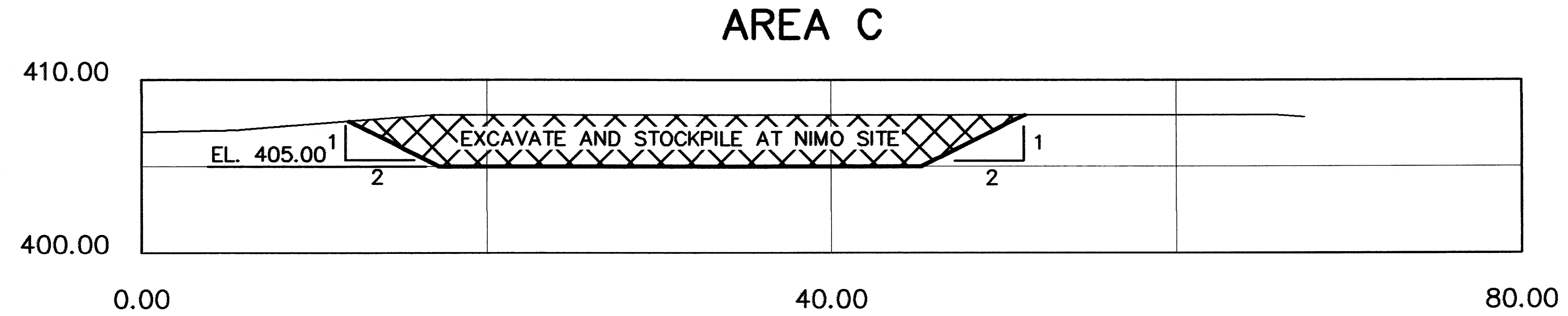
User:MAHONEY Spec:PIRNIE STANDARD File:I:\ACAD\PROJ\4098\003\contract\4098003-03.DWG Scale:1:1 Date:05/01/2003 Time:11:20 Layout:Layout1

XREFS: XREF



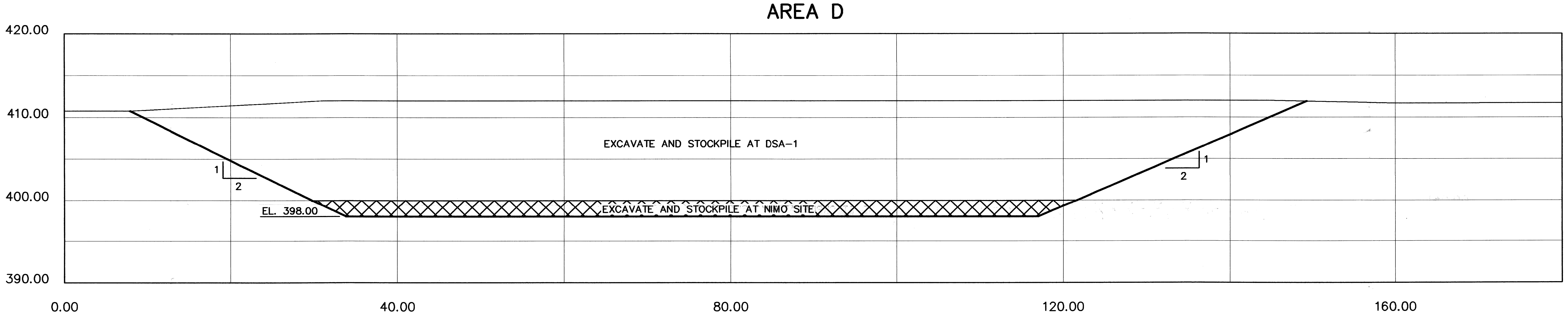
**SECTION** 1 5-1 5-2

SCALE: 1" = 10'



**SECTION** 2 5-1 5-2

SCALE: 1" = 10'



**SECTION** 3 5-1 5-2

SCALE: 1" = 10'

MALCOLM PIRNIE

REVISIONS

| NO. | BY | DATE | REMARKS |
|---|---|---|---|
| | | | |

DES EWS
DWN JJL
CKD JBM

NEW YORK STATE CANAL CORPORATION
UTICA, NEW YORK

# NIAGARA MOHAWK HARBOR POINT SITE

DREDGE SPOILS AREA 1

# PROPOSED EXCAVATION SECTIONS

SCALE: AS SHOWN

DATE FEBRUARY 2003

FIGURE 5-2

CADD REF. NO. 4098003-04

User: laplante Spec: NYC STANDARD File: I: \ACAD\PROJ\4098\003\contract\4098003-04.DWG Scale: 1:1 Date: 03/24/2003 Time: 15:49 Layout: Layout1

XREFS: XREF

# APPENDIX A

## Soil Boring Logs

**MALCOLM PIRNIE**

# TEST BORING LOG

# BORING No. SB-B3

| | | | | | |
|---|---|---|---|---|---|
| PROJECT | **Niagra Mohawk Harbor** | LOCATION | **Utica, NY** | SHEET | **1** OF **1** |
| CLIENT | | | | PROJECT No. | **4098003** |
| DRILLING CONTRACTOR | | | | MEAS. PT. ELEV. | |
| PURPOSE | **DSA-1 Pre-Design Investigation** | | | GROUND ELEV. | **406.5** |
| WELL MATERIAL | | | | DATUM | **NGVD** |
| DRILLING METHOD(S) | | | | DATE STARTED | **12/5/02** |
| DRILL RIG TYPE | **Geoprobe** | | | DATE FINISHED | **12/5/02** |
| GROUND WATER DEPTH | **6.0'** | | | DRILLER | **PES** |
| MEASURING POINT | | | | PIRNIE STAFF | **S. Compston** |
| DATE OF MEASUREMENT | | | | | |

| | SAMPLE | CORE | CASING |
|---|---|---|---|
| TYPE | | | |
| DIA. | " | | |
| WEIGHT | # | | |
| FALL | " | | |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 0–4 (2) | 4 | | 0.0 | | Brn.; silty clay; some mottling; decreased firmness and increased plasticity w/depth. | 402.5<br>4.0 | | Sample collected 2-4'. |
| 4–8 (6) | 4 | | 0.0 | | Brn. to gry.; silty clay; firm; high clay content. Increasing clay and decreasing silt w/depth. | | | ▼<br>Sample collected 6.5-8.5'. |
| 8–10 | 2 | | 0.0 | | | 396.5<br>10.0 | | |

MALCOLM PIRNIE

# TEST BORING LOG

# BORING No. SB-B5

| | | | | | |
|---|---|---|---|---|---|
| PROJECT **Niagra Mohawk Harbor** | LOCATION **Utica, NY** | | | | SHEET **1** OF **1** |
| CLIENT | | | | | PROJECT No. **4098003** |
| DRILLING CONTRACTOR | | | | | MEAS. PT. ELEV. |
| PURPOSE **DSA-1 Pre-Design Investigation** | | | | | GROUND ELEV. **409.3** |
| WELL MATERIAL | | | | | DATUM **NGVD** |
| DRILLING METHOD(S) | | SAMPLE | CORE | CASING | DATE STARTED **12/4/02** |
| DRILL RIG TYPE **Geoprobe** | TYPE | | | | DATE FINISHED **12/4/02** |
| GROUND WATER DEPTH **8.0'** | DIA. | " | | | DRILLER **PES** |
| MEASURING POINT | WEIGHT | # | | | PIRNIE STAFF **S. Compston** |
| DATE OF MEASUREMENT | FALL | " | | | |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | | Tan; silty sand. | 407.7<br>1.6 | | |
| 2 | 4 | | 0.0 | | Blk.; loam. | 406.3<br>3.0 | | |
| | | | | | Brn.; silty clay; some mottling. Increasing organic material w/depth. | | | Sample collected 2-4'. |
| 4 | | | | | | | | |
| 6 | 1.2 | | 0.0 | | | | | |
| 8 | | | | | | 400.3<br>9.0 | | ▼ |
| | 3 | | 0.0 | | Gry.; coarse sand. | 398.3<br>11.0 | | |
| 10 | | | | | | | | Sample collected 9.3-11.3'. |
| 12 | | | | | | | | |

**MALCOLM PIRNIE**

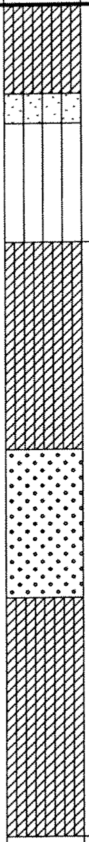
# TEST BORING LOG

# BORING No. SB-B6

| | | | |
|---|---|---|---|
| PROJECT | **Niagra Mohawk Harbor** | LOCATION | **Utica, NY** |
| CLIENT | | | |
| DRILLING CONTRACTOR | | | |
| PURPOSE | **DSA-1 Pre-Design Investigation** | | |
| WELL MATERIAL | | | |

| | | | | | |
|---|---|---|---|---|---|
| DRILLING METHOD(S) | | | SAMPLE | CORE | CASING |
| DRILL RIG TYPE | **Geoprobe** | TYPE | | | |
| GROUND WATER DEPTH | **9.0'** | DIA. | " | | |
| MEASURING POINT | | WEIGHT | # | | |
| DATE OF MEASUREMENT | | FALL | " | | |

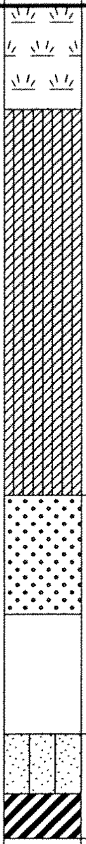
| | |
|---|---|
| SHEET | **1** OF **1** |
| PROJECT No. | **4098003** |
| MEAS. PT. ELEV. | |
| GROUND ELEV. | **411.0** |
| DATUM | **NGVD** |
| DATE STARTED | **12/4/02** |
| DATE FINISHED | **12/4/02** |
| DRILLER | **PES** |
| PIRNIE STAFF | **S. Compston** |



| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|
| | | | | Brn.; silty clay; firm; no plasticity. | 409.5<br>1.5 | | |
| | | | | Tan silt and fn. sand. | 409.0<br>2.0 | | |
| 2 | 4 | | 0.0 | Brn.; silt w/some clay; some mottling; increased clay w/depth. | 407.0<br>4.0 | | Sample collected 2-4'. |
| 4 | | | | Brn.; silty clay; some mottling. | 403.5<br>7.5 | | |
| 6 | 1.2 | | 0.0 | | | | |
| 8 | | | | Tan/gray; fine sand, some silt. | 401.0<br>10.0 | | ▼ |
| 10 | 4 | | 0.0 | Gry.; silty clay. | 397.0<br>14.0 | | Odor begins.<br>Sample collected 11-13'.<br>Some sheen; v. strong odor. Odor decreases w/depth. |
| 12 | 2 | | 0.0 | | | | |
| 14 | | | | | | | |

| | | |
|---|---|---|
| MALCOLM PIRNIE | **TEST BORING LOG** | **BORING No. SB-B8** |

| | | | | | |
|---|---|---|---|---|---|
| PROJECT **Niagra Mohawk Harbor** | | LOCATION **Utica, NY** | | | SHEET **1** OF **1** |
| CLIENT | | | | | PROJECT No. **4098003** |
| DRILLING CONTRACTOR | | | | | MEAS. PT. ELEV. |
| PURPOSE **DSA-1 Pre-Design Investigation** | | | | | GROUND ELEV. **411.8** |
| WELL MATERIAL | | | | | DATUM **NGVD** |
| DRILLING METHOD(S) | | SAMPLE | CORE | CASING | DATE STARTED **12/4/02** |
| DRILL RIG TYPE **Geoprobe** | TYPE | | | | DATE FINISHED **12/4/02** |
| GROUND WATER DEPTH **11.0'** | DIA. | " | | | DRILLER **PES** |
| MEASURING POINT | WEIGHT | # | | | |
| DATE OF MEASUREMENT | FALL | " | | | PIRNIE STAFF **S. Compston** |



| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | | Organic material w/some silt and fn. sand. | 410.0<br>1.8 | | |
| 2 | 4 | | 0.0 | | Brn.; silty clay. Color change @ 8' to gray. | | | Sample collected 2-4'. |
| 4 | | | | | | | | |
| 6 | 4 | | 0.0 | | | | | |
| 8 | | | | | Tan; medium grained sand. Color change at 9' to gray. | 403.5<br>8.3 | | |
| 10 | 2 | | 0.0 | | NR | 401.5<br>10.3 | | Faint odor.<br>▼ |
| 12 | | | | | Gry.; sand/silt; very wet. | 399.5<br>12.3 | | |
| | 2 | | 0.0 | | Gry.; clay w/some silt; high plasticity. | 398.5<br>13.3 | | Sample collected 11.8-13.8'.<br>Strong odor; Benzene sample collected @ 13.5'. |
| 14 | | | | | | 397.8<br>14.0 | | |

**MALCOLM PIRNIE**

# TEST BORING LOG

# BORING No. SB-C3

| | | | | | |
|---|---|---|---|---|---|
| PROJECT | **Niagra Mohawk Harbor** | LOCATION | **Utica, NY** | SHEET | **1** OF **1** |
| CLIENT | | | | PROJECT No. | **4098003** |
| DRILLING CONTRACTOR | | | | MEAS. PT. ELEV. | |
| PURPOSE | **DSA-1 Pre-Design Investigation** | | | GROUND ELEV. | **409.5** |
| WELL MATERIAL | | | | DATUM | **NGVD** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DRILLING METHOD(S) | | | SAMPLE | CORE | CASING | DATE STARTED | **12/5/02** |
| DRILL RIG TYPE | **Geoprobe** | TYPE | | | | DATE FINISHED | **12/5/02** |
| GROUND WATER DEPTH | **8.5'** | DIA. | " | | | DRILLER | **PES** |
| MEASURING POINT | | WEIGHT | # | | | | |
| DATE OF MEASUREMENT | | FALL | " | | | PIRNIE STAFF | **S. Compston** |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | ▥ | Brn.; silty clay. | 409.0<br>0.5 | | |
| | | | | ░ | Brn./tan; silt and fn. sand. | 407.8<br>1.8 | | |
| 2 | 1.2 | | 0.0 | ▨ | Brn.; silty clay w/some fn. sand. Some zones of blk. silt. | | | |
| | | | | | | | | Sample collected 2-4'. |
| 4 | | | | | | | | Faint odor. |
| 6 | .8 | | 0.0 | | | | | |
| | | | | ▥ | Blk./Olive; silty clay w/organics. | 402.5<br>7.0 | | |
| 8 | | | | ▨ | Gry.; sandy clay. | 401.5<br>8.0 | | ▼ |
| | | | | ▥ | Gry.; silty clay; very firm. Clay increases w/depth. | 400.5<br>9.0 | | Strong odor and sheen. |
| 10 | 4 | | 0.0 | | | | | Sample collected 9.5-11.5'. |
| 12 | | | | | | 397.5<br>12.0 | | |

**MALCOLM PIRNIE**

# TEST BORING LOG

# BORING No. SB-114

| | | | |
|---|---|---|---|
| PROJECT **Niagra Mohawk Harbor** | LOCATION **Utica, NY** | SHEET **1** OF **1** | |
| CLIENT | | PROJECT No. | **4098003** |
| DRILLING CONTRACTOR | | MEAS. PT. ELEV. | |
| PURPOSE | **DSA-1 Pre-Design Investigation** | GROUND ELEV. | **410.7** |
| WELL MATERIAL | | DATUM | **NGVD** |
| DATE STARTED | **12/4/02** | DATE FINISHED | **12/4/02** |
| DRILLER | **PES** | PIRNIE STAFF | **S. Compston** |

| | | SAMPLE | CORE | CASING |
|---|---|---|---|---|
| DRILLING METHOD(S) | | | | |
| DRILL RIG TYPE **Geoprobe** | TYPE | | | |
| GROUND WATER DEPTH **8.5'** | DIA. | " | | |
| MEASURING POINT | WEIGHT | # | | |
| DATE OF MEASUREMENT | FALL | " | | |

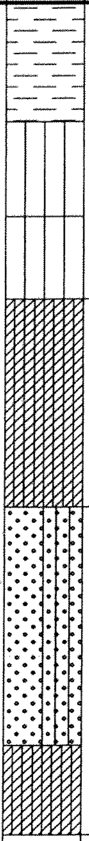
| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | **GEOLOGIC DESCRIPTION** KEY - Color, Major, Minor Moisture, Etc. | ELEV. DEPTH | **WELL Constr.** | **REMARKS** |
|---|---|---|---|---|---|---|---|---|
| 0 | | | | ▨ | Brn.; silty clay. | | | |
| 2 | 2.4 | | 0.0 | ⁞ | Blk.; silty sand. Color change to gray @ 4' | 408.7<br>2.0 | | Odor begins and increases w/ depth. |
| 4 | | | | ▨ | Gry.; silty clay. | 405.9<br>4.8 | | |
| 6 | 4 | | 0.0 | | | | | |
| | | | | ⁞ | Blk.; silty sand. | 403.5<br>7.3 | | |
| 8 | | | | ⁞ | Silt and fn. sand; v. wet. | 402.5<br>8.3 | | ▼ |
| 10 | 2.8 | | 0.0 | ▨ | Gry.; clay w/silt; no firmness; high plasticity. | 400.5<br>10.3 | | Strong odor, sheen.<br>Sample collected 10.7-12.7'.<br>Strong odor, sheen, and NAPL. |
| 12 | | | | | | | | |
| 14 | 2 | | 0.0 | | | 396.7<br>14.0 | | |

| MALCOLM PIRNIE | TEST BORING LOG | BORING No. SB-C5 |
|---|---|---|

| | | | |
|---|---|---|---|
| PROJECT **Niagra Mohawk Harbor** | LOCATION **Utica, NY** | SHEET **1** OF **1** | |
| CLIENT | | PROJECT No. | **4098003** |
| DRILLING CONTRACTOR | | MEAS. PT. ELEV. | |
| PURPOSE | **DSA-1 Pre-Design Investigation** | GROUND ELEV. | **411.4** |
| WELL MATERIAL | | DATUM | **NGVD** |

| | | | SAMPLE | CORE | CASING |
|---|---|---|---|---|---|
| DRILLING METHOD(S) | | | | | |
| DRILL RIG TYPE | **Geoprobe** | TYPE | | | |
| GROUND WATER DEPTH | **12.0'** | DIA. | " | | |
| MEASURING POINT | | WEIGHT | # | | |
| DATE OF MEASUREMENT | | FALL | " | | |

| | |
|---|---|
| DATE STARTED | **12/4/02** |
| DATE FINISHED | **12/4/02** |
| DRILLER | **PES** |
| PIRNIE STAFF | **S. Compston** |



| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | | Brn.; loam w/some organics. | | | |
| 2 | 4 | | 0.0 | | | 409.4<br>2.0 | | |
| | | | | | Tan/lt. brn.; silt and fn. sand. | | | Sample collected 2-4'. |
| | | | | | | 407.8<br>3.6 | | |
| 4 | | | | | Brn./blk.; silt and fn. sand. | | | Strong odor. Some sheen. |
| | | | | | | 406.4<br>5.0 | | Odor throughout to 8.5'. |
| | | | | | Gry.; silty clay, some sand near 8'. | | | |
| 6 | 4 | | 0.0 | | | | | |
| 8 | | | | | | 402.9<br>8.5 | | |
| | | | | | Gry.; sand w/some silt. | | | Slight odor. |
| 10 | 2 | | 0.0 | | | | | |
| 12 | | | | | | 398.9<br>12.5 | | ▼ |
| | 2 | | 0.0 | | Gry.; silty clay; no firmness; high plasticity. | | | Sample collected 11.4-13.4'.<br>Strong odor. Some sheen and product. |
| 14 | | | | | | 397.4<br>14.0 | | |

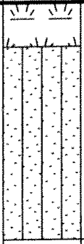
**MALCOLM PIRNIE**

# TEST BORING LOG

## BORING No. SB-116

| | | | |
|---|---|---|---|
| PROJECT **Niagra Mohawk Harbor** | LOCATION **Utica, NY** | SHEET **1** OF **1** | |
| CLIENT | | PROJECT No. | **4098003** |
| DRILLING CONTRACTOR | | MEAS. PT. ELEV. | |
| PURPOSE | **DSA-1 Pre-Design Investigation** | GROUND ELEV. | **412.0** |
| WELL MATERIAL | | DATUM | **NGVD** |

| | | SAMPLE | CORE | CASING | | |
|---|---|---|---|---|---|---|
| DRILLING METHOD(S) | | | | | DATE STARTED | **12/4/02** |
| DRILL RIG TYPE **Geoprobe** | TYPE | | | | DATE FINISHED | **12/4/02** |
| GROUND WATER DEPTH ' | DIA. | " | | | DRILLER | **PES** |
| MEASURING POINT | WEIGHT | # | | | PIRNIE STAFF | **S. Compston** |
| DATE OF MEASUREMENT | FALL | " | | | | |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | **GEOLOGIC DESCRIPTION** KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | **WELL Constr.** | **REMARKS** |
|---|---|---|---|---|---|---|---|---|
| | | | |  | O horizon. | 411.3<br>0.8 | | |
| 2 | 4 | | 0.0 | | Lt. brn.; silt w/fn. sand. | 408.0<br>4.0 | | Sample collected 2-4'. |
| 4 | | | | | | | | |

| MALCOLM PIRNIE | TEST BORING LOG | BORING No. SB-C7 |
|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| PROJECT Niagra Mohawk Harbor | | LOCATION Utica, NY | | SHEET 1 OF 1 | |
| CLIENT | | | | PROJECT No. | 4098003 |
| DRILLING CONTRACTOR | | | | MEAS. PT. ELEV. | |
| PURPOSE | DSA-1 Pre-Design Investigation | | | GROUND ELEV. | 411.5 |
| WELL MATERIAL | | | | DATUM | NGVD |
| DRILLING METHOD(S) | | SAMPLE | CORE | CASING | |
| DRILL RIG TYPE Geoprobe | TYPE | | | | DATE STARTED 12/4/02 |
| GROUND WATER DEPTH 10.0' | DIA. | " | | | DATE FINISHED 12/4/02 |
| MEASURING POINT | WEIGHT | # | | | DRILLER PES |
| DATE OF MEASUREMENT | FALL | " | | | PIRNIE STAFF S. Compston |

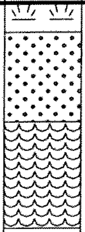
| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | | O horizon. | 411.2<br>0.3 | | |
| 2 | 3 | | 0.0 | | Gry silt w/clay and sand. | 408.2<br>3.3 | | Sample collected 2-4'. |
| | | | | | NR | 407.5<br>4.0 | | |
| 4<br>6 | 3.2 | | 0.0 | | Brn.; silty clay; firm; some mottling. | 403.5<br>8.0 | | |
| 8 | | | | | Tan; sand; zone of gravel from 9.75-10'. | 401.5<br>10.0 | | |
| 10 | 4 | | 0.0 | | Gry.; sandy clay; wet. | 400.2<br>11.3 | | ▼ Resampled 10-14': V. little recovery, appears to be sluff. |
| | | | | | Gry.; Gry.; clay w/some silt. | 399.5<br>12.0 | | Strong odor, sheen and some NAPL.<br>Sample collected 11.5-13.5'. |
| 12 | .4 | | 0.0 | | Gry.; silt and sand; wet. | 397.5<br>14.0 | | |

MALCOLM PIRNIE

# TEST BORING LOG

## BORING No. SB-112

| | | | | | |
|---|---|---|---|---|---|
| PROJECT **Niagra Mohawk Harbor** | | LOCATION **Utica, NY** | | | SHEET **1** OF **1** |
| CLIENT | | | | | PROJECT No. **4098003** |
| DRILLING CONTRACTOR | | | | | MEAS. PT. ELEV. |
| PURPOSE **DSA-1 Pre-Design Investigation** | | | | | GROUND ELEV. **---** |
| WELL MATERIAL | | | | | DATUM **NGVD** |
| DRILLING METHOD(S) | | SAMPLE | CORE | CASING | DATE STARTED **12/4/02** |
| DRILL RIG TYPE **Geoprobe** | TYPE | | | | DATE FINISHED **12/4/02** |
| GROUND WATER DEPTH ' | DIA. | " | | | DRILLER **PES** |
| MEASURING POINT | WEIGHT | # | | | PIRNIE STAFF **S. Compston** |
| DATE OF MEASUREMENT | FALL | " | | | |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | |  | Organic material. | 0.5<br>0.5 | | |
| | | | | | Tan/brn.; sand. | 2.0<br>2.0 | | |
| 2 | 4 | | 0.0 | | Brn.; loam w/ organic material. | 3.8<br>3.8 | | Sample collected 2-4'. |
| 4 | | | | | | | | |

MALCOLM PIRNIE

# TEST BORING LOG

## BORING No. SB-C9

| | | | |
|---|---|---|---|
| PROJECT | **Niagra Mohawk Harbor** | LOCATION | **Utica, NY** |
| SHEET | **1** OF **1** | | |
| CLIENT | | PROJECT No. | **4098003** |
| DRILLING CONTRACTOR | | MEAS. PT. ELEV. | |
| PURPOSE | **DSA-1 Pre-Design Investigation** | GROUND ELEV. | **412.4** |
| WELL MATERIAL | | DATUM | **NGVD** |
| DRILLING METHOD(S) | | DATE STARTED | **12/4/02** |
| DRILL RIG TYPE | **Geoprobe** | DATE FINISHED | **12/4/02** |
| GROUND WATER DEPTH | **13.5'** | DRILLER | **PES** |
| MEASURING POINT | | PIRNIE STAFF | **S. Compston** |
| DATE OF MEASUREMENT | | | |

| | SAMPLE | CORE | CASING |
|---|---|---|---|
| TYPE | | | |
| DIA. | " | | |
| WEIGHT | # | | |
| FALL | " | | |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | | Dark organic horizon. | 411.9<br>0.5 | | |
| 2 | 3.2 | | 0.0 | | Tan; sand; med. grained; some silt entering near bottom. | 408.2<br>4.2 | | Sample collected 2-4'. |
| 4 | | | | | | | | |
| 6 | 3 | | 0.0 | | Brn.; silty clay; some Fe mottling. | 403.9<br>8.5 | | |
| 8 | | | | | | | | |
| 10 | 4 | | 0.0 | | Gry.; sand; some silt. | 401.9<br>10.5 | | |
| | | | | | Gry.; silt and orgainic material. | 400.4<br>12.0 | | |
| 12 | | | | | Gry.; firm clay w/silt; high plasticity. | 398.9<br>13.5 | | |
| 14 | 4 | | 0.0 | | Gry.; silt; wet. | 397.9<br>14.5 | | ▼Sample collected 12.4'-14.4'. |
| | | | | | Gry.; sand; wet. | 396.4<br>16.0 | | Faint odor in sand. |
| 16 | | | | | | | | |

| | | |
|---|---|---|
| MALCOLM PIRNIE | **TEST BORING LOG** | **BORING No. SB-D1** |

| | | | | | | |
|---|---|---|---|---|---|---|
| PROJECT **Niagra Mohawk Harbor** | | LOCATION **Utica, NY** | | | SHEET **1** OF **1** | |
| CLIENT | | | | | PROJECT No. | **4098003** |
| DRILLING CONTRACTOR | | | | | MEAS. PT. ELEV. | |
| PURPOSE | **DSA-1 Pre-Design Investigation** | | | | GROUND ELEV. | **NM** |
| WELL MATERIAL | | | | | DATUM | **NGVD** |
| DRILLING METHOD(S) | | | SAMPLE | CORE | CASING | DATE STARTED **12/5/02** |
| DRILL RIG TYPE | **Geoprobe** | TYPE | | | | DATE FINISHED **12/5/02** |
| GROUND WATER DEPTH | ' | DIA. | " | | | DRILLER **PES** |
| MEASURING POINT | | WEIGHT | # | | | PIRNIE STAFF **S. Compston** |
| DATE OF MEASUREMENT | | FALL | " | | | |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | **GEOLOGIC DESCRIPTION** KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | **WELL Constr.** | **REMARKS** |
|---|---|---|---|---|---|---|---|---|
| | | | | ▨ | Brn.; clay w/silt; v. firm. | | | |
| 2 | 4 | | 0.0 | ▨ | | | | |
| | | | | ▨ | | | | Sample collected 2'-4'. |
| 4 | | | | ▨ | | | | |
| 6 | 4 | | 0.0 | ▨ | | | | |
| | | | | ▨ | | | | Sample collected 6'-8'. |
| 8 | | | | | | 8.0 | | |

MALCOLM PIRNIE

# TEST BORING LOG

# BORING No. SB-D2

| | | | | | |
|---|---|---|---|---|---|
| PROJECT **Niagra Mohawk Harbor** | | LOCATION **Utica, NY** | | | SHEET **1** OF **1** |
| CLIENT | | | | | PROJECT No. **4098003** |
| DRILLING CONTRACTOR | | | | | MEAS. PT. ELEV. |
| PURPOSE **DSA-1 Pre-Design Investigation** | | | | | GROUND ELEV. **408.8** |
| WELL MATERIAL | | | | | DATUM **NGVD** |
| DRILLING METHOD(S) | | SAMPLE | CORE | CASING | DATE STARTED **12/5/02** |
| DRILL RIG TYPE **Geoprobe** | TYPE | | | | DATE FINISHED **12/5/02** |
| GROUND WATER DEPTH ' | DIA. | " | | | DRILLER **PES** |
| MEASURING POINT | WEIGHT | # | | | PIRNIE STAFF **S. Compston** |
| DATE OF MEASUREMENT | FALL | " | | | |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION<br>KEY - Color, Major, Minor Moisture, Etc. | ELEV.<br>DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | | Brn., light; silty clay. | 408.3<br>0.5 | | |
| 2 | 4 | | 0.0 | | Brn.; silt and fn. sand. | 405.8<br>3.0 | | |
| 4 | | | | | Brn.; silty clay; mottled. | | | Sample collected 2'-4'. |
| 6 | 4 | | 0.0 | | | 401.8<br>7.0 | | |
| 8 | | | | | Gry./blk.; silty clay; low firmness; high plasticity; high clay content. Firmness increases at 10' | | | Slight odor.<br>Strong odorand sheen. |
| 10 | 4 | | 16.8 | | | | | Frequent NAPL, odor, and sheen throughout boring.<br>Benzene Sample collected @ 9.75'<br>Sample collected 8.8-10.8'.<br>LNAPL @ 10' on top of firm clay. |
| 12 | | | | | | 396.8<br>12.0 | | |

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| **MALCOLM PIRNIE** | **TEST BORING LOG** | **BORING No. SB-D4** |

| | | | | | |
|---|---|---|---|---|---|
| PROJECT **Niagra Mohawk Harbor** | | LOCATION **Utica, NY** | | | SHEET **1** OF **1** |
| CLIENT | | | | | PROJECT No. **4098003** |
| DRILLING CONTRACTOR | | | | | MEAS. PT. ELEV. |
| PURPOSE **DSA-1 Pre-Design Investigation** | | | | | GROUND ELEV. **411.5** |
| WELL MATERIAL | | | | | DATUM **NGVD** |
| DRILLING METHOD(S) | | SAMPLE | CORE | CASING | DATE STARTED **12/4/02** |
| DRILL RIG TYPE **Geoprobe** | TYPE | | | | DATE FINISHED **12/4/02** |
| GROUND WATER DEPTH **10.0'** | DIA. | " | | | DRILLER **PES** |
| MEASURING POINT | WEIGHT | # | | | PIRNIE STAFF **S. Compston** |
| DATE OF MEASUREMENT | FALL | " | | | |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 0-2.3 | 4 | | 0.0 | ▨ | Brn.; silty clay. | 409.2<br>2.3 | | |
| 2.3-3.3 | | | | ⁘ | Tan; fn. sand and some silt. | 408.2<br>3.3 | | Sample collected 2-4'. |
| 3.3-4.0 | | | | ▨ | Brn.; silty clay. | 407.5<br>4.0 | | |
| 4.0-5.0 | 2.4 | | 0.0 | ▥ | Gry.; silt and fn. sand. | 406.5<br>5.0 | | |
| 5.0-6.3 | | | | ▨ | Gry.; silty clay. | 405.2<br>6.3 | | |
| 6.3-8.0 | | | | | NR | 403.5<br>8.0 | | |
| 8.0-10.0 | 3 | | 0.0 | ▨ | Gry.; silty clay. | 401.5<br>10.0 | | ▼ |
| 10.0-12.0 | | | | ▥ | Gry.; silt and fn. sand. | 399.5<br>12.0 | | Odor begins.<br>Strong odor and sheen.<br>Sample collected 11.5-13.5'. |
| 12.0-14.0 | 2 | | 0.0 | ▨ | Clay w/silt; low firmness, high plasticity. | 397.5<br>14.0 | | |

| MALCOLM PIRNIE | TEST BORING LOG | BORING No. SB-D6 |
|---|---|---|

| | | | | |
|---|---|---|---|---|
| PROJECT **Niagra Mohawk Harbor** | | LOCATION **Utica, NY** | | SHEET **1** OF **1** |
| CLIENT | | | | PROJECT No. **4098003** |
| DRILLING CONTRACTOR | | | | MEAS. PT. ELEV. |
| PURPOSE **DSA-1 Pre-Design Investigation** | | | | GROUND ELEV. **410.4** |
| WELL MATERIAL | | | | DATUM **NGVD** |
| DRILLING METHOD(S) | | SAMPLE | CORE | CASING |
| DRILL RIG TYPE **Geoprobe** | TYPE | | | DATE STARTED **12/3/02** |
| GROUND WATER DEPTH ' | DIA. | " | | DATE FINISHED **12/3/02** |
| MEASURING POINT | WEIGHT | # | | DRILLER **PES** |
| DATE OF MEASUREMENT | FALL | " | | PIRNIE STAFF **S. Compston** |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION<br>KEY - Color, Major, Minor Moisture, Etc. | ELEV.<br>DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | | Drk brn loam. | 409.7<br>0.8 | | |
| | | | | | Drk brn silty clay. | 408.4<br>2.0 | | |
| 2 | 4 | | 0.0 | | Tan sand. | 408.2<br>2.3 | | |
| | | | | | Brn. loose silt w/some clay and fn. sand. | 406.4<br>4.0 | | Sample collected 2-4'. |
| 4 | | | | | Very firm grayish brn clay to silty clay. | | | |
| 6 | 4 | | 0.0 | | | | | |
| 8 | | | | | | | | |
| 10 | 4 | | 0.0 | | | | | |
| | | | | | | 398.4<br>12.0 | | Sample collected 10.4-12.4'. |
| 12 | | | | | | | | |

| | | |
|---|---|---|
| **MALCOLM PIRNIE** | **TEST BORING LOG** | **BORING No. SB-D8** |

PROJECT **Niagra Mohawk Harbor**
LOCATION **Utica, NY**
SHEET **1** OF **1**
PROJECT No. **4098003**
CLIENT
MEAS. PT. ELEV.
DRILLING CONTRACTOR
GROUND ELEV. **411.0**
PURPOSE **DSA-1 Pre-Design Investigation**
DATUM **NGVD**
WELL MATERIAL
DATE STARTED **12/3/02**
DRILLING METHOD(S)
DATE FINISHED **12/3/02**
DRILL RIG TYPE **Geoprobe**
DRILLER **PES**
GROUND WATER DEPTH **9.5'**
PIRNIE STAFF **S. Compston**
MEASURING POINT
DATE OF MEASUREMENT

| | SAMPLE | CORE | CASING |
|---|---|---|---|
| TYPE | | | |
| DIA. | " | | |
| WEIGHT | # | | |
| FALL | " | | |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | ░ | Tan sand | 409.5<br>1.5 | | |
| 2 | 2 | | 0.0 | ▨ | Silty clay, firm. | 409.0<br>2.0 | | |
| | | | | | NR | 407.0<br>4.0 | | Sample collected 2-4'. |
| 4<br>6 | 4 | | 0.0 | ▨ | Silty clay, brn. | 403.3<br>7.8 | | |
| 8 | | | | ░ | Tan sand and silt. | 401.3<br>9.8 | | ▼ |
| 10 | 4 | | 0.0 | ▨ | Brn/blk loose silty clay, wet. | 399.0<br>12.0 | | Increasing silt and changing to darker color.<br>Strong odor and sheen. Some NAPL.<br>Sample collected 11-13'. |
| 12 | 2 | | 0.0 | ▨ | Same as above. | 397.0<br>14.0 | | |

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|---|---|---|
| **MALCOLM PIRNIE** | **TEST BORING LOG** | **BORING No. SB-E0** |

| | | | |
|---|---|---|---|
| PROJECT | **Niagra Mohawk Harbor** | LOCATION | **Utica, NY** |
| CLIENT | | | |
| DRILLING CONTRACTOR | | | |
| PURPOSE | **DSA-1 Pre-Design Investigation** | | |
| WELL MATERIAL | | | |

| | | | | | |
|---|---|---|---|---|---|
| DRILLING METHOD(S) | | | SAMPLE | CORE | CASING |
| DRILL RIG TYPE | **Geoprobe** | TYPE | | | |
| GROUND WATER DEPTH | ' | DIA. | " | | |
| MEASURING POINT | | WEIGHT | # | | |
| DATE OF MEASUREMENT | | FALL | " | | |

| | |
|---|---|
| SHEET | **1** OF **1** |
| PROJECT No. | **4098003** |
| MEAS. PT. ELEV. | |
| GROUND ELEV. | **NM** |
| DATUM | **NGVD** |
| DATE STARTED | **12/5/02** |
| DATE FINISHED | **12/5/02** |
| DRILLER | **PES** |
| PIRNIE STAFF | **S. Compston** |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 2 | 4 | | 0.0 | ▨ | Brn.; silty clay; firm. | | | Sample collected: 2'-4' |
| 4 | | | | | | 4.0 | | |
| 6 | 4 | | 0.0 | ▨ | Brn./grayish drk. brn. clay, some silt. | | | Sample collected: 6'-8' |
| 8 | | | | | | 8.0 | | |

**MALCOLM PIRNIE**

# TEST BORING LOG

## BORING No. SB-E1

| | | | |
|---|---|---|---|
| PROJECT | Niagra Mohawk Harbor | LOCATION | Utica, NY |
| CLIENT | | | |
| DRILLING CONTRACTOR | | | |
| PURPOSE | DSA-1 Pre-Design Investigation | | |
| WELL MATERIAL | | | |

| | | | | | |
|---|---|---|---|---|---|
| DRILLING METHOD(S) | | | SAMPLE | CORE | CASING |
| DRILL RIG TYPE | Geoprobe | TYPE | | | |
| GROUND WATER DEPTH | 8.0' | DIA. | " | | |
| MEASURING POINT | | WEIGHT | # | | |
| DATE OF MEASUREMENT | | FALL | " | | |

| | |
|---|---|
| SHEET | 1 OF 1 |
| PROJECT No. | 4098003 |
| MEAS. PT. ELEV. | |
| GROUND ELEV. | 409.1 |
| DATUM | NGVD |
| DATE STARTED | 12/5/02 |
| DATE FINISHED | 12/5/02 |
| DRILLER | PES |
| PIRNIE STAFF | S. Compston |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 2<br>4 | 4 | | 0.0 | | Brn.; silt w/clay, mostly silt and some fn. sand. | 403.8<br>5.3 | | Sample collected 2-4'.<br>Faint odor. |
| 6 | 4 | | 0.0 | | Silty clay; v. firm. | ~~403.1~~<br>6.0 | | |
| 8 | | | | | Tan/brn.; silt and fn. sand. | 399.9<br>9.2 | | ▼ |
| 10 | 3.2 | | 39.5 | | Gry.; silty clay; no firmness; high plasticity. Organic material. | ~~399.1~~<br>10.0 | | Benzene ample collected.<br>Layer of organics with NAPL.<br>Sample collected 9.1-11.1'. |
| | | | | | Silty clay; v. firm. | 397.9<br>11.2 | | |

**MALCOLM PIRNIE**

# TEST BORING LOG

# BORING No. SB-103

| | | | |
|---|---|---|---|
| PROJECT | Niagra Mohawk Harbor | LOCATION | Utica, NY |
| CLIENT | | | |
| DRILLING CONTRACTOR | | | |
| PURPOSE | DSA-1 Pre-Design Investigation | | |
| WELL MATERIAL | | | |

SHEET 1 OF 1
PROJECT No. 4098003
MEAS. PT. ELEV.
GROUND ELEV. 407.7
DATUM NGVD
DATE STARTED 12/3/02
DATE FINISHED 12/3/02
DRILLER PES
PIRNIE STAFF S. Compston

| | | | SAMPLE | CORE | CASING |
|---|---|---|---|---|---|
| DRILLING METHOD(S) | | | | | |
| DRILL RIG TYPE | Geoprobe | TYPE | | | |
| GROUND WATER DEPTH | ' | DIA. | " | | |
| MEASURING POINT | | WEIGHT | # | | |
| DATE OF MEASUREMENT | | FALL | " | | |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 2 | 4 | | 0.0 | ▨ | Brn. Silty clay. Increased firmness w/depth. | 403.7<br>4.0 | | Sample collected 2-4'.<br>Slight odor. |
| 4 | | | | | | | | |

**MALCOLM PIRNIE**

## TEST BORING LOG

## BORING No. SB-E3

| | | | |
|---|---|---|---|
| PROJECT Niagra Mohawk Harbor | LOCATION Utica, NY | SHEET | 1 OF 1 |
| CLIENT | | PROJECT No. | 4098003 |
| DRILLING CONTRACTOR | | MEAS. PT. ELEV. | |
| PURPOSE | DSA-1 Pre-Design Investigation | GROUND ELEV. | 408.5 |
| WELL MATERIAL | | DATUM | NGVD |

| | | | SAMPLE | CORE | CASING |
|---|---|---|---|---|---|
| DRILLING METHOD(S) | | | | | |
| DRILL RIG TYPE | Geoprobe | TYPE | | | |
| GROUND WATER DEPTH | 5.0' | DIA. | " | | |
| MEASURING POINT | | WEIGHT | # | | |
| DATE OF MEASUREMENT | | FALL | " | | |

| | |
|---|---|
| DATE STARTED | 12/3/02 |
| DATE FINISHED | 12/3/02 |
| DRILLER | PES |
| PIRNIE STAFF | S. Compston |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | | Silt w/fn. sand, brn.<br>No odor, no firmness. | | | |
| 2 | 4 | | 0.0 | | | 406.1<br>2.4 | | |
| | | | | ▨ | Brn. silty clay. Increasing clay w/depth.<br>Increased firmness w/depth. | | | Sample collected 2-4'. |
| 4 | | | | | | 403.5<br>5.0 | | ▼ |
| | | | | ░ | Brn. silty sand. Color change to blk at 7.5'. | | | |
| 6 | 4 | | 0.0 | | | | | Strong odor, some sheen. |
| 8 | | | | | | | | |
| | 3 | | 0.0 | | | | | Sample collected 8.5-10.5'. |
| 10 | | | | | | 398.0<br>10.5 | | |
| | | | | | Firm silt/clay, brn. | 397.5<br>11.0 | | |

**MALCOLM PIRNIE**

# TEST BORING LOG

# BORING No. SB-E5

| | | | |
|---|---|---|---|
| PROJECT | **Niagra Mohawk Harbor** | LOCATION | **Utica, NY** |
| CLIENT | | | |
| DRILLING CONTRACTOR | | | |
| PURPOSE | **DSA-1 Pre-Design Investigation** | | |
| WELL MATERIAL | | | |
| DRILL RIG TYPE | **Geoprobe** | | |
| GROUND WATER DEPTH | **8.5'** | | |
| MEASURING POINT | | | |
| DATE OF MEASUREMENT | | | |

| DRILLING METHOD(S) | SAMPLE | CORE | CASING |
|---|---|---|---|
| TYPE | | | |
| DIA. | " | | |
| WEIGHT | # | | |
| FALL | " | | |

| | |
|---|---|
| SHEET | **1** OF **1** |
| PROJECT No. | **4098003** |
| MEAS. PT. ELEV. | |
| GROUND ELEV. | **409.7** |
| DATUM | **NGVD** |
| DATE STARTED | **12/3/02** |
| DATE FINISHED | **12/3/02** |
| DRILLER | **PES** |
| PIRNIE STAFF | **S. Compston** |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 0 | | | | ▨ | Brn., silty clay, increased firmness w/depth. | | | |
| 2 | 4 | | 0.0 | ▨ | | | | Sample collected 2-4'. |
| 4 | | | | ▨ | | | | |
| 6 | 4 | | 0.0 | ▨ | | | | |
| 7.5 | | | | ░ | Wet, brn. silty sand. | 402.2 / 7.5 | | |
| 8 | | | | ░ | | | | ▼ |
| 10 | 4 | | 0.0 | ▨ | Brn/blk silty clay. Increased firmness w/depth. | 399.7 / 10.0 | | Strong odor. Some sheen on outside of core.<br>Sample collected 9.7-11.7'.<br>Benzene sample collected. |
| 12 | | | | | | 397.7 / 12.0 | | |

| MALCOLM PIRNIE | TEST BORING LOG | BORING No. SB-104 |
|---|---|---|

|  |  |  |  |
|---|---|---|---|
| PROJECT **Niagra Mohawk Harbor** | LOCATION **Utica, NY** | SHEET **1** OF **1** | |
| CLIENT | | PROJECT No. | **4098003** |
| DRILLING CONTRACTOR | | MEAS. PT. ELEV. | |
| PURPOSE | **DSA-1 Pre-Design Investigation** | GROUND ELEV. | **410.6** |
| WELL MATERIAL | | DATUM | **NGVD** |
| | | DATE STARTED | **12/3/02** |
| | | DATE FINISHED | **12/3/02** |
| | | DRILLER | **PES** |
| | | PIRNIE STAFF | **S. Compston** |

|  |  |  | SAMPLE | CORE | CASING |
|---|---|---|---|---|---|
| DRILLING METHOD(S) | | | | | |
| DRILL RIG TYPE | **Geoprobe** | TYPE | | | |
| GROUND WATER DEPTH | ' | DIA. | " | | |
| MEASURING POINT | | WEIGHT | # | | |
| DATE OF MEASUREMENT | | FALL | " | | |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | ░ | Silty sand, brn. | 409.6 / 1.0 | | |
| 2 | 4 | | 0.0 | ▨ | Brn., silty clay. Some mottling | | | Sample collected 2-4'. |
| 4 | | | | | | 406.6 / 4.0 | | Slight odor.<br>Benzene sample collected @ 4'. |

| | | |
|---|---|---|
| **MALCOLM PIRNIE** | **TEST BORING LOG** | **BORING No. SB-E7** |

| | | | |
|---|---|---|---|
| PROJECT | **Niagra Mohawk Harbor** | LOCATION | **Utica, NY** |
| CLIENT | | | |
| DRILLING CONTRACTOR | | | |
| PURPOSE | **DSA-1 Pre-Design Investigation** | | |
| WELL MATERIAL | | | |

| | | | |
|---|---|---|---|
| SHEET | **1** OF **1** | | |
| PROJECT No. | **4098003** | | |
| MEAS. PT. ELEV. | | | |
| GROUND ELEV. | **410.4** | | |
| DATUM | **NGVD** | | |
| DATE STARTED | **12/3/02** | | |
| DATE FINISHED | **12/3/02** | | |
| DRILLER | **PES** | | |
| PIRNIE STAFF | **S. Compston** | | |

| DRILLING METHOD(S) | | | SAMPLE | CORE | CASING |
|---|---|---|---|---|---|
| DRILL RIG TYPE | **Geoprobe** | TYPE | | | |
| GROUND WATER DEPTH | **8.0'** | DIA. | " | | |
| MEASURING POINT | | WEIGHT | # | | |
| DATE OF MEASUREMENT | | FALL | " | | |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | **GEOLOGIC DESCRIPTION** KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | **WELL Constr.** | **REMARKS** |
|---|---|---|---|---|---|---|---|---|
| | | | | | Silty sand | 409.4<br>1.0 | | |
| | | | | | Silty clay, firm. | | | |
| 2 | 2 | | 0.0 | | | | | Sample collected 2-4'. |
| 4 | | | | | | | | |
| 6 | 4 | | 0.0 | | | | | |
| 8 | | | | | Very wet silty clay w/come fn. sand. Decreased clay w/depth. | 402.4<br>8.0 | | ▼<br>Strong odor, sheen and product observed. |
| 10 | 4 | | 0.0 | | | | | Sample collected 10.4-12.4'. |
| 12 | | | | | | 398.4<br>12.0 | | |

| | | |
|---|---|---|
| **MALCOLM PIRNIE** | **TEST BORING LOG** | **BORING No. SB-F2** |

| | | | |
|---|---|---|---|
| PROJECT | **Niagra Mohawk Harbor** | LOCATION | **Utica, NY** |
| CLIENT | | | |
| DRILLING CONTRACTOR | | | |
| PURPOSE | **DSA-1 Pre-Design Investigation** | | |
| WELL MATERIAL | | | |

| | |
|---|---|
| SHEET | **1** OF **1** |
| PROJECT No. | **4098003** |
| MEAS. PT. ELEV. | |
| GROUND ELEV. | **407.5** |
| DATUM | **NGVD** |
| DATE STARTED | **12/3/02** |
| DATE FINISHED | **12/3/02** |
| DRILLER | **PES** |
| PIRNIE STAFF | **S. Compston** |

| | | | | | |
|---|---|---|---|---|---|
| DRILLING METHOD(S) | | | SAMPLE | CORE | CASING |
| DRILL RIG TYPE | **Geoprobe** | TYPE | | | |
| GROUND WATER DEPTH | ' | DIA. | " | | |
| MEASURING POINT | | WEIGHT | # | | |
| DATE OF MEASUREMENT | | FALL | " | | |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | ▨ | Brn, firm silty clay w/some fine sands. Moisture increase near 2'. Increasing firmness with depth. | | | |
| 2 | 4 | | 0.0 | ▨ | | | | Sample collected 2-4'. |
| 4 | | | | ▨ | Firm brn. clay w/silt. Increased silt w/depth. | 403.5 / 4.0 | | |
| 6 | 3 | | 0.0 | ▨ | | | | |
| | | | | | | 400.0 / 7.5 | | |
| 8 | | | | | | | | Sample collected 7.5-9.5'. |

**MALCOLM PIRNIE**

# TEST BORING LOG

## BORING No. SB-F6

| | | | |
|---|---|---|---|
| PROJECT | Niagra Mohawk Harbor | LOCATION | Utica, NY |
| CLIENT | | | |
| DRILLING CONTRACTOR | | | |
| PURPOSE | DSA-1 Pre-Design Investigation | | |
| WELL MATERIAL | | | |

| | | | | |
|---|---|---|---|---|
| DRILLING METHOD(S) | | SAMPLE | CORE | CASING |
| DRILL RIG TYPE Geoprobe | TYPE | | | |
| GROUND WATER DEPTH ' | DIA. | " | | |
| MEASURING POINT | WEIGHT | # | | |
| DATE OF MEASUREMENT | FALL | " | | |

| | |
|---|---|
| SHEET | 1 OF 1 |
| PROJECT No. | 4098003 |
| MEAS. PT. ELEV. | |
| GROUND ELEV. | 410.4 |
| DATUM | NGVD |
| DATE STARTED | 12/3/02 |
| DATE FINISHED | 12/3/02 |
| DRILLER | PES |
| PIRNIE STAFF | S. Compston |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | | Silty sand, brn. | 409.9 | | |
| | | | | | Clayey silt, dry, brn. | 0.5 | | |
| 2 | 4 | | 0.0 | | | | | Sample collected 2-4'. |
| | | | | | | 406.4 | | |
| 4 | | | | | Very wet, unconsolidated silt w/some fine sand. Increased firmness and decreased wetness @ 7'. | 4.0 | | |
| 6 | 4 | | 0.0 | | | | | Staining, sheen, and strong odor. |
| | | | | | | 402.4 | | |
| 8 | | | | | [redacted]. Silt w/some fn. sand. | 8.0 | | |
| | | | | | | | | Odor and staining decreases w/depth. |
| 10 | 2 | | 0.0 | | | | | |
| | | | | | | | | Sample collected 10.4-12.4'. |
| | | | | | | 397.9 | | |
| 12 | 0.5 | | 0.0 | | | 12.5 | | |

MALCOLM PIRNIE

# TEST BORING LOG

# BORING No. SB-F10

| | | | |
|---|---|---|---|
| PROJECT | **Niagra Mohawk Harbor** | LOCATION | **Utica, NY** |
| CLIENT | | | |
| DRILLING CONTRACTOR | | | |
| PURPOSE | **DSA-1 Pre-Design Investigation** | | |
| WELL MATERIAL | | | |

| | | | | | |
|---|---|---|---|---|---|
| DRILLING METHOD(S) | | | SAMPLE | CORE | CASING |
| DRILL RIG TYPE | **Geoprobe** | TYPE | | | |
| GROUND WATER DEPTH | **10.0'** | DIA. | " | | |
| MEASURING POINT | | WEIGHT | # | | |
| DATE OF MEASUREMENT | | FALL | " | | |

| | |
|---|---|
| SHEET | **1** OF **1** |
| PROJECT No. | **4098003** |
| MEAS. PT. ELEV. | |
| GROUND ELEV. | **410.8** |
| DATUM | **NGVD** |
| DATE STARTED | **12/4/02** |
| DATE FINISHED | **12/4/02** |
| DRILLER | **PES** |
| PIRNIE STAFF | **S. Compston** |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | ░ | Tan/brn.; sand. | 410.0 / 0.8 | | |
| 2 | 3.2 | | 0.0 | ▨ | Brn.; silty clay. | 407.5 / 3.3 | | Sample collected 2-4'. |
| | | | | | NR | 406.8 / 4.0 | | |
| 4 | | | | ▨ | Brn.; silty clay, increased clay from 5 to 8'. Between 3 and 11.5' there are varying layers of sand and silty and clay, 3 to 4 inches in width. | | | |
| 6 | 4 | | 0.0 | ▨ | | | | |
| 8 | | | | ▨ | | | | |
| 10 | .25 | | 0.0 | ▨ | | 399.3 / 11.5 | | ▼ Very little recovery from 8-12'. Additional core collected from 10-14'.<br>Sample collected 10.8-12.8'. Strong odor. |
| 12 | 2 | | 49.8 | ▨ | Gry.; silt and clay. Some blk. organic zones. | 396.8 / 14.0 | | |
| 14 | | | | | | | | |

| | | |
|---|---|---|
| **MALCOLM PIRNIE** | **TEST BORING LOG** | **BORING No. SB-G1** |

| | | | | | |
|---|---|---|---|---|---|
| PROJECT | **Niagra Mohawk Harbor** | LOCATION | **Utica, NY** | SHEET | **1** OF **1** |
| CLIENT | | | | PROJECT No. | **4098003** |
| DRILLING CONTRACTOR | | | | MEAS. PT. ELEV. | |
| PURPOSE | **DSA-1 Pre-Design Investigation** | | | GROUND ELEV. | **404.9** |
| WELL MATERIAL | | | | DATUM | **NGVD** |
| DRILLING METHOD(S) | | | | DATE STARTED | **12/5/02** |
| DRILL RIG TYPE | **Geoprobe** | | | DATE FINISHED | **12/5/02** |
| GROUND WATER DEPTH | **10.0'** | | | DRILLER | **PES** |
| MEASURING POINT | | | | PIRNIE STAFF | **S. Compston** |
| DATE OF MEASUREMENT | | | | | |

| | SAMPLE | CORE | CASING |
|---|---|---|---|
| TYPE | | | |
| DIA. | " | | |
| WEIGHT | # | | |
| FALL | " | | |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 0 | | | | | Brn.; silty clay w/fn. sands; moist. Color change to gray @ 3.25'. | | | |
| 2 | 4 | | 0.0 | | | | | Sample collected 2-4'. |
| 4 | | | | | Gry.; clay w/some silt and mottling. | 400.9 / 4.0 | | |
| 6 | 2.4 | | 0.0 | | | | | Sample collected 4.9-6.9'. |
| | | | | | NR | 398.4 / 6.5 | | |
| 8 | | | | | Gry clay w/some silt; very firm. | 396.9 / 8.0 | | |
| 10 | 4 | | 0.0 | | | | | ▼ |
| | | | | | Gry Sand; wet. | 393.9 / 11.0 | | |
| 12 | | | | | | 392.9 / 12.0 | | |

**MALCOLM PIRNIE**

# TEST BORING LOG

## BORING No. SB-G3

| | | | |
|---|---|---|---|
| PROJECT | **Niagra Mohawk Harbor** | LOCATION | **Utica, NY** |
| CLIENT | | | |
| DRILLING CONTRACTOR | | | |
| PURPOSE | **DSA-1 Pre-Design Investigation** | | |
| WELL MATERIAL | | | |

| | | | | | |
|---|---|---|---|---|---|
| DRILLING METHOD(S) | | | SAMPLE | CORE | CASING |
| DRILL RIG TYPE | **Geoprobe** | TYPE | | | |
| GROUND WATER DEPTH | **8.0'** | DIA. | " | | |
| MEASURING POINT | | WEIGHT | # | | |
| DATE OF MEASUREMENT | | FALL | " | | |

| | |
|---|---|
| SHEET | **1** OF **1** |
| PROJECT No. | **4098003** |
| MEAS. PT. ELEV. | |
| GROUND ELEV. | **408.8** |
| DATUM | **NGVD** |
| DATE STARTED | **12/3/02** |
| DATE FINISHED | **12/3/02** |
| DRILLER | **PES** |
| PIRNIE STAFF | **S. Compston** |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 0–4 (2) | 4 | | 0.0 | ▨ | Brn. Silty clay. | | | Sample collected 2-4'. |
| 4–8 (6) | 4 | | 0.0 | ▨ | | 402.0<br>6.8 | | |
| | | | | ░ | Brn. silty sand. | 401.6<br>7.2 | | |
| | | | | ▨ | Brn. clay, v. firm. | 400.8<br>8.0 | | ▼ |
| 8–11 (10) | 1 | | 0.0 | ░ | Onobserved boundary<br>V. wet silt w/some fn. sands.<br>Limited recovery to 11'. | 397.8<br>11.0 | | Sample collected 8.8-10.8'. |

**MALCOLM PIRNIE**

# TEST BORING LOG

## BORING No. SB-G9

| | | | | | |
|---|---|---|---|---|---|
| PROJECT | Niagra Mohawk Harbor | LOCATION | Utica, NY | SHEET | 1 OF 1 |
| CLIENT | | | | PROJECT No. | 4098003 |
| DRILLING CONTRACTOR | | | | MEAS. PT. ELEV. | |
| PURPOSE | DSA-1 Pre-Design Investigation | | | GROUND ELEV. | 410.0 |
| WELL MATERIAL | | | | DATUM | NGVD |

| DRILLING METHOD(S) | | | SAMPLE | CORE | CASING |
|---|---|---|---|---|---|
| DRILL RIG TYPE | Geoprobe | TYPE | | | |
| GROUND WATER DEPTH | 8.0' | DIA. | " | | |
| MEASURING POINT | | WEIGHT | # | | |
| DATE OF MEASUREMENT | | FALL | " | | |

| | |
|---|---|
| DATE STARTED | 12/4/02 |
| DATE FINISHED | 12/4/02 |
| DRILLER | PES |
| PIRNIE STAFF | S. Compston |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | ⁘ | Tan/brn.; sand. | 409.0<br>1.0 | | |
| | | | | ▨ | Brn.; silty clay. | 408.2<br>1.8 | | |
| 2 | 2 | | 0.0 | ѱ | Organic matterial, wood, little decay. | 407.8<br>2.2 | | |
| | | | | ▨ | Brn./gry.; silty clay; some Fe mottling. | 406.2<br>3.8 | | Sample collected 2-4'. |
| 4 | | | | | NR | 406.0<br>4.0 | | |
| 6 | 2.8 | | 0.0 | ▨ | Brn.; silty clay. | 403.0<br>7.0 | | |
| | | | | | NR | 402.0<br>8.0 | | ▼ |
| 8 | | | | ▨ | Brn.; silt w/some caly and fn. sands; v. wet. | 400.0<br>10.0 | | |
| 10 | 4 | | 19.6 | ▨ | Gry.; silt and clay; higher clay; decreased firmness; increased plasticity; wet. | 398.0<br>12.0 | | Sample collected 10-12'. Sheen from 11.5 to 12'. Benzene sample collected @ 11.7'. Odor starts @ ~10' where brn. v. wet silt ends. |
| 12 | | | | | | | | |

**MALCOLM PIRNIE**

# TEST BORING LOG

# BORING No. SB-123

| | | | |
|---|---|---|---|
| PROJECT | **Niagra Mohawk Harbor** | LOCATION | **Utica, NY** |
| CLIENT | | | |
| DRILLING CONTRACTOR | | | |
| PURPOSE | **DSA-1 Pre-Design Investigation** | | |
| WELL MATERIAL | | | |
| DRILLING METHOD(S) | | | |
| DRILL RIG TYPE | **Geoprobe** | | |
| GROUND WATER DEPTH | ' | | |
| MEASURING POINT | | | |
| DATE OF MEASUREMENT | | | |

| | SAMPLE | CORE | CASING |
|---|---|---|---|
| TYPE | | | |
| DIA. | " | | |
| WEIGHT | # | | |
| FALL | " | | |

| | |
|---|---|
| SHEET | **1** OF **1** |
| PROJECT No. | **4098003** |
| MEAS. PT. ELEV. | |
| GROUND ELEV. | **411.0** |
| DATUM | **NGVD** |
| DATE STARTED | **12/4/02** |
| DATE FINISHED | **12/4/02** |
| DRILLER | **PES** |
| PIRNIE STAFF | **S. Compston** |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | ⁙ | Tan/brn.; sand. | 410.3<br>0.8 | | |
| 2 | 3 | | 0.0 | ▨ | Brn.; silty clay, no plasticity; some mottling. | 408.0<br>3.0 | | Sample collected 2-4'. |
| 4 | | | | | | | | |

**MALCOLM PIRNIE**

# TEST BORING LOG

## BORING No. SB-G11

| | | | |
|---|---|---|---|
| PROJECT | Niagra Mohawk Harbor | LOCATION | Utica, NY |
| CLIENT | | | |
| DRILLING CONTRACTOR | | | |
| PURPOSE | DSA-1 Pre-Design Investigation | | |
| WELL MATERIAL | | | |

| | | | |
|---|---|---|---|
| SHEET | 1 OF 1 | | |
| PROJECT No. | 4098003 | | |
| MEAS. PT. ELEV. | | | |
| GROUND ELEV. | 410.2 | | |
| DATUM | NGVD | | |
| DATE STARTED | 12/4/02 | | |
| DATE FINISHED | 12/4/02 | | |
| DRILLER | PES | | |
| PIRNIE STAFF | S. Compston | | |

| DRILLING METHOD(S) | | | SAMPLE | CORE | CASING |
|---|---|---|---|---|---|
| DRILL RIG TYPE | Geoprobe | TYPE | | | |
| GROUND WATER DEPTH | 8.0' | DIA. | " | | |
| MEASURING POINT | | WEIGHT | # | | |
| DATE OF MEASUREMENT | | FALL | " | | |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|
| 0 | | | | Sand w/some silt. | 409.7 / 0.5 | | |
| | | | | Brn. silty clay. | | | |
| 2 | 3 | | 0.0 | | 407.2 / 3.0 | | Sample collected 2-4'. |
| | | | | NR | 406.2 / 4.0 | | |
| 4 | | | | Brn. silty clay. | | | |
| 6 | 4 | | 0.0 | | 402.6 / 7.6 | | |
| | | | | Brn. moist silt and fn. sand. Thin layers of high plasticity clay. | | | ▼ |
| 8 | | | | | | | Strong odor, some sheen. |
| 10 | 2 | | 0.0 | | 398.2 / 12.0 | | Decreased odor w/depth<br>Sample collected 10.2-12.2'. |
| 12 | | | | Tan silt and fn. sand. | | | |
| | 2 | | 0.0 | | 396.2 / 14.0 | | |
| 14 | | | | | | | |

**MALCOLM PIRNIE**

# TEST BORING LOG

# BORING No. SB-H2

| | | | |
|---|---|---|---|
| PROJECT | **Niagra Mohawk Harbor** | LOCATION | **Utica, NY** |
| CLIENT | | | |
| DRILLING CONTRACTOR | | | |
| PURPOSE | **DSA-1 Pre-Design Investigation** | | |
| WELL MATERIAL | | | |
| DRILL RIG TYPE | **Geoprobe** | | |
| GROUND WATER DEPTH | **7.0'** | | |
| MEASURING POINT | | | |
| DATE OF MEASUREMENT | | | |

| DRILLING METHOD(S) | SAMPLE | CORE | CASING |
|---|---|---|---|
| TYPE | | | |
| DIA. | " | | |
| WEIGHT | # | | |
| FALL | " | | |

| | |
|---|---|
| SHEET | **1** OF **1** |
| PROJECT No. | **4098003** |
| MEAS. PT. ELEV. | |
| GROUND ELEV. | **407.1** |
| DATUM | **NGVD** |
| DATE STARTED | **12/3/02** |
| DATE FINISHED | **12/3/02** |
| DRILLER | **PES** |
| PIRNIE STAFF | **S. Compston** |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION<br>KEY - Color, Major, Minor Moisture, Etc. | ELEV.<br>DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 0 | | | | ▥ | Brown silty clay, no plasticity. | | | |
| 2 | 4 | | 0.0 | ▥ | | 404.6<br>2.5 | | |
| | | | | ▨ | Blk, silty clay. Increased clay, moisture and plasticity, strong odor. | | | Sample collected 2-4'. |
| 4 | | | | ▥ | Silty clay, no sand. Drk brown. | 402.9<br>4.2 | | |
| 6 | 3 | | 0.0 | ▥ | | | | ▼ |
| 8 | | | | ▥ | | | | Sample collected 7.1-9.1'. |
| 10 | 3.5 | | 0.0 | ▥ | | | | |
| | | | | | | 395.6<br>11.5 | | |

| MALCOLM PIRNIE | TEST BORING LOG | BORING No. SB-H8 |
|---|---|---|

| | | | |
|---|---|---|---|
| PROJECT | Niagra Mohawk Harbor | LOCATION | Utica, NY |
| CLIENT | | | |
| DRILLING CONTRACTOR | | | |
| PURPOSE | DSA-1 Pre-Design Investigation | | |
| WELL MATERIAL | | | |

| | | | SAMPLE | CORE | CASING |
|---|---|---|---|---|---|
| DRILLING METHOD(S) | | | | | |
| DRILL RIG TYPE | Geoprobe | TYPE | | | |
| GROUND WATER DEPTH | 8.0' | DIA. | " | | |
| MEASURING POINT | | WEIGHT | # | | |
| DATE OF MEASUREMENT | | FALL | " | | |

| | |
|---|---|
| SHEET | 1 OF 1 |
| PROJECT No. | 4098003 |
| MEAS. PT. ELEV. | |
| GROUND ELEV. | NM |
| DATUM | NGVD |
| DATE STARTED | 12/5/02 |
| DATE FINISHED | 12/5/02 |
| DRILLER | PES |
| PIRNIE STAFF | S. Compston |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 0–2 | 4 | | 0.0 | ▨ | Brn.; silty clay. | | | |
| | | | | ▥ | Brn.; silt w/some clay and fn. sand. | 2.5 | | Sample Collected: 2'-4' |
| 4 | 4 | | 0.0 | ▨ | Brn.; silty clay; firm. | 4.0 | | |
| 6 | | | | | | | | |
| | | | | | NR | 7.5 | | ▼ |
| 8 | 2 | | 0.0 | ▥ | Silt; very wet. | 8.0 | | |
| 10 | | | | ▥ | Gry.; silt w/clay. | 10.0 | | Sample collected:10'-12'<br>Strong odor. |
| 12 | | | | | | 12.0 | | |

| MALCOLM PIRNIE | TEST BORING LOG | BORING No. SB-H10 |
|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| PROJECT **Niagra Mohawk Harbor** | LOCATION **Utica, NY** | | | | SHEET **1** OF **1** |
| CLIENT | | | | | PROJECT No. **4098003** |
| DRILLING CONTRACTOR | | | | | MEAS. PT. ELEV. |
| PURPOSE **DSA-1 Pre-Design Investigation** | | | | | GROUND ELEV. **410.1** |
| WELL MATERIAL | | | | | DATUM **NGVD** |
| DRILLING METHOD(S) | | SAMPLE | CORE | CASING | DATE STARTED **12/4/02** |
| DRILL RIG TYPE **Geoprobe** | TYPE | | | | DATE FINISHED **12/4/02** |
| GROUND WATER DEPTH **8.0'** | DIA. | " | | | DRILLER **PES** |
| MEASURING POINT | WEIGHT | # | | | PIRNIE STAFF **S. Compston** |
| DATE OF MEASUREMENT | FALL | " | | | |

| DEPTH FT. | SAMPLE TYPE, RECOVERY, NUMBER | BLOWS ON SAMPLE SPOON PER 6" | PID | GRAPHIC LOG | GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc. | ELEV. / DEPTH | WELL Constr. | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | ░ | Tan/brn.; sand. | 408.8<br>1.3 | | |
| 2 | 4 | | 0.0 | ▨ | Brn.; silty clay w/some mottling. | 406.1<br>4.0 | | Sample collected 2-4'. |
| 4 | | | | | | | | |
| 6 | 2.4 | | 0.0 | ▨ | Brn./gry silty clay; some moist fn. sand veins. | 403.6<br>6.5 | | |
| 8 | | | | | No recovery; driller indicated v. wet silt. | 400.1<br>10.0 | | ▼ |
| 10 | 4 | | 0.0 | ▨ | Silty clay; v. low firmness and high plasticity. | 399.1<br>11.0 | | |
| | | | | ▥ | Brn.; silt; unconsolidated; v. wet. | 398.1<br>12.0 | | New sample collected from 10-14'.<br>Sample collected 10.1'-12.1'.<br>Strong odor in clay. Odor increases w/depth. |
| 12 | 2 | | 0.0 | ▧ | Gry. to gry/brn.; silty clay; high plasticity; very wet. | 396.1<br>14.0 | | |
| 14 | | | | | | | | |

# REMEDIAL INVESTIGATION REPORT

For The

# EXPANDED (OFFSITE) RI AT THE DREDGE SPOILS AREA

CITY OF UTICA, NEW YORK

**Prepared For**

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# EXECUTIVE SUMMARY

## SITE BACKGROUND

In April 1994, Niagara Mohawk Power Corporation (NMPC) retained Parsons Engineering Science, Inc. (Parsons ES) to conduct a remedial investigation (RI) at three Dredge Spoil Areas (designated as DSA-1, DSA-2, and DSA-3) located adjacent to the Harbor Point peninsula.

The DSA RI is being conducted under an amendment to the September 1989 Order on Consent (Index No. A6-0201-89-05) between NMPC and the NYSDEC. The amendment to the September 1989 Order is contained in Section II.C of the Blanket Order on Consent dated December 1992 (Index No. D6-0001-9210) between NMPC and the NYSDEC.

### Site Description

The DSA sites are comprised of the dredge spoil areas located to the northwest and the northeast of the Harbor Point area in the City of Utica, Oneida County, New York (Figure 1.1). The Harbor Point area is defined as the peninsula bounded to the west and north by the Mohawk River, to the east by the New York State Barge Canal and the Utica Terminal Harbor, and to the south by a railroad corridor currently owned by Conrail (Figure 1.2). The Harbor Point peninsula contains the NMPC Harbor Point property and the Mohawk Valley Oil (MVO), New York Tar Emulsion Products (NYTEP), and Monarch Chemical sites.

- DSA-1 is located east of the Harbor Point peninsula, between the Barge Canal and the Mohawk River. It occupies a small, roughly triangular-shaped peninsula measuring approximately 1300 feet long by 700 feet wide. The southern half of DSA-1 is surrounded by berms approximately 10 feet in height. In the northern section of the DSA, only remnants of former berms are visible.
- DSA-2 is located on a strip of land northeast of Harbor Point measuring about 1600 feet by 300 feet. The site is bounded by the Erie Canal on the north and the Mohawk River to the south. The area southeast of DSA-2 is occupied by the NYSDOT service garage, and the area northwest of DSA-2 is occupied by the Utica Harbor lock.
- DSA-3 is located northwest of Harbor Point in the Utica Marsh. It is an enclosed, bermed area measuring approximately 800 feet by 500 feet. The berms range from about 10 to 15 feet in height. DSA-3 is surrounded to the north, west, and south by the Utica Marsh. To the east is the Mohawk River and a pipeline right-of-way owned by the Buckeye Oil Company. NMPC maintains a power corridor right-of-way east-northeast of the site.

### Site History

In accordance with the NYSDEC-approved Work Plan (BB&L, 1993c), Parsons ES conducted a site visit to the Canal Corporation on June 23, 1994 (ES, 1994a).

During the site visit, a Canal Corporation employee was interviewed, and limited records provided were examined. The interview, records search and review of previous investigation documents were used to develop the findings summarized below:

- The dredge spoil areas were created by pushing up the material from inside the areas to form the berms.
- The eastern area of DSA-1 contained junked vehicles prior to its use as a dredge spoils area. The western end of DSA-1 was used for early dredge spoils.
- The southern section of DSA-3 was used as an overflow for the northern area. The NYSDEC was opposed to the release of excess water and fine material to the southern section and the process was stopped.
- Based on NYSDOT as-built construction drawings from September, 1912, material from the original construction of the harbor and Mohawk River diversion was deposited in DSA-1 and DSA-2 (NYSDOT, 1912).

## PROJECT OBJECTIVES

The objectives of the RI at the DSA site as outlined in the work plan are to;

- Determine the presence, nature and extent of source areas containing chemical constituents associated with manufactured gas plant (MGP) residuals. As MGP residuals were utilized by several industries on the Harbor Point peninsula, the presence of residuals at the DSAs cannot be attributed solely to former operations by NMPC or its predecessor, Utica Gas and Electric;
- Determine the presence, nature, and extent of chemical constituents associated with MGP residuals in the surface soils, subsurface soils, sediments, surface water, and groundwater. Based on previous sample results from the Harbor Point site, the NMPC site is not a source of PCB contamination;
- Provide the data necessary to determine the risks, if any, to human health and the environment; and
- Provide the data necessary to evaluate remedial actions, if any, which are appropriate for implementation at the site.

## SCOPE OF INVESTIGATION

The scope of work at the DSAs was determined by the 1993 Work Plan prepared by BB&L (1993c). Following completion of the work presented in the work plan additional work was required to meet the project objectives. The additional scope of work was presented in a phase II work plan (ES, 1995c). The field investigation of the DSAs began in June 1994 with soil borings and sampling. The field effort was completed with slug testing of Phase II monitoring wells in April 1995 followed by water level monitoring in May 1995. The scope of field work and laboratory analyses conducted at each of the three DSAs was designed to satisfy the objectives of the RI and included the following major elements:

- Installation of subsurface soil borings;

- Collection and laboratory analysis of surface and subsurface soil samples;
- Collection and laboratory analysis of surface water and sediment samples;
- Installation and development of groundwater monitoring wells;
- Collection and analysis of two rounds of groundwater samples;
- Quarterly water level monitoring;
- Rising/falling head tests (slug tests) on monitoring wells; and
- Validation of all analytical data.

## GEOLOGY

The geology encountered at the DSA sites during the Dredge Spoil Areas Investigation is consistent with regional geology (Fisher et al, 1970 and Cadwell, 1987) and the findings from the nearby Harbor Point peninsula. The stratigraphy is generally consistent between DSAs except where noted.

The DSAs are covered with fill material composed of the spoils from the original construction of the Mohawk River diversion and former dredging operations in the Utica Terminal Harbor, Barge Canal, and Mohawk River. The spoils material is highly variable ranging from silt and clay to very coarse and well sorted sand and fine gravels.

## HYDROGEOLOGY

Three aquifers and two aquitard layers were identified within the three major sedimentary units encountered, a dredge spoil and upper fluvial unit, a lower fluvial unit, and a glacial lacustrine unit. Distinct layers are present within the major sedimentary units. The upper aquifer is composed of the dredge material and upper fluvial sediments located adjacent to and below the dredge material. Within the upper fluvial sediments are peat beds, silts and clays which represent an upper (shallow) aquitard which is continuous throughout the DSA areas except in the southeast corner of the northern cell in DSA-3. Most DSA soil borings were terminated in the upper fluvial aquitard. The upper aquitard is underlain by the lower fluvial sand and gravel representing the intermediate aquifer. The lower fluvial sediments are underlain by glacial lacustrine sediments consisting of light-grey, pink-hued silt with very fine sand and a trace of clay. This glacial lacustrine silt bed is underlain by laminated grey, fine sand and silt with discontinuous clay and gravel layers. Deviations from the regional geology were observed at two locations, at DSA-1 (SB-132) where the intermediate (lower fluvial) aquifer was apparently not developed and in the southeast corner of the northern cell of DSA-3 (SB-317), where the upper fluvial aquitard was not present.

Hydraulic conductivities at the three DSAs are relatively low. Mean hydraulic conductivities in dredge materials at DSA-1 were 1.45 ft/day and 0.15 ft/day in upper fluvial sediments. In DSA-2 hydraulic conductivities were 14.1 ft/day in dredge materials and 0.11 ft/day in upper fluvial sediments. At DSA-3, hydraulic conductivities were 0.70 ft/day in upper fluvial sediments.

Shallow groundwater flow is radial from the center of each DSA towards the adjacent surface water bodies. Flow at DSA-1 is to the Utica Terminal Harbor, Barge Canal, and Mohawk River. Flow at DSA-2 is dominantly toward the Mohawk River, and flow at DSA-3 is toward the Mohawk River and Utica Marsh.

## NATURE AND EXTENT OF CONTAMINATION

Surface soils, subsurface soils, surface water, sediment, and groundwater samples were analyzed from each DSA for the presence of semivolatile organic compounds (SVOCs) including polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs) including benzene, toluene, ethylbenzene, and xylene (BTEX), cyanide, pesticides/PCBs and metals. Samples with visible nonaqueous phase liquids (NAPL) were analyzed for total petroleum hydrocarbons (TPH) by gas chromatograph-flame ionization detector (GC-FID) methods to characterize the NAPL. PAHs, BTEX, cyanide, and select metals are associated with MGP residuals. PAHs and BTEX are also present in petroleum products which are associated with most area sites. VOCs other than BTEX were detected in trace amounts in very few samples. Comparison to regulatory standards, criteria, and guidelines (SCGs) was not performed as part of this investigation. Rather, these comparisons will be completed as part of the Harbor Point FS. This approach is consistent with "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (USEPA, 1988).

Up to 22 metals were detected in surface soil, subsurface soil, sediment, and groundwater samples analyzed for TAL inorganic compounds. Metals are naturally occurring in soils, sediments and waters. Metals concentrations in groundwater are in part a function of turbidity in samples. All wells were developed prior to sampling to reduce turbidity. The presence of some turbidity can not be avoided during sampling due to aquifer materials. Turbidity can increase the concentrations of metals beyond what would normally be in solution.

Metals concentrations in the various media were compared to statistical background levels based on background upper tolerance limits (USEPA, 1989) using four background surface soil samples (SS-321A, SS-412A, SS-414A, and SS-415A) and four background groundwater samples from three wells, MW-24S, MW-50S, and MW-302S (two sampling rounds averaged for MW-302S). Calculated background upper tolerance levels (BUTLs) were also used for the DSA human health risk assessment. Of the 22 metals detected, up to three metals (arsenic, beryllium, and manganese) are considered as significant based on the human health risk assessment for various media:

- Surface Soil (arsenic, beryllium, manganese)
- Subsurface Soil (arsenic, beryllium, manganese).

However beryllium and manganese are not known to be associated with MGP residuals (EEI, 1984).

Analytical data are presented and discussed for the DSAs in the following paragraphs and in Section 4. Potential sources of constituents at the DSAs are the dredge material itself and abandoned cars at DSA-1. There are no known former structures within the DSAs. Elevated constituent concentrations within the DSAs were limited to the surface soils, subsurface soils, and sediments. The soils and sediments are generally contained within bermed areas. Concentrations of constituents were generally low in surface water and groundwater.

### DSA-1

Phase I sampling was conducted inside and adjacent to the bermed areas in the southern portion of DSA-1. Reviews of historical photographs revealed dredge spoil deposition may have also been conducted on the northern portion of the peninsula. Phase II sampling was conducted to evaluate the northern area.

#### PAHs

PAHs were present in samples collected from various media at DSA-1. PAH concentrations were generally higher inside the bermed area and were generally lower outside the bermed area in most media. PAHs were detected in surface soils throughout DSA-1. The area of elevated concentrations was generally in the west-central portion of the southern part of DSA-1. Detected concentrations ranged from 9.7 mg/kg (SS-106) to 1,105 mg/kg (SS-101) in the southern bermed area and 1.46 mg/kg (SS-116) to 22.75 mg/kg (SS-113) in the northern portion of the peninsula. PAHs were detected in subsurface soils inside the bermed area at concentrations ranging from not detected (five scattered samples) to 1,725 mg/kg (SB-115) and from not detected (SB-134) to 226.49 mg/kg (MW-105S) in the northern portion of the peninsula.

PAHs were detected in both sediment samples at low concentrations (20.63 mg/kg to 27.99 mg/kg), and one surface water sample at 7 ug/L. PAHs were detected in four of six Phase I groundwater samples at concentrations ranging from not detected to 535 ug/L (MW-105S), and in one of twelve groundwater samples collected during Phase II sampling at a concentration of 24 ug/L (MW-102S).

#### BTEX

BTEX concentrations were generally higher within or adjacent to the bermed area in subsurface soils and groundwater, with the exception of Phase II groundwater sample MW-112S. BTEX was not detected in surface soil, surface water or sediment samples. BTEX compounds were detected in seven of eight subsurface soil samples from within the bermed area at concentrations ranging from not detected (SB-110) to 187.60 mg/kg (SB-104), and from not detected (in many samples) to 13.06 mg/kg (MW-105S) between the bermed area and the end of the peninsula. Elevated concentrations of BTEX were generally in the west-central portion of the southern part of DSA-1 as were PAHs. BTEX was detected in four of six Phase I groundwater samples at concentrations ranging from not detected to 151 ug/L (MW-105S), and from not detected to 187 ug/L (MW-112S) in ten of twelve Phase II samples.

#### Cyanide

Cyanide was not detected in any of the samples of various media collected at DSA-1.

### PCBs

PCBs were primarily limited to soil and sediment samples collected within the bermed area. Based on previous sample results from the NMPC Harbor Point site, the NMPC site is not a source of PCBs. PCBs were detected in all ten surface soil samples collected inside the bermed area at concentrations ranging from 0.50 mg/kg (SS-101) to 6.00 mg/kg (SS-108), and in three of seven samples collected outside the bermed area at concentrations ranging from not detected to 0.78 mg/kg (SS-113). PCBs were detected in six of nine subsurface soil samples collected inside the bermed area at concentrations ranging from 0.057 mg/kg (SB-125) to 2.00 mg/kg (SB-115). PCBs were not detected in the eight subsurface soil samples collected outside the bermed area. PCBs were detected in both sediment samples at concentrations of 1.90 mg/kg (SD-101) and 1.70 mg/kg (SD-102) and in one of two surface water samples at a concentration of 0.66 ug/L (SW-101). PCBs were not detected in Phase I or Phase II groundwater samples.

### Metals

Up to 13 metals were detected above the BUTLs in surface soil and subsurface soil samples. Thirteen metals were detected above the BUTLs in Phase I groundwater samples and ten metals were above BUTLs in Phase II groundwater samples. Of the thirteen metals, three were of concern based on the human health risk assessment and one of the three was a potential MGP residual. Metals above the BUTLs were generally greatest in the west central area of the southern portion and the east-central portion in the area of abandoned cars.

### NAPL

NAPL was observed in subsurface soil samples collected in the center of DSA-1, and northwest of the berms in MW-104S and MW-105S. The NAPL was not present in a distinct product layer or zone but was observed in scattered discontinuous blebs adsorbed to the soil in a few borings. Stained soils, sheens and organic odors were also described in other subsurface soil samples. There was a strong correlation between soil and groundwater samples containing elevated PAHs and BTEX, and the presence of NAPL in subsurface soil samples.

Four samples containing visible NAPL were analyzed for total petroleum hydrocarbons using GC-FID methods. Three of the samples contained TPH as #2 fuel oil at concentrations ranging from 110 mg/kg to 6,000 mg/kg. One sample contained TPH as $C_{10}$ to $C_{20}$ petroleum at a concentration of 22 mg/kg.

## DSA-2

### PAHs

PAHs were present in samples collected from various media except surface water at DSA-2. PAHs were detected in surface soils throughout DSA-2 at concentrations ranging from 10.83 mg/kg (SS-413A) to 76.61 mg/kg (SS-201). PAHs were also detected in subsurface soils at concentrations ranging from not detected (SB-208) to 1,847.8 mg/kg (SB-225). PAHs were detected in all five sediment samples at lower concentrations than in most soils, ranging from 1.24 mg/kg (SD-205) to 21.88 mg/kg

(SD-203). Two areas of elevated PAHs were detected, the southeastern and southwestern ends of DSA-2. PAHs were detected in four of six Phase I groundwater samples at concentrations ranging from not detected to 40 ug/L (MW-200S) and in four of seven Phase II groundwater samples at concentrations ranging from not detected to 31 ug/L (MW-204S).

### BTEX

The presence of BTEX is limited to surface soils and subsurface soils with the exception of low concentrations in groundwater samples from one monitoring well. Low concentrations of BTEX were detected in four of eleven surface soil samples, ranging from not detected to 0.004 mg/kg (SS-201). BTEX was detected in 16 of 20 shallow subsurface soil samples at concentrations ranging from not detected to 3.86 mg/kg (SB-225). Most of the elevated BTEX were detected in the southeastern portion of DSA-2. BTEX was not detected in surface water or sediment samples at DSA-2. BTEX was detected in only one of six Phase I groundwater samples (3 ug/L, MW-204S) and one of seven Phase II groundwater samples (3 ug/L, MW-204S).

### Cyanide

Cyanide was not detected in any of the media sampled at DSA-2.

### PCBs

PCBs were present in all surface soil and sediment samples and in five of thirteen subsurface soils and two of five surface water samples. Based on previous sample results from the NMPC Harbor Point site, the NMPC site is not a source of PCBs. PCBs were detected in all eleven surface soil samples at concentrations ranging from 0.82 mg/kg (SS-413A) to 6.99 mg/kg (SS-203). PCBs were detected in five of thirteen subsurface soil samples, at concentrations ranging from not detected to 20.10 mg/kg (SB-204). PCBs were also detected in two of five surface water samples at concentrations ranging from not detected to 0.33 ug/L (SW-201), and in all five sediment samples at concentrations ranging from 0.02 mg/kg (SD-204) to 8.00 mg/kg (SD-202). PCBs were not detected in any Phase I or Phase II groundwater samples.

### Metals

Up to ten metals were detected above the BUTLs in surface soils, and up to 11 metals were above the BUTLs in subsurface soils. Up to eleven metals were detected above the BUTLs in Phase I and Phase II groundwater samples.

### NAPL

NAPL was observed in four subsurface soil samples collected in the center (3 samples) and southwest corner (1 sample) of the DSA-2. The NAPL was not present in a distinct product layer or zone but was observed in scattered discontinuous blebs adsorbed to the soil. In addition to the NAPL, stained soils, sheens, and odors were observed. There was a correlation between soil and groundwater samples that contained elevated PAH and BTEX concentrations and NAPL, sheens and odors described in subsurface soil samples.

Five samples were analyzed for TPH using GC-FID methods. TPH concentrations as #2 fuel oil ranged from 10 mg/kg to 3,500 mg/kg.

## DSA-3

### PAHs

PAHs were present in surface soils, subsurface soils, sediments, and in one well (in both the Phase I and Phase II samples). PAHs were detected in four of seven surface soil samples at concentrations ranging from not detected to 5.47 mg/kg (SS-303). PAHs were detected in 13 of 18 subsurface soil samples at concentrations ranging from not detected to 78.17 mg/kg (SB-313). PAHs were also detected in four of five sediment samples at concentrations ranging from not detected (SD-305) to 6.27 mg/kg (SD-301), and in ten of 13 sediment core samples (in the southern cell of DSA-3) at concentrations ranging from not detected to 1,316.60 mg/kg (SP-306). Confirmatory sampling around SP-306A resulted in PAHs at concentrations at least two orders of magnitude less than in SP-306A. PAHs were not detected in the five surface water samples, and were only detected in one groundwater well (MW-301S) at 262 ug/L (Phase I) and 70 ug/L (Phase II).

### BTEX

BTEX was detected in surface water samples, subsurface soil samples, and one groundwater well (Phase I and Phase II samples). BTEX was not detected in any surface soil sample and sediment sample. BTEX compounds were detected in all four subsurface soil samples at low concentrations ranging from 0.002 mg/kg to 0.015 mg/kg. BTEX was detected in three of five surface water samples at concentrations ranging from not detected to 29 ug/L (SW-303). BTEX was detected in groundwater sample MW-301S, at concentrations of 5 ug/L (Phase I) and 9 ug/L (Phase II).

### Cyanide

Cyanide was detected in only one sample collected at DSA-3. Cyanide was detected in sediment sample SD-302 at a concentration of 0.002 mg/kg, slightly above the detection limit.

### PCBs

PCBs were detected in surface soils, subsurface soils, sediments and surface water samples. Based on previous sample results from the NMPC Harbor Point site, the NMPC site is not a source of PCB contamination. PCBs were detected in six of seven surface soil samples at concentrations ranging from not detected to 0.47 mg/kg (SS-301). PCBs were also detected in three of four subsurface soils at concentrations ranging from not detected (SB-317) to 18.8 mg/kg (SB-307). PCBs were detected in two of five surface water samples at concentrations ranging from not detected to 0.39 ug/L (SW-304). PCBs detected in sediment samples ranged from not detected (SD-305) to 4.40 mg/kg (SD-301), and from not detected (SP-307) to 0.29 mg/kg (SP-304) in sediment core samples. PCBs were not detected in Phase I and Phase II groundwater samples.

### Metals

Up to seven metals were detected above the BUTLs in surface soil samples and up to 11 metals were above the BUTLs in subsurface soils. Up to ten metals were detected above the BUTLs in Phase I groundwater samples and up to nine metals were detected in Phase II groundwater samples.

### NAPL

Visible NAPL was not observed in DSA-3 samples; however stained soils, sheens, and organic odors were observed in some samples.

## CONTAMINANT FATE AND TRANSPORT

The groundwater route was determined to be the primary means by which detected compounds could migrate beyond their present boundaries. There is minimal potential for migration of organic compounds (PAHs and BTEX) from the DSAs to adjacent surface water bodies as shown by the data distributions. Concentrations of PAHs and BTEX in groundwater were low, and in many cases were equal to or less than detection limits.

A comparison of the groundwater and soil organic concentrations indicates that adsorption to the soil matrix is inhibiting leaching of these compounds to groundwater. The occurrence of adsorption is further supported by the measured mean TOC content of 4.9% in "clean" DSA soil samples. Other processes, such as aerobic biodegradation and dispersion also occur, resulting in reduced groundwater concentrations.

Although some organic constituents may be reaching the river and canal/harbor, previous Harbor Point RI surface water sampling results (AES, 1993) from the Mohawk River, Barge Canal, and Utica Harbor indicate that no PAHs and BTEX were detected.

## HUMAN HEALTH RISK ASSESSMENT

The baseline human health risk assessment (HHRA) determined the risks to current trespassers, as well as to three hypothetical future receptor groups: residents, recreators, and workers. However, land planning decisions by the City of Utica have indicated that the sites will include only non-residential uses (Nutter Associates, 1995). DSA-1 and DSA-3 are surrounded by berms which limit public access. The reasonable maximum exposure (RME) hazard indices exceeded 1 for all groups. RME indices above 1 indicates that there is a potential for adverse noncarcinogenic effects to occur and RME risks above $10^{-4}$ are above the upper limit of the USEPA target risk range for Superfund sites. The RME risks exceeded $10^{-4}$ for all groups. RME hazard indices and/or risks exceeding these points-of-departure indicate the need to consider risk management options.

The RME hazard indices exceeded 1 due primarily to the presence of manganese and Aroclor 1254 in soils. The results of the USEPA Lead Uptake Biokinetic Model indicated that lead in soil and groundwater at the site does not pose a threat to children. The carcinogenic risks exceeded $10^{-4}$ due primarily to the presence of PAHs, various Aroclors, arsenic and beryllium in soils.

## HABITAT-BASED ASSESSMENT

The preliminary Fish and Wildlife Impact Analysis consisted of the performance of Steps I and IIa of the analysis. The site characterization and pathway analysis have concluded that the DSA sites, and some surrounding areas, provide habitat for fish and wildlife and that exposure pathways exist via surface soils, sediments and surface water.

Significant habitats occur within a one mile radius of the site, offering some potential for consumptive and non-consumptive wildlife uses. The DSAs are idle property containing meadows, brush cover, deciduous forest canopy and scattered wet depressions and ditches which provide habitat for birds, small mammals, and amphibians. A regionally-significant wetland is located within one mile of the DSAs. Recreational fishing resources are utilized in the Mohawk River, Barge Canal, and Utica Harbor in the site vicinity. Currently, a fish consumption advisory for carp has been issued by the State of New York in the Harbor Point area. A fish sampling study was conducted in the Mohawk River, and Utica Harbor. Results are presented in the Investigation of the Utica Terminal Harbor, Barge Canal, and Mohawk River (Parsons ES, 1995a).

The widespread presence of PCBs and PAHs present exposure risks to resident and migratory birds, wildlife, and fish from the surface soil, surface water, and sediment media through one or more of the scenarios described in the pathway analysis (Section 6.2.2).

## CONCLUSIONS

The objectives of the investigation were met through the Phase I and Phase II data collection efforts and subsequent integration of the analytical results with site geology and hydrogeology. The first objective, to determine the nature and extent of source areas, was met primarily through the subsurface drilling program. No distinct areas or zones of source materials, such as NAPL, were encountered. NAPLs were identified sporadically in thin discontinuous layers or in blebs in several borings, but were typically found in a relatively immobile state, adsorbed to the soil matrix. NAPLs were limited to the shallow aquifer.

The second objective, to determine the presence and extent of chemical constituents, was accomplished through sampling and laboratory analysis of soil and groundwater samples throughout the site. PAHs, BTEX, PCBs, and metals were detected. The presence of a continuous aquitard (except at the southeast corner of the northern cell at DSA-3) has inhibited downward migration of constituents, restricting them primarily to the upper aquifer. The presence of berms prevent surface water runoff at most locations. The fate and transport evaluation shows that although limited migration to surface water bodies of PAHs, BTEX, and metals is occurring, impacts to surface water are minimal.

The third objective, to determine risks posed to human health and the environment, was met by conducting a human health risk assessment and a habitat-based assessment. The human health risk assessment indicates that there was a health risk to current and future receptors, based primarily on exposure to BTEX, chloromethane, PAHs, and metals in groundwater and PAHs, BTEX, PCBs, and metals in soils. The most significant potential impact to wildlife at the DSAs site is the distribution of elevated concentrations of PAHs in surficial soils. This distribution suggests possible exposure to biota through one or more of the scenarios described in the pathway analysis.

The final objective, to provide data necessary to evaluate remedial actions, was also met primarily through the sampling and laboratory analysis of surface soils, subsurface soils, sediments, surface water, and groundwater samples and data evaluation and interpretation.

# SECTION 1

# INTRODUCTION

## 1.1 PROJECT BACKGROUND

In April 1994, Parsons Engineering Science Inc. (Parsons ES) began an expanded remedial investigation of offsite areas adjacent to the Harbor Point site. The initial offsite areas investigated included the MVO site (NYSDEC Site No. 633032), the NYTEP perimeter (surrounding NYSDEC Site No. 633031), and three DSAs. This DSA RI comprises a part of the expanded remedial investigations being conducted in accordance with Section II.C of the Blanket Order on Consent dated December 1992 (Index No. D6-0001-9210) between the NYSDEC and NMPC. The Blanket Order on Consent is an amendment to the September 1989 Order on Consent (Index No. A6-0201-89-05) between the NYSDEC and NMPC. The remedial investigation of offsite areas became known under the amendment as the expanded remedial investigation, and included the three DSAs, MVO, and NYTEP. The adjacent Mohawk River and Utica Harbor were investigated during a separate effort (Parsons ES, 1995a).

The three DSAs, designated as DSA-1, DSA-2, and DSA-3, are located adjacent to the peninsula known as Harbor Point. Individual parcels within or adjacent to the peninsula include the Niagara Mohawk Power Corporation (NMPC) Harbor Point site, the MVO site, the NYTEP site, the Monarch Chemical site, and three Dredge Spoils Areas (DSAs) referenced above.

The scope of work at the DSAs was determined by the NYSDEC-approved 1993 Work Plan prepared by BB&L (1993c). The Work Plan was modified as described in Section 2.13 with NYSDEC approval. Following completion of the work presented in the Work Plan additional work was required to meet the project objectives. The additional scope of work was presented in a Phase II Work Plan (ES, 1995c). The field investigation of the DSAs began in June 1994 with soil borings and sampling. The field effort was completed with slug testing of Phase II monitoring wells in April 1995, followed by water level monitoring in May 1995. All field work and reporting associated with this investigation were performed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), the National Contingency Plan (NCP) of March 8, 1990 (40 CFR Part 300), the USEPA guidance document entitled "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (USEPA, 1988), and a NYSDEC-approved Work Plan (BB&L, 1993c) and subsequent Work Plan Addendum (ES, 1995c).

## 1.2 SITE BACKGROUND

### 1.2.1 Site Description

The DSA sites are dredge spoil areas located to the northwest and the northeast of the Harbor Point area in the City of Utica, Oneida County, New York (Figure 1.1).

The Harbor Point area is defined as the peninsula bounded to the west and north by the Mohawk River, to the east by the New York State Barge Canal and the Utica Terminal Harbor, and to the south by a railroad corridor currently owned by Conrail. Area features are identified on Figure 2.1.

DSA-1 is located east of the Harbor Point peninsula between the Barge Canal and the Mohawk River. It occupies a small, roughly triangular-shaped peninsula measuring approximately 1300 feet long by 700 feet wide. The southern half of DSA-1 is surrounded by berms approximately 10 feet in height. In the northern section, only remnants of former berms are visible.

DSA-2 is located on a strip of land northeast of Harbor Point measuring about 1600 feet by 300 feet. The site is bounded by the Erie Canal on the north and the Mohawk River to the south. The southeast end of DSA-2 is occupied by the NYSDOT service garage, and the Utica Harbor lock is on the northwest side.

DSA-3 is located northwest of Harbor Point in the Utica Marsh. It is surrounded by berms. The bermed area is approximately 800 feet by 500 feet. The berms range from about 10 to 15 feet in height. DSA-3 is surrounded to the north, west, and south by the Utica Marsh. To the east is the Mohawk River and a pipeline right-of-way owned by the Buckeye Oil Company. NMPC maintains a power corridor right-of-way along the east-northeast of the site.

For purposes of this report, and for consistency with historical documents, the Barge Canal refers only to the harbor entrance channel measuring approximately 1300 feet in length, connecting the Mohawk River with the mouth of the Utica Harbor. The Erie Canal refers to the canal running parallel to and east of the Mohawk River. The Erie Canal was not a subject of this investigation and is only mentioned as a point of reference and in descriptions of local hydrology and hydrogeology.

The Mohawk River flows from southwest to northeast between the Utica marsh (on the west) and the Harbor Point site (on the east). At its intersection with the Barge Canal and the Utica Harbor lock, the river turns and flows to the east-southeast. From this point, the river runs between DSA-1 and DSA-2 parallel to the Erie Canal, flows under North Genesee Street, past a number of tank farms, and over the taintor gates at the dam.

### 1.2.2 Site History

In accordance with the NYSDEC-approved Work Plan (BB&L, 1993c), Parsons ES conducted a site visit to the Canal Corporation on June 23, 1994. The purpose of the interview was to obtain information on past dredging operations within the Utica Harbor, Barge Canal, and Mohawk River in the vicinity of Harbor Point. During the site visit, a Canal Corporation employee was interviewed, and limited records provided by the Canal Corporation were examined. The interview, provided records, and data reviews were used to develop the historical information summarized below:

- The dredge spoil areas were created by pushing up the soil from inside the areas to form the berms. During subsequent dredging events, additional soil and/or dredge material from inside the berms was used to raise the berms as needed. The ditches inside the DSAs were created as material was excavated to form the berms. Drainage pathways were constructed around the outside of the berms to channel water away from the sites.

- The eastern area of DSA-1 contained junked vehicles prior to its use as a dredge spoils area. (This statement was confirmed by the presence of abandoned vehicles on aerial photos, including those taken in 1962. During the RI field work, abandoned vehicles were still present). The northwestern end of DSA-1 was used for early dredge spoils deposition.
- The southern section of DSA-3 was used as an overflow for the northern area. The NYSDEC was opposed to the release of excess water and fine material to the southern section and the process was stopped.
- An episode of dredging in the harbor occurred beginning on April 14, 1981, and was terminated on April 21, 1981.
- Based on NYSDOT as-built construction drawings from September, 1912, material from the original construction of the harbor and Mohawk River diversion was deposited in DSA-1 and DSA-2 (NYSDOT, 1912).

### 1.2.3 Demography and Land Use

The area in the vicinity of the DSA sites is subject to a variety of land uses including open space, light industrial and commercial, navigable waterway, major transportation corridors, and multi-family housing.

Open space areas comprise the Utica Marsh on the west side of the Mohawk River. Public access to the Utica Marsh is available via bikeways and walking paths. Just to the north of the site is the Utica Harbor lock, which provides access to the Erie Canal. The primary user of the Utica Harbor lock is the Canal Corporation, which maintains a canal maintenance facility at the head of the harbor. Light industrial use occurs to the east and south of the DSAs. The area to the south of DSA-1 is occupied by a hotel and restaurants.

Major arterial roadways leading to and from the City of Utica are located near the site. Route 790 passes through the Utica Marsh just to the west of DSA-2. The major public users of the harbor and river area are recreational fishermen.

To the east of DSA-2 the NYSDOT maintains a service garage for the highway department.

Recent land planning decisions by the City of Utica have indicated that the Harbor Point peninsula and vicinity will be restricted to only non-residential use and development (Nutter Associates, 1995).

### 1.2.4 Previous Sampling

Previous sampling at the DSAs have been of limited scope, and includes two sampling events at DSA-1. A complete summary of previous sampling events, including results of laboratory analyses, was provided in the DSA Work Plan (BB&L, 1993c). A brief summary of the two sampling events at DSA-1, which highlights the pertinent results, is provided below:

- The first event involved collection of a single sample of dredge spoil material from DSA-1 by NYSDEC in May 1981. Laboratory analysis indicated the presence of PAHs including naphthalene, anthracene/phenanthrene, and acenaphthylene (URS, 1992b).
- The second event was part of a Phase II investigation at DSA-1 completed by URS in January 1992 for the NYSDEC (URS, 1992b). In 1990 and 1991, URS Consultants conducted a Phase II Investigation for the NYSDEC in the harbor, canal, and part of DSA-1. These areas had been listed by the NYSDEC as the Utica Harbor site, a Class 2a hazardous waste site (NYSDEC Site No. 633018). The primary objectives of the investigation were to determine the environmental and health-related significance of the site, the need for further action (if any), and to recommend the assignment of an appropriate classification to the site. As part of the investigation, four subsurface soil samples were collected in August 1990 and analyzed for total contaminant list (TCL) organic compounds and total analyte list (TAL) metals and cyanide. PAHs were the predominant TCL constituent detected, with individual PAH concentrations ranging from 0.26 milligrams per kilogram (mg/kg) of dibenz(a,h)anthracene to 52 mg/kg of flouranthene.

## 1.3 PROJECT OBJECTIVES

The objectives of the RI at the DSA site, as outlined in the work plan, are to:

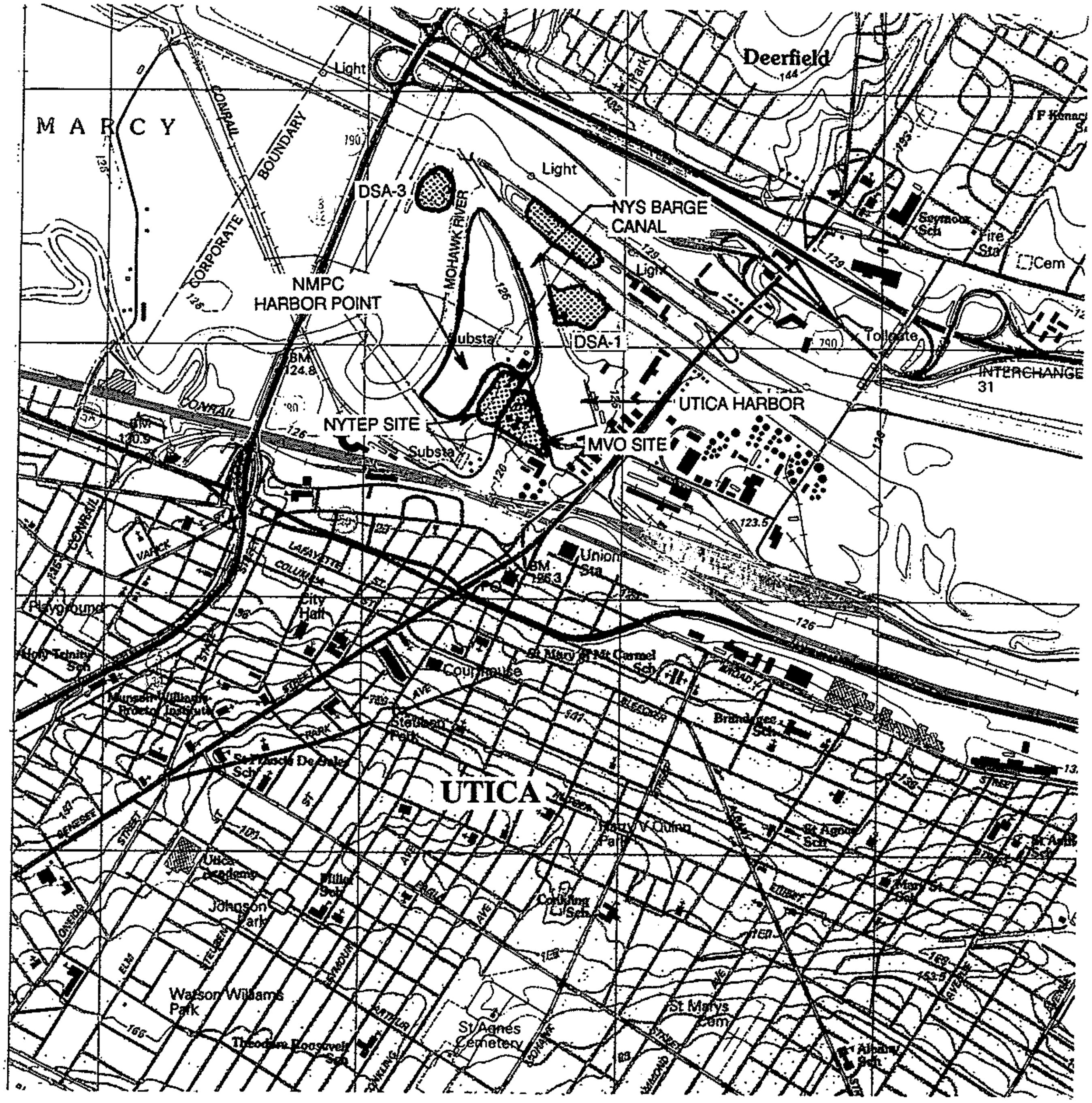
- Determine the presence, nature, and extent of source areas containing chemical constituents associated with MGP residuals. As MGP residuals were utilized by several industries on the Harbor Point peninsula, the presence of MGP residuals at the DSAs cannot be attributed solely to former operations by NMPC or its predecessor, UG&E;
- Determine the presence, nature, and extent of chemical constituents associated with MGP residuals in the surface soils, subsurface soils, sediments, surface water, and groundwater;
- Provide the data necessary to determine the risks, if any, to human health and the environment; and
- Provide the data necessary to evaluate remedial actions, if any, which are appropriate for implementation at the site.

## 1.4 REPORT ORGANIZATION

This report documents all work performed during the RI, provides detailed results of the chemical analyses, and describes the nature and extent of detected chemicals in each environmental medium sampled. The report is organized as follows:

- Section 1 - Describes the project background, project objectives, site description, site history, and previous investigations;
- Section 2 - Describes the field investigation methods;

- Section 3 - Discusses the physical characteristics of the site including surface features, land use, geology, and hydrogeology;
- Section 4 - Details the nature and extent of contamination. Results of previous investigations are summarized and compared with results of this investigation;
- Section 5 - Discusses contaminant fate and transport;
- Section 6 - Summarizes a baseline risk assessment and habitat assessment that describes the potential impacts to human health;
- Section 7 - Presents a summary of the findings and conclusions; followed by
- References - A list of references used in preparation of this report follow Section 7; and
- Appendices A through J - provide supporting documentation upon which this report is based.



LATITUDE: 43°07'00"
LONGITUDE: 75°14'00"

2000' 0 2000'

Approximate Scale in Feet

DATE: 9/8/95 (JHG)
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FIGURE 1.1

SOURCE: U.S.G.S. 7.5 SERIES TOPOGRAPHIC MAP, EAST UTICA, NEW YORK (1983).

NIAGARA MOHAWK

NIAGARA MOHAWK POWER CORPORATION
SYRACUSE, NEW YORK

OFF SITE RI SITE LOCATIONS
HARBOR POINT
UTICA, NEW YORK

**PARSONS ENGINEERING SCIENCE, INC.**
DESIGN • RESEARCH • PLANNING
290 ELWOOD DAVIS ROAD • SUITE 312 • LIVERPOOL, N.Y. 13088 • 315/451-9560
OFFICES IN PRINCIPAL CITIES

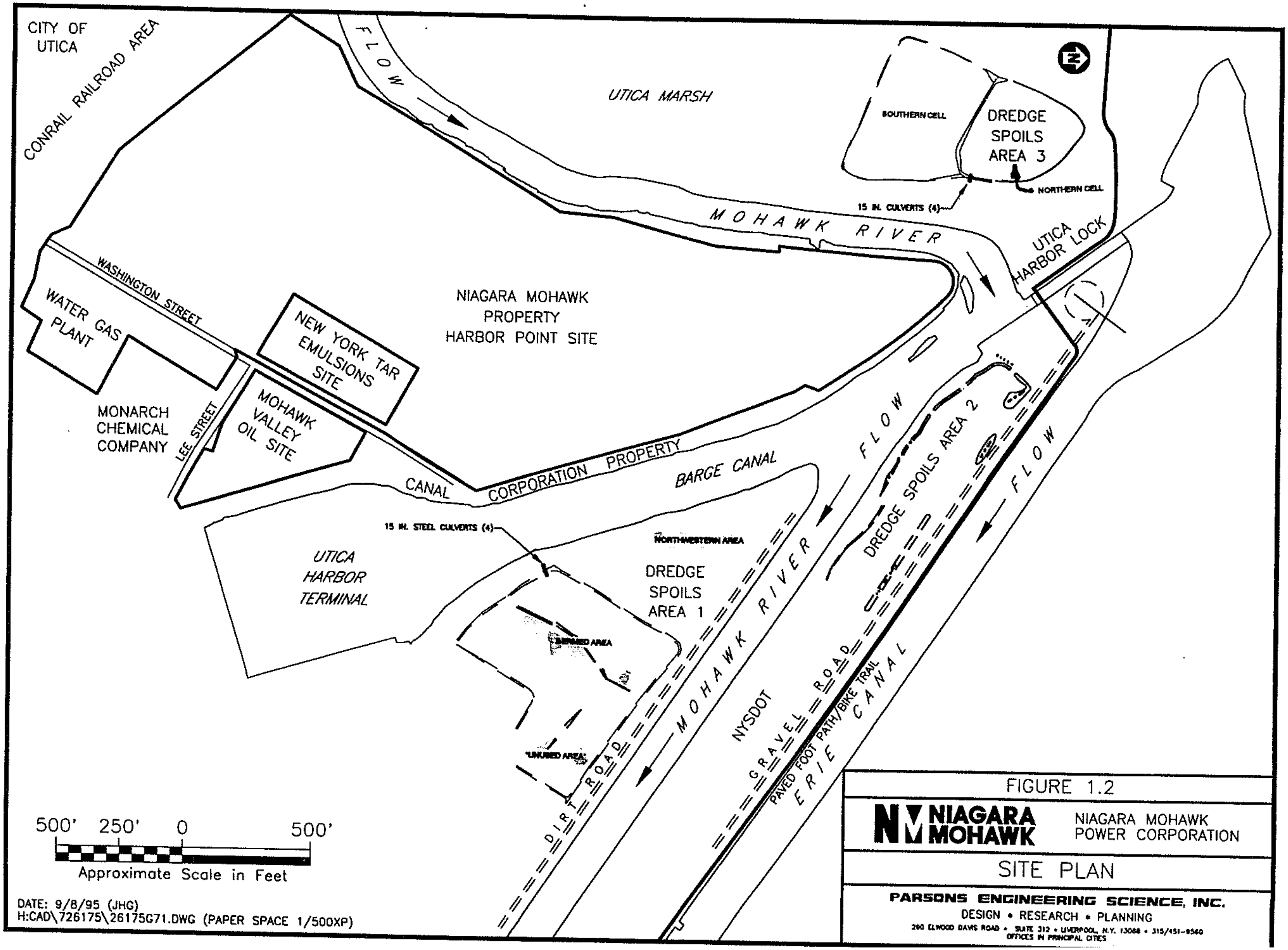

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FIGURE 1.2

**NIAGARA MOHAWK**

NIAGARA MOHAWK POWER CORPORATION

SITE PLAN

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# SECTION 2

# SCOPE OF WORK

## 2.1 INTRODUCTION

The purpose of this section is to describe and document the methods used during the field investigation. The field investigation of the DSAs began in June 1994 with soil borings and sampling, and was completed with slug testing of Phase II monitoring wells in April 1995, followed by water level monitoring in May 1995. All field work and reporting associated with this investigation were performed in accordance with the CERCLA, the NCP of March 8, 1990 (40 CFR Part 300), and the USEPA guidance document entitled "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (USEPA, 1988). The work was also performed in accordance with the NYSDEC-approved DSA Work Plan (BB&L, 1993c), Field Sampling Plan (FSP), Quality Assurance Project Plan (QAPP) Health and Safety Plan (HASP) and the NYSDEC-approved January 1995 Work Plan Addendum for the Phase II Expanded Offsite RI at Dredge Spoil Areas (ES, 1995c). Any deviations from the Work Plan are noted in the text of this section. All field sampling locations at DSA-1, DSA-2, and DSA-3 are identified on Plate 2.1.

The scope of the investigation consisted of the following activities:

- Site Reconnaissance and Mapping
- Surface Soil Investigation
- Surface Water / Sediment Investigation
- Phase I Soil Borings
- Phase II Soil Borings
- Monitoring Well Installation
- Phase I Groundwater Sampling
- Phase II Groundwater Sampling
- Hydraulic Conductivity Testing
- Decontamination Procedures
- Disposal of Investigation-Derived Wastes
- Deviations from the Field Sampling Plan
- QA/QC Program
- Laboratory Analysis
- Data Validation
- Database Management

Each of these activities are discussed in more detail in the following subsections.

## 2.2 SITE RECONNAISSANCE AND MAPPING

Before field work began, various agencies were contacted through the Underground Facilities Protective Organization (UFPO) utility locating service to ascertain buried utility locations. Among the agencies contacted were NMPC (gas and electric), Buckeye Pipeline Company, Utica City Water Board, NYNEX and various cable television companies.

Based on discussions and site walkovers with representatives of these agencies, the Parsons ES field geologist located well and boring locations to avoid any underground or aboveground utilities. No aboveground or subsurface utilities were encountered during the RI field work.

F. Sokolowski (Canal Section Superintendent), A. Sharpe (Floating Plant Supervisor) and a former employee of the Canal Corporation were interviewed and historic documents were reviewed by the Parsons ES field team leader prior to the start of field work to ascertain historical dredging and other practices at the DSAs.

Maps of the three DSAs were created by CNY Land Surveying which included topographic features in addition to Phase I sample locations, boring and well locations. These were surveyed and tied into the New York State Plane Coordinate System and United States Geological Survey (USGS) datum. Nearby topographic features such as part of the Harbor Point peninsula, the Mohawk River and the Barge Canal were also depicted on the maps. These maps were used as base maps upon which final well, boring and sample elevations and locations were depicted. Phase II sample locations, borings, and wells were surveyed by the NMPC survey department and tied into the existing Phase I survey.

## 2.3 SURFACE SOIL INVESTIGATION

Thirty-seven surface soil samples were collected from the DSA sites following methods specified in the Work Plan (BB&L, 1993c). Sample locations included 19 from DSA-1, 11 from DSA-2 and seven from DSA-3. Efforts were made to collect samples from areas of stained soils and/or stressed vegetation, however few such areas were seen during the sampling effort. The remaining surface soil samples were collected throughout the DSAs near grid points to provide broad coverage.

Four background samples were also collected. Two of these samples were collected from the Utica Marsh west of DSA-3, one was from near the harbor lock, and one was collected between the southern portion of DSA-3 and the Mohawk River. The primary use for surface soil sample data is for human health risk assessment and ecological evaluations.

All surface soil samples, including the background samples, were analyzed for TCL volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides/PCBs, Target Analyte List (TAL) metals, cyanide and total organic carbon (TOC). The results are presented in Section 4. Complete validated surface soil data are presented in Appendices A and B. A sample collection summary and list of analytical parameters is provided in Table 2.1.

Surface soil samples were collected with decontaminated stainless steel equipment. Decontamination procedures are discussed in Section 2.11.

## 2.4 SURFACE WATER / SEDIMENT INVESTIGATION / SEDIMENT CORE SAMPLES

### 2.4.1 Surface Water/Sediment

Twelve surface water/sediment samples, including duplicate samples, were collected from drainage ways, piping and gullies at the DSA sites. Two samples were collected from DSA-1, five samples were collected from DSA-2 and the remaining five samples were collected from DSA-3. When possible, samples were collected from areas of stained soils and/or stressed vegetation. The primary use for surface water/sediment sample data is for human health risk assessment and ecological evaluations.

All surface water/sediment samples were analyzed for TCL VOCs and SVOCs, pesticides/PCBs, TAL metals, cyanide and TOC. A sample collection summary is shown on Table 2.1, and complete validated surface water/sediment data are presented in Appendices A and B.

Surface water/sediment samples were collected with decontaminated stainless steel equipment. Decontamination procedures are discussed in Section 2.11.

### 2.4.2 DSA-3 Sediment Core Samples

In addition to sediment samples collection described above, sediment core samples were collected from the southern cell of DSA-3 to replace scheduled soil borings. This area was lower topographically than the northern cell and was mostly under water. Drill rig access was limited by the ponded water up to eight feet in depth. These samples were identified with an SP prefix to distinguish them from other sediment samples. This area was not used for the deposition of dredged material.

Eight Phase I sediment core samples were collected using a Wildco$^{tm}$ sediment core sampler which was manually pushed into the sediments. A sediment core up to 1.5 feet long was retrieved from the Wildco$^{tm}$ sampler and placed in laboratory sample bottles. Phase I samples were collected while wading in the shallow water, and from a row boat in deeper water. Phase II sampling was conducted during March 1995 to confirm Phase I results. Phase II samples were collected on a 50-foot grid spacing. The southern cell of DSA-3 was covered with ice so the Wildco$^{tm}$ sampler was pushed through holes in the ice.

Phase I and II samples were screened using ENSYS$^{tm}$ immunoassay methods. The screening method consisted of a real-time immunoassay semi-quantitative test for PAH compounds. This method allowed determination of total PAH concentration ranges including below 1 part per million (ppm), between 1 and 10 ppm and over 10 ppm in Phase I samples and below 10 ppm, between 10 and 100 ppm and over 100 ppm in Phase II samples. Screening results were used to select samples for laboratory analysis. A sample collection summary is shown in Table 2.1 and results of the Ensys$^{tm}$ screening are provided in Table 2.2.

Decontamination procedures as discussed in Section 2.11 were followed.

## 2.5 PHASE I SOIL BORINGS

A total of 64 soil borings were installed at the three DSAs. The Phase I soil borings were numbered SB-101 through SB-131 (DSA-1), SB-200 through SB-225 (DSA-2), and SB-301 through SB-317 (DSA-3). As discussed in Section 3.3.3, three primary hydrogeologic units were defined at the site: shallow and intermediate aquifers, separated by a shallow aquitard. Sixty of the 64 borings were shallow aquifer borings, while the remaining four were intermediate borings. Plate 2.1 shows sample locations and a drilling summary is provided in Table 2.3.

### 2.5.1 Drilling Methods

Shallow borings were advanced using hollow stem auger (HSA) methods to depths of ten to 20 feet in DSA-1, ten to 34 feet in DSA-2, and ten to 28 feet in DSA-3. The first aquitard was not encountered in two borings at DSA-3, so drilling was continued to a depth of 40 feet in SB-308 and 50 feet in SB-317. Split-spoon samples were collected continuously to the bottom of each borehole. Following completion of each boring to the desired depth and sample collection, the borehole was sealed to ground surface with hydrated bentonite pellets.

Two intermediate borings were installed to depths of 42 feet (SB-132) and 50 feet (SB-231) using HSA and spin-casing methods. These intermediate borings were cased off at the first low permeability zone (aquitard). This shallow aquitard was usually encountered at a depth of 10 to 14 feet below ground surface. A five-inch steel casing was driven approximately two feet into the shallow aquitard to inhibit vertical migration of any constituents between the shallow and intermediate zone. The casing was then grouted in place with a cement/bentonite grout mixture between the casing and the borehole wall (see Appendix C for boring logs). After the grout had set for a minimum of 48 hours, spin-casing drilling resumed through the steel casing to the desired depth in the intermediate aquifer. The intermediate borings were sampled continuously with split-spoons to the bottom of each hole. Upon completion of an intermediate boring to the desired depth, the borehole was sealed with grout to ground surface.

### 2.5.2 Subsurface Environmental Sampling

The objective of the subsurface sampling, according to the DSA RI Work Plan (BB&L, 1993a), was to identify and determine the horizontal and vertical extent of source materials at the DSA sites. Thus, samples containing the greatest concentrations of chemical constituents based on visual observations, photoionization detector (PID) readings and PAH screening were targeted for laboratory analysis. In the absence of observed constituents and screening results, samples were typically collected at the bottom of the borehole.

Subsurface soil samples were collected from most borings during Phase I and II drilling. All subsurface soil samples were collected by two-foot long, two-inch ID split-spoon samplers using ASTM Method D1586. Soil samples were collected continuously through each zone penetrated by the single boring or boring pair. A total of 108 samples were submitted for laboratory analysis. Most Phase I subsurface soil samples were analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL metals, and cyanide. Several samples were also analyzed for PAHs only, and a few were analyzed by gas chromatograph/flame ionization detector (GC-FID) methods to distinguish between various types of petroleum compounds, such as No. 2 versus No. 4 fuel oil. Table 2.1 summarizes pertinent sample information, including sample identification number, laboratory analyses, and quality assurance/quality control (QA/QC) samples. Sample results are discussed in Section 4.

Most Phase II subsurface soil samples were analyzed for TCL VOCs and SVOCs. Selected samples were also analyzed for pesticides/PCBs, TAL metals, cyanide and TOC. Several samples were also analyzed by GC-FID methods. Samples were selected based on PID readings and visual observations. As with the Phase I samples, environmental soil samples and QA/QC samples are summarized on Table 2.1, and sample results are discussed in Section 4.

### 2.5.3 PAH Screening

Approximately three samples were selected from continuous split spoon samples from each boring for PAH screening using the ENSYS™ screening method. The criteria listed in the above sections were used to select samples for ENSYS™ screening. Screening results are summarized on Table 2.2. The screening method consisted of a real-time immunoassay semi-quantitative test for total PAH compounds. This method allowed determination of total PAH concentration ranges below 1 ppm, between 1 and 10 ppm, and over 10 ppm. The screening results, PID readings, and visual observations were used to select samples containing constituents for laboratory analysis.

### 2.5.4 Subsurface Geotechnical Sampling

In addition to soil samples for chemical analysis, soil samples were collected during the Phase I drilling for geotechnical analyses. Six Shelby tube samples were collected for vertical permeability measurement and 43 samples were collected during the Phase I field work tasks for grain size analyses. All six Shelby tube samples were collected from the shallow aquitard. Of the 43 grain size analyses, 13 were from the shallow aquifer and two were from the shallow aquitard. The remaining 28 samples, as specified in the Work Plan, were from the surface soil samples (see Table 2.4 for sample summaries).

Soil samples were collected via Shelby tube in accordance with ASTM Method D-1587-83 and were analyzed for vertical permeability using ASTM Method D-5084-90. Soil samples collected via split-spoon in accordance with ASTM Method D-1586-84 and were analyzed for grain size distribution using ASTM Method D-422-63 and Atterberg limits using ASTM Method D-4318-84. Geotechnical results are discussed in Sections 3.2 and 3.3 and are presented in detail in Appendices D and E.

## 2.6 PHASE II SOIL BORINGS

Twenty-one shallow borings and two intermediate borings, numbered SB-132 through SB-145 at DSA-1 and SB-226 through SB-234 at DSA-3, were installed during the Phase II field effort. These borings were installed to fill data gaps and used the same methods as the Phase I borings (see Plate 2.1 and Table 2.3). Phase II subsurface soil sampling was discussed in Section 2.5.

## 2.7 MONITORING WELL INSTALLATION

Twenty-three monitoring wells were installed at the DSA sites during Phase I and II drilling (Figure 2.1). Twelve wells numbered MW-101S through MW-112S were installed at DSA-1; seven wells numbered MW-200S through MW-206S were installed at DSA-2; and four wells numbered MW-301S through MW-304S were installed at DSA-3. All wells were installed in the shallow aquifer at each site. Section 3 discusses the site geology and hydrogeology in detail. Well installation details are summarized on Table 2.3 and boring logs are presented in Appendix C.

The monitoring wells were installed by HSA drilling methods. Methods specified in the Work Plan (WP) and Field Sampling Plan (FSP) were followed, except where modifications were approved by the NYSDEC in advance (see Section 2.13).

Phase I wells were constructed with 2-inch inside diameter (ID) stainless steel riser and 2-inch ID, 0.02-inch slot stainless steel screens. Stainless steel sumps measuring one-foot long and 2-inch ID were placed below each screen to collect any silt or dense, non-aqueous phase liquid (DNAPL) entering the well. Sand packs were placed around the well screens to at least 1 foot above the screen top. Bentonite pellet seals at least 2 feet thick were placed above the sand packs. The remaining annular space above the bentonite seal was filled with grout. Protective casings were grouted in place and sloping concrete aprons were fashioned to channel water away from the well.

Phase II wells were constructed in a similar fashion, but were constructed using PVC screens and risers instead of stainless steel due to low concentrations of organic compounds detected in Phase I groundwater samples.

All wells were developed following installation. Development was completed by the drilling subcontractor using a Waterra$^{tm}$ pump and tubing system, along with foot valves and surge blocks. Development continued for a maximum of two hours or until the turbidity was below 50 nephelometric turbidity units (NTUs) or pH, conductivity, and temperature stabilized. Water generated during development of wells was ultimately discharged to the ground following NMPC approval. All procedures used were consistent with the WP and FSP. Appendix F contains well development logs, pH, conductivity and temperature readings, and other field observations relevant to the well development activities.

Monitoring well construction and boring logs containing details of well construction and geologic material encountered are presented in Appendix C.

## 2.8 PHASE I GROUNDWATER SAMPLING

The Phase I DSA wells were sampled in August, 1994 using methods specified in the WP and FSP. Groundwater sampling logs containing field pH, temperature and conductivity readings, and other field observations are presented in Appendix F.

Wells were purged and sampled using disposable polyethylene bailers and polypropylene rope. All wells were purged of at least three well volumes prior to sampling. The samples were analyzed for TCL VOCs and SVOCs, pesticides/PCBs, TAL metals, and cyanide. Groundwater sample analyses are summarized on Table 2.2.

Complete validated groundwater data are presented in Appendices A and B. Groundwater sample results are discussed in Section 4.

## 2.9 PHASE II GROUNDWATER SAMPLING

The Phase I and Phase II wells were sampled in March, 1995 using procedures specified in the WP and FSP. Groundwater sampling logs containing field pH, temperature and conductivity readings, and other field observations are presented in Appendix F, and sampling results are discussed in Section 4.

All wells were purged and sampled using disposable polyethylene bailers and polypropylene rope. All wells were purged of at least three well volumes of water prior to sampling. Most samples collected were analyzed for TCL VOCs and SVOCs, TAL metals, and cyanide. Several samples were also analyzed for pesticides/PCBs. Groundwater sample analyses are summarized on Table 2.1. Complete validated groundwater data are presented in Appendices A and B.

## 2.10 RISING/FALLING HEAD TESTS (SLUG TESTS)

Rising and/or falling head (slug) tests were performed on the majority of the monitoring wells installed at the DSA sites. The slug test results were used to determine horizontal hydraulic conductivity estimates of the formation penetrated by the well screen. Slug test plots are presented in Appendix G and results are discussed in Section 3.3.

Slug tests were performed using an *Insitu* Hermit™ 1000c data logger and stainless steel slugs. The insertion test procedure entailed inserting the Hermit pressure transducer into the well approximately 8 feet below the static water level, then waiting until the water level had returned to static. The stainless steel slug was then submerged, causing the water level in the well to rise. The data were then analyzed using the Bouwer and Rice method for unconfined aquifers (Bouwer & Rice, 1976). Selected deeper well tests were also analyzed using the Cooper, et al method for confined aquifers (Cooper et al, 1967). Slug withdrawal tests utilized the same procedure except, that the slug was inserted along with the transducer and was withdrawn (after static levels had been reached) causing an initial decline in water levels. Withdrawal tests were performed on wells with partially submerged screens and insertion tests were performed on wells with completely submerged screens. Insertion tests are not considered valid in situations where the water level is within the screened interval (Bouwer and Rice, 1976).

Hand readings were also taken during the tests as a QA/QC measure to ensure accuracy of data logger readings and to guard against the loss of electronic data.

## 2.11 DECONTAMINATION

All equipment coming into contact with the subsurface was decontaminated by steam cleaning at a minimum. Sampling equipment (split-spoons, stainless steel equipment) was steam cleaned, and triple-rinsed with nitric acid, methanol, and deionized water. Sampling equipment was then wrapped in aluminum foil until needed.

All decontamination occurred at an on-site decontamination pad. Decontamination water was ultimately discharged to the NMPC pretreatment lagoon following approval by NMPC personnel.

## 2.12 DISPOSAL OF INVESTIGATION-DERIVED WASTE

All soil cuttings produced during drilling activities was staged on-site for subsequent transportation to NMPC property. Soil was placed in an NMPC-approved staging location on the NMPC Harbor Point property.

Water generated during well development and groundwater sampling activities was discharged directly to the ground following NYSDEC approval.

All decontamination water generated during field activities was transported to the NMPC pretreatment lagoon at NMPC's Harbor Point site.

Personal protective equipment (PPE), such as tyvek and gloves, was placed in the PPE roll-off container on the NMPC Harbor Point property.

## 2.13 DEVIATIONS FROM THE FIELD SAMPLING PLAN

Several deviations from the FSP occurred during the Source Investigation. In each case, deviations were made to improve the efficiency of the operation, or to improve data integrity. None of the deviations had an adverse impact on the generated data. All deviations were approved by the NYSDEC prior to implementation.

### 2.13.1 Soil Boring Method Deviations

**Grouting**

The FSP required steel casings to be driven into the aquitards if encountered, and then filled with grout. The grout was required to set for 48 hours before being drilling continued. The method specified in the FSP would not attain the desired result of filling the annular space between the casing and the borehole wall with grout and bonding the outside of the casing and borehole wall to prevent vertical migration of constituents. An alternative method of filling the hole with grout during the removal of the drill string and then lowering the steel casing through the column of grout was proposed and implemented to improve the seal between the formation and the casing. This insured the annular space between the borehole and casing was filled with grout. For documentation, see the letter dated April 27, 1994 in Appendix C of Technical Memorandum 1 (ES, 1994c).

**Casing Advancement**

Another deviation from the FSP pertained to the method with which drill casing was advanced. The FSP required that the drill casing be advanced with the "drive and wash" method. The spin casing method was selected to replace the drive and wash method. This method improved the quality of the soil samples by minimizing the possibility of vertical downward movement of contaminants. For documentation, see the letter dated May 18, 1994 in Appendix C of Technical Memorandum 1 (ES, 1994c).

**Casing Size**

The ID of the outer steel casing was changed from six inches to five inches to improve downhole drilling efficiency and allow for a greater thickness of grout seal around the casing. For documentation, see Technical Memorandum 1, Appendix C, letter dated May 18, 1994.

### 2.13.2 Other Deviations

**Drill Cutting Containment**

The NYSDEC required plywood or heavy plastic be placed at the ground surface around each borehole. The plywood or plastic was decontaminated between each boring or well.

**Residual Soil Transport**

The original RI Work Plan allowed the soil produced during drilling operations to be backfilled in the hole. However, due to observed soil conditions, all of the soil cuttings were transported to the Harbor Point site and staged on plastic sheeting. Because the work areas were not secured from the public, NYSDEC required that soils from drilling operations be transported to the Harbor Point site within 24 hours.

**Test Pit Replacement**

All test pits planned during the subsurface investigation were replaced with shallow borings as provided for in the Work Plan. The test pits were replaced due to high water table conditions during the site investigation.

## 2.14 QA/QC PROGRAM

### 2.14.1 Duplicate and MS/MSD Samples

Duplicate and matrix spike/matrix spike duplicate (MS/MSD) samples were collected for laboratory analysis to evaluate the reproducibility of the sampling and laboratory methods. Duplicates and MS/MSD samples were submitted at a rate of one for every 20 regular samples submitted, or one per seven days, whichever was more frequent. False sample identification (ID) numbers were used to identify duplicates for the laboratory. The actual duplicate ID (i.e. the sample it was a duplicate of) was recorded in the field book. The MS/MSD samples were labeled as such for the laboratory. The duplicate and MS/MSD samples were analyzed for the same list of parameters as the corresponding field samples in the sample delivery group.

### 2.14.2 Wash Blanks

Wash blank samples were prepared by pouring laboratory-supplied analyte-free water over decontaminated sampling equipment. Wash blanks were collected to ensure that decontamination procedures were successful at removing all chemical constituents from the sampling equipment. Wash blanks were submitted at a rate of one sample per equipment type (split-spoon, stainless steel bowl, and polypropylene bailer). The wash blanks were analyzed for full TCL/TAL parameters.

### 2.14.3 Trip Blanks

Trip blanks consisting of a laboratory-supplied 40-milliliter (mL) aliquot of demonstrated analyte-free water accompanied the empty sample bottles from the laboratory to the site and the filled sample bottles from the site back to the laboratory. The purpose of the trip blank samples was to ensure that no VOC cross-contamination occurred during transport and sample handling. The trip blanks were analyzed for TCL VOCs only.

### 2.14.4 Potable Water Sample

A sample of Utica City potable (tap) water was submitted for analysis during the Mohawk Valley Oil (MVO) RI to determine the possible contributions of analytes from the potable water to any RI activities. Since the MVO and DSA RIs used the same potable water source, data from this sample were applied to the DSA RI as well.

### 2.14.5 Sample Custody and Custody Seals

Sample Chain-of-Custody (COCs) logs and custody seals were used for all sample shipments. These logs and custody seals were used to ensure that sample integrity was not compromised during shipment. Shipment particulars such as samples submitted, analyses requested and sampling responsibility were recorded on the COCs. The field team retained one copy of the COC while the laboratory received the remaining two copies for internal use.

## 2.15 LABORATORY ANALYSIS

TCL/TAL analyses were conducted using NYSDEC Analytical Services Protocol (ASP) dated September 1989 with December 1991 and September 1993 revisions. All analytical work was performed by a laboratory approved by the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) for all categories of solid and hazardous waste. Chemical and physical analyses not covered by ASP procedures were conducted using procedures as specified in the Quality Assurance Project Plan (QAPP). Sample custody, laboratory procedures and other QA/QC requirements were performed in accordance with the specifications in the QAPP.

## 2.16 DATA VALIDATION

All analytical results underwent full data validation using USEPA functional guidelines (USEPA, 1994), other USEPA guidance documents and the provisions of NYSDEC Analytical Services Protocol (ASP), September 1989, with December 1991 and September 1993 revisions.

Appendix A and B contain the full data validation reports for Phase I and II analytical data, respectively. All analytical results presented in Section 4 have been validated.

## 2.17 DATABASE MANAGEMENT

All data generated during the RI were stored and managed using *Paradox*™ database software. The database allowed efficient manipulation and presentation of data in such formats as *dBase*™, spreadsheet or ASCII for different end users during RI report preparation. Laboratory results were provided on diskettes and read directly into the database including field sample IDs, laboratory IDs, analytical results, and laboratory data qualifiers. Following data validation, the master database was updated to reflect any changes as a result of data validation. These changes included concentration changes where appropriate and removal, addition, and/or changes to data qualifiers. All data used in the RI report was provided by the updated master database to ensure the use of only current, validated analytical results.

The database was also used to store and retrieve water level data utilized to produce tables, hydrographs, and water level contour maps.

# TABLE 2.1

## NIAGARA MOHAWK POWER CORPORATION
Dredge Spoil Areas
Sample Tracking Report
Soil Boring Samples – Phase I

| SAMPLE ID | SAMPLE DELIVERY GROUP (SDG) | CHAIN OF CUSTODY | ANALYTICAL LABORATORY | DEPTH INTERVAL | DATE SAMPLED | TCL VOC | TCL SVOC | PAHs | PEST/ PCBS | TAL METALS | CN | TOC | GCFID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW104D | DS02SB04 | 0139 | NYTEST | 06–08' | 06/16/94 | | | | X | | | | X |
| MW105D | DS02SB04 | 0139 | NYTEST | 06–08' | 06/17/94 | X | X | | X | X | X | | |
| MW201J | DS02SB01 | 0128 | NYTEST | 18–20' | 06/13/94 | X | X | | X | X | X | | |
| MW204M | DS01SB03 | 0137 | NYTEST | 24–26' | 06/15/94 | | | X | | | | | |
| MW205M | DS02SB04 | 0138 | NYTEST | 24–26' | 06/21/94 | X | X | | X | X | X | | |
| MW301D | DS02SB06 | 0170 | NYTEST | 06–08' | 06/29/94 | | | | | | | | X |
| SB102D | DS01SB01 | 0112 | NYTEST | 06–08' | 06/06/94 | | | X | | | | | |
| SB103D | DS01SB01 | 0112 | NYTEST | 06–08' | 06/06/94 | | | X | | | | | |
| SB104F | DS01SB01 | 0112 | NYTEST | 10–12' | 06/07/94 | X | X | | X | X | X | | |
| SB105H | DS01SB01 | 0112 | NYTEST | 14–16' | 06/07/94 | | | X | | | | | |
| SB106F | DS01SB01 | 0112 | NYTEST | 10–12' | 06/07/94 | | | X | | | | | |
| SB107G | DS01SB01 | 0115 | NYTEST | 12–18' | 06/07/94 | | | X | | | | | |
| SB107GMS | DS01SB01 | 0115 | NYTEST | 12–18' | 06/07/94 | | | X | | | | | |
| SB107GMSD | DS01SB01 | 0115 | NYTEST | 12–14' | 06/07/94 | | | X | | | | | |
| SB108F | DS01SB01 | 0115 | NYTEST | 10–12' | 06/07/94 | X | X | | X | X | X | | |
| SB108I | DS01SB01 | 0115 | NYTEST | 16–18' | 06/07/94 | | | X | | | | | |
| SB109H | DS01SB01 | 0115 | NYTEST | 14–16' | 06/07/94 | | | X | | | | | |
| SB110H | DS01SB01 | 0115 | NYTEST | 14–16' | 06/08/94 | X | X | | X | X | X | | |
| SB111F | DS01SB01 | 0115 | NYTEST | 10–12' | 06/08/94 | | | X | | | | | |
| SB112E | DS01SB01 | 0115 | NYTEST | 08–10' | 06/08/94 | | | X | | | | | |
| SB112I | DS01SB01 | 0115 | NYTEST | 12–18' | 06/08/94 | X | X | | X | X | X | | |
| SB112I–DUP (SB1XXX) | DS01SB01 | 0115 | NYTEST | 12–18' | 06/08/94 | X | X | | X | X | X | | |
| SB112I–DUPMD (SB1XXXMSD) | DS01SB01 | 0115 | NYTEST | 12–18' | 06/08/94 | X | X | | X | X | X | | |
| SB112I–DUPMS (SB1XXXMS) | DS01SB01 | 0115 | NYTEST | 12–18' | 06/08/94 | X | X | | X | X | X | | |
| SB113I | DS01SB01 | 0115 | NYTEST | 12–18' | 06/08/94 | | | X | | | | | |
| SB114C | DS01SB02 | 0116 | NYTEST | 04–06' | 06/08/94 | | | X | | | | | |
| SB115D | DS01SB02 | 0116 | NYTEST | 06–08' | 06/09/94 | X | X | | X | X | X | | |
| SB115H | DS01SB02 | 0116 | NYTEST | 14–16' | 06/09/94 | | | X | | | | | |
| SB116G | DS01SB02 | 0116 | NYTEST | 12–14' | 06/09/94 | | | X | | | | | |
| SB118G | DS01SB02 | 0124 | NYTEST | 12–14' | 06/09/94 | X | X | | X | X | X | | |
| SB123H | DS01SB02 | 0124 | NYTEST | 14–16' | 06/10/94 | X | X | | X | X | X | | |
| SB124E | DS01SB02 | 0124 | NYTEST | 08–10' | 06/10/94 | | | X | | | | | |
| SB124EMS | DS01SB02 | ASSN | NYTEST | 08–10' | 06/10/94 | | | X | | | | | |
| SB124EMSD | DS01SB02 | ASSN | NYTEST | 08–10' | 06/10/94 | | | X | | | | | |
| SB125G | DS01SB02 | 0127 | NYTEST | 12–14' | 06/13/94 | X | X | | X | X | X | | |
| SB125G–DUP(SB125N) | DS01SB02 | 0127 | NYTEST | 12–14' | 06/13/94 | X | X | | X | X | X | | |
| SB126J | DS01SB03 | 0130 | NYTEST | 18–20' | 06/13/94 | | | X | | | | | |
| SB126J–DUP (SB126N) | DS01SB03 | 0130 | NYTEST | 18–20' | 06/13/94 | | | X | | | | | |
| SB127G | DS01SB03 | 0130 | NYTEST | 12–14' | 06/13/94 | | | X | | | | | |
| SB128G | DS01SB03 | 0130 | NYTEST | 12–14' | 06/13/94 | | | X | | | | | |
| SB129I | DS01SB02 | 0134 | NYTEST | 16–18' | 06/13/94 | X | X | | X | X | X | | |
| SB129IMS | DS01SB02 | 0134 | NYTEST | 16–18' | 06/13/94 | X | X | | X | X | X | | |
| SB129IMSD | DS01SB02 | 0134 | NYTEST | 16–18' | 06/13/94 | X | X | | X | X | X | | |

# TABLE 2.1 – CONT'D

NIAGARA MOHAWK POWER CORPORATION
Dredge Spoil Areas
Sample Tracking Report
Soil Boring Samples – Phase I

| SAMPLE ID | SAMPLE DELIVERY GROUP (SDG) | CHAIN OF CUSTODY | ANALYTICAL LABORATORY | DEPTH INTERVAL | DATE SAMPLED | TCL VOC | TCL SVOC | PAHs | PEST/ PCBS | TAL METALS | CN | TOC | GCFID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB130G | DS01SB02 | 0134 | NYTEST | 12–14' | 06/14/94 | | | | | | | | X |
| SB130K | DS01SB03 | 0137 | NYTEST | 20–22' | 06/16/94 | | | X | | | | | |
| SB131F | DS01SB03 | 0137 | NYTEST | 10–12' | 06/16/94 | | | X | | | | | |
| SB200G | DS02SB01 | 0113 | NYTEST | 12–14' | 06/08/94 | X | X | | X | X | X | | |
| SB203D | DS02SB01 | 0113 | NYTEST | 04–08' | 06/08/94 | X | X | | X | X | X | | |
| SB204E | DS02SB01 | 0121 | NYTEST | 08–10' | 06/08/94 | X | X | | X | X | X | | |
| SB205I | DS02SB01 | 0121 | NYTEST | 16–18' | 06/09/94 | X | X | | X | X | X | | |
| SB206H | DS02SB01 | 0121 | NYTEST | 14–16' | 06/09/94 | | | X | | | | | |
| SB207H | DS02SB01 | 0121 | NYTEST | 14–16' | 06/09/94 | | | X | | | | | |
| SB208C | DS02SB01 | 0125 | NYTEST | 04–06' | 06/10/94 | | | | | | | | X |
| SB208H | DS02SB01 | 0125 | NYTEST | 14–16' | 06/10/94 | | | X | | | | | |
| SB208HMS | DS02SB01 | 0125 | NYTEST | 14–16' | 06/10/94 | | | X | | | | | |
| SB208HMSD | DS02SB01 | 0125 | NYTEST | 14–16' | 06/10/94 | | | X | | | | | |
| SB210F | DS01SB03 | 0135 | NYTEST | 10–12' | 06/13/94 | | | X | | | | | |
| SB211K | DS02SB01 | 0133 | NYTEST | 20–22' | 06/14/94 | X | X | | X | X | X | | |
| SB211KMS | DS02SB01 | 0133 | NYTEST | 20–22' | 06/14/94 | X | X | | X | X | X | | |
| SB211KMSD | DS02SB01 | 0133 | NYTEST | 20–22' | 06/14/94 | X | X | | X | X | X | | |
| SB212K | DS02SB01 | 0136 | NYTEST | 20–22' | 06/15/94 | X | X | | X | X | X | | |
| SB214O | DS01SB03 | 0137 | NYTEST | 28–30' | 06/16/94 | | | X | | | | | |
| SB215F | DS01SB03 | 0143 | NYTEST | 10–12' | 06/20/94 | | | X | | | | | |
| SB215FMS | DS01SB03 | 0143 | NYTEST | 10–12' | 06/20/94 | | | X | | | | | |
| SB215FMSD | DS01SB03 | 0143 | NYTEST | 10–12' | 06/20/94 | | | X | | | | | |
| SB216I | DS02SB04 | 0142 | NYTEST | 16–18' | 06/20/94 | X | X | | X | X | X | | |
| SB217I | DS02SB05 | 0144 | NYTEST | 16–18' | 06/20/94 | | | X | | | | | |
| SB217I–DUP (SB217T) | DS01SB03 | 0143 | NYTEST | 16–18' | 06/20/94 | | | X | | | | | |
| SB217M | DS01SB03 | 0143 | NYTEST | 24–26' | 06/20/94 | | | X | | | | | |
| SB218L | DS02SB05 | 0145 | NYTEST | 22–24' | 06/21/94 | | | X | | | | | |
| SB218L–DUP (SB218T) | DS02SB05 | 0145 | NYTEST | 22–24' | 06/21/94 | | | X | | | | | |
| SB220K | DS02SB05 | 0145 | NYTEST | 20–22' | 06/22/94 | | | X | | | | | |
| SB222D | DS02SB05 | 0145 | NYTEST | 06–08' | 06/22/94 | | | X | | | | | |
| SB222DMS | DS02SB05 | 0145 | NYTEST | 06–08' | 06/22/94 | | | X | | | | | |
| SB222DMSD | DS02SB05 | 0145 | NYTEST | 06–08' | 06/22/94 | | | X | | | | | |
| SB223K | DS02SB05 | 0146 | NYTEST | 20–22' | 06/22/94 | | | X | | | | | |
| SB224H | DS02SB04 | 0147 | NYTEST | 14–16' | 06/22/94 | X | X | | X | X | X | | |
| SB225E | DS02SB04 | 0147 | NYTEST | 08–10' | 06/23/94 | X | X | | X | X | X | | |
| SB225E–DUP (SB225T) | DS02SB04 | 0147 | NYTEST | 08–10' | 06/23/94 | X | X | | X | X | X | | |
| SB225H | DS02SB04 | 0147 | NYTEST | 14–16' | 06/23/94 | X | X | | X | X | X | | |
| SB225HMS | DS02SB04 | 0147 | NYTEST | 14–16' | 06/23/94 | X | X | | X | X | X | | |
| SB225HMSD | DS02SB04 | 0147 | NYTEST | 14–16' | 06/23/94 | X | X | | X | X | X | | |
| SB301F | DS02SB05 | 0151 | NYTEST | 10–12' | 06/24/94 | | | X | | | | | |
| SB302E | DS02SB05 | 0151 | NYTEST | 08–10' | 06/24/94 | | | X | | | | | |
| SB302G | DS02SB05 | 0151 | NYTEST | 12–14' | 06/24/94 | | | X | | | | | |
| SB303E | DS02SB05 | 0151 | NYTEST | 08–10' | 06/24/94 | | | X | | | | | |
| SB304F | DS02SB05 | 0151 | NYTEST | 10–12' | 06/24/94 | | | X | | | | | |
| SB305G | DS02SB05 | 0151 | NYTEST | 12–14' | 06/24/94 | | | X | | | | | |
| SB306C | DS02SB05 | 0150 | NYTEST | 02–06' | 06/27/94 | | | X | | | | | |
| SB306I | DS02SB06 | 0154 | NYTEST | 16–18' | 06/27/94 | X | X | | X | X | X | | |
| SB307E | DS02SB06 | 0154 | NYTEST | 08–10' | 06/27/94 | X | X | | X | X | X | | |
| SB308I | DS02SB05 | 0155 | NYTEST | 16–18' | 06/27/94 | | | X | | | | | |
| SB308O | DS02SB05 | 0155 | NYTEST | 28–30' | 06/27/94 | | | X | | | | | |

# TABLE 2.1 – CONT'D

NIAGARA MOHAWK POWER CORPORATION
Dredge Spoil Areas
Sample Tracking Report
Soil Boring Samples – Phase I

| SAMPLE ID | SAMPLE DELIVERY GROUP (SDG) | CHAIN OF CUSTODY | ANALYTICAL LABORATORY | DEPTH INTERVAL | DATE SAMPLED | TCL VOC | TCL SVOC | PAHs | PEST/ PCBS | TAL METALS | CN | TOC | GCFID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB313E | DS02SB06 | 0097 | NYTEST | 08–10' | 06/28/94 | X | X |  | X | X | X |  |  |
| SB313E–DUP (SB313T) | DS02SB06 | 0097 | NYTEST | 08–10' | 06/29/94 | X | X |  | X | X | X |  |  |
| SB314C | DS02SB07 | 0166 | NYTEST | 04–06' | 06/28/94 |  |  | X |  |  |  |  |  |
| SB315D | DS02SB07 | 0166 | NYTEST | 06–08' | 06/28/94 |  |  | X |  |  |  |  |  |
| SB316B | DS02SB07 | 0166 | NYTEST | 02–04' | 06/29/94 |  |  | X |  |  |  |  |  |
| SB316B–DUP (SB316T) | DS02SB07 | 0166 | NYTEST | 02–04' | 06/29/94 |  |  | X |  |  |  |  |  |
| SB316E | DS02SB07 | 0166 | NYTEST | 08–10' | 06/29/94 |  |  | X |  |  |  |  |  |
| SB316EMS | DS02SB07 | 0166 | NYTEST | 08–10' | 06/29/94 |  |  | X |  |  |  |  |  |
| SB316EMSD | DS02SB07 | 0166 | NYTEST | 08–10' | 06/29/94 |  |  | X |  |  |  |  |  |
| SB317I | DS02SB06 | 0097 | NYTEST | 16–18' | 06/29/94 | X | X |  | X | X | X |  |  |
| SB317IMS | DS02SB06 | 0097 | NYTEST | 16–18' | 06/29/94 | X | X |  | X | X | X |  |  |
| SB317IMSD | DS02SB06 | 0097 | NYTEST | 16–18' | 06/29/94 | X | X |  | X | X | X |  |  |
| SB317O | DS02SB07 | 0166 | NYTEST | 28–30' | 06/29/94 |  |  | X |  |  |  |  |  |
| WB101X | DS01SB01 | 0115 | NYTEST |  | 06/08/94 | X | X |  | X | X | X |  |  |
| WB201X | DS01SB03 | 0143 | NYTEST |  | 06/20/94 | X | X |  | X | X | X |  |  |
| WB301X | DS02SB06 | 0097 | NYTEST |  | 06/29/94 | X | X |  | X | X | X |  |  |
| MSB | DS01SB01 |  | NYTEST |  |  | X | X |  | X | X | X |  |  |
| MSB | DS01SB02 |  | NYTEST |  |  | X | X |  | X | X | X |  |  |
| MSB | DS01SB03 |  | NYTEST |  |  |  |  | X |  |  |  |  |  |
| MSB | DS02SB01 |  | NYTEST |  |  |  |  | X |  |  |  |  |  |
| MSB | DS02SB04 |  | NYTEST |  |  | X | X |  | X | X | X |  |  |
| MSB | DS02SB05 |  | NYTEST |  |  |  |  | X |  |  |  |  |  |
| MSB | DS02SB06 |  | NYTEST |  |  | X | X |  | X | X | X |  |  |
| MSB | DS02SB07 |  | NYTEST |  |  |  |  | X |  |  |  |  |  |
| TOTAL ANALYSES |  |  |  |  |  | 47 | 47 | 66 | 48 | 47 | 47 | 0 | 4 |

# TABLE 2.1 – CONT'D

NIAGARA MOHAWK POWER CORPORATION
Dredge Spoil Areas
Sample Tracking Report
Surface Soil Samples – Phase I

| SAMPLE ID | SAMPLE DELIVERY GROUP (SDG) | CHAIN OF CUSTODY | ANALYTICAL LABORATORY | DEPTH INTERVAL | DATE SAMPLED | TCL VOC | TCL SVOC | PAHs | PEST/ PCBS | TAL METALS | CN | TOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SS101 | DS01SS01 | 0122 | NYTEST | 0-6" | 06/09/94 | X | X |  | X | X | X | X |
| SS102 | DS01SS01 | 0122 | NYTEST | 0-6" | 06/09/94 | X | X |  | X | X | X | X |
| SS103 | DS01SS01 | 0122 | NYTEST | 0-6" | 06/09/94 | X | X |  | X | X | X | X |
| SS104 | DS01SS01 | 0122 | NYTEST | 0-6" | 06/09/94 | X | X |  | X | X | X | X |
| SS105 | DS01SS01 | 0122 | NYTEST | 0-6" | 06/09/94 | X | X |  | X | X | X | X |
| SS105-DUP(SS115) | DS01SS01 | 0122 | NYTEST | 0-6" | 06/09/94 | X | X |  | X | X | X | X |
| SS106 | DS01SS01 | 0122 | NYTEST | 0-6" | 06/09/94 | X | X |  | X | X | X | X |
| SS107 | DS01SS01 | 0122 | NYTEST | 0-6" | 06/09/94 | X | X |  | X | X | X | X |
| SS108 | DS01SS01 | 0126 | NYTEST | 0-6" | 06/10/94 | X | X |  | X | X | X | X |
| SS108MS | DS01SS01 | 0126 | NYTEST | 0-6" | 06/10/94 | X | X |  | X | X | X | X |
| SS108MSD | DS01SS01 | 0126 | NYTEST | 0-6" | 06/10/94 | X | X |  | X | X | X | X |
| SS109 | DS01SS01 | 0126 | NYTEST | 0-6" | 06/10/94 | X | X |  | X | X | X | X |
| SS110 | DS01SS01 | 0126 | NYTEST | 0-6" | 06/10/94 | X | X |  | X | X | X | X |
| SS416A | MV01SS01 | 0096 | NYTEST |  | 05/31/95 | X | X |  | X | X | X | X |
| SS201 | DS02SS01 | 0129 | NYTEST | 0-6" | 06/13/94 | X | X |  | X | X | X | X |
| SS201-DUP(SB211) | DS02SS01 | 0140 | NYTEST | 0-6" | 06/16/94 | X | X |  | X | X | X | X |
| SS202 | DS02SS01 | 0129 | NYTEST | 0-6" | 06/13/94 | X | X |  | X | X | X | X |
| SS203 | DS02SS01 | 0129 | NYTEST | 0-6" | 06/13/94 | X | X |  | X | X | X | X |
| SS204 | DS02SS01 | 0129 | NYTEST | 0-6" | 06/13/94 | X | X |  | X | X | X | X |
| SS205 | DS02SS01 | 0129 | NYTEST | 0-6" | 06/13/94 | X | X |  | X | X | X | X |
| SS206 | DS02SS01 | 0132 | NYTEST | 0-6" | 06/14/94 | X | X |  | X | X | X | X |
| SS207 | DS02SS01 | 0132 | NYTEST | 0-6" | 06/14/94 | X | X |  | X | X | X | X |
| SS208 | DS02SS01 | 0132 | NYTEST | 0-6" | 06/14/94 | X | X |  | X | X | X | X |
| SS208MS | DS02SS01 | 0140 | NYTEST | 0-6" | 06/16/94 | X | X |  | X | X | X |  |
| SS208MSD | DS02SS01 | 0140 | NYTEST | 0-6" | 06/16/94 | X | X |  | X | X | X |  |
| SS209 | DS02SS01 | 0132 | NYTEST | 0-6" | 06/14/94 | X | X |  | X | X | X | X |
| SS210 | DS02SS01 | 0132 | NYTEST | 0-6" | 06/14/94 | X | X |  | X | X | X | X |
| SS413A | MV01SS01 | 0096 | NYTEST |  | 05/31/95 | X | X |  | X | X | X | X |
| SS301 | DS03SS01 | 0169 | NYTEST | 0-6" | 06/29/94 | X | X |  | X | X | X | X |
| SS301-DUP(SS311) | DS03SS01 | 0169 | NYTEST | 0-6" | 06/29/94 | X | X |  | X | X | X | X |
| SS301MS | DS03SS01 | 0169 | NYTEST | 0-6" | 06/29/94 | X | X |  | X | X | X | X |
| SS301MSD | DS03SS01 | 0169 | NYTEST | 0-6" | 06/29/94 | X | X |  | X | X | X | X |
| SS302 | DS03SS01 | 0169 | NYTEST | 0-6" | 06/29/94 | X | X |  | X | X | X | X |
| SS303 | DS03SS01 | 0169 | NYTEST | 0-6" | 06/29/94 | X | X |  | X | X | X | X |
| SS304 | DS03SS01 | 0169 | NYTEST | 0-6" | 06/29/94 | X | X |  | X | X | X | X |
| SS305 | DS03SS01 | 0169 | NYTEST | 0-6" | 06/30/94 | X | X |  | X | X | X | X |
| SS306 | DS03SS01 | 0169 | NYTEST | 0-6" | 06/30/94 | X | X |  | X | X | X | X |
| SS307 | DS03SS01 | 0169 | NYTEST | 0-6" | 06/30/94 | X | X |  | X | X | X | X |
| WB102 | DS01SS01 | 0126 | NYTEST |  | 06/10/94 | X | X |  | X | X | X |  |
| WB302 | DS03SS01 | 0169 | NYTEST |  | 06/30/94 | X | X |  | X | X | X |  |
| MSB | DS01SS01 |  | NYTEST |  |  | X | X |  | X | X | X | X |
| MSB | DS02SS01 |  | NYTEST |  |  | X | X |  | X | X | X | X |
| MSB | DS03SS01 |  | NYTEST |  |  | X | X |  | X | X | X | X |
| TOTAL ANALYSES |  |  |  |  |  | 43 | 43 | 0 | 43 | 43 | 43 | 39 |

# TABLE 2.1 – CONT'D

NIAGARA MOHAWK POWER CORPORATION
Dredge Spoil Areas
Sample Tracking Report
Sediment Core Samples – Phase I

| SAMPLE ID | SAMPLE DELIVERY GROUP (SDG) | CHAIN OF CUSTODY | ANALYTICAL LABORATORY | DEPTH INTERVAL | DATE SAMPLED | TCL VOC | TCL SVOC | PAHs | PEST/ PCBS | TAL METALS | CN | TOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SP301A | DS03SP01 | 0098 | NYTEST | 0–1' | 06/28/94 | | | X | | | | |
| SP302A | DS03SP01 | 0098 | NYTEST | 0–1' | 06/28/94 | | | X | | | | |
| SP303A | DS03SP01 | 0098 | NYTEST | 0–1' | 06/28/94 | | | X | | | | |
| SP304A | DS03SP01 | 0167 | NYTEST | 0–2' | 06/28/94 | X | X | | X | X | X | X |
| SP304AMS | DS03SP01 | 0167 | NYTEST | 0–2' | 06/28/94 | X | X | | X | X | X | |
| SP304AMSD | DS03SP01 | 0167 | NYTEST | 0–2' | 06/28/94 | X | X | | X | X | X | |
| SP304A–DUP (SP304T) | DS03SP01 | 0167 | NYTEST | 0–2' | 06/28/94 | X | X | | X | X | X | X |
| SP305A | DS03SP01 | 0098 | NYTEST | 0–1' | 06/28/94 | | | X | | | | |
| SP305A–DUP (SP325A) | DS03SP01 | 0098 | NYTEST | 0–1' | 06/28/94 | | | X | | | | |
| SP306A | DS03SP01 | 0098 | NYTEST | 0–1' | 06/28/94 | X | X | | X | X | X | X |
| SP307A | DS03SP01 | 0167 | NYTEST | 0–2' | 06/28/94 | X | X | | X | X | X | X |
| SP309A | DS03SP01 | 0152 | NYTEST | 0–2' | 06/27/94 | | | X | | | | |
| MSB | DS03SP01 | | NYTEST | | | X | X | | X | X | X | X |
| TOTAL ANALYSES | | | | | | 7 | 7 | 6 | 7 | 7 | 7 | 5 |

# TABLE 2.1 – CONT'D

NIAGARA MOHAWK POWER CORPORATION
Dredge Spoil Areas
Sample Tracking Report
Sediment Samples – Phase I

| SAMPLE ID | SAMPLE DELIVERY GROUP (SDG) | CHAIN OF CUSTODY | ANALYTICAL LABORATORY | DEPTH INTERVAL | DATE SAMPLED | TCL VOC | TCL SVOC | PAHs | PEST/ PCBS | TAL METALS | CN | TOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SD101 | DS01SD01 | 0220 | NYTEST | | 07/25/94 | X | X | | X | X | X | X |
| SD102 | DS01SD01 | 0220 | NYTEST | | 07/25/94 | X | X | | X | X | X | X |
| SD201 | DS01SD01 | 0220 | NYTEST | | 07/25/94 | X | X | | X | X | X | X |
| SD201MS | DS01SD01 | 0220 | NYTEST | | 07/25/94 | X | X | | X | X | X | X |
| SD201MSD | DS01SD01 | 0220 | NYTEST | | 07/25/94 | X | X | | X | X | X | X |
| SD202 | DS01SD01 | 0221 | NYTEST | | 07/26/94 | X | X | | X | X | X | X |
| SD202–DUP (SD212) | DS01SD01 | 0221 | NYTEST | | 07/26/94 | X | X | | X | X | X | X |
| SD203 | DS01SD01 | 0221 | NYTEST | | 07/26/94 | X | X | | X | X | X | X |
| SD204 | DS01SD01 | 0221 | NYTEST | | 07/26/94 | X | X | | X | X | X | X |
| SD205 | DS01SD01 | 0221 | NYTEST | | 07/26/94 | X | X | | X | X | X | X |
| SD301 | DS01SD01 | 0221 | NYTEST | | 07/26/94 | X | X | | X | X | X | X |
| SD302 | DS01SD01 | 0221 | NYTEST | | 07/26/94 | X | X | | X | X | X | X |
| SD303 | DS01SD01 | 0221 | NYTEST | | 07/26/94 | X | X | | X | X | X | X |
| SD304 | DS01SD01 | 0221 | NYTEST | | 07/26/94 | X | X | | X | X | X | X |
| SD305 | DS01SD01 | 0221 | NYTEST | | 07/26/94 | X | X | | X | X | X | X |
| MSB | DS01SD01 | | NYTEST | | | X | X | | X | X | X | X |
| TOTAL ANALYSES | | | | | | 16 | 16 | 0 | 16 | 16 | 16 | 16 |

# TABLE 2.1 – CONT'D

NIAGARA MOHAWK POWER CORPORATION
Dredge Spoil Areas
Sample Tracking Report
Surface Water Samples – Phase I

| SAMPLE ID | SAMPLE DELIVERY GROUP (SDG) | CHAIN OF CUSTODY | ANALYTICAL LABORATORY | DEPTH INTERVAL | DATE SAMPLED | TCL VOC | TCL SVOC | PAHs | PEST/ PCBS | TAL METALS | CN |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SW101 | DS01SW01 | 0243 | NYTEST | | 07/25/94 | X | X | | X | X | X |
| SW102 | DS01SW01 | 0243 | NYTEST | | 07/25/94 | X | X | | X | X | X |
| SW201 | DS01SW01 | 0243 | NYTEST | | 07/25/94 | X | X | | X | X | X |
| SW201MS | DS01SW01 | 0243 | NYTEST | | 07/25/94 | X | X | | X | X | X |
| SW201MSD | DS01SW01 | 0243 | NYTEST | | 07/25/94 | X | X | | X | X | X |
| SW202 | DS01SW01 | 0222 | NYTEST | | 07/26/94 | X | X | | X | X | X |
| SW202–DUP (SW212) | DS01SW01 | 0222 | NYTEST | | 07/26/94 | X | X | | X | X | X |
| SW203 | DS01SW01 | 0222 | NYTEST | | 07/26/94 | X | X | | X | X | X |
| SW204 | DS01SW01 | 0222 | NYTEST | | 07/26/94 | X | X | | X | X | X |
| SW205 | DS01SW01 | 0222 | NYTEST | | 07/26/94 | X | X | | X | X | X |
| SW301 | DS01SW01 | 0222 | NYTEST | | 07/26/94 | X | X | | X | X | X |
| SW302 | DS01SW01 | 0222 | NYTEST | | 07/26/94 | X | X | | X | X | X |
| SW303 | DS01SW01 | 0222 | NYTEST | | 07/26/94 | X | X | | X | X | X |
| SW304 | DS01SW01 | 0222 | NYTEST | | 07/26/94 | X | X | | X | X | X |
| SW305 | DS01SW01 | 0222 | NYTEST | | 07/26/94 | X | X | | X | X | X |
| TB050 | DS01SW01 | 0243 | NYTEST | | 07/25/94 | X | | | | | |
| TB051 | DS01SW01 | 0222 | NYTEST | | 07/26/94 | X | | | | | |
| WB105 | DS01SW01 | 0222 | NYTEST | | 07/26/94 | X | X | | X | X | X |
| MSB | DS01SW01 | | NYTEST | | | X | X | | X | X | X |
| TOTAL ANALYSES | | | | | | 19 | 17 | 0 | 17 | 17 | 17 |

# TABLE 2.1 – CONT'D

NIAGARA MOHAWK POWER CORPORATION
Dredge Spoil Areas
Sample Tracking Report
Groundwater Samples – Phase I

| SAMPLE ID | SAMPLE DELIVERY GROUP (SDG) | CHAIN OF CUSTODY | ANALYTICAL LABORATORY | DEPTH INTERVAL | DATE SAMPLED | TCL VOC | TCL SVOC | PAHs | PEST/ PCBS | TAL METALS | CN |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MW101 | DSGW01 | 0100 | NYTEST | | 08/12/94 | X | X | | X | X | X |
| MW102 | DSGW01 | 0100 | NYTEST | | 08/12/94 | X | X | | X | X | X |
| MW103 | DSGW01 | 0100 | NYTEST | | 08/12/94 | X | X | | X | X | X |
| MW103-DUP (MW100) | DSGW01 | 0100 | NYTEST | | 08/12/94 | X | X | | X | X | X |
| MW103MS | DSGW01 | 0100 | NYTEST | | 08/12/94 | X | X | | X | X | X |
| MW103MSD | DSGW01 | 0100 | NYTEST | | 08/12/94 | X | X | | X | X | X |
| MW104 | DSGW01 | 0100 | NYTEST | | 08/12/94 | X | X | | X | X | X |
| MW105 | DSGW01 | 0100 | NYTEST | | 08/12/94 | X | X | | X | X | X |
| MW106 | DSGW01 | 0100 | NYTEST | | 08/12/94 | X | X | | X | X | X |
| MW200 | DSGW01 | 0184 | NYTEST | | 08/11/94 | X | X | | X | X | X |
| MW201 | DSGW01 | 0184 | NYTEST | | 08/11/94 | X | X | | X | X | X |
| MW202 | DSGW01 | 0184 | NYTEST | | 08/11/94 | X | X | | X | X | X |
| MW203 | DSGW01 | 0184 | NYTEST | | 08/11/94 | X | X | | X | X | X |
| MW204 | NYGW01 | 0103A | NYTEST | | 08/17/94 | X | X | | | | |
| MW205 | DSGW01 | 0184 | NYTEST | | 08/11/94 | X | X | | X | X | X |
| MW301 | DSGW01 | 0184 | NYTEST | | 08/11/94 | X | X | | X | X | X |
| MW302 | DSGW01 | 0184 | NYTEST | | 08/11/94 | X | X | | X | X | X |
| MW303 | DSGW01 | 0184 | NYTEST | | 08/11/94 | X | X | | X | X | X |
| MW304 | DSGW01 | 0184 | NYTEST | | 08/11/94 | X | X | | X | X | X |
| TRIP | DSGW01 | 0184 | NYTEST | | 08/11/94 | X | | | | | |
| TRIP1 | DSGW01 | 0100 | NYTEST | | 08/12/94 | X | | | | | |
| WASH2 | DSGW01 | 0100 | NYTEST | | 08/12/94 | X | X | | X | X | X |
| MSB | DSGW01 | | NYTEST | | | X | X | | X | X | X |
| TOTAL ANALYSES: | | | | | | 23 | 21 | 0 | 20 | 20 | 20 |

# TABLE 2.1 – CONT'D

NIAGARA MOHAWK POWER CORPORATION
Dredge Spoil Areas
Sample Tracking Report
Soil Boring Samples – Phase II

| SAMPLE ID | SAMPLE DELIVERY GROUP (SDG) | CHAIN OF CUSTODY | ANALYTICAL LABORATORY | DEPTH INTERVAL | DATE SAMPLED | TCL VOC | TCL SVOC | PAHs | PEST/ PCBS | TAL METALS | CN | TOC | GCFID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW107I | DSASB21 | 0574 | NYTEST | 06–15 | 03/01/95 | X | X |  | X | X | X | X |  |
| MW107I–DUP(MW161A) | DSASB21 | 0574 | NYTEST | 06–15 | 03/01/95 | X | X |  | X | X | X | X |  |
| MW107IMS | DSASB21 | 0574 | NYTEST | 06–15 | 03/01/95 | X | X |  | X | X | X | X |  |
| MW107IMSD | DSASB21 | 0574 | NYTEST | 06–15 | 03/01/95 | X | X |  | X | X | X | X |  |
| MW108E | DSASB21 | 0575 | NYTEST | 06–10 | 03/01/95 | X | X |  |  |  |  |  |  |
| MW109E | DSASB21 | 0575 | NYTEST | 08–10 | 03/02/95 | X | X |  |  |  |  |  |  |
| MW110B | DSASB21 | 0104 | NYTEST | 00–04 | 03/02/95 | X | X |  |  |  |  |  |  |
| MW111H | DSASB21 | 0104 | NYTEST | 14–16 | 03/02/95 | X | X |  |  |  |  |  |  |
| MW112D | DSASB21 | 0447 | NYTEST | 06–08 | 03/07/95 | X | X |  |  |  |  |  |  |
| MW206D | DSASB22 | ES2 | NYTEST | 04–08 | 03/09/95 | X | X |  |  |  |  |  |  |
| SB132G | DSASB21 | 0574 | NYTEST | 12–14 | 02/28/95 | X | X |  |  |  |  |  |  |
| SB132P | DSASB21 | 0446 | NYTEST | 30–34 | 03/06/95 | X | X |  | X | X | X | X |  |
| SB133E | DSASB21 | 0104 | NYTEST | 08–10 | 03/03/95 | X | X |  | X | X | X | X |  |
| SB134C | DSASB21 | 0104 | NYTEST | 04–06 | 03/03/95 | X | X |  |  |  |  |  |  |
| SB135B | DSASB21 | 0104 | NYTEST | 02–04 | 03/03/95 | X | X |  |  |  |  |  |  |
| SB136B | DSASB21 | 0447 | NYTEST | 02–04 | 03/06/95 | X | X |  | X | X | X | X |  |
| SB137D | DSASB21 | 0447 | NYTEST | 06–08 | 03/07/95 | X | X |  |  |  |  |  |  |
| SB138B | DSASB21 | 0447 | NYTEST | 02–04 | 03/07/95 | X | X |  | X | X | X | X |  |
| SB139C | DSASB22 | 0576 | NYTEST | 02–06 | 03/07/95 | X | X |  |  |  |  |  |  |
| SB141F | DSASB22 | 0576 | NYTEST | 10–12 | 03/08/95 | X | X |  | X | X | X | X |  |
| SB142D | DSASB22 | 0576 | NYTEST | 06–08 | 03/08/95 | X | X |  |  |  |  |  |  |
| SB143D | DSASB22 | ES1 | NYTEST | 06–08 | 03/08/95 | X | X |  | X | X | X | X |  |
| SB144E | DSASB22 | ES1 | NYTEST | 06–10 | 03/08/95 |  |  |  |  |  |  |  | X |
| SB145C | DSASB22 | ES1 | NYTEST | 02–06 | 03/08/95 |  |  |  |  |  |  |  | X |
| SB226E | DSASB22 | ES2 | NYTEST | 06–10 | 03/09/95 | X | X |  |  |  |  |  |  |
| SB227E | DSASB22 | ES2 | NYTEST | 06–10 | 03/09/95 | X | X |  |  |  |  |  |  |
| SB228E | DSASB22 | 0539 | NYTEST | 08–10 | 03/09/95 | X | X |  |  |  |  |  |  |
| SB229E | DSASB22 | 0539 | NYTEST | 08–10 | 03/10/95 | X | X |  |  |  |  |  |  |
| SB230D | DSASB22 | 0539 | NYTEST | 06–08 | 03/10/95 | X | X |  |  |  |  |  |  |
| SB231I | DSASB22 | 0540 | NYTEST | 16–18 | 03/13/95 | X | X |  |  |  |  |  |  |
| SB231Y | DSASB22 | 0540 | NYTEST | 40–50 | 03/13/95 | X | X |  | X | X | X | X |  |
| SB231Y–DUP(SB261I) | DSASB22 | 0540 | NYTEST | 40–50 | 03/13/95 | X | X |  | X | X | X | X |  |
| SB231YMS | DSASB22 | 0540 | NYTEST | 40–50 | 03/13/95 | X | X |  | X | X | X | X |  |
| SB231YMSD | DSASB22 | 0540 | NYTEST | 40–50 | 03/13/95 | X | X |  | X | X | X | X |  |
| SB232C | DSASB22 | 0541 | NYTEST | 04–06 | 03/14/95 | X | X |  |  |  |  |  |  |
| SB233C | DSASB22 | 0541 | NYTEST | 02–06 | 03/14/95 |  |  |  |  |  |  |  | X |
| SB233G | DSASB22 | 0541 | NYTEST | 10–14 | 03/14/95 |  |  |  |  |  |  |  | X |
| SB234F | DSASB23 | 0542 | NYTEST | 10–12 | 03/14/95 |  |  |  |  |  |  |  | X |
| SB234L | DSASB23 | 0542 | NYTEST | 22–24 | 03/14/95 |  |  |  |  |  |  |  | X |
| WB161 | DSASB21 | 0446 | NYTEST |  | 03/06/95 | X | X |  | X | X |  |  |  |
| WB162 | DSASB21 | 0446 | NYTEST |  | 03/06/95 | X | X |  | X | X |  |  |  |
| WB261 | DSASB22 | 0541 | NYTEST |  | 03/14/95 | X | X |  | X | X | X |  |  |
| MSB | DSASB21 |  | NYTEST |  |  | X | X |  | X | X | X | X |  |
| MSB | DSASB22 |  | NYTEST |  |  | X | X |  | X | X | X | X |  |
| MSB | DSASB23 |  | NYTEST |  |  | X | X |  | X | X | X | X |  |
| TOTAL ANALYSES: |  |  |  |  |  | 39 | 39 | 0 | 20 | 20 | 18 | 17 | 6 |

# TABLE 2.1 – CONT'D

NIAGARA MOHAWK POWER CORPORATION
Dredge Spoil Areas
Sample Tracking Report
Surface Soil Samples – Phase II

| SAMPLE ID | SAMPLE DELIVERY GROUP (SDG) | CHAIN OF CUSTODY | ANALYTICAL LABORATORY | DEPTH INTERVAL | DATE SAMPLED | TCL VOC | TCL SVOC | PAHs | PEST/ PCBS | TAL METALS | CN | TOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SS111A | DSASB21 | 0574 | NYTEST | 6-12" | 03/01/95 | X | X |  | X | X | X | X |
| SS112A | DSASB23 | 0542 | NYTEST | 0-6" | 03/15/95 | X | X |  | X | X | X | X |
| SS113A | DSASB23 | 0542 | NYTEST | 0-6" | 03/15/95 | X | X |  | X | X | X | X |
| SS113A-DUP(SS161A) | DSASB23 | 0542 | NYTEST | 0-6" | 03/15/95 | X | X |  | X | X | X | X |
| SS113AMS | DSASB23 | 0542 | NYTEST | 0-6" | 03/15/95 | X | X |  | X | X | X | X |
| SS113AMSD | DSASB23 | 0542 | NYTEST | 0-6" | 03/15/95 | X | X |  | X | X | X | X |
| SS114A | DSASB23 | 0542 | NYTEST | 0-6" | 03/15/95 | X | X |  | X | X | X | X |
| SS115A | DSASB23 | 0542 | NYTEST | 0-6" | 03/15/95 | X | X |  | X | X | X | X |
| SS116A | DSASB23 | 0542 | NYTEST | 0-6" | 03/15/95 | X | X |  | X | X | X | X |
| SS117A | DSASB23 | 0542 | NYTEST | 0-6" | 03/15/95 | X | X |  | X | X | X | X |
| SB140A | DSASB22 | 0576 | NYTEST | 00-02 | 03/07/95 | X | X |  | X | X | X | X |
| SS321A | DSASB23 | 0542 | NYTEST | 0-6" | 03/15/95 | X | X |  | X | X | X | X |
| TOTAL ANALYSES |  |  |  |  |  | 12 | 12 | 0 | 12 | 12 | 12 | 12 |

# TABLE 2.1 – CONT'D

NIAGARA MOHAWK POWER CORPORATION
Dredge Spoil Areas
Sample Tracking Report
Sediment Core Samples – Phase II

| SAMPLE ID | SAMPLE DELIVERY GROUP (SDG) | CHAIN OF CUSTODY | ANALYTICAL LABORATORY | DEPTH INTERVAL | DATE SAMPLED | TCL VOC | TCL SVOC | PAHs | PEST/ PCBS | TAL METALS | CN | TOC | GCFID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SP310A | DSASP21 | 0448 | NYTEST | 0–2' | 03/07/95 |  | X |  |  |  |  |  | X |
| SP311A | DSASP21 | 0448 | NYTEST | 0–2' | 03/07/95 |  | X |  |  |  |  |  |  |
| SP311AMS | DSASP21 | 0448 | NYTEST | 0–2' | 03/07/95 |  | X |  |  |  |  |  |  |
| SP311AMSD | DSASP21 | 0448 | NYTEST | 0–2' | 03/07/95 |  | X |  |  |  |  |  |  |
| SP313A | DSASP21 | 0448 | NYTEST | 0–2' | 03/07/95 |  | X |  |  |  |  |  |  |
| SP313A–DUP(SP321A) | DSASP21 | 0448 | NYTEST | 0–2' | 03/07/95 |  | X |  |  |  |  |  |  |
| SP317A | DSASP21 | 0448 | NYTEST | 0–2' | 03/07/95 |  | X |  |  |  |  |  |  |
| SP319A | DSASP21 | 0448 | NYTEST | 0–2' | 03/07/95 |  | X |  |  |  |  |  |  |
| MSB | DSASP21 |  | NYTEST |  |  |  | X |  |  |  |  |  |  |
| TOTAL ANALYSES |  |  |  |  |  | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 1 |

# TABLE 2.1 – CONT'D

NIAGARA MOHAWK POWER CORPORATION
Dredge Spoil Areas
Sample Tracking Report
Groundwater Samples – Phase II

| SAMPLE ID | SAMPLE DELIVERY GROUP (SDG) | CHAIN OF CUSTODY | ANALYTICAL LABORATORY | DEPTH INTERVAL | DATE SAMPLED | TCL VOC | TCL SVOC | PAHs | PEST/ PCBS | TAL METALS | CN |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MW101S | HPGW8 | 0544 | NYTEST | | 03/22/95 | X | X | | | X | X |
| MW102S | HPGW8 | 0544 | NYTEST | | 03/22/95 | X | X | | | X | X |
| MW103S | HPGW8 | 0544 | NYTEST | | 03/22/95 | X | X | | | X | X |
| MW104S | HPGW8 | 0584 | NYTEST | | 03/21/95 | X | X | | | X | X |
| MW105S | HPGW8 | 0584 | NYTEST | | 03/21/95 | X | X | | | X | X |
| MW106S | HPGW8 | 0584 | NYTEST | | 03/21/95 | X | X | | | X | X |
| MW107S | HPGW8 | 0544 | NYTEST | | 03/22/95 | X | X | | X | X | X |
| MW107S-DUP(MW161S) | HPGW8 | 0544 | NYTEST | | 03/22/95 | X | X | | X | X | X |
| MW107SMS | HPGW8 | 0544 | NYTEST | | 03/22/95 | X | X | | X | X | X |
| MW107SMSD | HPGW8 | 0544 | NYTEST | | 03/22/95 | X | X | | X | X | X |
| MW108S | HPGW8 | 0584 | NYTEST | | 03/21/95 | X | X | | X | X | X |
| MW109S | HPGW8 | 0584 | NYTEST | | 03/21/95 | X | X | | X | X | X |
| MW110S | HPGW8 | 0584 | NYTEST | | 03/21/95 | X | X | | X | X | X |
| MW111S | HPGW8 | 0584 | NYTEST | | 03/21/95 | X | X | | X | X | X |
| MW112S | HPGW8 | 0584 | NYTEST | | 03/21/95 | X | X | | X | X | X |
| MW200S | HPGW8 | 0544 | NYTEST | | 03/22/95 | X | X | | | X | X |
| MW201S | HPGW8 | 0544 | NYTEST | | 03/22/95 | X | X | | | X | X |
| MW202S | HPGW8 | 0544 | NYTEST | | 03/22/95 | X | X | | | X | X |
| MW203S | HPGW8 | 0544 | NYTEST | | 03/22/95 | X | X | | | X | X |
| MW204S | HPGW8 | 0555 | NYTEST | | 03/23/95 | X | X | | | X | X |
| MW205S | HPGW8 | 0555 | NYTEST | | 03/23/95 | X | X | | | X | X |
| MW206S | HPGW8 | 0544 | NYTEST | | 03/22/95 | X | X | | X | X | X |
| MW301S | HPGW9 | 0556 | NYTEST | | 03/23/95 | X | X | | | X | X |
| MW302S | HPGW9 | 0556 | NYTEST | | 03/23/95 | X | X | | | X | X |
| MW303S | HPGW9 | 0556 | NYTEST | | 03/23/95 | X | X | | | X | X |
| MW304S | HPGW9 | 0556 | NYTEST | | 03/23/95 | X | X | | | X | X |
| MW304S-DUP (MW361S) | HPGW9 | 0556 | NYTEST | | 03/23/95 | X | X | | | X | X |
| MW304SMS | HPGW9 | 0556 | NYTEST | | 03/23/95 | X | X | | | X | X |
| MW304SMSD | HPGW9 | 0556 | NYTEST | | 03/23/95 | X | X | | | X | X |
| TB161 | HPGW8 | 0584 | NYTEST | | 03/21/95 | X | | | | | |
| TB261 | HPGW8 | 0544 | NYTEST | | 03/22/95 | X | | | | | |
| TB361 | HPGW8 | 0555 | NYTEST | | 03/23/95 | X | | | | | |
| WB163 | HPGW8 | 0544 | NYTEST | | 03/22/95 | X | X | | X | X | X |
| MSB | HPGW9 | | NYTEST | | | X | X | | | X | X |
| MSB | HPGW8 | | NYTEST | | | X | X | | X | X | X |
| TOTAL ANALYSES | | | | | | 35 | 32 | 0 | 12 | 32 | 32 |

# TABLE 2.2
# NIAGARA MOHAWK POWER CORPORATION
# DSA REMEDIAL INVESTIGATION
# PAH FIELD SCREENING RESULTS VS. LABORATORY RESULTS

| SAMPLE # | SAMPLE DATE | SAMPLE INTERVAL (FEET) | FIELD SCREENING CONCLUSION | SENT TO LAB | LABORATORY ANALYSIS (mg/kg) | CORRELATION Yes\No |
|---|---|---|---|---|---|---|
| SB102B | 06/06/94 | 2-4 | > = 10 ppm | | NA | |
| SB102D | 06/06/94 | 6-8 | > = 10 ppm | x | 1.2 | N |
| SB102F | 06/06/94 | 10-12 | > = 10 ppm | | NA | |
| SB103B | 06/06/94 | 2-4 | 1 ppm <x<10 ppm | | NA | |
| SB103D | 06/06/94 | 6-8 | > = 10 ppm | x | 139.13 | Y |
| SB103G | 06/06/94 | 12-14 | > = 10 ppm | | NA | |
| SB104B | 06/07/94 | 2-4 | 1 ppm <x<10 ppm | | NA | |
| SB104D | 06/07/94 | 6-8 | > = 10 ppm | | NA | |
| SB104F | 06/07/94 | 10-12 | > = 10 ppm | x | 722.1 | Y |
| SB105C | 06/07/94 | 4-6 | > = 10 ppm | | NA | |
| SB105E | 06/07/94 | 8-10 | <10 ppm | | NA | |
| SB105H | 06/07/94 | 14-16 | <10 ppm | x | ND | Y |
| SB106B | 06/07/94 | 2-4 | 1 ppm <x<10 ppm | | NA | |
| SB106D | 06/07/94 | 6-8 | 1 ppm <x<10 ppm | | NA | |
| SB106F | 06/07/94 | 10-12 | <10 ppm | x | 4.07 | Y |
| SB107B | 06/07/94 | 2-4 | 1 ppm <x<10 ppm | | NA | |
| S107D | 06/07/94 | 6-8 | <10 ppm | | NA | |
| SB107G | 06/07/94 | 12-14 | > = 10 ppm | x | 21.78 | Y |
| SB108A | 06/07/94 | 0-2 | 1 ppm <x<10 ppm | | NA | |
| SB108E | 06/07/94 | 8-10 | > = 10 ppm | | NA | |
| SB108F | 06/07/94 | 10-12 | 1 ppm <x<10 ppm | x | 2.264 | Y |
| SB108I | 06/07/94 | 16-18 | <10 ppm | x | 0.519 | Y |
| SB109D | 06/07/94 | 6-8 | > = 10 ppm | | NA | |
| SB109G | 06/07/94 | 12-14 | > = 10 ppm | | NA | |
| SB109H | 06/07/94 | 14-16 | > = 10 ppm | x | ND | N |
| SB110C | 06/08/94 | 4-6 | > = 10 ppm | | NA | |
| SB110E | 06/08/94 | 8-10 | > = 10 ppm | | NA | |
| SB110H | 06/08/94 | 14-16 | > = 10 ppm | x | 36.11 | Y |
| SB111F | 06/08/94 | 10-12 | > = 10 ppm | x | 687 | Y |
| SB112C | 06/08/94 | 4-6 | > = 10 ppm | | NA | |
| SB112E | 06/08/94 | 8-10 | 1 ppm <x<10 ppm | x | 1.58 | Y |
| SB112I | 06/08/94 | 16-18 | > = 10 ppm | x | 269.28 | Y |

ND – Not Detected
NA – Not Analyzed
** – Erroneous Result
>= – Greater than or equal to
ppm and mg/kg are equivalent units

## TABLE 2.2 continued
## NIAGARA MOHAWK POWER CORPORATION
## DSA REMEDIAL INVESTIGATION
## PAH FIELD SCREENING RESULTS VS. LABORATORY RESULTS

| SAMPLE # | SAMPLE DATE | SAMPLE INTERVAL (FEET) | FIELD SCREENING CONCLUSION | SENT TO LAB | LABORATORY ANALYSIS (mg/kg) | CORRELATION Yes\No |
|---|---|---|---|---|---|---|
| SB113C | 06/08/94 | 4-6 | > = 10 ppm | | NA | |
| SB113F | 06/08/94 | 10-12 | > = 10 ppm | | NA | |
| SB113I | 06/08/94 | 16-18 | <10 ppm | x | ND | Y |
| SB114C | 06/08/94 | 4-6 | > = 10 ppm | x | 1535.7 | Y |
| SB114F | 06/08/94 | 10-12 | > = 10 ppm | | NA | |
| SB114H | 06/08/94 | 14-16 | > = 10 ppm | | NA | |
| SB124C | 06/10/94 | 4-6 | 1 ppm <x<10 ppm | | NA | |
| SB124E | 06/10/94 | 8-10 | 1 ppm <x<10 ppm | x | 19.24 | N |
| SB124G | 06/10/94 | 12-14 | 1 ppm <x<10 ppm | | NA | |
| SB125G | 06/13/94 | 12-14 | > =10 ppm | x | 56.2 | Y |
| SB126C | 06/13/94 | 4-6 | 1 ppm <x<10 ppm | | NA | |
| SB126F | 06/13/94 | 10-12 | <10 ppm | | NA | |
| SB126J | 06/13/94 | 18-20 | <10 ppm ** | x | ND | Y |
| SB127C | 06/13/94 | 4-6 | 1 ppm <x<10 ppm | | NA | |
| SB127E | 06/13/94 | 8-10 | > =10 ppm | | NA | |
| SB127G | 06/13/94 | 12-14 | <10 ppm | x | ND | Y |
| SB128C | 06/13/94 | 4-6 | 1 ppm <x<10 ppm | | NA | |
| SB128E | 06/13/94 | 8-10 | > =10 ppm | | NA | |
| SB128G | 06/13/94 | 12-14 | 1 ppm <x<10 ppm | x | 6.452 | Y |
| SB130K | 06/16/94 | 20-22 | <10 ppm | x | 0.335 | Y |
| SB130M | 06/16/94 | 24-26 | <10 ppm | | NA | |
| SB131D | 06/16/94 | 6-8 | 1 ppm <x<10 ppm | | NA | |
| SB131F | 06/16/94 | 10-12 | 1 ppm <x<10 ppm | x | ND | N |
| SB205I | 06/09/94 | 16-18 | > = 10 ppm | x | 454.8 | Y |
| SB206B | 06/09/94 | 2-4 | > = 10 ppm | | NA | |
| SB206D | 06/09/94 | 6-8 | > = 10 ppm | | NA | |
| SB206H | 06/09/94 | 14-16 | > = 10 ppm | | 3.929 | N |
| SB207B | 06/09/94 | 2-4 | > = 10 ppm | | NA | |
| SB207D | 06/09/94 | 4-8 | > = 10 ppm | | NA | |
| SB207H | 06/09/94 | 14-16 | 1 ppm <x<10 ppm | x | 1.535 | Y |
| SB208B | 06/09/94 | 2-4 | > = 10 ppm | | NA | |
| SB208D | 06/10/94 | 4-8 | > = 10 ppm | | NA | |
| SB208H | 06/10/94 | 14-16 | <10 ppm | x | ND | Y |

ND - Not Detected
NA - Not Analyzed
** - Erroneous Result
> = - Greater than or equal to
ppm and mg/kg are equivalent units

## TABLE 2.2 continued
## NIAGARA MOHAWK POWER CORPORATION
## DSA REMEDIAL INVESTIGATION
## PAH FIELD SCREENING RESULTS VS. LABORATORY RESULTS

| SAMPLE # | SAMPLE DATE | SAMPLE INTERVAL (FEET) | FIELD SCREENING CONCLUSION | SENT TO LAB | LABORATORY ANALYSIS (mg/kg) | CORRELATION Yes\No |
|---|---|---|---|---|---|---|
| SB210A | 06/13/94 | 0-2 | 1 ppm <x<10 ppm | | NA | |
| SB210D | 06/13/94 | 6-8 | > = 10 ppm | | NA | |
| SB210F | 06/13/94 | 10-12 | > = 10 ppm | x | 95.9 | Y |
| SB211B | 06/14/94 | 2-4 | > = 10 ppm | | NA | |
| SB211F | 06/14/94 | 10-12 | > = 10 ppm | | NA | |
| SB211K | 06/14/94 | 20-22 | > = 10 ppm | x | 294.25 | Y |
| SB212B | 06/14/94 | 2-4 | > = 10 ppm | | NA | |
| SB212G | 06/14/94 | 12-14 | > = 10 ppm | | NA | |
| SB212K | 06/14/94 | 20-22 | > = 10 ppm | x | 126.28 | Y |
| SB204B | 06/16/94 | 2-4 | > = 10 ppm | | NA | |
| SB204G | 06/16/94 | 12-14 | > = 10 ppm | | NA | |
| SB204M | 06/16/94 | 24-26 | > = 10 ppm | x | 1617.5 | Y |
| SB214B | 06/16/94 | 2-4 | > = 10 ppm | | NA | |
| SB214H | 06/16/94 | 14-16 | > = 10 ppm | | NA | |
| SB214O | 06/16/94 | 28-30 | > = 10 ppm | x | 117.99 | Y |
| SB215B | 06/20/94 | 2-4 | <10 ppm | | NA | |
| SB215F | 06/20/94 | 10-12 | 1 ppm <x< 10 ppm | x | 9.71 | Y |
| SB215L | 06/20/94 | 22-24 | 1 ppm <x< 10 ppm | | NA | |
| SB217C | 06/20/94 | 4-6 | > = 10 ppm | | NA | |
| SB217I | 06/20/94 | 16-18 | 1 ppm <x< 10 ppm | x | 0.894 | N |
| SB217M | 06/20/94 | 24-26 | > = 10 ppm | x | 43.95 | Y |
| SB217T | 06/20/94 | 16-18 | NA | | NA | |
| MW205M | 06/21/94 | 24-26 | > = 10 ppm | x | 142.98 | Y |
| SB218B | 06/21/94 | 2-4 | > = 10 ppm | | NA | |
| SB218H | 06/21/94 | 14-16 | > = 10 ppm | | NA | |
| SB218L | 06/21/94 | 22-24 | > = 10 ppm | x | 323.8 | Y |
| SB218T | 06/21/94 | 22-24 | NA | | NA | |
| SB220D | 06/22/94 | 6-8 | > = 10 ppm | | NA | |
| SB220K | 06/22/94 | 20-22 | > = 10 ppm | x | 752 | Y |
| SB220N | 06/22/94 | 26-28 | > = 10 ppm | | NA | |
| SB222D | 06/22/94 | 6-8 | > = 10 ppm | x | 127.1 | Y |

ND – Not Detected
NA – Not Analyzed
** – Erroneous Result
>= – Greater than or equal to
ppm and mg/kg are equivalent units

## TABLE 2.2 continued
## NIAGARA MOHAWK POWER CORPORATION
## DSA REMEDIAL INVESTIGATION
## PAH FIELD SCREENING RESULTS VS. LABORATORY RESULTS

| SAMPLE # | SAMPLE DATE | SAMPLE INTERVAL (FEET) | FIELD SCREENING CONCLUSION | SENT TO LAB | LABORATORY ANALYSIS (mg/kg) | CORRELATION Yes\No |
|---|---|---|---|---|---|---|
| SB222F | 06/22/94 | 10-12 | <10 ppm | | NA | |
| SB222H | 06/22/94 | 14-16 | > = 10 ppm | | NA | |
| SB223C | 06/22/94 | 4-6 | > = 10 ppm | | NA | |
| SB223G | 06/22/94 | 12-14 | > = 10 ppm | | NA | |
| SB223K | 06/22/94 | 20-22 | 1 ppm <x<10 ppm | | NA | |
| SB224H | 06/22/94 | 14-16 | > = 10 ppm | x | 670.4 | Y |
| SB225C | 06/23/94 | 4-6 | > = 10 ppm | | NA | |
| SB225E | 06/23/94 | 8-10 | > = 10 ppm | x | 471.6 | Y |
| SB225H | 06/23/94 | 14-16 | > = 10 ppm | x | 1557 | Y |
| SB225T | 06/23/94 | 8-10 | NA | x | 390.2 | |
| SB301B | 06/24/94 | 0-4 | > = 10 ppm | | NA | |
| SB301D | 06/24/94 | 6-8 | > = 10 ppm | | NA | |
| SB301F | 06/24/94 | 10-12 | > = 10 ppm | x | 8.27 | N |
| SB303A | 06/24/94 | 0-2 | > = 10 ppm | | NA | |
| SB302B | 06/24/94 | 2-4 | <10 ppm | | NA | |
| SB302E | 06/24/94 | 8-10 | > = 10 ppm | x | 23.57 | Y |
| SB303C | 06/24/94 | 4-6 | 1 ppm <x< 10 ppm | | NA | |
| SB303E | 06/24/94 | 8-10 | 1 ppm <x< 10 ppm | | NA | |
| SB302G | 06/24/94 | 12-14 | <10 ppm | x | 0.294 | Y |
| SB304B | 06/24/94 | 2-4 | > = 10 ppm | | NA | |
| SB304D | 06/24/94 | 6-8 | > = 10 ppm | | NA | |
| SB304F | 06/24/94 | 10-12 | > = 10 ppm | x | 22.58 | Y |
| SB305C | 06/24/94 | 4-6 | > = 10 ppm | | NA | |
| SB305E | 06/24/94 | 8-10 | > = 10 ppm | | NA | |
| SB305G | 06/24/94 | 12-14 | > = 10 ppm | x | 43.42 | Y |
| SB306C | 06/27/94 | 2-6 | > = 10 ppm | x | 68.95 | Y |
| SB306E | 06/27/94 | 8-10 | > = 10 ppm | | NA | |
| SB306I | 06/27/94 | 16-18 | > = 10 ppm | x | 37.7 | Y |
| SB307E | 06/27/94 | 8-10 | > = 10 ppm | x | 59.96 | Y |
| SB308C | 06/27/94 | 4-6 | > = 10 ppm | | NA | |
| SB308I | 06/27/94 | 16-18 | <10 ppm | x | 15.56 | N |
| SB308O | 06/27/94 | 28-30 | <10 ppm | x | ND | Y |

ND - Not Detected
NA - Not Analyzed
** - Erroneous Result
>= - Greater than or equal to
ppm and mg/kg are equivalent units

## TABLE 2.2 continued
## NIAGARA MOHAWK POWER CORPORATION
## DSA REMEDIAL INVESTIGATION
## PAH FIELD SCREENING RESULTS VS. LABORATORY RESULTS

| SAMPLE # | SAMPLE DATE | SAMPLE INTERVAL (FEET) | FIELD SCREENING CONCLUSION | SENT TO LAB | LABORATORY ANALYSIS (mg/kg) | CORRELATION Yes\No |
|---|---|---|---|---|---|---|
| SB308T | 06/27/94 | 38-40 | <10 ppm | | NA | |
| SB314C | 06/28/94 | 4-6 | > = 10 ppm | x | 16.89 | Y |
| SB315D | 06/28/94 | 6-8 | > = 10 ppm | x | 48.47 | Y |
| SB316B | 06/29/94 | 2-4 | > = 10 ppm | x | 55.34 | Y |
| SB316E | 06/29/94 | 8-10 | <10 ppm | x | ND | Y |
| SB317I | 06/29/94 | 16-18 | > = 10 ppm | x | ND | N |
| SB317C | 06/29/94 | 4-6 | 1 ppm <x< 10 ppm | | NA | |
| SB317O | 06/29/94 | 28-30 | > = 10 ppm | x | ND | N |
| SB317Y | 06/29/94 | 48-50 | <10 ppm | | NA | |
| SP309A | 06/27/94 | 0-1 | 1 ppm <x< 10 ppm | x | ND | N |
| SP302A | 06/28/94 | 0-1 | <10 ppm | x | 0.08 | Y |
| SP303A | 06/28/94 | 0-1 | <10 ppm | x | 1.089 | Y |
| SP305A | 06/28/94 | 0-1 | <10 ppm | x | 1.65 | Y |
| SP306A | 06/28/94 | 0-1 | <10 ppm | x | 1308 | N |
| SP325A | 06/28/94 | 0-1 | NA | x | 0.205 | |
| SP301A | 06/28/94 | 0-1 | <10 ppm | x | ND | Y |
| SP304A | 06/28/94 | 0-1 | > = 10 ppm | x | 0.73 | N |
| SP307A | 06/28/94 | 0-1 | <10 ppm | x | 0.146 | Y |
| SP310A | 03/7/95 | 0-1 | <10 ppm | x | 0.393 | Y |
| SP311A | 03/7/95 | 0-1 | <10 ppm | x | ND | Y |
| SP312A | 03/7/95 | 0-1 | Unreliable result | | | |
| SP313A | 03/7/95 | 0-1 | <10 ppm | x | 0.11 | Y |
| SP314A | 03/7/95 | 0-1 | <10 ppm | | | |
| SP315A | 03/7/95 | 0-1 | Unreliable result | | | |
| SP316A | 03/7/95 | 0-1 | 10 ppm <x< 100 ppm | | | |
| SP317A | 03/7/95 | 0-1 | 10 ppm <x< 100 ppm | x | 6.09 | N |
| SP318A | 03/7/95 | 0-1 | <10 ppm | | | |
| SP319A | 03/7/95 | 0-1 | 10 ppm <x< 100 ppm | x | 14.7 | Y |

ND - Not Detected
NA - Not Analyzed
** - Erroneous Result
>= - Greater than or equal to
ppm and mg/kg are equivalent units

# Table 2.3
# Dredge Spoil Areas Remedial Investigation
# Drilling Summary

| Boring/ Well | Phase of Installation | Total Depth (feet) | Aquifer | 5" Steel Casing Depth (feet) | Screened Interval (feet) |
|---|---|---|---|---|---|
| SB101 | I | 14 | Shallow | – | – |
| SB102 | I | 14 | Shallow | – | – |
| SB103 | I | 14 | Shallow | – | – |
| SB104 | I | 18 | Shallow | – | – |
| SB105 | I | 18 | Shallow | – | – |
| SB106 | I | 14 | Shallow | – | – |
| SB107 | I | 14 | Shallow | – | – |
| SB108 | I | 18 | Shallow | – | – |
| SB109 | I | 16 | Shallow | – | – |
| SB110 | I | 18 | Shallow | – | – |
| SB111 | I | 14 | Shallow | – | – |
| SB112 | I | 18 | Shallow | – | – |
| SB113 | I | 18 | Shallow | – | – |
| SB114 | I | 16 | Shallow | – | – |
| SB115 | I | 18 | Shallow | – | – |
| SB116 | I | 18 | Shallow | – | – |
| SB117 | I | 16 | Shallow | – | – |
| SB118 | I | 18 | Shallow | – | – |
| SB119 | I | 16 | Shallow | – | – |
| SB120 | I | 16 | Shallow | – | – |
| SB121 | I | 16 | Shallow | – | – |
| SB122 | I | 14 | Shallow | – | – |
| SB123 | I | 18 | Shallow | – | – |
| SB124 | I | 14 | Shallow | – | – |
| SB125 | I | 14 | Shallow | – | – |
| SB126 | I | 20 | Shallow | – | – |
| SB127 | I | 14 | Shallow | – | – |
| SB128 | I | 14 | Shallow | – | – |
| SB129 | I | 18 | Shallow | – | – |
| SB130 | I | 26 | Intermediate | 16 | – |
| SB131 | I | 12 | Shallow | – | – |
| SB132 | II | 42 | Intermediate | 14 | – |
| SB133 | II | 10 | Shallow | – | – |
| SB134 | II | 14 | Shallow | – | – |
| SB135 | II | 10 | Shallow | – | – |
| SB136 | II | 10 | Shallow | – | – |
| SB137 | II | 10 | Shallow | – | – |
| SB138 | II | 14 | Shallow | – | – |
| SB139 | II | 14 | Shallow | – | – |
| SB140 | II | 14 | Shallow | – | – |
| SB141 | II | 16 | Shallow | – | – |
| SB142 | II | 10 | Shallow | – | – |
| SB143 | II | 12 | Shallow | – | – |
| SB144 | II | 12 | Shallow | – | – |
| SB145 | II | 10 | Shallow | – | – |
| MW101S | I | 16 | Shallow | – | 5–15 |
| MW102S | I | 16 | Shallow | – | 5–15 |
| MW103S | I | 20 | Shallow | – | 4–19 |
| MW104S | I | 10 | Shallow | – | 4–9 |
| MW105S | I | 10 | Shallow | – | 4–9 |
| MW106S | I | 12 | Shallow | – | 6–11 |
| MW107S | II | 15 | Shallow | – | 4–14 |
| MW108S | II | 10 | Shallow | – | 4–9 |
| MW109S | II | 14 | Shallow | – | 3–13 |
| MW110S | II | 14 | Shallow | – | 3–13 |
| MW111S | II | 15 | Shallow | – | 4–14 |
| MW112S | II | 12 | Shallow | – | 6–11 |
| SB200 | I | 14 | Shallow | – | – |
| SB201 | I | 16 | Shallow | – | – |
| SB202 | I | 10 | Shallow | – | – |
| SB203 | I | 10 | Shallow | – | – |
| SB204 | I | 20 | Shallow | – | – |
| SB205 | I | 22 | Shallow | – | – |

Note: all depths in feet below ground surface.

# Table 2.3 continued
# Dredge Spoil Areas Remedial Investigation
# Drilling Summary

| Boring/ Well | Phase of Installation | Total Depth (feet) | Aquifer | 5" Steel Casing Depth (feet) | Screened Interval (feet) |
|---|---|---|---|---|---|
| SB206 | I | 16 | Shallow | – | – |
| SB207 | I | 16 | Shallow | – | – |
| SB208 | I | 16 | Shallow | – | – |
| SB209 | I | 20 | Shallow | – | – |
| SB210 | I | 12 | Shallow | – | – |
| SB211 | I | 22 | Shallow | – | – |
| SB212 | I | 24 | Shallow | – | – |
| SB213 | I | 10 | Shallow | – | – |
| SB214 | I | 30 | Shallow | – | – |
| SB215 | I | 24 | Shallow | – | – |
| SB216 | I | 24 | Shallow | – | – |
| SB217 | I | 34 | Shallow | – | – |
| SB218 | I | 28 | Shallow | – | – |
| SB219 | I | 20 | Shallow | – | – |
| SB220 | I | 28 | Shallow | – | – |
| SB221 | I | 20 | Shallow | – | – |
| SB222 | I | 16 | Shallow | – | – |
| SB223 | I | 24 | Shallow | – | – |
| SB224 | I | 20 | Shallow | – | – |
| SB225 | I | 18 | Shallow | – | – |
| SB226 | II | 10 | Shallow | – | – |
| SB227 | II | 10 | Shallow | – | – |
| SB228 | II | 10 | Shallow | – | – |
| SB229 | II | 10 | Shallow | – | – |
| SB230 | II | 10 | Shallow | – | – |
| SB231 | II | 50 | Intermediate | 14 | – |
| SB232 | II | 12 | Shallow | – | – |
| SB233 | II | 14 | Shallow | – | – |
| SB234 | II | 24 | Shallow | – | – |
| MW200S | I | 12 | Shallow | – | 6–11 |
| MW201S | I | 20 | Shallow | – | 9–19 |
| MW202S | I | 9 | Shallow | – | 3–8 |
| MW203S | I | 20 | Shallow | – | 4–19 |
| MW204S | I | 26 | Shallow | – | 8–18 |
| MW205S | I | 30 | Shallow | – | 17–27 |
| MW206S | II | 10 | Shallow | – | 4–9 |
| SB301 | I | 14 | Shallow | – | – |
| SB302 | I | 16 | Shallow | – | – |
| SB303 | I | 10 | Shallow | – | – |
| SB304 | I | 14 | Shallow | – | – |
| SB305 | I | 16 | Shallow | – | – |
| SB306 | I | 18 | Shallow | – | – |
| SB307 | I | 14 | Shallow | – | – |
| SB308 | I | 40 | Intermediate | – | – |
| SB309 | I | 28 | Intermediate | – | – |
| SB310 | I | 14 | Shallow | – | – |
| SB311 | I | 14 | Shallow | – | – |
| SB312 | I | 14 | Shallow | – | – |
| SB313 | I | 16 | Shallow | – | – |
| SB314 | I | 10 | Shallow | – | – |
| SB315 | I | 10 | Shallow | – | – |
| SB316 | I | 10 | Shallow | – | – |
| SB317 | I | 50 | Intermediate | – | – |
| MW301S | I | 15 | Shallow | – | 4–14 |
| MW302S | I | 7.5 | Shallow | – | 2.5–7.5 |
| MW303S | I | 15 | Shallow | – | 4–14 |
| MW304S | I | 8.5 | Shallow | – | 2.5–7.5 |

Note: all depths in feet below ground surface.

# TABLE 2.4

## NIAGARA MOHAWK POWER CORPORATION
Dredge Spoil Areas
Sample Tracking Report
Soil Boring Samples – Phase I
Geotechnical Samples

| SAMPLE ID | DATE SAMPLED | DEPTH INTERVAL | CHAIN OF CUSTODY | GRAIN SIZE/ ATTERBERG LIMITS | PERMEABILITY TESTING |
|---|---|---|---|---|---|
| MW205M | 06/21/94 | 28–30' | 0148 | X | |
| SB109E | 06/07/94 | 08–10' | 0148 | X | |
| SB110I | | 16–18' | | | X |
| SB112B | 06/08/94 | 02–04' | 0148 | X | |
| SB112F | 06/08/94 | 10–12' | 0148 | X | |
| SB116I | 06/09/94 | 16–18' | 0148 | X | |
| SB119D | 06/09/94 | 06–08' | 0148 | X | |
| SB130H | | 14–16' | | | X |
| SB201E | 06/08/94 | 08–10' | 0148 | X | |
| SB205G | 06/09/94 | 12–14' | 0148 | X | |
| SB216M | | 28–30' | | | X |
| SB220J | 06/22/94 | 18–20' | 0148 | X | |
| SB220O | | 32–34' | | | X |
| SB223D | 06/22/94 | 06–08' | 0148 | X | |
| SB305H | 06/24/94 | 14–16' | 0149 | X | |
| SB306I | 06/27/94 | 16–18' | 0149 | X | |
| SB306J | | 18–20' | | | X |
| SB309F | 06/28/94 | 10–12' | 0149 | X | |
| SB310C | 06/28/94 | 04–06' | 0149 | X | |
| SB310E | 06/28/94 | 08–10' | 0149 | X | |
| SB312H | | 14–16' | | | X |
| TOTAL ANALYSES | | | | 15 | 6 |

# TABLE 2.4 – Cont'd

## NIAGARA MOHAWK POWER CORPORATION
## Dredge Spoil Areas
## Sample Tracking Report
## Surface Soil Samples – Phase I
## Geotechnical Samples

| SAMPLE ID | DATE SAMPLED | DEPTH INTERVAL | CHAIN OF CUSTODY | GRAIN SIZE/ ATTERBERG LIMITS |
|---|---|---|---|---|
| SS101 | 06/09/94 | 0–6" | 0123 | X |
| SS102 | 06/09/94 | 0–6" | 0123 | X |
| SS103 | 06/09/94 | 0–6" | 0123 | X |
| SS104 | 06/09/94 | 0–6" | 0123 | X |
| SS105 | 06/09/94 | 0–6" | 0123 | X |
| SS106 | 06/09/94 | 0–6" | 0123 | X |
| SS107 | 06/09/94 | 0–6" | 0123 | X |
| SS108 | 06/10/94 | 0–6" | 0123 | X |
| SS109 | 06/10/94 | 0–6" | 0123 | X |
| SS110 | 06/10/94 | 0–6" | 0123 | X |
| SS105–DUP (SS115) | 06/09/94 | 0–6" | 0123 | X |
| SS201 | 06/13/94 | 0–6" | 0131 | X |
| SS202 | 06/13/94 | 0–6" | 0131 | X |
| SS203 | 06/13/94 | 0–6" | 0131 | X |
| SS204 | 06/13/94 | 0–6" | 0131 | X |
| SS205 | 06/13/94 | 0–6" | 0131 | X |
| SS206 | 06/14/94 | 0–6" | 0131 | X |
| SS207 | 06/14/94 | 0–6" | 0131 | X |
| SS208 | 06/14/94 | 0–6" | 0131 | X |
| SS209 | 06/14/94 | 0–6" | 0131 | X |
| SS210 | 06/14/94 | 0–6" | 0131 | X |
| SS211 | 06/16/94 | 0–6" | 0141 | X |
| SS301 | 06/29/94 | 0–6" | 0171 | X |
| SS302 | 06/29/94 | 0–6" | 0171 | X |
| SS303 | 06/29/94 | 0–6" | 0171 | X |
| SS304 | 06/29/94 | 0–6" | 0171 | X |
| SS305 | 06/29/94 | 0–6" | 0171 | X |
| SS306 | 06/29/94 | 0–6" | 0171 | X |
| SS307 | 06/29/94 | 0–6" | 0171 | X |
| TOTAL ANALYSES | | | | 29 |

# SECTION 3

# PHYSICAL CHARACTERISTICS OF THE DSA SITES

## 3.1 PHYSICAL SETTING, TOPOGRAPHY AND PRESENT LAND USE

The three dredge spoil areas are located in the Mohawk River Valley adjacent to the Harbor Point peninsula. DSA-1 and DSA-3 are enclosed by berms ranging from 10 to 15 feet in height. Material from within the areas has been excavated to form the berms and internal dikes. Graded surface water drainage ditches are located inside and outside the perimeter berms. Site surveys were conducted during Phase I to characterize site topography and to locate sample locations. Plate 3.1 shows site topography for the three DSAs. NMPC conducted additional surveying to locate Phase II samples.

The three DSAs cover an area of approximately 34 acres. The southern bermed area of DSA-1 covers approximately ten acres and the northern area covers approximately six acres. DSA-2 covers approximately ten acres. The northern cell of DSA-3 covers approximately three acres and the southern cell covers approximately five acres. The DSAs are not fenced, but DSA-1 is not readily accessible by the public because of the high berms and standing water in the ditches and DSA-3 is not readily accessible by the public due to its high berms, standing water in the ditches, and remote location. DSA-2 can be accessed via the Erie Canal, Mohawk River, and a public pathway along the canal. Vehicular access to DSA-2 is controlled by the NYS Thruway Authority. A commercial area is located to the southeast of DSA-1. Operations include a trucking company, hotel, restaurant, and the Canal Corporation. DSA-3 is located within the Utica Marsh.

For purposes of this report, and for consistency with historical documents, the Barge Canal refers only to the harbor entrance channel measuring approximately 1300 feet in length, connecting the Mohawk River with the mouth of the Utica Harbor. The Erie Canal refers to the canal running parallel to and east of the Mohawk River. The Erie Canal was not a subject of this investigation and is only mentioned as a point of reference and in descriptions of local hydrology and hydrogeology.

Recent land planning decisions by the City of Utica have indicated that the Harbor Point peninsula and vicinity will be restricted to only non-residential use and development (Nutter Associates, 1995).

### 3.1.1 DSA-1

DSA-1 consists of a northwestern and a southeastern area; the southeastern area was the focus of the initial investigations, and the northwestern area was investigated as part of the Phase II field effort.

The southeastern end of DSA-1 is surrounded by berms approximately 10 feet in height. Inside the berms, the area is relatively flat with internal dividing berms and a shallow, wide ditch around the perimeter. Four drainage pipes pass from the spoils area through the berm in the northwest corner to the Barge Canal. In the northern section of the DSA, only remnants of former berms are visible. Both sections are heavily overgrown with vegetation ranging from scrub brush and grasses to a semi-mature woodlot in the northern section (see Section 6.2, Habitat Assessment for details).

The Mohawk River borders the northeast side of the site. The bank of the river is steep and is being actively eroded. A dirt access road lies between the river and spoils area. The Utica Terminal Harbor makes up the southwestern boundary of DSA-1. The bank on this side of the site slopes gently to the Barge Canal. The DSA-1 area experiences periodic flooding across the northern point and to the west of the site. Flood levels do not typically reach the berms or inundate the spoils area.

Present land use is largely undeveloped; site development is limited to two sets of overhead power cables and a petroleum transmission pipeline passing through the northern area. Land use south of DSA-1 includes a light industrial area, including a transportation company and a hotel.

### 3.1.2 DSA-2

DSA-2 has the greatest relief of the three dredge spoil areas. The dredge material in DSA-2 has been stockpiled in the central area and excavated in the northwestern end and possibly the southeastern end. High berms exist along portions of the northeast side of the site by the Erie Canal and southwest side adjacent to the Mohawk River. The top of the southwestern berm stands as much as 43 feet above the Mohawk River and the top of the northeastern berm stands 35 feet above the Erie Canal. The topography was very uneven within the DSA due to excavation activities. Vegetation on the majority of the site consists of scrub brush and grasses. The steep southwestern slope of DSA-2 is heavily wooded with little underbrush.

The drainage ditches found around the inside of the berm at DSA-1 and DSA-3 are not present in DSA-2. A drainage ditch runs between the gravel road and berm on the northeastern side of DSA-2. A small culvert and drainage channel runs between the Erie Canal and Mohawk River along the northwest end of the site. Three ponded areas were present at DSA-2, one between the DSA and the gravel road, one in the central area of the DSA, and one inside the berm near the northwestern corner of the DSA in excavated depressions.

A gravel access road to the Utica Harbor lock and a paved public foot path and bike trail occupies the northeast boundary of DSA-2 between the DSA and the Erie Canal. The bank of the canal is steep and is covered with rip-rap to prevent erosion. Outside the southwest margin of DSA-2 and below the steep bank is a flat area subject to flooding and material deposition from the Mohawk River.

Land use in the area of DSA-2 includes the NYSDOT service yard bordering the DSA on the southeast, the Erie Canal along the northeast side of the site, and the Utica Harbor lock to the northwest.

### 3.1.3 DSA-3

DSA-3 is surrounded by wetlands and is located in the Utica Marsh west of the Mohawk River. DSA-3 is divided into two cells by a central berm. The northern cell is a bermed area where dredge spoils were deposited. The area inside the berms is generally flat with a wide, shallow ditch about the perimeter. In some sections the ditch has become infilled and vegetated. The northern cell is forested and has some scrub brush and grass undergrowth. The southeastern corner of the northern area has four large-diameter, elevated drop pipes which provide drainage.

The southern cell of DSA-3 was reportedly used only for spoils water overflow from the northern cell (ES, 1994a). This area is topographically lower than the northern cell and for the most part is flooded. Water depth in the southern cell ranges from a few inches to greater than 8 feet. Most of the southern cell is covered by scrub brush, marsh vegetation, and a few willow trees.

Land use in the area of DSA-3 includes an NMPC power line right-of-way with overhead cables to the west and a Buckeye Pipeline Company underground petroleum pipeline to the north and east of DSA-3. The Utica Terminal Lock is located 350 feet northeast of the DSA. The Erie Canal and the pedestrian foot and bike path run approximately 350 feet north of DSA-3.

## 3.2 GEOLOGY

### 3.2.1 Regional Geology

The study area lies in the Mohawk Lowland Physiographic Province. The Mohawk River Valley is bounded to the north by the Tug Hill Plateau and on the south by the northern edge of the Allegheny Plateau (Fisher et al, 1970 and Cadwell, 1987). The topography of the Mohawk Valley is related directly to the glacial history of the region. The Mohawk River starts at Delta Reservoir, located a 23 miles upstream of the site where the Mohawk Valley blends into the Lake Oneida plain. The Mohawk River is said to be "underfit", meaning that it flows through a valley too large to have been carved by a stream of that size. The majority of the material deposited in the ancestral Mohawk Valley was deposited by Pleistocene glacial meltwater streams. The study area is characterized by stratified beds of silts and sand with some gravels, clay and peat. Pleistocene and Holocene flood plain sediments of the Mohawk River cap the glacial and fluvial deposits.

Previous studies on the Harbor Point peninsula (ES, 1995d and Parsons ES, 1995c) indicate that the unconsolidated sediments described above are underlain by a dense glacial till which is weathered in places. The till is underlain by the Utica Shale, a black finely laminated marine shale which has been encountered on the Harbor Point peninsula at depths ranging from 50 feet to over 100 feet.

### 3.2.2 Site Geology

The geology encountered at the DSA sites during the RI is consistent with the findings from previous Harbor Point peninsula soil borings and wells. Geologic cross sections presented in Figure 3.2, Figure 3.3, and Figure 3.4 are interpretations of subsurface conditions based on available site data, local geology from the area, and regional geology. The interpretation is more speculative with increasing depth and decreasing density of data points. Dashed lines and question marks have been used to identify areas where the interpretations are more speculative and based on projections of data from known areas. The stratigraphy is generally consistent between DSAs except as noted in the DSA-specific discussions below.

The DSAs are covered with fill material composed of the spoils from former dredging operations in the Utica Terminal Harbor, Barge Canal, and Mohawk River (URS, 1992b and Parsons ES, 1994a). The spoils material is highly variable in composition and ranges from silt and clay to very coarse and well sorted sand and fine gravels. In some of the borings, debris consisting of organic material, glass, and scrap metal was also encountered. Offshore borings in the vicinity of the DSAs encountered recent sediment deposits.

The subsurface sediments below the fill material are fluvial and glacial lacustrine in origin. The fluvial unit has been divided into upper and lower units on the Harbor Point peninsula. The upper fluvial unit includes three layers consisting of peat beds, silts and clays, while the lower fluvial, where present, consists mainly of coarser sand and gravel. Most DSA soil borings were terminated in the upper fluvial mottled clay layer at the base of the upper fluvial unit. This mottled clay layer is the shallow aquitard. The fluvial sediments are underlain by glacial lacustrine sediments consisting of light-grey, pink-hued silt with a high percentage of very fine sand and a trace of clay. This material also exhibits thixotropic qualities, that is, a plastic solid characterized by high viscosity at low stress, but decreased viscosity when applied stress is increased. This upper glacial lacustrine silt bed is underlain by medium-grey, fine sand and silt beds with black organic laminations, and silts and sands with discontinuous clay and gravel layers.

The glacial lacustrine sediments are underlain by a dense till layer and the Ordovician-age Utica Shale bedrock. The total thickness of the glacial lacustrine sediments and the thickness and depths of the glacial till and Utica Shale are undetermined in the area of the DSA sites.

### DSA-1

Four geologic cross sections (A-A', B-B', C-C', and D-D') and a cross section location map are presented on Plate 3.2. Offshore borings drilled in the Utica Harbor, Barge Canal, and Mohawk River were added to the cross sections where practical to extend the correlation of geologic units. Most of the DSA-1 peninsula is covered with a layer of dredge material ranging in thickness up to approximately 15 feet. The composition of the dredge material is variable depending upon dredge source area and depth. It ranges from tightly packed fines such as silt and clay to very coarse and well sorted sand and fine gravels. In some of the borings, debris consisting of organic material, glass, and scrap metal were also encountered. Different areas of DSA-1 received dredge material from distinct episodes of dredging (see Section 1.2.2). Dredge material was identified in the soil borings outside the present berms extending northwestward to the end of the peninsula. Remnants of berms were identified in this area. Laterally contiguous (next to) with the dredge materials is the upper layer (silts and sands with traces of clay, organics, and peat) of the upper fluvial unit. This upper layer of the upper fluvial unit was not present under most of the dredge fill material. Historical information from the Canal Corporation interview that indicates this layer was scraped off and used to form the original berms.

The dredge spoils material is underlain by the mottled clay layer of the upper fluvial unit. The mottled clay was 14 feet thick in SB-132. The mottled clay layer represents the first aquitard below the dredge material. All other DSA-1 soil borings were terminated within the upper two to four feet of the mottled clay layer. Boring SB-132 was drilled through the aquitard to confirm the thickness of the confining unit. Below the mottled clay was an additional four feet of silty clay in boring SB-132. Below the clay, boring SB-132 penetrated 16 feet of thixotropic sand with traces of black laminations representing glacial lacustrine sediments. The lower fluvial unit present between the upper fluvial unit and the glacial lacustrine unit on the Harbor Point peninsula, and at DSA-2 and DSA-3 was not present in boring SB-132.

Ten grain size samples of surface soil (dredge material at the surface) were collected. Results of grain size analyses are summarized in Table 3.1 and presented in Appendix D. Grain size distributions fell in the SM (silty sand, sand-silt mixture) to ML (inorganic silts and very fine sands, silty or clayey fine sands or silty clays) classes under the Unified Soil Classification System (USCS). Hydraulic conductivities for the SM to ML sediments range from $3x10^{-3}$ ft/day to 3 ft/day (USCS).

Five geotechnical samples of subsurface soils were also collected during the RI. Grain size distributions for four samples collected from the dredge material fell in the same SM to ML range as the surface soil samples. One sample collected from the upper fluvial mottled clay was in the CH range (inorganic clays of high plasticity, "fat clay"). Hydraulic conductivities in the CH clays range from $3x10^{-6}$ ft/day to $3x10^{-3}$ ft/day (USCS). Vertical permeability in two undisturbed Shelby Tube samples collected from the upper fluvial sediments ranged from $6.35x10^{-5}$ ft/day to $2.49x10^{-4}$ ft/day. These measured results fall within the range predicted for the CH clays. Shelby Tube samples were composed of variable proportions of grey silt and clay. Results of Shelby Tube testing are summarized in Table 3.1 and are presented in Appendix E.

### DSA-2

Four geologic cross sections (A-A', B-B', C-C', and D-D') and a cross section location map are presented on Plate 3.3. Offshore borings drilled in the Utica Harbor, Barge Canal, and Mohawk River were added to the cross sections where practical to extend the correlation of geologic units. DSA-2 is covered with varying thicknesses of dredge material. The berms are discontinuous and the topography is uneven. Dredge material and berms appear to be removed in the northwest and southeast ends of the DSA. Remaining thicknesses of dredge material range from ten to 28 feet. The composition of the dredge material is variable depending upon dredge source area and depth, and ranges from silt and clay to very coarse and well sorted sand and fine gravels. In some of the borings, debris consisting of organic material, glass, and scrap metal was also encountered. Contiguous with the dredge materials are an upper fluvial unit consisting of silts and sands with traces of clay and clayey silts, and sands with traces of organics and peat. These upper fluvial sediments were not present under most of the dredge fill material. Historical information from the Canal Corporation interview indicates that this unit was scraped off and used to form the original berms.

The dredge spoils material is underlain by an upper fluvial mottled clay containing traces of organics. Boring SB-231 was drilled through the mottled clay unit to confirm the thickness of this confining unit. The mottled clay was 12.5 feet thick in SB-231. All other DSA-2 soil borings were terminated within the upper two to four feet of the mottled clay unit or in the dredge material. The mottled clay unit represents the first confining unit below the dredge material. Below the mottled clay in boring SB-231, was six feet of the lower layer of the upper fluvial unit. Boring SB-231 was terminated at a depth of 50 feet after penetrating 20 feet of lower fluvial sand and gravel. None of the DSA-2 borings went deep enough to encounter the glacial lacustrine sediments.

Ten grain size samples were collected from surface soil samples. Results of grain size analyses are summarized in Table 3.1 and presented in Appendix D. Grain size distributions fell in the SM to ML range under the USCS. Hydraulic conductivities for the SM to ML sediments range from $3x10^{-3}$ ft/day to 3 ft/day (USCS). Five samples of subsurface soils were also collected for geotechnical analysis. All five samples contained dredge material consisting of sand and silt with varying percentages of other clastic material. Grain sizes fell in the SM, ML, MH, and SP-SM ranges. Hydraulic conductivities range from greater than $3x10^{-3}$ ft/day to 3 ft/day for USCS soils in the SM, ML, MH, and SP-SM soil classes. Vertical permeability in undisturbed Shelby Tube samples collected from the upper fluvial aquitard ranged from a low of $7.40x10^{-5}$ to $1.95x10^{-4}$ ft/day (Table 3.1 and Appendix F). Shelby Tube samples were composed of variable proportions of grey silt and clay. The measured vertical permeabilities fall in the range expected for CH to CL soils, such as the upper fluvial mottled clays.

### DSA-3

Four geologic cross sections (A-A', B-B', and C-C') and a cross section location map are presented on Plate 3.4. Offshore borings drilled in the Utica Harbor, Barge Canal, and Mohawk River were added to the cross sections where practical to extend the correlation of geologic units. The northern half of DSA-3 is covered with as much as 15 feet of dredge material. The composition of the dredge material is variable depending upon dredge source area and depth, ranging from silt and clay to very coarse and well sorted sand and fine gravels. In some of the borings, debris consisting of organic material, glass, and scrap metal were also encountered. The southern half of DSA-3 does not appear to contain any dredge material. Contiguous with the dredge materials and berms are an upper fluvial unit consisting of silts and sands with traces of clay and clayey silts, and sands with traces of organics and peat. These upper fluvial sediments were not present under most of the dredge fill material or in the southern half of DSA-3. Historical information from the land corporation interview indicates that this layer was scraped off and used to form the original berms.

Most of the DSA-3 dredge spoils material is underlain by an upper fluvial mottled clay containing traces of organics. The thickness of the mottled clay is undetermined at DSA-3. However, the thickness is expected to be comparable to that found in the other DSAs (12.5 to 14 feet). Most DSA-3 soil borings were terminated within the upper two to four feet of the mottled clay unit. However, borings SB-308, SB-309, SB-317, and MW-303S, located near the southeast corner of the northern cell, did not encounter the mottled clay unit. It is not known whether the unit was eroded by the Mohawk River in the past when the river course was shifted, or whether excavation during DSA construction was deeper in this area. The mottled clay unit represents the first confining unit below most of the dredge material. Below the mottled clay was an additional thirteen feet of upper fluvial sediments consisting of fine sand and silt with traces of wood debris. Up to 24 feet of this upper fluvial sediment was encountered in boring SB-317. Borings SB-308 and SB-317 were terminated at 40 feet and 50 feet respectively, after penetrating approximately eight feet of lower fluvial sediments. Both borings were terminated in the top of the glacial lacustrine sediments.

Seven samples were collected from surface soil samples for grain size analysis. Results of grain size analyses are summarized in Table 3.1 and is presented in Appendix D. Grain size distributions fell in the SM (silty sand, sand-silt mixture) to ML (inorganic silts and very fine sands, silty or clayey fine sands or silty clays) and MH (silt and clay, trace sand and organics) classes of the USCS. Hydraulic conductivities for the SM to ML soils range from $3x10^{-3}$ ft/day to 3 ft/day (USCS) and the MH sediments range from $3x10^{-3}$ to $3x10^{-1}$ ft/day. The MH soils were collected from the ditch areas around the inside perimeter of the northern cell. Five subsurface soil samples were also collected for geotechnical analysis. Grain sizes for four of the five samples fell in the SM, ML, MH classes. The four dredge soil samples contained sand and silt with varying percentages of other clastic material. One sample fell in the CL (silt some clay, little sand) class. This sample was collected from the upper fluvial mottled clay unit. Hydraulic conductivities (according to USCS classification) range from $3x10^{-3}$ ft/day to 3 ft/day for USCS soils in the SM, ML, MH soil classes and $3x10^{-5}$ to $3x10^{-3}$ in the CL soils. Vertical permeability in undisturbed Shelby Tube samples collected from the upper fluvial sediments ranged from a low of $1.47x10^{-4}$ to $8.82x10^{-4}$ ft/day (Table 3.1 and Appendix F). Shelby Tube samples were composed of variable proportions of grey silt and clay. The measured vertical permeabilities fall in the range expected for CL soils.

## 3.3 HYDROGEOLOGY

### 3.3.1 Regional Hydrology

The major surface water features in the area are the Mohawk River, the Barge Canal, the Utica Terminal Harbor and Erie Canal. The Mohawk River is a Class C waterway flowing north along the western side of the Harbor Point peninsula and the eastern side of DSA-3, then southeasterly around the northern end of the Harbor Point peninsula. The Mohawk River then flows between the northeastern side of DSA-1 and the southwestern side of DSA-2. The river level near the site is controlled by the Canal Corporation via the taintor gates at the dam located approximately 4000 feet southeast of the DSAs. The river elevation in the vicinity of the Utica Harbor lock is approximately 397 above mean sea level (AMSL).

The Utica Terminal Harbor and the Barge Canal are located between DSA-1 and the Harbor Point site. These man-made features were constructed along the former channel of the Mohawk River. The river was diverted in the early 1900s from its former path around the Harbor Point peninsula and through the City of Utica to its present course (AES, 1993). The water level in the harbor fluctuates with the river as shown by results of continuous water level monitoring during November 1994 through January 1995 (Parsons ES, 1995c). Debris and sediment from the river are deposited in the slack water near the mouth of the Barge Canal, along the east bank of the canal, and in the harbor.

The Erie Canal passes to the north of DSA-3 and northeast of DSA-2. Flow in the Erie Canal is to the southeast. The Canal Corporation maintains a water level in the canal of approximately 404 feet AMSL (7 feet above the Mohawk River). The canal was constructed with a clay lining, and leakage to the water table is expected to be small. The canal level is maintained from April to December and drained in the winter months. The Erie Canal was not part of this RI.

### 3.3.2 Site Hydrology

DSA-1 is a triangular shaped peninsula bordered on two sides by surface water bodies. The Barge Canal and Utica Terminal Harbor border DSA-1 on the west side and the Mohawk River borders the site on the northeast side, flowing southeasterly. There is no surface water runoff from the bermed area of DSA-1.

DSA-2 is generally rectangular in shape and is bordered along both long sides by surface water bodies. The Mohawk River flows southeast past the southwestern side of DSA-2. The Erie Canal is located along the northeastern side of the DSA-2 site. There is little surface water runoff from DSA-2. Most precipitation infiltrates into the dredge material or collects in the ditches and depressions.

DSA-3 is bordered on the east side by the Mohawk River and on the other three sides by the Utica Marsh. The Utica Harbor lock and the Erie Canal are north of DSA-3. The southern cell of DSA-3 is an unused portion of the DSA surrounded by berms. The southern end of DSA-3 is topographically low and holds ponded water with depths of up to eight feet. Even with the large volume of water present in DSA-3, no flow or leakage from the bermed area was evident during field inspections. There is no surface water runoff from the northern cell either.

### 3.3.3 Regional Hydrogeology

Groundwater in the region is found in the overburden and in the Utica Shale. Groundwater flow in the region is towards major surface water bodies, with local variations. The major surface water bodies in the region include the Utica Harbor, Barge Canal, Erie Canal, and Mohawk River.

Groundwater beneath the site is not a source of drinking water. The site lies within the City of Utica, which receives its water from Hinckley Reservoir, located 15 miles north of Utica (Utica City Water Board, 1995). The nearest groundwater usage is in the adjacent Towns of Marcy and Deerfield, outside the City of Utica limits (URS, 1992a). Marcy is located approximately 5,000 to 6,000 feet hydraulically upgradient of the DSA sites and Deerfield lies approximately 3,000 to 4,000 feet hydraulically upgradient of the DSA sites. DSA-1 is also across the Mohawk River from Deerfield.

### 3.3.4 Major Hydrogeologic Units

Based on well and boring information from the DSAs and the area, there are three hydrogeologic units or aquifers in the area of the DSAs and Harbor Point peninsula:

- The shallow aquifer (within the upper fluvial unit and dredge material) consists of dredge material, fluvial fine grained sediments, and peat grading laterally into silt and clay.
- The intermediate aquifer (within the lower fluvial unit) consists of fluvial sands and some gravel. The lower fluvial, or intermediate zone is the most permeable of the three units, and contains coarser sediments.
- The deep aquifer (within the glacial lacustrine unit) consists of glacial lacustrine silts and sands with discontinuous thin clay and gravel layers.
- All wells in the DSAs were screened in the shallow aquifer.

The aquifers and the dredged fill are differentiated primarily by variations in grain size and clay content. Most soil borings and well borings were drilled through the dredged material and were terminated in the top of the upper fluvial aquitard zone (mottled clay layer). The dense till below the clastic sediments was not penetrated in the DSAs. However, based on geologic cross sections of the Harbor Point peninsula (Parsons ES, 1995c), the till represents a lower boundary to the unconsolidated sediments in the DSAs.

Monitoring wells in the DSAs were drilled to the upper aquitard, and screened in the shallow aquifer. Hydraulic conductivity and groundwater flow data are also from the upper (shallow) aquifer.

### 3.3.5 Site Hydrogeology

#### DSA-1

Groundwater flow in the shallow aquifer in DSA-1 is generally radial to the nearest surface water body. Groundwater elevation contour maps for November 17, 1994 and May 16, 1995 are presented on Plates 3.5 and 3.6 respectively. Groundwater elevations are highest at the northwestern edge of the bermed area in MW-104S on November 17, 1994 and in MW-101S on May 16, 1995. Both wells fall within a groundwater mound which is centered over the east central portion of the DSA-1 peninsula. Gradients are relatively flat in the center of the peninsula (0.006 to 0.008 ft/ft) and steeper near the edges (0.04 to 0.05 ft/ft on the harbor side and 0.075 to 0.14 ft/ft on the Mohawk River side). Groundwater elevations were generally higher and gradients were steeper on May 16, 1995 than they were on November 17, 1994.

Hydraulic conductivities measured using slug test methods were variable and ranged from .04 ft/day to 14.40 ft/day with a mean of 1.45 ft/day in wells screened in the dredge materials. Hydraulic conductivity results from slug tests are summarized in Table 3.2 and presented in Appendix G. Hydraulic conductivities measured in wells located outside the DSA, in upper fluvial sediments, ranged from 0.01 ft/day to 0.83 ft/day with a mean of 0.154 ft/day. Measured hydraulic conductivities were in general agreement with those predicted based on grain size analyses. Hydraulic conductivities of dredge material were higher than the upper fluvial sediments by approximately an order of magnitude.

Due to the berms and sandy nature of the dredge spoils material, most of the precipitation on the DSA-1 peninsula infiltrates into the dredge material or collects in intermittent ponds in the ditches and depressions. Ponded water then either infiltrates to the subsurface or returns to the atmosphere through evapotranspiration.

### DSA-2

Groundwater flow in the shallow aquifer at DSA-2 is radial to the nearest surface water body. Groundwater elevation contour maps for November 17, 1994 and May 16, 1995 are presented on Plates 3.5 and 3.6, respectively. There is a groundwater mound present which is centered over the highest topographic area. The groundwater intersects the ground surface in several places, forming ponded areas. One area is on the northeast side between the gravel road and the DSA near surface water and sediment samples SW/SD-201 (see Plate 2.1). The other area is in an excavated depression located in the center of an elevated portion near samples SW/SD-202. The regional gradient is to the southwest toward the Mohawk River. Shallow gradients on the northeast side of the DSA are to the northeast toward the Erie Canal. It is expected that most of the flow on the northeast side is deflected downward by the clay lining of the Erie Canal. The localized flow then reverses and joins the southwesterly regional flow to the Mohawk River. Gradients are relatively flat in the center of DSA-2 (as low as 0.006 to 0.007 ft/ft) and are much steeper near the edges ( 0.21 ft/ft on the Mohawk River side and 0.05 to 0.065 ft/ft on the Erie Canal side).

Most groundwater elevations were slightly higher on May 16, 1995 than on November 17, 1994. The overall shallow groundwater picture was very similar for both months.

Hydraulic conductivities measured using slug test methods ranged from 3.28 ft/day to 110.32 ft/day with a mean of 14.1 ft/day in wells screened in the dredge materials (Table 3.2). Hydraulic conductivities measured in wells outside the dredge spoils materials ranged from 0.01 ft/day to 1.18 ft/day with a mean of .109 ft/day in wells screened in the upper fluvial sediments. Measured hydraulic conductivities were in general agreement with those predicted based on grain size analyses. Hydraulic conductivities of dredge material were higher than the upper fluvial sediments by up to two orders of magnitude.

Due to the berms and sandy nature of the dredge spoils material, most of the precipitation on DSA-2 infiltrates into the dredge material or collects in the ditches and depressions. The ponded water then infiltrates or returns to the atmosphere through evapotranspiration.

### DSA-3

Groundwater flow in the shallow aquifer at DSA-3 is radial to the nearest surface water body. Groundwater elevation contour maps for November 17, 1994 and May 16, 1995 are presented on Plates 3.5 and 3.6, respectively. There is a groundwater mound present which is centered over the northern half of DSA-3. The groundwater is exposed at the surface as ponded areas within the ditches inside the berm. One area is

# TABLE 3.2

## NIAGARA MOHAWK POWER CORPORATION
## HARBOR POINT – DSA
## GROUNDWATER ELEVATION DATA

| WELL ID | LOCATION | TOC feet (AMSL) | DATE: 7/26/94 | DATE: 9/15/94 | DATE: 11/17/94 | DATE: 2/14/95 | DATE: 5/16/95 |
|---|---|---|---|---|---|---|---|
| MW–101S | DSA–1 | 414.02 | 404.66 | 403.01 | 404.00 | 406.36 | 406.28 |
| MW–102S | DSA–1 | 410.31 | 404.46 | 403.58 | 404.32 | 405.55 | 405.67 |
| MW–103S | DSA–1 | 406.07 | 398.69 | 398.52 | 399.05 | 399.62 | 399.63 |
| MW–104S | DSA–1 | 409.95 | 404.47 | 403.91 | 404.49 | 405.18 | 404.85 |
| MW–105S | DSA–1 | 410.52 | 403.78 | 403.09 | 403.83 | 404.70 | 404.47 |
| MW–106S | DSA–1 | 412.23 | 402.97 | 400.67 | 402.15 | 405.18 | 405.11 |
| MW–107S | DSA–1 | 405.65 | NI | NI | NI | NI | 403.02 |
| MW–108S | DSA–1 | 410.35 | NI | NI | NI | NI | 403.77 |
| MW–109S | DSA–1 | 411.18 | NI | NI | NI | NI | 404.44 |
| MW–110S | DSA–1 | 411.39 | NI | NI | NI | NI | 404.90 |
| MW–111S | DSA–1 | 414.81 | NI | NI | NI | NI | 403.48 |
| MW–112S | DSA–1 | 412.58 | NI | NI | NI | NI | 405.07 |
| MW–200S | DSA–2 | 414.92 | 407.06 | 406.66 | 406.71 | 406.96 | 407.07 |
| MW–201S | DSA–2 | 421.23 | 408.62 | 414.14 | 408.32 | 408.72 | 408.73 |
| MW–202S | DSA–2 | 414.69 | 407.79 | 407.71 | 407.72 | 408.19 | 408.07 |
| MW–203S | DSA–2 | 413.81 | 403.17 | 407.74 | 407.31 | 408.48 | 409.69 |
| MW–204S | DSA–2 | 430.77 | 411.19 | 412.13 | 412.06 | 411.79 | 411.12 |
| MW–205S | DSA–2 | 425.13 | 410.06 | 409.38 | 409.40 | 409.92 | 410.02 |
| MW–206S | DSA–2 | 417.65 |  |  |  |  | 410.47 |
| MW–301S | DSA–3 | 413.15 | 403.95 | 402.15 | 401.72 | 404.47 | 406.28 |
| MW–302S | DSA–3 | 404.26 | 400.83 | 400.87 | 401.02 |  | 401.02 |
| MW–303S | DSA–3 | 403.85 | 399.37 | 399.62 | 399.98 | 399.37 | 400.00 |
| MW–304S | DSA–3 | 403.39 | 400.07 | 400.12 | 400.33 | 400.03 | 400.24 |

# TABLE 3.3
# SLUG TEST ANALYSIS RESULTS
# DREDGE SPOILS AREAS

| WELL | Depth to Screen Top (FEET) | Depth to Screen Bot. (FEET) | Screen Length (FEET) | Saturated Thickness (FEET) | Screen Mid-point (FEET) | Geologic Unit | ANALYSIS METHOD | HYDRAULIC CONDUCTIVITY (FT/MIN) | HYDRAULIC CONDUCTIVITY (FT/DAY) | HYDRAULIC CONDUCTIVITY (CM/SEC) |
|---|---|---|---|---|---|---|---|---|---|---|
| MW101S | 5 | 10 | 5 | 6.13 | 7.5 | DS | *BOUWER & RICE* | 2.95E-05 | 0.04 | 1.41E-05 |
| MW102S | 5 | 10 | 5 | 10.78 | 7.5 | UF | *BOUWER & RICE* | 1.18E-04 | 0.17 | 6.00E-05 |
| MW103S | 5 | 10 | 5 | 15.05 | 7.5 | UF | *BOUWER & RICE* | 5.43E-06 | 0.01 | 3.53E-06 |
| MW104S | 4 | 5 | 1 | 4.97 | 4.5 | DS | *BOUWER & RICE* | 3.52E-03 | 5.07 | 1.79E-03 |
| MW105S | 4 | 5 | 1 | 3.33 | 4.5 | DS | *BOUWER & RICE* | 1.07E-03 | 1.54 | 5.43E-04 |
| MW106S | 4 | 5 | 1 | 12.87 | 4.5 | UF | *BOUWER & RICE* | 5.77E-04 | 0.83 | 2.93E-04 |
| MW107S | 4 | 14 | 10 | 11.6 | 9 | UF | *BOUWER & RICE* | 2.79E-04 | 0.40 | 1.41E-04 |
| MW108S | 4 | 9 | 5 | 5.8 | 6.5 | DS | *BOUWER & RICE* | 2.30E-03 | 3.31 | 1.17E-03 |
| MW109S | 3 | 13 | 10 | 9.31 | 8 | DS | *BOUWER & RICE* | 7.98E-04 | 1.15 | 4.06E-04 |
| MW110S | 3 | 13 | 10 | 9.65 | 8 | DS | *BOUWER & RICE* | 1.00E-02 | 14.40 | 5.08E-03 |
| MW111S | 4 | 14 | 10 | 6.09 | 9 | DS | *BOUWER & RICE* | 7.96E-05 | 0.11 | 3.88E-05 |
| MW112S | 6 | 11 | 5 | 6.87 | 8.5 | DS | *BOUWER & RICE* | 7.19E-03 | 10.35 | 3.65E-03 |
| MW200S | 6 | 11 | 5 | 4.83 | 8.5 | DS | *BOUWER & RICE* | 5.40E-03 | 7.78 | 2.74E-03 |
| MW201S | 9 | 19 | 10 | 7.96 | 14 | UF | *BOUWER & RICE* | 8.18E-04 | 1.18 | 4.16E-04 |
| MW203S | 4 | 19 | 15 | 15.01 | 11.5 | UF | *BOUWER & RICE* | 7.48E-06 | 0.01 | 3.53E-06 |
| MW205S | 17 | 27 | 10 | 13.64 | 22 | DS | *BOUWER & RICE* | 2.28E-03 | 3.28 | 1.16E-03 |
| MW206S | 4 | 9 | 5 | 7.9 | 6.5 | DS | *BOUWER & RICE* | 7.66E-02 | 110.32 | 3.89E-02 |
| MW302S | 2.5 | 7.5 | 5 | 7.35 | 5 | UF | *BOUWER & RICE* | 2.44E-04 | 0.35 | 1.23E-04 |
| MW303S | 4 | 14 | 10 | 12.61 | 9 | UF | *BOUWER & RICE* | 5.85E-04 | 0.84 | 2.96E-04 |
| MW304S | 2.5 | 7.5 | 5 | 6.92 | 5 | UF | *BOUWER & RICE* | 8.09E-04 | 1.16 | 4.09E-04 |

DS = Dredge Spoils Material
UF = Upper Fluvial Sediments

Geometric Mean Formula

$$\sqrt[n]{K_1 \times K_2 \times K_3 \times \dots\dots\dots K_n}$$

| | HYDRAULIC CONDUCTIVITY (K) | | |
|---|---|---|---|
| | (FT/DAY) | (CM/SEC) | No. of Wells |
| DSA-1 Geometric Mean Upper Fluvial: | 1.54E-01 | 5.44E-05 | 4 |
| DSA-1 Geometric Mean Dredge Spoil Material: | 1.45E+00 | 5.11E-04 | 8 |
| DSA-2 Geometric Mean Upper Fluvial: | 1.09E-01 | 3.83E-05 | 2 |
| DSA-2 Geometric Mean Dredge Spoil Material: | 1.41E+01 | 4.98E-03 | 3 |
| DSA-3 Geometric Mean Upper Fluvial: | 6.99E-01 | 2.46E-04 | 3 |
| | | | |
| DSA-1 Geometric Mean of All Wells: | 6.87E-01 | 2.42E-04 | 12 |
| DSA-2 Geometric Mean of All Wells: | 2.02E+00 | 7.11E-04 | 5 |
| DSA-3 Geometric Mean of All Wells: | 6.99E-01 | 2.46E-04 | 3 |

# SECTION 4

# NATURE AND EXTENT OF CONTAMINATION

## 4.1 INTRODUCTION

The nature and extent of contamination is discussed for each DSA, by media and by constituent groups. Analytical data for surface soils, subsurface soils, sediments, surface water and groundwater were imported into a comprehensive site database. The data were then tabulated and plotted on maps and cross sections where appropriate to facilitate interpretation of the results. Comparison to regulatory standards, criteria, and guidelines (SCGs) was not performed as part of this investigation. Rather, these comparisons will be completed as part of the Harbor Point FS. This approach is consistent with "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (USEPA, 1988).

Surface soils, subsurface soils, surface water, sediment, and groundwater samples were analyzed for the presence of SVOCs including PAHs, VOCs including BTEX, cyanide, pesticides/PCBs and metals. Some subsurface soil samples were analyzed for PAHs only. Samples with visible NAPL were analyzed by GC-FID methods to characterize the NAPL. All analytical results are summarized in data tables but only MGP indicator compounds (PAHs, BTEX, cyanide and certain metals) and PCBs are discussed in detail below. VOCs other than BTEX were detected in trace amounts in limited samples. These VOCs are common laboratory contaminants. SVOCs other than PAHs and pesticides were detected in trace amounts in a small number of samples. These non-MGP compounds were not detected in significant concentrations and are not site-related so will not be discussed further.

Four surface soil samples collected during the RI were used as background samples. Background sample locations are identified on Figure 4.1. Two were from the Utica Marsh west of DSA-3 (SS-414A, SS-415A), one was from near the canal lock (SS-412A), and one was between the southern portion of DSA-3 and the Mohawk River (SS-321A). The background sample concentrations were compared to the results of the subsurface and surface soil samples. Most organic compounds were not detected in the background samples, with the exception of PAHs. Total PAHs ranged between 0.051 and 9.98 mg/kg in the background samples.

Three wells which were also utilized as background samples for the site-wide Groundwater Study and for the MVO RI were used for this DSA RI. These groundwater wells represent general groundwater background conditions in the area. MW-302S is located west of DSA-3, and MW-24S and MW-50S are located at the southern end of the Harbor Point peninsula. No organic compounds were detected in any of these three background wells. Metals were detected and are quantitatively compared to onsite concentrations.

Up to 22 metals were detected in surface soil, subsurface soil, sediment, and groundwater samples. Metals are naturally occurring in both soils and groundwater. Metals concentrations in groundwater are in part a function of turbidity in samples. All wells were developed prior to sampling to reduce turbidity. The presence of some turbidity can not be avoided during sampling which can increase the concentrations of metals beyond what would normally be in solution.

Metals concentrations in the various media were compared to statistical background levels based on background upper tolerance limits (USEPA, 1989) using four surface soil samples (SS-321A, SS-412A, SS-414A, and SS-415A) and four background groundwater samples from three wells (MW-24S, MW-50S, and two rounds averaged from MW-302S). Background upper tolerance limits (BUTLs) were generated using statistical calculations to determine appropriate background concentrations for individual metals. The BUTLs were used to focus the discussion of metals to those of most significance based on human health risk criteria. Calculated background upper tolerance levels (BUTLs) were also used for the DSA risk assessment which is presented in Section 6. The calculation of BUTLs and the determination of which metals are considered significant are also discussed in Section 6.

Of the 22 metals detected overall, three metals (arsenic, beryllium, and manganese) are considered significant based on the human health risk assessment for various media:

- surface soil (arsenic, beryllium, manganese)
- subsurface soil (arsenic, beryllium, manganese).

However, beryllium and manganese are not known to be associated with MGP residuals (EEI, 1984).

Certain metals that are not considered to pose significant human health risks, including aluminum, calcium, iron, magnesium, potassium, and sodium, were not included in the BUTL calculations. These metals are normally not evaluated in human health risk assessments because of their low toxicity.

The fate and transport characteristics of the principal organic and inorganic constituents are discussed in Section 5.

Analytical results for soil and sediment samples are presented in milligrams per kilogram (mg/kg). Because concentrations of constituents in groundwater and surface water were so low, groundwater and surface water results are presented in micrograms per liter (ug/L).

Sections 4.2, 4.3 and 4.4 are divided into eight subsections. Within each subsection analytical results for the major constituent groups including PAHs, BTEX, cyanide, PCBs, metals, and other media specific analyses are discussed. The subsections include:

- Introduction;
- Subsurface Soils;
- Surface Soils;

- Sediment;
- Surface Water;
- Groundwater (Phase I);
- Groundwater (Phase II); and
- Phase I and Phase II Groundwater Results Compared.

## 4.2 DSA-1 ANALYTICAL RESULTS

### 4.2.1 Introduction

Phase I sampling was conducted inside and adjacent to the bermed areas in DSA-1. Reviews of historical photographs revealed dredge spoils may have also been deposited between the bermed area and the end of the peninsula. Phase II sampling was conducted to evaluate this area.

### 4.2.2 Subsurface Soils (DSA-1)

Subsurface soil samples were collected during the drilling program from various depths in selected borings. Samples were selected for analysis based on field observations and Ensys$^{tm}$ screening as previously described. This screening allowed the sample with the greatest indications of the presence of constituents to be sent for laboratory analyses. All Phase I subsurface soil samples were collected from within DSA-1 berms or adjacent to the berms. Phase II samples were collected between the northwest berm and the end of the DSA-1 peninsula, and at selected other locations to fill data gaps. All samples except SB-132P were collected from above the first aquitard. Table 2.2 presents sample intervals and analyses. Appendix A and B contain complete records of subsurface soil data.

**PAHs**

PAHs were detected in 42 of 47 subsurface soil samples analyzed from DSA-1. As discussed in Section 2 samples which screened the highest or had the greatest visual field evidence of constituents were chosen for laboratory analyses. Most samples analyzed were from the deeper parts of the dredge material but above the aquitard. PAH concentrations are posted on Plate 4.1 and are summarized in Table 4.1. Concentrations ranged from not detected (in five samples) to 1,725 mg/kg (SB-115) inside the bermed area. The three highest detected concentrations of PAHs (1,725 mg/kg, 1,536 mg/kg and 1457 mg/kg) were detected inside the bermed area along the west side. This area is nearest the neck of the Utica Terminal Harbor where it joins the Barge Canal. PAH concentrations were comparatively low in the southeast part of DSA-1 in the area thought to be unused. A deep sample collected from below the confining layer in SB-132 located between the bermed area and the harbor had no detectable PAHs.

PAH concentrations were lower in the northwestern half of the peninsula than in the bermed area (southwestern half). Concentrations ranged from not detected (SB-134) to 226.49 mg/kg (MW-105S) between the berm and the northwestern end of the DSA-1 peninsula.

**BTEX**

BTEX compounds were detected in seven of eight samples collected inside the bermed area (Plate 4.1 and Table 4.1). Concentrations ranged from not detected (SB-125) to 187.60 mg/kg (SB-104). The highest BTEX concentrations were generally in the central part of the DSA within the bermed area.

BTEX concentrations were comparatively low outside the bermed area. Concentrations ranged from not detected in many samples to 13.06 mg/kg in MW-105S. There is no obvious pattern of BTEX distribution outside the bermed area. A deep sample collected from below the confining layer in SB-132 located between the bermed area and the harbor had no detectable BTEX.

**Cyanide**

Cyanide was not detected in subsurface soils at DSA-1.

**PCBs**

PCBs were detected in six of nine subsurface soils analyzed for PCBs within the bermed area of DSA-1 at concentrations generally two or more orders of magnitude lower than PAHs and BTEX (see Plate 4.1 and Table 4.1). Concentrations ranged from 0.057 mg/kg (SB-125) to 2.00 mg/kg (SB-115). Based on previous sample results from the NMPC Harbor Point site, the NMPC site is not a source of PCB contamination. PCBs were not detected in eight samples collected outside the bermed area. There was no pattern to the distribution of PCBs within the bermed area. Concentrations were within the same orders of magnitude as detected in surface soil samples. A deep sample collected from below the confining layer in SB-132 located between the bermed area and the harbor had no detectable PCBs.

**Metals**

Up to 21 metals were detected in subsurface soil samples analyzed for TAL inorganic compounds. Most metals are naturally-occurring in both soils and groundwater. Metals concentrations were compared to statistical background levels based on upper tolerance limits (USEPA, 1989) using four background samples.

Thirteen metals were detected above the BUTLs in subsurface soil samples collected from DSA-1. Background upper tolerance limits, maximum concentrations, the number of samples containing metals above background versus total samples and locations where metals exceeded BUTLs are presented on Table 4.2. The greatest number of metals above the BUTLs were detected in SB-125 (7) and SB-115 (6). The number of metals detected above the BUTLs was generally greater inside the bermed area than outside.

The concentrations of the three metals of concern based on the human health risk assessment ranged from 1.9 mg/kg to 13.5 mg/kg (arsenic), from not detected to 1.6 mg/kg (beryllium) and from 220 mg/kg to 610 mg/kg (manganese) in subsurface soil samples and were distributed as follows:

- Arsenic was present above the BUTL (12.5 mg/kg) in only one of 19 samples at a concentration of 13.5 mg/kg (SB-115) and detected below the BUTL in the other 18 samples. The one higher arsenic concentration was inside the bermed area in SB-115, which also contained five other metals above the BUTL. Boring SB-115 is located near the northwest corner of DSA-1 in an area which also contained elevated PAHs.

- Beryllium was detected in 17 of 19 subsurface soil samples but only two had concentrations above the BUTL (1.4 mg/kg). Both samples had concentrations of 1.6 mg/kg (SB-112 and SB-125) and were collected inside the bermed area.
- Manganese was present above the BUTL (517.9 mg/kg) in seven of the 19 samples. The highest concentration of manganese was detected in sample SB-125 (610 mg/kg) located inside the bermed area. Samples containing the highest concentrations of manganese were collected inside the bermed area or adjacent to the northwest berm.

**TOC**

Seven samples were analyzed for total organic carbon (TOC). TOC concentrations range from 6,826 mg/kg to 47,316 mg/kg (0.7% to 4.7 %). TOC results are summarized on Table 4.1 and discussed in more detail in Section 5.

**GC-FID**

Four samples were analyzed for the presence of total petroleum hydrocarbons (TPH) by GC-FID methods. These samples had visible NAPL. Three samples (SB-130G, SB-144E and SB-145C) collected inside the bermed area contained TPH as #2 fuel oil at concentrations ranging from 110 to 6,000 mg/kg. One sample collected northwest of the bermed area contained TPH as $C_{10}$ to $C_{20}$ petroleum (similar to #4, #5, and #6 fuel oil or lubricating oil) at a concentration of 22 mg/kg. Most of the visible NAPL was observed within the bermed area.

**Visible NAPL**

NAPL was observed in a total of six soil borings. Four of these borings were located in the center of DSA-1 and two were northwest of the bermed area (MW-104S and MW-105S). The NAPL was not present in a distinct product layer or zone but was observed in scattered discontinuous blebs adsorbed to the soil. Two additional borings had stained soils, eighteen borings had visible sheens and 21 had organic odors. Soil descriptions are contained in soil boring logs included in Appendix C. There was a strong correlation between subsurface soil and groundwater samples that contained elevated PAH and BTEX concentrations and NAPL, sheens and odors described in samples.

### 4.2.3 Surface Soils (DSA-1)

Surface soil samples were collected from the 0.5- to 1-foot interval below ground surface from various areas around the site. Decontaminated stainless steel equipment was used to collect samples. The RI sampling methodology and rationale are discussed in Section 2.3. Table 2.2 presents sample intervals and analyses. Plate 4.2 and Table 4.3 present a summary of the surface soil data.

### PAHs

PAHs were detected in all surface soils collected at DSA-1. PAH concentrations are posted on Plate 4.2 and are summarized in Table 4.3. Concentrations ranged from 9.7 mg/kg (SS-106) to 1,105 mg/kg (SS-101) inside the bermed area. The highest concentrations of PAHs (1,105 mg/kg and 1,037.6 mg/kg) were detected in two samples inside the bermed area along the southwest side. This area is nearest the neck of the Utica Terminal Harbor where it joins the Barge Canal.

PAH concentrations were lower by at least one order of magnitude outside the bermed area, compared to within the bermed area. Concentrations ranged from 1.46 mg/kg (SS-116) to 22.75 mg/kg (SS-113) between the berm and the northwestern end of the DSA-1 peninsula.

### BTEX

No BTEX was detected in surface soil samples.

### Cyanide

Cyanide was not detected in surface soil samples.

### PCBs

PCBs were detected in all ten surface soil samples collected at DSA-1 within the berms, at concentrations ranging from 0.50 mg/kg (SS-101) to 6 mg/kg (SS-108). Based on previous sample results from the NMPC Harbor Point site, the NMPC site is not a source of PCB contamination. There does not appear to be a pattern to the PCB distribution (see Plate 4.2 and Table 4.3).

PCBs were detected in three of seven surface soil samples collected outside the berms at concentrations ranging from not detected limits to 0.78 mg/kg (SS-113). PCBs were detected in samples SS-113 and SS-111 collected near the outside of the berm, and sample SS-112 collected near MW-107S located between the RPS Trucking yard and the Canal Corp. property. Sample SS-111 was collected below the drainage pipe discharges in the western corner of the bermed area, and SS-113 was collected within 50 feet of MW-104S and within 50 feet of the berm. The four samples collected northwest of MW-104S on the DSA-1 peninsula did not contain detectable concentrations of PCBs.

### Metals

Up to 22 metals were detected in surface soil samples analyzed for TAL inorganic compounds. Metals are naturally-occurring in both soils and groundwater. Metals concentrations were compared to statistical background levels based on upper tolerance limits (USEPA, 1989) using four background samples.

Up to 13 metals were detected above the BUTLs in surface soil samples collected from DSA-1. BUTLs, maximum concentrations, the number of samples containing metals above background versus total samples, and locations where metals exceeded BUTLs are presented on Table 4.4. The greatest number of metals above the BUTLs were detected in SS-108 (11), SS-110 (11), SS-104 (10), and SS-105 (10). There was no pattern to the distribution of metals above the BUTLs in DSA-1 with the exception that the number of metals detected above the BUTLs was generally greater inside the bermed area than outside.

The concentrations of the three metals of concern based on the human health risk assessment ranged from 3.5 mg/kg to 21.4 mg/kg (arsenic), from not detected to 1.4 mg/kg (beryllium), and from 239 mg/kg to 1,200 mg/kg (manganese) in surface soil samples and were distributed as follows:

- Arsenic was present above the BUTL (12.5 mg/kg) in only five of 19 samples. The highest concentrations were detected in SS-117 located at the end of the peninsula. The other four samples above the BUTL were located inside the bermed area. In general the higher arsenic concentrations were inside the bermed area, except for sample SS-117.
- Beryllium was detected in 17 of 19 surface soil samples but none had concentrations above the BUTL (1.4 mg/kg).
- Manganese was present above the BUTL (517.9 mg/kg) in ten of the 19 samples. The highest concentration was detected in sample SS-101 (903 mg/kg) located inside the bermed area. Five other samples were above the BUTL inside the bermed area. Four samples above the BUTL were located outside the berm (between the Canal Corporation and RPS Trucking, near the overflow pipes at the western corner of DSA-1, northwest of the berm, and at the end of the peninsula). There does not appear to be any pattern to the manganese distributions.

#### TOC

The surface soil samples were also analyzed for TOC content. TOC values ranged from 3,461 mg/kg to 556,168 mg/kg (0.3% and 55.6%) and are summarized on Table 4.3. There was no correlation between TOC concentrations and PAH concentrations in surface soil samples.

### 4.2.4 Sediment (DSA-1)

Two sediment samples and two corresponding surface water samples were collected from inside the bermed area of DSA-1. These samples were analyzed for the presence of PAHs, BTEX, cyanide, PCBs, and metals. The surface water and sediment pathways were not considered as pathways of concern in the human health risk assessment due to limited access by the public (see discussions in Section 5 Fate and Transport and Section 6 Human Health Risk Assessment).

#### PAHs

PAHs were detected in both sediment samples collected inside DSA-1 at low concentrations (Plate 4.2). All of the individual PAHs detected were at estimated concentrations below the contract required detection limits (CRDLs). PAHs were detected at 20.63 mg/kg in SD-101 and 27.99 mg/kg in SD-102. The PAH concentrations in sediments were less than those detected in surface soils, except in SS-106.

**BTEX**

No BTEX compounds were detected in sediment samples.

**Cyanide**

Cyanide was not detected in sediment samples.

**PCBs**

PCBs were detected in both sediment samples at concentrations ranging from 1.7 mg/kg to 1.9 mg/kg. Sediment sample concentrations were within the same order of magnitude as surface soil concentrations.

**Metals**

Up to nineteen metals were detected in the two sediment samples analyzed for TAL inorganic compounds. Analytical results are summarized in Table 4.5.

**TOC**

Both sediment samples were analyzed for TOC. Concentrations ranged from 112,000 mg/kg to 114,000 mg/kg (11.2% to 11.4%). TOC concentrations fell within the range detected in surface soils.

### 4.2.5 Surface Water (DSA-1)

Two surface water samples were collected from inside the bermed area of DSA-1. These samples were analyzed for the presence of PAHs, BTEX, cyanide, PCBs, and metals. The results are summarized on Table 4.6. The surface water pathway was not considered as a pathway of concern in the human health risk assessment due to limited access by the public (see discussions in Section 5 Fate and Transport and Section 6 Human Health Risk Assessment).

**PAHs**

One PAH (naphthalene) was detected in one of two surface water samples (SW-101) at a very low concentration (7 ug/L). PAHs were not detected in the other sample (SW-102). Sample SW-101 was collected from a ponded area in the ditch located along the southern side of the DSA. This area is 130 feet east of sample SS-101, which contained the highest concentrations of PAHs in the surface soils.

**BTEX**

No BTEX compounds were detected in surface water samples.

**Cyanide**

Cyanide was not detected in surface water samples.

**PCBs**

PCBs were detected in one of two surface water samples (SW-101) at a concentration of 0.66 ug/L.

#### Metals

Up to 15 metals were detected in surface water samples collected from two ponded areas within the bermed area. Surface water results are summarized in Table 4.6. These metals were also detected in sediment samples collected in the same vicinity. The potential for migration of metals to surface water bodies is discussed in more detail in Section 5, Contaminant Fate and Transport.

### 4.2.6 Phase I Groundwater-August 1994 (DSA-1)

Two rounds of groundwater sampling were conducted at DSA-1, Phase I in August 1994 and Phase II in March of 1995. Phase I results are discussed below and Phase II results are presented in Section 4.2.7.

#### PAHs

PAHs (primarily naphthalene and 2-methylnaphthaline) were detected in four of six groundwater samples. Concentrations ranged from not detected to 535 ug/L. Concentrations are posted on Plate 4.2 and are summarized in Table 4.7. The highest concentrations were observed in MW-101S located in the center of the bermed area, and in MW-105S located outside the northwestern berm. MW-105S is located at a side gradient to downgradient position with respect to the bermed area. It is closest to the area inside the berms containing the most visible NAPL and the highest PAH concentrations in the soil. The NAPL was not present in a distinct product layer or zone but was observed in scattered discontinuous blebs adsorbed to the soil. Low concentrations of PAHs near or below the CRDL were detected in MW-102S (44 ug/L), located south of the bermed area, and in MW-104S (6 ug/L) located northwest of the bermed area. Thus, the data indicate that the PAH distribution is limited to inside the bermed area and immediately adjacent to the berms. Phase II wells were installed to confirm the limits of PAHs detected in MW-104S and MW-105S.

#### BTEX

BTEX (primarily ethylbenzene and xylene) was detected in four of six groundwater samples at concentrations ranging from 16 ug/L to 151 ug/L. Concentrations are posted on Plate 4.2 and are summarized in Table 4.7. The groundwater samples containing BTEX came from the same wells which contained PAHs, indicating a similar source area. The highest concentrations were detected in MW-105S (151 ug/L) and MW-101S (69 ug/L). Concentrations in the remaining wells were only slightly above CRDLs.

#### Cyanide

Cyanide was not detected in any of the six Phase I groundwater samples.

#### PCBs

PCBs were not detected in any of the six Phase I groundwater samples.

#### Metals

Up to 20 metals were detected in the six groundwater samples analyzed for TAL inorganic compounds. Metals are naturally-occurring in sediments, soils, and groundwater. Metals concentrations were compared to statistical background levels in groundwater based on upper tolerance limits (USEPA, 1989) using four background samples.

Thirteen of the 20 metals detected were above the BUTLs in at least one groundwater sample (Table 4.8). The greatest number of metals above the BUTLs were in MW-101S (13) located in the center of DSA-1, followed by MW-105S (11) located northwest of the bermed area, and MW-106S (11) located between the berms and the Mohawk River.

### 4.2.7 Phase II Groundwater-March 1995 (DSA-1)

#### PAHs

PAHs (naphthalene and 2-methylnaphthalene) were detected in only one of twelve groundwater samples during Phase II sampling. Concentrations are posted on Plate 4.2 and are summarized in Table 4.9. Individual PAHs totaling 24 ug/L were detected slightly above CRDLs in MW-102S, located south of the bermed area. MW-102S is located between the bermed area and a light industrial area which includes a RPS trucking yard, ice plant, and two former bulk storage tanks. These former tanks were located approximately where the RPS trucking yard presently exists. No PAHs were detected in the two wells (MW-105S and MW-104S) located near the berm and the northwest end of the peninsula.

#### BTEX

BTEX was detected in two of twelve groundwater samples at concentrations ranging from 12 ug/L (MW-102S) to 187 ug/L (MW-112S), (see Plate 4.2 and Table 4.9). MW-102S is located south of the bermed area and MW-112S is located north of the bermed area along the Mohawk River. No PAHs were detected in association with the BTEX in MW-112S.

#### Cyanide

Cyanide was not detected in any of the twelve Phase II groundwater samples.

#### PCBs

PCBs were not detected in any of the twelve Phase II groundwater samples.

#### Metals

Up to 20 metals were detected in the 12 groundwater samples analyzed for TAL inorganic compounds (Table 4.9). Metals are naturally-occurring in sediments, soils, and groundwater. Metals concentrations were compared to statistical background levels in groundwater based on upper tolerance limits (USEPA, 1989) using four background samples.

Ten of the 20 metals detected were above the BUTLs in at least one groundwater sample (Table 4.10). The greatest number of metals above the BUTLs were in MW-111S (8) located at the northwest end of the peninsula, followed by MW-102S (7) located south of the bermed area. The numbers of metals above the BUTLs were lower during Phase II sampling, except in MW-103S.

### 4.2.8 Phase I and Phase II Groundwater Results Comparisons (DSA-1)

PAHs were detected in four of six Phase I samples. In Phase II, only a single well contained PAHs at a concentration of 24 ug/L in MW-102S located southeast of the DSA. Phase II BTEX concentrations were lower than Phase I concentrations. Metals detected above the BUTLs decreased in five of six Phase II samples when compared to Phase I.

## 4.3 DSA-2 Analytical Results

### 4.3.1 Introduction

Phase I sampling was conducted inside and adjacent to the bermed areas in DSA-2. Reviews of historical photographs revealed dredge spoil deposition may have also been conducted southeast of the present bermed area. Phase II sampling was conducted to evaluate this area and to fill Phase I data gaps.

### 4.3.2 Subsurface Soils (DSA-2)

Subsurface soil samples were collected during the drilling program from various depths in selected borings. Samples were selected for analysis based on field observations and Ensys$^{tm}$ screening as previously described. All subsurface soil samples were collected from within DSA-2. All samples except SB-231 were collected from above the first aquitard. Table 2.2 presents sample intervals and analyses. Appendices A and B contain complete records of subsurface soil data.

#### PAHs

PAHs were detected in 32 of 33 subsurface soil samples collected above the first confining layer. Analytical results are summarized in Table 4.1 and are plotted in Plate 4.3. The single sample collected below the first confining layer did not contain detectable concentrations of PAHs, indicating the clay is inhibiting downward migration of PAHs. PAH concentrations ranged from not detected (SB-208) to 1,847.8 mg/kg (SB-225). Of the eight samples containing PAHs at concentrations over 500 mg/kg total PAHs, seven samples were collected in the southeastern third of the DSA. The highest concentrations were detected in samples collected near the southwestern and northeastern berms. The total PAH concentrations in the central and northwestern thirds of DSA-2 were generally lower than in the southeastern third.

#### BTEX

BTEX was detected in 16 of 20 samples collected above the first confining layer, with concentrations ranging from not detected to 3.86 mg/kg. The highest concentrations were detected in two samples collected at different depths in SB-225 (3.86 mg/kg and 3.48 mg/kg) located in the southeastern end of DSA-2, and in MW-205S (3.06 mg/kg) located in the center of the DSA. SB-231, the single sample collected from below the first confining layer, contained low concentrations (estimated below the CRDLs) of benzene and toluene totaling 0.007 mg/kg. These results also indicate that the confining layer is inhibiting downward migration of organic compounds.

### Cyanide

Cyanide was not detected in any subsurface soil samples collected at DSA-2.

### PCBs

PCBs were detected in five of 13 samples. Based on previous sample results from the NMPC Harbor Point site, the NMPC site is not a source of PCB contamination. PCB concentrations are plotted on Plate 4.3 and are summarized in Table 4.1. Concentrations ranged from not detected in eight samples to 20.10 mg/kg (SB-204). The highest concentrations were detected in the southeastern end of the DSA in SB-204 (20.1 mg/kg), SB-224 (4.40 mg/kg) and SB-225 (3.32 mg/kg).

### Metals

Up to 21 metals were detected in subsurface soil samples analyzed for TAL inorganic compounds Table 4.1. Metals are naturally-occurring in both soils and groundwater. Metals concentrations were compared to statistical background levels based on upper tolerance limits (USEPA, 1989) using four background samples.

Eleven metals were detected above the BUTLs in subsurface soil samples collected from DSA-2. BUTLs, maximum concentrations, the number of samples containing metals above background versus total samples, and locations where metals exceeded BUTLs are presented on Table 4.2. The greatest number of metals above the BUTLs were detected in SB-224 (9), SB-204 (8), and two samples from SB-225 (SB-225E 8 metals and SB-225H 8 metals). The numbers of metals above the BUTLs are greater in the southeastern end of DSA-2.

The concentrations of the three metals of concern based on the human health risk assessment ranged from 3.0 mg/kg to 9.7 mg/kg (arsenic), from not detected to 1.4 mg/kg (beryllium), and from 364 mg/kg to 784 mg/kg (manganese) and were distributed as follows:

- Arsenic was not detected above the BUTL (12.5 mg/kg) in any of the 13 samples. The highest concentration was detected in SB-204 (9.7 mg/kg) located in the center of the southeastern end of DSA-2.
- Beryllium was detected equal to the BUTL (1.4 mg/kg) in one of the 13 samples collected at DSA-2. The highest concentration was detected in SB-205 (1.4 mg/kg) located in the center of the southeastern end of the DSA.
- Manganese was detected above the BUTL (517.9 mg/kg) in all of the thirteen samples. The highest concentration was detected in SB-204 (784 mg/kg) located in the southeastern end of DSA-2. Samples collected in the southeast end generally had higher concentrations than in other areas. The only comparable concentration in the northwestern end was in the deep sample collected from below the confining layer in SB-231. The manganese concentration in SB-231 may be representative of naturally-occurring levels in the area. Concentrations of manganese were within the same order of magnitude as shallow soil samples.

**GC-FID**

Five samples were analyzed for the presence of TPH using GC-FID methods. Detected TPH fell in the #2 fuel oil range. Concentrations of TPH, reported as #2 fuel oil, ranged from 10 mg/kg to 3,500 mg/kg. The highest TPH concentration was detected in SB-234 (3,500 mg/kg) located in the southeast end of the DSA. This area had some of the highest PAH concentrations in DSA-2 subsurface soils.

**Visible NAPL**

NAPL was described in four soil borings. These borings were located in the center of DSA-2 and southwestern corner of the DSA. The NAPL was not present in a distinct product layer or zone but was observed in scattered discontinuous blebs adsorbed to the soil. Soils in seven additional borings had staining, eight borings had visible sheens, and 34 had organic odors. Soil descriptions are contained in soil boring logs included in Appendix C. There was a correlation between soil and groundwater samples that contained elevated PAH and BTEX concentrations and subsurface soil samples that had descriptions of NAPL, sheens, and odors.

### 4.3.3 Surface Soils (DSA-2)

Surface soil samples were collected from the 0.5- to 1-foot interval below ground surface from various areas around the site with stainless steel equipment. The sampling methodology and rationale are discussed in Section 2.3. Table 2.2 presents sample intervals and analyses. Plate 4.4 and Table 4.3 present a summary of the surface soil data.

**PAHs**

PAHs were detected in all eleven surface soils collected at DSA-2, in concentrations ranging from 10.83 mg/kg to 76.61 mg/kg (Plate 4.4 and Table 4.3). The highest concentrations of PAHs were detected in SS-201 (76.61 mg/kg) located near the northwest end, in SS-204 (61.42 mg/kg) located along the center of the southwest side, and in SS-203 (55.55 mg/kg) located in the center of the DSA. PAH concentrations in samples SS-413A and SS-208 collected at the southeastern end of the DSA had slightly lower concentrations (10.83 mg/kg and 16.49 mg/kg respectively). There does not appear to be an obvious pattern to the distribution of PAHs in surface soils.

**BTEX**

BTEX was not detected in surface soil samples, with the exception of toluene which was detected at 0.004 mg/kg (estimated below the detection limit) in SS-201 (Table 4.3).

**Cyanide**

Cyanide was not detected in any surface soil samples.

**PCBs**

PCBs were detected in all eleven surface soils collected at DSA-2, in concentrations ranging from 0.82 mg/kg to 6.99 mg/kg (Plate 4.4 and Table 4.3). Based on previous sample results from the NMPC Harbor Point site, the NMPC site is not a source of PCB contamination. The highest detected concentrations of PCBs (6.99 mg/kg) were detected in SS-203, located near the center of the DSA. Concentrations nearly as high were detected in SS-205 (6.57 mg/kg) and SS-210 (5.81 mg/kg), located in the southeast end of DSA-2 and SS-201 (5.71 mg/kg) located in the northwest end of the DSA. PCBs appear to be distributed throughout the entire DSA in surface soils. There was not a good correlation between PCBs detected throughout the DSA in surface soils (Section 4.3.2) and the limited distribution in subsurface soils.

### Metals

Up to 22 metals were detected in surface soil samples analyzed for TAL inorganic compounds (Table 4.3). Metals are naturally occurring in both soils and groundwater. Metals concentrations were compared to statistical background levels based on background upper tolerance limits (USEPA, 1989) using four background samples.

Up to ten metals were detected above the BUTLs in surface soil samples collected from DSA-2. Background upper tolerance limits, maximum concentrations, the number of samples containing metals above background versus total samples, and locations where metals exceeded BUTLs are presented on Table 4.4. The greatest number of metals above the BUTLs were detected in SS-203 (9), SS-209 (8), and SS-201 (7). The three samples containing the greatest numbers of metals above the BUTLs were spread along the center line of DSA-2.

The concentrations of the three metals of concern (based on human health risk assessment) ranged from 3.0 mg/kg to 7.4 mg/kg (arsenic), 0.24 mg/kg to 1.1 mg/kg (beryllium), and 308 mg/kg to 776 mg/kg (manganese) in surface soil samples and were distributed as follows:

- Arsenic was detected in all eleven surface soil samples but at concentrations below the BUTL (12.5 mg/kg). The highest concentration was detected in SS-203 at 7.4 mg/kg.
- Beryllium was detected in all eleven surface soils but at concentrations below the BUTL (1.4 mg/kg). The highest concentration was detected in SS-203 at 1.1 mg/kg.
- Manganese was detected in all eleven surface soil samples. Seven of the samples had concentrations exceeding the BUTL (517.9 mg/kg). The highest concentrations (776 mg/kg and 624 mg/kg) were detected in SS-203 and SS-210, respectively. There does not appear to be any pattern to the distribution of manganese.

### TOC

Each surface soil sample was analyzed for total organic carbon. The concentrations of TOC ranged from 10,590 mg/kg to 48,955 mg/kg (1.1% to 4.9%) and are summarized in Table 4.3. TOC results are discussed further in Section 5.

### 4.3.4 Sediment (DSA-2)

Five sediment samples and five surface water samples were collected. Three sample sets were collected from the bermed area of DSA-2, one sample set was collected from the Mohawk River adjacent to the DSA, and one set was from a ditch northwest of the DSA. These samples were analyzed for PAHs, BTEX, cyanide, PCBs, and metals. No background surface water or sediment samples were specified in the Work Plan so none were collected. The surface water and sediment pathways were not considered of concern in the human health risk assessment due to limited access by the public (see discussions in Section 5, Fate and Transport and Section 6, Human Health Risk Assessment).

**PAHs**

PAHs were detected in all five sediment samples at concentrations ranging from 1.24 mg/kg to 21.88 mg/kg. Analytical results are summarized in Table 4.5 and presented on Plate 4.4. The highest PAH concentrations were detected in SD-203 (21.88 mg/kg) located in the northwest corner of the DSA, in SD-202 (16.79 mg/kg) located in the ponded area in the center of the southern third of the DSA, and in SD-201 (9.94 mg/kg) located in the ponded area between the gravel road and the berm. PAH concentrations in sediment samples were generally lower than surface soil concentrations.

**BTEX**

There were no BTEX compounds detected in any of the five sediment samples collected.

**Cyanide**

There was no cyanide detected in any of the five sediment samples collected.

**PCBs**

PCBs were detected in all five sediment samples collected from ponded areas and the Mohawk River (Table 4.5). Based on previous sample results from the NMPC Harbor Point site, the NMPC site is not a source of PCB contamination. Concentrations ranged from 0.02 mg/kg to 8 mg/kg. The highest concentration was detected in SD-202 located in a ponded area equidistant from the berms in the southeastern third of the DSA. The two lowest concentrations were in samples SD-204 (0.02 mg/kg), collected from a ponded area north of the DSA, and SD-205 (0.18 mg/kg) collected from the Mohawk River adjacent to the southern third of DSA-2.

**Metals**

Up to 19 metals were detected in sediment samples collected at DSA-2 and analyzed for TAL inorganic compounds. Metals results are summarized in Table 4.5. Metals are naturally-occurring in both soils and groundwater. As with surface waters, the sediment migration pathway was eliminated from consideration during the human health risk assessment due to the low probability of pathway completion.

### 4.3.5 Surface Water (DSA-2)

Five surface water samples were collected. Three samples were collected from the bermed area of DSA-2, one sample was collected from the Mohawk River adjacent to the DSA, and one was collected northwest of the DSA from a ditch. These samples were analyzed for the presence of PAHs, BTEX, cyanide, PCBs, and metals. No background surface water samples were specified in the Work Plan so none were collected. The surface water pathways were not considered of concern in the human health risk assessment due to limited access by the public (see discussions in Section 5, Fate and Transport and Section 6, Human Health Risk Assessment).

**PAHs**

PAHs were not detected in any of the five surface water samples collected.

**BTEX**

There were no BTEX compounds detected in the five surface water samples collected.

**Cyanide**

There was no cyanide detected in any of the five surface water samples collected.

**PCBs**

PCBs were detected in two of five surface water samples collected from ponded areas at DSA-2 and the Mohawk River (Table 4.6). See Plate 4.4 for plotted concentration values. Concentrations of total PCBs were very low, ranging from not detected to 0.33 ug/L (estimated concentration below detection limit). The sample containing the highest concentration (SW-201 at an estimated 0.33 ug/L) was collected from a ponded area located between the gravel road and the northeast side of the DSA. The other sample was collected from a ponded area located near the northwest corner of the DSA. Both areas receive surface water run-off from areas with PCBs in surface soils.

**Metals**

Up to 13 metals were detected in surface water samples collected from three ponded areas within the bermed area, from one ditch northwest of the DSA, and from the Mohawk River adjacent to the DSA. Surface water results are summarized in Table 4.6. Metals were also detected in sediment samples collected in the same vicinity.

Surface water is not a significant migration pathway and was not considered as part of the human health risk assessment. Potential migration of metals to surface water bodies is discussed in more detail in Section 5, Fate and Transport.

### 4.3.6 Phase I Groundwater-August 1994 (DSA-2)

Phase I groundwater analytical results are summarized on Table 4.7 and are plotted on Plate 4.4.

**PAHs**

PAHs were detected in four of six groundwater samples at very low concentrations (Table 4.7). Total PAH concentrations ranged from not detected to 40 ug/L (MW-200S). In all cases, individual PAHs were detected at concentrations near the detection limits or were estimated values below CRDLs. The three highest concentrations were detected in wells located along the southwest side of the DSA (Plate 4.4). The southwest side is on the downgradient end of the DSA which happens to be closest to the Mohawk River. PAHs were not detected in groundwater samples from wells MW-202S and MW-203S. These two wells are located on the upgradient side of the DSA based on regional gradients but may be within the area of influence based on shallow radial flow within DSA-2.

**BTEX**

BTEX compounds (benzene and toluene) were detected at very low concentrations (estimated below the CRDL) in one of six groundwater samples (Table 4.7). The concentration of total BTEX was 3 ug/L in MW-204S, located on the downgradient (southwest) side of the DSA.

**Cyanide**

Cyanide was not detected in the five Phase I groundwater samples collected. Due to low groundwater yield, MW-204S was not sampled for cyanide .

**PCBs**

PCBs were not detected in any of the six Phase I groundwater samples.

**Metals**

Up to 20 metals were detected in the five groundwater samples analyzed for TAL inorganic compounds (Table 4.7). Due to low groundwater yield, MW-204S was not sampled for metals. Metals are naturally-occurring in sediments, soils, and groundwater. Metals concentrations were compared to statistical background levels in groundwater based on upper tolerance limits (USEPA, 1989) using four background samples. BUTLs are listed in Table 4.8 along with exceedances of the BUTLs and maximum detected concentrations.

Eleven of the 20 metals detected were above the BUTLs in at least one groundwater sample. The greatest number of metals above the BUTLs were in MW-200S (11) located near the northwest corner of the DSA, followed by MW-201S (9) located inside the bermed area midway along the southwest side.

### 4.3.7 Phase II Groundwater-March 1995 (DSA-2)

Phase II groundwater analytical results are summarized on Table 4.9 and are plotted on Plate 4.4.

**PAHs**

PAHs were detected in four of seven groundwater samples collected during Phase II sampling (Table 4.9). As with the Phase I results, total PAH concentrations were very low, ranging from not detected to 31 ug/L (MW-204S). Most individual PAHs were estimated below CRDLs. PAH concentrations were lower in all Phase II groundwater samples except MW-204S which had slightly higher concentrations (Plate 4.4). Three of the four samples containing detectable PAH concentrations were collected from wells located along the southwest side of the DSA. The southwest side is on the downgradient end of the DSA closest to the Mohawk River. PAHs were not detected in groundwater samples from MW-206S on the southeast end of the site, located near the NYSDOT facility, and the two wells (MW-202S and MW-203S) located on the northeast side of the DSA.

**BTEX**

BTEX (benzene) was detected at a very low concentration (estimated below the CRDLs) in only one of seven groundwater samples (Table 4.9). The concentration of total BTEX was 3 ug/L in MW-204S located on the downgradient (southwest) side of the DSA.

**Cyanide**

Cyanide was not detected in any of the seven Phase II groundwater samples.

**PCBs**

PCBs were not detected in any of the seven Phase II groundwater samples.

**Metals**

Up to 20 metals were detected in the five groundwater samples analyzed for TAL inorganic compounds (Table 4.9). Metals are naturally-occurring in sediments, soils, and groundwater. Metals concentrations were compared to statistical background levels in groundwater based on upper tolerance limits (USEPA, 1989) using four background samples. BUTLs are listed in Table 4.10 along with exceedances of the BUTLs and maximum detected concentrations.

Eleven of the 20 metals detected were above the BUTLs in at least one groundwater sample. The greatest number of metals above the BUTLs were in MW-201S (10) located inside the bermed area midway along the southwest side followed by MW-201S (9) located near the northwest corner of the DSA, and MW-206S (8) located at the southern end of the DSA.

### 4.3.8 Phase I and Phase II Groundwater Results Comparison (DSA-2)

Phase I PAH concentrations were slightly higher than Phase II concentrations in three of the four wells which had detectable PAH concentrations. However, concentrations in both rounds were extremely low; most concentrations were estimated values below CRDLs. BTEX was detected in only one well MW-204S at the same concentration in both sampling rounds (3 ug/L). Metals concentrations and the numbers of metals above BUTLs varied but in general were similar between sampling rounds.

## 4.4 DSA-3 ANALYTICAL RESULTS

### 4.4.1 Introduction

Phase I sampling was conducted inside and adjacent to the bermed areas in DSA-3. Phase II sampling in the southern cell of DSA-3 was conducted to further evaluate this area. Phase II groundwater sampling was conducted as specified in the original Work Plan (BB&L, 1993).

### 4.4.2 Subsurface Soil Samples (DSA-3)

Subsurface soil samples were collected during the drilling program from various depths in selected borings. Samples were selected for analysis based on field observations and Ensys$^{tm}$ screening as previously described. All subsurface soil samples were collected from within the DSA-3 berms. All samples except SB-308O and SB-317O were collected from above the first aquitard. Table 2.2 presents sample intervals and analyses. Appendices A and B contain complete records of subsurface soil data.

### Total PAHs

PAH compounds were detected in 13 of 18 samples submitted for analysis. Total PAH concentrations are plotted in Plate 4.5 and analytical results are summarized on Table 4.1. Total PAH concentrations ranged from not detected to 78.17 mg/kg. The highest concentration was detected in SB-313, located in the northwest corner of the northern cell. PAHs at the same order of magnitude were present over most of the northern cell, except in SB-303 and SB-317 which are located in the southwest and southeast corners of the northern cell, respectively. PAHs were not detected in two deep samples (SS-308O and SS-317O). PAH constituents are limited to shallow samples in dredge material.

### BTEX

BTEX compounds were detected at low concentrations in all four samples analyzed for BTEX (Table 4.1). Sample locations were distributed across the northern cell of DSA-3. Total BTEX concentrations ranged between 0.002 mg/kg and 0.015 mg/kg, and were primarily near or below the CRDLs. Three of the four samples had total BTEX concentrations at or below 0.005 mg/kg. All samples were collected from within the bermed areas.

### Cyanide

Cyanide was not detected in the subsurface soil samples.

### PCBs

PCBs were detected in three of four samples analyzed for PCBs (Plate 4.5 and Table 4.1) at concentrations ranging from not detected to 18.8 mg/kg (SB-307). Sample SB-317 located in the southeast corner did not have detectable concentrations of PCBs. Based on previous sample results from the NMPC Harbor Point site, the NMPC site is not a source of PCB contamination.

### Metals

Up to 21 metals were detected in subsurface soil samples analyzed for TCL inorganic compounds. Metals are naturally occurring in both soils and groundwater. Metals concentrations were compared to statistical background levels based on upper tolerance limits (USEPA, 1989) using four background samples.

Eleven metals were detected above the BUTLs in subsurface soil samples collected from DSA-3. BUTLs, maximum concentrations, the number of samples containing metals above BUTLs versus total samples, and locations where metals exceeded BUTLs are presented on Table 4.2. The greatest number of metals above the BUTLs were detected in SB-313 (10) and SB-306 (9). The numbers of metals above the BUTLs are greater in the northern end of DSA-3.

The concentrations of the three metals of concern (based on human health risk assessment) ranged from 3.0 mg/kg to 7.7 mg/kg (arsenic), from not detected in all samples (beryllium), and from 507 mg/kg to 771 mg/kg (manganese) and were distributed as follows:

- Arsenic was detected in all four samples but at concentrations below the BUTL (12.5 mg/kg).
- Beryllium was not detected in the four samples.
- Manganese was detected above the BUTL (517.9 mg/kg) in three of the four samples (SB-307 at 535 mg/kg, SB-306 at 771 mg/kg, and SB-313 at 771 mg/kg). The highest concentrations of manganese were in SB-306 at 771 mg/kg and SB-313 at 771 mg/kg. Manganese was present within the same order of magnitude in all four samples, which were distributed across the northern cell of the DSA.

**Visible NAPL**

NAPL was not described in soil borings. Twelve borings had stained soils, three borings had visible sheens and 16 had organic odors. Soil descriptions are contained in soil boring logs included in Appendix C. There was a correlation between soil and groundwater samples that contained elevated PAH and BTEX concentrations and sheens and odors described in subsurface soil samples.

### 4.4.3 Surface Soil Samples (DSA-3)

Surface soil samples were collected from the 0.5- to 1-foot interval below ground surface from various areas around the site with stainless steel equipment. The sampling methodology and rationale are discussed in Section 2.3. Table 2.2 presents sample intervals and analyses. Plate 4.5 and Table 4.3 present a summary of the surface soil data.

**PAHs**

PAHs were detected in four of the seven surface soil samples. The total PAH concentrations in the surface soils were very low, ranging from not detected in three samples to 5.47 mg/kg. In most cases, individual compounds were detected at concentrations near or below the CRDLs. The highest concentration was detected in SS-303, located in the northwest central part of the DSA. All surface soil samples were collected within the bermed area at DSA-3. PAH concentrations are plotted on Plate 4.5 and summarized in Table 4.3. The four samples containing PAHs were all collected in the western half of the northern cell of DSA-3.

**BTEX**

BTEX was not detected in the surface soil samples.

**Cyanide**

Cyanide was not detected in the surface soil samples.

### PCBs

PCBs were detected in six of the seven surface soil samples collected in the northern bermed area of DSA-3, and in sample SS-321 collected outside of the berm. Based on previous sample results from the NMPC Harbor Point site, the NMPC site is not a source of PCB contamination. PCB concentrations are plotted on Plate 4.5 and are summarized in Table 4.3. Total PCB concentrations in the surface soil samples ranged from not detected to 0.47 mg/kg. The highest concentration was in SS-301 (0.47 mg/kg) collected near the southwest corner of the northern cell. Detectable concentrations in the five other samples were between 0.03 and 0.07 mg/kg, including sample SS-321 collected outside the DSA as a background sample. Individual PCB Aroclors in these five samples were primarily detected at concentrations estimated below the CRDL.

### Metals

Up to 22 metals were detected in surface soil samples analyzed for TAL inorganic compounds (Table 4.3). Metals are naturally-occurring in both soils and groundwater. Metals concentrations were compared to statistical background levels based on upper tolerance limits (USEPA, 1989) using four background samples.

Up to seven metals were detected above the BUTLs in surface soil samples collected from DSA-3. BUTLs, maximum concentrations, the number of samples containing metals above BUTLs versus total samples, and locations where metals exceeded BUTLs are presented on Table 4.4. The greatest number of metals above the BUTLs were detected in SS-305 (7) and SS-301 (6). There was no discernable pattern to the metals distribution in the northern half of DSA-3.

The concentrations of the three metals of concern (based on the human health risk assessment) ranged from 2.4 mg/kg to 7.1 mg/kg (arsenic), from not detected to 1.9 mg/kg (beryllium), and from 344 mg/kg to 1,270 mg/kg (manganese) and were distributed as follows:

- Arsenic was detected in all seven surface soil samples, but at concentrations below the BUTLs. The highest concentration was 7.1 mg/kg in SS-304, located in the southwestern corner of the northern cell.
- Beryllium was detected in six of the seven surface soil samples at concentrations ranging from not detected to 1.9 mg/kg. Four of the seven samples were above the BUTLs. The highest concentration was detected in SS-304. Beryllium was not detected in SS-303, located in the north central portion of the DSA. There was no discernable pattern to the beryllium distribution.
- Manganese was detected in all seven surface soil samples at concentrations ranging from 344 to 1,270 mg/kg. Manganese was detected above the BUTL (517.9 mg/kg) in four of the seven samples. The highest concentrations were detected in SS-306, located near the berm on the northeast side.

### TOC

Seven surface soil samples were analyzed for total organic carbon content. The TOC concentrations ranged from 9,107 mg/kg (0.9%) in SS-303 to 58,926 mg/kg

(5.9%) in SS-304. Results are summarized in Table 4.3 and are discussed in relation to fate and transport characteristics in Section 5.

### 4.4.4 Sediment Samples (DSA-3)

Sediment samples and surface water samples were collected during the Phase I field efforts. Sampling methodology and rationale are discussed in Section 2. Table 2.2 presents the sample intervals and analyses. Plate 4.5 and Tables 4.5 and 4.6 summarize the sediment/surface water data. Appendices A and B contain the full sediment/surface water data.

#### PAHs

PAHs were detected in four of five sediment samples. Total PAH concentrations in the sediment samples were low, ranging from not detected (SD-305) to 6.27 mg/kg (SD-301). Most of the individual PAHs detected were at concentrations near or below the CRDLs.

#### BTEX

BTEX compounds were not detected in the sediment samples.

#### Cyanide

Cyanide was detected in only one sediment sample (SD-302) at a concentration of 2.2 mg/kg, slightly above the CRDL (Table 4.6). SD-302 was located east of the northern cell which is downgradient of the DSA.

#### PCBs

PCBs (Aroclor 1254) were detected in four of five sediment samples. Based on previous sample results from the NMPC Harbor Point site, the NMPC site is not a source of PCB contamination. Total PCB concentrations in the sediment samples ranged from not detected (SD-305) to 4.40 mg/kg (SD-301). The concentration in SD-301 (4.40 mg/kg) was an order of magnitude greater than in the other samples. SD-301 is located in the northwest corner of the southern cell.

#### Metals

Up to 20 metals were detected in sediment samples collected at DSA-3 and analyzed for TAL inorganic compounds. Metals results are summarized in Table 4.5. Metals are naturally-occurring in both soils and groundwater. As with surface waters, the sediment migration pathway was eliminated from consideration during the human health risk assessment.

#### TOC

Five sediment samples were analyzed for total organic carbon content. The concentrations of TOC ranged from 32,700 mg/kg (3.2%) in SD-305 to 82,600 mg/kg (8.3%) in SD-302. Results are summarized in Table 4.5

### 4.4.5 Sediment Core Samples (Southern Half of DSA-3)

Sediment core samples were collected using a Wildco$^{tm}$ core sampler in the southern cell of DSA-3 to replace of soil borings because of the presence of ponded water up to eight feet in depth. Additional sediment core samples were collected during Phase II to confirm Phase I results and to provide more detail. Sampling methodology and rationale are discussed in Section 2.

Table 2.2 presents the sample intervals and analyses. Plate 4.5 and Tables 4.5 and 4.6 summarize the sediment/surface water data. Appendices A and B contain the full surface/sediment data.

**PAHs**

PAHs were detected in 10 of 13 sediment core samples (Table 4.5). Total PAH concentrations in the sediment core samples ranged between 0.08 mg/kg and 1,316.6 mg/kg, but were below 10 mg/kg in eight of these ten samples. SP-306A, located along the southern end of the southern cell, had a total PAH concentration of 1,316.6 mg/kg during Phase I sampling (Plate 4.5). Phase II sampling was conducted to define the limits of elevated PAHs detected in SP-306A. Phase II samples were screened for total PAHs using the ENSYS™ immunoassay test.

Five Phase II samples were submitted to the laboratory for PAH analysis to confirm screening results. Samples with the highest screening results and screening below detection were sent for laboratory analysis. Analytical results ranged from not detected to 14.7 mg/kg (SP-319A). Phase II sample SP-310 collected at the same location as SP-306 had a concentration of 0.39 mg/kg. The Phase I results in SP-306A (1,316.6 mg/kg) were anomalous. Screening results are posted on Plate 4.5 for those sediment samples which were screened but not analyzed by the laboratory. Three Phase II samples had screening results above 10 ppm (SP-316A, SP-317A, and SP-319A).

**BTEX**

BTEX was not detected in any of the SP sediment samples.

**Cyanide**

Cyanide was not detected in any of the SP sediment samples.

**PCBs**

PCBs (Aroclor 1254) were detected in two of three sediment core samples at concentrations of 0.21 (SP-306A) and 0.29 mg/kg (SP-304A). These samples were collected at the southern and northern ends of the southern cell.

**Metals**

Up to 18 metals were detected in sediment samples collected from the southern cell of DSA-3 and analyzed for TAL inorganic compounds. Metals results are summarized in Table 4.5.

**TOC**

Three SP sediment samples were analyzed for total organic carbon content. The concentrations of TOC ranged from 25,300 mg/kg (2.5%) in SP-307A to 43,200 mg/kg (4.3%) in SP-304A.

### 4.4.6 Surface Water (DSA-3)

Five surface water and sediment samples were collected during Phase I sampling. One sample was collected from a ponded area inside the berm in the northern cell, two samples were collected east of the northern cell, and two samples were collected in the northern end of the southern cell. Sampling methodology and rationale are discussed in Section 2.

Table 2.2 presents the sample intervals and analyses. Plate 4.5 and Tables 4.5 and 4.6 summarize the surface water/sediment data. Appendices A and B contain the full surface water/sediment data.

**PAHs**

PAHs were not detected in any of the five surface water samples.

**BTEX**

Toluene was the only BTEX compound detected in three of five surface water samples (Table 4.6). The toluene concentrations in surface water samples were low, ranging from not detected to 29 ug/L. Concentrations were only slightly above the CRDL. The two surface water samples containing the highest concentrations (29 ug/L and 9 ug/L) of toluene were collected just outside the bermed area (SW-303 and SW-302 respectively), while the remaining sample was collected from inside the southern bermed area (SW-305) and contained toluene at a low concentration (5 ug/L).

**Cyanide**

Cyanide was not detected in any of the five surface water samples.

**PCBs**

PCBs were detected in two of five surface water samples at very low concentrations, estimated below the CRDL (Plate 4.5). Total PCB concentrations in the surface water samples ranged from not detected in three samples, located in the southern cell (SW-301 and SW-305) and east of the berm (SW-303), to 0.25 ug/L in SW-302 located east of the berm, and 0.39 ug/L in SW-304 located inside the northern cell.

**Metals**

Up to 21 metals were detected in the surface water samples. Surface water results are summarized in Table 4.6. Metals were also detected in sediment samples collected in the same vicinity.

Surface water is not a significant migration pathway and was not considered as part of the human health risk assessment. Potential migration of metals to surface water bodies is discussed in more detail in Section 5, Fate and Transport.

### 4.4.7 Phase I Groundwater-August 1994 (DSA-3)

Two rounds of groundwater sampling were conducted at the DSAs. Phase I sampling took place August 1994 and Phase II sampling took place March 1995. Phase II results are presented in Section 4.4.8. Sampling methodology and rationale are discussed in Section 2.

A total of four groundwater samples were submitted to the laboratory for TCL/TAL analysis during the sampling effort at DSA-3.

**PAHs**

PAHs were only detected in MW-301S, located in the center of the northern cell of the DSA. The total PAH concentration in this well was 262 ug/L. PAHs were not detected in the other three wells which are located outside the west and east sides of the northern cell. PAH results are plotted on Plate 4.7 and are summarized on Table 4.7.

**BTEX**

BTEX (benzene and toluene) was detected in well MW-301S at 5 ug/L, and was not detected in the other three wells. BTEX results are plotted on Plate 4.5 and are summarized on Table 4.7.

**Cyanide**

Cyanide was not detected in the Phase I groundwater samples.

**PCB**

PCBs were not detected in the Phase I groundwater samples.

**Metals**

Up to 18 metals were detected in the four groundwater samples analyzed for TAL inorganic compounds. Metals are naturally-occurring in sediments, soils, and groundwater. Metals concentrations were compared to statistical background levels in groundwater based on upper tolerance limits (USEPA, 1989) using four background samples. BUTLs are listed in Table 4.8 along with exceedances of the BUTLs and maximum detected concentrations.

Ten of the 18 metals detected were above the BUTLs in at least one groundwater sample. The greatest number of metals above the BUTLs were in MW-303S (8), located outside the bermed area, and MW-301S (8) located in the center of the DSA.

### 4.4.8 Phase II Groundwater (March 1995)

Phase II groundwater samples were collected in March 1995. Four groundwater samples and one duplicate sample were submitted for laboratory analysis.

**PAH**

PAH compounds were detected in only one well (MW-301S) at a total concentration of 70 ug/L (Table 4.9 and Plate 4.5). Individual PAHs were detected at low concentrations, only slightly above the CRDLs. MW-301S is located in the center of the northern cell of DSA-3. The total PAH concentration was lower than in the corresponding Phase I sample.

**BTEX**

BTEX compounds (benzene, toluene, and xylene) were detected only in MW-301S at a total concentration of only 9 ug/L (Table 4.9 and Plate 4.5). As in the Phase I sample, concentrations were near the CRDLs.

**Cyanide**

Cyanide was not detected in the Phase II groundwater samples.

**PCBs**

PCBs were not detected in the groundwater samples.

**Metals**

Up to 19 metals were detected in the four groundwater samples analyzed for TAL inorganic compounds (Table 4.9). Metals are naturally-occurring in sediments, soils, and groundwater. Metals concentrations were compared to statistical background levels in groundwater based on upper tolerance limits (USEPA, 1989) using four background samples. BUTLs are listed in Table 4.10 along with exceedances of the BUTLs and maximum detected concentrations.

Eight of the 19 metals detected were above the BUTLs in at least one groundwater sample. The greatest number of metals above the BUTLs were in MW-301S (7) located in the center of the DSA. The metals above BUTLs in MW-303S (2) and MW-304S (3), located outside the berm, were lower than in MW-301S which is located in the center of the northern cell.

### 4.4.9 Phase I and II Groundwater Comparison (DSA-3)

Groundwater concentrations did not fluctuate appreciably between sampling rounds. BTEX results remained within the same order of magnitude in MW-301S for both rounds. PAH concentrations in MW-301S were slightly lower in the Phase II sample. PAHs were not detected in the three wells outside the berm during either sampling round. The numbers of metals above the BUTLs decreased in Phase II samples by one in MW-301S and by five in MW-303S. Arsenic and beryllium were not detected in Phase I samples but were detected at low concentrations in Phase II background sample MW-302S. Concentrations of arsenic in MW-301S and MW-303S decreased to below detection limits in Phase II samples.

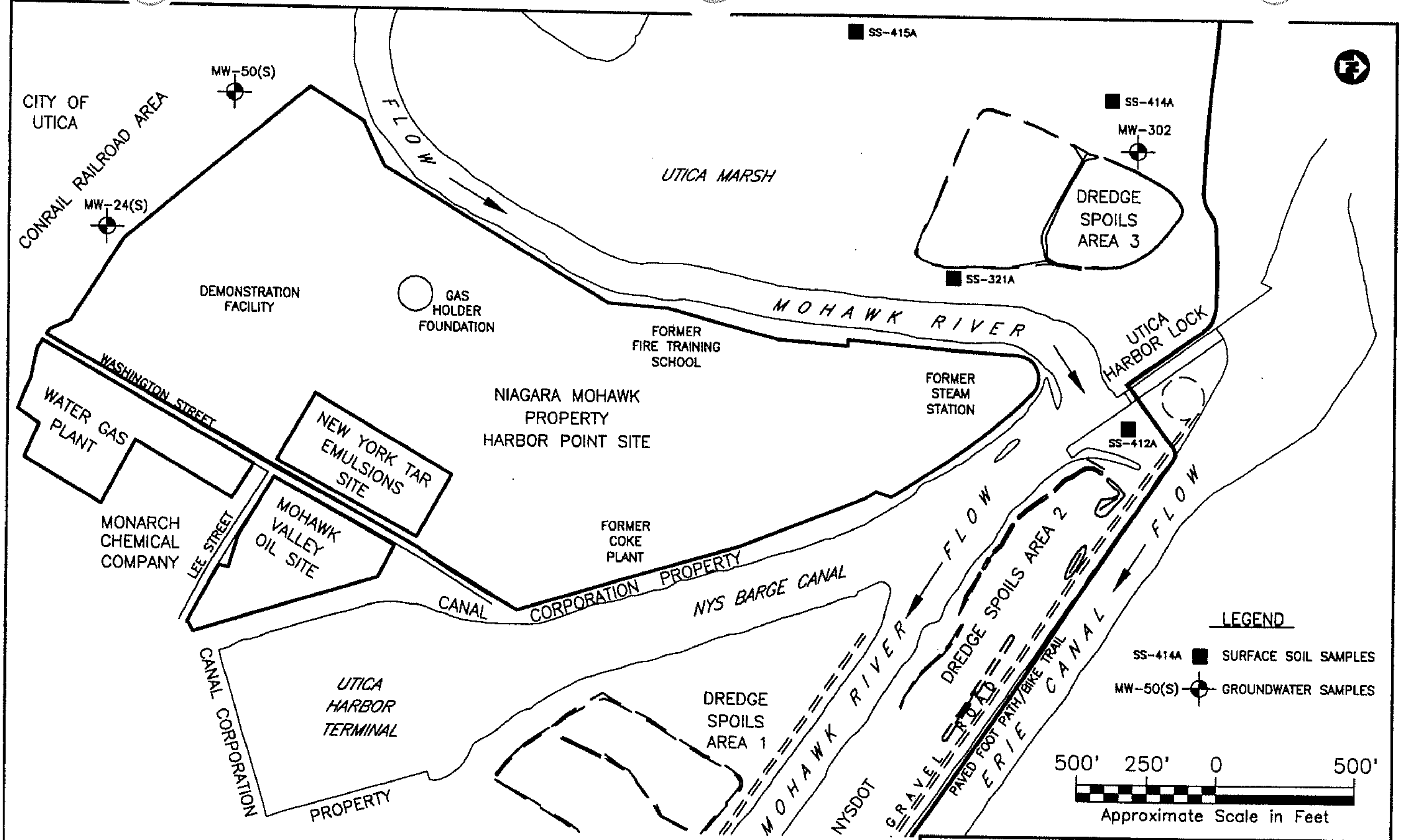

FIGURE 4.1

**NIAGARA MOHAWK**

NIAGARA MOHAWK
POWER CORPORATION

BACKGROUND SAMPLE LOCATIONS

**PARSONS ENGINEERING SCIENCE, INC.**
DESIGN • RESEARCH • PLANNING
290 ELWOOD DAVIS ROAD • SUITE 312 • LIVERPOOL, N.Y. 13088 • 315/451-9560
OFFICES IN PRINCIPAL CITIES

DATE: 04/12/96 (JHG)
C:\NIMO\726175\DSA\26175G01.DWG (PAPER SPACE 1/500XP)

# TABLE 4.1

| | | | BACKGROUND SAMPLES | | | | DSA-1 |
|---|---|---|---|---|---|---|---|
| SOIL BORING DETECTED COMPOUNDS | | SAMPLE ID: | SS-321A | SS-412A | SS-414A | SS-415A | MW-104D |
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT - DREDGE SPOIL AREAS | | DEPTH: | 0-6" | 0-2' | 0-2' | 0-2' | 6-8' |
| | | LAB ID: | 2333612 | 2088301 | 2088303 | 2088304 | 2108801 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DSASB23 | MV01SS01 | MV01SS01 | MV01SS01 | DS02SB04 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 3/15/95 | 5/31/94 | 5/31/94 | 5/31/94 | 6/16/94 |
| | | VALIDATED: | 6/19/96 | 8/15/94 | 8/15/94 | 8/15/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | ND | ND | ND | ND | |
| 78-93-3 | 2-Butanone | UG/KG | ND | ND | ND | 26 J | |
| 75-15-0 | Carbon Disulfide | UG/KG | ND | ND | ND | ND | |
| 108-90-7 | Chlorobenzene | UG/KG | ND | ND | ND | ND | |
| 75-35-4 | 1,1-Dichloroethene | UG/KG | ND | ND | ND | ND | |
| 100-42-5 | Styrene | UG/KG | ND | ND | ND | ND | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | UG/KG | ND | ND | ND | ND | |
| 79-01-6 | Trichloroethene | UG/KG | ND | ND | ND | ND | |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/KG | ND | ND | ND | ND | |
| 100-41-4 | Ethylbenzene | UG/KG | ND | ND | ND | ND | |
| 108-88-3 | Toluene | UG/KG | ND | ND | ND | ND | |
| 1330-20-7 | Xylene (total) | UG/KG | ND | ND | ND | ND | |
| | Total BTEX Volatiles | | ND | ND | ND | ND | |
| | SEMIVOLATILES | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | ND | ND | ND | ND | |
| 86-74-8 | Carbazole | UG/KG | ND | ND | ND | ND | |
| 91-58-7 | 2-Chloronaphthalene | UG/KG | ND | ND | ND | ND | |
| 84-74-2 | Di-n-butylphthalate | UG/KG | ND | ND | ND | ND | |
| 132-64-9 | Dibenzofuran | UG/KG | ND | ND | ND | ND | |
| 84-66-2 | Diethylphthalate | UG/KG | ND | ND | ND | ND | |
| 86-30-6 | N-Nitrosodiphenylamine | UG/KG | ND | ND | ND | ND | |
| 108-95-2 | Phenol | UG/KG | ND | ND | ND | ND | |
| 95-95-4 | 2,4,5-Trichlorophenol | UG/KG | ND | ND | ND | ND | |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | ND | ND | ND | ND | |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | 120 J | 700 J | ND | 300 J | |
| 50-32-8 | Benzo(a)pyrene | UG/KG | 120 J | 920 | ND | 140 J | |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | 100 J | 970 | ND | 220 J | |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | 110 J | 700 J | ND | 260 J | |
| 218-01-9 | Chrysene | UG/KG | 160 J | 1000 | ND | 390 J | |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | ND | ND | ND | ND | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | 76 J | 620 J | ND | ND | |
| | Total Probable Carcinogenic PAHS | | 686 | 4910 | ND | 1310 | |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | ND | ND | ND | ND | |
| 208-96-8 | Acenaphthylene | UG/KG | ND | 140 J | ND | ND | |
| 120-12-7 | Anthracene | UG/KG | ND | 150 J | ND | ND | |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | ND | 630 J | ND | ND | |
| 206-44-0 | Fluoranthene | UG/KG | 280 J | 1900 | 57 J | 690 J | |
| 86-73-7 | Fluorene | UG/KG | ND | ND | ND | ND | |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | ND | ND | ND | ND | |
| 91-20-3 | Naphthalene | UG/KG | ND | ND | ND | ND | |
| 85-01-8 | Phenanthrene | UG/KG | 140 J | 850 | ND | 330 J | |
| 129-00-0 | Pyrene | UG/KG | 210 J | 1400 | ND | 570 J | |
| | Total PAHs | | 1316 | 9980 | 57 | 2900 | |

J - Indicates an estimated value.
D - Indicates a diluted value.
N - Indicates presumptive evidence of a compound.
R - Indicates rejected data.
ND - Not detected.
(MAX) - Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

**SOIL BORING DETECTED COMPOUNDS**

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS

| | | | BACKGROUND SAMPLES | | | | DSA-1 |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | SS-321A | SS-412A | SS-414A | SS-415A | MW-104D |
| | | DEPTH: | 0-6" | 0-2' | 0-2' | 0-2' | 6-8' |
| | | LAB ID: | 2333612 | 2088301 | 2088303 | 2088304 | 2108801 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DSASB23 | MV01SS01 | MV01SS01 | MV01SS01 | DS02SB04 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 3/15/95 | 5/31/94 | 5/31/94 | 5/31/94 | 6/16/94 |
| | | VALIDATED: | 6/19/96 | 8/15/94 | 8/15/94 | 8/15/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | PESTICIDES | | | | | | |
| 72-54-8 | 4,4'-DDD | UG/KG | ND | ND | ND | ND | ND |
| 50-29-3 | 4,4'-DDT | UG/KG | ND | ND | ND | ND | ND |
| 60-57-1 | Dieldrin | UG/KG | ND | 36 J | ND | ND | ND |
| 959-98-8 | Endosulfan I | UG/KG | ND | ND | ND | ND | ND |
| 33213-65-9 | Endosulfan II | UG/KG | ND | ND | ND | ND | ND |
| 72-20-8 | Endrin | UG/KG | ND | ND | ND | ND | ND |
| 7421-93-4 | Endrin aldehyde | UG/KG | ND | 14 J | 4.8 J | ND | ND |
| 1024-57-3 | Heptachlor epoxide | UG/KG | ND | ND | ND | ND | ND |
| 5103-71-9 | alpha-Chlordane | UG/KG | ND | ND | ND | ND | ND |
| 5103-74-2 | gamma-Chlordane | UG/KG | ND | ND | ND | ND | ND |
| | PCBs | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | ND | ND | ND | ND | ND |
| 12672-29-6 | Aroclor-1248 | UG/KG | ND | ND | ND | ND | ND |
| 11097-69-1 | Aroclor-1254 | UG/KG | 69 J | 520 | 40 J | 69 J | ND |
| 11096-82-5 | Aroclor-1260 | UG/KG | ND | ND | ND | ND | ND |
| | Total PCBs | | | | | | ND |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | 14800 | 7130 | 21600 | 17300 | |
| 7440-36-0 | Antimony | MG/KG | ND | ND | ND | ND | |
| 7440-38-2 | Arsenic | MG/KG | 9.4 | 3.5 | 5.1 | 12.5 | |
| 7440-39-3 | Barium | MG/KG | 115 | 44.9 J | 123 | 133 | |
| 7440-41-7 | Beryllium | MG/KG | 0.53 J | ND | 1.4 | ND | |
| 7440-43-9 | Cadmium | MG/KG | 2.4 J | ND | ND | ND | |
| 7440-70-2 | Calcium | MG/KG | 5670 | 12100 J | ND | ND | |
| 7440-47-3 | Chromium | MG/KG | 36.4 | 33 | 29.3 | 65.1 | |
| 7440-48-4 | Cobalt | MG/KG | 13.8 J | 9.1 J | 11.7 J | 18.3 J | |
| 7440-50-8 | Copper | MG/KG | 119 | 116 | 38 | 229 | |
| 7439-89-6 | Iron | MG/KG | 32200 | 15300 | 23300 | 30600 | |
| 7439-92-1 | Lead | MG/KG | 79.9 | 39.6 | 32.6 | 106 J | |
| 7439-95-4 | Magnesium | MG/KG | 5600 | 5520 | 5630 | 5740 | |
| 7439-96-5 | Manganese | MG/KG | 1200 | 358 | 347 | 449 | |
| 7439-97-6 | Mercury | MG/KG | ND | 0.27 | 0.2 | 0.5 | |
| 7440-02-0 | Nickel | MG/KG | 36.2 J | 22.6 | 26.9 | 44.7 | |
| 7440-09-7 | Potassium | MG/KG | 2450 | 1440 | 2840 | 2270 J | |
| 7782-49-2 | Selenium | MG/KG | ND | ND | ND | ND | |
| 7440-23-5 | Sodium | MG/KG | ND | ND | ND | ND | |
| 7440-62-2 | Vanadium | MG/KG | 38.4 | 9.9 J | 32.8 | 32.9 | |
| 7440-66-6 | Zinc | MG/KG | 172 | 103 | 106 | 184 | |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | 96871 | 21892 | 71906 | 71323 | |
| | GC/FID | | | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | | | | ND |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | | | 22 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

**SOIL BORING DETECTED COMPOUNDS**

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS

| CAS NO. | COMPOUND | | DSA–1 | | | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | MW–105D | MW–107I$^{(MAX)}$ | MW–108E | MW–109E | MW–110B |
| | | DEPTH: | 6–8' | 16–18' | 08–10' | 08–10' | 02–04' |
| | | LAB ID: | 2108802 | 2322703 | 2323601 | 2323602 | 2324801 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS02SB04 | DSASB21 | DSASB21 | DSASB21 | DSASB21 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/17/94 | 3/01/95 | 3/01/95 | 3/02/95 | 3/02/95 |
| | | VALIDATED: | 9/27/94 | 5/30/95 | 5/30/95 | 5/30/95 | 5/30/95 |
| | | UNITS | | | | | |
| | VOLATILES | | | | | | |
| 67–64–1 | Acetone | UG/KG | ND | ND | ND | ND | ND |
| 78–93–3 | 2–Butanone | UG/KG | 60 J | ND | ND | ND | ND |
| 75–15–0 | Carbon Disulfide | UG/KG | 100 | 5 J | ND | ND | ND |
| 108–90–7 | Chlorobenzene | UG/KG | ND | ND | ND | ND | ND |
| 75–35–4 | 1,1–Dichloroethene | UG/KG | ND | ND | ND | ND | ND |
| 100–42–5 | Styrene | UG/KG | ND | ND | ND | ND | ND |
| 79–34–5 | 1,1,2,2–Tetrachloroethane | UG/KG | ND | ND | ND | ND | ND |
| 79–01–6 | Trichloroethene | UG/KG | ND | ND | ND | ND | ND |
| | BTEX VOLATILES | | | | | | |
| 71–43–2 | Benzene | UG/KG | 19 J | ND | ND | ND | ND |
| 100–41–4 | Ethylbenzene | UG/KG | 7600 D | ND | ND | ND | ND |
| 108–88–3 | Toluene | UG/KG | 140 | ND | 2 J | ND | 3 J |
| 1330–20–7 | Xylene (total) | UG/KG | 5300 D | ND | ND | ND | ND |
| | Total BTEX Volatiles | | 13059 | ND | 2 | ND | 3 |
| | SEMIVOLATILES | | | | | | |
| 85–68–7 | Butylbenzylphthalate | UG/KG | ND | ND | R | ND | ND |
| 86–74–8 | Carbazole | UG/KG | 240 J | ND | R | ND | 70 J |
| 91–58–7 | 2–Chloronaphthalene | UG/KG | ND | ND | R | ND | ND |
| 84–74–2 | Di–n–butylphthalate | UG/KG | ND | ND | R | ND | ND |
| 132–64–9 | Dibenzofuran | UG/KG | 1700 J | ND | R | ND | 79 J |
| 84–66–2 | Diethylphthalate | UG/KG | ND | ND | R | ND | ND |
| 86–30–6 | N–Nitrosodiphenylamine | UG/KG | 630 J | ND | R | ND | ND |
| 108–95–2 | Phenol | UG/KG | ND | ND | ND | ND | ND |
| 95–95–4 | 2,4,5–Trichlorophenol | UG/KG | ND | ND | ND | ND | ND |
| 117–81–7 | bis(2–Ethylhexyl)phthalate | UG/KG | ND | ND | R | ND | ND |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56–55–3 | Benzo(a)anthracene | UG/KG | 4400 | ND | 120 J | 150 J | 2600 |
| 50–32–8 | Benzo(a)pyrene | UG/KG | 4200 | 90 J | 83 J | 160 J | 2700 |
| 205–99–2 | Benzo(b)fluoranthene | UG/KG | 1800 J | ND | 48 J | 100 J | 2300 |
| 207–08–9 | Benzo(k)fluoranthene | UG/KG | 2200 | ND | 63 J | 96 J | 1300 |
| 218–01–9 | Chrysene | UG/KG | 6400 | ND | 120 J | 120 J | 1600 |
| 53–70–3 | Dibenz(a,h)anthracene | UG/KG | 290 J | ND | R | ND | 530 |
| 193–39–5 | Indeno(1,2,3–cd)pyrene | UG/KG | 1500 J | ND | R | 93 J | 1100 |
| | Total Probable Carcinogenic PAHS | | 20790 | 90 | 434 | 719 | 12130 |
| | OTHER PAHs | | | | | | |
| 83–32–9 | Acenaphthene | UG/KG | 23000 D | ND | R | ND | 160 J |
| 208–96–8 | Acenaphthylene | UG/KG | 5600 | ND | R | ND | 730 |
| 120–12–7 | Anthracene | UG/KG | 11000 | ND | R | ND | 580 |
| 191–24–2 | Benzo(g,h,i)perylene | UG/KG | 1200 J | ND | R | 94 J | 720 |
| 206–44–0 | Fluoranthene | UG/KG | 8900 | ND | 180 J | 130 J | 2900 |
| 86–73–7 | Fluorene | UG/KG | 21000 D | ND | R | ND | 190 J |
| 91–57–6 | 2–Methylnaphthalene | UG/KG | 29000 D | ND | R | ND | 140 J |
| 91–20–3 | Naphthalene | UG/KG | 41000 D | ND | R | 56 J | 480 |
| 85–01–8 | Phenanthrene | UG/KG | 50000 D | ND | 200 J | 60 J | 1300 |
| 129–00–0 | Pyrene | UG/KG | 15000 D | ND | 370 J | 150 J | 2100 |
| | Total PAHs | | 226490 | 90 | 1184 | 1209 | 21430 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

SOIL BORING DETECTED COMPOUNDS

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS

| | | | DSA-1 | | | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | MW-105D | MW-107I(MAX) | MW-108E | MW-109E | MW-110B |
| | | DEPTH: | 6-8' | 16-18' | 08-10' | 08-10' | 02-04' |
| | | LAB ID: | 2108802 | 2322703 | 2323601 | 2323602 | 2324801 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS02SB04 | DSASB21 | DSASB21 | DSASB21 | DSASB21 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/17/94 | 3/01/95 | 3/01/95 | 3/02/95 | 3/02/95 |
| | | VALIDATED: | 9/27/94 | 5/30/95 | 5/30/95 | 5/30/95 | 5/30/95 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | PESTICIDES | | | | | | |
| 72-54-8 | 4,4'-DDD | UG/KG | | ND | | | |
| 50-29-3 | 4,4'-DDT | UG/KG | | ND | | | |
| 60-57-1 | Dieldrin | UG/KG | | ND | | | |
| 959-98-8 | Endosulfan I | UG/KG | | ND | | | |
| 33213-65-9 | Endosulfan II | UG/KG | | ND | | | |
| 72-20-8 | Endrin | UG/KG | | ND | | | |
| 7421-93-4 | Endrin aldehyde | UG/KG | | ND | | | |
| 1024-57-3 | Heptachlor epoxide | UG/KG | | ND | | | |
| 5103-71-9 | alpha-Chlordane | UG/KG | | ND | | | |
| 5103-74-2 | gamma-Chlordane | UG/KG | | ND | | | |
| | PCBs | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | | ND | | | |
| 12672-29-6 | Aroclor-1248 | UG/KG | | ND | | | |
| 11097-69-1 | Aroclor-1254 | UG/KG | | ND | | | |
| 11096-82-5 | Aroclor-1260 | UG/KG | | ND | | | |
| | Total PCBs | | | ND | | | |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | 13500 | 23300 | | | |
| 7440-36-0 | Antimony | MG/KG | ND | ND | | | |
| 7440-38-2 | Arsenic | MG/KG | 4.8 | 3.6 J | | | |
| 7440-39-3 | Barium | MG/KG | 72.6 | 127 J | | | |
| 7440-41-7 | Beryllium | MG/KG | 0.72 J | 1 J | | | |
| 7440-43-9 | Cadmium | MG/KG | ND | ND | | | |
| 7440-70-2 | Calcium | MG/KG | 13300 | 2970 | | | |
| 7440-47-3 | Chromium | MG/KG | 19.8 J | 26.6 | | | |
| 7440-48-4 | Cobalt | MG/KG | 13.9 | 15.2 J | | | |
| 7440-50-8 | Copper | MG/KG | 35 | 31.2 J | | | |
| 7439-89-6 | Iron | MG/KG | 27500 | 29400 | | | |
| 7439-92-1 | Lead | MG/KG | 17.3 | 26.4 | | | |
| 7439-95-4 | Magnesium | MG/KG | 6480 | 6810 | | | |
| 7439-96-5 | Manganese | MG/KG | 545 | 246 | | | |
| 7439-97-6 | Mercury | MG/KG | 0.26 | ND | | | |
| 7440-02-0 | Nickel | MG/KG | 26.2 | 35.2 J | | | |
| 7440-09-7 | Potassium | MG/KG | 2130 | 3100 | | | |
| 7782-49-2 | Selenium | MG/KG | ND | ND | | | |
| 7440-23-5 | Sodium | MG/KG | ND | ND | | | |
| 7440-62-2 | Vanadium | MG/KG | 29.8 | 44.4 | | | |
| 7440-66-6 | Zinc | MG/KG | 86.3 | 115 | | | |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | | 18904 | | | |
| | GC/FID | | | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | | | | |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | | | |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

**SOIL BORING DETECTED COMPOUNDS**

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS

| | | | DSA-1 | | DSA-2 | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | MW-111H | MW-112D | MW-201J | MW-204M | MW-205M |
| | | DEPTH: | 14-16' | 06-08' | 18-20' | 24-26' | 24-26' |
| | | LAB ID: | 2324802 | 2326202 | 2102801 | 2108101 | 2110901 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DSASB21 | DSASB21 | DS02SB01 | DS01SB03 | DS02SB04 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 3/02/95 | 3/07/95 | 6/13/94 | 6/15/94 | 6/21/94 |
| | | VALIDATED: | 5/30/95 | 5/30/95 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | ND | ND | ND | | ND |
| 78-93-3 | 2-Butanone | UG/KG | ND | ND | 27 | | 22 |
| 75-15-0 | Carbon Disulfide | UG/KG | ND | ND | ND | | ND |
| 108-90-7 | Chlorobenzene | UG/KG | ND | ND | ND | | 16 J |
| 75-35-4 | 1,1-Dichloroethene | UG/KG | ND | ND | ND | | ND |
| 100-42-5 | Styrene | UG/KG | ND | ND | ND | | ND |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | UG/KG | ND | ND | ND | | ND |
| 79-01-6 | Trichloroethene | UG/KG | ND | ND | ND | | ND |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/KG | ND | ND | ND | | 15 |
| 100-41-4 | Ethylbenzene | UG/KG | ND | ND | 49 | | 1200 D |
| 108-88-3 | Toluene | UG/KG | 4 J | ND | 4 J | | 50 J |
| 1330-20-7 | Xylene (total) | UG/KG | ND | ND | 41 | | 1800 D |
| | Total BTEX Volatiles | | 4 | ND | 94 | | 3065 |
| | SEMIVOLATILES | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | ND | ND | ND | | ND |
| 86-74-8 | Carbazole | UG/KG | ND | ND | 410 J | | 230 J |
| 91-58-7 | 2-Chloronaphthalene | UG/KG | ND | ND | ND | | ND |
| 84-74-2 | Di-n-butylphthalate | UG/KG | ND | ND | ND | | ND |
| 132-64-9 | Dibenzofuran | UG/KG | ND | ND | 600 J | | 970 J |
| 84-66-2 | Diethylphthalate | UG/KG | ND | ND | ND | | ND |
| 86-30-6 | N-Nitrosodiphenylamine | UG/KG | ND | ND | 950 J | | 1100 J |
| 108-95-2 | Phenol | UG/KG | ND | ND | ND | | ND |
| 95-95-4 | 2,4,5-Trichlorophenol | UG/KG | ND | ND | ND | | ND |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | ND | ND | ND | | ND |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | ND | 820 | 3700 | 40000 | 5700 J |
| 50-32-8 | Benzo(a)pyrene | UG/KG | 61 J | 1600 | 5200 | 28000 | 5700 |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | ND | 1100 | 2400 | 22000 | 2600 |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | ND | 950 | 2800 | 24000 | 4000 |
| 218-01-9 | Chrysene | UG/KG | ND | 890 | 5300 | 38000 | 8600 J |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | ND | 260 J | 680 J | 3300 J | ND |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | ND | 620 | 1900 | 14000 | 2400 |
| | Total Probable Carcinogenic PAHS | | 61 | 6240 | 21980 | 169300 | 29000 |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | ND | 96 J | 9000 | 150000 D | 19000 D |
| 208-96-8 | Acenaphthylene | UG/KG | ND | 570 | 1000 J | 6200 | 980 J |
| 120-12-7 | Anthracene | UG/KG | ND | 180 J | 6000 | 80000 JD | 10000 |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | ND | 260 J | 2000 | 12000 | 2000 |
| 206-44-0 | Fluoranthene | UG/KG | ND | 490 J | 4500 | 140000 D | 10000 |
| 86-73-7 | Fluorene | UG/KG | ND | ND | 6400 | 120000 D | 13000 |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | ND | 190 J | 5100 | | 15000 D |
| 91-20-3 | Naphthalene | UG/KG | ND | 290 J | 6800 | 540000 D | 19000 D |
| 85-01-8 | Phenanthrene | UG/KG | ND | 260 J | 17000 D | 290000 D | 25000 D |
| 129-00-0 | Pyrene | UG/KG | ND | 860 | 9400 | 110000 DJ | 15000 D |
| | Total PAHs | | 61 | 9436 | 89180 | 1617500 | 157980 |

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ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| | | | DSA-1 | | DSA-2 | | |
|---|---|---|---|---|---|---|---|
| **SOIL BORING DETECTED COMPOUNDS** | | SAMPLE ID: | MW-111H | MW-112D | MW-201J | MW-204M | MW-205M |
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS | | DEPTH: | 14-16' | 06-08' | 18-20' | 24-26' | 24-26' |
| | | LAB ID: | 2324802 | 2326202 | 2102801 | 2108101 | 2110901 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DSASB21 | DSASB21 | DS02SB01 | DS01SB03 | DS02SB04 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 3/02/95 | 3/07/95 | 6/13/94 | 6/15/94 | 6/21/94 |
| | | VALIDATED: | 5/30/95 | 5/30/95 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | PESTICIDES | | | | | | |
| 72-54-8 | 4,4'-DDD | UG/KG | | | ND | | ND |
| 50-29-3 | 4,4'-DDT | UG/KG | | | ND | | ND |
| 60-57-1 | Dieldrin | UG/KG | | | ND | | ND |
| 959-98-8 | Endosulfan I | UG/KG | | | 9.7 JN | | ND |
| 33213-65-9 | Endosulfan II | UG/KG | | | R | | 7.4 J |
| 72-20-8 | Endrin | UG/KG | | | ND | | ND |
| 7421-93-4 | Endrin aldehyde | UG/KG | | | ND | | ND |
| 1024-57-3 | Heptachlor epoxide | UG/KG | | | ND | | ND |
| 5103-71-9 | alpha-Chlordane | UG/KG | | | ND | | ND |
| 5103-74-2 | gamma-Chlordane | UG/KG | | | ND | | ND |
| | PCBs | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | | | ND | | ND |
| 12672-29-6 | Aroclor-1248 | UG/KG | | | ND | | ND |
| 11097-69-1 | Aroclor-1254 | UG/KG | | | ND | | ND |
| 11096-82-5 | Aroclor-1260 | UG/KG | | | ND | | ND |
| | Total PCBs | | | | ND | | ND |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | | | 9500 J | | 11100 |
| 7440-36-0 | Antimony | MG/KG | | | ND | | 8.8 J |
| 7440-38-2 | Arsenic | MG/KG | | | 3 | | 4.8 |
| 7440-39-3 | Barium | MG/KG | | | 74.5 | | 96.6 |
| 7440-41-7 | Beryllium | MG/KG | | | 0.68 J | | 0.76 J |
| 7440-43-9 | Cadmium | MG/KG | | | ND | | ND |
| 7440-70-2 | Calcium | MG/KG | | | 12300 | | 12400 |
| 7440-47-3 | Chromium | MG/KG | | | 37.6 | | 29.8 |
| 7440-48-4 | Cobalt | MG/KG | | | 11.4 J | | 11.3 J |
| 7440-50-8 | Copper | MG/KG | | | 255 J | | 190 J |
| 7439-89-6 | Iron | MG/KG | | | 20500 | | 24700 |
| 7439-92-1 | Lead | MG/KG | | | 64.1 | | 53.8 J |
| 7439-95-4 | Magnesium | MG/KG | | | 5220 | | 5800 |
| 7439-96-5 | Manganese | MG/KG | | | 593 | | 595 |
| 7439-97-6 | Mercury | MG/KG | | | 0.25 | | 0.35 |
| 7440-02-0 | Nickel | MG/KG | | | 19.1 | | 29.4 |
| 7440-09-7 | Potassium | MG/KG | | | 2030 | | 1890 |
| 7782-49-2 | Selenium | MG/KG | | | ND | | ND |
| 7440-23-5 | Sodium | MG/KG | | | ND | | ND |
| 7440-62-2 | Vanadium | MG/KG | | | 17.9 | | 23.6 |
| 7440-66-6 | Zinc | MG/KG | | | 255 J | | 221 |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | | | | | |
| | GC/FID | | | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | | | | |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | | | |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

**SOIL BORING DETECTED COMPOUNDS**

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS

| CAS NO. | COMPOUND | | DSA-2 | DSA-3 | DSA-1 | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | MW-206D | MW-301D | SB-102D | SB-103D | SB-104F |
| | | DEPTH: | 06-08' | 06-08' | 6-8' | 6-8' | 10-12' |
| | | LAB ID: | 2328103 | 2122301 | 2095701 | 2095702 | 2095705 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DSASB22 | DS02SB06 | DS01SB01 | DS01SB01 | DS01SB01 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 3/09/95 | 6/29/94 | 6/06/94 | 6/06/94 | 6/07/94 |
| | | VALIDATED: | 6/19/95 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| | | UNITS | | | | | |
| | PESTICIDES | | | | | | |
| 72-54-8 | 4,4'-DDD | UG/KG | | | | | ND |
| 50-29-3 | 4,4'-DDT | UG/KG | | | | | ND |
| 60-57-1 | Dieldrin | UG/KG | | | | | ND |
| 959-98-8 | Endosulfan I | UG/KG | | | | | ND |
| 33213-65-9 | Endosulfan II | UG/KG | | | | | 12 JN |
| 72-20-8 | Endrin | UG/KG | | | | | 14 JN |
| 7421-93-4 | Endrin aldehyde | UG/KG | | | | | ND |
| 1024-57-3 | Heptachlor epoxide | UG/KG | | | | | ND |
| 5103-71-9 | alpha-Chlordane | UG/KG | | | | | 5.4 |
| 5103-74-2 | gamma-Chlordane | UG/KG | | | | | 10 |
| | PCBs | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | | | | | ND |
| 12672-29-6 | Aroclor-1248 | UG/KG | | | | | ND |
| 11097-69-1 | Aroclor-1254 | UG/KG | | | | | ND |
| 11096-82-5 | Aroclor-1260 | UG/KG | | | | | ND |
| | Total PCBs | | | | | | ND |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | | | | | 14100 J |
| 7440-36-0 | Antimony | MG/KG | | | | | 7.4 J |
| 7440-38-2 | Arsenic | MG/KG | | | | | 5.6 |
| 7440-39-3 | Barium | MG/KG | | | | | 79.3 |
| 7440-41-7 | Beryllium | MG/KG | | | | | 0.8 J |
| 7440-43-9 | Cadmium | MG/KG | | | | | ND |
| 7440-70-2 | Calcium | MG/KG | | | | | 11300 |
| 7440-47-3 | Chromium | MG/KG | | | | | 26.1 |
| 7440-48-4 | Cobalt | MG/KG | | | | | 13.1 J |
| 7440-50-8 | Copper | MG/KG | | | | | 63.6 J |
| 7439-89-6 | Iron | MG/KG | | | | | 25100 |
| 7439-92-1 | Lead | MG/KG | | | | | 19 |
| 7439-95-4 | Magnesium | MG/KG | | | | | 6880 |
| 7439-96-5 | Manganese | MG/KG | | | | | 538 J |
| 7439-97-6 | Mercury | MG/KG | | | | | 0.18 |
| 7440-02-0 | Nickel | MG/KG | | | | | 29.8 |
| 7440-09-7 | Potassium | MG/KG | | | | | 2110 |
| 7782-49-2 | Selenium | MG/KG | | | | | ND |
| 7440-23-5 | Sodium | MG/KG | | | | | ND |
| 7440-62-2 | Vanadium | MG/KG | | | | | 32.9 |
| 7440-66-6 | Zinc | MG/KG | | | | | 91.4 |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | | | | | |
| | GC/FID | | | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | 1200 | | | |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | | | |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

**SOIL BORING DETECTED COMPOUNDS**

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS

| | | | DSA-1 | | | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | SB-105H | SB-106F | SB-107G | SB-108F | SB-108I |
| | | DEPTH: | 14-16' | 10-12' | 12-14' | 10-12 | 16-18' |
| | | LAB ID: | 2095703 | 2095704 | 2096901 | 2096907 | 2096902 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS01SB01 | DS01SB01 | DS01SB01 | DS01SB01 | DS01SB01 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/06/94 | 6/06/94 | 6/07/94 | 6/07/94 | 6/07/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | | | | ND | |
| 78-93-3 | 2-Butanone | UG/KG | | | | ND | |
| 75-15-0 | Carbon Disulfide | UG/KG | | | | ND | |
| 108-90-7 | Chlorobenzene | UG/KG | | | | ND | |
| 75-35-4 | 1,1-Dichloroethene | UG/KG | | | | ND | |
| 100-42-5 | Styrene | UG/KG | | | | ND | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | UG/KG | | | | ND | |
| 79-01-6 | Trichloroethene | UG/KG | | | | ND | |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/KG | | | | ND | |
| 100-41-4 | Ethylbenzene | UG/KG | | | | 15 J | |
| 108-88-3 | Toluene | UG/KG | | | | ND | |
| 1330-20-7 | Xylene (total) | UG/KG | | | | ND | |
| | Total BTEX Volatiles | | | | | 15 | |
| | SEMIVOLATILES | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | | | | ND | |
| 86-74-8 | Carbazole | UG/KG | | | | ND | |
| 91-58-7 | 2-Chloronaphthalene | UG/KG | | | | ND | |
| 84-74-2 | Di-n-butylphthalate | UG/KG | | | | ND | |
| 132-64-9 | Dibenzofuran | UG/KG | | | | ND | |
| 84-66-2 | Diethylphthalate | UG/KG | | | | 220 J | |
| 86-30-6 | N-Nitrosodiphenylamine | UG/KG | | | | ND | |
| 108-95-2 | Phenol | UG/KG | | | | ND | |
| 95-95-4 | 2,4,5-Trichlorophenol | UG/KG | | | | ND | |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | | | | ND | |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | ND | 210 J | 1800 J | 250 J | ND |
| 50-32-8 | Benzo(a)pyrene | UG/KG | ND | 200 J | 2400 | 270 J | ND |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | ND | ND | ND | 300 J | ND |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | ND | 120 J | ND | 150 J | ND |
| 218-01-9 | Chrysene | UG/KG | ND | 300 J | 2400 | 320 J | ND |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | ND | ND | ND | ND | ND |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | ND | ND | ND | ND | ND |
| | Total Probable Carcinogenic PAHS | | ND | 830 | 6600 | 1290 | ND |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | ND | ND | 620 J | ND | 48 J |
| 208-96-8 | Acenaphthylene | UG/KG | ND | 350 J | 1200 J | ND | ND |
| 120-12-7 | Anthracene | UG/KG | ND | 250 J | 1200 J | ND | 48 J |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | ND | ND | ND | ND | ND |
| 206-44-0 | Fluoranthene | UG/KG | ND | 380 J | 2500 | 330 J | 58 J |
| 86-73-7 | Fluorene | UG/KG | ND | 280 J | 760 J | ND | 63 J |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | | | | ND | |
| 91-20-3 | Naphthalene | UG/KG | ND | 680 J | 1800 J | 94 J | 100 J |
| 85-01-8 | Phenanthrene | UG/KG | ND | 760 J | 2100 | 300 J | 150 J |
| 129-00-0 | Pyrene | UG/KG | ND | 540 J | 5000 J | 250 J | 52 J |
| | Total PAHs | | ND | 4070 | 21780 | 2264 | 519 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| | | | DSA-1 | | | | |
|---|---|---|---|---|---|---|---|
| SOIL BORING DETECTED COMPOUNDS | | SAMPLE ID: | SB-105H | SB-106F | SB-107G | SB-108F | SB-108I |
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT - DREDGE SPOIL AREAS | | DEPTH: | 14-16' | 10-12' | 12-14' | 10-12 | 16-18' |
| | | LAB ID: | 2095703 | 2095704 | 2096901 | 2096907 | 2096902 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS01SB01 | DS01SB01 | DS01SB01 | DS01SB01 | DS01SB01 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/06/94 | 6/06/94 | 6/07/94 | 6/07/94 | 6/07/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | PESTICIDES | | | | | | |
| 72-54-8 | 4,4'-DDD | UG/KG | | | | ND | |
| 50-29-3 | 4,4'-DDT | UG/KG | | | | ND | |
| 60-57-1 | Dieldrin | UG/KG | | | | ND | |
| 959-98-8 | Endosulfan I | UG/KG | | | | ND | |
| 33213-65-9 | Endosulfan II | UG/KG | | | | ND | |
| 72-20-8 | Endrin | UG/KG | | | | ND | |
| 7421-93-4 | Endrin aldehyde | UG/KG | | | | ND | |
| 1024-57-3 | Heptachlor epoxide | UG/KG | | | | ND | |
| 5103-71-9 | alpha-Chlordane | UG/KG | | | | ND | |
| 5103-74-2 | gamma-Chlordane | UG/KG | | | | ND | |
| | PCBs | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | | | | 51 | |
| 12672-29-6 | Aroclor-1248 | UG/KG | | | | ND | |
| 11097-69-1 | Aroclor-1254 | UG/KG | | | | 43 | |
| 11096-82-5 | Aroclor-1260 | UG/KG | | | | ND | |
| | Total PCBs | | | | | 94 | |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | | | | 4140 J | |
| 7440-36-0 | Antimony | MG/KG | | | | 8.9 J | |
| 7440-38-2 | Arsenic | MG/KG | | | | 2.5 | |
| 7440-39-3 | Barium | MG/KG | | | | 27 J | |
| 7440-41-7 | Beryllium | MG/KG | | | | 0.46 J | |
| 7440-43-9 | Cadmium | MG/KG | | | | ND | |
| 7440-70-2 | Calcium | MG/KG | | | | 6350 | |
| 7440-47-3 | Chromium | MG/KG | | | | 5.6 | |
| 7440-48-4 | Cobalt | MG/KG | | | | 5.7 J | |
| 7440-50-8 | Copper | MG/KG | | | | 10.5 J | |
| 7439-89-6 | Iron | MG/KG | | | | 11000 | |
| 7439-92-1 | Lead | MG/KG | | | | 7.7 | |
| 7439-95-4 | Magnesium | MG/KG | | | | 3310 | |
| 7439-96-5 | Manganese | MG/KG | | | | 439 J | |
| 7439-97-6 | Mercury | MG/KG | | | | 0.14 | |
| 7440-02-0 | Nickel | MG/KG | | | | 6.5 J | |
| 7440-09-7 | Potassium | MG/KG | | | | 452 J | |
| 7782-49-2 | Selenium | MG/KG | | | | ND | |
| 7440-23-5 | Sodium | MG/KG | | | | ND | |
| 7440-62-2 | Vanadium | MG/KG | | | | 10.5 J | |
| 7440-66-6 | Zinc | MG/KG | | | | 29.5 | |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | | | | | |
| | GC/FID | | | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | | | | |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | | | |

J - Indicates an estimated value.
D - Indicates a diluted value.
N - Indicates presumptive evidence of a compound.
R - Indicates rejected data.
ND - Not detected.
(MAX) - Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| | | | DSA-1 | | | | |
|---|---|---|---|---|---|---|---|
| SOIL BORING DETECTED COMPOUNDS | | SAMPLE ID: | SB-109H | SB-110H | SB-111F | SB-112E | SB-112I$^{(MAX)}$ |
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT - DREDGE SPOIL AREAS | | DEPTH: | 14-16' | 14-16 | 10-12' | 8-10' | 12-18 |
| | | LAB ID: | 2096903 | 2096908 | 2096904 | 2096905 | 2096909 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS01SB01 | DS01SB01 | DS01SB01 | DS01SB01 | DS01SB01 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/07/94 | 6/08/94 | 6/08/94 | 6/08/94 | 6/08/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | | 130 J | | | ND |
| 78-93-3 | 2-Butanone | UG/KG | | ND | | | ND |
| 75-15-0 | Carbon Disulfide | UG/KG | | ND | | | ND |
| 108-90-7 | Chlorobenzene | UG/KG | | ND | | | ND |
| 75-35-4 | 1,1-Dichloroethene | UG/KG | | ND | | | ND |
| 100-42-5 | Styrene | UG/KG | | ND | | | ND |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | UG/KG | | ND | | | ND |
| 79-01-6 | Trichloroethene | UG/KG | | ND | | | ND |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/KG | | ND | | | 220 J |
| 100-41-4 | Ethylbenzene | UG/KG | | ND | | | 17000 |
| 108-88-3 | Toluene | UG/KG | | ND | | | 1300 |
| 1330-20-7 | Xylene (total) | UG/KG | | ND | | | 17000 |
| | Total BTEX Volatiles | | | ND | | | 35520 |
| | SEMIVOLATILES | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | | ND | | | ND |
| 86-74-8 | Carbazole | UG/KG | | ND | | | 490 J |
| 91-58-7 | 2-Chloronaphthalene | UG/KG | | ND | | | ND |
| 84-74-2 | Di-n-butylphthalate | UG/KG | | ND | | | ND |
| 132-64-9 | Dibenzofuran | UG/KG | | ND | | | 7500 J |
| 84-66-2 | Diethylphthalate | UG/KG | | ND | | | ND |
| 86-30-6 | N-Nitrosodiphenylamine | UG/KG | | ND | | | 1400 J |
| 108-95-2 | Phenol | UG/KG | | ND | | | ND |
| 95-95-4 | 2,4,5-Trichlorophenol | UG/KG | | ND | | | ND |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | | ND | | | ND |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | ND | 2000 | 36000 DJ | 200 J | 34000 JD |
| 50-32-8 | Benzo(a)pyrene | UG/KG | ND | 3400 | 52000 D | ND | 13000 JD |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | ND | 1700 J | 18000 | ND | 4800 J |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | ND | 1800 | 22000 | ND | 14000 J |
| 218-01-9 | Chrysene | UG/KG | ND | 2600 | 68000 D | 280 J | 28000 JD |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | ND | ND | ND | ND | 2200 J |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | ND | 1100 J | 12000 | ND | 6100 J |
| | Total Probable Carcinogenic PAHS | | ND | 12600 | 208000 | 480 | 102100 |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | ND | 690 J | 22000 | ND | 33000 JD |
| 208-96-8 | Acenaphthylene | UG/KG | ND | 1900 | 29000 | 240 J | 98000 DJ |
| 120-12-7 | Anthracene | UG/KG | ND | 1900 | 65000 D | ND | 52000 JD |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | ND | 500 J | 14000 | ND | 3200 J |
| 206-44-0 | Fluoranthene | UG/KG | ND | 2900 | 16000 | 230 J | 49000 JD |
| 86-73-7 | Fluorene | UG/KG | ND | 2200 | 80000 D | ND | 86000 JD |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | | 230 J | | | 210000 DJ |
| 91-20-3 | Naphthalene | UG/KG | ND | 320 J | 13000 | 100 J | 360000 DJ |
| 85-01-8 | Phenanthrene | UG/KG | ND | 6400 | 120000 D | 170 J | 180000 DJ |
| 129-00-0 | Pyrene | UG/KG | ND | 6700 | 120000 DJ | 360 J | 54000 JD |
| | Total PAHs | | ND | 36340 | 687000 | 1580 | 1227300 |

J - Indicates an estimated value.
D - Indicates a diluted value.
N - Indicates presumptive evidence of a compound.
R - Indicates rejected data.
ND - Not detected.
$^{(MAX)}$ - Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

**SOIL BORING DETECTED COMPOUNDS**

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS

| CAS NO. | COMPOUND | | DSA-1 | | | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | SB-109H | SB-110H | SB-111F | SB-112E | SB-112I$^{(MAX)}$ |
| | | DEPTH: | 14-16' | 14-16 | 10-12' | 8-10' | 12-18 |
| | | LAB ID: | 2096903 | 2096908 | 2096904 | 2096905 | 2096909 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS01SB01 | DS01SB01 | DS01SB01 | DS01SB01 | DS01SB01 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/07/94 | 6/08/94 | 6/08/94 | 6/08/94 | 6/08/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| | | UNITS | | | | | |
| | PESTICIDES | | | | | | |
| 72-54-8 | 4,4'-DDD | UG/KG | | ND | | | ND |
| 50-29-3 | 4,4'-DDT | UG/KG | | 24 | | | ND |
| 60-57-1 | Dieldrin | UG/KG | | ND | | | ND |
| 959-98-8 | Endosulfan I | UG/KG | | ND | | | ND |
| 33213-65-9 | Endosulfan II | UG/KG | | 28 | | | 31 |
| 72-20-8 | Endrin | UG/KG | | ND | | | ND |
| 7421-93-4 | Endrin aldehyde | UG/KG | | ND | | | ND |
| 1024-57-3 | Heptachlor epoxide | UG/KG | | ND | | | 9 JN |
| 5103-71-9 | alpha-Chlordane | UG/KG | | ND | | | ND |
| 5103-74-2 | gamma-Chlordane | UG/KG | | ND | | | 8.7 |
| | PCBs | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | | ND | | | ND |
| 12672-29-6 | Aroclor-1248 | UG/KG | | ND | | | ND |
| 11097-69-1 | Aroclor-1254 | UG/KG | | ND | | | ND |
| 11096-82-5 | Aroclor-1260 | UG/KG | | ND | | | ND |
| | Total PCBs | | | ND | | | ND |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | | 6730 J | | | 19800 J |
| 7440-36-0 | Antimony | MG/KG | | ND | | | 8 J |
| 7440-38-2 | Arsenic | MG/KG | | 3.2 | | | 4.6 |
| 7440-39-3 | Barium | MG/KG | | 41.6 J | | | 98.6 |
| 7440-41-7 | Beryllium | MG/KG | | 0.52 J | | | 1.6 |
| 7440-43-9 | Cadmium | MG/KG | | ND | | | ND |
| 7440-70-2 | Calcium | MG/KG | | 13800 | | | 9750 |
| 7440-47-3 | Chromium | MG/KG | | 10.6 | | | 25.1 |
| 7440-48-4 | Cobalt | MG/KG | | 7 J | | | 14 |
| 7440-50-8 | Copper | MG/KG | | 17.5 J | | | 39.9 J |
| 7439-89-6 | Iron | MG/KG | | 15200 | | | 28300 |
| 7439-92-1 | Lead | MG/KG | | 10 | | | 19.4 |
| 7439-95-4 | Magnesium | MG/KG | | 4970 | | | 7150 |
| 7439-96-5 | Manganese | MG/KG | | 375 J | | | 536 J |
| 7439-97-6 | Mercury | MG/KG | | 0.13 | | | 0.25 |
| 7440-02-0 | Nickel | MG/KG | | 18.2 | | | 33.5 |
| 7440-09-7 | Potassium | MG/KG | | 1040 J | | | 2980 |
| 7782-49-2 | Selenium | MG/KG | | ND | | | ND |
| 7440-23-5 | Sodium | MG/KG | | ND | | | ND |
| 7440-62-2 | Vanadium | MG/KG | | 16.5 | | | 41.4 |
| 7440-66-6 | Zinc | MG/KG | | 43.5 | | | 95.6 |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | | | | | |
| | GC/FID | | | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | | | | |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | | | |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
$^{(MAX)}$ – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| | | | DSA–1 | | | | |
|---|---|---|---|---|---|---|---|
| SOIL BORING DETECTED COMPOUNDS | | SAMPLE ID: | SB–113I | SB–114C | SB–115D | SB–115H | SB–116G |
| NIAGARA MOHAWK POWER CORPORATION | | DEPTH: | 16–18' | 4–6' | 6–8' | 14–16' | 12–14' |
| HARBOR POINT – DREDGE SPOIL AREAS | | LAB ID: | 2096906 | 2100001 | 2100004 | 2100002 | 2100003 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS01SB01 | DS01SB02 | DS01SB02 | DS01SB02 | DS01SB02 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/08/94 | 6/08/94 | 6/09/94 | 6/09/94 | 6/09/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | VOLATILES | | | | | | |
| 67–64–1 | Acetone | UG/KG | | | 60 J | | |
| 78–93–3 | 2–Butanone | UG/KG | | | 12 J | | |
| 75–15–0 | Carbon Disulfide | UG/KG | | | ND | | |
| 108–90–7 | Chlorobenzene | UG/KG | | | ND | | |
| 75–35–4 | 1,1–Dichloroethene | UG/KG | | | ND | | |
| 100–42–5 | Styrene | UG/KG | | | 2 J | | |
| 79–34–5 | 1,1,2,2–Tetrachloroethane | UG/KG | | | 2 J | | |
| 79–01–6 | Trichloroethene | UG/KG | | | ND | | |
| | BTEX VOLATILES | | | | | | |
| 71–43–2 | Benzene | UG/KG | | | 4 J | | |
| 100–41–4 | Ethylbenzene | UG/KG | | | 83 | | |
| 108–88–3 | Toluene | UG/KG | | | 5 J | | |
| 1330–20–7 | Xylene (total) | UG/KG | | | 28 | | |
| | Total BTEX Volatiles | | | | 120 | | |
| | SEMIVOLATILES | | | | | | |
| 85–68–7 | Butylbenzylphthalate | UG/KG | | | ND | | |
| 86–74–8 | Carbazole | UG/KG | | | 4100 J | | |
| 91–58–7 | 2–Chloronaphthalene | UG/KG | | | ND | | |
| 84–74–2 | Di–n–butylphthalate | UG/KG | | | ND | | |
| 132–64–9 | Dibenzofuran | UG/KG | | | 34000 | | |
| 84–66–2 | Diethylphthalate | UG/KG | | | ND | | |
| 86–30–6 | N–Nitrosodiphenylamine | UG/KG | | | ND | | |
| 108–95–2 | Phenol | UG/KG | | | ND | | |
| 95–95–4 | 2,4,5–Trichlorophenol | UG/KG | | | ND | | |
| 117–81–7 | bis(2–Ethylhexyl)phthalate | UG/KG | | | ND | | |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56–55–3 | Benzo(a)anthracene | UG/KG | ND | 67000 JD | 35000 | 1600 | 32000 D |
| 50–32–8 | Benzo(a)pyrene | UG/KG | ND | 45000 JD | 50000 | 2000 | 24000 |
| 205–99–2 | Benzo(b)fluoranthene | UG/KG | ND | 40000 | 40000 | 900 | 9600 |
| 207–08–9 | Benzo(k)fluoranthene | UG/KG | ND | 31000 | 30000 | 1100 | 13000 |
| 218–01–9 | Chrysene | UG/KG | ND | 57000 JD | 53000 | 2300 | 28000 D |
| 53–70–3 | Dibenz(a,h)anthracene | UG/KG | ND | 9700 | 6400 J | 130 J | 3600 J |
| 193–39–5 | Indeno(1,2,3–cd)pyrene | UG/KG | ND | 33000 | 22000 | 780 J | 9200 |
| | Total Probable Carcinogenic PAHS | | ND | 282700 | 236400 | 8810 | 119400 |
| | OTHER PAHs | | | | | | |
| 83–32–9 | Acenaphthene | UG/KG | ND | 130000 D | 79000 | 780 J | 17000 |
| 208–96–8 | Acenaphthylene | UG/KG | ND | ND | 5600 J | 3600 | 83000 D |
| 120–12–7 | Anthracene | UG/KG | ND | 65000 JD | 54000 | 2200 | 54000 D |
| 191–24–2 | Benzo(g,h,i)perylene | UG/KG | ND | 27000 | 19000 | 890 | 9500 |
| 206–44–0 | Fluoranthene | UG/KG | ND | 38000 | 110000 | 1700 | 41000 D |
| 86–73–7 | Fluorene | UG/KG | ND | 93000 JD | 53000 | 3000 | 92000 D |
| 91–57–6 | 2–Methylnaphthalene | UG/KG | | | 14000 J | | |
| 91–20–3 | Naphthalene | UG/KG | ND | 580000 D | 890000 D | ND | 140000 D |
| 85–01–8 | Phenanthrene | UG/KG | ND | 200000 D | 180000 D | 5300 | 140000 D |
| 129–00–0 | Pyrene | UG/KG | ND | 120000 D | 84000 J | 4500 | 78000 D |
| | Total PAHs | | ND | 1535700 | 1725000 | 30780 | 773900 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| SOIL BORING DETECTED COMPOUNDS | | | | | DSA-1 | | |
|---|---|---|---|---|---|---|---|
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS | | SAMPLE ID: | SB-113I | SB-114C | SB-115D | SB-115H | SB-116G |
| | | DEPTH: | 16-18' | 4-6' | 6-8' | 14-16' | 12-14' |
| | | LAB ID: | 2096906 | 2100001 | 2100004 | 2100002 | 2100003 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS01SB01 | DS01SB02 | DS01SB02 | DS01SB02 | DS01SB02 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/08/94 | 6/08/94 | 6/09/94 | 6/09/94 | 6/09/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | PESTICIDES | | | | | | |
| 72-54-8 | 4,4'-DDD | UG/KG | | | ND | | |
| 50-29-3 | 4,4'-DDT | UG/KG | | | ND | | |
| 60-57-1 | Dieldrin | UG/KG | | | ND | | |
| 959-98-8 | Endosulfan I | UG/KG | | | ND | | |
| 33213-65-9 | Endosulfan II | UG/KG | | | ND | | |
| 72-20-8 | Endrin | UG/KG | | | ND | | |
| 7421-93-4 | Endrin aldehyde | UG/KG | | | ND | | |
| 1024-57-3 | Heptachlor epoxide | UG/KG | | | ND | | |
| 5103-71-9 | alpha-Chlordane | UG/KG | | | ND | | |
| 5103-74-2 | gamma-Chlordane | UG/KG | | | ND | | |
| | PCBs | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | | | ND | | |
| 12672-29-6 | Aroclor-1248 | UG/KG | | | ND | | |
| 11097-69-1 | Aroclor-1254 | UG/KG | | | 2000 | | |
| 11096-82-5 | Aroclor-1260 | UG/KG | | | ND | | |
| | Total PCBs | | | | 2000 | | |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | | | 9650 | | |
| 7440-36-0 | Antimony | MG/KG | | | ND | | |
| 7440-38-2 | Arsenic | MG/KG | | | 13.5 | | |
| 7440-39-3 | Barium | MG/KG | | | 67.2 | | |
| 7440-41-7 | Beryllium | MG/KG | | | 0.48 J | | |
| 7440-43-9 | Cadmium | MG/KG | | | 1.5 | | |
| 7440-70-2 | Calcium | MG/KG | | | 15500 | | |
| 7440-47-3 | Chromium | MG/KG | | | 78.6 J | | |
| 7440-48-4 | Cobalt | MG/KG | | | 10.8 J | | |
| 7440-50-8 | Copper | MG/KG | | | 406 J | | |
| 7439-89-6 | Iron | MG/KG | | | 22200 | | |
| 7439-92-1 | Lead | MG/KG | | | 63.4 | | |
| 7439-95-4 | Magnesium | MG/KG | | | 6000 | | |
| 7439-96-5 | Manganese | MG/KG | | | 502 | | |
| 7439-97-6 | Mercury | MG/KG | | | 0.9 | | |
| 7440-02-0 | Nickel | MG/KG | | | 28 | | |
| 7440-09-7 | Potassium | MG/KG | | | 1380 | | |
| 7782-49-2 | Selenium | MG/KG | | | 1.5 | | |
| 7440-23-5 | Sodium | MG/KG | | | ND | | |
| 7440-62-2 | Vanadium | MG/KG | | | 22.9 | | |
| 7440-66-6 | Zinc | MG/KG | | | 221 J | | |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | | | | | |
| | GC/FID | | | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | | | | |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | | | |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| | | | DSA-1 | | | | |
|---|---|---|---|---|---|---|---|
| SOIL BORING DETECTED COMPOUNDS | | SAMPLE ID: | SB-118G | SB-123H | SB-124E | SB-125G$^{(MAX)}$ | SB-126J$^{(MAX)}$ |
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS | | DEPTH: | 12-14' | 14-16' | 8-10' | 12-14' | 18-20' |
| | | LAB ID: | 2101101 | 2101102 | 2101103 | 2102701 | 2103001 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS01SB02 | DS01SB02 | DS01SB02 | DS01SB02 | DS01SB03 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/09/94 | 6/10/94 | 6/10/94 | 6/13/94 | 6/13/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | ND | ND | | ND | |
| 78-93-3 | 2-Butanone | UG/KG | ND | ND | | ND | |
| 75-15-0 | Carbon Disulfide | UG/KG | ND | ND | | ND | |
| 108-90-7 | Chlorobenzene | UG/KG | ND | ND | | ND | |
| 75-35-4 | 1,1-Dichloroethene | UG/KG | ND | ND | | ND | |
| 100-42-5 | Styrene | UG/KG | ND | ND | | ND | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | UG/KG | ND | ND | | ND | |
| 79-01-6 | Trichloroethene | UG/KG | ND | ND | | ND | |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/KG | ND | 1000 | | ND | |
| 100-41-4 | Ethylbenzene | UG/KG | 24 | 22000 D | | ND | |
| 108-88-3 | Toluene | UG/KG | ND | 2700 D | | ND | |
| 1330-20-7 | Xylene (total) | UG/KG | 25 | 22000 D | | ND | |
| | Total BTEX Volatiles | | 49 | 47700 | | ND | |
| | SEMIVOLATILES | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | | R | | ND | |
| 86-74-8 | Carbazole | UG/KG | | R | | ND | |
| 91-58-7 | 2-Chloronaphthalene | UG/KG | | R | | ND | |
| 84-74-2 | Di-n-butylphthalate | UG/KG | | R | | ND | |
| 132-64-9 | Dibenzofuran | UG/KG | | R | | 290 J | |
| 84-66-2 | Diethylphthalate | UG/KG | | R | | ND | |
| 86-30-6 | N-Nitrosodiphenylamine | UG/KG | | R | | ND | |
| 108-95-2 | Phenol | UG/KG | | R | | ND | |
| 95-95-4 | 2,4,5-Trichlorophenol | UG/KG | | R | | ND | |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | | R | | ND | |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | 1600 J | 5700 J | 1300 | 4100 | ND |
| 50-32-8 | Benzo(a)pyrene | UG/KG | R | R | 2600 | 5900 | ND |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | R | R | 1500 | 3200 | ND |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | R | R | 1100 | 3300 | ND |
| 218-01-9 | Chrysene | UG/KG | 1800 J | 4500 J | 2100 | 5400 | ND |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | R | R | 480 | 990 J | ND |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | R | R | 1500 | 2500 | ND |
| | | | | R | | | |
| | Total Probable Carcinogenic PAHS | | 3400 | 10200 | 10580 | 25390 | ND |
| | OTHER PAHs | | | R | | | |
| 83-32-9 | Acenaphthene | UG/KG | R | 55000 J | 140 J | 1400 J | ND |
| 208-96-8 | Acenaphthylene | UG/KG | R | 13000 J | 1400 | 1400 J | ND |
| 120-12-7 | Anthracene | UG/KG | R | 7300 J | 510 | 3200 | ND |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | R | R | 1700 | 2700 | ND |
| 206-44-0 | Fluoranthene | UG/KG | 1600 J | 8200 J | 660 | 4900 | ND |
| 86-73-7 | Fluorene | UG/KG | R | 12000 J | 240 J | 1700 J | ND |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | | 20000 J | | 200 J | |
| 91-20-3 | Naphthalene | UG/KG | R | 14000 J | 160 J | 410 J | ND |
| 85-01-8 | Phenanthrene | UG/KG | R | 27000 J | 450 J | 6800 | ND |
| 129-00-0 | Pyrene | UG/KG | 2700 J | 9500 J | 3400 J | 8300 | 52 J |
| | Total PAHs | | 7700 | 176200 | 19240 | 56400 | 52 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
$^{(MAX)}$ – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

**SOIL BORING DETECTED COMPOUNDS**

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS

| | | | DSA-1 | | | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | SB-118G | SB-123H | SB-124E | SB-125G$^{(MAX)}$ | SB-126J$^{(MAX)}$ |
| | | DEPTH: | 12-14' | 14-16' | 8-10' | 12-14' | 18-20' |
| | | LAB ID: | 2101101 | 2101102 | 2101103 | 2102701 | 2103001 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS01SB02 | DS01SB02 | DS01SB02 | DS01SB02 | DS01SB03 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/09/94 | 6/10/94 | 6/10/94 | 6/13/94 | 6/13/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | PESTICIDES | | | | | | |
| 72-54-8 | 4,4'-DDD | UG/KG | ND | ND | | ND | |
| 50-29-3 | 4,4'-DDT | UG/KG | ND | ND | | ND | |
| 60-57-1 | Dieldrin | UG/KG | ND | ND | | ND | |
| 959-98-8 | Endosulfan I | UG/KG | ND | ND | | ND | |
| 33213-65-9 | Endosulfan II | UG/KG | ND | ND | | ND | |
| 72-20-8 | Endrin | UG/KG | ND | ND | | ND | |
| 7421-93-4 | Endrin aldehyde | UG/KG | ND | ND | | ND | |
| 1024-57-3 | Heptachlor epoxide | UG/KG | ND | 8.7 J | | ND | |
| 5103-71-9 | alpha-Chlordane | UG/KG | ND | ND | | ND | |
| 5103-74-2 | gamma-Chlordane | UG/KG | ND | ND | | ND | |
| | PCBs | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | ND | ND | | ND | |
| 12672-29-6 | Aroclor-1248 | UG/KG | 94 J | ND | | ND | |
| 11097-69-1 | Aroclor-1254 | UG/KG | ND | ND | | ND | |
| 11096-82-5 | Aroclor-1260 | UG/KG | ND | 120 J | | 57 J | |
| | Total PCBs | | 94 | 120 | | 57 | |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | 6930 | 13200 | | 24500 | |
| 7440-36-0 | Antimony | MG/KG | ND | ND | | ND | |
| 7440-38-2 | Arsenic | MG/KG | 3.4 | 6 J | | 7.7 | |
| 7440-39-3 | Barium | MG/KG | 37.7 J | 81.7 | | 146 | |
| 7440-41-7 | Beryllium | MG/KG | 0.45 J | 0.56 J | | 1.6 | |
| 7440-43-9 | Cadmium | MG/KG | ND | ND | | ND | |
| 7440-70-2 | Calcium | MG/KG | 12600 | 10700 | | 13900 | |
| 7440-47-3 | Chromium | MG/KG | 12.8 J | 22.6 J | | 42.2 J | |
| 7440-48-4 | Cobalt | MG/KG | 6.9 J | 15.9 | | 20.4 | |
| 7440-50-8 | Copper | MG/KG | 22.1 J | 42.8 J | | 156 J | |
| 7439-89-6 | Iron | MG/KG | 15500 | 30700 | | 31800 | |
| 7439-92-1 | Lead | MG/KG | 13.6 | 22 | | 41.5 | |
| 7439-95-4 | Magnesium | MG/KG | 4770 | 6940 | | 7300 | |
| 7439-96-5 | Manganese | MG/KG | 375 | 588 | | 610 | |
| 7439-97-6 | Mercury | MG/KG | ND | ND | | 0.24 | |
| 7440-02-0 | Nickel | MG/KG | 16.6 | 37.7 | | 46.1 | |
| 7440-09-7 | Potassium | MG/KG | 1190 J | 1800 | | 3430 | |
| 7782-49-2 | Selenium | MG/KG | ND | ND | | ND | |
| 7440-23-5 | Sodium | MG/KG | ND | ND | | ND | |
| 7440-62-2 | Vanadium | MG/KG | 17.4 | 29.9 | | 48.8 | |
| 7440-66-6 | Zinc | MG/KG | 44.2 J | 88.9 J | | 151 J | |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | | | | | |
| | GC/FID | | | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | | | | |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | | | |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
$^{(MAX)}$ – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| SOIL BORING DETECTED COMPOUNDS | | SAMPLE ID: | SB-127G | SB-128G | SB-129I | SB-130G | SB-130K |
|---|---|---|---|---|---|---|---|
| | | | DSA-1 | | | | |
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT - DREDGE SPOIL AREAS | | DEPTH: | 12-14' | 12-14' | 10-18' | 12-14' | 20-22' |
| | | LAB ID: | 2103002 | 2103003 | 2104701 | 2104704 | 2108102 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS01SB03 | DS01SB03 | DS01SB02 | DS01SB02 | DS01SB03 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/13/94 | 6/13/94 | 6/13/94 | 6/13/94 | 6/16/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | | | ND | | |
| 78-93-3 | 2-Butanone | UG/KG | | | 8 J | | |
| 75-15-0 | Carbon Disulfide | UG/KG | | | ND | | |
| 108-90-7 | Chlorobenzene | UG/KG | | | ND | | |
| 75-35-4 | 1,1-Dichloroethene | UG/KG | | | ND | | |
| 100-42-5 | Styrene | UG/KG | | | ND | | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | UG/KG | | | ND | | |
| 79-01-6 | Trichloroethene | UG/KG | | | ND | | |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/KG | | | 2 J | | |
| 100-41-4 | Ethylbenzene | UG/KG | | | 32 J | | |
| 108-88-3 | Toluene | UG/KG | | | 3 J | | |
| 1330-20-7 | Xylene (total) | UG/KG | | | 37 J | | |
| | Total BTEX Volatiles | | | | 74 | | |
| | SEMIVOLATILES | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | | | ND | | |
| 86-74-8 | Carbazole | UG/KG | | | ND | | |
| 91-58-7 | 2-Chloronaphthalene | UG/KG | | | ND | | |
| 84-74-2 | Di-n-butylphthalate | UG/KG | | | ND | | |
| 132-64-9 | Dibenzofuran | UG/KG | | | 250 J | | |
| 84-66-2 | Diethylphthalate | UG/KG | | | ND | | |
| 86-30-6 | N-Nitrosodiphenylamine | UG/KG | | | ND | | |
| 108-95-2 | Phenol | UG/KG | | | ND | | |
| 95-95-4 | 2,4,5-Trichlorophenol | UG/KG | | | ND | | |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | | | ND | | |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | ND | 340 J | 890 J | | ND |
| 50-32-8 | Benzo(a)pyrene | UG/KG | ND | 240 J | 1300 | | ND |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | ND | 160 J | 930 | | ND |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | ND | 140 J | 740 J | | ND |
| 218-01-9 | Chrysene | UG/KG | ND | 410 J | 1400 | | ND |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | ND | ND | ND | | ND |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | ND | 98 J | 650 J | | ND |
| | Total Probable Carcinogenic PAHS | | ND | 1388 | 5910 | | ND |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | ND | 680 | 4300 J | | ND |
| 208-96-8 | Acenaphthylene | UG/KG | ND | ND | 1800 J | | ND |
| 120-12-7 | Anthracene | UG/KG | ND | 480 | 1200 | | ND |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | ND | 54 J | 780 J | | ND |
| 206-44-0 | Fluoranthene | UG/KG | ND | 500 | 1800 | | 72 J |
| 86-73-7 | Fluorene | UG/KG | ND | 740 | 2200 | | ND |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | | | 9700 DJ | | |
| 91-20-3 | Naphthalene | UG/KG | ND | 120 J | 26000 DJ | | 150 J |
| 85-01-8 | Phenanthrene | UG/KG | ND | 1500 | 3700 | | 55 J |
| 129-00-0 | Pyrene | UG/KG | ND | 990 | 2200 | | 58 J |
| | Total PAHs | | ND | 6452 | 59590 | | 335 |

J - Indicates an estimated value.
D - Indicates a diluted value.
N - Indicates presumptive evidence of a compound.
R - Indicates rejected data.
ND - Not detected.
(MAX) - Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| SOIL BORING DETECTED COMPOUNDS | | | DSA-1 | | | | |
|---|---|---|---|---|---|---|---|
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS | | SAMPLE ID: | SB-127G | SB-128G | SB-129I | SB-130G | SB-130K |
| | | DEPTH: | 12-14' | 12-14' | 10-18' | 12-14' | 20-22' |
| | | LAB ID: | 2103002 | 2103003 | 2104701 | 2104704 | 2108102 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS01SB03 | DS01SB03 | DS01SB02 | DS01SB02 | DS01SB03 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/13/94 | 6/13/94 | 6/13/94 | 6/13/94 | 6/16/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | PESTICIDES | | | | | | |
| 72-54-8 | 4,4'-DDD | UG/KG | | | ND | | |
| 50-29-3 | 4,4'-DDT | UG/KG | | | ND | | |
| 60-57-1 | Dieldrin | UG/KG | | | ND | | |
| 959-98-8 | Endosulfan I | UG/KG | | | ND | | |
| 33213-65-9 | Endosulfan II | UG/KG | | | ND | | |
| 72-20-8 | Endrin | UG/KG | | | 33 J | | |
| 7421-93-4 | Endrin aldehyde | UG/KG | | | ND | | |
| 1024-57-3 | Heptachlor epoxide | UG/KG | | | ND | | |
| 5103-71-9 | alpha-Chlordane | UG/KG | | | ND | | |
| 5103-74-2 | gamma-Chlordane | UG/KG | | | ND | | |
| | PCBs | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | | | ND | | |
| 12672-29-6 | Aroclor-1248 | UG/KG | | | ND | | |
| 11097-69-1 | Aroclor-1254 | UG/KG | | | 110 J | | |
| 11096-82-5 | Aroclor-1260 | UG/KG | | | ND | | |
| | Total PCBs | | | | 110 | | |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | | | 15200 | | |
| 7440-36-0 | Antimony | MG/KG | | | ND | | |
| 7440-38-2 | Arsenic | MG/KG | | | 5.6 | | |
| 7440-39-3 | Barium | MG/KG | | | 87.8 | | |
| 7440-41-7 | Beryllium | MG/KG | | | 0.91 J | | |
| 7440-43-9 | Cadmium | MG/KG | | | 1 J | | |
| 7440-70-2 | Calcium | MG/KG | | | 13400 | | |
| 7440-47-3 | Chromium | MG/KG | | | 39.9 J | | |
| 7440-48-4 | Cobalt | MG/KG | | | 13.8 | | |
| 7440-50-8 | Copper | MG/KG | | | 141 J | | |
| 7439-89-6 | Iron | MG/KG | | | 28200 | | |
| 7439-92-1 | Lead | MG/KG | | | 25.5 | | |
| 7439-95-4 | Magnesium | MG/KG | | | 7630 | | |
| 7439-96-5 | Manganese | MG/KG | | | 595 | | |
| 7439-97-6 | Mercury | MG/KG | | | 0.23 | | |
| 7440-02-0 | Nickel | MG/KG | | | 29.7 | | |
| 7440-09-7 | Potassium | MG/KG | | | 2540 | | |
| 7782-49-2 | Selenium | MG/KG | | | ND | | |
| 7440-23-5 | Sodium | MG/KG | | | ND | | |
| 7440-62-2 | Vanadium | MG/KG | | | 35.9 | | |
| 7440-66-6 | Zinc | MG/KG | | | 136 J | | |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | | | | | |
| | GC/FID | | | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | | | 6000 | |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | | | |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| | | | DSA-1 | | | | |
|---|---|---|---|---|---|---|---|
| SOIL BORING DETECTED COMPOUNDS | | SAMPLE ID: | SB-131F | SB-132G | SB-132P | SB-133E | SB-134C |
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS | | DEPTH: | 10-12' | 12-14' | 30-32' | 08-10' | 04-06' |
| | | LAB ID: | 2108103 | 2322701 | 2325701 | 2324803 | 2324804 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS01SB03 | DSASB21 | DSASB21 | DSASB21 | DSASB21 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/16/94 | 2/28/95 | 3/06/95 | 3/03/95 | 3/03/95 |
| | | VALIDATED: | 9/27/94 | 5/30/95 | 5/30/95 | 5/30/95 | 5/30/95 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | | ND | ND | ND | ND |
| 78-93-3 | 2-Butanone | UG/KG | | ND | ND | ND | ND |
| 75-15-0 | Carbon Disulfide | UG/KG | | ND | 4 J | 2 J | ND |
| 108-90-7 | Chlorobenzene | UG/KG | | ND | ND | ND | ND |
| 75-35-4 | 1,1-Dichloroethene | UG/KG | | ND | ND | ND | ND |
| 100-42-5 | Styrene | UG/KG | | ND | ND | ND | ND |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | UG/KG | | ND | ND | ND | ND |
| 79-01-6 | Trichloroethene | UG/KG | | ND | ND | ND | ND |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/KG | | ND | ND | 4 J | ND |
| 100-41-4 | Ethylbenzene | UG/KG | | ND | ND | 270 D | 2 J |
| 108-88-3 | Toluene | UG/KG | | ND | ND | 6 J | 2 J |
| 1330-20-7 | Xylene (total) | UG/KG | | ND | ND | 140 | 2 J |
| | Total BTEX Volatiles | | | ND | ND | 420 | 6 |
| | SEMIVOLATILES | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | | ND | ND | ND | ND |
| 86-74-8 | Carbazole | UG/KG | | ND | ND | ND | ND |
| 91-58-7 | 2-Chloronaphthalene | UG/KG | | ND | ND | ND | ND |
| 84-74-2 | Di-n-butylphthalate | UG/KG | | ND | ND | ND | ND |
| 132-64-9 | Dibenzofuran | UG/KG | | ND | ND | ND | ND |
| 84-66-2 | Diethylphthalate | UG/KG | | ND | ND | ND | ND |
| 86-30-6 | N-Nitrosodiphenylamine | UG/KG | | ND | ND | ND | ND |
| 108-95-2 | Phenol | UG/KG | | ND | ND | ND | ND |
| 95-95-4 | 2,4,5-Trichlorophenol | UG/KG | | ND | ND | ND | ND |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | | ND | ND | ND | ND |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | ND | ND | ND | 100 J | ND |
| 50-32-8 | Benzo(a)pyrene | UG/KG | ND | 130 J | ND | 54 J | ND |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | ND | ND | ND | ND | ND |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | ND | ND | ND | ND | ND |
| 218-01-9 | Chrysene | UG/KG | ND | ND | ND | 68 J | ND |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | ND | ND | ND | ND | ND |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | ND | ND | ND | ND | ND |
| | Total Probable Carcinogenic PAHS | | ND | 130 | ND | 222 | ND |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | ND | ND | ND | 650 | ND |
| 208-96-8 | Acenaphthylene | UG/KG | ND | ND | ND | ND | ND |
| 120-12-7 | Anthracene | UG/KG | ND | ND | ND | 170 J | ND |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | ND | ND | ND | ND | ND |
| 206-44-0 | Fluoranthene | UG/KG | ND | ND | ND | 160 J | ND |
| 86-73-7 | Fluorene | UG/KG | ND | ND | ND | 280 J | ND |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | | ND | ND | 230 J | ND |
| 91-20-3 | Naphthalene | UG/KG | ND | ND | ND | 7100 D | ND |
| 85-01-8 | Phenanthrene | UG/KG | ND | ND | ND | 850 | ND |
| 129-00-0 | Pyrene | UG/KG | ND | ND | ND | 270 J | ND |
| | Total PAHs | | ND | 130 | ND | 9932 | ND |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| | | | DSA-1 | | | | |
|---|---|---|---|---|---|---|---|
| SOIL BORING DETECTED COMPOUNDS | | SAMPLE ID: | SB-131F | SB-132G | SB-132P | SB-133E | SB-134C |
| | | DEPTH: | 10-12' | 12-14' | 30-32' | 08-10' | 04-06' |
| NIAGARA MOHAWK POWER CORPORATION | | LAB ID: | 2108103 | 2322701 | 2325701 | 2324803 | 2324804 |
| HARBOR POINT – DREDGE SPOIL AREAS | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS01SB03 | DSASB21 | DSASB21 | DSASB21 | DSASB21 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/16/94 | 2/28/95 | 3/06/95 | 3/03/95 | 3/03/95 |
| | | VALIDATED: | 9/27/94 | 5/30/95 | 5/30/95 | 5/30/95 | 5/30/95 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | PESTICIDES | | | | | | |
| 72-54-8 | 4,4'-DDD | UG/KG | | | ND | ND | |
| 50-29-3 | 4,4'-DDT | UG/KG | | | ND | ND | |
| 60-57-1 | Dieldrin | UG/KG | | | ND | ND | |
| 959-98-8 | Endosulfan I | UG/KG | | | ND | ND | |
| 33213-65-9 | Endosulfan II | UG/KG | | | ND | ND | |
| 72-20-8 | Endrin | UG/KG | | | ND | ND | |
| 7421-93-4 | Endrin aldehyde | UG/KG | | | ND | ND | |
| 1024-57-3 | Heptachlor epoxide | UG/KG | | | ND | ND | |
| 5103-71-9 | alpha-Chlordane | UG/KG | | | ND | ND | |
| 5103-74-2 | gamma-Chlordane | UG/KG | | | ND | ND | |
| | PCBs | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | | | ND | ND | |
| 12672-29-6 | Aroclor-1248 | UG/KG | | | ND | ND | |
| 11097-69-1 | Aroclor-1254 | UG/KG | | | ND | ND | |
| 11096-82-5 | Aroclor-1260 | UG/KG | | | ND | ND | |
| | Total PCBs | | | | ND | ND | |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | | | 3440 | 7540 | |
| 7440-36-0 | Antimony | MG/KG | | | ND | 26.5 J | |
| 7440-38-2 | Arsenic | MG/KG | | | 2 J | 8.7 J | |
| 7440-39-3 | Barium | MG/KG | | | 10.1 J | 70.1 | |
| 7440-41-7 | Beryllium | MG/KG | | | ND | 0.38 J | |
| 7440-43-9 | Cadmium | MG/KG | | | ND | 1.4 J | |
| 7440-70-2 | Calcium | MG/KG | | | 16700 | 12600 | |
| 7440-47-3 | Chromium | MG/KG | | | 4.4 | 53.6 J | |
| 7440-48-4 | Cobalt | MG/KG | | | 3 J | 7.9 J | |
| 7440-50-8 | Copper | MG/KG | | | 6.9 J | 270 J | |
| 7439-89-6 | Iron | MG/KG | | | 8990 | 20100 | |
| 7439-92-1 | Lead | MG/KG | | | 1.5 | 62.9 | |
| 7439-95-4 | Magnesium | MG/KG | | | 7280 | 5610 | |
| 7439-96-5 | Manganese | MG/KG | | | 435 | 536 | |
| 7439-97-6 | Mercury | MG/KG | | | ND | ND | |
| 7440-02-0 | Nickel | MG/KG | | | ND | 25.3 J | |
| 7440-09-7 | Potassium | MG/KG | | | 559 J | 953 J | |
| 7782-49-2 | Selenium | MG/KG | | | ND | ND | |
| 7440-23-5 | Sodium | MG/KG | | | ND | ND | |
| 7440-62-2 | Vanadium | MG/KG | | | 8.2 J | 19.5 | |
| 7440-66-6 | Zinc | MG/KG | | | 23.1 | 178 | |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | | | 12205 | 32520 | |
| | GC/FID | | | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | | | | |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | | | |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

**SOIL BORING DETECTED COMPOUNDS**

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS

| | | | DSA-1 | | | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | SB-135B | SB-136B | SB-137D | SB-138B | SB-139C |
| | | DEPTH: | 02-04' | 02-04' | 06-08' | 02-04' | 04-06' |
| | | LAB ID: | 2324805 | 2326204 | 2326203 | 2326201 | 2326804 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DSASB21 | DSASB21 | DSASB21 | DSASB21 | DSASB22 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 3/03/95 | 3/06/95 | 3/07/95 | 3/07/95 | 3/07/95 |
| | | VALIDATED: | 5/30/95 | 5/30/95 | 5/30/95 | 5/30/95 | 6/19/95 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | ND | ND | ND | ND | ND |
| 78-93-3 | 2-Butanone | UG/KG | ND | ND | ND | ND | ND |
| 75-15-0 | Carbon Disulfide | UG/KG | ND | ND | ND | ND | ND |
| 108-90-7 | Chlorobenzene | UG/KG | ND | ND | ND | ND | ND |
| 75-35-4 | 1,1-Dichloroethene | UG/KG | ND | ND | ND | ND | ND |
| 100-42-5 | Styrene | UG/KG | ND | ND | ND | ND | ND |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | UG/KG | ND | ND | ND | ND | ND |
| 79-01-6 | Trichloroethene | UG/KG | ND | ND | ND | ND | ND |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/KG | ND | ND | ND | ND | ND |
| 100-41-4 | Ethylbenzene | UG/KG | ND | ND | ND | ND | ND |
| 108-88-3 | Toluene | UG/KG | ND | ND | ND | ND | 2 J |
| 1330-20-7 | Xylene (total) | UG/KG | ND | ND | ND | ND | ND |
| | Total BTEX Volatiles | | ND | ND | ND | ND | 2 |
| | SEMIVOLATILES | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | ND | ND | ND | 140 J | ND |
| 86-74-8 | Carbazole | UG/KG | ND | ND | ND | ND | 42 J |
| 91-58-7 | 2-Chloronaphthalene | UG/KG | ND | ND | ND | ND | ND |
| 84-74-2 | Di-n-butylphthalate | UG/KG | ND | ND | ND | ND | 39 J |
| 132-64-9 | Dibenzofuran | UG/KG | 140 J | ND | ND | ND | ND |
| 84-66-2 | Diethylphthalate | UG/KG | ND | ND | ND | ND | ND |
| 86-30-6 | N-Nitrosodiphenylamine | UG/KG | ND | ND | ND | ND | ND |
| 108-95-2 | Phenol | UG/KG | ND | R | ND | ND | ND |
| 95-95-4 | 2,4,5-Trichlorophenol | UG/KG | ND | R | ND | ND | ND |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | ND | ND | ND | ND | 640 |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | 1600 | 1400 | 100 J | 1000 | 860 |
| 50-32-8 | Benzo(a)pyrene | UG/KG | 2300 | 1900 | 250 J | 730 | 900 |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | 2200 | 1400 | 140 J | 890 | 720 |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | 1800 | 740 | 110 J | 140 J | 720 |
| 218-01-9 | Chrysene | UG/KG | 1800 | 1100 | 110 J | 730 | 1000 |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | 460 J | 300 J | 70 J | ND | ND |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | 1600 | 690 | 140 J | 350 J | 220 J |
| | Total Probable Carcinogenic PAHS | | 11760 | 7530 | 920 | 3840 | 4420 |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | 190 J | 51 J | ND | 39 J | 41 J |
| 208-96-8 | Acenaphthylene | UG/KG | 790 J | 540 | 100 J | 160 J | 250 J |
| 120-12-7 | Anthracene | UG/KG | 530 J | 220 J | ND | 230 J | 200 J |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | 250 J | 280 J | 75 J | 150 J | 220 J |
| 206-44-0 | Fluoranthene | UG/KG | 1900 | 1200 | 47 J | 1700 | 1200 |
| 86-73-7 | Fluorene | UG/KG | 120 J | 66 J | ND | 60 J | 59 J |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | 260 J | 61 J | ND | ND | 51 J |
| 91-20-3 | Naphthalene | UG/KG | 1700 | 140 J | ND | ND | 100 J |
| 85-01-8 | Phenanthrene | UG/KG | 1300 | 370 J | ND | 510 | 380 J |
| 129-00-0 | Pyrene | UG/KG | 1800 | 1400 | 110 J | 1400 | 800 |
| | Total PAHs | | 20600 | 11858 | 1252 | 8089 | 7721 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| | | | DSA-1 | | | | |
|---|---|---|---|---|---|---|---|
| SOIL BORING DETECTED COMPOUNDS | | SAMPLE ID: | SB-135B | SB-136B | SB-137D | SB-138B | SB-139C |
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT - DREDGE SPOIL AREAS | | DEPTH: | 02-04' | 02-04' | 06-08' | 02-04' | 04-06' |
| | | LAB ID: | 2324805 | 2326204 | 2326203 | 2326201 | 2326804 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DSASB21 | DSASB21 | DSASB21 | DSASB21 | DSASB22 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 3/03/95 | 3/06/95 | 3/07/95 | 3/07/95 | 3/07/95 |
| | | VALIDATED: | 5/30/95 | 5/30/95 | 5/30/95 | 5/30/95 | 6/19/95 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | PESTICIDES | | | | | | |
| 72-54-8 | 4,4'-DDD | UG/KG | | ND | | ND | |
| 50-29-3 | 4,4'-DDT | UG/KG | | ND | | ND | |
| 60-57-1 | Dieldrin | UG/KG | | ND | | ND | |
| 959-98-8 | Endosulfan I | UG/KG | | ND | | ND | |
| 33213-65-9 | Endosulfan II | UG/KG | | ND | | ND | |
| 72-20-8 | Endrin | UG/KG | | ND | | ND | |
| 7421-93-4 | Endrin aldehyde | UG/KG | | ND | | ND | |
| 1024-57-3 | Heptachlor epoxide | UG/KG | | 2.5 | | ND | |
| 5103-71-9 | alpha-Chlordane | UG/KG | | R | | ND | |
| 5103-74-2 | gamma-Chlordane | UG/KG | | ND | | ND | |
| | PCBs | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | | ND | | ND | |
| 12672-29-6 | Aroclor-1248 | UG/KG | | ND | | ND | |
| 11097-69-1 | Aroclor-1254 | UG/KG | | ND | | ND | |
| 11096-82-5 | Aroclor-1260 | UG/KG | | ND | | ND | |
| | Total PCBs | | | ND | | ND | |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | | 9930 | | 3710 | |
| 7440-36-0 | Antimony | MG/KG | | ND | | ND | |
| 7440-38-2 | Arsenic | MG/KG | | 4.8 J | | 1.9 J | |
| 7440-39-3 | Barium | MG/KG | | 71.9 | | 18.4 J | |
| 7440-41-7 | Beryllium | MG/KG | | 0.35 J | | ND | |
| 7440-43-9 | Cadmium | MG/KG | | ND | | ND | |
| 7440-70-2 | Calcium | MG/KG | | 11500 | | 5280 | |
| 7440-47-3 | Chromium | MG/KG | | 49.2 | | 10 | |
| 7440-48-4 | Cobalt | MG/KG | | 7.5 J | | 2.9 J | |
| 7440-50-8 | Copper | MG/KG | | 248 J | | 52.9 J | |
| 7439-89-6 | Iron | MG/KG | | 22000 | | 9360 | |
| 7439-92-1 | Lead | MG/KG | | 38.5 | | 31.3 | |
| 7439-95-4 | Magnesium | MG/KG | | 6180 | | 3080 | |
| 7439-96-5 | Manganese | MG/KG | | 492 | | 222 | |
| 7439-97-6 | Mercury | MG/KG | | 0.27 | | ND | |
| 7440-02-0 | Nickel | MG/KG | | 21 J | | 11.9 J | |
| 7440-09-7 | Potassium | MG/KG | | 1360 J | | 498 J | |
| 7782-49-2 | Selenium | MG/KG | | ND | | ND | |
| 7440-23-5 | Sodium | MG/KG | | ND | | ND | |
| 7440-62-2 | Vanadium | MG/KG | | 25.6 | | 9.5 J | |
| 7440-66-6 | Zinc | MG/KG | | 159 | | 67.5 | |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | | 47316 | | 6826 | |
| | GC/FID | | | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | | | | |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | | | |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| SOIL BORING DETECTED COMPOUNDS | | | DSA-1 | | | | |
|---|---|---|---|---|---|---|---|
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS | | SAMPLE ID: | SB-141F | SB-142D | SB-143D | SB-144E | SB-145C |
| | | DEPTH: | 10-12' | 06-08' | 06-08' | 08-10' | 04-06' |
| | | LAB ID: | 2326801 | 2326803 | 2328601 | 2328602 | 2328603 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DSASB22 | DSASB22 | DSASB22 | DSASB22 | DSASB22 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 3/08/95 | 3/08/95 | 3/08/95 | 3/08/95 | 3/08/95 |
| | | VALIDATED: | 6/19/95 | 6/19/95 | 6/19/95 | 6/19/95 | 6/19/95 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | ND | ND | ND | | |
| 78-93-3 | 2-Butanone | UG/KG | ND | ND | ND | | |
| 75-15-0 | Carbon Disulfide | UG/KG | ND | ND | ND | | |
| 108-90-7 | Chlorobenzene | UG/KG | ND | ND | ND | | |
| 75-35-4 | 1,1-Dichloroethene | UG/KG | ND | ND | ND | | |
| 100-42-5 | Styrene | UG/KG | ND | ND | ND | | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | UG/KG | ND | ND | ND | | |
| 79-01-6 | Trichloroethene | UG/KG | ND | ND | ND | | |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/KG | 1 J | ND | ND | | |
| 100-41-4 | Ethylbenzene | UG/KG | 27 | ND | ND | | |
| 108-88-3 | Toluene | UG/KG | ND | ND | ND | | |
| 1330-20-7 | Xylene (total) | UG/KG | 15 | ND | ND | | |
| | Total BTEX Volatiles | | 43 | ND | ND | | |
| | SEMIVOLATILES | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | ND | ND | ND | | |
| 86-74-8 | Carbazole | UG/KG | 1400 J | ND | ND | | |
| 91-58-7 | 2-Chloronaphthalene | UG/KG | ND | ND | ND | | |
| 84-74-2 | Di-n-butylphthalate | UG/KG | ND | ND | ND | | |
| 132-64-9 | Dibenzofuran | UG/KG | 2000 J | ND | ND | | |
| 84-66-2 | Diethylphthalate | UG/KG | ND | ND | ND | | |
| 86-30-6 | N-Nitrosodiphenylamine | UG/KG | ND | ND | ND | | |
| 108-95-2 | Phenol | UG/KG | ND | ND | ND | | |
| 95-95-4 | 2,4,5-Trichlorophenol | UG/KG | ND | ND | ND | | |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | ND | 76 J | ND | | |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | 3200 | 110 J | 8000 | | |
| 50-32-8 | Benzo(a)pyrene | UG/KG | 2100 J | 100 J | 5400 | | |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | 1200 J | 140 J | 2200 J | | |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | 2100 J | 96 J | 2400 J | | |
| 218-01-9 | Chrysene | UG/KG | 3500 | 170 J | 8600 | | |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | ND | ND | ND | | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | 600 J | 60 J | 940 J | | |
| | Total Probable Carcinogenic PAHS | | 12700 | 676 | 27540 | | |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | 6600 | ND | 920 J | | |
| 208-96-8 | Acenaphthylene | UG/KG | 480 J | ND | 2500 J | | |
| 120-12-7 | Anthracene | UG/KG | 6300 | ND | 18000 | | |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | 520 J | 62 J | 840 J | | |
| 206-44-0 | Fluoranthene | UG/KG | 15000 | 270 J | 18000 | | |
| 86-73-7 | Fluorene | UG/KG | 5500 | ND | 4800 | | |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | 1200 J | ND | ND | | |
| 91-20-3 | Naphthalene | UG/KG | 3500 | ND | ND | | |
| 85-01-8 | Phenanthrene | UG/KG | 15000 D | 140 J | 31000 D | | |
| 129-00-0 | Pyrene | UG/KG | 9300 | 170 J | 26000 | | |
| | Total PAHs | | 76100 | 1318 | 129600 | | |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

**SOIL BORING DETECTED COMPOUNDS**

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS

| | | | DSA-1 | | | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | SB-141F | SB-142D | SB-143D | SB-144E | SB-145C |
| | | DEPTH: | 10-12' | 06-08' | 06-08' | 08-10' | 04-06' |
| | | LAB ID: | 2326801 | 2326803 | 2328601 | 2328602 | 2328603 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DSASB22 | DSASB22 | DSASB22 | DSASB22 | DSASB22 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 3/08/95 | 3/08/95 | 3/08/95 | 3/08/95 | 3/08/95 |
| | | VALIDATED: | 6/19/95 | 6/19/95 | 6/19/95 | 6/19/95 | 6/19/95 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | PESTICIDES | | | | | | |
| 72-54-8 | 4,4'-DDD | UG/KG | ND | | ND | | |
| 50-29-3 | 4,4'-DDT | UG/KG | ND | | ND | | |
| 60-57-1 | Dieldrin | UG/KG | ND | | ND | | |
| 959-98-8 | Endosulfan I | UG/KG | ND | | ND | | |
| 33213-65-9 | Endosulfan II | UG/KG | ND | | ND | | |
| 72-20-8 | Endrin | UG/KG | 19 J | | ND | | |
| 7421-93-4 | Endrin aldehyde | UG/KG | ND | | 22 JN | | |
| 1024-57-3 | Heptachlor epoxide | UG/KG | ND | | 8.4 J | | |
| 5103-71-9 | alpha-Chlordane | UG/KG | ND | | ND | | |
| 5103-74-2 | gamma-Chlordane | UG/KG | ND | | ND | | |
| | PCBs | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | ND | | ND | | |
| 12672-29-6 | Aroclor-1248 | UG/KG | ND | | ND | | |
| 11097-69-1 | Aroclor-1254 | UG/KG | ND | | ND | | |
| 11096-82-5 | Aroclor-1260 | UG/KG | ND | | ND | | |
| | Total PCBs | | ND | | ND | | |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | 7190 | | 6910 | | |
| 7440-36-0 | Antimony | MG/KG | ND | | ND | | |
| 7440-38-2 | Arsenic | MG/KG | 3.5 J | | 2.3 J | | |
| 7440-39-3 | Barium | MG/KG | 59 J | | 33.3 J | | |
| 7440-41-7 | Beryllium | MG/KG | 0.32 J | | 0.29 J | | |
| 7440-43-9 | Cadmium | MG/KG | ND | | ND | | |
| 7440-70-2 | Calcium | MG/KG | 14900 | | 6840 | | |
| 7440-47-3 | Chromium | MG/KG | 40 | | 10.3 | | |
| 7440-48-4 | Cobalt | MG/KG | 8.3 J | | 5.3 J | | |
| 7440-50-8 | Copper | MG/KG | 227 J | | 10.5 J | | |
| 7439-89-6 | Iron | MG/KG | 17000 | | 13000 | | |
| 7439-92-1 | Lead | MG/KG | 37.2 | | 9.5 | | |
| 7439-95-4 | Magnesium | MG/KG | 5510 | | 3720 | | |
| 7439-96-5 | Manganese | MG/KG | 462 | | 220 | | |
| 7439-97-6 | Mercury | MG/KG | 0.22 | | ND | | |
| 7440-02-0 | Nickel | MG/KG | 22.8 J | | 11.5 J | | |
| 7440-09-7 | Potassium | MG/KG | 1030 J | | 1350 | | |
| 7782-49-2 | Selenium | MG/KG | ND | | ND | | |
| 7440-23-5 | Sodium | MG/KG | ND | | ND | | |
| 7440-62-2 | Vanadium | MG/KG | 18.1 | | 17.9 | | |
| 7440-66-6 | Zinc | MG/KG | 148 | | 41.5 | | |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | 41115 | | 14334 | | |
| | GC/FID | | | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | | | 110 J | 1300 J |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | | | |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| SOIL BORING DETECTED COMPOUNDS | | | DSA-2 | | | | |
|---|---|---|---|---|---|---|---|
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS | | SAMPLE ID: | SB-200G | SB-203D | SB-204E | SB-205I | SB-206H |
| | | DEPTH: | 12-14' | 4-8' | 8-10' | 16-18' | 14-16' |
| | | LAB ID: | 2097001 | 2097002 | 2099901 | 2099902 | 2099903 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS02SB01 | DS02SB01 | DS02SB01 | DS02SB01 | DS02SB01 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/08/94 | 6/08/94 | 6/08/94 | 6/09/94 | 6/09/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | ND | ND | 44 J | 42 J | |
| 78-93-3 | 2-Butanone | UG/KG | ND | ND | 10 J | 8 J | |
| 75-15-0 | Carbon Disulfide | UG/KG | ND | ND | ND | ND | |
| 108-90-7 | Chlorobenzene | UG/KG | ND | ND | ND | ND | |
| 75-35-4 | 1,1-Dichloroethene | UG/KG | ND | ND | ND | ND | |
| 100-42-5 | Styrene | UG/KG | ND | ND | ND | ND | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | UG/KG | ND | ND | ND | ND | |
| 79-01-6 | Trichloroethene | UG/KG | ND | ND | ND | ND | |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/KG | ND | ND | 3 J | ND | |
| 100-41-4 | Ethylbenzene | UG/KG | 110 J | ND | 2 J | 75 | |
| 108-88-3 | Toluene | UG/KG | ND | ND | ND | 4 J | |
| 1330-20-7 | Xylene (total) | UG/KG | 160 J | ND | 17 J | 120 | |
| | Total BTEX Volatiles | | 270 | ND | 22 | 199 | |
| | SEMIVOLATILES | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | ND | ND | ND | ND | |
| 86-74-8 | Carbazole | UG/KG | 14000 | ND | 5400 J | ND | |
| 91-58-7 | 2-Chloronaphthalene | UG/KG | ND | ND | ND | ND | |
| 84-74-2 | Di-n-butylphthalate | UG/KG | ND | ND | ND | ND | |
| 132-64-9 | Dibenzofuran | UG/KG | 55000 | ND | 30000 | 2900 J | |
| 84-66-2 | Diethylphthalate | UG/KG | ND | ND | ND | ND | |
| 86-30-6 | N-Nitrosodiphenylamine | UG/KG | ND | ND | ND | ND | |
| 108-95-2 | Phenol | UG/KG | ND | ND | ND | ND | |
| 95-95-4 | 2,4,5-Trichlorophenol | UG/KG | ND | ND | ND | ND | |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | ND | ND | ND | ND | |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | 43000 J | 2600 J | 15000 J | 11000 J | 2600 |
| 50-32-8 | Benzo(a)pyrene | UG/KG | 34000 | 6700 | 13000 J | 15000 J | 5700 |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | 35000 | 3600 J | 12000 J | 7700 J | 3400 |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | 15000 | 3500 J | 8000 J | 7000 J | 2900 |
| 218-01-9 | Chrysene | UG/KG | 51000 J | 3800 J | 17000 J | 17000 | 3500 |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | 4600 J | ND | ND | ND | 1100 J |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | 18000 | 3700 J | 5400 J | 4900 J | 3800 |
| | Total Probable Carcinogenic PAHS | | 200600 | 23900 | 70400 | 62600 | 23000 |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | 62000 JD | ND | 31000 | 70000 | 450 J |
| 208-96-8 | Acenaphthylene | UG/KG | 6400 J | 2200 J | 3000 J | 5100 J | 2700 |
| 120-12-7 | Anthracene | UG/KG | 43000 JD | 740 J | 23000 | 27000 | 980 J |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | 16000 | 4400 J | ND | 2100 J | 3700 |
| 206-44-0 | Fluoranthene | UG/KG | 100000 J | 2900 J | 56000 | 28000 | 1800 J |
| 86-73-7 | Fluorene | UG/KG | 52000 JD | 690 J | 42000 | 43000 | 660 J |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | 93000 D | ND | 65000 | 73000 | |
| 91-20-3 | Naphthalene | UG/KG | 210000 D | 570 J | 27000 | 84000 | ND |
| 85-01-8 | Phenanthrene | UG/KG | 160000 D | 2100 J | 100000 | 84000 | 1200 J |
| 129-00-0 | Pyrene | UG/KG | 41000 JD | 3600 J | 50000 | 49000 | 4800 |
| | Total PAHs | | 984000 | 41100 | 467400 | 527800 | 39290 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| | | | DSA-2 | | | | |
|---|---|---|---|---|---|---|---|
| SOIL BORING DETECTED COMPOUNDS | | SAMPLE ID: | SB−200G | SB−203D | SB−204E | SB−205I | SB−206H |
| | | DEPTH: | 12−14' | 4−8' | 8−10' | 16−18' | 14−16' |
| NIAGARA MOHAWK POWER CORPORATION | | LAB ID: | 2097001 | 2097002 | 2099901 | 2099902 | 2099903 |
| HARBOR POINT − DREDGE SPOIL AREAS | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS02SB01 | DS02SB01 | DS02SB01 | DS02SB01 | DS02SB01 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/08/94 | 6/08/94 | 6/08/94 | 6/09/94 | 6/09/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | PESTICIDES | | | | | | |
| 72−54−8 | 4,4'−DDD | UG/KG | ND | ND | ND | 4.8 JN | |
| 50−29−3 | 4,4'−DDT | UG/KG | 4.9 JN | ND | ND | ND | |
| 60−57−1 | Dieldrin | UG/KG | ND | ND | ND | ND | |
| 959−98−8 | Endosulfan I | UG/KG | ND | ND | ND | ND | |
| 33213−65−9 | Endosulfan II | UG/KG | ND | ND | ND | 7 | |
| 72−20−8 | Endrin | UG/KG | 11 | ND | ND | ND | |
| 7421−93−4 | Endrin aldehyde | UG/KG | ND | ND | ND | ND | |
| 1024−57−3 | Heptachlor epoxide | UG/KG | ND | ND | ND | ND | |
| 5103−71−9 | alpha−Chlordane | UG/KG | ND | ND | ND | ND | |
| 5103−74−2 | gamma−Chlordane | UG/KG | ND | ND | ND | ND | |
| | PCBs | | | | | | |
| 53469−21−9 | Aroclor−1242 | UG/KG | ND | ND | 2100 D | ND | |
| 12672−29−6 | Aroclor−1248 | UG/KG | ND | ND | ND | ND | |
| 11097−69−1 | Aroclor−1254 | UG/KG | ND | ND | 18000 DJ | ND | |
| 11096−82−5 | Aroclor−1260 | UG/KG | ND | ND | ND | ND | |
| | Total PCBs | | ND | ND | 20100 | ND | |
| | INORGANICS | | | | | | |
| 7429−90−5 | Aluminum | MG/KG | 7950 J | 8290 | 15300 J | 13500 J | |
| 7440−36−0 | Antimony | MG/KG | ND | ND | ND | ND | |
| 7440−38−2 | Arsenic | MG/KG | 4.7 | 5.9 J | 9.7 J | 5.7 | |
| 7440−39−3 | Barium | MG/KG | 67.8 | 83.3 | 129 | 93.4 | |
| 7440−41−7 | Beryllium | MG/KG | 0.63 J | 0.73 J | 1.2 J | 1.4 J | |
| 7440−43−9 | Cadmium | MG/KG | ND | ND | ND | ND | |
| 7440−70−2 | Calcium | MG/KG | 16300 | 7540 | 23300 | 11300 | |
| 7440−47−3 | Chromium | MG/KG | 91.9 | 44.9 | 177 | 35.4 | |
| 7440−48−4 | Cobalt | MG/KG | 10 J | 11.2 J | 19.3 | 15.3 | |
| 7440−50−8 | Copper | MG/KG | 361 J | 312 | 857 J | 225 J | |
| 7439−89−6 | Iron | MG/KG | 17300 | 20500 | 31500 | 29900 | |
| 7439−92−1 | Lead | MG/KG | 62.5 | 78.2 | 99.9 | 53.2 | |
| 7439−95−4 | Magnesium | MG/KG | 5550 | 4410 | 8430 | 6040 | |
| 7439−96−5 | Manganese | MG/KG | 443 | 407 | 784 | 557 | |
| 7439−97−6 | Mercury | MG/KG | 0.24 | 0.41 | 0.47 | 0.31 | |
| 7440−02−0 | Nickel | MG/KG | 23.9 | 20.7 | 53 | 32.4 | |
| 7440−09−7 | Potassium | MG/KG | 1500 | 1070 J | 2540 | 2700 | |
| 7782−49−2 | Selenium | MG/KG | ND | ND | ND | ND | |
| 7440−23−5 | Sodium | MG/KG | ND | ND | ND | ND | |
| 7440−62−2 | Vanadium | MG/KG | 9.2 J | 14.8 | 26.4 | 25.4 | |
| 7440−66−6 | Zinc | MG/KG | 194 J | 275 | 321 J | 188 J | |
| | OTHER | | | | | | |
| 7440−44−0 | Total Organic Carbon | MG/KG | | | | | |
| | GC/FID | | | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | | | | |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | | | |

J − Indicates an estimated value.
D − Indicates a diluted value.
N − Indicates presumptive evidence of a compound.
R − Indicates rejected data.
ND − Not detected.
(MAX) − Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

**SOIL BORING DETECTED COMPOUNDS**

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS

| | | | DSA-2 | | | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | SB-207H | SB-208C | SB-208H | SB-210F | SB-211K |
| | | DEPTH: | 14-16' | 4-6' | 14-16' | 10-12' | 20-22' |
| | | LAB ID: | 2099904 | 2101201 | 2101202 | 2104501 | 2104401 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS02SB01 | DS02SB01 | DS02SB01 | DS01SB03 | DS02SB01 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/09/94 | 6/10/94 | 6/10/94 | 6/13/94 | 6/14/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | | | | | 38 J |
| 78-93-3 | 2-Butanone | UG/KG | | | | | 8 J |
| 75-15-0 | Carbon Disulfide | UG/KG | | | | | ND |
| 108-90-7 | Chlorobenzene | UG/KG | | | | | ND |
| 75-35-4 | 1,1-Dichloroethene | UG/KG | | | | | ND |
| 100-42-5 | Styrene | UG/KG | | | | | ND |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | UG/KG | | | | | ND |
| 79-01-6 | Trichloroethene | UG/KG | | | | | ND |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/KG | | | | | ND |
| 100-41-4 | Ethylbenzene | UG/KG | | | | | 14 |
| 108-88-3 | Toluene | UG/KG | | | | | ND |
| 1330-20-7 | Xylene (total) | UG/KG | | | | | 19 |
| | Total BTEX Volatiles | | | | | | 33 |
| | SEMIVOLATILES | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | | | | | ND |
| 86-74-8 | Carbazole | UG/KG | | | | | ND |
| 91-58-7 | 2-Chloronaphthalene | UG/KG | | | | | 620 J |
| 84-74-2 | Di-n-butylphthalate | UG/KG | | | | | ND |
| 132-64-9 | Dibenzofuran | UG/KG | | | | | 1700 J |
| 84-66-2 | Diethylphthalate | UG/KG | | | | | ND |
| 86-30-6 | N-Nitrosodiphenylamine | UG/KG | | | | | 1300 J |
| 108-95-2 | Phenol | UG/KG | | | | | ND |
| 95-95-4 | 2,4,5-Trichlorophenol | UG/KG | | | | | ND |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | | | | | ND |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | 74 J | | ND | 5000 | 6700 |
| 50-32-8 | Benzo(a)pyrene | UG/KG | 87 J | | ND | 11000 | 8100 |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | 56 J | | ND | 5300 | 2800 |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | 50 J | | ND | 6300 | 5300 |
| 218-01-9 | Chrysene | UG/KG | 110 J | | ND | 8000 | 9900 |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | ND | | ND | 1500 J | 550 J |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | ND | | ND | 4400 | 2400 |
| | Total Probable Carcinogenic PAHS | | 377 | | ND | 41500 | 35750 |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | 98 J | | ND | 4800 | 44000 D |
| 208-96-8 | Acenaphthylene | UG/KG | ND | | ND | 2600 J | 2600 |
| 120-12-7 | Anthracene | UG/KG | 110 J | | ND | 3000 J | 24000 D |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | ND | | ND | 4600 | 2900 |
| 206-44-0 | Fluoranthene | UG/KG | 160 J | | ND | 6000 | 24000 D |
| 86-73-7 | Fluorene | UG/KG | 100 J | | ND | 3400 J | 26000 D |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | | | | | 54000 D |
| 91-20-3 | Naphthalene | UG/KG | ND | | ND | 5800 | 37000 D |
| 85-01-8 | Phenanthrene | UG/KG | 270 J | | ND | 8200 | 74000 D |
| 129-00-0 | Pyrene | UG/KG | 420 J | | ND | 16000 J | 24000 D |
| | Total PAHs | | 1535 | | ND | 95900 | 348250 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

**SOIL BORING DETECTED COMPOUNDS**

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS

| CAS NO. | COMPOUND | | DSA-2 | | | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | SB-207H | SB-208C | SB-208H | SB-210F | SB-211K |
| | | DEPTH: | 14-16' | 4-6' | 14-16' | 10-12' | 20-22' |
| | | LAB ID: | 2099904 | 2101201 | 2101202 | 2104501 | 2104401 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS02SB01 | DS02SB01 | DS02SB01 | DS01SB03 | DS02SB01 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/09/94 | 6/10/94 | 6/10/94 | 6/13/94 | 6/14/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| | | UNITS | | | | | |
| | PESTICIDES | | | | | | |
| 72-54-8 | 4,4'-DDD | UG/KG | | | | | ND |
| 50-29-3 | 4,4'-DDT | UG/KG | | | | | ND |
| 60-57-1 | Dieldrin | UG/KG | | | | | ND |
| 959-98-8 | Endosulfan I | UG/KG | | | | | ND |
| 33213-65-9 | Endosulfan II | UG/KG | | | | | ND |
| 72-20-8 | Endrin | UG/KG | | | | | 11 JN |
| 7421-93-4 | Endrin aldehyde | UG/KG | | | | | ND |
| 1024-57-3 | Heptachlor epoxide | UG/KG | | | | | 4.6 |
| 5103-71-9 | alpha-Chlordane | UG/KG | | | | | ND |
| 5103-74-2 | gamma-Chlordane | UG/KG | | | | | ND |
| | PCBs | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | | | | | ND |
| 12672-29-6 | Aroclor-1248 | UG/KG | | | | | ND |
| 11097-69-1 | Aroclor-1254 | UG/KG | | | | | ND |
| 11096-82-5 | Aroclor-1260 | UG/KG | | | | | ND |
| | Total PCBs | | | | | | ND |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | | | | | 8670 J |
| 7440-36-0 | Antimony | MG/KG | | | | | ND |
| 7440-38-2 | Arsenic | MG/KG | | | | | 3.6 |
| 7440-39-3 | Barium | MG/KG | | | | | 54.5 J |
| 7440-41-7 | Beryllium | MG/KG | | | | | 0.5 J |
| 7440-43-9 | Cadmium | MG/KG | | | | | ND |
| 7440-70-2 | Calcium | MG/KG | | | | | 7820 |
| 7440-47-3 | Chromium | MG/KG | | | | | 25.9 |
| 7440-48-4 | Cobalt | MG/KG | | | | | 7.7 J |
| 7440-50-8 | Copper | MG/KG | | | | | 154 J |
| 7439-89-6 | Iron | MG/KG | | | | | 17000 |
| 7439-92-1 | Lead | MG/KG | | | | | 33 |
| 7439-95-4 | Magnesium | MG/KG | | | | | 4150 |
| 7439-96-5 | Manganese | MG/KG | | | | | 364 |
| 7439-97-6 | Mercury | MG/KG | | | | | 0.2 |
| 7440-02-0 | Nickel | MG/KG | | | | | 16.3 |
| 7440-09-7 | Potassium | MG/KG | | | | | 1700 |
| 7782-49-2 | Selenium | MG/KG | | | | | ND |
| 7440-23-5 | Sodium | MG/KG | | | | | ND |
| 7440-62-2 | Vanadium | MG/KG | | | | | 16.8 |
| 7440-66-6 | Zinc | MG/KG | | | | | 174 J |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | | | | | |
| | GC/FID | | | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | 1600 | | | |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | | | |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

**SOIL BORING DETECTED COMPOUNDS**

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS

| | | | DSA-2 | | | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | SB-212K | SB-214O | SB-215F | SB-216I | SB-217I$^{(MAX)}$ |
| | | DEPTH: | 20-22' | 28-30' | 10-12' | 16-18' | 16-18' |
| | | LAB ID: | 2105601 | 2108104 | 2109501 | 2109601 | 2111001 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS02SB01 | DS01SB03 | DS01SB03 | DS02SB04 | DS02SB05 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/15/94 | 6/16/94 | 6/20/94 | 6/20/94 | 6/21/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | 39 | | | ND | |
| 78-93-3 | 2-Butanone | UG/KG | 19 | | | 3 J | |
| 75-15-0 | Carbon Disulfide | UG/KG | ND | | | ND | |
| 108-90-7 | Chlorobenzene | UG/KG | ND | | | ND | |
| 75-35-4 | 1,1-Dichloroethene | UG/KG | ND | | | ND | |
| 100-42-5 | Styrene | UG/KG | ND | | | ND | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | UG/KG | ND | | | ND | |
| 79-01-6 | Trichloroethene | UG/KG | ND | | | ND | |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/KG | 2 J | | | ND | |
| 100-41-4 | Ethylbenzene | UG/KG | 210 | | | 43 | |
| 108-88-3 | Toluene | UG/KG | 10 J | | | 2 J | |
| 1330-20-7 | Xylene (total) | UG/KG | 240 | | | 52 | |
| | Total BTEX Volatiles | | 462 | | | 97 | |
| | SEMIVOLATILES | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | ND | | | ND | |
| 86-74-8 | Carbazole | UG/KG | ND | | | ND | |
| 91-58-7 | 2-Chloronaphthalene | UG/KG | 370 J | | | ND | |
| 84-74-2 | Di-n-butylphthalate | UG/KG | ND | | | ND | |
| 132-64-9 | Dibenzofuran | UG/KG | 620 J | | | 900 J | |
| 84-66-2 | Diethylphthalate | UG/KG | ND | | | ND | |
| 86-30-6 | N-Nitrosodiphenylamine | UG/KG | 830 J | | | 750 J | |
| 108-95-2 | Phenol | UG/KG | ND | | | ND | |
| 95-95-4 | 2,4,5-Trichlorophenol | UG/KG | ND | | | ND | |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | ND | | | ND | |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | 5500 J | 5600 J | 470 J | 3900 | 3900 |
| 50-32-8 | Benzo(a)pyrene | UG/KG | 6600 J | 26000 | 1100 J | 4800 | 5500 |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | 2400 J | 12000 | 870 J | 2400 | 4600 |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | 4200 J | 10000 | 1000 J | 2200 | 3900 |
| 218-01-9 | Chrysene | UG/KG | 6400 J | 9600 J | 1200 J | 6300 | 6800 |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | 680 J | 3800 J | ND | 630 J | ND |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | 2200 J | 13000 | ND | 2000 | 2300 |
| | Total Probable Carcinogenic PAHS | | 27980 | 80000 | 4640 | 22230 | 27000 |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | 13000 J | 950 J | 150 J | 17000 D | 5500 |
| 208-96-8 | Acenaphthylene | UG/KG | 1900 J | 8600 | 790 J | 1100 J | 1400 J |
| 120-12-7 | Anthracene | UG/KG | 7100 J | 1300 J | 290 J | 8300 | 5800 |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | 2400 J | 13000 | ND | 1600 J | 2500 |
| 206-44-0 | Fluoranthene | UG/KG | 8400 J | 1600 J | 950 J | 6900 | 10000 |
| 86-73-7 | Fluorene | UG/KG | 8500 J | 1500 J | 270 J | 12000 | 6700 |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | 18000 J | | | 19000 D | |
| 91-20-3 | Naphthalene | UG/KG | 20000 D | 2700 J | 220 J | 15000 D | 1700 J |
| 85-01-8 | Phenanthrene | UG/KG | 20000 D | 740 J | 600 J | 31000 D | 22000 D |
| 129-00-0 | Pyrene | UG/KG | 17000 J | 7600 J | 1800 J | 14000 | 9000 J |
| | Total PAHs | | 144280 | 117990 | 9710 | 148130 | 91600 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
$^{(MAX)}$ – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

**SOIL BORING DETECTED COMPOUNDS**

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS

| | | | DSA-2 | | | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | SB-212K | SB-214O | SB-215F | SB-216I | SB-217I(MAX) |
| | | DEPTH: | 20-22' | 28-30' | 10-12' | 16-18' | 16-18' |
| | | LAB ID: | 2105601 | 2108104 | 2109501 | 2109601 | 2111001 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS02SB01 | DS01SB03 | DS01SB03 | DS02SB04 | DS02SB05 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/15/94 | 6/16/94 | 6/20/94 | 6/20/94 | 6/21/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | PESTICIDES | | | | | | |
| 72-54-8 | 4,4'-DDD | UG/KG | ND | | | ND | |
| 50-29-3 | 4,4'-DDT | UG/KG | 9.3 J | | | ND | |
| 60-57-1 | Dieldrin | UG/KG | ND | | | ND | |
| 959-98-8 | Endosulfan I | UG/KG | ND | | | ND | |
| 33213-65-9 | Endosulfan II | UG/KG | 10 JN | | | 12 J | |
| 72-20-8 | Endrin | UG/KG | ND | | | ND | |
| 7421-93-4 | Endrin aldehyde | UG/KG | ND | | | 11 J | |
| 1024-57-3 | Heptachlor epoxide | UG/KG | ND | | | ND | |
| 5103-71-9 | alpha-Chlordane | UG/KG | ND | | | ND | |
| 5103-74-2 | gamma-Chlordane | UG/KG | ND | | | ND | |
| | PCBs | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | ND | | | 51 J | |
| 12672-29-6 | Aroclor-1248 | UG/KG | ND | | | ND | |
| 11097-69-1 | Aroclor-1254 | UG/KG | ND | | | 66 J | |
| 11096-82-5 | Aroclor-1260 | UG/KG | ND | | | ND | |
| | Total PCBs | | ND | | | 117 | |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | 14500 | | | 7580 | |
| 7440-36-0 | Antimony | MG/KG | ND | | | 9.7 J | |
| 7440-38-2 | Arsenic | MG/KG | 6.9 | | | 3.5 | |
| 7440-39-3 | Barium | MG/KG | 114 | | | 66.1 | |
| 7440-41-7 | Beryllium | MG/KG | 1.2 J | | | 0.29 J | |
| 7440-43-9 | Cadmium | MG/KG | ND | | | ND | |
| 7440-70-2 | Calcium | MG/KG | 12800 | | | 11400 | |
| 7440-47-3 | Chromium | MG/KG | 44 | | | 28.7 J | |
| 7440-48-4 | Cobalt | MG/KG | 14.1 J | | | 9.1 J | |
| 7440-50-8 | Copper | MG/KG | 269 | | | 187 | |
| 7439-89-6 | Iron | MG/KG | 30400 | | | 19000 | |
| 7439-92-1 | Lead | MG/KG | 59.4 | | | 57.4 | |
| 7439-95-4 | Magnesium | MG/KG | 6480 | | | 4860 | |
| 7439-96-5 | Manganese | MG/KG | 712 | | | 523 | |
| 7439-97-6 | Mercury | MG/KG | 0.35 | | | 0.28 | |
| 7440-02-0 | Nickel | MG/KG | 32.1 | | | 21.3 | |
| 7440-09-7 | Potassium | MG/KG | 2260 | | | 1100 J | |
| 7782-49-2 | Selenium | MG/KG | ND | | | ND | |
| 7440-23-5 | Sodium | MG/KG | ND | | | ND | |
| 7440-62-2 | Vanadium | MG/KG | 31.1 | | | 10.7 J | |
| 7440-66-6 | Zinc | MG/KG | 262 | | | 227 | |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | | | | | |
| | GC/FID | | | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | | | | |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | | | |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| SOIL BORING DETECTED COMPOUNDS | | | DSA-2 | | | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | SB-217M | SB-218L$^{(MAX)}$ | SB-220K | SB-222D | SB-223K |
| NIAGARA MOHAWK POWER CORPORATION | | DEPTH: | 24-26' | 22-24' | 20-22' | 06-08' | 20-22' |
| HARBOR POINT - DREDGE SPOIL AREAS | | LAB ID: | 2109504 | 2111901 | 2111903 | 2111904 | 2113801 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS01SB03 | DS02SB05 | DS02SB05 | DS02SB05 | DS02SB05 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/20/94 | 6/22/94 | 6/22/94 | 6/22/94 | 6/22/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | | | | | |
| 78-93-3 | 2-Butanone | UG/KG | | | | | |
| 75-15-0 | Carbon Disulfide | UG/KG | | | | | |
| 108-90-7 | Chlorobenzene | UG/KG | | | | | |
| 75-35-4 | 1,1-Dichloroethene | UG/KG | | | | | |
| 100-42-5 | Styrene | UG/KG | | | | | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | UG/KG | | | | | |
| 79-01-6 | Trichloroethene | UG/KG | | | | | |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/KG | | | | | |
| 100-41-4 | Ethylbenzene | UG/KG | | | | | |
| 108-88-3 | Toluene | UG/KG | | | | | |
| 1330-20-7 | Xylene (total) | UG/KG | | | | | |
| | Total BTEX Volatiles | | | | | | |
| | SEMIVOLATILES | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | | | | | |
| 86-74-8 | Carbazole | UG/KG | | | | | |
| 91-58-7 | 2-Chloronaphthalene | UG/KG | | | | | |
| 84-74-2 | Di-n-butylphthalate | UG/KG | | | | | |
| 132-64-9 | Dibenzofuran | UG/KG | | | | | |
| 84-66-2 | Diethylphthalate | UG/KG | | | | | |
| 86-30-6 | N-Nitrosodiphenylamine | UG/KG | | | | | |
| 108-95-2 | Phenol | UG/KG | | | | | |
| 95-95-4 | 2,4,5-Trichlorophenol | UG/KG | | | | | |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | | | | | |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | 1800 | 10000 DJ | 16000 JD | 4600 JD | 460 J |
| 50-32-8 | Benzo(a)pyrene | UG/KG | 2400 | 20000 D | 30000 | 6900 | ND |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | 1300 | 10000 | 17000 | 5800 | 130 J |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | 1200 | 8500 | 11000 J | 3700 | 360 J |
| 218-01-9 | Chrysene | UG/KG | 3400 | 25000 DJ | 38000 JD | 8900 JD | 710 J |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | ND | ND | ND | ND | ND |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | ND | 5600 | ND | 3200 | ND |
| | Total Probable Carcinogenic PAHS | | 10100 | 79100 | 112000 | 33100 | 1660 |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | 4300 | 37000 D | 70000 | 10000 | 810 J |
| 208-96-8 | Acenaphthylene | UG/KG | 750 J | 5500 | 11000 J | 2100 | 200 J |
| 120-12-7 | Anthracene | UG/KG | 3800 | 15000 D | 40000 | 8700 | 790 J |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | ND | 7200 | 12000 | ND | ND |
| 206-44-0 | Fluoranthene | UG/KG | 3800 | 17000 D | 40000 | 12000 | 1200 |
| 86-73-7 | Fluorene | UG/KG | 3800 | 26000 D | 61000 | 11000 | 610 J |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | | | | | |
| 91-20-3 | Naphthalene | UG/KG | 2600 | 25000 D | 200000 D | 2200 | 3100 |
| 85-01-8 | Phenanthrene | UG/KG | 12000 D | 42000 D | 150000 D | 35000 D | 2000 |
| 129-00-0 | Pyrene | UG/KG | 5400 J | 75000 DJ | 56000 JD | 13000 D | 1600 |
| | Total PAHs | | 46550 | 328800 | 752000 | 127100 | 11970 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
$^{(MAX)}$ – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SOIL BORING DETECTED COMPOUNDS | | | DSA-2 | | | | |
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS | | SAMPLE ID: | SB-217M | SB-218L(MAX) | SB-220K | SB-222D | SB-223K |
| | | DEPTH: | 24-26' | 22-24' | 20-22' | 06-08' | 20-22' |
| | | LAB ID: | 2109504 | 2111901 | 2111903 | 2111904 | 2113801 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS01SB03 | DS02SB05 | DS02SB05 | DS02SB05 | DS02SB05 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/20/94 | 6/22/94 | 6/22/94 | 6/22/94 | 6/22/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | PESTICIDES | | | | | | |
| 72-54-8 | 4,4'-DDD | UG/KG | | | | | |
| 50-29-3 | 4,4'-DDT | UG/KG | | | | | |
| 60-57-1 | Dieldrin | UG/KG | | | | | |
| 959-98-8 | Endosulfan I | UG/KG | | | | | |
| 33213-65-9 | Endosulfan II | UG/KG | | | | | |
| 72-20-8 | Endrin | UG/KG | | | | | |
| 7421-93-4 | Endrin aldehyde | UG/KG | | | | | |
| 1024-57-3 | Heptachlor epoxide | UG/KG | | | | | |
| 5103-71-9 | alpha-Chlordane | UG/KG | | | | | |
| 5103-74-2 | gamma-Chlordane | UG/KG | | | | | |
| | PCBs | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | | | | | |
| 12672-29-6 | Aroclor-1248 | UG/KG | | | | | |
| 11097-69-1 | Aroclor-1254 | UG/KG | | | | | |
| 11096-82-5 | Aroclor-1260 | UG/KG | | | | | |
| | Total PCBs | | | | | | |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | | | | | |
| 7440-36-0 | Antimony | MG/KG | | | | | |
| 7440-38-2 | Arsenic | MG/KG | | | | | |
| 7440-39-3 | Barium | MG/KG | | | | | |
| 7440-41-7 | Beryllium | MG/KG | | | | | |
| 7440-43-9 | Cadmium | MG/KG | | | | | |
| 7440-70-2 | Calcium | MG/KG | | | | | |
| 7440-47-3 | Chromium | MG/KG | | | | | |
| 7440-48-4 | Cobalt | MG/KG | | | | | |
| 7440-50-8 | Copper | MG/KG | | | | | |
| 7439-89-6 | Iron | MG/KG | | | | | |
| 7439-92-1 | Lead | MG/KG | | | | | |
| 7439-95-4 | Magnesium | MG/KG | | | | | |
| 7439-96-5 | Manganese | MG/KG | | | | | |
| 7439-97-6 | Mercury | MG/KG | | | | | |
| 7440-02-0 | Nickel | MG/KG | | | | | |
| 7440-09-7 | Potassium | MG/KG | | | | | |
| 7782-49-2 | Selenium | MG/KG | | | | | |
| 7440-23-5 | Sodium | MG/KG | | | | | |
| 7440-62-2 | Vanadium | MG/KG | | | | | |
| 7440-66-6 | Zinc | MG/KG | | | | | |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | | | | | |
| | GC/FID | | | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | | | | |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | | | |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| | | | DSA-2 | | | | |
|---|---|---|---|---|---|---|---|
| SOIL BORING DETECTED COMPOUNDS | | SAMPLE ID: | SB-224H | SB-225E$^{(MAX)}$ | SB-225H | SB-226E | SB-227E |
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT - DREDGE SPOIL AREAS | | DEPTH: | 14-16' | 8-10' | 14-16' | 08-10' | 08-10' |
| | | LAB ID: | 2113701 | 2113702 | 2113703 | 2328101 | 2328102 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS02SB04 | DS02SB04 | DS02SB04 | DSASB22 | DSASB22 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/22/94 | 6/23/94 | 6/23/94 | 3/09/95 | 3/09/95 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 6/19/95 | 6/19/95 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | 500 J | ND | ND | ND | ND |
| 78-93-3 | 2-Butanone | UG/KG | 140 J | 66 J | 66 J | ND | ND |
| 75-15-0 | Carbon Disulfide | UG/KG | ND | ND | ND | ND | ND |
| 108-90-7 | Chlorobenzene | UG/KG | ND | ND | ND | ND | ND |
| 75-35-4 | 1,1-Dichloroethene | UG/KG | ND | ND | ND | ND | ND |
| 100-42-5 | Styrene | UG/KG | ND | ND | ND | ND | ND |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | UG/KG | ND | ND | ND | ND | ND |
| 79-01-6 | Trichloroethene | UG/KG | ND | ND | ND | ND | ND |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/KG | 28 J | 16 J | 22 J | ND | ND |
| 100-41-4 | Ethylbenzene | UG/KG | 840 | 1400 DJ | 1300 | 3 J | 68 |
| 108-88-3 | Toluene | UG/KG | 23 J | 40 J | 61 J | ND | 5 J |
| 1330-20-7 | Xylene (total) | UG/KG | 520 | 2400 | 2100 | 8 J | 92 |
| | Total BTEX Volatiles | | 1411 | 3856 | 3483 | 11 | 165 |
| | SEMIVOLATILES | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | ND | ND | ND | ND | ND |
| 86-74-8 | Carbazole | UG/KG | 4300 J | 3300 J | 8700 J | 2400 J | 1300 |
| 91-58-7 | 2-Chloronaphthalene | UG/KG | ND | ND | ND | ND | ND |
| 84-74-2 | Di-n-butylphthalate | UG/KG | ND | ND | ND | ND | ND |
| 132-64-9 | Dibenzofuran | UG/KG | 32000 | 17000 | 44000 J | 4900 J | 2600 |
| 84-66-2 | Diethylphthalate | UG/KG | ND | ND | ND | ND | ND |
| 86-30-6 | N-Nitrosodiphenylamine | UG/KG | ND | ND | 6700 J | ND | ND |
| 108-95-2 | Phenol | UG/KG | ND | ND | ND | ND | ND |
| 95-95-4 | 2,4,5-Trichlorophenol | UG/KG | ND | ND | ND | ND | ND |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | ND | ND | ND | ND | ND |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | 19000 | 17000 | 54000 J | 23000 | 4000 |
| 50-32-8 | Benzo(a)pyrene | UG/KG | 12000 J | 13000 J | 38000 J | 24000 | 3000 |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | 8000 J | 11000 J | 30000 J | 19000 | 2200 |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | 10000 J | 10000 J | 26000 J | 16000 | 2400 |
| 218-01-9 | Chrysene | UG/KG | 21000 | 19000 | 55000 J | 26000 | 4100 |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | ND | ND | ND | 640 J | ND |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | 5900 J | 8200 J | ND | 5600 | 620 J |
| | Total Probable Carcinogenic PAHS | | 75900 | 78200 | 203000 | 114240 | 16320 |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | 56000 | 40000 | 130000 J | 17000 | 21000 D |
| 208-96-8 | Acenaphthylene | UG/KG | 1700 J | 1600 J | 7000 J | 3200 J | 650 J |
| 120-12-7 | Anthracene | UG/KG | 34000 | 21000 | 67000 J | 29000 | 7800 |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | 5800 J | 6800 J | ND | 5000 J | 520 J |
| 206-44-0 | Fluoranthene | UG/KG | 62000 | 47000 | 120000 J | 54000 D | 28000 D |
| 86-73-7 | Fluorene | UG/KG | 54000 | 37000 | 110000 J | 15000 | 7300 |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | 62000 | 53000 | 290000 D | 2200 J | 16000 D |
| 91-20-3 | Naphthalene | UG/KG | 180000 D | 120000 D | 470000 D | 7900 | 19000 D |
| 85-01-8 | Phenanthrene | UG/KG | 140000 D | 76000 | 290000 D | 67000 D | 65000 D |
| 129-00-0 | Pyrene | UG/KG | 61000 | 44000 | 160000 D | 38000 D | 20000 D |
| | Total PAHs | | 732400 | 524600 | 1847000 | 352540 | 201590 |

J - Indicates an estimated value.
D - Indicates a diluted value.
N - Indicates presumptive evidence of a compound.
R - Indicates rejected data.
ND - Not detected.
$^{(MAX)}$ - Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| | | | DSA-2 | | | | |
|---|---|---|---|---|---|---|---|
| SOIL BORING DETECTED COMPOUNDS | | SAMPLE ID: | SB-224H | SB-225E$^{(MAX)}$ | SB-225H | SB-226E | SB-227E |
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT - DREDGE SPOIL AREAS | | DEPTH: | 14-16' | 8-10' | 14-16' | 08-10' | 08-10' |
| | | LAB ID: | 2113701 | 2113702 | 2113703 | 2328101 | 2328102 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS02SB04 | DS02SB04 | DS02SB04 | DSASB22 | DSASB22 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/22/94 | 6/23/94 | 6/23/94 | 3/09/95 | 3/09/95 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 6/19/95 | 6/19/95 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | PESTICIDES | | | | | | |
| 72-54-8 | 4,4'-DDD | UG/KG | ND | ND | ND | | |
| 50-29-3 | 4,4'-DDT | UG/KG | ND | ND | ND | | |
| 60-57-1 | Dieldrin | UG/KG | 23 J | 44 | ND | | |
| 959-98-8 | Endosulfan I | UG/KG | ND | ND | ND | | |
| 33213-65-9 | Endosulfan II | UG/KG | 23 | ND | ND | | |
| 72-20-8 | Endrin | UG/KG | ND | ND | 12 JN | | |
| 7421-93-4 | Endrin aldehyde | UG/KG | ND | ND | ND | | |
| 1024-57-3 | Heptachlor epoxide | UG/KG | ND | ND | ND | | |
| 5103-71-9 | alpha-Chlordane | UG/KG | ND | ND | ND | | |
| 5103-74-2 | gamma-Chlordane | UG/KG | ND | ND | ND | | |
| | PCBs | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | 2000 J | 520 | 170 | | |
| 12672-29-6 | Aroclor-1248 | UG/KG | ND | ND | ND | | |
| 11097-69-1 | Aroclor-1254 | UG/KG | 2400 J | 2800 | ND | | |
| 11096-82-5 | Aroclor-1260 | UG/KG | ND | ND | ND | | |
| | Total PCBs | | 4400 | 3320 | 170 | | |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | 14100 | 12400 | 13900 | | |
| 7440-36-0 | Antimony | MG/KG | ND | ND | ND | | |
| 7440-38-2 | Arsenic | MG/KG | 8.6 | 8 | 8.7 | | |
| 7440-39-3 | Barium | MG/KG | 145 | 104 | 124 | | |
| 7440-41-7 | Beryllium | MG/KG | ND | ND | ND | | |
| 7440-43-9 | Cadmium | MG/KG | 3.7 | 2.8 | 1.4 J | | |
| 7440-70-2 | Calcium | MG/KG | 26100 | 23500 | 21700 | | |
| 7440-47-3 | Chromium | MG/KG | 200 J | 120 J | 171 J | | |
| 7440-48-4 | Cobalt | MG/KG | 15.2 J | 13.6 J | 14.7 J | | |
| 7440-50-8 | Copper | MG/KG | 919 | 596 | 838 | | |
| 7439-89-6 | Iron | MG/KG | 27000 | 27700 | 30300 | | |
| 7439-92-1 | Lead | MG/KG | 113 | 91.5 | 122 | | |
| 7439-95-4 | Magnesium | MG/KG | 8300 | 8350 | 8560 | | |
| 7439-96-5 | Manganese | MG/KG | 684 | 663 | 758 | | |
| 7439-97-6 | Mercury | MG/KG | 0.93 | 0.73 | 0.88 | | |
| 7440-02-0 | Nickel | MG/KG | 40.9 | 46.9 | 41.5 | | |
| 7440-09-7 | Potassium | MG/KG | 2030 | 1920 | 1550 J | | |
| 7782-49-2 | Selenium | MG/KG | ND | ND | ND | | |
| 7440-23-5 | Sodium | MG/KG | ND | ND | ND | | |
| 7440-62-2 | Vanadium | MG/KG | 33.6 | 28.9 | 32.4 | | |
| 7440-66-6 | Zinc | MG/KG | 369 | 282 | 399 | | |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | | | | | |
| | GC/FID | | | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | | | | |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | | | |

J - Indicates an estimated value.
D - Indicates a diluted value.
N - Indicates presumptive evidence of a compound.
R - Indicates rejected data.
ND - Not detected.
$^{(MAX)}$ - Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| | | | DSA-2 | | | | |
|---|---|---|---|---|---|---|---|
| SOIL BORING DETECTED COMPOUNDS | | SAMPLE ID: | SB-228E | SB-229E | SB-230D | SB-231I | SB-231Y$^{(MAX)}$ |
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS | | DEPTH: | 08-10' | 08-10' | 06-08' | 16-18' | 48-50' |
| | | LAB ID: | 2329101 | 2329102 | 2329103 | 2330501 | 2330503 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DSASB22 | DSASB22 | DSASB22 | DSASB22 | DSASB22 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 3/09/95 | 3/10/95 | 3/10/95 | 3/13/95 | 3/13/95 |
| | | VALIDATED: | 6/19/95 | 6/19/95 | 6/19/95 | 6/19/95 | 6/19/95 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | ND | ND | ND | ND | ND |
| 78-93-3 | 2-Butanone | UG/KG | ND | ND | ND | ND | ND |
| 75-15-0 | Carbon Disulfide | UG/KG | ND | ND | ND | ND | ND |
| 108-90-7 | Chlorobenzene | UG/KG | ND | ND | ND | ND | 3 J |
| 75-35-4 | 1,1-Dichloroethene | UG/KG | ND | ND | ND | ND | 2 J |
| 100-42-5 | Styrene | UG/KG | ND | ND | ND | ND | ND |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | UG/KG | ND | ND | ND | ND | ND |
| 79-01-6 | Trichloroethene | UG/KG | ND | ND | ND | ND | 2 J |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/KG | 18 J | 3 J | ND | ND | 4 J |
| 100-41-4 | Ethylbenzene | UG/KG | 520 D | 8 J | 4 J | ND | ND |
| 108-88-3 | Toluene | UG/KG | 23 | 2 J | ND | ND | 3 J |
| 1330-20-7 | Xylene (total) | UG/KG | 810 D | 39 | 18 | ND | ND |
| | Total BTEX Volatiles | | 1371 | 52 | 22 | ND | 7 |
| | SEMIVOLATILES | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | ND | ND | ND | ND | ND |
| 86-74-8 | Carbazole | UG/KG | 19000 | ND | 1900 J | ND | ND |
| 91-58-7 | 2-Chloronaphthalene | UG/KG | ND | ND | ND | ND | ND |
| 84-74-2 | Di-n-butylphthalate | UG/KG | ND | ND | ND | ND | ND |
| 132-64-9 | Dibenzofuran | UG/KG | 35000 | ND | 6300 J | ND | ND |
| 84-66-2 | Diethylphthalate | UG/KG | ND | ND | ND | ND | ND |
| 86-30-6 | N-Nitrosodiphenylamine | UG/KG | ND | ND | ND | ND | ND |
| 108-95-2 | Phenol | UG/KG | ND | ND | ND | ND | ND |
| 95-95-4 | 2,4,5-Trichlorophenol | UG/KG | ND | ND | ND | ND | ND |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | ND | ND | 1600 J | ND | 54 J |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | 47000 | 24000 J | 8800 J | ND | ND |
| 50-32-8 | Benzo(a)pyrene | UG/KG | 27000 | 29000 | 7000 J | ND | ND |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | 20000 | 19000 J | 5500 J | ND | ND |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | 23000 | 23000 J | 5300 J | ND | ND |
| 218-01-9 | Chrysene | UG/KG | 48000 | 29000 | 8800 J | ND | ND |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | ND | ND | ND | ND | ND |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | 5900 J | 8500 J | 1900 J | ND | ND |
| | Total Probable Carcinogenic PAHS | | 170900 | 132500 | 37300 | ND | ND |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | 100000 JD | 3500 J | 11000 J | 48 J | ND |
| 208-96-8 | Acenaphthylene | UG/KG | 5100 J | 3800 J | ND | ND | ND |
| 120-12-7 | Anthracene | UG/KG | 100000 | 8800 J | 9500 J | ND | ND |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | 4100 J | 5700 J | 1400 J | ND | ND |
| 206-44-0 | Fluoranthene | UG/KG | 170000 D | 50000 | 25000 | 56 J | ND |
| 86-73-7 | Fluorene | UG/KG | 94000 | 3500 J | 9100 J | ND | ND |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | 160000 JD | ND | 13000 | 60 J | ND |
| 91-20-3 | Naphthalene | UG/KG | 360000 D | 5100 J | 3900 J | 76 J | ND |
| 85-01-8 | Phenanthrene | UG/KG | 290000 D | 23000 J | 43000 | 99 J | ND |
| 129-00-0 | Pyrene | UG/KG | 110000 JD | 46000 | 17000 | 60 J | ND |
| | Total PAHs | | 1564100 | 281900 | 170200 | 399 | ND |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
$^{(MAX)}$ – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| | | | DSA-2 | | | | |
|---|---|---|---|---|---|---|---|
| SOIL BORING DETECTED COMPOUNDS | | SAMPLE ID: | SB-228E | SB-229E | SB-230D | SB-231I | SB-231Y$^{(MAX)}$ |
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT - DREDGE SPOIL AREAS | | DEPTH: | 08-10' | 08-10' | 06-08' | 16-18' | 48-50' |
| | | LAB ID: | 2329101 | 2329102 | 2329103 | 2330501 | 2330503 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DSASB22 | DSASB22 | DSASB22 | DSASB22 | DSASB22 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 3/09/95 | 3/10/95 | 3/10/95 | 3/13/95 | 3/13/95 |
| | | VALIDATED: | 6/19/95 | 6/19/95 | 6/19/95 | 6/19/95 | 6/19/95 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | PESTICIDES | | | | | | |
| 72-54-8 | 4,4'-DDD | UG/KG | | | | | ND |
| 50-29-3 | 4,4'-DDT | UG/KG | | | | | ND |
| 60-57-1 | Dieldrin | UG/KG | | | | | ND |
| 959-98-8 | Endosulfan I | UG/KG | | | | | ND |
| 33213-65-9 | Endosulfan II | UG/KG | | | | | ND |
| 72-20-8 | Endrin | UG/KG | | | | | ND |
| 7421-93-4 | Endrin aldehyde | UG/KG | | | | | ND |
| 1024-57-3 | Heptachlor epoxide | UG/KG | | | | | ND |
| 5103-71-9 | alpha-Chlordane | UG/KG | | | | | ND |
| 5103-74-2 | gamma-Chlordane | UG/KG | | | | | ND |
| | PCBs | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | | | | | ND |
| 12672-29-6 | Aroclor-1248 | UG/KG | | | | | ND |
| 11097-69-1 | Aroclor-1254 | UG/KG | | | | | ND |
| 11096-82-5 | Aroclor-1260 | UG/KG | | | | | ND |
| | Total PCBs | | | | | | ND |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | | | | | 5500 |
| 7440-36-0 | Antimony | MG/KG | | | | | 11.5 J |
| 7440-38-2 | Arsenic | MG/KG | | | | | 5.6 |
| 7440-39-3 | Barium | MG/KG | | | | | 11.3 J |
| 7440-41-7 | Beryllium | MG/KG | | | | | ND |
| 7440-43-9 | Cadmium | MG/KG | | | | | 0.76 J |
| 7440-70-2 | Calcium | MG/KG | | | | | 49100 |
| 7440-47-3 | Chromium | MG/KG | | | | | 7.8 |
| 7440-48-4 | Cobalt | MG/KG | | | | | 5.4 J |
| 7440-50-8 | Copper | MG/KG | | | | | 13.5 J |
| 7439-89-6 | Iron | MG/KG | | | | | 14400 |
| 7439-92-1 | Lead | MG/KG | | | | | 3.9 |
| 7439-95-4 | Magnesium | MG/KG | | | | | 10500 |
| 7439-96-5 | Manganese | MG/KG | | | | | 629 |
| 7439-97-6 | Mercury | MG/KG | | | | | ND |
| 7440-02-0 | Nickel | MG/KG | | | | | 11.5 |
| 7440-09-7 | Potassium | MG/KG | | | | | 1030 |
| 7782-49-2 | Selenium | MG/KG | | | | | ND |
| 7440-23-5 | Sodium | MG/KG | | | | | 91.8 J |
| 7440-62-2 | Vanadium | MG/KG | | | | | 12.6 |
| 7440-66-6 | Zinc | MG/KG | | | | | 35.4 J |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | | | | | 20618 |
| | GC/FID | | | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | | | | |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | | | |

J - Indicates an estimated value.
D - Indicates a diluted value.
N - Indicates presumptive evidence of a compound.
R - Indicates rejected data.
ND - Not detected.
$^{(MAX)}$ - Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

**SOIL BORING DETECTED COMPOUNDS**

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS

| | | | DSA-2 | | | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | SB-232C | SB-233C | SB-233G | SB-234F | SB-234L |
| | | DEPTH: | 04-06' | 04-06' | 12-14' | 10-12' | 22-24' |
| | | LAB ID: | 2331604 | 2331602 | 2331603 | 2333601 | 2333602 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DSASB22 | DSASB22 | DSASB22 | DSASB23 | DSASB23 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 3/14/95 | 3/14/95 | 3/14/95 | 3/14/95 | 3/14/95 |
| | | VALIDATED: | 6/19/95 | 6/19/95 | 6/19/95 | 6/19/95 | 6/19/95 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | ND | | | | |
| 78-93-3 | 2-Butanone | UG/KG | ND | | | | |
| 75-15-0 | Carbon Disulfide | UG/KG | 3 J | | | | |
| 108-90-7 | Chlorobenzene | UG/KG | ND | | | | |
| 75-35-4 | 1,1-Dichloroethene | UG/KG | ND | | | | |
| 100-42-5 | Styrene | UG/KG | ND | | | | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | UG/KG | ND | | | | |
| 79-01-6 | Trichloroethene | UG/KG | ND | | | | |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/KG | ND | | | | |
| 100-41-4 | Ethylbenzene | UG/KG | ND | | | | |
| 108-88-3 | Toluene | UG/KG | ND | | | | |
| 1330-20-7 | Xylene (total) | UG/KG | ND | | | | |
| | Total BTEX Volatiles | | ND | | | | |
| | SEMIVOLATILES | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | ND | | | | |
| 86-74-8 | Carbazole | UG/KG | 1600 J | | | | |
| 91-58-7 | 2-Chloronaphthalene | UG/KG | ND | | | | |
| 84-74-2 | Di-n-butylphthalate | UG/KG | ND | | | | |
| 132-64-9 | Dibenzofuran | UG/KG | 2700 | | | | |
| 84-66-2 | Diethylphthalate | UG/KG | ND | | | | |
| 86-30-6 | N-Nitrosodiphenylamine | UG/KG | ND | | | | |
| 108-95-2 | Phenol | UG/KG | ND | | | | |
| 95-95-4 | 2,4,5-Trichlorophenol | UG/KG | ND | | | | |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | ND | | | | |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | 2500 | | | | |
| 50-32-8 | Benzo(a)pyrene | UG/KG | 1500 J | | | | |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | 1100 J | | | | |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | 1200 J | | | | |
| 218-01-9 | Chrysene | UG/KG | 2500 | | | | |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | ND | | | | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | 390 J | | | | |
| | Total Probable Carcinogenic PAHS | | 9190 | | | | |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | 7800 | | | | |
| 208-96-8 | Acenaphthylene | UG/KG | 420 J | | | | |
| 120-12-7 | Anthracene | UG/KG | 5500 | | | | |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | 220 J | | | | |
| 206-44-0 | Fluoranthene | UG/KG | 12000 | | | | |
| 86-73-7 | Fluorene | UG/KG | 6100 | | | | |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | 7200 | | | | |
| 91-20-3 | Naphthalene | UG/KG | 10000 | | | | |
| 85-01-8 | Phenanthrene | UG/KG | 16000 D | | | | |
| 129-00-0 | Pyrene | UG/KG | 7400 | | | | |
| | Total PAHs | | 81830 | | | | |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| SOIL BORING DETECTED COMPOUNDS<br>NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS | | | DSA–2 | | | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | SB–232C | SB–233C | SB–233G | SB–234F | SB–234L |
| | | DEPTH: | 04–06' | 04–06' | 12–14' | 10–12' | 22–24' |
| | | LAB ID: | 2331604 | 2331602 | 2331603 | 2333601 | 2333602 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DSASB22 | DSASB22 | DSASB22 | DSASB23 | DSASB23 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 3/14/95 | 3/14/95 | 3/14/95 | 3/14/95 | 3/14/95 |
| | | VALIDATED: | 6/19/95 | 6/19/95 | 6/19/95 | 6/19/95 | 6/19/95 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | PESTICIDES | | | | | | |
| 72–54–8 | 4,4'–DDD | UG/KG | | | | | |
| 50–29–3 | 4,4'–DDT | UG/KG | | | | | |
| 60–57–1 | Dieldrin | UG/KG | | | | | |
| 959–98–8 | Endosulfan I | UG/KG | | | | | |
| 33213–65–9 | Endosulfan II | UG/KG | | | | | |
| 72–20–8 | Endrin | UG/KG | | | | | |
| 7421–93–4 | Endrin aldehyde | UG/KG | | | | | |
| 1024–57–3 | Heptachlor epoxide | UG/KG | | | | | |
| 5103–71–9 | alpha–Chlordane | UG/KG | | | | | |
| 5103–74–2 | gamma–Chlordane | UG/KG | | | | | |
| | PCBs | | | | | | |
| 53469–21–9 | Aroclor–1242 | UG/KG | | | | | |
| 12672–29–6 | Aroclor–1248 | UG/KG | | | | | |
| 11097–69–1 | Aroclor–1254 | UG/KG | | | | | |
| 11096–82–5 | Aroclor–1260 | UG/KG | | | | | |
| | Total PCBs | | | | | | |
| | INORGANICS | | | | | | |
| 7429–90–5 | Aluminum | MG/KG | | | | | |
| 7440–36–0 | Antimony | MG/KG | | | | | |
| 7440–38–2 | Arsenic | MG/KG | | | | | |
| 7440–39–3 | Barium | MG/KG | | | | | |
| 7440–41–7 | Beryllium | MG/KG | | | | | |
| 7440–43–9 | Cadmium | MG/KG | | | | | |
| 7440–70–2 | Calcium | MG/KG | | | | | |
| 7440–47–3 | Chromium | MG/KG | | | | | |
| 7440–48–4 | Cobalt | MG/KG | | | | | |
| 7440–50–8 | Copper | MG/KG | | | | | |
| 7439–89–6 | Iron | MG/KG | | | | | |
| 7439–92–1 | Lead | MG/KG | | | | | |
| 7439–95–4 | Magnesium | MG/KG | | | | | |
| 7439–96–5 | Manganese | MG/KG | | | | | |
| 7439–97–6 | Mercury | MG/KG | | | | | |
| 7440–02–0 | Nickel | MG/KG | | | | | |
| 7440–09–7 | Potassium | MG/KG | | | | | |
| 7782–49–2 | Selenium | MG/KG | | | | | |
| 7440–23–5 | Sodium | MG/KG | | | | | |
| 7440–62–2 | Vanadium | MG/KG | | | | | |
| 7440–66–6 | Zinc | MG/KG | | | | | |
| | OTHER | | | | | | |
| 7440–44–0 | Total Organic Carbon | MG/KG | | | | | |
| | GC/FID | | | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | 260 | 410 | 3500 J | 10 J |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | | | |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

SOIL BORING DETECTED COMPOUNDS

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS

| | | | DSA-3 | | | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | SB-301F | SB-302E | SB-302G | SB-303E | SB-304F |
| | | DEPTH: | 10-12' | 08-10' | 12-14' | 08-10' | 10-12' |
| | | LAB ID: | 2115601 | 2115602 | 2115603 | 2115605 | 2115604 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS02SB05 | DS02SB05 | DS02SB05 | DS02SB05 | DS02SB05 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/24/94 | 6/24/94 | 6/24/94 | 6/24/94 | 6/24/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | | | | | |
| 78-93-3 | 2-Butanone | UG/KG | | | | | |
| 75-15-0 | Carbon Disulfide | UG/KG | | | | | |
| 108-90-7 | Chlorobenzene | UG/KG | | | | | |
| 75-35-4 | 1,1-Dichloroethene | UG/KG | | | | | |
| 100-42-5 | Styrene | UG/KG | | | | | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | UG/KG | | | | | |
| 79-01-6 | Trichloroethene | UG/KG | | | | | |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/KG | | | | | |
| 100-41-4 | Ethylbenzene | UG/KG | | | | | |
| 108-88-3 | Toluene | UG/KG | | | | | |
| 1330-20-7 | Xylene (total) | UG/KG | | | | | |
| | Total BTEX Volatiles | | | | | | |
| | SEMIVOLATILES | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | | | | | |
| 86-74-8 | Carbazole | UG/KG | | | | | |
| 91-58-7 | 2-Chloronaphthalene | UG/KG | | | | | |
| 84-74-2 | Di-n-butylphthalate | UG/KG | | | | | |
| 132-64-9 | Dibenzofuran | UG/KG | | | | | |
| 84-66-2 | Diethylphthalate | UG/KG | | | | | |
| 86-30-6 | N-Nitrosodiphenylamine | UG/KG | | | | | |
| 108-95-2 | Phenol | UG/KG | | | | | |
| 95-95-4 | 2,4,5-Trichlorophenol | UG/KG | | | | | |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | | | | | |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | 460 J | 1200 J | ND | ND | 1000 J |
| 50-32-8 | Benzo(a)pyrene | UG/KG | 380 J | 1200 J | ND | ND | ND |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | 410 J | 1000 J | ND | ND | 690 J |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | 330 J | 940 J | ND | ND | 840 J |
| 218-01-9 | Chrysene | UG/KG | 520 J | 1400 J | ND | ND | 1300 J |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | ND | ND | ND | ND | ND |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | ND | ND | ND | ND | ND |
| | Total Probable Carcinogenic PAHS | | 2100 | 5740 | ND | ND | 3830 |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | 460 J | 1600 J | 51 J | ND | 1600 J |
| 208-96-8 | Acenaphthylene | UG/KG | 140 J | 360 J | ND | ND | 330 J |
| 120-12-7 | Anthracene | UG/KG | 400 J | 1200 J | ND | ND | 1100 J |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | ND | ND | ND | ND | ND |
| 206-44-0 | Fluoranthene | UG/KG | 1300 | 3300 | 92 J | ND | 3100 |
| 86-73-7 | Fluorene | UG/KG | 670 J | 2000 J | 65 J | ND | 2300 |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | | | | | |
| 91-20-3 | Naphthalene | UG/KG | 100 J | 470 J | 56 J | ND | 820 J |
| 85-01-8 | Phenanthrene | UG/KG | 1700 | 4800 | 120 J | ND | 4900 |
| 129-00-0 | Pyrene | UG/KG | 1400 | 4100 | 57 J | ND | 4600 |
| | Total PAHs | | 8270 | 23570 | 441 | ND | 22580 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| SOIL BORING DETECTED COMPOUNDS | | | DSA-3 | | | | |
|---|---|---|---|---|---|---|---|
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS | | SAMPLE ID: | SB-301F | SB-302E | SB-302G | SB-303E | SB-304F |
| | | DEPTH: | 10-12' | 08-10' | 12-14' | 08-10' | 10-12' |
| | | LAB ID: | 2115601 | 2115602 | 2115603 | 2115605 | 2115604 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS02SB05 | DS02SB05 | DS02SB05 | DS02SB05 | DS02SB05 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/24/94 | 6/24/94 | 6/24/94 | 6/24/94 | 6/24/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | PESTICIDES | | | | | | |
| 72-54-8 | 4,4'-DDD | UG/KG | | | | | |
| 50-29-3 | 4,4'-DDT | UG/KG | | | | | |
| 60-57-1 | Dieldrin | UG/KG | | | | | |
| 959-98-8 | Endosulfan I | UG/KG | | | | | |
| 33213-65-9 | Endosulfan II | UG/KG | | | | | |
| 72-20-8 | Endrin | UG/KG | | | | | |
| 7421-93-4 | Endrin aldehyde | UG/KG | | | | | |
| 1024-57-3 | Heptachlor epoxide | UG/KG | | | | | |
| 5103-71-9 | alpha-Chlordane | UG/KG | | | | | |
| 5103-74-2 | gamma-Chlordane | UG/KG | | | | | |
| | PCBs | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | | | | | |
| 12672-29-6 | Aroclor-1248 | UG/KG | | | | | |
| 11097-69-1 | Aroclor-1254 | UG/KG | | | | | |
| 11096-82-5 | Aroclor-1260 | UG/KG | | | | | |
| | Total PCBs | | | | | | |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | | | | | |
| 7440-36-0 | Antimony | MG/KG | | | | | |
| 7440-38-2 | Arsenic | MG/KG | | | | | |
| 7440-39-3 | Barium | MG/KG | | | | | |
| 7440-41-7 | Beryllium | MG/KG | | | | | |
| 7440-43-9 | Cadmium | MG/KG | | | | | |
| 7440-70-2 | Calcium | MG/KG | | | | | |
| 7440-47-3 | Chromium | MG/KG | | | | | |
| 7440-48-4 | Cobalt | MG/KG | | | | | |
| 7440-50-8 | Copper | MG/KG | | | | | |
| 7439-89-6 | Iron | MG/KG | | | | | |
| 7439-92-1 | Lead | MG/KG | | | | | |
| 7439-95-4 | Magnesium | MG/KG | | | | | |
| 7439-96-5 | Manganese | MG/KG | | | | | |
| 7439-97-6 | Mercury | MG/KG | | | | | |
| 7440-02-0 | Nickel | MG/KG | | | | | |
| 7440-09-7 | Potassium | MG/KG | | | | | |
| 7782-49-2 | Selenium | MG/KG | | | | | |
| 7440-23-5 | Sodium | MG/KG | | | | | |
| 7440-62-2 | Vanadium | MG/KG | | | | | |
| 7440-66-6 | Zinc | MG/KG | | | | | |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | | | | | |
| | GC/FID | | | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | | | | |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | | | |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| | | | DSA-3 | | | | |
|---|---|---|---|---|---|---|---|
| SOIL BORING DETECTED COMPOUNDS | | SAMPLE ID: | SB-305G | SB-306C | SB-306I | SB-307E | SB-308I |
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT - DREDGE SPOIL AREAS | | DEPTH: | 12-14' | 02-06' | 16-18' | 08-10' | 16-18' |
| | | LAB ID: | 2115605 | 2116501 | 2116601 | 2116602 | 2118601 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS02SB05 | DS02SB05 | DS02SB06 | DS02SB06 | DS02SB05 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/24/94 | 6/27/94 | 6/27/94 | 6/27/94 | 6/27/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | | | ND | ND | |
| 78-93-3 | 2-Butanone | UG/KG | | | ND | ND | |
| 75-15-0 | Carbon Disulfide | UG/KG | | | ND | ND | |
| 108-90-7 | Chlorobenzene | UG/KG | | | ND | ND | |
| 75-35-4 | 1,1-Dichloroethene | UG/KG | | | ND | ND | |
| 100-42-5 | Styrene | UG/KG | | | ND | ND | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | UG/KG | | | ND | ND | |
| 79-01-6 | Trichloroethene | UG/KG | | | ND | ND | |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/KG | | | ND | 2 J | |
| 100-41-4 | Ethylbenzene | UG/KG | | | ND | ND | |
| 108-88-3 | Toluene | UG/KG | | | ND | ND | |
| 1330-20-7 | Xylene (total) | UG/KG | | | 2 J | 4 J | |
| | Total BTEX Volatiles | | | | 2 | 6 | |
| | SEMIVOLATILES | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | | | ND | ND | |
| 86-74-8 | Carbazole | UG/KG | | | 290 J | 380 J | |
| 91-58-7 | 2-Chloronaphthalene | UG/KG | | | ND | ND | |
| 84-74-2 | Di-n-butylphthalate | UG/KG | | | ND | 240 J | |
| 132-64-9 | Dibenzofuran | UG/KG | | | 1800 J | 2700 | |
| 84-66-2 | Diethylphthalate | UG/KG | | | ND | ND | |
| 86-30-6 | N-Nitrosodiphenylamine | UG/KG | | | ND | ND | |
| 108-95-2 | Phenol | UG/KG | | | ND | ND | |
| 95-95-4 | 2,4,5-Trichlorophenol | UG/KG | | | ND | ND | |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | | | 1200 J | 880 J | |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | 2600 | 5400 | 2300 | 3600 | 870 J |
| 50-32-8 | Benzo(a)pyrene | UG/KG | 2300 | 4900 | 1900 J | 3000 | 640 J |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | 2100 J | 4000 | 1600 J | 2800 | 460 J |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | 2100 J | 3600 | 1400 J | 2900 | 520 J |
| 218-01-9 | Chrysene | UG/KG | 3200 | 5300 | 2600 | 4000 | 920 J |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | ND | ND | ND | ND | ND |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | ND | 2600 | 1300 J | 2000 | 510 J |
| | Total Probable Carcinogenic PAHS | | 12300 | 25800 | 11100 | 18300 | 3920 |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | 3000 | 1300 J | 2200 | 2800 | 690 J |
| 208-96-8 | Acenaphthylene | UG/KG | 840 J | 1400 J | 320 J | 370 J | 130 J |
| 120-12-7 | Anthracene | UG/KG | 2400 | 2700 | 1400 J | 2600 | 690 J |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | ND | ND | ND | 1100 J | 590 J |
| 206-44-0 | Fluoranthene | UG/KG | 5500 | 8900 | 5000 | 8800 | 2300 |
| 86-73-7 | Fluorene | UG/KG | 4000 | 2800 | 3200 | 4700 | 1200 |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | | | 4000 | 1800 J | |
| 91-20-3 | Naphthalene | UG/KG | 880 J | 650 J | 580 J | 790 J | 240 J |
| 85-01-8 | Phenanthrene | UG/KG | 9100 | 8400 | 7400 | 11000 | 2800 |
| 129-00-0 | Pyrene | UG/KG | 5400 | 17000 | 6500 | 9500 | 3000 |
| | Total PAHs | | 43420 | 68950 | 41700 | 61760 | 15560 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| | | | DSA-3 | | | | |
|---|---|---|---|---|---|---|---|
| SOIL BORING DETECTED COMPOUNDS | | SAMPLE ID: | SB-305G | SB-306C | SB-306I | SB-307E | SB-308I |
| | | DEPTH: | 12-14' | 02-06' | 16-18' | 08-10' | 16-18' |
| NIAGARA MOHAWK POWER CORPORATION | | LAB ID: | 2115606 | 2116501 | 2116601 | 2116602 | 2118601 |
| HARBOR POINT - DREDGE SPOIL AREAS | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS02SB05 | DS02SB05 | DS02SB06 | DS02SB06 | DS02SB05 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/24/94 | 6/27/94 | 6/27/94 | 6/27/94 | 6/27/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | PESTICIDES | | | | | | |
| 72-54-8 | 4,4'-DDD | UG/KG | | | ND | ND | |
| 50-29-3 | 4,4'-DDT | UG/KG | | | ND | ND | |
| 60-57-1 | Dieldrin | UG/KG | | | ND | ND | |
| 959-98-8 | Endosulfan I | UG/KG | | | ND | ND | |
| 33213-65-9 | Endosulfan II | UG/KG | | | ND | ND | |
| 72-20-8 | Endrin | UG/KG | | | ND | ND | |
| 7421-93-4 | Endrin aldehyde | UG/KG | | | ND | ND | |
| 1024-57-3 | Heptachlor epoxide | UG/KG | | | ND | ND | |
| 5103-71-9 | alpha-Chlordane | UG/KG | | | ND | ND | |
| 5103-74-2 | gamma-Chlordane | UG/KG | | | ND | ND | |
| | PCBs | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | | | 7100 D | 10000 D | |
| 12672-29-6 | Aroclor-1248 | UG/KG | | | ND | ND | |
| 11097-69-1 | Aroclor-1254 | UG/KG | | | 7400 D | 8800 D | |
| 11096-82-5 | Aroclor-1260 | UG/KG | | | ND | ND | |
| | Total PCBs | | | | 14500 | 18800 | |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | | | 10000 | 8970 | |
| 7440-36-0 | Antimony | MG/KG | | | ND | ND | |
| 7440-38-2 | Arsenic | MG/KG | | | 6.9 | 5.1 | |
| 7440-39-3 | Barium | MG/KG | | | 111 | 78.1 | |
| 7440-41-7 | Beryllium | MG/KG | | | ND | ND | |
| 7440-43-9 | Cadmium | MG/KG | | | 4.4 | 3 | |
| 7440-70-2 | Calcium | MG/KG | | | 32300 | 23500 | |
| 7440-47-3 | Chromium | MG/KG | | | 142 | 93.4 | |
| 7440-48-4 | Cobalt | MG/KG | | | 16.3 | 11.9 J | |
| 7440-50-8 | Copper | MG/KG | | | 608 | 380 | |
| 7439-89-6 | Iron | MG/KG | | | 25300 | 19400 | |
| 7439-92-1 | Lead | MG/KG | | | 102 | 60.3 | |
| 7439-95-4 | Magnesium | MG/KG | | | 9170 | 7650 | |
| 7439-96-5 | Manganese | MG/KG | | | 771 J | 535 J | |
| 7439-97-6 | Mercury | MG/KG | | | 0.63 | 0.23 | |
| 7440-02-0 | Nickel | MG/KG | | | 46.8 | 34.7 | |
| 7440-09-7 | Potassium | MG/KG | | | 1170 J | 1700 | |
| 7782-49-2 | Selenium | MG/KG | | | ND | ND | |
| 7440-23-5 | Sodium | MG/KG | | | ND | ND | |
| 7440-62-2 | Vanadium | MG/KG | | | 26.1 | 22.4 | |
| 7440-66-6 | Zinc | MG/KG | | | 296 | 191 | |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | | | | | |
| | GC/FID | | | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | | | | |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | | | |

J - Indicates an estimated value.
D - Indicates a diluted value.
N - Indicates presumptive evidence of a compound.
R - Indicates rejected data.
ND - Not detected.
(MAX) - Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| | | | DSA-3 | | | | |
|---|---|---|---|---|---|---|---|
| SOIL BORING DETECTED COMPOUNDS | | SAMPLE ID: | SB-308O | SB-313E$^{(MAX)}$ | SB-314C | SB-315D | SB-316B$^{(MAX)}$ |
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT - DREDGE SPOIL AREAS | | DEPTH: | 28-30' | 05-10' | 04-06' | 06-08' | 02-04' |
| | | LAB ID: | 2118602 | 2121001 | 2120906 | 2120907 | 2120901 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS02SB05 | DS02SB06 | DS02SB07 | DS02SB07 | DS02SB07 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/27/94 | 6/28/94 | 6/28/94 | 6/28/94 | 6/29/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | | 170 J | | | |
| 78-93-3 | 2-Butanone | UG/KG | | 45 | | | |
| 75-15-0 | Carbon Disulfide | UG/KG | | 2 J | | | |
| 108-90-7 | Chlorobenzene | UG/KG | | ND | | | |
| 75-35-4 | 1,1-Dichloroethene | UG/KG | | ND | | | |
| 100-42-5 | Styrene | UG/KG | | ND | | | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | UG/KG | | ND | | | |
| 79-01-6 | Trichloroethene | UG/KG | | ND | | | |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/KG | | ND | | | |
| 100-41-4 | Ethylbenzene | UG/KG | | ND | | | |
| 108-88-3 | Toluene | UG/KG | | 2 J | | | |
| 1330-20-7 | Xylene (total) | UG/KG | | 13 J | | | |
| | Total BTEX Volatiles | | | 15 | | | |
| | SEMIVOLATILES | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | | ND | | | |
| 86-74-8 | Carbazole | UG/KG | | 440 J | | | |
| 91-58-7 | 2-Chloronaphthalene | UG/KG | | ND | | | |
| 84-74-2 | Di-n-butylphthalate | UG/KG | | ND | | | |
| 132-64-9 | Dibenzofuran | UG/KG | | 2300 J | | | |
| 84-66-2 | Diethylphthalate | UG/KG | | ND | | | |
| 86-30-6 | N-Nitrosodiphenylamine | UG/KG | | ND | | | |
| 108-95-2 | Phenol | UG/KG | | 3400 | | | |
| 95-95-4 | 2,4,5-Trichlorophenol | UG/KG | | ND | | | |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | | 2400 J | | | |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | ND | 5000 | 940 J | 3300 | 5100 |
| 50-32-8 | Benzo(a)pyrene | UG/KG | ND | 4300 | 910 J | 3100 | 5000 |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | ND | 4100 | 720 J | 2500 | 3600 |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | ND | 4600 | 840 J | 2400 J | 4000 |
| 218-01-9 | Chrysene | UG/KG | ND | 5500 | 1100 | 3400 | 4800 |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | ND | 670 J | ND | ND | ND |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | ND | 2700 J | ND | ND | ND |
| | Total Probable Carcinogenic PAHS | | ND | 26870 | 4510 | 14700 | 22700 |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | ND | 2900 | 1300 | 3000 | 630 J |
| 208-96-8 | Acenaphthylene | UG/KG | ND | 1300 J | 270 J | 930 J | 1300 J |
| 120-12-7 | Anthracene | UG/KG | ND | 2900 | 900 J | 2400 J | 1900 |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | ND | 1200 J | ND | ND | 2200 |
| 206-44-0 | Fluoranthene | UG/KG | ND | 11000 | 2200 | 6800 | 8300 |
| 86-73-7 | Fluorene | UG/KG | ND | 3500 | 1500 | 4100 | 1500 J |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | | 3800 | | | |
| 91-20-3 | Naphthalene | UG/KG | ND | 1700 J | 410 J | 640 J | 310 J |
| 85-01-8 | Phenanthrene | UG/KG | ND | 10000 | 3500 | 8500 | 5500 |
| 129-00-0 | Pyrene | UG/KG | ND | 13000 J | 2300 | 7400 | 11000 |
| | Total PAHs | | ND | 78170 | 16890 | 48470 | 55340 |

J - Indicates an estimated value.

D - Indicates a diluted value.

N - Indicates presumptive evidence of a compound.

R - Indicates rejected data.

ND - Not detected.

$^{(MAX)}$ - Indicates a duplicate sample was taken and the higher concentration has been reported.

Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| SOIL BORING DETECTED COMPOUNDS<br>NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS | | | DSA-3 | | | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | SB-308O | SB-313E(MAX) | SB-314C | SB-315D | SB-316B(MAX) |
| | | DEPTH: | 28-30' | 05-10' | 04-06' | 06-08' | 02-04' |
| | | LAB ID: | 2118602 | 2121001 | 2120906 | 2120907 | 2120901 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS02SB05 | DS02SB06 | DS02SB07 | DS02SB07 | DS02SB07 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/27/94 | 6/28/94 | 6/28/94 | 6/28/94 | 6/29/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | | | |
| | PESTICIDES | | | | | | |
| 72-54-8 | 4,4'-DDD | UG/KG | | ND | | | |
| 50-29-3 | 4,4'-DDT | UG/KG | | ND | | | |
| 60-57-1 | Dieldrin | UG/KG | | ND | | | |
| 959-98-8 | Endosulfan I | UG/KG | | ND | | | |
| 33213-65-9 | Endosulfan II | UG/KG | | ND | | | |
| 72-20-8 | Endrin | UG/KG | | ND | | | |
| 7421-93-4 | Endrin aldehyde | UG/KG | | ND | | | |
| 1024-57-3 | Heptachlor epoxide | UG/KG | | ND | | | |
| 5103-71-9 | alpha-Chlordane | UG/KG | | ND | | | |
| 5103-74-2 | gamma-Chlordane | UG/KG | | ND | | | |
| | PCBs | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | | 7400 D | | | |
| 12672-29-6 | Aroclor-1248 | UG/KG | | ND | | | |
| 11097-69-1 | Aroclor-1254 | UG/KG | | 7100 D | | | |
| 11096-82-5 | Aroclor-1260 | UG/KG | | ND | | | |
| | Total PCBs | | | 14500 | | | |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | | 15500 | | | |
| 7440-36-0 | Antimony | MG/KG | | ND | | | |
| 7440-38-2 | Arsenic | MG/KG | | 7.7 | | | |
| 7440-39-3 | Barium | MG/KG | | 146 | | | |
| 7440-41-7 | Beryllium | MG/KG | | ND | | | |
| 7440-43-9 | Cadmium | MG/KG | | 5.7 | | | |
| 7440-70-2 | Calcium | MG/KG | | 31800 | | | |
| 7440-47-3 | Chromium | MG/KG | | 225 | | | |
| 7440-48-4 | Cobalt | MG/KG | | 22.3 | | | |
| 7440-50-8 | Copper | MG/KG | | 1050 | | | |
| 7439-89-6 | Iron | MG/KG | | 29800 | | | |
| 7439-92-1 | Lead | MG/KG | | 130 | | | |
| 7439-95-4 | Magnesium | MG/KG | | 9900 | | | |
| 7439-96-5 | Manganese | MG/KG | | 771 J | | | |
| 7439-97-6 | Mercury | MG/KG | | 0.9 | | | |
| 7440-02-0 | Nickel | MG/KG | | 64.3 | | | |
| 7440-09-7 | Potassium | MG/KG | | 3060 | | | |
| 7782-49-2 | Selenium | MG/KG | | ND | | | |
| 7440-23-5 | Sodium | MG/KG | | ND | | | |
| 7440-62-2 | Vanadium | MG/KG | | 40 | | | |
| 7440-66-6 | Zinc | MG/KG | | 412 | | | |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | | | | | |
| | GC/FID | | | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | | | | |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | | | |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

**SOIL BORING DETECTED COMPOUNDS**

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS

| | | | DSA-3 | | |
|---|---|---|---|---|---|
| | | SAMPLE ID: | SB-316E | SB-317I | SB-317O |
| | | DEPTH: | 08-10' | 16-18' | 28-30' |
| | | LAB ID: | 2120903 | 2121003 | 2120908 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS02SB07 | DS02SB06 | DS02SB07 |
| | | MATRIX: | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/29/94 | 6/29/94 | 6/28/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | |
| | VOLATILES | | | | |
| 67-64-1 | Acetone | UG/KG | | 58 | |
| 78-93-3 | 2-Butanone | UG/KG | | 16 | |
| 75-15-0 | Carbon Disulfide | UG/KG | | ND | |
| 108-90-7 | Chlorobenzene | UG/KG | | ND | |
| 75-35-4 | 1,1-Dichloroethene | UG/KG | | ND | |
| 100-42-5 | Styrene | UG/KG | | ND | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | UG/KG | | ND | |
| 79-01-6 | Trichloroethene | UG/KG | | ND | |
| | BTEX VOLATILES | | | | |
| 71-43-2 | Benzene | UG/KG | | 2 J | |
| 100-41-4 | Ethylbenzene | UG/KG | | ND | |
| 108-88-3 | Toluene | UG/KG | | 3 J | |
| 1330-20-7 | Xylene (total) | UG/KG | | ND | |
| | Total BTEX Volatiles | | | 5 | |
| | SEMIVOLATILES | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | | ND | |
| 86-74-8 | Carbazole | UG/KG | | ND | |
| 91-58-7 | 2-Chloronaphthalene | UG/KG | | ND | |
| 84-74-2 | Di-n-butylphthalate | UG/KG | | ND | |
| 132-64-9 | Dibenzofuran | UG/KG | | ND | |
| 84-66-2 | Diethylphthalate | UG/KG | | ND | |
| 86-30-6 | N-Nitrosodiphenylamine | UG/KG | | ND | |
| 108-95-2 | Phenol | UG/KG | | ND | |
| 95-95-4 | 2,4,5-Trichlorophenol | UG/KG | | ND | |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | | 62 J | |
| | PROBABLE CARCINOGENIC PAHs | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | ND | ND | ND |
| 50-32-8 | Benzo(a)pyrene | UG/KG | ND | ND | ND |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | ND | ND | ND |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | ND | ND | ND |
| 218-01-9 | Chrysene | UG/KG | ND | ND | ND |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | ND | ND | ND |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | ND | ND | ND |
| | Total Probable Carcinogenic PAHS | | ND | ND | ND |
| | OTHER PAHs | | | | |
| 83-32-9 | Acenaphthene | UG/KG | ND | ND | ND |
| 208-96-8 | Acenaphthylene | UG/KG | ND | ND | ND |
| 120-12-7 | Anthracene | UG/KG | ND | ND | ND |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | ND | ND | ND |
| 206-44-0 | Fluoranthene | UG/KG | ND | ND | ND |
| 86-73-7 | Fluorene | UG/KG | ND | ND | ND |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | | ND | |
| 91-20-3 | Naphthalene | UG/KG | ND | ND | ND |
| 85-01-8 | Phenanthrene | UG/KG | ND | ND | ND |
| 129-00-0 | Pyrene | UG/KG | ND | ND | ND |
| | Total PAHs | | ND | ND | ND |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.1

| | | | DSA-3 | | |
|---|---|---|---|---|---|
| SOIL BORING DETECTED COMPOUNDS | | SAMPLE ID: | SB-316E | SB-317I | SB-317O |
| | | DEPTH: | 08-10' | 16-18' | 28-30' |
| NIAGARA MOHAWK POWER CORPORATION | | LAB ID: | 2120903 | 2121003 | 2120908 |
| HARBOR POINT – DREDGE SPOIL AREAS | | SOURCE: | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS02SB07 | DS02SB06 | DS02SB07 |
| | | MATRIX: | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/29/94 | 6/29/94 | 6/28/94 |
| | | VALIDATED: | 9/27/94 | 9/27/94 | 9/27/94 |
| CAS NO. | COMPOUND | UNITS | | | |
| | PESTICIDES | | | | |
| 72-54-8 | 4,4'-DDD | UG/KG | | ND | |
| 50-29-3 | 4,4'-DDT | UG/KG | | ND | |
| 60-57-1 | Dieldrin | UG/KG | | ND | |
| 959-98-8 | Endosulfan I | UG/KG | | ND | |
| 33213-65-9 | Endosulfan II | UG/KG | | ND | |
| 72-20-8 | Endrin | UG/KG | | ND | |
| 7421-93-4 | Endrin aldehyde | UG/KG | | ND | |
| 1024-57-3 | Heptachlor epoxide | UG/KG | | ND | |
| 5103-71-9 | alpha-Chlordane | UG/KG | | ND | |
| 5103-74-2 | gamma-Chlordane | UG/KG | | ND | |
| | PCBs | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | | ND | |
| 12672-29-6 | Aroclor-1248 | UG/KG | | ND | |
| 11097-69-1 | Aroclor-1254 | UG/KG | | ND | |
| 11096-82-5 | Aroclor-1260 | UG/KG | | ND | |
| | Total PCBs | | | ND | |
| | INORGANICS | | | | |
| 7429-90-5 | Aluminum | MG/KG | | 11500 | |
| 7440-36-0 | Antimony | MG/KG | | ND | |
| 7440-38-2 | Arsenic | MG/KG | | 3 | |
| 7440-39-3 | Barium | MG/KG | | 61.2 | |
| 7440-41-7 | Beryllium | MG/KG | | ND | |
| 7440-43-9 | Cadmium | MG/KG | | 0.83 J | |
| 7440-70-2 | Calcium | MG/KG | | 2230 | |
| 7440-47-3 | Chromium | MG/KG | | 15.8 | |
| 7440-48-4 | Cobalt | MG/KG | | 11.4 J | |
| 7440-50-8 | Copper | MG/KG | | 21.2 | |
| 7439-89-6 | Iron | MG/KG | | 20700 | |
| 7439-92-1 | Lead | MG/KG | | 8.7 | |
| 7439-95-4 | Magnesium | MG/KG | | 4430 | |
| 7439-96-5 | Manganese | MG/KG | | 507 J | |
| 7439-97-6 | Mercury | MG/KG | | ND | |
| 7440-02-0 | Nickel | MG/KG | | 26.4 | |
| 7440-09-7 | Potassium | MG/KG | | 1810 | |
| 7782-49-2 | Selenium | MG/KG | | ND | |
| 7440-23-5 | Sodium | MG/KG | | ND | |
| 7440-62-2 | Vanadium | MG/KG | | 26.6 | |
| 7440-66-6 | Zinc | MG/KG | | 67.9 | |
| | OTHER | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | | | |
| | GC/FID | | | | |
| GCTPH#2 | TPH (as #2 Fuel Oil) | MG/KG | | | |
| GCTPHC10 | TPH (as C10..C20) | MG/KG | | | |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.2

BACKGROUND METALS CONCENTRATIONS (BUTLS)

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT - DREDGE SPOIL AREAS
VALIDATED SUBSURFACE SOIL DATA

| CAS NO. | COMPOUND | Background Upper Tolerance Limit | UNITS | Maximum On Site Concentration | No. of Exceedances / No. of Samples | Location of Exceedances |
|---|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | NS | MG/KG | 24500 | 0/34 | NONE |
| 7440-36-0 | Antimony | ND | MG/KG | 26.5 J | 7/34 | MW-205M, SB-104F, SB-106F, SB-112I$^{(MAX)}$, SB-133E, SB-216I, SB-231Y$^{(MAX)}$ |
| 7440-38-2 | Arsenic | 12.5 | MG/KG | 13.5 | 1/34 | SB-115D |
| 7440-39-3 | Barium | 104.4 | MG/KG | 146 | 8/34 | MW-107I$^{(MAX)}$, SB-125G$^{(MAX)}$, SB-204E, SB-212K, SB-224H, SB-225H, SB-306I, SB-313E$^{(MAX)}$ |
| 7440-41-7 | Beryllium | 1.4 | MG/KG | 1.6 | 2/34 | SB-112I$^{(MAX)}$, SB-125G$^{(MAX)}$ |
| 7440-43-9 | Cadmium | 2.4 | MG/KG | 5.7 | 5/34 | SB-224H, SB-225E$^{(MAX)}$, SB-306I, SB-307E, SB-313E$^{(MAX)}$ |
| 7440-70-2 | Calcium | NS | MG/KG | 49100 | 0/34 | NONE |
| 7440-47-3 | Chromium | 46.2 | MG/KG | 225 | 11/34 | SB-115D, SB-133E, SB-136B, SB-200G, SB-204E, SB-224H, SB-225E$^{(MAX)}$, SB-225H SB-306I, SB-307E, SB-313E$^{(MAX)}$ |
| 7440-48-4 | Cobalt | 18.3 | MG/KG | 22.3 | 3/34 | SB-125G$^{(MAX)}$, SB-204E, SB-313E$^{(MAX)}$ |
| 7440-50-8 | Copper | 115.5 | MG/KG | 1050 | 21/34 | MW-201J, MW-205M, SB-115D, SB-125G$^{(MAX)}$, SB-129I, SB-133E, SB-136B, SB-141F SB-200G, SB-203D, SB-204E, SB-205I, SB-211K, SB-212K, SB-216I, SB-224H, SB-225E$^{(MAX)}$, SB-225H, SB-306I, SB-307E, SB-313E$^{(MAX)}$ |
| 7439-89-6 | Iron | NS | MG/KG | 31800 | 0/34 | NONE |
| 7439-92-1 | Lead | 66.5 | MG/KG | 130 | 3/34 | SB-203D, SB-204E, SB-224H, SB-225E, SB-225H, SB-306I, SB-313E$^{(MAX)}$ |
| 7439-95-4 | Magnesium | NS | MG/KG | 10500 | 0/34 | NONE |
| 7439-96-5 | Manganese | 517.9 | MG/KG | 784 | 20/34 | MW-105D, MW201J, MW-205M, SB104F, SB112I$^{(MAX)}$, SB-123H, SB-125G$^{(MAX)}$, SB-129I SB-133E, SB-204E, SB-205I, SB-212K SB-216I, SB-224H, SB-225E$^{(MAX)}$, SB-225H, SB-231Y$^{(MAX)}$, SB-306I, SB-307E, SB-313E$^{(MAX)}$ |
| 7439-97-6 | Mercury | 0.5 | MG/KG | 0.93 | 6/34 | SB-115D, SB-224H, SB-225E$^{(MAX)}$, SB-225H, SB-306I, SB-313E$^{(MAX)}$ |
| 7440-02-0 | Nickel | 38.5 | MG/KG | 64.3 | 7/34 | SB-125G$^{(MAX)}$, SB-204E, SB-224H, SB-225E$^{(MAX)}$, SB-225H, SB-306I, SB-313E$^{(MAX)}$ |
| 7440-09-7 | Potassium | NS | MG/KG | 3430 | 0/34 | NONE |
| 7782-49-2 | Selenium | ND | MG/KG | 1.5 | 1/34 | SB-115D |
| 7440-23-5 | Sodium | NS | MG/KG | 91.8 J | 0/34 | NONE |
| 7440-62-2 | Vanadium | 35 | MG/KG | 48.6 | 5/34 | MW-107I$^{(MAX)}$, SB-112I$^{(MAX)}$, SB-125G$^{(MAX)}$, SB-129I, SB-313E$^{(MAX)}$ |
| 7440-66-6 | Zinc | 143.3 | MG/KG | 412 | 20/34 | MW-201J, MW-205M, SB-115D, SB-125G$^{(MAX)}$, SB-133E, SB-136B, SB-141F, SB-200G, SB-203D, SB-204E, SB-205I, SB-211K, SB-212K, SB-216I, SB-224H, SB-225E$^{(MAX)}$, SB-225H, SB-306I, SB-307E, SB-313E$^{(MAX)}$ |

# TABLE 4.3

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**SURFACE SOIL DETECTED COMPOUNDS**

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS

| | | | BACKGROUND SAMPLES | | | | DSA 1 | |
|---|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | SS–321A | SS–412A | SS–414A | SS–415A | SS–101 | SS–102 |
| | | DEPTH: | 00–06" | 0–2' | 0–2' | 0–2' | 0–1' | 0–1' |
| | | LAB ID: | 2333612 | 2088301 | 2088303 | 2088304 | 2099801 | 2099802 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DSASB23 | MV01SS01 | MV01SS01 | MV01SS01 | DS01SS01 | DS01SS01 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 3/15/95 | 5/31/94 | 5/31/94 | 5/31/94 | 6/09/94 | 6/09/94 |
| | | VALIDATED: | 6/19/95 | 8/15/94 | 8/15/94 | 8/15/94 | 9/13/94 | 9/13/94 |
| CAS NO. | COMPOUND | UNITS: | | | | | | |
| | VOLATILES | | | | | | | |
| 67–64–1 | Acetone | UG/KG | ND | ND | ND | ND | ND | ND |
| 78–93–3 | 2–Butanone | UG/KG | ND | ND | ND | 26 J | ND | ND |
| 75–09–2 | Methylene Chloride | UG/KG | ND | ND | ND | ND | ND | ND |
| 127–18–4 | Tetrachloroethene | UG/KG | ND | ND | ND | ND | ND | ND |
| | BTEX VOLATILES | | | | | | | |
| 108–88–3 | Toluene | UG/KG | ND | ND | ND | ND | ND | ND |
| | SEMIVOLATILES | | | | | | | |
| 85–68–7 | Butylbenzylphthalate | UG/KG | ND | ND | ND | ND | ND | ND |
| 86–74–8 | Carbazole | UG/KG | ND | ND | ND | ND | ND | ND |
| 84–74–2 | Di–n–butylphthalate | UG/KG | ND | ND | ND | ND | ND | ND |
| 132–64–9 | Dibenzofuran | UG/KG | ND | ND | ND | ND | ND | ND |
| 108–95–2 | Phenol | UG/KG | ND | ND | ND | ND | ND | ND |
| 117–81–7 | bis(2–Ethylhexyl)phthalate | UG/KG | ND | ND | ND | ND | 1600 J | ND |
| | PROBABLE CARCINOGENIC PAHs | | | | | | | |
| 56–55–3 | Benzo(a)anthracene | UG/KG | 120 J | 700 J | ND | 300 J | 110000 | 15000 |
| 50–32–8 | Benzo(a)pyrene | UG/KG | 120 J | 920 | ND | 140 J | 130000 J | 24000 |
| 205–99–2 | Benzo(b)fluoranthene | UG/KG | 100 J | 970 | ND | 220 J | 120000 | 14000 |
| 207–08–9 | Benzo(k)fluoranthene | UG/KG | 110 J | 700 J | ND | 260 J | 120000 | 16000 |
| 218–01–9 | Chrysene | UG/KG | 160 J | 1000 | ND | 390 J | 140000 J | 36000 |
| 53–70–3 | Dibenz(a,h)anthracene | UG/KG | ND | ND | ND | ND | 25000 | 2700 J |
| 193–39–5 | Indeno(1,2,3–cd)pyrene | UG/KG | 76 J | 620 J | ND | ND | 88000 | 11000 J |
| | Total Probable Carcinogenic PAHs | | 686 | 4910 | ND | 1310 | 733000 | 118700 |
| | OTHER PAHs | | | | | | | |
| 83–32–9 | Acenaphthene | UG/KG | ND | ND | ND | ND | 2600 J | 1400 J |
| 208–96–8 | Acenaphthylene | UG/KG | ND | 140 J | ND | ND | 18000 | 6000 J |
| 120–12–7 | Anthracene | UG/KG | ND | 150 J | ND | ND | 11000 J | 3800 J |
| 191–24–2 | Benzo(g,h,i)perylene | UG/KG | ND | 630 J | ND | ND | 44000 | 6000 J |
| 206–44–0 | Fluoranthene | UG/KG | 280 J | 1900 | 57 J | 690 J | 110000 | 22000 |
| 86–73–7 | Fluorene | UG/KG | ND | ND | ND | ND | 3400 J | 2100 J |
| 91–57–6 | 2–Methylnaphthalene | UG/KG | ND | ND | ND | ND | 4000 J | 3200 J |
| 91–20–3 | Naphthalene | UG/KG | ND | ND | ND | ND | 15000 | 9200 J |
| 85–01–8 | Phenanthrene | UG/KG | 140 J | 850 | ND | 330 J | 24000 | 9500 J |
| 129–00–0 | Pyrene | UG/KG | 210 J | 1400 | ND | 570 J | 140000 J | 48000 |
| | Total PAHs | | 1316 | 9980 | 57 | 2900 | 1105000 | 229900 |
| | PESTICIDES | | | | | | | |
| 309–00–2 | Aldrin | UG/KG | ND | ND | ND | ND | ND | ND |
| 72–55–9 | 4,4'–DDE | UG/KG | ND | ND | ND | ND | ND | ND |
| 50–29–3 | 4,4'–DDT | UG/KG | ND | ND | ND | ND | ND | ND |
| 60–57–1 | Dieldrin | UG/KG | ND | 36 J | ND | ND | ND | ND |
| 33213–65–9 | Endosulfan II | UG/KG | ND | ND | ND | ND | ND | ND |
| 72–20–8 | Endrin | UG/KG | ND | ND | ND | ND | ND | ND |
| 7421–93–4 | Endrin aldehyde | UG/KG | ND | 14 J | 4.8 J | ND | ND | ND |
| 76–44–8 | Heptachlor | UG/KG | ND | ND | ND | ND | ND | ND |
| 5103–71–9 | alpha–Chlordane | UG/KG | ND | ND | ND | ND | ND | ND |
| | PCBs | | | | | | | |
| 53469–21–9 | Aroclor–1242 | UG/KG | ND | ND | ND | ND | 63 J | 800 |
| 11097–69–1 | Aroclor–1254 | UG/KG | 69 J | 520 | 40 J | 69 J | 440 J | 1400 |
| 11096–82–5 | Aroclor–1260 | UG/KG | ND | ND | ND | ND | ND | ND |
| | Total PCBs | | 69 | 520 | 40 | 69 | 503 | 2200 |
| | INORGANICS | | | | | | | |
| 7429–90–5 | Aluminum | MG/KG | 14800 | 7130 | 21600 | 17300 | 13000 J | 6300 J |
| 7440–36–0 | Antimony | MG/KG | ND | ND | ND | ND | ND | ND |
| 7440–38–2 | Arsenic | MG/KG | 9.4 | 3.5 | 5.1 | 12.5 | 11.3 | 5.5 J |
| 7440–39–3 | Barium | MG/KG | 115 | 44.9 J | 123 | 133 | 121 | 39.6 J |
| 7440–41–7 | Beryllium | MG/KG | 0.53 J | ND | 1.4 | ND | 0.34 J | 0.28 J |
| 7440–43–9 | Cadmium | MG/KG | 2.4 J | ND | ND | ND | ND | ND |
| 7440–70–2 | Calcium | MG/KG | 5670 | 12100 J | ND | ND | 23600 | 5310 |
| 7440–47–3 | Chromium | MG/KG | 36.4 | 33 | 29.3 | 65.1 | 139 | 42.3 |
| 7440–48–4 | Cobalt | MG/KG | 13.8 J | 9.1 J | 11.7 J | 18.3 J | 13.7 J | 6.8 J |
| 7440–50–8 | Copper | MG/KG | 119 | 116 | 38 | 229 | 669 | 143 |
| 7439–89–6 | Iron | MG/KG | 32200 | 15300 | 23300 | 30600 | 28700 | 14400 |
| 7439–92–1 | Lead | MG/KG | 79.9 | 39.6 | 32.6 | 105 J | 96.1 | 38.8 |
| 7439–95–4 | Magnesium | MG/KG | 5600 | 5520 | 5630 | 5740 | 8430 | 3500 |
| 7439–96–5 | Manganese | MG/KG | 1200 | 358 | 347 | 449 | 903 | 249 |
| 7439–97–6 | Mercury | MG/KG | ND | 0.27 | 0.2 | 0.5 | 0.63 | 0.24 |
| 7440–02–0 | Nickel | MG/KG | 36.2 J | 22.6 | 26.9 | 44.7 | 46.7 | 19.8 |
| 7440–09–7 | Potassium | MG/KG | 2450 | 1440 | 2840 | 2270 J | 1910 | 1140 J |
| 7782–49–2 | Selenium | MG/KG | ND | ND | ND | ND | ND | ND |
| 7440–22–4 | Silver | MG/KG | ND | 2.9 | 2.5 J | 7.7 | 2.4 J | 1.3 J |
| 7440–23–5 | Sodium | MG/KG | ND | ND | ND | ND | 285 J | 234 J |
| 7440–62–2 | Vanadium | MG/KG | 38.4 | 9.9 J | 32.8 | 32.9 | 20 | 10.4 J |
| 7440–66–6 | Zinc | MG/KG | 172 | 103 | 106 | 184 | 289 J | 92.3 J |
| | OTHER | | | | | | | |
| 7440–44–0 | Total Organic Carbon | MG/KG | 96871 | 21892 | 71906 | 71323 | 56725 | 76025 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.3

X X X X

| | | | DSA 1 | | | | | |
|---|---|---|---|---|---|---|---|---|
| SURFACE SOIL DETECTED COMPOUNDS | | SAMPLE ID: | SS-103 | SS-104 | SS-105(MAX) | SS-106 | SS-107 | SS-108 |
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS | | DEPTH: | 0-1' | 0-1' | 0-1' | 0-1' | 0-1' | 0-1' |
| | | LAB ID: | 2099803 | 2099804 | 2099806 | 2099807 | 2099808 | 2101301 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS01SS01 | DS01SS01 | DS01SS01 | DS01SS01 | DS01SS01 | DS01SS01 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/09/94 | 6/09/94 | 6/09/94 | 6/09/94 | 6/09/94 | 6/10/94 |
| | | VALIDATED: | 9/13/94 | 9/13/94 | 9/13/94 | 9/13/94 | 9/13/94 | 9/13/94 |
| CAS NO. | COMPOUND | UNITS: | | | | | | |
| | VOLATILES | | | | | | | |
| 67-64-1 | Acetone | UG/KG | ND | 27 | ND | ND | ND | ND |
| 78-93-3 | 2-Butanone | UG/KG | ND | ND | ND | ND | ND | ND |
| 75-09-2 | Methylene Chloride | UG/KG | ND | ND | ND | ND | ND | ND |
| 127-18-4 | Tetrachloroethene | UG/KG | ND | ND | ND | ND | ND | ND |
| | BTEX VOLATILES | | | | | | | |
| 108-88-3 | Toluene | UG/KG | ND | ND | ND | ND | ND | ND |
| | SEMIVOLATILES | | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | ND | ND | ND | ND | ND | R |
| 86-74-8 | Carbazole | UG/KG | ND | ND | ND | ND | ND | R |
| 84-74-2 | Di-n-butylphthalate | UG/KG | ND | ND | ND | ND | ND | R |
| 132-64-9 | Dibenzofuran | UG/KG | 1300 J | ND | ND | ND | ND | R |
| 108-95-2 | Phenol | UG/KG | ND | ND | ND | ND | ND | R |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | ND | ND | ND | ND | ND | R |
| | PROBABLE CARCINOGENIC PAHs | | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | 6800 J | 5500 J | 6200 J | 1600 J | 80000 | 30000 J |
| 50-32-8 | Benzo(a)pyrene | UG/KG | 5600 J | 6100 J | 11000 J | ND | 140000 | 47000 J |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | 6600 J | 6300 J | 8400 J | ND | 92000 | 33000 J |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | 2300 J | 2500 J | 5900 J | ND | 66000 | 22000 J |
| 218-01-9 | Chrysene | UG/KG | 7200 J | 6200 J | 9100 J | 1600 J | 110000 | 46000 J |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | ND | ND | ND | ND | 24000 J | 7300 J |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | 3100 J | 3300 J | 7000 J | ND | 72000 | 23000 J |
| | Total Probable Carcinogenic PAHs | | 31600 | 29900 | 47600 | 3200 | 584000 | 208300 |
| | OTHER PAHs | | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | ND | ND | ND | ND | 4200 J | 1700 J |
| 208-96-8 | Acenaphthylene | UG/KG | 1200 J | 1600 J | 3700 J | ND | 40000 | 16000 J |
| 120-12-7 | Anthracene | UG/KG | 1600 J | 1500 J | 2100 J | ND | 15000 J | 7700 J |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | ND | 1700 J | 5000 J | ND | 58000 | 22000 J |
| 206-44-0 | Fluoranthene | UG/KG | 7800 J | 8800 J | 9900 J | 2100 J | 79000 | 30000 J |
| 86-73-7 | Fluorene | UG/KG | ND | ND | ND | ND | 6400 J | 2100 J |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | 3800 J | 3300 J | 5100 J | ND | 17000 J | 5200 J |
| 91-20-3 | Naphthalene | UG/KG | 26000 | 14000 J | 18000 | 1500 J | 34000 | 12000 J |
| 85-01-8 | Phenanthrene | UG/KG | 5500 J | 4400 J | 5700 J | 1500 J | 20000 J | 12000 J |
| 129-00-0 | Pyrene | UG/KG | 7900 J | 5500 J | 10000 J | 1400 J | 180000 | 30000 J |
| | Total PAHs | | 85400 | 70700 | 107100 | 9700 | 1037600 | 347000 |
| | PESTICIDES | | | | | | | |
| 309-00-2 | Aldrin | UG/KG | ND | ND | ND | ND | ND | ND |
| 72-55-9 | 4,4'-DDE | UG/KG | ND | ND | ND | ND | ND | ND |
| 50-29-3 | 4,4'-DDT | UG/KG | ND | ND | ND | ND | ND | ND |
| 60-57-1 | Dieldrin | UG/KG | ND | 120 JN | ND | ND | ND | ND |
| 33213-65-9 | Endosulfan II | UG/KG | ND | ND | ND | ND | ND | ND |
| 72-20-8 | Endrin | UG/KG | ND | ND | ND | ND | ND | ND |
| 7421-93-4 | Endrin aldehyde | UG/KG | ND | ND | ND | ND | ND | ND |
| 76-44-8 | Heptachlor | UG/KG | ND | ND | ND | ND | ND | ND |
| 5103-71-9 | alpha-Chlordane | UG/KG | ND | ND | ND | ND | ND | ND |
| | PCBs | | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | 370 J | 690 | 730 | 520 J | 1000 J | 1500 |
| 11097-69-1 | Aroclor-1254 | UG/KG | 610 J | 2100 J | 1800 | 3600 | 1900 J | 4500 J |
| 11096-82-5 | Aroclor-1260 | UG/KG | ND | ND | ND | ND | ND | ND |
| | Total PCBs | | 980 | 2790 | 2530 | 4120 | 2900 | 6000 |
| | INORGANICS | | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | 5830 J | 14000 J | 18100 J | 8360 J | 8120 J | 13000 J |
| 7440-36-0 | Antimony | MG/KG | 5.8 J | ND | ND | ND | ND | ND |
| 7440-38-2 | Arsenic | MG/KG | 10 J | 18.7 | 17.6 J | 8.7 J | 10 J | 16.9 |
| 7440-39-3 | Barium | MG/KG | 40 J | 118 | 142 | 82.1 | 68.1 | 128 |
| 7440-41-7 | Beryllium | MG/KG | 0.26 J | 1 J | 1.3 J | 0.32 J | 0.3 J | 0.48 J |
| 7440-43-9 | Cadmium | MG/KG | ND | ND | ND | ND | ND | 4.9 |
| 7440-70-2 | Calcium | MG/KG | 6710 | 16000 | 13800 | 21200 | 5910 | 7830 |
| 7440-47-3 | Chromium | MG/KG | 45.5 | 178 | 320 | 77.7 | 124 | 257 |
| 7440-48-4 | Cobalt | MG/KG | 6.7 J | 16.2 | 16.4 | 10.2 J | 10 J | 16.2 |
| 7440-50-8 | Copper | MG/KG | 163 | 749 | 1290 | 367 | 454 | 996 |
| 7439-89-6 | Iron | MG/KG | 13600 | 30800 | 36400 | 21000 | 19700 | 31900 |
| 7439-92-1 | Lead | MG/KG | 29.7 | 99.5 | 140 | 62.8 | 80.7 | 113 |
| 7439-95-4 | Magnesium | MG/KG | 3830 | 7940 | 7830 | 7170 | 4410 | 6360 |
| 7439-96-5 | Manganese | MG/KG | 258 | 676 | 602 | 645 | 291 | 738 |
| 7439-97-6 | Mercury | MG/KG | 0.32 | 0.91 | 1.4 | 0.29 | 0.86 | 0.99 |
| 7440-02-0 | Nickel | MG/KG | 19.7 | 48.4 | 58.6 | 32.8 | 31.2 | 51 |
| 7440-09-7 | Potassium | MG/KG | 1060 J | 2150 | 2450 | 1060 J | 1320 | 1880 |
| 7782-49-2 | Selenium | MG/KG | 1.4 | 1.5 | 2.5 | ND | ND | 1.4 |
| 7440-22-4 | Silver | MG/KG | ND | 3 | 2.7 | 2.3 J | ND | ND |
| 7440-23-5 | Sodium | MG/KG | ND | ND | ND | ND | ND | ND |
| 7440-62-2 | Vanadium | MG/KG | 8.4 J | 21.2 | 22.4 | 13.5 | 12.7 | 32.3 |
| 7440-66-6 | Zinc | MG/KG | 112 J | 337 J | 505 J | 195 J | 194 J | 408 J |
| | OTHER | | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | 556168 | 114814 | 91284 | 55838 | 62364 | 78007 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.3

**SURFACE SOIL DETECTED COMPOUNDS**

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS

| CAS NO. | COMPOUND | | DSA 1 | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | SS–109 | SS–110 | SS–111A | SS–112A | SS–113A$^{(MAX)}$ | SS–114A |
| | | DEPTH: | 0–1' | 0–1' | 00–02' | 00–06 in. | 00–06 in. | 00–06 in. |
| | | LAB ID: | 2101304 | 2101305 | 2322702 | 2333603 | 2333604 | 2333608 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS01SS01 | DS01SS01 | DSASB21 | DSASB23 | DSASB23 | DSASB23 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/10/94 | 6/10/94 | 3/01/95 | 3/15/95 | 3/15/95 | 3/15/95 |
| | | VALIDATED: | 9/13/94 | 9/13/94 | 5/30/95 | 6/19/95 | 6/19/95 | 6/19/95 |
| | | UNITS: | | | | | | |
| | VOLATILES | | | | | | | |
| 67–64–1 | Acetone | UG/KG | ND | ND | ND | ND | ND | ND |
| 78–93–3 | 2–Butanone | UG/KG | ND | ND | ND | ND | ND | ND |
| 75–09–2 | Methylene Chloride | UG/KG | ND | ND | ND | 2 J | 2 J | 2 J |
| 127–18–4 | Tetrachloroethene | UG/KG | ND | ND | ND | ND | ND | ND |
| | BTEX VOLATILES | | | | | | | |
| 108–88–3 | Toluene | UG/KG | ND | ND | ND | ND | ND | ND |
| | SEMIVOLATILES | | | | | | | |
| 85–68–7 | Butylbenzylphthalate | UG/KG | R | R | ND | ND | ND | ND |
| 86–74–8 | Carbazole | UG/KG | R | ND | ND | ND | 96 J | ND |
| 84–74–2 | Di–n–butylphthalate | UG/KG | R | ND | ND | ND | ND | ND |
| 132–64–9 | Dibenzofuran | UG/KG | R | R | ND | ND | 61 J | ND |
| 108–95–2 | Phenol | UG/KG | R | R | ND | ND | 98 J | ND |
| 117–81–7 | bis(2–Ethylhexyl)phthalate | UG/KG | R | R | ND | 72 J | ND | ND |
| | PROBABLE CARCINOGENIC PAHs | | | | | | | |
| 56–55–3 | Benzo(a)anthracene | UG/KG | 6600 J | 3600 J | 540 | 260 J | 2400 | 1900 J |
| 50–32–8 | Benzo(a)pyrene | UG/KG | 7600 J | 3500 J | 1200 | 330 J | 2600 J | 2000 J |
| 205–99–2 | Benzo(b)fluoranthene | UG/KG | 7100 J | 2800 J | 880 | 280 J | 2200 J | 1600 J |
| 207–08–9 | Benzo(k)fluoranthene | UG/KG | 4900 J | 2300 J | 440 | 350 J | 2400 J | 1500 J |
| 218–01–9 | Chrysene | UG/KG | 7800 J | 4700 J | 850 | 320 J | 2400 | 2000 J |
| 53–70–3 | Dibenz(a,h)anthracene | UG/KG | R | R | 66 J | ND | 70 J | ND |
| 193–39–5 | Indeno(1,2,3–cd)pyrene | UG/KG | 4300 J | R | 470 | 120 J | 740 J | 880 J |
| | Total Probable Carcinogenic PAHs | | 38300 | 16900 | 4446 | 1660 | 12810 | 9880 |
| | OTHER PAHs | | | | | | | |
| 83–32–9 | Acenaphthene | UG/KG | | | ND | ND | 110 J | ND |
| 208–96–8 | Acenaphthylene | UG/KG | 1900 J | | 650 | ND | 630 | 400 J |
| 120–12–7 | Anthracene | UG/KG | 1800 J | ND | 150 J | 60 J | 430 J | 290 J |
| 191–24–2 | Benzo(g,h,i)perylene | UG/KG | 2500 J | | 380 J | 82 J | 540 J | 650 J |
| 206–44–0 | Fluoranthene | UG/KG | 7900 J | 4900 J | 290 J | 520 | 3600 | 2500 |
| 86–73–7 | Fluorene | UG/KG | | | 59 J | ND | 170 J | ND |
| 91–57–6 | 2–Methylnaphthalene | UG/KG | | | 47 J | ND | 120 J | ND |
| 91–20–3 | Naphthalene | UG/KG | 6200 J | 3000 J | 92 J | ND | 340 J | 360 J |
| 85–01–8 | Phenanthrene | UG/KG | 4100 J | 2900 J | 130 J | 180 J | 1300 | 670 J |
| 129–00–0 | Pyrene | UG/KG | 7600 J | 4400 J | 670 | 440 J | 2700 J | 1700 J |
| | Total PAHs | | 70300 | 32100 | 6914 | 2942 | 22750 | 16450 |
| | PESTICIDES | | | | | | | |
| 309–00–2 | Aldrin | UG/KG | ND | ND | ND | ND | ND | ND |
| 72–55–9 | 4,4'–DDE | UG/KG | ND | ND | ND | ND | 20 | ND |
| 50–29–3 | 4,4'–DDT | UG/KG | ND | ND | ND | ND | 10 JN | ND |
| 60–57–1 | Dieldrin | UG/KG | ND | ND | ND | ND | ND | ND |
| 33213–65–9 | Endosulfan II | UG/KG | ND | ND | ND | ND | 6.1 | ND |
| 72–20–8 | Endrin | UG/KG | ND | ND | ND | ND | ND | ND |
| 7421–93–4 | Endrin aldehyde | UG/KG | ND | ND | ND | 8.3 JN | 7.7 JN | 6 JN |
| 76–44–8 | Heptachlor | UG/KG | ND | ND | ND | ND | ND | ND |
| 5103–71–9 | alpha–Chlordane | UG/KG | ND | ND | ND | ND | ND | ND |
| | PCBs | | | | | | | |
| 53469–21–9 | Aroclor–1242 | UG/KG | 810 J | 740 J | ND | ND | 140 JN | ND |
| 11097–69–1 | Aroclor–1254 | UG/KG | 850 J | 3200 | 23 J | 85 | 640 | ND |
| 11096–82–5 | Aroclor–1260 | UG/KG | ND | ND | ND | ND | ND | ND |
| | Total PCBs | | 1660 | 3940 | 23 | 85 | 780 | ND |
| | INORGANICS | | | | | | | |
| 7429–90–5 | Aluminum | MG/KG | 7400 J | 15600 J | 12500 | 4510 | 8390 | 5110 |
| 7440–36–0 | Antimony | MG/KG | 9.2 J | ND | ND | ND | 13.4 J | ND |
| 7440–38–2 | Arsenic | MG/KG | 13.5 | 11.5 | 5.9 J | 4.1 | 8.1 | 8.2 |
| 7440–39–3 | Barium | MG/KG | 49.5 | 112 | 68.9 | 63.5 | 74.4 | 42.7 J |
| 7440–41–7 | Beryllium | MG/KG | 0.43 J | 1.3 J | 0.3 J | 0.44 J | 0.56 J | 0.31 J |
| 7440–43–9 | Cadmium | MG/KG | ND | 3.7 | ND | 0.86 J | 1.7 J | 1.5 J |
| 7440–70–2 | Calcium | MG/KG | 11300 | 10700 | 4850 | 102000 | 12000 | 5740 |
| 7440–47–3 | Chromium | MG/KG | 64.8 | 184 | 25.6 | 9.1 | 64 | 22.6 |
| 7440–48–4 | Cobalt | MG/KG | 8.8 J | 16.4 | 9.7 J | 5.1 J | 10.6 J | 4.9 J |
| 7440–50–8 | Copper | MG/KG | 237 | 805 | 67.2 J | 21.9 | 304 | 112 |
| 7439–89–6 | Iron | MG/KG | 17400 | 31600 | 23200 | 17600 | 22300 | 13300 |
| 7439–92–1 | Lead | MG/KG | 50.1 | 101 | 21.9 | 50.6 | 67.3 | 51.6 |
| 7439–95–4 | Magnesium | MG/KG | 5050 | 7680 | 4740 | 4130 | 6350 | 3180 |
| 7439–96–5 | Manganese | MG/KG | 317 | 725 | 584 | 850 | 613 | 338 |
| 7439–97–6 | Mercury | MG/KG | 0.58 | 0.75 | ND | ND | 0.34 | 0.22 |
| 7440–02–0 | Nickel | MG/KG | 25 | 51.5 | 23.9 J | 10.3 J | 27.2 J | 10.6 J |
| 7440–09–7 | Potassium | MG/KG | 1220 | 2770 | 1910 | 555 J | 1320 J | 822 J |
| 7782–49–2 | Selenium | MG/KG | 1.5 | 1.6 | ND | ND | ND | ND |
| 7440–22–4 | Silver | MG/KG | ND | 2.4 J | ND | ND | ND | ND |
| 7440–23–5 | Sodium | MG/KG | ND | ND | ND | 229 J | ND | ND |
| 7440–62–2 | Vanadium | MG/KG | 17.3 | 37.1 | 29.1 | 16.7 | 24.2 | 13.5 J |
| 7440–66–6 | Zinc | MG/KG | 148 J | 358 J | 103 | 130 | 200 | 138 |
| | OTHER | | | | | | | |
| 7440–44–0 | Total Organic Carbon | MG/KG | 356402 | 52805 | 39556 | 91080 | 87372 | 358233 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
$^{(MAX)}$ – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.3

| SURFACE SOIL DETECTED COMPOUNDS<br>NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS | | | DSA 1 | | | | | DSA 2 |
|---|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | SS–115A | SS–116A | SS–117A | SS–416A | SB–140A | SS–201$^{(MAX)}$ |
| | | DEPTH: | 00–06 in. | 00–06 in. | 00–06 in. | 0–2' | 00–02' | 0–1' |
| | | LAB ID: | 2333609 | 2333610 | 2333611 | 2088305 | 2326602 | 2102901 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DSASB23 | DSASB23 | DSASB23 | MV01SS01 | DSASB22 | DS02SS01 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 3/15/95 | 3/15/95 | 3/15/95 | 5/31/94 | 3/07/95 | 6/13/94 |
| | | VALIDATED: | 6/19/95 | 6/19/95 | 6/19/95 | 8/15/94 | 6/19/95 | 9/13/94 |
| CAS NO. | COMPOUND | UNITS: | | | | | | |
| | VOLATILES | | | | | | | |
| 67–64–1 | Acetone | UG/KG | ND | ND | ND | ND | ND | ND |
| 78–93–3 | 2–Butanone | UG/KG | ND | ND | ND | ND | ND | ND |
| 75–09–2 | Methylene Chloride | UG/KG | 2 J | ND | ND | ND | ND | ND |
| 127–18–4 | Tetrachloroethene | UG/KG | ND | ND | ND | ND | ND | ND |
| | BTEX VOLATILES | | | | | | | |
| 108–88–3 | Toluene | UG/KG | ND | ND | ND | ND | ND | 4 J |
| | SEMIVOLATILES | | | | | | | |
| 85–68–7 | Butylbenzylphthalate | UG/KG | ND | ND | ND | ND | ND | ND |
| 86–74–8 | Carbazole | UG/KG | 62 J | ND | 110 J | ND | ND | ND |
| 84–74–2 | Di–n–butylphthalate | UG/KG | ND | ND | ND | ND | ND | ND |
| 132–64–9 | Dibenzofuran | UG/KG | ND | ND | ND | ND | ND | ND |
| 108–95–2 | Phenol | UG/KG | ND | ND | ND | ND | ND | 430 J |
| 117–81–7 | bis(2–Ethylhexyl)phthalate | UG/KG | 58 J | ND | 69 J | ND | ND | ND |
| | PROBABLE CARCINOGENIC PAHs | | | | | | 57 J | ND |
| 56–55–3 | Benzo(a)anthracene | UG/KG | 1400 | 160 J | 420 J | 840 | 130 J | 4900 |
| 50–32–8 | Benzo(a)pyrene | UG/KG | 1300 | 140 J | 520 J | 1100 | 120 J | 6000 |
| 205–99–2 | Benzo(b)fluoranthene | UG/KG | 1100 | 130 J | 330 J | 810 | 110 J | 6100 |
| 207–08–9 | Benzo(k)fluoranthene | UG/KG | 940 | 120 J | 420 J | 1100 | 120 J | 3100 |
| 218–01–9 | Chrysene | UG/KG | 1700 | 180 J | 520 J | 1100 | 150 J | 5400 |
| 53–70–3 | Dibenz(a,h)anthracene | UG/KG | ND | ND | ND | 140 J | ND | 860 J |
| 193–39–5 | Indeno(1,2,3–cd)pyrene | UG/KG | 390 J | 68 J | 260 J | 790 | 76 J | 3900 |
| | Total Probable Carcinogenic PAHs | | 6830 | 798 | 2470 | 5880 | 706 | 30260 |
| | OTHER PAHs | | | | | | | |
| 83–32–9 | Acenaphthene | UG/KG | ND | ND | 71 J | ND | ND | 450 J |
| 208–96–8 | Acenaphthylene | UG/KG | 330 J | ND | 300 J | 200 J | ND | 1600 J |
| 120–12–7 | Anthracene | UG/KG | 200 J | ND | 180 J | 240 J | ND | 2700 |
| 191–24–2 | Benzo(g,h,i)perylene | UG/KG | 290 J | 47 J | 200 J | 710 J | 67 J | 3900 |
| 206–44–0 | Fluoranthene | UG/KG | 2100 | 290 J | 730 | 1500 | 250 J | 13000 |
| 86–73–7 | Fluorene | UG/KG | ND | ND | 100 J | ND | ND | 1100 J |
| 91–57–6 | 2–Methylnaphthalene | UG/KG | ND | ND | 65 J | 93 J | ND | 600 J |
| 91–20–3 | Naphthalene | UG/KG | 88 J | ND | 110 J | 470 J | ND | 1100 J |
| 85–01–8 | Phenanthrene | UG/KG | 460 J | 140 J | 510 J | 540 J | 88 J | 8900 |
| 129–00–0 | Pyrene | UG/KG | 1800 | 190 J | 590 J | 1300 | 150 J | 13000 J |
| | Total PAHs | | 12096 | 1465 | 5326 | 10933 | 1261 | 76610 |
| | PESTICIDES | | | | | | | |
| 309–00–2 | Aldrin | UG/KG | ND | ND | ND | ND | ND | ND |
| 72–55–9 | 4,4'–DDE | UG/KG | ND | ND | ND | ND | ND | ND |
| 50–29–3 | 4,4'–DDT | UG/KG | ND | ND | ND | 4.9 J | ND | ND |
| 60–57–1 | Dieldrin | UG/KG | ND | ND | ND | ND | ND | ND |
| 33213–65–9 | Endosulfan II | UG/KG | ND | ND | ND | ND | ND | ND |
| 72–20–8 | Endrin | UG/KG | ND | ND | ND | 13 J | ND | ND |
| 7421–93–4 | Endrin aldehyde | UG/KG | ND | 9.3 JN | ND | 4.5 J | ND | ND |
| 76–44–8 | Heptachlor | UG/KG | ND | ND | ND | ND | ND | ND |
| 5103–71–9 | alpha–Chlordane | UG/KG | ND | ND | ND | ND | ND | ND |
| | PCBs | | | | | | | |
| 53469–21–9 | Aroclor–1242 | UG/KG | ND | ND | ND | ND | ND | 810 J |
| 11097–69–1 | Aroclor–1254 | UG/KG | ND | ND | ND | ND | ND | 4900 D |
| 11096–82–5 | Aroclor–1260 | UG/KG | ND | ND | ND | ND | ND | ND |
| | Total PCBs | | ND | ND | ND | ND | ND | 5710 |
| | INORGANICS | | | | | | | |
| 7429–90–5 | Aluminum | MG/KG | 5160 | 3600 | 12600 | 4590 | 4100 | 14400 |
| 7440–36–0 | Antimony | MG/KG | ND | ND | ND | ND | 13.7 | ND |
| 7440–38–2 | Arsenic | MG/KG | 7.4 | 5.9 | 21.4 | 6.2 | 3.8 J | 6.6 J |
| 7440–39–3 | Barium | MG/KG | 53.5 | 29 J | 123 | 28 J | 28.5 J | 116 |
| 7440–41–7 | Beryllium | MG/KG | 0.41 J | 0.35 J | 1 J | ND | ND | 0.84 J |
| 7440–43–9 | Cadmium | MG/KG | 1.8 J | ND | 1.2 J | ND | ND | ND |
| 7440–70–2 | Calcium | MG/KG | 6270 | 6730 | 6870 | ND | 9160 | 24900 |
| 7440–47–3 | Chromium | MG/KG | 15.4 | 7.3 | 38.2 | 14.4 | 7.5 | 148 |
| 7440–48–4 | Cobalt | MG/KG | 5.9 J | 3.5 J | 12.3 J | 6.2 J | 3.7 J | 14.3 |
| 7440–50–8 | Copper | MG/KG | 72.1 | 25 | 276 | 55 | 31.6 J | 685 |
| 7439–89–6 | Iron | MG/KG | 12800 | 9580 | 26900 | 10300 | 9890 | 26400 |
| 7439–92–1 | Lead | MG/KG | 52.8 | 28.3 | 70.8 | 36.4 | 23.4 | 91.1 |
| 7439–95–4 | Magnesium | MG/KG | 3100 | 2910 | 4470 | 2830 | 3470 | 7810 |
| 7439–96–5 | Manganese | MG/KG | 293 | 239 | 662 | 229 | 214 | 650 |
| 7439–97–6 | Mercury | MG/KG | 0.19 | ND | 0.31 | 0.21 | ND | 0.25 |
| 7440–02–0 | Nickel | MG/KG | 19.5 J | 15.8 J | 33.4 J | 9.6 | 11.8 J | 49.6 |
| 7440–09–7 | Potassium | MG/KG | 877 J | 626 J | 2570 | 914 J | 776 J | 2820 |
| 7782–49–2 | Selenium | MG/KG | ND | ND | ND | ND | ND | ND |
| 7440–22–4 | Silver | MG/KG | ND | ND | ND | 1.1 J | ND | ND |
| 7440–23–5 | Sodium | MG/KG | ND | ND | ND | ND | ND | ND |
| 7440–62–2 | Vanadium | MG/KG | 14.7 | 12 | 36 | 6.3 J | 12.1 | 32.2 |
| 7440–66–6 | Zinc | MG/KG | 150 | 66.7 | 233 | 79.4 | 56.4 | 259 |
| | OTHER | | | | | | | |
| 7440–44–0 | Total Organic Carbon | MG/KG | 45306 | 20445 | 69064 | 122395 | 3461 | 21632 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
$^{(MAX)}$ – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.3

**SURFACE SOIL DETECTED COMPOUNDS**

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS

| | | | DSA 2 | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | SS-202 | SS-203 | SS-204 | SS-205 | SS-206 | SS-207 |
| | | DEPTH: | 0-1' | 0-1' | 0-1' | 0-1' | 0-1' | 0-1' |
| | | LAB ID: | 2102902 | 2102903 | 2102904 | 2102905 | 2104601 | 2104602 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS02SS01 | DS02SS01 | DS02SS01 | DS02SS01 | DS02SS01 | DS02SS01 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/13/94 | 6/13/94 | 6/13/94 | 6/13/94 | 6/14/94 | 6/14/94 |
| | | VALIDATED: | 9/13/94 | 9/13/94 | 9/13/94 | 9/13/94 | 9/13/94 | 9/13/94 |
| CAS NO. | COMPOUND | UNITS: | | | | | | |
| | VOLATILES | | | | | | | |
| 67-64-1 | Acetone | UG/KG | ND | ND | ND | ND | ND | ND |
| 78-93-3 | 2-Butanone | UG/KG | ND | ND | ND | ND | ND | ND |
| 75-09-2 | Methylene Chloride | UG/KG | ND | ND | ND | ND | ND | ND |
| 127-18-4 | Tetrachloroethene | UG/KG | ND | ND | ND | 4 J | ND | ND |
| | BTEX VOLATILES | | | | | | | |
| 108-88-3 | Toluene | UG/KG | 2 J | 2 J | ND | 1 J | ND | ND |
| | SEMIVOLATILES | | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | ND | ND | ND | ND | ND | ND |
| 86-74-8 | Carbazole | UG/KG | ND | ND | ND | ND | ND | ND |
| 84-74-2 | Di-n-butylphthalate | UG/KG | ND | ND | ND | 320 J | ND | ND |
| 132-64-9 | Dibenzofuran | UG/KG | ND | 960 J | 280 J | ND | ND | 160 J |
| 108-95-2 | Phenol | UG/KG | ND | ND | ND | ND | ND | ND |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | ND | ND | ND | ND | ND | ND |
| | PROBABLE CARCINOGENIC PAHs | | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | 1600 | 3300 J | 4300 | 2800 | 2700 | 1700 |
| 50-32-8 | Benzo(a)pyrene | UG/KG | 3200 | 5000 | 6000 | 3800 | 4200 | 2700 |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | 2800 | 3900 J | 4500 | 2700 | 3900 | 2400 |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | 2000 | 2900 J | 4200 | 2200 | 3100 | 2000 |
| 218-01-9 | Chrysene | UG/KG | 2600 | 4500 | 6000 | 3300 | 3900 | 2600 |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | 700 J | ND | 1300 J | 870 J | 560 J | 410 J |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | 2500 | 4100 | 4100 | 3000 | 2700 | 1800 |
| | Total Probable Carcinogenic PAHs | | 15200 | 23700 | 30400 | 18670 | 21060 | 13610 |
| | OTHER PAHs | | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | 170 J | 1200 J | 420 J | ND | 220 J | 260 J |
| 208-96-8 | Acenaphthylene | UG/KG | 320 J | 750 J | 850 J | 500 J | 1000 J | 800 J |
| 120-12-7 | Anthracene | UG/KG | 560 J | 1600 J | 1100 J | 550 J | 1400 J | 680 J |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | 2200 | 4100 | 4200 | 2900 | 2600 | 1900 |
| 206-44-0 | Fluoranthene | UG/KG | 2400 | 5500 | 7200 | 3700 | 5500 | 3200 |
| 86-73-7 | Fluorene | UG/KG | 230 J | 1500 J | 640 J | 230 J | 400 J | 380 J |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | ND | 1600 J | 320 J | ND | 250 J | 260 J |
| 91-20-3 | Naphthalene | UG/KG | 340 J | 2200 J | 990 J | 270 J | 600 J | 560 J |
| 85-01-8 | Phenanthrene | UG/KG | 870 J | 5000 | 3300 | 1300 J | 2300 | 1700 |
| 129-00-0 | Pyrene | UG/KG | 3800 | 8400 | 12000 | 5400 | 5700 | 3400 |
| | Total PAHs | | 26090 | 55550 | 61420 | 33520 | 41030 | 26750 |
| | PESTICIDES | | | | | | | |
| 309-00-2 | Aldrin | UG/KG | ND | ND | ND | ND | ND | ND |
| 72-55-9 | 4,4'-DDE | UG/KG | ND | ND | ND | ND | ND | ND |
| 50-29-3 | 4,4'-DDT | UG/KG | ND | ND | ND | ND | ND | ND |
| 60-57-1 | Dieldrin | UG/KG | ND | ND | ND | ND | ND | ND |
| 33213-65-9 | Endosulfan II | UG/KG | ND | ND | ND | ND | ND | ND |
| 72-20-8 | Endrin | UG/KG | ND | ND | ND | ND | ND | ND |
| 7421-93-4 | Endrin aldehyde | UG/KG | ND | ND | ND | ND | ND | ND |
| 76-44-8 | Heptachlor | UG/KG | ND | ND | ND | ND | ND | ND |
| 5103-71-9 | alpha-Chlordane | UG/KG | ND | ND | ND | ND | ND | ND |
| | PCBs | | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | 760 | 890 J | 920 J | 840 | 450 J | 630 J |
| 11097-69-1 | Aroclor-1254 | UG/KG | 2200 | 6100 D | 1700 | 1500 | 1600 | 2200 |
| 11096-82-5 | Aroclor-1260 | UG/KG | ND | ND | ND | ND | ND | ND |
| | Total PCBs | | 2960 | 6990 | 2620 | 2340 | 2050 | 2830 |
| | INORGANICS | | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | 7000 | 16200 | 7630 | 6700 | 8720 | 10900 |
| 7440-36-0 | Antimony | MG/KG | ND | ND | ND | ND | ND | ND |
| 7440-38-2 | Arsenic | MG/KG | 4.1 | 7.4 | 6 | 3 | 4 | 4.9 |
| 7440-39-3 | Barium | MG/KG | 57.2 | 131 | 53.3 | 39.9 J | 65.2 | 73.4 |
| 7440-41-7 | Beryllium | MG/KG | 0.25 J | 1.1 J | 0.24 J | 0.26 J | 0.59 J | 0.64 J |
| 7440-43-9 | Cadmium | MG/KG | 0.99 J | 2.1 | ND | ND | ND | ND |
| 7440-70-2 | Calcium | MG/KG | 12000 | 18800 | 12300 | 9650 | 11500 | 12900 |
| 7440-47-3 | Chromium | MG/KG | 60.2 | 188 | 33.1 | 30.9 | 55.1 | 80.9 |
| 7440-48-4 | Cobalt | MG/KG | 8.9 J | 17.3 | 8.3 J | 6.3 J | 12.6 | 10.4 J |
| 7440-50-8 | Copper | MG/KG | 284 | 919 | 166 | 143 | 243 | 351 |
| 7439-89-6 | Iron | MG/KG | 17400 | 31800 | 16500 | 13300 | 19400 | 22100 |
| 7439-92-1 | Lead | MG/KG | 59.2 | 101 | 49.5 | 38.5 | 45.5 | 65 |
| 7439-95-4 | Magnesium | MG/KG | 4960 | 8060 | 4840 | 4340 | 5160 | 6240 |
| 7439-96-5 | Manganese | MG/KG | 443 | 776 | 408 | 308 | 548 | 456 |
| 7439-97-6 | Mercury | MG/KG | 0.19 | 0.6 | 0.19 | 0.17 | 0.29 | 0.37 |
| 7440-02-0 | Nickel | MG/KG | 23.2 | 57.7 | 20.1 | 17.6 | 28.3 | 35.9 |
| 7440-09-7 | Potassium | MG/KG | 861 J | 2380 | 1300 | 1120 | 1280 | 1910 |
| 7782-49-2 | Selenium | MG/KG | ND | ND | ND | ND | ND | ND |
| 7440-22-4 | Silver | MG/KG | ND | 1.6 J | ND | ND | ND | ND |
| 7440-23-5 | Sodium | MG/KG | ND | ND | ND | ND | ND | ND |
| 7440-62-2 | Vanadium | MG/KG | 16.5 | 36.5 | 18.6 | 14.7 | 22.8 | 29.1 |
| 7440-66-6 | Zinc | MG/KG | 147 | 340 | 112 | 96.6 | 142 | 180 |
| | OTHER | | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | 23478 | 48623 | 19683 | 10590 | 19988 | 35668 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.3

| | | | DSA 2 | | | | DSA 3 | |
|---|---|---|---|---|---|---|---|---|
| SURFACE SOIL DETECTED COMPOUNDS | | SAMPLE ID: | SS-208 | SS-209 | SS-210 | SS-413A | SS-301$^{(MAX)}$ | SS-302 |
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS | | DEPTH: | 0-1' | 0-1' | 0-1' | 0-2' | 0-1' | 0-1' |
| | | LAB ID: | 2104603 | 2104604 | 2104605 | 2088302 | 2122401 | 2122404 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS02SS01 | DS02SS01 | DS02SS01 | MV01SS01 | DS03SS01 | DS03SS01 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/14/94 | 6/14/94 | 6/14/94 | 5/31/94 | 6/29/94 | 6/29/94 |
| | | VALIDATED: | 9/13/94 | 9/13/94 | 9/13/94 | 8/15/94 | 9/13/94 | 9/13/94 |
| CAS NO. | COMPOUND | UNITS: | | | | | | |
| | VOLATILES | | | | | | | |
| 67-64-1 | Acetone | UG/KG | ND | ND | ND | ND | ND | ND |
| 78-93-3 | 2-Butanone | UG/KG | ND | ND | ND | ND | ND | ND |
| 75-09-2 | Methylene Chloride | UG/KG | ND | ND | ND | ND | ND | ND |
| 127-18-4 | Tetrachloroethene | UG/KG | ND | ND | ND | ND | ND | ND |
| | BTEX VOLATILES | | | | | | | |
| 108-88-3 | Toluene | UG/KG | ND | ND | ND | ND | ND | ND |
| | SEMIVOLATILES | | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | 47 J | ND | ND | ND | ND | ND |
| 86-74-8 | Carbazole | UG/KG | ND | ND | ND | ND | ND | ND |
| 84-74-2 | Di-n-butylphthalate | UG/KG | ND | ND | ND | 760 J | ND | ND |
| 132-64-9 | Dibenzofuran | UG/KG | 160 J | 610 J | 230 J | ND | ND | ND |
| 108-95-2 | Phenol | UG/KG | 500 J | ND | ND | ND | ND | ND |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | ND | ND | ND | ND | ND | ND |
| | PROBABLE CARCINOGENIC PAHs | | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | 1600 J | 2100 | 2600 | 660 J | 140 J | 120 J |
| 50-32-8 | Benzo(a)pyrene | UG/KG | 1600 J | 3700 | 3500 | 1400 J | 140 J | 120 J |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | 1800 J | 2400 | 3000 | 1200 J | 170 J | 130 J |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | 1000 J | 3000 | 2400 | 960 J | 150 J | 170 J |
| 218-01-9 | Chrysene | UG/KG | 1600 J | 3100 | 3100 | 1100 J | 190 J | 170 J |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | ND | ND | 340 J | ND | ND | ND |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | 1200 J | 2400 | 2200 | 1200 J | 66 J | ND |
| | Total Probable Carcinogenic PAHs | | 8800 | 16700 | 17140 | 6520 | 856 | 710 |
| | OTHER PAHs | | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | 210 J | 600 J | 260 J | ND | ND | ND |
| 208-96-8 | Acenaphthylene | UG/KG | 530 J | 940 J | 970 J | 290 J | ND | ND |
| 120-12-7 | Anthracene | UG/KG | 400 J | 1200 J | 1000 J | 210 J | ND | ND |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | 880 J | 2300 | 2200 | 1100 J | ND | ND |
| 206-44-0 | Fluoranthene | UG/KG | 1700 J | 4600 | 5700 | 1000 J | 360 J | 310 J |
| 86-73-7 | Fluorene | UG/KG | 240 J | 920 J | 550 J | ND | ND | ND |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | 300 J | 1200 J | 280 J | ND | 280 J | 250 J |
| 91-20-3 | Naphthalene | UG/KG | 430 J | 1100 J | 600 J | 280 J | 600 | 630 |
| 85-01-8 | Phenanthrene | UG/KG | 1200 J | 3800 | 3600 | 490 J | 170 J | 160 J |
| 129-00-0 | Pyrene | UG/KG | 1800 J | 4500 | 5400 | 940 J | 240 J | 200 J |
| | Total PAHs | | 16490 | 37860 | 37700 | 10830 | 2506 | 2260 |
| | PESTICIDES | | | | | | | |
| 309-00-2 | Aldrin | UG/KG | ND | ND | ND | ND | ND | ND |
| 72-55-9 | 4,4'-DDE | UG/KG | ND | ND | ND | ND | ND | ND |
| 50-29-3 | 4,4'-DDT | UG/KG | ND | ND | ND | ND | ND | ND |
| 60-57-1 | Dieldrin | UG/KG | ND | ND | ND | 35 J | 7.4 J | ND |
| 33213-65-9 | Endosulfan II | UG/KG | ND | ND | ND | ND | ND | ND |
| 72-20-8 | Endrin | UG/KG | ND | ND | ND | ND | ND | ND |
| 7421-93-4 | Endrin aldehyde | UG/KG | ND | ND | ND | 22 J | ND | ND |
| 76-44-8 | Heptachlor | UG/KG | ND | ND | ND | 2.7 J | ND | ND |
| 5103-71-9 | alpha-Chlordane | UG/KG | ND | ND | ND | ND | ND | ND |
| | PCBs | | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | 770 J | 520 J | 810 | ND | ND | ND |
| 11097-69-1 | Aroclor-1254 | UG/KG | 5800 D | 2100 | 5000 D | 820 | 470 J | 69 J |
| 11096-82-5 | Aroclor-1260 | UG/KG | ND | ND | ND | ND | ND | ND |
| | Total PCBs | | 6570 | 2620 | 5810 | 820 | 470 | 69 |
| | INORGANICS | | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | 9720 | 9320 | 9110 | 9110 | 17300 | 12600 |
| 7440-36-0 | Antimony | MG/KG | ND | ND | ND | ND | ND | ND |
| 7440-38-2 | Arsenic | MG/KG | 6.3 | 6.1 | 5.4 | 5.9 | 5.2 J | 5.2 J |
| 7440-39-3 | Barium | MG/KG | 75.7 | 100 | 87.9 | 67.1 | 96.1 | 73.1 |
| 7440-41-7 | Beryllium | MG/KG | 0.73 J | 0.63 J | 0.59 J | 0.42 J | 1.6 | 1.6 |
| 7440-43-9 | Cadmium | MG/KG | 1.6 | 3 | 2 | ND | ND | 1.6 |
| 7440-70-2 | Calcium | MG/KG | 25400 | 22000 | 27000 | 40900 J | 4070 | 10600 |
| 7440-47-3 | Chromium | MG/KG | 71.7 | 148 | 111 | 62.5 | 45.9 | 45.8 |
| 7440-48-4 | Cobalt | MG/KG | 11.7 J | 13.8 | 12.9 | 10.3 J | 15.7 | 12.5 J |
| 7440-50-8 | Copper | MG/KG | 321 | 679 | 500 | 270 | 205 | 248 |
| 7439-89-6 | Iron | MG/KG | 23600 | 24200 | 23000 | 21200 | 28100 | 26200 |
| 7439-92-1 | Lead | MG/KG | 46.9 | 84.8 | 70.4 | 67.7 J | 26.3 | 35.3 |
| 7439-95-4 | Magnesium | MG/KG | 7010 | 7090 | 7450 | 5640 | 5520 | 5210 |
| 7439-96-5 | Manganese | MG/KG | 566 | 609 | 624 | 575 | 389 | 517 |
| 7439-97-6 | Mercury | MG/KG | 0.34 | 0.63 | 0.37 | 0.34 | 0.23 | 0.23 |
| 7440-02-0 | Nickel | MG/KG | 36.8 | 48.6 | 41.1 | 32.5 | 34 | 39.7 |
| 7440-09-7 | Potassium | MG/KG | 1630 | 1090 J | 1350 | 1340 | 1760 | 2390 |
| 7782-49-2 | Selenium | MG/KG | ND | ND | ND | ND | ND | ND |
| 7440-22-4 | Silver | MG/KG | ND | 2.6 | ND | 2.5 | 2.1 J | ND |
| 7440-23-5 | Sodium | MG/KG | ND | ND | ND | ND | ND | ND |
| 7440-62-2 | Vanadium | MG/KG | 24.5 | 24.3 | 22.1 | 14.3 | 35.7 | 28.9 |
| 7440-66-6 | Zinc | MG/KG | 158 | 255 | 226 | 151 | 140 | 156 |
| | OTHER | | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | 31661 | 48955 | 45202 | 22869 | 35916 | 38928 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
$^{(MAX)}$ – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.3

| SURFACE SOIL DETECTED COMPOUNDS | | | DSA 3 | | | | |
|---|---|---|---|---|---|---|---|
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS | | SAMPLE ID: | SS-303 | SS-304 | SS-305 | SS-306 | SS-307 |
| | | DEPTH: | 0-1' | 0-1' | 0-1' | 0-1' | 0-1' |
| | | LAB ID: | 2122405 | 2122406 | 2122408 | 2122409 | 2122410 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS03SS01 | DS03SS01 | DS03SS01 | DS03SS01 | DS03SS01 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/29/94 | 6/29/94 | 6/30/94 | 6/30/94 | 6/30/94 |
| | | VALIDATED: | 9/13/94 | 9/13/94 | 9/13/94 | 9/13/94 | 9/13/94 |
| CAS NO. | COMPOUND | UNITS: | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | ND | ND | ND | ND | ND |
| 78-93-3 | 2-Butanone | UG/KG | ND | ND | ND | ND | ND |
| 75-09-2 | Methylene Chloride | UG/KG | ND | ND | ND | ND | ND |
| 127-18-4 | Tetrachloroethene | UG/KG | ND | ND | ND | ND | ND |
| | BTEX VOLATILES | | | | | | |
| 108-88-3 | Toluene | UG/KG | ND | ND | ND | ND | ND |
| | SEMIVOLATILES | | | | | | |
| 85-68-7 | Butylbenzylphthalate | UG/KG | ND | ND | ND | ND | ND |
| 86-74-8 | Carbazole | UG/KG | ND | ND | ND | ND | ND |
| 84-74-2 | Di-n-butylphthalate | UG/KG | ND | ND | ND | ND | ND |
| 132-64-9 | Dibenzofuran | UG/KG | ND | ND | ND | ND | ND |
| 108-95-2 | Phenol | UG/KG | ND | ND | ND | ND | ND |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/KG | ND | ND | ND | ND | ND |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | ND | 110 J | ND | ND | ND |
| 50-32-8 | Benzo(a)pyrene | UG/KG | ND | 100 J | ND | ND | ND |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | ND | 150 J | ND | ND | ND |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | ND | 90 J | ND | ND | ND |
| 218-01-9 | Chrysene | UG/KG | 48 J | 170 J | ND | ND | ND |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | ND | ND | ND | ND | ND |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | ND | ND | ND | ND | ND |
| | Total Probable Carcinogenic PAHs | | 48 | 620 | ND | ND | ND |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | ND | ND | ND | ND | ND |
| 208-96-8 | Acenaphthylene | UG/KG | ND | ND | ND | ND | ND |
| 120-12-7 | Anthracene | UG/KG | ND | ND | ND | ND | ND |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | ND | ND | ND | ND | ND |
| 206-44-0 | Fluoranthene | UG/KG | 99 J | 320 J | ND | ND | ND |
| 86-73-7 | Fluorene | UG/KG | ND | ND | ND | ND | ND |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | 1300 | 210 J | ND | ND | ND |
| 91-20-3 | Naphthalene | UG/KG | 3900 D | 580 | ND | ND | ND |
| 85-01-8 | Phenanthrene | UG/KG | 75 J | 200 J | ND | ND | ND |
| 129-00-0 | Pyrene | UG/KG | 51 J | 260 J | ND | ND | ND |
| | Total PAHs | | 5473 | 2190 | ND | ND | ND |
| | PESTICIDES | | | | | | |
| 309-00-2 | Aldrin | UG/KG | ND | ND | ND | ND | 2.7 |
| 72-55-9 | 4,4'-DDE | UG/KG | ND | ND | ND | ND | ND |
| 50-29-3 | 4,4'-DDT | UG/KG | ND | ND | ND | ND | ND |
| 60-57-1 | Dieldrin | UG/KG | ND | ND | ND | ND | ND |
| 33213-65-9 | Endosulfan II | UG/KG | ND | ND | ND | ND | ND |
| 72-20-8 | Endrin | UG/KG | ND | ND | ND | ND | ND |
| 7421-93-4 | Endrin aldehyde | UG/KG | ND | ND | ND | ND | 8.2 J |
| 76-44-8 | Heptachlor | UG/KG | ND | ND | ND | ND | ND |
| 5103-71-9 | alpha-Chlordane | UG/KG | ND | ND | 2.8 JN | ND | 3 |
| | PCBs | | | | | | |
| 53469-21-9 | Aroclor-1242 | UG/KG | ND | ND | ND | ND | ND |
| 11097-69-1 | Aroclor-1254 | UG/KG | ND | ND | ND | ND | ND |
| 11096-82-5 | Aroclor-1260 | UG/KG | ND | 34 J | 58 J | 31 J | 60 |
| | Total PCBs | | ND | 34 | 58 | 31 | 60 |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | 5040 | 14300 | 14500 | 14000 | 14900 |
| 7440-36-0 | Antimony | MG/KG | ND | ND | ND | ND | ND |
| 7440-38-2 | Arsenic | MG/KG | 2.4 | 7.1 | 5.4 J | 5.4 J | 6.5 |
| 7440-39-3 | Barium | MG/KG | 22.4 J | 68.3 | 72.5 | 80 | 77.8 |
| 7440-41-7 | Beryllium | MG/KG | ND | 1.9 | 1.8 | 1.4 J | 1.3 J |
| 7440-43-9 | Cadmium | MG/KG | ND | 2 | ND | ND | ND |
| 7440-70-2 | Calcium | MG/KG | 6960 | 5120 | 5550 | 7380 | 5680 |
| 7440-47-3 | Chromium | MG/KG | 9.1 | 91.3 | 65.1 | 73.6 | 66.6 |
| 7440-48-4 | Cobalt | MG/KG | ND | 16 | 14.4 | 14.2 J | 13.9 J |
| 7440-50-8 | Copper | MG/KG | 44.8 | 528 | 371 | 418 | 361 |
| 7439-89-6 | Iron | MG/KG | 11100 | 30900 | 27600 | 27200 | 30500 |
| 7439-92-1 | Lead | MG/KG | 13 | 39.3 | 24.6 | 33.9 | 28.1 |
| 7439-95-4 | Magnesium | MG/KG | 3100 | 5580 | 5310 | 4830 | 6090 |
| 7439-96-5 | Manganese | MG/KG | 344 | 970 | 841 | 1270 | 861 |
| 7439-97-6 | Mercury | MG/KG | ND | 0.18 | 0.26 | 0.31 | 0.23 |
| 7440-02-0 | Nickel | MG/KG | 18 | 54.1 | 39.3 | 38.9 | 40.4 |
| 7440-09-7 | Potassium | MG/KG | 695 J | 2370 | 2680 | 2670 | 2150 |
| 7782-49-2 | Selenium | MG/KG | ND | ND | ND | ND | ND |
| 7440-22-4 | Silver | MG/KG | ND | ND | ND | ND | ND |
| 7440-23-5 | Sodium | MG/KG | ND | ND | ND | ND | ND |
| 7440-62-2 | Vanadium | MG/KG | 9.8 J | 32.4 | 35.6 | 33.8 | 31.5 |
| 7440-66-6 | Zinc | MG/KG | 61.3 | 216 | 185 | 254 | 178 |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | 9107 | 58926 | 55718 | 54157 | 29463 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.4

BACKGROUND METALS CONCENTRATIONS (BUTLS)

| SURFACE SOIL DETECTED COMPOUNDS<br>NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS | | | | | | |
|---|---|---|---|---|---|---|
| CAS NO. | COMPOUND | Background Upper Tolerance Limit | UNITS: | Maximum On Site Concentration | No. of Exceedances / No. of Samples | Location of Exceedances |
| 7429–90–5 | Aluminum | NS | MG/KG | 18100 J | 0/37 | NONE |
| 7440–36–0 | Antimony | ND | MG/KG | 13.7 | 4/37 | SS–103, SS–109, SS–113A$^{(MAX)}$, SB–140A |
| 7440–38–2 | Arsenic | 12.5 | MG/KG | 21.4 | 5/37 | SS–104, SS–105$^{(MAX)}$, SS–106, SS–109, SS–117A |
| 7440–39–3 | Barium | 104.4 | MG/KG | 142 | 8/37 | SS–101, SS–104, SS–105$^{(MAX)}$, SS–108, SS–110, SS–117A, SS–201$^{(MAX)}$, SS–203 |
| 7440–41–7 | Beryllium | 1.4 | MG/KG | 1.9 | 4/37 | SS–301$^{(MAX)}$, SS–302, SS–304, SS–305 |
| 7440–43–9 | Cadmium | 2.4 | MG/KG | 4.9 | 3/37 | SS–106, SS–110, SS–209 |
| 7440–70–2 | Calcium | NS | MG/KG | 102000 | 0/37 | NONE |
| 7440–47–3 | Chromium | 46.2 | MG/KG | 320 | 22/37 | SS–101, SS–104, SS–105$^{(MAX)}$, SS–106, SS–107, SS–108, SS–109, SS–110, SS–113A$^{(MAX)}$, SS–201$^{(MAX)}$, SS–202, SS–203, SS–206, SS–207, SS–208, SS–209, SS–210, SS–413A, SS–304, SS–305, SS–306, SS–307 |
| 7440–48–4 | Cobalt | 16.3 | MG/KG | 17.3 | 0/37 | NONE |
| 7440–50–8 | Copper | 115.5 | MG/KG | 1290 | 29/37 | SS–101, SS–102, SS–103, SS–104, SS–105$^{(MAX)}$, SS–106, SS–107, SS–108, SS–109, SS–110, SS–113A$^{(MAX)}$, SS–117A, SS–201$^{(MAX)}$, SS–202, SS–203, SS–204, SS–205, SS–206, SS–207, SS–208, SS–209, SS–210, SS–413A, SS–301, SS–302, SS–304, SS–305, SS–306, SS–307 |
| 7439–89–6 | Iron | NS | MG/KG | 36400 | 0/37 | NONE |
| 7439–92–1 | Lead | 66.5 | MG/KG | 140 | 13/37 | SS–101, SS–104, SS–105$^{(MAX)}$, SS–107, SS–108, SS–110, SS–113A$^{(MAX)}$, SS–117A, SS–201$^{(MAX)}$, SS–203, SS–209, SS–210, SS–413A |
| 7439–95–4 | Magnesium | NS | MG/KG | 8430 | 0/37 | NONE |
| 7439–96–5 | Manganese | 517.9 | MG/KG | 1270 | 21/37 | SS–101, SS–104, SS–105$^{(MAX)}$, SS–106, SS–108, SS–110, SS–111A, SS–112A, SS–113A SS–113A$^{(MAX)}$, SS–117A, SS–201$^{(MAX)}$, SS–203, SS–206, SS–208, SS–209, SS–210, SS–413A, SS–304, SS–305, SS–306, SS–307 |
| 7439–97–6 | Mercury | 0.5 | MG/KG | 1.4 | 9/37 | SS–101, SS–104, SS–105$^{(MAX)}$, SS–107, SS–108, SS–109, SS–110, SS–203, SS–209 |
| 7440–02–0 | Nickel | 38.5 | MG/KG | 58.6 | 14/37 | SS–101, SS–104, SS–105$^{(MAX)}$, SS–108, SS–110, SS–201$^{(MAX)}$, SS–203, SS–209, SS–210, SS–302, SS–304, SS–305, SS–306, SS–307 |
| 7440–09–7 | Potassium | NS | MG/KG | 2820 | 0/37 | NONE |
| 7782–49–2 | Selenium | ND | MG/KG | 2.5 | 6/37 | SS–103, SS–104, SS–105$^{(MAX)}$, SS–108, SS–109, SS–110 |
| 7440–22–4 | Silver | 7.7 | MG/KG | 3 | 0/37 | NONE |
| 7440–23–5 | Sodium | NS | MG/KG | 285 J | 0/37 | NONE |
| 7440–62–2 | Vanadium | 35 | MG/KG | 37.1 | 5/37 | SS–110, SS–117A, SS–203, SS–301, SS–305 |
| 7440–66–6 | Zinc | 143.3 | MG/KG | 505 J | 24/37 | SS–101, SS–104, SS–105$^{(MAX)}$,SS–106,SS–107,SS–108,SS–109,SS–110,SS–113A$^{(MAX)}$, SS–115, SS–117A, SS–201$^{(MAX)}$, SS–202, SS–203, SS–207, SS–209, SS–210, SS–413A, SS–302, SS–304, SS–305, SS–306, SS–307 |

# TABLE 4.5

| | | | DSA-2 | | DSA-3 | | |
|---|---|---|---|---|---|---|---|
| SEDIMENT DETECTED COMPOUNDS | | SAMPLE ID: | SD-204 | SD-205 | SD-301 | SD-302 | SD-303 |
| | | DEPTH: | 0-6" | 0-6" | 0-6" | 0-6" | 0-6" |
| NIAGARA MOHAWK POWER CORPORATION | | LAB ID: | 2143904 | 2143905 | 2143906 | 2143907 | 2143908 |
| HARBOR POINT - DREDGE SPOIL AREAS | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS01SD01 | DS01SD01 | DS01SD01 | DS01SD01 | DS01SD01 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 7/26/94 | 7/26/94 | 7/26/94 | 7/26/94 | 7/26/94 |
| | | VALIDATED: | 10/22/94 | 10/22/94 | 10/22/94 | 10/22/94 | 10/22/94 |
| CAS NO. | COMPOUND | UNITS: | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | 4 J | 17 J | 13 J | 15 J | 12 J |
| 78-93-3 | 2-Butanone | UG/KG | ND | ND | 28 | ND | ND |
| | SEMIVOLATILES | | | | | | |
| 86-74-8 | Carbazole | UG/KG | ND | ND | ND | ND | ND |
| 132-64-9 | Dibenzofuran | UG/KG | ND | ND | ND | ND | ND |
| 106-44-5 | 4-Methylphenol | UG/KG | ND | ND | ND | ND | ND |
| 108-95-2 | Phenol | UG/KG | ND | ND | 86 J | ND | ND |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | 310 J | 130 J | 480 J | 290 J | 150 J |
| 50-32-8 | Benzo(a)pyrene | UG/KG | 200 J | 83 J | 560 J | 190 J | 90 J |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | 200 J | 82 J | 490 J | 140 J | 110 J |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | 230 J | 110 J | 530 J | 160 J | 100 J |
| 218-01-9 | Chrysene | UG/KG | 380 J | 140 J | 630 J | 280 J | 180 J |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | ND | ND | ND | ND | ND |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | 160 J | ND | 550 J | 140 J | ND |
| | Total Probable Carcinogenic PAHs | | 1480 | 545 | 3240 | 1200 | 630 |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | ND | ND | ND | ND | ND |
| 208-96-8 | Acenaphthylene | UG/KG | ND | ND | 190 J | ND | ND |
| 120-12-7 | Anthracene | UG/KG | 71 J | ND | 96 J | ND | ND |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | ND | ND | 490 J | 130 J | ND |
| 206-44-0 | Fluoranthene | UG/KG | 840 | 250 J | 800 | 610 J | 390 J |
| 86-73-7 | Fluorene | UG/KG | 57 J | ND | ND | ND | ND |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | ND | ND | ND | ND | ND |
| 91-20-3 | Naphthalene | UG/KG | ND | ND | 93 J | ND | ND |
| 85-01-8 | Phenanthrene | UG/KG | 480 | 140 J | 360 J | 280 J | 200 J |
| 129-00-0 | Pyrene | UG/KG | 680 | 300 J | 1000 | 510 J | 420 J |
| | Total PAHs | | 3608 | 1235 | 6269 | 2730 | 1640 |
| | PCBs | | | | | | |
| 11097-69-1 | Aroclor-1254 | UG/KG | 20 J | 180 | 4400 | 390 | 62 J |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | 3450 J | 13400 J | 16600 J | 11700 J | 14000 J |
| 7440-36-0 | Antimony | MG/KG | ND | ND | ND | ND | ND |
| 7440-38-2 | Arsenic | MG/KG | 2.2 J | 8.9 | 14.1 | 18.5 | 6 |
| 7440-39-3 | Barium | MG/KG | 20.1 J | 130 | 147 | 331 | 91.3 |
| 7440-41-7 | Beryllium | MG/KG | ND | ND | 1.8 J | ND | 1.7 J |
| 7440-43-9 | Cadmium | MG/KG | ND | ND | 3 | 2.4 J | ND |
| 7440-70-2 | Calcium | MG/KG | 9670 | 46800 | 4040 | 8790 | 2590 |
| 7440-47-3 | Chromium | MG/KG | 5.1 | 29.8 | 103 | 37.2 | 62.4 |
| 7440-48-4 | Cobalt | MG/KG | ND | 12.8 J | 21.8 | 34.4 | 14.1 J |
| 7440-50-8 | Copper | MG/KG | 11 | 96.5 | 385 | 155 | 312 |
| 7439-89-6 | Iron | MG/KG | 8520 | 29800 | 49400 | 79600 | 29800 |
| 7439-92-1 | Lead | MG/KG | 12.2 | 28.9 | 92 | 31.8 | 38.4 |
| 7439-95-4 | Magnesium | MG/KG | 2870 | 12600 | 5930 | 4860 | 4920 |
| 7439-96-5 | Manganese | MG/KG | 270 | 1300 | 759 | 18400 | 281 |
| 7439-97-6 | Mercury | MG/KG | ND | 0.24 | 0.55 | ND | 0.22 |
| 7440-02-0 | Nickel | MG/KG | ND | 28.4 | 48.9 | 31.6 | 53.1 |
| 7440-09-7 | Potassium | MG/KG | 622 J | 2530 | 1620 J | 2330 J | 2020 |
| 7440-22-4 | Silver | MG/KG | ND | ND | ND | 4.1 J | ND |
| 7440-62-2 | Vanadium | MG/KG | 9.2 J | 30.1 | 49.1 | 41.6 | 33.8 |
| 7440-66-6 | Zinc | MG/KG | 77.8 | 133 | 215 | 142 | 160 |
| 57-12-5 | Cyanide | MG/KG | ND | ND | ND | 2.2 | ND |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | 8870 | 95200 | 60800 | 82600 | 48600 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.5

| | | | DSA-3 | | DSA-3 Southern Cell | | |
|---|---|---|---|---|---|---|---|
| SEDIMENT DETECTED COMPOUNDS | | SAMPLE ID: | SD-304 | SD-305 | SP-301A | SP-302A | SP-303A |
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT - DREDGE SPOIL AREAS | | DEPTH: | 0-6" | 0-6" | 0-1.5' | 0-1.5' | 0-1.5' |
| | | LAB ID: | 2143909 | 2143910 | 2118505 | 2118501 | 2118502 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS01SD01 | DS01SD01 | DS03SP01 | DS03SP01 | DS03SP01 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 7/26/94 | 7/26/94 | 6/28/94 | 6/28/94 | 6/28/94 |
| | | VALIDATED: | 10/22/94 | 10/22/94 | 10/22/94 | 10/22/94 | 10/22/94 |
| CAS NO. | COMPOUND | UNITS: | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | 10 J | 11 J | | | |
| 78-93-3 | 2-Butanone | UG/KG | ND | ND | | | |
| | SEMIVOLATILES | | | | | | |
| 86-74-8 | Carbazole | UG/KG | ND | ND | | | |
| 132-64-9 | Dibenzofuran | UG/KG | ND | ND | | | |
| 106-44-5 | 4-Methylphenol | UG/KG | ND | ND | | | |
| 108-95-2 | Phenol | UG/KG | ND | ND | | | |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | 240 J | ND | ND | ND | 88 J |
| 50-32-8 | Benzo(a)pyrene | UG/KG | 180 J | ND | ND | ND | ND |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | ND | ND | ND | ND | 120 J |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | ND | ND | ND | ND | 81 J |
| 218-01-9 | Chrysene | UG/KG | 260 J | ND | ND | ND | 160 J |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | ND | ND | ND | ND | ND |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | ND | ND | ND | ND | ND |
| | Total Probable Carcinogenic PAHs | | 680 | ND | ND | ND | 449 |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | ND | ND | ND | ND | ND |
| 208-96-8 | Acenaphthylene | UG/KG | ND | ND | ND | ND | ND |
| 120-12-7 | Anthracene | UG/KG | ND | ND | ND | ND | ND |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | ND | ND | ND | ND | ND |
| 206-44-0 | Fluoranthene | UG/KG | 510 J | ND | ND | ND | 210 J |
| 86-73-7 | Fluorene | UG/KG | ND | ND | ND | ND | ND |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | ND | ND | | | |
| 91-20-3 | Naphthalene | UG/KG | ND | ND | ND | ND | ND |
| 85-01-8 | Phenanthrene | UG/KG | 280 J | ND | ND | ND | 170 J |
| 129-00-0 | Pyrene | UG/KG | 500 J | ND | ND | 80 J | 260 J |
| | Total PAHs | | 1970 | ND | ND | 80 | 1089 |
| | PCBs | | | | | | |
| 11097-69-1 | Aroclor-1254 | UG/KG | 330 | ND | | | |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | 13600 J | 13600 J | | | |
| 7440-36-0 | Antimony | MG/KG | ND | ND | | | |
| 7440-38-2 | Arsenic | MG/KG | 5.5 | 6.5 | | | |
| 7440-39-3 | Barium | MG/KG | 87.9 J | 104 | | | |
| 7440-41-7 | Beryllium | MG/KG | ND | 1.5 | | | |
| 7440-43-9 | Cadmium | MG/KG | 1.9 J | 1.2 J | | | |
| 7440-70-2 | Calcium | MG/KG | 5350 | 2170 | | | |
| 7440-47-3 | Chromium | MG/KG | 53.8 | 18.9 | | | |
| 7440-48-4 | Cobalt | MG/KG | 14 J | 13.7 J | | | |
| 7440-50-8 | Copper | MG/KG | 308 | 30.2 | | | |
| 7439-89-6 | Iron | MG/KG | 27600 | 30500 | | | |
| 7439-92-1 | Lead | MG/KG | 42.4 | 16.8 | | | |
| 7439-95-4 | Magnesium | MG/KG | 4600 | 4840 | | | |
| 7439-96-5 | Manganese | MG/KG | 393 | 527 | | | |
| 7439-97-6 | Mercury | MG/KG | 0.33 | 0.17 | | | |
| 7440-02-0 | Nickel | MG/KG | 51.6 | 40 | | | |
| 7440-09-7 | Potassium | MG/KG | 3010 | 1510 | | | |
| 7440-22-4 | Silver | MG/KG | ND | ND | | | |
| 7440-62-2 | Vanadium | MG/KG | 33.4 | 32.7 | | | |
| 7440-66-6 | Zinc | MG/KG | 250 | 175 | | | |
| 57-12-5 | Cyanide | MG/KG | ND | ND | | | |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | 77300 | 32700 | | | |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.5

| | | | DSA-3 Southern Cell | | | | |
|---|---|---|---|---|---|---|---|
| **SEDIMENT DETECTED COMPOUNDS** | | SAMPLE ID: | SP-304A (MAX) | SP-305A (MAX) | SP-306A | SP-307A | SP-309A |
| | | DEPTH: | 0-1.5' | 0-1.5' | 0-1.5' | 0-1.5' | 0-1.5' |
| NIAGARA MOHAWK POWER CORPORATION | | LAB ID: | 2121101 | 2118503 | 2118506 | 2121102 | 2116701 |
| HARBOR POINT - DREDGE SPOIL AREAS | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS03SP01 | DS03SP01 | DS03SP01 | DS03SP01 | DS03SP01 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 6/28/94 | 6/28/94 | 6/28/94 | 6/28/94 | 6/27/94 |
| | | VALIDATED: | 10/22/94 | 10/22/94 | 10/22/94 | 10/22/94 | 10/22/94 |
| CAS NO. | COMPOUND | UNITS: | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/KG | 16 J | | 89 J | ND | |
| 78-93-3 | 2-Butanone | UG/KG | ND | | 17 J | ND | |
| | SEMIVOLATILES | | | | | | |
| 86-74-8 | Carbazole | UG/KG | ND | | 14000 | ND | |
| 132-64-9 | Dibenzofuran | UG/KG | ND | | 13000 | ND | |
| 106-44-5 | 4-Methylphenol | UG/KG | ND | | ND | ND | |
| 108-95-2 | Phenol | UG/KG | ND | | ND | ND | |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/KG | 78 J | 110 J | 98000 D | ND | ND |
| 50-32-8 | Benzo(a)pyrene | UG/KG | ND | 150 J | 68000 D | ND | ND |
| 205-99-2 | Benzo(b)fluoranthene | UG/KG | 82 J | 210 J | 69000 D | ND | ND |
| 207-08-9 | Benzo(k)fluoranthene | UG/KG | ND | 130 J | 51000 D | ND | ND |
| 218-01-9 | Chrysene | UG/KG | 130 J | 220 J | 110000 D | ND | ND |
| 53-70-3 | Dibenz(a,h)anthracene | UG/KG | ND | ND | 20000 | ND | ND |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | UG/KG | ND | 100 J | 42000 D | ND | ND |
| | Total Probable Carcinogenic PAHs | | 290 | 920 | 458000 | ND | ND |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/KG | ND | ND | 18000 | ND | ND |
| 208-96-8 | Acenaphthylene | UG/KG | ND | ND | 18000 | ND | ND |
| 120-12-7 | Anthracene | UG/KG | ND | ND | 96000 D | ND | ND |
| 191-24-2 | Benzo(g,h,i)perylene | UG/KG | ND | ND | 31000 | ND | ND |
| 206-44-0 | Fluoranthene | UG/KG | 200 J | 290 J | 230000 D | 64 J | ND |
| 86-73-7 | Fluorene | UG/KG | ND | ND | 41000 | ND | ND |
| 91-57-6 | 2-Methylnaphthalene | UG/KG | ND | | 8600 | ND | |
| 91-20-3 | Naphthalene | UG/KG | ND | ND | 16000 | ND | ND |
| 85-01-8 | Phenanthrene | UG/KG | 120 J | 200 J | 170000 D | 82 J | ND |
| 129-00-0 | Pyrene | UG/KG | 120 J | 240 J | 230000 D | ND | ND |
| | Total PAHs | | 730 | 1650 | 1316600 | 146 | ND |
| | PCBs | | | | | | |
| 11097-69-1 | Aroclor-1254 | UG/KG | 290 | | 210 | ND | |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | MG/KG | 20500 | | 23000 | 20800 | |
| 7440-36-0 | Antimony | MG/KG | ND | | ND | ND | |
| 7440-38-2 | Arsenic | MG/KG | 14.3 | | 5.4 | 6.9 | |
| 7440-39-3 | Barium | MG/KG | 150 | | 134 | 123 | |
| 7440-41-7 | Beryllium | MG/KG | 1.6 J | | 2.1 | 1.5 | |
| 7440-43-9 | Cadmium | MG/KG | 2.6 | | 2.1 | 1.2 J | |
| 7440-70-2 | Calcium | MG/KG | 3860 | | 2530 | 3020 | |
| 7440-47-3 | Chromium | MG/KG | 64.4 | | 36 | 27.8 | |
| 7440-48-4 | Cobalt | MG/KG | 17.3 J | | 21.4 | 16 | |
| 7440-50-8 | Copper | MG/KG | 206 J | | 65.5 J | 37.4 J | |
| 7439-89-6 | Iron | MG/KG | 35300 | | 38600 | 35800 | |
| 7439-92-1 | Lead | MG/KG | 70 J | | 28.4 | 19.7 | |
| 7439-95-4 | Magnesium | MG/KG | 6170 | | 7010 | 6500 | |
| 7439-96-5 | Manganese | MG/KG | 1150 | | 525 | 912 | |
| 7439-97-6 | Mercury | MG/KG | 0.36 | | 0.31 | 0.18 | |
| 7440-02-0 | Nickel | MG/KG | 38 | | 39.4 | 33.1 | |
| 7440-09-7 | Potassium | MG/KG | 3190 | | 3420 | 2820 | |
| 7440-22-4 | Silver | MG/KG | ND | | ND | ND | |
| 7440-62-2 | Vanadium | MG/KG | 42.7 | | 50 | 47.3 | |
| 7440-66-6 | Zinc | MG/KG | 195 | | 138 | 194 | |
| 57-12-5 | Cyanide | MG/KG | ND | | ND | ND | |
| | OTHER | | | | | | |
| 7440-44-0 | Total Organic Carbon | MG/KG | 43200 | | 30200 | 25300 | |

J - Indicates an estimated value.
D - Indicates a diluted value.
N - Indicates presumptive evidence of a compound.
ND - Not detected.
(MAX) - Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.5

**SEDIMENT DETECTED COMPOUNDS**

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS

| | | | DSA–3 Southern Cell | | | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | SP–310A | SP–311A | SP–313A (MAX) | SP–317A | SP–319A |
| | | DEPTH: | 0–1.5' | 0–1.5' | 0–1.5' | 0–1.5' | 0–1.5' |
| | | LAB ID: | 2326901 | 2326906 | 2326905 | 2326903 | 2326902 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DSASP21 | DSASP21 | DSASP21 | DSASP21 | DSASP21 |
| | | MATRIX: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | SAMPLED: | 3/07/95 | 3/07/95 | 3/07/95 | 3/07/95 | 3/07/95 |
| | | VALIDATED: | 5/30/95 | 5/30/95 | 5/30/95 | 5/30/95 | 5/30/95 |
| CAS NO. | COMPOUND | UNITS: | | | | | |
| | VOLATILES | | | | | | |
| 67–64–1 | Acetone | UG/KG | | | | | |
| 78–93–3 | 2–Butanone | UG/KG | | | | | |
| | SEMIVOLATILES | | | | | | |
| 86–74–8 | Carbazole | UG/KG | ND | ND | ND | ND | ND |
| 132–64–9 | Dibenzofuran | UG/KG | ND | ND | ND | ND | ND |
| 106–44–5 | 4–Methylphenol | UG/KG | ND | ND | ND | ND | ND |
| 108–95–2 | Phenol | UG/KG | ND | ND | ND | ND | 380 J |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56–55–3 | Benzo(a)anthracene | UG/KG | ND | ND | ND | 560 J | 1100 J |
| 50–32–8 | Benzo(a)pyrene | UG/KG | ND | ND | ND | 1100 | 1400 J |
| 205–99–2 | Benzo(b)fluoranthene | UG/KG | ND | ND | ND | 430 J | 1600 J |
| 207–08–9 | Benzo(k)fluoranthene | UG/KG | ND | ND | ND | 580 J | 2100 J |
| 218–01–9 | Chrysene | UG/KG | 73 J | ND | ND | 830 | 1500 J |
| 53–70–3 | Dibenz(a,h)anthracene | UG/KG | ND | ND | ND | ND | ND |
| 193–39–5 | Indeno(1,2,3–cd)pyrene | UG/KG | ND | ND | ND | 270 J | 340 J |
| | Total Probable Carcinogenic PAHs | | 73 | ND | ND | 3770 | 8040 |
| | OTHER PAHs | | | | | | |
| 83–32–9 | Acenaphthene | UG/KG | ND | ND | ND | ND | ND |
| 208–96–8 | Acenaphthylene | UG/KG | ND | ND | ND | 300 J | 370 J |
| 120–12–7 | Anthracene | UG/KG | ND | ND | ND | 80 J | 290 J |
| 191–24–2 | Benzo(g,h,i)perylene | UG/KG | ND | ND | ND | 300 J | 210 J |
| 206–44–0 | Fluoranthene | UG/KG | 130 J | ND | 110 J | 370 J | 2300 J |
| 86–73–7 | Fluorene | UG/KG | ND | ND | ND | ND | 160 J |
| 91–57–6 | 2–Methylnaphthalene | UG/KG | ND | ND | ND | ND | 250 J |
| 91–20–3 | Naphthalene | UG/KG | ND | ND | ND | ND | 590 J |
| 85–01–8 | Phenanthrene | UG/KG | 98 J | ND | ND | 66 J | 1100 J |
| 129–00–0 | Pyrene | UG/KG | 92 J | ND | ND | 1200 | 1400 J |
| | Total PAHs | | 393 | ND | 110 | 6086 | 14710 |
| | PCBs | | | | | | |
| 11097–69–1 | Aroclor–1254 | UG/KG | | | | | |
| | INORGANICS | | | | | | |
| 7429–90–5 | Aluminum | MG/KG | | | | | |
| 7440–36–0 | Antimony | MG/KG | | | | | |
| 7440–38–2 | Arsenic | MG/KG | | | | | |
| 7440–39–3 | Barium | MG/KG | | | | | |
| 7440–41–7 | Beryllium | MG/KG | | | | | |
| 7440–43–9 | Cadmium | MG/KG | | | | | |
| 7440–70–2 | Calcium | MG/KG | | | | | |
| 7440–47–3 | Chromium | MG/KG | | | | | |
| 7440–48–4 | Cobalt | MG/KG | | | | | |
| 7440–50–8 | Copper | MG/KG | | | | | |
| 7439–89–6 | Iron | MG/KG | | | | | |
| 7439–92–1 | Lead | MG/KG | | | | | |
| 7439–95–4 | Magnesium | MG/KG | | | | | |
| 7439–96–5 | Manganese | MG/KG | | | | | |
| 7439–97–6 | Mercury | MG/KG | | | | | |
| 7440–02–0 | Nickel | MG/KG | | | | | |
| 7440–09–7 | Potassium | MG/KG | | | | | |
| 7440–22–4 | Silver | MG/KG | | | | | |
| 7440–62–2 | Vanadium | MG/KG | | | | | |
| 7440–66–6 | Zinc | MG/KG | | | | | |
| 57–12–5 | Cyanide | MG/KG | | | | | |
| | OTHER | | | | | | |
| 7440–44–0 | Total Organic Carbon | MG/KG | | | | | |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.6

| | | | DSA-1 | | DSA-2 | | |
|---|---|---|---|---|---|---|---|
| SURFACE WATER DETECTED COMPOUNDS | | SAMPLE ID: | SW101 | SW102 | SW201 | SW202$^{(MAX)}$ | SW203 |
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS | | LAB ID: | 2143101 | 2143102 | 2143103 | 2143802 | 2143803 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS01SW01 | DS01SW01 | DS01SW01 | DS01SW01 | DS01SW01 |
| | | MATRIX: | WATER | WATER | WATER | WATER | WATER |
| | | SAMPLED: | 07/25/94 | 07/25/94 | 07/25/94 | 07/26/94 | 07/26/94 |
| | | VALIDATED: | 10/22/94 | 10/22/94 | 10/22/94 | 10/22/94 | 10/22/94 |
| CAS NO. | COMPOUND | UNITS: | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/L | 3 J | 6 J | 4 J | ND | ND |
| | BTEX VOLATILES | | | | | | |
| 108-88-3 | Toluene | UG/L | ND | ND | ND | ND | ND |
| | SEMIVOLATILES | | | | | | |
| 84-66-2 | Diethylphthalate | UG/L | ND | ND | 9 J | 18 | 8 J |
| 106-44-5 | 4-Methylphenol | UG/L | 15 J | ND | ND | ND | ND |
| 108-95-2 | Phenol | UG/L | 11 J | ND | ND | ND | ND |
| | PAHS | | | | | | |
| 91-20-3 | Naphthalene | UG/L | 7 J | ND | ND | ND | ND |
| | PCBs | | | | | | |
| 11097-69-1 | Aroclor-1254 | UG/L | 0.66 J | ND | 0.33 J | ND | 0.27 J |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | UG/L | 2830 J | 5060 J | 1140 J | 99.6 J | 380 J |
| 7440-36-0 | Antimony | UG/L | ND | ND | ND | ND | ND |
| 7440-38-2 | Arsenic | UG/L | 14 | 10.2 | ND | ND | ND |
| 7440-39-3 | Barium | UG/L | 136 J | 120 J | ND | ND | ND |
| 7440-41-7 | Beryllium | UG/L | ND | ND | ND | ND | ND |
| 7440-43-9 | Cadmium | UG/L | 5.7 | ND | ND | ND | 3.6 J |
| 7440-70-2 | Calcium | UG/L | 371000 | 273000 | 183000 | 191000 | 56100 |
| 7440-47-3 | Chromium | UG/L | 38.3 | 70.7 | 14.4 | ND | ND |
| 7440-48-4 | Cobalt | UG/L | ND | ND | ND | ND | ND |
| 7440-50-8 | Copper | UG/L | 451 J | 373 J | 40.3 J | 14.3 J | 27.2 J |
| 7439-89-6 | Iron | UG/L | 17500 J | 13400 J | 2300 J | 579 J | 2650 J |
| 7439-92-1 | Lead | UG/L | 34 | 40.4 | 5.9 J | ND | 5.7 J |
| 7439-95-4 | Magnesium | UG/L | 27300 | 32100 | 27500 | 29900 | 4280 J |
| 7439-96-5 | Manganese | UG/L | 1200 J | 1030 J | 549 J | 373 J | 262 J |
| 7439-97-6 | Mercury | UG/L | 0.34 J | 0.32 J | ND | ND | ND |
| 7440-02-0 | Nickel | UG/L | ND | ND | ND | ND | ND |
| 7440-09-7 | Potassium | UG/L | 6330 | 4540 J | ND | 7650 | ND |
| 7440-22-4 | Silver | UG/L | ND | ND | ND | ND | ND |
| 7440-23-5 | Sodium | UG/L | 6080 | 8150 | 11700 | 4200 J | 3030 J |
| 7440-62-2 | Vanadium | UG/L | ND | ND | ND | ND | ND |
| 7440-66-6 | Zinc | UG/L | 276 J | 157 J | 19.7 J | 34.2 J | 29.1 J |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
$^{(MAX)}$ – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.6

| | | | DSA-2 | | DSA-3 | | |
|---|---|---|---|---|---|---|---|
| **SURFACE WATER DETECTED COMPOUNDS** | | SAMPLE ID: | SW204 | SW205 | SW301 | SW302 | SW303 |
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS | | LAB ID: | 2143805 | 2143806 | 2143807 | 2143808 | 2143809 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DS01SW01 | DS01SW01 | DS01SW01 | DS01SW01 | DS01SW01 |
| | | MATRIX: | WATER | WATER | WATER | WATER | WATER |
| | | SAMPLED: | 07/26/94 | 07/26/94 | 07/26/94 | 07/26/94 | 07/26/94 |
| | | VALIDATED: | 10/22/94 | 10/22/94 | 10/22/94 | 10/22/94 | 10/22/94 |
| CAS NO. | COMPOUND | UNITS: | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/L | ND | ND | ND | 6 J | 6 J |
| | BTEX VOLATILES | | | | | | |
| 108-88-3 | Toluene | UG/L | ND | ND | ND | 9 J | 29 |
| | SEMIVOLATILES | | | | | | |
| 84-66-2 | Diethylphthalate | UG/L | ND | 3 J | 8 J | 3 J | 17 |
| 106-44-5 | 4-Methylphenol | UG/L | R | ND | ND | 42 J | 9 J |
| 108-95-2 | Phenol | UG/L | R | ND | ND | 2 J | ND |
| | PAHS | | | | | | |
| 91-20-3 | Naphthalene | UG/L | ND | ND | ND | ND | ND |
| | PCBs | | | | | | |
| 11097-69-1 | Aroclor-1254 | UG/L | ND | ND | ND | 0.25 J | ND |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | UG/L | 186 J | 3490 J | 513 J | 81600 J | 23200 J |
| 7440-36-0 | Antimony | UG/L | ND | ND | ND | ND | ND |
| 7440-38-2 | Arsenic | UG/L | ND | ND | ND | 25.3 | 23.4 |
| 7440-39-3 | Barium | UG/L | 71.8 J | 87.7 J | ND | 3700 | 425 |
| 7440-41-7 | Beryllium | UG/L | ND | ND | ND | 8.1 | ND |
| 7440-43-9 | Cadmium | UG/L | ND | ND | ND | 20.7 | 7.4 |
| 7440-70-2 | Calcium | UG/L | 93600 | 67400 | 29600 | 293000 | 89300 |
| 7440-47-3 | Chromium | UG/L | ND | 7.2 J | ND | 232 | 68.9 |
| 7440-48-4 | Cobalt | UG/L | ND | ND | ND | 302 | 40.6 J |
| 7440-50-8 | Copper | UG/L | ND | 54.1 J | 12.8 J | 1030 J | 308 J |
| 7439-89-6 | Iron | UG/L | 648 J | 8670 J | 2920 J | 557000 J | 154000 J |
| 7439-92-1 | Lead | UG/L | ND | 12.2 J | 3 J | 226 J | 75.7 J |
| 7439-95-4 | Magnesium | UG/L | 13400 | 15900 | 5550 | 73000 | 22600 |
| 7439-96-5 | Manganese | UG/L | 311 J | 495 J | 438 J | 301000 J | 4120 J |
| 7439-97-6 | Mercury | UG/L | ND | ND | ND | 0.76 J | 0.29 J |
| 7440-02-0 | Nickel | UG/L | ND | ND | ND | 284 | 93.9 |
| 7440-09-7 | Potassium | UG/L | 2060 J | 2060 J | 3530 J | 8190 | 6370 |
| 7440-22-4 | Silver | UG/L | ND | ND | ND | 42.1 | ND |
| 7440-23-5 | Sodium | UG/L | 144000 | 16200 | 4590 J | 99500 | 5050 |
| 7440-62-2 | Vanadium | UG/L | ND | ND | ND | 230 | 90.2 |
| 7440-66-6 | Zinc | UG/L | 41.4 J | 49.6 J | 12.8 J | 1360 J | 434 J |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.6

**SURFACE WATER DETECTED COMPOUNDS**

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS

| | | | DSA-3 | |
|---|---|---|---|---|
| | | SAMPLE ID: | SW304 | SW305 |
| | | LAB ID: | 2143810 | 2143811 |
| | | SOURCE: | NYTEST | NYTEST |
| | | SDG: | DS01SW01 | DS01SW01 |
| | | MATRIX: | WATER | WATER |
| | | SAMPLED: | 07/26/94 | 07/26/94 |
| | | VALIDATED: | 10/22/94 | 10/22/94 |
| CAS NO. | COMPOUND | UNITS: | | |
| | VOLATILES | | | |
| 67-64-1 | Acetone | UG/L | 6 J | ND |
| | BTEX VOLATILES | | | |
| 108-88-3 | Toluene | UG/L | ND | 5 J |
| | SEMIVOLATILES | | | |
| 84-66-2 | Diethylphthalate | UG/L | ND | 4 J |
| 106-44-5 | 4-Methylphenol | UG/L | 170 J | 2 J |
| 108-95-2 | Phenol | UG/L | 44 | ND |
| | PAHS | | | |
| 91-20-3 | Naphthalene | UG/L | ND | ND |
| | PCBs | | | |
| 11097-69-1 | Aroclor-1254 | UG/L | 0.39 J | ND |
| | INORGANICS | | | |
| 7429-90-5 | Aluminum | UG/L | 24900 J | 144 J |
| 7440-36-0 | Antimony | UG/L | 43.8 J | ND |
| 7440-38-2 | Arsenic | UG/L | 13.3 | ND |
| 7440-39-3 | Barium | UG/L | 243 | 55.8 J |
| 7440-41-7 | Beryllium | UG/L | ND | ND |
| 7440-43-9 | Cadmium | UG/L | 4.6 J | ND |
| 7440-70-2 | Calcium | UG/L | 105000 | 10600 |
| 7440-47-3 | Chromium | UG/L | 124 | 6 J |
| 7440-48-4 | Cobalt | UG/L | 37.7 J | ND |
| 7440-50-8 | Copper | UG/L | 581 J | 12.8 J |
| 7439-89-6 | Iron | UG/L | 66200 J | 2200 J |
| 7439-92-1 | Lead | UG/L | 123 J | 3.1 J |
| 7439-95-4 | Magnesium | UG/L | 23300 | 3390 J |
| 7439-96-5 | Manganese | UG/L | 1980 J | 473 J |
| 7439-97-6 | Mercury | UG/L | 0.41 J | ND |
| 7440-02-0 | Nickel | UG/L | 123 | ND |
| 7440-09-7 | Potassium | UG/L | 11300 | 4890 J |
| 7440-22-4 | Silver | UG/L | ND | ND |
| 7440-23-5 | Sodium | UG/L | 3220 J | 3220 J |
| 7440-62-2 | Vanadium | UG/L | 60.8 | ND |
| 7440-66-6 | Zinc | UG/L | 702 J | ND |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
R – Indicates rejected data.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.7

**GROUNDWATER DETECTED COMPOUNDS**

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS
PHASE I

| | | | BACKGROUND | DSA–1 | | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | MW–302S | MW–101S | MW–102S | MW–103S$^{(MAX)}$ | MW–104S |
| | | LAB ID: | 2161202 | 2164009 | 2164008 | 2164004 | 2164002 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DSGW01 | DSGW01 | DSGW01 | DSGW01 | DSGW01 |
| | | MATRIX: | WATER | WATER | WATER | WATER | WATER |
| | | SAMPLED: | 8/11/94 | 8/12/94 | 8/12/94 | 8/12/94 | 8/12/94 |
| | | VALIDATED: | 11/08/94 | 11/08/94 | 11/08/94 | 11/08/94 | 11/08/94 |
| CAS NO. | COMPOUND | UNITS: | | | | | |
| | VOLATILES | | | | | | |
| 67–64–1 | Acetone | UG/L | ND | ND | ND | ND | ND |
| | BTEX VOLATILES | | | | | | |
| 71–43–2 | Benzene | UG/L | ND | 3 J | 2 J | ND | ND |
| 100–41–4 | Ethylbenzene | UG/L | ND | 33 | 19 | ND | 9 J |
| 108–88–3 | Toluene | UG/L | ND | 2 J | ND | ND | 1 J |
| 1330–20–7 | Xylene (total) | UG/L | ND | 31 | 18 | ND | 6 J |
| | Total BTEX Volatiles | | ND | 69 | 39 | ND | 16 |
| | SEMIVOLATILES | | | | | | |
| 86–74–8 | Carbazole | UG/L | ND | ND | ND | ND | ND |
| 132–64–9 | Dibenzofuran | UG/L | ND | ND | ND | ND | ND |
| 84–66–2 | Diethylphthalate | UG/L | 2 J | ND | ND | ND | ND |
| 106–44–5 | 4–Methylphenol | UG/L | ND | ND | ND | ND | ND |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56–55–3 | Benzo(a)anthracene | UG/L | ND | ND | ND | ND | ND |
| 50–32–8 | Benzo(a)pyrene | UG/L | ND | ND | ND | ND | ND |
| 205–99–2 | Benzo(b)fluoranthene | UG/L | ND | ND | ND | ND | ND |
| 207–08–9 | Benzo(k)fluoranthene | UG/L | ND | ND | ND | ND | ND |
| 218–01–9 | Chrysene | UG/L | ND | ND | ND | ND | ND |
| | Total Probable Carcinogenic PAHs | | ND | ND | ND | ND | ND |
| | OTHER PAHs | | | | | | |
| 83–32–9 | Acenaphthene | UG/L | ND | 44 J | 16 | ND | ND |
| 208–96–8 | Acenaphthylene | UG/L | ND | 19 J | ND | ND | 4 J |
| 120–12–7 | Anthracene | UG/L | ND | ND | 2 J | ND | ND |
| 206–44–0 | Fluoranthene | UG/L | ND | ND | 1 J | ND | 1 J |
| 86–73–7 | Fluorene | UG/L | ND | 17 J | 8 J | ND | ND |
| 91–57–6 | 2–Methylnaphthalene | UG/L | ND | 86 J | 6 J | ND | ND |
| 91–20–3 | Naphthalene | UG/L | ND | 350 | 2 J | ND | ND |
| 85–01–8 | Phenanthrene | UG/L | ND | 19 J | 7 J | ND | ND |
| 129–00–0 | Pyrene | UG/L | ND | ND | 2 J | ND | 1 J |
| | Total PAHs | | ND | 535 | 44 | ND | 6 |
| | INORGANICS | | | | | | |
| 7429–90–5 | Aluminum | UG/L | 15200 J | 76900 J | 23300 J | 4920 J | 11800 J |
| 7440–36–0 | Antimony | UG/L | ND | 67.3 | ND | ND | ND |
| 7440–38–2 | Arsenic | UG/L | 5.6 J | 23.7 | 18.6 | 5.1 J | 9.6 J |
| 7440–39–3 | Barium | UG/L | 420 | 615 | 418 | 168 J | 260 |
| 7440–41–7 | Beryllium | UG/L | ND | 12.1 | ND | ND | ND |
| 7440–43–9 | Cadmium | UG/L | ND | 27.2 | ND | 2 J | ND |
| 7440–70–2 | Calcium | UG/L | 74300 | 596000 | 284000 | 199000 | 476000 |
| 7440–47–3 | Chromium | UG/L | 30.5 J | 194 J | 65.8 J | 28.7 J | 35.3 J |
| 7440–48–4 | Cobalt | UG/L | ND | 89.2 | 26.7 J | ND | ND |
| 7440–50–8 | Copper | UG/L | 195 | 748 | 95.6 | 65.1 | 136 |
| 7439–89–6 | Iron | UG/L | 45400 | 211000 | 97700 | 68400 | 44000 |
| 7439–92–1 | Lead | UG/L | 51 | 190 | 67.9 | 16.3 | 48.9 |
| 7439–95–4 | Magnesium | UG/L | 14100 | 106000 | 53200 | 41400 | 47300 |
| 7439–96–5 | Manganese | UG/L | 3610 | 15000 | 8340 | 5380 | 20200 |
| 7439–97–6 | Mercury | UG/L | 0.27 | 2 | 0.26 | ND | 0.31 |
| 7440–02–0 | Nickel | UG/L | 88.7 | 318 | 90.4 | 93 | 73.5 |
| 7440–09–7 | Potassium | UG/L | ND | 6420 | 2110 J | 1710 J | 3510 J |
| 7440–23–5 | Sodium | UG/L | 19300 | 9910 | 15700 | 8560 | 7120 |
| 7440–62–2 | Vanadium | UG/L | 45.5 J | 260 | 74 | 32 J | 38.2 J |
| 7440–66–6 | Zinc | UG/L | 135 | 2020 | 218 | 53.8 | 152 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
ND – Not detected.
$^{(MAX)}$ – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.7

| | | | DSA-1 | | DSA-2 | | |
|---|---|---|---|---|---|---|---|
| GROUNDWATER DETECTED COMPOUNDS | | SAMPLE ID: | MW-105S | MW-106S | MW-200S | MW-201S | MW-202S |
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS<br>PHASE I | | LAB ID: | 2164003 | 2164001 | 2161207 | 2161208 | 2161206 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DSGW01 | DSGW01 | DSGW01 | DSGW01 | DSGW01 |
| | | MATRIX: | WATER | WATER | WATER | WATER | WATER |
| | | SAMPLED: | 8/12/94 | 8/12/94 | 8/11/94 | 8/11/94 | 8/11/94 |
| | | VALIDATED: | 11/08/94 | 11/08/94 | 11/08/94 | 11/08/94 | 11/08/94 |
| CAS NO. | COMPOUND | UNITS: | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/L | ND | ND | ND | ND | ND |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/L | 2 J | ND | ND | ND | ND |
| 100-41-4 | Ethylbenzene | UG/L | 78 | ND | ND | ND | ND |
| 108-88-3 | Toluene | UG/L | 6 J | ND | ND | ND | ND |
| 1330-20-7 | Xylene (total) | UG/L | 65 | ND | ND | ND | ND |
| | Total BTEX Volatiles | | 151 | ND | ND | ND | ND |
| | SEMIVOLATILES | | | | | | |
| 86-74-8 | Carbazole | UG/L | ND | ND | ND | ND | ND |
| 132-64-9 | Dibenzofuran | UG/L | 1 J | ND | ND | ND | ND |
| 84-66-2 | Diethylphthalate | UG/L | ND | ND | 4 J | ND | 1 J |
| 106-44-5 | 4-Methylphenol | UG/L | ND | ND | ND | ND | ND |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/L | 1 J | ND | ND | ND | ND |
| 50-32-8 | Benzo(a)pyrene | UG/L | ND | ND | ND | ND | ND |
| 205-99-2 | Benzo(b)fluoranthene | UG/L | ND | ND | ND | ND | ND |
| 207-08-9 | Benzo(k)fluoranthene | UG/L | ND | ND | ND | ND | ND |
| 218-01-9 | Chrysene | UG/L | 2 J | ND | ND | ND | ND |
| | Total Probable Carcinogenic PAHs | | 3 | ND | ND | ND | ND |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/L | 35 | ND | 14 | 8 J | ND |
| 208-96-8 | Acenaphthylene | UG/L | 8 J | ND | ND | ND | ND |
| 120-12-7 | Anthracene | UG/L | 3 J | ND | 1 J | ND | ND |
| 206-44-0 | Fluoranthene | UG/L | 5 J | ND | 1 J | ND | ND |
| 86-73-7 | Fluorene | UG/L | 14 | ND | 4 J | 2 J | ND |
| 91-57-6 | 2-Methylnaphthalene | UG/L | 72 | ND | 3 J | 2 J | ND |
| 91-20-3 | Naphthalene | UG/L | 310 D | ND | 10 | 3 J | ND |
| 85-01-8 | Phenanthrene | UG/L | 22 | ND | 6 J | 3 J | ND |
| 129-00-0 | Pyrene | UG/L | 8 J | ND | 1 J | 2 J | ND |
| | Total PAHs | | 480 | ND | 40 | 20 | ND |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | UG/L | 33300 J | 49700 J | 16700 J | 16400 J | 3920 J |
| 7440-36-0 | Antimony | UG/L | ND | ND | 48.2 J | ND | ND |
| 7440-38-2 | Arsenic | UG/L | 31.5 | 16 | 20.8 | 20.8 | 10.4 J |
| 7440-39-3 | Barium | UG/L | 361 | 399 | 570 | 559 | 187 J |
| 7440-41-7 | Beryllium | UG/L | 4.2 J | 8.4 | ND | ND | ND |
| 7440-43-9 | Cadmium | UG/L | ND | ND | 2.9 J | ND | ND |
| 7440-70-2 | Calcium | UG/L | 511000 | 560000 | 404000 | 579000 | 319000 |
| 7440-47-3 | Chromium | UG/L | 141 J | 81.9 J | 98.2 J | 68.2 J | 253 J |
| 7440-48-4 | Cobalt | UG/L | 52.3 | 86.2 | 37.9 J | 27.7 J | ND |
| 7440-50-8 | Copper | UG/L | 149 | 649 | 394 | 530 | 27.6 |
| 7439-89-6 | Iron | UG/L | 101000 | 115000 | 121000 | 175000 | 85800 |
| 7439-92-1 | Lead | UG/L | 107 | 169 | 164 | 180 | 14 |
| 7439-95-4 | Magnesium | UG/L | 65500 | 79200 | 46600 | 54600 | 52600 |
| 7439-96-5 | Manganese | UG/L | 8170 | 4270 | 6330 | 15800 | 13700 |
| 7439-97-6 | Mercury | UG/L | 0.78 | 1.4 | 0.6 | 1.1 | ND |
| 7440-02-0 | Nickel | UG/L | 269 | 283 | 79.2 | ND | 203 |
| 7440-09-7 | Potassium | UG/L | 4310 J | 6590 | 9630 | 6420 | 2040 J |
| 7440-23-5 | Sodium | UG/L | 4700 J | 6120 | 7710 | 11800 | 5900 |
| 7440-62-2 | Vanadium | UG/L | 98.7 | 153 | 65.8 | 75.4 | 34.2 J |
| 7440-66-6 | Zinc | UG/L | 345 | 513 | 725 | 723 | 69.4 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
ND – Not detected.
$^{(MAX)}$ – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.7

| GROUNDWATER DETECTED COMPOUNDS | | | DSA-2 | | | DSA-3 | |
|---|---|---|---|---|---|---|---|
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS<br>PHASE I | | SAMPLE ID: | MW-203S | MW-204S | MW-205S | MW-301S | MW-303S |
| | | LAB ID: | 2161205 | 2168805 | 2161209 | 2161201 | 2161204 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | DSGW01 | NY01GW01 | DSGW01 | DSGW01 | DSGW01 |
| | | MATRIX: | WATER | WATER | WATER | WATER | WATER |
| | | SAMPLED: | 8/11/94 | 8/17/94 | 8/11/94 | 8/11/94 | 8/11/94 |
| | | VALIDATED: | 11/08/94 | 11/14/94 | 11/08/94 | 11/08/94 | 11/08/94 |
| CAS NO. | COMPOUND | UNITS: | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/L | ND | 44 | ND | ND | ND |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/L | ND | 2 J | ND | 2 J | ND |
| 100-41-4 | Ethylbenzene | UG/L | ND | ND | ND | ND | ND |
| 108-88-3 | Toluene | UG/L | ND | 1 J | ND | 3 J | ND |
| 1330-20-7 | Xylene (total) | UG/L | ND | ND | ND | ND | ND |
| | Total BTEX Volatiles | | ND | 3 | ND | 5 | ND |
| | SEMIVOLATILES | | | | | | |
| 86-74-8 | Carbazole | UG/L | ND | ND | ND | 6 J | ND |
| 132-64-9 | Dibenzofuran | UG/L | ND | 2 J | ND | 19 | ND |
| 84-66-2 | Diethylphthalate | UG/L | ND | ND | ND | ND | ND |
| 106-44-5 | 4-Methylphenol | UG/L | ND | ND | ND | 12 | ND |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/L | ND | 1 J | ND | ND | ND |
| 50-32-8 | Benzo(a)pyrene | UG/L | ND | 2 J | ND | ND | ND |
| 205-99-2 | Benzo(b)fluoranthene | UG/L | ND | 2 J | ND | ND | ND |
| 207-08-9 | Benzo(k)fluoranthene | UG/L | ND | 1 J | ND | ND | ND |
| 218-01-9 | Chrysene | UG/L | ND | 2 J | ND | ND | ND |
| | Total Probable Carcinogenic PAHs | | ND | 8 | ND | ND | ND |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/L | ND | 8 J | 2 J | 26 | ND |
| 208-96-8 | Acenaphthylene | UG/L | ND | ND | ND | ND | ND |
| 120-12-7 | Anthracene | UG/L | ND | ND | ND | 2 J | ND |
| 206-44-0 | Fluoranthene | UG/L | ND | 2 J | ND | 2 J | ND |
| 86-73-7 | Fluorene | UG/L | ND | ND | ND | 28 | ND |
| 91-57-6 | 2-Methylnaphthalene | UG/L | ND | ND | 2 J | 74 | ND |
| 91-20-3 | Naphthalene | UG/L | ND | 3 J | 2 J | 100 D | ND |
| 85-01-8 | Phenanthrene | UG/L | ND | ND | ND | 28 | ND |
| 129-00-0 | Pyrene | UG/L | ND | 3 J | ND | 2 J | ND |
| | Total PAHs | | ND | 24 | 6 | 262 | ND |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | UG/L | 1230 J | | 3620 J | 12200 J | 17800 J |
| 7440-36-0 | Antimony | UG/L | 38.7 J | | ND | ND | ND |
| 7440-38-2 | Arsenic | UG/L | ND | | 12.2 | 9.8 J | 11.6 |
| 7440-39-3 | Barium | UG/L | 257 | | 418 | 674 | 287 |
| 7440-41-7 | Beryllium | UG/L | ND | | ND | ND | ND |
| 7440-43-9 | Cadmium | UG/L | ND | | ND | ND | ND |
| 7440-70-2 | Calcium | UG/L | 206000 | | 398000 | 416000 | 108000 |
| 7440-47-3 | Chromium | UG/L | 46.6 J | | 157 J | 105 J | 35.4 J |
| 7440-48-4 | Cobalt | UG/L | ND | | ND | 26.6 J | 24.6 J |
| 7440-50-8 | Copper | UG/L | 21.8 J | | 147 | 296 | 67 |
| 7439-89-6 | Iron | UG/L | 71100 | | 97200 | 138000 | 60600 |
| 7439-92-1 | Lead | UG/L | 4.2 | | 34.7 | 79.7 | 33 |
| 7439-95-4 | Magnesium | UG/L | 36600 | | 45600 | 56200 | 30000 |
| 7439-96-5 | Manganese | UG/L | 6740 | | 4130 | 4900 | 12800 |
| 7439-97-6 | Mercury | UG/L | ND | | ND | 0.68 | ND |
| 7440-02-0 | Nickel | UG/L | 564 | | 90.2 | 87.4 | 62.8 |
| 7440-09-7 | Potassium | UG/L | 2980 J | | 5480 | 14900 | 1710 J |
| 7440-23-5 | Sodium | UG/L | 7950 | | 5880 | 8640 | 5920 |
| 7440-62-2 | Vanadium | UG/L | 22.3 J | | 26.9 J | 65.3 | 45.6 J |
| 7440-66-6 | Zinc | UG/L | 76.8 | | 152 | 260 | 147 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.7

| | | | DSA-3 |
|---|---|---|---|
| **GROUNDWATER DETECTED COMPOUNDS** | | SAMPLE ID: | MW-304S |
| | | LAB ID: | 2161203 |
| NIAGARA MOHAWK POWER CORPORATION | | SOURCE: | NYTEST |
| HARBOR POINT – DREDGE SPOIL AREAS | | SDG: | DSGW01 |
| PHASE I | | MATRIX: | WATER |
| | | SAMPLED: | 8/11/94 |
| | | VALIDATED: | 11/08/94 |
| CAS NO. | COMPOUND | UNITS: | |
| | VOLATILES | | |
| 67-64-1 | Acetone | UG/L | ND |
| | BTEX VOLATILES | | |
| 71-43-2 | Benzene | UG/L | ND |
| 100-41-4 | Ethylbenzene | UG/L | ND |
| 108-88-3 | Toluene | UG/L | ND |
| 1330-20-7 | Xylene (total) | UG/L | ND |
| | Total BTEX Volatiles | | ND |
| | SEMIVOLATILES | | |
| 86-74-8 | Carbazole | UG/L | ND |
| 132-64-9 | Dibenzofuran | UG/L | ND |
| 84-66-2 | Diethylphthalate | UG/L | ND |
| 106-44-5 | 4-Methylphenol | UG/L | ND |
| | PROBABLE CARCINOGENIC PAHs | | |
| 56-55-3 | Benzo(a)anthracene | UG/L | ND |
| 50-32-8 | Benzo(a)pyrene | UG/L | ND |
| 205-99-2 | Benzo(b)fluoranthene | UG/L | ND |
| 207-08-9 | Benzo(k)fluoranthene | UG/L | ND |
| 218-01-9 | Chrysene | UG/L | ND |
| | Total Probable Carcinogenic PAHs | | ND |
| | OTHER PAHs | | |
| 83-32-9 | Acenaphthene | UG/L | ND |
| 208-96-8 | Acenaphthylene | UG/L | ND |
| 120-12-7 | Anthracene | UG/L | ND |
| 206-44-0 | Fluoranthene | UG/L | ND |
| 86-73-7 | Fluorene | UG/L | ND |
| 91-57-6 | 2-Methylnaphthalene | UG/L | ND |
| 91-20-3 | Naphthalene | UG/L | ND |
| 85-01-8 | Phenanthrene | UG/L | ND |
| 129-00-0 | Pyrene | UG/L | ND |
| | Total PAHs | | ND |
| | INORGANICS | | |
| 7429-90-5 | Aluminum | UG/L | 1660 J |
| 7440-36-0 | Antimony | UG/L | 34 J |
| 7440-38-2 | Arsenic | UG/L | ND |
| 7440-39-3 | Barium | UG/L | ND |
| 7440-41-7 | Beryllium | UG/L | ND |
| 7440-43-9 | Cadmium | UG/L | ND |
| 7440-70-2 | Calcium | UG/L | 25400 |
| 7440-47-3 | Chromium | UG/L | 15.5 J |
| 7440-48-4 | Cobalt | UG/L | ND |
| 7440-50-8 | Copper | UG/L | ND |
| 7439-89-6 | Iron | UG/L | 10800 |
| 7439-92-1 | Lead | UG/L | 4.2 |
| 7439-95-4 | Magnesium | UG/L | 5740 |
| 7439-96-5 | Manganese | UG/L | 591 |
| 7439-97-6 | Mercury | UG/L | ND |
| 7440-02-0 | Nickel | UG/L | 40.3 |
| 7440-09-7 | Potassium | UG/L | ND |
| 7440-23-5 | Sodium | UG/L | 4160 J |
| 7440-62-2 | Vanadium | UG/L | ND |
| 7440-66-6 | Zinc | UG/L | 315 |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
ND – Not detected.
$^{(MAX)}$ – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.8
## COMPARISON OF METALS BUTLS TO PHASE I GROUNDWATER RESULTS

| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS<br>VALIDATED GROUNDWATER DATA – PHASE I | | Background Upper Tolerance Limit | UNITS | Maximum Concentration | No. of Exceedances / No. of Samples | Location of Exceedances |
|---|---|---|---|---|---|---|
| s No. | Compound | | | | | |
| 429-90-5 | Aluminum | NS | UG/L | 76900 J | 0/14 | NONE |
| 7440-36-0 | Antimony | ND | UG/L | 67.3 | 4/14 | MW-101S, MW-200S, MW-203S, MW-304S |
| 7440-38-2 | Arsenic | 10 | UG/L | 31.5 | 9/14 | MW-101S, MW-102S, MW-105S, MW-106S, MW-200S, MW-201S, MW-202S, MW-205S, MW-303S |
| 7440-39-3 | Barium | 200 | UG/L | 674 | 11/14 | MW-101S, MW-102S, MW-104S, MW-105S, MW-106S, MW-200S, MW-201S, MW-203S, MW-205S, MW-301S, MW-303S |
| 7440-41-7 | Beryllium | 2 | UG/L | 12.1 | 3/14 | MW-101S, MW-105S, MW-106S |
| 7440-43-9 | Cadmium | 10 | UG/L | 27.2 | 1/14 | MW-101S |
| 7440-70-2 | Calcium | NS | UG/L | 596000 | 0/14 | NONE |
| 7440-47-3 | Chromium | 30 | UG/L | 253 J | 12/14 | MW-101S, MW-102S, MW-104S, MW-105S, MW-106S, MW-200S, MW-201S, MW-202S, MW-203S, MW-205S, MW-301S, MW-303S |
| 7440-48-4 | Cobalt | 10 | UG/L | 89.2 | 8/14 | MW-101S, MW-102S, MW-105S, MW-106S, MW-200S, MW-201S, MW-301S, MW-303S |
| 7440-50-8 | Copper | 90 | UG/L | 748 | 9/14 | MW-101S, MW-102S, MW-104S, MW-105S, MW-106S, MW-200S, MW-201S, MW-205S, MW-301S |
| 7439-89-6 | Iron | NS | UG/L | 211000 | 0/14 | NONE |
| 7439-92-1 | Lead | 100 | UG/L | 190 | 5/14 | MW-101S, MW-105S, MW-106S, MW-200S, MW-201S |
| 7439-95-4 | Magnesium | NS | UG/L | 106000 | 0/14 | NONE |
| 7439-96-5 | Manganese | 1000 | UG/L | 20200 | 13/14 | MW-101S, MW-102S, MW-103S(MAX), MW-104S, MW-105S, MW-106S, MW-200S, MW-201S, MW-202S, MW-203S, MW-205S, MW-301S, MW-303S |
| 7439-97-6 | Mercury | 4 | UG/L | 2 | 0/14 | NONE |
| 40-02-0 | Nickel | 40 | UG/L | 564 | 13/14 | MW-101S, MW-102S, MW-103S(MAX), MW-104S, MW-105S, MW-106S, MW-200S, MW-202S, MW-203S, MW-205S, MW-301S, MW-303S, MW-304S |
| 7440-09-7 | Potassium | NS | UG/L | 14900 | 0/14 | NONE |
| 7440-23-5 | Sodium | NS | UG/L | 19300 | 0/14 | NONE |
| 7440-62-2 | Vanadium | 40 | UG/L | 260 | 8/14 | MW-101S, MW-102S, MW-105S, MW-106S, MW-200S, MW-201S, MW-301S, MW-303S |
| 7440-66-6 | Zinc | 100 | UG/L | 2020 | 11/14 | MW-101S, MW-102S, MW-104S, MW-105S, MW-106S, MW-200S, MW-201S, MW-205S, MW-301S, MW-303S, MW-304S |

# TABLE 4.9

| | | | BACKGROUND SAMPLES | | | DSA-1 | |
|---|---|---|---|---|---|---|---|
| GROUNDWATER DETECTED COMPOUNDS | | SAMPLE ID: | MW-24S | MW-50S | MW-302S | MW-101S | MW-102S |
| | | LAB ID: | 2310602 | 2340008 | 2340002 | 2338504 | 2338506 |
| NIAGARA MOHAWK POWER CORPORATION | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| HARBOR POINT – DREDGE SPOIL AREAS | | SDG: | HPGW2 | HPGW9 | HPGW9 | HPGW8 | HPGW8 |
| PHASE II | | MATRIX: | WATER | WATER | WATER | WATER | WATER |
| | | SAMPLED: | 2/14/95 | 3/23/95 | 3/23/95 | 3/22/95 | 3/22/95 |
| | | VALIDATED: | 5/03/95 | 5/11/95 | 5/11/95 | 6/08/95 | 6/08/95 |
| CAS NO. | COMPOUND | UNITS: | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/L | ND | ND | ND | ND | ND |
| 74-87-3 | Chloromethane | UG/L | ND | ND | ND | ND | ND |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/L | ND | ND | ND | ND | ND |
| 100-41-4 | Ethylbenzene | UG/L | ND | ND | ND | ND | 12 |
| 1330-20-7 | Xylene (total) | UG/L | ND | ND | ND | ND | ND |
| | Total BTEX Volatiles | | ND | ND | ND | ND | 12 |
| | SEMIVOLATILES | | | | | | |
| 86-74-8 | Carbazole | UG/L | ND | ND | ND | ND | ND |
| 106-47-8 | 4-Chloroaniline | UG/L | ND | ND | ND | ND | ND |
| 132-64-9 | Dibenzofuran | UG/L | ND | ND | ND | ND | ND |
| 106-44-5 | 4-Methylphenol | UG/L | ND | ND | ND | ND | ND |
| 99-09-2 | 3-Nitroaniline | UG/L | ND | ND | ND | ND | ND |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/L | ND | ND | ND | ND | ND |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/L | ND | ND | ND | ND | ND |
| 50-32-8 | Benzo(a)pyrene | UG/L | ND | ND | ND | ND | ND |
| 205-99-2 | Benzo(b)fluoranthene | UG/L | ND | ND | ND | ND | ND |
| 207-08-9 | Benzo(k)fluoranthene | UG/L | ND | ND | ND | ND | ND |
| 218-01-9 | Chrysene | UG/L | ND | ND | ND | ND | ND |
| | Total Probable Carcingenic PAHs | | ND | ND | ND | ND | ND |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/L | ND | ND | ND | ND | 3 J |
| 120-12-7 | Anthracene | UG/L | ND | ND | ND | ND | ND |
| 191-24-2 | Benzo(g,h,i)perylene | UG/L | ND | ND | ND | ND | ND |
| 206-44-0 | Fluoranthene | UG/L | ND | ND | ND | ND | ND |
| 86-73-7 | Fluorene | UG/L | ND | ND | ND | ND | ND |
| 91-57-6 | 2-Methylnaphthalene | UG/L | ND | ND | ND | ND | 4 J |
| 91-20-3 | Naphthalene | UG/L | ND | ND | ND | ND | 17 |
| 85-01-8 | Phenanthrene | UG/L | ND | ND | ND | ND | ND |
| 129-00-0 | Pyrene | UG/L | ND | ND | ND | ND | ND |
| | Total PAHs | | ND | ND | ND | ND | 24 |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | UG/L | 831 J | 8250 J | 9620 J | 14600 | 21900 |
| 7440-36-0 | Antimony | UG/L | ND | ND | ND | 64.2 | ND |
| 7440-38-2 | Arsenic | UG/L | ND | 6.1 J | 6 J | 9.4 J | 8.6 J |
| 7440-39-3 | Barium | UG/L | 94.9 J | 213 | 394 | 127 J | 318 |
| 7440-41-7 | Beryllium | UG/L | ND | ND | 2.3 J | ND | ND |
| 7440-43-9 | Cadmium | UG/L | 2.2 J | 5.7 | ND | ND | ND |
| 7440-70-2 | Calcium | UG/L | 118000 | 109000 | 61000 | 517000 | 263000 |
| 7440-47-3 | Chromium | UG/L | 8.4 J | 15.6 | 31.5 | 72 J | 53.5 J |
| 7440-48-4 | Cobalt | UG/L | 7 J | ND | 14.8 J | 8.7 J | 51 |
| 7440-50-8 | Copper | UG/L | 17.4 J | 118 | 142 | 178 | 62.5 |
| 7439-89-6 | Iron | UG/L | 12600 | 21100 | 53400 | 26800 | 92100 |
| 7439-92-1 | Lead | UG/L | 42.1 | 377 | 49.8 | 32.6 J | 36.5 J |
| 7439-95-4 | Magnesium | UG/L | 12000 | 10600 | 12700 | 53500 | 54300 |
| 7439-96-5 | Manganese | UG/L | 363 | 1030 | 2520 | 795 | 7490 |
| 7439-97-6 | Mercury | UG/L | ND | 4 | 0.36 | 0.23 | 0.29 |
| 7440-02-0 | Nickel | UG/L | ND | ND | 37.6 J | 47.6 | 53.3 |
| 7440-09-7 | Potassium | UG/L | 2810 J | 4200 J | ND | 5370 | 3330 J |
| 7440-22-4 | Silver | UG/L | ND | ND | ND | ND | ND |
| 7440-23-5 | Sodium | UG/L | 89200 | 3590 J | 30700 | 9690 | 6520 |
| 7440-62-2 | Vanadium | UG/L | 15.7 J | 24.4 J | 47.6 J | 46.6 J | 69.7 |
| 7440-66-6 | Zinc | UG/L | 25.2 J | 315 J | 90.8 J | 249 J | 168 J |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.9

| GROUNDWATER DETECTED COMPOUNDS | | SAMPLE ID: | MW-103S | MW-104S | MW-105S | MW-106S | MW-107S$^{(MAX)}$ |
|---|---|---|---|---|---|---|---|
| | | | | | DSA-1 | | |
| NIAGARA MOHAWK POWER CORPORATION<br>HARBOR POINT – DREDGE SPOIL AREAS<br>PHASE II | | LAB ID: | 2338507 | 2337301 | 2337302 | 2337303 | 2338501 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | HPGW8 | HPGW8 | HPGW8 | HPGW8 | HPGW8 |
| | | MATRIX: | WATER | WATER | WATER | WATER | WATER |
| | | SAMPLED: | 3/22/95 | 3/21/95 | 3/21/95 | 3/21/95 | 3/22/95 |
| | | VALIDATED: | 6/08/95 | 6/08/95 | 6/08/95 | 6/08/95 | 6/08/95 |
| CAS NO. | COMPOUND | UNITS: | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/L | ND | ND | ND | ND | ND |
| 74-87-3 | Chloromethane | UG/L | ND | ND | ND | ND | ND |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/L | ND | ND | ND | ND | ND |
| 100-41-4 | Ethylbenzene | UG/L | ND | ND | ND | ND | ND |
| 1330-20-7 | Xylene (total) | UG/L | ND | ND | ND | ND | ND |
| | Total BTEX Volatiles | | ND | ND | ND | ND | ND |
| | SEMIVOLATILES | | | | | | |
| 86-74-8 | Carbazole | UG/L | ND | ND | ND | ND | ND |
| 106-47-8 | 4-Chloroaniline | UG/L | R | ND | ND | ND | ND |
| 132-64-9 | Dibenzofuran | UG/L | ND | ND | ND | ND | ND |
| 106-44-5 | 4-Methylphenol | UG/L | ND | ND | ND | ND | ND |
| 99-09-2 | 3-Nitroaniline | UG/L | R | ND | ND | ND | ND |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/L | 2 J | ND | ND | ND | ND |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/L | ND | ND | ND | ND | ND |
| 50-32-8 | Benzo(a)pyrene | UG/L | ND | ND | ND | ND | ND |
| 205-99-2 | Benzo(b)fluoranthene | UG/L | ND | ND | ND | ND | ND |
| 207-08-9 | Benzo(k)fluoranthene | UG/L | ND | ND | ND | ND | ND |
| 218-01-9 | Chrysene | UG/L | ND | ND | ND | ND | ND |
| | Total Probable Carcingenic PAHs | | ND | ND | ND | ND | ND |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/L | ND | ND | ND | ND | ND |
| 120-12-7 | Anthracene | UG/L | ND | ND | ND | ND | ND |
| 191-24-2 | Benzo(g,h,i)perylene | UG/L | ND | ND | ND | ND | ND |
| 206-44-0 | Fluoranthene | UG/L | ND | ND | ND | ND | ND |
| 86-73-7 | Fluorene | UG/L | ND | ND | ND | ND | ND |
| 91-57-6 | 2-Methylnaphthalene | UG/L | ND | ND | ND | ND | ND |
| 91-20-3 | Naphthalene | UG/L | ND | ND | ND | ND | ND |
| 85-01-8 | Phenanthrene | UG/L | ND | ND | ND | ND | ND |
| 129-00-0 | Pyrene | UG/L | ND | ND | ND | ND | ND |
| | Total PAHs | | ND | ND | ND | ND | ND |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | UG/L | 5280 | 3930 | 430 | 3650 | 8560 |
| 7440-36-0 | Antimony | UG/L | ND | ND | ND | ND | 129 J |
| 7440-38-2 | Arsenic | UG/L | 6.6 J | ND | ND | ND | 8.2 J |
| 7440-39-3 | Barium | UG/L | 161 J | 144 J | 53.8 J | 54.7 J | 179 J |
| 7440-41-7 | Beryllium | UG/L | ND | ND | ND | ND | 1 J |
| 7440-43-9 | Cadmium | UG/L | 3.9 J | ND | ND | ND | ND |
| 7440-70-2 | Calcium | UG/L | 224000 | 460000 | 532000 | 406000 | 109000 |
| 7440-47-3 | Chromium | UG/L | 63.1 J | 34.3 | 19.9 | 15.9 | 8 J |
| 7440-48-4 | Cobalt | UG/L | 17.5 J | 13.1 J | ND | ND | ND |
| 7440-50-8 | Copper | UG/L | 93.8 | 51.5 | ND | 34.3 | 18.4 J |
| 7439-89-6 | Iron | UG/L | 43600 | 16600 | 5950 | 10400 | 68200 |
| 7439-92-1 | Lead | UG/L | 9.9 J | 9.2 J | ND | 10.8 J | 29.3 J |
| 7439-95-4 | Magnesium | UG/L | 46400 | 40300 | 54800 | 46700 | 25300 |
| 7439-96-5 | Manganese | UG/L | 2790 | 20300 | 2460 | 518 | 3120 |
| 7439-97-6 | Mercury | UG/L | 0.2 | ND | ND | ND | ND |
| 7440-02-0 | Nickel | UG/L | 47.2 | ND | ND | ND | ND |
| 7440-09-7 | Potassium | UG/L | 2680 J | 3790 J | 1930 J | 2930 J | ND |
| 7440-22-4 | Silver | UG/L | 12.6 J | ND | ND | ND | 21 J |
| 7440-23-5 | Sodium | UG/L | 8610 | 5950 | 19700 | 8730 | 15900 |
| 7440-62-2 | Vanadium | UG/L | 26.4 J | ND | ND | ND | 35.2 J |
| 7440-66-6 | Zinc | UG/L | 39.3 | 50.9 J | 23.6 | 43.5 | 53 J |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
ND – Not detected.
$^{(MAX)}$ – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.9

| GROUNDWATER DETECTED COMPOUNDS | | | DSA-1 | | | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | MW-106S | MW-109S | MW-110S | MW-111S | MW-112S |
| NIAGARA MOHAWK POWER CORPORATION | | LAB ID: | 2337304 | 2337305 | 2337306 | 2337307 | 2337308 |
| HARBOR POINT - DREDGE SPOIL AREAS | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| PHASE II | | SDG: | HPGW8 | HPGW8 | HPGW8 | HPGW8 | HPGW8 |
| | | MATRIX: | WATER | WATER | WATER | WATER | WATER |
| | | SAMPLED: | 3/21/95 | 3/21/95 | 3/21/95 | 3/21/95 | 3/21/95 |
| | | VALIDATED: | 6/08/95 | 6/08/95 | 6/08/95 | 6/08/95 | 6/08/95 |
| CAS NO. | COMPOUND | UNITS: | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/L | 16 J | ND | ND | ND | ND |
| 74-87-3 | Chloromethane | UG/L | 58 | ND | ND | ND | ND |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/L | ND | ND | ND | ND | ND |
| 100-41-4 | Ethylbenzene | UG/L | ND | ND | ND | ND | 27 |
| 1330-20-7 | Xylene (total) | UG/L | ND | ND | ND | ND | 160 |
| | Total BTEX Volatiles | | ND | ND | ND | ND | 187 |
| | SEMIVOLATILES | | | | | | |
| 86-74-8 | Carbazole | UG/L | ND | ND | ND | ND | ND |
| 106-47-8 | 4-Chloroaniline | UG/L | ND | ND | ND | ND | ND |
| 132-64-9 | Dibenzofuran | UG/L | ND | ND | ND | ND | ND |
| 106-44-5 | 4-Methylphenol | UG/L | ND | 1 J | ND | ND | ND |
| 99-09-2 | 3-Nitroaniline | UG/L | ND | ND | ND | ND | ND |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/L | ND | ND | ND | ND | 64 |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/L | ND | ND | ND | ND | ND |
| 50-32-8 | Benzo(a)pyrene | UG/L | ND | ND | ND | ND | ND |
| 205-99-2 | Benzo(b)fluoranthene | UG/L | ND | ND | ND | ND | ND |
| 207-08-9 | Benzo(k)fluoranthene | UG/L | ND | ND | ND | ND | ND |
| 218-01-9 | Chrysene | UG/L | ND | ND | ND | ND | ND |
| | Total Probable Carcingenic PAHs | | ND | ND | ND | ND | ND |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/L | ND | ND | ND | ND | ND |
| 120-12-7 | Anthracene | UG/L | ND | ND | ND | ND | ND |
| 191-24-2 | Benzo(g,h,i)perylene | UG/L | ND | ND | ND | ND | ND |
| 206-44-0 | Fluoranthene | UG/L | ND | ND | ND | ND | ND |
| 86-73-7 | Fluorene | UG/L | ND | ND | ND | ND | ND |
| 91-57-6 | 2-Methylnaphthalene | UG/L | ND | ND | ND | ND | ND |
| 91-20-3 | Naphthalene | UG/L | ND | ND | ND | ND | ND |
| 85-01-8 | Phenanthrene | UG/L | ND | ND | ND | ND | ND |
| 129-00-0 | Pyrene | UG/L | ND | ND | ND | ND | ND |
| | Total PAHs | | ND | ND | ND | ND | ND |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | UG/L | 5440 | 12400 | 12400 | 13400 | 6550 |
| 7440-36-0 | Antimony | UG/L | ND | ND | ND | ND | ND |
| 7440-38-2 | Arsenic | UG/L | ND | ND | 7.4 J | 25 | 5.3 J |
| 7440-39-3 | Barium | UG/L | 144 J | 155 J | 185 J | 387 | 155 J |
| 7440-41-7 | Beryllium | UG/L | ND | ND | ND | ND | ND |
| 7440-43-9 | Cadmium | UG/L | 7.7 J | 3.6 J | 7.8 J | ND | ND |
| 7440-70-2 | Calcium | UG/L | 382000 | 224000 | 290000 | 273000 | 166000 |
| 7440-47-3 | Chromium | UG/L | 8.5 J | 25.4 | 31.8 | 22.5 | 29.6 |
| 7440-48-4 | Cobalt | UG/L | ND | 12.4 J | 12.4 J | 27.6 J | ND |
| 7440-50-8 | Copper | UG/L | 25.7 | 51.5 | 223 | 175 | 307 |
| 7439-89-6 | Iron | UG/L | 17800 | 23700 | 35600 | 80600 | 16200 |
| 7439-92-1 | Lead | UG/L | 20.2 J | 17.8 J | 55.6 J | 93.6 J | 66.6 J |
| 7439-95-4 | Magnesium | UG/L | 40800 | 30700 | 36600 | 45000 | 22900 |
| 7439-96-5 | Manganese | UG/L | 2650 | 1020 | 6230 | 8300 | 1190 |
| 7439-97-6 | Mercury | UG/L | ND | ND | 0.4 | 0.65 | 0.41 |
| 7440-02-0 | Nickel | UG/L | ND | ND | ND | 51.4 | ND |
| 7440-09-7 | Potassium | UG/L | 2880 J | 4270 J | 2030 J | 2240 J | 2030 J |
| 7440-22-4 | Silver | UG/L | ND | ND | ND | ND | ND |
| 7440-23-5 | Sodium | UG/L | 12400 | 5400 | 3890 J | 3300 J | 2440 J |
| 7440-62-2 | Vanadium | UG/L | ND | 27.2 J | 29.4 J | 50.4 | 22.6 J |
| 7440-66-6 | Zinc | UG/L | 66.3 J | 97.9 J | 188 J | 233 J | 213 J |

J - Indicates an estimated value.
D - Indicates a diluted value.
N - Indicates presumptive evidence of a compound.
ND - Not detected.
(MAX) - Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.9

**GROUNDWATER DETECTED COMPOUNDS**

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS
PHASE II

| | | | DSA-2 | | | | |
|---|---|---|---|---|---|---|---|
| | | SAMPLE ID: | MW-200S | MW-201S | MW-202S | MW-203S | MW-204S |
| | | LAB ID: | 2338511 | 2338512 | 2338510 | 2338509 | 2339901 |
| | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| | | SDG: | HPGW8 | HPGW8 | HPGW8 | HPGW8 | HPGW8 |
| | | MATRIX: | WATER | WATER | WATER | WATER | WATER |
| | | SAMPLED: | 3/22/95 | 3/22/95 | 3/22/95 | 3/22/95 | 3/23/95 |
| | | VALIDATED: | 6/08/95 | 6/08/95 | 6/08/95 | 6/08/95 | 6/08/95 |
| CAS NO. | COMPOUND | UNITS: | | | | | |
| | VOLATILES | | | | | | |
| 67-64-1 | Acetone | UG/L | ND | ND | ND | ND | ND |
| 74-87-3 | Chloromethane | UG/L | ND | ND | ND | ND | ND |
| | BTEX VOLATILES | | | | | | |
| 71-43-2 | Benzene | UG/L | ND | ND | ND | ND | 3 J |
| 100-41-4 | Ethylbenzene | UG/L | ND | ND | ND | ND | ND |
| 1330-20-7 | Xylene (total) | UG/L | ND | ND | ND | ND | ND |
| | Total BTEX Volatiles | | ND | ND | ND | ND | 3 |
| | SEMIVOLATILES | | | | | | |
| 86-74-8 | Carbazole | UG/L | ND | 3 J | ND | ND | ND |
| 106-47-8 | 4-Chloroaniline | UG/L | ND | ND | ND | ND | ND |
| 132-64-9 | Dibenzofuran | UG/L | ND | ND | ND | ND | ND |
| 106-44-5 | 4-Methylphenol | UG/L | ND | ND | ND | ND | ND |
| 99-09-2 | 3-Nitroaniline | UG/L | ND | ND | ND | ND | ND |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | UG/L | ND | ND | ND | ND | ND |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56-55-3 | Benzo(a)anthracene | UG/L | ND | ND | ND | ND | 3 J |
| 50-32-8 | Benzo(a)pyrene | UG/L | ND | ND | ND | ND | 4 J |
| 205-99-2 | Benzo(b)fluoranthene | UG/L | ND | ND | ND | ND | 3 J |
| 207-08-9 | Benzo(k)fluoranthene | UG/L | ND | ND | ND | ND | 3 J |
| 218-01-9 | Chrysene | UG/L | ND | ND | ND | ND | 4 J |
| | Total Probable Carcingenic PAHs | | ND | ND | ND | ND | 17 |
| | OTHER PAHs | | | | | | |
| 83-32-9 | Acenaphthene | UG/L | 2 J | 4 J | ND | ND | 4 J |
| 120-12-7 | Anthracene | UG/L | ND | ND | ND | ND | ND |
| 191-24-2 | Benzo(g,h,i)perylene | UG/L | ND | ND | ND | ND | 2 J |
| 206-44-0 | Fluoranthene | UG/L | ND | ND | ND | ND | 4 J |
| 86-73-7 | Fluorene | UG/L | ND | ND | ND | ND | ND |
| 91-57-6 | 2-Methylnaphthalene | UG/L | ND | ND | ND | ND | ND |
| 91-20-3 | Naphthalene | UG/L | ND | ND | ND | ND | ND |
| 85-01-8 | Phenanthrene | UG/L | ND | ND | ND | ND | ND |
| 129-00-0 | Pyrene | UG/L | ND | ND | ND | ND | 4 J |
| | Total PAHs | | 2 | 4 | ND | ND | 31 |
| | INORGANICS | | | | | | |
| 7429-90-5 | Aluminum | UG/L | 10600 | 15500 | 8890 | 3630 | 3820 |
| 7440-36-0 | Antimony | UG/L | ND | ND | ND | ND | ND |
| 7440-38-2 | Arsenic | UG/L | 12.7 | 25.1 | 13.3 | 12.3 | ND |
| 7440-39-3 | Barium | UG/L | 450 | 675 | 225 | 303 | 886 |
| 7440-41-7 | Beryllium | UG/L | ND | ND | ND | ND | ND |
| 7440-43-9 | Cadmium | UG/L | 3.5 J | 3.4 J | ND | 2.8 J | ND |
| 7440-70-2 | Calcium | UG/L | 392000 | 628000 | 305000 | 346000 | 489000 |
| 7440-47-3 | Chromium | UG/L | 76.4 J | 97.6 J | 140 J | 75.4 J | 63 J |
| 7440-48-4 | Cobalt | UG/L | 16 J | 33.5 J | 13.1 J | 17.5 J | 16 J |
| 7440-50-8 | Copper | UG/L | 217 | 476 | 62.5 | 46 | 246 |
| 7439-89-6 | Iron | UG/L | 111000 | 222000 | 53300 | 175000 | 69700 |
| 7439-92-1 | Lead | UG/L | 103 J | 103 J | 21.7 J | 9.6 J | 68 J |
| 7439-95-4 | Magnesium | UG/L | 43400 | 63100 | 39500 | 42300 | 44300 |
| 7439-96-5 | Manganese | UG/L | 5970 | 14700 | 6650 | 12000 | 7300 |
| 7439-97-6 | Mercury | UG/L | 0.35 | 0.61 | ND | ND | 3.3 |
| 7440-02-0 | Nickel | UG/L | 28.1 J | 71.7 | 80.8 | 59 | ND |
| 7440-09-7 | Potassium | UG/L | 5840 | 5950 | 3730 J | 1810 J | 8750 J |
| 7440-22-4 | Silver | UG/L | ND | ND | ND | ND | ND |
| 7440-23-5 | Sodium | UG/L | 6350 | 14400 | 45200 | 10200 | 5220 |
| 7440-62-2 | Vanadium | UG/L | 41.3 J | 72.7 | 26.3 J | 54.1 | 24.5 J |
| 7440-66-6 | Zinc | UG/L | 310 J | 526 J | 147 J | 45 | 158 J |

J – Indicates an estimated value.
D – Indicates a diluted value.
N – Indicates presumptive evidence of a compound.
ND – Not detected.
(MAX) – Indicates a duplicate sample was taken and the higher concentration has been reported.
Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.9

| | | | DSA-2 | | DSA-3 | | |
|---|---|---|---|---|---|---|---|
| GROUNDWATER DETECTED COMPOUNDS | | SAMPLE ID: | MW-205S | MW-206S | MW-301S | MW-303S | MW-304S$^{(MAX)}$ |
| | | LAB ID: | 2339902 | 2338508 | 2340001 | 2340003 | 2340005 |
| NIAGARA MOHAWK POWER CORPORATION | | SOURCE: | NYTEST | NYTEST | NYTEST | NYTEST | NYTEST |
| HARBOR POINT – DREDGE SPOIL AREAS | | SDG: | HPGW8 | HPGW8 | HPGW9 | HPGW9 | HPGW9 |
| PHASE II | | MATRIX: | WATER | WATER | WATER | WATER | WATER |
| | | SAMPLED: | 3/23/95 | 3/22/95 | 3/23/95 | 3/23/95 | 3/23/95 |
| | | VALIDATED: | 6/08/95 | 6/08/95 | 5/11/95 | 5/11/95 | 5/11/95 |
| CAS NO. | COMPOUND | UNITS: | | | | | |
| | VOLATILES | | | | | | |
| 67–64–1 | Acetone | UG/L | ND | ND | ND | ND | ND |
| 74–87–3 | Chloromethane | UG/L | ND | ND | ND | ND | ND |
| | BTEX VOLATILES | | | | | | |
| 71–43–2 | Benzene | UG/L | ND | ND | 5 J | ND | ND |
| 100–41–4 | Ethylbenzene | UG/L | ND | ND | 2 J | ND | ND |
| 1330–20–7 | Xylene (total) | UG/L | ND | ND | 2 J | ND | ND |
| | Total BTEX Volatiles | | ND | ND | 9 | ND | ND |
| | SEMIVOLATILES | | | | | | |
| 86–74–8 | Carbazole | UG/L | ND | ND | 5 J | ND | ND |
| 106–47–8 | 4–Chloroaniline | UG/L | ND | ND | ND | ND | ND |
| 132–64–9 | Dibenzofuran | UG/L | ND | ND | 8 J | ND | ND |
| 106–44–5 | 4–Methylphenol | UG/L | ND | ND | ND | ND | ND |
| 99–09–2 | 3–Nitroaniline | UG/L | ND | ND | ND | ND | ND |
| 117–81–7 | bis(2–Ethylhexyl)phthalate | UG/L | ND | ND | ND | ND | ND |
| | PROBABLE CARCINOGENIC PAHs | | | | | | |
| 56–55–3 | Benzo(a)anthracene | UG/L | ND | ND | ND | ND | ND |
| 50–32–8 | Benzo(a)pyrene | UG/L | ND | ND | ND | ND | ND |
| 205–99–2 | Benzo(b)fluoranthene | UG/L | ND | ND | ND | ND | ND |
| 207–08–9 | Benzo(k)fluoranthene | UG/L | ND | ND | ND | ND | ND |
| 218–01–9 | Chrysene | UG/L | ND | ND | ND | ND | ND |
| | Total Probable Carcingenic PAHs | | ND | ND | ND | ND | ND |
| | OTHER PAHs | | | | | | |
| 83–32–9 | Acenaphthene | UG/L | ND | ND | 12 | ND | ND |
| 120–12–7 | Anthracene | UG/L | ND | ND | 2 J | ND | ND |
| 191–24–2 | Benzo(g,h,i)perylene | UG/L | ND | ND | ND | ND | ND |
| 206–44–0 | Fluoranthene | UG/L | ND | ND | 3 J | ND | ND |
| 86–73–7 | Fluorene | UG/L | ND | ND | 11 | ND | ND |
| 91–57–6 | 2–Methylnaphthalene | UG/L | ND | ND | 18 | ND | ND |
| 91–20–3 | Naphthalene | UG/L | 1 J | ND | 11 | ND | ND |
| 85–01–8 | Phenanthrene | UG/L | ND | ND | 11 | ND | ND |
| 129–00–0 | Pyrene | UG/L | ND | ND | 2 J | ND | ND |
| | Total PAHs | | 1 | ND | 70 | ND | ND |
| | INORGANICS | | | | | | |
| 7429–90–5 | Aluminum | UG/L | 4490 | 12700 | 6020 J | 4050 J | 4940 J |
| 7440–36–0 | Antimony | UG/L | ND | ND | ND | ND | 51.4 J |
| 7440–38–2 | Arsenic | UG/L | 12 | 14.1 | ND | ND | ND |
| 7440–39–3 | Barium | UG/L | 389 | 166 J | 421 | 89.7 J | 66.8 J |
| 7440–41–7 | Beryllium | UG/L | ND | ND | ND | ND | ND |
| 7440–43–9 | Cadmium | UG/L | 6 J | 10.1 | ND | ND | ND |
| 7440–70–2 | Calcium | UG/L | 368000 | 310000 | 496000 | 101000 | 25900 |
| 7440–47–3 | Chromium | UG/L | 53.2 J | 170 J | 83.6 | 30.4 | 19.4 |
| 7440–48–4 | Cobalt | UG/L | 20.4 J | 14.5 J | 11.4 J | ND | ND |
| 7440–50–8 | Copper | UG/L | 160 | 974 | 363 | 37.1 | 17 J |
| 7439–89–6 | Iron | UG/L | 84700 | 40500 | 100000 | 11700 | 15600 |
| 7439–92–1 | Lead | UG/L | 54.1 J | 108 J | 55.3 | 9.3 | 9.2 |
| 7439–95–4 | Magnesium | UG/L | 46900 | 30600 | 72300 | 22700 | 6980 |
| 7439–96–5 | Manganese | UG/L | 3690 | 1580 | 5520 | 8010 | 562 |
| 7439–97–6 | Mercury | UG/L | 0.35 | 0.74 | 0.86 | ND | ND |
| 7440–02–0 | Nickel | UG/L | 39.6 J | 36.3 J | ND | ND | 41.8 |
| 7440–09–7 | Potassium | UG/L | 9220 J | 2860 J | 9980 | ND | 2350 J |
| 7440–22–4 | Silver | UG/L | ND | ND | ND | ND | ND |
| 7440–23–5 | Sodium | UG/L | 5500 | 6040 | 9130 | 4800 J | 4270 J |
| 7440–62–2 | Vanadium | UG/L | 31.5 J | 27.2 J | 35.3 J | 10.2 J | 12.3 J |
| 7440–66–6 | Zinc | UG/L | 178 J | 488 J | 215 J | 35.3 J | 970 J |

J – Indicates an estimated value.

D – Indicates a diluted value.

N – Indicates presumptive evidence of a compound.

ND – Not detected.

$^{(MAX)}$ – Indicates a duplicate sample was taken and the higher concentration has been reported.

Note: Total PAHs include Carcinogenic PAHs.

# TABLE 4.10
## COMPARISON OF METALS BUTLS TO PHASE II GROUNDWATER RESULTS

NIAGARA MOHAWK POWER CORPORATION
HARBOR POINT – DREDGE SPOIL AREAS
VALIDATED GROUNDWATER DATA – PHASE II

| Cas No. | Compound | Background Upper Tolerance Limit | UNITS: | Maximum Concentration | No. of Exceedances / No. of Samples | Location of Exceedances |
|---|---|---|---|---|---|---|
| 7429–90–5 | Aluminum | NS | UG/L | 21900 | 0/22 | NONE |
| 7440–36–0 | Antimony | ND | UG/L | 129 J | 3/22 | MW–101S, MW–107S$^{(MAX)}$, MW–304S$^{(MAX)}$ |
| 7440–38–2 | Arsenic | 10 | UG/L | 25.1 | 7/22 | MW–111S, MW–200S, MW–201S, MW–202S, MW–203S, MW–205S, MW–206S |
| 7440–39–3 | Barium | 200 | UG/L | 886 | 9/22 | MW–102S, MW–111S, MW–200S, MW–201S, MW–202S, MW–203S, MW–204S, MW–205S, MW–301S. |
| 7440–41–7 | Beryllium | 2 | UG/L | 1 J | 0/22 | NONE |
| 7440–43–9 | Cadmium | 10 | UG/L | 10.1 | 1/22 | MW–206S |
| 7440–70–2 | Calcium | NS | UG/L | 628000 | 0/22 | NONE |
| 7440–47–3 | Chromium | 30 | UG/L | 170 J | 14/22 | MW–101S, MW–102S, MW–103S, MW–104S, MW–110S, MW–200S, MW–201S, MW–202S, MW–203S, MW–204S, MW–205S, MW–206S, MW–301S, MW–303S |
| 7440–48–4 | Cobalt | 10 | UG/L | 51 | 14/22 | MW–102S, MW–103S, MW–104S, MW–109S, MW–110S, MW–111S, MW–200S, MW–201S, MW–202S, MW–203S, MW–204S, MW–205S, MW–206S, MW–301S |
| 7440–50–8 | Copper | 90 | UG/L | 974 | 11/22 | MW–101S, MW–103S, MW–110S, MW–111S, MW–112S, MW–200S, MW–201S, MW–204S, MW–205S, MW–206S, MW–301S |
| 7439–89–6 | Iron | NS | UG/L | 222000 | 0/22 | NONE |
| 7439–92–1 | Lead | 100 | UG/L | 108 J | 3/22 | MW–200S, MW–201S, MW–206S |
| 7439–95–4 | Magnesium | NS | UG/L | 72300 | 0/22 | NONE |
| 7439–96–5 | Manganese | 1000 | UG/L | 20300 | 19/22 | MW–102S, MW–103S, MW–104S, MW–105S, MW–107S$^{(MAX)}$, MW–108S, MW–109S MW–110S, MW–111S, MW–112S, MW–200S, MW–201S, MW–202S, MW–203S, MW–204S, MW–205S, MW–206S, MW–301S, MW–303S |
| 7439–97–6 | Mercury | 4 | UG/L | 3.3 | 0/22 | NONE |
| 7440–02–0 | Nickel | 40 | UG/L | 80.8 | 8/22 | MW–101S, MW–102S, MW–103S, MW–111S, MW–201S, MW–202S, MW–203S, MW–304S$^{(MAX)}$ |
| 7440–09–7 | Potassium | NS | UG/L | 9980 | 0/22 | NONE |
| 7440–22–4 | Silver | NS | UG/L | 21 J | 0/22 | NONE |
| 7440–23–5 | Sodium | NS | UG/L | 45200 | 0/22 | NONE |
| 7440–62–2 | Vanadium | 40 | UG/L | 72.7 | 6/22 | MW–101S, MW–102S, MW–111S, MW–200S, MW–201S, MW–203S |
| 7440–66–6 | Zinc | 100 | UG/L | 970 J | 13/22 | MW–101S, MW–102S, MW–110S, MW–111S, MW–112S, MW–200S, MW–201S, MW–202S, MW–204S, MW–205S, MW–206S, MW–301S, MW–304S$^{(MAX)}$ |

# SECTION 5

# CONTAMINANT FATE AND TRANSPORT

The purpose of this section is to: (1) identify pathways through which contaminants detected in the various environmental media may be transported, and; (2) estimate the potential for migration of these compounds away from the source area(s). Potential risks to human health and the environment, potential routes of exposure, and potential receptors are discussed in Section 6.1, the Baseline Risk Assessment.

The environmental pathways evaluated as potential routes of migration include air, groundwater, surface water, and soil/sediment. Chemical compounds of concern for various routes were selected based on historical investigations, results of analytical sampling conducted during the RI, and results of the human health risk assessment. The fate and transport discussion is limited primarily to the soil and groundwater routes, because these pose the greatest potential for migration and potential exposure by detected compounds. The primary compounds or compound groups of concern for these routes are listed below:

(1) Groundwater
   - BTEX
   - PAHs

(2) Surficial and subsurface soils
   - BTEX
   - PAHs
   - PCBs
   - metals: arsenic, beryllium, manganese

## 5.1 POTENTIAL ROUTES OF MIGRATION

The potential migration pathways presented in the 1993 Work Plan (BB&L, 1993c) were modified based on new data obtained during the DSA RI. These potential pathways are evaluated below. Their importance as migration pathways is discussed relative to site conditions and features observed during the RI field operations.

### 5.1.1 Air Route

Migration of site-related volatile contaminants via the air route could occur through volatilization at or near the soil surface. This process could be enhanced by low barometric pressure, high winds and high temperatures. However, background air monitoring during all aspects of the field work with a photoionization detector and colorimetric tubes did not indicate the presence of VOCs in the breathing zone above action levels specified in the Project Health & Safety Plan on any part of the three DSAs.

Transport of particulate matter (i.e., wind-born dust) has a very low potential to occur because essentially all of the DSAs are vegetated except for gravel access roads. In addition, the water table is at or near the surface in many areas, which further minimizes the production of air-borne dust emissions. Therefore, the air route does not appear to be a significant route of contaminant migration.

### 5.1.2 Groundwater Route

Shallow, unconfined groundwater flow in DSA-1 is generally radially outward from the center. The nearest discharge areas are the adjacent Utica Harbor and Barge Canal to the west and Erie Canal to the east.

Shallow, unconfined groundwater flow at DSA-2 is radial to the nearest surface water body. The primary discharge area for DSA-2 is expected to be the Mohawk River on the southwest boundary of the site. Minimal discharge is expected into the Erie Canal on the northeast boundary because the canal has a clay lining.

Groundwater flow at DSA-3 is also radially outward from the center, particularly in the northern section. Flow directions are primarily easterly to the Mohawk River, with a component of flow to the west, discharging to the Utica Marsh. The southern half of DSA-3 holds ponded water, which probably provides a source of recharge to the shallow water table. Groundwater flow from the southern half of DSA-3 is more difficult to define because of the ponded water, but is also expected to discharge to both the Utica Marsh and the Mohawk River based on surface topography and water level elevations.

### 5.1.3 Surface Water and Sediment Route

The most significant perennial surface water features in the vicinity of the DSAs are the Utica Harbor, Barge Canal, and Mohawk River. As mentioned, shallow groundwater from the DSAs ultimately discharges to the harbor, the canal, or the river. Chemical constituents dissolved in groundwater could reach these water bodies via the shallow and intermediate groundwater flow systems. However, results of the RI groundwater sampling at the DSAs indicate concentrations of organic compounds are generally very low. In addition, previous surface water sampling results by AES (AES, 1993) in the New York State Barge Canal adjacent to the Utica Harbor, and in the Mohawk River indicate that no organic compounds were detected. A single surface water sample collected from the Mohawk River during the DSA RI (SW-205) indicated the lack of organic compounds in the river.

Overland runoff, which would carry suspended sediments, is expected to be minimal because the DSAs are well vegetated, and the water table is shallow or approaching the surface. Also, DSA-1 and DSA-3 are enclosed by berms, which minimizes the release of surface water from within the site boundaries.

A drainage ditch runs through the middle of the DSA-1 peninsula (outside of the northwestern berm), and terminates in the Barge Canal. Although there is some potential for transport of surface water and sediment in the ditch during precipitation events and snow melt events, it is expected to be minimal, since gradient of the ditch is small, and the site is well-vegetated. These factors will minimize the generation and transport of sediment-laden runoff.

Depressions also exist on the interior boundaries of the berms which collect and hold surface water. However, these were not observed to be hydraulically connected to the river, harbor, or canal.

Two drainage ditches with small gradients are present at the northwestern and southeastern ends of DSA-2. These ditches have some potential to transport surface water and sediment during rain events from parts of DSA-2 to the Mohawk River, where they terminate. However, because of the nearly complete vegetative cover, sediment-laden runoff will be minimized.

At DSA-3, an area of ponded water exists south of the central dividing berm. However, this area is completely enclosed on all four sides by berms ranging in height from 10 to 15 feet. The only apparent means for water to exit this enclosed area is by evapotranspiration and groundwater discharge beneath the berms.

### 5.1.4 Soil Route

As mentioned above, migration of surface soils and sediments from the site via runoff is limited by the presence of berms, and the heavy vegetative cover. In subsurface soils, the unsaturated zone does provide a path for vertical downward movement via percolation. For certain compounds that are relatively mobile in soils, water derived from recharge events will transport the dissolved or suspended constituents vertically downward to the water table surface.

## 5.2 CONTAMINANT PERSISTENCE

### 5.2.1 BTEX

Petroleum hydrocarbons detected in soils and groundwater at the site include the common constituents of fuel products and MGP residues: benzene, toluene, ethylbenzene, and xylenes. These compounds are relatively mobile and non-persistent in many shallow soil environments, but tend to be more persistent in deeper soils and groundwater. BTEX compounds tend to volatilize relatively rapidly from surface soil and surface water. Half-lives in soil range on the order of several days to several weeks. Persistence in groundwater tends to be much longer, with half-lives ranging from several days to two years (Howard, 1990).

Organic carbon partition coefficients are relatively low, indicating limited ability to sorb to soils, and a preference to partition to groundwater. Once in the groundwater system, biodegradation of BTEX (and other hydrocarbons and related organic compounds) can be significant and rapid in the presence of oxygen (Borden and Bedient, 1986).

BTEX was present in DSA subsurface soils in concentrations ranging from not detected to greater than 180 mg/kg (SB-104 at DSA-1). These results indicate that in spite of the relatively low partitioning coefficients, significant concentrations still remain in some site soils, particularly at DSA-1. Limited leaching (partitioning) to groundwater is occurring, however. This is demonstrated by the presence of BTEX in shallow groundwater during the two rounds of RI sampling at the DSAs conducted in November 1994 and March 1995. At DSA-1, where BTEX was most prevalent, BTEX concentrations in shallow groundwater ranged from not detected to 151 ug/L during the November 1994 sampling event.

### 5.2.2 PAHs

PAHs were detected in soil and groundwater at the DSAs. Because the physical and chemical properties of these compounds vary substantially depending on the specific compound in question, the fate and transport characteristics also vary. Some fate characteristics, though, are roughly correlated with molecular weight. Low molecular weight aromatic organic compounds (such as PAHs and phenols) degrade more rapidly and may migrate more easily than higher molecular weight compounds in the same compound class. The compounds detected during the RI can be grouped by molecular weight as follows (ATSDR, 1990):

- Low molecular weight: acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, 2-methylnaphthalene, and phenanthrene;
- Medium molecular weight: fluoranthene and pyrene; and
- High molecular weight: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene.

Potential mobility of PAHs in soil is related to the organic carbon partition coefficient ($K_{oc}$). The low molecular weight PAHs have $K_{oc}$ values in the range of $10^3$ to $10^4$ ml/g, which indicates a moderate potential to be adsorbed to organic material. Medium and higher molecular weight compounds with larger $K_{oc}$ values ($10^4$ to $10^6$ ml/g) have a much greater tendency to adsorb and resist movement through soil. Volatilization of the lower molecular weight compounds from shallow soils may occur similar to VOCs. However, some PAHs in soil may be transported to groundwater, and then move laterally in the aquifer, depending on soil/water conditions.

The tendency of medium and higher molecular weight PAHs to adsorb to soils is indicated by the relationship between soil and groundwater analytical results at the DSAs. PAHs from all molecular weight classes (low, medium, and high) were detected in soil samples at each of the DSAs. However, in groundwater, the PAHs detected most frequently and in the highest concentrations were of the low molecular weight class, such as naphthalene and 2-methylnaphthalene. As an example, naphthalene and 2-methylnaphthalene were detected at concentrations of 350 ug/L and 86 ug/L, respectively in MW-101S (August 1994) at DSA-1. This represented 81% of the total PAH concentration of 535 ug/L in this monitoring well.

These two compounds have the lowest molecular weights of all the PAHs. The water solubility of naphthalene (and 2-methylnaphthalene) are higher and the $K_{oc}$ values are consequently lower than many of the PAHs. They are significantly less soluble (less mobile) than the monocyclic aromatics, such as benzene (Gherini et al, 1988). In groundwater and soils, aerobic biodegradation of naphthalene can occur, but the rate varies significantly depending on availability of dissolved oxygen and the concentration of microorganisms.

### 5.2.3 PCBs

As a class of compounds, polychlorinated biphenyls exhibit a tendency to sorb strongly to soils and suspended solids/sediments in waters. This is indicated by their moderate to high $K_{oc}$ values ranging from $10^3$ to $10^6$ ml/g. PCB releases to the environment are expected to show very limited mobility and present only a slight danger of leaching to unprotected groundwaters. This expectation is supported by the complete absence of PCBs in groundwater at all three DSA sites, where PCBs are present in both surface and subsurface soils. PCBs are present in surface soils in concentrations ranging from not detected to 7 mg/kg, and subsurface soils from not detected to 20.1 mg/kg in SB-204E. No PCBs were detected in any groundwater samples during either of the RI sampling events (August 1994 or March 1995).

Generally, the PCBs having a higher chlorine content exhibit greater persistence in the environment than do PCBs with lower chlorine content. Aroclor 1254, having the second highest chlorine content of the seven common Aroclors, was most frequently detected and had the highest concentrations.

There is a wide distribution of a variety of microorganisms capable of degrading PCBs, mainly through dechlorination actions. The degradation rate/action of these microorganisms is lowered, however, as the number of chlorine ion substitutions on the biphenyl parent compound increases. In addition, biodegradation rates are slowed by the sorptive tendency of PCBs, low ambient temperatures, low moisture content, extremes in pH, and available oxygen content (with little or no biodegradation observed under anaerobic conditions).

The number of chlorine ion substitutions also affects volatilization and photoionization rates; as chlorine ion substitutions increase, so do these rates. PCBs volatilized to the atmosphere undergo two major modes of degradation: reaction with hydroxyl radicals and/or reaction with ozone. Reaction with hydroxyl radicals (resulting in substitution of $OH^-$ for $Cl^-$ on the biphenyl parent compounds) is the more important of these two processes.

Hydrolysis and/or oxidative reactions are not considered to be important fate processes for PCBs. Bioconcentration of PCBs in aquatic organisms is expected to be an important process for all PCBs, and tends to increase as the chlorine content increases.

### 5.2.4 Metals

Three metals of concern, arsenic, beryllium and manganese, were detected at levels which posed a potential human health risk in surficial and subsurface soils. Groundwater is not currently used on the site and is not a completed pathway for future receptors due the proposed restriction of land use to non-residential (see Section 6.1 for details). Of these three metals, beryllium and manganese have been shown not to be associated with MGP residuals (EEI, 1984).

Arsenic, determined to be of potential human health concern only in soils, was detected above statistical background levels (BUTLs) in five of 37 surface soil samples, and only one of 34 subsurface samples. In groundwater, it was detected above BUTLs in nine of 14 Phase I groundwater samples, and seven of 22 Phase II groundwater samples.

Elemental arsenic is extremely persistent in both water and soil. Environmental fate processes can transform one arsenic compound to another; however, arsenic itself is not degraded. Soluble forms of arsenic tend to be quite mobile in water, while less soluble species adsorb to clay or soil particles. Microorganisms in soils, sediments, and water can reduce and methylate arsenic to yield methyl arsines, which volatilize and enter the atmosphere. These forms then undergo oxidation to become methyl arsonic acids and are ultimately transformed back to inorganic arsenic (ATSDR, 1991a).

Beryllium, although determined to be of potential concern in soils based on the human health risk assessment, had a limited occurrence on the site. It was detected above the BUTL in three of 14 Phase I groundwater samples and none of 22 Phase II groundwater samples. It was detected slightly above BUTLs in four of 37 surface soil samples, and slightly above BUTLs in two of 34 subsurface samples. Due to its limited distribution in soils and groundwater, and its low concentrations in groundwater (maximum of 12 ug/L during Phase I sampling), beryllium's fate and transport characteristics are of little significance in light of the low concentrations detected. Beryllium will not be considered further in relation to fate and transport characteristics.

Manganese was the most prevalent metal of potential concern detected above BUTLs in groundwater and soils. It was detected above BUTLs in 13 of 14 Phase I groundwater samples, and 19 of 22 Phase II groundwater samples, 21 of 37 surface soil samples and 20 of 34 subsurface soil samples. As previously mentioned, groundwater is not currently used at the site and is not a completed pathway for future receptors.

Its occurrence in groundwater is not unexpected since manganese-containing minerals are ubiquitous in natural groundwater systems. Its distribution in groundwater may be attributable to oxygen-depleting (reducing) conditions in groundwater. Under oxidizing conditions, manganese tends to precipitate out of solution (Stumm and Morgan, 1970).

Environmental fate processes can transform one manganese compound to another, but manganese itself is not degraded. In water, manganese exists in any of four oxidation states (+2, +3, +4, or +7). Mn(+2) is predominant in most waters, and usually combines with carbonate to form a compound of low solubility. In extremely reduced water, poorly soluble sulfides are formed.

Adsorption of manganese to soils is highly variable, increasing with higher organic content and anion-exchange capacity. At low concentrations, manganese can be "fixed" by clays, and will not be readily released into solution. At higher concentrations, desorption by ion exchange can occur (ATSDR, 1990).

## 5.3 CONTAMINANT MIGRATION

Of the four major migration routes mentioned in Section 5.1 (air, groundwater, surface water/sediment, and soil), the groundwater route is the primary means by which detected compounds will be transported beyond their present boundaries.

Minimal transport of sediments is expected to occur in the drainage ditches present at DSA-1 and DSA-2. As mentioned in Section 5.1, the shallow water table, heavy vegetation cover, and presence of 10 to 15 feet high berms, are all factors which minimize the potential for offsite transport through the air, surface water/sediment, and soil pathways. Thus, this section will focus on the groundwater route, and the distribution of the primary constituents detected in groundwater.

Chemical constituents in soils at depths greater than two feet below ground surface (BGS) have limited ability to migrate by resedimentation or soil movement. Subsurface soils deeper than two feet BGS do act as an indirect route for migration by: (1) adsorbing certain compounds, and; (2) serving as a contaminant source to water infiltrating through the vadose (unsaturated) zone to the water table. As presented in Section 5.2, certain compounds exhibit a preference towards adsorption to soils or leaching to groundwater. Those that leach to groundwater will then move coincident with prevailing groundwater flow paths, both horizontally and vertically through the groundwater system.

### 5.3.1 Groundwater Velocity

As described in Section 3.5.2, shallow groundwater at each DSA is expected to discharge to either the Utica Harbor, Barge Canal, or Mohawk River.

The average linear groundwater velocities from the center of each DSA to the adjacent surface water bodies were calculated using Darcy's law as follows:

$$V = \frac{K \times i}{n_e}$$

where: $K$ = hydraulic conductivity (ft/d);
$i$ = hydraulic gradient ft/ft; and
$n_e$ = effective porosity (%)

Results of the calculations are shown below, assuming an effective porosity of 15%. Geometric mean hydraulic conductivities (K) for each DSA were calculated using results from slug tests (Table 3.3)

**Velocity Calculations**

| Area | i | K | V (ft/d) | V (ft/yr) | Flow path |
|---|---|---|---|---|---|
| DSA-1 | 0.027 | 0.69 | 0.12 | 44.8 | site interior to river |
| DSA-1 | 0.020 | 0.69 | 0.09 | 33.6 | site interior to harbor |
| DSA-2 | 0.067 | 2.02 | 0.90 | 327.0 | site interior to river |
| DSA-3 | 0.013 | 0.70 | 0.06 | 21.3 | site interior to river |

It can be seen from the calculations that groundwater velocities range from 21 to greater than 300 ft/yr. Velocities are one order of magnitude greater at DSA-2 than DSAs 1 and 3 as a result of steeper gradients and higher hydraulic conductivities.

### 5.3.2 Organic Compound Migration Potential

The primary organic compounds detected in groundwater during the DSA RI were PAHs and BTEX. Most organic compounds will move more slowly than the average linear groundwater velocities shown above. The mobility of organic compounds is related to the degree to which they adsorb to the soil, and in particular to any organic carbon in the soil. Soil with a high TOC content more readily adsorbs organic compounds than soils with a low TOC. Organic compounds with a large organic carbon partitioning coefficient ($K_{oc}$) will more readily adsorb to soils. Thus, the movement of the organic compounds relative to the movement of groundwater will be slowed.

The reduction in organic compound velocity is due to retardation processes such as adsorption. Retardation by partitioning to soil is supported by the measured TOC content of uncontaminated Harbor Point soils. The mean TOC concentration of nine "clean" DSA soil samples containing little to no TCL organic compounds (PAHs, BTEX, etc.) was 4.9%.

Aerobic biodegradation also occurs to some extent, particularly in shallow groundwater. This process further reduces the movement of solute fronts by reducing chemical mass and therefore concentrations. The physical process of mechanical dispersion also tends to spread and dilute solute concentrations with increasing distance from any given source area.

**DSA-1**

PAHs were detected in four DSA interior wells at concentrations up to 535 ug/L, but were not detected in perimeter wells adjacent to the river and harbor/canal. This distribution indicates that no discharge of PAHs to surface water is occurring.

BTEX was detected in five wells ranging from 12 to 187 ug/L. The presence of BTEX in MW-112S, 100 feet from the Mohawk River, indicates the potential exists for migration to the river.

**DSA-2**

PAHs were detected in four wells at very low concentrations ranging from 1 to 40 ug/L. The individual PAHs detected were either equal to the detection limits or estimated at concentrations less than the detection limit. The potential for migration of PAHs to the river is therefore minimal. SW-205, a surface water sample collected from the river adjacent to DSA-2, contained no PAHs.

There is very low potential for the migration of BTEX from DSA-2 to the river, based on analytical results. Only a single well, MW-204S located 80 feet from the river, contained BTEX at a concentration of 3 ug/L, estimated below the detection limits.

**DSA-3**

PAHs were detected at MW-301S inside the berm at concentrations varying from 70 to 262 ug/L between the two sampling rounds. However, no PAHs were detected in the three wells outside the berm, indicating that no migration of PAHs to the river or the Utica Marsh is occurring.

BTEX was detected at a maximum concentration of 9 ug/L in MW-301S inside the berm. Individual compounds were detected at estimated concentrations at or below the detection limits. No BTEX was detected in wells outside the berm. Thus, no migration of BTEX to the Mohawk River or Utica Marsh is occurring.

### 5.3.3 Inorganic Compounds

Adsorption of metals in soils, sediments, and groundwater is a complex process. Metal ions exist as charged species which can form soluble complexes both with organic and inorganic ligands (anions or molecules with which it forms a coordination compound) (Allen and others, ed., 1993). The groundwater pathway is not complete based on the human health risk assessment. Thus, potential migration of individual metals is not discussed further in this section. A detailed discussion of fate and transport characteristics of arsenic, beryllium, and manganese was provided in Section 5.2.4.

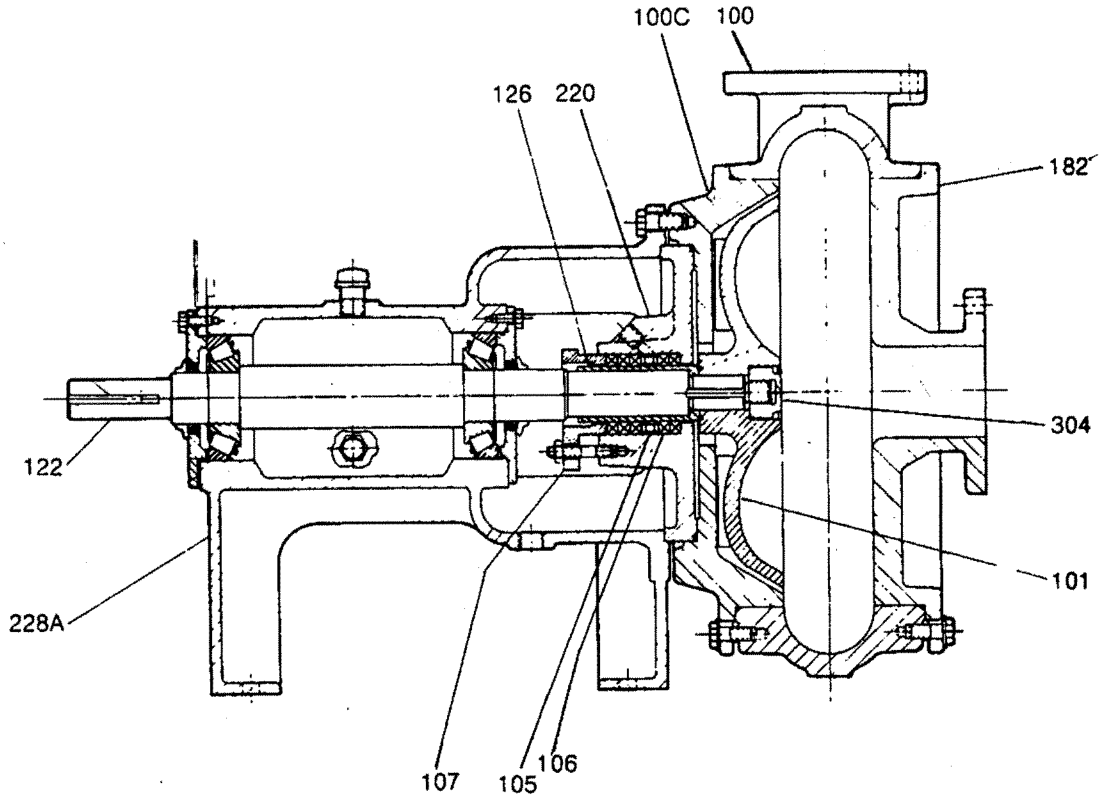
### 5.3.4 Fate and Transport Summary

The groundwater route was determined to be the primary means by which detected compounds could migrate beyond their present boundaries. The data distributions indicate that there is minimal potential for migration of organic compounds (PAHs and BTEX) from the DSAs to adjacent surface water bodies. Concentrations of PAHs and BTEX in groundwater were low, and in many cases were equal to or less than detection limits.

A comparison of the groundwater and soil concentrations indicates that adsorption to the soil matrix is inhibiting leaching of organic compounds to groundwater. The occurrence of adsorption is further supported by the measured mean TOC content of 4.9% in "clean" DSA soil samples. As mentioned above, other processes, such as aerobic biodegradation and dispersion also occur, resulting in reduced groundwater concentrations.

# TYPE CT Construction Details and Materials
# CUP TYPE RECESSED IMPELLER PUMPS

## SECTIONAL VIEW



## PARTS LIST

| Part No. | Part Name | Material |
|---|---|---|
| 100 | Casing | HC600 |
| 100C | Impeller Wearplate | HC600 |
| 101 | Impeller | HC600 |
| 105 | Lantern Ring | Teflon |
| 106 | Packing | Lubricated Graphite |
| 107 | Gland | 316SS |
| 122 | Shaft | 1045 Steel |
| 126 | Shaft Sleeve | 420SS |
| 182 | Suction Cover | HC600 |
| 220 | Stuffing Box | Cast Iron |
| 228A | Frame, Bearing | Cast Iron |
| 304 | Impeller Nut | 316SS |

## MATERIALS OF CONSTRUCTION

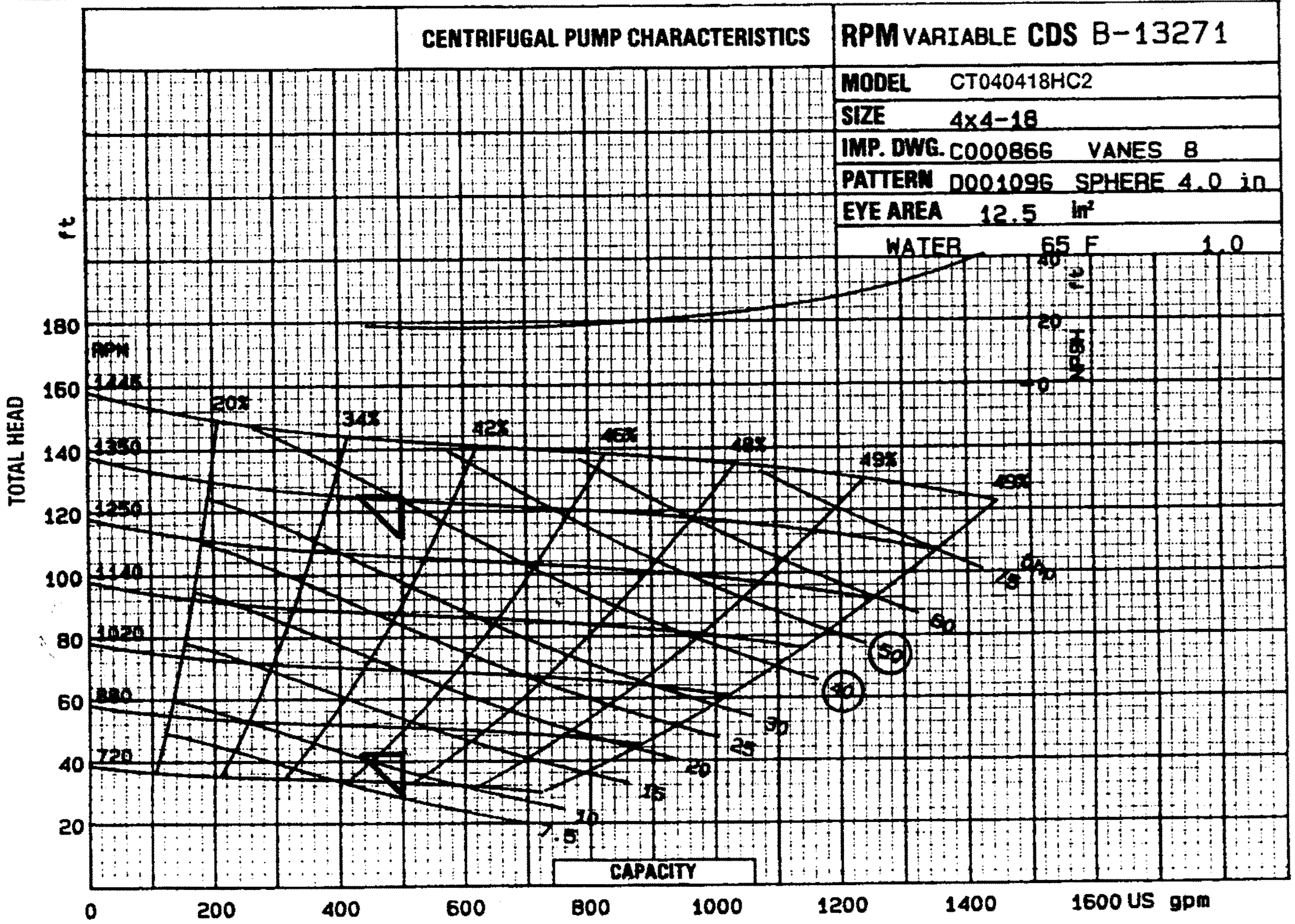
| Material | Specification |
|---|---|
| Cast Iron | ASTM A 48, Class 25/35 |
| HC600 | ASTM A 532, Class III, Type A Hardened (650 BHN. Min.) |
| Lubricated Graphite | Garlock 8909 or Equal |
| 420SS | ANSI 420 Stainless Steel (450 BHN. Min.) |
| 316SS | ANSI 316 Stainless Steel |

MORRIS

# TYPE CT HYDRAULIC PERFORMANCE CURVES
# CUP TYPE RECESSED IMPELLER PUMPS

**Series 6100**

Size: **4 x 4 - 18** Group: RPM: **Var.**



**CENTRIFUGAL PUMP CHARACTERISTICS**

**RPM** VARIABLE **CDS** B-13271
**MODEL** CT040418HC2
**SIZE** 4x4-18
**IMP. DWG.** C000866 VANES 8
**PATTERN** D001096 SPHERE 4.0 in
**EYE AREA** 12.5 in²
WATER 65 F 1.0

MORRIS

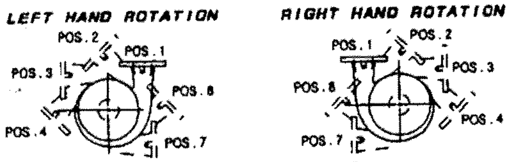
# TYPE CT OVERHEAD V-BELT DRIVE
# CUP TYPE RECESSED IMPELLER PUMPS

**Series 6100**

OUTLINE DWG # A00522G
S.O.
JOB:

| ISSUE | REVISION | DATE |
|---|---|---|
| | | |

**RELATIVE POSITION OF SUCTION AND DISCHARGE**
**(AS VIEWED FROM THE DRIVEN END)**



DISCHARGE IN POSITION NO. 1 FURNISHED AS STANDARD.
OTHER POSITIONS AVALIABLE FROM FACTORY WHEN SPECIFIED.

## Size: 3X3-16
## 3X4-16
## 4X4-18

**LIST OF EQUIPMENT FURNISHED:**

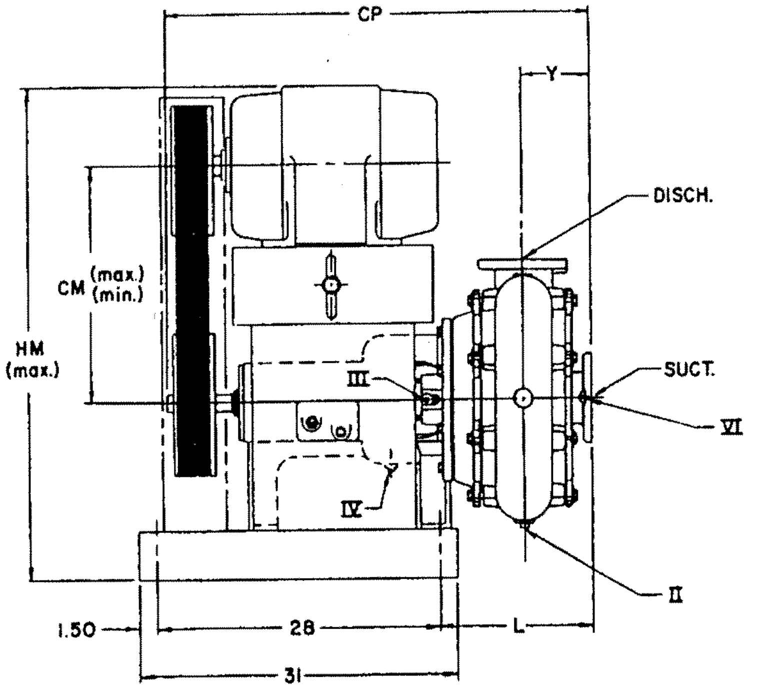
__ Model__________Pump
Rated for______GPM at______Ft.TDH.
__ ______HP,______RPM,______Volts
____Phase,____Hz Horizontal
Motor in__________NEMA
enclosure complete with base, motor support, v-belt drive and guard.
__ ROTATION______POSITION #______
__ ROTATION______POSITION #______

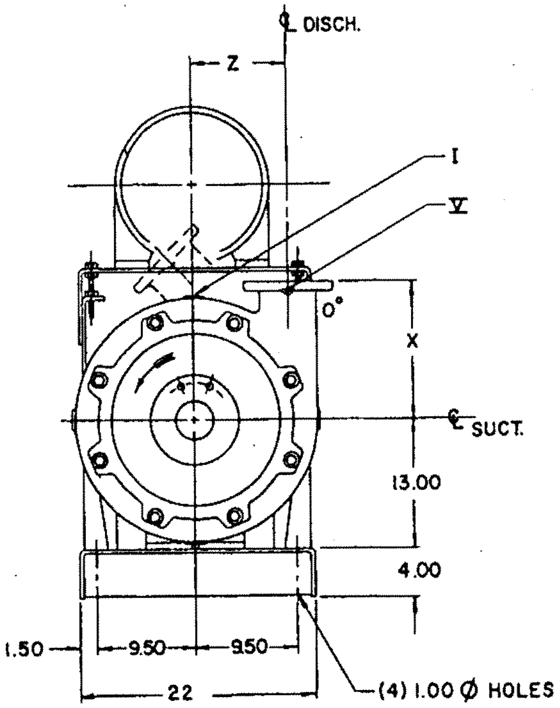
**OPTIONAL FEATURES:**

LUBRICATION: OIL ☑ GREASE ☐
STUFF. BOX: PACKING ☑ A. WEEP ☐ B. FLUSH ☑ MECH. SEAL ☐

**DIMENSIONS DETERMINED BY MOTOR**

| ✓ | MOTOR FRAME | HM MAX | CM MAX | CM MIN | UNIT WT. (LBS.) 3" | UNIT WT. (LBS.) 4" |
|---|---|---|---|---|---|---|
| | 182T | 50.00 | 27.50 | 21.50 | 1200 | 1325 |
| | 184T | 50.00 | 27.50 | 21.50 | 1225 | 1350 |
| | 213T | 52.00 | 28.25 | 22.25 | 1275 | 1400 |
| | 215T | 52.00 | 28.25 | 22.25 | 1275 | 1400 |
| | 254T | 53.00 | 29.25 | 23.25 | 1475 | 1600 |
| | 256T | 53.00 | 29.25 | 23.25 | 1525 | 1650 |
| | 284T | 55.00 | 30.00 | 24.00 | 1625 | 1750 |
| | 286T | 55.00 | 30.00 | 24.00 | 1675 | 1800 |
| ✓ | 324T | 57.00 | 31.00 | 25.00 | 1775 | 1900 |
| | 326T | 57.00 | 31.00 | 25.00 | 1875 | 2000 |





**DIMENSIONS DETERMINED BY PUMP**

| ✓ | PUMP SIZE | DIS | SUC | L | X | Y | Z | CP |
|---|---|---|---|---|---|---|---|---|
| | 3X3-16 | 3 | 3 | 14.25 | 12.50 | 6.50 | 8.50 | 39.50 |
| | 3X4-16 | 3 | 4 | 14.25 | 12.50 | 6.50 | 8.50 | 39.50 |
| ✓ | 4X4-18 | 4 | 4 | 15.25 | 14.00 | 7.00 | 9.50 | 40.50 |

**TAPPED OPENINGS**

| ITEM | SIZE NPT | QTY | DESCRIPTION | FURNISHED YES | FURNISHED NO |
|---|---|---|---|---|---|
| I | 3/4 | 1 | VENT, CASING | ☒ | ☐ |
| II | 3/4 | 1 | DRAIN, CASING | ☒ | ☐ |
| III | 3/8 | 2 | SEAL WATER | ☒ | ☐ |
| IV | 3/4 | 1 | DRAIN, FRAME | ☒ | ☐ |
| V | 1/2 | 1 | GAUGE, DISCH. | ☒ | ☐ |
| VI | 1/2 | 1 | GAUGE, SUCT. | ☒ | ☐ |

NOTES:
1. 125 LB. ANSI. B16-1 FLANGES DRILLING STRADDLES CENTERLINE
2. BASE INCLUDES 6" DIAMETER GROUT HOLE
3. ANCHOR BOLTS BY OTHERS

REF. C00428G

MORRIS

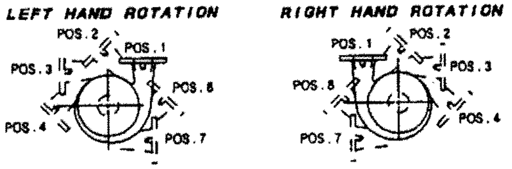
# TYPE CT BELT DRIVE-SIDE X SIDE CUP TYPE RECESSED IMPELLER PUMPS

## Series 6100

OUTLINE DWG # A00521G
S.O.
JOB:

| ISSUE | REVISION | DATE |
|---|---|---|
| | | |

RELATIVE POSITION OF SUCTION AND DISCHARGE
(AS VIEWED FROM THE DRIVEN END)



DISCHARGE IN POSITION NO. 1 FURNISHED AS STANDARD.
OTHER POSITIONS AVALIABLE FROM FACTORY WHEN SPECIFIED.

**Size: 3x3-16**
**3x4-16**
**4x4-18**

**LIST OF EQUIPMENT FURNISHED:**

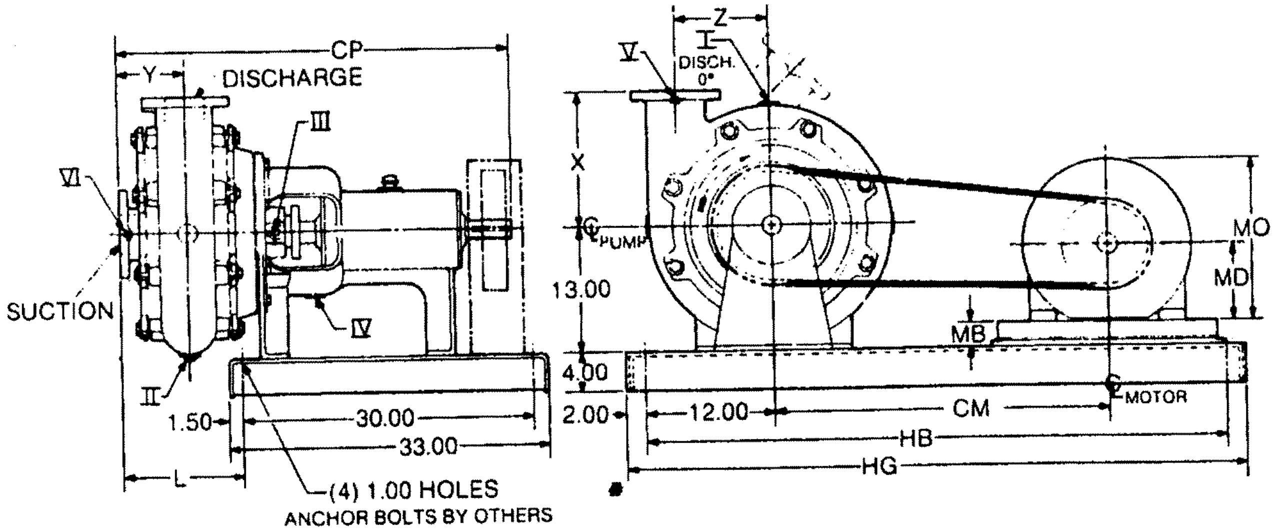
__ Model______________________Pump
Rated for________GPM at_______Ft.TDH.
__ __________HP,__________RPM,________Volts
____Phase,_____Hz Horizontal
Motor in____________________NEMA
enclosure complete with common base, motor slide base, v-belt drive and guard.
__ ROTATION________POSITION #______
__ ROTATION________POSITION #______

**OPTIONAL FEATURES:**

LUBRICATION: OIL ☑ GREASE ☐
STUFF. BOX: PACKING ☑ A. WEEP ☐ B. FLUSH ☑ MECH. SEAL ☐

DIMENSIONS DETERMINED BY MOTOR

| ✓ | MOTOR FRAME | CM | | MB SLIDE BASE | HB | HG | MD | MO APPROX. | UNIT WT. (LBS.) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MAX | MIN | | | | | | WITH 3X3-16 | WITH 4X4-18 |
| | 182T | 30.50 | 21.00 | 5.00 | 50 | 54 | 4.50 | 10.00 | 1200 | 1325 |
| | 184T | 30.50 | 21.00 | 5.00 | 50 | 54 | 4.50 | 10.00 | 1225 | 1350 |
| | 213T | 29.50 | 23.00 | 5.00 | 50 | 54 | 5.25 | 12.00 | 1275 | 1400 |
| | 215T | 29.50 | 23.00 | 5.00 | 50 | 54 | 5.25 | 12.00 | 1275 | 1400 |
| | 254T | 40.00 | 24.50 | 6.00 | 62 | 66 | 6.25 | 13.00 | 1475 | 1600 |
| | 256T | 40.00 | 24.50 | 6.00 | 62 | 66 | 6.25 | 13.00 | 1525 | 1650 |
| | 284T | 39.00 | 25.50 | 6.00 | 62 | 66 | 7.00 | 15.00 | 1625 | 1750 |
| | 286T | 39.00 | 25.50 | 6.00 | 62 | 66 | 7.00 | 15.00 | 1675 | 1800 |
| ✓ | 324T | 37.50 | 27.00 | 6.25 | 62 | 66 | 8.00 | 17.00 | 1775 | 1900 |
| | 326T | 37.50 | 27.00 | 6.25 | 62 | 66 | 8.00 | 17.00 | 1875 | 2000 |



DIMENSIONS DETERMINED BY PUMP

| ✓ | PUMP SIZE | DIS | SUC | L | X | Y | Z | CP |
|---|---|---|---|---|---|---|---|---|
| | 3X3-16 | 3 | 3 | 11.50 | 12.50 | 6.50 | 8.50 | 39.50 |
| | 3X4-16 | 3 | 4 | 11.50 | 12.50 | 6.50 | 8.50 | 39.50 |
| ✓ | 4X4-18 | 4 | 4 | 12.50 | 14.00 | 7.00 | 9.50 | 40.50 |

NOTES:
1. MOTOR SHOWN AT RIGHT SIDE OF PUMP
MOTOR POSITION TO BE FURNISHED:
☐ LEFT SIDE ☐ RIGHT SIDE
2. 125 LB. ANSI. B16-1 FLANGES
DRILLING STRADDLES CENTERLINE
3. COMMON BASE INCLUDES 6" DIA. GROUT HOLE

TAPPED OPENINGS

| ITEM | SIZE NPT | QTY | DESCRIPTION | FURNISHED YES | FURNISHED NO |
|---|---|---|---|---|---|
| I | 3/4 | 1 | VENT, CASING | ☒ | ☐ |
| II | 3/4 | 1 | DRAIN, CASING | ☒ | ☐ |
| III | 3/8 | 2 | SEAL WATER | ☒ | ☐ |
| IV | 3/4 | 1 | DRAIN, FRAME | ☒ | ☐ |
| V | 1/2 | 1 | GAUGE, DISCH. | ☒ | ☐ |
| VI | 1/2 | 1 | GAUGE, SUCT. | ☒ | ☐ |

REF. C00375G

# SECTION 6

# RISK ASSESSMENT

### 6.1.1 Summary

This Baseline Human Health Risk Assessment (HHRA) examines the potential risk to human health resulting from exposure to contaminated media present at the Dredge Spoils Areas (DSA) site located at Harbor Point in Utica, New York.

Data used in the risk assessment were obtained from the 1994/1995 sampling rounds completed for this RI. A full data validation was performed on these data.

Fifty-five chemicals of potential concern were quantitatively evaluated in the risk assessment: 7 VOCs, 22 SVOCs, 5 pesticides, 3 PCBs, 18 metals, and cyanide. Metals that are considered essential nutrients and that are toxic only at very high doses (i.e., calcium, iron, magnesium, sodium, potassium) were not evaluated in the quantitative risk assessment (USEPA, 1989a).

Currently, the site is zoned industrial, and surrounding land use consists dominantly of urban commercial development and transportation corridors. The site is currently accessible to nearby residents. Therefore, exposure of a residential trespasser to onsite surface soil was evaluated. In the future, the site is anticipated to be used for non-residential purposes only (Nutter Associates, 1995). In accordance with the work plan, noncarcinogenic hazard indices and carcinogenic risks were quantitated for current residential trespassers as well as for hypothetical future residents, recreators, and workers. The following pathways were quantitatively evaluated:

1. ingestion of groundwater (future residents),
2. dermal contact with groundwater during showering (future residents),
3. inhalation of vapor generated during showering (future residents),
4. ingestion of surface soils (current residential trespassers),
5. dermal contact with surface soils (current residential trespassers),
6. ingestion of mixed soils (surface and subsurface combined) (future residents, recreators and workers),
7. dermal contact with mixed soils (future residents, recreators and workers),
8. inhalation of VOCs generated from mixed soils (future workers), and
9. inhalation of fugitive dust generated from mixed soils (future workers).

Although the future residential scenario was evaluated, as indicated above, it will not be discussed further in this summary, and it will not serve as a basis for risk management decisions. The justification for this is that the City of Utica intends to restrict use of the DSA site to exclusively non-residential purposes (Nutter Associates, 1995). Additionally, since groundwater is not currently used and it may be reasonably anticipated that it will not be used in the future, it is concluded that the groundwater pathway is incomplete.

Two exposure levels were assessed for the current and hypothetical future receptors: exposure of an average individual (central tendency or CT) and exposure of a more highly exposed individual (reasonable maximum exposure or RME).

To assess the possible noncarcinogenic health effects associated with exposure, the chronic daily intakes (CDIs) were estimated for oral, inhalation and dermal exposure. The CDI values were then compared to the available USEPA oral reference doses (RfDs) or inhalation reference concentrations (RfCs). A hazard index (HI) value greater than 1 indicates a potential concern.

The hazard indices for the receptors evaluated in the risk assessment are as follows:

| Receptor | HI (CT) | HI (RME) |
|---|---|---|
| Current Trespassers | 0.3 | 2 |
| Future Recreators | 1.4 | 6 |
| Future Workers | 1.4 | 7 |

With the exception of the CT exposure of current trespassers, these hazard indices exceed 1, indicating a potential for the occurrence of adverse health effects. The increased hazards derived for the receptors were due primarily to the presence of manganese and one PCB Aroclor (1254) in soils.

The results of the USEPA Lead Uptake Biokinetic Model indicated that lead in soil and groundwater at the site does not pose a threat to children, as the predicted blood lead concentrations for over 97 percent of the exposed population would be expected to be below 10 ug/dL. The criterion of a blood level of 10 ug/dL or less in 95 percent of children was used a health guideline. The predicted blood lead concentration (geometric mean) of current/future children was 4.1 ug/dL.

To assess possible carcinogenic health effects associated with exposure, the lifetime average daily exposure (LADE) was estimated for oral, inhalation and dermal exposure. The LADE values were then multiplied by the available USEPA oral slope factor or inhalation unit risk factor for each chemical to calculate the upper bound excess lifetime risk of a receptor developing cancer due to a given chemical by a given exposure pathway. The USEPA has established a target risk range for carcinogenic effects of one-in-one million (1E-06) to one-in-ten thousand (1E-04) for Superfund sites. That is, the risks posed by the site should not exceed this target range.

The total cancer risks for the current and future receptors are as follows:

| Receptor | Risk (CT) | Risk (RME) |
|---|---|---|
| Current Trespassers | 3E-05 | 5E-04 |
| Future Recreators | 5E-05 | 1E-03 |
| Future Workers | 3E-04 | 2E-03 |

These cancer risks exceed the USEPA target range of 1E-06 to 1E-04, indicating a potential increase in excess carcinogenic risk in these receptors. The risks for these exposure scenarios were due primarily to the presence of PAHs, PCBs (Aroclors 1242, 1254, and 1260), arsenic and beryllium in soils.

Given the conservative (health protective) approach used in performing this risk assessment, the hazards and risks calculated herein may be overstated, especially for the RME exposure scenario. The risk assessment indicates that there is a potential health threat to both current and future receptors, based primarily on exposure to PAHs, PCBs, and metals (arsenic, beryllium, and manganese) in soils.

### 6.1.2 Introduction

A baseline human health risk assessment (HHRA) was conducted at the Dredge Spoils Areas (DSA) site located at Harbor Point in Utica, New York. The objective of this risk assessment was to assess the potential risks to human health which may be caused by chemicals in media originating from this site, in the absence of any actions to control or mitigate their presence.

The primary references used to perform this risk assessment were as follows:

1. USEPA, 1989a. Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual Part A. Interim Final.
2. USEPA, 1990. Exposure Factors Handbook. Office of Health and Environmental Assessment.
3. USEPA, 1991a. Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors."
4. USEPA, 1992a. Dermal Exposure Assessment: Principles and Applications. Interim Report.
5. USEPA, 1992b. Guidelines for Exposure Assessment. Final.
6. USEPA, 1992c. Supplemental Guidance to RAGS: Calculating the Concentration Term.
7. USEPA, 1995a. Land Use in the CERCLA Remedy Selection Process.
8. Nutter Associates, 1995. Utica Harbor Point Urban Renewal Plan, September 1995.

### 6.1.3 Identification of Chemicals of Potential Concern

The analytical data base for the baseline HHRA is comprised of all data collected in the course of the RI during 1994 and 1995. A complete data validation was performed on the 1994/1995 samples.

During the course of the RI investigation, groundwater and soils (surface and subsurface) were sampled and analyzed by standard USEPA methods for one or more of the following: VOCs, SVOCs, pesticides, PCBs, metals and cyanide. Surface soil data include those for onsite sediment under shallow, transient water.

Groundwater and soil data were used to develop representative site concentrations. The representative site concentration was the 95 percent upper confidence limit (UCL) on the arithmetic mean or, if data variability resulted in a 95 percent UCL greater than the maximum measured concentration, the maximum site value. Table 6.1 presents the representative site concentrations used in the risk assessment. Further statistical information regarding these data can be found in Appendix H.1.

Appropriate background data for inorganics were analyzed for comparative purposes. If the data were normally distributed, they were not transformed prior to statistical manipulation. If they were lognormally distributed, they were transformed. Nondetects were averaged in at one-half the sample quantitation limit.

A background upper tolerance limit (BUTL) was calculated for each chemical in each medium, where possible. This BUTL was taken to define background at the site. Specifically, chemicals detected at maximum concentrations above their respective BUTLs were assumed to be site-related. Inorganics detected at maximum concentrations at or below their respective BUTLs were assumed not to be site-related. Organic compounds detected at maximum concentrations at or below their respective BUTLs may not be site-related, but were still retained for quantitative assessment.

The formula for calculating a BUTL is as follows (USEPA 1989b):

$$\text{BUTL} = \overline{X} + k(a)$$

Where:

$\overline{X}$ = statistical mean value for a background chemical
$k$ = tolerance factor
$a$ = standard deviation

The tolerance factors are provided in the USEPA guidance. The BUTLs for each inorganic chemical in the media of concern are presented in Tables 6.2 and 6.3; details may be found in Appendix H.1.

### 6.1.4 Exposure Assessment

The objective of the exposure assessment is to estimate the type and magnitude of exposures to the chemicals of potential concern that are present at or migrating from a site. A completed exposure pathway is comprised of the following four elements:

- A source and mechanism for chemical release;
- An environmental transport medium;
- An exposure point; and
- A human receptor and a feasible route of exposure at the exposure point.

A pathway is not complete unless each of these elements is present.

#### 6.1.4.1 Exposure Setting

A detailed description of the exposure setting is provided in Section 3; a brief summary is provided below. The site is located in the City of Utica, in the Mohawk River Valley. The three dredge spoils areas are located within 0.5 mile of each other at a bend in the Mohawk River where it joins the New York State Barge Canal. One area is located between the Barge Canal to the west and the Mohawk River to the north, and the other two areas are located on the north bank of the Mohawk.

One of the DSA sites is located adjacent to the northeast shore of the Utica Harbor. This water body is used by the Canal Corporation as an equipment storage (barges, dredges, tugboats, etc.) and work area. Access to the harbor is mostly restricted by fences, but the harbor is accessible by boat from the Mohawk River. The Utica Harbor, the Barge Canal, and the Mohawk River are not used as drinking water sources within at least 25 miles of the site.

#### 6.1.4.2 Identification of Potentially Exposed Populations and Exposure Pathways

Current receptors at the DSA site are nearby residents that may trespass onto the site. The trespassers are assumed to be exposed to surface soils. Groundwater is not accessible to current receptors and exposure to groundwater is not considered to be an exposure pathway.

The City of Utica intends to restrict future use of the site to non-residential purposes (Nutter Associates, 1995). Additionally, recent USEPA (1995a) guidance emphasizes the importance of making reasonable assumptions regarding future land use. Since the work plan called for evaluating a hypothetical future resident, this was done: however, the results of the evaluation are provided for comparative purposes only. No risk management decisions will be based on this portion of the evaluation.

Future receptors include potential onsite workers and recreators and nearby or onsite residents. All future receptors are assumed to be exposed to a mixture of both surface and subsurface soils that have been excavated and mixed as a result of residential, recreational or industrial development. In addition, the future residents are assumed to be exposed to groundwater located beneath the site via the use of private wells. Future workers are assumed to continue to obtain water via the municipal system that currently supplies the facility.

It must be emphasized that the groundwater pathway is incomplete. Furthermore, given that a highly reliable municipal supply is already in place and that the site will not be used for residential purposes, it is safe to conclude that the groundwater pathway will remain incomplete in the future. The evaluation of the groundwater pathway contained herein is for comparative purposes only.

A matrix of potential exposure pathways is presented in Table 6.4.

The following exposure pathways were evaluated for current and hypothetical future receptors:

1. ingestion of groundwater (future residents),
2. dermal contact with groundwater during showering (future residents),
3. inhalation of vapor generated during showering (future residents),
4. ingestion of surface soils (current residential trespassers),
5. dermal contact with surface soils (current residential trespassers),
6. ingestion of mixed soils (surface and subsurface combined) (future residents, recreators and workers),
7. dermal contact with mixed soils (future residents, recreators and workers),
8. inhalation of VOCs generated from mixed soils (future workers), and
9. inhalation of fugitive dust generated from mixed soils (future workers).

In accordance with USEPA (1992b) guidance, both current and hypothetical future receptors are assumed to receive either a central tendency (CT or "average") exposure or a reasonable maximum exposure (RME). CT exposure was determined by utilizing estimates of CT, such as mean values for chemical intake variables. RME was determined by utilizing primarily maximum values for chemical intake variables. Both the CT and RME scenarios utilize the 95 percent upper confidence limit (UCL) on the arithmetic mean as the exposure point concentration. USEPA states that "because of the uncertainty associated with estimating the true average concentration at a site, the 95 percent upper confidence limit (UCL) of the arithmetic mean should be used for this variable" for both the CT and RME scenarios (USEPA, 1992c).

### 6.1.4.3 Quantification of Exposure to Humans

Potential exposure of humans to constituents in site media is quantified by evaluating the concentration of a chemical in a given medium and the assumed daily intake of the chemical.

#### Exposure Point Concentrations

Exposure point concentrations are the concentrations of chemicals in a given medium to which a hypothetical receptor may be exposed at a specific location known as the "exposure point." Exposure point concentrations can be based on analytical data obtained from onsite sampling, or they may be estimated through modeling. The exposure point concentrations for oral and dermal pathways in this evaluation are equal to the representative site concentrations for groundwater and soil. The exposure point concentrations for the inhalation of volatiles released while showering were modeled based on the representative concentration of volatiles in groundwater. The exposure point concentrations for the inhalation of volatiles and fugitive dust from soil were calculated using the representative concentrations for soil.

A representative concentration, also known as the "concentration term," was calculated for each chemical in each pathway. The representative concentration is the basis for calculating both the central tendency and RME hazards and risks. The representative concentration was calculated according to current USEPA guidance (USEPA, 1992c). In all cases the onsite and downgradient data were assumed to be lognormally distributed, and were transformed using the natural logarithm of each datum. The representative concentration was usually taken to be the upper 95 percent confidence limit (UCL) on the arithmetic mean of the transformed data ($UCL_T$).

Mean concentrations for each chemical were determined by averaging detected concentrations along with the non-detects, using one-half the sample quantitation limit as the concentration value for nondetects. In cases where the UCL equaled or exceeded the maximum concentration detected, the maximum concentration detected was used for the representative concentration.

The representative concentration is generally an estimate of the arithmetic average concentration for a constituent. Because of the uncertainty associated with estimating the true average concentration at a site, the UCL is normally used. The UCL provides reasonable confidence that the true site average will not be underestimated (USEPA, 1992c), although it will usually be overestimated.

Standard statistical methods were used to calculate the 95 percent UCL on the arithmetic mean (USEPA, 1992c; Gilbert, 1987). The 95 percent UCL on a mean is defined as a value that, when calculated repeatedly for randomly drawn subsets of site data, equals or exceeds the true mean 95 percent of the time (USEPA, 1992c). Furthermore, as sample size increases, the 95 percent UCL approaches the true mean. The 95 percent UCL on the transformed data was calculated as follows:

$$UCL_T = e^{(\overline{X}+0.5s^2+sH/\sqrt{n-1})}$$

where:

$\overline{X}$ = mean of the transformed data
$UCL_T$ = 95 percent UCL for the transformed data
e = base of natural log (= 2.718)
s = standard deviation of the transformed data
H = H-statistic
n = number of samples

The USEPA asserts that the arithmetic mean is the appropriate basis for estimating the representative site concentration. The USEPA maintains that the geometric mean is not an appropriate basis for estimating the representative site concentration (USEPA, 1992c).

Table 6.1 presents the representative concentrations used in the risk assessment for all potential chemicals of concern in all media. Further statistical information regarding these potential chemicals of concern are provided in Appendix H.1.

### Exposure Point Concentrations in Shower Air

For inhalation of vapors generated during showering, a shower model was used to estimate air concentrations based on the measured groundwater concentrations. Exposure point concentrations for VOCs released from water during showering were modeled on the basis of work conducted by Andelman (1984, 1985a,b). In the model, the air concentrations are determined by a balance between the rate of release from the shower water and the rate of air exchange between the shower and the rest of the house. The constants occurring in the model have been set to match the observed efficiency of volatilization of trichloroethene (TCE) in model showers, and to fit the observed shower air concentrations of TCE in several homes with contaminated water where measurements have been made. Scaling to other contaminants is accomplished by assuming that the rate of volatilization from shower water to air is proportional to the Henry's Law Constant (Appendix H.2). The assumed shower durations in the average and high end exposure scenarios were 7 and 12 minutes, respectively. The concentration of a volatile compound in the shower air over a period of $t_s$ minutes is (appropriate units in parentheses):

$C_s$ = $C_{inf}[1+(1/(kt_s))(\exp(-kt_s)-1)]$ for $t_s > 0$

$C_s$ = average concentration of a volatile compound in the shower air over a duration of $t_s$ minutes ($mg/m^3$)

$t_s$ = time in shower; typical value for an adult is 12 (min)

$k$ = rate constant for exponential function, defined below (1/min)

$k$ = $F_a/V_b$

$F_a$ = flow rate of air in shower, typical value is 2.4 ($m^3/min$)

$V_b$ = volume of bathroom, typical value is 12 ($m^3$)

$C_{inf}$ = asymptotic concentration in air if shower ran for a long time (much longer than 5 minutes), calculated below ($mg/m^3$)

$C_{inf}$ = $[(E)(F_w)(C_t/1,000)]/F_a$

$C_t$ = concentration in shower water, determined by case (mg/L)

$E$ = efficiency of release of compounds from water to air, defined below (unitless)

$E$ = $(E_{TCE})(H)/(H_{TCE})$

$F_W$ = flow rate of water in shower, typical value is 8 (L/min)

$E_{TCE}$ = efficiency of release of TCE from water to air, 0.6 is a typical value; this is assumed for all compounds (unitless)

$H$ = Henry's Law Constant for a given organic compound ($m^3$-atm/mol)

$H_{TCE}$ = Henry's Law Constant for TCE, typical value is $9.10 \times 10^{-3}$ ($m^3$-atm/mol)

Modeled indoor air concentrations of VOCs released from groundwater during showering, for both the average and RME scenarios, are presented in Appendix H.2.

### Human Intakes

Oral and dermal intakes associated with long-term exposures were calculated in terms of chronic daily intakes (CDIs) for noncarcinogenic effects and lifetime average daily exposures (LADEs) for carcinogenic effects. CDIs are averaged over the exposure time only, while LADEs are averaged over the standard assumed lifetime of 70 years. For purposes of this risk assessment, intake variables have been combined to produce terms known as intake factors. The USEPA (1989a, 1990, 1991a, and 1992a) provides central tendency and RME intake variables for most media and routes of exposure. Both central tendency and RME intake factors were derived for all pathways except ingestion of soil by workers. Only the RME was derived for this pathway because variables to describe central tendency were not available.

An explanation of the intake variables used to derive the intake factors is presented in Tables 6.5 (water pathways) and 6.6 (soil pathways). The intake factors for each pathway calculated from these intake variables are presented in Appendix H.2.

To calculate oral intakes from groundwater and soil, the exposure point concentrations were multiplied by the appropriate intake factors. To calculate dermal intakes from groundwater and soil, the exposure point concentrations were multiplied by the appropriate intake factors and the chemical-specific permeability constants (groundwater - Appendix H.2) or dermal absorption factors (soil - Appendix H.2). Intakes via air were not calculated. Instead, the estimated ambient air concentrations were combined directly with the appropriate toxicity values (RfCs or unit risks; see Toxicity Assessment below).

### Lead Exposure

Lead was evaluated separately from the other chemicals. There are no toxicity values available for lead, so a hazard index or risk cannot be calculated. Lead was evaluated using the USEPA Integrated Exposure Lead Uptake Biokinetic (IEUBK) Model, Version 0.99 (USEPA, 1994d).

The model predicts blood lead concentrations in children exposed to lead via a variety of media. The model is designed to estimate blood lead levels using a combination of default assumptions and exposure concentrations combined with site-specific information where available. The model contains two separate components: an uptake section that allows for the estimation of lead uptake from five media (air, drinking water, soil/dust, food and paint), and the biokinetic section, which uses the uptake data to estimate the blood lead levels. The default values used by the uptake program are based on nationwide surveys of lead distribution in the environment and studies of inhalation and ingestion for each biologic age modeled. A non-linear method of gastrointestinal absorption of lead was utilized in the uptake section, which allows for a more accurate estimate over a wider range of environmental lead levels.

For this assessment, blood lead levels for children from 0 to 7 years of age were modeled. Low-level exposure to lead during infancy and childhood has been associated with an increase in the risk of irreversible neurobehavioral deficits at blood levels as low as 10 ug/dL. In this assessment, the criterion of a blood level of 10 ug/dL or less in 95 percent of children was used as a health guideline. The model output predicts a probability curve around the geometric mean blood lead concentration. From this curve, the 95th percentile of children's blood lead concentration can be determined. This model plots this blood curve, marks the 10 ug/dL level of concern and predicts the percentage of the population falling above the level of concern.

### 6.1.5 Toxicity Assessment

The objective of the toxicity assessment is to weigh available evidence regarding the potential that particular contaminants will cause adverse effects in exposed individuals. In addition, the toxicity assessment provides, where possible, an estimate of the relationship between the extent of exposure to a contaminant and the increased likelihood and/or severity of adverse effects. For humans, USEPA has conducted numerous toxicity assessments which have undergone extensive review within the scientific community.

The types of USEPA toxicity values used in this risk assessment include oral reference doses (RfDs), inhalation reference concentrations (RfCs), oral carcinogenic slope factors (SFs) and inhalation unit risk factors (URFs). RfDs and RfCs are used to evaluate noncarcinogenic effects. SFs and URFs are used to evaluate carcinogenic effects. The toxicity values used in the risk assessment are presented in Table 6.7 (toxicity values for noncarcinogenic effects) and Table 6.8 (toxicity values for carcinogenic effects). Further details regarding the basis for the toxicity values used in this risk assessment are presented in Appendix H.3.

The toxicity information used in a baseline risk assessment is obtained from the USEPA Integrated Risk Information System (IRIS; USEPA, 1995b), if possible. If values were not available from IRIS, the USEPA Health Effects Assessment Summary Tables (HEAST; USEPA, 1994a) were used.

#### Noncarcinogenic Effects

The chronic RfD or RfC for a compound is ideally based on studies in which either animal or human populations were exposed to a given compound by a given route of exposure for the major portion of the life span (referred to as a chronic study). The RfD is an oral value which is derived by determining dose-specific effect levels from all the available quantitative studies, and applying uncertainty factors to the most appropriate effect-level in order to determine a chronic RfD for humans. RfCs are inhalation values which are derived by determining concentration-specific effect-levels from all of the available literature and transforming the most appropriate concentration to a human RfC. Transformation usually entails converting an animal exposure concentration to a continuous 24-hour exposure, transforming the exposure-adjusted value to account for differences in animal and human inhalation, and then dividing the adjusted human concentration by uncertainty factors to arrive at an RfC.

RfDs are reported as doses in milligrams of chemical per kilogram body weight per day (mg/kg/day). RfCs are reported as concentrations in mg of chemical per cubic meter of air (mg/m$^3$). RfDs and RfCs represent thresholds for toxicity. They are derived such that human lifetime exposure to a given chemical via a given route at a dose at or below the RfD or RfC should not result in adverse health effects, even for the most sensitive members of the population.

### Carcinogenic Effects

Carcinogenic slope factors and unit risk factors are derived only for compounds which have been shown to cause an increased incidence of tumors in either human or animal studies. SFs and URFs are the upper 95 percent confidence limits on lifetime risk and are determined by low-dose extrapolation from human or animal studies. When an animal study is used, the final SF or URF has been adjusted to account for extrapolation of animal data to humans. If the studies used to derive the SF or URF were conducted for less-than the life span of the test organism, the final SF or URF has been adjusted to reflect risk associated with lifetime exposure. Oral slope factors are reported as risk per dose (mg/kg/day)$^{-1}$. Inhalation unit risk factors are reported in units of risk per concentration ($\mu$g/m$^3$)$^{-1}$.

For carcinogens, USEPA has developed weight-of-evidence classifications which are reported along with SFs and URFs. The weight-of-evidence classification developed by the USEPA reflects the likelihood that an agent is a human carcinogen based on available data. There are five groups into which chemicals may be classified with regard to carcinogenic potential:

A - Human carcinogen.

B1 or B2 - Probable human carcinogen. B1 indicates that limited human data are available. B2 indicates sufficient evidence in animals and inadequate or no evidence in humans.

C - Possible human carcinogen.

D - Not classified as to human carcinogenicity.

E - Evidence of noncarcinogenicity for humans.

### Chemicals Lacking Toxicity Values for a Particular Route of Exposure

The USEPA has not derived toxicity values for all routes of exposure; however, in some cases toxicity values may be calculated for chemicals which lack toxicity values for a specified route of exposure.

## Dermal Toxicity Values

Most of the available toxicity values are for oral exposure, and many inhalation values are available as well. No values are currently available for dermal exposure. This is due to the lack of scientific studies available to quantify dermal toxicity and carcinogenic potential for a vast majority of priority pollutants.

In the absence of dermal reference toxicity values, USEPA (1989a) has suggested that in some cases it may be possible to modify an oral reference toxicity value (RfD or slope factor) to reflect dermal absorption. This requires that the toxic endpoints observed are the same for both oral and dermal exposure, and that one have quantitative estimates of both dermal and oral absorption of the compound. This information is generally not available for most priority pollutants, but oral toxicity values are nevertheless often used to quantify risks associated with dermal exposure. As a consequence, any valuation of the contribution of dermal exposure to overall risk needs to be viewed as highly tentative at best.

Oral toxicity values are usually presented as administered-dose values. The calculation of hazards and risks via the dermal route, however, requires the use of absorbed-dose values. Therefore, the administered-dose values must be converted to absorbed-dose values (Appendix H.3). To convert an administered-dose RfD to an absorbed-dose RfD, the administered-dose value must be multiplied by the appropriate oral absorption factor. To convert an administered-dose slope factor to an absorbed-dose slope factor, the administered-dose value must be divided by the appropriate oral absorption factor.

The oral absorption factors for the chemicals of concern were taken from the appropriate ATSDR Profiles (1989-1994), where possible. The absorption of a chemical through the gastrointestinal tract is dependent upon several factors: the vehicle in which the chemical is administered (e.g., chemicals are more readily absorbed in corn oil than in water); the nutritional status of the individual (e.g., chemicals are absorbed to a greater extent when the individual is fasting and when given with water as compared to food); the age of the individual (some chemicals are more readily absorbed in children than in adults); and, with metals, the solubility of the chemical (soluble metals are more readily absorbed than insoluble metals). The absorption factors presented in Appendix H.3 represent conservative (health protective) estimates of oral absorption. When information on the extent of oral absorption was lacking, default values were used. The default values were determined by adopting absorption factors for similar chemicals. It should be noted that to assume 100 percent absorption to modify the toxicity value would be a non-conservative (non-health protective) approach.

## Route-to-Route Extrapolation

It is also possible to calculate toxicity values for one route of exposure (e.g., inhalation) when a toxicity value is available for another route of exposure (e.g., oral). This requires that the toxic endpoints observed are systemic (i.e., not portal-of-entry effects) and are the same for both routes of exposure. If it is determined that there is a common systemic endpoint for both routes of exposure, it may be appropriate to convert the toxicity value from one route to the other (route-to-route extrapolation). If doubt exists as to the appropriateness of the conversion, however, it should not be performed. Route-to-route extrapolation will not be performed in this risk assessment.

### 6.1.6 Risk Characterization

To characterize potential noncarcinogenic effects, comparisons are made between projected intakes of substances and toxicity values. To characterize potential carcinogenic effects, probabilities that an individual will develop cancer over a lifetime of exposure are estimated from projected intakes and chemical-specific dose-response information. The major assumptions and scientific judgments embodied in this risk assessment are presented in this subsection, while the uncertainties are discussed in Subsection 6.1.7.

#### 6.1.6.1 Noncarcinogenic Effects

The potential for noncarcinogenic effects is evaluated by comparing an exposure level or intake (chronic daily intake or CDI) over a specified time period with a reference dose derived for a similar exposure period. This ratio is termed the hazard quotient (HQ), and is calculated as follows:

oral HQ = exposure intake (administered dose)/oral RfD (administered dose)
dermal HQ = intake (absorbed dose)/oral RfD (absorbed dose)

inhalation HQ = exposure concentration/RfC

The hazard quotient assumes that there is a level of exposure (i.e., RfD or RfC) below which it is unlikely for even sensitive populations to experience adverse health effects. If the exposure level (E) exceeds the threshold (i.e., if HQ exceeds unity) there may be concern for potential noncancer effects.

To assess the overall potential for noncarcinogenic effects posed by more than one chemical, a hazard index (HI) approach has been developed by the USEPA. This approach assumes that simultaneous subthreshold exposures to several chemicals could result in an adverse health effect. The Hazard Index is calculated as follows:

$$\text{hazard index} = \Sigma \ (HQ_1, HQ_2 \ldots HQ_i)$$

where:

HQ = hazard quotient

$HQ_i$ = the HQ for the $i^{th}$ substance

It should be noted that exposure intake is taken to mean "chronic" exposure. Chronic exposure is defined as exposure which occurs over the majority of a life span.

Calculation of the HI in excess of 1 (one) indicates the potential for adverse health effects. HIs greater than 1 will be generated anytime intake or exposure point concentration for any of the chemicals of concern exceeds its RfD or RfC. However, if there are two or more chemicals involved, it is possible to generate an HI greater than 1 even if none of the individual chemical intakes or concentrations exceed their respective RfDs or RfCs.

Oral chronic daily intake (CDI) is calculated by multiplying the appropriate intake factor by the corresponding exposure point concentration. Dermal CDI is calculated by multiplying the appropriate intake factor by the corresponding exposure point concentration and by the permeability constant. Hazard quotients and indices have been calculated for all chemicals of concern for all pathways in Appendix H.4. Summaries of these indices by pathway are found in Tables 6.9 and 6.10.

The hazard indices for the receptors evaluated in the risk assessment are as follows:

| Receptor | HI (CT) | HI (RME) |
|---|---|---|
| Current Trespassers | 0.3 | 2 |
| Future Recreators | 1.4 | 6 |
| Future Workers | 1.4 | 7 |

With the exception of the CT exposure of current trespassers, these HIs exceed 1, indicating a potential for the occurrence of adverse health effects. The increased hazards derived for the receptors were due primarily to the presence of one PCB Aroclor (1254) and manganese in soils.

Profiles of the chemicals causing the pathway HI to exceed 1 are presented in Appendix I. These profiles include CAS Number, common synonyms, analytical classification, physical and chemical data, and information on half-lives (organics), background concentrations (inorganics), fate and transport, human toxicity, and ecological toxicity.

The results of the USEPA Lead Uptake Biokinetic Model indicated that lead in soil and groundwater at the site does not pose a threat to children, as the predicted blood lead concentrations for over 97 percent of the exposed population were expected to be below 10 ug/dL. The criterion of a blood level of 10 ug/dL or less in 95 percent of children was used a health guideline. The predicted blood lead concentration (geometric mean) of current/future children was 4.1 ug/dL. Appendix H.5 contains the inputs and the outputs for the Lead IEUBK Model.

#### 6.1.6.2 Carcinogenic Effects

Carcinogenic risk is expressed as a probability of developing cancer as a result of lifetime exposure (lifetime average daily exposure or LADE). For a given chemical and route of exposure, carcinogenic risk is calculated as follows:

oral risk = LADE (administered dose) x oral slope factor (administered dose)

dermal risk = LADE (absorbed dose) x oral slope factor (absorbed dose)

inhalation risk = exposure concentration x unit risk factor

For simultaneous exposure to several carcinogens, USEPA assumes that the risks are additive. That is to say:

$$\text{risk}_T = \Sigma\ (\text{risk}_1, \text{risk}_2, \ldots\ \text{risk}_i)$$

where:

$\text{risk}_T$ = the total cancer risk, expressed as a unitless probability, and

$\text{risk}_i$ = the risk estimate for the $i^{th}$ substance

Addition of the carcinogenic risks is valid when the following assumptions are met:

- doses are low,
- no synergistic or antagonistic interactions occur, and
- similar endpoints are evaluated.

USEPA's target range for carcinogenic risk associated with Superfund sites is one-in-one million (1E-06) to one-in-ten thousand (1E-04). That is, the risks due to the site should not exceed this target range. If they do, the need for remediation may be indicated.

Oral lifetime average daily exposure (LADE) is calculated by multiplying the appropriate intake factor by the corresponding exposure point concentration. Dermal LADE is calculated by multiplying the appropriate intake factor by the corresponding exposure point concentration and by the permeability constant. Cancer risks have been calculated for all chemicals of concern for all pathways in Appendix H.4. Summaries of these risks by pathway are found in Tables 6.11 and 6.12.

The total cancer risks for the current and future receptors are as follows:

| Receptor | Risk (CT) | Risk (RME) |
|---|---|---|
| Current Trespassers | 3E-05 | 5E-04 |
| Future Recreators | 5E-05 | 1E-03 |
| Future Workers | 3E-04 | 2E-03 |

These cancer risks exceed the USEPA target range of 1E-06 to 1E-04, indicating a potential increase in excess carcinogenic risk in these receptors. The risks for these exposure scenarios were due primarily to the presence of PAHs, PCBs, arsenic, and beryllium in soils. Profiles of the chemicals causing the pathway risk to exceed $10^{-4}$ are presented in Appendix I.

### 6.1.7 Uncertainty

There are several categories of uncertainty associated with site risk assessments. One is the initial selection of substances used to characterize exposures, noncarcinogenic hazards and carcinogenic risks on the basis of the sampling data and available toxicity information. Other sources of uncertainty are inherent in the toxicity values used to characterize hazards and risks for each substance. Additional uncertainties are inherent in the exposure assessment for individual substances and individual exposures. These uncertainties are driven by the degree of reliability of the chemical monitoring data, the models used to estimate exposure concentrations in the absence of monitoring data, and the population intake parameters. Finally, additional uncertainties are incorporated into the risk assessment when exposures to several substances across multiple pathways are summed.

#### 6.1.7.1 Uncertainties in the Selection of Chemicals of Concern

The identification of chemicals of concern is somewhat uncertain in all risk assessments. For the DSA site, additional uncertainty is generated from the fact that the site is located in a highly industrialized area which makes it difficult to ascertain whether all contaminants detected are site-related or not. An additional source of uncertainty is that not all media were evaluated in the risk assessment. However, the DSA site is only one of several sites at Harbor Point which have been or will be evaluated in a baseline HHRA. Once all sites have been evaluated, all relevant media will have been covered.

#### 6.1.7.2 Uncertainties in the Exposure Assessment

This risk assessment is based on an unrestricted future land use scenario where current residents and hypothetical future residents (the receptors) are assumed to receive an average (CT) exposure or a RME to onsite chemicals. It should be noted that the RME approach is conservative (health protective) in that it assumes that the residents will ingest and otherwise contact contaminated groundwater almost every day for up to 30 years. Both the CT and the RME scenarios assume that the concentrations of compounds present at the site will never diminish over the course of 9 to 30 years.

The evaluation of hypothetical future residents, including their consumption of groundwater, was presented for comparative purposes only. Since the City of Utica intends to prohibit residential development of the site (Nutter Associates, 1995), and the groundwater pathway can reasonably be expected to remain incomplete, the hazard indices and risks calculated for the associated pathways should be considered as purely hypothetical, with no significant probability of realization.

There is always some doubt as to how well an exposure model or its mathematical expression approximates the true relationships among site-specific environmental conditions. Additionally, the shower model which predicts chemical concentrations in shower air from concentrations in groundwater, may not truly be representative of air concentrations. Groundwater concentrations based on environmental sampling and analysis may overestimate or underestimate exposure. Further, a steady state condition was assumed which would tend to overestimate hazards and risks since concentrations of organic chemicals, at least, are expected to decrease over time.

Finally, uncertainty in the exposure assessment is impacted by the use of default exposure variables provided by USEPA and based on best professional judgment. Standard assumptions regarding body weight, period exposed, life expectancy, population characteristics, and lifestyle may not be representative of actual exposure situations. Given that the exposure variables provided by USEPA are considered conservative, hazards and risks generated using these values probably tend to overestimate hazards and risks.

#### 6.1.7.3 Uncertainties in the Toxicity Assessment

Some uncertainty is inherent in the toxicity values used to quantitate potential systemic and carcinogenic effects. USEPA toxicity values for systemic effects are derived using all available toxicity information and standard uncertainty factors. Uncertainty factors are assigned based on the quality of the available data. Consequently, the less information that is known about a given chemical, the more conservative the systemic toxicity value. Carcinogenic toxicity values (oral slope factors and inhalation unit risk factors) are based on the 95 percent UCL on lifetime risk and, therefore, will tend to be conservative and overestimate cancer risks.

On the other hand, it must be emphasized that not all chemicals detected could be quantitatively evaluated for health effects since toxicity values do not exist for all chemicals or for all routes of exposure. Additionally, monitoring data may not exist for some chemicals present at the site such as degradation products of target chemicals (e.g., hydroxylated PAHs).

#### 6.1.7.4 Uncertainties in the Risk Characterization

Uncertainties in the use of USEPA toxicity values are compounded by the assumption of dose additivity for multiple substance exposure. This assumption ignores the possible synergisms or antagonisms that exist among chemicals, and assumes similarity in mechanisms of action and metabolism. Additional uncertainty is associated with the assumption that all toxicity values used in the evaluation have an equal degree of reliability, which in reality is not the case. In particular, dermal toxicity values have low reliability due to the extrapolation from oral reference doses and are thus very conservative (health-protective). As a result, the risks and hazards for dermal exposure to soil on the DSA site are likely to be exaggerated. Overall, all of these assumptions tend to overestimate hazards and risks.

### 6.1.8 Conclusions

The risk assessment results indicate that there is a potential health threat, both carcinogenic and noncarcinogenic, to both current and future receptors, based primarily on exposure to PAHs, PCBs, and metals in soils located at the DSA site. This potential health threat is based on a number of highly conservative (health protective) assumptions, which will increase the calculated potential health threat. The health threat to actual receptors will be substantially lower than indicated.

## 6.2 HABITAT BASED ASSESSMENT

### Introduction

The purposes of the Phase I Habitat Based Assessment are to develop a site description to address existing environmental conditions and to characterize local ecological resources. The Habitat Based Assessment follows the requirements outlined as Step I and Step IIA of the June 1993 NYSDEC, Division of Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites. A preliminary evaluation of the potential for ecologic impacts is included in the assessment. This preliminary evaluation is based on the observed constituent levels detected in various media at the site and the incidence of chemical compounds in habitats available to resident wildlife.

The characterization and description of the local wildlife habitat and ecological conditions within the radius of concern is presented in Section 6.2.1. This section also addresses the value of local habitats to both wildlife and humans. An evaluation of the potential for site-attributable chemical compounds to adversely impact local ecology is presented in the Pathway Analysis, Section 6.2.2. Applicable standards, criteria, and guidelines (SCGs) relating to the ecological assessment are identified in Section 6.2.3. Conclusions based on the information available and recommendations for further evaluation, if necessary, are presented in Section 6.2.4. Fish and wildlife are referred to in the body of the report by common name. A table listing scientific names is provided in Appendix J.

Significant habitats occur within a 0.5-mile radius of the site offering some potential for consumptive and non-consumptive wildlife uses. Unposted lands within the floodplain, containing suitable pheasant and woodcock habitat, offer good game hunting opportunities for sportsmen. Utica Marsh, within 0.5-mile of the site is a regionally significant wetland habitat. Limited waterfowl hunting is conducted in the Utica Marsh wetlands (NYSDEC, 1980). Mallards, black ducks, wood ducks, and teal are hunted along the river, backwater areas, and old channels of the Mohawk River (Chamberlain, 1974). Recreational fishing resources are utilized in the Mohawk River, Barge Canal, and Utica Harbor in the site vicinity.

PAHs were detected in all surface soil samples collected from DSA-1 and DSA-2 and from over half of the samples from DSA-3. PCBs were detected in all surface soil samples collected from the bermed area of DSA-1, all surface soil samples collected from DSA-2, and in six of seven surface soil samples collected from DSA-3. PAHs were detected in one surface water sample from DSA-1 and were absent in other samples from DSA-2 and DSA-3. BTEX compounds were present in three surface water samples from DSA-3 but were absent in the other two spoils areas. Each of the dredge spoil areas had detectable levels of PCBs in surface water. A similar contaminant distribution in soils and DSA sediment probably arises from their common origin. Dredge materials at the DSAs are likely the source for PCBs and PAHs detected in surface water and sediment. The absence of background surface water and sediment samples limits the evaluation of potential impact attributable to site contamination.

The widespread presence of PCBs and PAHs in surface soils present possible exposure and impacts to resident and migratory birds, wildlife, and fish from the surface soil through one or more of the scenarios described in the pathway analysis. Off-site migration of chemical compounds is primarily through the groundwater route as discussed in Section 5.

### 6.2.1 Site Habitat Characterization

No site-specific data exist regarding all the types of habitats and wildlife species found in the site vicinity. No biological sample collection or inventory was conducted for the Phase I Habitat Based Assessment. The area considered likely to exhibit an interaction between elements of the local ecology and site-related chemical compounds occurs within 2-mile radius of the site property. Due to land use patterns and geography within the 2-mile radius, evaluation of ecological resources and habitats is focused more on areas of potential exposure rather than on arbitrary distances or boundaries that lack a biological justification (USEPA, 1989).

Multiple site visits were conducted to evaluate the habitat conditions within a 0.5-mile radius of the site. Observations and assessments were concentrated on undeveloped areas, waterways, and wetlands on and adjacent to the site. A more general evaluation of ecological resources and land use patterns within a 2-mile radius was conducted in conjunction with the site inspection.

Information presented in this section was acquired by a combination of literature searches, telephone interviews, office visits, and site inspection. Information was obtained from various departments of the NYSDEC including the headquarters in Albany, New York; the Region 6 offices in Watertown, NY; the Region 6 sub-office in Utica; NY, Wildlife Resources Center in Latham, NY; and the NYSDEC Bureau of Monitoring and Assessment Ambient Surface Water Monitoring Program Rotating Intensive Basin Survey. Information was also obtained from the Albany headquarters of the New York State Department of Health (NYSDOH), State University of New York College of Environmental Science and Forestry (SUNY ESF), Oneida County Environmental Management Council, Cornell University, U.S. Fish and Wildlife Service (USFWS), and publications of the Society of American Foresters (SAF). Regional information was obtained from the USGS 7-1/2 minute Utica East, New York topographic map, New York State Article 24 Freshwater Wetlands maps, USFWS National Wetlands Inventory, the US Department of Agriculture (USDA) Soil Conservation Service, the NYSDOH Community Water Systems Atlas, and the US Commerce Department (USDOC) Climatic Atlas of the U.S.

#### 6.2.1.1 Regional Climate

Utica, New York is located in the Mohawk Valley climatological zone (USDOC, 1990). Weather conditions exhibit seasonal fluctuations in temperature, precipitation, and prevailing winds. The climate in the region consists of moderately cold winters and warm, humid summers. The region exhibits a growing season of approximately 135 to 167 days from April through September. The county receives about 50 percent of its annual rainfall of 40 to 50 inches during the growing season. Average seasonal snowfall is 110 inches. An average of 45 days per year have at least 1 inch of snow cover on the ground. The percentage of possible sunshine is 65 in summer and 30 in winter. Prevailing winds are from the west-northwest (SCS, 1981).

### 6.2.1.2 Terrestrial Physical Environment

The site lies within the area described in the "Atlas of Forestry in New York" as the 2-million acre Mohawk sub-region, which occupies the Mohawk River Valley from east of Oneida Lake to the Hudson River (SAF, 1973). The gently rolling to hilly land surface of the river valley lies between the Adirondack Mountain region to the north and the Appalachian Plateau to the south. Elevations within the sub-region range from 400 to 2500 feet above mean sea level (AMSL).

#### DSA-1

DSA-1, located east of the Barge Canal, consists of a northern and a southern area. The southern area is surrounded by berms approximately 10 feet in height. Inside the berms, the area is relatively flat with internal dividing berms and a shallow, wide ditch around the perimeter. Four drainage pipes pass from the spoils area through the berm into the Barge Canal. In the northern section of the DSA, only remnants of former berms are visible.

The Mohawk River occupies the northeast side of the site. The bank to the river is steep and is actively eroding. A dirt access road lies between the river and spoils area. The Utica Harbor makes up the eastern boundary of DSA-1. The bank on this side of the site slopes gently to the Barge Canal. On this side of the site, sediment is being deposited from the waterway. The DSA-1 area experiences periodic flooding across the northern point and to the west of the site. Flood levels do not reach the berms or inundate the spoils area.

#### DSA-2

DSA-2, located east of the Mohawk River and west of the Erie Canal, has the most extreme topography of the three areas. The dredge material in DSA-2 has been stockpiled in the center and excavated in the northwestern end and possibly the southeastern end. The stockpiling and excavation has formed high berms along portions of the northeast side of the site adjacent to the Erie Canal and southwest side by the Mohawk River. The top of the southwestern berm reaches a 43 feet above the Mohawk River and 35 feet above the Erie Canal along the northeast side. The topography was very uneven within the DSA due to excavation activities.

The depression commonly found around the inside of the berm in the dredge spoils areas is not present in DSA-2. A drainage ditch runs between the gravel road and berm on the northeastern side of the DSA. A small culvert and drainage channel runs between the Erie Canal and Mohawk River along the northwest end of the site. Three ponded areas were present at DSA-2, one between the DSA and the gravel road, one in the central area of the DSA, and one inside the berm near the northwestern corner of the DSA in excavated depressions.

The Erie Canal occupies the northeast boundary of DSA-2. The bank of the canal is steep and is covered with rip-rap to prevent erosion. Between the Erie Canal and the northern berm is a dirt access road to the Utica Harbor Lock and a paved public foot and bike trail. Outside the southwest margin of DSA-2 below the steep bank is a flat area subject to flooding and material deposition from the southeastern-flowing Mohawk River.

### DSA-3

DSA-3 is located west of the Mohawk River near the Utica Harbor Lock. DSA-3 is surrounded by wetlands. The DSA has been divided into two cells. The northern cell is a bermed area where dredge spoils were deposited. The area inside of the berms is generally flat with a wide, shallow ditch around the perimeter. In some sections, the ditch has become filled in and vegetated. The southeastern corner of the northern area has four, large diameter, elevated drop pipes that provide drainage during very high water periods. The southern part of DSA-3 was purported to be used only for spoils water overflow. This area is substantially lower topographically than the north and for the most part is flooded. Water depth in the southern section ranges from shallow to over 8 feet. Most of the southern section is covered by short scrub brush and marsh vegetation.

### 6.2.1.3 Land Use and Vegetative Cover

Much of the industrial and commercial activity in the Central New York region has been historically located along the highway, railroad, and canal transportation corridor provided by the Mohawk River. As a result, the Mohawk River Valley contains several of the largest cities in the state. Outside of the cities, three quarters of the Mohawk Valley is under intensive agricultural production. The region exhibits moderate to highly productive soils and widespread agriculture. Nearly all of the forests in the region are on farmlands. The average farm has 20 acres of forest lands (SAF, 1973). Forests are dominated by northern hardwoods with scattered concentrations of hemlock occurring frequently in ravines. White pine and northern white cedar commonly occur in wet areas. Oaks, hickories, and conifers are scarce within the Mohawk River floodplain (Chamberlain, 1974).

The most significant concentrations of vegetation within 0.5-mile of the site occur on the Harbor Point property, owned by NMPC; the Utica Marsh; and on the dredge spoil areas themselves. Major classes of vegetative cover types occurring within a 0.5-mile radius of the site are depicted on Figure 6.1.

The Harbor Point peninsula exhibits a mix of wetland and upland environments with areas of deciduous overstory, successional cover types, and open meadows. Moderately dense overstory dominated by large eastern cottonwood, green ash, and red maple, covers approximately one third of the Harbor Point peninsula. Overstory vegetation is concentrated along the center of the peninsula and is flanked by shrub layers of locust, staghorn sumac, and thin stands of aspen and box elder of less than 12-inch diameter at breast height (DBH). Meadows, largely clear of trees and shrubs, occur around the periphery of the peninsula and consist of Canada goldenrod, white sweet clover, Queen Anne's lace, bull thistle, chickory, common mullein, and many other common northeastern meadow species.

The vegetation types at the three DSAs is comparable and appears to be of similar ages, based on tree trunk diameters. Dredging of the river and harbor areas for navigation purposes and the subsequent deposition of dredge spoils on idle lands created the current topography. Low-lying deciduous forest cover is dominant. The poorly drained soils within the extensive perimeter berms support a dense, very uniform cover of even-aged green ash trees with scattered sycamore, eastern cottonwood, and poplar. The western edge of DSA-1, along Utica Harbor, is dominated by black willow. A few meadows resulting from road cuts and power lines are scattered around the perimeter of DSA-1 and DSA-2. The most abundant meadow species consist of goldenrod, Queen Anne's lace, various grasses, red-osier dogwood, baneberry, chicory, sweet white clover, bird-foot trefoil, raspberry, and grape vines. Small areas of water horsetail, purple loosestrife, soft rush, and common three square are scattered over the eastern half of DSA-2 in small wetland microhabitats occupying shallow depressions and ditches.

Land use classifications adjacent in the immediate vicinity of the dredge spoil areas include commercial/industrial development to the north, east, and south and former industrial properties and wetlands to the west. Little vegetative cover is associated with the commercial and industrial land uses except scattered open lots managed as lawns and storage yards. Therefore, sparsely vegetated commercial/industrial areas within 1 mile of the site are considered as having only marginal habitat value.

Present land use in the vicinity of DSA-1 is limited to two sets of overhead power cables and a petroleum transmission pipeline passing through the northern area. Land use south of DSA-1 includes a light industrial area, including a transportation company, a hotel, and restaurants. Land use in the area of DSA-2 include the NYSDOT service yard bordering the DSA on the southeast, the Erie Canal and bike/foot path along the northeast side of the site, and the Utica Harbor Lock to the northwest. Land use in the area of DSA-3 is limited to a NMPC power line right-of-way with overhead cables and the Buckeye Pipeline Company maintains an underground petroleum pipeline to the north and east of DSA-3. The Utica Terminal Lock is located 350 feet northeast of DSA-3. The Erie Canal and the pedestrian foot and bike path run approximately 350 feet north of DSA-3. The bike/foot path connects with recreational trails leading to observation towers in Utica Marsh.

#### 6.2.1.4 Wetlands

The revised NYSDEC (1984) Article 24 Freshwater Wetlands map and USFWS 1991 National Wetlands Inventory (NWI) map identify dozens of regulated freshwater wetlands within a 2-mile radius of the site. Neither source indicates the presence of state or federal jurisdictional wetlands on the dredge spoils sites. Local wetlands consist of palustrine forested, scrub-shrub, and emergent vegetative types and riverine wetlands exhibiting a wide range of vegetative subclasses and hydrologic regimes. For the purposes of an assessment of the possible impacts of the dredge spoils areas, wetlands to the north of the Barge Canal channel are considered hydrologically isolated from the site. The wetlands of primary concern to this investigation are those immediately adjacent to the site or within two miles downstream having interconnection with the Mohawk River. The wetland areas of primary concern consist of those associated with the Barge Canal, the Mohawk River and Utica Marsh.

The NWI map identifies the Barge Canal and Utica Harbor as a permanently flooded limnetic environment with an unconsolidated bottom. The canal and harbor areas consist of a open water environment with a generally steep shoreline profile that offers little opportunity for emergent vegetation or development of characteristic wetland plant communities. Most sections of the west bank are bermed above the typical water level and support a variety of facultative upland plants above the water line, and obligate wetland plants along a very narrow littoral zone. The east shore of the canal exhibits a somewhat gentler slope in most places and has a littoral zone with scattered emergent vegetation and an overstory of large black willows.

The Mohawk River, in the site vicinity, is classified as a permanent lower perennial river environment with a broad, seasonally innundated, floodplain (NWI, 1991). Wetland environments dominate the Mohawk River floodplain area upstream of the site. Downstream excavation and channelling of the barge canal have modified the topography, limiting wetlands to a narrow littoral zone.

Utica Marsh is a 213.5-acre wetland complex consisting of shallow pools, emergent vegetation, wet meadows, and deciduous forest wetlands in the Mohawk River floodplain (NYSDEC, 1980). Several transportation and powerline corridors have disrupted local drainage patterns in the marsh area and created extensive wetland habitat in the vicinity of the site. Resource value and habitat quality of the marsh are considered very high. The wetland complex provides nesting habitat and foraging area for resident and migrating waterfowl and songbirds, as well as breeding habitat for mammals, reptiles, and amphibians (NYSDEC, 1980).

No state or federal jurisdictional wetlands are presently identified on any of the DSAs. The uneven topography has created several small isolated wetland microhabitats consisting of seasonally wet depressions and ditches. No detailed investigation of vegetative composition or soils characteristics was conducted to determine whether any of these areas meet New York State or federal wetland jurisdictional definitions. DSA-3 is mapped as an upland inclusion surrounded by wetlands. No determination of the extent of dredge spoils into the wetland environments, if any, was conducted as part of this investigation.

#### 6.2.1.5 Wildlife Resources

No site-specific inventory of wildlife species was conducted as part of this phase of the analysis. Undeveloped areas, forested lots, meadows, and waterways in the Mohawk River floodplain provide an intricate pattern of cover types within a 0.5-mile radius of the site suitable for a wide array of wildlife species.

At least 30 mammal species occur in the Mohawk River floodplain area (Chamberlain, 1974). Commonly occurring small game mammals harvested in the site region include eastern cottontail rabbit, grey squirrel, raccoon, snowshoe hare, red fox, and grey fox. In spite of the presence of suitable habitat, mink, beaver, and cottontail rabbit are not common in the Mohawk River floodplain (Chamberlain, 1974). The wildlife observed on the DSAs from either tracks, scat, browse, or direct observation include raccoon, white tailed deer, and many northern leopard frogs and green frogs (ES, 1994). While not observed, the presence of small mammals such as deer mouse, white-footed mouse, meadow vole, mole, and other rodents is very likely. Wildlife directly or indirectly observed at various locations within the 0.5-mile radius include beaver, raccoon, feral cat, woodchuck, and white-tailed deer (including two fawns) (ES, 1994).

Whitetailed deer are common throughout the Mohawk Valley. Deer harvest estimates for the nearby towns of Whitestown, Marcy, and Deerfield New York, range from an average of 20 to 40 bucks harvested from each township during 1989 through 1993 big game hunting seasons. Total annual deer harvest each year from 1989 to 1993 in Oneida County has averaged approximately 2,800 individuals. NYSDEC harvest data for 1991 through 1993 for Deer Management Units (DMUs) #17, #32, and #67 estimate an average concentration of 1.3, 0.6, and 2.4 whitetailed deer bucks per square mile, respectively. During a site reconnaissance performed during this RI, two white-tailed deer does, with fawns, were observed near the site on the Harbor Point area. A part of a deer carcass (head only) was observed adjacent to the DSA-1 site.

One hundred forty nine bird species are known to inhabit the Mohawk floodplain. Eighty eight of these species are migratory summer residents, 25 species are transients, and 34 species are year-round residents. Two species, the tree sparrow and evening grosbeak, are considered winter residents (Chamberlain, 1974). Birds observed in the vicinity include great blue heron, green heron, belted kingfisher, common gallinule, kestrel, numerous dabbling ducks, American goldfinch, brown-headed cowbird, song sparrow, robin, red-winged blackbird, pigeon, common crow, European starling, mourning dove, American goldfinch, killdeer, red-winged blackbird, and wild turkey (ES, 1994). Raptors observed in the vicinity include marsh hawk and American kestrel (sparrow hawks). A pair of kestrel were observed nesting near DSA-1, and a fresh kestrel carcass was observed along the railroad tracks southwest of the site.

Upland game bird species harvested in WMU #17 include ruffed grouse, ring-necked pheasant, and woodcock. Of these species, only ring-necked pheasant has shown an increased harvest in recent years (NYSDEC, 1993a).

#### 6.2.1.6 Aquatic Environments

There are no aquatic environments capable of supporting fish life on DSA-1 or DSA-2. The seasonally wet ditches and depressions provide habitat for amphibians and aquatic insects. A perimeter ditch around the southern end of DSA-3 is a permanent waterbody and may support small fish and a limited aquatic community.

Surface waters a within 0.5-mile radius of the site include the Mohawk River, the Barge Canal, and Utica Harbor. The NYS surface water classifications for each of these waters is Class C (6 NYCRR Chapter X). Best usage of Class C waters include fish propagation, fishing, and primary and secondary contact recreation.

The Mohawk River flows eastward through a narrow "underfit" channel in a large valley that extends from Oneida Lake to the Hudson River (Van Diver, 1985). The Mohawk is 140 miles long with a watershed of approximately 3,400 square miles. The size of the Mohawk River floodplain from Delta Lake to the Oneida-Herkimer County line is 7,678 acres (Chamberlain, 1974). The Mohawk River in the site vicinity has a broadly meandering stream pattern with deeply scoured concave banks with a water depth of up to 20 feet.

Mohawk River flow data are available from the USGS gaging station located 16 miles upstream of the site at the Rome Fish Hatchery, 1 mile downstream of Delta Reservoir. The nearest downstream gaging station is located in Little Falls, NY. The downstream station includes the contribution of the West Canada Creek and numerous other smaller tributaries, and is not considered indicative of flow conditions at the site location. Data from the Rome gaging station record a 65-year average discharge of 368 cubic feet per second (CFS) for the upper 152 square miles of the watershed. Flow extremes for water year 1991 were a maximum discharge of 3,820 CFS and a minimum of 21 CFS (USGS, 1991).

Water quality data available from the NYSDEC Ambient Surface Water Monitoring program are available for the Mohawk River approximately 3.8 miles downstream of the site at a sample location in West Schuyler, NY. Data from this station, consisting of conventional water quality parameters and toxic chemicals analyses, have been collected from 1964 through the present. These analyses indicate an average (1989-1992) dissolved oxygen content of 87.5 percent saturation, consistently ranging from a maximum of 90 percent to a minimum of 80 percent throughout the seasons. Water temperatures peak in August at an average of 23 degrees Celcius (C). Seasonal temperature patterns range from summer maximums to an average of 12 degrees C in the spring/early summer months as well as the autumn/early winter. The single winter measurement this decade was 2.9 degrees C. A circum-neutral pH was recorded in 16 samples over a four year period. Flow estimates ranged from an average of 2,000 to 2,600 CFS in the months of April and May, 300 to 500 CFS through the summer and early autumn months, and approximately 1,200 CFS in November.

Grain size analysis of bottom sediments determined that 100 percent of the sediments were less than 0.125 millimeters (mm) diameter. Summer 1990 data show 43 percent of particles to be less than 0.063 mm and 13 percent smaller than 0.004 mm diameter. Total volatile solids content (determined by loss on ignition) ranges from 2.7 percent to 7.4 percent.

Toxic chemicals analyses indicate the sporadic presence of low levels of chloroform, trichloroethylene, and phenols detected in water samples and PCB Aroclors 1254 and 1260 in bottom sediments (NYSDEC, 1987). The updated 1994-1995 NYSDOH consumption advisory includes a recommendation to eat no carp from the Mohawk River between Oriskany Creek (6 miles upstream of the site) to West Canada Creek (15 miles downstream) due to PCB contamination (NYSDOH, 1994).

The Barge Canal and Utica harbor have a depth of approximately 12-14 feet. The width of the harbor is approximately 500 feet. The harbor and barge canal have been excavated and flooded by the waters of the Mohawk River to provide boat and barge service to the Erie Canal through the Utica Terminal Lock. The harbor and canal are dredged and maintained for barge access and exhibit a uniformly straight shoreline and consistent depth with the exception of the barge canal mouth which receives sediment deposition from the Mohawk River. The shape of the basin provides limited opportunities for emergent shoreline vegetation and very limited structural diversity of the substrate.

Two Class C trout streams are tributary to the Mohawk River upstream of the site location. The confluence of Oriskany Creek (Class C(t)) and the Mohawk River is located 6 miles upstream of the site and is considered beyond the radius of concern.

Sanquoit Creek, also a Class C(t) stream, enters the Mohawk River approximately 2.4 miles upstream of the site. Ferguson Creek is a Class C(t) trout stream that enters the Mohawk River approximately 2.5 miles downstream of the site. Ferguson Creek is considered beyond the radius of concern of the site. Small, unnamed and unclassified tributaries to the Mohawk River downstream of the site are not considered relevant to site assessment.

#### 6.2.1.7 Aquatic Resources

There are no aquatic environments capable of supporting fish life on the DSA-1 or DSA-2. The seasonally wet ditches and scattered depressions are incapable of supporting fish life. A perimeter ditch around the southern end of DSA-3 is a permanent waterbody and may support small fish and a limited aquatic community.

A wide array of freshwater fish species inhabit the Mohawk River and Barge Canal within a 0.5-mile radius of the site. A complex pattern of habitats in the Mohawk River is created by a meandering channel pattern and abundant submerged refugia, providing conditions suitable for a diverse fishery. Historical records and recent field data indicate the presence of at least 38 species of freshwater fish in the Mohawk River and tributaries in Oneida County. Large predatory, piscivorous fishes in the vicinity of the site include largemouth bass, walleye pike, northern pike, and tiger muskellunge. Forage fish evident in these waters include gizzard shad, yellow perch, rock bass, and white crappie. White sucker, brown bullhead, and carp are also present (ES, 1994). Two species of migratory fish, the catadromous (ocean spawning) American eel and anadromous (freshwater spawning) blue-backed herring have been observed in the site vicinity.

The NYSDEC Division of Water has conducted sampling of benthic macroinvertebrate communities and water quality assessments in the Mohawk River as part of the Rotating Intensive Basin Survey (RIBS). The Mohawk River below Rome NY has experienced a significant improvement in water quality attributable to improved treatment of industrial and municipal wastewaters since 1972. Increased species richness and pollution-intolerant indicator species have been observed in this reach of the Mohawk. Likewise the macroinvertebrate community below Utica has changed from a pollution-tolerant community of worm and midge fauna to a diverse fauna containing mayflies and caddisflies. The Mohawk River, below both Rome and Utica, is evaluated as "moderately impacted" and is considered among the most improved river reaches in the state since 1972 (RIBS, 1992).

#### 6.2.1.8 Endangered Species and Significant Habitats

There are no known federally- or state-listed endangered or threatened species or significant habitats located on the DSA site. NYSDEC Natural Heritage Program Biological and Conservation Data System identifies two species of birds within 2 miles of the site having a designated status of "special concern" within New York State. Known only from their historical occurrence, without recent field observations, the locations of their occurrence are known only to the nearest minute of latitude/longitude (NHP, 1994). Compiled lists of local bird sightings have documented the presence of both of these species in the Utica Marsh wetlands (NYSDEC, 1980). The Natural

Heritage database identifies no New York State or federally threatened or endangered species within a 2-mile radius of the site.

#### 6.2.1.9 Habitat Based Assessment

The DSAs provide terrestrial habitat for common wildlife capable of exploiting highly dissected vegetative communities and tolerating frequent human presence. While the DSAs are rather small in extent, they contribute to a complex pattern of upland and wetland environments. The DSAs provide small islands of continuous forest canopy surrounded by shrub wetlands, wet and dry meadows, and river environments. Rodents and other small mammals, snakes, frogs, songbirds, waterfowl, raptors, and whitetailed deer were observed in the site vicinity. The site appeared particularly attractive to summer songbirds, possibly due to the large number of insects and availability of shallow pools of fresh water. Numerous piscivorous birds such as green heron, great blue heron, and belted kingfisher were observed in the site area. .

The availability of terrestrial wildlife habitat within a 0.5-mile radius of the site is limited by the extent of commercial and industrial development to the north, east, and south. Transportation corridors for highways, local roads and railroads, and the urbanization effects at the fringe of the City of Utica, dominate the landscape. Despite these limitations, wildlife habitats occur in the wetlands of Utica Marsh, the Mohawk River floodplain, and the Harbor Point peninsula. The Mohawk River and its floodplain support 149 bird species, 38 species of fish, 30 mammalian species, 18 amphibian species, and 14 reptile species (Chamberlain, 1974). The notably absent or rare wildlife species in the Mohawk River floodplain include beaver, otter, mink, red squirrel, and gray squirrel.

The Utica Marsh is a regionally significant habitat exhibiting a variety of wetland habitat conditions. The wetland complex provides nesting habitat and foraging area for resident and migrating waterfowl and songbirds, as well as breeding habitat for mammals, reptiles and amphibians (NYSDEC, 1980).

A wide array of freshwater fish species inhabits the Mohawk River in the site vicinity. A complex pattern of habitats provides conditions suitable for a diverse fishery. Large predatory gamefish and panfish are abundant. Small boat access sites along the river make it attractive to sports fishermen. Shallow sandbars along the meanders of the Mohawk were observed to be significant summer fishing grounds for great blue heron, green heron and belted kingfisher. Several beaver trails and numerous muskrat dens were observed along the banks of the river.

The meadow and early successional forests in the vicinity present somewhat diverse conditions offering many resident wildlife species opportunity for both good cover and forage. Abandoned fields and shrub meadows of alders and poplars in the shrub meadows are attractive to pheasant and migrating woodcock. Mast-bearing hardwoods (oak, hickory, walnut) and conifers (pine and spruce) are, however, absent from the subject area, making the habitat unsuitable for species that rely on these trees for food sources.

#### 6.2.1.10 Resource Value to Humans

Hunters and target shooters have been observed in the Harbor Point area in the vicinity of the site (RETEC, 1992). Spent shot casings were observed on and near the DSAs suggesting that hunters are pursuing small game and waterfowl in the site vicinity. The site and adjacent lands are all private property with no authorized public access.

Significant habitats occur within a 0.5-mile radius of the site offering some potential for consumptive and non-consumptive wildlife uses. Unposted lands within the floodplain, containing suitable pheasant and woodcock habitat, offer good game hunting opportunities for sportsmen. Limited waterfowl hunting is conducted in the Utica Marsh wetlands (NYSDEC, 1980). Mallards, black ducks, wood ducks, and teal are hunted along the river, backwater areas, and old channels of the river (Chamberlain, 1974).

Recreational fishing resources are utilized in the Mohawk River, Barge Canal, and Utica Harbor in the site vicinity. Angling activity within Oneida County is estimated at 630,040 angler days involving 49,580 participants who expend over two million dollars in "at location" expenditures (NYSDEC, 1990). These estimates include all waters within the county and no data are available to determine to what degree the fisheries of the Mohawk River contribute toward the total estimated values. Several recreational fishing sites were observed along the Utica Harbor shoreline and along the Mohawk River. Anglers were observed fishing from the banks in the Mohawk River at the canal lock, along the lock access road, and on the banks of Utica Harbor.

NYSDOH issues advisories on eating sportfish and wildlife from New York State because some of these foods contain potentially harmful levels of chemical compounds. The 1993-1994 NYSDOH fish consumption advisory for the Mohawk River was a result of elevated PCB levels detected in smallmouth bass and white perch. The advisory applied only to waters below Lock # 7, far downstream of the site in Schenectady, NY (NYSDOH, 1993). The updated 1994-1995 NYSDOH consumption advisory now includes a recommendation to eat no carp from the Mohawk River from Oriskany Creek, 6 miles upstream of the site, to West Canada Creek, 15 miles downstream, due to PCB contamination (NYSDOH, 1994). Health advisories are considered to have a negative impact on the value of the fisheries resource to humans, however; it is not known to what degree such advisories deter anglers.

Sixty-five fish tissue samples were collected in August and September, 1995 and analyzed for PCBs, PAHs, selected metals, and percent lipids as part of an investigation of sediments and fish in the Utica Harbor, Mohawk River, Barge Canal. The results of the sampling and analysis are presented in detail in the final report associated with the investigation (Parsons ES, 1995a).

Resource values of the nearby Utica Marsh are considered very high due to its intense management as a wildlife habitat and educational resource. Permanent nature trails and wildlife observation towers have been constructed within the wetland area to facilitate access and utilization. The 1980 Utica Marsh Management Plan prepared by NYSDEC in cooperation with numerous local agency, business, and community organizations is focused on preserving the wetland environment and fostering community participation in its management. The management plan identifies objectives that include improving access, improving wildlife habitat, facilitating educational opportunities, and providing facilities for increased intensity of multiple uses.

### 6.2.2 Pathway Analysis

This section identifies potential pathways of exposure to chemical compounds of potential concern to biota. This section is followed by description of the types of chemicals detected in each of the physical media for which there is a completed exposure pathway.

The concepts of bioaccumulation and biomagnification are used throughout this report. Because these concepts have been historically applied in several ways, the following definitions describe their application in this study. Bioaccumulation is considered to be a process by which toxic substances are absorbed by organisms from the surrounding physical environment (e.g., fish absorbing mercury from water) or through consumption of another organism. Biomagnification refers to the resultant total process, by which tissue concentrations of bioaccumulated toxic substances increase as the substances pass up through two or more trophic levels (adapted from Brunge and Mount, 1978).

Ecological exposure pathways for biota may be direct or indirect. Direct exposure pathways include dermal contact, absorption, inhalation, and ingestion. Examples of direct exposure include animals incidentally ingesting chemicals in soil, sediment, or surface water (e.g., during burrowing or dust-bathing activities); plants absorbing chemical compounds by uptake from sediments or soils; and dermal contact of aquatic organisms with chemicals of concern surface water. Indirect exposure pathways for biota can occur when terrestrial or aquatic fauna consume biota which have consumed and retained chemical constituents. Examples of indirect exposure include higher-order animals consuming plants or animals that bioaccumulate chemical constituents.

Adverse impacts to biota could result from exposure to one or more chemicals of potential concern at the site. Chemical bioavailability is an important contaminant characteristic that regulates a receptor's reaction to contaminant exposure. Bioavailable chemicals are in a chemical form that a receptor can accumulate and react to. Bioavailability, which is regulated by several physical and chemical environmental factors, is a concern with many inorganic chemicals, especially the metals. Pathway evaluations must account for this characteristic. In addition to bioavailability, exposure pathways for chemical compounds consist of four components: 1) source and mechanism of chemical release, 2) transport medium, 3) potential receptors, and 4) exposure route. All components were evaluated during this study. If either chemical bioavailability or the exposure pathway between affected media and the receptors are not complete, then chemical compounds in those media do not constitute an environmental concern at the site.

#### 6.2.2.1 Groundwater Exposure Pathway

Based on the depths to groundwater, and the absence of springs at the site, there is no apparent completed pathway for exposure of wildlife or fish to chemical compounds in the groundwater. Moreover, any recharge of nearby surface waters from the groundwater would be addressed through the surface water exposure pathways.

#### 6.2.2.2 Surface Water Exposure Pathway

Surface water represents a potential transport medium for the chemicals of concern. Potential sources for these chemicals in surface water include affected soil and groundwater. The release mechanisms include storm water runoff and groundwater seepage. Aquatic organisms and terrestrial wildlife may be exposed to chemical constituents in surface water. Fish and other aquatic animals may be exposed through respiration, ingestion, and dermal contact with affected surface waters. Terrestrial wildlife may be exposed to these waters primarily through ingestion. Consumption by other animals in which chemical constituents have bioaccumulated constitutes a potential indirect exposure pathway for faunal receptors. Chemical bioavailability of some metals and other chemicals is controlled by water hardness and pH.

The wet depressions and ditches on the DSA-1 site do not constitute an exposure pathway to fish because they are incapable of supporting fish life. Surface water ditches around the DSA-3 site appear capable of supporting small fish and were observed to provide habitat for amphibians (frogs) and reptiles (turtles). Aquatic insects and amphibians may be exposed to chemical constituents in these surface waters via their respiratory surfaces. Birds and terrestrial wildlife may use the on-site pools as a drinking water source and could be exposed to chemicals through ingestion. Birds may use the ditches for bathing and could be exposed to constituents through dermal contact.

#### 6.2.2.3 Sediment Exposure Pathway

Sediment consists of materials precipitated or settled out of suspension in surface water. Sediment represents a potential transport medium for chemical constituents from the site. Potential sources for these chemicals in sediment include buried waste, and affected surface water, groundwater, and soil. The release mechanisms include surface water run-off (limited by berms in most areas), airborne deposition, and groundwater discharge. Aquatic organisms such as fish and macroinvertebrates may be exposed to sediment through dermal contact, ingestion, and respiration. Indirect exposure pathways from sediment include consumption by other consumers in the food chain of plants or animals in which chemicals have bioaccumulated. Chemical bioavailability of many nonpolar organic compounds, including PCBs and pesticides, is decreased with increasing concentrations of organic carbon (TOC) in the sediment.

The presence of on-site sediment is limited to the seasonally wet portions of DSA-3. The potential receptors to chemicals present in ditch sediment are amphibians, and aquatic insect, and other benthic macroinvertebrates via direct dermal contact. Since the pools are isolated from other surface water bodies by the berms, sediment is not likely to constitute a transport medium to off-site receptors.

#### 6.2.2.4 Soils Exposure Pathway

Wildlife receptors are generally not exposed to chemical constituents in soil below the 2-foot depth. Therefore, pathways for exposure of these receptors to chemical compounds in subsurface soils at depths greater than 2 feet are not considered complete. Surface soil on the DSAs consists of sediments (dredge material) previously excavated from the Mohawk River and Barge Canal.

Surficial soils represent a potential source and transport medium for the chemicals of concern. The release mechanisms for chemicals in soil include limited stormwater runoff (berms retain most stormwater runoff), tracking, groundwater seepage, and fugitive dust generation/deposition. Exposure routes include dermal contact by birds, mammals, and invertebrates; uptake by plants; and incidental ingestion or inhalation by birds and mammals while foraging and grooming. Consumption of biota which have been exposed to and retained some of the chemicals of concern by higher-order predators in the food chain can provide an indirect exposure pathway.

Soil exposure pathways are potentially important for terrestrial plants and wildlife at the site. The soils at the DSA sites are dredged river sediments. Plants are directly exposed to chemicals in soil by absorption and assimilation of soluble chemical forms through the root system. This represents the primary exposure route for vegetation at the site. Chemicals may be accumulated in different plant tissues, at different rates, or not at all depending on the specific chemical and plant species involved and prevailing soil chemical and physical conditions. In addition, environmental conditions such as soil moisture, soil pH, and cation exchange capacities significantly influence whether potential soil chemicals remain chemically bound in the soil matrix or whether they can be chemically mobilized (in a bioavailable form) and released for plant absorption. Generally, neutral to alkaline soils (soil pH of 6.5 or greater) restrict the absorption of toxic metals, making pathway completion to plants difficult. Soils in the region of the site are moderately to extremely acidic (USGS, 1991) suggesting conditions that may facilitate mobilization of metals available for plant uptake. The site soils however consist of sediment fill and are quite different from native soils.

#### 6.2.2.5 Summary of Nature and Extent of Contamination

The following is a brief summary of the Nature and Extent of Contamination presented in Section 4, including the ecological assessment considerations. Analytical data relevant to each of the three DSA areas will be addressed separately in the following subsections. In accordance with the preceding Pathway Analysis, incomplete exposure pathways will not be addressed in the contamination assessment. Physical media contaminant concentrations in shallow soils, surface water, and sediment will be addressed.

**Surface soils**

PAHs were detected in all surface soil sample collected at DSA-1 in concentrations ranging from 9.7 mg/kg (SS-106) to 1,105 mg/kg inside the bermed area and from 1.46 mg/kg to 22.75 mg/kg outside the berm. PAHs were detected in all 11 surface soil samples at DSA-2 in concentrations ranging from 10.83 mg/kg to 76.61 mg/kg. PAHs were found in five of the nine surface soil samples from DSA-3, ranging from 1.31 to 5.47 mg/kg.

No BTEX compounds were detected in shallow soils at the DSAs, with the exception of toluene at a low concentration at DSA-2.

PCBs were detected in all ten surface soil samples collected inside DSA-1 at concentrations ranging from 0.50 mg/kg to 6 mg/kg. PCBs were detected in three of seven surface soil samples collected outside the berms at concentrations ranging from not detected to 0.78 mg/kg. PCBs were detected in all 11 surface soils collected at DSA-2 in concentrations from 0.83 mg/kg to 6.99 mg/kg. PCBs were found in seven of the nine DSA-3 surface soil samples between 0.31 and 0.47 mg/kg.

Up to 13 metals were detected above the BUTLs in surface soil samples collected from DSA-1. There was no pattern to the distribution of metals above the BUTLs in DSA-1. The number of metals detected above the BUTLs was generally greater inside the bermed area than outside. Up to 22 metals were detected and up to ten metals were detected above the BUTLs in surface soil samples collected from DSA-2. Metals concentrations exceeded BUTLs in six of nine DSA-3 samples. The number of exceedences per metal ranged from zero to six.

### Surface water

PAHs were detected in one of two surface water samples from DSA-1 at very low concentrations (7 ug/L). They were not detected in the other sample (SW-102). No BTEX compounds or cyanide were detected in DSA-1 surface water samples. PCBs were detected in one of two surface water samples (SW-101) at a concentration of 0.66 ug/L. Up to 15 metals were detected at low concentrations in DSA-1 surface water samples collected from two ponded areas within the bermed area.

Five surface water and five sediment samples were collected from the bermed area of DSA-2, one sample was collected from the Mohawk River adjacent to the DSA, and one from northwest of the DSA from a ditch. PAHs, BTEX compounds, and cyanide were not detected in any of the five surface water samples collected. PCBs were detected in two of five surface water samples collected from ponded areas at DSA-2 and the Mohawk River. Concentrations ranged from not detected to 0.33 ug/L. Up to 13 metals were detected at low concentrations in surface water samples collected from three ponded areas within the bermed area, one ditch northwest of DSA, and from the Mohawk River adjacent to the DSA-2. Surface water results are summarized in Table 4.6.

Five surface water samples were collected from DSA-3. One sample was collected from a ponded area inside the berm in the northern cell, two samples were collected east of the northern cell, and two samples were collected in the northern end of the southern cell. PAHs and cyanide were not detected in any of the five DSA-3 surface water samples. BTEX was detected in three of the surface water samples. The total BTEX concentrations in surface water samples ranged from not detected to 29 ug/L. PCBs were detected in two of five DSA-3 surface water samples ranging from not detected to 0.39 ug/L. Up to 21 metals were detected in surface water samples collected from ponded areas associated with DSA-3.

### Sediment

PAHs were detected in both sediment samples collected inside DSA-1 at low concentrations. Total PAHs were detected at 20.63 mg/kg in SD-101 and 27.99 mg/kg in SD-102. The PAH concentrations in sediments were below those detected in surface soils except in SS-106. No BTEX compounds or cyanide were detected in sediment samples. PCBs were detected in both sediment samples at concentrations ranging from 1.7 mg/kg to 1.9 mg/kg. Up to 19 metals were detected at low levels in the two sediment samples.

Total PAHs were detected in all five DSA-2 sediment samples at concentrations ranging from 1.24 mg/kg to 21.88 mg/kg. There were no BTEX compounds or cyanide detected in any of the five DSA-2 sediment samples collected. PCBs were detected in all five sediment samples collected from ponded areas and the Mohawk River. Concentrations ranged from 0.02 mg/kg to 8 mg/kg. Up to 19 metals were detected in sediment samples collected at DSA-2 and analyzed for TAL inorganic compounds. The concentrations of arsenic ranged from 2.2 mg/kg to 8.9 mg/kg, beryllium ranged from below detection to 1.5 mg/kg, and manganese ranged from 270 mg/kg to 1,300 mg/kg in sediment samples.

PAHs were detected at DSA-3 in four of five sediment samples. Total PAH concentrations in the sediment samples ranged between 1.64 mg/kg and 6.26 mg/kg. BTEX compounds were not detected in the sediment samples. Cyanide was detected in one sediment sample (SD-302) at a concentration of 0.0022 mg/kg. PCBs were detected in four of five sediment samples. Total PCB concentrations in the sediment samples ranged between 0.062 mg/kg and 4.4 mg/kg. Twenty metals were detected in sediment samples collected at DSA-3. The concentrations of arsenic ranged from 5.5 mg/kg to 18.5 mg/kg, beryllium ranged from not detected in two samples to 1.8 mg/kg, and manganese ranged from 281 mg/kg to 18,400 mg/kg in sediment samples.

Sediment core samples were collected with a Wildco™ sampler (as described in Section 2) in the southern cell of DSA-3 instead of soil borings because of the ponded water. Total PAH concentrations in the sediment cores ranged between 0.08 mg/kg and 1,316.60 mg/kg. BTEX and cyanide were not detected in any of the SP sediment cores. PCBs were detected at low concentrations in two of three sediment samples that were analyzed for PCBs. Total PCB concentrations in the samples were 0.021 mg/kg (SP-306) and 0.029 mg/kg (SP-304). These samples were collected at the southern and northern end of the southern cell of the DSA. Eighteen metals were detected in sediment cores collected from the southern cell of DSA-3. The concentrations arsenic ranged from 5.4 mg/kg to 14.3 mg/kg, beryllium ranged from 1.5 mg/kg to 1.8 mg/kg, and manganese ranged from 525 mg/kg to 1,150 mg/kg.

### 6.2.3 Identification of Ecological SCGs

As part of Step I of the HBA, the NYSDEC (1993) guidance document calls for identification of SCGs which are intended to be protective of ecological receptors potentially exposed to contaminated media at the site. For the Dredge Spoil Areas, specific SCGs were identified for surface water, sediment, and shallow (0 to 2 feet deep) soils. Based on the pathway analysis, exposure pathways are not considered to be complete for groundwater, or subsurface (more than 2 feet deep) soils. Therefore, ecological SCGs were not identified for these media.

### 6.2.3.1 Surface Water SCGs

For surface water, SCGs protective of aquatic organisms in freshwater under chronic exposure conditions were identified. The NYSDEC classifies the Mohawk River as a Class C stream suitable for fish propagation and survival [Title 6, Chapter V, Part 609 of the New York Codes, Rules and Regulations (6 NYCRR 609)]. Therefore, New York aquatic surface water quality standards for fresh Class C waters were identified as SCGs (6 NYCRR 703.5). USEPA (1991) aquatic life water quality criteria protective of the most sensitive aquatic freshwater organisms in a chronic exposure scenario were also identified as SCGs. Site-specific surface water criteria for certain water-hardness-dependent metals are developed by applying the average measured site water hardness value of calcium carbonate ($CaCO_3$) to state and federal formulas.

### 6.2.3.2 Sediment SCGs

SCGs identified for sediment include the freshwater aquatic toxicity-basis sediment criteria developed by NYSDEC (1989) and proposed USEPA (1991) sediment criteria. These criteria are intended to be protective of benthic and epi-benthic aquatic organisms and for wildlife consuming fish and/or benthic macroinvertebrates exposed to contaminated sediments. The NYSDEC (1989) sediment criteria for non-polar organic compounds are based on TOC content in the sediments. Therefore, these criteria must be adjusted for the average measured site TOC concentration (approximately 3 percent). Site-specific background concentrations of certain compounds may be determined from sediment samples collected in the Mohawk River upstream from the site. Background concentrations are used for comparative purposes only, and are not considered SCGs for sediment.

### 6.2.3.3 Soil SCGs

SCGs for shallow soils follow NYSDEC (1992) TAGM HWR-92-4046 guidance. For organic compounds, soil cleanup objectives established by NYSDEC were identified as SCGs. For most inorganic compounds, average site-specific background concentrations may be used as SCGs. The soil cleanup objectives were developed to "at a minimum, eliminate all significant threats to human health and/or the environment posed by the inactive hazardous waste site" (NYSDEC, 1992). For most detected metals, the average site-specific background values are calculated as the mean concentration for each metal based on soil samples collected in the 0- to 2-foot depth interval upgradient/upwind at sampling locations thought to be outside the area of site influence.

### 6.2.3.4 Fish and Wildlife SCGs

Promulgated standards are available for limited sectors of the diverse biological environment. Federal and state standards, based on the Clean Water Act and reflecting acute and chronic aquatic life standards, are generally used to establish aquatic life protection requirements. Risks to the remaining biological groups are evaluated by comparing site chemical concentrations to toxicological response data derived from laboratory and field testing as reported in technical literature. In some situations, USEPA and a few states issue advisories or guidelines addressing acceptable concentrations of chemicals of concern in specific physical media. These recommendations are generally intended as interim planning or evaluation guidelines for avoiding or minimizing potential adverse effects from food chain biomagnification, bioaccumulation, or chronic exposures. These recommendations are usually chemical-specific.

**Wildlife**

There are no promulgated or established federal or State of New York standards relating specific chemical concentrations in sediments or surface waters directly to toxic effects on wildlife species. There are abundant toxicological testing data that relate known chemical dosages in either food or surface water to acute and chronic effects on specific species. These dosage values are important as reference points. However, dosage values cannot be used as absolute measurements of risk because other sophisticated site measurements required to credibly apply the dosage data (e.g., proportion of a species' annual diet derived from the site) involve analysis of food chain dynamics beyond the scope of this study.

For potential wildlife impact encountered through diet, toxic contaminant concentrations and resulting effects reported for laboratory animals such as ducks, rats, and mice may be used as appropriate. This approach conservatively assumes that chemical concentrations are transferred from soil or sediment through direct ingestion or through vegetation at 100 percent of the reported amount.

**Aquatic Life**

Under the authority of the Clean Water Act, USEPA has developed federal water-quality criteria (WQC), including criteria for protection of aquatic life, for each of more than 120 inorganic and organic compounds. Numerical ambient WQC are provided to protect marine and freshwater animals and nonvascular plants from chronic and acute toxicities (USEPA, 1991a). These criteria, as well as analogous aquatic life protection criteria established by the state of New York (NYSDEC, 1991), are used as standards for receptors in the aquatic life group. In addition, median lethal dose or median lethal concentration (LD50 or LC50) toxicity data are used as guidelines for those chemicals of potential concern not addressed by either federal or state ambient water quality criteria. The LC50 values for aquatic life receptors are used to represent acute toxicity concentrations. If chronic toxicity values are unavailable, a chronic toxicity threshold is determined by using 10 percent of the acute LC50 value for the specific receptor species (NYSDEC, 1991c). Acute and chronic toxicity values are then used to evaluate the potential for risks to aquatic life.

### 6.2.4 Fish and Wildlife Impact Assessment Summary

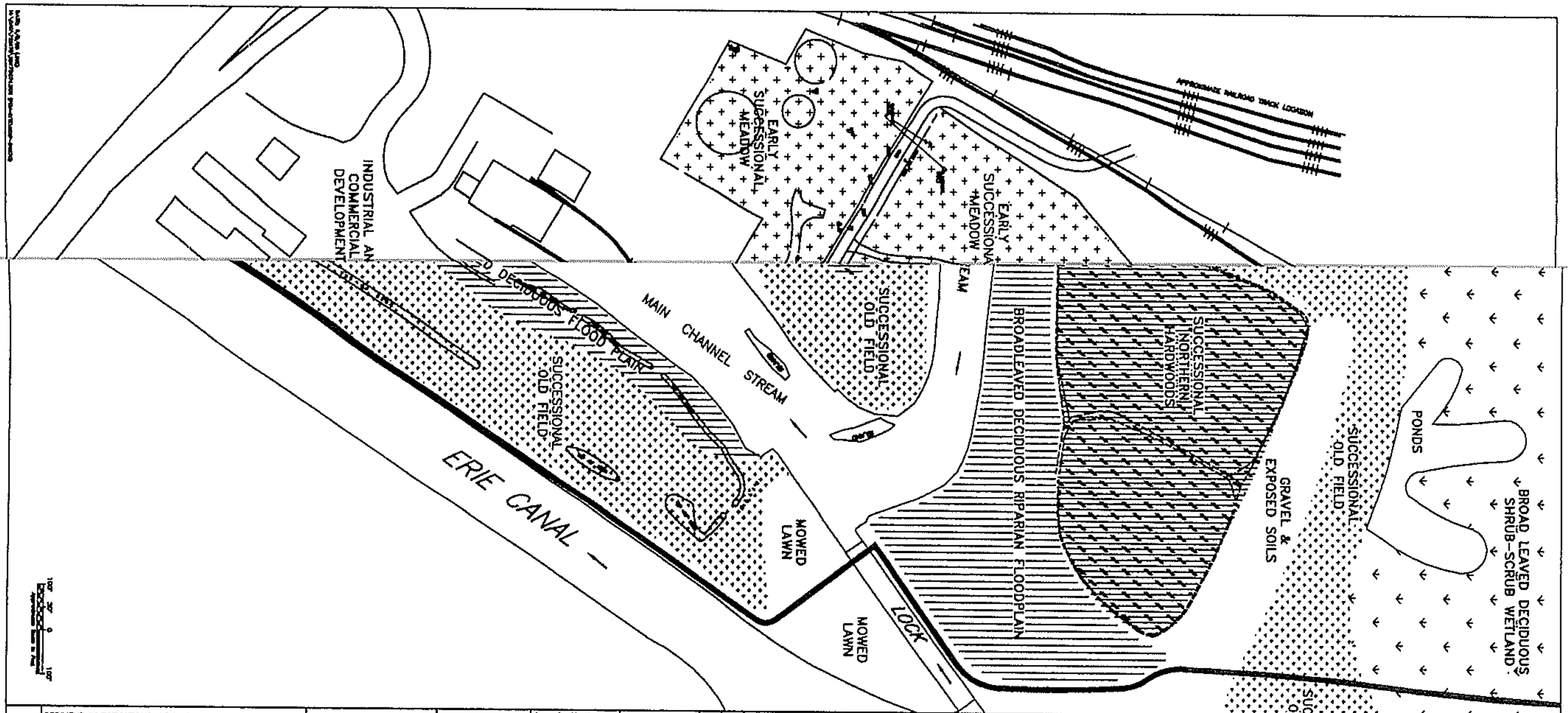
PCBs and PAHs were detected in surface soils at all of the samples collected from DSA-1 and DSA-2 and from over half of the samples from DSA-3. PAHs were detected in one sample from DSA-1 and were absent in other samples from DSA-2 and DSA-3. BTEX compounds were present in three surface water samples from DSA-3 but were absent in the other two spoils areas. DSA-2 and DSA-3 each had detectable levels of PCBs in surface water. A similar contaminant distribution in soils and DSA sediment probably arises from their common origin. Soils (dredge material) are the logical source for PCBs and PAHs detected in surface water and sediment. The absence of background surface water and sediment samples limits the evaluation of site potential impact attributable to site contamination.

The widespread presence of PCBs and PAHs in surficial soils suggest possible exposure and impacts to biota from the surface soil media through one or more of the scenarios described in the pathway analysis.

Pathways to on-site ecological receptors are considered incomplete for chemical compounds in groundwater, and subsurface (deeper than 2 feet) soils. Surface waters constitute an exposure pathway to fish only at DSA-3. Isolated wet depressions and ditches on DSA-1 and DSA-2 are incapable of supporting fish life and are isolated from other surface water bodies. Aquatic insects, macroinvertebrates, and amphibians may be exposed to chemical compounds in these surface waters and underlying sediments via their respiratory surfaces, dermal exposure, and ingestion. Birds and terrestrial wildlife may use the on-site surface water as a drinking water source and could be exposed to chemical compounds through ingestion.

Exposure routes to chemical compounds in shallow site soils and sediment include dermal contact by birds, mammals, and invertebrates; uptake by plants; and incidental ingestion or inhalation by birds and mammals while foraging and grooming. Consumption of contaminated biota by higher-order predators in the food chain can provide an indirect exposure pathway for some chemical compounds in surface water, sediment, and soil.

Significant habitats occur within a 0.5-mile radius of the site offering some potential for consumptive and non-consumptive wildlife uses. Unposted lands within the floodplain, containing suitable pheasant and woodcock habitat, offer good game hunting opportunities for sportsmen. Utica Marsh, within 0.5-mile of the site is a regionally significant wetland habitat. Limited waterfowl hunting is conducted in the Utica Marsh wetlands (NYSDEC, 1980). Mallards, black ducks, wood ducks, and teal are hunted along the river, backwater areas, and old channels of the Mohawk River (Chamberlain, 1974). Recreational fishing resources are utilized in the Mohawk River, Barge Canal, and Utica Harbor in the site vicinity.



SEDIMENT INVESTIGATIONS OF THE UTICA TERMINAL HARBOR, BARGE CANAL AND MOHAWK RIVER

VEGETATIVE SITE PLAN
FOR FISH AND WILDLIFE

NIAGARA MOHAWK POWER CO.
SYRACUSE, NEW YORK

NIAGARA MOHAWK

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Date

| Rev | Date | Description | By |
|---|---|---|---|

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## TABLE 6.1
## REPRESENTATIVE CONCENTRATIONS OF CHEMICALS OF POTENTIAL CONCERN (1)

| Chemical | Surface Soil (2) (mg/kg) | Mixed Soil (3) (mg/kg) | Groundwater (mg/L) |
|---|---|---|---|
| | | | |
| **Pesticides/PCBs** | | | |
| Aldrin | 2.70E−03 | 2.70E−03 | ND |
| Alpha−chlordane | 3.00E−03 | 5.34E−03 | ND |
| Aroclor−1242 | 1.50E+00 | 1.14E+00 | ND |
| Aroclor−1254 | 6.10E+00 | 6.19E+00 | ND |
| Aroclor−1260 | 6.00E−02 | 1.03E−01 | ND |
| 4,4'−DDE | 1.87E−02 | 1.87E−02 | ND |
| Dieldrin | 2.11E−02 | 1.24E−02 | ND |
| Endrin aldehyde | ND | 1.11E−02 | ND |
| | | | |
| **Inorganics** | | | |
| Aluminum | ND | 1.22E+04 | 1.97E+01 |
| Antimony | 5.61E+00 | 5.62E+00 | ND |
| Arsenic | 9.55E+00 | 7.87E+00 | 1.49E−02 |
| Barium | 1.03E+02 | 9.83E+01 | ND |
| Beryllium | 1.08E+00 | 9.29E−01 | 2.02E−03 |
| Cadmium | 1.95E+00 | 1.52E+00 | 3.66E−03 |
| Chromium | 1.27E+02 | 1.00E+02 | 9.91E−02 |
| Cobalt | 1.46E+01 | 1.36E+01 | ND |
| Copper | 6.54E+02 | 5.99E+02 | 4.81E−01 |
| Lead | 6.84E+01 | 6.94E+01 | 1.10E−01 |
| Manganese | 8.91E+02 | 7.05E+02 | 1.18E+01 |
| Mercury | 5.08E−01 | 4.41E−01 | 6.80E−04 |
| Nickel | 4.19E+01 | 3.76E+01 | 1.20E−01 |
| Selenium | 9.30E−01 | 8.12E−01 | ND |
| Silver | 1.48E+00 | 1.47E+00 | ND |
| Vanadium | ND | ND | 6.35E−02 |
| Zinc | 2.30E+02 | 2.22E+02 | 4.28E−01 |
| Cyanide | 8.03E−01 | 8.03E−01 | ND |
| | | | |

(1) The representative concentration used in the risk assessment was the lesser of the 95% UCL on the arithmetic mean and the maximum detected value. ND = not detected.

(2) Surface soil = 0 to 2 feet below ground surface.

(3) Mixed soils = surface soils and subsurface soils to 14 feet below grade.

# TABLE 6.2
# COMPARISON OF MAXIMUM LEVELS OF INORGANIC CHEMICALS IN GROUNDWATER TO BACKGROUND UPPER TOLERANCE LIMITS

| Chemical | Maximum Site Groundwater Concentration (mg/L) (1) | Background Upper Tolerance Limit (mg/L) | Is BUTL Exceeded? |
|---|---|---|---|
| **Inorganics** | | | |
| Aluminum | 77 | ND | YES |
| Antimony | ND | ND | NO |
| Arsenic | 0.032 | 0.006 | YES |
| Barium | 0.89 | 0.218 | YES |
| Beryllium | 0.012 | 0.002 | YES |
| Cadmium | 0.027 | 0.006 | YES |
| Chromium | 0.25 | 0.031 | YES |
| Cobalt | 0.089 | 0.015 | YES |
| Copper | 0.97 | 0.096 | YES |
| Lead | 0.19 | 0.119 | YES |
| Manganese | 20 | 1.069 | YES |
| Mercury | 0.0033 | 0.004 | YES |
| Nickel | 0.56 | 0.039 | YES |
| Selenium | ND | ND | NO |
| Silver | 0.021 | ND | YES |
| Vanadium | 0.26 | ND | YES |
| Zinc | 2.0 | 0.124 | YES |
| Cyanide | ND | ND | NO |

(1) Maximum site groundwater concentration in wells. ND = not detected.

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# TABLE 6.3
# COMPARISON OF MAXIMUM LEVELS OF INORGANIC CHEMICALS IN SOILS TO BACKGROUND UPPER TOLERANCE LIMITS

| Chemical | Background Upper Tolerance Limit (mg/kg) | Maximum Surface Soil Concentration (mg/kg) (2) | Is BUTL Exceeded in Surface Soil? | Maximum Mixed Soil Concentration (mg/kg) (3) | Is BUTL Exceeded in Mixed Soil? |
|---|---|---|---|---|---|
| **Inorganics** | | | | | |
| Aluminum | ND | 19,300 | YES | 24,500 | YES |
| Antimony | ND | 14 | YES | 27 | YES |
| Arsenic | 12.5 | 21 | YES | 21 | YES |
| Barium | 104.4 | 331 | YES | 331 | YES |
| Beryllium | 1.4 | 2.1 | YES | 2.1 | YES |
| Cadmium | 2.4 | 8.0 | YES | 8.0 | YES |
| Chromium | 46.2 | 320 | YES | 320 | YES |
| Cobalt | 18.3 | 34 | YES | 34 | YES |
| Copper | 115.5 | 1,290 | YES | 1,290 | YES |
| Lead | 66.5 | 142 | YES | 142 | YES |
| Manganese | 517.9 | 18,400 | YES | 18,400 | YES |
| Mercury | 0.5 | 1.5 | YES | 1.5 | YES |
| Nickel | 38.5 | 69 | YES | 69 | YES |
| Selenium | ND | 2.5 | YES | 2.5 | YES |
| Silver | 7.7 | 4.1 | NO | 4.1 | NO |
| Vanadium | 35.0 | 49 | YES | 49 | YES |
| Zinc | 143.3 | 505 | YES | 505 | YES |
| Cyanide | ND | 2.2 | YES | 2.2 | YES |

(1) ND = not detected.
(2) Surface soil = 0 to 2 feet below ground surface. Shallow sediments from ephemeral ponds were included with surface soils.
(3) Mixed soils = surface soils and subsurface soils to 14 feet below grade.

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# TABLE 6.4
# POTENTIAL PATHWAYS FOR HUMAN EXPOSURE

| Potentially Exposed Population | Exposure Route, Medium, and Exposure Point | Pathway Selected for Evaluation? | Reason for Selection or Exclusion |
|---|---|---|---|
| **CURRENT RECEPTORS** | | | |
| Residential Trespassers | Ingestion of, dermal contact with, or inhalation of chemicals of potential concern from groundwater wells downgradient of the site. | No | The area in the vicinity of the Dredge Spoils Area site obtains its water via the City of Utica municipal supply. |
| Residential Trespassers | Ingestion of or dermal contact with chemicals of potential concern from soils at the site. | Yes | Nearby residents may trespass onto the site and may be exposed to surface soils (0 to 2 feet below ground surface). |
| Residential Trespassers | Inhalation of VOCs and particulate matter for chemicals of potential concern from soils at the site. | No | The site is covered by compacted soil and is completely vegetated, making VOC and fugitive dust generation from soils unlikely. |
| **FUTURE RECEPTORS** | | | |
| Residents | Ingestion of, dermal contact with, or inhalation of chemicals of potential concern from groundwater wells downgradient of the site. | Yes | Although it may be reasonably anticipated that onsite and downgradient water will not be used, the evaluation is provided for comparison only. |
| Workers | Ingestion of or dermal contact with chemicals of potential concern from groundwater wells downgradient of the site. | No | It is anticipated that the site will remain commercial/ industrial in the future and, therefore, will continue to be supplied via a municipal source. |

## TABLE 6.4
## POTENTIAL PATHWAYS FOR HUMAN EXPOSURE

| Potentially Exposed Population | Exposure Route, Medium, and Exposure Point | Pathway Selected for Evaluation? | Reason for Selection or Exclusion |
|---|---|---|---|
| **FUTURE RECEPTORS (CON'T)** | | | |
| Residents | Ingestion of or dermal contact with chemicals of potential concern from soils at the site. | Yes | The site will have only nonresidential uses in the future; however, evaluation of hypothetical future residents is provided for comparison. |
| Recreators | Ingestion of or dermal contact with chemicals of potential concern from soils at the site. | Yes | Assuming future recreational development of the site, future recreators may be exposed to a mixture of both surface and subsurface soils. |
| Workers | Ingestion of or dermal contact with chemicals of potential concern from soils at the site. | Yes | Assuming future excavation of the site, future workers may be exposed to a mixture of both surface and subsurface soils. |
| Residents and Recreators | Inhalation of VOCs and particulate matter for chemicals of potential concern from soils at the site. | No | It is highly unlikely that activities performed by residents/recreators will result in VOCs or particulates becoming airborne. |
| Workers | Inhalation of VOCs and particulate matter for chemicals of potential concern from soils at the site. | Yes | Contaminants in site surface soils may become airborne in the form of VOCs or particulates during industrial activities. |

## TABLE 6.5
## SUMMARY OF EXPOSURE VARIABLES, WATER PATHWAYS

| Exposure Variable | Receptor (1) | Rationale | Reference |
|---|---|---|---|
| **CW = Chemical Conc. in Water** | | | |
| chemical–specific value, mg/L | All receptors | Value used is the upper limit of the 95 percent confidence interval of measured concentrations in groundwater, or the maximum detected concentration, whichever value is lower. | Analytical data and USEPA, 1989a |
| **IR = Intake Rate** | | | |
| 2.0 L/day | RME – Adult residents | 90th percentile for adult residents | USEPA, 1989a |
| 1.4 L/day | CT – Adult residents | Mean for adult residents | USEPA, 1989a |
| **EF = Exposure Frequency** | | | |
| 350 days/year | Adult residents | Assumes year round exposure to groundwater and vacation from home for 2 weeks/year. | USEPA, 1991 |
| **ET = Exposure Time** | | | |
| 0.2 hr/day | RME – Adult residents | Upper bound of time spent in shower (12 minutes). | USEPA, 1992a |
| 0.12 hr/day | CT – Adult residents | Average of time spent in shower (7 minutes). | USEPA, 1992a |
| **ED = Exposure Duration** | | | |
| 30 years | RME – Adult residents | Upper bound time at one residence. | USEPA, 1989a |
| 9 years | CT – Adult residents | Average time at one residence. | USEPA, 1989a |

## TABLE 6.5
## SUMMARY OF EXPOSURE VARIABLES, WATER PATHWAYS

| Exposure Variable | Receptor (1) | Rationale | Reference |
|---|---|---|---|
| **SA = Surface Area of Skin** | | | |
| 23,000 $cm^2$ | RME – Adult residents | Upper bound total skin surface for adults. | USEPA, 1992a |
| 20,000 $cm^2$ | CT – Adult residents | Average total skin surface for adults. | USEPA, 1992a |
| **CF = Conversion Factor** | | | |
| 0.001 L/cm3 | All receptors | Unit conversion factor. | USEPA, 1989a |
| **BW = Body Weight** | | | |
| 70 kg | All receptors | Approximate mean weight for adults. | USEPA, 1989a |
| **AT = Averaging Time** | | | |
| 70 years x 365 days/year (Carcinogens) | All receptors | Conventional human lifespan. Intakes for carcinogens are averaged over the lifespan since risk is accrued over a lifetime. | USEPA, 1989a |
| ED x 365 days/year (Noncarcinogens) | All receptors | Intakes for noncarcinogens are averaged over the duration of exposure. | USEPA, 1989a |

(1) RME = reasonable maximum exposure; CT = central tendency.

## TABLE 6.6
## SUMMARY OF EXPOSURE VARIABLES, SOIL PATHWAYS

| Exposure Variable | Receptor (1) | Rationale | Reference |
|---|---|---|---|
| **CS = Chemical Conc. in Soil** | | | |
| chemical–specific value, mg/kg | All receptors | Value used is the upper limit of the 95 percent confidence interval of measured concentrations in soil or the maximum detected concentration, whichever value is lower. | Analytical data and USEPA, 1989a |
| **IR = Intake Rate** | | | |
| 100 mg/kg | Adult residents | Average residential adult exposure to indoor and outdoor dirt and dust. | USEPA, 1991 |
| 200 mg/kg | Child residents | USEPA standard average for children ages 1–6. | USEPA, 1991 |
| 50 mg/kg | Workers | Average indoor worker exposure to dirt and dust. | USEPA, 1991 |
| **EF = Exposure Frequency** | | | |
| 350 days/year | RME – All residents | Assumes year–round exposure to soil and vacation from home for 2 weeks/year. | USEPA, 1991 |
| 40 days/year | CT – Adult residents | Average time of adult exposure to soil. | USEPA, 1992a |
| 130 days/year | CT – Child residents | Average time of child exposure to soil. | USEPA, 1992a |
| 250 days/year | Workers | Assumes employment of 5 days/week and absence of 10 days/year for vacation. | USEPA, 1991 |
| 52 days/year | Adult Recreators/ Trespassers | Assumes exposure of 1 day/week. | Best Professional Judgment |

## TABLE 6.6
## SUMMARY OF EXPOSURE VARIABLES, SOIL PATHWAYS

| Exposure Variable | Receptor (1) | Rationale | Reference |
|---|---|---|---|
| **ED = Exposure Duration** | | | |
| 30 years | RME – Resident<br>6 yrs child/24 yrs adult | Upper bound time in one residence. | USEPA, 1991 |
| 9 years | CT – Resident<br>6 yrs child/3 yrs adult | Average time in one residence. | USEPA, 1989a |
| 25 years | Worker | Upper bound time for employment at a job. | USEPA, 1991 |
| **SA = Surface Area of Skin** | | | |
| 5,800 $cm^2$ | RME – Adult receptors | Upper bound adult skin surface exposed to soils. | USEPA, 1992a |
| 5,000 $cm^2$ | CT – Adult receptors | Average adult skin surface exposed to soils. | USEPA, 1992a |
| **AF = Adherence Factor** | | | |
| 1.0 mg/cm2 | RME – Adult receptors | Upper bound soil to skin adherence factor. | USEPA, 1992a |
| 0.2 mg/cm2 | CT – Adult receptors | Average soil to skin adherence factor. | USEPA, 1992a |
| **CF = Conversion Factor** | | | |
| 1E–06 kg/mg | All receptors | Unit conversion factor. | USEPA, 1989a |

## TABLE 6.6
## SUMMARY OF EXPOSURE VARIABLES, SOIL PATHWAYS

| Exposure Variable | Receptor (1) | Rationale | Reference |
|---|---|---|---|
| **BW = Body Weight** | | | |
| 15 kg | Child receptors | Standard reference weight for children. | USEPA, 1991 |
| 70 kg | All adult receptors | Approximate mean weight for adults. | USEPA, 1991 |
| **AT = Averaging Time** | | | |
| 70 years x 365 days/year (Carcinogens) | All receptors | Conventional human lifespan. Intakes for carcinogens are averaged over the lifespan since risk is accrued over a lifetime. | USEPA, 1989a |
| ED x 365 days/year (Noncarcinogens) | All receptors | Intakes for noncarcinogens are averaged over the duration of exposure. | USEPA, 1989a |

(1) RME = reasonable maximum exposure; CT = central tendency.

# TABLE 6.7
# CHEMICAL SPECIFIC TOXICITY VALUES
# NONCARCINOGENIC EFFECTS (1)

| CAS No. | Chemical | Administered–Dose Oral RfD (mg/kg–d) | Absorbed–Dose Dermal RfD (2) (mg/kg–d) | Inhalation RfC (mg/m$^3$) |
|---|---|---|---|---|
| | **Volatiles** | | | |
| 67–64–1 | Acetone | 1E–01 | 9E–02 | – |
| 71–43–2 | Benzene | – | – | – |
| 74–87–3 | Chloromethane | UR | – | UR |
| 100–41–4 | Ethylbenzene | 1E–01 | 9E–02 | 1E+00 |
| 100–42–5 | Styrene | 2E–01 | 2E–01 | 1E+00 |
| 108–88–3 | Toluene | 2E–01 | 2E–01 | 4E–01 |
| 1330–20–7 | Xylenes | 2E+00 | 2E+00 | – |
| | | | | |
| | **Semivolatiles** | | | |
| 83–32–9 | Acenaphthene | 6E–02 | 1E–02 | – |
| 208–96–8 | Acenaphthylene | – | – | – |
| 120–12–7 | Anthracene | 3E–01 | 6E–02 | – |
| 56–55–3 | Benzo(a)anthracene | – | – | – |
| 50–32–8 | Benzo(a)pyrene | – | – | – |
| 205–99–2 | Benzo(b)fluoranthene | – | – | – |
| 191–24–2 | Benzo(g,h,i)perylene | – | – | – |
| 207–08–9 | Benzo(k)fluoranthene | – | – | – |
| 117–81–7 | Bis(2–ethylhexyl)phthalate | 2E–02 | 1E–02 | – |
| 91–58–7 | 2–Chloronaphthalene | 8E–02 | – | – |
| 218–01–9 | Chrysene | – | – | – |
| 53–70–3 | Dibenzo(a,h)anthracene | – | – | – |
| 132–64–9 | Dibenzofuran | – | – | – |
| 206–44–0 | Fluoranthene | 4E–02 | 8E–03 | – |
| 86–73–7 | Fluorene | 4E–02 | 8E–03 | – |
| 193–39–5 | Indeno(1,2,3–cd)pyrene | – | – | – |
| 91–57–6 | 2–Methylnaphthalene | – | – | – |
| 106–44–5 | 4–Methylphenol | 5E–03 | 4E–03 | – |
| 91–20–3 | Naphthalene | 4E–02 | 8E–03 | – |
| 86–30–6 | N–Nitrosodiphenylamine | – | – | – |
| 85–01–8 | Phenanthrene | – | – | – |
| 108–95–2 | Phenol | 6E–01 | 5E–01 | – |
| 129–00–0 | Pyrene | 3E–02 | 6E–03 | – |
| 95–95–4 | 2,4,5–Trichlorophenol | 1E–01 | – | – |
| | | | | |
| | **Pesticides/PCBs** | | | |
| 309–0–2 | Aldrin | 3E–05 | 2E–05 | – |
| 5103–71–9 | Alpha–chlordane | 6E–05 | 1E–05 | – |
| 53469–21–9 | Aroclor–1242 | 2E–05 | – | – |
| 12672–29–6 | Aroclor–1248 | 2E–05 | – | – |
| 11097–69–1 | Aroclor–1254 | 2E–05 | 2E–05 | – |
| 11096–82–5 | Aroclor–1260 | 2E–05 | 2E–05 | – |
| 72–55–9 | 4,4'–DDE | – | – | – |
| 60–57–1 | Dieldrin | 5E–05 | 3E–05 | – |
| 7421–93–4 | Endrin aldehyde | 1E–05 | – | – |

# TABLE 6.7
# CHEMICAL SPECIFIC TOXICITY VALUES
# NONCARCINOGENIC EFFECTS (1)

| CAS No. | Chemical | Administered–Dose Oral RfD (mg/kg–d) | Absorbed–Dose Dermal RfD (2) (mg/kg–d) | Inhalation RfC (mg/m$^3$) |
|---|---|---|---|---|
| | | | | |
| | **Inorganics** | | | |
| 7429–90–5 | Aluminum | 1E+00 | – | – |
| 7440–36–0 | Antimony | 4E–04 | 4E–06 | – |
| 7440–38–2 | Arsenic | 3E–04 | 2E–04 | – |
| 7440–39–3 | Barium | 7E–02 | 4E–03 | 5E–04 |
| 7440–41–7 | Beryllium | 5E–03 | 5E–05 | – |
| 7440–43–9 | Cadmium | 5E–04 | – | – |
| 7440–47–3 | Chromium (VI) | 5E–03 | 1E–04 | – |
| 7440–48–4 | Cobalt | 6E–02 | – | – |
| 7440–50–8 | Copper | 4E–02 | 2E–02 | – |
| 7439–92–1 | Lead | – | – | – |
| 7439–96–5 | Manganese | 5E–03 | 2E–04 | 5E–05 |
| 7439–97–6 | Mercury | 3E–04 | 3E–06 | 3E–04 |
| 7440–02–0 | Nickel | 2E–02 | 8E–04 | – |
| 7782–49–2 | Selenium | 5E–03 | 5E–03 | – |
| 7440–22–4 | Silver | 5E–03 | 1E–03 | – |
| 7440–62–2 | Vanadium | 7E–03 | 7E–05 | – |
| 7440–66–6 | Zinc | 3E–01 | 8E–02 | – |
| 57–12–5 | Cyanide | 2E–02 | 1E–02 | – |
| | | | | |

(1) From IRIS (USEPA, 1995b). When IRIS values were unavailable, HEAST (USEPA, 1994a) was used.
RfD = reference dose, RfC = reference concentration, NR = not reported, UR = under review
A dash ("–") indicates that this item is not applicable, or that there is no entry in either IRIS or HEAST.

(2) Absorbed–Dose Dermal RfD = Administered–Dose Oral RfD x oral absorption factor (see Appendix H.3).

# TABLE 6.8
# CHEMICAL SPECIFIC TOXICITY VALUES
# CARCINOGENIC EFFECTS (1)

| CAS No. | Chemical | CAG Group (2) | Administered-Dose Oral SF $(mg/kg-d)^{-1}$ | Absorbed-Dose Dermal SF (3) $(mg/kg-d)^{-1}$ | Inhalation URF $(\mu g/m^3)^{-1}$ |
|---|---|---|---|---|---|
| | | | | | |
| | **Volatiles** | | | | |
| 67-64-1 | Acetone | D | – | – | – |
| 71-43-2 | Benzene | A | 3E-02 | 3E-02 | 8E-06 |
| 74-87-3 | Chloromethane | C | 1E-02 | 1E-02 | 2E-06 |
| 100-41-4 | Ethylbenzene | D | – | – | – |
| 100-42-5 | Styrene | NR | – | – | – |
| 108-88-3 | Toluene | D | – | – | – |
| 1330-20-7 | Xylenes | D | – | – | – |
| | | | | | |
| | **Semivolatiles** | | | | |
| 83-32-9 | Acenaphthene | NR | – | – | – |
| 208-96-8 | Acenaphthylene | D | – | – | – |
| 120-12-7 | Anthracene | D | – | – | – |
| 56-55-3 | Benzo(a)anthracene | B2 | 7E-01 | 4E+00 | – |
| 50-32-8 | Benzo(a)pyrene | B2 | 7E+00 | 4E+01 | – |
| 205-99-2 | Benzo(b)fluoranthene | B2 | 7E-01 | 4E+00 | – |
| 191-24-2 | Benzo(g,h,i)perylene | D | – | – | – |
| 207-08-9 | Benzo(k)fluoranthene | B2 | 7E-02 | 4E-01 | – |
| 117-81-7 | Bis(2-ethylhexyl)phthalate | B2 | 1E-02 | 3E-02 | – |
| 91-58-7 | 2-Chloronaphthalene | NR | – | – | – |
| 218-01-9 | Chrysene | B2 | 7E-03 | 1E-02 | – |
| 53-70-3 | Dibenzo(a,h)anthracene | B2 | 7E+00 | 4E+01 | – |
| 132-64-9 | Dibenzofuran | D | – | – | – |
| 206-44-0 | Fluoranthene | D | – | – | – |
| 86-73-7 | Fluorene | D | – | – | – |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | B2 | 7E-01 | 4E+00 | – |
| 91-57-6 | 2-Methylnaphthalene | NR | – | – | – |
| 106-44-5 | 4-Methylphenol | C | – | – | – |
| 91-20-3 | Naphthalene | D | – | – | – |
| 86-30-6 | N-Nitrosodiphenylamine | B2 | 5E-03 | 2E-02 | – |
| 85-01-8 | Phenanthrene | D | – | – | – |
| 108-95-2 | Phenol | D | – | – | – |
| 129-00-0 | Pyrene | D | – | – | – |
| 95-95-4 | 2,4,5-Trichlorophenol | NR | – | – | – |
| | | | | | |
| | **Pesticides/PCBs** | | | | |
| 309-0-2 | Aldrin | B2 | 2E+01 | 3E+01 | 5E-03 |
| 5103-71-9 | Alpha-chlordane | B2 | 1E+00 | 7E+00 | 4E-04 |
| 53469-21-9 | Aroclor-1242 | NR | 8E+00 | – | – |
| 12672-29-6 | Aroclor-1248 | NR | 8E+00 | – | – |
| 11097-69-1 | Aroclor-1254 | B2 | 8E+00 | 9E+00 | – |
| 11096-82-5 | Aroclor-1260 | B2 | 8E+00 | 9E+00 | – |
| 72-55-9 | 4,4'-DDE | B2 | 3E-01 | 2E+00 | – |
| 60-57-1 | Dieldrin | B2 | 2E+01 | 3E+01 | 5E-03 |
| 7421-93-4 | Endrin aldehyde | NR | – | – | – |
| | | | | | |

# TABLE 6.8
# CHEMICAL SPECIFIC TOXICITY VALUES
# CARCINOGENIC EFFECTS (1)

| CAS No. | Chemical | CAG Group (2) | Administered-Dose Oral SF $(mg/kg-d)^{-1}$ | Absorbed-Dose Dermal SF (3) $(mg/kg-d)^{-1}$ | Inhalation URF $(\mu g/m^3)^{-1}$ |
|---|---|---|---|---|---|
| | **Inorganics** | | | | |
| 7429-90-5 | Aluminum | NR | – | – | – |
| 7440-36-0 | Antimony | NR | – | – | – |
| 7440-38-2 | Arsenic | A | 2E+00 | 2E+00 | 4E-03 |
| 7440-39-3 | Barium | NR | – | – | – |
| 7440-41-7 | Beryllium | B2 | 4E+00 | 4E+02 | 2E-03 |
| 7440-47-3 | Chromium (VI) | A | – | – | 1E-02 |
| 7440-48-4 | Cobalt | NR | – | – | – |
| 7440-50-8 | Copper | D | – | – | – |
| 7439-92-1 | Lead | B2 | – | – | – |
| 7439-96-5 | Manganese | D | – | – | – |
| 7439-97-6 | Mercury | D | – | – | – |
| 7440-02-0 | Nickel | NR | – | – | – |
| 7782-49-2 | Selenium | D | – | – | – |
| 7440-22-4 | Silver | D | – | – | – |
| 7440-62-2 | Vanadium | NR | – | – | – |
| 7440-66-6 | Zinc | D | – | – | – |
| 57-12-5 | Cyanide | D | – | – | – |

(1) From IRIS (USEPA, 1995b). When IRIS values were unavailable, HEAST (USEPA, 1994a) was used.
NR = not reported, UR = under review
A dash ("–") indicates that this item is not applicable, or that there is no entry in either IRIS or HEAST.

(2) CAG = USEPA Carcinogen Assessment Group (see text).

(3) Dermal-SF = Oral-SF/oral absorption factor (See Appendix H.3).

# TABLE 6.9
# SUMMARY OF NONCARCINOGENIC HAZARDS FOR CURRENT TRESPASSERS AND FUTURE RESIDENTS AND RECREATORS

| Exposure Pathway | Pathway Hazard | | |
|---|---|---|---|
| | Central Tendency | RME[1] | Primary Source(s) of Hazard[2] |
| Current Trespassers | | | |
| Ingestion of surface soil | 9.96E−02 | 1.30E−01 | |
| Dermal contact with surface soil | 1.91E−01 | 1.44E+00 | Manganese, Aroclor−1254 |
| TOTAL RECEPTOR HAZARD INDEX | 2.91E−01 | 1.57E+00 | |
| Hypothetical Future Residents[3] | | | |
| Ingestion of groundwater | 3.72E+01 | 6.77E+01 | Manganese, arsenic |
| Inhalation of volatiles during showering | 3.54E−05 | 8.17E−05 | |
| Dermal contact with groundwater | 2.10E+00 | 5.13E+00 | Manganese |
| Ingestion of mixed soil | 2.83E+00 | 7.63E+00 | Aroclor−1254, manganese |
| Dermal contact with mixed soil | 1.77E−01 | 9.01E+00 | Manganese, Aroclor−1254, antimony |
| TOTAL RECEPTOR HAZARD INDEX | 4.23E+01 | 8.94E+01 | |
| Hypothetical Future Recreators | | | |
| Ingestion of mixed soil | 1.13E+00 | 2.83E+00 | Aroclor−1254 |
| Dermal contact with mixed soil | 2.31E−01 | 3.35E+00 | Manganese, Aroclor−1254 |
| TOTAL RECEPTOR HAZARD INDEX | 1.36E+00 | 6.18E+00 | |

1. RME = reasonable maximum exposure.
2. Those chemicals causing the total RME receptor hazard index to exceed 1.
3. This receptor group is provided for comparative purposes only; risk management decisions will not be made based on this receptor group.

## TABLE 6.10
## SUMMARY OF NONCARCINOGENIC HAZARDS FOR HYPOTHETICAL FUTURE WORKERS

| Exposure Pathway | Pathway Hazard | | Primary Source(s) of Hazard[2] |
|---|---|---|---|
| | Central Tendency | RME[1] | |
| Ingestion of mixed soil | 2.92E−01 | 2.92E−01 | |
| Dermal contact with mixed soil | 1.11E+00 | 6.43E+00 | Manganese, Aroclor−1254 |
| Inhalation of VOCs from mixed soil | − | 3.02E−04 | |
| Inhalation of fugitive dust | − | 3.09E−03 | |
| TOTAL RECEPTOR HAZARD INDEX | 1.40E+00 | 6.73E+00 | |

1. RME = reasonable maximum exposure.
2. Those chemicals causing the total RME receptor hazard index to exceed 1.

## TABLE 6.11
## SUMMARY OF CARCINOGENIC RISKS FOR CURRENT TRESPASSERS AND FUTURE RESIDENTS AND RECREATORS

| Exposure Pathway | Pathway Risk | | Primary Source(s) of Risk[2] |
|---|---|---|---|
| | Central Tendency | RME[1] | |
| Current Trespassers | | | |
| Ingestion of surface soil | 5.24E−06 | 2.27E−05 | Benzo(a)pyrene, Aroclor−1254, arsenic, Aroclor−1242 |
| Dermal contact with surface soil | 2.04E−05 | 5.12E−04 | PAHs, Aroclor−1254, beryllium, Aroclor−1242, arsenic |
| TOTAL RECEPTOR RISK | 2.56E−05 | 5.35E−04 | |
| Hypothetical Future Residents[3] | | | |
| Ingestion of groundwater | 7.25E−05 | 4.39E−04 | arsenic, beryllium, PAHs, benzene, chloromethane |
| Inhalation of volatiles during showering | 2.78E−08 | 2.16E−07 | |
| Dermal contact with groundwater | 3.27E−05 | 2.66E−04 | PAHs, beryllium |
| Ingestion of mixed soil | 6.31E−05 | 1.35E−04 | PAHs, Aroclor−1254, arsenic, Aroclor−1242, beryllium |
| Dermal contact with mixed soil | 1.74E−05 | 2.94E−03 | PAHs, beryllium, Aroclor−1254, Aroclor−1242, arsenic, Aroclor−1260, dieldrin |
| TOTAL RECEPTOR RISK | 1.86E−04 | 3.78E−03 | |
| Future Recreators | | | |
| Ingestion of mixed soil | 2.53E−05 | 5.01E−05 | PAHs, Aroclor−1254, arsenic, Aroclor−1242 |
| Dermal contact with mixed soil | 2.26E−05 | 1.09E−03 | PAHs, Aroclor−1254, beryllium, Aroclor−1242, arsenic, Aroclor−1260 |
| TOTAL RECEPTOR HAZARD INDEX | 4.78E−05 | 1.14E−03 | |

1. RME = reasonable maximum exposure.
2. Those chemicals causing the associated RME pathway risk to exceed $1 \times 10^{-6}$. PAHs = polycyclic aromatic hydrocarbons.
3. This receptor group is provided for comparative purposes only; risk management decisions will not be made based on this receptor group.

## TABLE 6.12
## SUMMARY OF CARCINOGENIC RISKS FOR HYPOTHETICAL FUTURE WORKERS

| Exposure Pathway | Pathway Risk | | Primary Source(s) of Risk[2] |
|---|---|---|---|
| | Central Tendency | RME[1] | |
| Ingestion of mixed soil | 1.43E−05 | 3.96E−05 | PAHs, Aroclor−1254, arsenic, Aroclor−1242 |
| Dermal contact with mixed soil | 3.01E−04 | 1.75E−03 | PAHs, Aroclor−1254, beryllium, Aroclor−1242, arsenic, Aroclor−1260 |
| Inhalation of VOCs from soil | – | 7.16E−11 | |
| Inhalation of fugitive dust | – | 8.39E−12 | |
| TOTAL RECEPTOR RISK | 3.16E−04 | 1.79E−03 | |

[1] RME = reasonable maximum exposure.

[2] Those chemicals causing the associated RME pathway risk to exceed 1 x $10^{-6}$. PAHs = polycyclic aromatic hydrocarbons.

# SECTION 7

# CONCLUSIONS

The following conclusions were made based in Phase I and Phase I RI investigation activities, including the installation of monitoring wells and soil borings, and the sampling and analyses of surface soils, subsurface soils, sediments, surface water, and groundwater.

## 7.1 SITE PHYSICAL CHARACTERISTICS

- The three major hydrogeologic units were identified at the DSAs. These include the upper aquifer consisting of dredge material and upper fluvial sediments, the intermediate aquifer consisting of lower fluvial sediments, and the deep aquifer consisting of the glacial lacustrine sediments.
- Horizontal groundwater flow in the shallow aquifer is primarily radially outwards from the interior of each DSA towards the nearest surface water body (Mohawk River, Utica Terminal Harbor, and Barge Canal).
- Hydraulic conductivities in the dredge material ranged from 0.109 ft/day to 12.9 ft/day and from 0.109 ft/day to 0.699 ft/day in the upper fluvial sediments.
- A mottled gray upper fluvial clay, ranging in thickness from five at DSA-2 to 14 feet at DSA-1, is an aquitard which has impeded downward migration of NAPL and other constituents. Measured vertical permeabilities in the aquitard are from $6.35\times10^{-5}$ ft/day to $2.49\times10^{-4}$ ft/day.

## 7.2 NATURE AND EXTENT OF CONTAMINATION

### 7.2.1 DSA-1

- PAHs were detected in surface soils, subsurface soils, sediments, surface water, and groundwater samples. PAH concentrations in surface soils, subsurface soils and groundwater were generally higher within the southern bermed area or immediately adjacent to the berms at DSA-1. The area of elevated concentrations was generally in the west-central portion of the southern part of DSA-1.
- BTEX compounds were detected in subsurface soils and groundwater. Concentrations were generally higher within the southern bermed area or immediately adjacent to the berms in both media. Elevated concentrations of BTEX were generally in the west-central portion of the southern part of DSA-1 as were PAHs.
- Cyanide was not detected in any of the samples of various media collected at DSA-1.

- PCBs were detected in surface soils, subsurface soils, sediments, and in one surface water sample. PCB concentrations were higher inside the bermed area. Based on previous sample results from the NMPC Harbor Point site, the NMPC site is not a source of PCB contamination.
- Metals were detected in all media sampled, however metals are naturally occurring in the environment. Metals concentrations were compared to BUTLs. Up to 13 metals were detected above the BUTLs in surface soil and subsurface soil samples. Thirteen metals in Phase I groundwater and ten metals in Phase II groundwater samples were detected above the BUTLs. Of the three metals detected above BUTLs determined to be of concern based on human health risk assessment, only arsenic is potentially associated with MGP residuals.
- NAPL (as discontinuous scattered blebs adsorbed to the soil), stained soils, sheens, and organic odors were observed in subsurface soil samples. There was a strong correlation between observed NAPL, stained soils, sheens, and organic odors, and soil and groundwater samples containing elevated PAHs and BTEX. The NAPL was present in only a few borings in scattered discontinuous blebs.
- Four samples containing visible NAPL were analyzed for TPH using GC-FID methods. Three of the samples contained TPH as #2 fuel oil at concentrations ranging from 110 mg/kg to 6,000 mg/kg. One sample contained TPH as $C_{10}$ to $C_{20}$ petroleum at a concentration of 22 mg/kg.
- The sources of PAHs, BTEX, PCBs, metals, and NAPL in DSA-1 were the surface water bodies and sediments from which the dredge material originated. Many industries exist and previously existed around the Utica Terminal Harbor and along the Mohawk River.

### 7.2.2 DSA-2

- PAHs were detected in surface soils, subsurface soils, sediments, and groundwater samples.
- BTEX was detected in surface soil samples, subsurface soil samples and one Phase I and one Phase II groundwater sample.
- Cyanide was not detected in any of the media sampled at DSA-2.
- PCBs were detected in surface soil, sediment, subsurface soil and surface water samples. Based on previous sample results from the NMPC Harbor Point site, the NMPC site is not a source of PCB contamination.
- Up to ten metals were detected above the BUTLs in surface soils, and up to eleven metals were detected above the BUTLs in subsurface soils. Up to 11 metals were detected above the BUTLs in Phase I and Phase II groundwater samples.
- NAPL was observed in four subsurface soil samples as scattered discontinuous blebs. Stained soils, sheens, and organic odors were described in additional samples. TPH concentrations as #2 fuel oil ranged from 10 mg/kg to 3,500 mg/kg in samples which contained visible NAPL.

- The sources of PAHs, BTEX, PCBs, metals, and NAPL in DSA-2 were the surface water bodies and sediments from which the dredge material originated. Many industries exist and previously existed around the Utica Terminal Harbor and along the Mohawk River.

### 7.2.3 DSA-3

- PAHs were present in surface soils, subsurface soils, sediments, SP sediments, and in a few surface water and groundwater samples.
- BTEX was detected in surface water samples, subsurface soil samples and in one groundwater well (in both) Phase I and Phase II samples). BTEX compounds were not detected in surface soil or sediment samples.
- Cyanide was detected in only one sediment sample collected at DSA-3. This was the only sample containing detectable cyanide during the Phase I and Phase II RI sampling effort.
- PCBs were detected in surface soils, subsurface soils, sediments, and surface water samples. PCBs were not detected in groundwater samples. Based on previous sample results from the NMPC Harbor Point site, the NMPC site is not a source of PCB contamination.
- Up to seven metals were detected above the BUTLs in surface soil samples and up to eleven metals were above the BUTLs in subsurface soils. Up to ten metals were detected above the BUTLs in Phase I groundwater samples and up to nine metals were detected in Phase II groundwater samples.
- Visible NAPL was not described in DSA-3 samples, however stained soils, sheens, and organic odors were described.
- The sources of PAHs, BTEX, PCBs, and metals in DSA-3 were the surface water bodies and sediments from which the dredge material originated. Many industries exist and previously existed around the Utica Terminal Harbor and along the Mohawk River.

## 7.3 FATE AND TRANSPORT

- The groundwater route is the primary means by which detected compounds could migrate beyond their present boundaries. However, concentration distributions in the data indicate that there is minimal potential for migration of organic compounds (PAHs, BTEX, and PCBs) from the DSAs to adjacent surface water bodies.
- A comparison of the groundwater and soil concentrations indicates that adsorption to the soil matrix is inhibiting leaching of organic compounds to groundwater.
- Although some organic and inorganic constituents may be reaching the river and canal/harbor, previous Harbor Point RI surface water sampling results (AES, 1993) from the Mohawk River, Barge Canal, and Utica Harbor indicate that no PAHs and BTEX were detected. Detectable concentrations of PAHs in surface

water were limited to a few samples collected from ponded areas within or near the bermed areas.

- Arsenic was detected in only two samples at concentrations of 2 and 4 ug/L respectively. Manganese was detected at concentrations ranging from 63 to 1,370 ug/L. The majority of the manganese samples were less than 100 ug/L.

## 7.4 HUMAN HEALTH RISK ASSESSMENT

- There is a potential human health threat to both current and future receptors based primarily on exposure to volatile organic compounds, PAHs and several metals in groundwater, and exposure to PAHs, PCBs, and metals in soils located at the DSA site.
- The greatest potential human health threat is to hypothetical future residents who utilize groundwater from the site and to future residents and workers who have dermal contact with soil on the site.
- The potential health threat is based on a number of highly conservative (health protective) assumptions. The health threat to actual receptors will likely be substantially lower than indicated.

## 7.5 HABITAT BASED ASSESSMENT

- The DSAs contain meadows, brush cover, deciduous forest canopy and scattered wet depressions and ditches which provide habitat for birds, small mammals, and amphibians. The widespread presence of PCBs and PAHs present potential exposure risks to resident and migratory birds, wildlife, and fish.
- Exposure pathways to biota are considered complete via surface soil, surface water, and sediment media for PAHs and PCBs at the DSAs.

## 7.6 CONCLUSIONS

The objectives of the investigation were met through the Phase I and Phase II data collection efforts and subsequent integration of the analytical results with site geology and hydrogeology. The first objective, to determine the nature and extent of source areas containing constituents associated with MGP residuals, was met primarily through the subsurface drilling program. No distinct areas or zones of source materials, such as NAPL, were encountered. NAPLs were identified sporadically in thin layers and discontinuous blebs in only a few borings. Where NAPL was observed, it was in discontinuous blebs in a relatively immobile state, adsorbed to the soil matrix. NAPLs were limited to the shallow aquifer.

The second objective, to determine the presence and extent of chemical constituents, was accomplished through sampling and laboratory analysis of soil and groundwater samples throughout the site. PAHs, BTEX, PCBs, and metals were detected. The presence of a continuous aquitard (except at the southeast corner of the northern cell at DSA-3) has inhibited downward migration of constituents. Constituents are restricted to the upper aquifer. The presence of berms prevent surface water runoff at most locations. The fate and transport evaluation shows that impacts to surface water are minimal. Distributions of PAHs and BTEX in groundwater indicated the potential for these constituents to migrate to surface water bodies.

The third objective, to determine risks posed to human health and the environment, was met by conducting a human health risk assessment and a habitat-based assessment. The human health risk assessment indicates that there is a health risk to current and future receptors, based primarily on exposure to BTEX, PAHs, and metals in groundwater and PAHs, BTEX, chloromethane, PCBs, and metals in soils. The most significant potential impact to wildlife at the DSAs site is the distribution of elevated concentrations of PAHs in surficial soils. This distribution suggests possible exposure to biota through one or more of the scenarios described in the pathway analysis.

The final objective, to provide data necessary to evaluate remedial actions, was also met primarily through the sampling and laboratory analysis of surface soils, subsurface soils, sediments, surface water, and groundwater samples and data evaluation and interpretation.

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