SOILS REMEDIATION WORK PLAN

ALBANY MIRON LUMBER
GUILDERLAND, NEW YORK

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1.0 INTRODUCTION

Environmental investigations have been performed at the Albany Miron Lumber Corporation property (Site) on Railroad Avenue in the Town of Guilderland, Albany County, New York. The location of the site is shown on Figure 1.1. The results of these investigations revealed the presence of chromium, copper, and arsenic, the Compounds of Concern (COCs), in soil and groundwater. The COCs were found in the south central area of the Site surrounding the former location of a wood preserving operation (Osmose Area) that used chromated copper arsenate (CCA). A Site Plan showing the Osmose Area is presented on Figure 1.2.

Albany Miron Lumber Corporation entered into a Voluntary Cleanup Agreement ("the Agreement") with the New York State Department of Environmental Conservation (NYSDEC) on March 19, 2002 under the Voluntary Cleanup Program. The Agreement arises, however, in the context of Federal litigation involving the Site. This Site is now the subject of litigation in the United States Court for the Northern District of New York (*Albany Miron Lumber Corp. v. Paulsen and Sons, et. al. CIV-99-CV 900*). This litigation has been in process for over 3 years. Earlier this year, the District Court approved a deferral of certain proceedings in the Federal litigation, pending the filing of a Voluntary Cleanup Application. It is important to note that this application is a part of a continuing Federal litigation process. One major purpose of this Work Plan, therefore, is to assist the United States District Court in achieving a reasonable, timely, and efficient technical approach to the remediation of the Site in aid of this Federal litigation.

This report presents a Work Plan for the proposed remediation of COC impacted on-Site soils. The report is organized as follows:

Section 1.0	Introduction: An overview of the project and description of the report contents are presented in Section 1.0.
Section 2.0	Site Investigations and Analytical Results: The investigations conducted in the Osmose Area to date and the results of those investigations are briefly summarized in Section 2.0.
Section 3.0	Geology and Hydrogeology: The regional and Site geology and hydrogeology are briefly described in Section 3.0.
Section 4.0:	Proposed Soils Remediation Scope of Work: The proposed scope of work for the soils remediation is presented in Section 4.0.

2.0 SITE INVESTIGATIONS AND ANALYTICAL RESULTS

The investigations described below have been performed at the Site and provide the data which have been utilized to define the Site conditions and develop the remediation plan:

i) installation of shallow soil borings with collection and analyses of soil samples (1989);

ii) installation of five boreholes with soil sample collection and analyses and subsequent installation of monitoring wells (August 1996);

iii) installation of shallow test pits (December 1996);

iv) installation of 13 boreholes with collection and analyses of soil samples (March 1999); and

v) the Baseline Investigation (October 2001).

The scope of the investigations performed between 1989 and 1999 have been reported previously and, therefore, are not repeated in this report. A summary of the field activities associated with the Baseline Investigation is presented in Section 2.1. The locations of the test pits, soil borings, and monitoring wells installed in the vicinity of the Osmose Area during these investigations are shown on Figure 1.2.

The following subsections present summaries of the analytical data collected to date.

2.1 SOILS AND CONCRETE

Soil and concrete samples have been collected and analyzed to provide the data necessary to:

i) define the extent of the impact of COCs;

ii) identify the presence of organic chemical compounds and other metals in soils in the Osmose Area; and

iii) determine the toxicity characteristics of these materials for the purpose of selecting appropriate disposal methods.

2.1.1 CCA AND OTHER TARGET ANALYTE LIST (TAL) METALS

A summary of the soils COC analytical data is presented in Table 2.1. The highest concentrations of COCs in soil occur in two areas, one located in the south corner of the Osmose Area and one north of the Osmose Pad around soil boring SB-21. These areas are referred to as "hotspots" and their locations are shown on Figure 2.1.

2.1.2 ORGANIC CHEMICAL COMPOUNDS

Eleven samples from five borings advanced during the Site investigations were analyzed for organic chemical compounds included in the Target Compound List (TCL). Four of these 11 samples were analyzed for the complete TCL list and seven were analyzed for volatile organic compounds (VOCs) only.

No VOCs or polychlorinated biphenyls (PCBs) were detected in Osmose Area soil samples. Therefore, neither VOCs nor PCBs in soil in the Osmose Area are of concern.

Based on the review of historic reports, a potential for the presence of organic chemical compounds in soils within the former containment area was identified. Therefore, analyses for the complete TCL analytical parameter list were performed on samples collected from within this area. No VOCs or PCBs were detected in the soils in the containment area. The concentrations of semi-volatile organic compounds (SVOCs) and pesticides detected in the soil samples collected within the former containment area are presented in Table 2.2. Also presented in Table 2.2 are the NYSDEC recommended cleanup levels for the compounds detected. The data presented in Table 2.2 show concentrations of SVOCs exceeding the NYSDEC cleanup objectives in one duplicate soil sample. The discrepant duplicate data is not representative of the overall quality of soil within the containment area.

2.1.3 TOXICITY CHARACTERISTIC

Samples for EP and Toxicity Characteristic Leaching Procedure (TCLP) preparation and analyses were collected during the Site investigations. Early data from these analyses were either inconsistent or the sample locations were not identified. Therefore, the usable TCLP data consist of those collected during the Baseline Investigation and presented in Table 2.3. The borings from which usable TCLP data are available are:

i) SB-5 and SB-30 located in the Osmose Area within the area exhibiting the highest COC concentrations; and

ii) SB-11 located in the former containment area

In addition, a composite sample for TCLP analyses was collected from the concrete Osmose Pad.

The TCLP analytical data demonstrate that none of the concentrations detected in these samples exceed the Resource Conservation and Recovery Act (RCRA) criteria for toxicity which defines a characteristic hazardous waste.

2.2 GROUNDWATER

Groundwater samples have been collected from site monitoring wells on two occasions; in 1996 following installation and in 2001 during the Baseline Investigation. The groundwater samples were analyzed for the TCL/TAL parameters. During the Baseline Investigation, the turbidity reading of the purged groundwater at the end of purging was greater than 50 nephelometric turbidity unit (NTU); therefore, both total and dissolved metals were analyzed. The concentrations of the analytes detected in groundwater samples are presented in Table 2.4. The NYSDEC standards for Class GA, or potable, groundwater are also presented in Table 2.4.

The groundwater analytical data show that concentrations of two organic chemical compounds detected in 1996, tetrachloroethene in upgradient monitoring well ML-1 and 1,2,4-trichlorobenzene detected in monitoring well ML-2 marginally exceeded the New York State (NYS) criteria for Class GA groundwater.

The detected concentrations of several metals (antimony, arsenic, chromium, copper, iron, and manganese) exceeded the groundwater standards. Of these metals, only arsenic, chromium, and copper are associated with the Osmose process. The water table at the time of the most recent sampling, October 2001, was lowered due to dry weather conditions and was below the elevation of the bottoms of most of the well screens. Therefore, with the exception of well ML-2R installed in October 2001 and screened below the top of the water table surface, the groundwater analytical database could not be updated during the Baseline Investigation.

No exceedances of the groundwater standards for metals have been detected in the samples from upgradient wells ML-1 or ML-3. The highest concentrations of COCs have been detected in monitoring well ML-2/2R located within the soil hotspot in the south corner of the Osmose Area (see Figure 2.1). Green-stained soils and wood were observed below grade in this area during the excavation of test pits in 1999 and in the boring for monitoring well ML-2R. The well is located within these obviously contaminated materials. Comparison of the 1996 and 2001 data from well ML-2/2R show significantly reduced concentrations of COCs over time. The concentrations of both arsenic and chromium in ML-2/2R have decreased by approximately one order of magnitude. The concentration of copper in 1996, 280 micrograms per liter (µg/L), exceeded the standard of 200 µg/L. In the sample collected from the replacement well in 2001, copper was present at a total concentration of 89.6 µg/L, well below the standard. Because current data are not available from the other monitoring wells, it is not known whether the differences in the concentrations observed in ML-2/2R are a result of natural attenuation of the metals in groundwater or of the condition of the original well (ML-2) when sampled.

The concentrations of COCs in groundwater decrease with distance from the Osmose Area; however, the concentrations detected in 1996 exceeded the standards in both of the downgradient wells (ML-4 and ML-5). With the absence of data from these wells in 2001 and the variability in the data from ML-2/2R it is not possible to predict the current concentrations in the downgradient wells.

3.0 SURFICIAL GEOLOGY

3.1 REGIONAL

The location of the Site has been plotted on the NYS Surficial Geology Map as shown on Figure 3.1. The Site is located in an area of lacustrine silt and clay deposited in proglacial lakes. These materials are generally calcareous with low permeability. The thickness of the materials is variable, ranging up to approximately 165 feet. Lacustrine sand ranging between 6 and 60 feet in thickness is the primary component in the overburden north and south of the Site.

3.2 SITE

The stratigraphic information from the Site borings is limited to shallow soils extending from ground surface to a depth of approximately 20 feet below grade. In general, the surface conditions consist of asphalt, concrete, topsoil, or sand fill. Underlying the surface materials, the subsurface conditions consist of sand fill materials, to a depth of about 2 to 3 feet below grade. The sand fill is typically brown in color, fine grained, and poorly graded.

The upper sand fill is underlain by native fine sand, which extended to the explored borehole depth of 12 to 20 feet below grade. The native sand consists of fine grained, poorly graded sand, and is brown in color. The upper fill at the site appears to be reworked or disturbed native soil. Standard penetration (N) values recorded during the sampling of the boreholes ranged from about 7 to 35 blows per foot, indicating generally loose to compact conditions. Most of the sand samples were slightly moist to moist. No odors associated with these samples were observed.

Information regarding deeper overburden materials is not available for the Site. However, information obtained from logs of borings advanced at the State of New York Campus Building 7 and Fuller Road Exploration projects approximately one-half mile south and southwest of the Site indicate that the upper fine sand extends to approximately 20 feet below grade . Below the fine sand to a depth of approximately 40 feet below grade is a gray silt with traces of clay. The gray clay extends to the top of bedrock; however, it becomes soft and plastic below the approximately 40 feet below grade. Bedrock was encountered at the Campus Building 7 location at approximately 207 feet below grade. These soil types and depths are consistent with the lacustrine silt and clay shown on the regional map presented on Figure 3.1.

4.0 PROPOSED SOILS REMEDIATION PLAN

The proposed soil remediation will consist of the excavation and disposal of hotspot soils and implementation of institutional controls to restrict area use. The remedial work will be conducted in steps as follows:

Step 1: Site Preparation.
Step 2: Excavate Contaminated Materials Above the Water Table and Dispose.
Step 3: Site Restoration.
Step 4: Implementation of Institutional Controls.

The work to be performed in each of these steps is described in the following subsections.

4.1 SITE PREPARATION

The scope of Site preparation activities will generally include the following:

Garage Demolition: The existing garage adjacent to the Osmose Area will be demolished. The resultant debris will be removed for disposal. Asbestos containing building materials are not believed to have been used for construction of this building; however, prior to demolition an asbestos-containing materials (ACM) survey will be undertaken to determine the presence of ACM. ACM, if present, will be removed during preliminary stages of demolition, and will be handled/disposed in accordance with all applicable regulatory requirements.

Containment Area Soil Removal: A section of the south corner of the containment area pad may be removed to gain access for soil excavation extending into this area. The hydrocarbon-impacted soil currently stored in this area of the pad will either be removed for off-Site disposal or will be moved into the undisturbed portion of the containment area.

Concrete Removal and Disposal: Concrete that will or may need to be removed includes that from the garage structure, the containment area pad, and the Osmose Pad. Generally, the concrete will be removed only to the extent necessary to allow soil excavation to be undertaken.

4.2 EXCAVATION AND DISPOSAL

4.2.1 EXCAVATION

The source of the COCs to groundwater will be substantially reduced by the excavation of hotspot soils above the water table. In addition, the risks to human health associated with exposure to the remaining impacted soils would be reduced to acceptable levels given the reasonable maximum exposure scenario (a construction worker repairing underground utilities) for the Site.

The results of the Baseline Investigation demonstrated that soils exhibiting concentrations of 200 milligrams per kilogram (mg/Kg) or higher of chromium or arsenic represent the hotspots, or source areas, within the Osmose Area. The locations of the borings from which samples exhibiting these concentrations were collected are shown on Figure 2.1. The hotspot locations in the south corner of the Osmose Area are directly over the area in which the COCs are present at the highest concentrations in groundwater.

The protectiveness to human health of the proposed 200 mg/Kg action level has been evaluated through the completion of site-specific assessments of risk. The assessments evaluated the oral, dermal, and inhalation pathways of exposure to a construction worker performing routine repair of underground utilities within the Osmose Area.

Assuming an acceptable carcinogenic risk of 10^{-6} for arsenic and hazard indices of 1.0 for chromium and copper, acceptable Site-specific concentrations of these metals in soils of 663 mg/Kg, 7,020,000 mg/Kg, and 601,000 mg/Kg, respectively, were calculated. The evaluation of the inhalation pathway showed that concentrations of 1,349 mg/Kg or less of arsenic in soil would not present unacceptable carcinogenic risk in the exposure scenario evaluated. The risk assessments performed demonstrate that the proposed action criteria of 200 mg/Kg is well below the maximum acceptable concentrations of arsenic and chromium and will provide an additional margin of safety against unacceptable oral, dermal, or inhalation exposures of construction workers in the Osmose Area. The assessments of risk and acceptable concentrations of the COCs in soil are described in detail in the memorandum presented Appendix A.

4.2.2 DISPOSAL

The COC-impacted soil and concrete from the containment pad and the Osmose pad will be disposed of in accordance with all applicable regulations of off-site secure disposal facilities. As shown by the TCLP data presented in Table 2.3, the concrete and hotspot soils do not exhibit the characteristics of a hazardous waste.

4.3 SITE RESTORATION

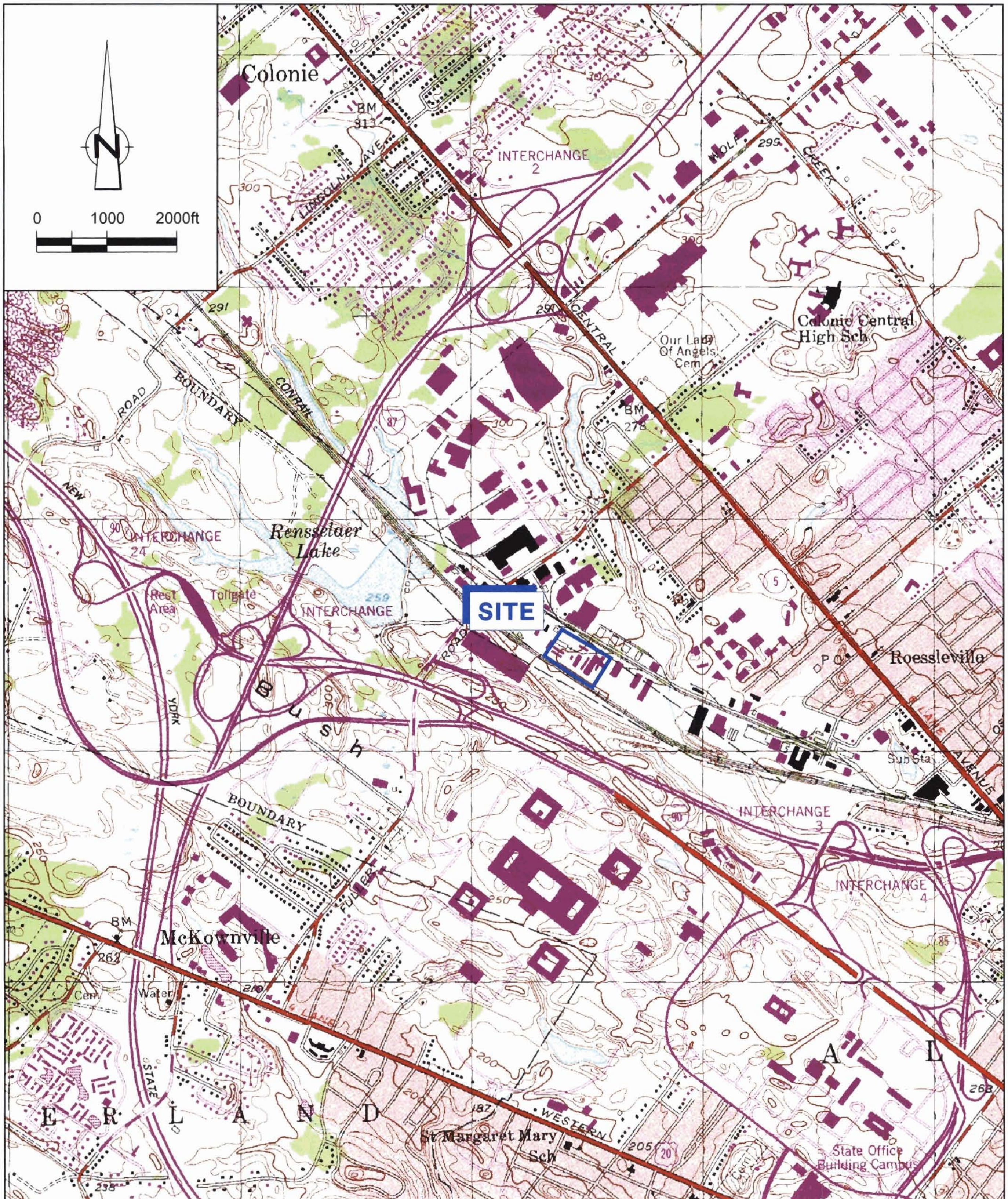
Restoration will consist of backfilling the excavation following removal of the hotspot soils. The backfill will consist of imported, free-draining, granular sand or sand and gravel, similar to the native fine sand soils.

Catch basins, storm drains, and other utilities will be restored as necessary.

Upon completion, the Osmose Area, including the surface of the backfilled area, will be covered with asphalt pavement. The placement and maintenance of the asphalt pavement cover over the Osmose Area will prevent both incidental contact and air-borne dispersion of the remaining soils and will minimize surface water infiltration. The reduction in surface water infiltration combined with the removal of hotspot soils will essentially eliminate the potential for continuing transport of the COCs to groundwater from soils within the Osmose Area.

4.4 INSTITUTIONAL CONTROLS

Institutional controls consisting of the placement of deed restrictions on the property within the Osmose Area will be implemented following the completion of the hotspot removal and area restoration. These deed restrictions will limit future use of the Osmose Area such that below grade construction (except as required for routine utility maintenance as described previously) is not allowed prior to approval of the NYSDEC.

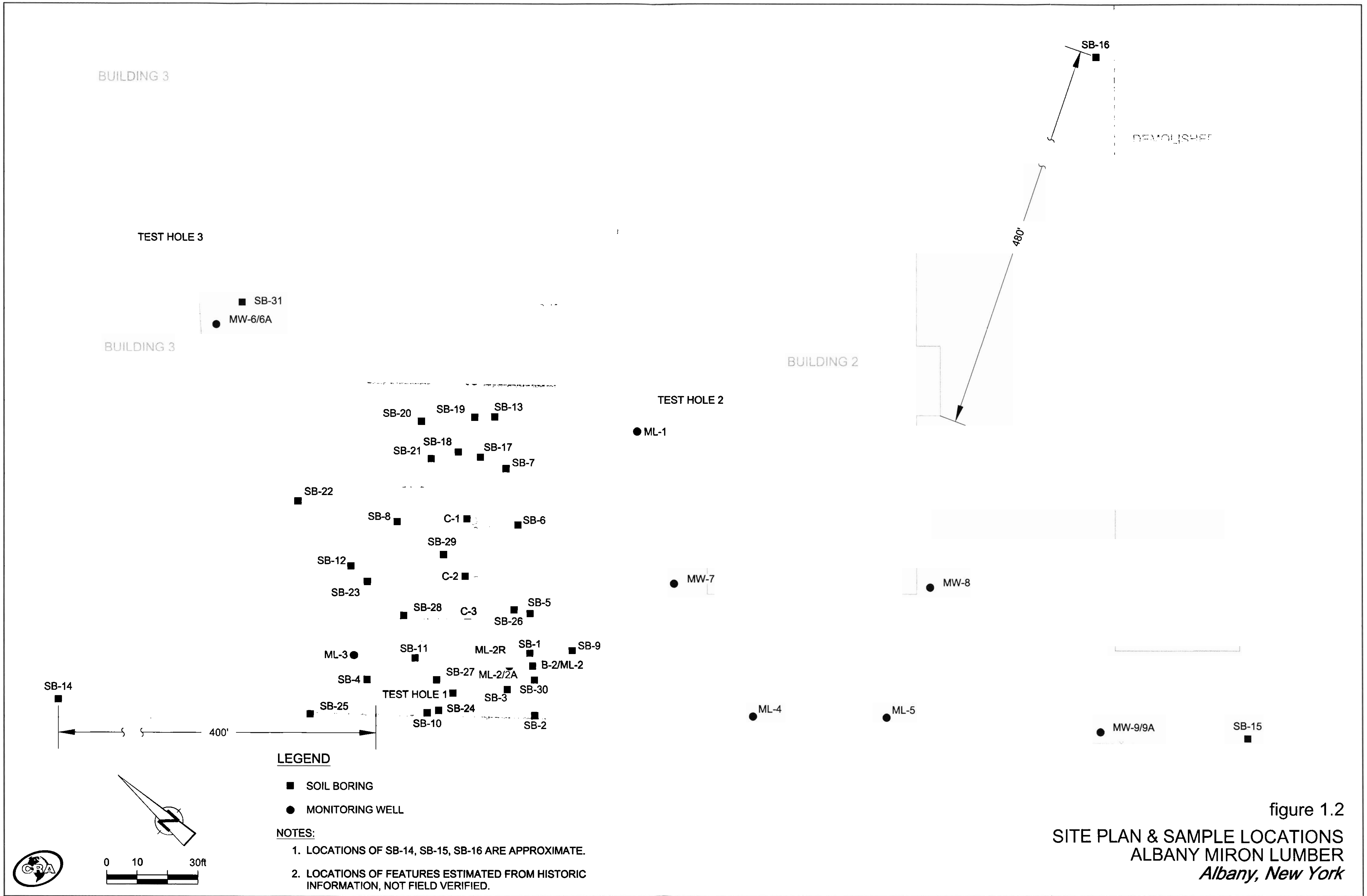


SOURCE:

USGS ALBANY, NEW YORK
QUADRANGLE, PHOTOREVISED 1980.

figure 1.1

SITE LOCATION
ALBANY MIRON LUMBER
Albany, New York



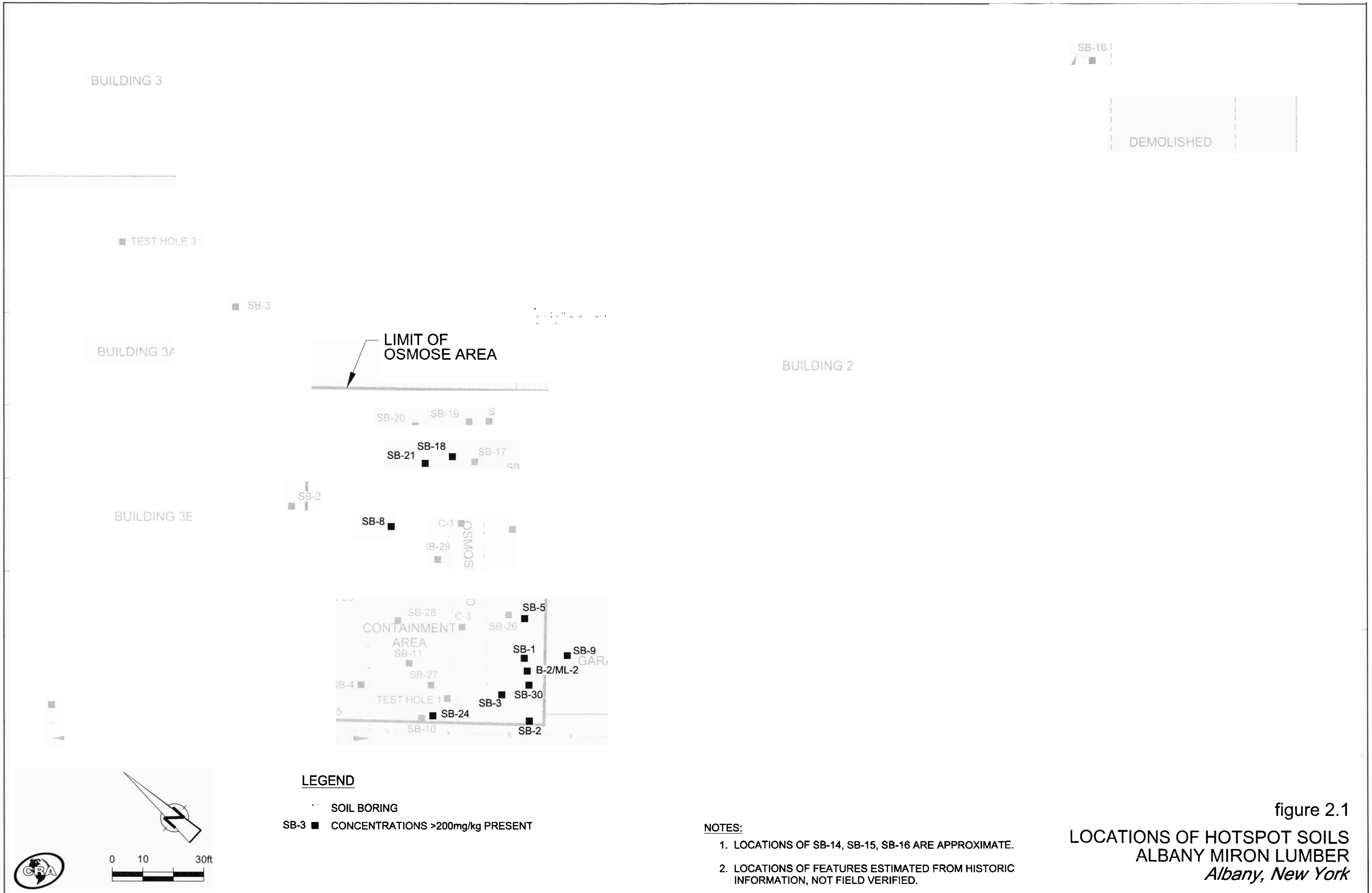
NOTES:

1. LOCATIONS OF SB-14, SB-15, SB-16 ARE APPROXIMATE.
2. LOCATIONS OF FEATURES ESTIMATED FROM HISTORIC INFORMATION, NOT FIELD VERIFIED.

figure 1.2

SITE PLAN & SAMPLE LOCATIONS
ALBANY MIRON LUMBER
Albany, New York

17087-00(003)GN-NF002 OCT 15/2002



LEGEND

SOIL BORING

SB-3 ■ CONCENTRATIONS >200mg/kg PRESENT

NOTES:

1. LOCATIONS OF SB-14, SB-15, SB-16 ARE APPROXIMATE.
2. LOCATIONS OF FEATURES ESTIMATED FROM HISTORIC INFORMATION, NOT FIELD VERIFIED.

figure 2.1

LOCATIONS OF HOTSPOT SOILS
ALBANY MIRON LUMBER
Albany, New York

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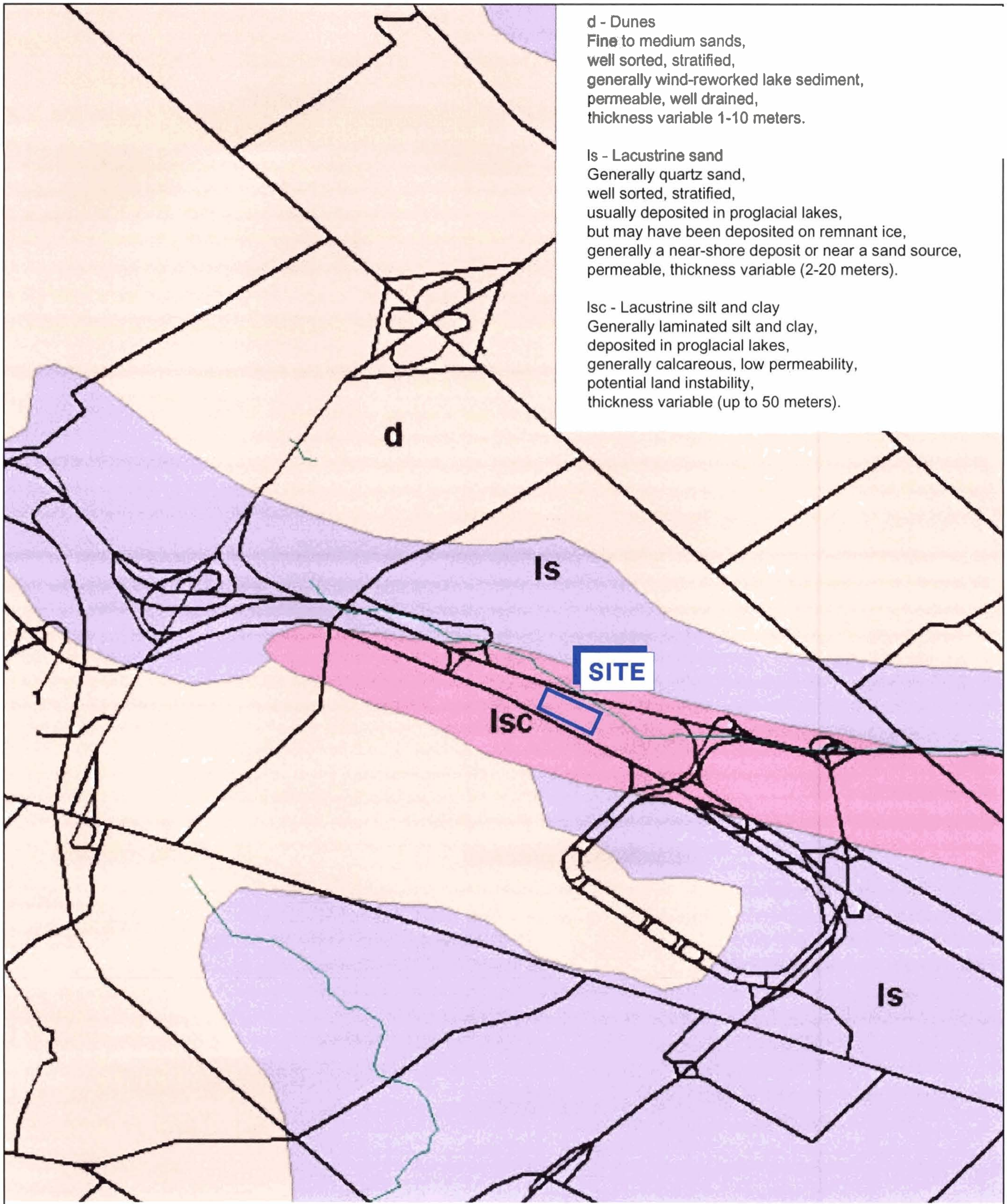

d - Dunes
Fine to medium sands,
well sorted, stratified,
generally wind-reworked lake sediment,
permeable, well drained,
thickness variable 1-10 meters.

ls - Lacustrine sand
Generally quartz sand,
well sorted, stratified,
usually deposited in proglacial lakes,
but may have been deposited on remnant ice,
generally a near-shore deposit or near a sand source,
permeable, thickness variable (2-20 meters).

lsc - Lacustrine silt and clay
Generally laminated silt and clay,
deposited in proglacial lakes,
generally calcareous, low permeability,
potential land instability,
thickness variable (up to 50 meters).

figure 3.1

REGIONAL SURFACE GEOLOGY
ALBANY MIRON LUMBER
Albany, New York

TABLE 2.1

COC ANALYTICAL DATA - OSMOSE AREA SOILS
REMEDIAL ACTION WORK PLAN
ALBANY MIRON LUMBER COMPANY

		Sample Location:	*B-2*	*B-2*	*SB-1*	*SB-2*	*SB-2*	*SB-3*	*SB-4*	*SB-5*	*SB-6*	*SB-7*
		Sample Date:	*08/09/96*	*08/09/96*	*02/26/99*	*02/26/99*	*02/26/99*	*02/26/99*	*02/26/99*	*02/26/99*	*02/26/99*	*02/26/99*
		Sample Depth (feet BGS):	*0-7*	*5-7*	*2-4*	*2-4*	*2-4*	*2-4*	*2-4*	*2-4*	*2-4*	*2-4*
							Duplicate					
Parameter	*Unit*	*Proposed Cleanup Criteria*										
Arsenic	mg/Kg	200	5150	8900	4720	1640	2410	527	120	3350	132	13.1
Chromium	mg/Kg	200	1540	3980	1480	3270	3540	458	23.5	2480	96.2	113
Copper	mg/kg		NA	NA	7660	280	471	737	5.81	1050	9.79	12.3

		Sample Location:	*SB-8*	*SB-9*	*SB-10*	*SB-17*	*SB-17*	*SB-17*	*SB-17*	*SB-17*	*SB-17*	*SB-18*
		Sample Date:	*02/26/99*	*02/26/99*	*02/26/99*	*10/16/2001*	*10/16/2001*	*10/16/2001*	*10/16/2001*	*10/16/2001*	*10/16/2001*	*10/16/2001*
		Sample Depth (feet BGS):	*0-4*	*1-4*	*0-4*	*(0-2)*	*(2-4)*	*(4-6)*	*(6-8)*	*(8-10)*	*(10-12)*	*(0-2)*
Arsenic	mg/Kg	200	952	331	28.6	43.7	1.8	1.6	1.7	2.7	2.6	419
Chromium	mg/Kg	200	293	228	119	167	24.4	19.3	14.6	25.0	17.4	122
Copper	mg/kg		367	10.9	13.0	17.8	4.9	6.1	6.7	11.7	8.6	10.7

		Sample Location:	*SB-18*	*SB-18*	*SB-18*	*SB-18*	*SB-18*	*SB-19*	*SB-19*	*SB-19*	*SB-19*	*SB-19*
		Sample Date:	*10/16/2001*	*10/16/2001*	*10/16/2001*	*10/16/2001*	*10/16/2001*	*10/15/2001*	*10/15/2001*	*10/15/2001*	*10/15/2001*	*10/15/2001*
		Sample Depth (feet BGS):	*(2-4)*	*(4-6)*	*(6-8)*	*(8-10)*	*(10-12)*	*(0-2)*	*(2-4)*	*(4-6)*	*(6-8)*	*(8-10)*
Arsenic	mg/Kg	200	158	6.1	2.5	186	2.5	94.4	1.6	2.0	1.6	1.4
Chromium	mg/Kg	200	456	105	46.0	188	43.3	44.1	111	90.6	30.3	31.4
Copper	mg/kg		5.4	6.2	9.5	10.4	10.8	15.2	3.0	6.4	6.0	6.1

TABLE 2.1

COC ANALYTICAL DATA - OSMOSE AREA SOILS
REMEDIAL ACTION WORK PLAN
ALBANY MIRON LUMBER COMPANY

		Sample Location:	*SB-19*	*SB-20*	*SB-20*	*SB-20*	*SB-20*	*SB-20*	*SB-21*	*SB-21*	*SB-21*	*SB-21*
		Sample Date:	*10/15/2001*	*10/16/2001*	*10/16/2001*	*10/16/2001*	*10/16/2001*	*10/16/2001*	*10/16/2001*	*10/16/2001*	*10/16/2001*	*10/16/2001*
		Sample Depth (feet BGS):	*(10-12)*	*(0-2)*	*(2-4)*	*(4-6)*	*(8-10)*	*(10-12)*	*(0-2)*	*(2-4)*	*(4-6)*	*(6-8)*
Parameter	*Unit*	*Proposed Cleanup Criteria*										
Arsenic	mg/Kg	200	2.5	113	5.2	1.5	1.7	1.5	535	160	1.5	1.6
Chromium	mg/Kg	200	26.1	84.7	33.9	9.3	9.3	10.1	705	82.7	32.5	29.4
Copper	mg/kg		8.5	12.6	5.3	5.8	6.0	5.1	22.0	9.1	5.9	6.2

		Sample Location:	*SB-21*	*SB-21*	*SB-22*	*SB-22*	*SB-22*	*SB-22*	*SB-22*	*SB-22*	*SB-23*	*SB-23*
		Sample Date:	*10/16/2001*	*10/16/2001*	*10/16/2001*	*10/16/2001*	*10/16/2001*	*10/16/2001*	*10/16/2001*	*10/16/2001*	*10/16/2001*	*10/16/2001*
		Sample Depth (feet BGS):	*(8-10)*	*(10-12)*	*(0-2)*	*(2-4)*	*(4-6)*	*(6-8)*	*(8-10)*	*(10-12)*	*(0-2)*	*(2-4)*
Arsenic	mg/Kg	200	2.5	2.5	2.3	1.6	1.4	1.7	1.7	1.8	106	46.6
Chromium	mg/Kg	200	37.6	16.8	12.0	10.5	5.2	5.2	4.9	5.0	23.3	7.6
Copper	mg/kg		10.1	10.3	8.5	4.8	5.6	6.3	7.9	8.1	6.0	5.2

		Sample Location:	*SB-23*	*SB-23*	*SB-23*	*SB-23*	*SB-24*	*SB-24*	*SB-24*	*SB-24*	*SB-24*	*SB-24*
		Sample Date:	*10/16/2001*	*10/16/2001*	*10/16/2001*	*10/16/2001*	*10/17/2001*	*10/17/2001*	*10/17/2001*	*10/17/2001*	*10/17/2001*	*10/17/2001*
		Sample Depth (feet BGS):	*(4-6)*	*(6-8)*	*(8-10)*	*(10-12)*	*(0-2)*	*(2-4)*	*(4-6)*	*(6-8)*	*(8-10)*	*(10-12)*
Arsenic	mg/Kg	200	100	3.4	2.1	1.8 J	414 J	439 J	142 J	160 J	85.6 J	116 J
Chromium	mg/Kg	200	7.1	6.6	5.1	5.6	234 J	226 J	22.9 J	10.3 J	13.2 J	20.4 J
Copper	mg/kg		6.2	8.7	8.0	7.2	329	449	6.9	6.5	8.5	10.9

TABLE 2.1

COC ANALYTICAL DATA - OSMOSE AREA SOILS
REMEDIAL ACTION WORK PLAN
ALBANY MIRON LUMBER COMPANY

		Sample Location:	***SB-25***	***SB-25***	***SB-25***	***SB-25***	***SB-25***	***SB-25***	***SB-26***	***SB-26***	***SB-26***	***SB-26***
		Sample Date:	***10/17/2001***	***10/17/2001***	***10/17/2001***	***10/17/2001***	***10/17/2001***	***10/17/2001***	***10/17/2001***	***10/17/2001***	***10/17/2001***	***10/17/2001***
		Sample Depth (feet BGS):	***(0-2)***	***(2-4)***	***(4-6)***	***(6-8)***	***(8-10)***	***(10-12)***	***(0-2)***	***(2-4)***	***(4-6)***	***(6-8)***
Parameter	***Unit***	***Proposed Cleanup Criteria***										
Arsenic	mg/Kg	200	30.7 J	4.3 J	1.7 J	1.5 J	153 J	2.0 J	118 J	42.7 J	52.9 J	128 J
Chromium	mg/Kg	200	6.4	6.9	4.5	4.1	80.1	4.5	120	19.8	38.2 J	15.8 J
Copper	mg/kg		6.5	6.3	5.2	5.0	10.0	7.2	8.9	10.4	6.9	8.3

		Sample Location:	***SB-26***	***SB-26***	***SB-27***	***SB-28***	***SB-28***	***SB-29***	***SB-30***	***SB-30***	***SB-30***	***SB-30***
		Sample Date:	***10/17/2001***	***10/17/2001***	***10/17/2001***	***10/17/2001***	***10/17/2001***	***10/17/2001***	***10/17/2001***	***10/17/2001***	***10/17/2001***	***10/17/2001***
		Sample Depth (feet BGS):	***(8-10)***	***(10-12)***	***(0-2)***	***(0-2)***	***(0-2)*** ***Duplicate***	***(0-2)***	***(0-2)***	***(2-4)***	***(4-6)***	***(6-8)***
Arsenic	mg/Kg	200	87.1 J	83.1 J	114 J	37.6 J	96.1 J	69.2 J	162	178 J	139 J	$\boxed{\text{390 J}}$
Chromium	mg/Kg	200	11.3 J	21.4 J	62.4 J	24.3 J	57.8 J	28.1 J	90.6	120	43.4	116
Copper	mg/kg		8.2	9.2	43.8	40.4 J	133 J	37.9 J	7.9	17.7	82.6	642

		Sample Location:	***SB-30***	***SB-30***
		Sample Date:	***10/17/2001***	***10/17/2001***
		Sample Depth (feet BGS):	***(8-10)***	***(10-12)***
Arsenic	mg/Kg	200	$\boxed{\text{723 J}}$	$\boxed{\text{1000 J}}$
Chromium	mg/Kg	200	174	$\boxed{\text{224}}$
Copper	mg/kg		1250	1710

Notes:

J	Associated value is estimated.
☐	Value outside of associated proposed criteria.
NA	Not Analyzed.

TABLE 2.2

ORGANIC CHEMICAL COMPOUNDS DETECTED IN SOIL
REMEDIAL ACTION WORK PLAN
ALBANY MIRON LUMBER COMPANY

		Sample Location:	*SB-27*	*SB-28*	*SB-28*	*SB-29*
		Sample Date:	10/17/2001	10/17/2001	10/17/2001	10/17/2001
			(0-2)	(0-2)	(0-2)	(0-2)
					Duplicate	
Parameter	*Unit*	*Standard* (1)				
Semi-Volatiles						
2-Methyl naphthalene	µg/Kg	36,400	ND 420	ND 390 J	6800 J	ND 360
Acenaphthene	µg/Kg	50,000	ND 420	ND 390 J	3100 J	ND 360
Anthracene	µg/Kg	50,000	ND 420	ND 390 J	6900 J	ND 360
Benzo(a)anthracene	µg/Kg	224	ND 420	ND 390 J	10000 J	99 J
Benzo(a)pyrene	µg/Kg	61	ND 420	ND 390 J	7700 J	78 J
Benzo(b)fluoranthene	µg/Kg	1,100	ND 420	ND 390 J	7600 J	56 J
Benzo(g,h,i)perylene	µg/Kg	50,000	ND 420	ND 390 J	3400 J	61 J
Benzo(k)fluoranthene	µg/Kg	1,100	ND 420	ND 390 J	5400 J	94 J
Biphenyl	µg/Kg	NA	ND 420	ND 390 J	560 J	ND 360
Bis(2-Ethyl hexyl)phthalate	µg/Kg	50,000	44J	ND 390 J	ND1800	ND 360
Carbazole	µg/Kg	NA	ND 420	ND 390 J	3000 J	ND 360
Chrysene	µg/Kg	400	ND 420	ND 390 J	11000 J	110 J
Dibenz(a,h)anthracene	µg/Kg	14	ND 420	ND 390 J	1900 J	ND 360
Dibenzofuran	µg/Kg	6,200	ND 420	ND 390 J	1800 J	ND 360
Fluoranthene	µg/Kg	50,000	ND 420	ND 390 J	NA	170 J
Fluorene	µg/Kg	50,000	ND 420	ND 390 J	3400 J	ND 360
Indeno(1,2,3-cd)pyrene	µg/Kg	3,200	ND 420	ND 390 J	3500 J	56 J
Naphthalene	µg/Kg	13,000	ND 420	ND 390 J	7800 J	ND 360
Phenanthrene	µg/Kg	50,000	ND 420	ND 390 J	28000 J	140 J
Pyrene	µg/Kg	50,000	ND 420	ND 390 J	21000 J	170 J
Pesticides						
4,4-DDD	µg/Kg	2,900	ND 2.1	ND 0.40	ND 0.45	0.63 J
4,4'-DDE	µg/Kg	2,100	ND 2.1	ND 0.63	ND 0.37	1.3 J
alpha-Chlordane	µg/Kg	540	ND 0.15	3.3 J	1.4 J	6.1
Dieldrin	µg/Kg	44	0.36 J	ND 2.0	ND 1.8	0.82 J
Endosulfan II	µg/Kg	900	0.70 J	0.61 J	0.67 J	0.39 J
gamma-Chlordane	µg/Kg	540	ND 2.1	3.4 J	1.3 J	5.2
Heptachlor epoxide	µg/Kg	20	ND 2.1	ND 0.17	0.22 J	ND 0.31

Notes:

(1)	New York State Department of Environmental Conservation, Technical and Administrative Guidance Memorandum (TAGM) #4046, January 24,
J	Associated value is estimated.
NA	Not Analyzed.
ND	Non-detect at associated value.
☐	Value outside of associated control limits.

TABLE 2.3

TCLP ANALYTICAL DATA - OSMOSE AREA SOILS
REMEDIAL ACTION WORK PLAN
ALBANY MIRON LUMBER COMPANY

		Sample Location:	*SB-5*	*SB-11*	*SB-30*	*Concrete*
		Sample Date:	*10/17/2001*	*10/17/2001*	*10/17/2001*	*10/17/2001*
			(0-4)	*(0-2)*	*(0-2)*	
Parameter	*Regulatory Level (1)*	*Unit*				
Herbicides - TCLP						
2,4,5-TP (Silvex)	1.0	mg/L	ND 0.010	ND 0.010	ND 0.010	ND 0.010
2,4-Dichlorophenoxy-acetic acid (2,4-D)	10.0	mg/L	ND 0.040	ND 0.040	ND 0.040	ND 0.040
Metals - TCLP						
Arsenic	5.0	mg/L	1.3	ND 0.50	1.5	ND 0.50
Barium	100	mg/L	ND 10.0	ND 10.0	ND 10.0	ND 10.0
Cadmium	1.0	mg/L	ND 0.10	ND 0.10	ND 0.10	ND 0.10
Chromium	5.0	mg/L	ND 0.50	ND 0.50	ND 0.50	1.4
Lead	5.0	mg/L	ND 0.50	ND 0.50	ND 0.50	ND 0.50
Mercury	0.2	mg/L	ND 0.00020	ND 0.00020	ND 0.00020	ND 0.00020
Selenium	1.0	mg/L	ND 0.25	ND 0.25	ND 0.25	ND 0.25
Silver	5.0	mg/L	ND 0.50	ND 0.50	ND 0.50	ND 0.50
Pesticides - TCLP						
Chlordane	0.03	mg/L	ND 0.0050	ND 0.0050	ND 0.0050	ND 0.0050
Endrin	0.02	mg/L	ND 0.00050	ND 0.00050	ND 0.00050	ND 0.00050
gamma-BHC (Lindane)	0.4	mg/L	ND 0.00050	ND 0.00050	ND 0.00050	ND 0.00050
Heptachlor	0.008	mg/L	ND 0.00050	ND 0.00050	ND 0.00050	ND 0.00050
Heptachlor epoxide	0.008	mg/L	ND 0.00050	ND 0.00050	ND 0.00050	ND 0.00050
Methoxychlor	10.0	mg/L	ND 0.0010	ND 0.0010	ND 0.0010	ND 0.0010
Toxaphene	0.5	mg/L	ND 0.020	ND 0.020	ND 0.020	ND 0.020
RCRA - Characteristics						
Ignitability		deg. f.	neg	neg	neg	neg
Reactive Cyanide		mg/Kg	ND 200	ND 200	ND 200	ND 200
Reactive Sulfide		mg/Kg	ND 200	ND 200	ND 200	ND 200
Semi - Volatiles - TCLP						
1,4-Dichlorobenzene	7.5	mg/L	ND 0.050	ND 0.050	ND 0.050	ND 0.050
2,4,5-Trichlorophenol	400	mg/L	ND 0.050	ND 0.050	ND 0.050	ND 0.050
2,4,6-Trichlorophenol	2.0	mg/L	ND 0.050	ND 0.050	ND 0.050	ND 0.050
2,4-Dinitrotoluene	0.13	mg/L	ND 0.050	ND 0.050	ND 0.050	ND 0.050
Hexachlorobenzene	0.13	mg/L	ND 0.050	ND 0.050	ND 0.050	ND 0.050
Hexachlorobutadiene	0.5	mg/L	ND 0.050	ND 0.050	ND 0.050	ND 0.050
Hexachloroethane	3.0	mg/L	ND 0.050	ND 0.050	ND 0.050	ND 0.050
Methylphenol (Cresol)	200	mg/L	ND 0.050	ND 0.050	ND 0.050	ND 0.050
Nitrobenzene	2.0	mg/L	ND 0.050	ND 0.050	ND 0.050	ND 0.050
Pentachlorophenol	100	mg/L	ND 0.25	ND 0.25	ND 0.25	ND 0.25
Pyridine	5.0	mg/L	ND 0.10	ND 0.10	ND 0.10	ND 0.10

TABLE 2.3

TCLP ANALYTICAL DATA - OSMOSE AREA SOILS
REMEDIAL ACTION WORK PLAN
ALBANY MIRON LUMBER COMPANY

Parameter	Regulatory Level [1]	Unit	SB-5	SB-11	SB-30	Concrete
		Sample Location:	*SB-5*	*SB-11*	*SB-30*	*Concrete*
		Sample Date:	*10/17/2001* *(0-4)*	*10/17/2001* *(0-2)*	*10/17/2001* *(0-2)*	*10/17/2001*
Volatiles - TCLP						
1,1-Dichloroethene	0.7	mg/L	ND 0.050	ND 0.050	ND 0.050	ND 0.050
1,2-Dichloroethane	0.5	mg/L	ND 0.050	ND 0.050	ND 0.050	ND 0.050
2-Butanone	200	mg/L	ND 0.050	ND 0.050	ND 0.050	ND 0.050
Benzene	0.5	mg/L	ND 0.050	ND 0.050	ND 0.050	ND 0.050
Carbon tetrachloride	0.5	mg/L	ND 0.050	ND 0.050	ND 0.050	ND 0.050
Chlorobenzene	100	mg/L	ND 0.050	ND 0.050	ND 0.050	ND 0.050
Chloroform (Trichloromethane)	6.0	mg/L	ND 0.050	ND 0.050	ND 0.050	ND 0.050
Tetrachloroethene	0.7	mg/L	ND 0.050	ND 0.050	ND 0.050	ND 0.050
Trichloroethene	0.5	mg/L	ND 0.050	ND 0.050	ND 0.050	ND 0.050
Vinyl chloride	0.2	mg/L	ND 0.050	ND 0.050	ND 0.050	ND 0.050

Notes:

(1)	40 CFR, Part 261.
deg. f.	degrees fahrenheit
ND	Non-detect at associated value.
s.u.	Standard Units
TCLP	Toxicity Characteristic Leaching Procedure.

TABLE 2.4

COMPOUNDS DETECTED IN GROUNDWATER
REMEDIAL ACTION WORK PLAN
ALBANY MIRON LUMBER COMPANY

		Sample Location:	*ML-1*	*ML-2*	*ML-2R*	*ML-3*	*ML-4*	*ML-5*
		Sample Date:	*08/09/96*	*08/09/96*	*10/18/2001*	*08/09/96*	*08/09/96*	*08/09/96*
Parameter	*Unit*	*Standard* (1)						
Volatiles								
1,3,5-Trimethylbenzene	µg/L	5	ND1	3	NA	ND1	ND1	ND1
1,2,4-Trichlorobenzene	µg/L	5	ND1	6	ND 5.0	ND1	ND1	ND1
Chloroform (Trichloromethane)	µg/L	7	ND1	ND1	ND 5.0	ND1	1	ND1
Tetrachloroethene	µg/L	5	8	4	ND 5.0	ND1	ND1	ND1
Trichloroethene	µg/L	5	ND1	ND1	2.7 J	ND1	ND1	ND1
Semi - Volatiles								
Caprolactam	µg/L	NS	NA	NA	320	NA		
Di-n-butylphthalate	µg/L	NS	ND10	12	ND 10	ND10	ND10	NR
p-Cymene	µg/L	NS	ND1	1	NA	ND1	ND1	ND1
Metals								
Aluminum	µg/L	NS	NA	NA	3840 J	NA	NA	NA
Aluminum (Dissolved)	µg/L		NA	NA	ND 49.6	NA	NA	NA
Antimony	µg/L	3	NA	NA	7.8	NA	NA	NA
Antimony (Dissolved)	µg/L		NA	NA	8.0	NA	NA	NA
Arsenic	µg/L	25	ND5	3930	627	ND5	450	200
Arsenic (Dissolved)	µg/L		NA	NA	541	NA	NA	NA
Barium	µg/L	1000	120	150	79.7	100	70	30
Barium (Dissolved)	µg/L		NA	NA	49.9	NA	NA	NA
Cadmium	µg/L	5	ND5	32	ND 5	ND5	ND5	ND5
Cadmium (Dissolved)	µg/L		NA	NA	ND 5	NA	NA	NA
Calcium	µg/L	50	NA	NA	124000	NA	NA	NA
Calcium (Dissolved)	µg/L		NA	NA	122000	NA	NA	NA
Chromium	µg/L	50	38	1940	143	8	750	150
Chromium (Dissolved)	µg/L		NA	NA	89.2	NA	NA	NA
Cobalt	µg/L	NS	NA	NA	2.6	NA	NA	NA
Cobalt (Dissolved)	µg/L		NA	NA	ND 50	NA	NA	NA
Copper	µg/L	200	ND50	280	89.6	ND50	ND50	150
Copper (Dissolved)	µg/L		NA	NA	5.3	NA	NA	NA
Iron	µg/L	300	NA	NA	4370	NA	NA	NA
Iron (Dissolved)	µg/L		NA	NA	ND 100	NA	NA	NA
Lead	µg/L	25	8	ND5	3.5	ND5	ND5	9
Lead (Dissolved)	µg/L		NA	NA	1.9	NA	NA	NA

TABLE 2.4

COMPOUNDS DETECTED IN GROUNDWATER
REMEDIAL ACTION WORK PLAN
ALBANY MIRON LUMBER COMPANY

		Sample Location:	*ML-1*	*ML-2*	*ML-2R*	*ML-3*	*ML-4*	*ML-5*
		Sample Date:	*08/09/96*	*08/09/96*	*10/18/2001*	*08/09/96*	*08/09/96*	*08/09/96*
Parameter	*Unit*	*Standard* (1)						
Metals (Continued)								
Magnesium	µg/L	NS	NA	NA	18800	NA	NA	NA
Magnesium (Dissolved)	µg/L		NA	NA	18100	NA	NA	NA
Manganese	µg/L	300	NA	NA	$\boxed{449}$	NA	NA	NA
Manganese (Dissolved)	µg/L		NA	NA	$\boxed{310}$	NA	NA	NA
Nickel	µg/L	100	NA	NA	5.3	NA	NA	NA
Nickel (Dissolved)	µg/L		NA	NA	ND 40	NA	NA	NA
Potassium	µg/L	NS	NA	NA	3440 J	NA	NA	NA
Potassium (Dissolved)	µg/L		NA	NA	2450 J	NA	NA	NA
Sodium	µg/L	20000	NA	NA	165000	NA	NA	NA
Sodium (Dissolved)	µg/L		NA	NA	165000	NA	NA	NA
Vanadium	µg/L	NS	NA	NA	8.1	NA	NA	NA
Vanadium (Dissolved)	µg/L		NA	NA	2	NA	NA	NA
Zinc	µg/L	NS	NA	NA	15.1	NA	NA	NA
Zinc (Dissolved)	µg/L		NA	NA	ND 20	NA	NA	NA

Notes:

(1) New York State Department of Environmental Conservation, Technical and Administrative Guidance Memorandum (TAGM) #4046, January 24, 1994.

J	Associated value is estimated.
NA	Not Analyzed.
ND	Non-detect at associated value.
☐	Value outside of associated control limits.

APPENDIX A

ASSESSMENTS OF RISK AND ACCEPTABLE CONCENTRATIONS

DERIVATION OF RISK-BASED CRITERIA
ALBANY MIRON LUMBER
ALBANY NEW YORK

1. INTRODUCTION

Risk-based soil cleanup goals have been derived for use in evaluating the protectiveness of concentrations of the chemicals of potential concern (COPC) utilized for the definition of hotspot soils in the Soil Remediation Work Plan for the Albany Miron Lumber site. The COPC consist of chromium, copper and arsenic. Soils above the water table within the Osmose Area that exhibit concentrations of COPC greater than 200 parts per million (ppm) have been defined in the Work Plan as hot spots and will be subject to removal. Soils within the Osmose Area that are not excavated and contain residual concentrations of COPC less than or equal to 200 ppm will be covered with asphalt paving and the area will be protected from unauthorized use through the implementation of deed restrictions.

In order to evaluate the protectiveness of the proposed remediation, risk calculations were performed to determine acceptable concentrations under an exposure scenario consistent with the plan for restoration and protection of the area. This scenario involves ground intrusive activity where maintenance and installation of sewers or utilities may be conducted. Therefore, Site-specific cleanup goals were derived consistent with a short-term construction/utility worker exposure scenario.

The clean-up goals were derived consistent with the United States Environmental Protection Agency (USEPA) guidance presented in the documents "Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites " (USEPA 2001) and "Region 9 Preliminary Remediation Goals (PRGs)" (USEPA 2002).

2. SOIL CLEANUP GOALS - DERMAL AND INGESTION EXPOSURE

Soil cleanup goals were derived for the construction worker scenario by combining the oral and dermal exposure routes into one algorithm. The generic algorithms used to derive the soil cleanup goals for carcinogenic and/or non-carcinogenic COPC are presented as follows:

Carcinogenic COPC

$$C_{Soil} = \frac{TR \times BW \times AT}{EF \times ED \times 10^{-6}\ kg/mg\ [(IRS \times RAFo \times CSFo) + (SA \times AF \times RAFd \times CSFd)\ ]}$$

Non- Carcinogenic COPC

$$C_{Soil} = \frac{THQ \times BW \times AT}{EF \times ED \times 10^{-6}\ kg/mg\ \ [(\frac{1}{RfDo} \times IRS \times RAFo) + (\frac{1}{RfDd} \times SA \times AF \times RAFd)]}$$

where:
CSoil = Risk-Based Soil Clean-Up Goal (calculated, mg/kg);
CSFo = Cancer Slope Factor - Oral (chemical-specific) (mg/kg - day)-1;
CSFd = Cancer Slope Factor - Dermal (chemical-specific) (mg/kg - day)-1;
RfDo = Reference Dose - Oral (chemical-specific) (mg/kg - day);
RfDd = Reference Dose - Dermal (chemical-specific) (mg/kg - day);
TR = Target Cancer Risk (1.0E-06, unitless);
THQ = Target Hazard Quotient (1.0, unitless);
BW = Body Weight, Adult Worker (70 kg);
EF = Exposure Frequency, Construction (5 days/year);
ED = Exposure Duration, Construction (1 year);
IRS = Soil Ingestion Rate, Construction (330 mg/day);
SA = Exposed Surface Area, Construction (3300 cm2/day);
AF = Soil Adherence Factor (0.3 mg/cm2);
RAFo = Relative Absorption Factor - oral (default = 1)(unitless);
RAFd = Relative Absorption Factor - dermal (arsenic = 0.03, chromium = 0.01, copper 0.01)(unitless);
ATc = Averaging Time - Carcinogens (25550 days); and
ATnc = Averaging Time - Non-Carcinogens (ED x 365 days/year).

Toxicity Factors are required to establish the clean-up goals. The clean-up goals were derived using chemical-specific and route-specific Reference Dose values (RfD) and Cancer Slope Factors (CSF). USEPAs integrated risk information system (IRIS) and health effects assessment table (HEAST) databases were used as the source of the RfDs and CSFs applied in the clean-up goal derivation.

If both a carcinogenic and non-carcinogenic risk-based value was derived for a particular COPC, then the lower of the two values was chosen as the applicable cleanup goal.

Table A-1 presents the derivation of soil clean-up goals for COPC identified for the construction worker exposure scenario via ingestion and dermal exposure routes. References for the exposure parameters are provided in Table A-1.

3. SOIL CLEAN-UP GOALS - INHALATION OF PARTICULATE EXPOSURE

Exposure to the COPC in soil can also occur through the inhalation exposure route, as particulate bound metals can become airborne during an excavation event. In order to derive soil cleanup goals based on the ambient air pathway, allowable air concentrations for the COPC were calculated, and then used to derive a health-protective concentration using an appropriate air model.

3.1 DERIVATION OF ALLOWABLE AIR CONCENTRATIONS

The allowable air concentrations were derived as follows:

Carcinogenic COPC

$$C_{air} = \frac{TR \times BW \times AT}{EF \times ED \times InR \times CSFi}$$

Non- Carcinogenic COPC

$$C_{air} = \frac{THQ \times BW \times AT}{EF \times ED \times InR \times \frac{1}{RfDi}}$$

where:

C_{air} = Allowable Risk-Based Air Concentration (calculated, mg/m^3);
CSF_i = Cancer Slope Factor - Inhalation (chemical-specific) $(mg/kg - day)^{-1}$;
RfD_i = Reference Dose - Inhalation (chemical-specific) (mg/kg - day);
TR = Target Cancer Risk (1.0E-06, unitless);

THQ = Target Hazard Quotient (1.0, unitless);
BW = Body Weight, Adult Worker (70 kg);
EF = Exposure Frequency, Construction (5 days/year);
ED = Exposure Duration, Construction (1 year);
InR = Inhalation Rate, Construction (20 m^3/day);
AT_c = Averaging Time - Carcinogens (25550 days); and
AT_{nc} = Averaging Time - Non-Carcinogens (ED x 365 days/year).

Table A-2 presents the derivation of the allowable risk-based air concentrations for COPC identified for the construction worker scenario. References for the exposure parameters are provided in Table A-2. It is noted that allowable air concentrations were derived for arsenic only, since toxicity data for the inhalation route are not available for chromium and copper.

The allowable air concentrations were used to back-calculate soil clean-up goals using an appropriate air model, as explained in the following section.

3.2 AIR DISPERSION MODELING

A conservative air dispersion model, SCREEN3, recommended by USEPA for screening purposes was used. SCREEN3 uses Gaussian dispersion equations and worst-case meteorological conditions to estimate maximum downwind concentrations due to emissions from a source.

To calculate the emission rate in g/s, the allowable air concentration was divided by a time averaging conversion factor of 0.7 to obtain a 1-hour concentration. The SCREEN3 model calculates a 1-hour concentration. Therefore a 1-hour criteria concentration was required.

An excavation activity will result in the maximum ambient air exposure point concentrations to which construction workers may be exposed. In addition the emissions from exposed contaminated soils at the Site were also accounted for. The emissions modeled in this scenario are potential respirable particulate matter emissions of inorganics released from excavated soil.

The SCREEN3 model utilizes rectangular source areas and only one source may be modeled at a time. A 290 square meter (m^2) area, 17 m x 17 m was used for the excavated soil for the exposed soil surface area. This area value is consistent with USEPA guidance for excavation area exposure on a daily basis.

The SCREEN3 model was used to determine the worst-case atmospheric conditions that would produce the maximum ground level concentrations. The modeling showed that maximum concentrations occurred for stability class 6 (stable) and a wind speed of 1 meter per second (m/s). The maximum concentration occurs at the edge of the area source. The source and receptor height was set at 0 m, and the urban dispersion coefficient was used. The SCREEN3 model output for a normalized 1-gram per second emission rate over the surface area is presented in Attachment 1.

3.3 AIR EMISSIONS MODELING

Air emission modeling was conducted to calculate an acceptable subsurface soil concentration based on the allowable emission rates determined above.

Particulate matter emissions from the excavation of contaminated soils from the area sources were calculated using the 1993 USEPA document *"Estimation of Air Impacts from Area Sources of Particulate Matter Emissions at Superfund Sites"*. The particulate matter excavation emission model and the particulate matter emission rates from the source area during excavation are detailed in Table A-3.

The bases for this model are the following Equations:

$$E = k\,(0.0016)(M)\,\frac{\left(\frac{U}{2.2}\right)^{1.3}}{\left(\frac{X_{H2O}}{2}\right)^{1.4}} \qquad \text{(Eq.1)}$$

$$X = C\ Z\ 10\text{^}6 \qquad \text{(Eq.2)}$$

where:

E = PM10 emissions (g);

k = particle size multiplier for PM10 (0.35 unitless);

0.0016 = empirical constant (g/kg);

M = mass handled (63 kg);

U = mean wind speed (4.4 m/sec);

2.2 = empirical constant (2.2 m/sec);

X_{H2O} = percent moisture content (10 %);

C = concentration of metal in bulk soil (μg/g);

Z = enrichment factor (1.28 unitless); and

10^6 = conversion factor (g/μg).

A single area source (17 m by 17 m) was chosen to approximate the potential area of erodable soil. The emission rates resulting from the excavation activities were calculated using allowable air concentrations of inorganics. The bulk soil concentration of inorganics was then calculated by dividing the emission rate by the enrichment and emission factors. Table A-3 summarizes the area sources inorganic bulk soil concentrations at the Site based on the allowable air concentrations.

4. SUMMARY

The allowable soil concentrations that were determined from this assessment are shown in the Tables A-1 and A-3.

The allowable concentrations of arsenic in soil for the oral/dermal contact and inhalation pathways were determined to be 663 ppm and 1349 ppm, respectively.

The allowable soil concentration of chromium for the oral/dermal contact pathway was determined to be 7.02E+06 ppm (i.e., greater than 100%).

The allowable soil concentration of copper for the oral/dermal contact pathway was determined to be 6.01E+05 ppm (i.e., greater than 60 percent).

Based on the above, it is concluded that the proposed criteria for hotspot removal of 200 ppm is conservative and will be protective under the envisioned future use scenario.

APPENDIX A

TABLES

TABLE A-1

DERIVATION OF SITE-SPECIFIC REMEDIATION CRITERIA
CONSTRUCTION WORKER ORAL & DERMAL EXPOSURE TO SOIL
MIRON LUMBER SITE
ALBANY, NEW YORK

Constituent of Human Concern	*Oral to Dermal Adjustment Fact (%/100)*	*oral CSF 1/(mg/kg-d)*	*dermal CSF (1) 1/(mg/kg-d)*	*oral RfD (mg/kg-d)*	*dermal RfD (1) (mg/kg-d)*	*Relative Absorption Factor oral (%/100)*	*Relative Absorption Factor dermal (%/100)*	*Carcinogen RISK =1.0E-06 Adult (mg/kg)*	*Non-Carcinogen HI = 1.0 Adult (mg/kg)*	*Site-Specific emediation Criteria (mg/kg)*
Inorganic Metals										
Arsenic	100%	1.50E+00	1.50E+00	3.00E-04	3.00E-04	1.00E+00	3.00E-02	6.63E+02	4.26E+03	6.63E+02
Chromium	1.3%	NA	NA	1.50E+00	1.95E-02	1.00E+00	1.00E-02	NV	7.02E+06	7.02E+06
Copper	100%	NA	NA	4.00E-02	4.00E-02	1.00E+00	1.00E-02	NV	6.01E+05	6.01E+05

Notes:

NA = Not Available
NV = No Value
(1) Adjusted Dermal Toxicity Data = Oral Toxicity Data x Oral to Dermal Adjustment Factor taken from USEPA, 2001.
(2) The selected Site-specific criterion is the lower of the carcinogenic-based level and the non-carcinogenic-based level.

Construction Worker Exposure Assumptions		Reference
Concentration in Soil (mg/kg)	calculated	--
Target Risk Level (unitless)	1.0E-06	USEPA, 2001
Target Hazard Level (unitless)	1.0	USEPA, 2001
Cancer Slope Factor (per mg/kg-day)	chemical-specific	IRIS, 2002; HEAST 1997
Reference Dose Factor (mg/kg-day)	chemical-specific	IRIS, 2002; HEAST 1997
Ingestion Rate (mg/day)	330	USEPA, 2001
Relative Absorption Factor - Oral (%/100)	chemical-specific	USEPA, 2001
Surface Area Exposed (cm^2/day)	3300	USEPA, 2001
Adherence Factor (mg/cm^2)	0.3	USEPA, 2001
Relative Absorption Factor - Dermal (%/100)	chemical-specific	USEPA, 2001
Exposure Frequency (days/year)	5	Professional Judgement
Exposure Duration (years)	1	Professional Judgement
Body Weight (kg)	70	USEPA, 2001
Convesrion Factor (kg/mg)	1.0E-06	USEPA, 2001
Averaging Time - carc. (days)	25550	USEPA, 2001
Averaging Time - noncarc. (days)	365	USEPA, 2001

Exposure Equations

Carcinogenic Endpoints:

$$CS = \frac{TR \times BW \times ATc}{EF \times ED \times CF \times [(CSFo \times IR \times RAFo) + (CSFd \times SA \times AF \times RAFd)]}$$

Non-Carcinogenic Endpoints:

$$CS = \frac{THQ \times BW \times ATnc}{EF \times ED \times CF \times [((1/RfDo) \times IR \times RAFo) + ((1/RfDd) \times SA \times AF \times RAFd)]}$$

USEPA, 2001: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, Office of Emergency and Remedial Response, OSWER 6355.4-24, March 2001
IRIS, 2002: USEPA Integrated Risk Information System Database, October 2002.
HEAST, 1997: USEPA Health Effects Assessment Table, 9200.6-303 (97-1), EPA/540-R-99-036, July 1997.
Professional Judgement: Site specific below-ground utility work occurs for 5 days within a year.

TABLE A-2

DERIVATION OF SITE-SPECIFIC REMEDIATION CRITERIA
CONSTRUCTION WORKER INHALATION EXPOSURE TO AMBIENT AIR
MIRON LUMBER SITE
ALBANY, NEW YORK

CHEMICAL	*inhalationCSF 1/(mg/kg-d)*	*inhalation RfD (mg/kg/day)*	*Carcinogen RISK =1.0E-06 Adult (mg/m³)*	*Non-Carcinoge HI = 1.0 Adult (mg/m³)*	*Ambient Air Site-Specific 'emediation Criteria (1) (mg/m³)*
Arsenic	1.51E+01	NA	1.18E-03	NV	1.18E-03
Chromium	NA	NA	NV	NV	NV
Copper	NA	NA	NV	NV	NV

Notes :
NA = Not Available
NV = No Value
(1) The selected Site-specific criterion is the lower of the carcinogenic-based level and the non-carcinogenic-based level.

Construction Worker Exposure Assumptions		Reference
Concentration in Air (mg/m3)	calculated	--
Target Risk Level (unitless)	1.0E-06	USEPA, 2001
Target Hazard Level (unitless)	1.0	USEPA, 2001
Cancer Slope Factor (per mg/kg-day)	chemical-specific	IRIS, 2002; HEAST 1997
Reference Dose Factor (mg/kg-day)	chemical-specific	IRIS, 2002; HEAST 1997
IR - adult (m3/day)	20	USEPA, 2001
EF (days/year)	5	Professional Judgement
ED (yrs)	1	Professional Judgement
BW (adult) (kg)	70	USEPA, 2001
AT (carc.) (yrs x days/yr)	25550	USEPA, 2001
AT (non-carc.) (yrs x days/yr)	365	USEPA, 2001

Exposure Equations

Carcinogenic Endpoints:

$$CS = \frac{TR \times BW \times ATc}{IR \times EF \times ED \times CSFi}$$

Non-Carcinogenic Endpoints:

$$CS = \frac{THQ \times BW \times ATnc}{IR \times EF \times ED \times (1/RfDi)}$$

USEPA, 2001: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, Office of Emergency and Remedial Response, OSWER 6355.4-24, March 2001.
IRIS, 2002: USEPA Integrated Risk Information System Database, October 2002.
HEAST, 1997: USEPA Health Effects Assessment Table, 9200.6-303 (97-1), EPA/540-R-99-036, July 1997.
Professional Judgement: Site specific; construction campaign occurs for 5 days within a year.

TABLE A-3
PARTICULATE INORGANIC EMISSIONS DURING EXCAVATION AND ESTIMATED MAXIMUM GROUND LEVEL CONCENTRATIONS
MIRON LUMBER SITE
ALBANY, NEW YORK

Inorganic	*Ambient Air Site-Specific Criteria (1) ug/m3*	*Emission Rate (g/s)*	*Enrichment Value*	*Bulk Conc. mg/kg*
Arsenic	1.69E+00	1.58E-05	1.28	1353

Notes:

(1) To calculate the emission rate in g/s, the Ambient Air Site-Specific Criteria was divided by a time averaging conversion factor of 0.7 to obtain a 1-hour concentration. SCREEN3 model calculates a 1-hour concentration, therefore a 1-hour criteria concentration was required.

EF = (k (0.0016) M (U/2.2)^(1.3))/((XH2O/2)^(1.4))

Where: EF = PM emissions (g/s)	
k = particle size multiplier for PM10 =	0.35
0.0016 = empirical constant (g/Kg)	0.0016
M = mass of waste handled (Kg/s) =	63
U = mean wind speed (m/s) =	4.4
2.2 = empirical constant (m/s) =	2.2
XH2O = percent moisture content (%) =	10

EF = 9.13E-03 g/s

The metal emission rates were calculated as follows:

C = ER * 10^6/Z/EF

Where: ER = emission rate of contaminant (g/s)

C = concentration of metal/PCB in the bulk soil (ug/g)

Z = enrichment factor

ATTACHMENT 1

SCREEN3 MODEL

```
                                                                 10/10/02
                                                                 11:57:23
 ***  SCREEN3 MODEL RUN  ***
 *** VERSION DATED 96043 ***

Miron Lumber Site

SIMPLE TERRAIN INPUTS:
   SOURCE TYPE                  =         AREA
   EMISSION RATE (G/(S-M**2))   =      .344800E-02
   SOURCE HEIGHT (M)            =        .0000
   LENGTH OF LARGER SIDE (M)    =      17.0290
   LENGTH OF SMALLER SIDE (M)   =      17.0290
   RECEPTOR HEIGHT (M)          =        .0000
   URBAN/RURAL OPTION           =        URBAN
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

   MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION


BUOY. FLUX =     .000 M**4/S**3;  MOM. FLUX =     .000 M**4/S**2

*** FULL METEOROLOGY ***

**********************************
*** SCREEN AUTOMATED DISTANCES ***
**********************************

*** TERRAIN HEIGHT OF     0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES
***

  DIST     CONC             U10M   USTK  MIX HT   PLUME  MAX DIR
   (M)   (UG/M**3)   STAB  (M/S)  (M/S)    (M)   HT (M)   (DEG)
-------  ----------  ----  -----  -----  ------  ------  -------
     1.   .8545E+05    6     1.0    1.0 10000.0     .00     45.
   100.   3612.        6     1.0    1.0 10000.0     .00     41.
   200.   1045.        6     1.0    1.0 10000.0     .00      1.
   300.   505.9        6     1.0    1.0 10000.0     .00     32.
   400.   305.9        6     1.0    1.0 10000.0     .00      2.
   500.   208.6        6     1.0    1.0 10000.0     .00     18.
   600.   153.6        6     1.0    1.0 10000.0     .00     33.
   700.   119.1        6     1.0    1.0 10000.0     .00     18.
   800.   96.01        6     1.0    1.0 10000.0     .00      7.
   900.   79.64        6     1.0    1.0 10000.0     .00      1.
  1000.   67.51        6     1.0    1.0 10000.0     .00      3.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND     1. M:
    12.   .1070E+06    6     1.0    1.0 10000.0     .00     45.

     ***************************************
     *** SUMMARY OF SCREEN MODEL RESULTS ***
     ***************************************

 CALCULATION         MAX CONC     DIST TO    TERRAIN
  PROCEDURE         (UG/M**3)     MAX (M)     HT (M)
--------------     -----------    -------    -------
SIMPLE TERRAIN      .1070E+06        12.         0.

***************************************************
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
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