

Remedial Work Plan & Alternative Analysis

29 Grant Street
Brownfield Cleanup Program
NYSDEC Site No. C336079

Village of Walden, NY
Orange County, New York

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Chazen Project No. 41115.00



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I Daniel W. Stone certify that I am currently a NYS registered professional engineer and that this Remedial Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

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EXECUTIVE SUMMARY

This Remedial Work Plan (RWP) and Alternatives Analysis (AA) outlines the activities that will serve to mitigate impacts remaining in the surface and subsurface at the former Packaged Lighting Site (hereinafter referred to as the “site”). This RWP&AA is submitted as part of the New York State Brownfields Cleanup Program (BCP) for Site No. C336079, that is located at 29 Grant Street, Walden, Orange County, NY.

The site is unoccupied, but has a history of industrial use dating back to the mid-1800s. The 2015 Remedial Investigation Report identified the following:

- Dissolved trichloroethylene (TCE) concentrations exceed groundwater Part 703 standards, criteria and guidance (SCGs), with the highest concentrations near the center of the site along the south and north sides of the Main Building. In addition, an isolated area of TCE impact was identified in the subsurface soil immediately south of the Main Building. No TCE source area was identified on the site. As an Interim Remedial Measure (IRM), a persulfate injection pilot program reduced prior TCE in the shallow groundwater by a weighted average of 55 percent by March 2016. In addition, VOC vapor, consisting primarily of TCE, has been identified in the sub-slab vapor samples collected under the Main Building. Indoor air quality samples from the second floor area of the Main Building that is planned for future residential use reported a TCE concentration in one of three samples that is slightly greater than the no further action level.
- Soil samples associated with a fill layer covering much of the site identified semi-volatile organic compounds (SVOCs) in concentrations exceeding Restricted-Residential Use Soil Cleanup Objectives (RRSCOs) in shallow soil samples. Copper was detected in two shallow soil samples exceeding the RRSCO. Underlying native soils were generally free of contaminant impacts.
- Additional IRMs completed concurrent with the RI included the closure of two USTs, sealing of building floor drains, cleaning of a building cistern, removal of paint material containers, and a persulfate injection program.

This RWP&AA details the process by which metals and semi-volatile organic compounds (SVOC) impacts shall be addressed within the site surface, and chlorinated volatile organic compounds (CVOCs) will be addressed within the soil vapor at the northeastern section of the Main Building, and by which progress monitoring shall document the effectiveness of the remedial action. The remedial action objective is to provide engineering controls to be protective of human health and the environment, where no further remedial action is warranted.

1.0 INTRODUCTION

This Remedial Work Plan (RWP) and Alternatives Analysis (AA) for the former Packaged Lighting facility (BCP Site No. C336079) was prepared by Chazen Engineering, Land Surveying & Landscape Architecture Co., D.P.C. (Chazen) for submission to the New York State Department of Environmental Conservation (NYSDEC) as part of the Brownfields Cleanup Program (BCP). This RWP&AA was prepared with guidance and assistance from NYSDEC and New York State Department of Health (NYSDOH). The Site is located at 29 Grant Street in the Village of Walden, Orange County, New York. A site Location Map is included as **Figure 1** and a site survey is included as **Figure 2**.

This RWP summarizes the activities completed to date and the additional future actions necessary to mitigate and/or control identified environmental impacts and achieve the remedial action objectives for the Site. The remedial action objective (RAO) is to achieve a Track 3 (restricted-residential) cleanup for the site through mitigation or engineering control so that further remedial action is not warranted. The AA evaluates the potential mitigation/control options that could be used to achieve the Track 3 clean-up and selection of the remedy.

The known impacts for the site include semi-volatile organic compounds (SVOCs) and metals in surface soil, chlorinated volatile organic compounds (CVOCs) impacts in the subsurface soil, groundwater, and soil vapor. The RWP&AA addresses each of these issues. Also included is a progress monitoring plan to document the effectiveness of the remedial action at achieving the RAO for the Site.

1.1 Site Description

1.1.1 Site Location and Future Use

The BCP site is a 1.53-acre former industrial property situated on the southwest corner of Grant Street and Elm Street in the Village of Walden, Town of Montgomery, Orange County, NY. The Site contains three buildings, currently unoccupied, with a combined footprint of approximately 20,000 square feet. The Site has previously been used for industrial purposes.

The Main Building occupies the western section of the Site. It consists a primary structure with multiple building additions and includes interconnected one, two, and three story structures with a basement beneath one addition and a crawlspace beneath another. The others are slab on grade.

The planned future use is to renovate the existing structures for mixed commercial and residential uses. Raised levels would be renovated for use as residential units, grade levels for commercial use, and subgrades for mechanical/utility uses.

1.1.2 Geology

Available information regarding regional and local geology was reviewed to determine the general characteristics of the overburden and bedrock geology of the Site and the surrounding properties. A review of the *Surficial Geologic Map of New York (Lower Hudson Sheet, 1989)* indicates that surficial soils

in the northern portion of the Site are mapped as recent deposits consisting of fine sand to gravel typically confined to valley floodplain areas.

During the BCP remedial investigation, geologic logs were prepared by the on-site geologist during installation of soil borings and test pits. Soils encountered during the remedial investigation included several feet of urban fill overlying silty clay and clayey silt, with an intermittent sand layer encountered in some soil borings 6 to 8 feet below the ground surface (bgs).

Materials in the urban fill horizon included coal and ash, masonry debris, metalworking cuttings, gravel, lumber and scrap metal in a brown sandy matrix.

Bedrock was not encountered during remedial investigation activities.

1.1.3 Hydrogeology

The groundwater flow direction was assessed based on regional topographic interpretation and 11 groundwater monitoring wells/piezometers installed on the property as part of the remedial investigation. The groundwater elevation in all but two monitoring wells was determined by establishing a benchmark on the site at a location of known elevation, then surveying the top-of-well elevations relative to the benchmark. The groundwater elevations were calculated by subtracting the depth to water from the corresponding top-of-well elevation. The calculated groundwater elevations from the wells were used to create a groundwater contour map. Two groundwater monitoring wells installed off-site to the north-northeast late in the remedial investigation (RI) process have been used for sampling purposes but have not been surveyed into the elevation network given the reasonable understanding of groundwater flow movement.

The groundwater interface in the unconfined aquifer was encountered 6 to 8.55 feet bgs across the property. Groundwater elevation data indicate that groundwater flows through the unconfined aquifer toward the Tin Brook north-northeast of the site.

1.1.4 Surface Water Resources

No surface water resources were identified on the BCP site. An off-site drainage channel is located on the southern end of the tax parcel, approximately 210 feet to the south of the BCP site. The next closest surface water body is the Tin Brook located approximately 500 feet northeast of the Site. The Tin Brook flows west-northwesterly discharging into the Wallkill River. The Wallkill River is located approximately 2,000 feet to the west of the site.

1.2 Site Background

The site is unoccupied, but has a history of industrial use dating back to the mid-1800s. From 1885 to 1894, the site was operated by the Rider Engine Company, a manufacturer of steam engines. From 1900 to 1939 the facility operated under the name Rider-Ericsson Engine Company, and continued manufacturing steam engines. From the 1920s until 1967, the facility was operated by Spence Engineering, a manufacturer of steam regulators and valve mechanisms. From 1968 until 2008, the facility was used by Packaged Lighting Systems, Inc., which designed lighting systems for New York City theaters.

Past uses of the Main Building include offices, two residential apartments, showroom, storage areas, utility rooms, a former degreasing room, a parts steam cleaning room, a machine shop, a foundry, a warehouse, and loading areas/garages. The ground level of the northern portion of the building was converted into self-storage units by a prior property owner but not put into use. The Lab Building has reportedly been used also as a warehouse, research laboratory, and medical offices. The Paint Building contains a paint booth.

A 2008 Phase I Environmental Site Assessment and a 2010 Phase II ESA Site Subsurface Investigation were conducted at the site. These investigations were used as the basis of initially characterizing site soil and groundwater impacts. Chazen began work at the site for a prior owner (The Estate of Hy Hilzen) and has continued work on behalf of Grant Street Factory, Inc., under the New York State BCP.

In 2012, Chazen began surface, subsurface, and soil vapor sampling. The investigations have identified SVOCs and select metals in the surface soils, and chlorinated solvent impacts in the subsurface. CVOCs, primarily trichloroethylene (TCE) was identified in the groundwater on-site, with diminishing levels off-site to the north-northeast and an isolated area of CVOC impact in the subsurface soils immediately south of the main building. No “hot spot” source area of TCE groundwater contamination has been discovered.

1.3 Nature and Extent of Contamination

A Remedial Investigation Report dated November 2015 was prepared by The Chazen Companies. The remedial investigation objective was to gather data to assess soil, groundwater, and soil vapor quality, delineate the nature and extent of contaminant impacts. Investigation objectives were met through the collection and laboratory analysis of soil, groundwater, and soil vapor samples. Various Interim Remedial Measures (IRMs) were implemented during the investigation period, including removal/closure of out-of-service underground storage tanks, closure of building floor drains, cleaning of a water cistern, and removal of paint material containers.

The RI found potential sources of contamination associated with historical site uses as a lighting manufacturing plant and former engine manufacturing company. The results of the RI indicated dissolved TCE exceeding groundwater Part 703 standards, criteria and guidance (SCGs) are present in the vicinity of four on-site monitoring wells and three off-site monitoring wells, with the highest concentrations near the center of the site along the south and north sides of the Main Building. No free product source was identified. A surrounding affected area of shallow groundwater with decreasing dissolved TCE concentrations extends in a northeasterly direction. As part of an IRM activity, a persulfate injection pilot program reduced prior TCE in the shallow groundwater by an average of 38 percent by June 2014.

VOC vapor, consisting primarily of TCE, were identified in sub-slab vapor samples collected from beneath the Main Building. On March 10, 2016, Chazen collected three indoor air samples from the second floor area of the Main Building that is planned for future residential use, plus one outdoor air sample. The laboratory results indicate concentrations of carbon tetrachloride similar to outdoor air concentrations, and a trichloroethylene (TCE) concentration in one sample (0.27 ug/m³) that is slightly greater than the no further action level of 0.25 ug/m³.

Soil samples associated with the urban fill layer covering much of the site identified SVOCs in concentrations exceeding Restricted-Residential Use Soil Cleanup Objectives (RRSCOs) in shallow soil samples. Copper was detected in two shallow soil samples near the eastern side of the Main Building exceeding the RRSCO. In addition, an isolated area of TCE impact was identified in the subsurface soil immediately south of the Main Building. No TCE source area was identified on the site. Underlying native soils were generally free of contaminant impacts.

IRMs completed concurrent with the RI included the closure of two USTs, sealing of building floor drains, cleaning of a building cistern, removal of paint material containers, and a persulfate injection program.

2.0 REMEDIAL ACTION ALTERNATIVES

2.1 Remedial Goals and Remedial Action Objectives

The goal of remedial action for the site is to protect human health and the environment through administrative or engineering controls that would mitigate residual impacts or prevent exposure to affected site soil vapor, soil and groundwater to the extent feasible, consistent with DER-10.

As defined in NYSDEC DER-10 (Section 4.0), remedial alternatives are evaluated based on the following criteria:

- a) Overall Protection of Public Health and the Environment: This criterion evaluates exposure and residual risks to human health and the environment during or subsequent to implementation of the alternative.
- b) Compliance with SCGs: This criterion evaluates whether the remedial alternative will ultimately result in compliance with SCGs, to the extent practicable.
- c) Long-Term Effectiveness and Permanence: This criterion evaluates if the remedy is effective in the long-term after implementation (e.g., potential rebound). In the event that residual impacts will remain as part of the alternative, then the risks and adequacy/reliability of the controls are also evaluated.
- d) Reduction of Toxicity, Mobility, or Volume with Treatment: This criterion evaluates the reduction of contaminant toxicity, mobility or volume as a result of the remedial alternative. In addition, the reversibility of the contaminant destruction or treatment is evaluated.
- e) Short-Term Effectives: This criterion evaluates if the remedial alternative protects the community, workers and the environment during implementation.
- f) Implementability: This criterion evaluates the remedial alternative based on its suitability, implementability at the specific site, and availability of services and materials that will be required.

- g) **Cost:** This criterion evaluates the capital, operation, maintenance, and monitoring costs for the remedial alternative. The estimated costs are presented on a present worth basis.
- h) **Community Acceptance:** This criterion takes into account concerns of the community regarding the proposed remedy. Any public comments and overall public perception are addressed as part of the criterion.
- i) **Land Use:** This criterion evaluates the proposed remedial approach against the current, intended, and reasonably anticipated future use of the land and its surroundings.

The Remedial Action Objectives (RAOs) are:

- Prevent exposure to or the inhalation of volatile organics identified in the subsurface;
- Prevent the ingestion and/or direct contact with impacted soil or groundwater; and,
- Mitigate potential public health impacts from potential soil vapor intrusion.

2.2 Analysis of Alternatives

Based on the findings of the Remedial Investigation, an AA was performed to assess reasonable and appropriate site remediation options and to select an appropriate alternative for mitigation the site. Three alternatives determined to be relevant were considered and evaluated. These are summarized as follows and the selected alternative is identified.

Alternative 1: No Further Action

Under the No Further Action (NFA) alternative, no additional remedial actions, institutional, or engineering controls would be implemented.

No further action would leave the site in its current condition with the identified potential exposures to impacts from on-site soil, groundwater, and soil vapor that exceed the RRSCOs.

This alternative was considered as a baseline in the assessment process, and will not selected because it is not protective of human health or the environment and does not meet the remedial goals and objectives. Therefore, it is not evaluated further.

Alternative 2: Install Cover System, Install a Vapor Barrier and Ventilation System

Under Alternative 2, a protective cover would be installed across the exposed surface soil on the site (southeast of the Main Building), and would primarily consist of asphalt paving (small stone binder). Soil berms may be installed along some property boundaries to eliminate potential contact with remaining contamination in the surface and subsurface soils and groundwater. If installed, soil berms would be at least two feet thick and comprised of soil that meets the RRSCOs. Figure 3 shows planned cover areas.

This alternative would also include installation of a vapor barrier and ventilation system within the basement of the Main Building, below the area of proposed residences. This barrier/ventilation system would mitigate the exposure of future residents from the VOC vapor present beneath the building foundation. The owner is considering various options for the vapor barrier, including installation of a gunnite material or an epoxy layer in the basement area. In addition, an SSDS line is anticipated to be

installed in the unpaved utility trench. Figure 3 shows the areas planned for the vapor barrier and ventilation system.

Annual indoor air quality sampling would be conducted to confirm effectiveness of the remedy. In addition, annual sampling of groundwater would be conducted to document continued groundwater quality following the IRM.

Under this alternative, an environmental easement would be issued as an institutional control to restrict site use options (e.g., restricted-residential use, no groundwater usage) and activities in the impact area (e.g., soil management plan for future excavation work).

The analysis of this alternative is presented below. **This alternative is the best alternative because it is protective of human health or the environment, meets the remedial goals and objectives, and is economically feasible.**

Overall Protection of Human Health and the Environment

Selecting this alternative would be protective of human health and the environment and would meet the RAOs. The cover would prevent potential contact with surface soil contamination, and the vapor barrier and ventilation system in the Main Building would mitigate the exposure of future site residents from residual VOC vapor present beneath the building foundation.

This alternative is expected to be consistent with the planned future use of the site for both residential and commercial activities.

Compliance with Standards, Criteria and Guidance

Under this alternative, the site would comply with the SCGs as the cover system and vapor barrier with ventilation system would mitigate exposure to remaining impacted soil, groundwater, and soil vapor.

Long-term Effectiveness and Permanence

The cover system and a vapor barrier with ventilation system would be effective in the long term, as exposures would be mitigated. The cover system would prevent direct contact with impacted surface soil. The 2013 groundwater treatment IRM significantly reduced VOC concentrations in the subsurface, which would decrease potential VOCs available to volatilize and collect in vapor beneath the building foundation. The vapor barrier and ventilation system would mitigate potential exposures sub-slab vapor.

This alternative satisfies the RAOs. An environmental easement and Site Management Plan (SMP) would be issued with institutional controls to restrict site use options (e.g., restricted-residential use, no groundwater usage) and activities in the impact area (e.g., soil management plan for future excavation work).

Reduction of Toxicity, Mobility, and Volume with Treatment

The cover system and vapor barrier with ventilation system would not reduce the volume and magnitude of the site impacts associated with toxicity and mobility of contaminants at the site. However, due to the localized and low concentration of contaminants in the native soils beneath the fill (one 2012 exceedance in TP-16 at 10 feet below grade) and the low concentration of CVOCs in the groundwater (localized near the northeastern and southeastern building corners), this consideration is less of a concern given this remedial alternative.

Short-Term Impact and Effectiveness

This alternative would be immediately effective as the protective cover would prevent contact with the soil and prevent exposure to VOCs migrating into the basement of the Main Building. This alternative could be implemented immediately and would be effective in achieving the site RAOs. The cover system would continue operating unless the site were redeveloped and the impacted soil removed. The vapor barrier with ventilation would remain in place until groundwater sampling and indoor air quality results adequately demonstrate that the ventilation is no longer needed. The ventilation system is considered sustainable, as it would not require substantial energy for operation.

Implementability

The cover system and vapor barrier with ventilation system alternative is technically feasible as it would be easily implementable. It would include two engineering controls and institutional controls (environmental easement). The environmental easement required to leave residual contamination in place at concentrations greater than Unrestricted Use SCOs would include a land use restrictions (e.g., restricted-residential use), groundwater use restrictions, and compliance with an approved SMP. There would be no difficulties in securing personnel, materials, equipment or access to implement and maintain this alternative.

Cost Effectiveness

This alternative would be the most cost-effective alternative and the costs are shown in the table below.

Alternative 2 Table Estimated Cost to Install Protective Cover System, Install a Vapor Barrier and Ventilation System

TASK	UNIT	UNIT COST	QUANTITY	TOTAL COST
Capital Including Labor				\$0
Engineering Controls				
Installation of Cover and Berms	Lump Sum	\$88,000	1	\$88,000
Installation of Vapor Barrier and Ventilation System		\$30,000	1	\$30,000
Engineering Controls Subtotal				\$118,000
Contingency (20%)				\$23,600
Engineering Controls Total				\$141,600
Monitoring (annual events)				
Groundwater Monitoring	Event	\$1,800	10	\$18,000
Indoor Air Quality Monitoring	Event	\$3,600	10	\$36,000
Annual Site Inspection and Reporting	Event	\$3,000	10	\$30,000
Monitoring Total				\$84,000
Total Alternative 2 Costs				\$225,600

Land Use

The cover system and vapor barrier with ventilation system alternative is consistent with the planned future use of the site for residences on the second floor and commercial uses, as the soil cover would prevent contact with the remaining surface and subsurface contamination and groundwater monitoring activities would monitor future groundwater conditions until they met NYSDEC SCGs.

Both the soil cover and vapor barrier/ventilation system would be active engineering control operating through the life of the property and an environmental easement would be issued as an institutional control identifying site use restrictions and activities in the impacted areas (e.g., soil management plan for future excavation work).

Community Acceptance

Community views on the RWP will be obtained during the public comment period, and will be addressed when the RWP is finalized. Community acceptance will be evaluated as part of the RWP process.

Alternative 3: Remediate to Achieve Unrestricted Use with No IC/ECs

This alternative would restore the site to pre-release conditions by an aggressive in-situ treatment of groundwater and soil excavation. The aggressive in-situ groundwater treatment includes additional site-wide PersulfOx® infusion program work to achieve ambient water quality standards of 5 µg/l or less for CVOCs. Surface soils would be removed from impacted areas across currently accessible areas (i.e., those not covered by buildings) to a depth of two feet below ground surface (bgs). In areas where CVOCs were

detected in subsurface soil, groundwater, or soil vapor, the subsurface soil would be excavated to a depth of 10 feet bgs, including soil beneath the Lab Building and the majority of the Main Building. In order to conduct this soil removal action, the buildings will need to be demolished prior to soil removal. Prior to demolition, the buildings will need to be inspected and sample for suspected asbestos-containing materials (ACM), and identified ACM would need to be removed. The 10,000-gallon closed-in-place underground storage tank located in the southwestern part of the Parts Steam Cleaning Areas would also be removed. Following soil removal, the site would be backfilled.

No follow-up remedial activities would be required.

Overall Protection of Human Health and the Environment

Selecting this alternative would be protective of human health and the environment, would meet the RAOs, and would meet Unrestricted Use SCOs, and groundwater SCGs, and no institutional or engineering controls would be needed.

Compliance with Standards, Criteria and Guidance

Under this alternative, the Site would comply with the SCGs.

Long-term Effectiveness and Permanence

This alternative would be a permanent solution and be the most effective in the long term and satisfies the RAOs. Under this alternative no ICs or ECs would be required for the Site. The majority of the Site buildings would be demolished to provide access to the impacted soil and

Reduction of Toxicity, Mobility, and Volume with Treatment

This alternative would remove the site impacts and leave no residual contaminants at the site; therefore, there would be no remaining or associated toxicity or mobility.

Short-Term Impact and Effectiveness

This alternative would be effective in achieving the site RAOs once implemented. However, in the short-term the site conditions would remain unmitigated and potential exposures would remain. During implementation, there would be increased truck traffic during weekdays for approximately 154 days. There would also be noise and emissions associated with demolition and excavation equipment. Residences are located adjoining to the site and are anticipated to be adversely impacted by 30+ weeks of construction noise and truck traffic. This alternative is not considered sustainable or consistent with DER-31 based on fossil fuel usage, truck trips, truck and heavy equipment emissions, and on-site idling.

Implementability

Given the very high cost, this alternative would be difficult for the owner to implement and as such, take a longer time to complete. It would demolish existing site structures that are functional and useable, and

require additional investment to replace them. This alternative would be technically feasible, however, would not be easily implementable, although it would not require any ICs or ECs for the Site.

Cost Effectiveness

This alternative would be the least cost-effective alternative as there are high costs associated with the excavation of soils and in-situ treatment of groundwater.

The costs associated with this alternative are shown in the table below.

Alternative 3 Table Estimated Cost for Remediate to Meet Unrestricted Use SCOs with No IC/ECs

TASK	UNIT	UNIT COST	QUANTITY	TOTAL COST
Asbestos Abatement				
Asbestos survey and abatement plans	each	\$12,000	1	\$13,000
Asbestos abatement (estimated volumes since survey has not been conducted)	SF	\$8.90	178,400	\$1,587,760
Abatement Subtotal				\$1,600,760
Building Demolition to Access Impacted Soil				
Building demolition	SF	\$4	178,400	\$713,600
Load and dispose of building debris	Ton	\$116.50	17,840	\$2,078,360
Demolition Subtotal				\$2,791,960
Groundwater Treatment				
Plans and Reporting	LS	\$30,000	1	\$30,000
Rig, crew, equipment, oversight	Day	\$5,630	12	\$67,560
Infusions	Day	\$2,700	12	\$32,400
Reactant	Event	\$21,435	2	\$42,870
Sampling Labor	Event	\$1,600	5	\$8,000
Laboratory Analyses Fees	Event	\$7,935	5	\$39,675
Per diem	Day	\$135	17	\$ 3,645
Treatment Subtotal				\$224,150
Soil Removal				
Plans and Reporting	LS	\$30,000	1	\$30,000
Remove closed-in-place UST	Event	\$5,000	1	\$5,000
Excavate/load (13,876 CY @ 90 CY/day)	Day	\$1,250	154	\$192,722
Transport (19,426 tons at 30 tons/load)	Load	\$450	648	\$291,396
Disposal	Ton	\$82	19,426	\$1,592,964
Excavation & loading oversight	Day	\$1,000	154	\$154,000
CAMP station rentals (three)	Week	\$759	31	\$23,377
Laboratory Analyses for waste characterization samples	sample	\$735	5	\$3,675
Laboratory Analyses for confirmation samples:				
VOCs	sample	\$90.20	36	\$3,247
SVOCs & metals	sample	\$315.70	14	\$4,546

TASK	UNIT	UNIT COST	QUANTITY	TOTAL COST
Backfill	CY	\$13	13,876	\$174,838
Project coordination and management	hour	\$140	25	\$3,500
Soil Removal Subtotal				\$2,479,265
Alternative Subtotal				\$7,096,135
Contingency (10%)				\$709,613
Engineering (20%)				\$1,419,227
Total Alternative 3 Costs				\$9,224,975

Land Use

This alternative would allow planned future use of the Site to be Unrestricted.

Community Acceptance

Community views on the RWP will be obtained during the public comment period, and will be addressed when the RWP is finalized. Community acceptance would be evaluated as part of the RWP process.

This alternative is the most protective of the alternatives but is not economically feasible. The cost flips the property value upside-down and removes existing structures and the potential for their redevelopment. The cost does not reflect the additional cost of constructing new buildings on the Site.

2.3 Selected Remedial Action Option

Based on the information available and presented above, the recommended remedy is Alternative 2 - Install Protective Cover System, Install a Vapor Barrier and Ventilation System. The cost for Alternative 3 – Remediate to Achieve Unrestricted Use with No IC/ECs (over \$9 million) is extremely high to Implement and would require the demolition of existing site structures that are functional and usable. While Alternative 2 would be protective of human health and the environment.

3.0 REMEDIAL MEASURES

This section describes the proposed remedial components for the Site.

3.1 Protective Cover

A protective cover will be installed across unpaved areas of the Site to prevent direct contact with remaining contaminated soil, as well as groundwater.

3.2 Vapor Barrier and Ventilation System within the Main Building

A vapor barrier/ventilation system will be installed within the main building to prevent exposure of building occupants to residual VOC vapors present beneath the sub-slab.

4.0 OPERATIONS, MONITORING AND MAINTENANCE

This section addresses the operations, monitoring and maintenance, which are necessary to implement the selected site engineering controls.

4.1 Protective Cover

The cover will be inspected on an annual basis to ensure it remains intact and effective in preventing direct contact with underlying contaminated media. Annual inspections will be recorded on a Site inspection form and submitted to the NYSDEC. If the owner becomes aware of any damage to the cover, they will repair the damaged cover and inform Chazen so that the repair can be included in the annual report.

4.2 Vapor Barrier and Ventilation System

The vapor barrier and ventilation system will be inspected monthly by the owner. Monthly inspection findings will be recorded in a written log. Any indication of unusual or problematic performance will be conveyed to the project engineer and the system will be evaluated and maintained or repaired accordingly to ensure system effectiveness. On an annual basis, the project engineer will visually inspect and monitor the system.

An annual outdoor air sample and basement indoor air sample will be collected and analyzed for VOCs via method TO-15. Annual inspections will be recorded on a Site inspection form and submitted to the NYSDEC with annual sampling results.

4.3 Groundwater Monitoring

Groundwater monitoring will be completed on an annual basis to document CVOC concentrations remaining in the groundwater. Consistent with prior sampling events, groundwater samples will be collected from monitoring wells MW-1, MW-2, MW-3, MW-8, and MW-10 for VOC analysis, using low flow techniques. Monitoring results will be tabulated, compared to state standards and historical data to identify trends in the data, and included in the annual monitoring/inspection report for the Site.

5.0 INSTITUTIONAL CONTROLS, AND PROTECTIVE COVER & VENTILATION SYSTEM/VAPOR BARRIER ENGINEERING CONTROLS

5.1 Institutional Controls

Imposition of institutional controls under the BCP is defined within the approved environmental easement and the SMP. The institutional controls are combined with the engineering controls described in this remedial work plan to constitute the extent of the site remedial actions under the BCP. The institutional controls imposed on this project include the following:

- Requires the site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);

-
- Allows the use and development of the controlled property for restricted-residential and commercial uses provided that the long-term Engineering and Institutional Controls are employed;
 - Restricts the use of groundwater underlying the property without necessary water quality treatment for intended use;
 - Prohibits agriculture or vegetable gardens on the controlled property;
 - Requires that all future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP;
 - Requires that the potential for vapor intrusion be evaluated for any buildings developed on-site, and any potential impacts that are identified must be monitored or mitigated; and
 - Requires compliance with the Department-approved environmental easement and Site Management Plan.

5.2 Protective Cover

Because soil remains on site with impacts greater than the applicable RRSCOs, a protective soil cover will be installed and maintained to prevent exposure to impacted soil. Any site redevelopment will include a cover, which may consist either of the structures such as buildings, pavement and sidewalks comprising the site development or a protective cover in areas across the Site.

The protective cover will primarily be asphalt paving that will be of normal design thickness for the proposed use (e.g., parking lot, driveway, roadway), and may have different thicknesses for the different uses and/or traffic types.

Soil berms may also be used as part of the protective cover, and will be comprised of fill material that meets the lower of the RRSCOs or the protection of groundwater SCOs as set forth in 6 NYCRR Part 375-6.7(d).

5.3 Ventilation/Vapor Barrier

A Ventilation System and Vapor Barrier will be installed in the basement of the Main Building and crawl space of the northeastern-most building to prevent exposure to VOC vapors beneath the sub-slab. This remedy will allow for the full use and occupation of the first and second floors of these building areas with no further action. Additional future Site redevelopment will be evaluated for potential vapor intrusion and potential impacts will be monitored or mitigated as needed.

6.0 GREEN REMEDIATION GOALS OF THIS REMEDIAL WORK PLAN

Green remediation principals and techniques will be implemented to the extent feasible in the management of the remedy, as per DER-31.

Considerations for the environmental impacts of treatment technologies and remedy stewardship will be continuously evaluated over the long term operations of engineering controls. Special consideration will be applied to the following:

-
- Reducing direct and indirect greenhouse gas and other emissions;
 - Minimizing use of non-renewable energy;
 - Conserving and efficiently managing resources and materials;
 - Reducing waste, increasing recycling and increasing reuse of materials that would otherwise be considered a waste.

The selected remedy, Alternative 2, would comply with these goals while continuing to meet the remedial action objectives with the protection of human health and the environment.

Operation of the ventilation system will include running blowers, which consume non-renewable energy. The use of these blowers can be reduced to operation during specific periods to minimize the use of non-renewable energy.

7.0 IMPLEMENTATION SCHEDULE

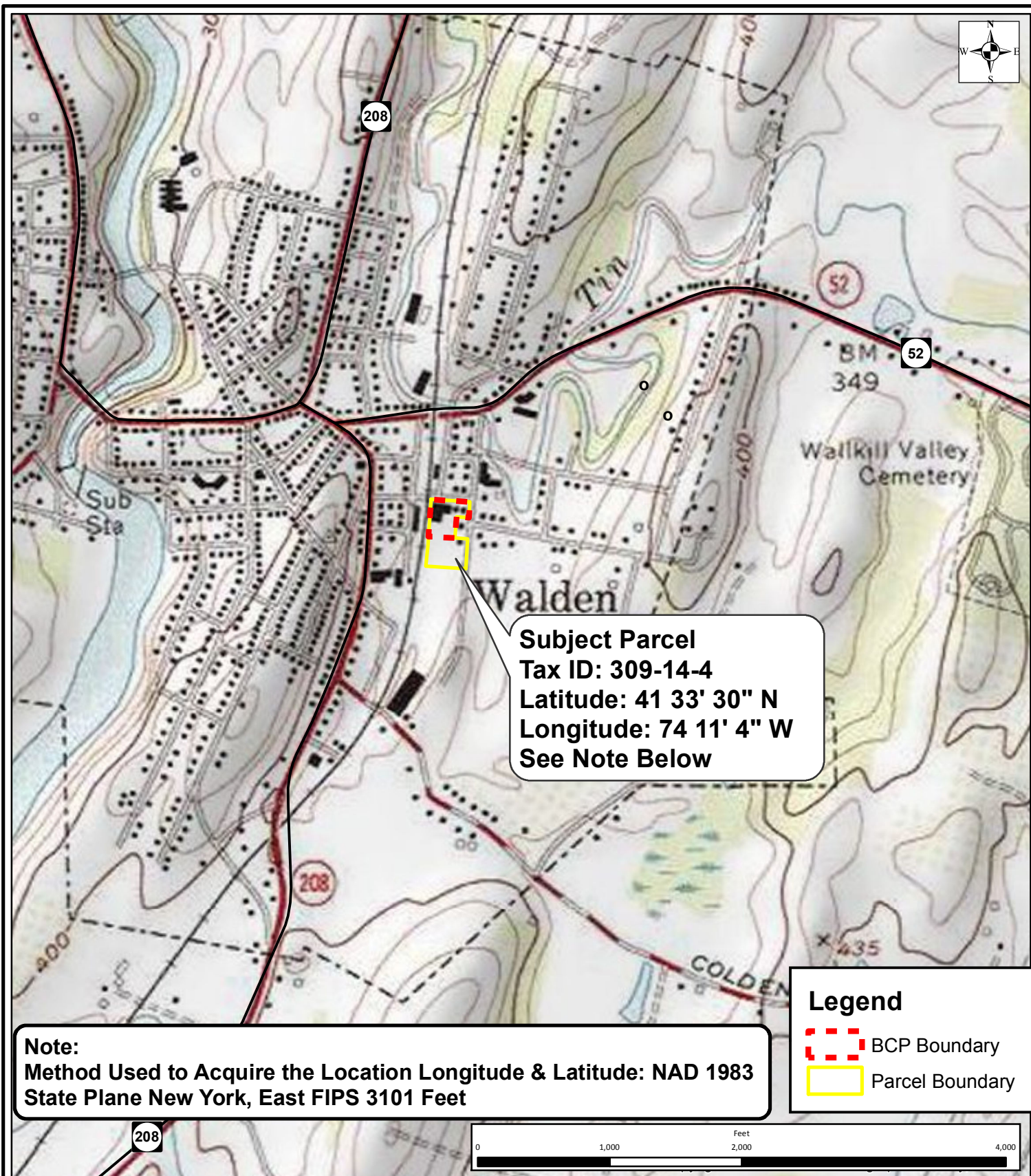
This section describes the schedule under which the described remedial actions will be implemented at the site.

7.1 Schedule of Implementation

The proposed remedial action engineering controls (i.e., vapor barrier/ventilation system and soil cover) can be implemented immediately upon approval by the NYSDEC of this RWP/Alternative Analysis Report. These systems will be operated according to the approved Site Management Plan.

7.2 Duration of Operation

The protective cover and vapor barrier/ventilation system will be operated according to the SMP until NYSDEC determines that site management is no longer required.



THE
Chazen
 COMPANIES

ENGINEERS/SURVEYORS
 PLANNERS
 ENVIRONMENTAL SCIENTISTS
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Glens Falls Office:
 100 Glen Street, Glens Falls, NY 12801
 Phone: (518) 812-0513

Estate of Hy Hilzen

Figure 1 - Site Location Map

29 Grant Street
 Village of Walden, Orange County, New York

Source: U.S.G.S. Topographic Map Dated 1978, Photo Revised 1980: USGS Ref. Code: Walden - 41074-E2-TF-024; Village of Walden 2007 Tax Parcel Data; State of New York DOT 2008 Roads dataset.

Drawn:	SCP/STF
Date:	July 2013/Feb. 2015
Scale:	1 inch = 1,000 feet
Project:	41115.00
Figure:	1

LEGEND:

- PROPERTY LINE NO PHYSICAL BOUNDS
ADJACENT PROPERTY LINE
EXISTING PROPERTY EASEMENT
EXISTING BUILDING
EXISTING CURB/GUTTER
EXISTING GRAVEL DRIVEWAY
EXISTING GUIDERAIL
EXISTING FENCE
EXISTING TREE LINE
EXISTING BRUSH LINE
EXISTING OVERHEAD WIRES
EXISTING GAS LINE

SYMBOLS:

- EXISTING SIGN
EXISTING MAILBOX
EXISTING POST
EXISTING IRON PIPE FOUND
EXISTING IRON ROD FOUND
EXISTING MAGNETIC NAIL SET
EXISTING MAGNETIC READING/TONE
EXISTING STAKE FOUND
EXISTING SANITARY MANHOLE
EXISTING CLEANOUT
EXISTING DRAINAGE MANHOLE
EXISTING CATCH BASIN
EXISTING ROOF DRAIN LEADER
EXISTING GUY WIRE
EXISTING UTILITY POLE
EXISTING UTILITY POLE W/ LIGHT
EXISTING AIR CONDITION COMPRESSOR
EXISTING PANEL/SWITCH BOX
EXISTING CONDUIT TO/FROM UNDERGROUND
EXISTING SATELLITE DISH
EXISTING GAS STRUCTURE
EXISTING GAS VALVE
EXISTING WELL
EXISTING HYDRANT
EXISTING AUTO SPKLR. HYDRANT
EXISTING WATER SHUT OFF VALVE
EXISTING WATER VALVE
EXISTING UNKNOWN MANHOLE
EXISTING MONITORING WELL
EXISTING UTILITY VALVE
EXISTING VENT

EASEMENT NOTES:

WITH RESPECT TO OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY TITLE NO. 437-O-ORT HAVING AN EFFECTIVE DATE OF NOVEMBER 15, 2013, SCHEDULE B;

32. UTILITY COMPANY EASEMENT IN LIBER 3412 OF DEEDS AT PAGE 316 (20' WIDE EASEMENT AND RIGHT OF WAY FOR UNDERGROUND GAS PIPELINE). [AFFECTS THE SUBJECT PARCEL APPROXIMATE LOCATION SHOWN HEREON, THE CENTERLINE OF WHICH BEGINS AT A POINT ON THE WESTERLY SIDE OF ELM STREET 26' NORTHERLY OF POLE NUMBERED 38 OF LINE NUMBER 927, EXTENDING WESTERLY 102'± AND 120'± SOUTHWESTERLY AND SOUTHERLY 2'± TO THE WESTERLY SIDE OF GRANTORS PACKAGED LIGHTING BUILDING]

33. RIGHTS AND AGREEMENTS FOUND IN LIBER 1798 CP 967.

34. DRIVEWAY EASEMENT RECITED IN MANY DEEDS OF RECORD (INCLUDING SUBJECT PARCEL DEED, LIBER 5915 OF DEEDS AT PAGE 303, PARCEL NO. 2) [AFFECTS THE SUBJECT PARCEL AND IS SHOWN HEREON]

DEED REFERENCE:

ESTATE OF HY HILZEN BY MICHAEL DANIELS AND WILLIAM MARLIER, CO-EXECUTORS TO GRANT STREET FACTORY, INC. DATED JANUARY 21, 2014 AND FILED IN THE OFFICE OF THE ORANGE COUNTY CLERK ON FEBRUARY 7, 2014 IN BOOK 13714 PAGE 0186.

TAX PARCEL NUMBER:

VILLAGE OF WALDEN, ORANGE COUNTY, NEW YORK
SECTION 309 BLOCK 14 LOT 4

AREA:

SUBJECT PARCEL= 3.08 AC.

PROPERTY ADDRESS:

29 GRANT STREET, WALDEN, NY 12586

NOTES:

UNAUTHORIZED ALTERATION OR ADDITION TO A SURVEY MAP BEARING A LICENSED LAND SURVEYOR'S SEAL IS A VIOLATION OF SECTION 7209, SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

ONLY COPIES FROM THE ORIGINAL OF THIS SURVEY MARKED WITH AN ORIGINAL OF THE LAND SURVEYOR'S INKED SEAL OR HIS EMBOSSED SEAL SHALL BE CONSIDERED TO BE VALID TRUE COPIES.

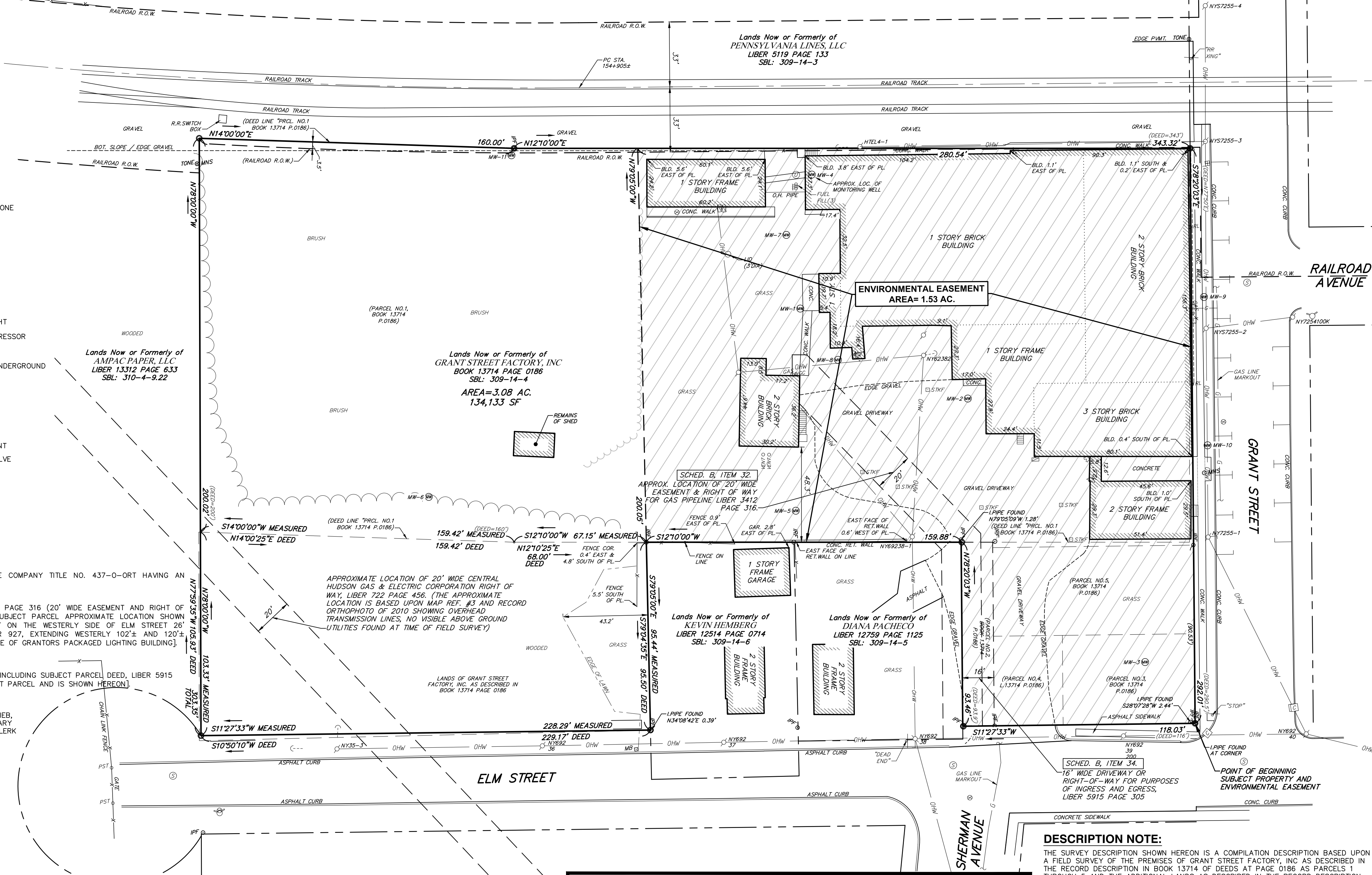
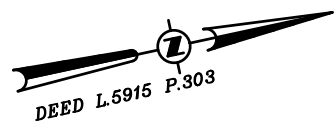
SURVEYED FROM RECORD DESCRIPTION AND AS IN POSSESSION.

SUB-SURFACE STRUCTURES NOT VISIBLE OR READILY APPARENT ARE NOT SHOWN AND THEIR LOCATION AND EXTENT ARE NOT CERTIFIED.

BUILDINGS SHOWN HEREON SERVED BY UNDERGROUND UTILITIES.

ENVIRONMENTAL EASEMENT NOTE:

THE ENGINEERING AND INSTITUTIONAL CONTROLS FOR THIS EASEMENT ARE SET FORTH IN THE SITE MANAGEMENT PLAN (SMP). A COPY OF THE SMP MUST BE OBTAINED BY ANY PARTY WITH AN INTEREST IN THE PROPERTY. THE SMP CAN BE OBTAINED FROM NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION, DIVISION OF ENVIRONMENTAL REMEDIATION, SITE CONTROL SECTION, 625 BROADWAY, ALBANY, NY 12233 OR AT derweb@w.dec.state.ny.us.



SURVEY DESCRIPTION
ENVIRONMENTAL EASEMENT, SITE #C336079

ALL that plot, piece or parcel of land situate and being in the Village of Walden, Town of Montgomery, County of Orange, State of New York, bounded and described as follows:

BEGINNING at a point marked by an iron pipe found at the intersection of the southerly line of Grant Street with the westerly side of Elm Street, said point being the northeasterly corner of the herein described Environmental Easement and being located N28°07'28"E 2.44 feet from another iron pipe found, and running; thence southerly along the westerly side of Elm Street S 11°27'33" W 118.03 feet to an iron pipe found; thence along the northerly line of lands now or formerly of Diana Pacheco as described in liber 12759 of deeds at page 1125, N 78°20'03" W 93.46 feet to a point being S79°05'09"E 1.28 feet from an iron pipe found; thence along the westerly line of said lands of Pacheco and also along the westerly line of lands now or formerly of Kevin Hemberg as described in liber 12514 of deeds at page 714, S 12°10'00" W 159.88 feet to an iron rod found; thence through the lands of Grant Street Factory, Inc. as described in Book 13714 of deeds at page 0186, N 79°05'00" W 200.05 feet to the southwesterly corner of the herein described Environmental Easement; thence along the westerly line of Grant Street Factory, Inc. and the herein described Environmental Easement, N 12°10'00" E 280.54 feet to a point on the southerly side of Grant Street; thence along the southerly side of Grant Street, S 78°20'03" E 292.01 feet, passing through an iron pipe found at 201.48 feet, to the point or place of beginning;

CONTAINING AN AREA OF 1.53 AC. OF LAND MORE OR LESS

DESCRIPTION NOTE:

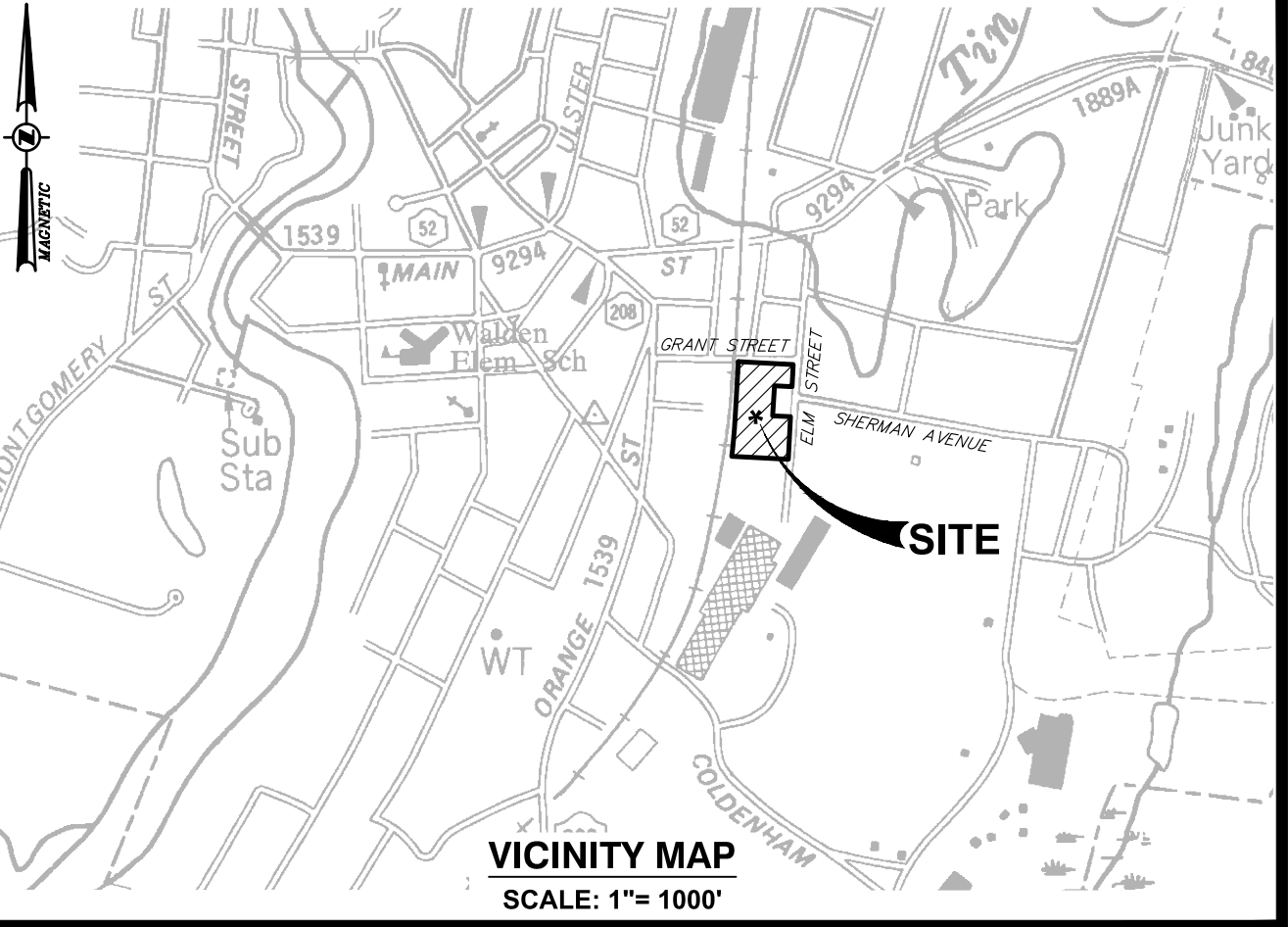
THE SURVEY DESCRIPTION SHOWN HEREON IS A COMPILATION DESCRIPTION BASED UPON A FIELD SURVEY OF THE PREMISES OF GRANT STREET FACTORY, INC. AS DESCRIBED IN THE RECORD DESCRIPTION IN BOOK 13714 OF DEEDS AT PAGE 0186 AS PARCELS 1 THROUGH 5 AND THE ADDITIONAL LANDS AS DESCRIBED IN THE RECORD DESCRIPTION REFERENCED AS CONTAINING 0.524 ACRES OF LAND MORE OR LESS. THE RECORD DESCRIPTION CONTAINS 2 DIFFERENT BEARING MERIDIANS FOR PARCEL 1 AND THE LAST PARCEL. CHAZEN CHOSE PARCEL 1 AS THE BASIS FOR THE SURVEY BEARING SYSTEM.

THE RECORD DESCRIPTION CONTAINS 6 PARCELS WITH PARCEL NO. 1 BEING DESCRIBED BY METES AND BOUNDS WITH A MIS-CLOSURE OF 0.58 FEET AND PARCELS NO. 2 THROUGH NO. 5 BEING GENERALLY DESCRIBED BY DISTANCE AND ADJOINING LAND OWNERSHIP AND SUBJECT TO THE INTERPRETATION OF FOUND EVIDENCE. THE ADDITIONAL 0.524 ACRE PARCEL REFERENCED ABOVE HAD A MIS-CLOSURE OF 0.01'.

ALTA/ACSM CERTIFICATION:

TO:
NEW YORK STATE - DEPARTMENT OF ENVIRONMENTAL CONSERVATION
GRANT STREET FACTORY, INC.
OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE "2011 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/ACSM LAND TITLE SURVEYS", JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 2, 4, 7a, 8, 11a, 12, 13, AND 14 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON MAY 7, 2013.



SURVEY DESCRIPTION
SUBJECT PROPERTY
LANDS OF GRANT STREET FACTORY, INC.

ALL that plot, piece or parcel of land situate and being in the Village of Walden, Town of Montgomery, County of Orange, State of New York, bounded and described as follows:

BEGINNING at a point marked by an iron pipe found at the intersection of the southerly line of Grant Street with the westerly side of Elm Street, said point being the northeasterly corner of the herein described parcel of land and being located N28°07'28"E 2.44 feet from another iron pipe found, and running; thence southerly along the westerly side of Elm Street S 11°27'33" W 118.03 feet to an iron pipe found; thence along the northerly line of lands now or formerly of Diana Pacheco as described in liber 12759 of deeds at page 1125, N 78°20'03" W 93.46 feet to a point being S79°05'09"E 1.28 feet from an iron pipe found; thence along the westerly line of said lands of Pacheco and also along the westerly line of lands now or formerly of Kevin Hemberg as described in liber 12514 of deeds at page 714, S 12°10'00" W 159.88 feet to an iron rod found; thence along the southerly line of said lands of Hemberg, S 79°05'00" E 95.44 feet to a point being S34°08'42" W 0.39 feet of an iron pipe found at the westerly side of Elm Street; thence along the westerly side of Elm Street, S 11°27'33" W 228.29 feet; thence westerly along lands now or formerly of Ampac Paper, LLC as described in liber 13312 of deeds at page 633, N 78°00'00" W 303.35 feet to a point; thence along the westerly line of the herein described parcel, N 14°00'00" E 160.00 feet to an iron pipe found; thence continuing along the westerly line of the herein described parcel, N 12°10'00" E 343.32 feet to a point on the southerly side of Grant Street; thence along the southerly side of Grant Street, S 78°20'03" E 292.01 feet, passing through an iron pipe found at 201.48 feet, to the point or place of beginning;

CONTAINING AN AREA OF 134,133 SF OR 3.08 AC. OF LAND MORE OR LESS

RECORD DESCRIPTION (AS IT APPEARS IN DEED BOOK 13714 PAGE 0186)
SUBJECT PROPERTY
LANDS OF GRANT STREET FACTORY, INC.

ALL that certain lot, pieces or parcel of land with the buildings and improvements thereon, situate, lying and being in the VILLAGE OF WALDEN, TOWN OF MONTGOMERY, County of Orange and State of New York, bounded and described as follows:

PARCEL NO. 1
BEGINNING at a point in the easterly line of Walkill Valley Railway at the intersection of a high picket fence; **RUNNING** THENCE along the said Railroad Company lands North 14°00'00" East, 160 feet; THENCE along same North 12°10'00" East, 343 feet to its intersection with the southerly line of Grant Street; THENCE along said southerly line of Grant Street South 77°50'00" East, 200 feet to the line of H.B. Wooster's lot marked by an old picket fence; THENCE along the said Wooster and other lots South 12°10'00" West, 343 feet to a point in the fence; THENCE along same South 14°00'00" West, 160 feet to a corner post in the fence, and THENCE along the fence North 78°00'00" West, 200 feet to the point or place of **BEGINNING**.

PARCEL NO. 2
BEGINNING at a point on the westerly side of Elm Street, which said point is marked by an iron and is the northeasterly corner of the premises herein described; and **RUNNING** THENCE in a westerly direction along the southerly line of premises of Bodine and premises of DuBois; a distance of 93.9 feet, more or less, to a point marked by an iron set on the easterly line of premises owned by Spence Engineering Company, Inc.; THENCE in a southerly direction, along the easterly line of premises of the aforesaid Spence Engineering Company, Inc., a distance of 16 feet to a point marked by an iron set on the lands formerly of Mary Crapis and now of John R. Noonan; THENCE in an easterly direction through the lands formerly of Mary Crapis (now John R. Noonan) parallel to the first mentioned corner, a distance of 93.9 feet, more or less, to an iron set on the westerly side of Elm Street; THENCE in a northerly direction along the westerly side of Elm Street a distance of the point or place of **BEGINNING**.

FOR CONVEYANCE ONLY:
EXCEPTING AND RESERVING to John R. Noonan, his heirs and amigoss, the right and privilege of using the foregoing premises as a driveway or right-of-way for purposes of ingress and egress from premises of said John R. Noonan, lying southerly of the foregoing described premises.

PARCEL NO. 3
Bounded and described as follows: On the NORTH by Grant Street; on the EAST by Creamery Street, on the WEST by lands now or formerly of William Bray; and on the SOUTH by lands now or formerly of Thomas Hepper, being 45 feet 6 inches front and rear and 65 feet deep.

Bounded and described as follows: On the NORTH by lands now or formerly of C. Fred Fowler; on the EAST by Creamery Street; on the WEST by lands now or formerly of William Bray, and on the SOUTH by lands now or formerly of Thomas Hepper being 45 feet 6 inches front and rear and 35 feet deep.

PARCEL NO. 5
Bounded and described as follows: NORTH by Grant Street, EAST by lands formerly of John Cates, now or formerly of C. Fred Fowler; SOUTH by lands now or formerly of Thomas Hepper; WEST by lands belonging to the foundry, Being a lot of land 45 feet front and rear and 100 feet deep.

Note: Being District, Section 309, Block(s) 14, Lot(s) 4, Tax Map of the Town of Montgomery, County of Orange.
Note: Lot and Block shown for informational purposes only.

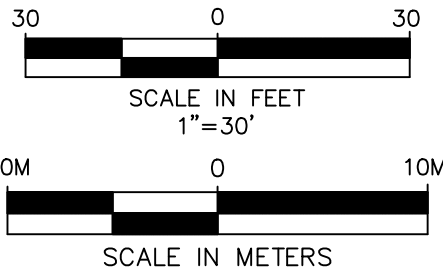
Also the land described as follows:

All that certain piece or parcel of land, with buildings and improvements thereon erected, situate, lying and being in the Village of Walden, County of Orange, and the State of New York and being more particularly bounded and described as follows:

Beginning at an iron pipe found on the westerly side of Elm Street, said point being the southeasterly most corner of the lands reputedly of Hemberg and also being 158.31 feet southerly from an iron pipe found; thence from said point or place of beginning and along the westerly side of said Elm Street South 13°39'45" West a distance of 229.17 feet, thence along the lands reputedly of Interstate Acquisition Corp., North 78°10'00" West a distance of 105.93 feet; thence the following two (2) courses and distances through the lands of Hizen, 1) North 16° 50'00" East a distance of 159.42 feet, 2) North 15°00'00" East a distance of 68.00 feet; thence along the lands reputedly of said Hemberg, South 76°15'00" East a distance of 95.50 feet to the point or place of beginning, and containing 0.524 acres of land more or less.

STEVEN J ALEX, L.S.
REGISTERED SURVEYOR, STATE OF NEW YORK
REGISTRATION NO. 050016

Date



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CHAZEN ENGINEERING, LAND SURVEYING
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375 Bay Road
Queensbury, New York 12804
Phone: (518) 812-0513

11/12/14	1	REVISE LIMITS OF ENVIRONMENTAL EASEMENT AND SURVEY DESCRIPTION
rev.	date	description

29 GRANT STREET - GRANT STREET FACTORY, INC

ALTA/ACSM LAND TITLE SURVEY
PREPARED FOR STATE OF NEW YORK -
DEPT. OF ENVIRONMENTAL CONSERVATION

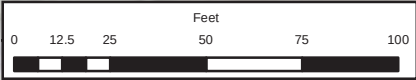
VILLAGE OF WALDEN, TOWN OF MONTGOMERY, ORANGE COUNTY, NEW YORK

designed CJS checked SJA
date 05/30/13 scale 1"=30'
project no. 41115.01
sheet no. SV1
1 OF 1



LEGEND

- Soil Boring Location
- Test Pit Locations
- UST Closure Soil Sample
- Area of planned cover system installation
- Area of planned vapor barrier and ventilation system installation
- GWFlow
- Boundaries of Areas of Concern
- Groundwater Flow Direction (Dec 2012)
- BCP Boundary



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Former Packaged Lighting Systems, Inc. Site
Figure 3 - Alternative 2 Engineering Control Areas
29 Grant Street
Town of Walden, Orange County, New York

Source: NYS Department of Homeland Security and Emergency Services 2010 Orthoimagery; Existing Sample Locations and Site Features from Going Phase II, 2010; Proposed Features Drawn by Chazen, 2011-2013.

Drawn:	RL/STF
Date:	May 2016
Scale:	1 inch equals 50 feet
Project:	41115.00
Figure:	3