REMEDIAL ACTION WORK PLAN – PHASE 1

118 PETTEN STREET
ROCHESTER, NEW YORK

NYSDEC SPILL #1113079
NYSDEC BCP SITE #C828130

Prepared for:	Gibbs Marine Group, Inc. 118 Petten Street Rochester, New York
Prepared by:	Day Environmental, Inc. 1563 Lyell Avenue Rochester, New York
Project No.:	4668R-12
Date:	June 2012 **(Revised September 14, 2012)** **(Revised December 20, 2012)**

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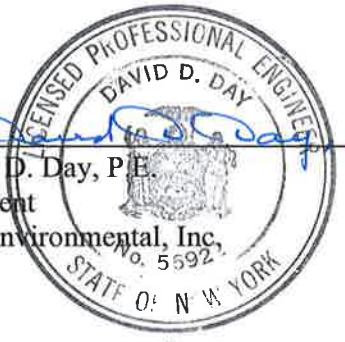
I David D. Day, P.E., certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Remedial Action Work Plan was prepared in accordance with applicable statutes and regulations and is in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).



Pres.

David D. Day, P.E.
President
Day Environmental, Inc.

1.0 INTRODUCTION

This Remedial Action Work Plan (RAWP), prepared by Day Environmental, Inc. (DAY) on behalf of Gibbs Marine Group, Inc. (Gibbs Marine), describes the proposed initial remedial efforts to address the petroleum-impacted media associated with New York State Department of Environmental Conservation (NYSDEC) Spill #1113079 located at 118 Petten Street, Rochester, New York (Site). The Site is also a NYSDEC Brownfield Cleanup Program (BCP) site (BCP Site #C828130). The location of the Site is shown on a Project Locus Map included as Figure 1.

1.1 Background

Soil and groundwater impacted with petroleum were encountered at the Site on February 16, 2012 during excavation work to install a holding tank for the collection of sanitary wastewater in the vicinity of the office building (referred to as Building #8 in BCP documents). A thin layer (i.e., less than ¼ inch) of light non-aqueous phase liquid (LNAPL) that was black in color, and which exhibited a petroleum sheen and odors, was encountered on the surface of the groundwater in the excavation. However, LNAPL was not observed in the groundwater monitoring well (designated GM-DAY-MW-6) that was installed as part of the BCP Remedial Investigation. Monitoring Well GM-DAY-MW-6 is located within five feet of the northern edge of the excavation sidewall. The location of Building #8 is shown on Figure 2. The approximate extent of the excavation and the location of monitoring well GM-DAY-MW-6 are depicted on Figure 3.

The New York State Department of Environmental Conservation (NYSDEC) Spills Unit was notified by Gibbs Marine and by a third party on February 16, 2012, and Spill File #s 1113080 and 1113079 (respectively) were opened by the NYSDEC. Spill File #1113080 was subsequently closed by the NYSDEC.

The suspected source of the petroleum impact is from an aboveground storage tank (AST) containing heating oil that was formerly located adjacent to the office building. This former AST was replaced by a new AST that is currently located in the same vicinity as the former AST. With the approval of the NYSDEC, a limited surface soil removal was conducted under, and in the immediate vicinity of, the existing AST on February 23, 2012. Petroleum impacted soils/fill materials were excavated from an area approximately 75 square feet in size, excluding soils immediately adjacent to a power pole located in the vicinity of the AST (refer to Figure 3). Soils were removed to an average depth of approximately two feet below ground surface (bgs) with a maximum depth of approximately three feet bgs. Groundwater was encountered at approximately 2.0 feet bgs. The impacted soil/fill materials were stockpiled and transported off-site for disposal at the Mill Seat Landfill in Bergen, NY.

With concurrence of the NYSDEC, Gibbs Marine stabilized the sidewalls of the holding tank excavation, secured the perimeter of the excavation with fencing material for safety reasons, and subsequently removed LNAPL from the surface of the groundwater in the excavation using hydrophobic oil absorbent pads. The LNAPL removal effort commenced on February 16th 2012 and continued through March 13th 2012.

On March 13, 2012, Gibbs Marine installed an LNAPL recovery well in the holding tank excavation adjacent to the location of the installed holding tank. The well was constructed of a four-inch diameter PVC perforated standpipe that extended approximately 3.5 feet below the groundwater surface. A sixteen-inch diameter steel casing was placed around the stand pipe, and the annulus was filled with pea gravel. The holding tank excavation was backfilled to match the surrounding grade and the steel casing was subsequently removed from the ground. The approximate location of the LNAPL recovery well is depicted on Figure 3.

2.0 REMEDIAL MEASURES

The objective of the remedial program described herein is to delineate the extent of the LNAPL plume, and to remove LNAPL from the groundwater located in proximity of Building #8 at the Site. Note, it is anticipated that the remedial work will involve clean-up of only heating oil (i.e., petroleum-related wastes that are characterized as non-hazardous wastes).

Applicable portions of the "Site Specific Health and Safety Plan, Genesee Marina, Inc., Site #828130, 118 Petten Street, Rochester, New York" (HASP) dated June 29, 2007, that was prepared for conducting the remedial investigation work at the Site, will be followed during the remedial work described in this work plan. This HASP addresses the potential exposures associated with the activities that will be conducted as part of the proposed remedial measures. Personnel that will be involved with the remedial work will be HAZWOPER trained as defined under OSHA 1910.120. Certifications will be provided upon request. In addition, the Community Air Monitoring Program (CAMP) as presented in Appendix 1A of the NYSDEC DER-10 guidance document, and included in Appendix C of the HASP, will be implemented during excavation activities conducted as part of the remedial work.

The following sections of this RAWP describe the proposed remedial activities.

2.1 LNAPL Delineation and Perimeter Well Installation

Prior to conducting any intrusive work, a utility stakeout will be completed for the Site. The purpose of the intrusive work is to delineate the extent of the LNAPL plume. Hand-held direct-push soil sampling equipment will be used to advance test borings into the uppermost groundwater table in a radial direction away from the source area. The initial test borings will be advanced starting in the approximate locations shown on Figure 3. Supplemental test borings will be advanced at locations extending away from the presumed source area, at approximately ten-foot intervals, until evidence of LNAPL is no longer observed in the samples. Also, additional test borings, beyond those shown on Figure 3, will be advanced if needed in order to delineate the extent of the LNAPL plume.

To the extent practicable, continuous soil samples will be collected from the existing ground surface to the final depth of each test boring, expected to be about three to four feet bgs (i.e., the anticipated depth to groundwater). The collected test boring samples will be observed and documented in order to develop a stratigraphic description of the subsurface conditions encountered, including evidence of suspect contamination (e.g., staining, unusual odors, etc.). Portions of each recovered soil sample will be screened with a photoionization detector (PID) for field evidence of volatile organic compound (VOC) impact. In addition, portions of each recovered soil sample will be placed in a closed container, the container and contents will be agitated for at least 30 seconds then allowed to equilibrate, and subsequently the headspace in the container will be screened with a PID for evidence of VOC impact. A test boring log summarizing the subsurface conditions encountered (e.g., stratigraphic conditions, evidence of contamination, PID readings, etc.) will be prepared.

Once the presence of LNAPL is encountered on the groundwater, the test boring will be backfilled, and another test boring (i.e., Supplemental Test Boring – refer to Figure 3) will be advanced about

ten feet further out from the test boring that was just backfilled. Soil samples from test borings that exhibit no evidence of petroleum contamination will be returned to the test boring in the reverse order that the soil samples were removed. Soil samples that exhibit evidence of contamination [i.e., PID readings greater than 50 parts per million (ppm), evidence of LNAPL, petroleum-type staining, or petroleum-type odors] will be segregated, placed in a steel 55-gallon drum, staged on-site for characterization, and disposed in accordance with applicable regulations.

Test borings will continue to be advanced as described above until LNAPL is not encountered on the surface of the groundwater. In test borings where LNAPL is not encountered, the test borings will be advanced to a depth of approximately five feet bgs and completed as 1-inch inner diameter (ID) polyvinyl chloride (PVC) LNAPL monitoring wells with a sand pack. The direct-push soil sampling equipment will be capable of completing the test boring to a depth of five feet bgs. The LNAPL monitoring wells will be completed with a protective flush mounted curb box in areas where there is vehicle traffic, and as stick-up wells with a protective casing in areas where there is minimal to no vehicle traffic. The locations of the LNAPL monitoring wells will be determined at the time of the delineation work (i.e., LNAPL monitoring wells will be installed in the first test boring locations where no evidence of LNAPL is observed), and will be configured so as to function as a perimeter (i.e., sentry) monitoring well network.

Non-disposable sampling equipment will be decontaminated between each test boring location by washing using a residue-free soap (i.e., Alconox) and potable water rinse. Decontamination liquids will be containerized and subsequently disposed in accordance with applicable regulations.

The location of each test boring and LNAPL monitoring well will be surveyed using a hand-held GPS unit or tape measured relative to existing Site features. Also, the top of each LNAPL monitoring well casing will be surveyed relative to existing monitoring wells that were installed and surveyed during the BCP Remedial Investigation.

2.2 Extraction Well Installation

Once the extent of the LNAPL plume is delineated, one or more LNAPL extraction wells will be installed in key locations within the LNAPL plume. The LNAPL extraction wells will consist of four-inch diameter PVC perforated standpipes that extend approximately 3.0 feet below the groundwater surface. Details describing the installation of the LNAPL extraction wells are provided below.

The LNAPL extraction well(s) will be installed using a backhoe to excavate a pit in the selected location(s). It is anticipated that the excavated pit(s) will only be about three feet wide by six feet long by about six feet deep in the center of the excavated pit. Excavated soil that is not contaminated (i.e., the top two or three feet of soil) will be staged next to the excavated pit and reused to backfill the pit. Any soil that is removed from the excavation and which exhibits evidence of contamination (i.e., PID readings greater than 50 ppm, evidence of LNAPL, petroleum-type staining, or petroleum-type odors) will be segregated, and placed in DOT approved 55-gallon drums or on a double layer of poly sheeting (a minimum of 12 mil in thickness). Any contaminated soil that is staged on poly sheeting will be covered with poly sheeting to prevent precipitation runoff and wind erosion. Also, any saturated contaminated soil

that is removed from the excavated pit will be placed on the poly sheeting and solidified with an absorbent additive such as Speedy Dry, cellulose, or some other absorbent material, as needed, to prevent runoff. If the contaminated soil is not staged on an impervious surface (e.g., cement, asphalt), and if the poly sheeting below the contaminated soil is breached prior to or during the removal of the contaminated soil (i.e., the poly sheeting on the ground becomes torn or ripped, etc.), the top three inches of ground surface below the breached area will be excavated and disposed in accordance with applicable regulations. Note, it is not anticipated that groundwater or LNAPL that requires handling or disposal will be generated during the LNAPL extraction well installation activities.

Once the excavated pit is completed, a sixteen-inch diameter steel casing will be placed around a PVC perforated standpipe that is placed in the center (i.e., deepest part) of the excavation, and the annulus will be filled with imported pea gravel. The pea gravel will meet the applicable provisions of Section 5.4 of the NYSDEC DER-10 guidance document regarding imported materials. The excavation will then be backfilled with staged uncontaminated soil material that was removed from the excavation (i.e., soil that does not exhibit PID readings greater than 50 ppm, evidence of LNAPL, petroleum-type staining, or petroleum-type odors), and the steel casing will subsequently be removed from the ground. It is not anticipated that any material other than pea gravel will need to be imported to the site to complete backfilling of the excavation.

Excavation equipment (i.e., the bucket of the backhoe) will be decontaminated between each LNAPL extraction well location, by mechanically removing (i.e., brushing, scraping, etc.) any soil adhering to the equipment, and wiping off any residual LNAPL that may be present on the equipment with cloth rags. The decontamination activities will be performed over a double layer of poly sheeting (a minimum of 12 mil in thickness). Any waste generated during the decontamination activities (i.e., contaminated soil and rags, the poly sheeting, etc.) will be containerized and disposed in accordance with applicable regulations.

The riser pipes of LNAPL extraction well(s) installed in areas of vehicle traffic will be cut off at an elevation slightly below the ground surface, and a protective flush mounted curb box will be installed at each location to protect the LNAPL extraction well. LNAPL extraction well(s) installed in non-traffic areas will be left as stick-up wells, and a protective casing will be installed over each riser pipe.

The location of each LNAPL extraction well will be surveyed using a hand-held GPS unit or tape measured relative to existing Site features. Also, the top of each LNAPL extraction well casing will be surveyed relative to existing monitoring well(s) that were installed and surveyed during the BCP Remedial Investigation. The LNAPL extraction well(s) will then be developed (refer to Section 2.3), and monitored (refer to Section 2.4).

2.3 Monitoring Well Development

The new groundwater LNAPL monitoring wells, and the LNAPL extraction wells, will be developed prior to use. Well development will occur a minimum of 48 hours after installation of the wells. Note, the LNAPL extraction well installed in the holding tank excavation has not been developed or monitored since it was installed on March 13, 2012, so it will also be developed when the other wells are developed. Prior to well development, the wells will be monitored for the presence of LNAPL using an oil/water interface probe. Any LNAPL detected will be removed by pumping or by placement of a LNAPL recovery device in the well (refer to Section 2.4 for a description of the LNAPL recovery devices). Any LNAPL collected will be containerized, characterized and subsequently disposed in accordance with applicable regulations. During development, the purge water will also be observed for the presence of LNAPL. Purge water containing LNAPL will also be containerized, characterized and subsequently disposed in accordance with applicable regulations.

Well development will be performed utilizing either a new disposable bailer with dedicated cord, or a pump and dedicated tubing. No fluids will be added to the well during development, and well development equipment will be decontaminated as described in Section 2.1 prior to development of the well. The well development procedure will be as follows:

- Obtain a pre-development static water level reading.
- Calculate the water/sediment volume in the well.
- Obtain a groundwater sample for field analysis using a bailer.
- Select a development method and set up equipment depending on method used.
- Begin pumping or bailing.
- Obtain initial field water quality measurements (e.g., conductance, temperature, and PID readings). Record water quantities and rates removed.
- Obtain additional field water quality measurements as water removal progresses.
- Stop development when water quality criteria are met.
- Obtain post-development water level readings.
- Document development procedures, measurements, quantities, etc.

Development will continue until the following criteria are achieved:

- pH, specific conductance, turbidity, and temperature are relatively stable for three consecutive measurements and/or,
- a minimum of three well volumes has been removed.

The results of the LNAPL evaluation and well development activities will be documented on a well development log.

2.4 LNAPL Monitoring, and Recovery from LNAPL Extraction Wells

After the development of the wells, and any initial LNAPL removal activities, the LNAPL extraction wells will be monitored on a weekly basis. The monitoring will consist of measuring the groundwater surface and LNAPL thickness (if any) in the LNAPL extraction wells using an oil/water interface meter. In addition, the LNAPL monitoring well network (Section 2.1) will also be monitored using an oil/water interface meter. If LNAPL is detected in any of the LNAPL extraction wells, the LNAPL will be removed by pumping or by using a LNAPL recovery device. The LNAPL recovery devices will be comprised of a hydrophobic oil absorbent material (pads), rolled to a diameter slightly less than the inside diameter of the extraction well and bound with wire to maintain the diameter and cylindrical shape. These devices will be attached to the well cap with string and lowered onto the LNAPL or water surface to allow LNAPL to be absorbed onto the device. In the event LNAPL is collected, it will be containerized for subsequent disposal in accordance with applicable regulations. Based on the quantity of LNAPL observed and collected from the LNAPL extraction wells, the schedule for these monitoring events will be adjusted as needed (i.e., conducted more frequently or less frequently than once per week). The NYSDEC will be notified of any proposed change in the frequency of monitoring in order to obtain NYSDEC concurrence before the change is implemented. Also, if LNAPL is ever encountered in the LNAPL monitoring wells, the NYSDEC will be notified and additional delineation work will be conducted (as described in Section 2.1). In that case, additional LNAPL extraction wells will also be installed and monitored as warranted.

2.5 Indoor Air

As discussed with a New York State Department of Health (NYSDOH) representative, an indoor air evaluation will not be conducted in Building #8 as part of this remedial work. An indoor air evaluation is not warranted at this time due to reasons such as those stated below:

1) The NYSDEC approved RI report for the Site indicates that VOC contamination at the Site is not an issue, except possibly in the vicinity of two specific and limited source areas. The remedial work described in this work plan is not being conducted within those two source areas (i.e., this spill/release of fuel oil is in the vicinity of Building #8 at the Site, and Building #8 is not located within the two possible source areas of VOC contamination that have been identified at the Site).

2) This remedial action is in response to the spill/release of fuel oil. Typically, fuel oil does not create a vapor intrusion issue (i.e., fuel oil typically only becomes a vapor issue if it is spilled within the building, such as in a basement). Also, if there is an indoor air issue regarding fuel oil, a fuel oil odor will typically be evident in the building. In addition, based on the information available to date, it appears that the extent of fuel oil contamination in the vicinity of Building #8 is limited.

If information is obtained as part of the remedial work that indicates that vapor intrusion into Building #8 could be an issue (i.e., another contaminant is encountered besides fuel oil that could potentially impact the indoor air of Building #8, etc.), then this RAWP will be revised at that time to include evaluation of indoor air.

3.0 DELIVERABLES

The documents listed below will be prepared and submitted to the NYSDEC.

- **LNAPL Delineation Report:** A report describing the results of the work described in Sections 2.1, 2.2 and 2.3 will be prepared and submitted to the NYSDEC for review following the completion of the work. This report will include: a summary of the work completed, appropriate figures, test boring logs, development logs, and the LNAPL monitoring well and LNAPL extraction well installation logs.

- **Quarterly Progress Reports:** Quarterly progress reports will be prepared and submitted to the NYSDEC that summarize the results of LNAPL removal from the extraction wells (i.e., the work described in Section 2.4). During the first three month period that the LNAPL recovery efforts are conducted, the effectiveness of the LNAPL recovery efforts will be evaluated and it will be determined if additional and/or supplementary remedial measures are warranted to augment the LNAPL recovery efforts. If supplementary remedial measures become necessary, a supplemental work plan will be submitted to the NYSDEC for review and approval.

- **Final Remedial Report:** Once the LNAPL removal efforts are completed, a final report will be prepared and submitted to the NYSDEC. The final report will summarize the work that was completed and include documentation that was developed during remedial activities (i.e., LNAPL recovery logs, any analytical data, etc.). The final report will ask for NYSDEC's concurrence that Spill # 1113079 can be closed.

4.0 SCHEDULE

The proposed schedule for remedial measures and deliverables described in this RAWP are described below:

- **LNAPL Delineation, LNAPL Monitoring Well Installation, and LNAPL Extraction Well Installation** – within 20 business days of NYSDEC approval of the RAWP.

- **LNAPL Monitoring Well and LNAPL Extraction Well Development** – within 5 business days of perimeter monitoring well installation and LNAPL extraction well installation.

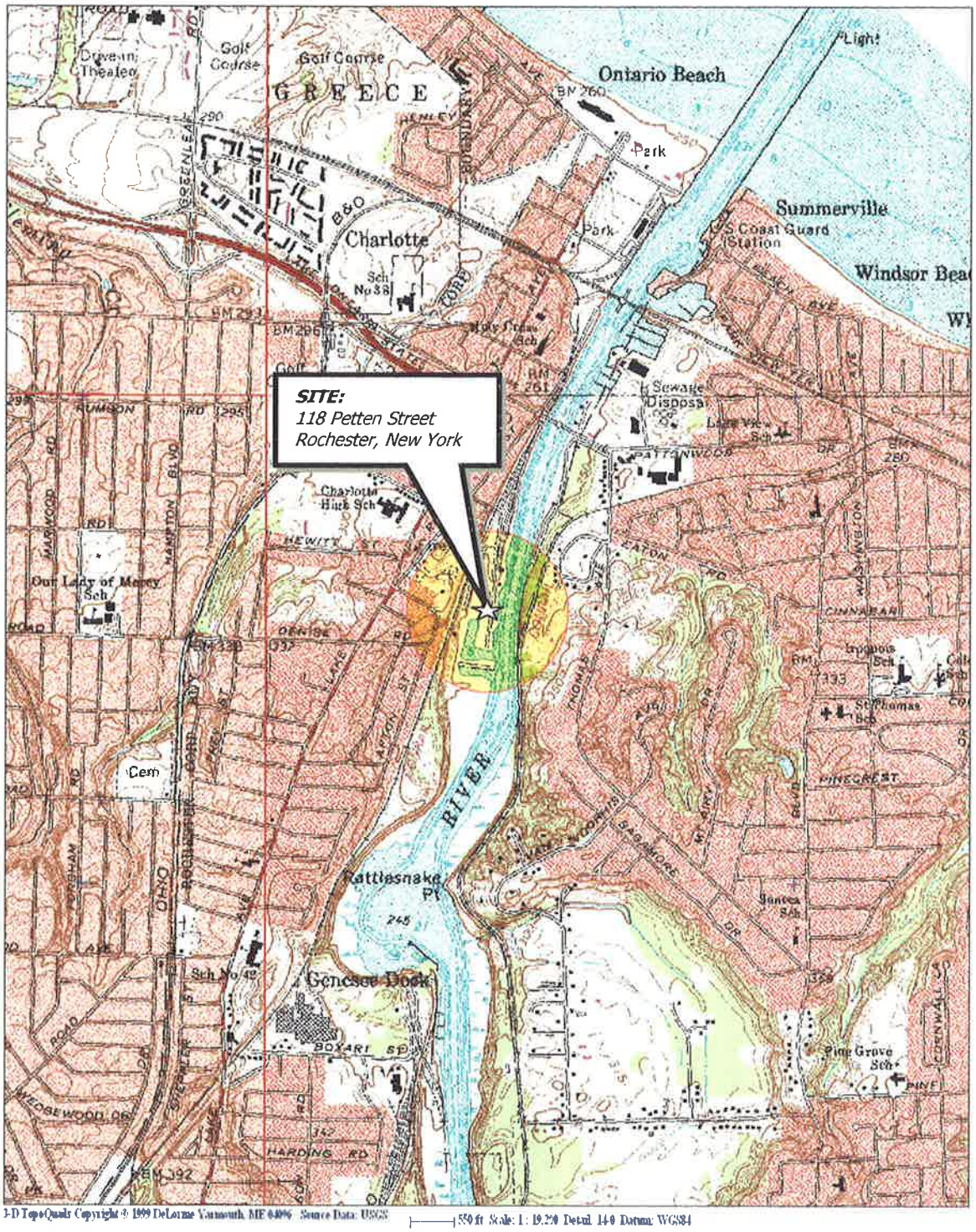
- **Initiation of Periodic LNAPL Extraction Well Monitoring and LNAPL Recovery** – within 25 business days of NYSDEC approval of the RAWP.

- **LNAPL Delineation Report –** within 30 business days of NYSDEC approval of the RAWP.

- **Quarterly Progress Reports** – submitted to the NYSDEC on or about the 10th day of the month that follows the collection of three months of data.

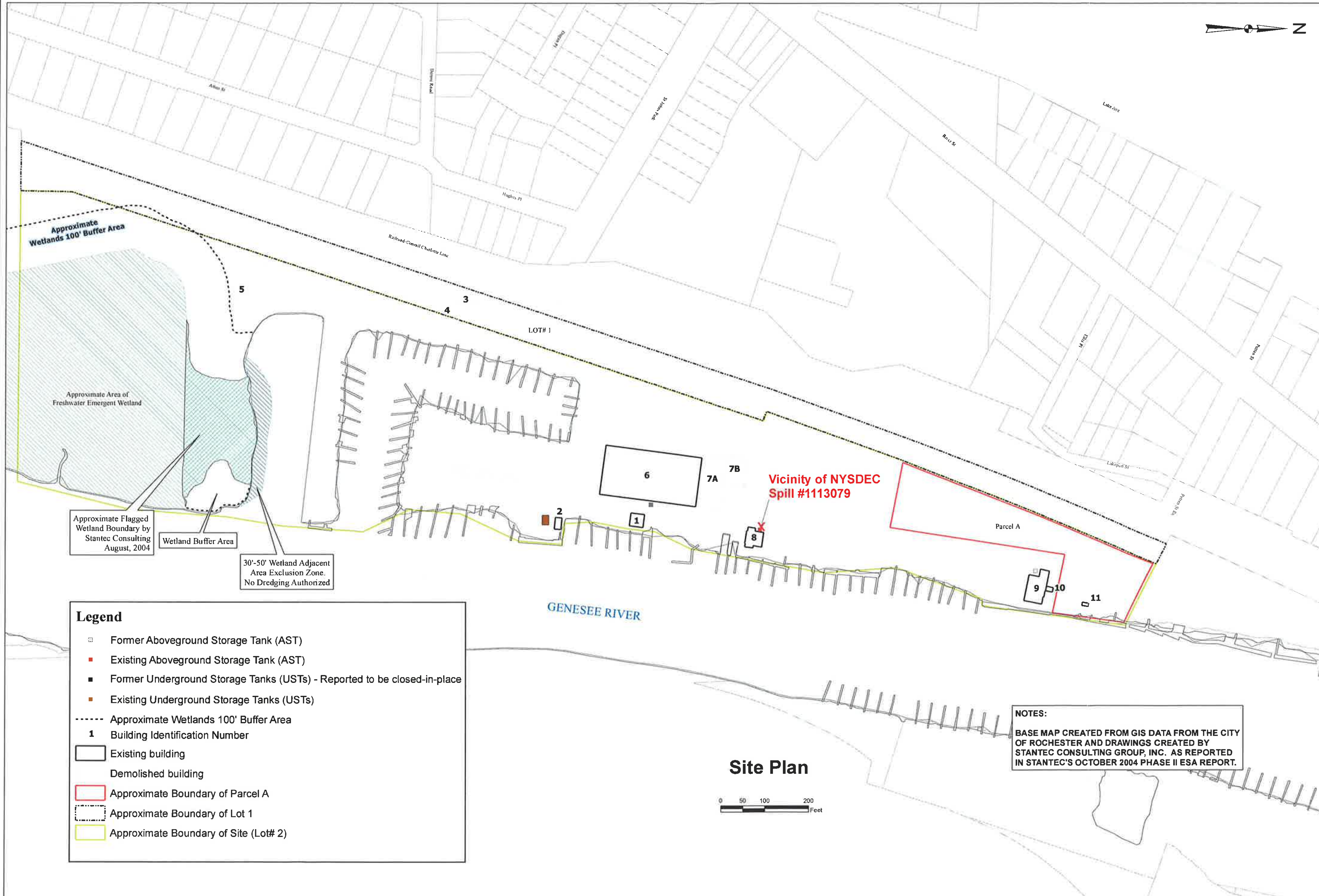
Any modifications to this RAWP or the above schedule will be submitted to the NYSDEC for approval prior to implementation.

FIGURES



Drawing Produced From: 3-D TopoQuads, DeLorme Map Co., referencing USGS quad maps Rochester East and West (NY) 1995. Site Lat/Long: N43° 14.57' – W77° 36.87'

DATE **5/14/2012** DRAWN BY **CAH** SCALE **1" = 2000'**	**day** DAY ENVIRONMENTAL, INC. ENVIRONMENTAL CONSULTANTS ROCHESTER, NEW YORK 14614-1008 NEW YORK. NEW YORK 10165-1617	PROJECT TITLE **118 PETTEN STREET** **ROCHESTER, NEW YORK** **NYSDEC SPILL #1113079** **REMEDIAL WORK PLAN** DRAWING TITLE **PROJECT LOCUS MAP**	PROJECT NO. **4668R-12** **FIGURE 1**



NOTES:

BASE MAP CREATED FROM GIS DATA FROM THE CITY OF ROCHESTER AND DRAWINGS CREATED BY STANTEC CONSULTING GROUP, INC. AS REPORTED IN STANTEC'S OCTOBER 2004 PHASE II ESA REPORT.

DESIGNED BY: DJG	DATE: 06-2008
DRAWN BY: CPS	DATE: 09-2009
CHECKED BY: RJM	DATE: 09-2009
APPROVED BY: DDD	DATE: 09-2009
SCALE: AS NOTED	DATE: 09-28-2009

REVISIONS

DAY ENVIRONMENTAL, INC.
ENVIRONMENTAL CONSULTANTS
ROCHESTER, NEW YORK
NEW YORK, NEW YORK

PROJECT TITLE: GIBBS MARINA
118 PETTEN STREET
ROCHESTER, NEW YORK

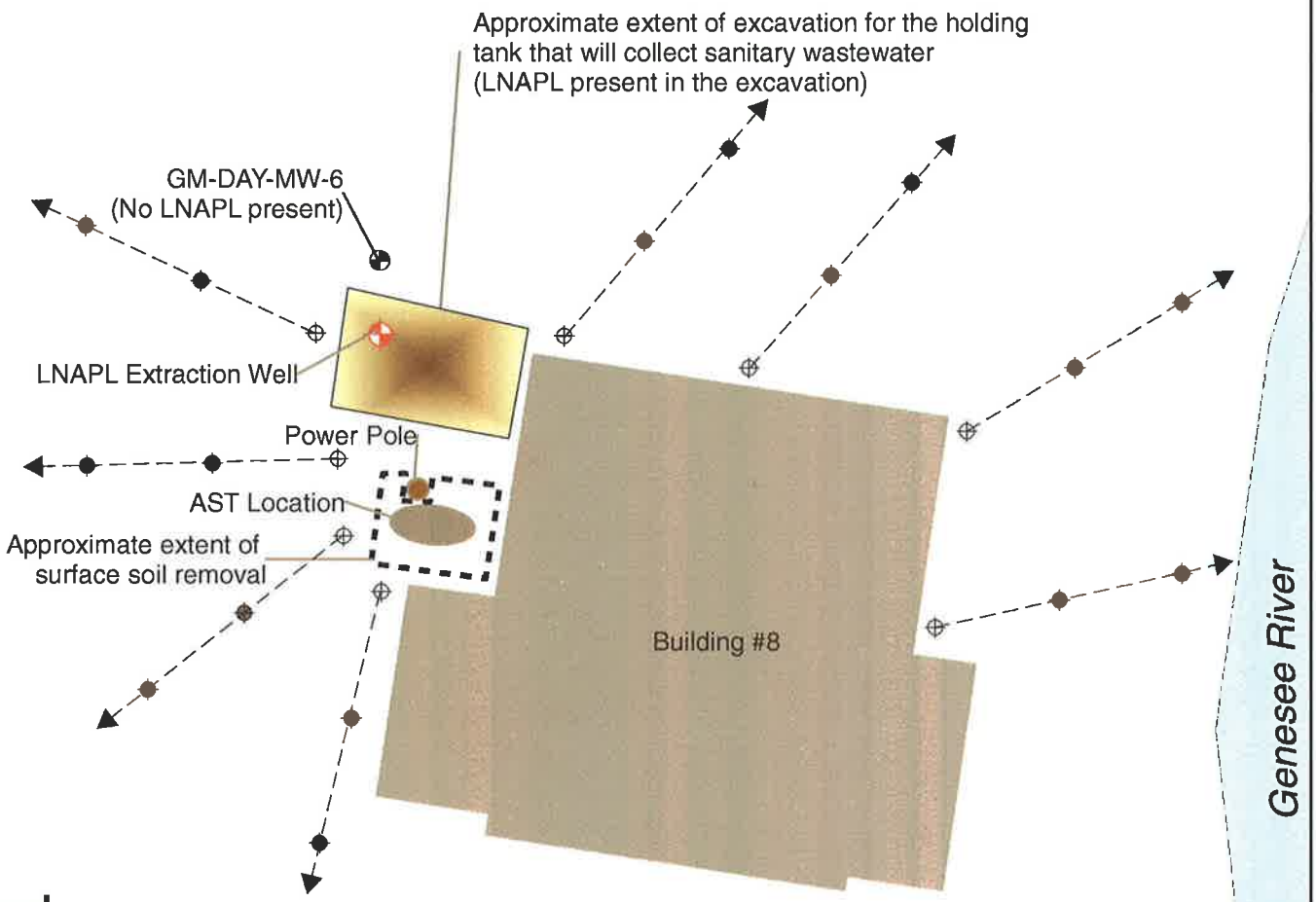
NYSDEC SPILL #1113079 REMEDIAL WORK PLAN

DRAWING TITLE: SITE PLAN

PROJECT NO: 4668S-12

FIGURE 2

Last Date Saved: 12 Sep 2012 Document Path: E:\GIS Mapping\4668R-12\4668R-1 RWP Site Plan(revised 091112).mxd



Legend

- Proposed Intitial Delineation Test Borings
- Proposed Supplemental Test Borings (as necessary)

Note: Test boring locations that do not encounter LNAPL will be converted to LNAPL monitoring wells as part of the perimeter (i.e. sentry) monitoring well network (refer to Section 2.1 of the Remedial Action Work Plan), and no further delineation will be conducted beyond that point.

Date: 09-11-2012 Drawn By: CAH Scale: AS NOTED	**DAY ENVIRONMENTAL, INC.** Environmental Consultants Rochester, New York 14606 New York, New York 10016-0710	Project Title: GIBBS MARINA 118 PETTEN STREET ROCHESTER, NEW YORK NYDEC SPILL #1113079 REMEDIAL WORK PLAN Drawing Title: Plan Depicting RWP Components	Project No. 4668R-12 FIGURE 3