

FORENSIC TESTING WORK PLAN

Former Abalene Pest Control Site 108 McBride Avenue Clinton, New York

NYSDEC Site # 6-33-035

August 2018 Revision 1 The Syl

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1 INTRODUCTION

The Former Abalene Pest Control Site in Clinton, New York is identified by the New York State Department of Environmental Conservation (NYSDEC) as a Class 2 Inactive Hazardous Waste Site (Site No. 6-33-035). The NYSDEC has required that a Remedial Investigation (RI) and Feasibility Study (FS) be conducted to evaluate surface and subsurface conditions at the site and identify potential risks associated with site conditions. The objective of the RI and FS was to evaluate the nature and extent of contaminants of concern, and to assess potential remedial alternatives.

Orkin LLC (Orkin) completed the RI (Arcadis, 2015a), subsequent supplemental sampling (Arcadis, 2015b and Arcadis, 2015c), and a draft FS (Arcadis, 2015d) in accordance with the NYSDEC Order on Consent (Index #A-6-0464-0602) for "the development and implementation of a remedial program for an inactive hazardous waste site, under Article 27, Title 13, and Article 71, Title 27 of the Environmental Conservation Law of the State of New York." The FS has not been finalized, pending further analysis of the source or sources of arsenic at and in the vicinity of the site. Orkin has provided historical documentation, visual, and analytical data strongly suggesting that arsenic on and in the vicinity of the site is the product of deposition of coal or coal ash, and/or pre-1962 historic fill. The NYSDEC has requested additional information with which to further assess whether the source of arsenic is coal and/or coal ash associated with fill or air emissions, as opposed to pesticides/herbicides. To that end, this Work Plan has been developed to present the objectives and scope of a supplemental forensic investigation designed to further evaluate the source of the arsenic at the site.

1.1 Site Location and Description

The Former Abalene Pest Control property is located at 108 McBride Avenue, Clinton, Oneida County, New York. It comprises approximately 1/3 acre and is generally flat. The ground surface is gravel, paved, or bare soil and vegetation is sparse. No structures are on the property; however, portions of the foundation of a former building are present, mainly along the western side of the property.

The site is located in a mix of residential, commercial, and industrial properties. It is bordered to the west by a collision service, to the east-southeast by a dance studio (former bowling alley) and to the north by two lanes of McBride Avenue. Residential properties are present north of McBride Avenue. The location of the site is shown on Figures 1 and 2.

1.2 Site History

Sanborn® fire insurance maps, historical topographic maps, and historical aerial photographs were obtained for the site area during the RI and have been shared and/or discussed with the NYSDEC at previous meetings. For convenience, these materials are provided in Appendices A, B, and C, respectively.

Based on review of historic topographic maps, the Chenango Canal, which operated from 1834 to1878, passed directly through the site. The canal was filled in around the turn of the twentieth century.

Historic Sanborn® fire insurance maps, previously presented in the RI Report show that the Clinton Canning Company operated from at least 1895 to 1941 on the parcel that today encompasses the Former

Abalene property. The canning facility also encompassed several adjacent and surrounding properties totaling approximately 3 acres. The facility was operated with coal-fueled boilers that were located on what is now the Former Abalene property (Figure 3). The timespan during which Clinton Canning operated the facility predates the NYSDEC regulatory historic fill date of October 10, 1962. Over at least the same time period, the New York Ontario and Western Railroad mainline and spurs were adjacent to the site on what is now part of Taylor Avenue, with a lumber yard and coal storage sheds present on the opposite side of the tracks from the site. Thus, both coal storage and combustion are documented at the site and on surrounding areas.

The former Abalene property was used as a pest control facility from 1968 to 1987 by Abalene Pest Control. Orkin purchased the property in 1987. A site visit report from 1989 indicated that the building included a warehouse and office area. The site visit report described the condition of the building as weathered and indicated that a majority of the windows were boarded up. The building was demolished and removed from the site in 1990.

To summarize, the site history reveals that the area has been used for industrial purposes for over 100 years. Coal storage and combustion were common on and adjacent to the site prior to the arrival of Abalane Pest Control. Historical documents also show the placement of fill material prior to 1962 at the site and vicinity. Residuals from coal combustion are a likely source of fill material. Coal and coal ash are well-documented to contain elevated concentrations of arsenic (EPRI, 2010; Gao et al., 2012; USGS, 2015); on average 70 parts per million (ppm) but up to 1,400 ppm. Concentrations of arsenic observed in project samples are within this range. As coal and coal ash have been found in the soil at the site and vicinity, it is likely that the presence of these materials is a key factor influencing arsenic concentrations in soil.

1.3 Previous Site Investigations

Soil and groundwater samples were collected at the former Abalene property on multiple occasions from 1987 to 1992 (Law, 1987; Law, 1989, EC Jordan, 1990, YEC, 1994). These sampling events identified the presence of pesticides and metals (including arsenic) in surface and shallow soil samples (less than 12 inches below ground surface (bgs)). Concentrations of some pesticides in these samples exceeded NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 soil cleanup objectives. Groundwater samples collected from a shallow dug well on the former Abalene property did not contain any detectable concentrations of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides/poly chlorinated biphenyls (PCBs) or metals.

1.4 Remedial Investigation Summary

The RI was conducted between 2007 and 2014 (Arcadis, 2015a). The scope of the RI expanded on earlier site investigations and was designed to evaluate the potential effects of the use of the property on surface and subsurface soil and groundwater. In consultation with the NYSDEC, based on shallow soil sampling and subsequent analytical results and/or field indications of contamination, the laboratory analyte list for samples was slowly reduced over time to focus on organochlorine pesticides, lead, arsenic, and mercury; and eventually only arsenic.

Arsenic is present in many of the soil samples from the former Abalene property and adjacent properties at concentrations greater than the 6 NYCRR Part 375 Commercial SCO of 16 mg/kg to depths as great as 7.5 feet below current ground surface. While the spatial extent of arsenic-impacted soil is generally widespread and has not been completely defined, the highest concentrations of arsenic in soil were in the southern half of the investigation area including the adjacent properties to the east and south.

Few soil samples contained organochlorine pesticides at concentrations greater than the corresponding 6 NYCRR Part 375 Commercial SCOs. Only two samples, from SS-7 and SB-17 in the southeast corner of the site contained dieldrin at concentrations (1,800 and 1,500 μ g/kg) greater than the 6 NYCRR Part 375 Commercial SCO of 1,400 μ g/kg. Additionally, pesticides were generally detected at depths of less than two feet below current ground surface.

During the RI, dieldrin was detected in groundwater samples collected in 2010 at concentrations greater than the corresponding NYSDEC Class GA Standard from four of the site monitoring wells. Aldrin was detected in one groundwater sample at a concentration greater than the corresponding NYSDEC Class GA Standard during the same event. Supplemental groundwater sampling conducted in July 2015 indicated that pesticide concentrations in groundwater had decreased since the 2010 sampling event such that samples from only one well currently contained pesticides at concentrations greater than NYSDEC Class GA Standards. These results were potentially a false positive (Arcadis, 2015b). To date, arsenic has not been detected in groundwater samples at concentrations greater than the NYSDEC Class GA Standard or laboratory detection limits.

During soil sampling events, coal and coal ash residuals were visible in the soil. Based on the observation of coal and coal ash residuals in soil borings and the potential for these materials to contain elevated levels of arsenic, supplemental sampling was performed in October 2015. This sampling event examined the presence of coal/ash and arsenic simultaneously (beyond the visual identification of coal ash in the samples) using polarized light microscopy (PLM), scanning electron microscopy (SEM), and energy dispersive X-ray spectroscopy (EDS), coupled with standard USEPA laboratory methods. Results of this sampling event suggest that the areas of coal/coal ash presence are co-located with the soil containing arsenic concentrations greater than applicable SCO (Arcadis, 2015c). Approximately 89% (31 of 35) of locations sampled contained visual and/or laboratory microscopic evidence of coal, coal ash, and/or combustion products. Approximately 82% (9 of the 11) of samples in which coal/ash was present contained arsenic at concentrations greater than the applicable SCO. Of the four locations that did not contain visual and/or microscopic evidence of coal/ash, none contained arsenic at concentrations greater than applicable SCO. Further, eight of the 12 soil samples that had no visible evidence of coal/coal ash in the field showed the presence of coal ash when subsequently subjected to PLM, SEM and EDS. Based on the results of this study, it is evident that coal/coal ash is far more widespread than indicated by the field visual examination of soil cores alone, and that there is very high degree of correlation between the presence of coal/coal ash and the presence of arsenic above the SCO (and, likewise, a high correlation between the absence of coal/coal ash and the absence of arsenic exceeding the SCO).

2 SUPPLEMENTAL INVESTIGATION

As an example of forensic testing and historic fill determination, the NYSDEC provided Orkin with the Technical Memorandum of the Interim Remedial Measure Work Plan for the Duracell Inc. Site. This project example utilized analyses (sequential extraction and speciation) and evaluations (visual coal/ash,

contaminant distribution patterns, etc.) consistent with Orkin's efforts to-date and those that are presented in this Work Plan. The forensic testing proposed herein will further assess the relationship between arsenic and coal or coal ash residuals in soil/fill. The analysis includes further environmental sampling and review of historical site documentation. Soil sample collection and handling activities will be conducted in accordance with the NYSDEC-approved RI Work Plan and Sampling and Analysis Plan.

2.1 Historic Fill Forensic Evaluation

The historic fill forensic work plan consists of the following:

- Analytical testing of soil/fill to evaluate constituents commonly associated with coal and coal ash (polycyclic aromatic hydrocarbons (PAHs) and metals).
- Microscopy analyses, using the accepted protocols from the October 2015 sampling event, to identify evidence of coal and coal ash residuals that are not evident under visual inspection.
- Arsenic sequential extraction and speciation to understand the nature of arsenic chemical
 associations with the soil. This analysis will be used as a means of distinguishing soil arsenic
 derived from aqueous-phase inputs (e.g., from pesticide/herbicide), if any, versus those
 associated with coal/ash.

These methods and rationale for selection are provided in the following sections.

2.1.1 Sample Locations

Surface and subsurface samples will be collected from the outer edges of the site investigation area, and in areas with previous sample results indicating elevated arsenic concentrations more proximal to the former Abalene property. Figures 4 and 5 and Table 1 identify the proposed sampling locations and depth intervals, provide a rationale for selection, and decision flow chart. Borings will be advanced to five feet bgs using direct-push and/or hand auger methods. Soil cores will be examined, classified, and photographed. Samples will be collected from up to two depth intervals at most boring locations, with up to three depth intervals collected at select locations from which previous soil samples have contained elevated arsenic concentrations (Table 1). Specifically, additional depth sampling in high-arsenic zones will be conducted to understand the extent of vertical arsenic distribution. As noted on Figure 5, the sampling and analysis plan shown in Table 1 may be modified based on field observations and preliminary laboratory analyses.

2.1.2 Soil Analytical Testing

An analytical laboratory, TestAmerica, Inc. in Amherst, New York, which is approved by the New York State Department of Health (NYSDOH) in conformance with the National Environmental Laboratory Accreditation Conference (NELAC) Standards, will analyze all samples collected during the investigation as shown below. Microvision Laboratories, Inc. of Chelmsford, Massachusetts, and Brooks Applied Labs (BAL) of Bothell, Washington, will analyze samples for PLM/SEM/EDS and sequential extraction/speciation, respectively, as subcontractors to TestAmerica. Appropriate duplicate and quality control samples will be collected.

BAL method detection limits (MDLs) will be calculated on a batch-specific basis with new blanks prepared with every batch. The MDL will be estimated by multiplying the standard deviation of the prepared blanks by three; however, the MDL can never be less than 1/10th the level of the method reporting limit (MRL) and will be set as such if there is no measurable arsenic in the blanks. The MRL is calculated as either two times the level of the MDL or set at the level of the low calibration standard converted to solid units, whichever is greater. The method default sample preparation masses and volumes are used when converting the low calibration standard to solid units. A certified standard reference material (SRM) that is certified for total arsenic will be used and taken through the sequential extraction steps. The sum of the results from each of the extractions will be compared to the certified total arsenic value and a percent recovery will be reported.

As applicable, analytical results will be reported in ASP Category B data packages and a Data Usability Summary Report (DUSR) will be prepared upon receipt of all analytical data to ensure that the quality of the data is sufficient to support the project objectives.

Samples will be analyzed by TestAmerica for the following parameters:

- Polycyclic aromatic hydrocarbons (PAHs) by United States Environmental Protection Agency (USEPA) Method 8270;
- Target Analyte List (TAL) Metals by USEPA Methods, including 3052 digestion followed by 6010/6020/7471 analysis as applicable to achieve low detection limits.

As described on Figure 5, initial field visual inspection, PAH, and metals results will be reviewed to determine which samples will be further analyzed for microscopy and sequential extraction/speciation.

2.1.3 Microscopy Evaluation

The October 2015 soil sampling event included an evaluation of coal/ash in samples using microscopy methods that could identify evidence of coal/ash that was not visible to the naked eye. The results of this investigation revealed that coal/coal ash is more prevalent across the site than indicated by visual examination in the field. Comparing the microscopy results to arsenic analytical results showed that elevated arsenic concentrations coincided with presence of coal/coal ash. This is consistent with the observation that smaller ash particles can contain just as much, if not more, arsenic compared to larger residuals (Querol et al., 1995). We propose further analysis using microscopy to supplement the existing data comparing coal/ash distribution with arsenic concentration distribution.

Samples will be analyzed by MicroVision for evaluation of coal ash content which includes the following:

- Macroscopic Inspection
- Polarized light microscopy (PLM)
- Scanning electron microscopy (SEM)
- Energy dispersive X-ray spectroscopy (EDS)

The proposed microscopy evaluation is designed to confirm the presence of coal/coal ash, particularly in the specific intervals where arsenic hotspots have been identified during previous sampling. SEM has been used successfully in the past to determine the morphology of ash particles, which tend to be curved and porous relative to native soil/fill materials (e.g., Kutchko and Kim, 2006). Under certain conditions,

EDS also may also be used to determine elemental associations of arsenic (e.g., silica and aluminum in the case of an aluminosilicate glass, or calcium in the case of a calcium arsenate precipitate). As an example, EDS coupled with SEM has been used to assess the association of arsenic with pyrite in coal samples (Kolker et al., 2000). Elemental association data can be used to support findings from the sequential extraction testing, described below.

2.1.4 Sequential Extraction and Speciation

Sequential extraction is a method which uses select chemical reagents to extract target constituents from samples based on specific chemical forms and associations (e.g., Gleyzes et al., 2002; Zhang et al., 2013), with methods developed specifically for arsenic (e.g., Hudson-Edwards et al., 2004; Rodriguez et al., 2003; Wenzel et al., 2001). When different potential sources of the constituent exist that would lead to differing chemical associations in the sample, the sequential extraction profile can be used as a chemical "fingerprint" to help in quantifying source contributions (e.g., Cances et al., 2005; Gao et al. 2012; Huggins et al., 2002; Niazi, 2011; Rahman et al. 2017; Veselska, 2013). Adsorbed and extractable arsenic can be further characterized by determination of chemical speciation (e.g., inorganic arsenate, inorganic arsenite, and organoarsenate forms). A common method for determining arsenic speciation is ion chromatography coupled to inductively-coupled plasma-mass spectrometry (IC-ICP-MS). This method is well-established for arsenic, and has been used specifically for understanding the speciation of arsenic associated with coal combustion products (e.g., Shah et al., 2008).

Generally speaking, when arsenic is present in soils, it may appear in the following forms:

- Adsorbed onto mineral surfaces
- Co-ion within various mineral phases, including amorphous (i.e., poorly-ordered, non-crystalline)
 metal oxyhydroxides, crystalline metal oxyhydroxides, or aluminosilicates
- Pure phase minerals such as arsenopyrite or calcium arsenate.

The proposed extraction strategy is designed to sequentially elute arsenic that may be present in one or more of the forms described above, creating the arsenic "fingerprint" for soil on and around the site. The proposed extraction sequence, based on the Wenzel et al. (2001) method, is provided below:

- Ammonium phosphate releases the adsorbed arsenic fraction into solution (herbicide/pesticide source likely; coal/coal ash source possible).
- Ammonium oxalate dissolves amorphous iron and manganese oxyhydroxides without
 dissolving crystalline phases, resulting in the release of co-precipitated arsenic into solution
 (herbicide/pesticide source possible; coal/coal ash source increasingly likely).
- Ammonium oxalate and ascorbic acid dissolves crystalline iron and manganese oxyhydroxides, releasing co-precipitated arsenic into solution (coal/coal ash source increasingly likely)
- 4. **Digestion with hydrofluoric acid (HF) (USEPA Method 3052)** releases arsenic within residual phases, including pure phase arsenic sulfide minerals (e.g., arsenopyrite), silica, aluminosilicates, and recalcitrant organic matter (coal/coal ash source highly likely)

The extracts from each step will be analyzed for arsenic by USEPA Method 6020. Additionally, analysis of the extract from step one will include arsenic speciation for arsenite (As [III]), arsenate (As[V]), monomethylarsonic acid (MMA), and dimethylarsenic acid (DMA) by ion chromatography inductively

coupled plasma dynamic reaction cell mass spectrometry (IC-ICP-DRC-MS). The speciation analysis will help to positively identify potential herbicide/pesticide source if organoarsenate herbicide/pesticide residuals are present. Total elemental analysis via USEPA Method 3052 will also be performed on a split of the sequential extraction soil sub-sample for comparison with the sum of sequential extractions.

Differences in these chemical associations are expected based on the source of arsenic, specifically coal/coal ash versus arsenical herbicide/pesticide residues. Characterization of both coal/coal ash and arsenic-pesticide containing soil by sequential extraction procedures is well documented in peer-reviewed literature (Huggins et al., 2002; Rahman et al., 2017; Gao et al., 2011; Quazi et al., 2010).

Comparing the results of the sequential extraction and speciation tests with the literature will provide further information with which to evaluate the source of the arsenic. For example, if the arsenic in site samples were from an herbicide/pesticide source, it is likely that it would have been released to the environment in the aqueous phase and would largely be adsorbed to mineral surfaces (Johnson and Hiltbold, 1969; Rahman et al., 2017). Over time, the organoarsenate would break down to inorganic arsenate and arsenite, which is capable of incorporation into amorphous mineral phases such as amorphous ferric arsenate as well as surface adsorption (Quazi et al., 2010). In that instance, we would expect that higher arsenic concentrations would be present in the first and second extraction steps (adsorbed and amorphous minerals) and that lower concentrations of arsenic would be seen in the latter extraction steps (organic matter and pure-phase minerals) (Cances et al., 2005; Niazi, 2011). Conversely, arsenic present in coal/coal ash could be present in a number of different forms depending on the nature of the coal/coal ash. For example, combustion can potentially melt clays and quartz that may entrap arsenic in aluminosilicates as it cools and resolidifies within bottom ash as glassy material (Huffman et al., 1994; Goodarzi and Huggins, 2001). Other possibilities include incorporation of arsenic in calcium arsenate and adsorption of arsenic to clays and oxides (Huffman et al., 1994; Izquierdo and Querol, 2012). In that instance, we would expect that greater concentrations of arsenic to be present in the latter steps of the extraction procedure (Gao et al., 2012; Huggins et al., 2002; Veselska, 2013).

2.2 Historical Data Evaluation

Sanborn® fire insurance maps, historical topographic maps, and historical aerial photographs obtained for the site area during the RI provide evidence of industrial activity and placement of fill on and in the vicinity of the site prior to 1962. In particular, the 1895 and 1898 topographic maps (Appendix B) indicate that the Chenango Canal passed directly through the site. Filling of the canal occurred around the turn of the twentieth century, thus the placement of historic fill materials and regrading of the site and vicinity is well-established.

Additional historical research will be conducted to supplement and further evaluate the location and extent of the Clinton Canning Company, Chenango Canal, New York Ontario and Western Railroad, and other industrial activity in the area, as they relate to potential areas of historic fill. This research will include the following:

- Review of additional Sanborn® fire insurance map coverages along the canal/railroad corridor adjacent to the site area
- Review of historical photographs, maps, and/or documents from:
 - Clinton Historical Society

- Chenango Canal Association
- Oneida County History Center
- New York State Archives

3 REPORTING

A report will be prepared and submitted to the NYSDEC for review and comment. The report will include the following:

- Discussion of field activities and observations.
- Presentation of analytical results.
- Discussion of the nature of historic fill at the site.
- Discussion of the nature and association of arsenic at the site.
- Presentation and discussion of historical data.
- Conclusions and recommendations drawn from the interpretation of the data.
- Supporting data, including analytical data packages, field log forms, and photographic logs.

4 SCHEDULE

The estimated project schedule is presented on Figure 6. The actual schedule will be dependent on subcontractor availability, site access, and the date of project initiation (Work Plan approval and Notice to Proceed).

The schedule does not account for delays due to unforeseen site conditions (e.g., inclement weather, access to site or adjacent properties). Every attempt will be made to adhere to the schedule presented. Unexpected delays will be documented and reported to the NYSDEC in a timely fashion. In the event that the schedule needs to be modified, Arcadis and/or Orkin will contact the NYSDEC for approval of the updated schedule.

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FIGURES

\\ALBANY\Data\PROJECT\1368050\FILE\RIFS Report\Fig 1.

PARCADIS Design & Consultancy for natural and built assets

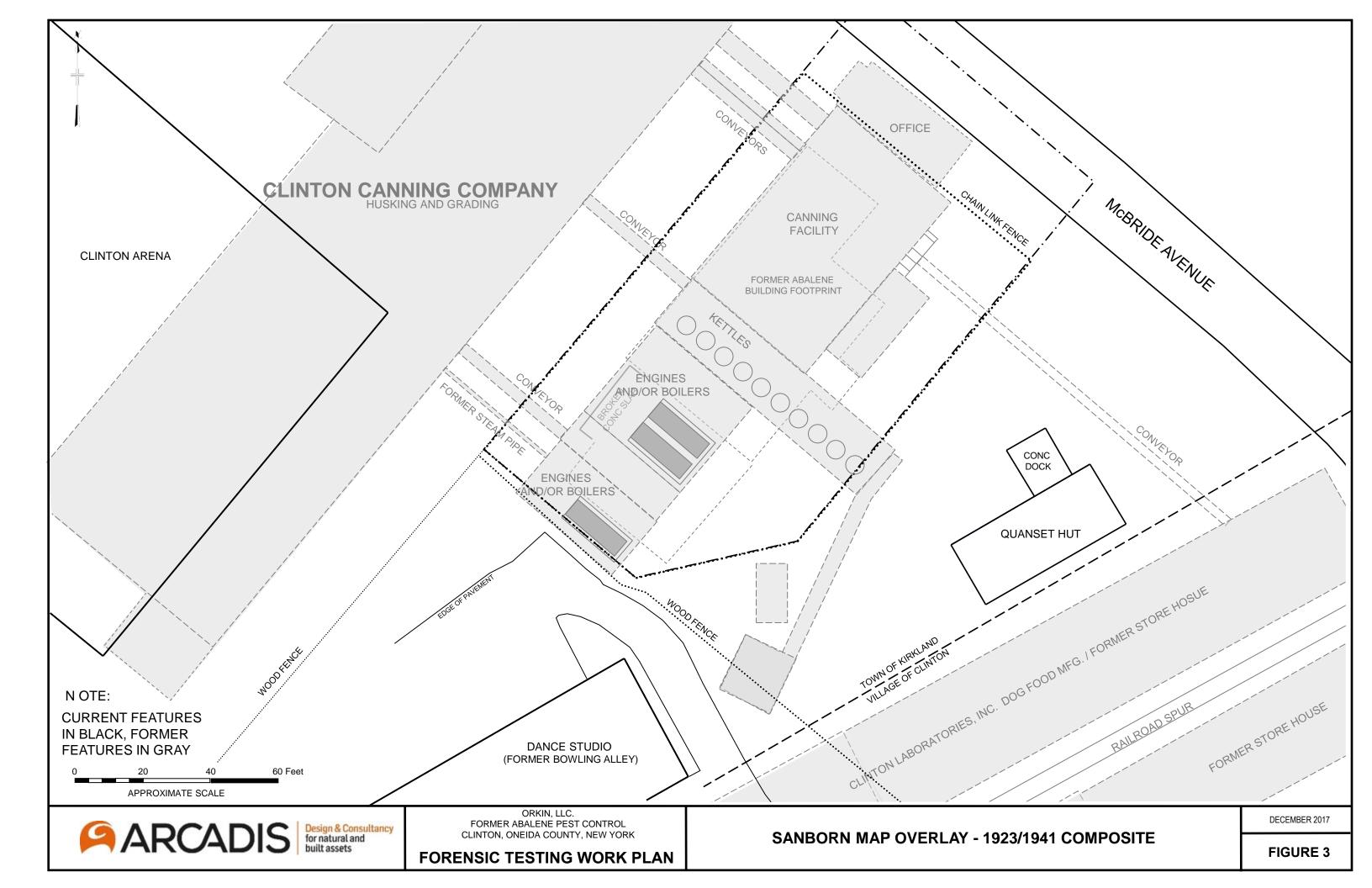
ORKIN LLC FORMER ABALENE PEST CONTROL SITE CLINTON, NEW YORK

FORENSIC TESTING WORK PLAN

SITE LOCATION

DECEMBER 2017

FIGURE 1



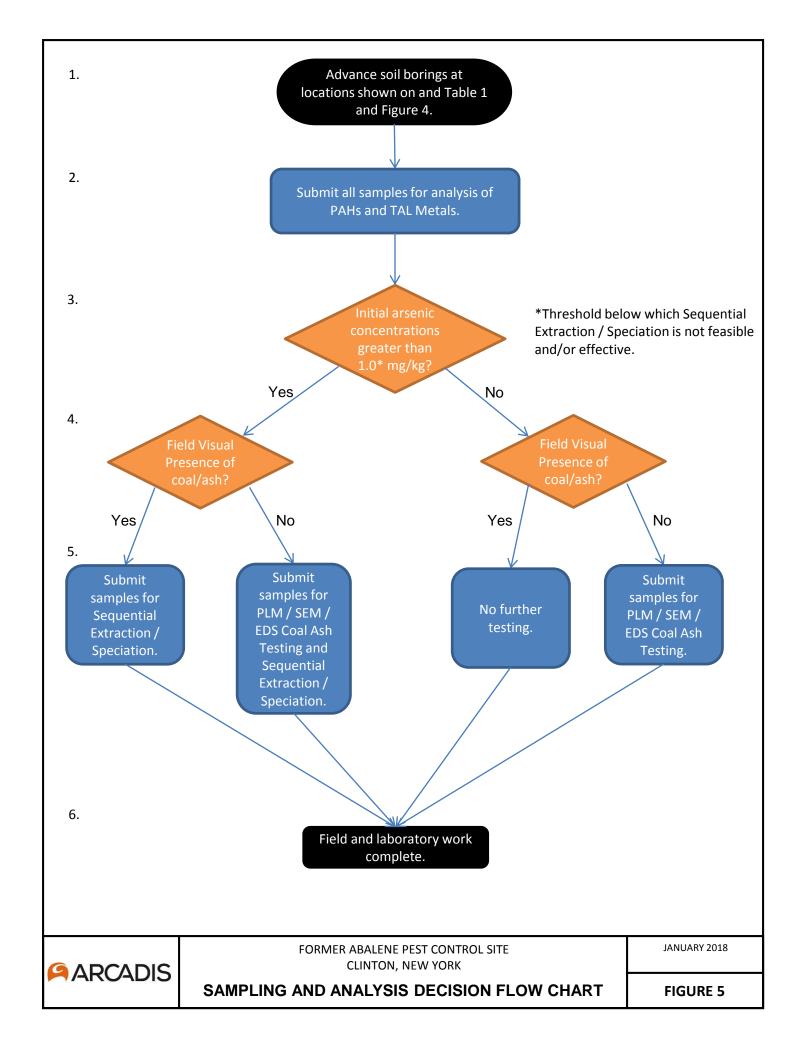
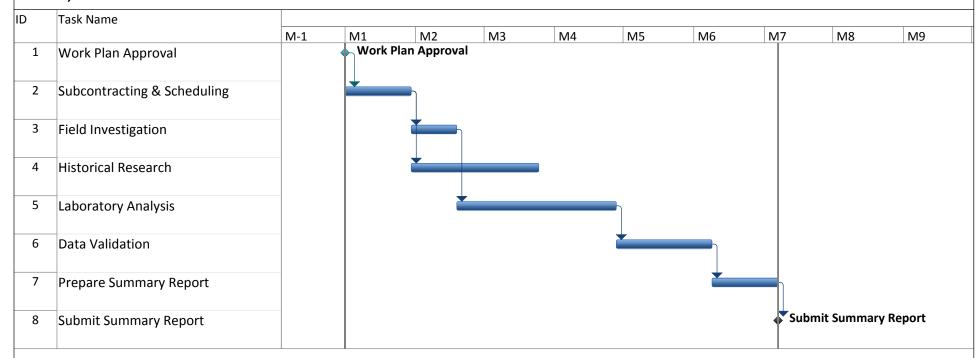


Figure 6
Conceptual Schedule
Forensic Testing
Former Abalene Pest Control Site
Clinton, New York

Month



TABLES

Table 1 Summary of Proposed Sampling Former Abalene Pest Control Site Clinton, New York

				T	Proposed Sampling						
Boring ID	Depth (ft bgs)	Previous Maximum Arsenic Concentration (mg/kg)	Previous Field and/or Microscopic Visual Evidence of coal/ash	Property	Visual Inspection for coal/ash	PAHs	TAL Metals	PLM/SEM/EDS Coal Ash Testing*	Sequential Extraction/ Speciation**	Rationale	
SB-15			Yes								
	Field decision		-		X	X	Х	X	X	near-surface interval to evaluate vertical arsenic distribution	
	Field decision		-		X	X	Х	X	X	sample interval with field visible coal/ash, if different than below	
	5-5.5	863	No		X	X	Х	X	X	on-site arsenic hotspot	
SB-16			Yes								
	Field decision		-		X	X	Х	X	X	sample interval with field visible coal/ash, if different than below	
	1.5-2.5	25.8	No	Orkin	X	X	X	X	X	on-site pesticide hotspot, average arsenic, truck washing area	
SB-17			No	0							
	Field decision		-		X	X	X	X	X	sample interval with field visible coal/ash, if different than below	
	3.5-4.5	11.3	No		X	Х	Х	Х	Х	on-site pesticide hotspot, low arsenic, truck washing area	
SB-77			Yes								
	Field decision		-		X	X	Х	X	X	sample interval with field visible coal/ash, if different than below	
	0-0.5	349	No		X	X	X	X	X	on-site arsenic hotspot	
	Field decision		-		X	X	X	X	X	deep interval to evaluate vertical arsenic distribution	
SB-65			Yes								
	Field decision		-		X	Х	X	X	X	sample interval with field visible coal/ash, if different than below	
	1.5-2.5	13.1	Yes	Clinton Collision	X	Х	X	X	Х	Peripheral location, low arsenic, potential historic fill	
SB-129			Yes	Cilition Comolon							
	Field decision		-		X	X	Х	X	X	sample interval with field visible coal/ash, if different than below	
	0.5-1.5	11.1	Yes		X	X	X	X	X	Peripheral location, low arsenic, potential historic fill	
SB-79			Yes								
	Field decision		-		X	X	Х	X	X	sample interval with field visible coal/ash, if different than below	
	0-0.5	56.1 J	No		X	X	X	X	X	Peripheral location, average arsenic, coal/ash not identified	
SB-83			Yes								
	Field decision		-	Quonset Hut	X	X	Х	X	X	sample interval with field visible coal/ash, if different than below	
	2.5-3.5	19.3	Yes	Quonoctriat	X	X	Х	X	X	Peripheral location, low to average arsenic, potential historic fill	
SB-98			Yes								
	Field decision		-		X	X	X	X	X	sample interval with field visible coal/ash, if different than below	
	0-0.5	682	Yes		X	X	Х	X	X	off-site arsenic hotspot	
	Field decision		-		X	X	X	X	X	deep interval to evaluate vertical arsenic distribution	
SB-91			Yes								
	Field decision		-		X	Х	Х	X	X	near-surface interval to evaluate vertical arsenic distribution	
	Field decision		-		X	X	Х	X	X	sample interval with field visible coal/ash, if different than below	
	1-2	54.8	No		X	Х	X	X	X	Peripheral location, average arsenic, coal/ash not identified, potential historic fi	
SB-100			Yes								
	Field decision		-		X	X	Х	X	X	sample interval with field visible coal/ash, if different than below	
	1.5-2.5	24.2	No	Dance Studio	X	X	X	X	X	Peripheral location, average arsenic, coal/ash not identified, potential historic fi	
SB-109			Yes								
	Field decision		-		X	X	Х	X	Х	sample interval with field visible coal/ash, if different than below	
	2-3	29.7	No		X	X	Х	X	X	Peripheral location, average arsenic, coal/ash not identified, potential historic fi	
New Boring			Yes								
	Field decision	N/A	N/A		X	X	X	X	X	near-surface interval to evaluate vertical arsenic distribution	
	Field decision	N/A	N/A		X	X	X	X	X	sample interval with field visible coal/ash	
				TOTAL	30	30	30	30	30		

- Concentration exceeds corresponding 6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objective

- Concentration exceeds corresponding 6 NYCRR Part 375 Commercial Use Soil Cleanup Objective

Note:

^{*} If field visual observation reveals evidence of coal/ash, PLM/SEM/EDS Coal Ash Testing will not be conducted.

^{**} If initial arsenic concentrations are below approx. 1 mg/kg, Sequential Extraction/Speciation Testing will not be conducted. See Figure 5 Decision Flow Chart.

APPENDIX A

Sanborn® Fire Insurance Maps

Former Abalene Pest Control

108 McBride Ave Clinton, NY 13323

Inquiry Number: 4456618.3

November 03, 2015

Certified Sanborn® Map Report



Certified Sanborn® Map Report

11/03/15

Site Name:

Former Abalene Pest Control 108 McBride Ave Clinton, NY 13323 ARCADIS U.S., Inc. 855 Route 146 SUITE 210 Clifton Park, NY 12065

Client Name:



EDR Inquiry # 4456618.3 Contact: Stefan Bagnato

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by ARCADIS U.S., Inc. were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Site Name: Former Abalene Pest Control

Address: 108 McBride Ave City, State, Zip: Clinton, NY 13323

Cross Street:

P.O. # 01368050.0000

Project: Former Abalene Pest Control

Certification # AA2B-4FC4-81BE

Maps Provided:

1941

1923

1910

1904

1895



Sanborn® Library search results Certification # AA2B-4FC4-81BE

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

✓ Library of Congress

✓ University Publications of America

▼ EDR Private Collection

The Sanborn Library LLC Since 1866^{TM}

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Sanborn Sheet Thumbnails

This Certified Sanborn Map Report is based upon the following Sanborn Fire Insurance map sheets.



1941 Source Sheets



Volume 1, Sheet 7

1923 Source Sheets



Volume 1, Sheet 7

1910 Source Sheets



Volume 1, Sheet Keymap/Sheet1

1904 Source Sheets

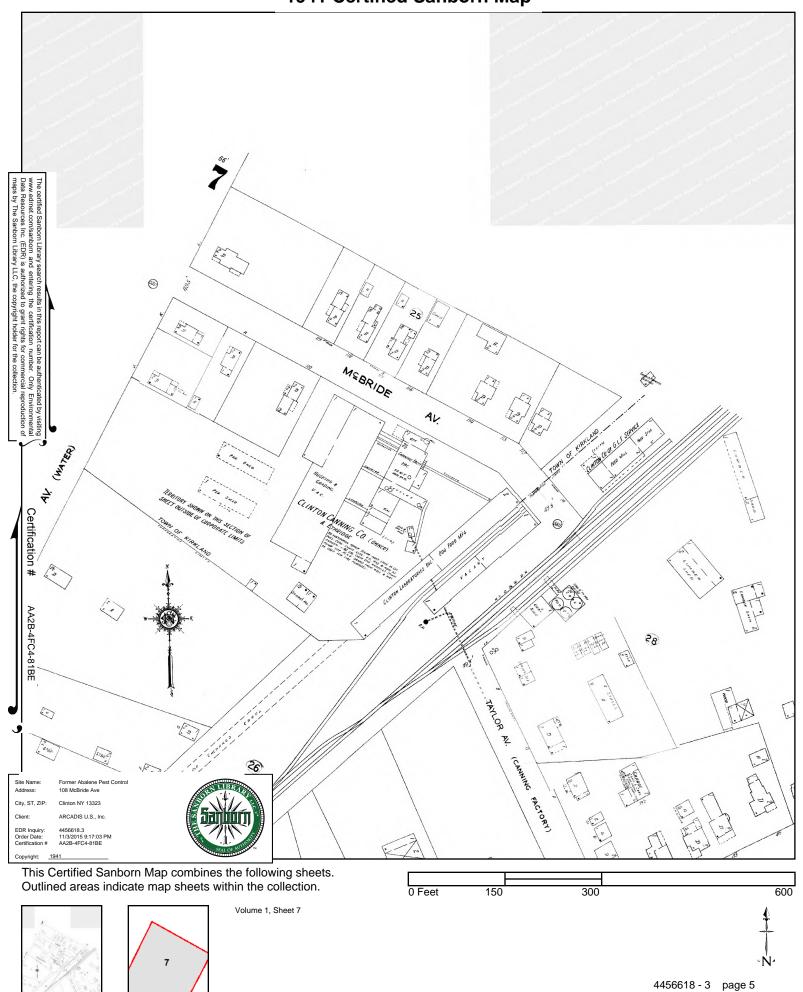


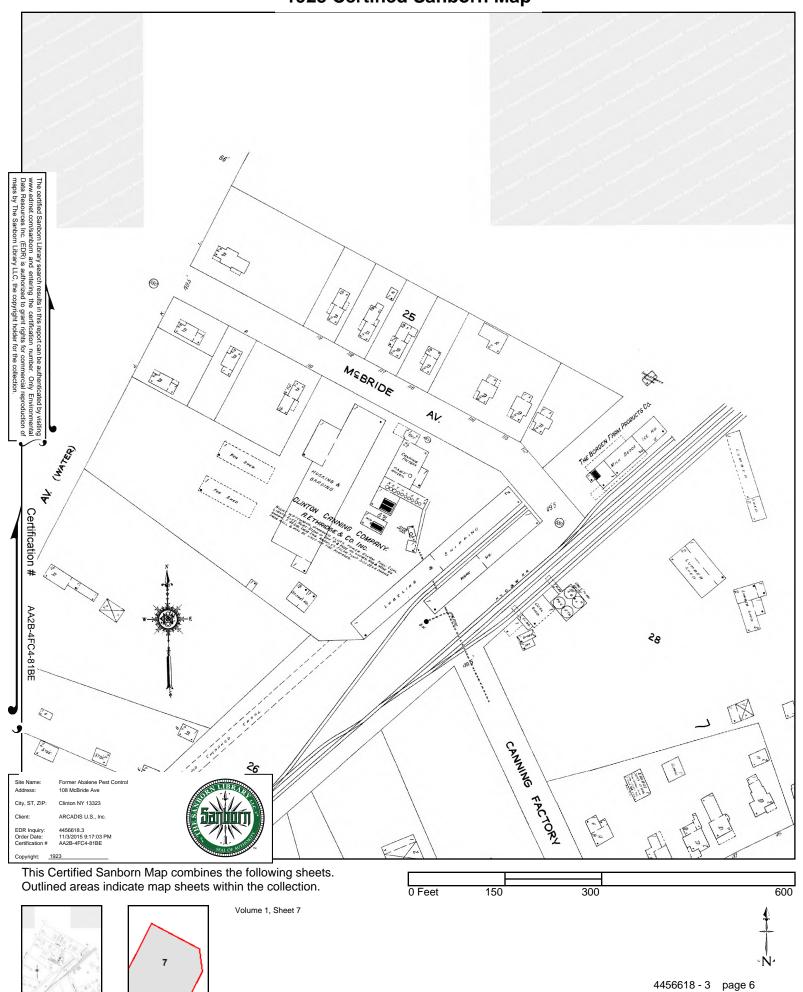
Volume 1, Sheet Keymap/Sheet1

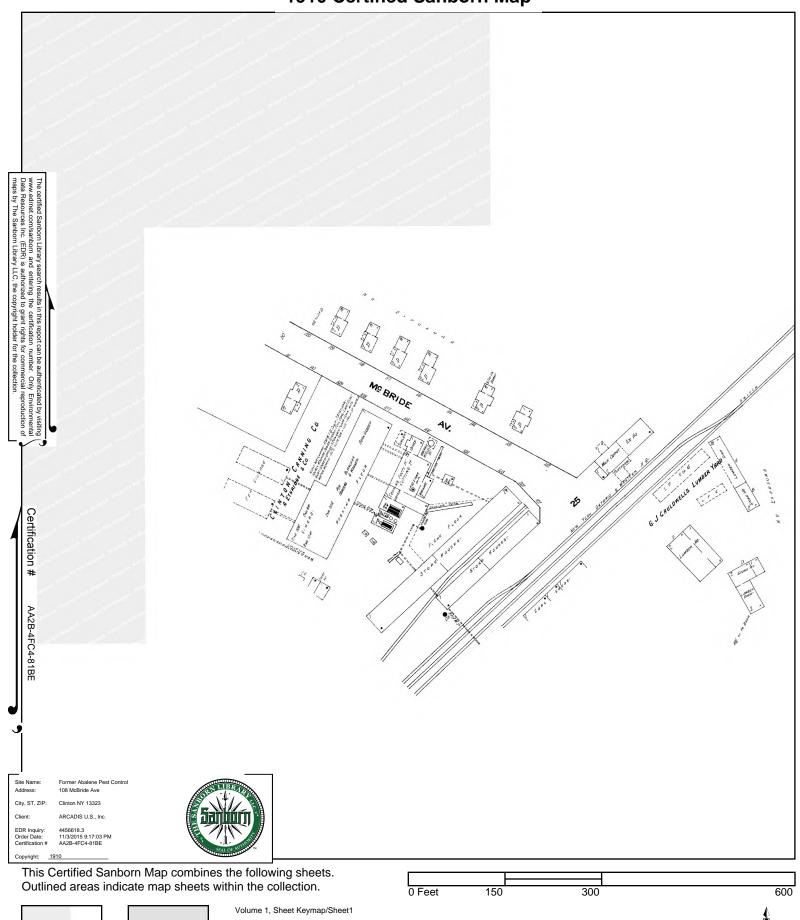
1895 Source Sheets



Volume 1, Sheet Keymap/Sheet1



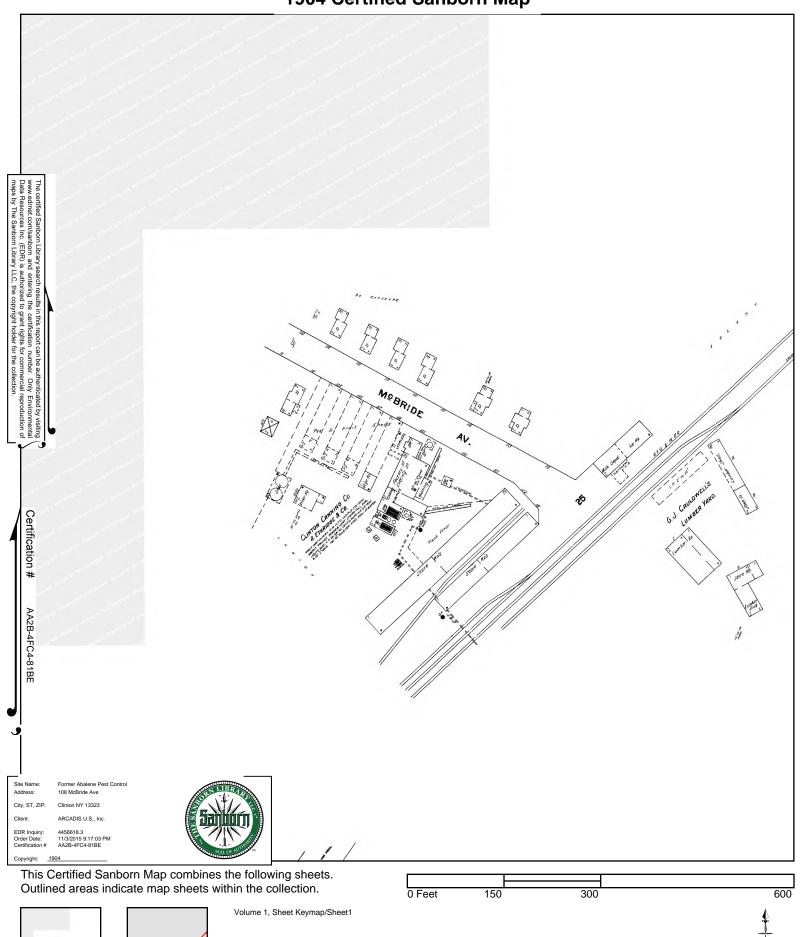






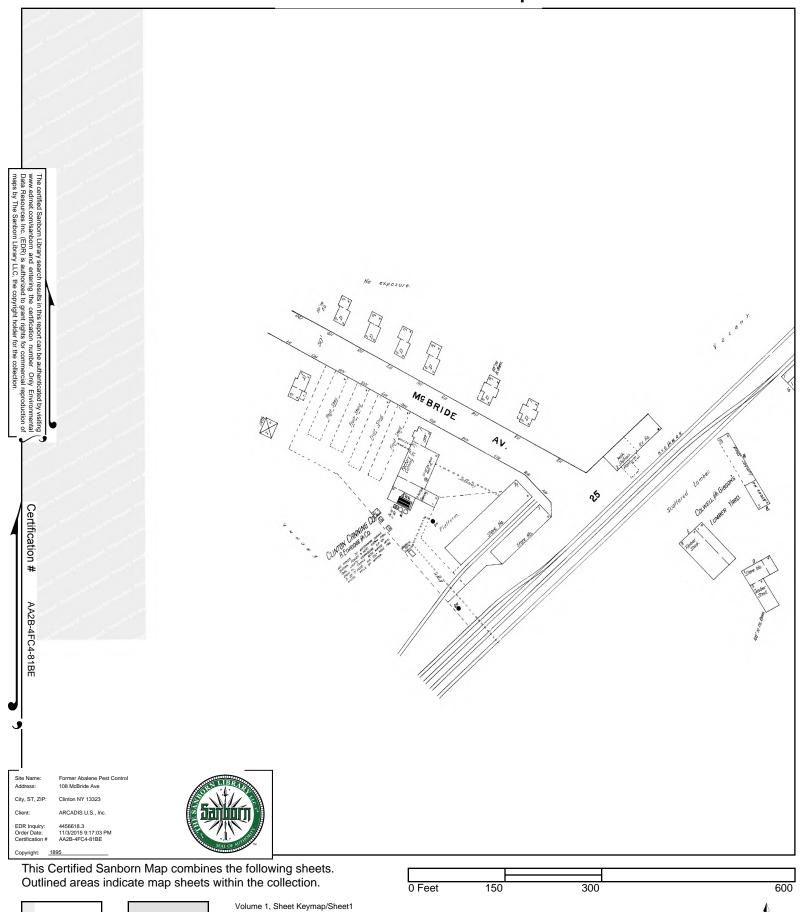






Keymap/Sheet1

4456618 - 3 page 8







APPENDIX B

Historical Topographic Maps

Former Abalene Pest Control 108 McBride Ave Clinton, NY 13323

Inquiry Number: 4456618.4

November 03, 2015

EDR Historical Topo Map Report

with QuadMatch™



EDR Historical Topo Map Report

11/03/15

-75.3757 -75° 22' 33" West

Site Name:

Former Abalene Pest Control

108 McBride Ave Clinton, NY 13323

EDR Inquiry # 4456618.4

Client Name:

ARCADIS U.S., Inc.

855 Route 146 SUITE 210 Clifton Park, NY 12065

Contact: Stefan Bagnato



EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by ARCADIS U.S., Inc. were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

s: Coordinates:
s: C

Former Abalene Pest Control Site Name:

Address: 108 McBride Ave City, State, Zip: Clinton, NY 13323

P.O.# 01368050.0000

Project: Former Abalene Pest Control

43.0538 43° 3' 14" North Latitude:

Longitude: **UTM Zone:** Zone 18 North

469404.03 **UTM X Meters:**

UTM Y Meters: 4766857.70

Elevation: 573.02' above sea level

Maps Provided:

2013

1955

1949

1947

1898

1895

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Topo Sheet Thumbnails

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2013 Source Sheets



Clinton 2013 7.5-minute, 24000



Utica West 2013 7.5-minute, 24000

1955 Source Sheets



Clinton 1955 7.5-minute, 24000 Aerial Photo Revised 1941 Edited 1955



Utica West 1955 7.5-minute, 24000 Aerial Photo Revised 1941 Edited 1955

1949 Source Sheets



Clinton 1949 7.5-minute, 24000 Aerial Photo Revised 1941



Utica West 1949 7.5-minute, 24000 Aerial Photo Revised 1941

1947 Source Sheets

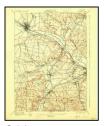


Rome 1947 15-minute, 62500 Aerial Photo Revised 1941

Topo Sheet Thumbnails

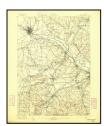
This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1898 Source Sheets

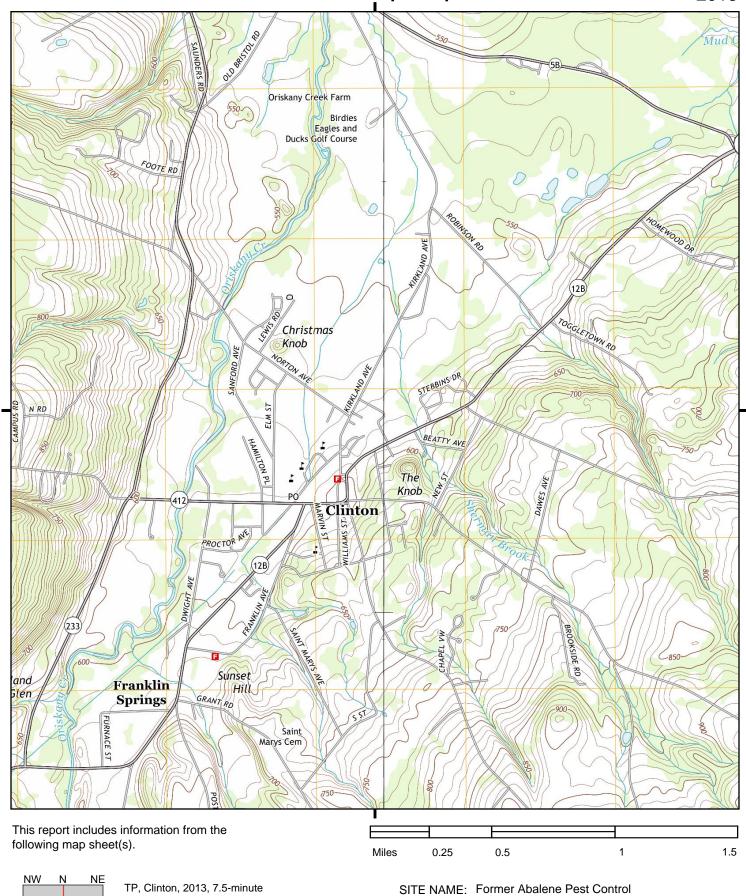


Oriskany 1898 15-minute, 62500

1895 Source Sheets



Oriskany 1895 15-minute, 62500



W lΕ

S

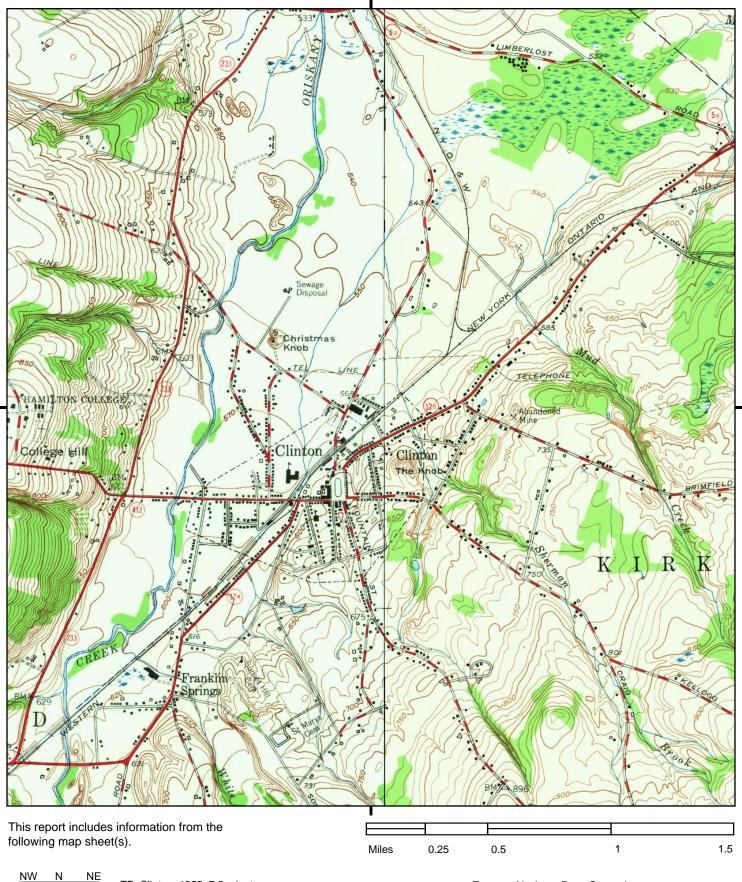
SE

SW

E, Utica West, 2013, 7.5-minute

108 McBride Ave ADDRESS: Clinton, NY 13323

ARCADIS U.S., Inc. CLIENT:



W E SW S SE

TP, Clinton, 1955, 7.5-minute

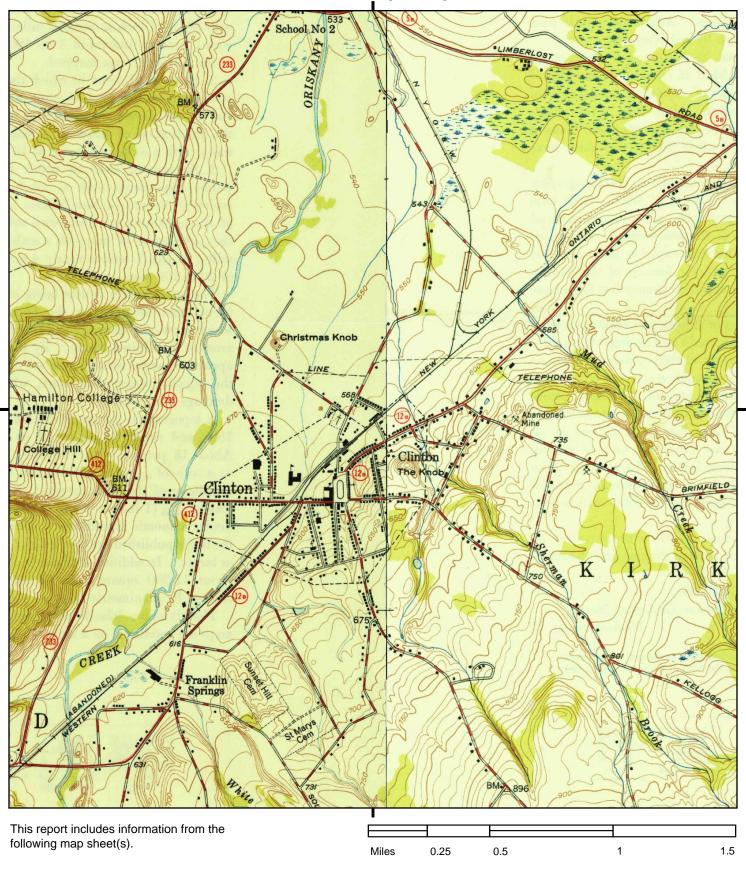
E, Utica West, 1955, 7.5-minute

SITE NAME: Former Abalene Pest Control

ADDRESS: 108 McBride Ave

Clinton, NY 13323

CLIENT: ARCADIS U.S., Inc.



NW N NE TP, CI

SE

S

SW

TP, Clinton, 1949, 7.5-minute

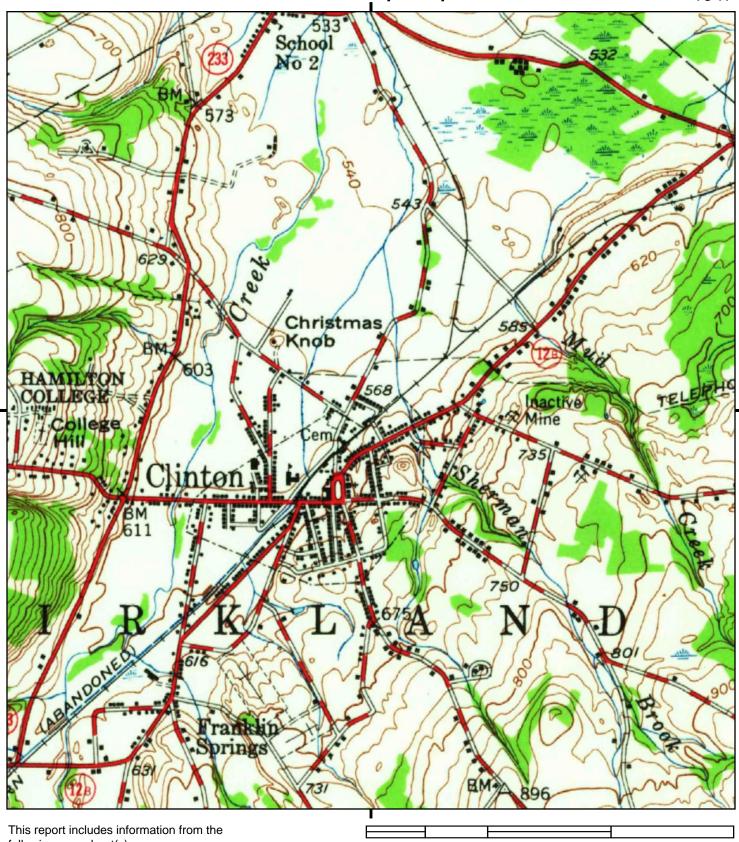
E, Utica West, 1949, 7.5-minute

SITE NAME: Former Abalene Pest Control

ADDRESS: 108 McBride Ave

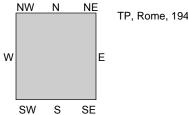
Clinton, NY 13323

CLIENT: ARCADIS U.S., Inc.



Miles

following map sheet(s).



TP, Rome, 1947, 15-minute

SITE NAME: Former Abalene Pest Control

0.5

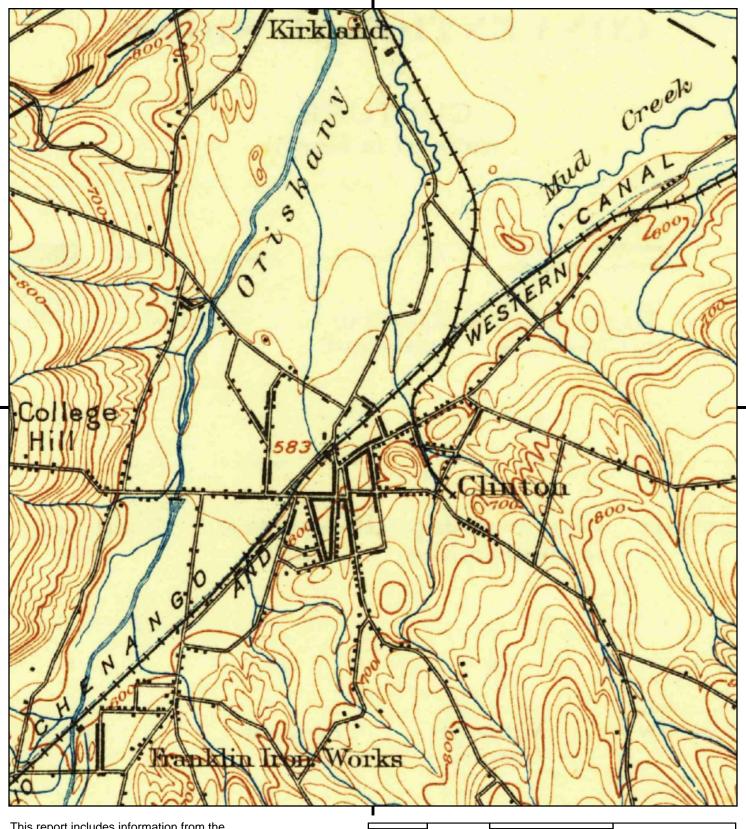
ADDRESS: 108 McBride Ave

0.25

Clinton, NY 13323 ARCADIS U.S., Inc. CLIENT:

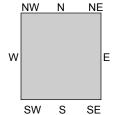


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Miles

This report includes information from the following map sheet(s).



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ADDRESS: 108 McBride Ave

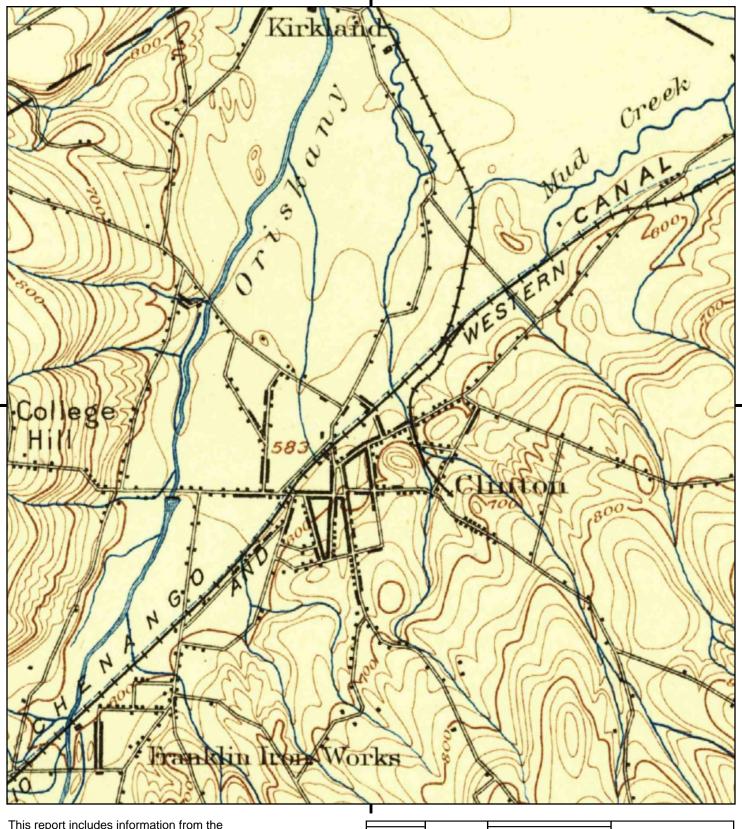
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Clinton, NY 13323

ARCADIS U.S., Inc. CLIENT:

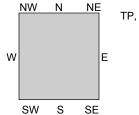


1.5



Miles

This report includes information from the following map sheet(s).



TP, Oriskany, 1895, 15-minute

SITE NAME: Former Abalene Pest Control

0.5

ADDRESS: 108 McBride Ave

0.25

Clinton, NY 13323

ARCADIS U.S., Inc. CLIENT:



1.5

APPENDIX C

Historical Aerial Photographs

Former Abalene Pest Control

108 McBride Ave Clinton, NY 13323

Inquiry Number: 4456618.9

November 05, 2015

The EDR Aerial Photo Decade Package



EDR Aerial Photo Decade Package

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Date EDR Searched Historical Sources:

Aerial Photography November 05, 2015

Target Property:

108 McBride Ave

Clinton, NY 13323

<u>Year</u>	<u>Scale</u>	<u>Details</u>	<u>Source</u>
1941	Aerial Photograph. Scale: 1"=500'	Flight Date: July 10, 1941	EDR
1956	Aerial Photograph. Scale: 1"=500'	Flight Date: October 14, 1956	USGS
1958	Aerial Photograph. Scale: 1"=500'	Flight Date: October 13, 1958	USGS
1974	Aerial Photograph. Scale: 1"=500'	Flight Date: April 17, 1974	EDR
1981	Aerial Photograph. Scale: 1"=500'	Flight Date: May 07, 1981	USGS
1989	Aerial Photograph. Scale: 1"=500'	Flight Date: April 28, 1989	EDR
1997	Aerial Photograph. Scale: 1"=500'	DOQQ - acquisition dates: May 18, 1997	USGS/DOQQ
2006	Aerial Photograph. Scale: 1"=500'	Flight Year: 2006	USDA/NAIP
2008	Aerial Photograph. Scale: 1"=500'	Flight Year: 2008	USDA/NAIP
2009	Aerial Photograph. Scale: 1"=500'	Flight Year: 2009	USDA/NAIP
2011	Aerial Photograph. Scale: 1"=500'	Flight Year: 2011	USDA/NAIP





INQUIRY #: 4456618.9

YEAR: 1956

<mark>─</mark> = 500'



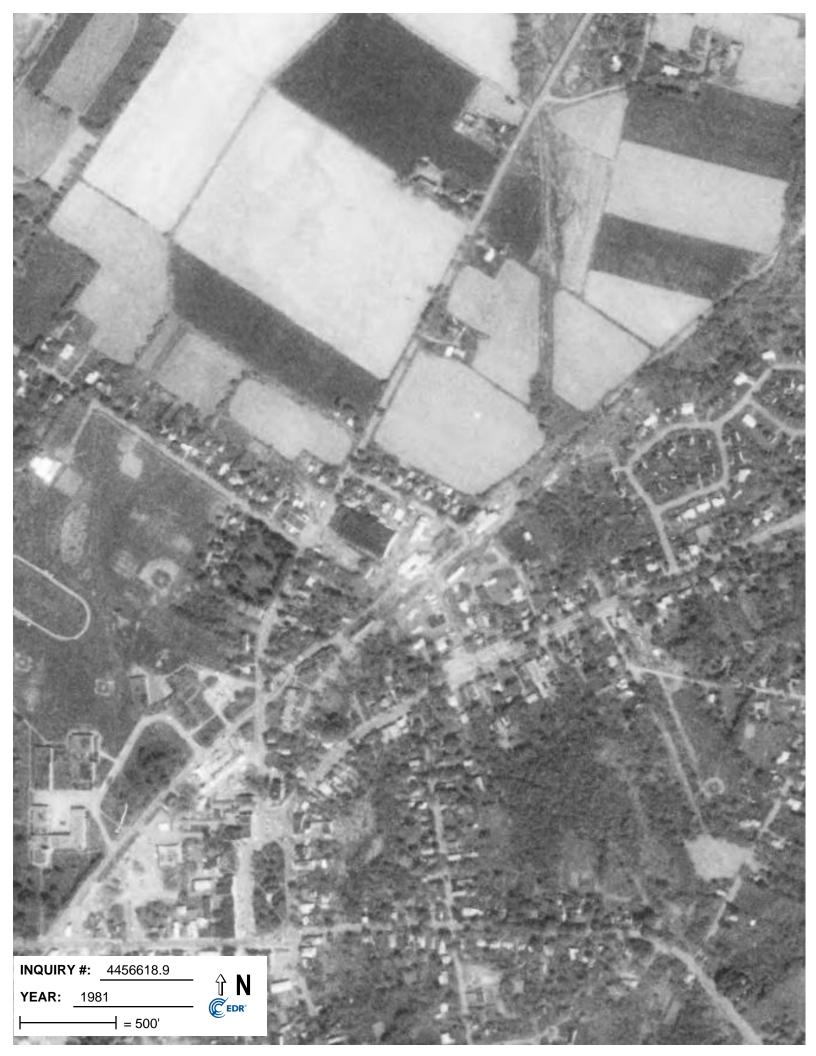


INQUIRY #: 4456618.9

YEAR: 1958

 $\frac{4456618.9}{8}$ $\frac{1}{1} = 500'$



















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855 Route 146

Suite 210

Clifton Park, New York 12065

Tel 518 250 7300

Fax 518 250 7301

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