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FOCUSED FEASIBILITY STUDY REPORT

KATZMAN RECYCLING SITE
GRANVILLE, NEW YORK 12832
NYSDEC Site No. 558035
Work Assignment No. D007620-24

Submitted to:

New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, New York 12233

Prepared by:

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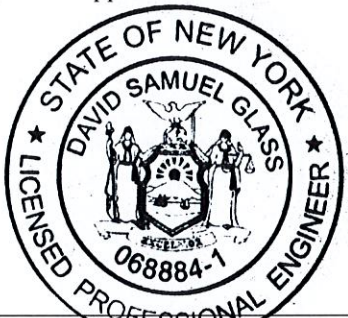
P.E. CERTIFICATION

I, David S. Glass, PE, PG, certify that I am currently a NYS registered professional engineer and that this Focused Feasibility Study Report 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) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.



NYS Professional Engineer #68884	11.12.2018 Date	Signature

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1.0 INTRODUCTION

1.1 Purpose and Organization

This Focused Feasibility Study (FFS) Report has been prepared to evaluate remedial alternatives for polychlorinated biphenyl (PCB) impacts in soil at the Katzman Recycling Inactive Hazardous Waste Disposal Site (Site No. 558035) located at 24 County Road 26, near the intersection with Route 22, in Granville, Washington County, New York (the "Site") (**Figure 1**). The Site boundary and surrounding parcels are shown on **Figure 2**. Shown on **Figure 3** is a Site Plan including the approximate limits of the majority of impacts (identified as the main waste accumulation area), which are the subject of this FFS Report. This FFS Report was completed in accordance with NYSDEC Division of Environmental Remediation (DER) Work Assignment (WA) No. D007620-24, 6 NYCRR Part 375, and Technical Guidance for Site Investigation and Remediation (DER-10).

Between December 2015 and June 2017, a Remedial Investigation (RI) was completed for NYSDEC by TRC Engineers, Inc. (TRC), primarily to investigate the nature and extent of PCB impacts at the Site. The findings of the investigation are presented in the Final RI Report prepared by TRC.

This FFS Report describes remedial alternatives that may be implemented to address PCB impacts in soil identified by the RI as well as by previous investigations of the Site. The FFS Report has been organized into six sections as follows:

- **Section 1** – Introduction, including Site setting, Site uses, and Site history, geology, hydrogeology, and summaries of Site investigations and remedial actions.
- **Section 2** – Qualitative Human Health Risk Evaluation.
- **Section 3** – Identification of remedial action objectives and standards, criteria, and guidance.
- **Section 4** – Remedial alternatives analysis, including descriptions of each remedial alternative.
- **Section 5** – Comparative analysis of remedial alternatives.
- **Section 6** – A listing of references used for preparation of this report.

1.2 Site Location and Setting

The Site is located at 24 County Road 26 in the Town of Granville, Washington County, New York (Washington County Tax Map ID: 126.-1-26) (**Figure 2**). The Site is located in a mixed commercial and residential area. According to the Washington County property description records, the property is zoned Commercial. The Site encompasses approximately 20.3 acres and is bounded by County Route 26 and commercial properties to the west. Adjacent to the Site along the southwestern boundary is a tractor equipment supplier and New York State Route 22. Warner's Auto Body, an auto sales and repair facility, is directly north of the western portion of the property, and vehicles associated with the auto body property have been observed encroaching on the Site. Further north are athletic fields and farmland. Directly east of the property is a former Delaware and Hudson Railroad roadbed that has been converted into a recreational trail. Further to the east are agricultural land and undeveloped land.

As shown on **Figure 3**, there is a delineated wetland that has consistent standing water, in the western portion of the Site, and a second delineated wetland band that extends from north to south near the center of the property, east of the main waste accumulation area. Site surface water drainage is generally expected to flow towards the Indian River, located southwest of Route 22, which ultimately flows into the Mettawee River. The Site is secured along the western and northern boundaries with fencing and the entrance from Route 26 is secured with a locked gate; however, the south and eastern boundaries are readily accessible. The gravel road leading from Route 26 to the eastern portion of the Site provides access to the former scrap metal recycling areas that were the focus of the RI. The majority of the Site is undeveloped and the eastern half of the property is heavily wooded. The Site is generally level with the exception of the southwestern portion. The wetland in the western portion of the Site is approximately 30 feet lower than the developed portion of the Site.

1.3 Current and Historic Site Uses

Currently the Site is abandoned. Between 1949 and 2007, the Site was occupied by a facility that accepted various metal products for recovery and recycling. The former incinerator building used during historical operations is centrally located on the Site (refer to **Figure 3**). There is associated incinerator waste north, west, and south of the structure. Among the waste materials identified at the Site are used auto parts, carburetors, chain saws, automobiles, heavy equipment, white goods, transformer carcasses, capacitors, and other electrical equipment. A pile in the southern portion of the Site located along the embankment near the western wetland area was found to be composed of incinerator waste. The area east of the incinerator building appears to be the location where capacitors and transformers were dismantled. Additionally, to the east of the incinerator, several older model automobiles were discovered, scattered throughout the wooded area. There is a pole barn which was used for storage and possibly mechanical work located near the northwestern Site boundary.

1.4 Geology and Hydrogeology

1.4.1 Surficial Geology

During the RI, borings were advanced to depths ranging from 5 to 16 feet bgs, with the exception of one boring that was advanced to 44 feet bgs. The groundwater table was observed at approximately 12 feet bgs at most locations. Based on the information gathered during the RI, the surficial geology at the Site consists of brown, medium-grain sand above a gray to brown silt, beginning at approximately 5 feet below ground surface (bgs) and extending to the observed maximum depth of approximately 44 feet bgs.

According to the Surficial Geology Map of New York – Hudson-Mohawk Sheet (1987), the material underlying the Site is classified as Lacustrine sand (ls). The material is described as "sand deposits associated with large bodies of water, generally a near-shore deposit or near a sand source. Well sorted, stratified, generally quartz sand with variable thickness (2 to 20 meters)." According to the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS), soil at the Site and in the surrounding area is classified as Hartland-Belgrade, very fine sandy loam (HcC) and silt loam (BeB).

Based on field observations, native surficial geology at the Site was found to coincide with the description above; however, native soil within the main waste accumulation area was found to be covered with fill material consisting of abundant debris, ash, and scrap material. This fill material is primarily observed in the area around the former incinerator building and debris pile extending toward the south-southwest. Thickness of the fill material within the main waste accumulation area was observed to be approximately 1 to 4 feet thick, with a maximum thickness of over 10 feet along the embankment located south of the incinerator building.

1.4.2 Bedrock Geology

According to the Bedrock Geology Map of New York State – Hudson-Mohawk Sheet (1970), bedrock underlying the Site and surrounding area is classified as the Late Ordovician aged Indian River Slate. The Indian River Slate Formation is described as "deep-maroon and bluish-green weathering, well-bedded and variegated slate." Borings were not advanced into bedrock during the RI; however, abundant outcrops of the Indian River Slate Formation are found in the immediate vicinity of the Site.

1.4.3 Hydrogeology

The groundwater table at the Site was generally encountered within a silt and fine sand layer, generally between 3 and 18 feet bgs. Based on groundwater surface elevation measurements collected during the August 2016, November 2016, and April 2017 groundwater sampling events, the inferred predominant groundwater flow direction in the overburden aquifer at the Site is toward the west-southwest, in the direction of the wetland in the western portion of the Site.

1.5 Previous Investigations and Remedial Action History

A summary of information related to potential sources of impacts, previous sampling events and investigations, and remedial actions performed at the Site is presented in this section. Detailed descriptions of previous investigations and remedial actions are included in the RI Report.

1.5.1 NYSDEC 2006 – Preliminary Site Sampling Event

As described in detail in the Site RI Report, NYSDEC conducted a limited Site sampling event in 2006 to identify contaminants of concern south and east of the waste incinerator building. Based on the findings, the Site was reclassified as a Class 2 Inactive Hazardous Waste Disposal Site by NYSDEC, and on August 23, 2007, Site No. 558035 was assigned to the Site.

1.5.2 Precision Environmental Services 2014 & 2015 – Interim Remedial Measure

Between October 2014 and January 2015, Precision conducted an Interim Remedial Measure (IRM) which included the excavation of surface soil and former transformer "windings" impacted with PCBs, lead, and arsenic located south and east of the incinerator building. Approximately 2,200 tons of soil were removed and transported off-Site for disposal. Based on Site reconnaissance, the excavations appear to have been backfilled to grade.

1.6 Remedial Investigation Summary

Between December 2015 and June 2017, TRC completed RI field activities at the Site consisting of wetland and waterbody delineation; a land survey of property boundaries, topography, prominent Site features/structures, and RI sampling locations; advancement of test pits and direct push soil borings; installation of groundwater monitoring wells; collection and laboratory analysis of soil, groundwater, surface water, and sediment samples; and removal of a 2,000-gallon aboveground storage tank (AST) from the incinerator building. Detailed descriptions of RI field activities and findings are included in the Site RI Report. Tables summarizing analyte detections and exceedances in comparison to applicable criteria are presented in **Appendix A**. Presented below is a brief summary of findings.

1.6.1 Summary of Remedial Investigation Findings

1.6.1.1 Surface Soil Findings

The metals arsenic, barium, cadmium, chromium, copper, lead, and mercury; polycyclic aromatic hydrocarbons (PAHs) benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene; and PCBs were detected in surface (0 to 2 feet bgs) soil samples at concentrations above Commercial Use Soil Cleanup Objectives (SCOs). There were no other constituents detected in surface soil samples above the Commercial Use SCOs. Metals, SVOCs and PCBs detected at concentrations greater than Commercial Use SCOs are shown on **Figures 4 and 5**. The surface soil samples which contained metals and PAHs at concentrations above Commercial Use SCOs were collected within the main waste accumulation area and at sampling location KTZ-SS-1, and coincide with the PCB impacts detected in surface soil.

1.6.1.2 Subsurface Soil Findings

The subsurface investigations revealed limited VOC, SVOC, pesticide, and herbicide impacts in soil at the Site. These parameters are not considered compounds of concern for the Site.

Arsenic, barium, cadmium, chromium, copper, lead, nickel, zinc, benzo(a)pyrene, and PCB impacts above Commercial Use SCOs were encountered in subsurface soil throughout the Site, though primarily in and around the former incinerator building and within the piles of debris associated with the scrap recycling process (located within the main waste accumulation area). Constituents detected at concentrations greater than Commercial Use SCOs are shown on **Figures 5, 6, and 7**. The subsurface soil samples which contained metals and benzo(a)pyrene at concentrations above the Commercial Use SCOs were primarily collected within the main waste accumulation area and coincide with the PCB impacts.

1.6.1.3 Groundwater Findings

Two separate groundwater sampling events (August 2016 and April 2017) were completed as part of the RI. One or more VOCs were detected at concentrations marginally above Class GA Values in groundwater samples collected during both events. PCBs were detected at a concentration marginally above the Class GA Value in one groundwater sample collected in August 2016. Constituents detected at concentrations greater than Class GA Values are shown on **Figure 8**. These isolated marginal exceedances of Class GA Values are not considered to be a significant concern for the Site. PCBs were not detected above the Class GA Value in groundwater samples collected in April 2017. Four metals (iron, manganese, sodium, and thallium) were detected above Class GA values in several monitoring wells during both the August 2016 and April 2017 sampling events; however, these metals are typically found naturally in the environment and are not considered to be a concern for the Site (USGS, 1982).

1.6.1.4 Surface Water Findings

Three of the five surface water samples collected from the wetland area located in the western portion of the Site contained iron at concentrations above the Type A(C) (Fish Propagation) Value, which corresponds with the results of analyses for iron for the two monitoring wells (KTZ-MW-6 and KTZ-MW-7) located directly adjacent to the wetland area.

One pesticide, methoxychlor, was detected in one surface water sample at a concentration above the corresponding Type A(C) Value. Three pesticides (4,4'-DDD, beta-BHC, and delta-BHC) were detected in surface water samples at concentrations above the corresponding Type H(FC) (Human Consumption of Fish) Values. One pesticide, 4,4'-DDD, was detected in two surface water samples at concentrations greater than the Type W (Wildlife Protection) Value. Additionally, 2,3,7,8-tetrachlorodibenzo-*p*-dioxin equivalent, was detected in two surface water samples at concentrations greater than the Type H(FC) Value. Constituents detected at concentrations greater than comparison criteria are shown on **Figure 9**.

There were no significant detections of VOCs, SVOCs, or PCBs in surface water.

1.6.1.5 Sediment Findings

Three metals (arsenic, chromium and lead) were detected at concentrations slightly above Class C Sediment Guidance Values (SGVs) in one sediment sample (KTZ-SD-3). Constituents detected at concentrations greater than Class C SGVs are shown on **Figure 10**. Three additional step-out samples were collected to delineate the extent of impacts detected at this location. No concentrations above Class C SGVs were detected in the step-out samples. Therefore, the impacts are considered localized and minor.

There were no significant detections of VOCs, SVOCs, PCBs, pesticides, or dioxins in any of the sediment samples.

1.7 Conceptual Site Model

With the conclusion of the IRM and RI sampling activities, the current Conceptual Site Model is described below.

While no single source location has been identified, the general nature of previous Site use as an accepter of scrap metal, including items that contained PCBs (e.g., transformers, capacitors, etc.), can be identified as the source of PCB impacts, with the associated accumulated waste as the primary contributor. The delineated extents of potentially PCB-containing scrap on the surface correlates well with subsurface sampling results and indicates the impacts are primarily west of the eastern wetland, within the main waste accumulation area. There were no significant PCB-related impacts to groundwater, surface water or sediment identified during the RI.

Native surficial geology at the Site consists of sandy loam and silty loam. In the main waste accumulation area, fill material consisting of abundant debris, ash, and scrap metal was found above the native soil. The fill material is primarily found around the former incinerator building and a debris pile extending toward the south-southwest. Depth of the overlying fill material within the main waste accumulation area ranges from a thin layer to multiple feet thick. The maximum thickness measured within the large debris pile extending over the embankment southwest of the former incinerator building was approximately 44 feet. Groundwater across the main waste accumulation area was found to flow west-southwest, toward the low-lying western wetland area.

2.0 QUALITATIVE HUMAN HEALTH RISK EVALUATION

A qualitative exposure assessment was performed using the data collected during the RI. Currently, the Site property is zoned for Commercial use within a mixed use area. Surrounding properties are primarily commercial; however, the former Delaware and Hudson Railroad roadbed, which has been converted into a recreational use trail, is adjacent to the eastern border of the Site.

Soil

Surface and subsurface soil, generally in the main waste accumulation area at the Site, contain PCBs at concentrations greater than the corresponding 6 NYCRR Part 375 Unrestricted Use SCO, and in many locations above the Commercial Use SCO. Subsurface soils do not presently have a direct exposure point or route, as they are at depth. However, contact with impacted surface soils by wildlife, construction workers, and/or utility workers represent possible current and future exposure pathways.

Inhalation of contaminated soil particulates as well as ingestion and absorption of contaminated soil represent potential pathways for human exposure. The Site entrance from Route 26 is secured by fencing and a locked gate; however, the Site's southwestern and eastern boundaries are readily accessible, allowing the potential for exposure to wildlife and/or trespassers, as well as the potential to track contaminated soils offsite.

Groundwater

Ingestion and absorption of contaminated groundwater are potential pathways for human exposure. The groundwater table is at depths ranging between 3 and 18 feet below ground surface at the Site; therefore absorption of groundwater is generally unlikely. Additionally, groundwater at the Site is not utilized for any potable or non-potable purpose. Therefore, under current conditions, ingestion and absorption of contaminated groundwater do not represent significant potential exposure pathways, and for this reason, the potential for exposure to contaminated groundwater by human receptors is expected to be very low. The potential for exposure of workers to contaminated groundwater via absorption exists if soil excavation is required at depths below the water table; however, direct contact with groundwater is unlikely.

Surface Water and Sediment

Samples of both surface water and sediment did not show evidence of PCB impacts, and only minor exceedances of comparison criteria for other parameters. With limited potential for exposure to surface water or sediment under current Site conditions, these media are not considered of concern.

Since there are no occupied structures on the property, exposure to Site contaminants via vapor intrusion is not a potential pathway.

3.0 IDENTIFICATION OF REMEDIAL ACTION OBJECTIVES AND STANDARDS, CRITERIA AND GUIDANCE

This section identifies the Remedial Action Objectives (RAOs) which provide a general description of the objectives of a cleanup action and the applicable Standards, Criteria and Guidance (SCGs) for this FFS Report. The primary purpose of this FFS Report is to evaluate remedial alternatives to address elevated concentrations of PCBs in soil.

In order to identify and evaluate the remedial alternatives, an initial identification of RAOs and preliminary remediation goals (PRGs) is required. RAOs provide the basis for developing numerical remediation goals, which are used to identify the appropriate extent of a cleanup action. This section also describes the potential SCGs that a remedial action must achieve.

Consistent with the land use that is typical of the area the Site property is zoned for Commercial use. Accordingly, the RAOs discussed in this section were developed based primarily on continued commercial use of the Site.

3.1 Remedial Action Objectives

RAOs are developed in order to set objectives for protecting public health and the environment early in the remedial alternative development process. The objectives should be as specific as possible but should not unduly limit the range of alternatives that can be developed. RAOs should specify (1) the contaminants of concern; (2) the exposure route(s) and receptor(s); and (3) an acceptable contaminant level (or range of levels) for each exposure route. The RAOs for the Site, presented below for each type of environmental media, were developed in consideration of current known Site conditions.

3.1.1 Soil

- Prevent ingestion/direct contact with contaminated soil; and
- Prevent migration of contaminants that would result in groundwater or surface water contamination.

3.1.2 Groundwater

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.

3.2 Potentially Applicable Standards, Criteria, and Guidance and Preliminary Remediation Goals

SCGs are defined as follows:

> "Standards and criteria are cleanup standards, standards of control, and other substantive environmental requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location or other circumstance."
>
> "Guidance are non-promulgated criteria, advisories and/or guidance that are not legal requirements and do not have the same status as standards and criteria; however, remedial alternatives should consider guidance documents that, based on professional judgment, may be applicable to the project."

Chemical-specific SCGs are usually health- or risk-based restrictions on the amount or concentration of a chemical that may be found in or discharged to the environment. These SCGs control remedial activities involving the design or use of certain equipment, or regulate discrete actions.

Note, location-specific and action-specific SCGs, which are more relevant to the evaluation of remedial alternatives, are not specifically identified in this section of the FFS; however, were considered in the evaluation presented in Section 4.0, Remedial Alternatives Analysis.

3.2.1 Chemical-Specific Standards, Criteria, and Guidance

3.2.1.1 Soil Preliminary Remediation Goals

Under 6 NYCRR 375-6 NYSDEC has established soil cleanup objectives for protection of ecological resources, protection of groundwater, and protection of public health. Applicable chemical-specific SCGs are summarized below and presented in **Table 1**.

Protection of Ecological Resources

The area of concern at the Site is primarily comprised of disturbed land. The area of concern is located between two areas of freshwater wooded/shrubbed wetlands. The wetland area on the western portion of the Site contains an intermittent surface water pond. The Indian River is downgradient approximately 600 feet southwest of the area of concern. Other than the freshwater wooded/shrubbed wetlands, there are no known ecological resources located on Site. The New York State Environmental Resource Mapper and

Nature Explorer were checked for the presence of rare plants and animals or significant natural communities in the vicinity of the Site and none were identified.

Surface water and sediment sampling of the freshwater wooded/shrubbed wetland area on the western portion of the Site revealed no significant detections of PCBs. Additionally, remedial alternatives evaluated in this FFS Report would not impact the wetland areas. Therefore, for this FFS Report, Protection of Ecological Resources SCOs are not considered further.

Protection of Groundwater

PCBs were not detected in groundwater samples collected during the April 2017 sampling event at concentrations greater than the Class GA Value. Therefore, the Protection of Groundwater SCO of 3.2 mg/kg for PCBs was not considered for the purpose of evaluating remedial alternatives.

Protection of Human Health

The Site is a listed Class 2 Inactive Hazardous Waste Disposal Site in the State Superfund Program; therefore, the NYSDEC has jurisdiction over the remedial action. Federal PCB remediation waste requirements at 40 CFR 761.61 were evaluated, however the administrative requirements are not anticipated to be implemented through the United States Environmental Protection Agency (USEPA), as the remedial action will be administered by NYSDEC. The following is a description of the soil cleanup levels and SCOs for PCBs used to develop the remedial alternatives described in the following section of the FFS Report:

- The soil cleanup level of 25 mg/kg of PCBs applies to bulk PCB remediation waste in low occupancy areas (40 CFR 761.61(a)(4)(i)(B)(1)) and is the basis for the Industrial Use SCO[1].

- Bulk PCB remediation waste may remain at concentrations >25 mg/kg and ≤50 mg/kg in a low occupancy area without being covered if the cleanup site is secured by a fence and marked with a sign (40 CFR 761.61(a)(4)(i)(B)(2)).

- Bulk PCB remediation waste may remain at concentrations >25 mg/kg and ≤100 mg/kg in a low occupancy area if the cleanup site is covered with a cap meeting the requirements of 40 CFR 761.61 (a)7 and (a)8 (40 CFR 761.61(a)(4)(i)(B)(3)).

[1] New York State Brownfield Cleanup Program, Development of Soil Cleanup Objectives, Technical Support Document, Section 6.0 - SCOs for Polychlorinated Biphenyls (PCBs).

- The soil cleanup level of 1 mg/kg of PCBs is applicable to high occupancy areas (40 CFR 761.61(a)(4)(i)(A)) and is the basis for the Commercial Use SCO[2]. Considering the Site is zoned Commercial, the Commercial Use SCO of 1 mg/kg for PCBs is applicable to the Site.

- Bulk PCB remediation waste may remain at concentrations >1 mg/kg and ≤10 mg/kg in a high occupancy area if the area is covered with a cap meeting the requirements of 40 CFR 761.61 (a)7 and (a)8 (40 CFR 761.61(a)(4)(i)(A)).

- To satisfy the requirement of DER-10 to evaluate an "unrestricted alternative", the Unrestricted Use SCO of 0.1 mg/kg for PCBs is used to develop remedial alternatives.

Additionally, the applicable federal and state regulations for disposal of PCB remediation waste were considered in the preparation of this FFS Report.

3.2.1.2 Additional Preliminary Remediation Goals

As stated above, there were no significant PCB-related impacts to groundwater, surface water or sediment identified during the RI. Therefore, identification of remediation goals for media other than soil is not necessary as part of this FFS.

3.3 General Response Actions

General Response Actions (GRAs) are remedial actions that will satisfy the RAOs identified in Section 3.1.

Impacts to soil were considered in determining appropriate GRAs. For soil, GRAs are identified and an initial evaluation of the areas or volumes to which the GRAs may be applied was conducted, as described below. In determining the volumes/areas, consideration was given to Site conditions, the nature and extent of contamination, acceptable exposure levels, and potential exposure routes.

Since this FFS Report is limited to addressing PCBs in soil, identification and analysis of GRAs, technologies, and process options for the remediation of groundwater (or other media) were not performed. However, long-term groundwater monitoring for Target Compound List (TCL) VOCs[3], PCBs, and per- and polyfluoroalkyl substances (PFAS) is included as part of the Remedial Alternatives described in Section 4.0.

[2] New York State Brownfield Cleanup Program, Development of Soil Cleanup Objectives, Technical Support Document, Section 6.0 - SCOs for Polychlorinated Biphenyls (PCBs).
[3] Analyses for VOCs would include USEPA Methods 8260 and 8270SIM to ensure acceptable reporting limits and data quality for 1,4-dioxane.

3.3.1 Soil

The GRAs for PCB-impacted soil include the following:

- No Action – no remedial action.
- Institutional Controls – administrative instruments, such as environmental easements or deed restrictions, which limit the use of a parcel, or portion thereof, for specific purposes and may impose additional administrative requirements.
- Containment – covering or capping impacted soil to eliminate exposure pathways and/or mitigate the infiltration of precipitation and associated contaminant migration.
- Excavation and Ex-Situ Management – excavation of impacted soil and on-Site treatment/disposal or transportation to an off-Site facility permitted to treat/dispose the waste.
- In-Situ Management – use of subsurface equipment and/or injection of amendments to treat or remove contaminants.

An analysis of the above-listed GRAs is presented in **Table 2**. As indicated in **Table 2**, No Action, Institutional Controls, Containment, and Excavation and Ex-Situ Management are the selected GRAs for further detailed analysis in this FFS Report.

3.4 Technology Screening

Technology screening was performed to evaluate technologies for the remediation of soil, as presented in **Table 2**. The table identifies technologies and includes brief descriptions of process options, and presents comments on applicability of each to the Site. The technology options that do not pass the screening process on the basis of technical implementability are identified in the table, and are not retained for further consideration.

Institutional Controls (ICs) include a range of legal administrative instruments (e.g., environmental easement) to notify the public of residual contamination, restrict Site use and require the development and implementation of a Site Management Plan (SMP).

The retained Containment technology consists of placement of a soil cover over areas containing concentrations of PCBs in soil greater than the applicable cleanup objective. The Containment technology may include consolidation and on-Site disposal of excavated PCB-impacted material and placement of a soil cover over the disposal area. Retained Excavation and Ex-situ Management technologies include excavation and off-Site disposal/treatment.

3.5 Remedial Alternatives Summary

The RAOs and GRAs, presented in Section 3.1 and 3.3, respectively, and the technologies retained in **Table 2** were used as guidance in the development of the remedial alternatives listed below.

<u>Alternative 1: No Action</u>

No remedial actions would be implemented under Alternative 1.

<u>Alternative 2: Removal of Soil with PCBs ≥ 50 mg/kg and Consolidation and Covering of Soil with PCBs >1 mg/kg with Site Management to Remediate to the Toxic Substance Controls Act (TSCA) Low-Occupancy Criteria</u>

The primary elements of Alternative 2 include the removal and off-Site disposal of soil containing concentrations of PCBs equal to or greater than 50 mg/kg and excavation and consolidation of remaining soils containing concentrations of PCBs greater than 1 mg/kg. The excavated PCB impacted soils which is not removed from the Site would be buried above the water table. The buried impacted material would be covered with 1 foot of clean soil and an environmental easement would restrict use of the portion of the Site corresponding to the footprint of the cell. Additional elements of Alternative 2 are described in Section 4.3.1.

<u>Alternative 3: Removal of Surface Soil with PCBs >1 mg/kg and Subsurface Soil with PCBs > 25 mg/kg with Site Management to Remediate to the Industrial Use SCO</u>

The primary elements of Alternative 3 include the removal and off-Site disposal of surface soil within the waste accumulation area containing concentrations of PCBs greater than 1 mg/kg and subsurface soil containing concentrations of PCBs greater than 25 mg/kg. Surface soil containing PCBs at concentrations greater than 1 mg/kg outside the waste accumulation area would be covered with 1 foot of clean soil. Additional elements of Alternative 3 are described in Section 4.4.1.

<u>Alternative 4: Removal of Surface Soil with PCBs > 1 mg/kg and Subsurface Soil with PCBs > 10 mg/kg with Site Management to Remediate to the Commercial Use SCO</u>

The primary elements of Alternative 4 include the removal and off-Site disposal of surface soil within the waste accumulation area containing concentrations of PCBs greater than 1 mg/kg and subsurface soil containing concentrations of PCBs greater than 10 mg/kg. Surface soil containing PCBs at concentrations greater than 1 mg/kg outside the waste accumulation area would be covered with 1 foot of clean soil. Additional elements of Alternative 4 are described in Section 4.5.1.

Alternative 5: Removal of Soil with PCBs > 0.1 mg/kg with Site Management to Remediate to the Unrestricted Use SCO

The primary elements of Alternative 5 include the removal and off-Site disposal of soil containing concentrations of PCBs greater than 0.1 mg/kg. Additional elements of Alternative 5 are described in Section 4.6.1.

4.0 REMEDIAL ALTERNATIVES ANALYSIS

The following sections present an analysis of the above remedial alternatives for the Site in accordance with the criteria described in Section 4.1.1.

4.1 Introduction

This section provides a detailed analysis of the above-referenced remedial alternatives. Each alternative is described in detail and evaluated with respect to ability to protect against risks to public health and the environment and technical applicability at the Site. Additionally, each alternative is compared on the basis of environmental benefits and costs using criteria established in 6 NYCRR Part 375, DER-10, and DER-31. The five remedial alternatives (including a "No Action" alternative) listed above are described in this section and compared to the RAOs for soil for the Site.

4.1.1 Evaluation Criteria

This section discusses the evaluation criteria against which each remedial alternative has been compared in accordance with 6 NYCRR Part 375 and Title 40 of the Code of Federal Regulations §300.430 (40 CFR §300.430, as required by DER-10). The evaluation criteria include the following:

- Overall protectiveness of public health and the environment
- Compliance with SCGs
- Short-term effectiveness and potential impacts during remediation
- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, and volume of hazardous waste
- Implementation and technical reliability
- Cost
- Community acceptance
- Land use

When evaluating alternatives in terms of overall protectiveness of public health and the environment, consideration is given to the manner in which Site-related risks are eliminated, reduced, or controlled. Compliance with SCGs, long-term effectiveness and permanence, and short-term effectiveness are given major consideration in determining the overall protectiveness offered by each alternative.

The alternatives are assessed to determine whether they attain SCGs under applicable federal environmental laws and state environmental and facility siting laws. The identification of SCGs is a site-specific process that is dependent on the specific hazardous substances, pollutants, and contaminants at a site, the physical characteristics and location of a site and the remedial actions under consideration at a site. Therefore, it is an iterative process requiring re-examination throughout the RI/FFS process, until the Record of Decision (ROD) is issued. Chemical-specific SCGs were previously discussed in Section 3.2. In the following alternative analyses, the individual remedial alternatives are evaluated in detail to determine compliance with SCGs that are applicable to the specific media being addressed by the alternative, and the potential impacts of SCGs on implementation of each alternative.

Selected remedial actions must meet the threshold criteria, and thereby be protective of public health and the environment. Effectiveness of an alternative is determined by evaluation with respect to the criteria listed above, including cost[4]. The result is a selected alternative that satisfies the threshold criteria and provides the best balance of the criteria, with an emphasis on long-term effectiveness and reduction of toxicity, mobility, and volume.

Community acceptance is not evaluated in the following sections since the related criteria will be evaluated as part of future activities (e.g., future public participation events). Land use is evaluated in the following sections as potential future land use may vary under each of the alternatives.

4.1.2 DER-31 Implementation

As part of the FFS process, TRC considered NYSDEC DER-31 implementation objectives. The NYSDEC DER's approach to remediating sites in the context of the larger environment is a concept referred to as "Green Remediation." The approach is intended to minimize overall environmental impacts by promoting the use of more sustainable practices and technologies. Green Remediation practices and technologies are less disruptive to the environment, generate less waste, increase reuse and recycling, and emit fewer pollutants, including greenhouse gases, to the atmosphere. Remedial alternatives and technologies were evaluated with respect to DER-31 throughout the FFS process as part of the overall protectiveness of public health and the environment evaluation criteria.

[4] For the purposes of this FFS, a discount rate of 7% was used in the present worth analyses.

4.2 Alternative 1: No Action

4.2.1 Description

Alternative 1, the No Action alternative, involves no remedial activities. NYSDEC 6 NYCRR Part 375 requires consideration of the No Action alternative; at a minimum it provides a baseline for comparison with other alternatives. Natural attenuation would be the sole method of remediation.

4.2.2 Overall Protection of Human Health and the Environment

The No Action alternative is not protective of public health and the environment. No action would be taken to prevent human exposure to concentrations of Site contaminants above SCOs present in surface and subsurface soils. Furthermore, no action would be taken to minimize the potential for off-Site contaminant migration. Potential future exposure to contaminated soil through ingestion of soil and/or soil disturbances at the Site or adjacent properties would not be prevented.

With respect to sustainability, Alternative 1 utilizes very few natural resources and does not include the disturbance of the existing landscape.

4.2.3 Compliance with SCGs

Chemical-specific SCGs for PCBs in soil would not be achieved with Alternative 1.

4.2.4 Short-Term Effectiveness

Alternative 1 would not result in any increased short-term risks, due to the lack of activities associated with its implementation. However, health risks associated with unrestricted access by the public to the Site and contaminated soil would not be addressed since the perimeter of the Site is currently not secure. Therefore, no action does pose a short-term risk under the current Site use. RAOs would not be achieved over the short-term.

4.2.5 Long-Term Effectiveness and Permanence

Alternative 1 is not effective in the long-term. Risks associated with PCB concentrations in soil would be expected to remain relatively the same in the long-term under this alternative. Alternative 1 also does not offer any long-term monitoring or Site use restrictions to prevent exposures to Site contamination. RAOs would not be achieved over the long-term.

4.2.6 Reduction of Toxicity, Mobility, and Volume with Treatment

Alternative 1 does not include any treatment methods other than naturally occurring degradation or attenuation processes. Therefore, the alternative offers no significant reductions in the toxicity, mobility, or volume of contamination through treatment.

4.2.7 Implementability

Alternative 1 would require no implementation. Future implementation of additional remedial actions, if needed, would not be limited.

4.2.8 Cost

Since this alternative encompasses no action, there is no cost to implement Alternative 1.

4.2.9 Land Use

The Site is currently not being used. This would not change under Alternative 1.

Alternative 1 is not considered to be viable since it would not meet any of the applicable criteria and will not provide any protection to human health and the environment. Accordingly, it will not be considered or discussed further in this document.

4.3 Alternative 2: Removal of Soil with PCBs ≥ 50 mg/kg and Consolidation and Covering of Soil with PCBs > 1 mg/kg with Site Management to Remediate to the TSCA Low-Occupancy Criteria

4.3.1 Description

Alternative 2 would include the demolition of the former incinerator building, site preparation, implementation of a pre-design investigation, excavation of surface and subsurface soil, confirmatory soil sampling, off-Site disposal and on-Site reuse of excavated soil, placement of a soil cover over soil reused on-Site, replacement of monitoring wells, and ICs.

The former incinerator building would be demolished and bulk scrap and debris piles within the main waste accumulation area, including the embankment along the southern edge, would be removed from the Site for recycling or disposal. Bulk scrap includes, but is not limited to, transformer carcasses, capacitors, automobile parts, and other miscellaneous scrap material. Additionally, limited clearing and grubbing of vegetation would be required in certain areas for implementation of the remedial alternative, as well as establishment of erosion and sediment controls (e.g., silt fencing and/or hay bales).

In order to confirm required limits of remediation (i.e., delineation of PCB concentrations above the applicable SCOs) and minimize the amount of waste transported off-Site for disposal, a pre-design investigation consisting of additional soil sampling would be performed as part of the remedial design. Additionally, the pre-design investigation would include sampling and analyses to characterize the waste to be removed in accordance with disposal facility acceptance criteria.

Surface and subsurface soil containing PCBs at concentrations greater than 1 mg/kg would be excavated. The approximate area and volume of soil to be excavated is shown on **Figure 11**. For the purpose of this FFS Report, it is estimated that under Alternative 2 approximately 14,100 cubic yards of soil would be excavated from depths of up to 19 feet bgs over an area of approximately 63,750 square feet. It is anticipated that the installation of temporary sheeting and/or shoring and dewatering would be necessary to excavate soil at depths generally greater than 8 feet bgs. Soil containing PCBs at concentrations equal to or greater than 50 mg/kg, estimated to be approximately 3,600 cubic yards, would be segregated and transported off-Site to disposal facilities permitted to accept the waste. For the purposes of this FFS Report, it is estimated that approximately 15% of soil transported off-Site for disposal would be characterized as RCRA hazardous waste exhibiting the characteristic of toxicity [i.e., exceeding Toxicity Characteristic Leaching Procedure (TCLP) regulatory limits]. The final extents of excavation and quantities of soil to be disposed of as RCRA hazardous waste would be determined based on the results of the pre-design investigation. Post-excavation confirmatory sampling would be performed in accordance with the Department-approved remedial design. It is expected that post-excavation sampling would be limited to TCL PCBs.

Excavated soil which does not contain concentrations of PCBs equal to or greater than 50 mg/kg, estimated to be approximately 10,500 cubic yards, would be stockpiled on-Site for reuse. Excavated soil would be staged on and covered with geomembranes and tarps. Stockpile covers would be secured (with sand bags or similar) to prevent erosion of and exposure to any portion of the stockpiles. Each stockpile would be surrounded by erosion and sedimentation controls. Stockpiled soil would be placed into an excavation on-Site and compacted between approximately 1 and 8 feet bgs (above the water table, estimated to be present at 12 feet bgs), over an area of approximately 40,000 square feet. Alternative 2 would reduce the footprint of the existing area impacted with PCBs at concentrations greater than 1 mg/kg by approximately 40 percent.

A soil cover consisting of imported environmentally clean fill meeting the general fill requirements of 6 NYCRR Part 360 with a minimum thickness of 1 foot would be placed over the impacted material. A demarcation layer (e.g., orange snow fencing or geotextile membrane) would be installed beneath the imported certified environmentally clean fill during backfilling. Clean fill would be imported to the Site, placed over the demarcation layer, and compacted to provide an approximately 8-inch thick layer of subbase. A 4-inch thick layer of topsoil would be installed over the clean fill and hydroseeded. Depending on the results of the pre-design investigation, the final grade of the filled area would potentially be higher than the existing grade. Excavations beyond the limits of the consolidated material would be backfilled with compacted clean fill and topsoil and hydroseeded. No demarcation layer would be installed in excavations outside the limits of the consolidated material.

Monitoring wells damaged during remedial actions would be replaced after backfilling and surface restoration is complete, since long-term groundwater monitoring would be performed as part of Site Management. Groundwater sampling would be performed on an annual basis for 10 years. After 10 years, the requirement for further groundwater monitoring would be re-evaluated. Estimated costs are based on analysis of groundwater samples for TCL VOCs, PCBs, and PFAS. However, a remedy-specific groundwater monitoring program would be developed as part of the final remedy selection.

ICs would include an environmental easement prohibiting on-Site groundwater extraction, limiting the future use of the Site, and requiring implementation of a SMP. The SMP developed for Alternative 2 would include requirements for soil management, periodic inspection and maintenance, if needed, of the soil cover, and long-term groundwater monitoring for TCL VOCs, PCBs and PFAS.

4.3.2 Overall Protection of Human Health and the Environment

Alternative 2 would be protective of public health and the environment as a result of consolidating and covering of soil containing PCBs at concentrations greater than 1 mg/kg and less than 50 mg/kg and removal of soil containing PCBs at concentrations equal to or greater than 50 mg/kg.

Short-term risks include exposure to contaminants during removal and covering of soil. Exposure to contaminants would be minimized by establishment and implementation of a health and safety plan and community air monitoring plan. The soil cover would act as a physical barrier to prevent disturbances of contaminated soil. The implementation of ICs would protect public health by ensuring the maintenance of the soil cover and restricting future Site development.

With respect to sustainability, Alternative 2 would consume a significant amount of energy in the short term, as a result of soil removal, consolidation, and covering activities. Long-term inspection of the soil cover and groundwater sampling would consume a minor amount of energy.

4.3.3 Compliance with SCGs

Alternative 2 would comply with the applicable chemical-specific SCGs for PCBs in soil since remaining soils with PCB concentrations above 1 mg/kg would be covered.

4.3.4 Short-Term Effectiveness

Removal of all soil impacted with PCBs at concentrations equal to or greater than 50 mg/kg and consolidating and covering all soil impacted with PCBs at concentrations greater than 1 mg/kg and less than 50 mg/kg provides effective short-term elimination of exposure risks. However, during removal and covering of soil impacted with PCBs, stockpiling and reuse of soil impacted with PCBs, and backfilling, there would be short-term risk to on-Site workers and the community. Appropriate establishment and implementation of a health and safety plan, community air monitoring plan, and best management practices (BMPs) would mitigate these risks.

The implementation of ICs would be effective in the short-term by ensuring the maintenance of the soil cover and restricting future Site development.

4.3.5 Long-Term Effectiveness and Permanence

Removal of soil impacted with PCBs at concentrations equal to or greater than 50 mg/kg and consolidating and covering soil impacted with PCBs at concentrations greater than 1 mg/kg and less than 50 mg/kg provides permanent effective long-term reduction of exposure risks, although concentrations of PCBs greater than the SCO applicable to the current zoning would remain in subsurface soils, which represents a limited remaining potential for long-term exposure risks.

The implementation of ICs would be effective in the long-term by ensuring the maintenance of the soil cover and restricting future Site development.

4.3.6 Reduction of Toxicity, Mobility, and Volume with Treatment

Alternative 2 would reduce the toxicity and volume of the impacted soil at the Site by removing soil with PCB concentrations above the TSCA-regulated waste limit of 50 mg/kg. Alternative 2 would also reduce the horizontal limits of soil containing PCBs at concentrations greater than the applicable SCO by consolidating impacted soil. Furthermore, Alternative 2 would reduce the mobility of impacted soil within the waste accumulation area and surface soil outside the waste accumulation area impacted with PCBs at concentrations greater than the SCO. However, the toxicity and volume of subsurface soil impacted with PCBs at concentrations less than 50 mg/kg would be unchanged.

4.3.7 Implementability

Alternative 2 requires the demolition of the on-Site incinerator, removal and off-Site disposal of scrap metal and debris, excavation and off-Site disposal of soil impacted with PCBs at concentrations equal to or greater than 50 mg/kg, consolidating and covering soil impacted with PCBs at concentrations greater than 1 mg/kg and less than 50 mg/kg, and establishment and implementation of ICs. All of the primary elements of

Alternative 2 would utilize well-proven technologies, and vendors with the qualifications to implement the alternative are readily available. However, the logistics of excavating, segregating, stockpiling, and backfilling of material on-Site under this alternative would represent significant challenges during construction, particularly where soil containing PCBs at concentrations greater than or equal to 50 mg/kg are present between intervals containing PCBs at concentrations less than 50 mg/kg. It is estimated that implementation of Alternative 2 would be completed within approximately 8 months of notice to proceed.

4.3.8 Cost

The primary costs of Alternative 2 are those associated with demolition of the incinerator, removal of scrap and debris, excavation and off-Site disposal and consolidation of PCB-impacted soil, covering of PCB-impacted soil, and long-term groundwater monitoring. The estimated direct capital cost for Alternative 2 is $7.0 million, and the estimated indirect capital cost is $1.8 million. The estimated present value for groundwater monitoring and Site inspection/monitoring is $170,000. Therefore, the estimated present value of Alternative 2, including contingency ($1.8 million), is $10.8 million. A detailed cost estimate is presented in **Table 3**.

4.3.9 Land Use

Use of the Site for a purpose consistent with current zoning (Commercial) would be permitted after implementation of Alternative 2, in accordance with the ICs and the conditions of the SMP.

4.4 Alternative 3: Removal of Surface Soil with PCBs >1 mg/kg and Subsurface Soil with PCBs > 25 mg/kg with Site Management to Remediate to the Industrial Use SCO

4.4.1 Description

Alternative 3 would include the demolition of the former incinerator building, site preparation, implementation of a pre-design investigation, excavation of surface and subsurface soil, confirmatory soil sampling, off-Site disposal and on-Site reuse of excavated soil, placement of soil cover over limited areas of surface soil, replacement of monitoring wells, and ICs.

Activities associated with the demolition of the Site incinerator, site preparation, implementation of a pre-design investigation, replacement of groundwater monitoring wells, and long-term groundwater monitoring would be performed as described in Section 4.3.

Alternative 3 would also include excavation, transportation and off-Site disposal of soil impacted with PCBs at concentrations greater than 25 mg/kg and surface soil impacted with PCBs at concentrations greater than 1 mg/kg within the waste accumulation area. For the purpose of this FFS Report, it is estimated that approximately 8,000 cubic yards of soil would be removed from depths of up to 10 feet bgs. The approximate areas of soil to be removed as well as soil to be covered are shown on **Figure 12**. It is anticipated that the installation of temporary sheeting and/or shoring and dewatering would be necessary to excavate soil at depths generally greater than 8 feet bgs. For the purposes of this FFS Report, it is estimated that approximately 15% of soil transported off-Site for disposal would be characterized as RCRA hazardous waste exhibiting the characteristic of toxicity. The final extents of excavation and quantities of soil to be disposed of as RCRA hazardous waste would be determined based on the results of the pre-design investigation. Post-excavation confirmatory sampling would be performed in accordance with the Department-approved remedial design. It is expected that post-excavation sampling would be limited to TCL PCBs.

Shallow excavated soil which does not contain concentrations of PCBs above 25 mg/kg would be stockpiled on-Site for reuse as backfill as described in Section 4.3. Backfilling and covering of excavations would be performed as described in Section 4.3.

A soil cover would be installed over surface soil containing PCBs at concentrations greater than 1 mg/kg outside the waste accumulation area as shown on **Figure 12**. A demarcation layer (e.g., orange snow fencing or geotextile membrane) would be installed over each area to be covered. Certified environmentally clean fill would be imported to the Site, placed over the demarcation layer, and compacted to provide an approximately 8-inch thick layer of subbase. A 4-inch thick layer of topsoil would be installed over the clean fill and hydroseeded. For the purpose of this FFS Report, it is estimated that 3,750 square feet would be covered.

ICs would include an environmental easement prohibiting on-Site groundwater extraction, limiting the future use of the Site, and requiring implementation of an SMP. The SMP developed for Alternative 3 would include requirements for soil management, periodic inspection and maintenance, if needed, of soil cover and long-term groundwater monitoring for TCL VOCs, PCBs and PFAS.

4.4.2 Overall Protection of Human Health and the Environment

Alternative 3 would be protective of public health and the environment since surface soil with PCB concentrations exceeding the Commercial Use SCO would either be removed or covered and subsurface soil containing PCBs at concentrations greater than the Industrial Use SCO of 25 mg/kg would be removed from the Site. However, Alternative 3 would result in concentrations of PCBs remaining in soil exceeding the SCO applicable to existing zoning (Commercial).

Short-term risks include exposure to contaminants during soil removal and covering. Exposure to contaminants would be minimized by establishment and implementation of a health and safety plan and community air monitoring plan. Soil removal provides long-term protection from exposure by removing the source of exposure risk. Soil covering provides long-term protection by minimizing the potential for direct exposure. The implementation of ICs would protect public health by ensuring the maintenance of the soil cover and restricting future Site development.

With respect to sustainability, Alternative 3 would consume a moderate amount of energy in the short term, as a result of soil removal and soil cover installation. Long-term inspection of the soil cover, and groundwater sampling, would consume a minor amount of energy.

4.4.3 Compliance with SCGs

Since soil containing PCBs at concentrations greater than the Commercial Use SCO would be covered with at least one foot of clean soil, Alternative 3 would comply with applicable chemical-specific SCGs for PCBs in soil for the existing Site zoning (Commercial).

4.4.4 Short-Term Effectiveness

Removal of subsurface soil impacted with PCBs at concentrations greater than 25 mg/kg and surface soil impacted with PCBs at concentrations greater than 1 mg/kg within the waste accumulation area and covering of surface soil impacted with PCBs at concentrations greater than 1 mg/kg outside the waste accumulation area would effectively reduce the potential for short-term exposure risks. However, during removal and covering of soil impacted with PCBs, stockpiling and reuse of soil impacted with PCBs at concentrations less than 25 mg/kg, and backfilling, there would be short-term risk to on-Site workers and the community. Appropriate establishment and implementation of a health and safety plan, community air monitoring plan, and BMPs would mitigate these risks.

The implementation of ICs would be effective in the short-term by ensuring the maintenance of the soil cover and restricting future Site development.

4.4.5 Long-Term Effectiveness and Permanence

Removal of subsurface soil impacted with PCBs at concentrations greater than 25 mg/kg and surface soil impacted with PCBs at concentrations greater than 1 mg/kg within the waste accumulation area and covering of surface soil impacted with PCBs at concentrations greater than 1 mg/kg outside the waste accumulation area provides permanent effective long-term reduction of exposure risks, although does not completely eliminate the risk since concentrations of PCBs greater than the SCO applicable to the current zoning would remain in subsurface soils.

The implementation of ICs would be effective in the long-term by ensuring the maintenance of the soil cover and restricting future Site development.

4.4.6 Reduction of Toxicity, Mobility, and Volume with Treatment

Alternative 3 would reduce the toxicity and volume of PCB-impacted soil at the Site by removing subsurface soil with PCB concentrations above the Industrial Use SCO of 25 mg/kg and surface soil with PCB concentrations above the Commercial Use SCO of 1 mg/kg. Furthermore, Alternative 3 would reduce the mobility of surface soil outside the waste accumulation area impacted with PCBs greater than the applicable SCO. However, the toxicity and volume of subsurface soil impacted with PCBs at concentrations less than 25 mg/kg would be unchanged.

4.4.7 Implementability

Alternative 3 requires the demolition of the on-Site incinerator, removal and off-Site disposal of scrap metal and debris, excavation and off-Site disposal of subsurface soil impacted with PCBs at concentrations greater than 25 mg/kg and surface soil impacted with PCBs at concentrations greater than 1 mg/kg within the waste accumulation area, covering of surface soil impacted with PCBs at concentrations greater than 1 mg/kg outside the waste accumulation area, and establishment and implementation of ICs. All of the primary elements of Alternative 3 would utilize well-proven technologies, and vendors with the qualifications to implement the alternative are readily available. It is estimated that implementation of Alternative 3 would be completed within approximately 5 months of notice to proceed.

4.4.8 Cost

The primary costs of Alternative 3 are those associated with demolition of the incinerator, removal of scrap and debris, excavation and off-Site disposal of PCB-impacted soil, installation of soil cover, and long-term groundwater monitoring. The estimated direct capital cost for Alternative 3 is $4.5 million, and the estimated indirect capital cost is $1.1 million. The estimated present value for groundwater monitoring and Site inspection/monitoring is $170,000. Therefore, the estimated present value of Alternative 3, including contingency ($1.1 million), is $6.9 million. A detailed cost estimate is presented in **Table 4**.

4.4.9 Land Use

Use of the Site for a purpose consistent with current zoning (Commercial) would be permitted after implementation of Alternative 3, in accordance with the ICs and the conditions of the SMP.

4.5 Alternative 4: Removal of Surface Soil with PCBs > 1 mg/kg and Subsurface Soil with PCBs > 10 mg/kg with Site Management to Remediate to the Commercial Use SCO

4.5.1 Description

Alternative 4 would include the demolition of the former incinerator building, site preparation, implementation of a pre-design investigation, excavation of surface and subsurface soil, confirmatory soil sampling, off-Site disposal and on-Site reuse of excavated soil, covering of excavated soil reused on-Site, placement of soil cover over limited areas of surface soil, replacement of monitoring wells, and ICs.

Activities associated with the demolition of the Site incinerator, site preparation, implementation of a pre-design investigation, covering of surface soil outside the waste accumulation area impacted with PCBs at concentrations greater than 1 mg/kg, replacement of groundwater monitoring wells, and long-term groundwater monitoring would be performed as described in Section 4.4.

Alternative 4 would include excavation and off-Site disposal of surface soil within the waste accumulation area containing PCBs at concentrations greater than 1 mg/kg and subsurface soil containing PCBs at concentrations greater than 10 mg/kg. The approximate areas of soil to be removed as well as soil to be covered are shown on **Figure 13**. For the purpose of this FFS Report, it is estimated that approximately 9,400 cubic yards of soil would be removed to depths of up to 13.5 feet bgs. It is anticipated that the installation of temporary sheeting and/or shoring and dewatering would be necessary to excavate soil at depths generally greater than 8 feet bgs. For the purposes of this FFS Report, it is estimated that approximately 15% of soil transported off-Site for disposal would be characterized as RCRA hazardous waste exhibiting the characteristic of toxicity. The final extents of excavation and quantities of soil to be disposed of as RCRA hazardous waste would be determined based on the results of the pre-design investigation. Post-excavation confirmatory sampling would be performed in accordance with the Department-approved remedial design. It is expected that post-excavation sampling would be limited to TCL PCBs.

Shallow excavated soil which does not contain concentrations of PCBs above 10 mg/kg would be stockpiled on-Site for reuse as backfill as described in Section 4.3. Backfilling and covering of excavations would be performed as described in Section 4.3.

ICs would include an environmental easement prohibiting on-Site groundwater extraction, limiting the future use of the Site, and requiring implementation of an SMP. The SMP developed for Alternative 4 would include requirements for soil management, periodic inspection and maintenance, if needed, of soil cover and long-term groundwater monitoring for TCL VOCs, PCBs and PFAS.

4.5.2 Overall Protection of Human Health and the Environment

Alternative 4 would be protective of public health and the environment since surface and subsurface soil containing PCBs at concentrations greater than 1 mg/kg and 10 mg/kg, respectively, within the waste accumulation area would be removed, and surface soil outside the waste accumulation area containing PCBs at concentrations greater than 1 mg/kg would be covered.

Short-term risks include exposure to contaminants during soil removal and installation of soil cover. Exposure to contaminants would be minimized by establishment and implementation of a health and safety plan and community air monitoring plan. Soil removal provides long-term protection of human health and the environment by removing the source of exposure risk.

The implementation of ICs would protect public health by requiring inspection and maintenance of the soil cover and restricting future Site development for purposes that do not comply with current zoning.

With respect to sustainability, Alternative 4 would consume a significant amount of energy in the short term, as a result of soil removal and soil cover installation activities. Long-term inspection of the soil cover and long-term groundwater sampling would consume a minor amount of energy.

4.5.3 Compliance with SCGs

Alternative 4 would achieve the chemical-specific SCGs for PCBs in soil in accordance with the current Commercial zoning for the Site since remaining soils with PCB concentrations above 1 mg/kg would be covered.

4.5.4 Short-Term Effectiveness

Removal of surface and subsurface soil impacted with PCBs at concentrations greater than 1 mg/kg and 10 mg/kg, respectively, within the waste accumulation area and covering of surface soil impacted with PCBs at concentrations greater than 1 mg/kg outside the waste accumulation area provides short-term elimination of exposure risks. However, during removal and covering of soil impacted with PCBs at concentration greater than 1 mg/kg, stockpiling and reuse of subsurface soil impacted with PCBs at concentrations less than 10 mg/kg and backfilling, there would be short-term risk to on-Site workers and the community. Appropriate establishment and implementation of a health and safety plan, community air monitoring plan and BMPs would mitigate these risks.

The implementation of ICs would be effective in the short-term by restricting future Site development for purposes other than permitted by current zoning and requiring maintenance of the soil cover.

4.5.5 Long-Term Effectiveness and Permanence

Removal of surface and subsurface soil impacted with PCBs at concentrations greater than 1 mg/kg and 10 mg/kg, respectively, within the waste accumulation area and covering of surface soil impacted with PCBs at concentrations greater than 1 mg/kg outside the waste accumulation area would result in permanent long-term elimination of exposure risks, although does not completely eliminate the risk since concentrations of PCBs greater than the SCO applicable to the current zoning would remain in subsurface soils.

The implementation of ICs would be effective in the long-term by restricting future Site development for purposes other than permitted by current zoning and requiring maintenance of the soil cover.

4.5.6 Reduction of Toxicity, Mobility, and Volume with Treatment

Alternative 4 would reduce the toxicity and volume of PCB-impacted soil at the Site by removing subsurface soil with PCB concentrations above 10 mg/kg and surface soil with PCB concentrations above the Commercial Use SCO of 1 mg/kg. Furthermore, Alternative 4 would reduce the mobility of surface soil outside the waste accumulation area impacted with PCBs greater than the applicable SCO. However, the toxicity and volume of subsurface soil impacted with PCBs at concentrations less than 10 mg/kg would be unchanged.

4.5.7 Implementability

Alternative 4 requires the demolition of the on-Site incinerator, removal and off-Site disposal of scrap metal and debris, excavation and off-Site disposal of surface and subsurface soils within the waste accumulation area impacted with PCBs at concentrations greater than 1 mg/kg and 10 mg/kg, respectively, covering of surface soil impacted with PCBs at concentrations greater than 1 mg/kg outside the waste accumulation area, and establishment and implementation of ICs. All of the primary elements of Alternative 4 would utilize well-proven technologies, and vendors with the qualifications to implement the alternative are readily available. It is estimated that implementation of Alternative 4 would be completed within approximately 6 months of notice to proceed.

4.5.8 Cost

The primary costs of Alternative 4 are those associated with demolition of the incinerator, removal of scrap and debris, excavation and off-Site disposal of PCB-impacted soil, covering of PCB-impacted soil, and long-term groundwater monitoring. The estimated direct capital cost for Alternative 4 is $5.4 million, and the estimated indirect capital cost is $1.4 million. The estimated present value for groundwater monitoring and Site inspection/monitoring is $170,000. Therefore, the estimated present value of Alternative 4, including contingency ($1.4 million), is $8.3 million. A detailed cost estimate is presented in **Table 5**.

4.5.9 Land Use

Use of the Site for a purpose consistent with current zoning (Commercial) would be permitted after implementation of Alternative 4, in accordance with the ICs and the conditions of the SMP.

4.6 Alternative 5: Removal of Soil with PCBs > 0.1 mg/kg with Site Management to Remediate to the Unrestricted Use SCO

4.6.1 Description

Alternative 5 would include the demolition of the former incinerator building, site preparation, implementation of a pre-design investigation, excavation of surface and subsurface soil, confirmatory soil sampling, off-Site disposal and on-Site reuse of excavated soil, replacement of monitoring wells, and ICs.

Activities associated with the demolition of the Site incinerator, site preparation, implementation of a pre-design investigation, replacement of groundwater monitoring wells, and long-term groundwater monitoring would be performed as described in Section 4.3.

Alternative 5 would include excavation and off-Site disposal of all soil impacted with PCBs at concentrations greater than the Unrestricted Use SCO of 0.1 mg/kg. For the purpose of this FFS, it is estimated that approximately 19,600 cubic yards of soil would be removed from depths of up to 19 feet bgs. The approximate areas of soil to be removed is shown on **Figure 14**. The SMP developed for Alternative 5 would be limited to requirements for long-term groundwater monitoring for TCL VOCs, PCBs, and PFAS.

4.6.2 Overall Protection of Human Health and the Environment

Alternative 5 would be protective of public health and the environment since all soil containing PCBs at concentrations greater than the Unrestricted Use SCO of 0.1 mg/kg would be removed.

Short-term risks include exposure to contaminants during soil removal. Exposure to contaminants would be minimized by establishment and implementation of a health and safety plan and community air monitoring plan. Soil removal provides long-term protection of human health and the environment by removing the source of exposure risk.

With respect to sustainability, Alternative 5 would consume a significant amount of energy in the short term, as a result of soil removal activities. Long-term groundwater sampling would consume a minor amount of energy.

4.6.3 Compliance with SCGs

Alternative 5 would achieve the chemical-specific SCGs for PCBs in soil in accordance with the current Commercial zoning and allow for the potential future unrestricted use of the Site.

4.6.4 Short-Term Effectiveness

Removal of all soil impacted with PCBs at concentrations greater than 0.1 mg/kg would be effective at short-term elimination of exposure risks. However, during removal of soil impacted with PCBs at concentrations greater than 0.1 mg/kg, stockpiling and reuse of soil, and backfilling there would be short-term risk to on-Site workers and the community. Appropriate establishment and implementation of a health and safety plan, community air monitoring plan, and BMPs would mitigate these risks.

4.6.5 Long-Term Effectiveness and Permanence

Removal of all soil impacted with PCBs at concentrations greater than 0.1 mg/kg would result in permanent long-term elimination of exposure risks.

4.6.6 Reduction of Toxicity, Mobility, and Volume with Treatment

Alternative 5 would reduce the toxicity and volume of the impacted soil at the Site by removing soil with concentrations of PCBs above the Unrestricted Use SCO of 0.1 mg/kg.

4.6.7 Implementability

Alternative 5 requires the demolition of the on-Site incinerator, removal and off-Site disposal of scrap metal and debris, and excavation and off-Site disposal of soils impacted with PCBs at concentrations greater than 0.1 mg/kg. All of the primary elements of Alternative 5 would utilize well-proven technologies, and vendors with the qualifications to implement the alternative are readily available. It is estimated that implementation of Alternative 5 would be completed within approximately 8 months of notice to proceed.

4.6.8 Cost

The primary costs of Alternative 5 are those associated with demolition of the incinerator, removal of scrap and debris, excavation and off-Site disposal of PCB-impacted soil, and long-term groundwater monitoring. The estimated direct capital cost for Alternative 5 is $11.3 million, and the estimated indirect capital cost is $2.8 million. The estimated present value for groundwater monitoring and Site inspection/monitoring is $170,000. Therefore, the estimated present value of Alternative 5, including contingency ($2.9 million), is $17.1 million. A detailed cost estimate is presented in **Table 6**.

4.6.9 Land Use

Unrestricted use of the Site would be possible after implementation of Alternative 5. However, additional evaluation and remediation of Site contaminants other than PCBs in soil would be necessary to achieve unrestricted use conditions Site-wide.

5.0 COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES

5.1 Introduction

The comparative analysis presented in this section evaluates the relative performance of each alternative using the same criteria by which the detailed analysis of each alternative was conducted. The purpose of the comparative analysis is to identify the advantages and disadvantages of each alternative relative to one another to aid in selecting an overall remedy for the Site.

The comparative analysis includes a narrative discussion of the strengths and weaknesses of the alternatives relative to one another with respect to each criterion, and how reasonable variations of key uncertainties could change the expectations of their relative performance, as applicable. The comparative analysis presented in this document uses a qualitative approach, with the exceptions of comparing estimated alternative costs and the required time to implement each alternative.

5.2 Comparison of Alternatives

Overall Protectiveness of Public Health and the Environment – Alternative 5 provides the highest level of protectiveness of public health and the environment since it represents the most rigorous approach to remediation of PCB-impacted soil. Alternatives 2 through 4 are approximately equally protective of public health and the environment, since each alternative minimizes the risk of exposure to impacted soil via removal and capping.

Compliance with SCGs – Alternatives 2 through 5 will result in compliance with SCGs with respect to PCB concentrations in soil, with Alternative 5 complying with stricter SCGs than Alternatives 2 through 4.

Short-term Impacts and Effectiveness – The soil excavation and disposal components of Alternatives 2 through 4 would be effective at reducing concentrations of PCBs in Site soil to progressively stringent SCGs in the short-term, the soil cover component of Alternatives 2 through 4 would also be effective in the short term of minimizing exposure risks, and the alternatives would each have limited short-term impacts. The soil excavation and disposal components of Alternative 5 would be effective at reducing concentrations of PCBs in Site soil to the most stringent SCO in the short term, but would have the greatest short-term impacts due to the extent of excavation required.

Long-term Effectiveness and Permanence – The soil excavation and disposal and soil cover components of Alternatives 2 through 4 along with ICs would permanently address exposure to contaminants in soil at concentrations meeting progressively stringent SCGs. The soil excavation and disposal components of

Alternative 5 would be effective at reducing concentrations of PCBs in Site soil to the most stringent SCG in the long term.

Reduction of Toxicity, Mobility, and Volume by Treatment – The soil cover components of Alternatives 2 through 4 are approximately equal with respect to reducing mobility of PCB-impacted soil. The excavation and disposal components of Alternatives 2 through 5 represent progressively increasing reductions in the toxicity, mobility, and volume of PCBs in soil by transfer to a controlled disposal or destruction (e.g., incineration) site.

Implementability – Alternative 2 would be the most difficult of the alternatives to implement due to the complicated soil excavation, segregating, and backfilling activities required to segregate and separately dispose of soil with PCB concentrations equal to or greater than 50 mg/kg and consolidate and cover soil with PCB concentrations greater than 1 mg/kg and less than 50 mg/kg. It is estimated that implementation of Alternatives 2 would be completed in 8 months. Alternatives 3 through 5 are approximately equally implementable. However, soil removal, backfilling, and restoration time frames would vary among Alternatives 3 through 5. Alternative 3 would likely be completed in approximately 5 months. Implementation of Alternative 4 would likely be completed in approximately 6 months. Implementation of Alternative 5 would likely be completed in approximately 8 months.

Cost-Effectiveness – Alternative 3 is the lowest cost alternative. Alternatives 4, 2, and 5 then rank least to most expensive, in that order. The estimated total present value cost of Alternative 5 is over 50 percent greater than the estimated total present value cost of Alternative 2. A summary comparison of the remedial alternative costs is presented in **Table 7**.

Land Use – The Site is zoned Commercial and is currently not being used. The Site could potentially be used for commercial purposes, for which it is currently zoned, under Alternatives 2 through 4. Alternative 5 would result in the least restrictions on future use.

Green Remediation (DER-31) – Alternatives 3, 2, 4 and 5 rate highest to lowest, in that order, with respect to green remediation. Alternatives 2 through 5 would progressively generate more waste for off-Site disposal. Alternative 3 would consume the least amount of resources, followed by Alternative 4. Alternatives 2 and 5 would consume approximately the same amount of resources (excluding off-Site waste disposal), both greater than Alternatives 3 and 4. Alternative 3 would disturb the existing Site landscape the least. Alternatives 2 and 4 would cause approximately equal disturbances to the existing Site landscape. Alternative 5 would cause the greatest disturbance to the existing Site landscape.

5.3 Ranking of Alternatives

A points-based ranking system was developed as a means to provide a comparative analysis with respect to the evaluation criteria. A relative ranking score that is intended to be representative of the relative strengths and weaknesses of each alternative, was assigned for each of the evaluation criteria: 1 being lowest and 3 being highest.

To address the cost component of this alternatives ranking effort (refer to **Table 7** for a summary comparison of estimated remedial alternative costs), points were assigned as follows:

- Lowest Cost – 3 points
- Moderate Cost – 2 points
- Highest Cost – 1 point

Based upon this points ranking system, the treatment alternative that provides the best relative overall balance in achieving the evaluation criteria, at a reasonable relative cost will necessarily score the highest. A summary of the results of the ranking of alternatives is presented in the table below.

Comparative Analysis Ranking of Alternatives

EVALUATION CRITERIA	ALT 2 Removal of Soil with PCBs ≥ 50 mg/kg and Consolidation and Covering of Soil with PCBs > 1 mg/kg	ALT 3 Removal of Surface Soil with PCBs >1 mg/kg and Subsurface Soil with PCBs > 25 mg/kg	ALT 4 Removal of Surface Soil with PCBs > 1 mg/kg and Subsurface Soil with PCBs > 10 mg/kg	ALT 5 Removal of Soil with PCBs > 0.1 mg/kg
Overall Protectiveness of the Public Health and the Environment	**2**	**2**	**2**	**3**
Compliance with SCGs	**2**	**2**	**2**	**3**
Short-term Impacts and Effectiveness	**2**	**3**	**3**	**1**
Long-term Effectiveness and Permanence	**3**	**3**	**3**	**3**
Reduction of Toxicity, Mobility, Volume	**2**	**2**	**2**	**3**
Implementability	**1**	**3**	**3**	**2**
Relative Cost	**2**	**3**	**2**	**1**
Land Use	**3**	**3**	**3**	**3**
Green Remediation	**2**	**3**	**2**	**1**
Total	**19**	**24**	**22**	**20**

6.0 REFERENCES

1. 6 NYCRR 375, Remedial Program Requirements.
2. 6 NYCRR 703, Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations.
3. New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health, New York State Brownfield Cleanup Program Development of Soil Cleanup Objectives Technical Support Document, September 2006.
4. New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation, Technical Guidance for Site Investigation and Remediation (DER-10), May 2010.
5. TRC Engineers, Inc., Standby Engineering Contract Work Assignment (WA) No. D007620-24, NYSDEC-approved Scope of Work dated November 30, 2015.
6. TRC Engineers, Inc., Remedial Investigation Report, Katzman Recycling Site, March 2018.
7. United States Geological Survey, Ground Water and the Rural Homeowner, 1982.

TABLES

Table 1
New York State Department of Environmental Conservation
Katzman Recycling Site
Focused Feasibility Study Report
Soil Contaminants of Concern and Chemical-Specific SCGs

Constituents of Concern for Soil	NYSDEC Part 375 Protection of Public Health Industrial Use Soil Cleanup Objective[1] (ppm)	NYSDEC Part 375 Protection of Public Health Commercial / Residential Use Soil Cleanup Objective[1] (ppm)	NYSDEC Part 375 Protection of Public Health Unrestricted Use Soil Cleanup Objective[1] (ppm)
PCBs			
Total PCBs	25	1	0.1

Notes
ppm - parts per million (or milligrams per kilogram)
PCBs - polychlorinated biphenyls
[1]6 NYCRR 375-6.8

Table 2
New York State Department of Environmental Conservation
Katzman Recycling Site
Focused Feasibility Study Report
Summary of Soil Remedial Technology Screening

				Applicability to			
Environmental Medium	**General Response Action**	**Remedial Technology**	**Process Option**	**Site-Limiting Characteristics**	**Waste-Limiting Characteristics**	**Screening Status**	**Comments**
Soil	No Action	None	Not Applicable	Not Applicable	Not Applicable	Retained	Does not meet remedial goals but will be retained as baseline for comparison to alternatives.
	Institutional Controls	Land Use Restrictions	Requires a Site Management Plan and Environmental Easement	The Site is currently zoned for commercial use.	Does not actively treat, contain, or remove impacted soil.	Retained	Retained to be included in detailed analysis of alternatives.
	Containment	Capping	Clean Fill Cover - May Include Consolidation and Covering	Requires space for stockpile management and on-Site consolidation.	Prevents direct exposure but does not reduce toxicity or volume of contaminated soil.	Retained	Retained to be included in detailed analysis of alternatives.
	Excavation and Ex-Situ Management	On-Site Treatment or Disposal	On-Site Physical, Biological or Chemical Treatment and Reuse of Treated Soil or On-Site Landfilling	Extensive permitting process. Requires space for treatment and stockpile management during soil removal and reuse, or uses space for landfilling.	Treatment options likely not effective for all waste.	Eliminated	Potential process options would include thermal treatment, stabilization, or soil washing.
		Off-Site Treatment or Disposal	Off-Site Physical, Biological or Chemical Treatment or Landfilling	Requires space for excavated material management during soil removal.	None.	Retained	Retained to be included in detailed analysis of alternatives.
	In-Situ Management	On-Site Thermal Treatment	Heat-Enhanced Extraction	Requires installation and operation of an on-Site treatment system and electrical service.	Disposal or treatment of concentrated PCB waste stream would be required.	Eliminated	
		On-Site Biological Treatment	Bioventing/Bioremediation	Requires installation and operation of an on-Site remediation system.	Not effective at treating Site waste and contaminants.	Eliminated	
			Phytoremediation	Depth of contamination and characteristics of fill may limit viability.	Not effective at treating Site waste and contaminants.	Eliminated	
		On-Site Physical/Chemical Treatment	Chemical Oxidation	None.	Not effective at treating Site waste and contaminants.	Eliminated	
			Soil Flushing	Requires installation and operation of an on-Site remediation system.	Disposal or treatment of concentrated PCB waste stream would be required.	Eliminated	
			Solidification/Stabilization	Impedes potential for future Site development.	Prevents direct exposure but does not reduce toxicity or volume of contaminated material.	Eliminated	

Table 3
New York State Department of Environmental Conservation
Katzman Recycling Site
Focused Feasibility Study Report
Alternative 2 Cost Estimate
Removal of Soil with PCBs ≥ 50 mg/kg and Consolidation and Covering of Soils with PCBs > 1 mg/kg with Site Management to Remediate to the TSCA Low-Occupancy Criteria

Item	Quantity	Units	Unit Cost	Extended Cost	# Yrs - Future Costs	Present Value (Rounded)
CAPITAL COST - DIRECT						
Mobilization and Site Preparation						
Mobilization	1	l.s.	$ 15,000	$ 15,000	NA	$ 15,000
Erosion and Sediment Control	1	l.s.	$ 25,000	$ 25,000	NA	$ 25,000
Site Preparation and Surface Debris Cleanup	1	l.s.	$ 45,000	$ 45,000	NA	$ 45,000
Building Demolition	1	l.s.	$ 20,000	$ 20,000	NA	$ 20,000
Transportation and Disposal - Capacitors	20	drum	$ 275	$ 5,500	NA	$ 5,500
Transportation and Disposal - Scrap Metal	600	ton	$ 25	$ 15,000	NA	$ 15,000
Transportation and Disposal - Construction and Demolition Debris	400	ton	$ 161	$ 64,400	NA	$ 64,400
Pre-Design Investigation						
Delineation Sampling	1	l.s.	$ 25,000	$ 25,000	NA	$ 25,000
Waste Characterization Sampling	1	l.s.	$ 5,000	$ 5,000	NA	$ 5,000
Soil Excavation and Backfill						
Excavation, Stockpiling, and Backfilling	20	week	$ 45,000	$ 900,000	NA	$ 900,000
Sheeting (Install, Remove, Salvage)	48,600	sq. ft.	$ 75	$ 3,645,000	NA	$ 3,645,000
Dewatering	7	week	$ 25,000	$ 175,000	NA	$ 175,000
Transportation and Disposal - PCBs 50+ mg/kg (RCRA non-Haz)	5,200	ton	$ 267	$ 1,388,400	NA	$ 1,388,400
Transportation and Disposal - PCBs 50+ mg/kg (RCRA Haz)	900	ton	$ 385	$ 346,500	NA	$ 346,500
Confirmatory Samples (Analysis)	125	ea.	$ 50	$ 6,250	NA	$ 6,250
Backfill Samples (Analysis)	13	ea.	$ 750	$ 9,750	NA	$ 9,750
Backfill Material	4,000	ton	$ 30	$ 120,000	NA	$ 120,000
Site Restoration (Topsoil, Mulch, and Seed)	23,750	sq. ft.	$ 2.00	$ 47,500	NA	$ 47,500
Monitoring Well Replacement	2	ea.	$ 7,500	$ 15,000	NA	$ 15,000
Soil Cover In the Waste Accumulation Area						
Geotextile, Soil Cover, and Hydroseeding	40,000	sq. ft.	$ 4.00	$ 160,000	NA	$ 160,000
TOTAL DIRECT COSTS						$7,033,300
CAPITAL COST - INDIRECT						
Engineering and Design (10%)						$ 703,330
Construction Phase Engineering Services (10%)						$ 703,330
Permits and Plans (5%)						$ 351,665
TOTAL INDIRECT COSTS						$ 1,758,325
TOTAL CAPITAL COSTS						$ 8,791,625

Table 3
New York State Department of Environmental Conservation
Katzman Recycling Site
Focused Feasibility Study Report
Alternative 2 Cost Estimate
Removal of Soil with PCBs ≥ 50 mg/kg and Consolidation and Covering of Soils with PCBs > 1 mg/kg with Site Management to Remediate to the TSCA Low-Occupancy Criteria

Item	Quantity	Units	Unit Cost	Extended Cost	# Yrs - Future Costs	Present Value (Rounded)
FUTURE ACTIONS						
Annual Groundwater Sampling/Reporting (Years 1 through 10)	1	l.s. (per year)	$ 15,000	$ 15,000	10	$ 105,400
Periodic Reviews	1	l.s. (per year)	$ 5,000	$ 5,000	30	$ 62,000
TOTAL PRESENT VALUE OF FUTURE ACTIONS						$ 167,400
CONTINGENCY (20%)						$ 1,791,800
TOTAL PRESENT VALUE COST FOR ALTERNATIVE 2						$ 10,750,800

Notes
1. 7% discount rate used to calculate present value cost.
2. Cost estimate intended only for the purpose of determining relative cost in comparison to other alternatives.
3. Legal and administrative costs are not included in cost estimate.
4. Estimate based on approximately 15% of excavated soil requiring disposal as RCRA hazardous waste.

Table 4
New York State Department of Environmental Conservation
Katzman Recycling Site
Focused Feasibility Study Report
Alternative 3 Cost Estimate
Removal of Surface Soil with PCBs > 1 mg/kg and Subsurface Soil with PCBs > 25 mg/kg with Site Management to Remediate to the Industrial Use SCO

Item	Quantity	Units	Unit Cost	Extended Cost	# Yrs - Future Costs	Present Value (Rounded)
CAPITAL COST - DIRECT						
Mobilization and Site Preparation						
Mobilization	1	l.s.	$ 15,000	$ 15,000	NA	$ 15,000
Erosion and Sediment Control	1	l.s.	$ 25,000	$ 25,000	NA	$ 25,000
Site Preparation and Surface Debris Cleanup	1	l.s.	$ 45,000	$ 45,000	NA	$ 45,000
Building Demolition	1	l.s.	$ 20,000	$ 20,000	NA	$ 20,000
Transportation and Disposal - Capacitors	20	drum	$ 275	$ 5,500	NA	$ 5,500
Transportation and Disposal - Scrap Metal	600	ton	$ 25	$ 15,000	NA	$ 15,000
Transportation and Disposal - Construction and Demolition Debris	400	ton	$ 161	$ 64,400	NA	$ 64,400
Pre-Design Investigation						
Delineation Sampling	1	l.s.	$ 25,000	$ 25,000	NA	$ 25,000
Waste Characterization Sampling	1	l.s.	$ 10,000	$ 10,000	NA	$ 10,000
Soil Excavation and Backfill						
Excavation, Stockpiling, and Backfilling	8	week	$ 45,000	$ 360,000	NA	$ 360,000
Sheeting (Install, Remove, Salvage)	13,500	sq. ft.	$ 75	$ 1,012,500	NA	$ 1,012,500
Dewatering	2	week	$ 25,000	$ 50,000	NA	$ 50,000
Transportation and Disposal - PCBs 1-49 mg/kg (RCRA non-Haz)	6,400	ton	$ 56	$ 358,400	NA	$ 358,400
Transportation and Disposal - PCBs 1-49 mg/kg (RCRA Haz)	1,100	ton	$ 122	$ 134,200	NA	$ 134,200
Transportation and Disposal - PCBs 50+ mg/kg (RCRA non-Haz)	5,200	ton	$ 267	$ 1,388,400	NA	$ 1,388,400
Transportation and Disposal - PCBs 50+ mg/kg (RCRA Haz)	900	ton	$ 385	$ 346,500	NA	$ 346,500
Confirmatory Samples (Analysis)	60	ea.	$ 50	$ 3,000	NA	$ 3,000
Backfill Samples (Analysis)	28	ea.	$ 750	$ 21,000	NA	$ 21,000
Backfill Material	10,000	ton	$ 30	$ 300,000	NA	$ 300,000
Monitoring Well Replacement	2	ea.	$ 7,500	$ 15,000	NA	$ 15,000
Soil Cover In and Outside the Waste Accumulation Area						
Geotextile, Soil Cover, and Hydroseeding	61,250	sq. ft.	$ 4.00	$ 245,000	NA	$ 245,000
TOTAL DIRECT COSTS						$ 4,458,900
CAPITAL COST - INDIRECT						
Engineering and Design (10%)						$ 445,900
Construction Phase Engineering Services (10%)						$ 445,900
Permits and Plans (5%)						$ 222,900
TOTAL INDIRECT COSTS						$ 1,114,700
TOTAL CAPITAL COSTS						$ 5,573,600

Table 4
New York State Department of Environmental Conservation
Katzman Recycling Site
Focused Feasibility Study Report
Alternative 3 Cost Estimate
Removal of Surface Soil with PCBs > 1 mg/kg and Subsurface Soil with PCBs > 25 mg/kg with Site Management to Remediate to the Industrial Use SCO

Item	Quantity	Units	Unit Cost	Extended Cost	# Yrs - Future Costs	Present Value (Rounded)
FUTURE ACTIONS						
Annual Groundwater Sampling/Reporting (Years 1 through 10)	1	l.s. (per year)	$ 15,000	$ 15,000	10	$ 105,400
Periodic Reviews	1	l.s. (per year)	$ 5,000	$ 5,000	30	$ 62,000
TOTAL PRESENT VALUE OF FUTURE ACTIONS						$ 167,400
CONTINGENCY (20%)						$ 1,148,200
TOTAL PRESENT VALUE COST FOR ALTERNATIVE 3						$ 6,889,200

Notes
1. 7% discount rate used to calculate present value cost.
2. Cost estimate intended only for the purpose of determining relative cost in comparison to other alternatives.
3. Legal and administrative costs are not included in cost estimate.
4. Estimate based on approximately 15% of excavated soil requiring disposal as RCRA hazardous waste.

Table 5
New York State Department of Environmental Conservation
Katzman Recycling Site
Focused Feasibility Study Report
Alternative 4 Cost Estimate
Removal of Surface Soil with PCBs > 1 mg/kg and Subsurface Soil with PCBs > 10 mg/kg with Site Management to Remediate to the Commercial Use SCO

Item	Quantity	Units	Unit Cost	Extended Cost	# Yrs - Future Costs	Present Value (Rounded)
CAPITAL COST - DIRECT						
Mobilization and Site Preparation						
Mobilization	1	l.s.	$ 15,000	$ 15,000	NA	$ 15,000
Erosion and Sediment Control	1	l.s.	$ 27,000	$ 27,000	NA	$ 27,000
Site Preparation and Surface Debris Cleanup	1	l.s.	$ 45,000	$ 45,000	NA	$ 45,000
Building Demolition	1	l.s.	$ 20,000	$ 20,000	NA	$ 20,000
Transportation and Disposal - Capacitors	20	drum	$ 275	$ 5,500	NA	$ 5,500
Transportation and Disposal - Scrap Metal	600	ton	$ 25	$ 15,000	NA	$ 15,000
Transportation and Disposal - Construction and Demolition Debris	400	ton	$ 161	$ 64,400	NA	$ 64,400
Pre-Design Investigation						
Delineation Sampling	1	l.s.	$ 25,000	$ 25,000	NA	$ 25,000
Waste Characterization Sampling	1	l.s.	$ 15,000	$ 15,000	NA	$ 15,000
Soil Excavation and Backfill						
Excavation, Stockpiling, and Backfilling	10	week	$ 45,000	$ 450,000	NA	$ 450,000
Sheeting (Install, Remove, Salvage)	21,600	sq. ft.	$ 75	$ 1,620,000	NA	$ 1,620,000
Dewatering	3	week	$ 25,000	$ 75,000	NA	$ 75,000
Transportation and Disposal - PCBs 1-49 mg/kg (RCRA non-Haz)	8,400	ton	$ 56	$ 470,400	NA	$ 470,400
Transportation and Disposal - PCBs 1-49 mg/kg (RCRA Haz)	1,500	ton	$ 122	$ 183,000	NA	$ 183,000
Transportation and Disposal - PCBs 50+ mg/kg (RCRA non-Haz)	5,200	ton	$ 267	$ 1,388,400	NA	$ 1,388,400
Transportation and Disposal - PCBs 50+ mg/kg (RCRA Haz)	900	ton	$ 385	$ 346,500	NA	$ 346,500
Confirmatory Samples (Analysis)	75	ea.	$ 50	$ 3,750	NA	$ 3,750
Backfill Samples (Analysis)	3	ea.	$ 750	$ 2,250	NA	$ 2,250
Backfill Material	12,200	ton	$ 30	$ 366,000	NA	$ 366,000
Monitoring Well Replacement	2	ea.	$ 7,500	$ 15,000	NA	$ 15,000
Soil Cover In and Outside the Waste Accumulation Area						
Geotextile, Soil Cover, and Hydroseeding	63,750	sq. ft.	$ 4.00	$ 255,000	NA	$ 255,000
TOTAL DIRECT COSTS						$ 5,407,200
CAPITAL COST - INDIRECT						
Engineering and Design (10%)						$ 540,700
Construction Phase Engineering Services (10%)						$ 540,700
Permits and Plans (5%)						$ 270,400
TOTAL INDIRECT COSTS						$ 1,351,800
TOTAL CAPITAL COSTS						$ 6,759,000

Table 5
New York State Department of Environmental Conservation
Katzman Recycling Site
Focused Feasibility Study Report
Alternative 4 Cost Estimate
Removal of Surface Soil with PCBs > 1 mg/kg and Subsurface Soil with PCBs > 10 mg/kg with Site Management to Remediate to the Commercial Use SCO

Item	Quantity	Units	Unit Cost	Extended Cost	# Yrs - Future Costs	Present Value (Rounded)
FUTURE ACTIONS						
Annual Groundwater Sampling/Reporting (Years 1 through 10)	1	l.s. (per year)	$ 15,000	$ 15,000	10	$ 105,400
Periodic Reviews	1	l.s. (per year)	$ 5,000	$ 5,000	30	$ 62,000
TOTAL PRESENT VALUE OF FUTURE ACTIONS						$ 167,400
CONTINGENCY (20%)						$ 1,385,300
TOTAL PRESENT VALUE COST FOR ALTERNATIVE 4						$ 8,311,700

Notes
1. 7% discount rate used to calculate present value cost.
2. Cost estimate intended only for the purpose of determining relative cost in comparison to other alternatives.
3. Legal and administrative costs are not included in cost estimate.
4. Estimate based on approximately 15% of excavated soil requiring disposal as RCRA hazardous waste.

Table 6
New York State Department of Environmental Conservation
Katzman Recycling Site
Focused Feasibility Study Report
Alternative 5 Cost Estimate
Removal of Soil with PCBs > 0.1 mg/kg with Site Management to Remediate to the Unrestricted Use SCO

Item	Quantity	Units	Unit Cost	Extended Cost	# Yrs - Future Costs	Present Value
CAPITAL COST - DIRECT						
Mobilization and Site Preparation						
Mobilization	1	l.s.	$ 15,000	$ 15,000	NA	$ 15,000
Erosion and Sediment Control	1	l.s.	$ 30,000	$ 30,000	NA	$ 30,000
Site Preparation and Surface Debris Cleanup	1	l.s.	$ 45,000	$ 45,000	NA	$ 45,000
Building Demolition	1	l.s.	$ 20,000	$ 20,000	NA	$ 20,000
Transportation and Disposal - Capacitors	20	drum	$ 275	$ 5,500	NA	$ 5,500
Transportation and Disposal - Scrap Metal	600	ton	$ 25	$ 15,000	NA	$ 15,000
Transportation and Disposal - Construction and Demolition Debris	400	ton	$ 161	$ 64,400	NA	$ 64,400
Pre-Design Investigation						
Delineation Sampling	1	l.s.	$ 25,000	$ 25,000	NA	$ 25,000
Waste Characterization Sampling	1	l.s.	$ 20,000	$ 20,000	NA	$ 20,000
Soil Excavation and Backfill						
Excavation, Stockpiling, and Backfilling	20	week	$ 45,000	$ 900,000	NA	$ 900,000
Sheeting (Install, Remove, Salvage)	69,000	sq. ft.	$ 75	$ 5,175,000	NA	$ 5,175,000
Dewatering	10	week	$ 25,000	$ 250,000	NA	$ 250,000
Transportation and Disposal - PCBs 0.1-49 mg/kg (RCRA non-Haz)	23,100	ton	$ 56	$ 1,293,600	NA	$ 1,293,600
Transportation and Disposal - PCBs 0.1-49 mg/kg (RCRA Haz)	4,100	ton	$ 122	$ 500,200	NA	$ 500,200
Transportation and Disposal - PCBs 50+ mg/kg (RCRA non-Haz)	5,200	ton	$ 267	$ 1,388,400	NA	$ 1,388,400
Transportation and Disposal - PCBs 50+ mg/kg (RCRA Haz)	900	ton	$ 385	$ 346,500	NA	$ 346,500
Confirmatory Samples (Analysis)	150	ea.	$ 50	$ 7,500	NA	$ 7,500
Backfill Samples (Analysis)	65	ea.	$ 750	$ 48,750	NA	$ 48,750
Backfill Material	32,100	ton	$ 30	$ 963,000	NA	$ 963,000
Site Restoration (Topsoil, Mulch, and Seed)	77,500	sq. ft.	$ 2.00	$ 155,000	NA	$ 155,000
Monitoring Well Replacement	3	ea.	$ 7,500	$ 22,500	NA	$ 22,500
TOTAL DIRECT COSTS						$ 11,290,350
CAPITAL COST - INDIRECT						
Engineering and Design (10%)						$ 1,129,035
Construction Phase Engineering Services (10%)						$ 1,129,035
Permits and Plans (5%)						$ 564,518
TOTAL INDIRECT COSTS						$ 2,822,588
TOTAL CAPITAL COSTS						$ 14,112,938

Table 6
New York State Department of Environmental Conservation
Katzman Recycling Site
Focused Feasibility Study Report
Alternative 5 Cost Estimate
Removal of Soil with PCBs > 0.1 mg/kg with Site Management to Remediate to the Unrestricted Use SCO

Item	Quantity	Units	Unit Cost	Extended Cost	# Yrs - Future Costs	Present Value
FUTURE ACTIONS						
Annual Groundwater Sampling/Reporting (Years 1 through 10)	1	l.s. (per year)	$ 15,000	$ 15,000	10	$ 105,360
Periodic Reviews	1	l.s. (per year)	$ 5,000	$ 5,000	30	$ 62,045
TOTAL PRESENT VALUE OF FUTURE ACTIONS						$ 167,405
CONTINGENCY (20%)						$ 2,856,069
TOTAL PRESENT VALUE COST FOR ALTERNATIVE 5						$ 17,136,411

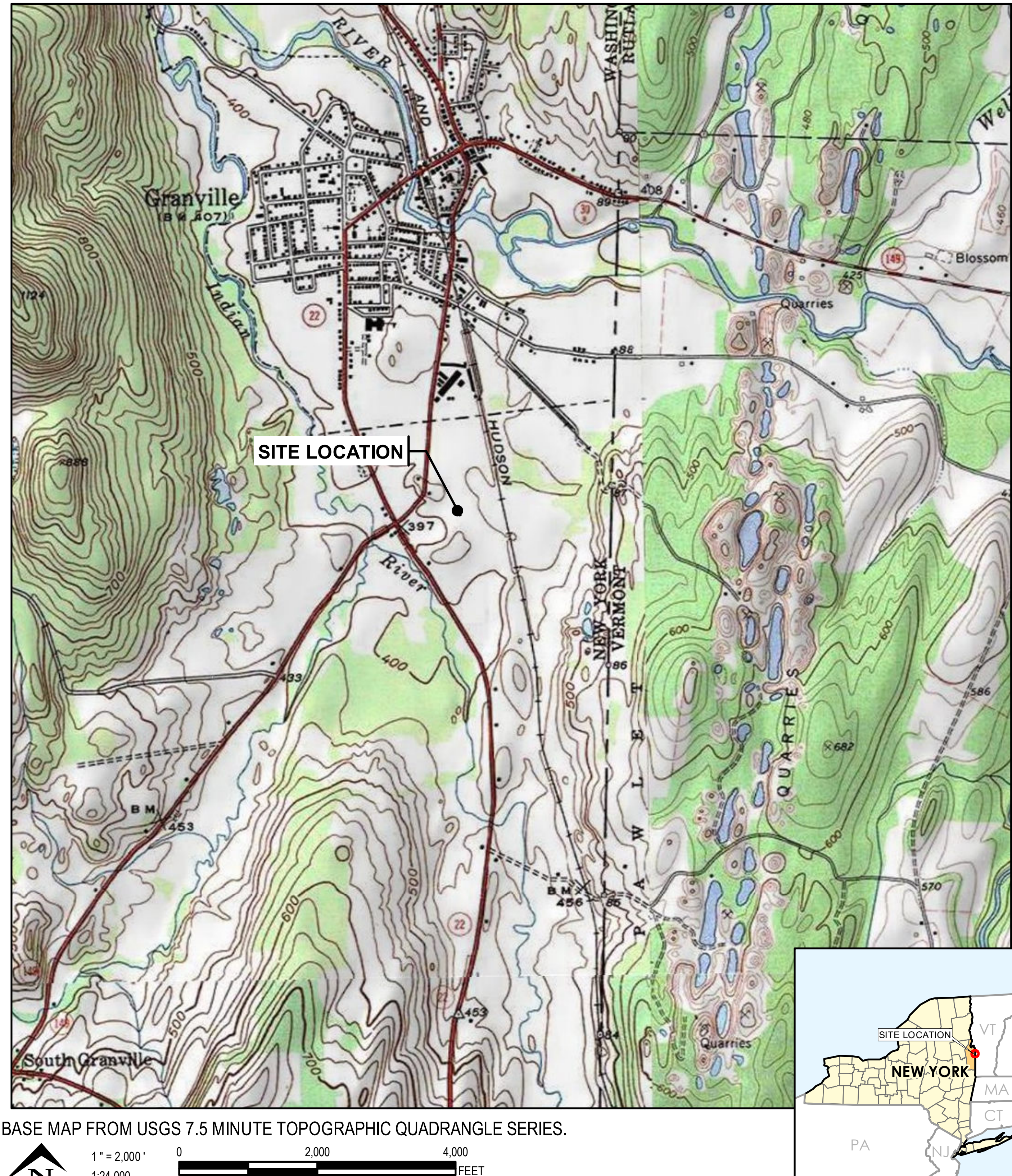
Notes
1. 7% discount rate used to calculate present value cost.
2. Cost estimate intended only for the purpose of determining relative cost in comparison to other alternatives.
3. Legal and administrative costs are not included in cost estimate.
4. Estimate based on approximately 15% of excavated soil requiring disposal as RCRA hazardous waste.

Table 7
New York State Department of Environmental Conservation
Focused Feasibility Study Report
Katzman Recycling Site
Comparison of Remedial Alternative Costs

ALTERNATIVE	TOTAL CAPITAL COST	PRESENT WORTH OF FUTURE ACTIONS COST	TOTAL PRESENT WORTH[1]
Alternative 1 - No Action	$0	$0	$0
Alternative 2 – Removal of Soil with PCBs ≥ 50 mg/kg and Consolidation and Covering of Soil with PCBs > 1 mg/kg with Site Management to Remediate to the TSCA Low-Occupancy Criteria	$8,790,000	$170,000	$10,750,000
Alternative 3 – Removal of Surface Soil with PCBs > 1 mg/kg and Subsurface Soil with PCBs > 25 mg/kg with Site Management to Remediate to the Industrial Use SCO	$5,570,000	$170,000	$6,890,000
Alternative 4 – Removal of Surface Soil with PCBs > 1 mg/kg and Subsurface Soil with PCBs > 10 mg/kg with Site Management to Remediate to the Commercial Use SCO	$6,760,000	$170,000	$8,310,000
Alternative 5 – Removal of Soil with PCBs > 0.1 mg/kg with Site Management to Remediate to the Unrestricted Use SCO	$14,110,000	$170,000	$17,140,000

Notes:
Estimated costs are rounded.
[1] Includes contingency.

FIGURES



BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.

N

1 " = 2,000 '
1:24,000

0 2,000 4,000 FEET

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TRC - GIS

PROJECT:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
KATZMAN RECYCLING - SITE NO: 558035
GRANVILLE, NY 12832

TITLE:

SITE LOCATION MAP

DRAWN BY:	B. DEEGAN
CHECKED BY:	M. DOWD
APPROVED BY:	J. LAROCK
DATE:	JUNE 2018
PROJ. NO.:	240658.0004
FILE:	240658-0004-003slm.mxd

FIGURE 1

LEGEND

- ACCESS ROAD
- PROJECT AREA
- PARCELS

NOTES

1. BASE MAP IMAGERY FROM ESRI, VERMONT 2016.
2. PARCELS FROM WASHINGTON COUNTY NEW YORK, GIS WEBMAP.

N

0 200 400 Feet

1 " = 200 '

PROJECT:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
KATZMAN RECYCLING - SITE NO: 558035
GRANVILLE, NY 12832

TITLE:
PROJECT LIMITS AND VICINITY MAP

DRAWN BY:	B. DEEGAN	PROJ NO.:	240658.0004
CHECKED BY:	M. DOWD		
APPROVED BY:	J. LAROCK	FIGURE 2	
DATE:	JUNE 2018		

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Coordinate System: NAD 1983 UTM Zone 18N (Meter)
Map Rotation: 0

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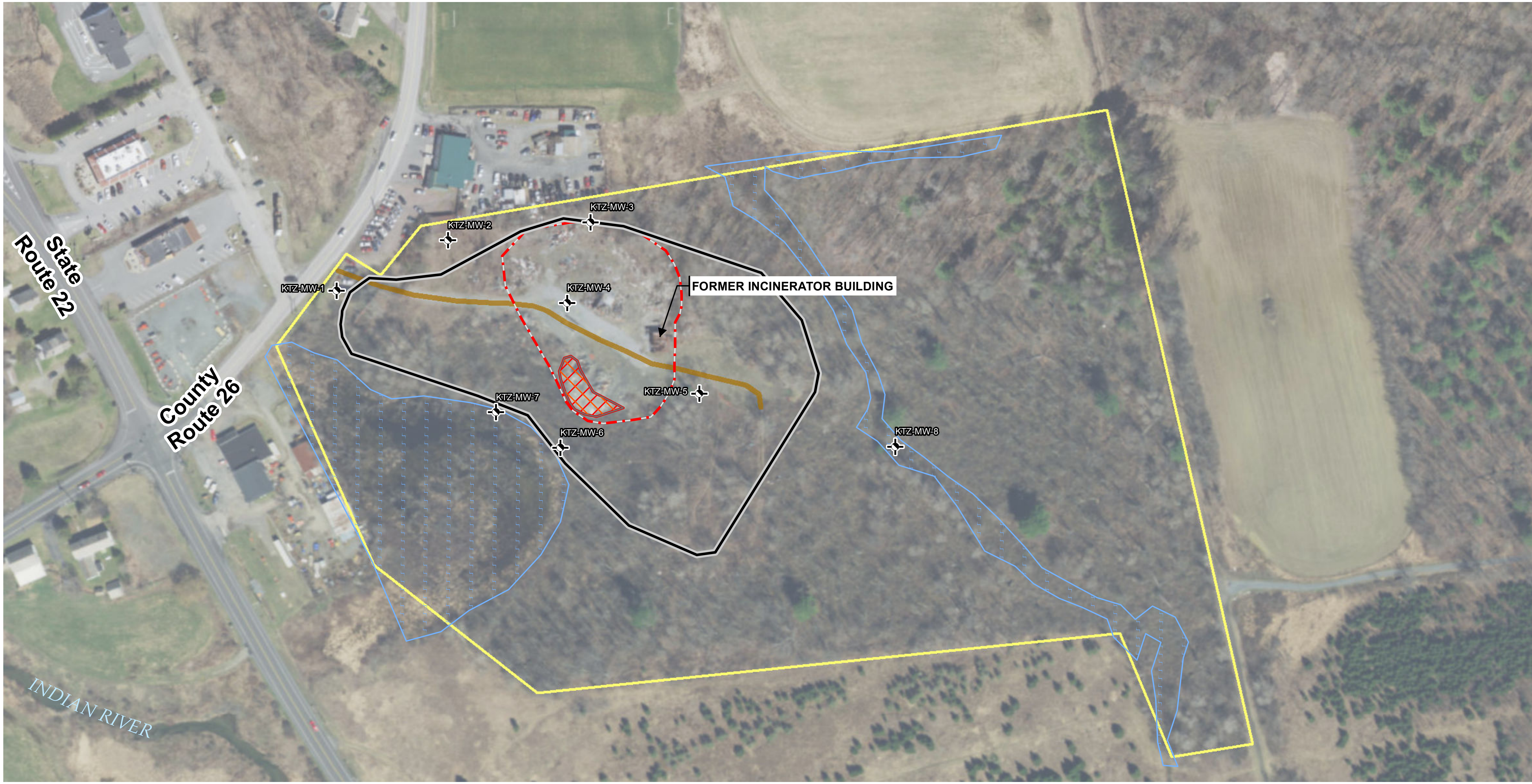

LEGEND

- GROUNDWATER MONITORING WELL LOCATION
- APPROXIMATE AREA OF CONCERN
- APPROX. EXTENT OF MAIN WASTE ACCUMULATION AREA
- DEBRIS PILE
- DELINEATED WETLAND
- PROJECT AREA
- ACCESS ROAD

NOTES

1. BASE MAP IMAGERY FROM ESRI, VERMONT 2016.

N

0 150 300 Feet

1 " = 150 '

PROJECT:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
KATZMAN RECYCLING - SITE NO: 558035
GRANVILLE, NY 12832

TITLE:
SITE PLAN

DRAWN BY:	B. DEEGAN	PROJ NO.:	240658.0004
CHECKED BY:	M. DOWD	FIGURE 3	
APPROVED BY:	J. LAROCK		
DATE:	JUNE 2018		

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Coordinate System: NAD 1983 UTM Zone 18N (Meter)
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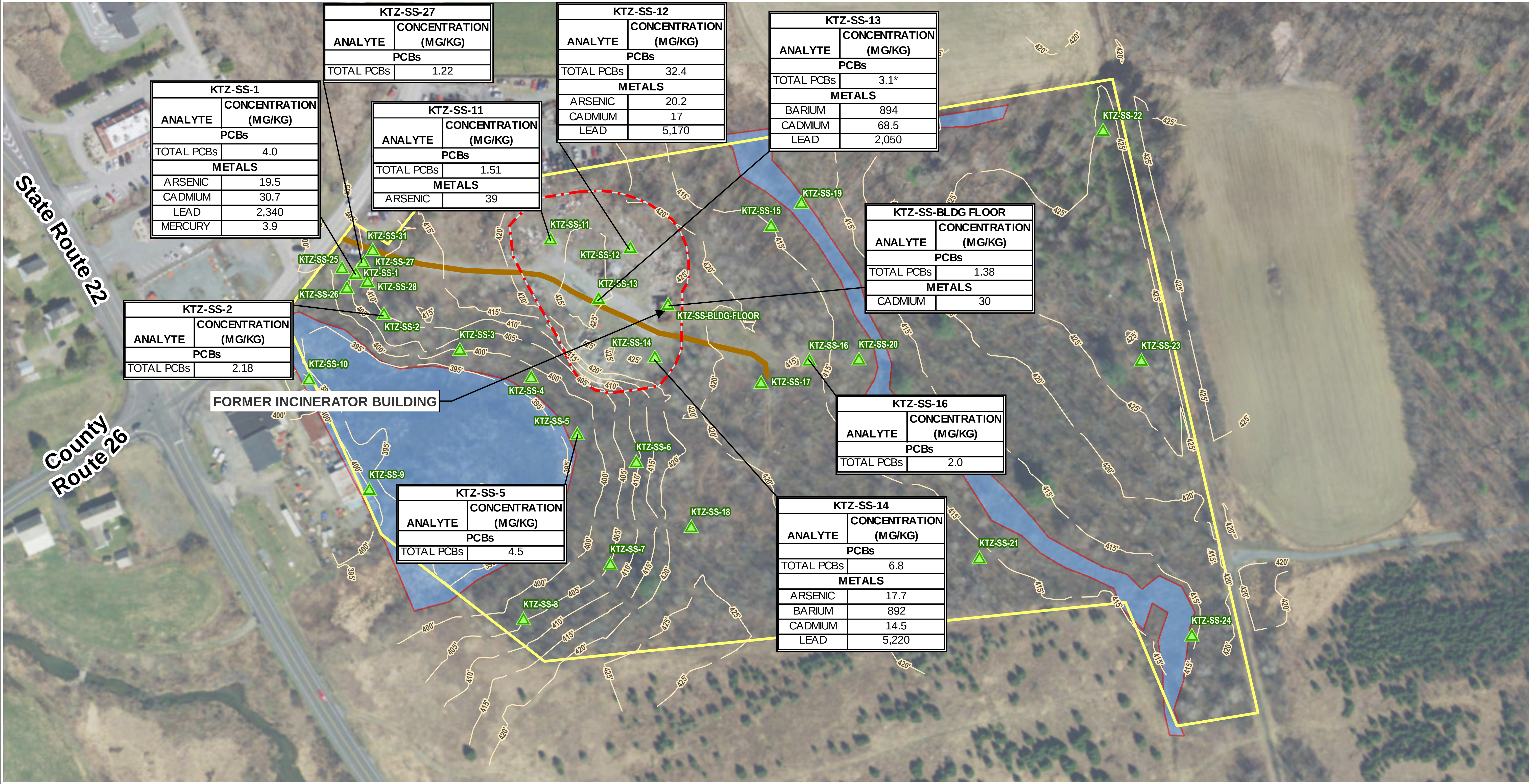

KTZ-SS-27	
ANALYTE	CONCENTRATION (MG/KG)
PCBs	
TOTAL PCBs	1.22

KTZ-SS-12	
ANALYTE	CONCENTRATION (MG/KG)
PCBs	
TOTAL PCBs	32.4
METALS	
ARSENIC	20.2
CADMIUM	17
LEAD	5,170

KTZ-SS-13	
ANALYTE	CONCENTRATION (MG/KG)
PCBs	
TOTAL PCBs	3.1*
METALS	
BARIUM	894
CADMIUM	68.5
LEAD	2,050

KTZ-SS-1	
ANALYTE	CONCENTRATION (MG/KG)
PCBs	
TOTAL PCBs	4.0
METALS	
ARSENIC	19.5
CADMIUM	30.7
LEAD	2,340
MERCURY	3.9

KTZ-SS-11	
ANALYTE	CONCENTRATION (MG/KG)
PCBs	
TOTAL PCBs	1.51
METALS	
ARSENIC	39

KTZ-SS-BLDG FLOOR	
ANALYTE	CONCENTRATION (MG/KG)
PCBs	
TOTAL PCBs	1.38
METALS	
CADMIUM	30

KTZ-SS-2	
ANALYTE	CONCENTRATION (MG/KG)
PCBs	
TOTAL PCBs	2.18

KTZ-SS-16	
ANALYTE	CONCENTRATION (MG/KG)
PCBs	
TOTAL PCBs	2.0

KTZ-SS-5	
ANALYTE	CONCENTRATION (MG/KG)
PCBs	
TOTAL PCBs	4.5

KTZ-SS-14	
ANALYTE	CONCENTRATION (MG/KG)
PCBs	
TOTAL PCBs	6.8
METALS	
ARSENIC	17.7
BARIUM	892
CADMIUM	14.5
LEAD	5,220

LEGEND

- SURFACE SOIL SAMPLING LOCATION
- GROUND SURFACE ELEVATION CONTOUR (FEET)
- ACCESS ROAD
- PROJECT AREA (APPROX)
- DELINEATED WETLANDS
- APPROX. EXTENT OF MAIN WASTE ACCUMULATION AREA

APPLICABLE NYSDEC SOIL CLEANUP OBJECTIVES (SCOS)		
ANALYTE	UNRESTRICTED USE SCO (MG/KG)	COMMERCIAL USE SCO (MG/KG)
PCBs		
TOTAL PCBs	0.1	1
METALS		
ARSENIC	13	16
BARIUM	350	400
CADMIUM	2.5	9.3
LEAD	63	1,000
MERCURY	0.18	2.8

NOTES

1. BASE MAP IMAGERY FROM ESRI/VERMONT, 2016.
2. ANALYTICAL DATA SHOWN EXCEEDS THE NYSDEC COMMERCIAL USE SOIL CLEANUP OBJECTIVES (SCOs).
3. SURFACE SOIL SAMPLING LOCATIONS WITHOUT ANALYTICAL RESULTS HAD NO CONCENTRATIONS EXCEEDING NYSDEC COMMERCIAL USE SCOs FOR VOCs, SVOCs, PCBs OR RCRA 8 METALS.
4. MG/KG – MILLIGRAMS PER KILOGRAM
5. CORRESPONDING ANALYTICAL QUALIFIERS ARE SHOWN ON TABLES 2A THROUGH 2C INCLUDED IN THE KATZMAN RECYCLING SITE REMEDIAL INVESTIGATION REPORT.
6. *-PCBs AT LOCATION KTZ-SS-13 WERE NOT DETECTED ABOVE THE LABORATORY REPORTING LIMIT (RL), HOWEVER THE RL EXCEEDED COMMERCIAL USE SCOs.

N

0 150 300 Feet

1 " = 150 '

Coordinate System: NAD 1983 UTM Zone 18N (Meter)
Map Rotation: 0

PROJECT:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
KATZMAN RECYCLING, SITE NO: 558035
GRANVILLE, NY 12832

TITLE:
SURFACE SOIL SAMPLING LOCATION MAP & SELECT ANALYTICAL RESULTS APRIL 2016

DRAWN BY:	B. DEEGAN	PROJ NO.:	240658.0003
CHECKED BY:	M. DOWD		
APPROVED BY:	J. LAROCK	FIGURE 4	
DATE:	JANUARY 2018		

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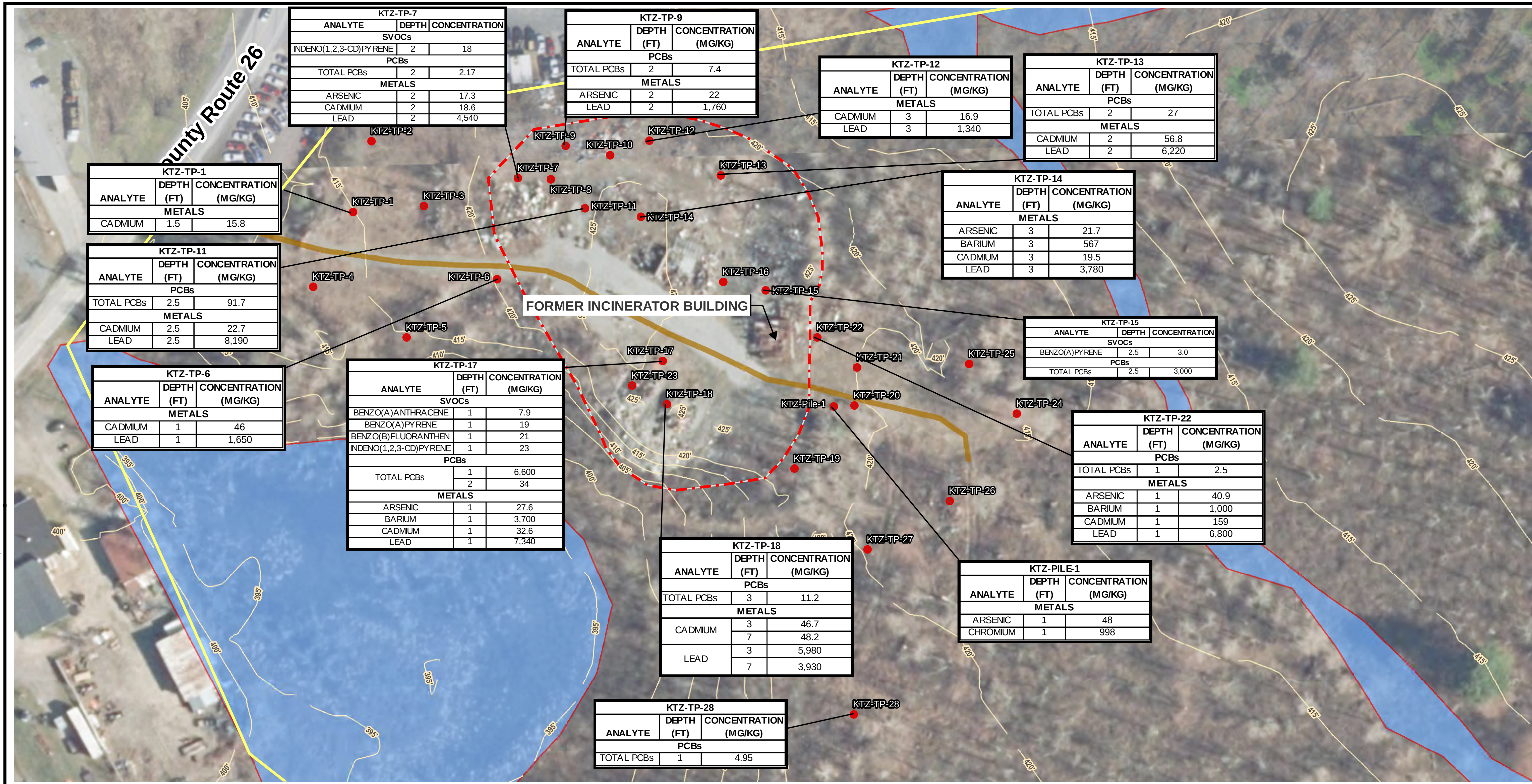

KTZ-TP-7

ANALYTE	DEPTH	CONCENTRATION
SVOCs		
INDENO(1,2,3-CD)PYRENE	2	18
PCBs		
TOTAL PCBs	2	2.17
METALS		
ARSENIC	2	17.3
CADMIUM	2	18.6
LEAD	2	4,540

KTZ-TP-9

ANALYTE	DEPTH (FT)	CONCENTRATION (MG/KG)
PCBs		
TOTAL PCBs	2	7.4
METALS		
ARSENIC	2	22
LEAD	2	1,760

KTZ-TP-12

ANALYTE	DEPTH (FT)	CONCENTRATION (MG/KG)
METALS		
CADMIUM	3	16.9
LEAD	3	1,340

KTZ-TP-13

ANALYTE	DEPTH (FT)	CONCENTRATION (MG/KG)
PCBs		
TOTAL PCBs	2	27
METALS		
CADMIUM	2	56.8
LEAD	2	6,220

KTZ-TP-1

ANALYTE	DEPTH (FT)	CONCENTRATION (MG/KG)
METALS		
CADMIUM	1.5	15.8

KTZ-TP-14

ANALYTE	DEPTH (FT)	CONCENTRATION (MG/KG)
METALS		
ARSENIC	3	21.7
BARIUM	3	567
CADMIUM	3	19.5
LEAD	3	3,780

KTZ-TP-11

ANALYTE	DEPTH (FT)	CONCENTRATION (MG/KG)
PCBs		
TOTAL PCBs	2.5	91.7
METALS		
CADMIUM	2.5	22.7
LEAD	2.5	8,190

KTZ-TP-15

ANALYTE	DEPTH	CONCENTRATION
SVOCs		
BENZO(A)PYRENE	2.5	3.0
PCBs		
TOTAL PCBs	2.5	3,000

KTZ-TP-6

ANALYTE	DEPTH (FT)	CONCENTRATION (MG/KG)
METALS		
CADMIUM	1	46
LEAD	1	1,650

KTZ-TP-17

ANALYTE	DEPTH (FT)	CONCENTRATION (MG/KG)
SVOCs		
BENZO(A)ANTHRACENE	1	7.9
BENZO(A)PYRENE	1	19
BENZO(B)FLUORANTHEN	1	21
INDENO(1,2,3-CD)PYRENE	1	23
PCBs		
TOTAL PCBs	1	6,600
	2	34
METALS		
ARSENIC	1	27.6
BARIUM	1	3,700
CADMIUM	1	32.6
LEAD	1	7,340

KTZ-TP-22

ANALYTE	DEPTH (FT)	CONCENTRATION (MG/KG)
PCBs		
TOTAL PCBs	1	2.5
METALS		
ARSENIC	1	40.9
BARIUM	1	1,000
CADMIUM	1	159
LEAD	1	6,800

KTZ-TP-18

ANALYTE	DEPTH (FT)	CONCENTRATION (MG/KG)
PCBs		
TOTAL PCBs	3	11.2
METALS		
CADMIUM	3	46.7
	7	48.2
LEAD	3	5,980
	7	3,930

KTZ-PILE-1

ANALYTE	DEPTH (FT)	CONCENTRATION (MG/KG)
METALS		
ARSENIC	1	48
CHROMIUM	1	998

KTZ-TP-28

ANALYTE	DEPTH (FT)	CONCENTRATION (MG/KG)
PCBs		
TOTAL PCBs	1	4.95

LEGEND

- TEST PIT SOIL SAMPLING LOCATION
- ACCESS ROAD
- GROUND SURFACE ELEVATION CONTOUR (FEET)
- PROJECT AREA
- DELINEATED WETLAND
- APPROX. EXTENT OF MAIN WASTE ACCUMULATION AREA

APPLICABLE NYSDEC SOIL CLEANUP OBJECTIVES (SCOs)

ANALYTE	UNRESTRICTED USE SCO (MG/KG)	COMMERCIAL USE SCO (MG/KG)
SVOCs		
BENZO(A)PYRENE	1	1
BENZO(A)ANTHRACENE	1	5.6
BENZO(B)FLUORANTHENE	1	5.6
INDENO(1,2,3-CD)PYRENE	0.5	5.6
PCBs		
TOTAL PCBs	0.1	1/10
METALS		
ARSENIC	13	16
BARIUM	350	400
CADMIUM	2.5	9.3
CHROMIUM	1	400
LEAD	63	1,000

NOTES

1. BASE MAP IMAGERY FROM ESRI/VERMONT, 2016.
2. ANALYTICAL DATA SHOWN EXCEEDS NYSDEC COMMERCIAL USE SOIL CLEANUP OBJECTIVES (SCOs).
3. AT TEST PIT LOCATIONS WITHOUT ANALYTICAL RESULTS, NO CONCENTRATIONS EXCEED COMMERCIAL USE SCO, FOR VOCs, SVOCs, PCBs, OR RCRA 8 METALS WITH THE EXCEPTION OF KTZ-TP-2, KTZ-TP-4, KTZ-TP-8, KTZ-TP-10, AND KTZ-TP-20, SINCE NO SAMPLES WERE COLLECTED AT THESE LOCATIONS.
4. NOTE THAT SOIL SAMPLES KTZ-TP-14 (2') AND KTZ-TP-18 (3') WERE ANALYZED FOR HERBICIDES AND PESTICIDES.
5. MG/KG - MILLIGRAM PER KILOGRAM
6. FT – FEET
7. CORRESPONDING ANALYTICAL QUALIFIERS ARE SHOWN ON TABLES 1A THROUGH 1C INCLUDED IN THE KATZMAN RECYCLING SITE REMEDIAL INVESTIGATION REPORT.
8. THE NYSDEC COMMERCIAL USE SCO FOR PCBs IS 1 MG/KG FOR SURFACE SOILS, 10 MG/KG FOR SOILS AT DEPTH.

N

0 40 80 Feet

1 " = 80 '

PROJECT:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
KATZMAN RECYCLING, SITE NO: 558035
GRANVILLE, NY 12832

TITLE:
TEST PIT SOIL SAMPLING ANALYTICAL SUMMARY & SELECT ANALYTICAL RESULTS JANUARY 2016

DRAWN BY:	B. DEEGAN	PROJ NO.:	240658.0003
CHECKED BY:	M. DOWD		
APPROVED BY:	J. LAROCK		
DATE:	JULY 2018		

FIGURE 5

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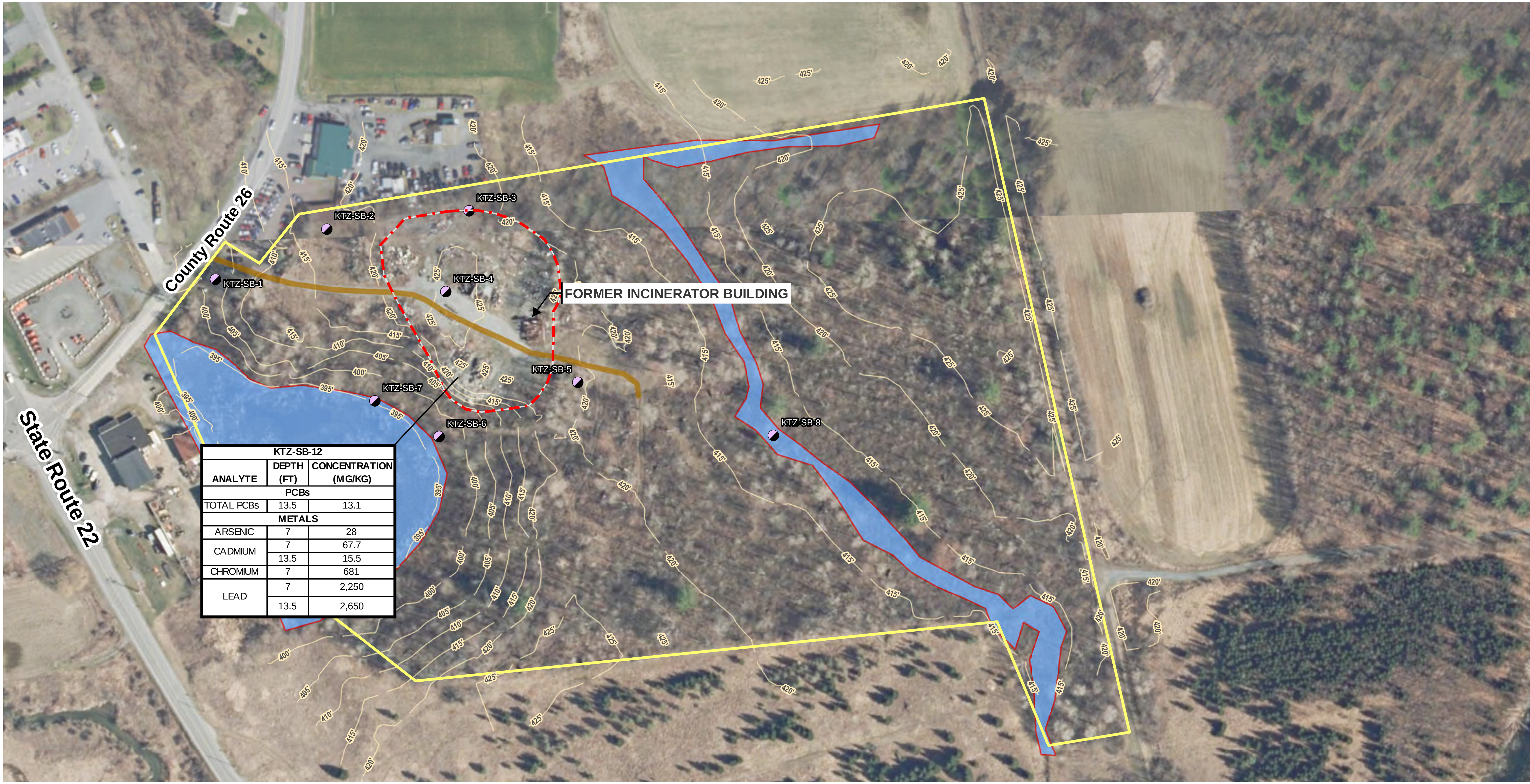

KTZ-SB-12		
ANALYTE	DEPTH (FT)	CONCENTRATION (MG/KG)
PCBs		
TOTAL PCBs	13.5	13.1
METALS		
ARSENIC	7	28
CADMIUM	7	67.7
	13.5	15.5
CHROMIUM	7	681
LEAD	7	2,250
	13.5	2,650

LEGEND

- DIRECT PUSH SOIL SAMPLING LOCATION
- ACCESS ROAD
- GROUND SURFACE ELEVATION CONTOUR (FEET)
- PROJECT AREA
- DELINEATED WETLAND
- APPROX. EXTENT OF MAIN WASTE ACCUMULATION AREA

APPLICABLE NYSDEC SOIL CLEANUP OBJECTIVES (SCOs)		
ANALYTE	UNRESTRICTED USE SCO (MG/KG)	COMMERCIAL USE SCO (MG/KG)
PCBs		
TOTAL PCBs	0.1	1/10
METALS		
ARSENIC	13	16
CADMIUM	2.5	9.3
CALCIUM	NS	NS
CHROMIUM	1	400
LEAD	63	1,000

NOTES

1. BASE MAP IMAGERY FROM ESRI/VERMONT, 2016.
2. ANALYTICAL DATA SHOWN EXCEEDS THE NYSDEC COMMERCIAL USE SOIL CLEANUP OBJECTIVES (SCOs).
3. SAMPLES FROM DIRECT PUSH SOIL BORING LOCATIONS KTZ-SB-2, KTZ-SB-5, KTZ-SB-7, AND KTZ-SB-9 THROUGH KTZ-SB-14 WERE NOT ANALYZED FOR VOCs, SVOCs, PESTICIDES, OR HERBICIDES.
4. CORRESPONDING ANALYTICAL QUALIFIERS ARE SHOWN ON TABLES 5A THROUGH 5D INCLUDED IN THE KATZMAN RECYCLING SITE REMEDIAL INVESTIGATION REPORT.
5. MG/KG – MILLIGRAMS PER KILOGRAM
6. FT – FEET
7. THE NYSDEC COMMERCIAL USE SCO FOR PCBs IS 1 MG/KG FOR SURFACE SOILS, 10 MG/KG FOR SOILS AT DEPTH.

N

0 150 300 Feet

1 " = 150 '

PROJECT:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
KATZMAN RECYCLING, SITE NO: 558035
GRANVILLE, NY 12832

TITLE:
DIRECT PUSH SOIL SAMPLING LOCATION MAP & SELECT ANALYTICAL RESULTS
JULY 2016

DRAWN BY:	B DEEGAN	PROJ NO.:	240658.0003
CHECKED BY:	M. DOWD		
APPROVED BY:	J. LAROCK		FIGURE 6
DATE:	JULY 2018		

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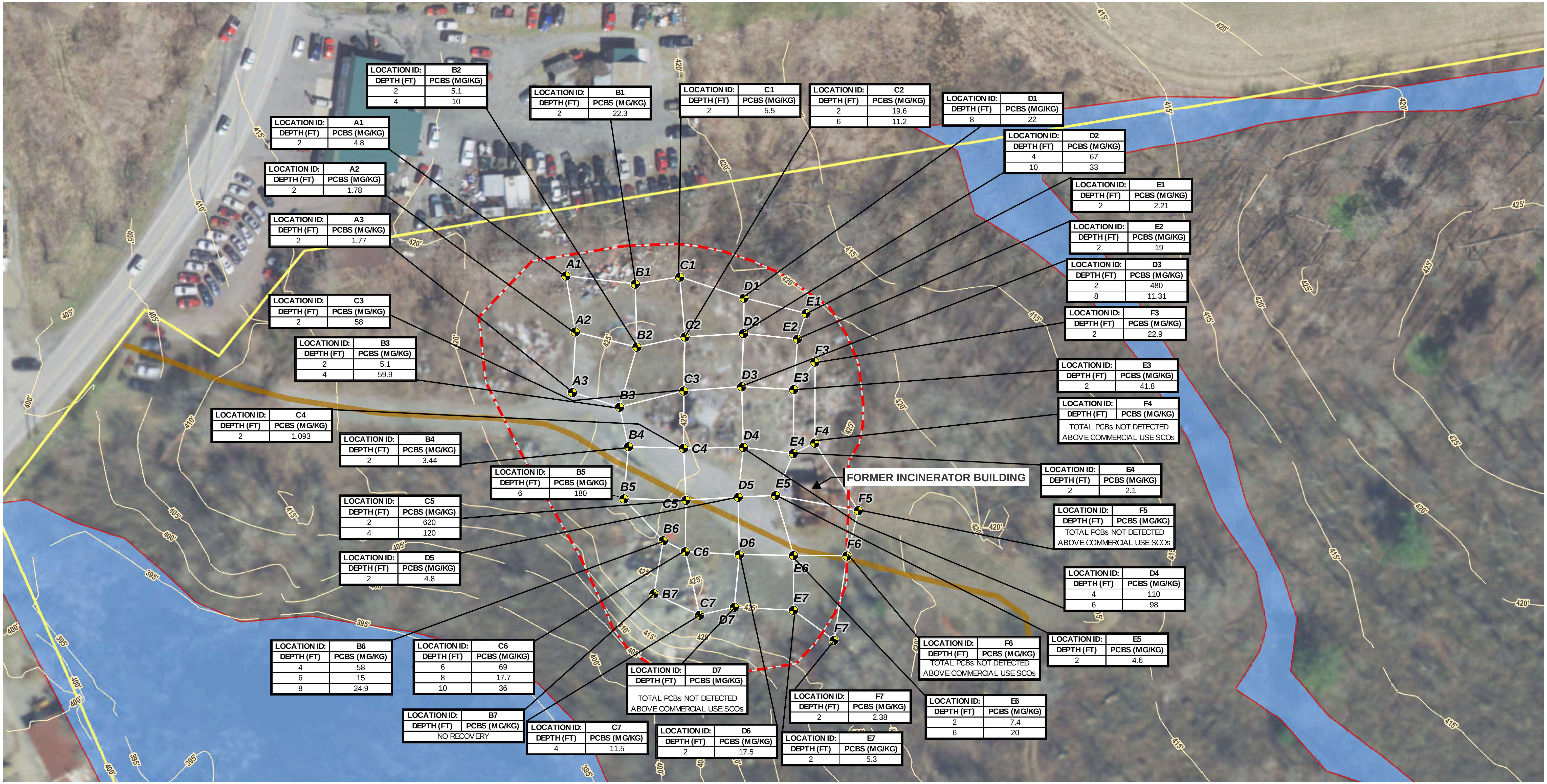
TRC - GIS

Coordinate System: NAD 1983 StatePlane New York East FIPS 3101 Feet (Foot US)
Map Rotation: 0



LEGEND

- SOIL BORING LOCATION - NOVEMBER 2016 SAMPLING EVENT
- APPROX. EXTENT OF MAIN WASTE ACCUMULATION AREA
- PROJECT AREA
- ACCESS ROAD
- DELINEATED WETLAND
- GROUND SURFACE ELEVATION CONTOUR (FEET)
- SAMPLING GRID

PCB DATA

LOCATION ID:	C4
DEPTH (FT)	PCBS (MG/KG)
2	1,093
6	6.5
8	6.1
10	1.94

PCBs-POLYCHLORINATED BIPHENYLS
MG/KG-MILLIGRAMS PER KILOGRAM
FT-FEET
SCO-SOIL CLEANUP OBJECTIVE

NOTES

1. BASE MAP IMAGERY FROM ESRI/VERMONT, 2016
2. ANALYTICAL RESULTS SHOWN EXCEED NYSDEC COMMERCIAL USE SCO FOR PCBs (1.0 MG/KG FOR SURFACE SOILS, 10 MG/KG FOR SOILS AT DEPTH).
3. CORRESPONDING ANALYTICAL QUALIFIERS ARE SHOWN ON TABLE 7 INCLUDED IN THE KATZMAN RECYCLING SITE REMEDIAL INVESTIGATION REPORT.

N

0 70 140 Feet
1 " = 70 '

PROJECT:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
KATZMAN RECYCLING, SITE NO:558035
GRANVILLE, NY 12832

TITLE: **SUPPLEMENTAL SOIL PCB INVESTIGATION ANALYTICAL SUMMARY NOVEMBER 2016**

DRAWN BY:	B. DEEGAN	PROJ NO.:	240658.0003
CHECKED BY:	M. DOWD		
APPROVED BY:	J. LAROCK	FIGURE 7	
DATE:	JULY 2018		

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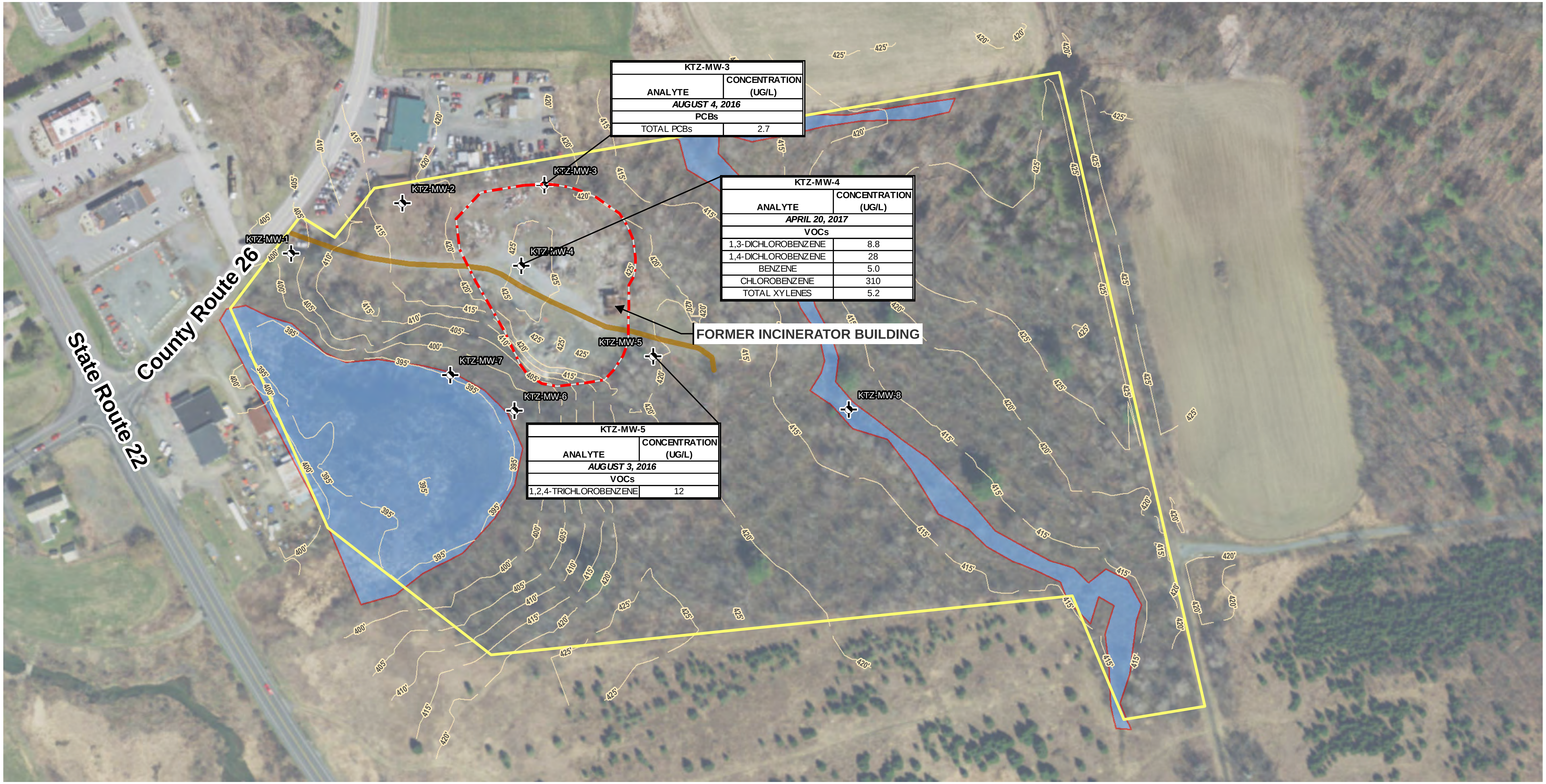

LEGEND

- GROUNDWATER MONITORING WELL LOCATION
- ACCESS ROAD
- GROUND SURFACE ELEVATION CONTOUR (FEET)
- PROJECT AREA (APPROX)
- DELINEATED WETLAND
- APPROX. EXTENT OF MAIN WASTE ACCUMULATION AREA

APPLICABLE NYSDEC GUIDANCE VALUES	
ANALYTE	CLASS GA VALUE (UG/L)
VOCs	
1,2,4-TRICHLOROBENZENE	5
1,3-DICHLOROBENZENE	3
1,4-DICHLOROBENZENE	3
BENZENE	1
CHLOROBENZENE	5
TOTAL XYLENES	5
PCBs	
TOTAL PCBs	0.09

NOTES

1. BASE MAP IMAGERY FROM ESRI/VERMONT, 2016.
2. ANALYTICAL DATA SHOWN EXCEEDS NYSDEC CLASS GA VALUES.
3. MONITORING WELL SAMPLING LOCATIONS WITHOUT ANALYTICAL RESULTS HAD NO CONCENTRATIONS EXCEEDING CLASS GA VALUES FOR VOCs, SVOCs, PCBs OR RCRA 8 METALS.
4. UG/L – MICROGRAMS PER LITER
5. NO STANDARD OR GUIDANCE VALUE FOR TOTAL XYLENES. THE STANDARD FOR O-XYLENE, M-XYLENE, AND P-XYLENE IS 5 UG/L.
6. CORRESPONDING ANALYTICAL QUALIFIERS ARE SHOWN ON TABLES 6A THROUGH 6E INCLUDED IN THE KATZMAN RECYCLING SITE REMEDIAL INVESTIGATION REPORT.

N

0 150 300 Feet

1 " = 150 '

PROJECT:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
KATZMAN RECYCLING, SITE NO: 558035
GRANVILLE, NY 12832

TITLE:
GROUNDWATER SAMPLING LOCATION MAP
& SELECT ANALYTICAL RESULTS
AUGUST 2016 & APRIL 2017

DRAWN BY:	B. DEEGAN	PROJ NO.:	240658.0003
CHECKED BY:	M. DOWD		
APPROVED BY:	J. LAROCK		FIGURE 8
DATE:	JANUARY 2018		

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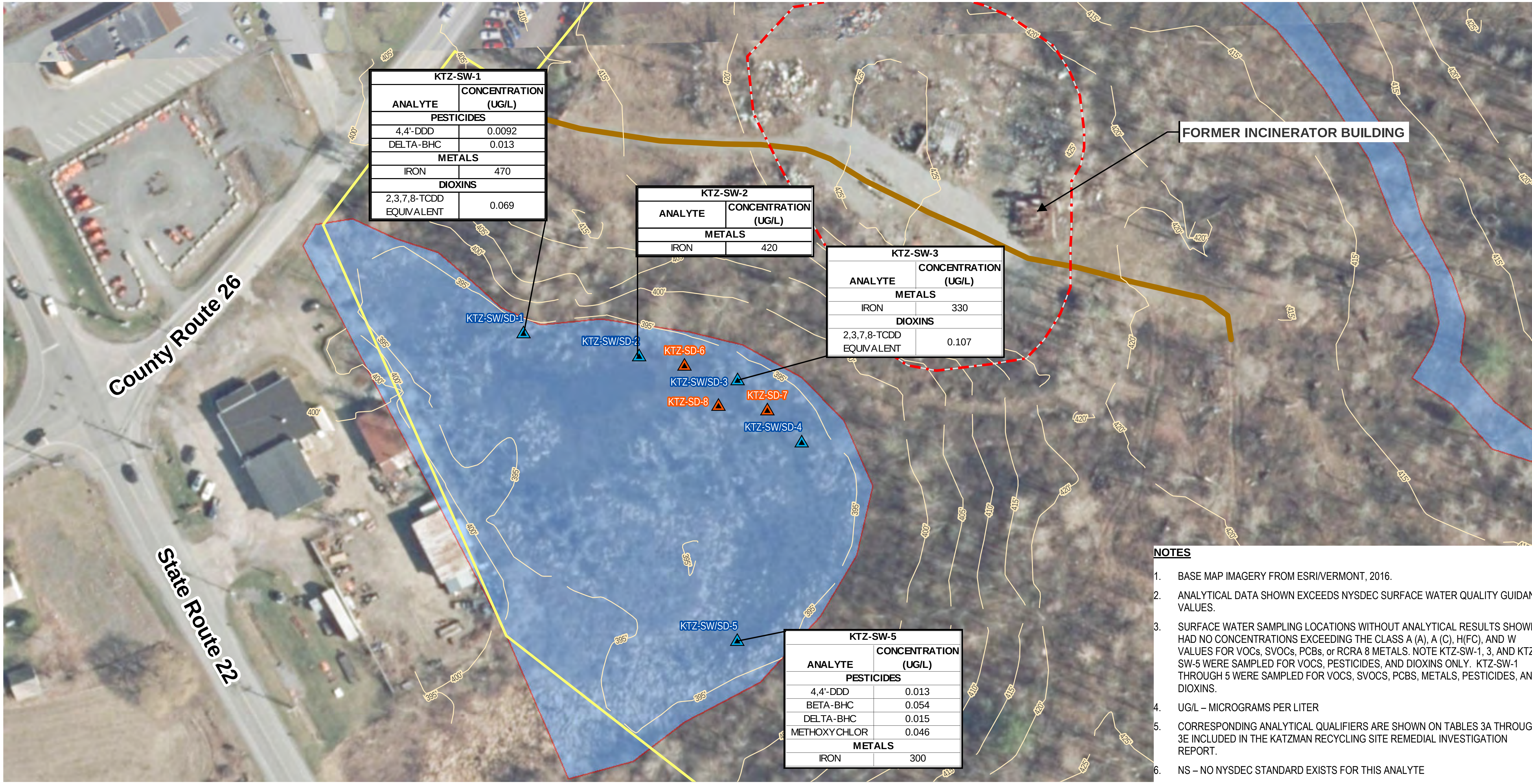


KTZ-SW-1	
ANALYTE	CONCENTRATION (UG/L)
PESTICIDES	
4,4'-DDD	0.0092
DELTA-BHC	0.013
METALS	
IRON	470
DIOXINS	
2,3,7,8-TCDD EQUIVALENT	0.069

KTZ-SW-2	
ANALYTE	CONCENTRATION (UG/L)
METALS	
IRON	420

KTZ-SW-3	
ANALYTE	CONCENTRATION (UG/L)
METALS	
IRON	330
DIOXINS	
2,3,7,8-TCDD EQUIVALENT	0.107

KTZ-SW-5	
ANALYTE	CONCENTRATION (UG/L)
PESTICIDES	
4,4'-DDD	0.013
BETA-BHC	0.054
DELTA-BHC	0.015
METHOXYCHLOR	0.046
METALS	
IRON	300

NOTES

1. BASE MAP IMAGERY FROM ESRI/VERMONT, 2016.
2. ANALYTICAL DATA SHOWN EXCEEDS NYSDEC SURFACE WATER QUALITY GUIDANCE VALUES.
3. SURFACE WATER SAMPLING LOCATIONS WITHOUT ANALYTICAL RESULTS SHOWN HAD NO CONCENTRATIONS EXCEEDING THE CLASS A (A), A (C), H(FC), AND W VALUES FOR VOCs, SVOCs, PCBs, or RCRA 8 METALS. NOTE KTZ-SW-1, 3, AND KTZ-SW-5 WERE SAMPLED FOR VOCS, PESTICIDES, AND DIOXINS ONLY. KTZ-SW-1 THROUGH 5 WERE SAMPLED FOR VOCS, SVOCS, PCBS, METALS, PESTICIDES, AND DIOXINS.
4. UG/L – MICROGRAMS PER LITER
5. CORRESPONDING ANALYTICAL QUALIFIERS ARE SHOWN ON TABLES 3A THROUGH 3E INCLUDED IN THE KATZMAN RECYCLING SITE REMEDIAL INVESTIGATION REPORT.
6. NS – NO NYSDEC STANDARD EXISTS FOR THIS ANALYTE

LEGEND

- SEDIMENT ONLY SAMPLING LOCATIONS
- SURFACE WATER/SEDIMENT SAMPLING LOCATION
- GROUND SURFACE ELEVATION CONTOUR (FEET)
- ACCESS ROAD
- PROJECT AREA (APPROX)
- DELINEATED WETLANDS
- APPROX. EXTENT OF MAIN WASTE ACCUMULATION AREA

APPLICABLE NYSDEC GUIDANCE VALUES				
ANALYTE	CLASS A(A) VALUE (UG/L)	CLASS A(C) VALUE (UG/L)	CLASS H(FC) VALUE (UG/L)	CLASS W VALUE (UG/L)
PESTICIDES				
4,4'-DDD	NS	NS	0.00008	0.000011
BETA-BHC	NS	NS	0.007	NS
DELTA-BHC	NS	NS	0.008	NS
METHOXYCHLOR	NS	0.03	NS	NS
METALS				
IRON	300	300	NS	NS
DIOXINS				
2,3,7,8-TCDD EQUIVALENT	NS	NS	0.0006	NS

0 80 160 Feet

1 " = 80 '

PROJECT:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
KATZMAN RECYCLING, SITE NO: 558035
GRANVILLE, NY 12832

TITLE:
SURFACE WATER SAMPLING LOCATION MAP & SELECT ANALYTICAL RESULTS APRIL 2016

DRAWN BY:	B. DEEGAN	PROJ NO.:	240658.0003
CHECKED BY:	M. DOWD		
APPROVED BY:	J. LAROCK	FIGURE 9	
DATE:	APRIL 2018		

TRC

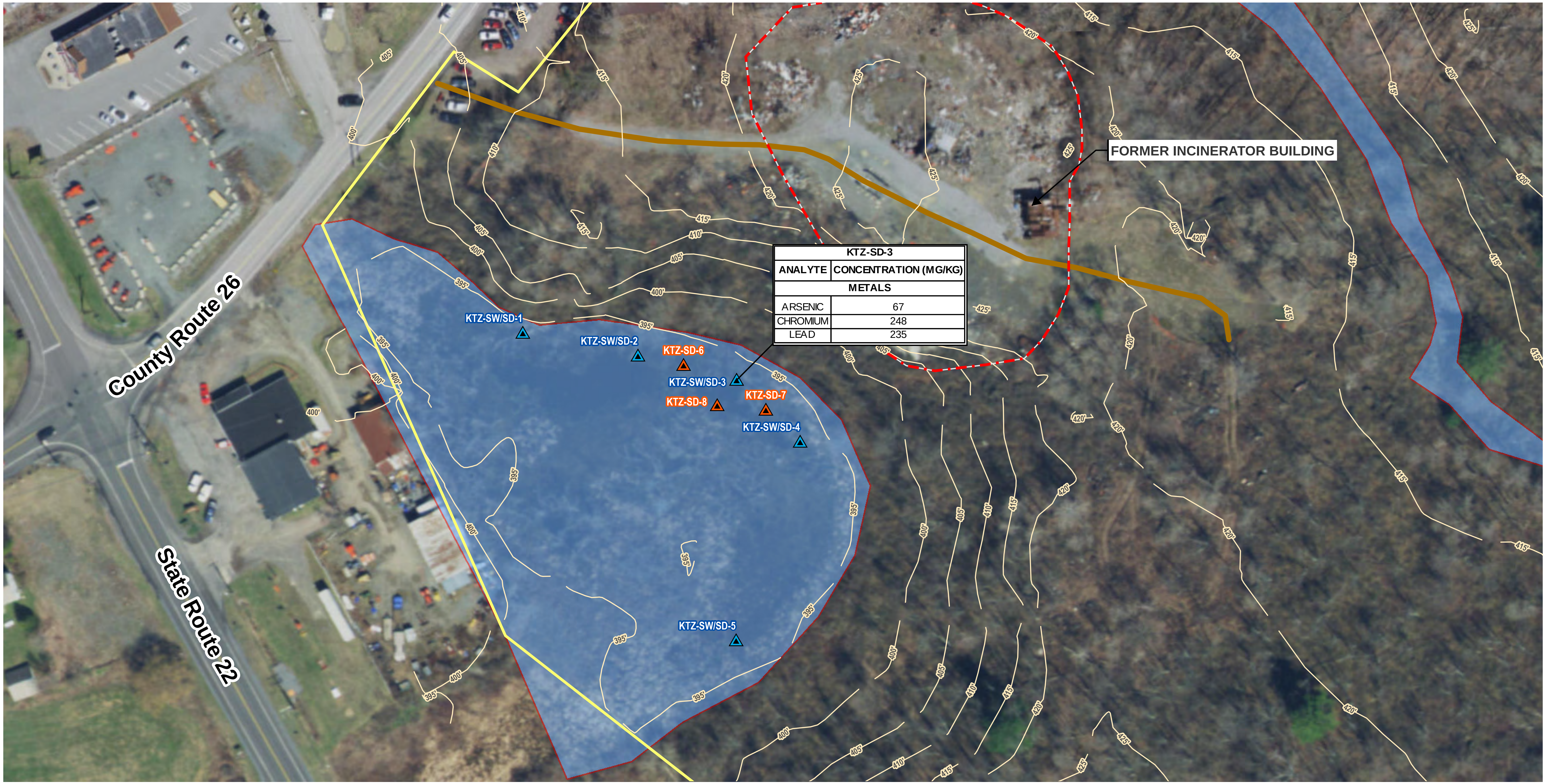
10 Maxwell Drive, Suite 200
Clifton Park, NY 12065
Phone: 518.348.1190
www.trcsolutions.com

FILE NO.: 240658-0003-012.mxd

TRC - GIS

Coordinate System: NAD 1983 UTM Zone 18N (Meter)
Map Rotation: 0

Plot Date: 4/20/2018, 07:57:09 AM by BDEEGAN -- LAYOUT: ANSI B(11"x17")
Path: S:\1-PROJECTS\NYSDEC\240658_Katzman\240658-0003-012.mxd



KTZ-SD-3	
ANALYTE	CONCENTRATION (MG/KG)
METALS	
ARSENIC	67
CHROMIUM	248
LEAD	235

LEGEND

- SEDIMENT ONLY SAMPLING LOCATION
- SURFACE WATER/SEDIMENT SAMPLING LOCATION
- GROUND SURFACE ELEVATION CONTOUR (FEET)
- ACCESS ROAD
- PROJECT AREA (APPROX)
- DELINEATED WETLANDS
- APPROX. EXTENT OF MAIN WASTE ACCUMULATION AREA

APPLICABLE NYSDEC GUIDANCE VALUES	
ANALYTE	CLASS C SGV (MG/KG)
METALS	
ARSENIC	33
CHROMIUM	110
LEAD	130

NOTES

1. BASE MAP IMAGERY FROM ESRI/VERMONT, 2016.
2. ANALYTICAL DATA SHOWN EXCEEDS NYSDEC CLASS C SEDIMENT GUIDANCE VALUES (SGVs).
3. SEDIMENT SAMPLING LOCATIONS WITHOUT ANALYTICAL HAD NO CONCENTRATIONS EXCEEDING THE NYSDEC CLASS C SGVs.
4. NOTE THAT SEDIMENT SAMPLES KTZ-SD-1, 3, AND 5 WERE SAMPLED FOR VOCs AND PESTICIDES ONLY. SEDIMENT SAMPLES KTZ-SD-1 THROUGH 8 WERE SAMPLED FOR VOCs, SVOCs, PCBs, METALS, PESTICIDES, AND DIOXINS.
5. UG/L – MICROGRAMS PER LITER
6. CORRESPONDING ANALYTICAL QUALIFIERS ARE SHOWN ON TABLES 4A THROUGH 4D INCLUDED IN THE KATZMAN RECYCLING SITE REMEDIAL INVESTIGATION REPORT.

N

0 80 160 Feet

1 " = 80 '

PROJECT:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
KATZMAN RECYCLING, SITE NO: 558035
GRANVILLE, NY 12832

TITLE:
SEDIMENT SAMPLING LOCATION MAP & SELECT ANALYTICAL RESULTS APRIL & JUNE 2016

DRAWN BY:	B. DEEGAN	PROJ NO.:	240658.0003
CHECKED BY:	M. DOWD		
APPROVED BY:	J. LAROCK		FIGURE 10
DATE:	JANUARY 2018		

TRC
10 Maxwell Drive, Suite 200
Clifton Park, NY 12065
Phone: 518.348.1190
www.trcsolutions.com

FILE NO.: 240658-0003-013.mxd

TRC - GIS

Coordinate System: NAD 1983 UTM Zone 18N (Meter)
Map Rotation: 0

Plot Date: 1/11/2018, 09:41:22 AM by SMAJOR -- LAYOUT: ANSI B(11"x17")
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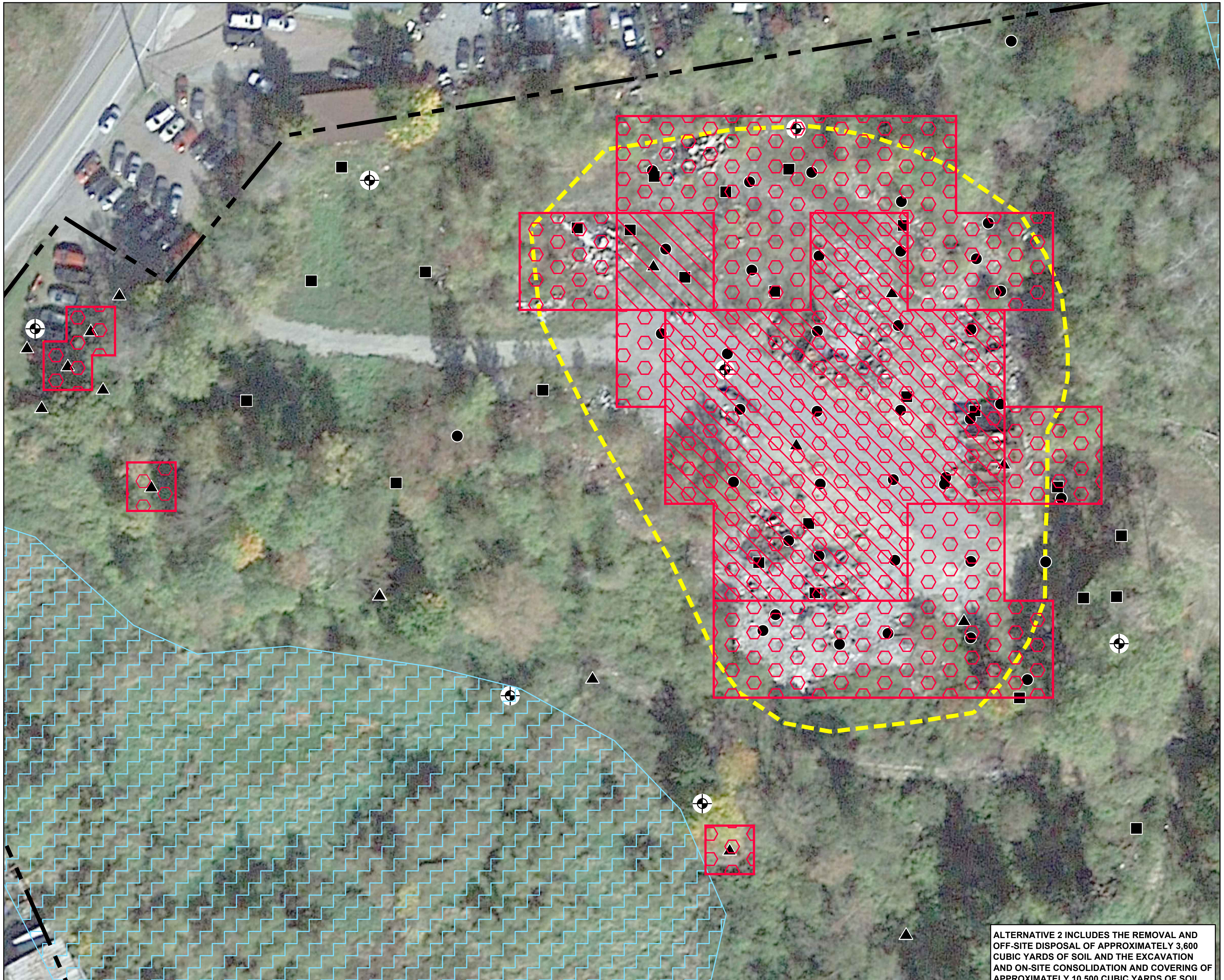


LEGEND (SYMBOLS NOT TO SCALE):

- PROJECT BOUNDARY
- APPROXIMATE EXTENT OF WASTE ACCUMULATION AREA
- DELINEATED WETLAND
- RI SURFACE SOIL SAMPLE LOCATION
- RI SOIL BORING LOCATION
- RI TEST PIT LOCATION
- RI SOIL BORING / MONITORING WELL LOCATION
- SOIL WITH PCBs < 50 MG/KG AND > 1 MG/KG TO BE EXCAVATED, CONSOLIDATED, AND COVERED ON-SITE
- SOIL WITH PCBs ≥ 50 MG/KG TO BE REMOVED

NOTES:

1. LOCATIONS AND DIMENSIONS OF PHYSICAL FEATURES AND PROPERTY BOUNDARIES ARE APPROXIMATE.
2. NOT SHOWN ARE ADDITIONAL SURFACE SOIL "HOT SPOTS" TO BE EXCAVATED, CONSOLIDATED, AND COVERED ON-SITE IN THE LOCATIONS OF KTZ-SS-16 AND KTZ-TP-28.
3. PCB CONCENTRATIONS DETECTED AT SURFACE SOIL "HOT SPOT" LOCATIONS ARE NOT CONTINUOUS WITH, OR ATTRIBUTED TO, THE DEBRIS PILE OBSERVED WITHIN THE WASTE ACCUMULATION AREA.
4. APPROXIMATE MAXIMUM DEPTH OF SOIL EXCAVATION IS 19 FEET BGS.
5. DIMENSIONS OF EXCAVATION AREAS SHOWN ARE CONCEPT LEVEL FOR PURPOSES OF ESTIMATING RELATIVE EXTENTS IN COMPARISON TO OTHER REMEDIAL ALTERNATIVES FOR THE FOCUSED FEASIBILITY STUDY ONLY.

N

0 50' 100'

SCALE: 1"=50'
SHEET SIZE: 11' BY 17"

PROJECT:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
KATZMAN RECYCLING - SITE NO. 558035
GRANVILLE, NY 12832

TITLE:
ALTERNATIVE 2
REMOVAL OF SOIL WITH PCBs ≥ 50 MG/KG AND CONSOLIDATION AND COVERING OF SOIL WITH PCBs > 1 MG/KG (DEPTH OF SOIL EXCAVATION UP TO 19')

DRAWN BY:	H. DELGADO	PROJ NO.:	240658.0004
CHECKED BY:	D. WARREN		FIGURE 11
APPROVED BY:	D. GLASS		
DATE:	AUGUST 2018		

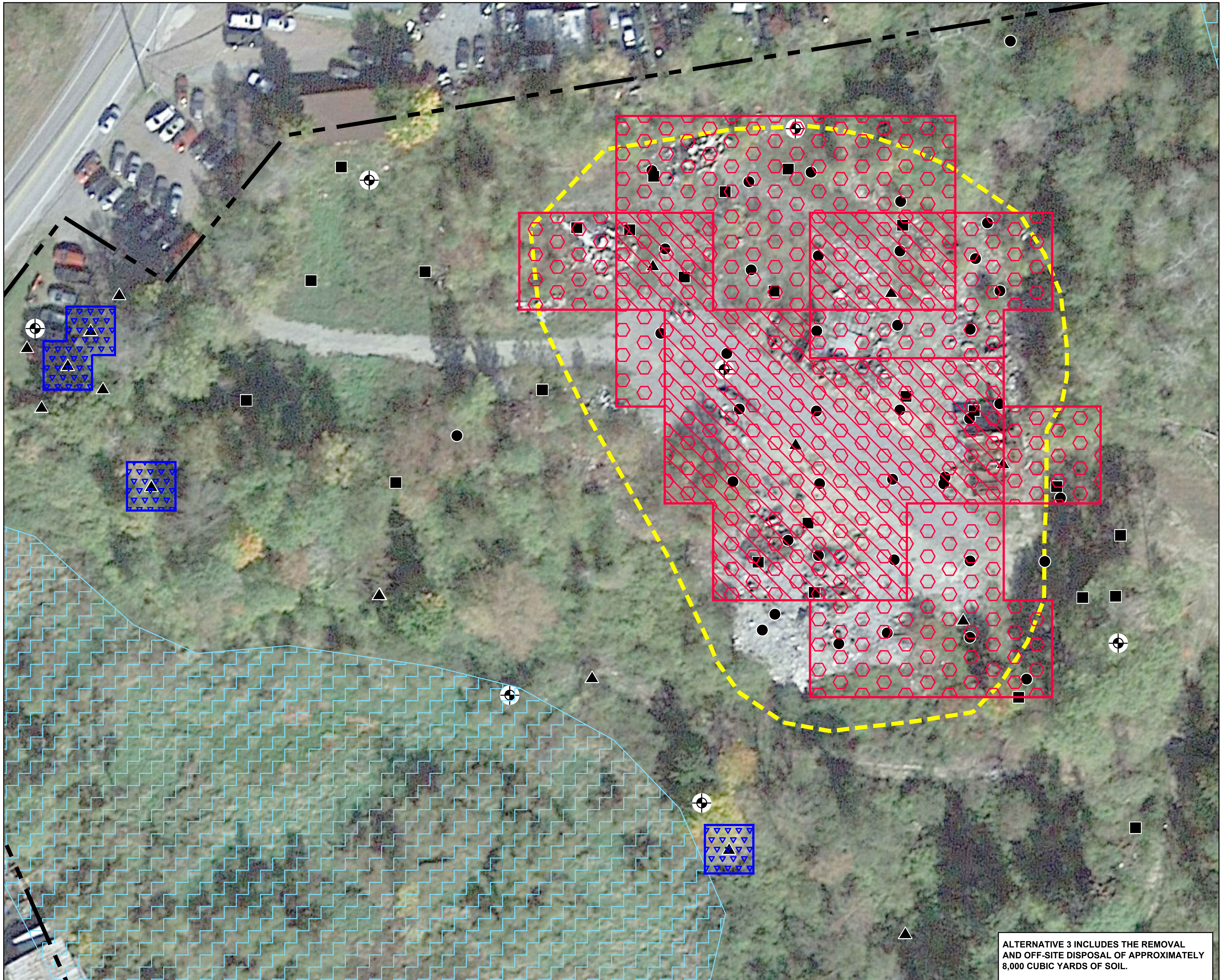
TRC

1430 Broadway
10th Floor
New York, NY 10018
Phone: 212.221.7822

FILE NO.: Figure 11 - Alt. 2 - Removal of Soil with PCBs Greater than 50 mg-kg 08.01.18.dwg

DRAWING NAME: I:\Projects\NYSDEC\Assignments\WA #24 - Katzman Recycling\Feasibility Study\Figures\TRC Working Drawings\Figure 11 - Alt. 2 - Removal of Soil with PCBs Greater than 50 mg-kg 08.01.18.dwg --- PLOT DATE: August 09, 2018 - 5:38PM --- LAYOUT: 11X17L

Version: 2017-10-21



LEGEND (SYMBOLS NOT TO SCALE):

- PROJECT BOUNDARY
- APPROXIMATE EXTENT OF WASTE ACCUMULATION AREA
- DELINEATED WETLAND
- RI SURFACE SOIL SAMPLE LOCATION
- RI SOIL BORING LOCATION
- RI TEST PIT LOCATION
- RI SOIL BORING / MONITORING WELL LOCATION
- SURFACE SOIL (0-2' BGS) WITH PCBs > 1 MG/KG TO BE COVERED
- SURFACE SOIL (0-2' BGS) WITH PCBs > 1 MG/KG TO BE REMOVED
- SUBSURFACE SOIL WITH PCBs > 25 MG/KG TO BE REMOVED

NOTES:

1. LOCATIONS AND DIMENSIONS OF PHYSICAL FEATURES AND PROPERTY BOUNDARIES ARE APPROXIMATE.
2. NOT SHOWN ARE ADDITIONAL SURFACE SOIL "HOT SPOTS" TO BE COVERED IN THE LOCATIONS OF KTZ-SS-16 AND KTZ-TP-28.
3. PCB CONCENTRATIONS DETECTED AT SURFACE SOIL "HOT SPOT" LOCATIONS ARE NOT CONTINUOUS WITH, OR ATTRIBUTED TO, THE DEBRIS PILE OBSERVED WITHIN THE WASTE ACCUMULATION AREA.
4. APPROXIMATE MAXIMUM DEPTHS OF REQUIRED SUBSURFACE SOIL REMOVAL VARY FROM 4 TO 10 FEET BGS.
5. DIMENSIONS OF EXCAVATION AREAS SHOWN ARE CONCEPT LEVEL FOR PURPOSES OF ESTIMATING RELATIVE EXTENTS IN COMPARISON TO OTHER REMEDIAL ALTERNATIVES FOR THE FOCUSED FEASIBILITY STUDY ONLY.

N

0 50' 100'

SCALE: 1"=50'
SHEET SIZE: 11' BY 17"

PROJECT:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
KATZMAN RECYCLING - SITE NO. 558035
GRANVILLE, NY 12832

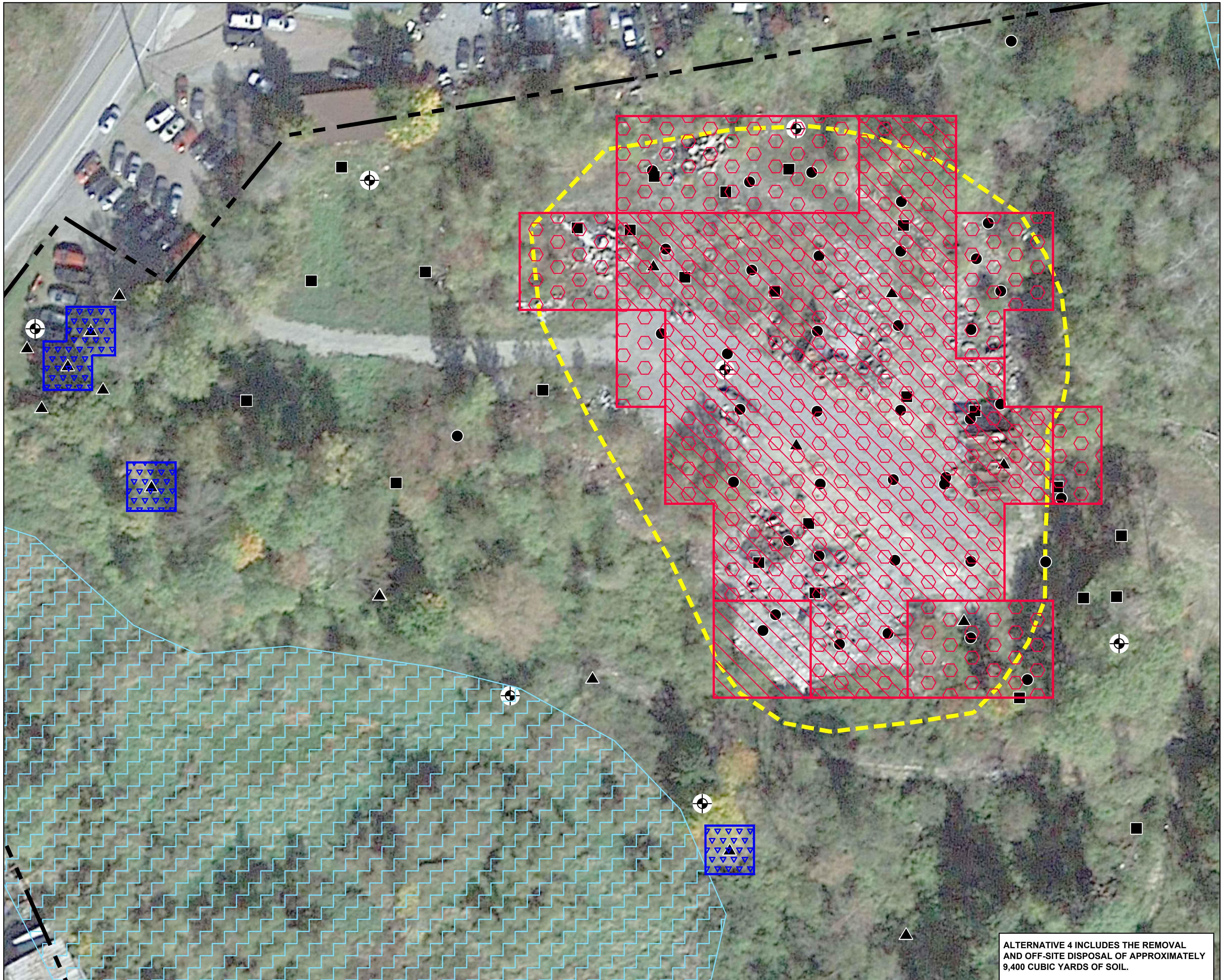
TITLE:
ALTERNATIVE 3
REMOVAL OF SURFACE SOIL WITH PCBs > 1 MG/KG AND SUBSURFACE SOIL WITH PCBS > 25 MG/KG (DEPTH OF SOIL REMOVAL UP TO 10')

DRAWN BY:	H. DELGADO	PROJ NO.:	240658.0004
CHECKED BY:	D. WARREN	**FIGURE 12**	
APPROVED BY:	D. GLASS		
DATE:	AUGUST 2018		

TRC
1430 Broadway
10th Floor
New York, NY 10018
Phone: 212.221.7822

FILE NO.: Figure 12 - Alt. 3 - Removal of Soil with PCBs Greater than 25 mg-kg 08.01.18.dwg

11x17 --- USER: hdelgado --- ATTACHED XREF'S: Katzman Site Samples; Contours_2ft_Copy; Katzman_Site Samp.(no Labels) --- ATTACHED IMAGES: Figure 12A - 240658_Binder20171213 (002); GEP_Katzman2016;
DRAWING NAME: I:\Projects\NYSDEC\Assignments\WA #24 - Katzman Recycling\Feasibility Study\Figures\TRC Working Drawings\ Figure 12 - Alt. 3 - Removal of Soil with PCBs Greater than 25 mg-kg 08.01.18.dwg --- PLOT DATE: August 15, 2018 - 1:32PM --- LAYOUT: 11X17L
Version: 2017-10-21



LEGEND (SYMBOLS NOT TO SCALE):

- PROJECT BOUNDARY
- APPROXIMATE EXTENT OF WASTE ACCUMULATION AREA
- DELINEATED WETLAND
- RI SURFACE SOIL SAMPLE LOCATION
- RI SOIL BORING LOCATION
- RI TEST PIT LOCATION
- RI SOIL BORING / MONITORING WELL LOCATION
- SURFACE SOIL (0-2' BGS) WITH PCBs > 1 MG/KG TO BE COVERED
- SURFACE SOIL WITH PCBs > 1 MG/KG TO BE REMOVED
- SUBSURFACE SOIL WITH PCBs > 10 MG/KG TO BE REMOVED

NOTES:

1. LOCATIONS AND DIMENSIONS OF PHYSICAL FEATURES AND PROPERTY BOUNDARIES ARE APPROXIMATE.
2. NOT SHOWN ARE ADDITIONAL SURFACE SOIL "HOT SPOTS" TO BE COVERED IN THE LOCATIONS OF KTZ-SS-16 AND KTZ-TP-28.
3. PCB CONCENTRATIONS DETECTED AT SURFACE SOIL "HOT SPOT" LOCATIONS ARE NOT CONTINUOUS WITH, OR ATTRIBUTED TO, THE DEBRIS PILE OBSERVED WITHIN THE WASTE ACCUMULATION AREA.
4. APPROXIMATE MAXIMUM DEPTHS OF REQUIRED SUBSURFACE SOIL REMOVAL VARY FROM 4 TO 13.5 FEET BGS.
5. DIMENSIONS OF EXCAVATION AREAS SHOWN ARE CONCEPT LEVEL FOR PURPOSES OF ESTIMATING RELATIVE EXTENTS IN COMPARISON TO OTHER REMEDIAL ALTERNATIVES FOR THE FOCUSED FEASIBILITY STUDY ONLY.

N

0 50' 100'

SCALE: 1"=50'
SHEET SIZE: 11' BY 17"

PROJECT:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
KATZMAN RECYCLING - SITE NO. 558035
GRANVILLE, NY 12832

TITLE:
ALTERNATIVE 4
REMOVAL OF SURFACE SOIL WITH PCBs > 1 MG/KG AND SUBSURFACE SOIL WITH PCBs > 10 MG/KG (DEPTH OF SOIL REMOVAL UP TO 13.5')

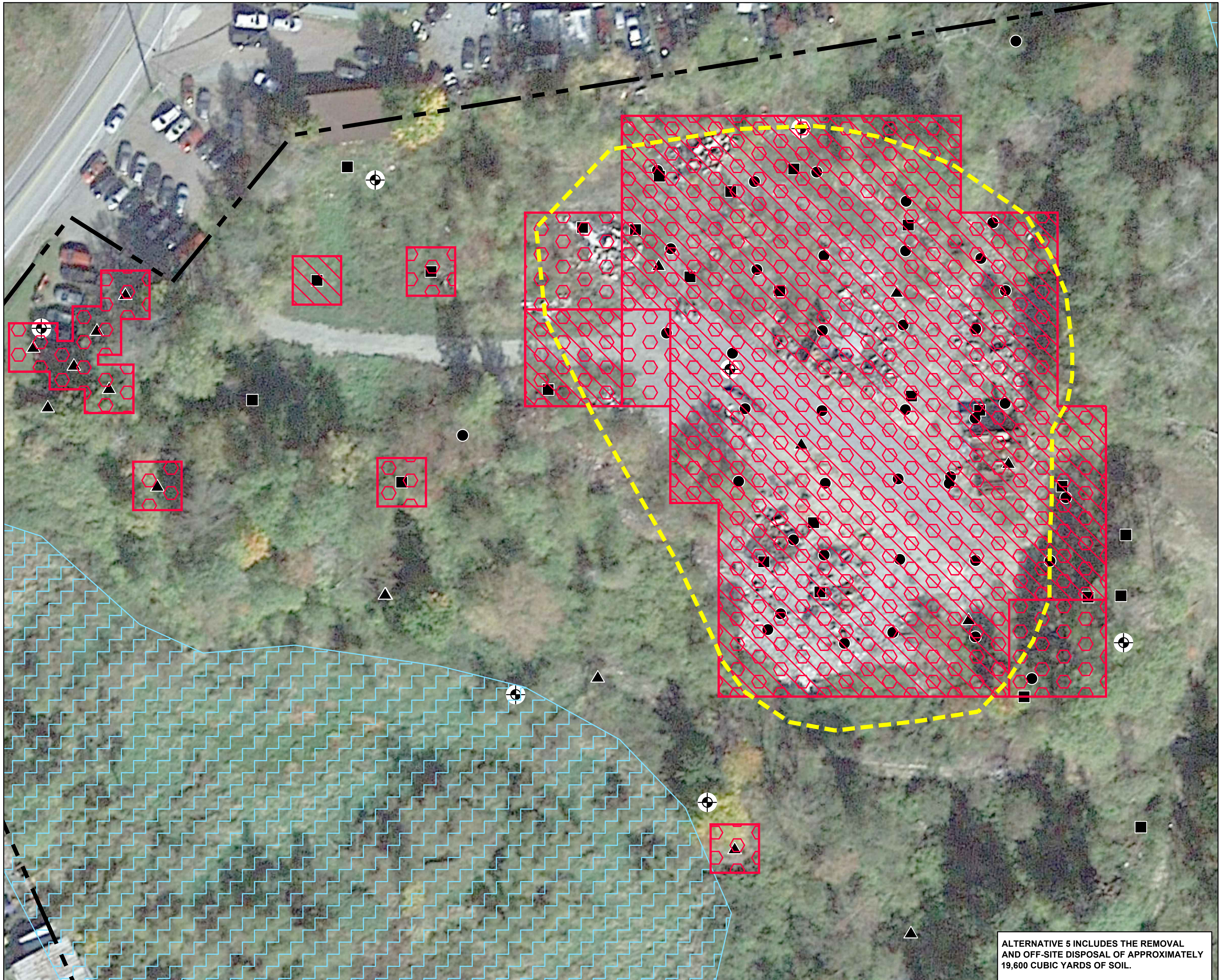
DRAWN BY:	H. DELGADO	PROJ NO.:	240658.0004
CHECKED BY:	D. WARREN	**FIGURE 13**	
APPROVED BY:	D. GLASS		
DATE:	AUGUST 2018		

TRC
1430 Broadway
10th Floor
New York, NY 10018
Phone: 212.221.7822

FILE NO.: Figure 13 - Alt. 4 - Removal of Surf. Soil with PCBs Greater than 10 mg-kg 08.01.18.dwg

DRAWING NAME: I:\Projects\NYSDEC\Assignments\WA #24 - Katzman Recycling\Feasibility Study\Figures\TRC Working Drawings\Figure 13 - Alt. 4 - Removal of Surf. Soil with PCBs Greater than 10 mg-kg 08.01.18.dwg --- PLOT DATE: August 15, 2018 - 1:34PM --- LAYOUT: 11X17L

Version: 2017-10-21



LEGEND (SYMBOLS NOT TO SCALE):

- PROJECT BOUNDARY
- APPROXIMATE EXTENT OF WASTE ACCUMULATION AREA
- DELINEATED WETLAND
- RI SURFACE SOIL SAMPLE LOCATION
- RI SOIL BORING LOCATION
- RI TEST PIT LOCATION
- RI SOIL BORING / MONITORING WELL LOCATION
- SURFACE SOIL (0-2' BGS) WITH PCBs > 0.1 MG/KG TO BE REMOVED
- SUBSURFACE SOIL WITH PCBs > 0.1 MG/KG TO BE REMOVED

NOTES:

1. LOCATIONS AND DIMENSIONS OF PHYSICAL FEATURES AND PROPERTY BOUNDARIES ARE APPROXIMATE.
2. NOT SHOWN ARE ADDITIONAL SURFACE SOIL "HOT SPOTS" TO BE REMOVED IN THE LOCATIONS OF KTS-SB-11, KTZ-SS-10, KTZ-SS-16, KTZ-SS-17, AND KTZ-TP-28.
3. PCB CONCENTRATIONS DETECTED AT SOIL "HOT SPOT" LOCATIONS ARE NOT CONTINUOUS WITH, OR ATTRIBUTED TO, THE DEBRIS PILE OBSERVED WITHIN THE WASTE ACCUMULATION AREA.
4. APPROXIMATE MAXIMUM DEPTHS OF REQUIRED SUBSURFACE SOIL REMOVAL VARY FROM 4 TO 19 FEET BGS.
5. DIMENSIONS OF EXCAVATION AREAS SHOWN ARE CONCEPT LEVEL FOR PURPOSES OF ESTIMATING RELATIVE EXTENTS IN COMPARISON TO OTHER REMEDIAL ALTERNATIVES FOR THE FOCUSED FEASIBILITY STUDY ONLY.

N

0 50' 100'

SCALE: 1"=50'
SHEET SIZE: 11' BY 17"

PROJECT:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
KATZMAN RECYCLING - SITE NO. 558035
GRANVILLE, NY 12832

TITLE:
ALTERNATIVE 5
REMOVAL OF SOIL WITH PCBs > 0.1 MG/KG
(DEPTH OF SOIL REMOVAL UP TO 19')

DRAWN BY:	H. DELGADO	PROJ NO.:	240658.0004
CHECKED BY:	D. WARREN		FIGURE 14
APPROVED BY:	D. GLASS		
DATE:	AUGUST 2018		

TRC
1430 Broadway
10th Floor
New York, NY 10018
Phone: 212.221.7822

FILE NO.: Figure 14 - Alt. 5 - Removal of Soil with PCBs Greater than 0.1 mg-kg 08.01.18.dwg

DRAWING NAME: I:\Projects\NYSDEC\Assignments\WA #24 - Katzman Recycling\Feasibility Study\Figures\TRC Working Drawings\Figure 14 - Alt. 5 - Removal of Soil with PCBs Greater than 0.1 mg-kg 08.01.18.dwg --- PLOT DATE: August 09, 2018 - 5:34PM --- LAYOUT: 11X17L

Version: 2017-10-21

APPENDIX A

Analyte Detections and Exceedances Summary Tables

Appendix A-1
New York State Department of Environmental Conservation
Katzman Recycling Site
Focused Feasibility Study Report
Summary of Detections in Surface Soil

VOCs					
Analyte	**Concentration Range (mg/kg)**	**Unrestricted Use SCO (mg/kg)**	**Frequency Exceeding UUSCO**	**Commercial Use SCO (mg/kg)**	**Frequency Exceeding CUSCO**
1,2-Dichlorobenzene	0.0019 - 0.11	1.1	0/27	500	0/27
1,3-Dichlorobenzene	0.0017 - 0.94	2.4	0/27	280	0/27
1,4-Dichlorobenzene	0.0035 - 6.0	1.8	1/27	130	0/27
2-Butanone (MEK)	0.019 - 0.041	0.12	0/27	500	0/27
Acetone	0.0071 - 0.38	0.05	4/27	500	0/27
Benzene	0.0061 - 0.5	0.06	1/27	44	0/27
Chlorobenzene	0.0043 - 8.2	1.1	1/27	500	0/27
Ethylbenzene	0.019 - 3.6	1	1/27	390	0/27
Methylene chloride	ND - 0.075	0.05	1/27	500	0/27
Toluene	0.025 - 0.21	0.7	0/27	500	0/27
Xylenes, Total	0.005 - 23	0.26	1/27	500	0/27
SVOCs					
Analyte	**Concentration Range (mg/kg)**	**Unrestricted Use SCO (mg/kg)**	**Frequency Exceeding UUSCO**	**Commercial Use SCO (mg/kg)**	**Frequency Exceeding CUSCO**
Acenaphthylene	ND - 0.62	100	0/46	500	0/46
Benzo(a)anthracene	0.022 - 7.9	1	2/46	5.6	1/46
Benzo(a)pyrene	0.14 - 19	1	1/46	1	1/46
Benzo(b)fluoranthene	0.11 - 21	1	2/46	5.6	1/46
Benzo(g,h,i)perylene	0.12 - 19	100	0/46	500	0/46
Benzo(k)fluoranthene	0.48 - 0.89	0.8	1/46	56	0/46
Chrysene	0.29 - 8.6	1	2/46	56	0/46
Fluoranthene	0.027 - 16	100	0/46	500	0/46
Fluorene	ND - 0.58	30	0/46	500	0/46
Indeno(1,2,3-cd)pyrene	0.2 - 23	0.5	4/46	5.6	2/46
Naphthalene	0.055 - 4.8	12	0/46	500	0/46
Phenanthrene	0.043 - 13	100	0/46	500	0/46
Pyrene	0.043 - 13	500	0/46	500	0/46
Metals					
Analyte	**Concentration Range (mg/kg)**	**Unrestricted Use SCO (mg/kg)**	**Frequency Exceeding UUSCO**	**Commercial Use SCO (mg/kg)**	**Frequency Exceeding CUSCO**
Arsenic	2.1 - 48	13	10/49	16	9/49
Barium	14 - 3,700	350	4/49	400	4/49
Beryllium	0.21 - 0.55	7.2	0/7	590	0/7
Cadmium	0.063 - 159	2.5	19/49	9.3	11/49
Chromium (total)	9 - 998	1	49/49	400	1/49
Copper	16.4 - 969	50	2/7	270	1/7
Lead	10.9 - 7,340	63	17/49	1000	10/49
Manganese	206 - 958	1600	0/7	10,000	0/7
Nickel	20.3 - 37.9	30	2/7	310	0/7
Selenium	0.51 - 5.2	3.9	1/49	1500	0/49
Silver	0.52 - 14.9	2	9/49	1500	0/49
Zinc	68.8 - 1,270	109	1/7	10,000	0/7
Mercury	0.011 - 3.9	0.18	10/49	2.8	1/49

Appendix A-1
New York State Department of Environmental Conservation
Katzman Recycling Site
Focused Feasibility Study Report
Summary of Detections in Surface Soil

Pesticides					
Analyte	**Concentration Range (mg/kg)**	**Unrestricted Use SCO (mg/kg)**	**Frequency Exceeding UUSCO**	**Commercial Use SCO (mg/kg)**	**Frequency Exceeding CUSCO**
4,4'-DDD	ND - 0.69	0.0033	1/9	92	0/9
4,4'-DDE	0.079 - 0.54	0.0033	2/9	62	0/9
4,4'-DDT	0.11 - 0.19	0.0033	2/9	47	0/9
Aldrin	ND - 0.012	0.005	1/9	0.68	0/9
alpha-BHC	ND - 0.00094	0.02	0/9	3.4	0/9
alpha-Chlordane	ND - 0.079	0.094	0/9	24	0/9
beta-BHC	ND - 0.0014	0.036	0/9	3	0/9
delta-BHC	0.00094 - 0.22	0.04	1/9	500	0/9
Dieldrin	0.044 - 0.40	0.005	3/9	1	0/9
Endosulfan I	ND - 0.021	2.4	0/9	200	0/9
Endosulfan sulfate	ND - 0.041	2.4	0/9	200	0/9
gamma-BHC (Lindane)	ND - 0.034	0.1	0/9	9.2	0/9
Heptachlor	ND - 0.039	0.042	0/9	15	0/9
PCBs					
Analyte	**Concentration Range (mg/kg)**	**Unrestricted Use SCO (mg/kg)**	**Frequency Exceeding UUSCO**	**Commercial Use SCO (mg/kg)**	**Frequency Exceeding CUSCO**
Total PCBs	0.14 - 6,600	0.1	52/80	1	40/80

Notes:

mg/kg - milligrams per kilogram (dry weight) or parts per million (ppm)
ND - Analyte was not detected above the laboratory quantitation limit.
VOCs - Volatile Organic Compounds
PCBs - Polychlorinated Biphenyls
SVOCs - Semivolatile Organic Compounds
SCO - Soil Cleanup Objective
UUSCO - Unrestricted Use Soil Cleanup Objective
CUSCO - Commercial Use Soil Cleanup Objective

Appendix A-2
New York State Department of Environmental Conservation
Katzman Recycling Site
Focused Feasibility Study Report
Summary of Detections in Subsurface Soil

VOCs					
Analyte	**Concentration Range (mg/kg)**	**Unrestricted Use SCO (mg/kg)**	**Frequency Exceeding UUSCO**	**Commercial Use SCO (mg/kg)**	**Frequency Exceeding CUSCO**
1,2-Dichlorobenzene	0.003 - 0.5	1.1	0/25	500	0/25
1,3-Dichlorobenzene	0.029 - 1.9	2.4	0/25	280	0/25
1,4-Dichlorobenzene	0.0026 - 11	1.8	3/25	130	0/25
Acetone	0.0046 - 0.12	0.05	6/25	500	0/25
Benzene	0.00048 - 0.10	0.06	1/25	44	0/25
Chlorobenzene	0.0024 - 47	1.1	2/25	500	0/25
Ethylbenzene	0.0019 - 2.3	1	1/25	390	0/25
Methyl-tert-butyl-ether	0.00074 - 0.001	0.93	0/25	500	0/25
Methylene chloride	0.0034 - 0.38	0.05	1/25	500	0/25
Tetrachloroethene	ND - 0.0031	1.3	0/25	150	0/25
Toluene	0.00075 - 0.33	0.7	0/25	500	0/25
Trichloroethene	ND - 0.0021	0.47	0/25	200	0/25
Xylenes, Total	0.0015 - 14	0.26	2/25	500	0/25
SVOCs					
Analyte	**Concentration Range (mg/kg)**	**Unrestricted Use SCO (mg/kg)**	**Frequency Exceeding UUSCO**	**Commercial Use SCO (mg/kg)**	**Frequency Exceeding CUSCO**
Benzo(a)anthracene	ND - 1.5	1	1/25	5.6	0/25
Benzo(a)pyrene	0.10 - 3.0	1	1/25	1	1/25
Benzo(b)fluoranthene	0.10 - 3.4	1	1/25	5.6	0/25
Benzo(g,h,i)perylene	0.12 - 2.8	100	0/25	500	0/25
Benzo(k)fluoranthene	ND - 0.78	0.8	0/25	56	0/25
Chrysene	ND - 1.5	1	1/25	56	0/25
Fluoranthene	1.6 - 2.2	100	0/25	500	0/25
Hexachlorobenzene	ND - 0.19	0.33	0/25	6	0/25
Indeno(1,2,3-cd)pyrene	2.5 - 3.5	0.5	2/25	5.6	0/25
Naphthalene	0.83 - 5.3	12	0/25	500	0/25
Phenanthrene	0.069 - 3.5	100	0/25	500	0/25
Pyrene	0.03 - 3.0	500	0/25	500	0/25
Metals					
Analyte	**Concentration Range (mg/kg)**	**Unrestricted Use SCO (mg/kg)**	**Frequency Exceeding UUSCO**	**Commercial Use SCO (mg/kg)**	**Frequency Exceeding CUSCO**
Arsenic	4.6 - 28	13	3/40	16	2/40
Barium	33.9 - 567	350	1/40	400	1/40
Beryllium	0.26 - 0.81	7.2	0/23	590	0/23
Cadmium	0.064 - 67.7	2.5	7/40	9.3	7/40
Chromium (total)	9.8 - 681	1	40/40	400	1/40
Copper	20.4 - 9,900	50	5/23	270	2/23
Lead	9.7 - 8,190	63	10/40	1000	7/40
Manganese	389 - 2,510	1,600	1/23	10,000**	0/23
Nickel	19.5 - 357	30	17/23	310	1/23
Selenium	0.47 - 18.9	3.9	4/40	1500	0/40
Silver	0.23 - 13.3	2	5/40	1500	0/40
Zinc	59.2 - 10,900	109	6/23	10,000**	1/23
Mercury	0.01 - 0.46	0.18	6/40	2.8	0/40
Pesticides					
Analyte	**Concentration Range (mg/kg)**	**Unrestricted Use SCO (mg/kg)**	**Frequency Exceeding UUSCO**	**Commercial Use SCO (mg/kg)**	**Frequency Exceeding CUSCO**
4,4'-DDE	ND - 0.14	0.0033	1/9	62	0/9
4,4'-DDT	ND - 0.23	0.0033	1/9	47	0/9
delta-BHC	ND - 0.39	0.04	1/9	500	0/9
Endosulfan sulfate	ND - 0.0045	2.4	0/9	200	0/9
Endrin	ND - 0.027	0.014	1/9	89	0/9
gamma-BHC (Lindane)	ND - 0.00068	0.1	0/9	9.2	0/9
PCBs					
Analyte	**Concentration Range (mg/kg)**	**Unrestricted Use SCO (mg/kg)**	**Frequency Exceeding UUSCO**	**Soil Cleanup Level[1] (mg/kg)**	**Frequency Exceeding Soil Cleanup Level**
Total PCBs	0.06 - 3,000	0.1	84/168	10	22/168

Notes:

mg/kg - milligrams per kilogram (dry weight) or parts per million (ppm)
ND - Analyte was not detected above the laboratory quantitation limit.

VOCs - Volatile Organic Compounds

SVOCs - Semivolatile Organic Compounds

PCBs - Polychlorinated Biphenyls

SCO - Soil Cleanup Objective

UUSCO - Unrestricted Use Soil Cleanup Objective

CUSCO - Commercial Use Soil Cleanup Objective

[1] In accordance with paragraph V.I.1 of NYSDEC CP-51/Soil Cleanup Guidance, "[a]n acceptable presumptive remedy for soil where neither the unrestricted SCOs nor the ESCOs are applied in the remedial program may include a soil cleanup level for PCBs of 1 ppm in the surface soils and 10 ppm in subsurface soils."

Appendix A-3
New York State Department of Environmental Conservation
Katzman Recycling Site
Focused Feasibility Study Report
Summary of Detections in Groundwater

VOCs			
Analyte	**Concentration Range (µg/L)**	**Class GA Value* (µg/L)**	**Frequency Exceeding Class GA Value**
1,2,4-Trichlorobenzene	4.3 - 12	5	1/13
1,2-Dichlorobenzene	ND - 1.3	3	0/13
1,3-Dichlorobenzene	ND - 8.8	3	1/13
1,4-Dichlorobenzene	ND - 28	3	1/13
Acetone	ND - 11	50	0/13
Benzene	ND - 5.0	1	1/13
Chlorobenzene	ND - 310	5	1/13
Ethylbenzene	ND - 1.6	5	0/13
Isopropylbenzene	ND - 2.2	5	0/13
Methyl tert-butyl ether	0.3 - 2.0	10	0/13
Toluene	ND - 1.0	5	0/13
Xylenes, Total	ND - 5.2	5	1/13
SVOCs			
Analyte	**Concentration Range (µg/L)**	**Class GA Value* (µg/L)**	**Frequency Exceeding Class GA Value**
4-Methylphenol	ND - 0.37	1	0/13
PCBs			
Analyte	**Concentration Range (µg/L)**	**Class GA Value* (µg/L)**	**Frequency Exceeding Class GA Value**
Total PCBs	ND - 2.7	0.09	1/13
Metals (Unfiltered)			
Analyte	**Concentration Range (µg/L)**	**Class GA Value* (µg/L)**	**Frequency Exceeding Class GA Value**
Arsenic	ND - 5.7	25	0/13
Barium	14 - 150	1,000	0/13
Cadmium	0.53 - 3.0	5	0/13
Chromium	1.6 - 3.3	50	0/13
Copper	1.8 - 32	200	0/13
Iron	31 - 4,600	300	5/13
Lead	5.6 - 15	25	0/13
Magnesium	4,800 - 24,100	35,000	0/13
Manganese	7.0 - 8,100	300	6/13
Nickel	2.2 - 10	100	0/13
Sodium	5,900 - 30,200	20,000	3/13
Zinc	1.5 - 400	2,000	0/13
PFAS			
Detected Constituents	**Concentration Range Detected (ng/L)**	**Class GA Value***	**Frequency Exceeding Class GA**
Perfluorobutanoic acid (PFBA)	2.6 - 2,600	NS	0/13
Perfluoropentanoic acid (PFPeA)	24 - 2,700	NS	0/13
Perfluorohexanoic acid (PFHxA)	0.86 - 1.0	NS	0/13
Perfluoroheptanoic acid (PFHpA)	1.2 - 6.4	NS	0/13
Perfluorooctanoic acid (PFOA)	1.1 - 16	NS	0/13
Perfluorononanoic acid (PFNA)	0.59 - 2.4	NS	0/13
Perfluorodecanoic acid (PFDA)	0.4 - 0.77	NS	0/13
Perfluorobutanesulfonic acid (PFBS)	1.4 - 110	NS	0/13
Perfluorohexanesulfonic acid (PFHxS)	0.93 - 8.8	NS	0/13
Perfluoroheptanesulfonic acid (PFHpS)	ND - 0.66	NS	0/13
Perfluorooctanesulfonic acid (PFOS)	1.8 - 43	NS	0/13
Perfluorooctane sulfonamide (FOSA)	ND - 1.8	NS	0/13

Notes:
µg/L - micrograms per liter
ng/L - Nanograms per liter.
ND - Analyte was not detected above the laboratory quantitation limit.
NS - No NYSDEC standards exist for this analyte.
VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
PCBs - Polychlorinated Biphenyls
PFAS - Per- and polyfluoroalkyl substances.
* NYSDEC Ambient Water Quality Standards and Guidance Values for Class GA water.

Appendix A-4
New York State Department of Environmental Conservation
Katzman Recycling Site
Focused Feasibility Study Report
Summary of Detections in Sediment

SVOCs			
Analyte	**Concentration Range (mg/kg)**	**Class C SGV* (mg/kg)**	**Frequency Exceeding Class C SGV**
Total PAHs [(1)]	0.081 - 5.14	>35	0/8
PCBs			
Analyte	**Concentration Range (mg/kg)**	**Class C SGV* (mg/kg)**	**Frequency Exceeding Class C SGV**
Total PCBs	0.78 - 0.81	>1.0	0/8
Metals			
Analyte	**Concentration Range (mg/kg)**	**Class C SGV* (mg/kg)**	**Frequency Exceeding Class C SGV**
Arsenic	4.5 - 67	> 33	1/8
Cadmium	0.083 - 1.2	> 5.0	0/8
Chromium	19.1 - 248	> 110	1/8
Copper	17.5 - 22.6	> 150	0/8
Lead	14.1 - 235	> 130	1/8
Mercury	0.049 - 0.86	>1	0/8
Nickel	23.9 - 28.1	> 49	0/8
Zinc	90.4 - 126	>460	0/8
Pesticides			
Analyte	**Concentration Range (mg/kg)**	**Class C SGV* (mg/kg)**	**Frequency Exceeding Class C SGV**
Endosulfan II [(2)]	ND - 0.0017	>0.02	0/8
Endrin	ND - 0.002	>0.22	0/8

Notes:
mg/kg - milligrams per kilogram (dry weight) or parts per million (ppm)
ND - Analyte was not detected above the laboratory quantitation limit.
PAHs - Polycyclic Aromatic Hydrocarbons
PCBs - Polychlorinated Biphenyls
SVOCs - Semivolatile Organic Compounds
*Class C SGV - Freshwater Sediment Guidance Values from NYSDEC "Screening and Assessment of Contaminated Sediment", Table 5, June 24, 2014.
[(1)] Total PAHs is a calculated value that assigns a value of zero to any parameter which was not detected above the quantitation limit.
[(2)] Value for Endosulfan used.

Appendix A-5
New York State Department of Environmental Conservation
Katzman Recycling Site
Focused Feasibility Study Report
Summary of Detections in Surface Water

Pesticides									
Analyte	**Concentration Range (µg/L)**	**Type A(A) Value* (µg/L)**	**Type A(C) Value* (µg/L)**	**Type H(FC) Value* (µg/L)**	**Type W Value* (µg/L)**	**Frequency Exceeding Type A(A) Value**	**Frequency Exceeding Type A(C) Value**	**Frequency Exceeding Type H(FC) Value**	**Frequency Exceeding Type W Value**
4,4'-DDD	0.0092 - 0.013	NS	NS	0.00008	0.000011(a)	NS	NS	2/5	2/5
beta-BHC	ND - 0.054	NS	NS	0.007	NS	NS	NS	1/5	NS
delta-BHC	0.013 - 0.015	NS	NS	0.008	NS	NS	NS	2/5	NS
Methoxychlor	ND - 0.046	NS	0.03	NS	NS	NS	1/5	NS	NS
Metals									
Analyte	**Concentration Range (µg/L)**	**Type A(A) Value* (µg/L)**	**Type A(C) Value* (µg/L)**	**Type H(FC) Value* (µg/L)**	**Type W Value* (µg/L)**	**Frequency Exceeding Type A(A) Value**	**Frequency Exceeding Type A(C) Value**	**Frequency Exceeding Type H(FC) Value**	**Frequency Exceeding Type W Value**
Iron	260 - 470	NS	300	NS	NS	NS	3/5	NS	NS
Zinc	3.4 - 5.3	91.8(b)**	64.7(b)**	NS	NS	0/5	0/5	NS	NS
Dioxins									
Analyte	**Concentration Range (µg/L)**	**Type A(A) Value* (µg/L)**	**Type A(C) Value* (µg/L)**	**Type H(FC) Value* (µg/L)**	**Type W Value* (µg/L)**	**Frequency Exceeding Type A(A) Value**	**Frequency Exceeding Type A(C) Value**	**Frequency Exceeding Type H(FC) Value**	**Frequency Exceeding Type W Value**
2,3,7,8-TCDD equivalent	ND - 0.107	NS	NS	0.0006	NS	NS	NS	2/3	NS

Notes:
µg/L - micrograms per liter
ND - Analyte was not detected above the laboratory quantitation limit.
* NYSDEC Ambient Water Quality Standards and Guidance Values.
** Values are calculated based on hardness; value assumes hardness is less than or equal to 75,000 ug/L.
A(A) - Fish Survival (fresh waters)
A(C) - Fish Propagation (fresh waters)
H(FC) - Human Consumption of Fish (fresh waters)
W - Wildlife Protection (fresh waters)
(a) Applies to the sum of 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT.
(b) Value for dissolved form used.