
CONSTRUCTION SUMMARY REPORT ONONDAGA LAKE THROUGH 2013

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TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION.....	1
2.0 DREDGING.....	1
2.1 2012-2013 Actual Dredging and Dewatering Operational Metrics Summary	1
2.2 2012-2013 Dredging/Dewatering Operational Improvements	2
2.3 2014 Planned Dredging and Dewatering Productivity	3
2.4 2014 Planned Dredging/Dewatering Operational Improvements	3
3.0 CAPPING	4
3.1 2012-2013 Actual Capping Operational Metrics Summary	4
3.2 2012-2013 Capping Operational Improvements	5
3.3 2014 Planned Capping Productivity	5
3.4 2014 Planned Capping Operational Improvements.....	5

LIST OF FIGURES

Figure 2-1 RA-C Dredging Progress	7
Figure 2-2 RA-D Dredging Progress	8
Figure 3-1 RA-C Capping Progress	9
Figure 3-2 RA-D Capping Progress.....	10
Figure 3-3 RA-E Capping Progress	11

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1.0 INTRODUCTION

This construction summary report documents dredging and capping production for the Onondaga Lake remediation project through 2013, and summarizes enhancements that have been and/or will be implemented to further improve productivity, quality, and safety. Through 2013, approximately 1,210,000 cubic yards (cy) of sediment have been dredged, exceeding the original planned production (935,000 cy). It is now estimated that dredging can reasonably be completed by the end of the 2014 construction season. The cumulative cap material volume placed by the end of 2013 is approximately 550,000 cy, which is slightly less than design projections. However, capping operations in 2013 were consistent with design volumes and the capping is still projected to be completed within five years as originally planned.

2.0 DREDGING

This section summarizes the dredging operational metrics through 2013 and the projected 2014 values. The operational improvements incorporated to date and additional enhancements that will be made prior to 2014 start up are also summarized.

2.1 2012-2013 Actual Dredging and Dewatering Operational Metrics Summary

The dredging and dewatering operation achieved several key milestones through the 2013 season. Project startup in July 2012 of the dredging and dewatering systems was completed consistent with the planned schedule. Dredging was conducted in Remediation Areas (RA) C and D in 2012. RA-D and the western outboard were dredged in 2013, including removal of approximately 90 percent of the required In-Lake Waste Deposit (ILWD). Dredge Management Units (DMUs) were completed and approved by New York State Department of Environmental Conservation (NYSDEC) throughout both dredge seasons in RA-C and D. These DMUs are presented on Figures 2-1 and 2-2.

Overall planned and actual dredge production through 2013 is summarized in the table below. Dredge progress through 2013 has exceeded the production estimates that were included in the remedial design.

	2012 - 2013 Design Estimate	2012 - 2013 Actual
Volume (cy)	940,000 cy	1,210,000 cy
Percent of Total (%)	47%	60%

Air quality monitoring was conducted in accordance with the project Community Health and Safety Plan (http://www.dec.ny.gov/docs/regions_pdf/chaspfin.pdf). Monitoring data is provided to the NYSDEC on an ongoing basis. Through 2013, there were no exceedances of short-term or long-term air quality criteria.

Additional details pertaining to the first two years of dredging productivity, including operational enhancements that were made to improve productivity, are provided below.

2.2 2012-2013 Dredging/Dewatering Operational Improvements

Several process enhancements and modifications were implemented to further improve overall dredge system performance, as summarized below. These optimizations improved overall system uptime and dredging productivity. These process enhancements and modifications are summarized below. The ability to dredge productively is directly impacted by the ability to manage the dredged materials. Therefore, optimizations that enhanced dewatering and Sediment Consolidation Area (SCA) operations are included in this summary.

- **Hard material in West Outboard** – Following testing completed by Dredging Supply Company, a larger cutter head with more aggressive teeth and more power was installed on the Marlin dredge. This increased the dredge production capabilities for hard material found in specific areas of the lake.
- **Odor** – Several odor mitigation measures were identified, evaluated, and implemented in the 2012-2013 operating seasons. These measures included the installation of a misting system, installation of floating covers on the active water basins and on the perimeter of the SCA, a stand-alone carbon filtration system for the treatment of vapors from the thickeners, the installation of a 30-foot tall wind screen, and enhanced water management to reduce the flow of water to the geotubes.
- **Foam** – Effective defoaming/anti-foaming agents were identified and incorporated into the thickener system. Adding these agents has reduced the total suspended solids of thickener weir water, increased the volume of water removed from the process by the thickener, and subsequently increased the solids throughput capacity of the dewatering system.
- **Optimization of pipeline and pump system** – During 2013 startup phase, the booster pump control system was rebalanced and optimized for greater pumping efficiency, resulting in greater system capacity. The leak detection system on the slurry pipeline was also enhanced in 2013 to more quickly determine the location of a potential leak from the inner pipe into the interspatial space of the double-walled pipe, should one occur.
- **Geotube feed system** – In 2012, an additional booster pump was installed immediately downstream of the geotube feed pumps to improve the speed with which the thickened slurry is transferred to the geotubes. This resulted in an increase in the solids throughput capacity of the dewatering system.
- **Hypack GPS controls** – System enhancements to the dredge GPS control system were made, which increased the level of dredge operability (e.g., lateral control, elevation control, etc). This resulted in a decrease in the amount of overdredge volume removed by the dredge.
- **Residual polymer to water treatment plant (WTP)** – WTP operations have been expanded to include use of the china clay test as a field measurement of polymer carryover. This has resulted in a decrease in residual polymer within the water being pumped to the WTP and thereby increased efficiency of WTP operations.

- **System Uptime** – The stormwater pollution prevention plan has been modified to use the West basin to temporarily hold treated water during periods in which the discharge of treated water to Onondaga County's treatment facility (Metro) is shutdown due to precipitation. This modification was approved by NYSDEC on 10/25/13. This use of the West basin will allow the dredge to continue operating through a short-term storm event, or shut down more efficiently for both the dredge system and personnel during long-term storm events.

2.3 2014 Planned Dredging and Dewatering Productivity

Additional system enhancements are planned to be in place for the start of the 2014 dredging season and are described below. Based on these enhancements and increased productivity achieved through 2013, dredging productivity estimates have been updated from the original design estimates, as reflected in the following table. It is now anticipated that dredging can reasonably be completed by the end of the 2014 construction season. The table below reflects updates from the original design estimates.

	2014 Design Estimate	2014 Updated Estimate	2014 Projected Cumulative
Dredge Volume (cy)	544,000	800,000 cy	2,000,000 cy
Percent of Total (%)	27%	40%	100%

The sequencing for dredging the remaining RAs in 2014 will continue to follow the original design sequencing. The original sequencing was designed to account for operational conditions, the status of preceding remediation activities, the planned capping sequence and schedule, and other influencing factors.

2.4 2014 Planned Dredging/Dewatering Operational Improvements

In addition to the modifications that were made prior to the completion of the 2013 dredging season, several enhancements are being implemented to further improve dredging productivity and overall system uptime in the 2014 season. These enhancements are described in detail below.

- **Optimization of pipeline and pump system** – Pipeline inspections conducted during 2013 season indicated normal wear on the invert of the transport pipe. Pipeline maintenance and partial replacement is being completed during the winter 2013-2014 shutdown. As part of these activities, and consistent with manufacturer recommendations, the pipeline will either be replaced with new pipe, rolled, and/or further inspected for erosion. These activities are expected to result in a more uniformly operating pipeline system. The system rebalancing discussed in Section 2.2 will be repeated for 2014 startup.
- **Hard Material in West Outboard** – In assessing the most effective way to remove the hard material found in the western Outboard Area, the planned approach for excavating hard material found in this area was modified. As part of this modified plan, shallow draft areas along the west wall will be mechanically excavated prior to hydraulic dredging. This will address areas where insufficient water depth is present

for hydraulic dredging and where hard material is present that will more efficiently be handled by mechanical excavation. Since mechanical excavation can be completed during winter months, the modified plan also provides schedule advantages through use of the winter months when hydraulic dredging is not feasible.

- **Geotube feed system** – The impellers within the geotube feed pumps will be replaced with an alternatively designed impeller (vortex design). A test impeller was added at the end of the 2013 season on one of the three feed pumps, and performed well. The new impellers are designed to increase the capacity for the transfer of solids and debris from the thickeners to the geotubes.

3.0 CAPPING

This section summarizes the capping operational metrics through 2013 and projected 2014 values. It also summarizes the operational improvements that have been made to date and additional enhancements that will be made prior to 2014 start up.

3.1 2012-2013 Actual Capping Operational Metrics Summary

The capping operation achieved several key milestones through 2013, including:

- Approximately 59 acres of GAC amended cap and 35 acres of siderite cap were placed and approved.
- Material was placed at the projected operational rates.
- Placement tolerances in 2013 were consistent and improved over 2012 tolerances.
- The amendment verification process was completed successfully for both siderite and carbon for multiple dosages.
- Modifications to the cap placement methodologies, resulting in thinner targeted placement lifts, were made in 2013 to ensure stability in the underlying sediment.

Capping operations through 2013 resulted in the placement of more than 550,000 cy of cap material over more than 140 acres of lake bottom. Cap material was placed in RA-C, D, E, and SMU 8 (thin layer cap) as presented in Figures 3.1, 3.2, and 3.3, respectively. The overall planned and actual capping production through 2013 are summarized in the table below. The cumulative capping productivity by the end of 2013 was slightly less than design projections. However, this discrepancy is largely due to 2012 production, which was lowered when dredging could not be completed in all areas in which cap placement was planned. As a result of operational enhancements for both dredging and capping operations, cap production exceeded planned values for 2013.

Metric	2012 - 2013 Planned	2012 - 2013 Actual
Capping Volume	583,000 CY	550,000 CY

The planned production rates for 2013, actual 2013 production rates, and planned production rates for 2014 are presented in the table below. As shown, actual 2013 production rates for both hydraulic and mechanical placement operations achieved design production rates. Planned production rates for 2014 have been modified based on these results, and additional operational

factors identified in the sections below. Also provided are details pertaining to capping productivity through 2013, including operational enhancements that were made to improve productivity.

Equipment	Materials	2013 Planned Production Rates	2013 Actual Production Rates	2014 Planned Production Rates
Hydraulic Capper	Sand Sand / Siderite Sand / GAC	1,660 cy/day	1,780 cy/day	1,700 cy/day
Mechanical Capper (24 hr) Sennebogen	Fine Gravel Coarse Gravel	960 cy/day	1,810 cy/day	1,700 cy/day

3.2 2012-2013 Capping Operational Improvements

Several process enhancements were implemented during the 2012 and 2013 seasons to improve capping productivity. These process enhancements and modifications are summarized below.

- **Quality Control / Quality Assurance (QC/QA)** – In conjunction with NYSDEC, several enhancements have been made to the QC / QA program to improve the efficiency of collecting cap placement data. These enhancements have included use of gravity cores in lieu of catch pans and a streamlined siderite detection procedure.
- **24 hour/day operation** – A 24 hour/day capping schedule was implemented for the hydraulic capping operation, which resulted in increased efficiencies and production.
- **Cap slurry pump production rate** – Similar to the dredging booster pump and pipeline system, the sand slurry pumping system was balanced and optimized, resulting in an increased pumping capacity.
- **Siderite production** – Mine visits were conducted during winter 2013, resulting in process and equipment modifications that improved the siderite production capacity.

3.3 2014 Planned Capping Productivity

Starting in 2014, additional equipment will be operating on the Lake, including a second hydraulic and a second mechanical capping unit. It is anticipated that the increased productivity realized in 2013 will carry into subsequent years, and that capping productivity will catch up to the design schedule by the end of the 2014 season. Overall, capping operations are projected to be completed as originally scheduled.

3.4 2014 Planned Capping Operational Improvements

Several enhancements have been planned in addition to the modifications that were made prior to the completion of the 2013 capping season which are designed to further improve capping productivity. These enhancements are described in detail below:

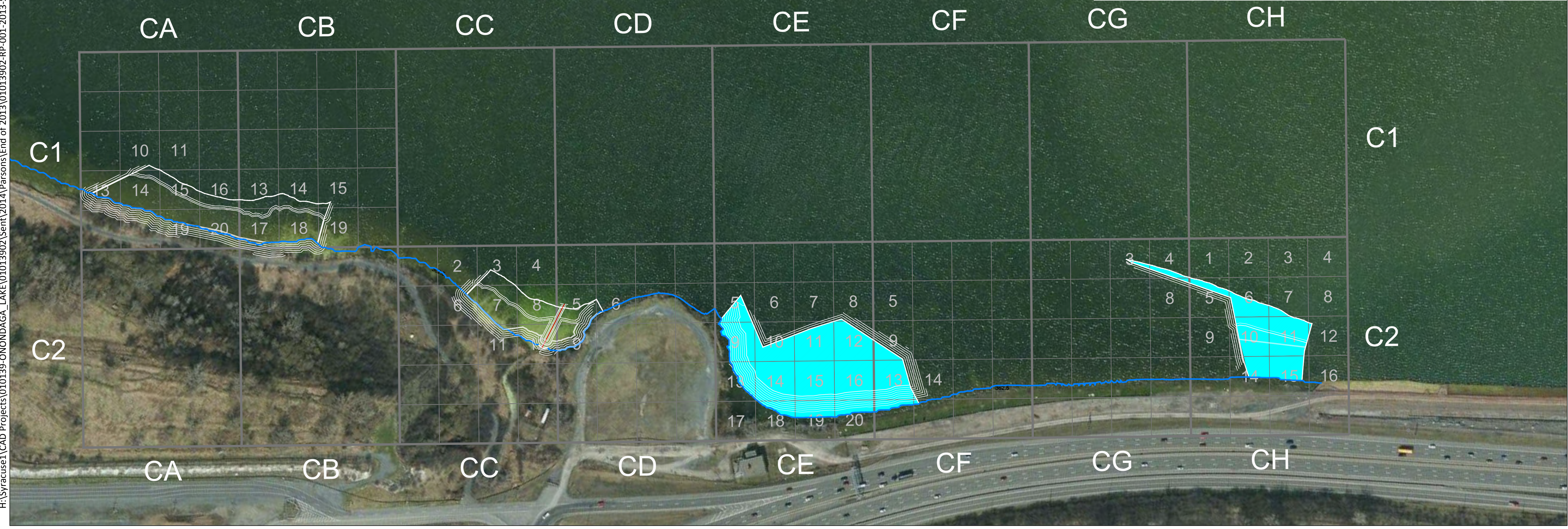
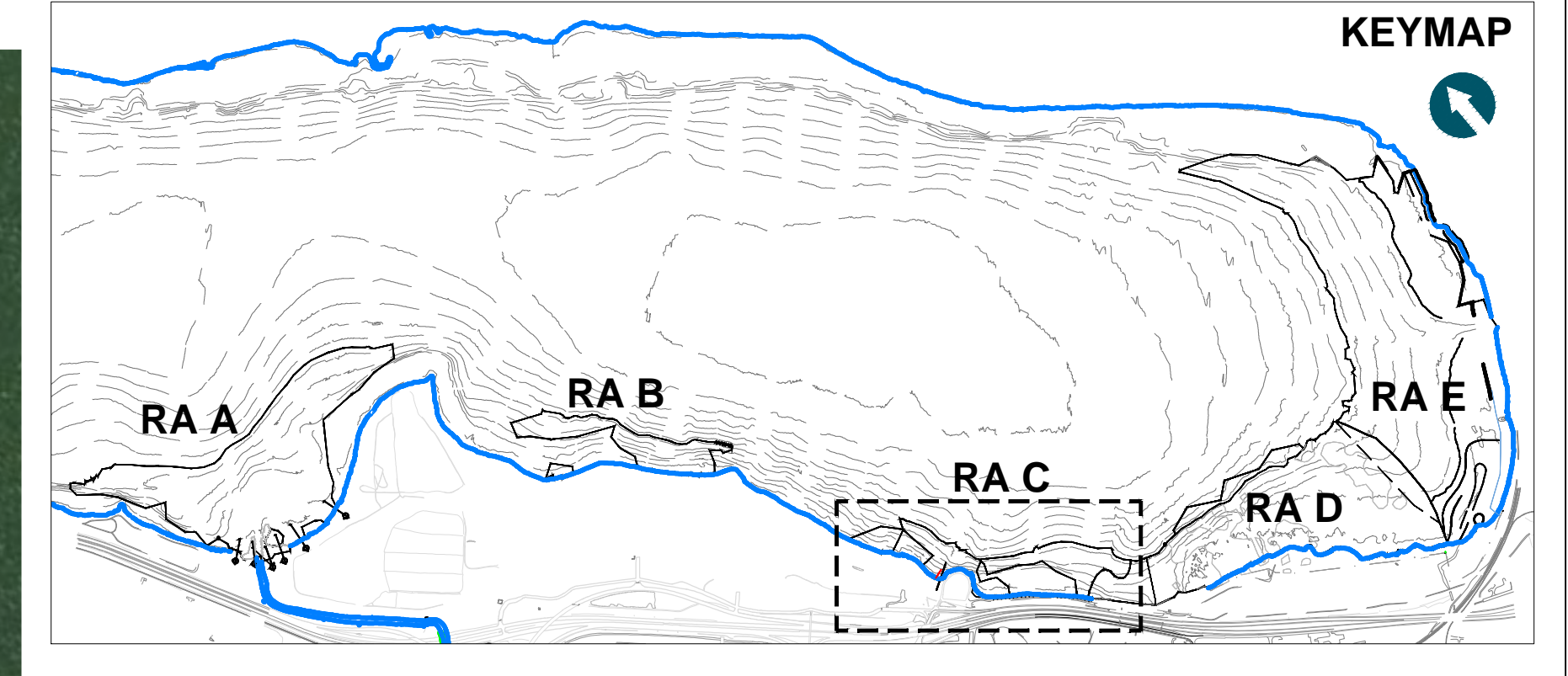
- **Second hydraulic capper** – The land-based support system for a second hydraulic capping operation will be constructed on Wastebeds 1-8 adjacent to Ninemile Creek in

spring 2014. Once dredging has been completed in RA-A, a cap area will be opened for a second hydraulic capping operation.

- **RA-D hydraulic capping** – Once weather permits, the hydraulic capping operation in RA-D will be mobilized and resume capping. Approved layers and QC final pass areas are available from the 2013 season, which will provide enough open acreage for the hydraulic capping operation to operate for the entire 2014 season without relying on the dredge to open additional areas.
- **Mechanical capping operations** – Mechanical capping operations ran successfully under a 24 hour/day schedule for a limited trial basis during 2013. Based on the results of this trial, mechanical capping operations will begin a 24 hour/day work schedule as soon as areas are approved and become available.
- **RA-B shoreline stabilization** – Placement of shoreline stabilization material will begin along the shore of RA-B during winter 2014. This allows the placement of cap material during the winter months, when hydraulic capping is not feasible.

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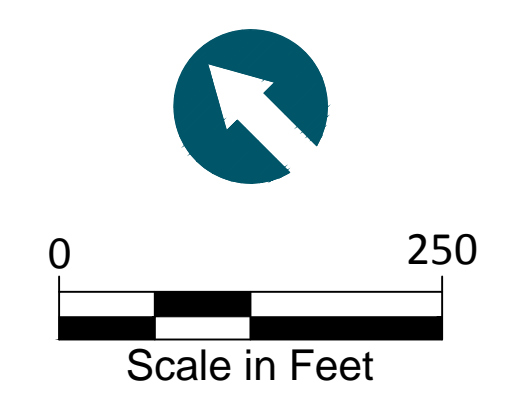
Onondaga Lake Dredging Status "Remediation Area C" (RA-C)



HORIZONTAL DATUM: New York State Plane, Central Zone, NAD83.
VERTICAL DATUM: North American Vertical Datum, NAVD 88 .

LEGEND:

- Shoreline (elev. 362.5)
- Dredge Boundary
- Dredge Complete and Approved
- Dredge in Progress
- DMU Boundary

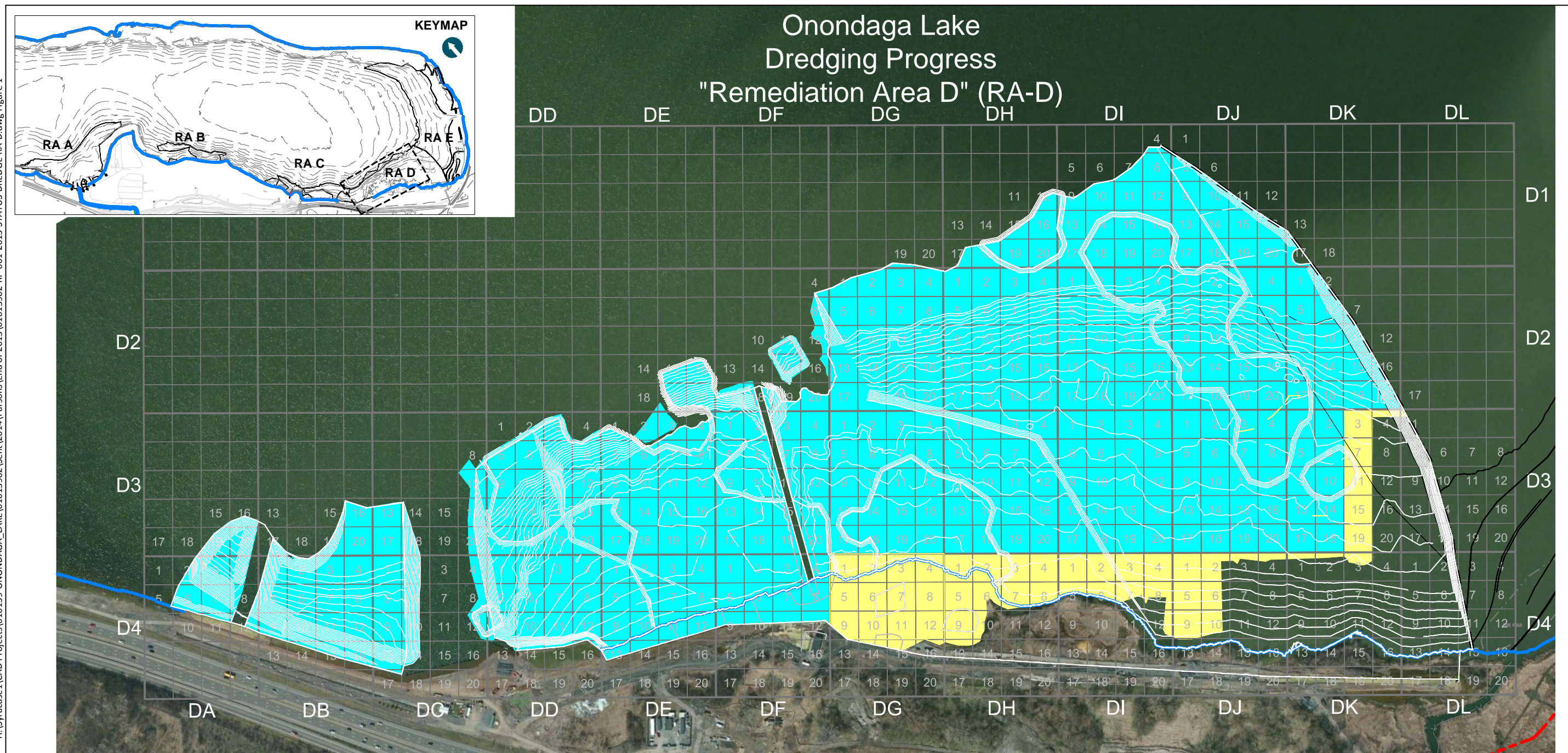


Mar 25, 2014 11:00am cyard



Figure 2-1
RA-C Dredging Progress
December 31, 2013
Onondaga Lake

H:\Syracuse\1\CAD Projects\010139-ONONDAGA_LAKE\01013902\Sent\2014\Parsons\End of 2013\01013902-RP-001-2013-STATUS-DREDGE-RA-D.dwg Figure 1



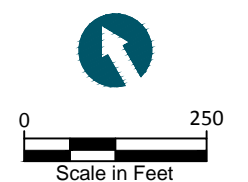
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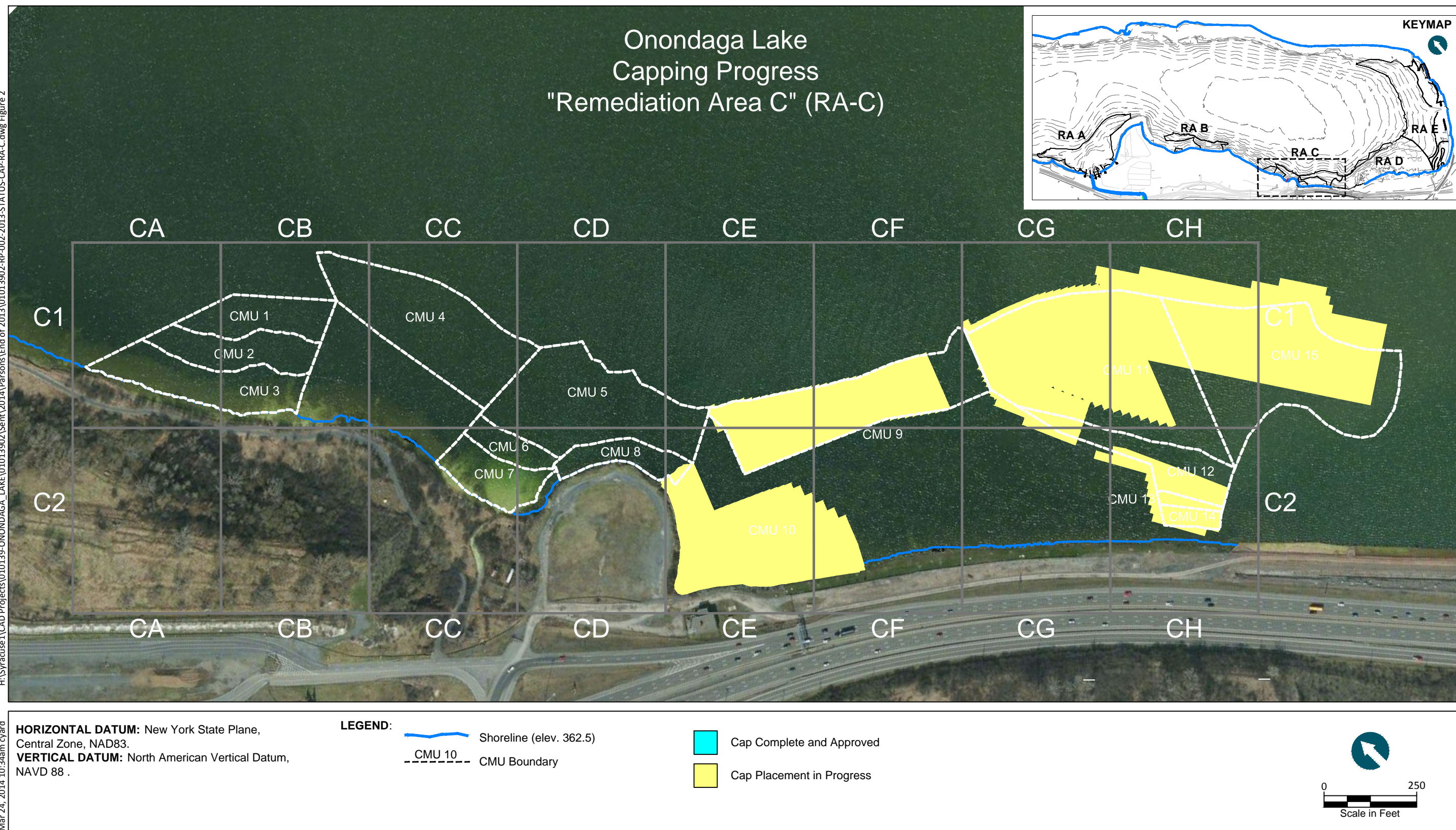
- Shoreline (elev. 362.5)
- Dredge Boundary
- DMU Boundary

- Dredge Complete and Approved
- Dredge in Progress

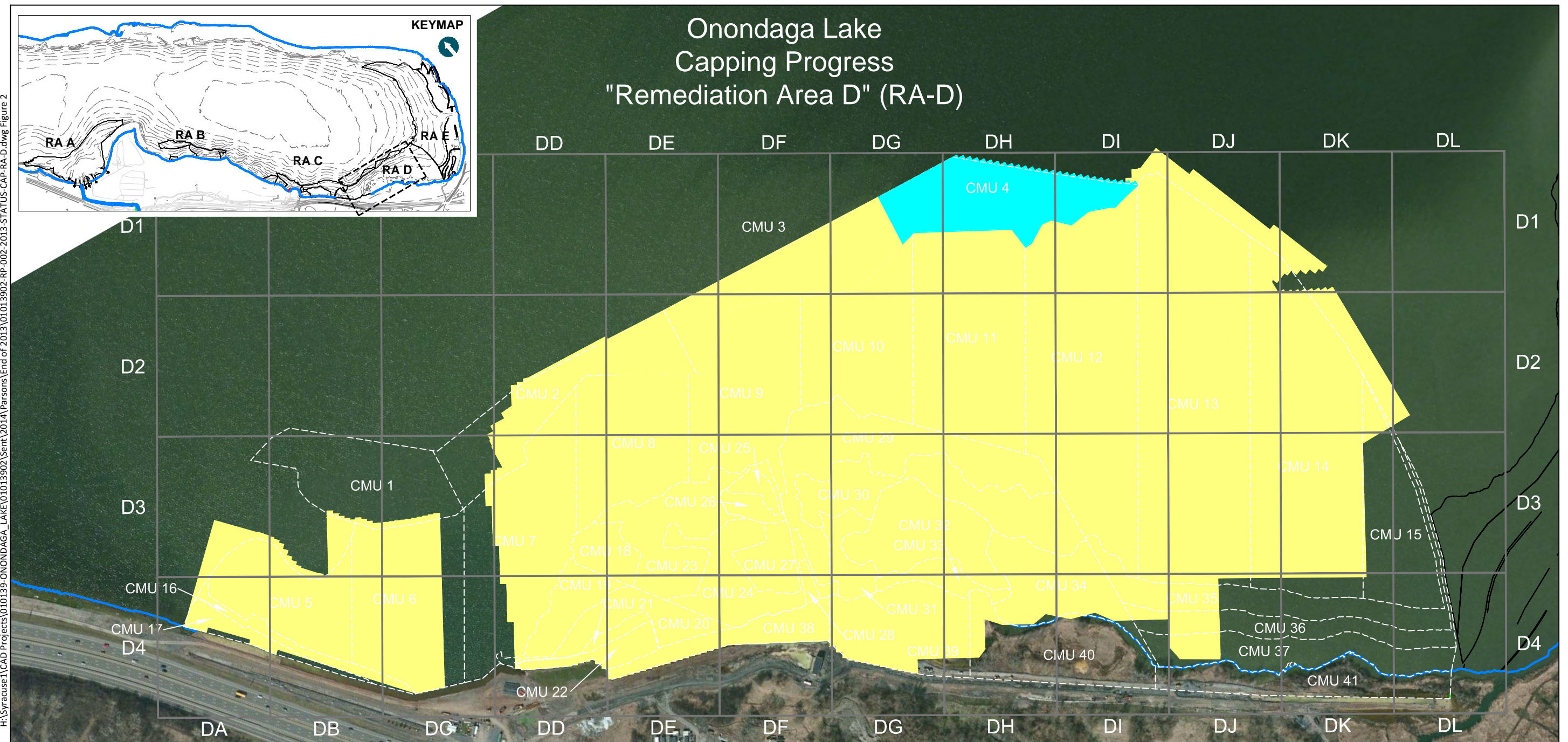


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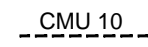
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



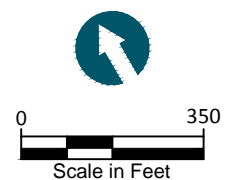
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HORIZONTAL DATUM: New York State Plane,
Central Zone, NAD83.
VERTICAL DATUM: North American Vertical Datum,
NAVD 88 .

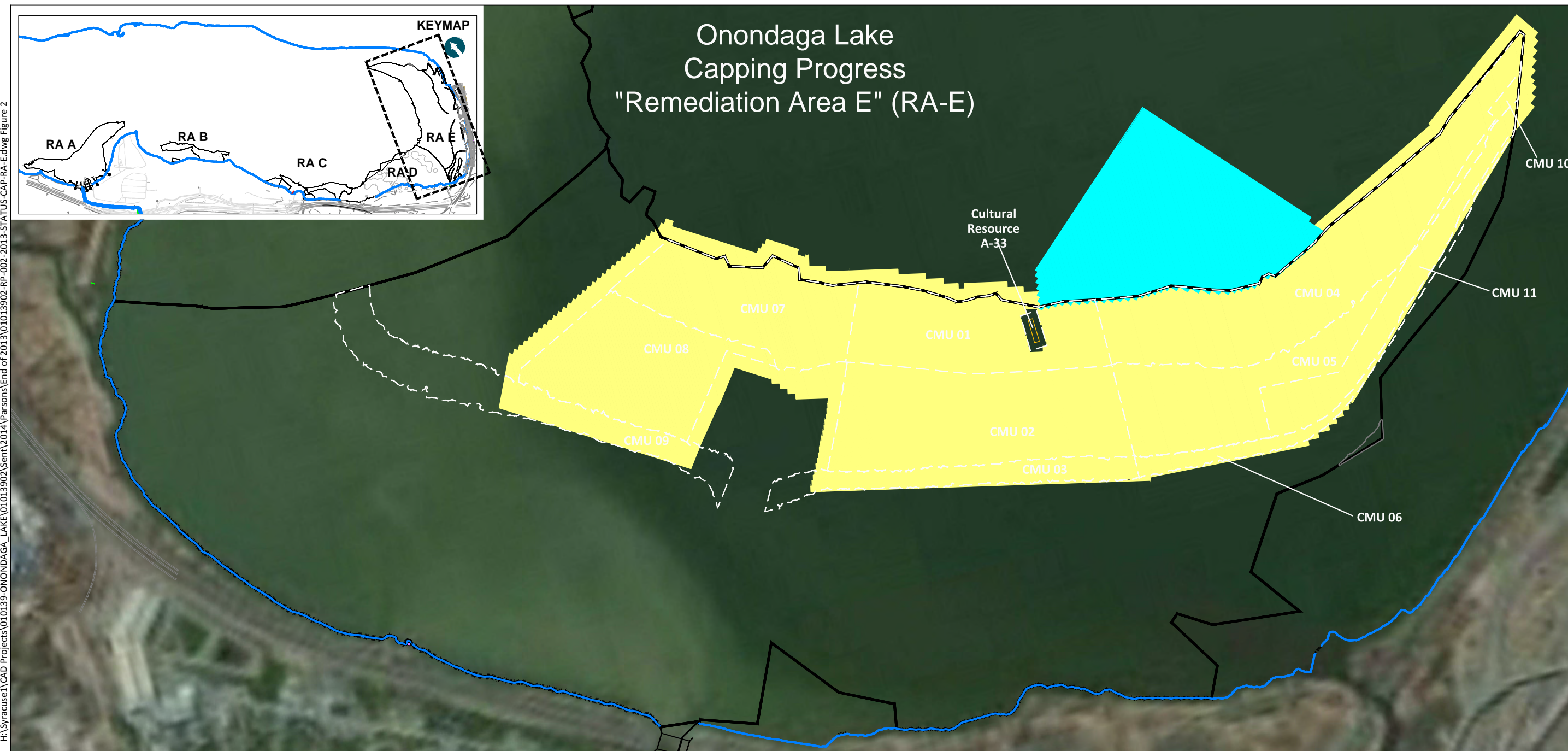
LEGEND:

 Shoreline (elev. 362.5)
 CMU 10
CMU Boundary

 Cap Complete and Approved
 Cap Placement in Progress



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HORIZONTAL DATUM: New York State Plane, Central Zone, NAD83.
VERTICAL DATUM: North American Vertical Datum, NAVD 88 .

LEGEND:

- Shoreline (elev. 362.5)
- RA-E Boundary
- CMU 9
- CMU Boundary

- Cap Complete and Approved
- Cap Placement in Progress

