A USFWS Information for Planning and Conservation (IPaC) Trust Resources Report was created for the Bushaway Road Parcel (Appendix I). This report identified the same protected wildlife resources identified in the formal consultation associated with the proposed project.

While formal wildlife surveys were not conducted for this project, animals observed by AES ecologists during the September 20, 2016, field assessment of the proposed project included a large muskellunge (*Esox masquinongy*, observed under the west dock, by the beach), bluegills (*Lepomis macrochirus*, mostly under/near docks), and unidentified small fish (also near the existing docks). No fish or notable wildlife were observed at the Bushaway Road Parcel.

b. Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.

The proposed project may adversely affect some plant and animal species; however, effects are anticipated to be minor and/or temporary, with the proposed project resulting in a net benefit for native plant communities, fish, and wildlife. Plants, animals, and their habitats may be temporarily affected by placement of riprap and lake bottom sediments in the vicinity of the proposed lake walk, construction of a submerged linear reef in the east portion of the project area, minor grading along the shoreline, and construction of boardwalks. However, the net benefit of placement of riprap and lake bottom sediments along the proposed lake walk will enable establishment of shoreline marsh, and the proposed linear reef will provide protection to this relatively shallow bay and facilitate restoration of an historical shoreline marsh in this area.

Introduction and spread of invasive terrestrial vegetation during project construction and operation will be avoided or minimized by following the MnDNR's "Identification and Description of Practices to Avoid the Introduction or Movement of Invasive Species" guidance document. Lake Minnetonka is already known to have aquatic invasive species (AIS), including Eurasian water milfoil, curly-leaf pondweed, zebra mussels, and flowering rush. However, further introductions and spread of AIS will be avoided or minimized by the construction contractor following best practices. Watercraft and equipment used in project construction will be properly cleaned, drained, and inspected prior to entering the lake and also upon leaving Lake Minnetonka so as not to infest other waterbodies. The MnDNR's best practices for preventing the spread of AIS are provided in Appendix J.

<u>Pugnose shiner</u>
The preferred habitat of pugnose shiner is clear, glacial lakes and streams with an abundance of aquatic vegetation. While most of the near-shore aquatic habitats in the vicinity of the proposed project are altered (e.g., riprap, docks, and maintained sand along the beach), this species may use the proposed project area. It is unlikely that pugnose shiner uses the lagoon along the Bushaway Road Parcel due to its turbidity. Pugnose shiner are vulnerable to:

- The removal of aquatic vegetation from lakes
- Increases in eutrophication from nutrient enrichment

- Increases in water turbidity or siltation that can be caused from pollution, pesticides, and runoff

Section 13.d, below, lists conservation practices that will be followed for this species and other listed species.

Blanding's turtle

Blanding's turtle requires both wetland (pond, marsh, shrub swamp, bog, slow-moving ditch/stream) and upland (open, grassy or brushy, sandy) habitats to complete their life cycle. The proposed project area does not provide preferred wetland habitat for this species, since this portion of Lake Minnetonka contains only littoral open water wetlands, degraded cattail marshes, and constructed stormwater basins. The Bushaway Road Parcel may be more suitable habitat, but the distribution and age of local records of this species suggest its presence is unlikely. Impacts and threats to Blanding's turtle are:

- Loss of wetland habitat through drainage or flooding (converting wetlands into ponds or lakes)
- Loss of upland habitat through development or conversion to agriculture
- Human disturbance, including collection for the pet trade and road kills during seasonal movements
- Increase in predator populations (skunks, raccoons, etc.) which prey on nests and young

Higgins eye

Higgins eye is endangered due to habitat loss and degradation, as well as exotic species. It is unlikely that this species uses the proposed project area or Bushaway Road Parcel given its habitat requirements. Impacts and threats to Higgins eye are:

- Impoundment of rivers and subsequent changes in flow, substrates, and host fish
- Municipal, industrial, and farm runoff that degrade water quality
- Dredging and waterway traffic that produce siltation

Snuffbox mussel

Snuffbox mussel is endangered for reasons similar to Higgins eye. It is unlikely that this species uses the proposed project area or Bushaway Road Parcel given its habitat requirements. Impacts and threats to snuffbox mussel are:

- Dams which alter aquatic habitats and host fish populations as well as prevent migration
- Pollution as this species is easily harmed by toxins and poor water quality
- Sedimentation which can suffocate mussels or reduce feeding and respiration
- Non-native species, especially zebra mussel and round goby

Rusty patched bumble bee

Rusty patched bumble bees' habitat requirements include food (nectar and pollen from flowers), nesting sites (underground and abandoned rodent cavities or clumps of grasses above ground), and overwintering sites for queens (undisturbed soil). It is unlikely that this species uses the

proposed project area or Bushaway Road Parcel given its habitat requirements. Impacts and threats to rusty patched bumble bees are:

- Habitat loss and degradation, e.g. loss of native prairie
- Intensive farming and associated loss of crop diversity, hedgerows, and pastures
- Disease and pesticides
- Global climate change, which can lead to increased disease and loss of habitat elements at the critical time

Northern long-eared bat

Northern long-eared bat has winter (hibernating) and summer (roosting/nesting and foraging) habitat requirements. While possible, it is unlikely that this species uses the proposed project area due to the limited number of trees and their relatively young age (younger trees are less likely to have peeling bark and cavities used by roosting bats). The Bushaway Road Parcel may contain more suitable habitat, but local records of this species suggest its presence is unlikely. Impacts and threats to northern long-eared bat are:

- White-nose syndrome, which is a severe and immediate threat to this and other bat species
- Impacts to hibernacula, such as access changes, microclimate changes, and human disturbances
- Loss or degradation to summer habitat (loss of forests/trees)
- Wind farm operation (turbines can kill bats)

c. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to fish, wildlife, plant communities, and sensitive ecological resources.

Measures are discussed below by the species that will be protected.

Pugnose shiner

Pugnose shiner will be protected during the construction and operation of the proposed project as follows:

- The proposed project will reduce the use of pesticides and fertilizers along the lakeshore.
- The proposed project will improve shoreline vegetation through control of invasive species and extensive seeding/planting of diverse native plants.
- The proposed project will remove invasive aquatic vegetation (primarily Eurasian water milfoil) in select areas (namely the restored shoreline marsh near the Eco Park) and re-introduce native vegetation.
- The proposed project will follow best practices for erosion and sediment control.
- The proposed project will protect spawning fish by avoiding work within the water in March through May.

Blanding's turtle

Blanding's turtle will be protected during the construction of the proposed project by the following MnDNR recommendations:

General

- A flyer with an illustration of a Blanding's turtle shall be given to all contractors working in the area (Appendix K).
- Turtles which are in imminent danger shall be moved, by hand, out of harm's way. Turtles which are not in imminent danger shall be left undisturbed.
- If a Blanding's turtle nest is in the proposed project, the nest shall not be disturbed.
- Silt fencing shall be set up to keep turtles out of construction areas. Silt fencing shall be removed after the area has been revegetated.

Wetlands

- The proposed project's three small Type 3 wetlands (Invasive Cattail Marshes, Figure 9) shall not be dredged, deepened, filled, or converted to storm water retention basins as this wetland type can provide important habitat during spring and summer.
- Wetlands (including littoral/lakeshore wetlands) shall be protected from pollution; use of fertilizers and pesticides shall be avoided, and run-off from lawns and streets shall be controlled. Erosion shall be prevented to keep sediment from reaching wetlands and Lake Minnetonka.

Utilities

- Utility access and maintenance roads shall be kept to a minimum to reduce road-kill potential.
- Because trenches can trap turtles, trenches shall be checked for turtles prior to being backfilled, and the areas will be returned to original grade where possible.

Landscaping and Vegetative Management

- Terrain shall be left with as much natural contour as possible.
- Graded areas shall be revegetated with native grasses and forbs where it complies with the project goals (some non-natives form dense patches through which it is difficult for turtles to travel).
- Vegetation management in infrequently mowed areas - such as in ditches, along utility access roads, and under power lines - shall be done mechanically when feasible (chemicals should be avoided). When feasible, vegetation management shall occur fall through spring (after October 1st and before June 1st).
- Erosion control mesh shall be made of wildlife-friendly materials so as not to endanger turtles or other wildlife susceptible to entanglement (see MnDNR recommendations in Appendix K).

Higgins eye and snuffbox mussel

Higgins eye and snuffbox mussel will be protected during the construction of the proposed project by following best practices:

- Erosion and sediment control best practices will be followed to protect water quality.
- Water quality will also be protected by minimizing the use of lawn chemicals and proper handling and disposal of oil, paint, batteries, or other toxic products.
- Lake dredging, filling or other substrate disturbance will be conducted only after proper installation of floating silt curtains and/or other techniques to minimize siltation.

Rusty patched bumble bee

Rusty patched bumble bees will be protected during the construction of the proposed project by following best practices:

- Installation of diverse native flowering plants and removal/control of invasive vegetation.
- Preservation of native landscapes areas, where lack of mowing and soil disturbance will provide potential habitat.
- Avoidance of use of pesticides and chemical fertilizers.

Northern long-eared bat

Northern long-eared bat will be protected during the construction of the proposed project by following best practices:

- Few, if any, trees (which bats could use for roosting) will be removed as part of the proposed project.
- Known roost trees and trees within 150 feet of a known roost will not be cut when young bats are with mothers at the roost. This "non-volant pup" phase is June 1 through July 31.

14. Historic properties:

Describe any historic structures, archeological sites, and/or traditional cultural properties on or in close proximity to the site. Include: 1) historic designations, 2) known artifact areas, and 3) architectural features. Attach letter received from the State Historic Preservation Office (SHPO). Discuss any anticipated effects to historic properties during project construction and operation. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to historic properties.

A letter was sent to the State Historic Preservation Office (SHPO) for consultation with that office. A response was received on December 8, 2016 (Appendix L). The SHPO office indicated the presence of both recorded archaeological sites and a historic/architectural property within the project area. Due to the location of these sites, the SHPO recommended that a Phase I archaeological survey be completed unless the project area or more detailed plans indicate that the project areas have been previously surveyed or disturbed.

In addition, the letter noted that the Section Foreman House has been determined to be eligible for listing in the National Register of Historic Places (NRHP). Based on information at the SHPO office, a draft Historic Structures Report was completed in 2015. The SHPO noted that for work that will be done on this area of the proposed project, consideration should be given to appropriate preservation or rehabilitation treatment in accordance with the Secretary of the Interior's *Standards for the Treatment of Historic Places*.

A Phase I Archaeological Survey for the proposed project was completed in November 2017 (the Phase I Survey). The Phase I Survey included conducting a literature review and historical research at the Office of the State Archaeologist (OSA) and the Minnesota Historic Preservation Office; online research to locate historical map and aerial photographs; an on-site visual assessment; and a Phase I archaeological field survey to identify any archaeological sites within the proposed project.

The Phase I Survey did not result in the identification of any archaeological sites. Several locations within the proposed project were paved but could contain archaeological deposits given their proximity to previously identified precontact burial mounds. For these areas, the City of Wayzata will engage in consultation with the OSA to determine what additional steps may be necessary prior to ground disturbance.

Shovel testing was not conducted in some high-potential locations with the project area due to the proximity of the railroad. The City will have an archaeological monitor present during any project-related ground disturbance within those areas.

15. **Visual:**
Describe any scenic views or vistas on or near the project site. Describe any project related visual effects such as vapor plumes or glare from intense lights. Discuss the potential visual effects from the project. Identify any measures to avoid, minimize, or mitigate visual effects.

The views of Lake Minnetonka from the City of Wayzata are considered to be scenic and are important to the owners and users of property in the City. The proposed project's goals include naturalizing and restoring the Lake Minnetonka shoreline, which will have the added benefit of improving the look of the shoreline. Lights from the Lake Walk will be visible from the City and the Lake. Lighting will use the "dark sky" concept where feasible to reduce light impacts. Lighting will meet applicable requirements of the City of Wayzata ordinances.

16. **Air:**
    a. **Stationary source emissions - Describe the type, sources, quantities and compositions of any emissions from stationary sources such as boilers or exhaust stacks. Include any hazardous air pollutants, criteria pollutants, and any greenhouse gases. Discuss effects to air quality including any sensitive receptors, human health or applicable regulatory criteria. Include a discussion of any methods used assess the project's effect on air quality and the results of that assessment. Identify pollution control equipment and other measures that will be taken to avoid, minimize, or mitigate adverse effects from stationary source emissions.**

       The proposed project is not anticipated to generate additional stationary source emissions. The existing Section Foreman House is currently heated with natural gas and is not anticipated to change once the project is complete.

    b. **Vehicle emissions - Describe the effect of the project's traffic generation on air emissions. Discuss the project's vehicle-related emissions effect on air quality. Identify measures (e.g.**

traffic operational improvements, diesel idling minimization plan) that will be taken to minimize or mitigate vehicle-related emissions.

The proposed project will create a small amount of fugitive emissions from construction equipment during the construction phase. However, these temporary emissions are expected to be small and intermittent and are not expected to be a significant threat to air quality in the project area.

Over the long term, the proposed project is not anticipated to generate significant additional air pollutant emissions. The project area is not in any non-attainment area for any air quality standards.

c. Dust and odors - Describe sources, characteristics, duration, quantities, and intensity of dust and odors generated during project construction and operation. (Fugitive dust may be discussed under item 16a). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize or mitigate the effects of dust and odors.

During construction, the proposed project will generate temporary dust and odors. Construction equipment will have gasoline and diesel engine emissions and will create temporary fugitive dust emissions, especially in the areas where fill or lake bottom will be excavated, transported, and placed. The fugitive dust emissions will be controlled by watering, sprinkling, and/or calcium products as necessary and appropriate. Dust mitigation measures will include preparing and implementing a dust control plan.

Temporary odors may be generated from operation of facility equipment engines and excavation of lake bottom sediments. Odor mitigation measures will include minimizing equipment used on-site, minimize idling, keep engines in good repair, and minimize idling truck traffic through scheduling.

Once construction is complete, the proposed project is not anticipated to produce any ongoing odors or dust.

17. Noise:

Describe sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. Discuss the effect of noise in the vicinity of the project including 1) existing noise levels/sources in the area, 2) nearby sensitive receptors, 3) conformance to state noise standards, and 4) quality of life. Identify measures that will be taken to minimize or mitigate the effects of noise.

1) Existing noise in the area is from traffic along Lake Street and other streets in the area, railcar traffic from the Burlington Northern railroad that crosses the proposed project, and from boating traffic on Lake Minnetonka. Boat traffic is driven in part by an existing boat dock in the central portion of the proposed project, docks on the west end near the Boatworks, and in the two Boatworks marina lagoons on the west end of the project.

2) Residences and senior living complexes are present just to the north-northeast of the proposed project area. No other known sensitive receptors are located nearby.
3) The proposed project is expected to generate noise during the construction phase. This noise will be temporary in nature. Daily hours of construction will follow regulatory and construction permit regulated times. Noise will primarily be produced by the construction machinery on-site and potentially placement of piling during construction. All machinery is equipped with back-up alarms for safety purposes, which would likely be the producers of the loudest noise on the construction site (97-112 decibels), outside of the potential pile driving. Ongoing operations will conform to state and local noise standards.
4) Excessive noise is not expected once the construction phase is complete. Noise generated once the project is complete will be primarily noise from automobiles, railcars, and recreational boats in the area. Noise would be expected seasonally from use of the beach area.

18. Transportation:

a. Describe traffic-related aspects of project construction and operation. Include: 1) existing and proposed additional parking spaces, 2) estimated total average daily traffic generated, 3) estimated maximum peak hour traffic generated and time of occurrence, 4) indicate source of trip generation rates used in the estimates, and 5) availability of transit and/or other alternative transportation modes.

The proposed project includes removing the existing municipal parking lot along Lake Street and revisions to parking along Lake Street to accommodate the parking that will be eliminated. The proposed project does not include other additions or modifications of parking areas. The proposed project is not anticipated to generate additional daily traffic, other than what is already present in this heavily used area. Public transportation is available to the north and east of the proposed project, but does not currently serve the proposed project area. No revisions to public transit are planned for the proposed project or are anticipated to be necessary once the proposed project has been completed.

b. Discuss the effect on traffic congestion on affected roads and describe any traffic improvements necessary. The analysis must discuss the project's impact on the regional transportation system. ***If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW.*** **Use the format and procedures described in the Minnesota Department of Transportation's Access Management Manual, Chapter 5** ***(available at: http://www.dot.state.mn.us/accessmanagement/resources.html)*** **or a similar local guidance.**

The proposed project is not expected to negatively impact traffic congestion in the area. Traffic flow is expected to improve after the changes to Lake Street have been completed. The proposed project is not expected to have an impact on the regional transportation system.

c. Identify measures that will be taken to minimize or mitigate project related transportation effects.

No mitigation measures are proposed.

19. Cumulative potential effects: (Preparers can leave this item blank if cumulative potential effects are addressed under the applicable EAW Items)

a. Describe the geographic scales and timeframes of the project related environmental effects that could combine with other environmental effects resulting in cumulative potential effects.

The proposed project will occur within the limits of work (LOW) shown on Figures 5 and 6. Environmental effects are anticipated to be localized to within the LOW or in nearby adjacent areas. The timeframe of the proposed project is spring 2018 to fall 2018.

b. Describe any reasonably foreseeable future projects (for which a basis of expectation has been laid) that may interact with environmental effects of the proposed project within the geographic scales and timeframes identified above.

The City is aware of three other development projects that are located in close proximity to the project area. They are: the Wayzata Blu, which is 18 residential condos and 3,000 square feet of commercial space; 253 Lake St E, which is a 16-residential unit condo project; and 235 Lake St E, which is a 40,000 square foot office project. The City is not aware of other future projects that may interact with the environmental effects of the proposed project.

c. Discuss the nature of the cumulative potential effects and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to these cumulative effects.

Because cumulative potential effects have not been identified in association with the proposed project, cumulative effects are not believed to increase the potential for significant environmental effects as a result of the proposed project.

20. Other potential environmental effects: If the project may cause any additional environmental effects not addressed by items 1 to 19, describe the effects here, discuss the how the environment will be affected, and identify measures that will be taken to minimize and mitigate these effects.

No additional impacts from this project other than those discussed above are anticipated.

RGU CERTIFICATION. *(The Environmental Quality Board will only accept **SIGNED** Environmental Assessment Worksheets for public notice in the EQB Monitor.)*

I hereby certify that:

- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minnesota Rules, parts 4410.0200, subparts 9c and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Signature Date 2/23/2018

Title Director of Planning and Building

Figures

BRAUN
INTERTEC
11001 Hampshire Avenue S
Minneapolis, MN 55438
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FAX (952) 995-2020

COUNTY LOCATION MAP

WAYZATA LAKE EFFECT
WAYZATA, MINNESOTA

APPROXIMATE LIMITS OF WORK

BUSHAWAY RD PARCEL

FRA ADDED

Burlington Northern Railroad

Soo Line Railroad

Mn S Railroad

Bn Railroad

Chi Milw St Paul and Pac RR

Chicago and Northwestern RR

Chicago Milw St Pk Pacific RR

C and NW Railway

C NW Railroad

Np Railroad

Cmsp and P Railroad

M St Railroad

LEGEND

APPROXIMATE LIMITS OF WORK

HENNEPIN COUNTY BOUNDARY

DATA SOURCE:
USGS QUADRANGLE,
EXCELSIOR, MN
PUBLISHED IN 1967, REVISED 1993

TOWNSHIP: 118N
RANGE: 023W
SECTION: 06

0 2 4 Miles

N

Project No:	B1607634
Drawing No.	B1607634_Fig1
Scale:	1 in = 4 miles
Drawn By:	CMF
Date Drawn:	01/20/2017
Checked By:	JBW
Last Modified:	2/9/17
Sheet:	1 of 1
Fig.	1

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SITE LOCATION MAP
WAYZATA LAKE EFFECT
WAYZATA, MINNESOTA

BUSHAWAY RD PARCEL

APPROXIMATE LIMITS OF WORK

LEGEND

APPROXIMATE LIMITS OF WORK

DATA SOURCE:
USGS QUADRANGLE,
EXCELSIOR, MN
PUBLISHED IN 1967, REVISED 1993

TOWNSHIP: 118N
RANGE: 023W
SECTION: 06

0 1,000 2,000 Feet

N

Project No:	B1607634
Drawing No.	B1607634_Fig2
Scale:	1 in = 2,000 ft
Drawn By:	CMF
Date Drawn:	01/20/2016
Checked By:	JBW
Last Modified:	1/24/18
Sheet:	1 of 1
Fig.	2

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Edgewood Ct

LAKE ST E

BIKE TRAIL

DEPOT

Grove Ln E

BOATWORKS

BEACH

BOATWORKS MARINA

SECTION FOREMAN HOUSE

LAKE MINNETONKA
WAYZATA BAY

LEGEND

APPROXIMATE LIMITS OF WORK

0 125 250 Feet

N

Google

Imagery ©2018 , DigitalGlobe, U.S. Geological Survey

EXISTING CONDITIONS

WAYZATA LAKE EFFECT
WAYZATA, MINNESOTA

Project No:	B1607634
Drawing No.	B1607634_Fig3
Scale:	1 in = 250 ft
Drawn By:	CMF
Date Drawn:	01/20/2017
Checked By:	JBW
Last Modified:	1/24/18
Sheet:	1 of 1
Fig.	3

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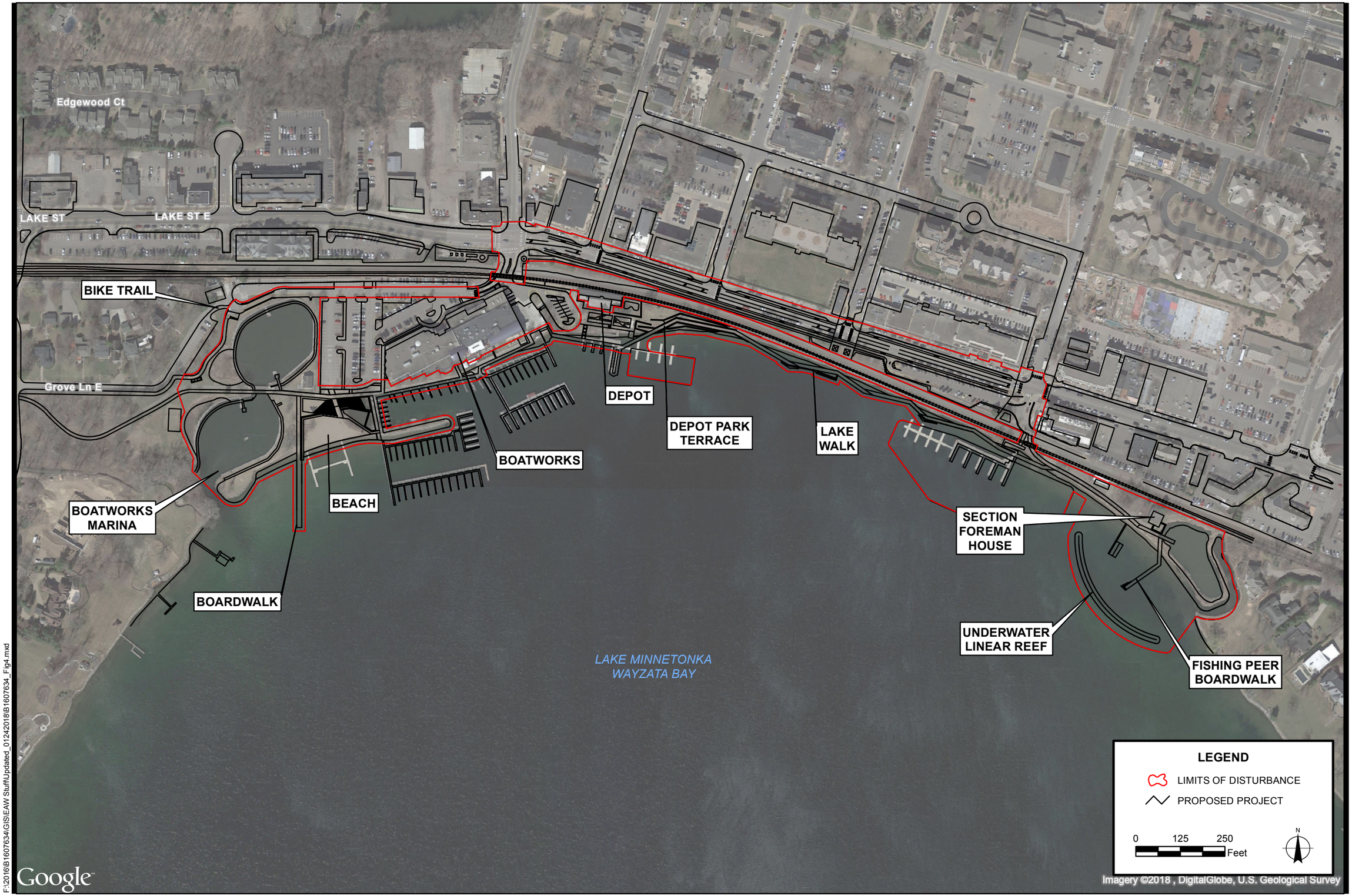
PROPOSED PROJECT POST-CONSTRUCTION

WAYZATA LAKE EFFECT
WAYZATA, MINNESOTA



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Drawn By:	CMF
Date Drawn:	01/20/2017
Checked By:	JBW
Last Modified:	1/24/18
Sheet:	1 of 1
Fig.	4

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Minneapolis, MN 55438
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EXISTING CONDITIONS- BUSHAWAY ROAD PARCEL

WAYZATA LAKE EFFECT
WAYZATA, MINNESOTA

Project No:	B1607634
Drawing No.	B1607634_Fig5
Scale:	1 in = 200 ft
Drawn By:	CMF
Date Drawn:	01/20/2017
Checked By:	JBW
Last Modified:	2/9/17
Sheet:	1 of 1
Fig.	5

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POST-CONSTRUCTION CONDITIONS - BUSHAWAY ROAD PARCEL

WAYZATA LAKE EFFECT
WAYZATA, MINNESOTA

Project No:	B1607634
Drawing No.	B1607634_Fig6
Scale:	1 in = 50 ft
Drawn By:	CMF
Date Drawn:	01/25/2017
Checked By:	JBW
Last Modified:	2/9/17
Sheet:	1 of 1
Fig.	6

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Wayzata Lake Effect EAW

Park Project Area - 1937 Aerial Photograph

Limits of Work

Data Sources:
- Civitas site plan
- 1937 aerial photograph

AES Project Number: 16-0549
Date: 4/11/17
File Name: Wayzata EAW_1937 aerial_2017-04-11

APPLIED ECOLOGICAL SERVICES

Applied Ecological Services, Inc.
21938 Mushtown Road
Prior Lake, MN 55372
952-447-1919
www.appliedeco.com

N

0 150 300 600 Feet

BRAUN INTERTEC
11001 Hampshire Avenue S
Minneapolis, MN 55438
PH. (952) 995-2000
FAX (952) 995-2020

PROPOSED PROJECT - 1937 AERIAL PHOTOGRAPH
WAYZATA LAKE EFFECT
WAYZATA, MINNESOTA

Project No:	B1607634
Drawing No.	B1607634_Fig7
Drawn By:	CMF
Date Drawn:	01/20/2017
Checked By:	JBW
Last Modified:	1/24/18
Sheet:	1 of 1
Fig.	7

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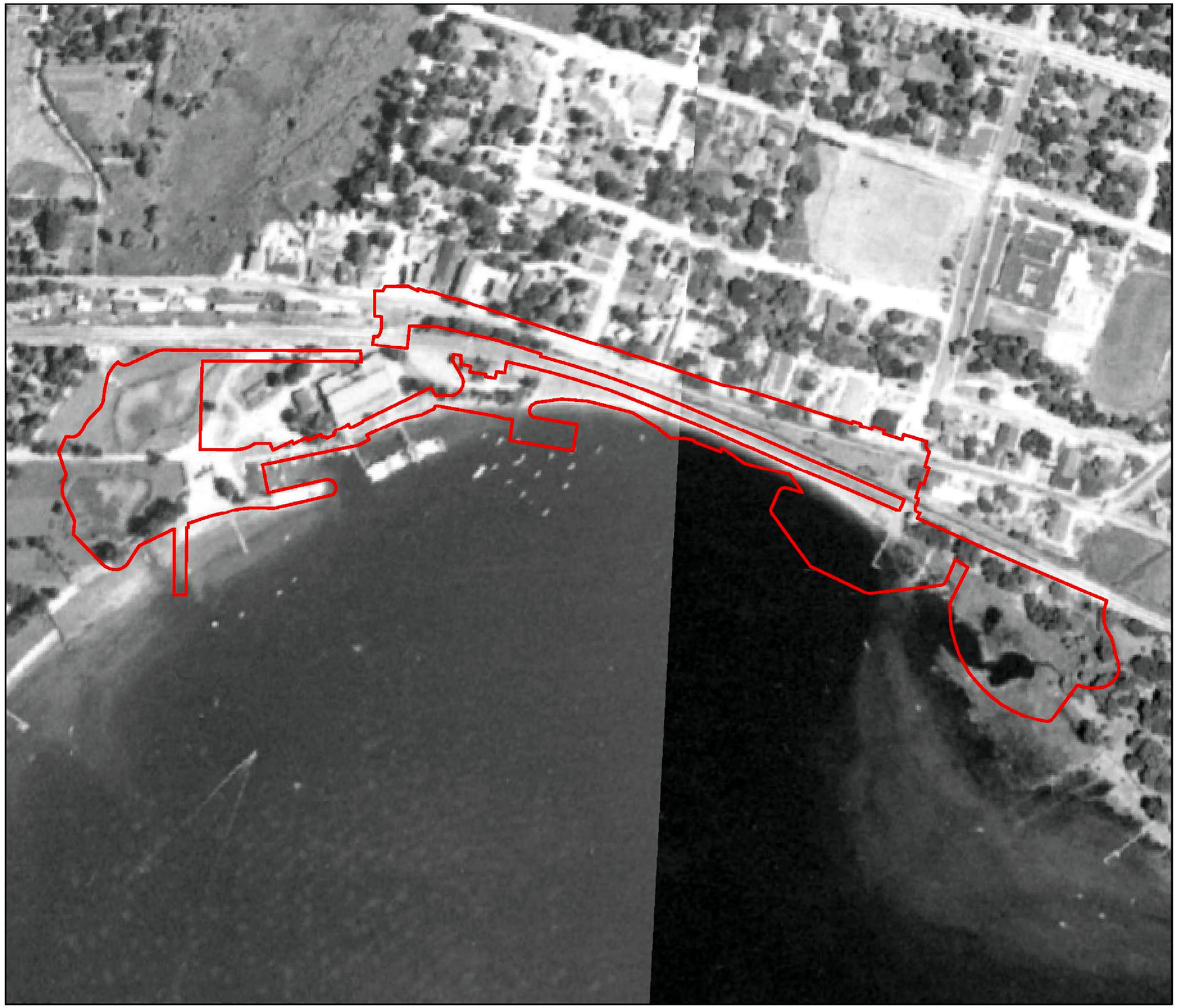

Wayzata Lake Effect EAW

Park Project Area - 1940 Aerial Photograph

Limits of Work

Data Sources:
- Civitas site plan
- 1940 aerial photograph

AES Project Number: 16-0549
Date: 4/11/17
File Name: Wayzata EAW_1940 aerial_2017-04-11

APPLIED ECOLOGICAL SERVICES

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PROPOSED PROJECT - 1940 AERIAL PHOTOGRAPH
WAYZATA LAKE EFFECT
WAYZATA, MINNESOTA

Project No:	B1607634
Drawing No.	B1607634_Fig8
Drawn By:	CMF
Date Drawn:	01/20/2017
Checked By:	JBW
Last Modified:	1/24/18
Sheet:	1 of 1
Fig.	8

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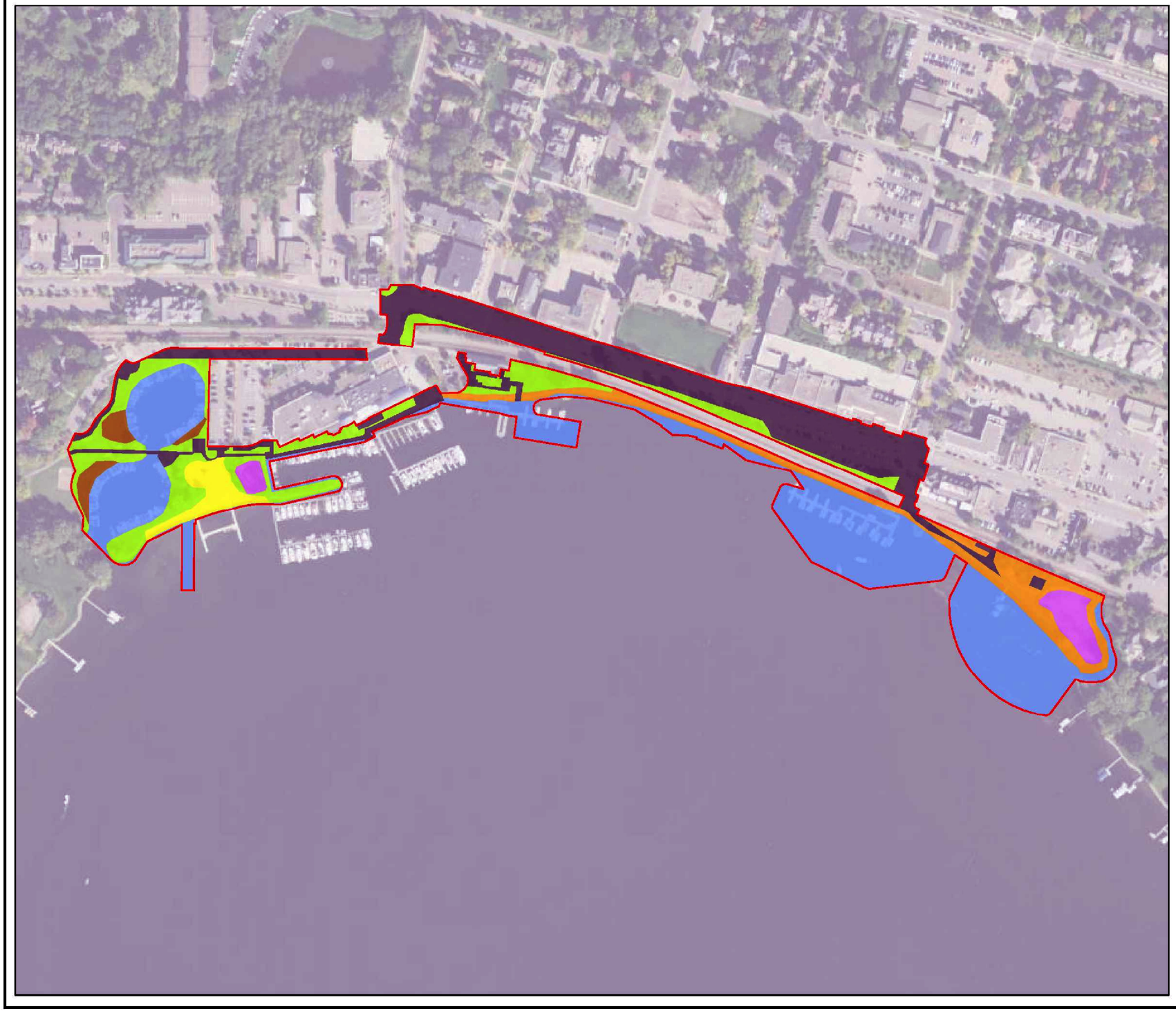

Wayzata Lake Effect EAW

Park Project Area - Existing Land Cover

Limits of Work

Existing Land Cover

- Littoral (Lakeshore) Wetland
- Invasive Cattail Marsh
- Brush/Grassland
- Lawn/Landscaping
- Impervious Surface
- Stormwater Pond
- Sand Beach

Data Sources:
- Civitas site plan
- LMIC WMS server (2015 aerial)

AES Project Number: 16-0549
Date: 4/11/17
File Name: Wayzata EAW_exist lc_2017-04-11

APPLIED ECOLOGICAL SERVICES

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N

0 150 300 600 Feet

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PROPOSED PROJECT AREA - EXISITING LAND COVER
WAYZATA LAKE EFFECT
WAYZATA, MINNESOTA

Project No:	B1607634
Drawing No.	B1607634_Fig9
Drawn By:	CMF
Date Drawn:	01/20/2017
Checked By:	JBW
Last Modified:	1/24/18
Sheet:	1 of 1
Fig.	9

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Wayzata Lake Effect EAW

Park Project Area - Proposed Land Cover

Limits of Work

Proposed Land Cover

- Littoral (Lakeshore) Wetland
- Shoreline Marsh
- Invasive Cattail Marsh
- Brush/Grassland
- Lawn/Landscaping
- Impervious Surface
- Stormwater Pond
- Sand Beach

Data Sources:
- Civitas site plan
- LMIC WMS server (2015 aerial)

AES Project Number: 16-0549
Date: 4/11/17
File Name: Wayzata EAW_prop lc_2017-04-11

APPLIED ECOLOGICAL SERVICES

Applied Ecological Services, Inc.
21938 Mushtown Road
Prior Lake, MN 55372
952-447-1919
www.appliedeco.com

N

0 150 300 600 Feet

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FAX (952) 995-2020

PROPOSED PROJECT AREA - PROPOSED LAND COVER
WAYZATA LAKE EFFECT
WAYZATA, MINNESOTA

Project No:	B1607634
Drawing No.	B1607634_Fig10
Drawn By:	CMF
Date Drawn:	01/20/2017
Checked By:	JBW
Last Modified:	1/24/18
Sheet:	1 of 1
Fig.	10

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Wayzata Lake Effect EAW

Bushaway Road Parcel - Existing Land Cover

Limits of Work

Existing Land Cover

- Wooded/Forest
- Brush/Grassland
- Lawn/Landscaping
- Impervious Surface
- Stormwater Pond

Data Sources:
- LMIC WMS server (2012 aerial)

AES Project Number: 16-0549
Date: 1/4/17
File Name: Wayzata EAW_bush_exist lc_2017-01-04

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Prior Lake, MN 55372
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0 25 50 100 Feet

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BUSHAWAY ROAD PARCEL EXISTING LAND COVER
WAYZATA LAKE EFFECT
WAYZATA, MINNESOTA

Project No:	B1607634
Drawing No.	B1607634_Fig11
Drawn By:	CMF
Date Drawn:	01/20/2017
Checked By:	JBW
Last Modified:	2/9/17
Sheet:	1 of 1
Fig.	11

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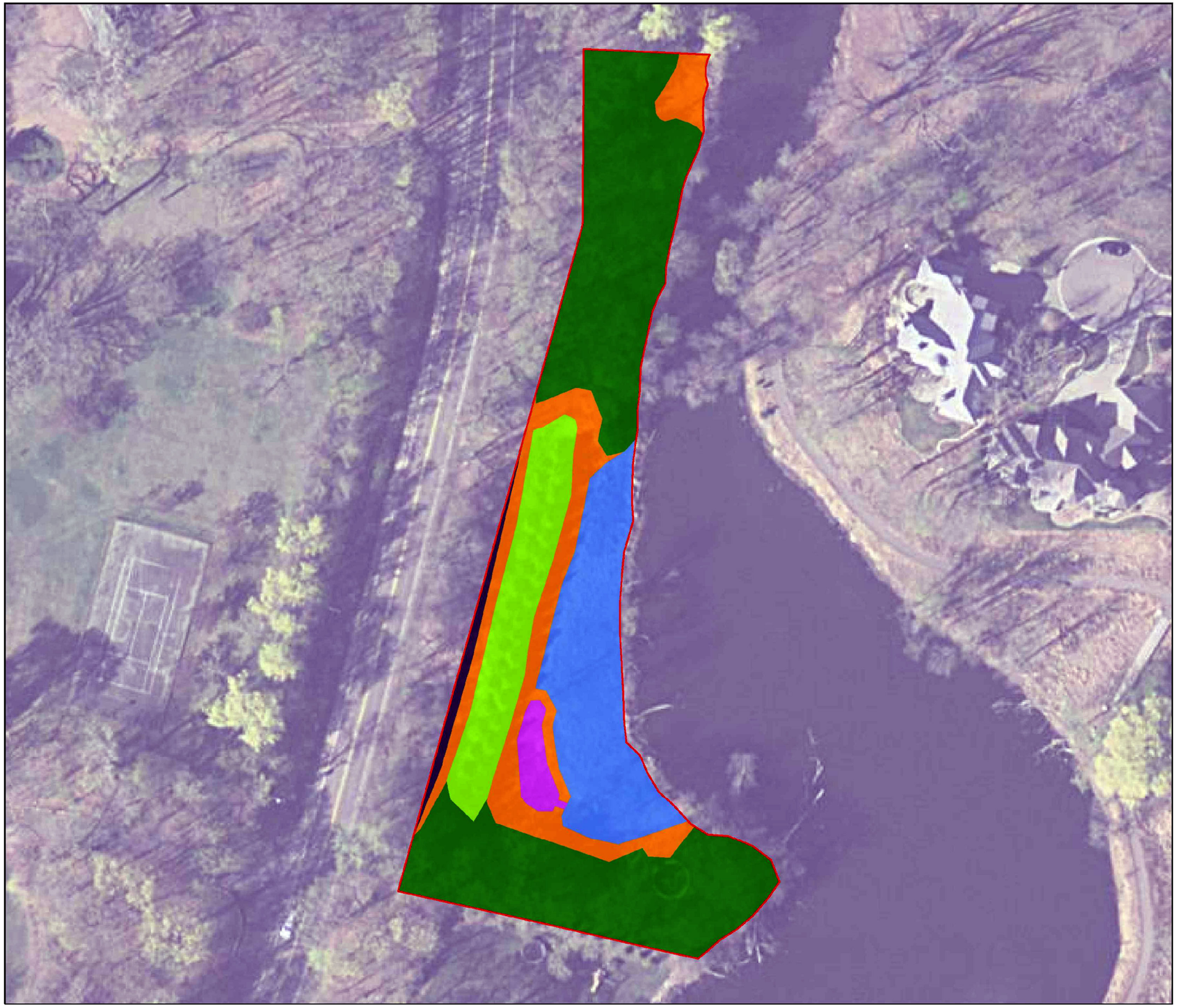

Wayzata Lake Effect EAW

Bushaway Road Parcel - Proposed Land Cover

Limits of Work

Proposed Land Cover

- Wooded/Forest
- Littoral (Lakeshore) Wetland
- Brush/Grassland
- Lawn/Landscaping
- Impervious Surface
- Stormwater Pond

Data Sources:
- LMIC WMS server (2012 aerial)

AES Project Number: 16-0549
Date: 1/4/17
File Name: Wayzata EAW_bush_prop lc_2017-01-04

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Prior Lake, MN 55372
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BUSHAWAY ROAD PARCEL PROPOSED LAND COVER
WAYZATA LAKE EFFECT
WAYZATA, MINNESOTA

Project No:	B1607634
Drawing No.	B1607634_Fig12
Drawn By:	CMF
Date Drawn:	01/20/2017
Checked By:	JBW
Last Modified:	2/9/17
Sheet:	1 of 1
Fig.	12

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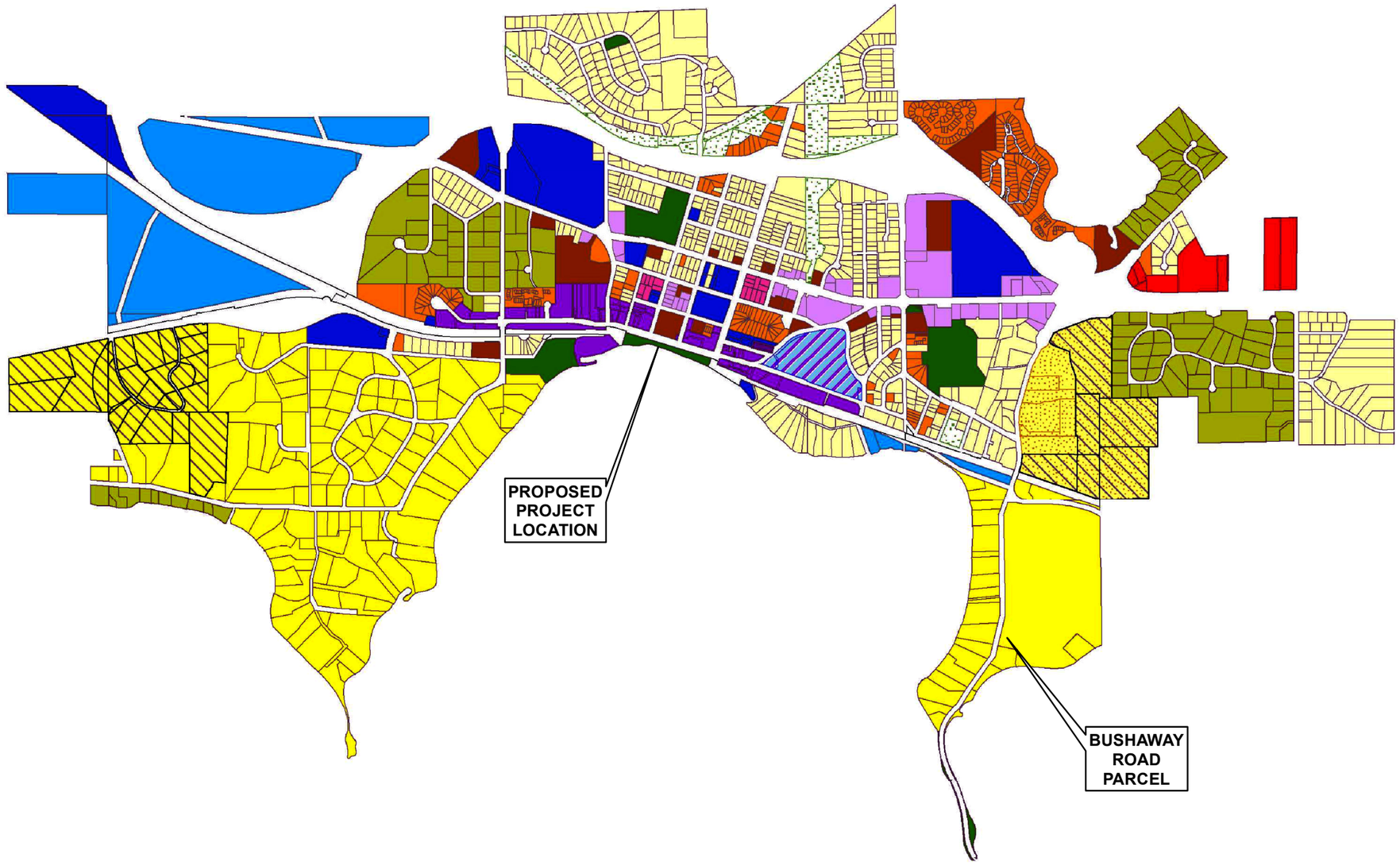

Proposed Land Use Map

Map 3.2

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2030 COMPREHENSIVE PLAN, REDEVELOPMENT SITES MAP 3.5
WAYZATA LAKE EFFECT
WAYZATA, MINNESOTA

Project No:	B1607634
Drawing No.	B1607634_Fig13
Drawn By:	CMF
Date Drawn:	01/20/2017
Checked By:	JBW
Last Modified:	2/9/17
Sheet:	1 of 1
Fig.	13

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Orono

Plymouth

Minnetonka

PROPOSED PROJECT LOCATION

Legend

- C-1 Office and Limited Commercial District
- C-1A Neighborhood Office & Limited Commercial District
- C-1B Mixed Use Residential
- C-2 Shopping Center Business District
- C-3 Service District
- C-4 Central Business District
- C-4A Limited Central Business District
- C-4B Central Business District
- INS Institutional
- PUD Planned Unit Development
- R-1 Low Density Single Family Residential District
- R-1A Low Density Single Family Estate District
- R-2 Medium Density Single Family Residential District
- R-2A Single Family Residential District
- R-3 Single and Two Family Residential District
- R-3A Single and Two Family Residential District
- R-4 Medium Density Multiple Residential District
- R-5 Average Density Multiple Residential District

Browns Bay

Minnetonka

Grays Bay

BUSHAWAY ROAD PARCEL

Source: City of Wayzata

Last Amended: 04/28/2015

N
W E
S

Wayzata Zoning Map

Map 9.1

ZONING MAP
WAYZATA LAKE EFFECT
WAYZATA, MINNESOTA

Project No:	B1607634
Drawing No.	B1607634_Fig14
Drawn By:	CMF
Date Drawn:	01/20/2017
Checked By:	JBW
Last Modified:	2/9/17
Sheet:	1 of 1
Fig.	34

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Osp
Opc
Osp
Osp
Opc
Osp
Opc
Osp

LEGEND

- LIMITS OF DISTURBANCE
- PROPOSED PROJECT
- OSP - ST PETER SANDSTONE
- OPC - PRAIRIE DU CHIEN GROUP

0 250 500 Feet

N

BEDROCK GEOLOGY

WAYZATA LAKE EFFECT
WAYZATA, MINNESOTA

Project No:	B1607634
Drawing No.	B1607634_Fig15
Scale:	
Drawn By:	CMF
Date Drawn:	01/24/2017
Checked By:	JBW
Last Modified:	1/24/18
Sheet:	1 of 1
Fig.	15

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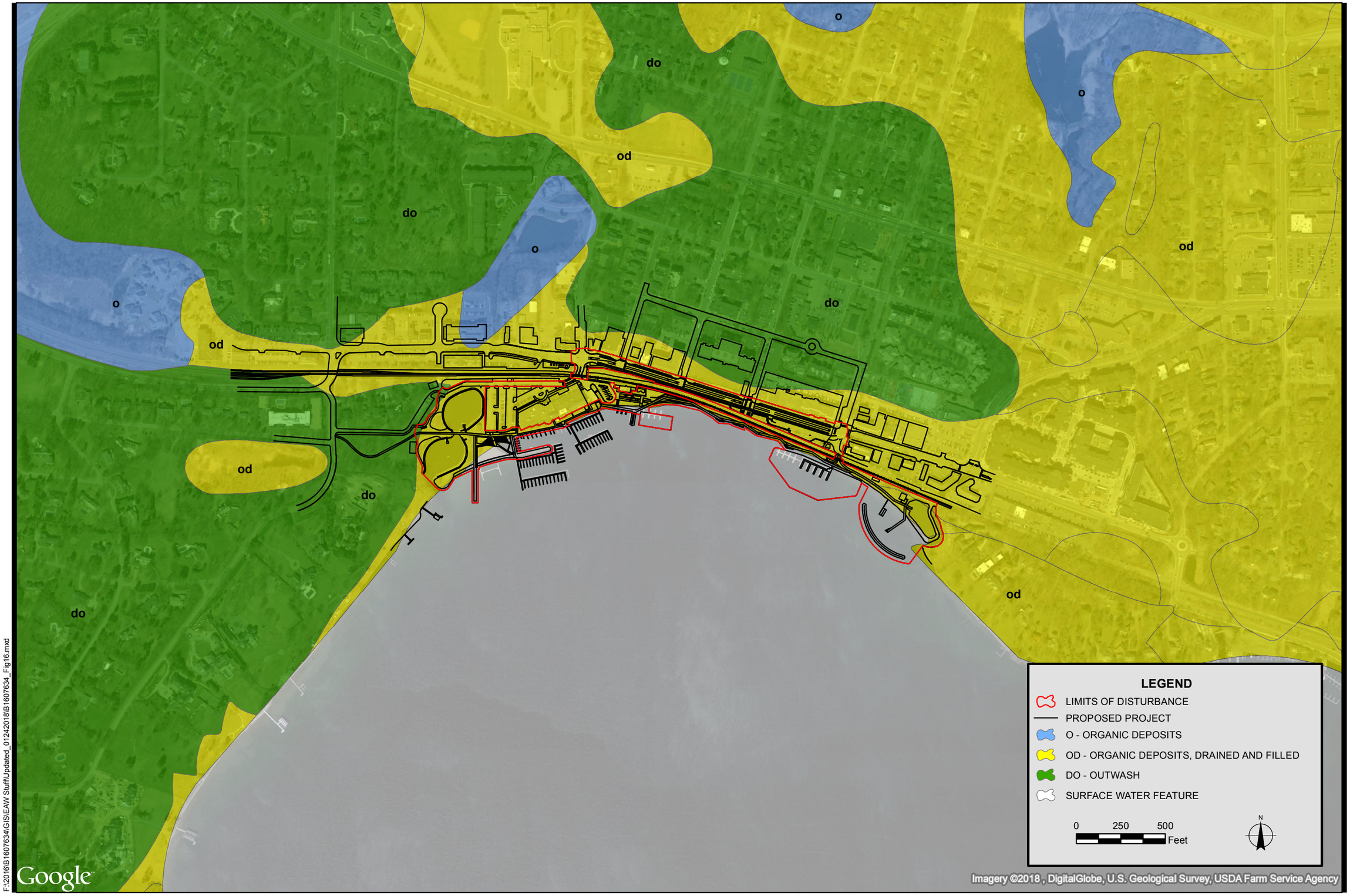

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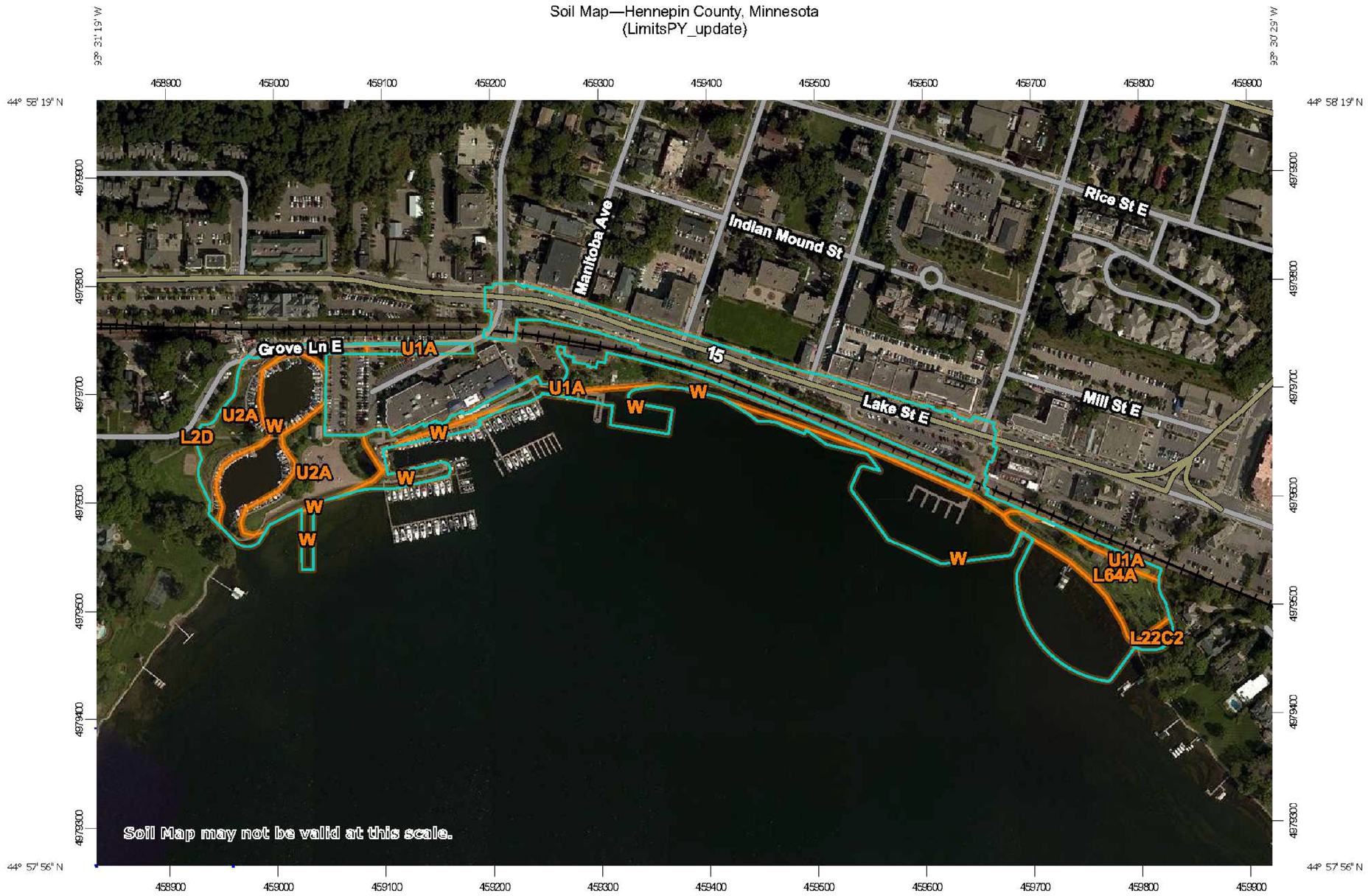
SURFICIAL GEOLOGY

WAYZATA LAKE EFFECT
WAYZATA, MINNESOTA

Project No:	B1607634
Drawing No.	B1607634_Fig16
Scale:	1 in = 500 ft
Drawn By:	CMF
Date Drawn:	01/24/2017
Checked By:	JBW
Last Modified:	1/24/18
Sheet:	1 of 1
Fig.	16

Soil Map—Hennepin County, Minnesota
(LimitsPY_update)



Map Scale: 1:4,970 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

USDA **Natural Resources Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

1/24/2018
Page 1 of 3

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SOIL SURVEY - PROPOSED PROJECT
WAYZATA LAKE EFFECT
WAYZATA, MINNESOTA

Project No:	B1607634
Drawing No.	B1607634_Fig17
Drawn By:	CMF
Date Drawn:	01/20/2017
Checked By:	JBW
Last Modified:	1/24/18
Sheet:	1 of 1
Fig.	17

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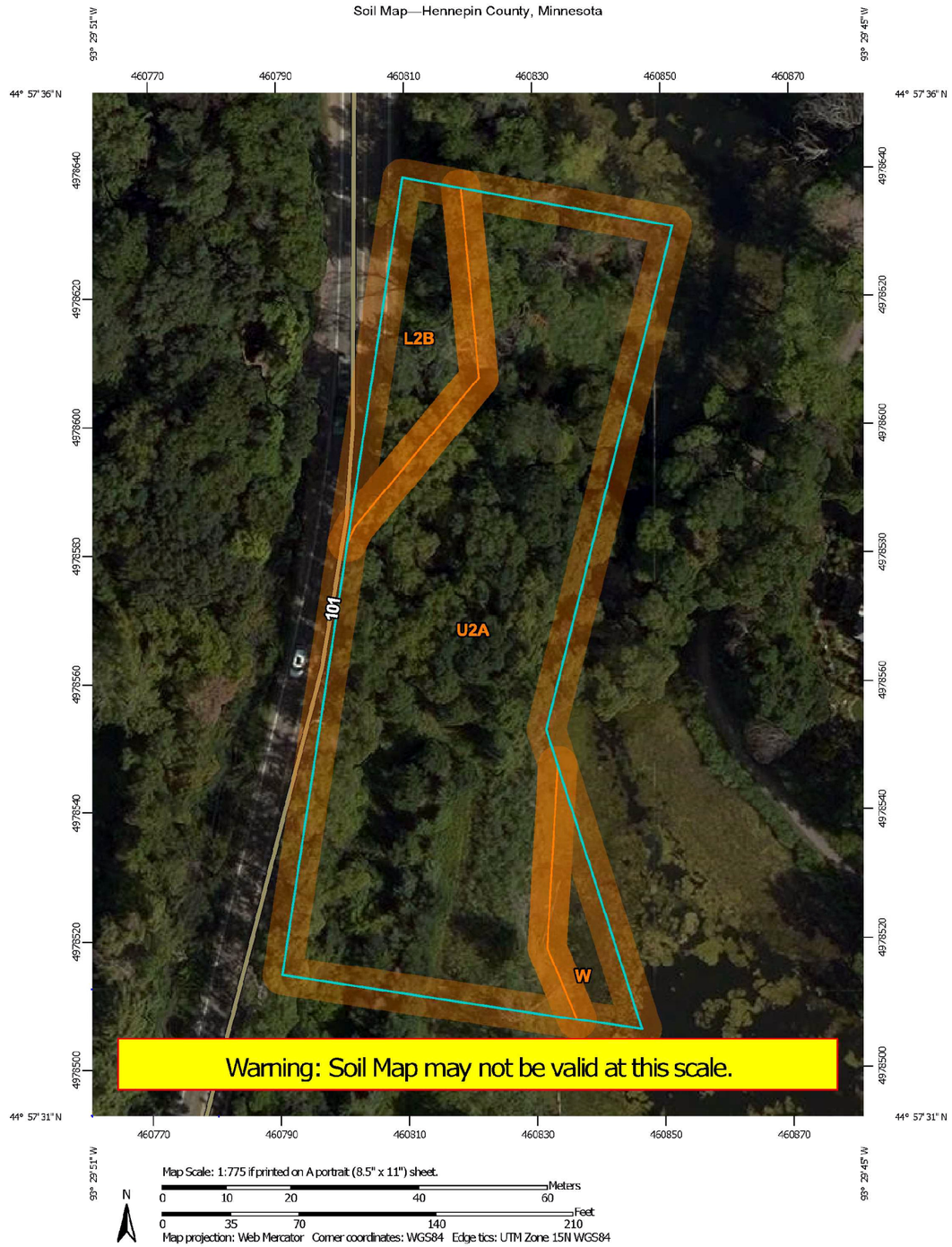
SOIL SURVEY - BUSHAWAY ROAD PARCEL

WAYZATA LAKE EFFECT
WAYZATA, MINNESOTA



Project No:	B1607634
Drawing No.	B1607634_Fig18
Drawn By:	CMF
Date Drawn:	01/20/2017
Checked By:	JBW
Last Modified:	2/9/17
Sheet:	1 of 1
Fig.	18

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Appendix A

Restored Lake Edge Construction Options

Figures:

A-1: Option A1 Lake Edge: Continuous Riprap Plan
A-2: Option A2 Lake Edge: Intermittent Riprap Plan
A-3: Options A1 & A2 Lake Edge: Riprap Section
A-4: Option A3 Lake Edge: Continuous Sheet Pile Plan
A-5: Option A4 Lake Edge: Intermittent Sheet Pile Plan
A-6: Option A3 & A4 Lake Edge: Sheet Pile Section
A-7: Option A5 Lake edge: Continuous Toe-Wood Plan
A-8: Option A6 Lake Edge: Intermittent Toe-Wood Plan
A-9: Options A5 & A6 Lake Edge: Toe-Wood Section

Appendix A: Restored Lake Edge Construction Options

Option A1 Lake Edge – continuous riprap plan. Under this plan, riprap would be placed continuously along the shoreline to create a linear ridge 2' below the OHWL (Figures A-1 and A-3). Lake bottom sediment (fill) would be placed on the land side of the riprap, creating an aquatic shelf for establishment of aquatic and emergent shoreline marsh vegetation. Please note, for illustration purposes only, the diagram presented as Figure A-3 shows a single support for the Lake Walk. However, as will be discussed below, several options are being considered for the Lake Walk support. The riprap and fill would be placed along 1,637 lf of the lake shore, at a width of approximately 14.31'.

Option A2 Lake Edge – intermittent riprap plan. Similar to Option A1, however under this plan, the riprap would be placed in four discrete areas along the lake edge, rather than continuously as discussed in Option A1 (Figures A-2 and A-3). This would create smaller areas of discrete shoreline marsh.

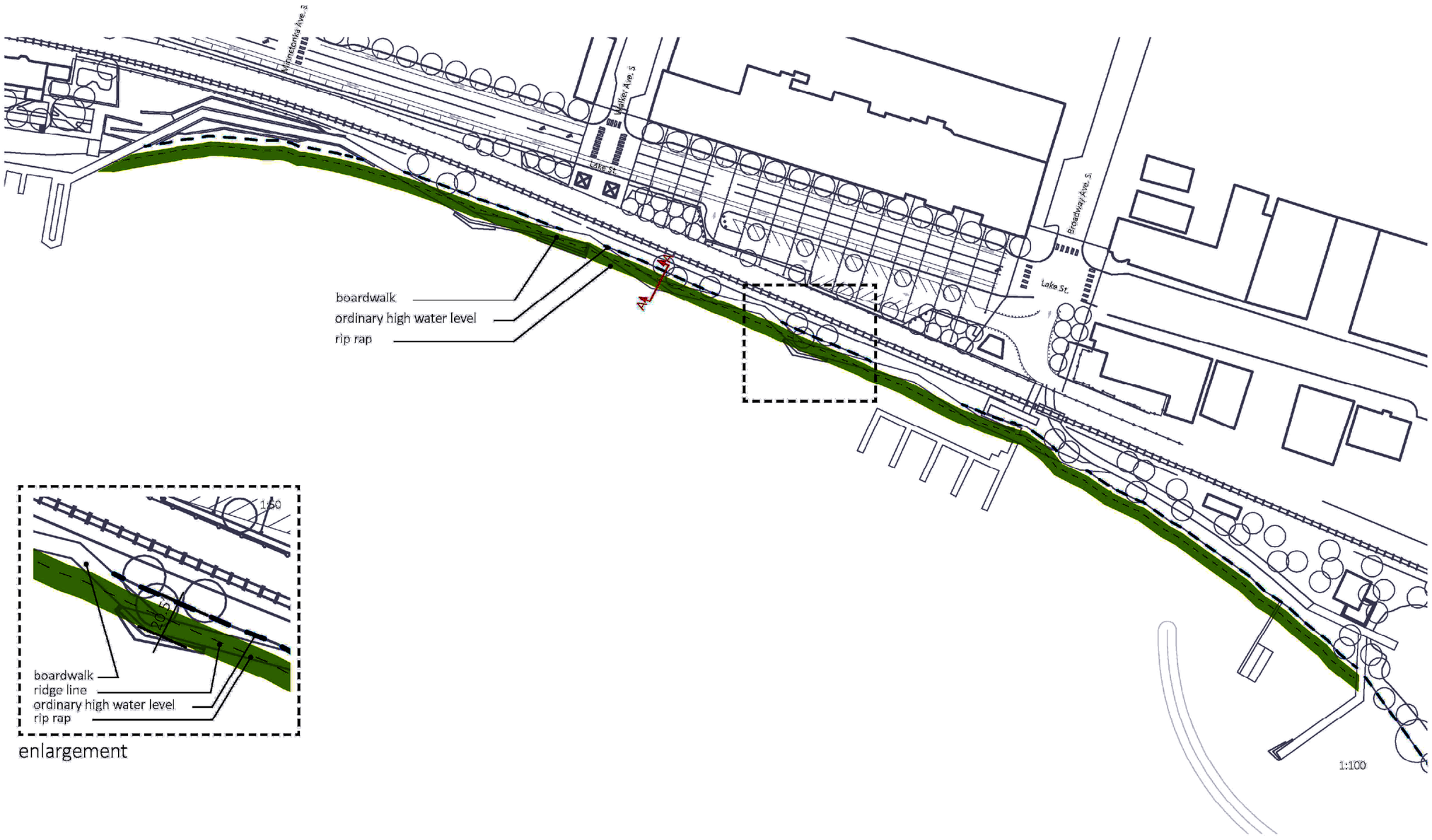
Option A3 Lake Edge – continuous sheet pile plan. Under this plan, 1, 637 lf of sheet pile would be placed along the lake shore approximately 11' from the shoreline (Figure A-4). The top of the sheet pile would be at a depth of 2' below the OHWL. Fill would be placed on the land side of the sheet pile for a width of approximately 5' (Figure A-6), creating an aquatic shelf for establishment of aquatic and emergent shoreline marsh vegetation.

Option A4 Lake Edge – intermittent sheet pile. Under this plan, 585 lf of sheet pile would be placed in four areas along the lake shore, just inside the land edge of the Lake Walk (Figure A-5). The top of the sheet pile would be at a depth of 2' below the OHWL. Fill would be placed on the land side of the sheet pile (Figure A-6). This would result in discrete areas of shoreline marsh.

Option A5 Lake Edge – continuous toe-wood plan. Under this plan, 1,637 lf of toe-wood would be placed along the lake shore approximately 11' from the shoreline (Figure A-7). The toe-wood create a ridge approximately 2' in height and fill would be placed on the landward side of the toe-wood (Figure A-9). The fill would create an aquatic shelf for establishment of aquatic and emergent shoreline marsh vegetation.

Option A6 Lake Edge – intermittent toe-wood plan. Under this plan, the toe-wood would be placed at four discrete locations (Figure A-8). The placement of the toe-wood and fill would be similar to Option A4 (Figure A-9), and would result in discrete areas of shoreline marsh.

Option A7 Lake Edge – floating islands. Under this plan, a synthetic mesh or other similar floating substrate would be installed along the lake edge. Living wetland plants are installed on the mesh, creating a floating structure that rises and falls with fluctuating water levels. Floating islands would not disturb lake bottom or displace lake volume, but would need to be removed each fall and reinstalled each spring due to the destructive forces of ice on Lake Minnetonka.



enlargement

WAYZATA LAKE EFFECT

Lake Edge Diagrams : Continuous Riprap Plan Diagram

CIVITAS

1

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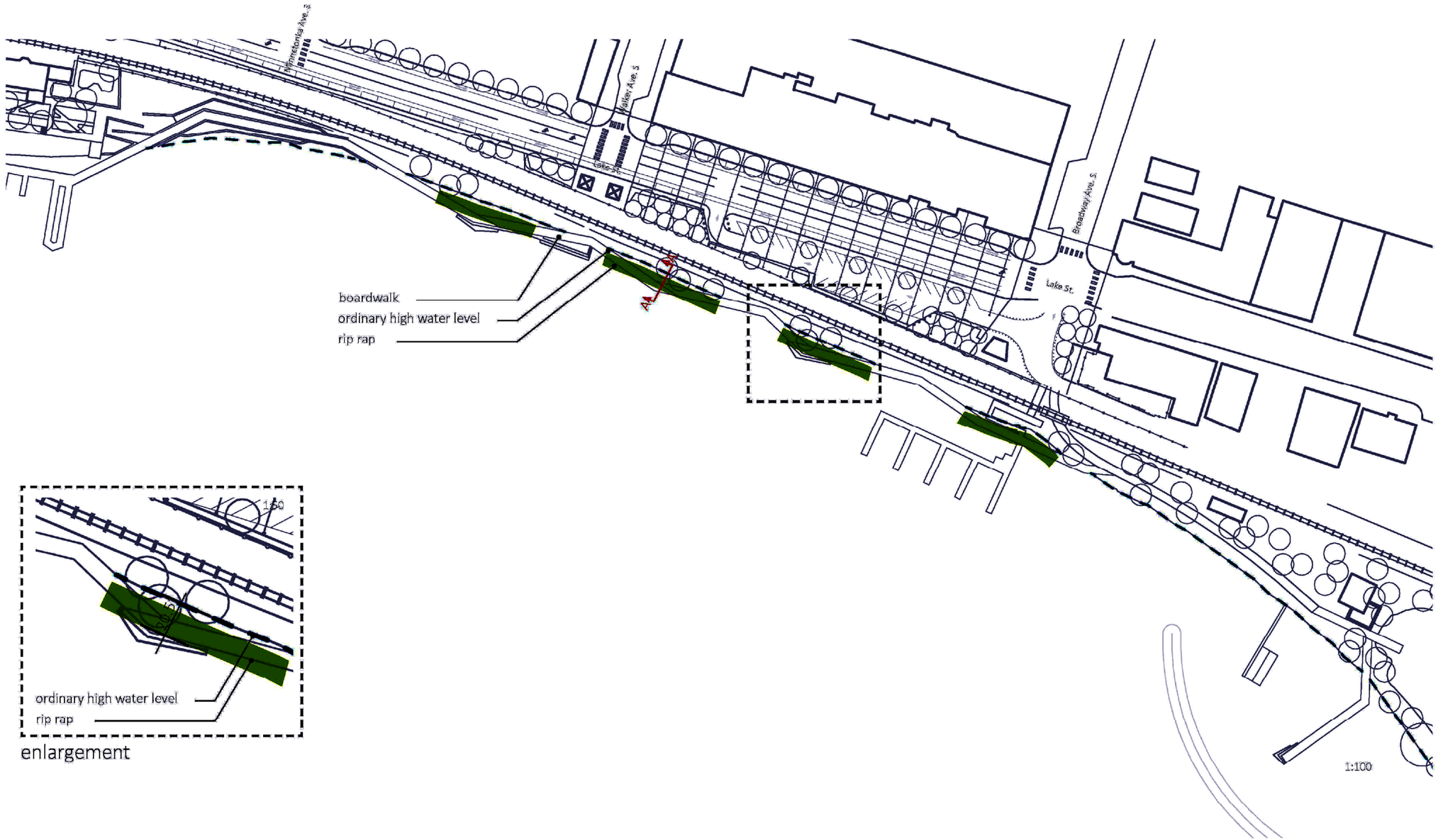
OPTION A1 LAKE EDGE: CONTINUOUS RIPRAP PLAN
WAYZATA LAKE EFFECT
WAYZATA, MINNESOTA

Project No:	B1607634
Drawing No.	B1607634_FigA1
Drawn By:	CMF
Date Drawn:	01/20/2017
Checked By:	JBW
Last Modified:	2/9/17
Sheet:	1 of 1
Fig.	A-1



enlargement

WAYZATA LAKE EFFECT

Lake Edge Diagrams : Intermittent Riprap Plan Diagram

CIVITAS

2

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OPTION A2 LAKE EDGE: INTERMITTENT RIPRAP
WAYZATA LAKE EFFECT
WAYZATA, MINNESOTA

Project No:	B1607634
Drawing No.	B1607634_FigA2
Drawn By:	CMF
Date Drawn:	01/20/2017
Checked By:	JBW
Last Modified:	2/9/17
Sheet:	1 of 1
Fig.	A-2

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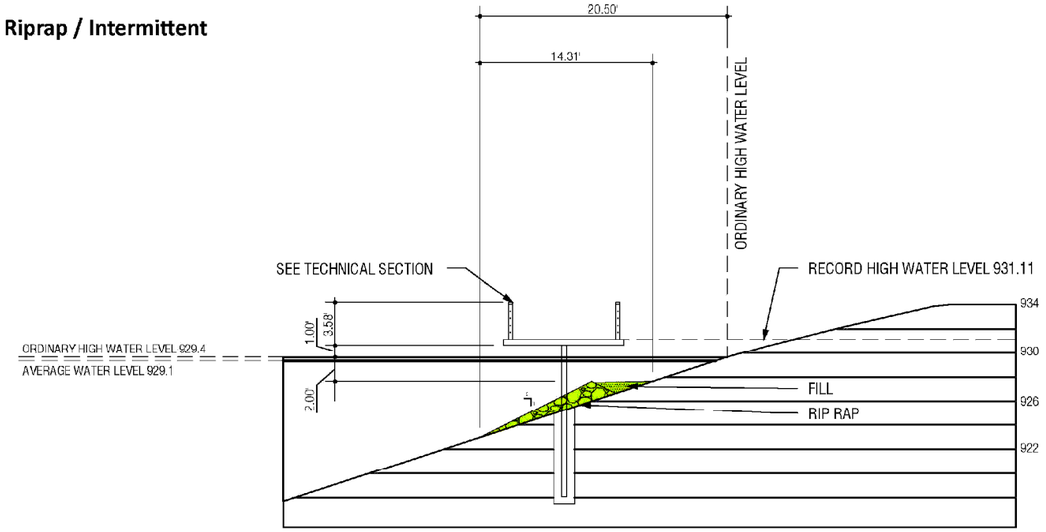
Continuous Riprap / Intermittent
Section A-A



1:10

1:10

1:10

VOLUME CALCULATIONS

1. Continuous Riprap

Rip Rap
length = 1,637 lf
Area = 9 sf
Volume =14,733 cf

Lake Bottom Disturbance
23,426 s.f

Fill
length = 1,637 lf
Area = 2.4 sf
Volume = 3,929 cf

Total Volume = 18,662 cf

2. Intermittent Riprap

Rip Rap
length = 585 lf
Area = 9 sf
Volume = 5,265 cf

Lake Bottom Disturbance
8,371 s.f

Fill
length = 585 lf
Area = 2.4 sf
Volume = 1,404 cf

Total Volume = 6,669 cf

WAYZATA LAKE EFFECT
Lake Edge Diagrams : Riprap Section

CIVITAS

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OPTIONS A1 AND A2 LAKE EDGE: RIPRAP SECTION
WAYZATA LAKE EFFECT
WAYZATA, MINNESOTA

Project No:	B1607634
Drawing No.	B1607634_FigA3
Drawn By:	CMF
Date Drawn:	01/20/2017
Checked By:	JBW
Last Modified:	2/9/17
Sheet:	1 of 1
Fig.	A-3

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