PROPOSED REMEDIAL ACTION PLAN

Glenmere Lake Property
Environmental Restoration Project
Chester, Orange County
Site No. E336071
February 2011

Prepared by
Division of Environmental Remediation
New York State Department of Environmental Conservation

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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the above referenced site. The disposal of contaminants at the site has resulted in threats to public health and the environment that would be addressed by the remedy proposed by this Proposed Remedial Action Plan (PRAP). The disposal of contaminants at this site, as more fully described in Section 6 of this document, has contaminated various environmental media. Contaminants include hazardous waste and/or petroleum. The proposed remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This PRAP identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for the preferred remedy.

The 1996 Clean Water/ Clean Air Bond Act provides funding to municipalities for the investigation and cleanup of brownfields. Brownfields are abandoned, idled, or under-used properties where redevelopment is complicated by real or perceived environmental contamination. They typically are former industrial or commercial properties where operations may have resulted in environmental contamination. Brownfields often pose not only environmental, but legal and financial burdens on communities. Under the Environmental Restoration Program, the state provides grants to municipalities to reimburse up to 90 percent of eligible costs for site investigation and remediation activities. Once remediated, the property can then be reused.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York; (6 NYCRR) Part 375. This document is a summary of the information that can be found in the site-related reports and documents in the document repository identified below.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all PRAPs. This is an opportunity for public participation in the remedy selection process. The public is encouraged to review the reports and documents, which are available at the following repository:

Florida Public Library

4 Cohen Circle
Florida, NY 10921
Phone: 845-651-7659

A public comment period has been set from:

2/8/2011 to 3/25/2011

A public meeting is scheduled for the following date:

3/1/2011 at 7:00 PM

Public meeting location:

Legislative Chambers, Orange Co. Govt. Center, 255 Main Street, Goshen, NY

At the meeting, the findings of the remedial investigation (RI) and the alternatives analyses (AA) will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP.

Written comments may also be sent through 3/25/2011 to:

Joshua Cook
NYS Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233
jpcook@gw.dec.state.ny.us

The Department may modify the proposed remedy or select another of the alternatives presented in this PRAP based on new information or public comments. Therefore, the public is encouraged to review and comment on the proposed remedy identified herein. Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the Department's final selection of the remedy for this site.

Receive Site Citizen Participation Information By Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program, Voluntary Cleanup Program, and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at http://www.dec.ny.gov/chemical/61092.html

SECTION 3: SITE DESCRIPTION AND HISTORY

Location: The Glenmere Lake Property is an approximately 9.9 acre site owned by Orange County located in a rural portion of Orange County. It is located at the north end of Glenmere Lake, to the southeast of the intersection of Glenmere Avenue Extension and Pine Hill Road in the Town of Chester.

Site Features: The main site features include the remnants of several buildings located in the western portion of the site including a former barn, former milk-barn, and a former house. There were formerly seven buildings in this area; the foundations are the only remaining portion of three of these; three have deteriorated into piles of rubble; and the remaining one is also severely dilapidated, but still standing. These structures were part of the Glenmere Lake Estates, a former resort and golf course. All of the former buildings have been condemned. There is also a small building, referred to as the pump house, located in the eastern portion of the site. Various debris has been abandoned or dumped at the site as well, primarily in the vicinity of the building remnants on the western portion of the site. Much of the site is wooded, with several small meadow areas present across the central portion of the site.

Several oil storage tanks were present at the site, which were removed as part of an interim remedial measure. Contamination at the site is the result of past daily operation and activities and the deterioration of the buildings and debris.

Current Zoning/Use(s): The site is fenced and is currently vacant.

Site Geology and Hydrogeology: Bedrock is shallow across much of the site (less than 10 feet below grade), except for the area around the pump house, where bedrock is approximately 22 feet below grade. Groundwater is not present in the overburden for much of the site. Groundwater was encountered in the overburden in areas immediately adjacent to Glenmere Lake. It is assumed that groundwater flows south, towards Glenmere Lake. Glenmere Lake serves as the drinking water supply for the Village of Florida and is a Class AA waterbody.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, an alternative which allows for unrestricted use of the site was evaluated.

A comparison of the results of the investigation against unrestricted use standards, criteria and guidance values (SCGs) for the site contaminants is included in the Tables for the media being evaluated in Exhibit A.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

No PRPs have been documented to date.

Since no viable PRPs have been identified, there are currently no ongoing enforcement actions. However, legal action may be initiated at a future date by the state to recover state response costs should PRPs be identified. Orange County will assist the state in its efforts by providing all information to the state which identifies PRPs. Orange County will also not enter into any agreement regarding response costs without the approval of the Department.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A Remedial Investigation (RI) has been conducted. The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The field activities and findings of the investigation are described in the RI Report.

The following general activities are conducted during an RI:

- Research of historical information,
- Geophysical survey to determine the lateral extent of wastes,
- Test pits, soil borings, and monitoring well installations,
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor,
- Sampling of surface water and sediment,
- Ecological and Human Health Exposure Assessments.

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in Exhibit A list the applicable SCGs in the footnotes. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

6.1.2: RI Information

The analytical data collected on this site includes data for:

- groundwater
- soil
- sediment

The data have identified contaminants of concern. A "contaminant of concern" is a contaminant that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized in Exhibit A. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified at this site is/are:

lead
arsenic
unknown petroleum

As illustrated in Exhibit A, the contaminant(s) of concern exceed the applicable standards, criteria and guidance for:

- soil
- sediment

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Record of Decision.

The following IRM(s) has/have been completed at this site based on conditions observed during the RI.

IRM Tank Removal

An IRM was performed to remove several petroleum bulk storage tanks from the site. Four underground storage tanks (USTs) and one aboveground storage tank (AST) were removed.

The contents of the tanks were removed prior to excavating the tanks. Approximately 470 gallons of oil-contaminated water was generated and disposed of off-site.

Soil excavated to access the USTs was disposed off-site due to the presence of lead that was documented during the remedial investigation. Petroleum-contaminated soil, which was identified by staining and odors, was encountered below a vaulted 5,000-gallon UST (UST-3). Petroleum-impacted soil was excavated from an area measuring approximately 620 square feet down to bedrock, which was present at about six to eight feet below grade. Petroleum-

contaminated soil was not encountered in the vicinity of any other tanks. A total of 204.5 tons of soil, including lead- and petroleum-contaminated soil, was disposed off-site.

Petroleum-related contamination (i.e., volatile organic compounds and semi-volatile organic compounds) was not detected in soil samples collected at the base of the tank excavations. Soil samples collected from the base of the excavations for UST-6 showed elevated levels of arsenic. The IRM did not address this subsurface metal contamination.

6.3: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure*.

Contact with surface soil contaminants is not likely because the site is heavily vegetated, and access is generally restricted by fencing. Persons who dig below the ground surface may come into contact with contaminants in subsurface soil.

6.4: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water. The Fish and Wildlife Resources Impact Analysis (FWRIA), which is included in the RI report, presents a detailed discussion of the existing and potential impacts from the site to fish and wildlife receptors.

The primary contaminants of concern include lead, arsenic and petroleum. Metals, primarily lead and arsenic, are present in surface soil, primarily in the western portion of the site in the vicinity of the building remnants. Concentrations of lead detected at the site in surface soil range from 0.6 parts per million (ppm) to 9,560 ppm. The soil cleanup objective for lead for the protection of ecological resources is 63 ppm. Arsenic impacts were less widespread than lead, and concentrations in surface soil ranged from 1.3 ppm to 115 ppm. The soil cleanup objective for arsenic for the protection of ecological resources is 13 ppm. The concentrations of lead and other metals in soil generally decrease quickly with depth. Arsenic contamination has been identified in the subsurface adjacent to the remnants of Building 6 and UST-6.

Lead and other metals have been detected in Glenmere Lake sediments in a small embayment to the southeast of the remnants of Buildings 1-7 above sediment criteria. Lead was detected above sediment criteria in every sample collected from this area at levels ranging from 63.9 ppm to 859 ppm, compared to sediment criteria for lead of 31 ppm (lower effect level) and 110 ppm (severe effect level). Ten of the twelve samples from this area exceeded the severe effect level sediment criterion for lead. Other metals were also detected in this area above sediment criteria, but lead was the most widespread.

Petroleum impacts were detected in two isolated locations: one in the eastern portion of the site in the vicinity of an underground storage tank adjacent to the pump house building (UST-8); another in the vicinity of an underground storage tank (UST-3) adjacent to the building remnants in the western portion of the site. The petroleum-contaminated soil near UST-3 was excavated and disposed of off-site as part of an interim remedial measure (IRM). UST-8 was removed along with other storage tanks during the IRM. Groundwater sampling results did not show any impact to groundwater.

The site and adjacent portions of Glenmere Lake provide important habitat for a wide range of wildlife. Wildlife, or evidence of wildlife (e.g., carcasses, feces, footprints), observed at the site include deer, bear, beaver, fox, mice, vultures, turkey, turtles, salamanders, several frog species and snakes. Wildlife observed adjacent to the site includes bald eagles, osprey and swans.

Glenmere Lake and the surrounding area, including the site, is important habitat for the northern cricket frog (NCF), which is an endangered species in the State of New York. In spring 2008 a drift fence survey was conducted to determine if the NCFs were using the on-site buildings or building remnants as overwintering hibernacula. A hibernaculum is a shelter for a hibernating animal. The drift fence study concluded the buildings and building remnants were not being used for hibernation; however, NCF were identified in the eastern portion of the site, which was determined to be important NCF habitat.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

To be selected, the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Exhibit B. Potential remedial alternatives for the Site were identified, screened and evaluated in the AA report.

A summary of the remedial alternatives that were considered for this site is presented in Exhibit C. Cost information is presented in the form of present worth, which represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved. A summary of the Remedial Alternatives Costs is included as Exhibit D.

7.1: Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375. A detailed discussion of the evaluation criteria and comparative analysis is included in the AA report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

The next six "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

4. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

5. Short-term Impacts and Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

7. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision.

8. Land Use. The Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

The final criterion, Community Acceptance, is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

7.2: Elements of the Proposed Remedy

The basis for the Department's proposed remedy is set forth at Exhibit E.

The estimated present worth cost to implement the remedy is $1,620,000. The cost to construct the remedy is estimated to be $1,620,000 and the estimated average annual cost is $0.

The elements of the proposed remedy are as follows:

1. Implementation of a remedial design program to provide the details necessary for the construction, maintenance and monitoring of the remedial program. Green remediation principals and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:

- Considering the environmental impacts of remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gas and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Demolition and off-site disposal of the remnants of Buildings 1 through 7, which represent a source of lead contamination, and removal and off-site disposal of solid waste present at the site. The remnants of Buildings 1 through 7 also contain asbestos, so the demolition must be performed in the manner required by applicable laws and regulations.

3. Excavation and off-site disposal of soils located in the western portion of the site as depicted on Figure 5 which exceed the unrestricted soil cleanup objectives for the primary contaminants of concern, which are lead and arsenic. By using these indicator compounds, other contaminants detected at the site will also be addressed. It is estimated that approximately 2,000 cubic yards of soil will be excavated. Confirmatory soil samples will be collected. Clean fill and topsoil which meets the requirements of 6 NYCRR 375-6.7(d) will then be brought in to replace the

excavated soil and restore the site to its original contours. Disturbed areas will be re-vegetated with appropriate native species. An effort will be made to avoid removing large trees (diameter greater than or equal to 6 inches). Where removal cannot be avoided, trees will be replaced in accordance with Department requirements.

4. Removal (excavation or dredging) and off-site disposal of contaminated sediments from the small embayment to the southeast of the remnants of Buildings 1 through 7, in the vicinity of sediment samples SED-4 and SED-5. The exact area to be removed will be determined during the remedial design and is not expected to extend significantly more than 40 feet off-shore. Excavated sediments will be replaced with an appropriate substrate and the area restored to pre-excavation contours. Disturbed areas will be re-vegetated with locally native nursery stock and/or by stockpiling and re-planting rhizomes. All remediation and restoration activities will comply with the substantive technical requirements of 6 NYCRR Parts 608 and 663.

5. Due to the presence of the endangered northern cricket frog, remedial activities will be consistent with 6 NYCRR Part 182 and applicable guidance, including Guidelines for Reviewing Projects for Potential Impacts to the Northern Cricket Frog, June 2009. Efforts will be made to reduce potential impacts to northern cricket frogs and their habitat during construction, and to maximize the value of cricket frog habitat during restoration. Details of specific habitat actions will be determined during remedial design. All restored areas will be inspected for a period of one year following the Department's determination of substantial completion of the site remediation by the contractor. During this time the restored areas will be inspected for erosion, settlement and growth of plantings and grass. Areas will be repaired and restored as directed by the Department. Details of the inspection program will be developed in the remedial design.

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation (RI). This section describes the findings for all environmental media that were evaluated. As described in Section 6.1.2, samples were collected from various environmental media to characterize the nature and extent of contamination. Figure 2 depicts soil, groundwater and several sediment sampling locations. Figure 4 depicts additional sediment sampling locations from the area indicated on Figure 2.

For each medium, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compares the data with the applicable SCGs for the site. The contaminants are arranged into one category; metals. For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use.

Waste/Source Areas

As described in the RI report, waste/source materials were identified at the site and are impacting soil and sediment. Wastes are defined in 6 NYCRR Part 375-1.2 (aw) and include solid, industrial and/or hazardous wastes. Source Areas are defined in 6 NYCRR Part 375 (au). Source areas are areas of concern at a site were substantial quantities of contaminants are found which can migrate and release significant levels of contaminants to another environmental medium. Wastes and Source areas which were identified at the site include the following: the remnants of the buildings in the western portion of the site (labeled as Buildings 1 through 7), which contain lead paint and represent a source of lead contamination in soil; the debris present at the site, primarily in the vicinity of the remnants of Buildings 1-7; and the former petroleum bulk storage tanks, which were removed as an interim remedial measure and were formerly a source or potential source of petroleum contamination. The building debris also contains asbestos-containing material (ACM); however, soil samples did not identify asbestos in the soil. ACM has become detached from the buildings and is in contact with soil. Refer to Figure 2 for a depiction of site features, including the locations of the building remnants and former petroleum bulk storage tanks.

Certain waste/source areas identified at the site were addressed by the IRM described in Section 6.2 (*i.e.*, the petroleum bulk storage tanks). The remaining waste/source areas identified during the RI will be addressed in the remedy selection process.

Groundwater

No site-related groundwater contamination of concern was identified during the RI. Therefore, no remedial alternatives need to be evaluated for groundwater.

Soil

Surface and subsurface soil samples were collected at the site during the RI. Surface soil samples were collected from a depth of 0-2 inches to assess the potential for direct exposure to contaminants by humans. Subsurface soil samples were collected from depths ranging from 1 - 12 feet to assess the potential for subsurface soil contamination and to determine if contamination was present at concentrations that would pose a threat to groundwater. Samples were analyzed for volatile organic compounds, semi-volatile organic

compounds, pesticides, polychlorinated biphenyls (PCBs), metals and cyanide. The results indicate that metals, primarily lead and arsenic, are the contaminants of concern for the site. Lead is present as a result of the deteriorating buildings which contain lead paint. A definitive source of the arsenic contamination was not identified; however, arsenic-containing compounds were formerly used as pesticides.

As noted on Figure 3, soil contamination has been identified on the western portion of the site adjacent to the remnants of Buildings 1-7 and in the area between the building remnants and the lakeshore. Lead and arsenic are present in surface soils above their SCOs for the protection of ecological resources (ecological SCO) which is equivalent to their SCOs for unrestricted site use (unrestricted SCO). Soil impacted with lead above its unrestricted SCO is present over an area of approximately 1.3 acres. Arsenic-impacted surface soil is present over a smaller area, and the affected area is mostly within the area impacted by lead. Arsenic has also been detected in subsurface soils above SCOs in the vicinity of the remnants of Building 6 and UST 6.

Subsurface soils which exhibited signs of petroleum contamination (odors or staining or both) were found in two locations at the site; adjacent to UST-3 and adjacent to UST-8. However, soil samples from those locations did not contain contaminants above SCOs. Petroleum-impacted soil under and adjacent to UST-3 was removed during the IRM discussed in Section 6.2. Soil contamination was not found upon excavation of UST-8.

Table 1 summarizes the results of the soil sampling conducted during the RI for the primary contaminants of concern. The areas where these samples were collected were outside of the areas affected by the IRM, and so represent post-IRM soil conditions. Site-specific background was used for certain metals as the unrestricted SCO for the site. The site-specific background values were determined by analytical results obtained from five surface soil samples collected from the eastern periphery of the site, in areas which were not impacted by site operations.

Table 1 - Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG
Lead	11.1 – 9,560	63	39/62
Arsenic	0.851 - 115	13	17/44
Cadmium	0.079 – 10.7	4[c]	3/19
Copper	17.8 – 157	50	9/27
Mercury	0.011 – 2.4	0.239[c]	10/27
Nickel	10.5 – 49.8	30	1/19
Silver	2.25 – 7.9	6.06[c]	1/19
Zinc	46.6 - 872	109	11/27

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives, unless otherwise noted.
c - Site background concentration

Based on the findings of the Remedial Investigation, the presence of lead, arsenic and several other metals has resulted in the contamination of soil. The site contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process, are lead and arsenic, since

the area affected by those contaminants encompasses the areas where other metals exceed their corresponding site-specific unrestricted soil SCG.

Sediments

Sediment samples were collected during the RI from Glenmere Lake in areas immediately adjacent to the site to assess the potential for impacts to lake sediments from the site. The results indicate that sediments in certain areas, in particular in a small embayment to the southeast of the remnants of Buildings 1-7, exceed the Department's SCGs for lead, arsenic, and several other metals. The sediment sampling results were also compared to the results obtained from five background samples collected from areas of the lake not affected by the site. Copper was detected above SCGs in background samples. Lead was detected in sediments above SCGs over a larger area than other metals. Samples impacted by other metals were also impacted by lead. The locations of sediment samples and the results of the sampling are depicted on Figures 2 and 4. Table 2 summarizes the results of the sediment sampling conducted during the RI for the primary contaminants of concern for sediments.

Table 2 - Sediment

Detected Constituents	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)	Frequency Exceeding SCG	Site Derived Value[c] (ppm)	Frequency Exceeding Site Derived Value
Metals					
Lead	63.9 - 859	LEL – 31.0	15/15	44.7	15/15
		SEL – 110.0	11/15		
Arsenic	3.04 – 176	LEL – 6.0	10/15	NA	NA
		SEL – 33.0	4/15		
Antimony	ND – 5.79	LEL – 2.0	4/15	NA	NA
		SEL – 25.0	0/15		
Cadmium	0.53 – 4.68	LEL – 0.6	11/15	1.38	9/15
		SEL – 9.0	0/15		
Chromium	5.69 – 35.2	LEL – 26.0	1/15	NA	NA
		SEL – 110.0	0/15		
Copper	37.1 - 1350	LEL – 16.0	15/15	71.7	11/15
		SEL – 110.0	10/15		
Manganese	158 – 1,490	LEL – 460	6/15	NA	NA
		SEL – 1,100.0	2/15		
Mercury	ND – 6.5	LEL – 0.15	8/15	NA	NA
		SEL – 1.3	4/15		
Silver	ND – 4.61	LEL – 1.0	5/15	NA	NA
		SEL – 2.2	5/15		
Zinc	72.3 - 698	LEL – 120	13/15	NA	NA
		SEL – 270	5/15		

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in sediment;

b - SCG: The Department's "Technical Guidance for Screening Contaminated Sediments."
c – Site Derived Value: Background value
LEL = Lowest Effects Level and SEL = Severe Effects Level. Sediment is considered contaminated if either of these criteria is exceeded.
ND = not detected
NA = not applicable. The background value is less than the LEL.

Based on the findings of the RI, the presence of lead and other metals has resulted in the contamination of sediment. The site contaminant that is considered to be the primary contaminant of concern which will drive the evaluation of remedial alternatives for sediment is lead, since the area of the lead contamination encompasses sediment areas where other metals exceed sediment SCGs.

Exhibit B

SUMMARY OF THE REMEDIATION OBJECTIVES

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial objectives for this site are:

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

Sediment

RAOs for Public Health Protection

- Prevent direct contact with contaminated sediments

RAOs for Environmental Protection

- Prevent releases of contaminants from sediments that would result in surface water levels in excess of Class AA, which is the classification of Glenmere Lake, surface water criteria.
- Prevent impacts to biota from ingestion/direct contact with sediments causing toxicity or impacts from bioaccumulation through the aquatic food chain.
- Restore sediments to background conditions to the extent feasible.

Exhibit C

Description of Remedial Alternatives

The following alternatives were considered based on the remedial action objectives (see Exhibit B) to address the contaminated media identified at the site as described in Exhibit A:

Alternative 1: No Further Action

The No Further Action Alternative recognizes the remediation of the site completed by the IRM(s) described in Section 6.2. This alternative leaves the site in its present condition and does not provide any additional protection of human health and the environment.

Alternative 2: Restoration to Pre-Disposal Conditions for Site-Specific Contaminants of Concern

This alternative achieves all of the SCGs discussed in Section 6.1.1 and Exhibit A and soil meets the unrestricted soil clean objectives listed in Part 375-6.8 (a) for the contaminants of concern. This alternative would include demolition of the remnants of Buildings 1 through 7 and excavation and off-site disposal of all waste and soil contaminated with lead or arsenic above the unrestricted soil cleanup objectives. It would also include the excavation or dredging and off-site disposal of sediments contaminated with site-related contaminants of concern. The remedy will not rely on institutional or engineering controls to prevent future exposure.

The remnants of Buildings 1 through 7 are proposed to be demolished and/or removed because their deteriorated condition is resulting in contamination of surrounding soils and sediments, and they pose a hazard to workers that would be performing the remediation. The building remnants contain asbestos-containing materials (ACM), and they are in such disrepair that proper asbestos abatement cannot be conducted prior to demolition. In cases where buildings are demolished prior to abatement, applicable regulations require that all building components must be removed as ACM, and the surrounding soils removed to a depth of six inches. This results in the removal of an estimated 700 cubic yards of ACM-contaminated soils.
In order to remove all soils that contain contamination above unrestricted soil cleanup objectives for the contaminants of concern, excavation would be required across approximately 1.5 acres on the western portion of the site to depths of approximately 2 feet or more. The areas to be excavated would need to be cleared of vegetation prior to excavation. Certain trees may be able to be preserved if the excavation does not extend too deep in the immediate vicinity of the tree. The approximate area of sediment removal has been determined; however, further sampling would need to be conducted prior to implementation of the remedy to refine the boundaries of the area to be removed. It is estimated that approximately 2,000 cubic yards of soil and approximately 100 cubic yards of sediment would need to be removed for off-site disposal.

Once all contaminated soil and sediment has been removed, the site and lake bottom would be restored by importing clean soil to restore the site and appropriate clean material to restore the lake bottom. Affected areas would be re-vegetated as well. The approximate area to be excavated under this remedy is depicted by Figure 5.

The estimated cost of Alternative 2 is as follows:

Capital Cost:.....$1,620,000

Exhibit D

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
Alt. 1: No Further Action	0	0	0
Alt. 2: Restoration to Pre-Disposal Conditions	1,620,000	0	1,620,000

Exhibit E

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 2: Restoration to Pre-Disposal Conditions. The elements of this remedy are described in Section 7.2. The proposed remedy is depicted in Figure 5.

Basis for Selection

The proposed remedy is based on the results of the RI and the evaluation of alternatives.

Alternative 2 is being proposed because, as described below, it satisfies the threshold criteria and would restore the site to pre-disposal conditions. It would achieve the remediation goals for the site by removing soils which contain lead and arsenic above applicable soil cleanup objectives for disposal off-site.

Alternative 1 (No Further Action) does not provide any additional protection to public health and the environment and will not be evaluated further. Alternative 2 (Restoration to Pre-Disposal Conditions), by removing all soil contaminated above the unrestricted soil cleanup objectives for the contaminants of concern and sediment above SCGs, meets the threshold criteria.

Alternative 2 would create short-term impacts during the course of remediation which could be controlled, including the potential for generation of dust and the potential for erosion of contaminated soils following clearing of the area to be excavated. It would also generate truck traffic associated with the transportation of soils, sediments and clean backfill to and from the site. The removal of sediments would suspend sediments which could impact water quality in the work area; however, suspended sediments would be contained in the immediate work area and would not impact water quality at the intakes to the water treatment plant. As a result of the presence of the northern cricket frog (NCF) at the site and in Glenmere Lake, remediation will be limited to certain times of year to limit the impact to the NCF and the near-shore habitat in Glenmere Lake. Since the NCF is an endangered species, remediation must be conducted so as to prevent "takes" of NCFs, as defined by 6 NYCRR Part 182. For the on-site area, remediation can occur during the winter and summer months. The time available for remediation in the summer would be enough time to implement the on-site remedy. Allowable seasons for removal of lake sediments would need to be determined so as to minimize the potential impact to the NCFs and the near-shore habitat.

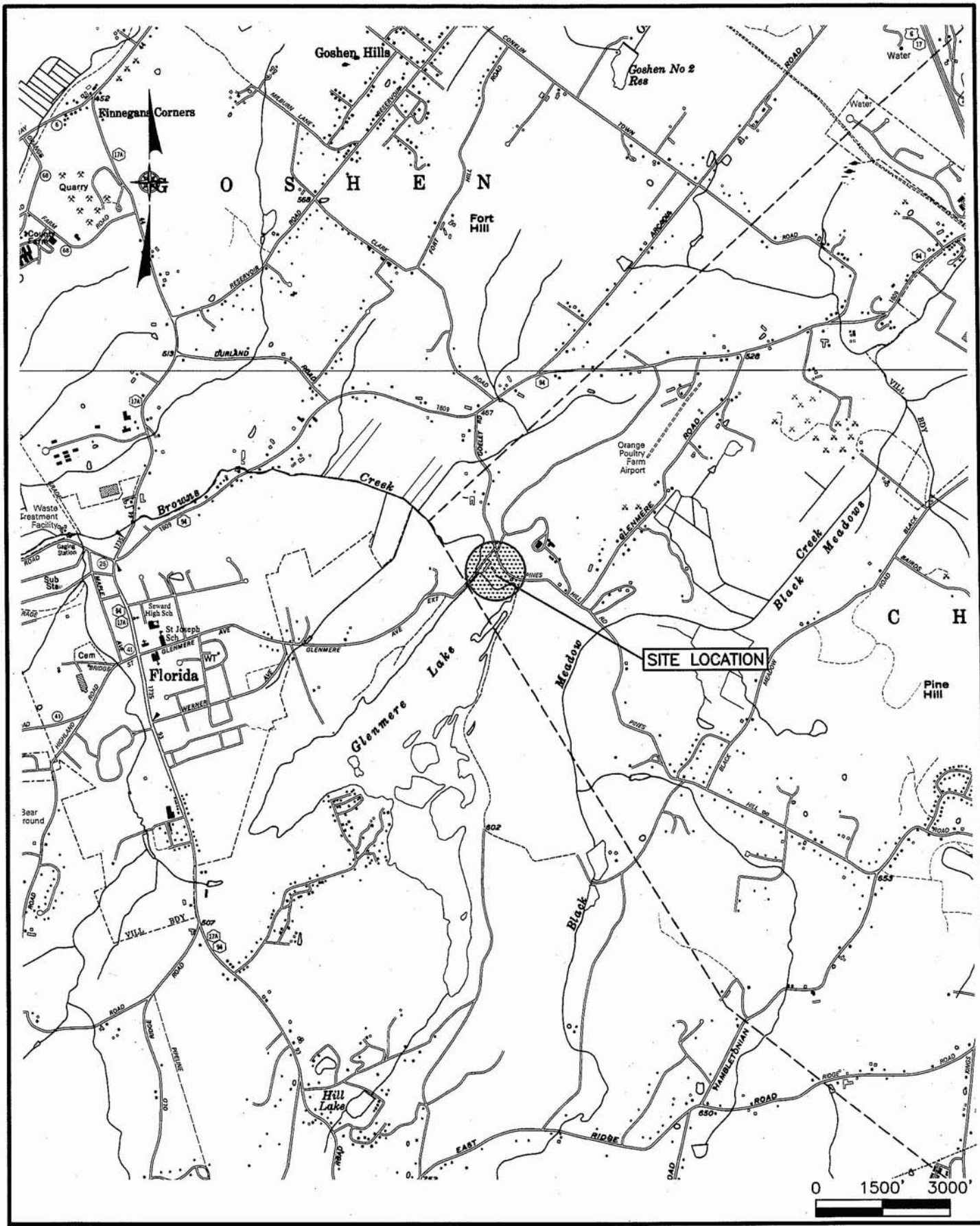
Alternative 2 would be effective in the long-term by removing all contaminants of concern from the site which are present at levels above background or unrestricted SCGs.

Alternative 2 would reduce the toxicity, mobility and volume of on-site contamination by transferring the material to an approved off-site location (*i.e.*, a landfill).

Alternative 2 is readily implementable. Sediment removal is somewhat more specialized than excavation and requires additional controls (turbidity curtains in the lake and containment pad for dewatering sediments) to manage potential short-term impacts; however, these are manageable issues.

Since the remedy does not result in any restrictions on the use of the site, there is no recurring (annual) costs created by the remedy.

Alternative 2 would not place any restrictions on the use of the property.



Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

GLENMERE LAKE PROPERTY
ORANGE COUNTY, NEW YORK

SITE LOCATION MAP

FIGURE 1

F:\2777\1234 OC SITE LOCATION MAP.dwg, FIG 1-1, 11/5/2009 10:50:14 AM, Canon IR C3200-C1 PS Ver2.1, Letter, 1:1

SITE BOUNDARY
GATE
PINE HILL ROAD
GLENMERE LAKE ESTATES
SITE BOUNDARY
GATE
ORANGE COUNTY PROPERTY
SITE BOUNDARY
WOODS ROAD
GRAVEL PARKING AREA
CHAIN LINK FENCE
GLENMERE EXTENSION
DAM
DIRT DRIVE
EDGE OF SHORE
GLENMERE LAKE
BUILDING REMAINS
BUILDING REMAINS
1-MIDDLE
1-SOUTH
1-N
5
6
4
7
3
2
8
FOUNDATION REMAINS
DUMPING GROUND
OPEN FIELD
ASSUMED GROUNDWATER FLOW DIRECTION
PUMP HOUSE
UST-8
UST-6
UST-3
AST-3
UST-1
GP-01 (No Recovery)
GP-02 (No Recovery)
GP-03 (No Recovery)
GP-04 (No Recovery)
GP-05 (No Recovery)
GP-06 (No Recovery)
GP-07
GP-08
GP-09
GP-10
SED-01
SED-02
SED-03
SED-04
SED-05
SS-01 SS-02 SS-03 SS-04 SS-05 SS-06 SS-07 SS-08 SS-09 SS-10 SS-11 SS-12 SS-13 SS-14 SS-15 SS-16 SS-17 SS-18 SS-19 SS-20 SS-21 SS-22 SS-23 SS-24 SS-25 SS-26 SS-27 SS-28 SS-29 SS-30 SS-31 SS-32 SS-33 SS-34 SS-35 SS-36 SS-37 SS-38 SS-39 SS-40 SS-41 SS-42 SS-43 SS-44 SS-45 SS-46 SS-47 SS-48 SS-49 SS-50 SS-51 SS-52
SB-01 SB-02 SB-03 SB-04 SB-05 SB-06 SB-07 SB-08 SB-09 SB-10 SB-11 SB-12 SB-13 SB-14 SB-15
SITE AREA=9.9076 ACRES
AREA=431,576 S.F.
SEE FIGURE 2-1 FOR DELINEATION SEDIMENT SAMPLE LOCATIONS
GLENMERE LAKE
EDGE OF SHORE
BEAVER LODGE
WOODS ROAD
EDGE OF SHORE

LEGEND:

- SED-01 — SEDIMENT SAMPLE LOCATION
- SS-01 — SURFACE SOIL SAMPLE LOCATION
- SB-01 — SOIL PROBE LOCATION
- GP-01 — GROUNDWATER PROBE LOCATION (No Recovery) – GROUNDWATER PROBE DID NOT PRODUCE GROUNDWATER SAMPLE
- UST-8 — AST OR UST LOCATION, REMOVED IN JULY/AUGUST 2010
- CONTOURLINE
- SHORELINE

NOTE:
DEPICTED ASTs/USTs WERE REMOVED IN JULY/AUGUST 2010 AS PART OF IRM.

SOURCE: ALTA / ACSM LAND TITLE SURVEY, WILLIAM D. YOUNGBLOOD LAND SURVEYING , P.C, APRIL 21, 2008

NO.	DATE	REVISION	INT.

PROJECT ENGINEER:	DRAWN BY:
T.F.	A.R.S.
DESIGNED BY:	CHECKED BY:
A.C.	T.F.

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

ORANGE COUNTY DEPARTMENT OF PARKS
RECREATION AND CONSERVATION
ORANGE COUNTY NEW YORK

GLENMERE LAKE PROPERTY

COMPLETED SAMPLE LOCATION MAP

PROJECT NO.	DRAWING NO.
2777	2
DATE: NOVEMBER 2010	
SCALE: 1"=40'	

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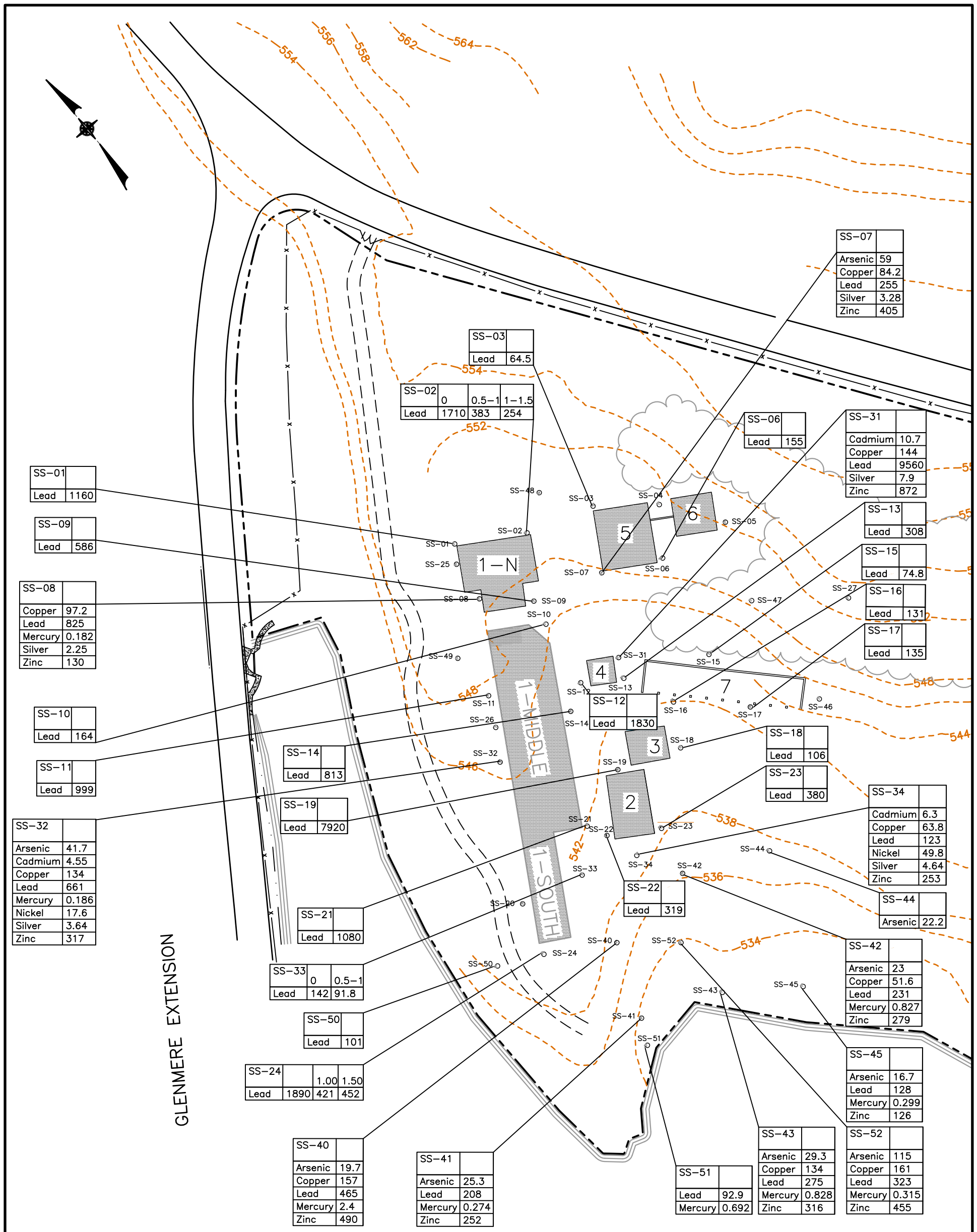

LEGEND:

○ SS–51 **SURFACE SOIL LOCATON**

SS-51	
LEAD	92.9
MERCURY	0.69

CONCENTRATION IN MILLIGRAMS PER KILOGRAM. EXCEEDS UNRESTRICTED SCOs.

SOURCE: ALTA / ACSM. LAND TITLE SURVEY, WILLIAM D. YOUNGBLOOD LAND SURVEYING , P.C, APRIL 21, 2008

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GLENMERE LAKE ENVIRONMENTAL SITE RESTORATION
ORANGE COUNTY DEPARTMENT OF PARKS, RECREATION AND CONSERVATION

METAL CONCENTRATIONS IN SURFACE SOIL EXCEEDING SCOs

SCALE: 1"=60'

FIGURE 3

SED-05-2	
Arsenic	149
Cadmium	3.05
Chromium	20.2
Mercury	0.516
Copper	398
Lead	428
Zinc	478

SED-05	
Arsenic	86
Cadmium	2.55
Chromium	5.69
Mercury	0.108
Copper	900
Lead	106
Zinc	234

SED-05-1	
Arsenic	14.5
Cadmium	1.03
Chromium	22.2
Mercury	1.1
Copper	110
Lead	227
Zinc	291

SED-05-4	
Arsenic	8.74
Cadmium	0.53
Chromium	13.8
Mercury	ND
Copper	37.1
Lead	88.8
Zinc	136

SED-05-3	
Arsenic	41
Cadmium	2.8
Chromium	21.7
Mercury	ND
Copper	215
Lead	801
Zinc	698

SED-04-1	
Arsenic	176
Cadmium	2.51
Chromium	35.2
Mercury	6.5
Copper	1350
Lead	859
Zinc	424

SED-05-5	
Arsenic	3.04
Cadmium	4.68
Chromium	17.1
Mercury	ND
Copper	120
Lead	223
Zinc	191

SED-04	
Arsenic	20.2
Cadmium	1.43
Chromium	18.4
Mercury	0.466
Copper	194
Lead	506
Zinc	112

SED-04-5	
Arsenic	27
Cadmium	0.81
Chromium	12.4
Mercury	3.1
Copper	376
Lead	338
Zinc	185

SED-04-3	
Arsenic	23.9
Cadmium	0.75
Chromium	16.4
Mercury	2.6
Copper	128
Lead	463
Zinc	158

SED-04-2	
Arsenic	4.09
Cadmium	0.58
Chromium	15.1
Mercury	2.6
Copper	45.8
Lead	530
Zinc	163

SED-04-4	
Arsenic	9.25
Cadmium	1.55
Chromium	20.3
Mercury	0.328
Copper	38.4
Lead	561
Zinc	307

SED−05
SED−05−1
SED−05−2
SED−05−3
SED−05−4
SED−05−5
SED−04
SED−04−1
SED−04−2
SED−04−3
SED−04−4
SED−04−5

LEGEND

- SED−05 — FIRST ROUND SEDIMENT SAMPLE LOCATION
- SED−05−5 — MAY 2009 SEDIMENT DELINEATION SAMPLE LOCATION
- SHORELINE

SED-05-5	
Arsenic	3.04
Cadmium	4.68
Chromium	17.1
Mercury	ND
Copper	120
Lead	223
Zinc	191

- SED-05-5 — SAMPLE ID
- Arsenic 3.04, Cadmium 4.68, Chromium 17.1 — CONCENTRATION IN MILLIGRAMS PER KILOGRAM
- Mercury ND — CONSTITUENT WAS NOT DETECTED
- Copper 120, Lead 223, Zinc 191 — CONCENTRATION EXCEEDS THE SEDIMENT SEVERE EFFECT LEVEL

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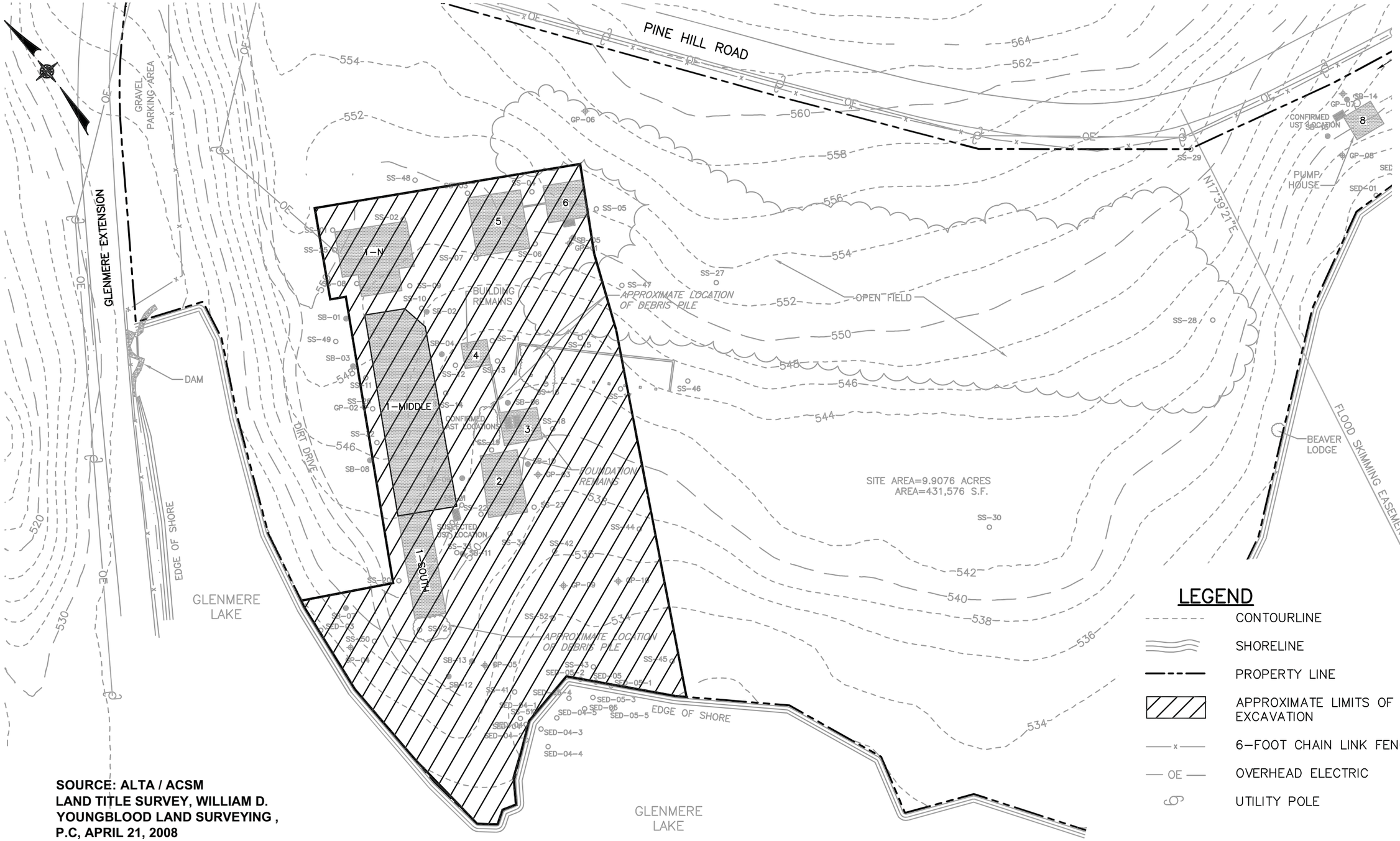
ORANGE COUNTY DEPARTMENT OF PARKS
RECREATION AND CONSERVATION

DELINEATION SEDIMENT SAMPLE CONCENTRATION MAP

SCALE: 1"=10'

FIGURE 4

F:\2777\2777-SED04 Concentration.dwg, 11x17 Conc., 11/5/2010 7:53:57 AM, KSaul



SOURCE: ALTA / ACSM LAND TITLE SURVEY, WILLIAM D. YOUNGBLOOD LAND SURVEYING , P.C, APRIL 21, 2008

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GLENMERE LAKE ENVIRONMENTAL SITE RESTORATION
ORANGE COUNTY DEPARTMENT OF PARKS, RECREATION AND CONSERVATION

REMEDIAL PLAN - ALTERNATIVE 2

SCALE: 1"=80'

FIGURE 5

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