



REMEDIATION ACTION REPORT

**OUTOKUMPU AMERICAN BRASS PLANT
BUFFALO, NEW YORK**

**NYSDEC SITE NO.: 915007
VCP AGREEMENT NO.: V00314-9**

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1.0 INTRODUCTION

The Outokumpu American Brass (OAB) plant (Site) is located at 70 Sayre Street in Buffalo, New York. The Site is approximately 71 acres in size, and includes a plant building, which occupies approximately 1,200,000 square feet, located in the southern portion of the Site. The plant has operated as a copper and copper-based alloy production facility since 1907, and is currently active. The Site location is shown on Figure 1.

Ecology & Environment, Inc. (E&E) completed a Preliminary Site Investigation (PSA) in 1989. The information gathered from that investigation was used to design a Remedial Investigation (RI) of the Site, which was completed by E&E in 1991. The RI included the collection and chemical analysis of soil, groundwater and stormwater samples. A Supplemental Remedial Investigation (SRI) was completed by McLaren/Hart Engineers Midwest, Inc. (McLaren/Hart) in 1995. The SRI included the collection and chemical analysis of additional soil, groundwater, and stormwater samples. A human health risk assessment (HHRA) also was completed by ChemRisk/McLaren/Hart in 1996.

Based on the results of the PSA, RI, SRI, and HHRA, McLaren/Hart completed a Feasibility Study (FS) in 1996. The FS recommended remedial measures for selected areas of the Site, identified as Areas A, C, D, and M, comprising construction of an asphalt pavement cover system over all unpaved metal-impacted surface soils in those areas, erection of an industrial quality fence around Area M, and implementation of institutional controls. Conservative Site-specific soil background concentrations were used as criteria to determine whether soils were metal-impacted. The locations of Areas A, C, D, and M at the Site are shown on Figure 2.

In response to the FS, in 1998 an 8-foot high industrial quality chain-link security fence was installed around the south, west, and east sides of Area M to prevent unauthorized entry by the public. Construction of the asphalt pavement cover system, the main component of the remedial action completed in Areas A, C, D, and M, was conducted in two phases, during October to November 1999, and October to November 2001. The limits of the new asphalt pavement cover system constructed in Areas A, C, D, and M are shown on Figures 3 through 6.

During ongoing communications between the New York State Department of Environmental Conservation (NYSDEC) and representatives of OAB, NYSDEC stated a concern with respect to concentrations of arsenic detected in some soils in an area identified as Area J, located in the northern portion of the Site. The location of Area J at the Site is shown on Figure 2. In response to NYSDEC's concerns, a vegetated soil cover

system was constructed over a portion of Area J, and a commercial/industrial quality security fence was erected around Area J to restrict access to the area where the vegetated soil cover system is constructed.

Construction of the security fence at Area J commenced in mid-November 2005 and was completed on December 2, 2005. Construction of the vegetated soil cover system commenced on November 14, 2005 and was completed on December 6, 2005. The limits of the vegetated soil cover system relative to the arsenic soil sample results are shown on Figure 7. The locations of the vegetated soil cover system and security fence are shown on Figure 8.

This document presents the Remedial Action Report (RAR) for areas (identified as Areas A, C, D, M, and J) addressed by the Voluntary Cleanup Program (VCP) agreement (VCP No.: V00314-9) between NYSDEC and OAB, dated June 18, 2004. In addition to the areas of new asphalt pavement and vegetated soil cover systems constructed at the Site, as identified in the RAR, pre-existing asphalt pavement and concrete surfaces also remain in place at Areas A, C, and D, and are included within the limits of the areas addressed by the VCP agreement. The limits of the areas defined as Areas A, C, D, M, and J in the VCP agreement are shown on Plans 1 through 6.

This RAR has been prepared in accordance with the requirements of letters from NYSDEC to OAB dated February 10, 2006, February 27, 2006, and May 19, 2006, and applicable guidance documents, and includes a Site history; investigative summary; comprehensive remediation summary; a Site Management Plan which includes an operation, maintenance, and monitoring (O,M,&M) plan; and a discussion of the institutional controls and engineering controls that have been established for Areas A, C, D, M, and J.

2.0 BACKGROUND

All of the relevant data from the PSA, RI, and SRI are presented in a report entitled "Supplemental Remedial Investigation, Outokumpu American Brass Buffalo Plant, Buffalo, New York" (SRI Report), dated December 1995 and prepared by McLaren/Hart. As detailed in the SRI Report, sampling of Site soils identified that polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs) were not of concern in Site soils. PCBs were detected in several soil samples, all at concentrations less than 1 milligram per kilogram (mg/kg), with the exception of at one location in Area C; these soils containing PCBs at a concentration greater than 1 mg/kg, subsequently, were removed. Fuel related VOCs and SVOCs were detected in the vicinity of a former underground storage tank (UST), however the data indicated that only a small quantity of petroleum impacted soil is present within the interior of the demolished tank, and the impacted soil is underlain by the concrete floor of the tank and 30 to 40 feet of clay. VOCs were detected at only a few other locations on Site, at concentrations less than 0.1 mg/kg, with the exception of two samples that were less than 1 mg/kg. Samples of fill soil material collected at several locations on Site consistently contained one or more metals (arsenic, cadmium, copper, lead, nickel, and zinc) at concentrations elevated as compared to conservative Site-specific soil background concentrations. Concentrations of metals detected in groundwater samples collected from Site monitoring wells indicated that, with the exception of zinc, detected in a sample of perched water from one well, all detections are below NYSDEC Ambient Water Quality Standards. These water quality standards are applicable to drinking water, and are not appropriate for the Site. Samples of stormwater runoff collected from several areas at the Site and analyzed for metals, indicated that the concentrations of detected metals were within acceptable limits established by the City of Buffalo for its combined sanitary sewer and stormwater sewer system. Figures and tables from the SRI Report, summarizing the data from Areas A, C, D, M, and J, are presented in Appendix A.

The FS is presented in a report entitled "Revised Draft Feasibility Study, Outokumpu American Brass Buffalo Plant, Buffalo, New York" (FS Report), dated November 5, 1996 and prepared by McLaren/Hart. The following remedial action objectives (RAOs) were developed for Areas A, C, D, and M in the FS Report:

- i) reduce direct contact with metal-impacted soils;
- ii) reduce stormwater contact with and transport of metal-impacted soils;
- iii) reduce airborne transport of metal-impacted soils; and
- iv) reduce leaching potential of metal-impacted soils to perched water.

The FS evaluated the following remedial alternatives to achieve the RAOs:

- i) Alternative I - No Action/Institutional Controls;
- ii) Alternative II - Excavation and Off-Site Disposal/Institutional Controls/Gravel Cover;
- iii) Alternative III - Ex-Situ Stabilization/Institutional Controls/Gravel Cover; and
- iv) Alternative IV - Asphalt Cover System/Institutional Controls.

The FS concluded that Alternative IV, Asphalt Cover System/Institutional Controls would be the most cost-effective alternative to implement which satisfied the RAOs. This alternative primarily consisted of the following activities:

- i) construction of an asphalt pavement cover system over all unpaved metal-impacted surface soils in Areas A, C, D, and M;
- ii) implementation of an O&M program to maintain the integrity of the new asphalt pavement in Areas A, C, D, and M;
- iii) erection of industrial caliber fencing around Area M; and
- iv) placing deed restrictions on metal-impacted soils left in place.

The security fence was constructed around Area M in 1998. A plan for implementation of the McLaren/Hart recommended remedial measures in Areas A, C, D, and M was developed by Conestoga-Rovers & Associates (CRA), on behalf of OAB, and presented in the document entitled "Remedial Action Work Plan, Outokumpu American Brass Plant, Buffalo, New York" (RAWP), dated September 1999. The RAWP was developed to identify the details of the remedial activities, and included a Health and Safety Plan (HASP). The RAWP was submitted to NYSDEC on or about September 25, 1999. Further to a meeting between NYSDEC, OAB, CRA, and others on September 28, 1999, by letter dated October 13, 1999 updated sections of the HASP component of the RAWP were provided to NYSDEC. Specifically, the HASP was updated to include an air monitoring plan and a revised section on dust suppression. The asphalt pavement cover system in Areas A, C, D, and M was constructed in two phases, during October to November 1999, and October to November 2001. Details of the remedial action activities completed in Areas A, C, D, and M in accordance with the RAWP are presented in the report entitled "Remedial Action Completion Report, Outokumpu American Brass Plant, Buffalo, New York" (RACR), dated March 2002 and prepared by CRA. The RACR was submitted to NYSDEC on May 30, 2002.

During ongoing communications between NYSDEC and representatives of OAB, NYSDEC stated a concern with respect to concentrations of arsenic detected in some soils in Area J, located in the northern portion of the Site. Soil arsenic data were originally collected by E&E during the PSA and RI. These data were supplemented by additional soil arsenic data collected from Area J by CRA during the period May to July 1999. A work plan entitled "Area J Interim Remedial Measures, Outokumpu American Brass Plant, Buffalo, New York" (IRM Work Plan), dated July 2004 and prepared by CRA, was developed to address the presence of arsenic in surface soils in Area J that exceed a concentration of 30 mg/kg, and proposed interim remedial work activities and the implementation of institutional controls to protect on-Site workers and potential trespassers from exposure to arsenic in near-surface soils. The Area J surficial soil arsenic data are presented on Figure 1 of the IRM Work Plan, and included in Appendix A to this RAR. The concentrations of arsenic detected in all Area J subsurface soil samples collected during the PSA and RI are well below the 30 mg/kg soil action level suggested by NYSDEC, and generally are in the single digit mg/kg range.

The remedial measures proposed in the IRM Work Plan consist of the following activities:

- i) construction of a vegetated soil cover system over parts of Area J at the Site where arsenic has been detected in near-surface soils at concentrations greater than 30 mg/kg;
- ii) erection of a commercial/industrial quality security fence around Area J that will restrict access to the area where the vegetated soil cover system is constructed; and
- iii) implementation of an O&M program to maintain the integrity of the vegetated soil cover system and security fence constructed at Area J.

The IRM Work Plan was submitted to NYSDEC on August 2, 2004. The IRM Work Plan was approved by NYSDEC by letter to OAB dated March 18, 2005.

Construction of the security fence and vegetated soil cover system at Area J commenced in mid-November 2005 and was completed on December 6, 2005. Details of the security fence and vegetated soil cover system construction are presented in the report entitled "Construction Report, Area J Interim Remedial Measures, Outokumpu American Brass Plant, Buffalo, New York" (Area J Construction Report), dated July 2006 and prepared by CRA.

3.0 REMEDIAL ACTION CONSTRUCTION ACTIVITIES

3.1 INTRODUCTION

This section describes the remedial construction activities conducted in Areas A, C, D, M, and J at the Site. Construction activities conducted in Areas A, C, D, and M, which generally included construction of an asphalt pavement cover system, are discussed in Section 3.2. Construction activities conducted in Area J, which generally included construction of a vegetated soil cover system and fence, are discussed in Section 3.3.

3.2 AREAS A, C, D, AND M

3.2.1 GENERAL

The remedial action field activities conducted at areas of the Site designated as Areas A, C, D, and M generally consisted of surface preparation, pregrading, and compaction activities; and placement of asphalt base and top coarse pavement in areas where asphalt or concrete surface materials did not previously exist. Additionally, an 8-foot high industrial quality chain-link security fence was installed around the south, west, and east sides of Area M to prevent unauthorized entry by the public. The security fence was installed in 1998, as arranged for by OAB. The other remaining remedial action field activities were conducted in two phases during October to November 1999, and October to November 2001, by Occhino Corporation, located in West Seneca, New York. All field activities, with the exception of construction of the security fence around Area M, were conducted under the oversight of CRA. The locations of Areas A, C, D, and M at the Site are shown on Figure 2. The limits of the new asphalt pavement cover system constructed in Areas A, C, D, and M are shown on Figures 3 through 6.

All field activities were performed, as a minimum, in accordance with the HASP presented in the RAWP, as amended by the letter from CRA to NYSDEC dated October 13, 1999.

3.2.2 SURFACE PREPARATION ACTIVITIES

Prior to commencing pregrading and compaction activities, the following surface preparation activities were conducted to facilitate pregrading and construction of the asphalt pavement cover system:

Area A

- i) removal and off-Site disposal of the east-west chain-link fence and an adjacent section of guardrail in the northern portion of Area A;
- ii) removal of a section of the north-south chain-link fence in the western portion of Area A, for reinstallation following completion of construction of the asphalt pavement cover system; and
- iii) removal and off-Site disposal of several small shrubs.

Area C

- i) removal of the chain-link fence around the lagoons, for reinstallation following completion of construction of the asphalt pavement cover system;
- ii) demolition, removal, and off-Site disposal of several small sections of concrete curb, and a section of a wall of a former diked area;
- iii) extending two existing manholes to accommodate final grades; and
- iv) removal and off-Site disposal of several small trees and shrubs.

Area D

- i) removal of the chain-link fence around the transformer area of Area D, for reinstallation following completion of construction of the asphalt pavement cover system; and
- ii) cutting, removal and off-Site disposal of grasses and weeds, and application of a soil sterilant to mitigate future vegetative growth.

Area M

- i) removal and off-Site disposal of the east-west chain-link fence in the northern portion of Area M;
- ii) removal and off-Site disposal of several large trees, including clearing and grubbing of the tree roots;
- iii) removal and off-Site disposal of several concrete foundations and other surficial concrete debris;
- iv) mowing surficial grasses and weeds, collection of such mowed vegetation using a mechanical sweeper, and off-Site disposal of same; and
- v) application of a soil sterilant to mitigate future vegetative growth.

3.2.3 PREGRADING AND COMPACTION

Minor pregrading of the existing ground surface materials in the areas to be paved was performed in order to remove minor surface irregularities, maintain positive drainage of surface water flow, and facilitate tie-in of the new asphalt with existing paved or concrete surfaces and various surficial features and structures, such as buildings and stormwater structures. The limits of pregrading were designed to approximately balance the cut and fill quantities. Pregraded material was evenly spread over the ground surface within the areas designated for asphalt pavement in such a manner that the resultant grades were not significantly altered. In general, the final grades of Areas A, C, D, and M were similar to the pre-existing grades in these areas. Some pregraded material was moved from Area D to Area C, and from the northern portion of Area A to the northern portion of Area M (north of the two new catch basins) to improve the final grades at these areas and contribute to maintaining the long-term integrity of the asphalt pavement cover system. Some features, such as catchbasins and manholes, were raised to facilitate tie-in.

During pregrading and compaction activities, a dust suppression program was implemented to minimize the generation and potential on-Site and off-Site migration of dust resulting from minor grading activities. Prior to pregrading and compacting individual areas, potable water was applied on an as-required basis to the areas for dust suppression such that no sustained visible dust was generated during pregrading and compaction. During on-Site construction activities, however, precipitation frequently occurred at the Site such that additional application of water for dust suppression typically was not required.

To improve the structural capacity of the existing soil and gravel materials at Area M, for the purpose of supporting the new asphalt pavement following pregrading of the existing surficial materials, 6 inches of New York State Department of Transportation (NYSDOT) Type 2, 2-inch Crusher Run crushed stone was placed and compacted over the pregraded ground surface. The crushed stone was imported by Occhino from Buffalo Crushed Stone, located in Buffalo, New York. The crushed stone was compacted to a minimum of 100 percent Standard Maximum Dry Density (SMDD).

Stormwater runoff from Areas A, C, D, and M was directed to existing catchbasins that discharge to the City of Buffalo combined sanitary sewer and stormwater system. Grading and appropriate surface restoration activities were performed in the immediate vicinity of the catchbasins to accommodate final grades following construction of the

asphalt cover. Additionally, to facilitate drainage of surface water from Area M, as approved by the City of Buffalo, two new catchbasins were installed in Area M and connected to the existing sewer system. The RAWP identified that only one new catchbasin would be installed, and that an existing manhole located within Area M would be converted to a catchbasin by replacing the manhole lid with a grated catchbasin cover. However, based on a meeting on September 28, 1999, the City of Buffalo recommended that the manhole remain as-is and a second catchbasin be installed. In accordance with City of Buffalo regulations, the new catchbasin installations were completed under the supervision of a licensed master plumber to City of Buffalo Sewer Authority standards.

To minimize the impact of soil pregrading activities and stormwater runoff on areas contiguous to the direct work areas, prior to commencing pregrading activities silt fence was installed at downgradient portions of the work areas. In addition, silt fence material was also placed over the catchbasin grates to reduce the potential of soil/sediment entering the sewer system.

Following surface pregrading, the ground surface was compacted using a smooth-drum compactor. Soft areas were brought up to suitable compaction for purposes of structural support of the asphalt pavement.

Portions of heavy equipment that contacted Site soils during the pregrading and compaction activities were decontaminated prior to leaving the designated work areas (i.e., unpaved portions of Areas A, C, and M). Based on the relatively small size of Area D and the presence of high voltage electrical devices, heavy equipment was not used for pregrading or compaction in this area. Decontamination procedures involved the manual removal of dirt, grit, and debris from equipment tracks and rollers, followed by pressure washing the portions of the equipment that were in contact with the soils with potable water. All decontamination procedures were conducted on unpaved portions of Areas A, C, and M. Washwaters were allowed to infiltrate into the ground at these locations.

Grass, weeds, trees, and shrubs removed from Areas A, C, D, and M were consolidated into a lugger box for off-Site disposal at a sanitary landfill. Prior to placement in the lugger box the roots of the trees and shrubs were cleaned using potable water. The washwater was allowed to infiltrate into the ground in Areas A, C, and M.

During the pregrading activities, air monitoring of respirable dust was conducted by CRA using a Mini-Ram real-time dust monitor in accordance with the HASP. Air monitoring activities consisted of the collection of respirable dust measurements at one

upwind (background) location, one downwind location, and one location within the active work area approximately every 2 hours, unless rain made air monitoring unwarranted as a result of damp or wet Site conditions. No downwind concentrations of respirable dust were detected during the pregrading activities that exceeded the upwind location concentration by more than 100 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). Additionally, in the active work area, no concentrations of respirable dust exceeded the upwind location concentrations by more than 75 $\mu\text{g}/\text{m}^3$. As such, in accordance with the HASP, additional dust suppression techniques involving the application of potable water were not required during pregrading and compaction. The air monitoring results indicate that on-Site pregrading and compaction activities had no significant on-Site or off-Site impacts.

Following removal of surficial vegetation from Areas D and M, Roundup® Pro herbicide, a commercially available soil sterilant manufactured by Monsanto Company, was applied to the ground surface to mitigate future growth of vegetation beneath the asphalt pavement. Additionally, the soil sterilant also was applied to small and localized areas of vegetation in Areas A and C.

3.2.4 ASPHALT PAVEMENT

Following pregrading and compaction activities, an asphalt pavement cover system was constructed over all unpaved metal-impacted surface soils in Areas A, C, D, and M, with the exception of several small, localized, grass and gravel areas in Area A that were not paved due to aesthetic or drainage considerations (such small grass and gravel areas are excluded from the VCP agreement). The limits of the new asphalt pavement cover system are shown on Figures 3 through 6.

The asphalt pavement was placed to generally follow the grades resulting from the pregrading activities, except where necessary or appropriate to match elevations of surface features such as buildings and stormwater structures. The asphalt pavement was a nominal 100 millimeters (mm) (4 inches) in thickness, comprising a 50-mm (2-inch) thick base course layer and a 50-mm (2-inch) thick top course layer. At selected locations the binder course and/or top course was constructed thicker than 50 mm to accommodate surface features or to improve drainage in several small and localized areas.

The RAWP identified that the base course of asphalt pavement to be used for the asphalt pavement cover system would be Type 1, which is described in the NYSDOT document entitled "Standard Specifications, Construction and Materials, Metric Units, Office of

Engineering, January 2, 1995" (Standard Specifications) as a dense base course with relatively low permeability. The RAWP identified that the top course of asphalt pavement to be used for the asphalt pavement cover system would be Type 6, which is described in the Standard Specifications as having a dense, granular texture for rural, suburban, and urban arterial roadways. Prior to commencement of construction of the asphalt pavement cover system in the fall of 1999, it was determined that NYSDOT Type 3 asphalt pavement, which is described in the Standard Specifications as a dense intermediate course with relatively low permeability, would be preferable to the Type 1 asphalt pavement. Specifically, it was determined that the slightly smaller aggregate size in the Type 3 asphalt pavement would be more conducive to placement to a 50 mm thickness, as specified in the RAWP, without sacrificing the structural integrity of the asphalt cover. The Type 3 asphalt pavement also had a higher asphalt cement content, which would also make the base course less permeable to infiltration. Accordingly, Type 3 asphalt pavement was used as the base course of the asphalt cover.

Prior to recommencement of construction activities in the fall of 2001, it was determined appropriate to revise the grade of top course asphalt pavement to be used in Areas A and M from Type 6 to Type 6F, and to revise the grade of top course asphalt pavement to be used in Areas C and D from Type 6 to Type 7F. The "F" designation indicates that high-friction course aggregates are used in the asphalt pavement mix, which is consistent with the typical mixes used in NYSDOT road projects. The Type 7F asphalt pavement also was determined more suitable than the Type 6 asphalt pavement for the surface course to be placed in Areas C and D because the Type 7F pavement has a slightly finer aggregate mixture and would be more conducive to the hand placement of asphalt that would be required in Area D and some locations within Area C. The Type 7F asphalt pavement also has a slightly greater asphalt cement content than the Type 6, which also would facilitate compaction and decrease permeability. Type 7F asphalt pavement is described in the Standard Specifications as a dense, gritty texture for single course resurfacing of rural, suburban, and urban arterial roadways.

The asphalt pavement was placed and compacted in accordance with Section 400 of the Standard Specifications. Over the majority of Areas A, C, and M, the asphalt was spread and finished using large or medium-sized commercial mechanical paving equipment, then was uniformly compacted by commercial rolling equipment. In Area D, and parts of the northern portion of Area A and in Area C in the vicinity of the lagoons, and close to structures that could not be accessed by the larger commercial paving and compaction equipment, asphalt was placed manually and spread with asphalt rakes, then compacted using power-operated mechanical tampers.

The asphalt used during the project was obtained from Buffalo Crushed Stone and County Line Stone Co., Inc. of Akron, New York.

Adherence of the asphalt to adjacent pavement edges and concrete structures such as catchbasins, foundations, and lagoons was facilitated by application of a thin, uniform coating of bituminous material (tacking) to these surfaces prior to the asphalt pavement being placed against them.

Type 3 base course was placed in Areas A and M during the fall of 1999, and in Areas C and D during the fall of 2001. All of the top course of asphalt, Type 6F in Areas A and M, and Type 7F in Areas C and D, was placed during the fall of 2001. Due to the length of time that had elapsed since the placement of Type 3 base course in Areas A and M in the fall of 1999, prior to placement of Type 6F asphalt top course in the fall of 2001 the areas were swept using a mechanical sweeper and a tack coat of bituminous material was applied to facilitate adherence of the top course to the base course. Prior to commencing placement of Type 6F asphalt top course in Areas A and M, several localized areas of base course asphalt that had deteriorated between 1999 and 2001 were removed and replaced with new Type 3 base course.

Following completion of asphalt placement activities, the north-south chain-link fence in Area A, the chain-link fence around the lagoons in Area C and the chain-link fence around Area D were re-constructed. New chain-link fences and adjacent guardrails were constructed in an east-west direction at the north and south limits of the main portion of Area A.

On-Site construction and project demobilization activities associated with construction of the asphalt pavement cover system in Areas A, C, D, and M were completed on November 8, 2001.

A photographic log showing the completed asphalt pavement cover system is provided in Appendix B. A copy of the daily construction log book maintained by CRA during construction activities is provided in Appendix C.

3.2.5 CONSTRUCTION QUALITY ASSURANCE AND QUALITY CONTROL

Construction Quality Assurance (CQA) and Construction Quality Control (CQC) inspections and tests were performed during on-Site construction activities to ensure compliance with the RAWP and Project Specifications, as well as to ensure completion of

the work tasks to a high level of quality. Inspections and testing provided a means of monitoring the quality and progress of work performed.

CQA inspections and tests were performed by CRA and SJB Services, Inc. (SJB), CRA's geotechnical testing subcontractor, on behalf of OAB, to ensure that materials and installations met the standards as set forth in the RAWP and Project Specifications. CQA inspections and tests were performed by CRA and/or SJB in accordance with the RAWP. A summary of the results of key CQA geotechnical tests conducted on the asphalt pavement cover system is presented in Table D.1 in Appendix D. Both the frequency and results of the CQA geotechnical testing met or exceeded the requirements of the RAWP and the Project Specifications.

CQC inspections and tests were performed by Occhino and Occhino's subcontractors and suppliers to measure and control the characteristics of the materials and installations and demonstrate that the materials and installations meet the requirements of the Project Specifications. Table D.1 includes a summary of the CQC geotechnical test results for the sub-base course crushed stone placed and compacted in Area M prior to placement of the asphalt pavement. Both the frequency and the results of the CQC geotechnical testing met or exceeded the requirements of the RAWP and the Project Specifications.

A copy of the geotechnical reports for the CQA and CQC testing are provided in Appendix D.

3.3 AREA J

3.3.1 GENERAL

The remedial action field activities conducted at Area J at the Site generally consisted of preparation, pregrading, and compaction activities, and construction of a vegetated soil cover system was constructed over all parts of Area J where arsenic has been detected in near-surface soils at a concentration greater than 30 mg/kg. Additionally, a 10-foot high industrial quality chain-link security fence was installed to restrict unauthorized access to the vegetated soil cover system and to define the boundary of Area J under the VCP agreement. The limits of the vegetated soil cover system were designed to extend 10 feet beyond a "clean line" established between perimeter surface soil samples where arsenic was not detected at concentrations greater than 30 mg/kg. The limits of the vegetated soil cover system relative to the arsenic soil sample results are shown on Figure 7. The

locations of the vegetated soil cover system and security fence constructed at Area J are shown on Figure 8.

Occhino was awarded the contract for construction of the vegetated soil cover system, based on a competitive bidding process. Engineering oversight and project management, as well as CQA activities, were conducted by CRA on behalf of OAB. CRA personnel were on Site, in general, on a full-time basis during the soil cover construction activities. NYSDEC representatives visited the Site three times during the soil cover construction.

Construction of the vegetated soil cover system comprised the following major components:

- i) mobilization of labor, materials, and equipment;
- ii) clearing trees and vegetation, pregrading, and compaction;
- iii) importing and placement of a 6-inch layer of common fill material;
- iv) importing and placement of a 6-inch layer of topsoil;
- v) hydroseeding the topsoiled area; and
- vi) demobilization of labor, materials, and equipment.

Vegetated soil cover system construction, as outlined above, commenced on November 14, 2005 and was completed on December 6, 2005.

3.3.2 CONSTRUCTION OF VEGETATED SOIL COVER SYSTEM

3.3.2.1 PRE-GRADING AND SURFACE PREPARATION ACTIVITIES

The pre-existing ground surface within the limits of the vegetated soil cover system was sparsely covered with grass, some stones and bricks up to approximately 6 inches in diameter, and approximately 15 stands of poplar trees up to approximately 8 inches in diameter and 35 feet high. To facilitate pregrading, common fill and topsoil placement, and seeding activities, prior to pregrading, the existing grass within the limits of the vegetated soil cover was cut to a height of approximately 2 to 3 inches above ground surface. Additionally, trees and saplings within the limits of the vegetated soil cover were cut off as close as practical to the ground surface, but in any event within approximately 3 inches of ground surface. Tree limbs were chipped on Site, then removed from Site for use by Occhino as mulch. Tree trunks were cut into logs and

were removed from the area of the soil cover system by Occhino, for removal from Site by OAB.

In general, the final contours of the portion of Area J where the vegetated soil cover system was constructed follow pre-existing surface contours. However, minor pregrading of the existing ground surface materials was performed, using a Caterpillar D5 bulldozer, to remove minor surface irregularities, reduce surface slopes, and facilitate tie-in of the cover system with existing adjacent vegetated areas. To minimize the impact of stormwater runoff to areas contiguous to the direct work area, a silt fence was installed around downgradient portions of the work area.

The limits of pregrading were designed to balance the cut and fill quantities. All pregraded materials were kept within the limits of the soil cover system. Any excess material resulting from the pregrading was spread at the base of one area of sloped ground within the limits of the vegetated soil cover system, in such a manner that the slope was reduced. Following surface pregrading the ground surface within the area of the vegetated soil cover was compacted using a Caterpillar smooth-drum compactor.

During pregrading and compaction activities periods of light and heavy rain were common throughout the workdays. Accordingly, wet weather conditions at the Site during pregrading and compaction prevented dust generation, and additional dust suppression techniques were not required to control the generation and migration of dust.

3.3.2.2 SOIL COVER

Construction of the soil cover layer commenced following pregrading and compaction activities. The soil cover layer generally follows the grades resulting from the pregrading and compaction activities, except where necessary or appropriate to tie in with existing adjacent vegetated areas.

The soil cover layer was constructed to a nominal 12-inch thickness, and consists of a 6-inch thick common fill layer overlain by a 6-inch thick topsoil layer. At selected locations the common fill and topsoil layers were constructed thicker than 6 inches to provide a more uniform grade. Common fill and topsoil both were placed in advance of the bulldozer by pushing, to minimize the potential for contact of the bulldozer with underlying Site soils. Grading of the common fill layer and placement of the topsoil layer was conducted carefully to minimize the potential for disturbance and contact with underlying Site soils.

During soil cover placement activities, periods of rain and snow resulted in soil conditions at the Site being quite wet at times. In order to minimize rutting of the ground surface outside the limits of the soil cover system by trucks hauling imported soil materials to the area of the soil cover, several loads of rock and stone were placed to the northeast of the soil cover area to make a supportive truck access road. Trucks delivering soil materials (common fill and topsoil) for placement in the soil cover area traveled over the access road, and dumped the soil onto the edge of the soil cover area, typically without driving onto the soil cover area. Accordingly, any rutting of soil materials that may have occurred beyond the access road also was outside of the limits of the vegetative soil cover system. After the soil was dumped, a bulldozer was used to place and grade the material by pushing the material in advance of the bulldozer. Placement and grading of soil cover materials within the limits of the soil cover system, particularly during periods of wet soil conditions, was monitored very closely by both CRA and Occhino personnel, to ensure that intermingling of pre-existing (underlying) Site soils with imported common fill and topsoil did not occur. On one or more occasions, when the underlying soil was extremely wet or saturated, soil placement activities were discontinued for one or more days, as appropriate, until the soil dried sufficiently, or alternatively, froze, such that soil placement could continue without intermingling of underlying soils with imported soil materials.

Close monitoring by CRA and Occhino during common fill placement activities identified that, due to the wide tracks on the bulldozer, rutting of the common fill layer did not occur, even when the common fill was wet. As the common fill was placed in advance of the bulldozer by pushing, and graded very carefully under the oversight of CRA and Occhino, in no instance did the underlying pre-existing Site soils become intermingled with the imported common fill. During placement of the topsoil, CRA observed that some shallow rutting of the topsoil did occur at times, when soil conditions were wet. However, careful monitoring of the ruts by CRA and Occhino identified that in no instances did any ruts extend beneath the surface of the imported common fill layer, which overlies the pre-existing Site soils, further confirming that intermingling of pre-existing Site soils below the common fill layer did not occur. Accordingly, while construction conditions during November and December 2005, when the soil cover system was being constructed, were not optimal, the overall goal of covering the pre-existing Site soils with clean imported soil materials was achieved, with no adverse impact occurring as a result of wet or frozen conditions.

The common fill soil is a fine-grained soil material, free from refuse, materials containing hazardous or toxic constituents at hazardous or toxic concentrations, and

stones greater than 2 inches in diameter. The common fill soil was imported by Occhino from Buffalo Crushed Stone.

The topsoil cover layer consists of naturally occurring topsoil, free from refuse, materials containing hazardous or toxic constituents at hazardous or toxic concentrations, and stones greater than 1 inch in diameter. The topsoil was imported by Occhino from C. Destro Development, located in Buffalo, New York.

To confirm the common fill soil and topsoil do not contain hazardous or toxic constituents at hazardous or toxic concentrations, prior to importing soil materials to the Site, two soil samples were collected by CRA, one from the common fill source stockpile and one from the topsoil source stockpile. Soil samples were submitted to Severn Trent Laboratories (STL) in Amherst, New York, for chemical analysis of Target Compound List (TCL) volatile organic compounds (VOCs), TCL semivolatile organic compounds (SVOCs), pesticides, PCBs, herbicides, and arsenic. Following receipt of the analytical results from STL the data was validated by a CRA chemist. The analytical data reports and data validation memorandum are presented in Appendix E. Validated analytical data were compared to the recommended generic soil cleanup objectives identified in the NYSDEC document entitled "Technical and Administrative Guidance Memorandum #4046, Determination of Soil Cleanup Objectives and Cleanup Levels" (TAGM #4046), dated January 24, 1994, to confirm the common fill and topsoil were of suitable quality.

Pesticides, herbicides, and PCBs were not detected in either the common fill or topsoil samples, and VOCs were not detected in the topsoil sample. Analytical data for the common fill soil sample indicates one VOC, methylene chloride, was detected at a concentration of 8 micrograms per kilogram ($\mu\text{g}/\text{kg}$); one SVOC, bis(2-ethylhexyl)phthalate, was detected at 25J $\mu\text{g}/\text{kg}$ (estimated concentration below the detection limit); and arsenic was detected at a concentration of 3.0 mg/kg. Analytical data for the topsoil sample indicates seven SVOCs were detected; 4-methylphenol at a concentration of 32J $\mu\text{g}/\text{kg}$, benzo(a)anthracene at 24J $\mu\text{g}/\text{kg}$, bis(2-ethylhexyl)phthalate at 38J $\mu\text{g}/\text{kg}$, chrysene at 22J $\mu\text{g}/\text{kg}$, fluoranthene at 47J $\mu\text{g}/\text{kg}$, phenanthrene at 24J $\mu\text{g}/\text{kg}$, and pyrene at 35J $\mu\text{g}/\text{kg}$; and arsenic was detected at a concentration of 7.1 mg/kg. The detected concentrations of arsenic in the common fill and topsoil samples are well below the 30 mg/kg limit identified in the IRM Work Plan, and also are below the recommended generic soil cleanup objective of 7.5 mg/kg (or background concentration) identified in TAGM #4046. Concentrations of the other compounds detected in the common fill and topsoil samples are low concentrations, and are, in all cases, well below the respective TAGM #4046 criteria.

3.3.2.3 SEEDING

The 6-inch thick topsoil layer was hydroseeded with a slurry mixture of grass seed, Terra Mulch wood fiber mulch, fertilizer, and potable water. The grass seed mixture was selected in accordance with New York State Natural Resource Conservation Service (NYSNRCS) recommendations for low maintenance seed mixtures for erosion control, in the Buffalo area, and was composed of 30 percent Creeping Red Fescue, 50 percent Kentucky Blue Grass, 10 percent Annual Rye, and 10 percent Perennial Rye. The seed mixture was applied at a minimum rate of 200 pounds per acre.

3.3.2.4 DEMARCATIION BOLLARDS

Demarcation bollards were installed at key locations prior to commencing common fill placement to demarcate the limits of the vegetated soil cover system within Area J. The locations of the demarcation bollards are shown on Figure 8 and Plan 6.

The demarcation bollards were constructed of 4-inch diameter steel pipe filled with concrete, and were painted red. The bollards extend to a height of 4 feet above grade, and are secured into the ground with poured concrete footings 4 feet deep. Soil auger cuttings resulting from the bollard installations were spread evenly over the pre-existing ground surface within the limits of the soil cover system and adjacent to the demarcation bollard locations, and were covered with the common fill and topsoil layers.

3.3.2.5 CONSTRUCTION QUALITY ASSURANCE AND QUALITY CONTROL

CQA and CQC inspections and tests were performed during construction activities to ensure compliance with the IRM Work Plan and the Project Specifications prepared and issued to Occhino, as well as to ensure completion of the work tasks to a high level of quality.

CQA inspections and tests were performed by CRA, on behalf of OAB, to ensure that materials and installations meet the standards as set forth in the IRM Work Plan and Project Specifications. CQC inspections were performed by Occhino to measure and control the characteristics of the materials and installations and to demonstrate that the materials and installations meet the requirements of the Project Specifications.

A photographic log documenting construction of the vegetated soil cover system is provided in Appendix F. A copy of the daily construction log book maintained by CRA during construction activities is provided in Appendix G.

3.3.2.6 HEALTH AND SAFETY

As detailed in the IRM Work Plan, a Health and Safety Plan (HASP), was developed to address health and safety considerations, requirements, and procedures associated with the construction of the vegetated soil cover system, to ensure that construction activities were performed safely and in accordance with applicable regulatory requirements, and that construction personnel, the general public, and the environment were protected from exposure to Site-related constituents (primarily arsenic) during implementation of the construction activities at the Site. The HASP, included in the IRM Work Plan, was followed by all personnel working on the construction of the vegetated soil cover system.

Due to the wet weather conditions during pregrading and compaction activities, through to the completion of placement of topsoil and hydroseeding, dust was not generated during construction, therefore, significant exposure of personnel to Site constituents did not occur.

During pregrading and compaction activities, through to the completion of placement of the common fill material over the pregraded materials, CRA conducted air monitoring for respirable dust, in accordance with the HASP, to confirm the absence of significant concentrations of respirable dust. The HASP required that air monitoring data be collected every 2 hours during pregrading and compaction activities or as deemed necessary by the resident engineer based on Site-specific conditions. When it was not raining or snowing during pregrading and compaction, CRA collected respirable dust measurements every 2 hours, using a Mini-Ram real time dust monitor. When it was raining or snowing, air monitoring was not conducted, to avoid damaging the monitoring equipment. During times of rain or snow, however, Site conditions were wet and no dust was generated.

None of the air monitoring results recorded during pregrading and compaction activities exceeded the action levels identified in the HASP. The maximum respirable dust concentration identified was 20 µg/m³ above background concentrations, which is well below both the action levels of 150 µg/m³ for downwind work area perimeter locations and 100 µg/m³ for the work area. Respirable dust concentrations ranged from

0.0 to 11 µg/m³ above background concentrations at the perimeter of the work area, and from 1 to 20 µg/m³ above background concentrations in the work area.

All pregraded materials were kept within the limits of the soil cover system, and were not tracked onto adjacent areas. Prior to removal from within the limits of the pregraded and compacted ground surface, all heavy construction equipment that contacted pre-existing surface soils were cleaned by manual scraping and pressure washing over pre-existing soils within the limits of the soil cover system, in accordance with the procedures established in the HASP.

3.3.3 CONSTRUCTION OF SECURITY FENCE

In accordance with the IRM Work Plan, a commercial/industrial quality security fence was constructed to restrict unauthorized access to the vegetated soil cover system and to define the boundary of Area J under the VCP agreement. Fox Fencing (Fox) of Buffalo, New York, was awarded the contract for construction of the security fence based on a competitive bidding process. Oversight and project management of the fence construction activities were conducted by OAB.

In general, the security fence is of chain link construction, nominal 10 feet in height plus three strands of barbed wire, with line posts spaced at intervals not exceeding 10 feet. Fence posts are secured into the ground with poured concrete footings. Three 12-foot wide gates to permit controlled access to the vegetated soil cover area for maintenance equipment, in the event that such access is required, are provided. The gates are equipped with a locking mechanism to prevent unauthorized entry to the vegetated soil cover area.

The limits of the constructed security fence were expanded slightly, as compared to the limits estimated in the IRM Work Plan, since the size of the parking lot northeast of the baseball diamonds was reduced. The location of the new security fence is shown on Figure 8 and Plan 6. As shown on Figure 8 and Plan 6, the new security fence is tied in to the existing chain link fences north of the substation area and at the baseball diamond area at the Site.

Security fence construction, as outlined above, commenced in mid November 2005 and was completed on December 2, 2005.

4.0 INSTITUTIONAL AND ENGINEERING CONTROLS

As detailed in this RAR, Areas A, C, D, M, and J were remediated through the implementation of both institutional and engineering controls.

Institutional controls, which are designed to preserve the integrity of the engineering controls from an administrative perspective, are to be implemented in the form of a Declaration of Covenants and Restrictions, which is to be filed with the County Clerk in Erie County. In general, the Declaration of Covenants and Restrictions is a property deed restriction which limits the current and future use of Areas A, C, D, M, and J, and requires the maintenance of the specified engineering controls in these areas. A certified copy of the Declaration of Covenants and Restrictions filed by the County Clerk is to be presented in Appendix H.

The engineering controls include cover systems constructed at Areas A, C, D, M, and J, and a chain link security fence constructed around the boundary of Area J. A chain link security fence also was constructed at Area M, generally within 1 foot of the east, west, and south boundaries of Area M, however, this fence was constructed primarily as a measure of OAB plant security, and is not defined as an engineering control in the Declaration of Covenants and Restrictions.

Cover systems constructed in Areas A, C, D, M, and J as a result of the FS and in response to concerns stated by NYSDEC, are described as follows:

- Area A - 4-inch thick asphalt pavement;
- Area C - 4-inch thick asphalt pavement;
- Area D - 4-inch thick asphalt pavement;
- Area M - 6-inch thick crushed stone layer overlain by 4-inch thick asphalt pavement; and
- Area J (within limits of the vegetated soil cover system only) - 6-inch thick common fill layer overlain by 6-inch thick vegetated topsoil layer.

Pre-existing asphalt pavement and concrete surfaces also remain in place at Areas A, C, and D. These pre-existing asphalt pavement and concrete surfaces at Areas A, C, and D are included in the areas addressed by the VCP agreement. The limits of the areas defined as Areas A, C, D, M, and J in the VCP agreement are shown on Plans 1 through 6.

5.0 OPERATION, MAINTENANCE, AND MONITORING PLAN

A comprehensive O,M,&M plan has been developed for the new asphalt pavement cover systems constructed in Areas A, C, D, and M, the pre-existing asphalt pavement and concrete surfaces at Areas A, C, and D, and the vegetated soil cover system and security fence constructed in Area J. The purpose of the O,M,&M plan is to specify inspection and maintenance activities that will be implemented in order to maintain the integrity of the asphalt pavement and concrete surfaces at Areas A, C, D, and M, the vegetated soil cover system at Area J, and the security fence around Area J, and identify potential problems and appropriate corrective actions to mitigate such problems. The O,M,&M plan is included as a component of the Site Management Plan presented in Appendix I.

6.0 CONCLUSIONS

The RAWP for the Site was developed and submitted to NYSDEC in September 1999. The RAWP identified the remediation activities for areas of the Site identified as Areas A, C, D, and M, including construction of an asphalt pavement cover system over unpaved metal-impacted surface soils in those areas, and construction of an industrial quality fence around Area M. The RAWP also identified an O,M,&M plan for the asphalt pavement cover system at Areas A, C, D, and M and the fence around Area M, and identified a plan for implementing institutional controls (i.e., deed restrictions).

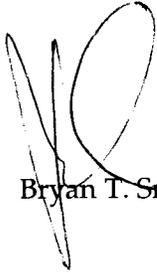
The construction of the asphalt pavement cover system and erection of the fence were completed by November 8, 2001. All construction activities were completed in general accordance with the RAWP, with appropriate modifications, as identified in this report. O,M,&M activities are to be conducted in accordance with an updated O,M,&M plan included in the Site Management Plan. The updated O,M,&M plan addresses the new asphalt pavement cover systems constructed in Areas A, C, D, and M, the pre-existing asphalt pavement and concrete surfaces at Areas A, C, and D, and the vegetated soil cover system and security fence constructed in Area J. Institutional controls, in the form of deed restrictions, are to be implemented as required.

The IRM Work Plan for the Site was approved by NYSDEC by letter to OAB dated March 18, 2005. The IRM Work Plan identifies interim remedial work activities and the implementation of institutional controls to protect workers and potential trespassers from exposure to arsenic in near-surface soils at the north area of the OAB plant site identified as Area J, including construction of a vegetated soil cover system and an industrial quality security fence around Area J. The IRM Work Plan also identifies an O,M,&M plan for the vegetated soil cover system in Area J and the security fence around Area J; an updated version of the O,M,&M plan is included in the Site Management Plan.

The construction of the vegetated soil cover system and erection of the security fence were completed by December 6, 2005. All construction activities were completed in general accordance with the IRM Work Plan, as identified in this report. O,M,&M activities are to be conducted in accordance with the updated O,M,&M plan included in the Site Management Plan in Appendix I.

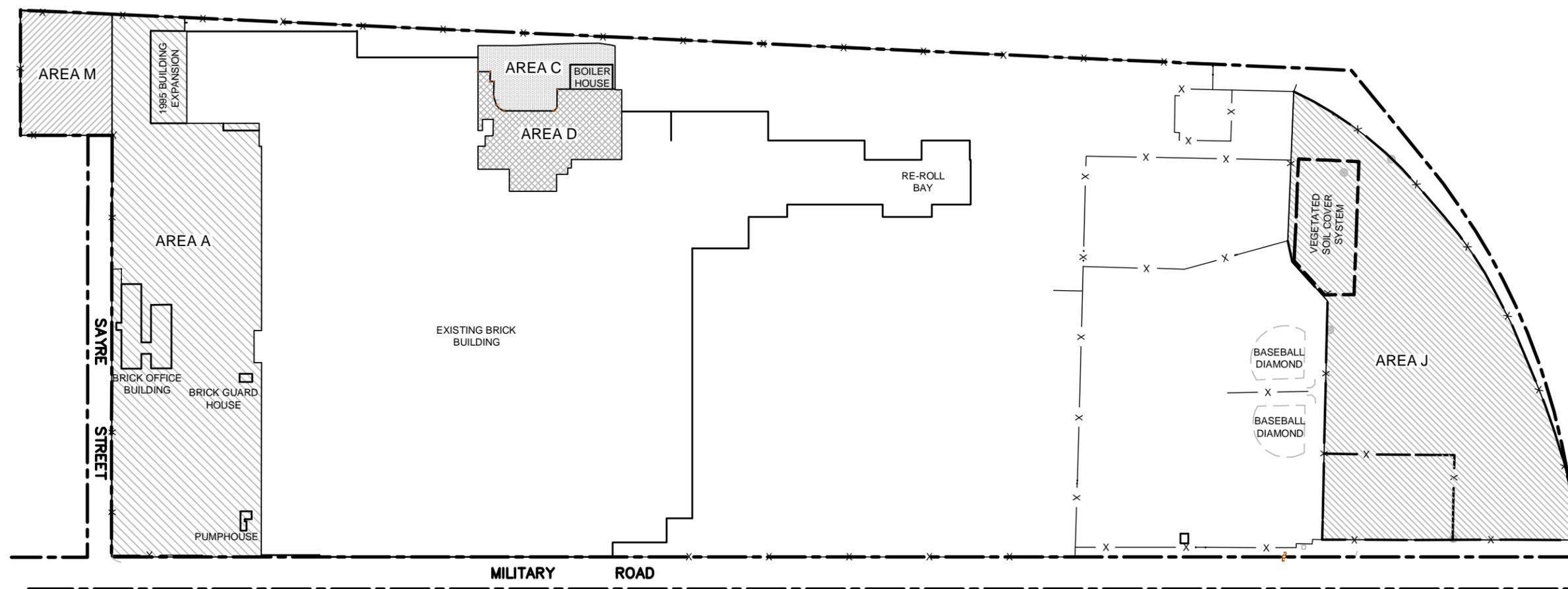
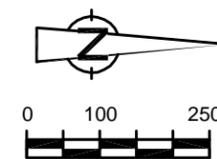
7.0 CERTIFICATION STATEMENT

"I certify that I have reviewed this RAR and supporting documentation and have visited the Site, and to the best of my knowledge and belief, the remedial activities in Areas A, C, D, M, and J were completed substantially in accordance with the RAWP, and the IRM Work Plan approved by NYSDEC."



Bryan T. Smith, P.E.





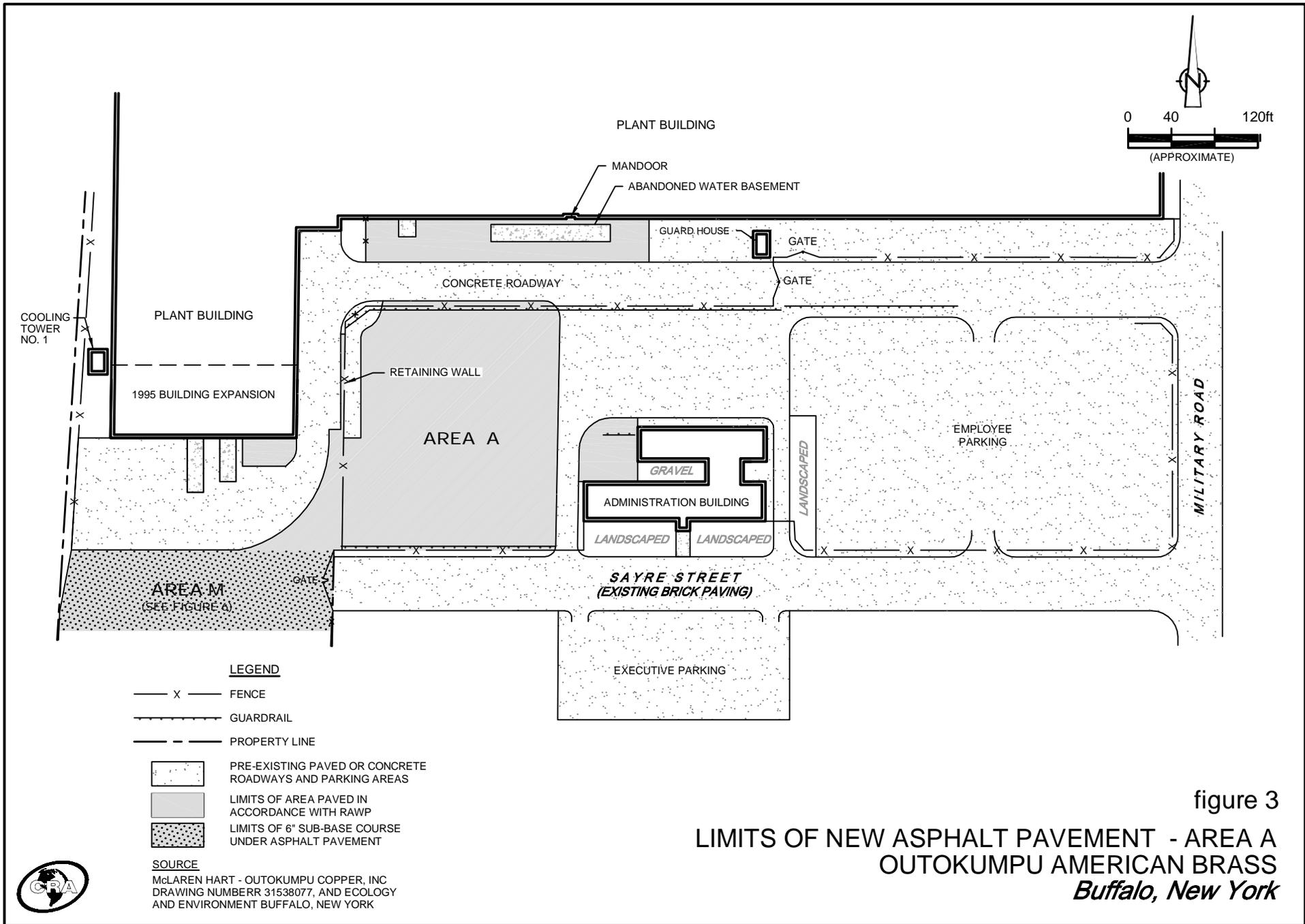
- LEGEND**
- x — NEW AREA J SECURITY FENCE
 - x — PRE-EXISTING SECURITY FENCE
 - - - - - PROPERTY LINE

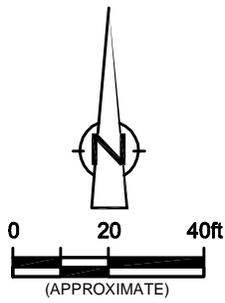
NOTE: NOT ALL BUILDING FEATURES WITHIN PROPERTY BOUNDARY ARE SHOWN.

SOURCE: SITE PLAN BY SONNENBERGER LAND SURVEYOR, PLAN 1.

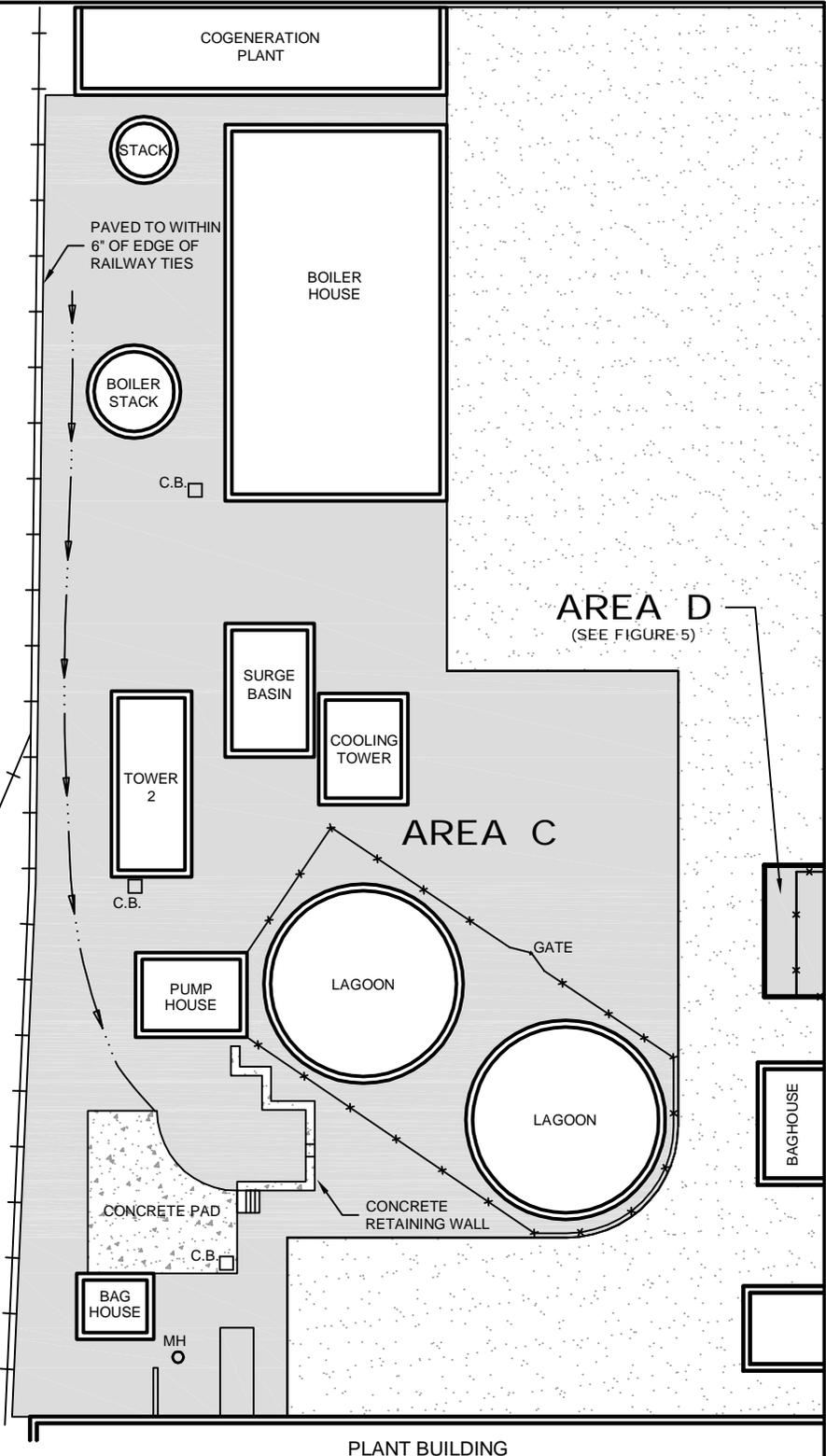
figure 2
SITE PLAN
OUTOKUMPU AMERICAN BRASS
Buffalo, New York







SOURCE:
 McLAREN HART - OUTOKUMPU COPPER, INC.
 DRAWING NUMBER: 31538011, AND
 ECOLOGY AND ENVIRONMENT
 BUFFALO, NEW YORK



- LEGEND**
- FENCE
 - PROPERTY LINE
 - RAILROAD
 - CONSTRUCTED DRAINAGE SWALE
 - C.B. □ CATCHBASIN
 - PRE-EXISTING PAVED OR CONCRETE ROADWAYS AND PARKING AREAS
 - LIMITS OF AREA PAVED IN ACCORDANCE WITH RAWP

figure 4

LIMITS OF NEW ASPHALT PAVEMENT - AREA C
OUTOKUMPU AMERICAN BRASS
Buffalo, New York



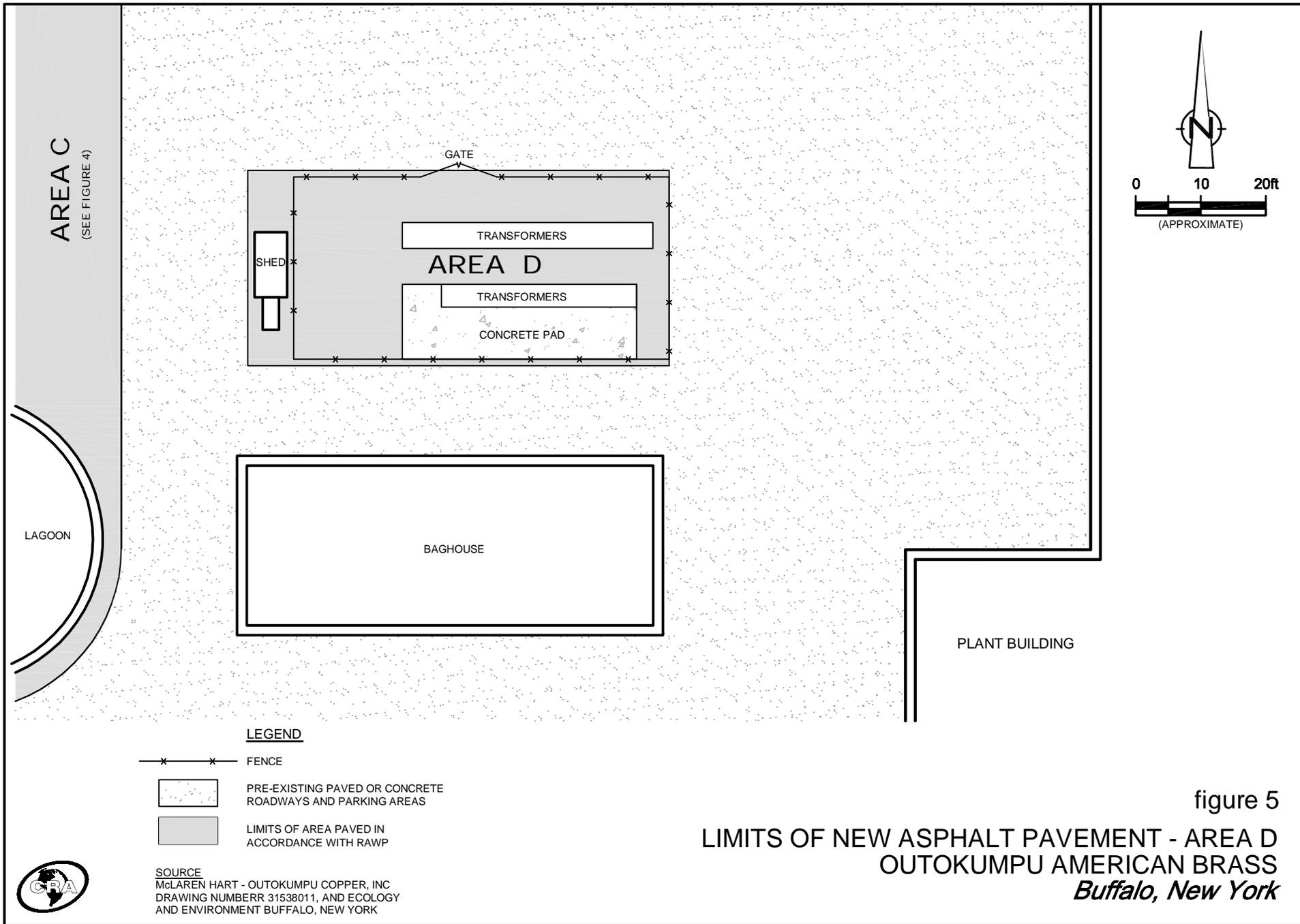
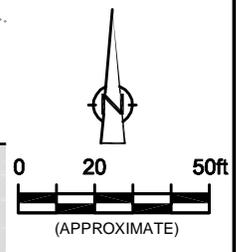
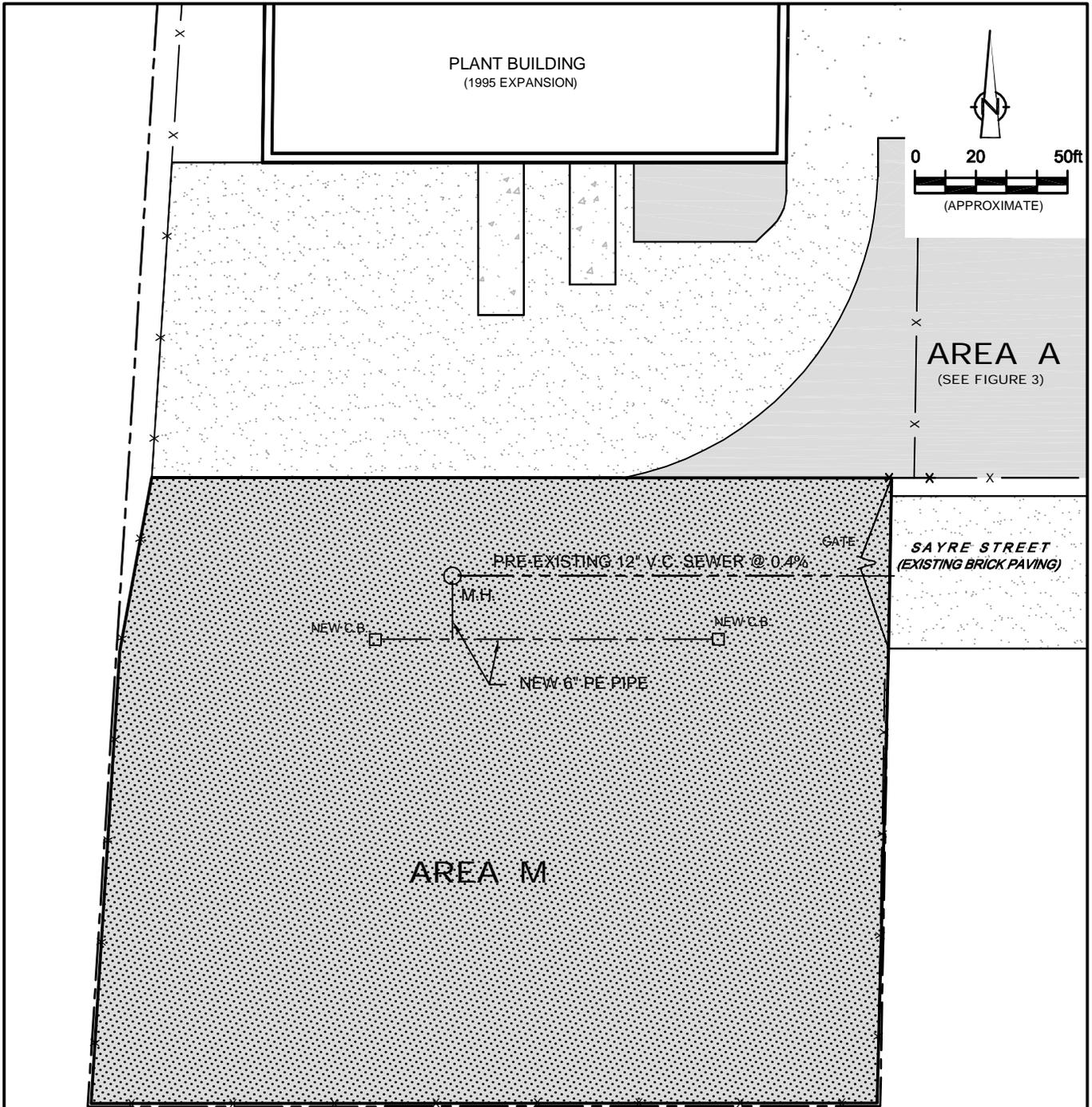


figure 5
LIMITS OF NEW ASPHALT PAVEMENT - AREA D
OUTOKUMPU AMERICAN BRASS
Buffalo, New York





LEGEND

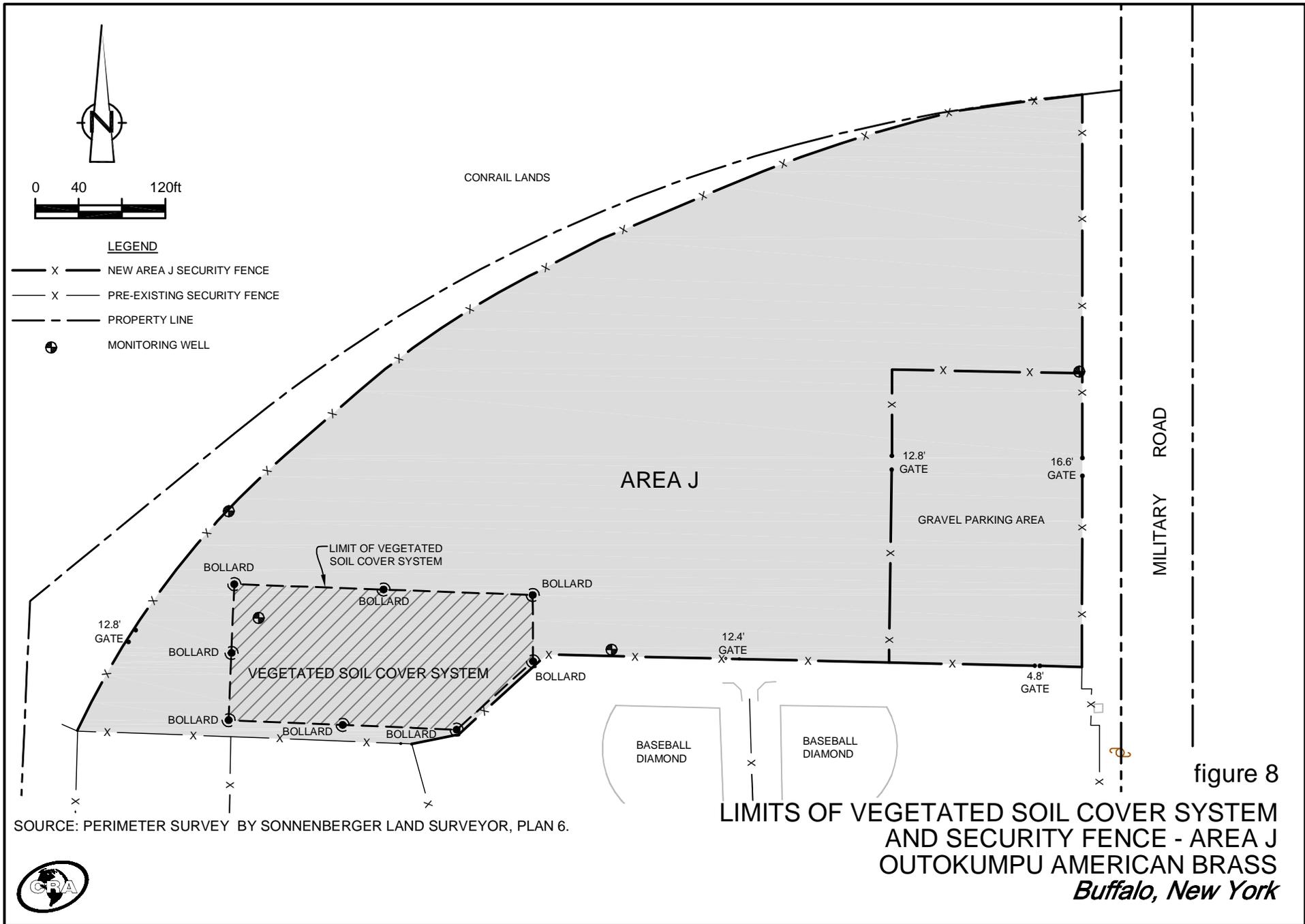
- | | | | |
|--------|----------------------|---|---|
| — x — | FENCE |  | PRE-EXISTING PAVED OR CONCRETE ROADWAYS AND PARKING AREAS |
| - - - | PROPERTY LINE |  | LIMITS OF AREA PAVED IN ACCORDANCE WITH RAWP |
| - - - | SEWER |  | LIMITS OF 6" SUB-BASE COURSE UNDER ASPHALT PAVEMENT |
| M.H. ○ | PRE-EXISTING MANHOLE | | |
| C.B. □ | CATCHBASIN | | |

figure 6

LIMITS OF NEW ASPHALT PAVEMENT - AREA M
OUTOKUMPU AMERICAN BRASS
Buffalo, New York

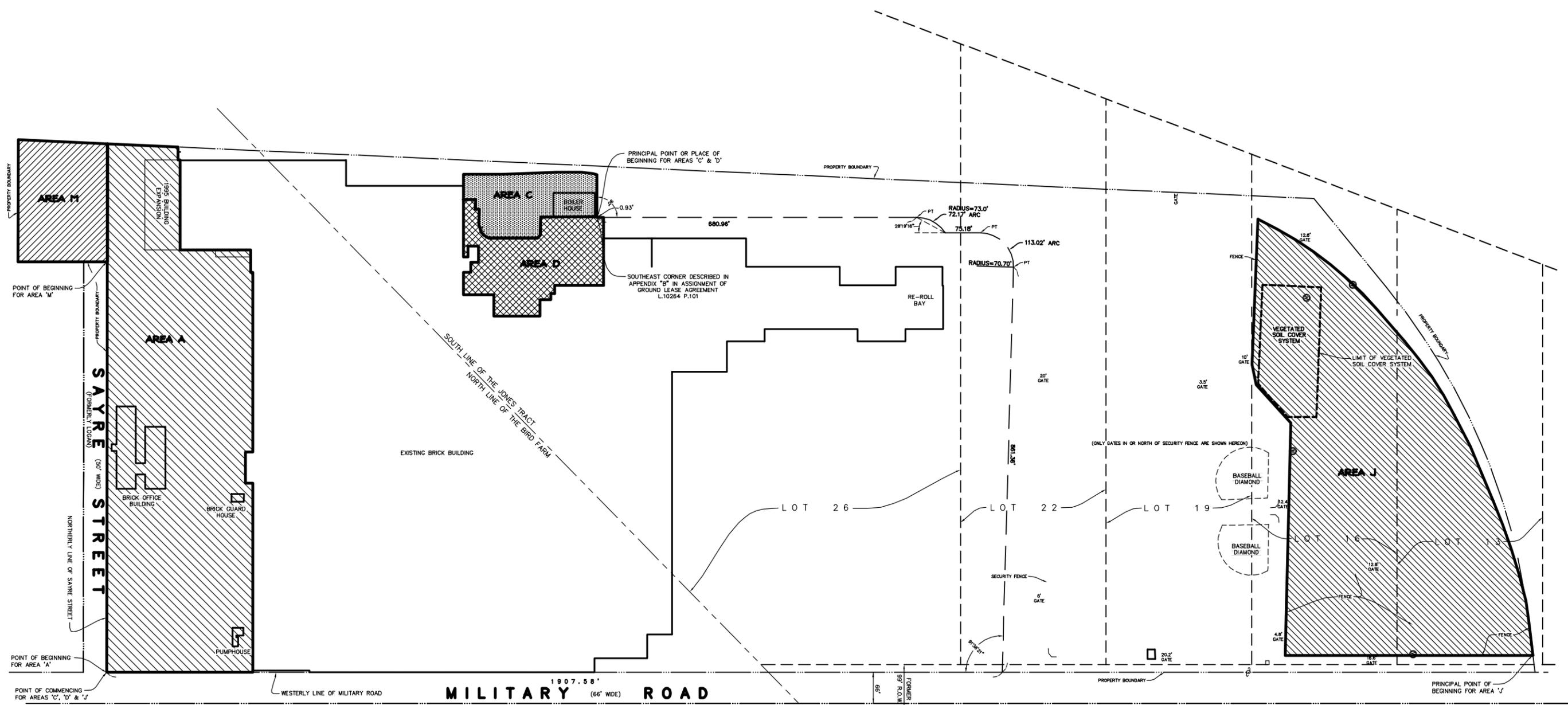


SOURCE
 McLAREN HART - OUTOKUMPU COPPER, INC
 DRAWING NUMBERR 31538077, AND ECOLOGY
 AND ENVIRONMENT BUFFALO, NEW YORK



SOURCE: PERIMETER SURVEY BY SONNENBERGER LAND SURVEYOR, PLAN 6.





NOTE: UNAUTHORIZED ALTERATIONS OR ADDITIONS TO ANY SURVEY, DRAWING, DESIGN SPECIFICATION, PLAN, OR REPORT IS A VIOLATION OF SECTION 2209, PROVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

SITE PLAN
PART OF
OUTOKUMPU AMERICAN BRASS

PART OF THE BIRD FARM & JONES TRACT
CITY OF BUFFALO, COUNTY OF ERIE, STATE OF NEW YORK

NYSDEC SITE NO.: 915007
VCP AGREEMENT NO.: V00314-9

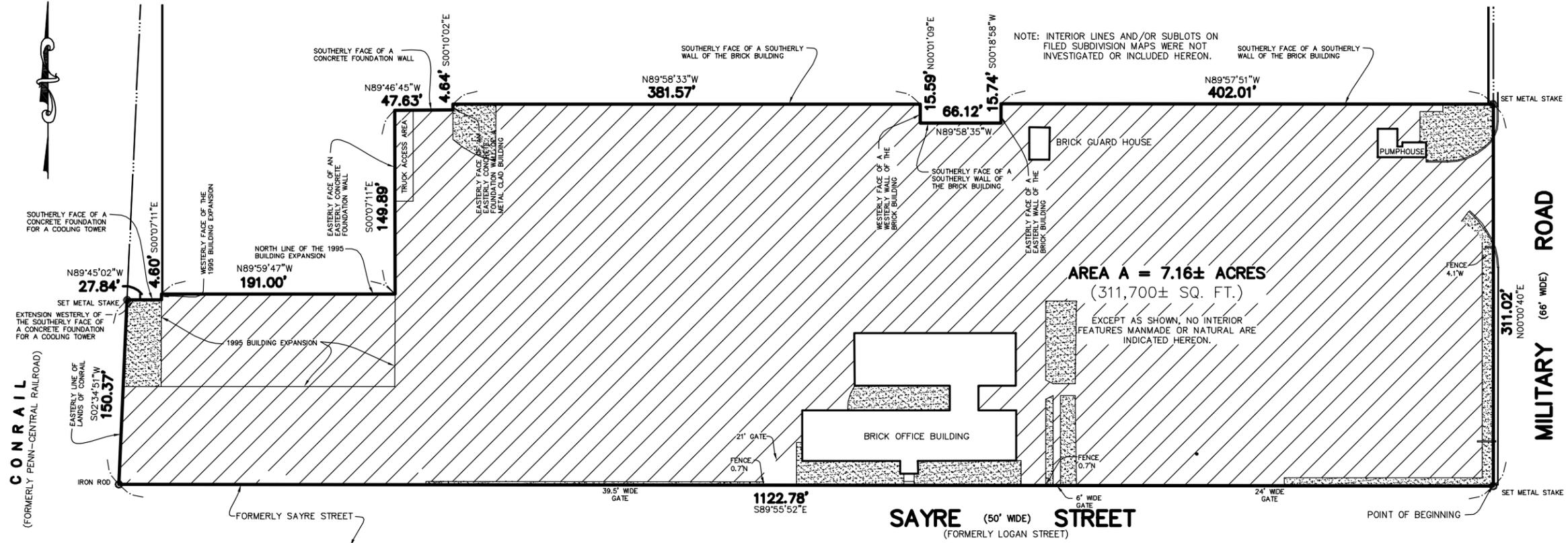


LAND SURVEYOR
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(716) 854-0199
FAX (716) 854-1462

RAY L. SONNENBERGER, PLS
N.Y.S. LIC. No. 036193

SCALE: 1" = 100'	DATE: 10-08-04	PLAN NO. 1
LL NO. 59505	JOB NO. 04-830 (VEG)	





NOTE: INTERIOR LINES AND/OR SUBLOTS ON FILED SUBDIVISION MAPS WERE NOT INVESTIGATED OR INCLUDED HEREON.

AREA A = 7.16± ACRES
(311,700± SQ. FT.)
EXCEPT AS SHOWN, NO INTERIOR FEATURES MANMADE OR NATURAL ARE INDICATED HEREON.

PERIMETER DESCRIPTION AREA A
JOB NO. 04-630A

ALL THAT TRACT OR PARCEL OF LAND, situate in the City of Buffalo, County of Erie and State of New York, being part of the Bird Farm, bounded and described as follows;

BEGINNING at the intersection of the northerly line of Sayre Street (as a street 50 feet wide) and the westerly line of Military Road (as a street 66 feet wide);

Thence N00°00'40"W along the westerly line of Military Road a distance of 311.02 feet to the intersection of the westerly line of Military Road with the extension easterly of the southerly face of the southerly wall of a brick building standing on a parcel north of premises herein described;

Thence N89°57'51"W along the extension of and along the southerly face of the aforesaid brick building a distance of 402.01 feet to a corner therein;

Thence S00°18'58"W and along an easterly face of an easterly wall of the aforementioned brick building a distance of 15.74 feet to a corner therein;

Thence N89°58'35"W and along a southerly face of a southerly wall of the aforementioned brick building a distance of 66.12 feet to a corner therein;

Thence N00°01'09"E and along a westerly face of a westerly wall of the aforementioned brick building a distance of 15.59 feet to a corner therein;

Thence S89°58'33"W and along a southerly face of a southerly wall of the aforementioned brick building a distance of 381.57 to the intersection of said southerly face of the southerly wall of the aforementioned brick building with the easterly face of the concrete foundation wall of a metal clad building standing on a parcel northerly and westerly to premises herein described;

Thence S00°10'02"W and along the easterly face of said concrete foundation wall a distance of 4.64 feet to a corner therein;

Thence S89°46'45"W and along the southerly face of said foundation wall and the extension westerly thereof, a distance of 47.63 feet to a corner therein;

Thence S00°07'11"E and along the easterly face of the easterly foundation wall of the aforementioned metal clad building a distance of 149.89 feet to the north line of a newer section of said metal clad building constructed in 1995, said newer standing on premises herein described;

Thence N89°59'47"W and along the north line of the 1995 Building expansion a distance of 191 feet to the west face of the west wall thereof;

Thence S00°07'11"E along the westerly face of the aforesaid 1995 Building Expansion a distance of 4.60 feet to the intersection of same with the southerly face of a concrete footing for a cooling tower standing on the parcel north of premises herein described;

Thence S89°45'02"W and along the southerly face of said concrete footing and its extension westerly, a distance of 27.84 feet to a point in the easterly line of lands of (the former Penn-Central Railroad) Conrail;

Thence S2°34'51"W and along the easterly line of said Railroad Lands a distance of 150.37 feet to the intersection of same with the northerly line of Sayre Street;

Thence S89°55'52"E and along the northerly line of Sayre Street a distance of 1122.78 feet to the point or place of beginning.

Containing an area of 7.16± Acres (311,700± sq)

UNPAVED AREAS WITHIN PROPERTY BOUNDARIES SHOWN THUS



THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A CURRENT FULL ABSTRACT OF TITLE AND IS SUBJECT TO ANY STATE OF FACTS THAT MAY BE REVEALED BY AN EXAMINATION OF SAME.

NOTE: UNAUTHORIZED ALTERATIONS OR ADDITIONS TO ANY SURVEY, DRAWING, DESIGN, SPECIFICATION, PLAN, OR REPORT IS A VIOLATION OF SECTION 7209, PROVISION 2 OF THE NEW YORK STATE EDUCATION LAW.



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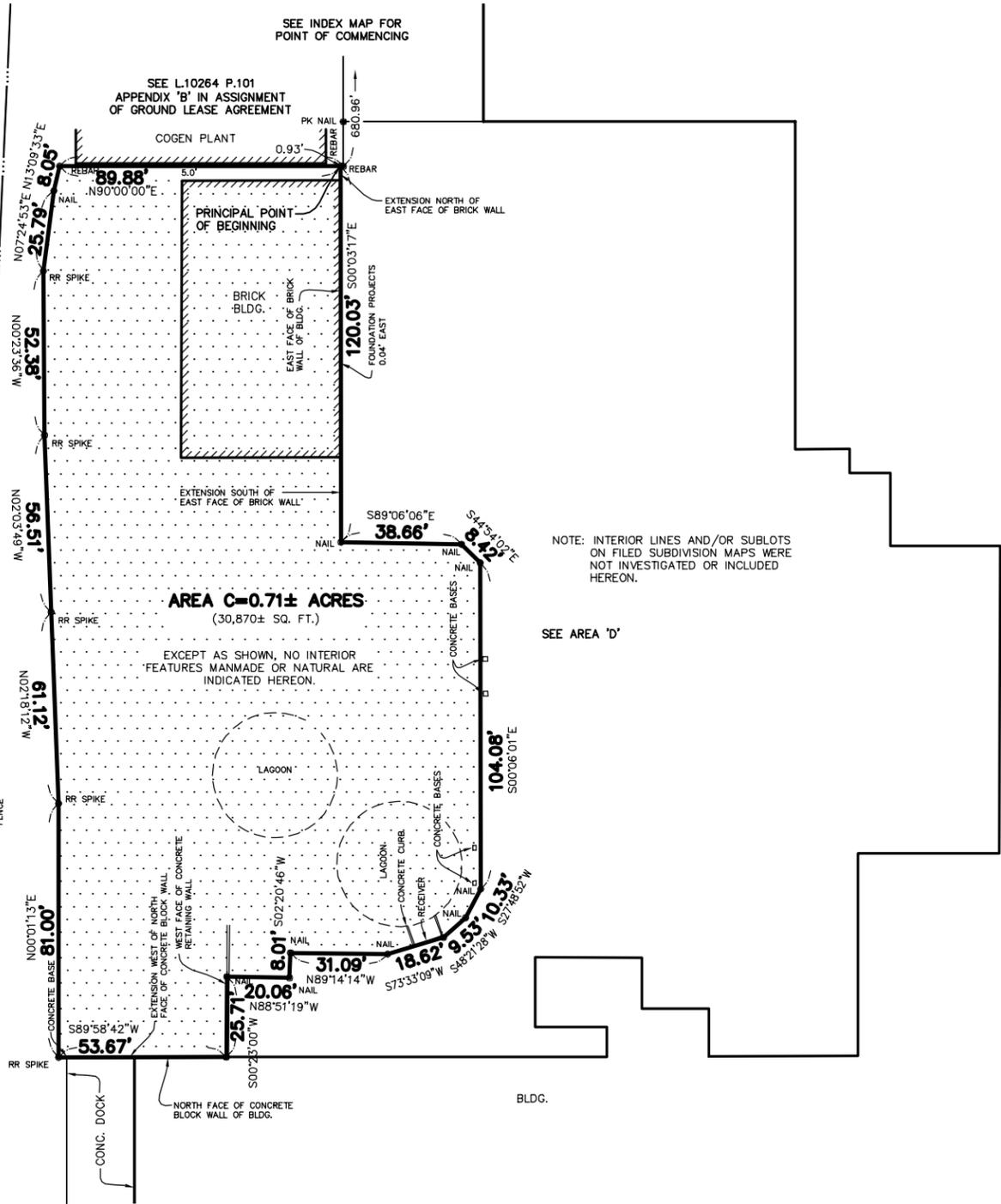
LAND SURVEYOR
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This map void unless EMBOSSED with New York State Licensed Land Surveyor's Seal No. 036193

PERIMETER SURVEY
PART OF
OUTOKUMPU AMERICAN BRASS

AREA A
PART OF THE JONES TRACT
CITY OF BUFFALO, COUNTY OF ERIE, STATE OF NEW YORK
NYSDEC SITE NO.: 915007
VCP AGREEMENT NO.: V00314-9

SCALE: 1" = 60'	DATE: 10-08-04	PLAN NO. 2
LL NO. 59505	JOB NO. 04-630 A	



SEE L.10264 P.101
APPENDIX 'B' IN ASSIGNMENT
OF GROUND LEASE AGREEMENT

SEE INDEX MAP FOR
POINT OF COMMENCING

AREA C=0.71± ACRES
(30,870± SQ. FT.)

EXCEPT AS SHOWN, NO INTERIOR
FEATURES MANMADE OR NATURAL ARE
INDICATED HEREON.

NOTE: INTERIOR LINES AND/OR SUBLOTS
ON FILED SUBDIVISION MAPS WERE
NOT INVESTIGATED OR INCLUDED
HEREON.

SEE AREA 'D'

BLDG.

PERIMETER DESCRIPTION AREA C
JOB NO. 04-630C

ALL THAT TRACT OR PARCEL OF LAND, situate in the City of Buffalo, County of Erie and State of New York, being part of Lot No. 26 of the Jones Tract, bounded and described as follows:

COMMENCING at a point in the westerly line of Military Road (as a street 66 feet wide), a distance of 1907.58 feet northerly line of Sayre Street, formerly Logan Street (as a street 50 feet wide);

Thence westerly on a line forming an angle of 91 degrees 36 minutes 21 seconds as measured from south to west from the aforesaid line of Military Road a distance of 861.36 feet;

Thence southwesterly on a line curving to the left and having a radius of 70.70 feet, being tangent with the last described line an arc length of 113.02 feet;

Thence southerly on a straight line, tangent to the last described course, a distance of 75.18 feet to a point;

Thence southwest on a line curving to the left, having a radius of 73.0 feet, the chord of said curve deflecting 28 degrees 19 minutes 16 seconds to the right from a continuation southerly of the last described course an arc length of 72.17 feet to a point;

Thence southerly in a straight line and tangent to the last described course a distance of 680.96 feet to the southeasterly corner of lands described in APPENDIX "B" in ASSIGNMENT OF GROUND LEASE AGREEMENT, recorded in the Erie County Clerk's Office in Liber 10264 of Deeds at page 101;

Thence westerly on a line at right angles to the last described course, a distance of 0.93 hundredths of a foot to the intersection of said right angle line with the extension northerly of the easterly face of the easterly wall of a brick building standing on the parcel herein described, being the principal point or place of beginning;

Thence S00'03'17"E along the aforesaid extension and along the east face of said brick building and the extension of same southerly, a distance of 120.03 feet to a point;

Thence S89'06'06"E a distance of 38.66 feet to a point;

Thence S44'54'02"E a distance of 8.42 feet to a point;

Thence S00'06'01"E a distance of 104.08 feet to a point;

Thence S27'48'52"W a distance of 10.33 feet to a point;

Thence S48'21'28"W a distance of 9.53 feet to a point;

Thence S73'33'09"W a distance of 18.62 feet to a point;

Thence S89'14'14"W a distance of 31.09 feet to a point;

Thence S02'20'46"W a distance of 8.01 feet to a point;

Thence N88'51'19"W a distance of 20.06 feet to the westerly face of a concrete retaining wall;

Thence S00'23'00"W and along the westerly face of the concrete retaining wall, a distance of 25.71 feet to the northerly face of the northerly wall of a concrete block building standing on the parcel to the south of the parcel herein described;

Thence S89'58'43"W and along the northerly face of the aforesaid concrete block wall and the extension of same westerly, a distance of 53.67 feet to a point;

Thence N00'01'13"E a distance of 81.00 feet to a point;

Thence N02'18'12"W a distance of 61.12 feet to a point;

Thence N02'03'49"W a distance of 56.51 feet to a point;

Thence N00'23'36"W a distance of 52.38 feet to a point;

Thence N07'24'53"E a distance of 25.79 feet to a point;

Thence N13'09'33"E a distance of 8.05 feet to the southwesterly corner of the aforesaid lands described in APPENDIX "B" in ASSIGNMENT OF GROUND LEASE AGREEMENT recorded in the Erie County Clerk's Office in Liber 010264 of Deeds at page 101;

Thence S90'00'00"E and along the southerly line of said AGREEMENT a distance of 89.88 feet to the PRINCIPAL POINT OR PLACE OF BEGINNING.

Containing an area of 0.71± Acres (30,870± sf).

THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A CURRENT FULL ABSTRACT OF TITLE AND IS SUBJECT TO ANY STATE OF FACTS THAT MAY BE REVEALED BY AN EXAMINATION OF SAME.

NOTE: UNAUTHORIZED ALTERATIONS OR ADDITIONS TO ANY SURVEY, DRAWING, DESIGN, SPECIFICATION, PLAN, OR REPORT IS A VIOLATION OF SECTION 7209, PROVISION 2 OF THE NEW YORK STATE EDUCATION LAW.



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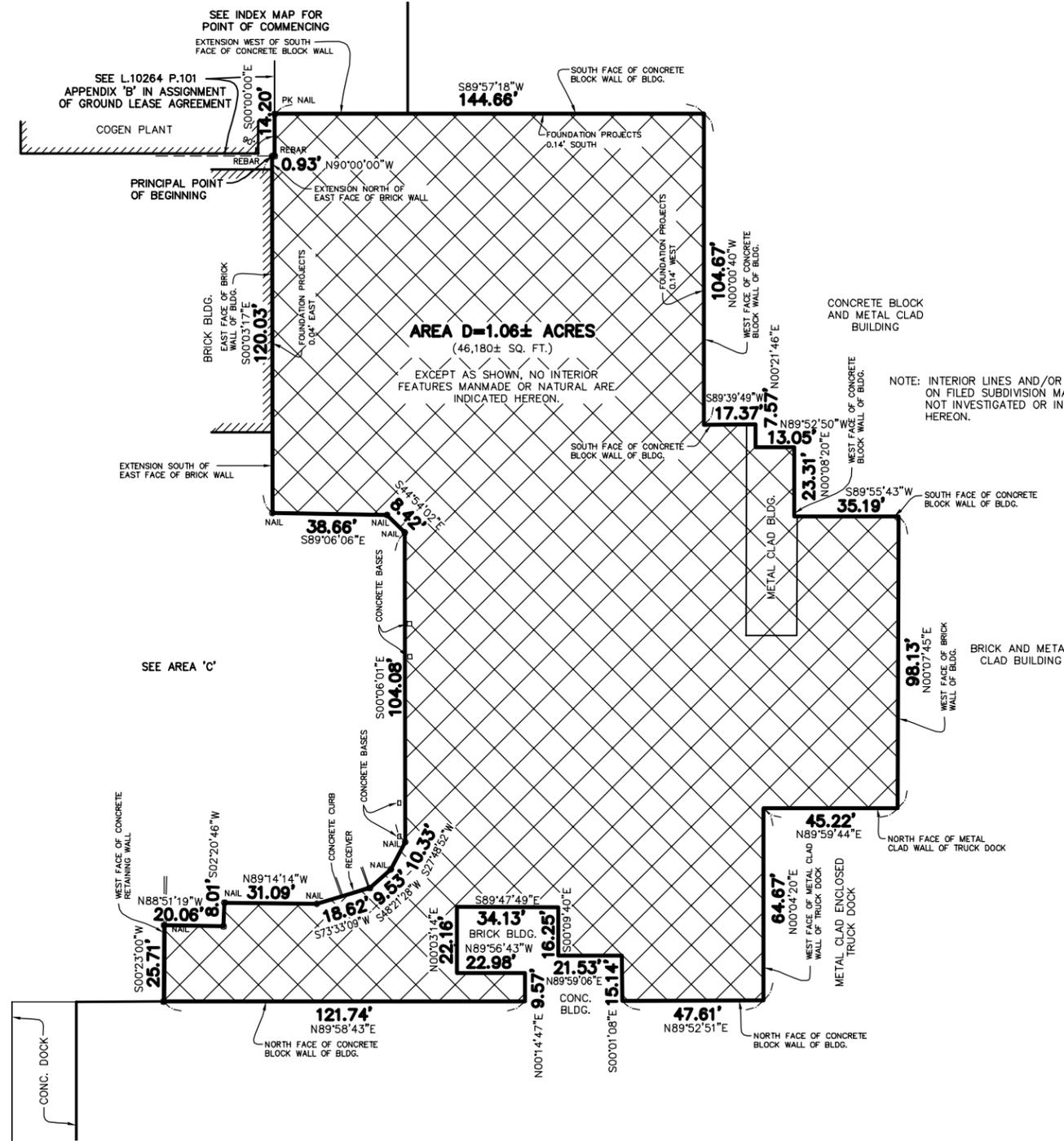
This map void unless EMBOSSED with New York State Licensed Land Surveyor's Seal No. 036193

PERIMETER SURVEY
PART OF
OUTOKUMPU AMERICAN BRASS
AREA C
PART OF THE JONES TRACT
CITY OF BUFFALO, COUNTY OF ERIE, STATE OF NEW YORK
NYSDEC SITE NO.: 915007
VCP AGREEMENT NO.: V00314-9

REV. 04/03/06	PLAN NO.
SCALE: 1" = 30'	DATE: 10-08-04
LL NO. 59505	JOB NO. 04-630 C

3

PERIMETER DESCRIPTION AREA D
JOB NO. 04-630D



ALL THAT TRACT OR PARCEL OF LAND, situate in the City of Buffalo, County of Erie and State of New York, being part of Lot No. 26 of the Jones Tract, bounded and described as follows:

COMMENCING at a point in the westerly line of Military Road (as a street 66 feet wide), a distance of 1907.58 feet northerly line of Sayre Street, formerly Logan Street (as a street 50 feet wide);

Thence westerly on a line forming an angle of 91 degrees 36 minutes 21 seconds as measured from south to west from the aforesaid line of Military Road a distance of 861.36 feet;

Thence southwesterly on a line curving to the left and having a radius of 70.70 feet, being tangent with the last described line an arc length of 113.02 feet;

Thence southerly on a straight line, tangent to the last described course, a distance of 75.18 feet to a point;

Thence southwest on a line curving to the left, having a radius of 73.0 feet, the chord of said curve deflecting 28 degrees 19 minutes 16 seconds to the right from a continuation southerly of the last described course on an arc length of 72.17 feet to a point;

Thence southerly in a straight line and tangent to the last described course a distance of 680.96 feet to the southeasterly corner of lands described in APPENDIX "B" in ASSIGNMENT OF GROUND LEASE AGREEMENT, recorded in the Erie County Clerk's Office in Liber 10264 of Deeds at page 101;

Thence westerly on a line at right angles to the last described course, a distance of 0.93 hundredths of a foot to the intersection of said right angle line with the extension northerly of the easterly face of the easterly wall of a brick building standing on the parcel herein described, being the principal point or place of beginning;

Thence S00°03'17"E along the aforesaid extension of and along the east face of said brick building and the extension of same southerly, a distance of 120.03 feet to a point;

Thence S89°06'06"E a distance of 38.66 feet to a point;

Thence S44°54'02"E a distance of 8.42 feet to a point;

Thence S00°06'01"E a distance of 104.08 feet to a point;

Thence S27°48'52"W a distance of 10.33 feet to a point;

Thence S48°21'28"W a distance of 9.53 feet to a point;

Thence S73°33'09"W a distance of 18.62 feet to a point;

Thence N89°14'14"W a distance of 31.09 feet to a point;

Thence S02°20'46"W a distance of 8.01 feet to a point;

Thence N88°51'29"W a distance of 20.06 feet to the westerly face of a concrete retaining wall;

Thence S00°23'00"W and along the westerly face of the concrete retaining wall, a distance of 25.71 feet to the northerly face of the northerly wall of a concrete block building standing on the parcel to the south of the parcel herein described;

Thence N89°58'43"E along the northerly face of the aforesaid concrete block wall a distance of 121.74 feet to the intersection of same with the westerly face of the westerly wall of a concrete block building;

Thence N00°14'47"E and along the westerly face of said wall a distance of 9.57 feet to a corner therein;

Thence N89°56'43"W and along the southerly face of a brick building, a distance of 22.98 feet to a corner therein;

Thence N00°03'41"E and along the westerly face of said brick building, a distance of 22.16 feet to a corner therein;

Thence S89°47'49"E and along the northerly face of said brick building, a distance of 34.13 feet to a corner therein;

Thence S00°09'40"E and along the easterly face of said brick building, a distance of 16.25 feet to the intersection of same with the northerly face of the northerly wall of a concrete block building;

Thence N89°59'06"E and along the northerly face of the aforesaid building, a distance of 21.53 feet to a corner therein;

Thence S00°01'08"E and along the easterly face of said concrete block building, a distance of 15.14 feet to the northerly face of the northerly wall of concrete block building standing on that parcel to the south of the parcel herein described;

Thence N89°52'51"E and along the northerly face of the aforesaid wall, a distance of 47.61 feet to the intersection of same with the westerly wall of metal clad enclosed truck dock;

Thence N00°04'20"E and along the westerly face of said metal clad truck dock, a distance of 64.67 feet to a corner therein;

Thence N89°59'44"E and along the northerly face of said truck dock, a distance of 45.22 feet to the intersection of same with the westerly wall of a brick and metal clad building, standing on the parcel to the east of the parcel herein described;

Thence N00°07'45"E and along the brick portion on the westerly wall of the aforesaid building, a distance of 98.13 feet to the intersection of same with the southerly wall of a concrete block and metal clad building standing on the east of the parcel herein described;

Thence S89°55'43"W and along a southerly face of said building, a distance of 35.19 to a corner therein;

Thence N00°08'20"E and along a westerly face of said building, a distance of 23.31 feet to a point;

Thence N89°52'50"W a distance of 13.05 feet to a point;

Thence N00°21'46"E a distance of 7.57 feet to a point in the southerly face of a concrete block and metal clad building standing on that parcel described herein;

Thence S89°39'49"W and along the southerly face of the concrete block portion of the aforesaid wall, a distance of 17.37 feet to a corner therein;

Thence N00°00'40"W and along the westerly face of said concrete block portion of the aforesaid wall, a distance of 104.67 feet to the intersection of same with the southerly face of the southerly wall of a concrete block and metal clad building standing on that parcel to the north of the parcel herein described;

Thence S89°57'18"W and along the southerly face of the concrete block portion of said wall and the extension westerly of same, a distance of 144.66 feet to a point in the easterly line of lands described in APPENDIX "B" in ASSIGNMENT OF GROUND LEASE AGREEMENT, recorded in the Erie County Clerk's Office in Liber 010264 of Deeds at page 101;

Thence S00°00'00"W and along the easterly line of said AGREEMENT a distance of 14.20 feet to the southeasterly corner of same;

Thence S80°00'00"W and along the southerly line of said AGREEMENT, a distance of 0.93 hundredths of a foot to the PRINCIPAL POINT OR PLACE OF BEGINNING.

Containing an area of 1.06± Acres (46,180± sf).

NOTE: INTERIOR LINES AND/OR SUBLOTS ON FILED SUBDIVISION MAPS WERE NOT INVESTIGATED OR INCLUDED HEREON.

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RAY L. SONNEMBERGER, PLS
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This map void unless EMBOSSED with New York State Licensed Land Surveyor's Seal No. 056193

THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A CURRENT FULL ABSTRACT OF TITLE AND IS SUBJECT TO ANY STATE OF FACTS THAT MAY BE REVEALED BY AN EXAMINATION OF SAME.



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PERIMETER SURVEY
PART OF
OUTOKUMPU AMERICAN BRASS

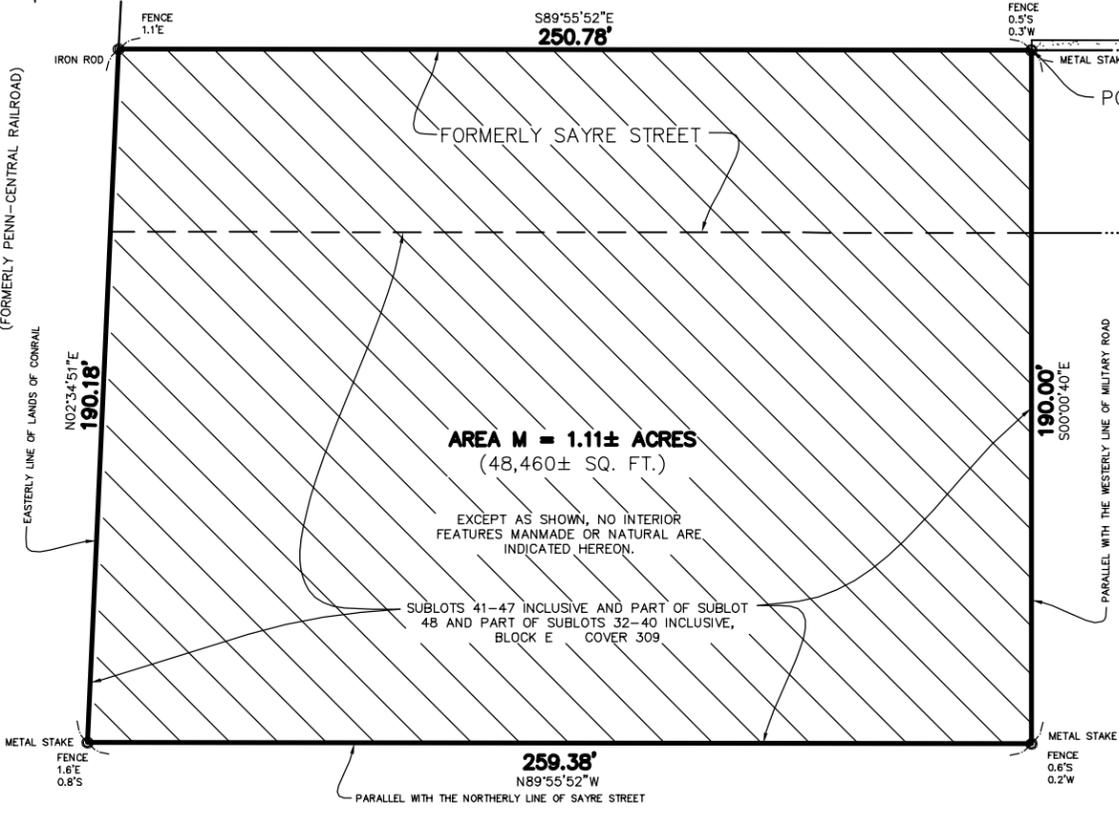
AREA D
PART OF THE JONES TRACT
CITY OF BUFFALO, COUNTY OF ERIE, STATE OF NEW YORK

NYSDEC SITE NO.: 915007
VCP AGREEMENT NO.: V00314-9

SCALE: 1" = 30'	DATE: 10-08-04	PLAN NO. 4
LL NO. 59505	JOB NO. 04-630 D	



CONRAIL
(FORMERLY PENN-CENTRAL RAILROAD)



AREA M = 1.11± ACRES
(48,460± SQ. FT.)

EXCEPT AS SHOWN, NO INTERIOR
FEATURES MANMADE OR NATURAL ARE
INDICATED HEREON.

SUBLOTS 41-47 INCLUSIVE AND PART OF SUBLOT
48 AND PART OF SUBLOTS 32-40 INCLUSIVE,
BLOCK E COVER 309

SAYRE (50' WIDE) STREET
(FORMERLY LOGAN STREET)

MILITARY (66' WIDE) ROAD

PERIMETER DESCRIPTION AREA M
JOB NO. 04-630M.

ALL THAT TRACT OR PARCEL OF LAND, situate in the City of Buffalo,
County of Erie and State of New York, being part of the Bird Farm,
bounded and described as follows;

BEGINNING at a point in the northerly line of Sayre Street
(formerly Logan Street, as a street 50 feet wide) a distance of
872.00 feet westerly from the intersection of the northerly line of
Sayre Street and the westerly line of Military Road (as a street 66
feet wide);

Thence S00°00'40"E parallel with the westerly line of Military Road
a distance of 190.00 feet;

Thence N89°55'52"W parallel with the northerly line of Sayre Street
a distance of 259.38 feet to a point in the easterly line of lands of
(the former Penn-Central Railroad) Conrail;

Thence N02°34'51"E along the easterly line of the aforesaid
Railroad Lands a distance of 190.18 feet to the intersection thereof
with the northerly line of Sayre Street;

Thence S89°55'52"E and along the northerly line of Sayre Street a
distance of 250.78 feet to the point or place of beginning.

Containing an area of 1.11± Acres (48,460± sf).

THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A
CURRENT FULL ABSTRACT OF TITLE AND IS SUBJECT TO
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PERIMETER SURVEY
PART OF
OUTOKUMPU AMERICAN BRASS

AREA M
PART OF THE JONES TRACT
CITY OF BUFFALO, COUNTY OF ERIE, STATE OF NEW YORK

NYSDEC SITE NO.: 915007
VCP AGREEMENT NO.: V00314-9



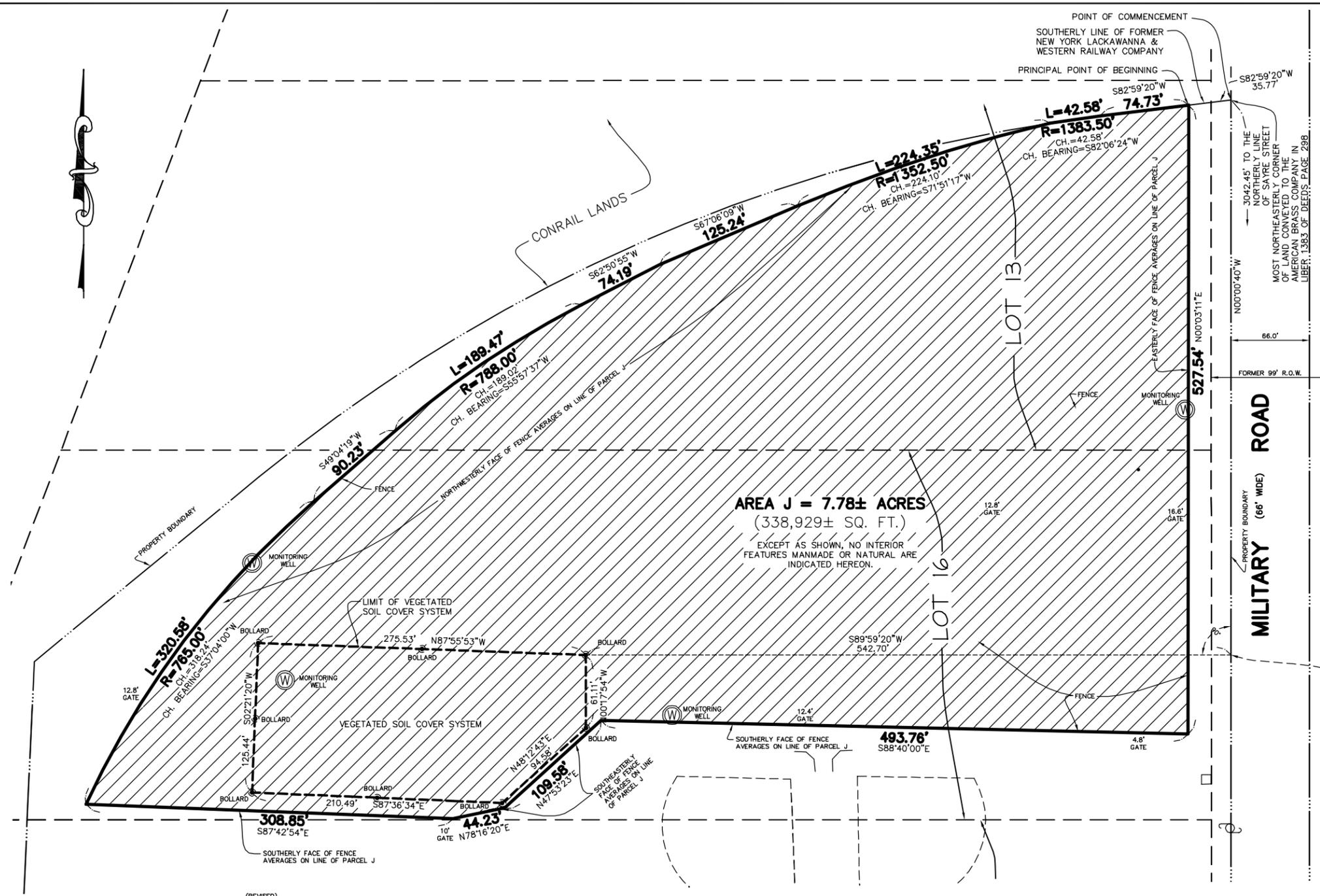
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State Licensed Land Surveyor's Seal No. 036193

SCALE: 1" = 30'	REV. 04/03/06	PLAN NO. 5
LL NO. 59505	DATE: 10-08-04	
	JOB NO. 04-630 M	



AREA J = 7.78± ACRES
 (338,929± SQ. FT.)
 EXCEPT AS SHOWN, NO INTERIOR
 FEATURES MANMADE OR NATURAL ARE
 INDICATED HEREON.

(REVISED)
PERIMETER DESCRIPTION AREA J
JOB NO. 04-630J

Commencing at a point in the westerly line of Military Road (as a road 66 feet wide) a distance of 3042.45 feet northerly from the intersection of said westerly line of Military Road with a northerly line of Sayre Street, formerly Logan Street (as a street 50 feet wide), said point being a point in the southerly line of lands of the former New York Lackawanna and Western Railroad Company at the most northeasterly corner of lands conveyed to the American Brass Company by deed recorded in the Erie County Clerk's Office in Liber 1383 of Deeds at page 298;

Thence S82°59'20"W along the southerly line of the aforesaid Railroad Company lands being also the most northerly line of lands so conveyed to the American Brass Company by deed Liber 1383 of Deeds at page 298 a distance of 35.77 feet to a point, being the PRINCIPAL POINT OR PLACE OF BEGINNING;

Thence continuing S82°59'20"W along the most northerly line of lands of The American Brass Company as aforesaid, a distance of 74.73 feet to a point of curve therein;

Thence southwesterly along the most northerly line of The American Brass Company lands as aforesaid, on a line curving to the left having a radius of 1383.50 feet and tangent to the last described line, the chord of said curve bearing S82°06'24"W, an arc length of 42.58 feet to a point;

Thence southwesterly on a line curving to the left, having a radius of 1352.50 feet, the chord of same bearing S71°51'17"W, an arc length of 224.35 feet to a point;

Thence S67°06'09"W, tangent to the last described course, a distance of 125.24 feet to an angle point;

Thence S62°50'55"W a distance of 74.19 feet to a point of curve;

Thence southwesterly on a line curving to the left, having a radius of 788.00 feet and tangent to the described course, the chord of same bearing S55°57'37"W an arc length of 189.47 to a point;

Thence S49°04'19"W tangent to the described course a distance of 90.23 feet to a point of curve;

Thence southwesterly on a line curving to the left, having a radius of 765.00 feet; tangent to the last described course, the chord of same bearing S37°04'00"W, an arc length of 320.58 feet to a point;

Thence along the following seven courses, being the southerly, southeasterly or easterly face of an existing chain link fence, S87°42'54"E a distance of 308.85 feet to a point;

(Description continued)

Thence N78°16'20"E a distance of 44.23 feet to a point;

Thence N47°53'23"E a distance of 109.58 feet to a point;

Thence S88°40'00"E a distance of 493.76 feet to a point;

Thence N00°03'11"E a distance of 527.54 feet to the PRINCIPAL POINT OR PLACE OF BEGINNING.

Containing an area of 7.78± Acres (338,929± sf).



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PERIMETER SURVEY
 PART OF
OUTOKUMPU AMERICAN BRASS

AREA J
 PART OF THE JONES TRACT
 CITY OF BUFFALO, COUNTY OF ERIE, STATE OF NEW YORK
 NYSDEC SITE NO.: 915007
 VCP AGREEMENT NO.: V00314-9

SCALE: 1" = 60'	DATE: 10-08-04	PLAN NO. 6
LL NO. 59505	JOB NO. 04-630 J (VEG)	