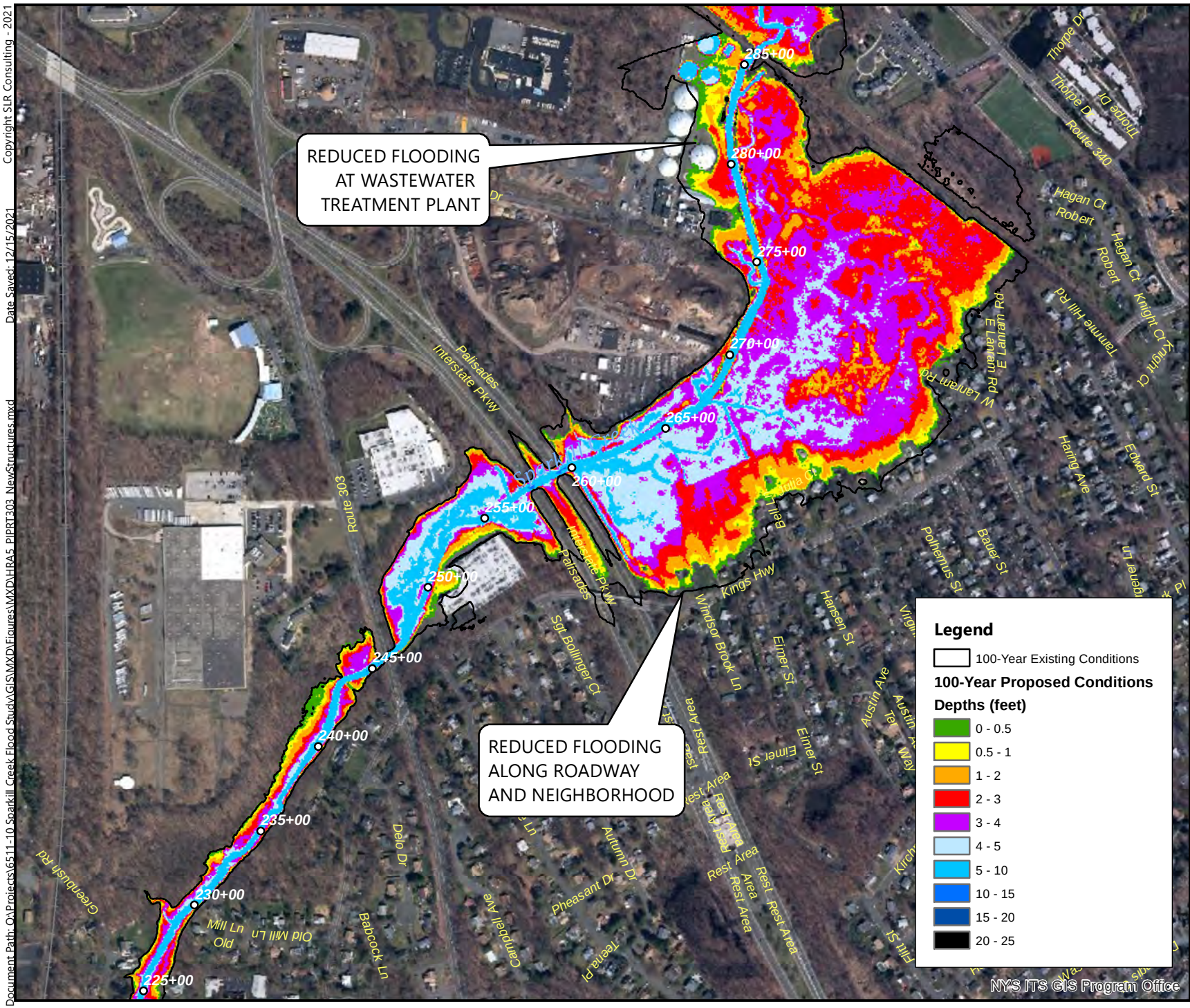


N

0 500 Feet

SLR
231 MAIN STREET
SUITE 102
NEW PALTZ, NY 12561
845.633.8153

HRA #5 - 100-YEAR PROPOSED CONDITIONS FLOOD DEPTHS

SPARKILL CREEK FLOOD & RESILIENCE STUDY

SD115

ROCKLAND COUNTY

NEW YORK

SCALE 1 " = 650 '

DATE 12/15/2021

PROJ. NO. 16511.00010

FIG. 4-47

Date Saved: 12/15/2021

Document Path: O:\Projects\6511-10 Sparkill Creek Flood Study\GIS\MXD\Figures\MXD\HRA5_PIPRT303_NewStructures.mxd

4.6 HIGH RISK AREA #6 – RAIL TRAIL

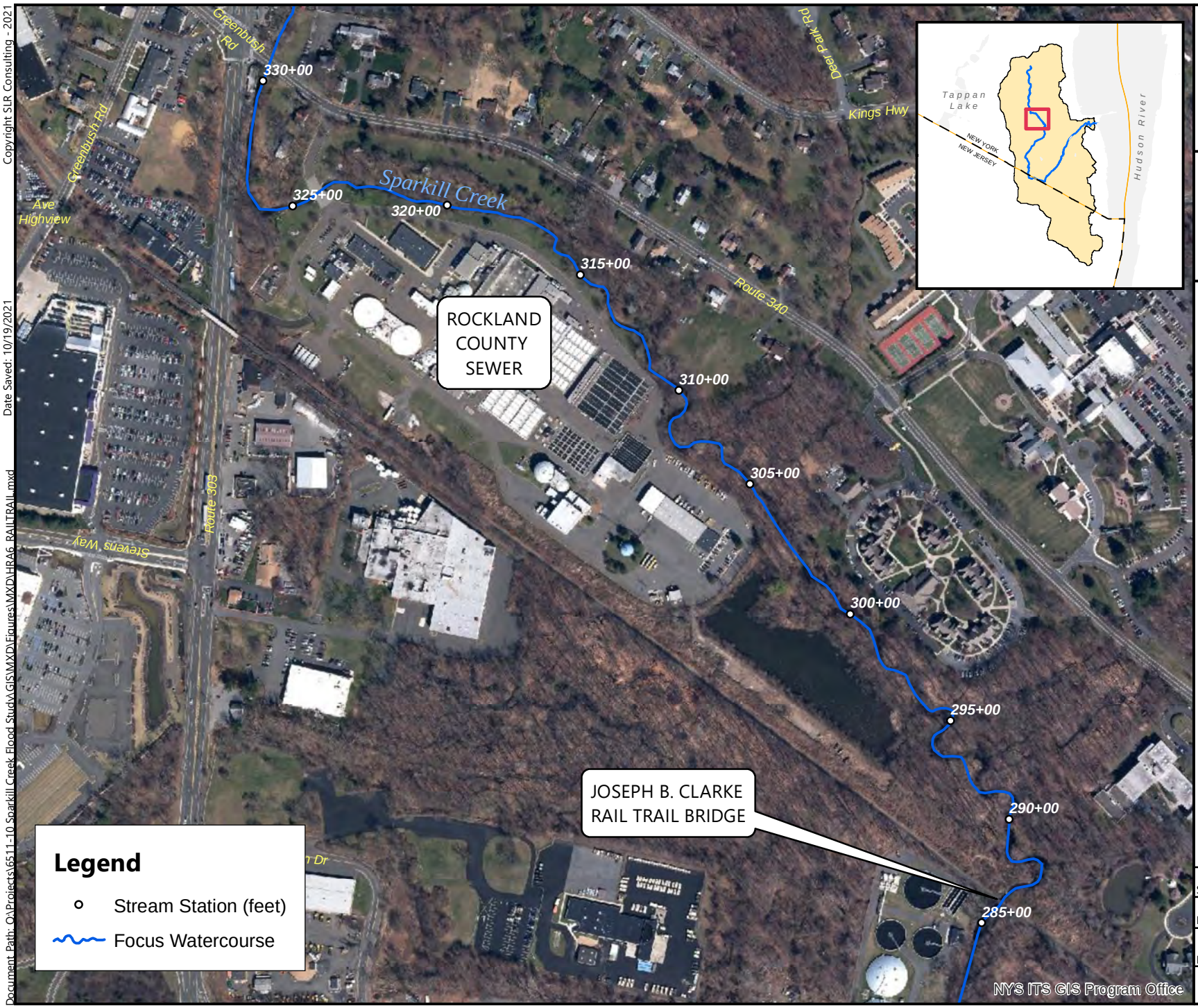
HRA 6 contains the Joseph B. Clarke Rail Trail, next to the Rockland County Sewer Facility, in the hamlet of Orangeburg (Figure 4-48). The bridge passing over Sparkill Creek at the rail trail (Figure 4-49), owned by Norfolk Southern Railway Co., has the NAACC crossing code *xy4103783373937337* and an aquatic passability score of 0.93 out of 1.0, an *insignificant barrier*. The watershed of the creek at this location is over 3 square miles.

The rail trail crossing currently consists of a 12-foot-wide culvert, which only passes the 10-year flood event and creates an extensive backwater that contributes to flooding in the vicinity of the Rockland County Sewer Facility as well as along Route 340, Route 303, and Greenbush Road.

Replacement of the rail trail bridge with a new structure with a span of at least 44 feet, removal of the railroad embankment to accommodate the larger span, widening of the Sparkill Creek channel to a bankfull width of 34 feet, and widening the floodplain immediately upstream and downstream of the crossing would result in reduced flooding depths and extent upstream of the crossing, including a reduction in depth and frequency of flooding at the Rockland County Sewer Facility. Floodplain creation would run along the left bank from STA 309+69 to STA 323+92 or approximately 1,400 linear feet. This floodplain bench would have varying widths, measuring 77 feet at its most narrow point and 140 feet at its widest. Excavation depths would range from 1.0 to 7.5 feet below existing grade.

The improvements described above are depicted in concept in Figure 4-50. Flood reductions during the 10-year flood event are illustrated in Figure 4-51 (existing conditions) and Figure 4-52 (proposed conditions). Flood reductions during the 50-year flood event are illustrated in Figure 4-53 (existing conditions) and Figure 4-54 (proposed conditions). Flood reductions during the 100-year flood event are illustrated in Figure 4-55 (existing conditions) and Figure 4-56 (proposed conditions).

Floodproofing and elevation of pumps and electrical equipment are recommended at the Rockland County Sewer Facility to ensure that the facility can continue to function as required during extreme weather events.



N

0 400

Feet

SLR
231 MAIN STREET
SUITE 102
NEW PALTZ, NY 12561
845.633.8153

HIGH RISK AREA #6 - RAIL TRAIL

SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

SCALE 1 " = 400 '

DATE 11/8/2021

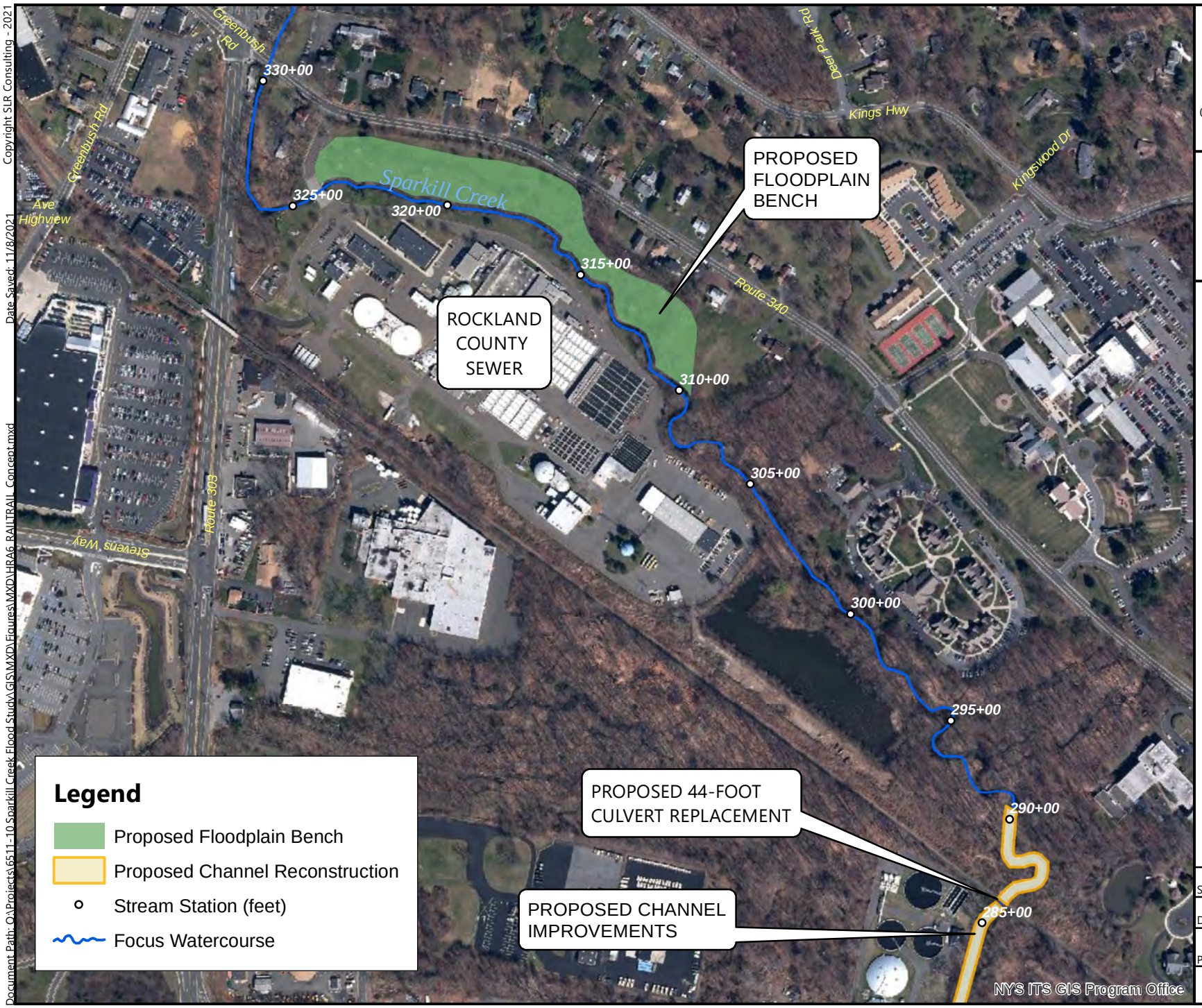
PROJ. NO. 16511.00010

FIG. 4-48

Date Saved: 10/19/2021

Document Path: O:\Projects\16511-10 Sparkill Creek Flood Study\GIS\MXD\Figures\MXD\HRA6_RAILTRAIL.mxd

Figure 4-49: Joseph B. Clarke Rail Trail Crossing



Date Saved: 11/8/2021

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231 MAIN STREET
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NEW PALTZ, NY 12561
845.633.8153

HRA#6 - CONCEPT MAP

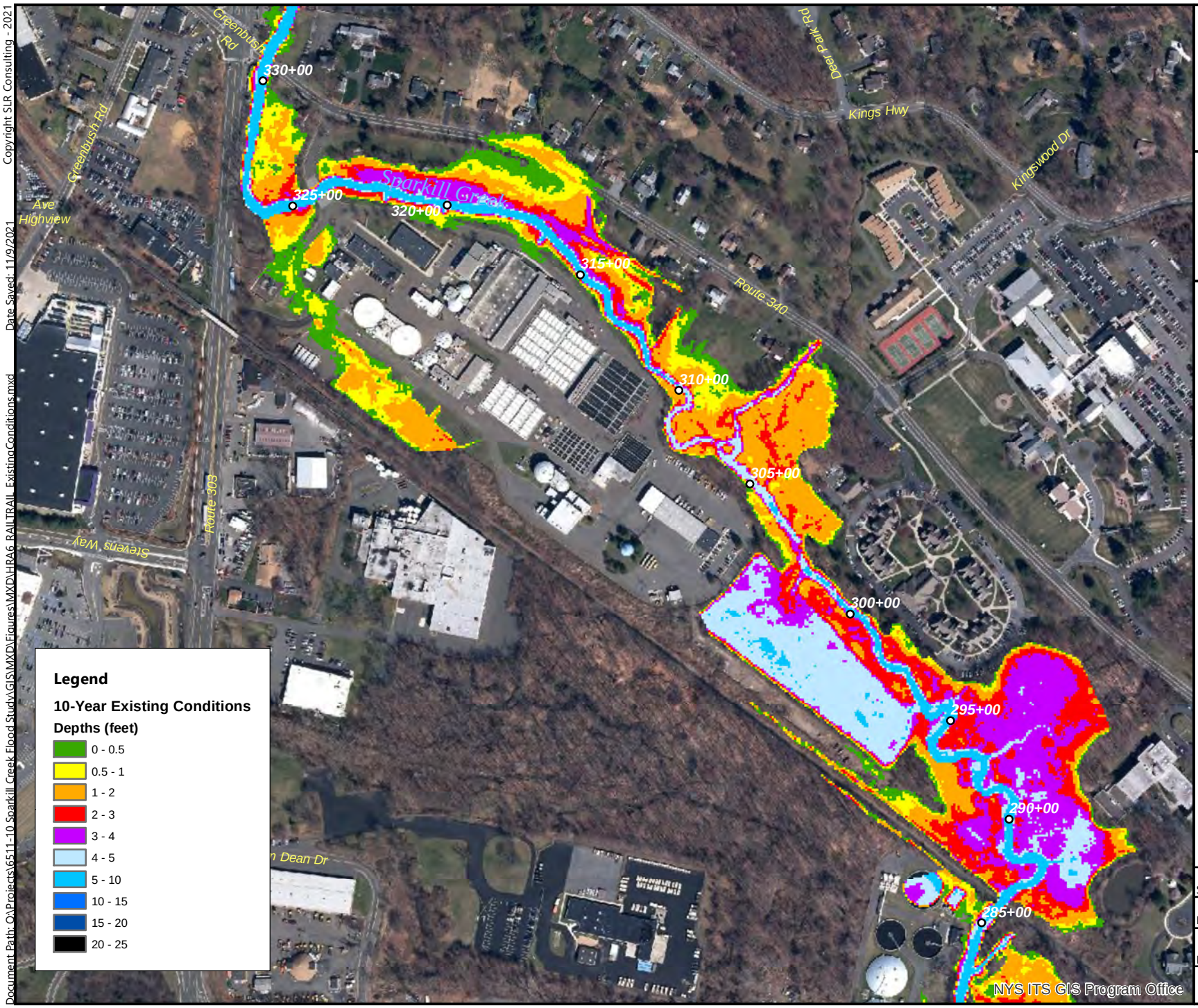
SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

SCALE 1 " = 400 '

DATE 11/8/2021

PROJ. NO. 16511.00010

FIG. 4-50



N

0 400

Feet

SLR
231 MAIN STREET
SUITE 102
NEW PALTZ, NY 12561
845.633.8153

HRA #6 - 10- YEAR EXISTING CONDITIONS FLOOD DEPTHS

SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

SCALE 1 " = 400 '

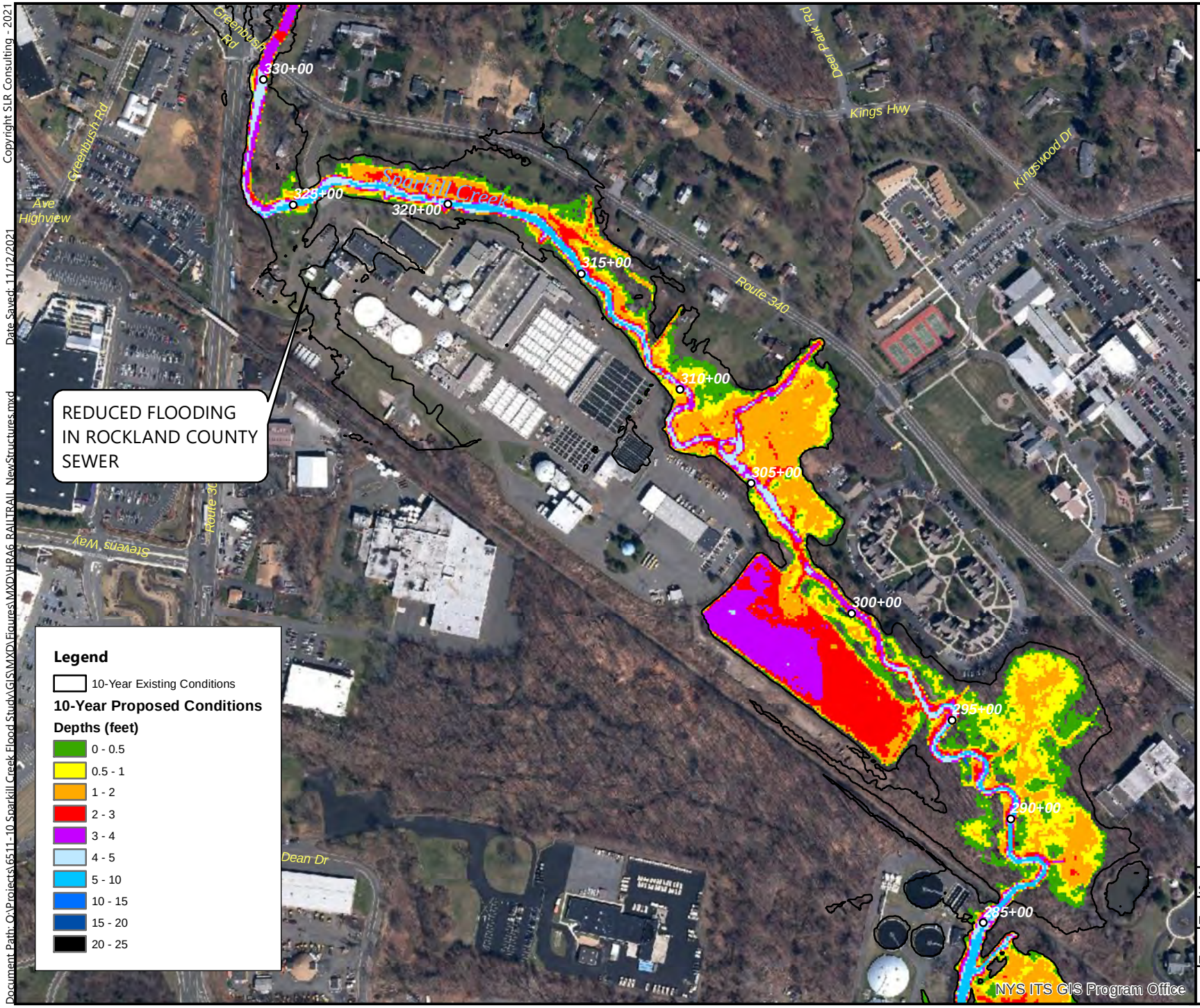
DATE 11/9/2021

PROJ. NO. 16511.00010

FIG. 4-51

Date Saved: 11/9/2021

Document Path: O:\Projects\16511.10 Sparkill Creek Flood Study\GIS\MXD\Figures\MXD\HRA6_RAILTRAIL_ExistingConditions.mxd



N

0 400
Feet

SLR
231 MAIN STREET
SUITE 102
NEW PALTZ, NY 12561
845.633.8153

HRA #6 - 10-YEAR PROPOSED CONDTIONS FLOOD DEPTHS

SPARKILL CREEK FLOOD & RESILIENCE STUDY

SD115

ROCKLAND COUNTY
NEW YORK

SCALE 1 " = 400 '

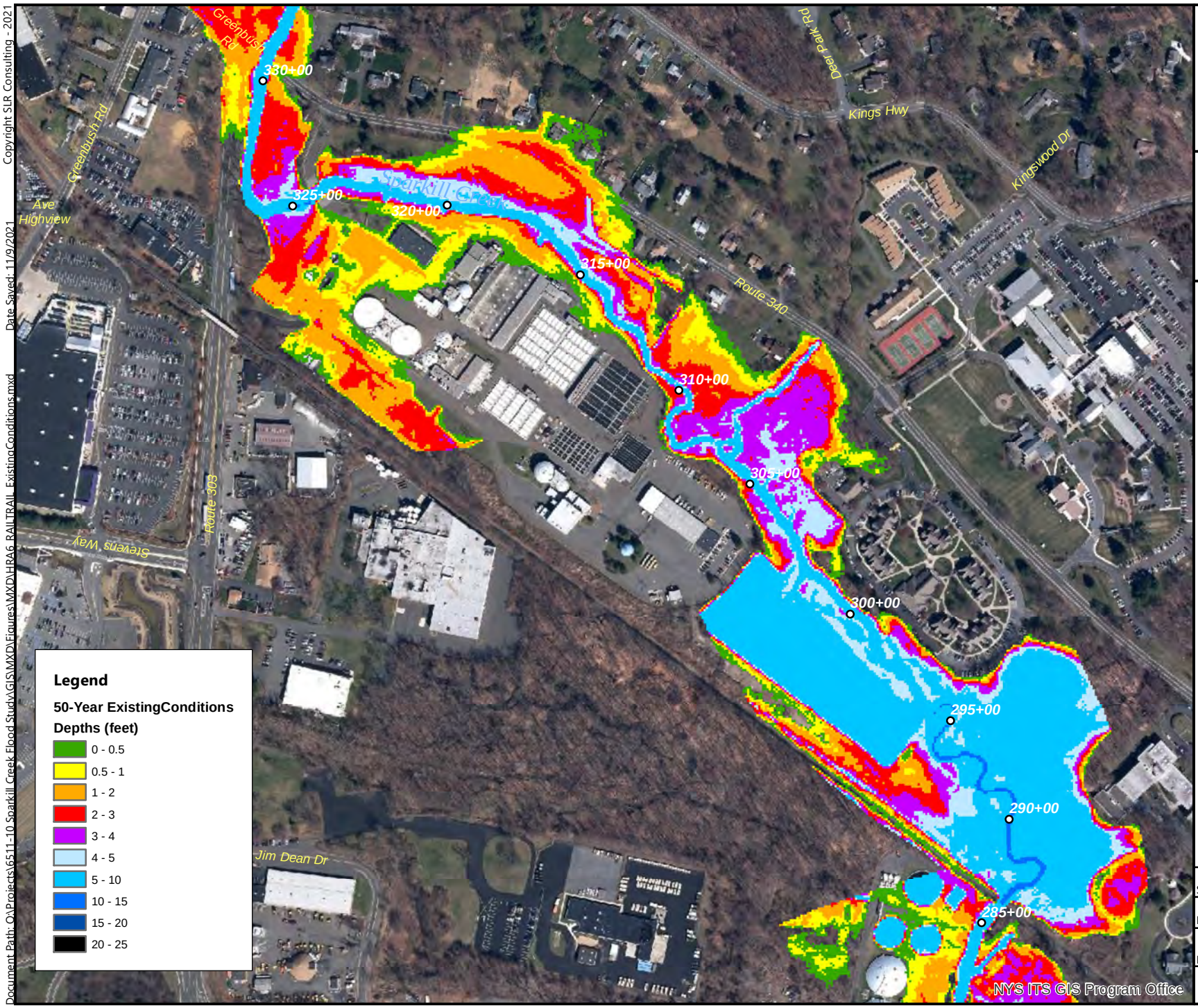
DATE 11/15/2021

PROJ. NO. 16511.00010

FIG. 4-52

Date Saved: 11/12/2021

Document Path: Q:\Projects\6511-10 Sparkill Creek Flood Study\GIS\MXD\Figures\MXD\HRA6_RAILTRAIL_NewStructures.mxd



Date Saved: 11/9/2021

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N

0 400
Feet

SLR
231 MAIN STREET
SUITE 102
NEW PALTZ, NY 12561
845.633.8153

HRA #6 - 50- YEAR EXISTING CONDITIONS FLOOD DEPTHS

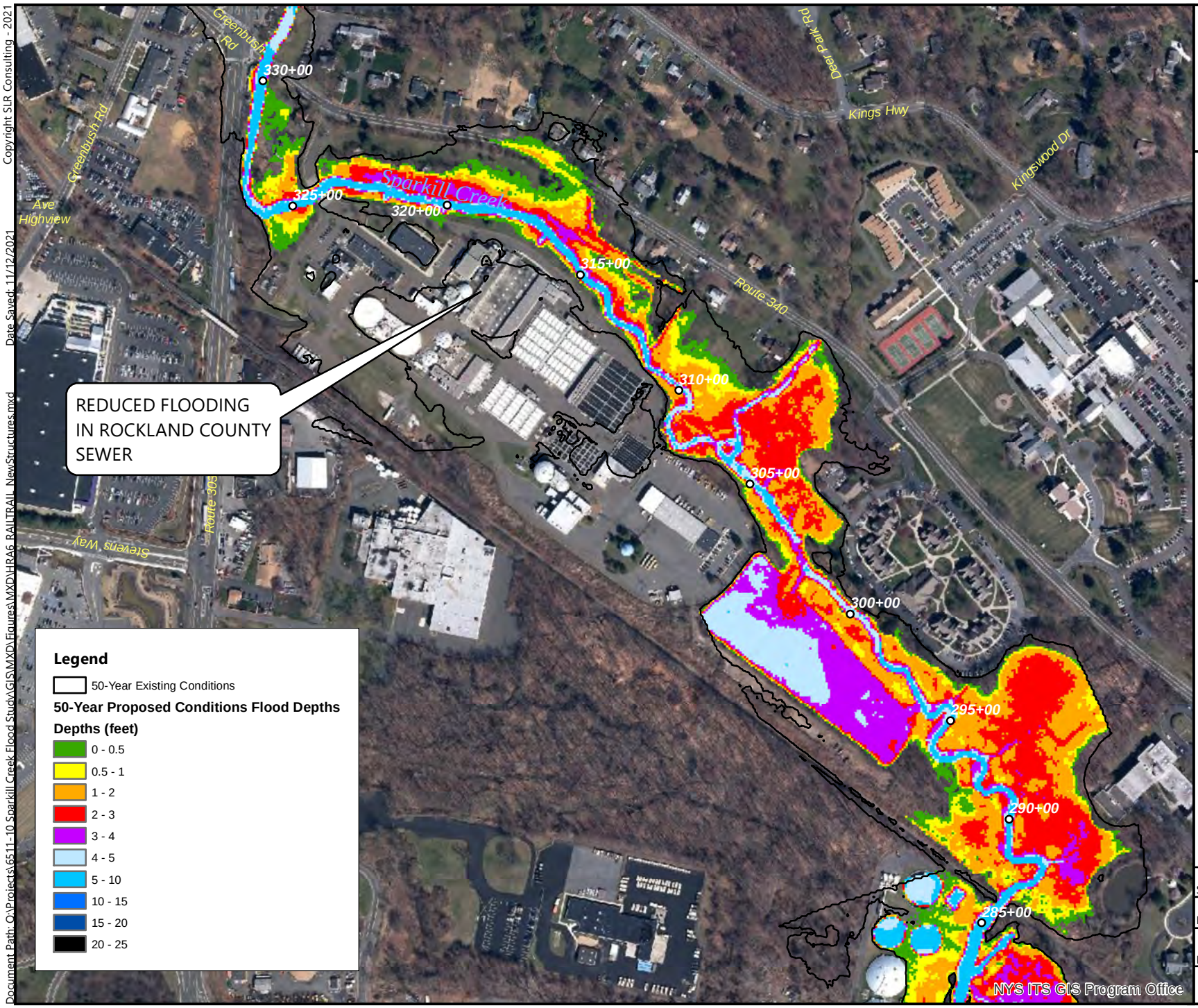
SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

SCALE 1 " = 400 '

DATE 11/9/2021

PROJ. NO. 16511.00010

FIG. 4-53



N

0 400
Feet

SLR
231 MAIN STREET
SUITE 102
NEW PALTZ, NY 12561
845.633.8153

HRA #6 - 50-YEAR PROPOSED CONDTIONS FLOOD DEPTHS

SPARKILL CREEK FLOOD & RESILIENCE STUDY

SD115

ROCKLAND COUNTY
NEW YORK

SCALE 1 " = 400 '

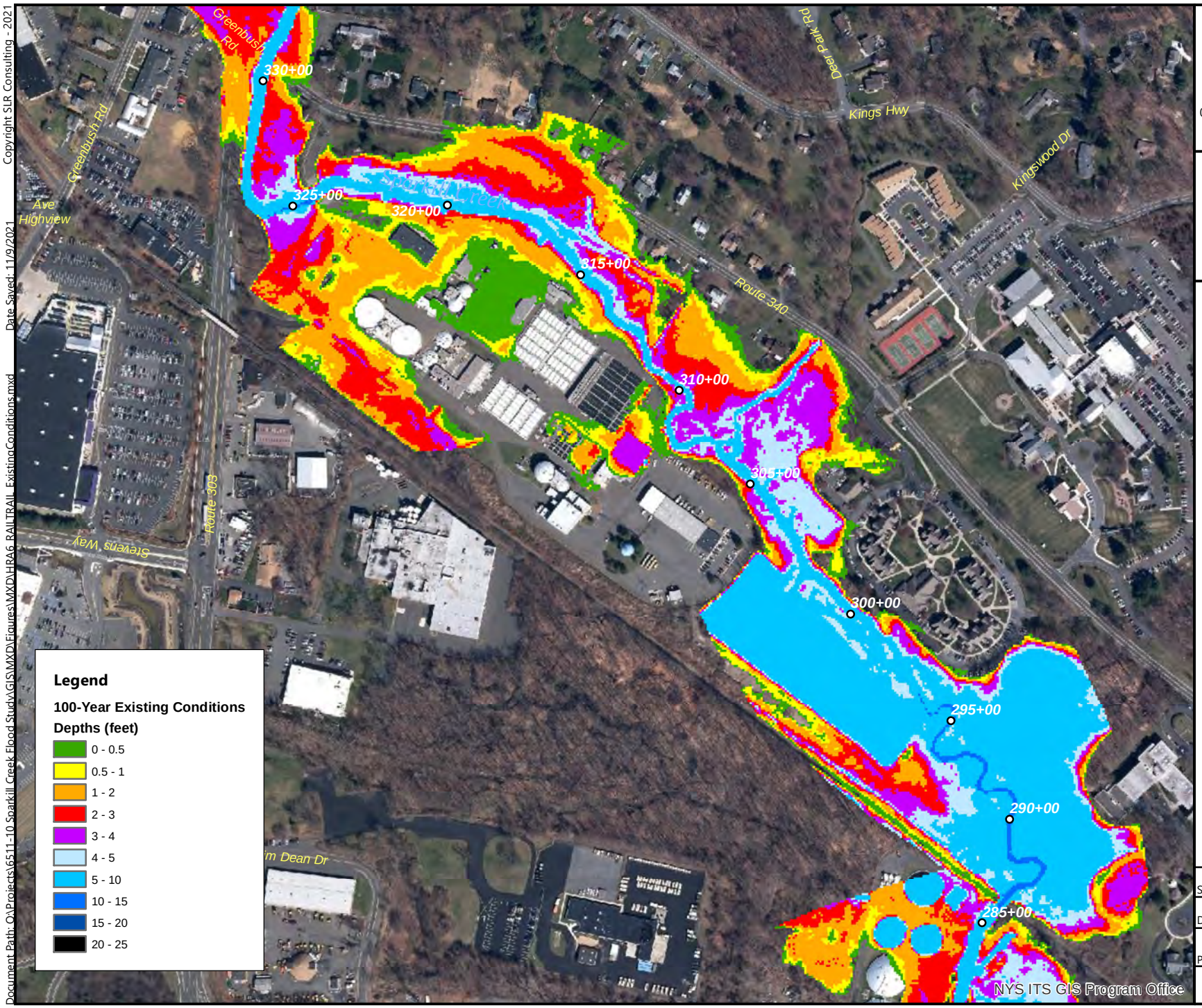
DATE 11/15/2021

PROJ. NO. 16511.00010

FIG. 4-54

Date Saved: 11/12/2021

Document Path: Q:\Projects\6511-10 Sparkill Creek Flood Study\GIS\MXD\Figures\MXD\HRA6_RAILTRAIL_NewStructures.mxd



N

0 400

Feet

SLR
231 MAIN STREET
SUITE 102
NEW PALTZ, NY 12561
845.633.8153

HRA #6 - 100- YEAR EXISTING CONDITIONS FLOOD DEPTHS

SPARKILL CREEK FLOOD & RESILIENCE STUDY

SD115

ROCKLAND COUNTY

NEW YORK

SCALE 1 " = 400 '

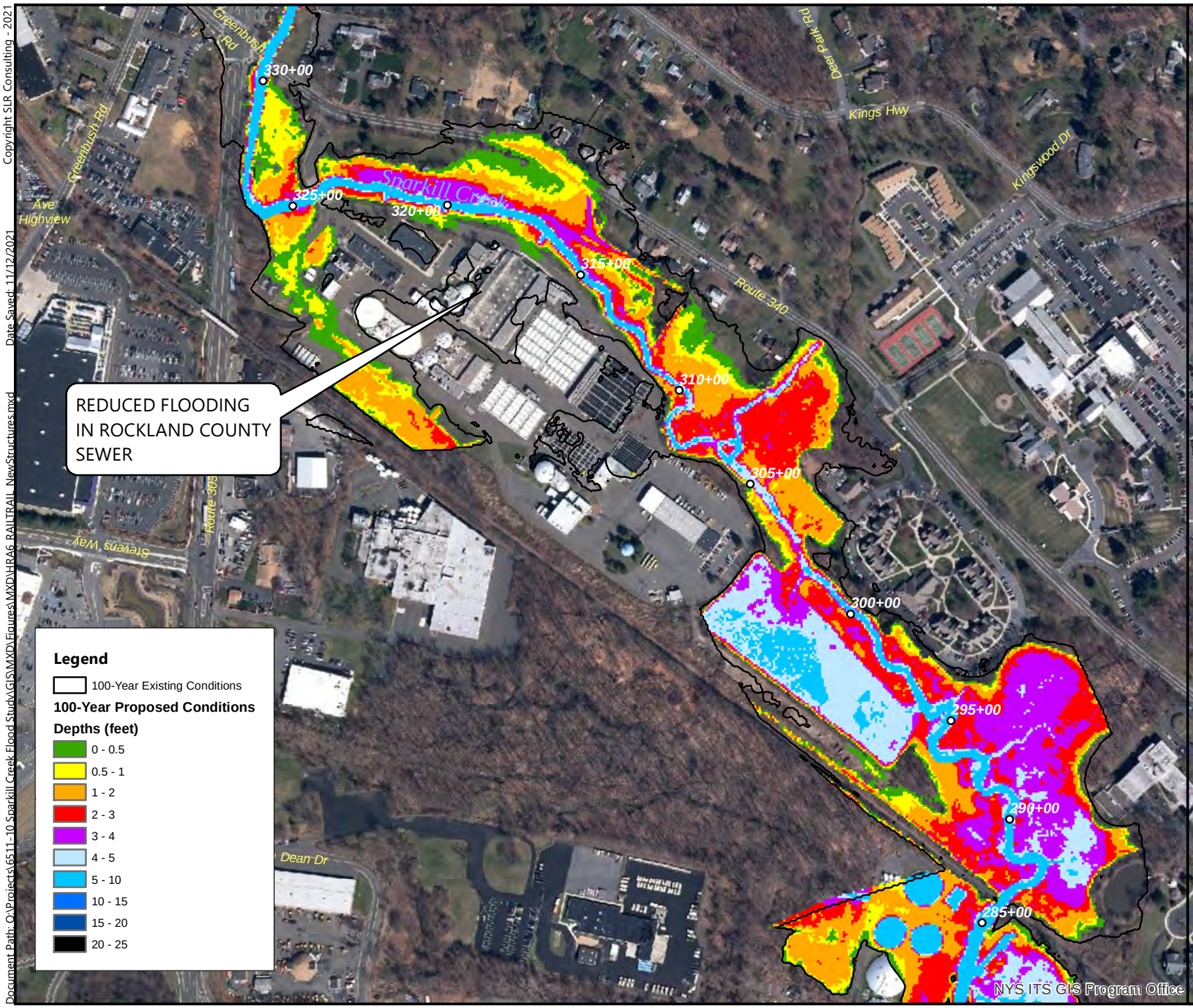
DATE 11/9/2021

PROJ. NO. 16511.00010

FIG. 4-55

Date Saved: 11/9/2021

Document Path: O:\Projects\16511-10 Sparkill Creek Flood Study\GIS\MXD\Figures\MXD\HRA6_RAILTRAIL_ExistingConditions.mxd



N

0 400
Feet

SLR
231 MAIN STREET
SUITE 102
NEW PALTZ, NY 12561
845.633.8153

HRA #6 - 100-YEAR PROPOSED CONDTIONS FLOOD DEPTHS
SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

SCALE 1 " = 400 '
DATE 11/15/2021
PROJ. NO. 16511.00010

FIG. 4-56

Date Saved: 11/12/2021
Document Path: Q:\Projects\6511-10 Sparkill Creek Flood Study\GIS\MXD\Figures\MXD\HRA6_RAILTRAIL_NewStructures.mxd

4.7 HIGH RISK AREA #7 – HAMLET OF ORANGEBURG

HRA 7 includes the area from the intersection of State Route 303 and Mountain View Avenue, south to the Rockland County Sewer Facility off State Route 340, in the hamlet of Orangeburg (Figure 4-57). The watershed of the creek at this location is approximately 2.4 square miles. Sparkill Creek is spanned by five bridges and two culverts within HRA 7. The hydraulic adequacy of each crossing was assessed, and crossings were grouped according to proximity and influence on each other.

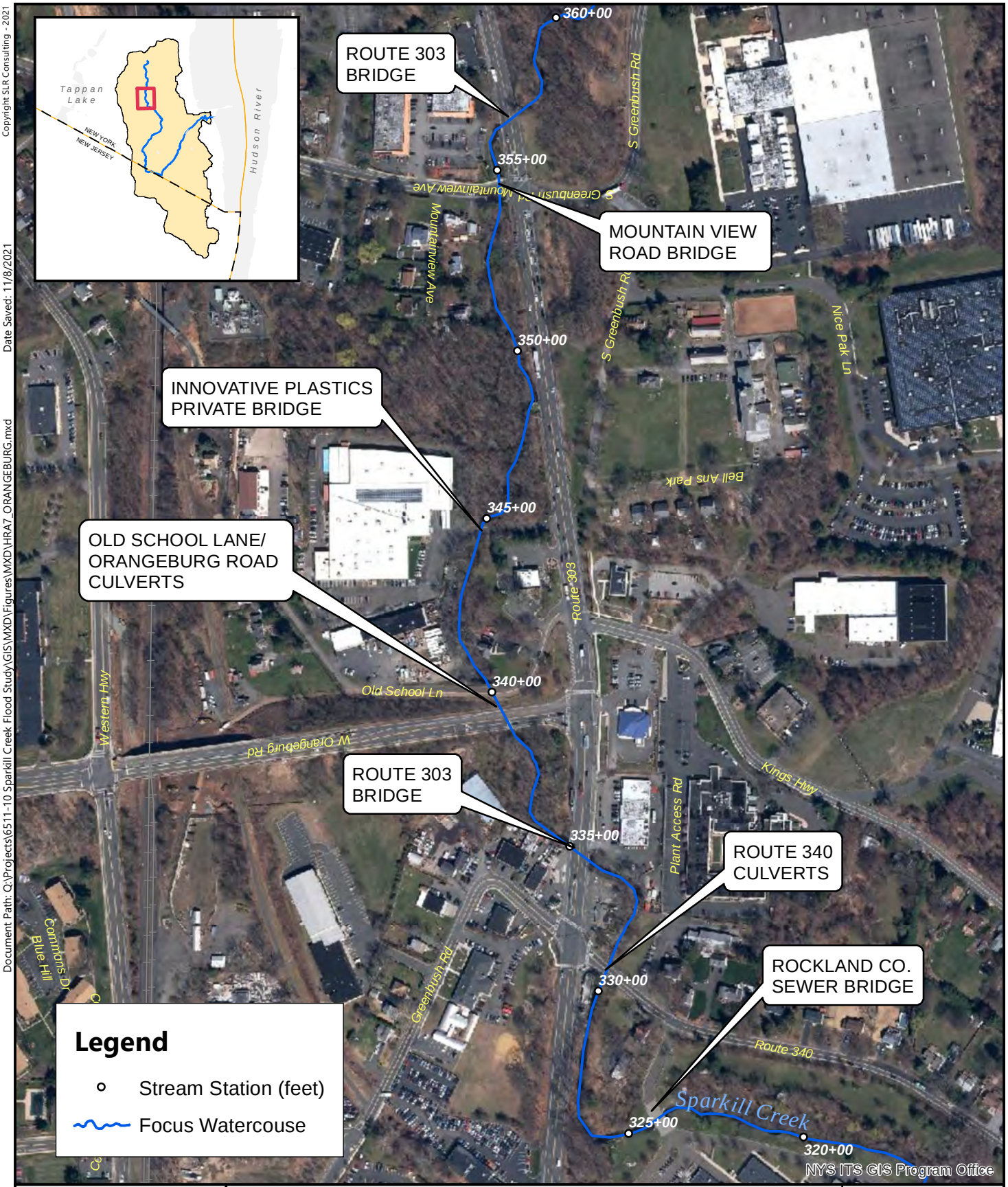
4.7.1 ROUTE 303/MOUNTAIN VIEW AVENUE BRIDGES

North of the intersection of State Route 303 and Mountain View Avenue, a 20-foot NYSDOT bridge crosses the creek on State Route 303 (Figure 4-58). This bridge passes up to the 100-year flood without overtopping the bridge deck; however, the intersection floods by several feet as the bridge backwaters and is flanked. Replacement of the existing bridge with a new structure with a span of 50 feet, widening the channel upstream and downstream to the bankfull width of 31 feet, and creating a floodplain where possible would result in a reduction in water surface elevation of over 2.5 feet during the 100-year flood event and reduce the depth and frequency of flooding at the intersection.

Replacement of the State Route 303 bridge with a new structure with a span of 50 feet, widening the channel upstream and downstream to the bankfull width of 31 feet, and creating a floodplain where possible would result in a reduction in water surface elevation of over 2.5 feet during the 100-year flood event and reduce the depth and frequency of flooding at the intersection.

West of the intersection of State Route 303 and Mountain View Avenue, a 17-foot bridge crosses the creek on Mountain View Avenue (Figure 4-59). The ownership is unlisted. This bridge currently does not pass the 10-year flood event and contributes to flooding of the intersection. Replacement of the existing bridge with a new structure span of 50 feet, widening the channel upstream and downstream to the bankfull width of 31 feet, and creating a floodplain where possible would result in a reduction in water surface elevation of over 1 foot during the 100-year flood event and reduce the depth and frequency of flooding at the intersection. The floodplain bench would extend from STA 355+00 to STA 356+36, measure 30 feet at its widest point, and be excavated approximately 2 feet deep below the existing grade.

A concept map of the recommended flood mitigation alternatives near Mountain View Avenue and Route 303 is depicted in Figure 4-60. Flood reductions during the 10-year flood event are illustrated in Figure 4-61 (existing conditions) and Figure 4-62 (with proposed improvements implemented at both intersections). Flood reductions during the 50-year flood event are illustrated in Figure 4-63 (existing conditions) and Figure 4-64 (proposed conditions). Flood reductions during the 100-year flood event are illustrated in Figure 4-65 (existing conditions) and Figure 4-66 (proposed conditions).



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SLR
231 MAIN STREET
SUITE 102
NEW PALTZ, NY 12561
845.633.8153

HIGH RISK AREA #7 - HAMLET OF ORANGEBURG

SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

N
0 350
Feet

SOURCE: 2016 AERIAL PHOTO, NYS ITS GIS Program Office

SCALE 1 " = 350 '
DATE 11/8/2021
PROJ. NO. 16511.00010

FIG. 4-57

Figure 4-58: Looking Upstream at Route 303 Bridge Outlet Near the Intersection with Mountain View Avenue

Figure 4-59: Looking Downstream at Mountain View Avenue Bridge Inlet

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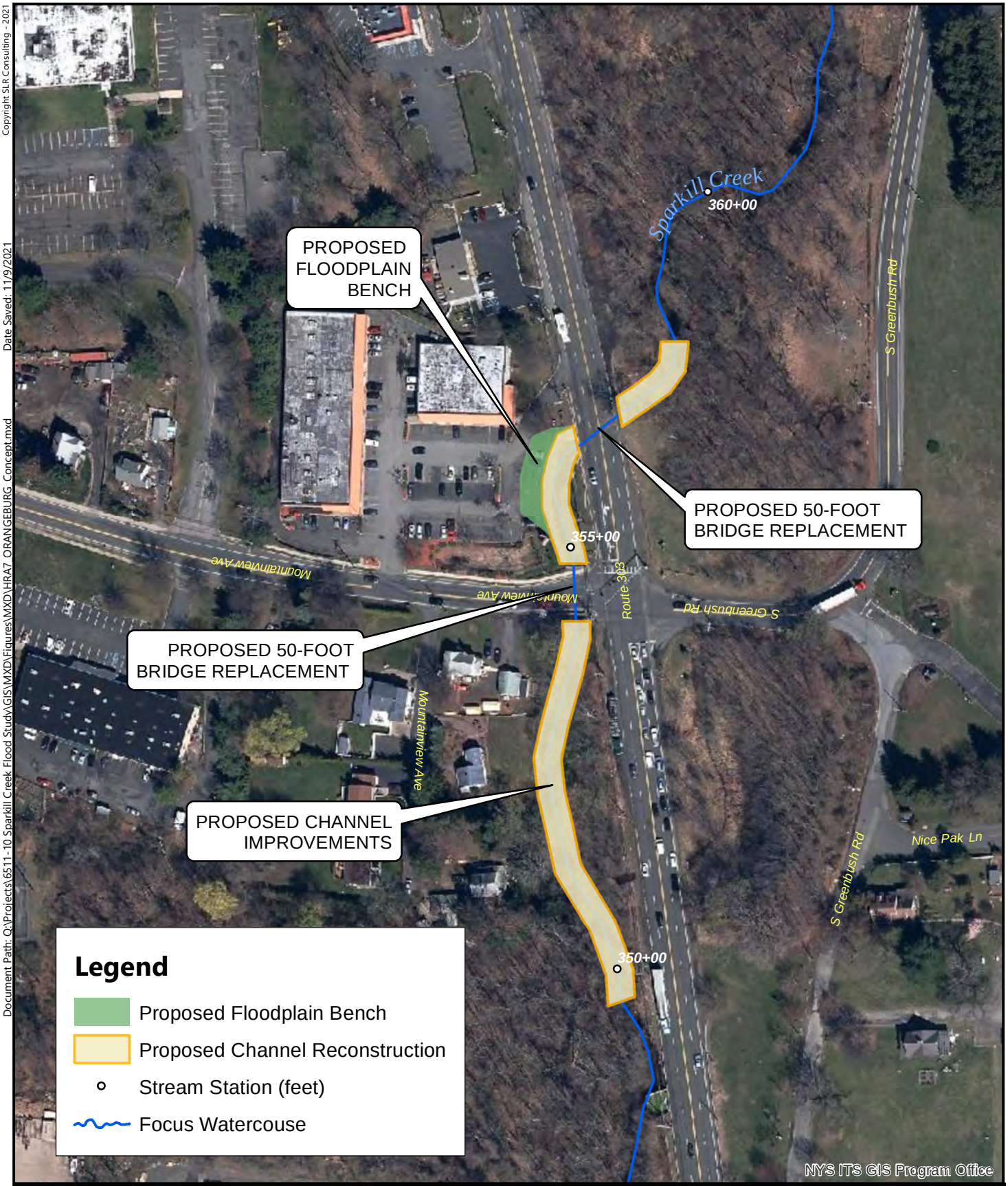
Document Path: Q:\Projects\6511-10 Sparkill Creek Flood Study\GIS\MXD\Figures\MXD\HRA7_ORANGEBURG_Concept.mxd



SLR

231 MAIN STREET
SUITE 102
NEW PALTZ, NY 12561
845.633.8153

HRA#7.1 - CONCEPT MAP

SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

N

0 150
Feet

SOURCE: 2016 AERIAL PHOTO, NYS ITS GIS Program Office

SCALE 1 " = 150 '

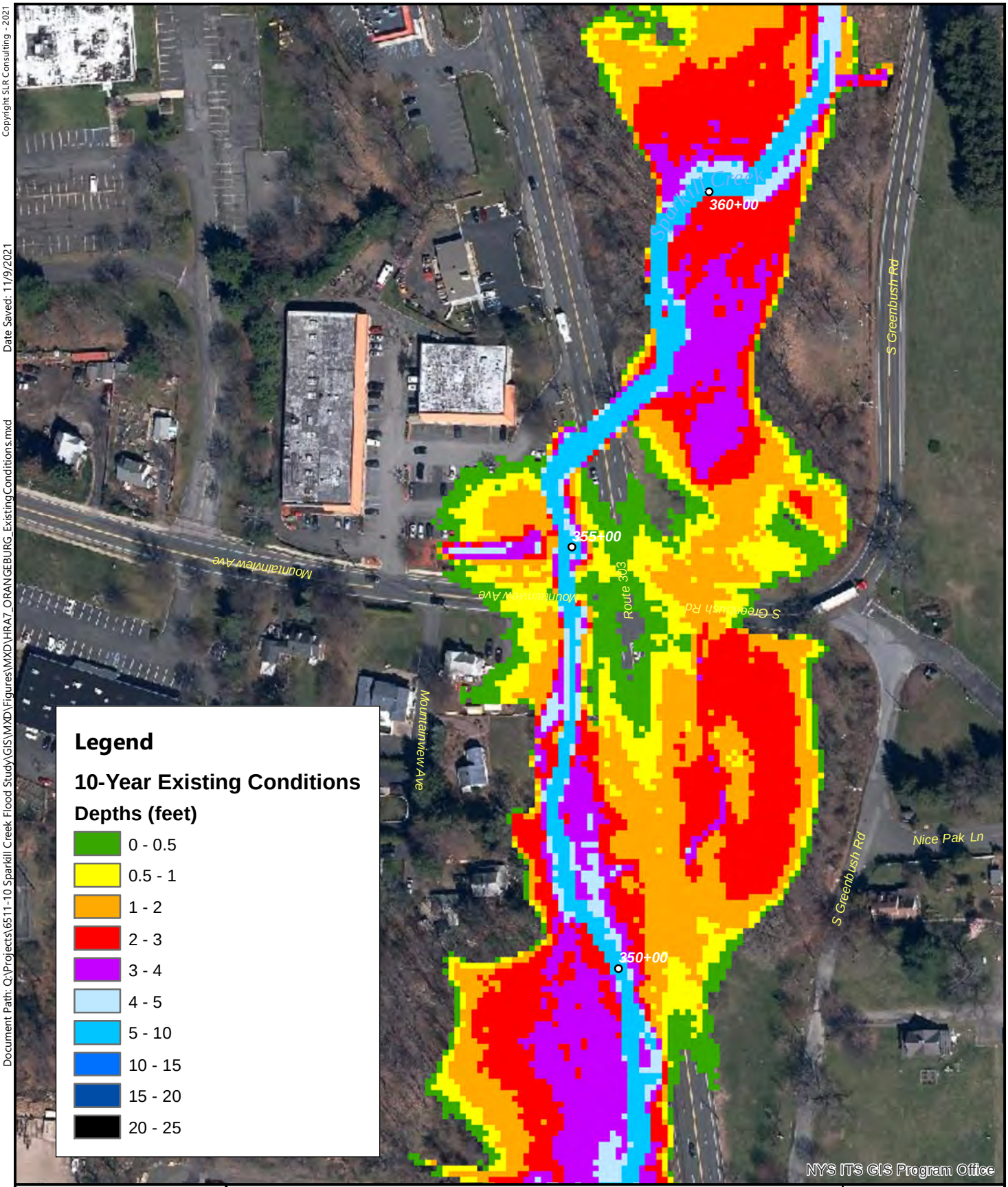
DATE 11/9/2021

PROJ. NO. 16511.00010

FIG. 4-60

Date Saved: 11/9/2021

Document Path: Q:\Projects\6511-10 Sparkill Creek Flood Study\GIS\MXD\Figures\MXD\HRA7_ORANGEBURG_ExistingConditions.mxd



SLR
231 MAIN STREET
SUITE 102
NEW PALTZ, NY 12561
845.633.8153

HRA #7.1 - 10-YEAR EXISTING CONDITIONS FLOOD DEPTHS

SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

N
0 150
Feet

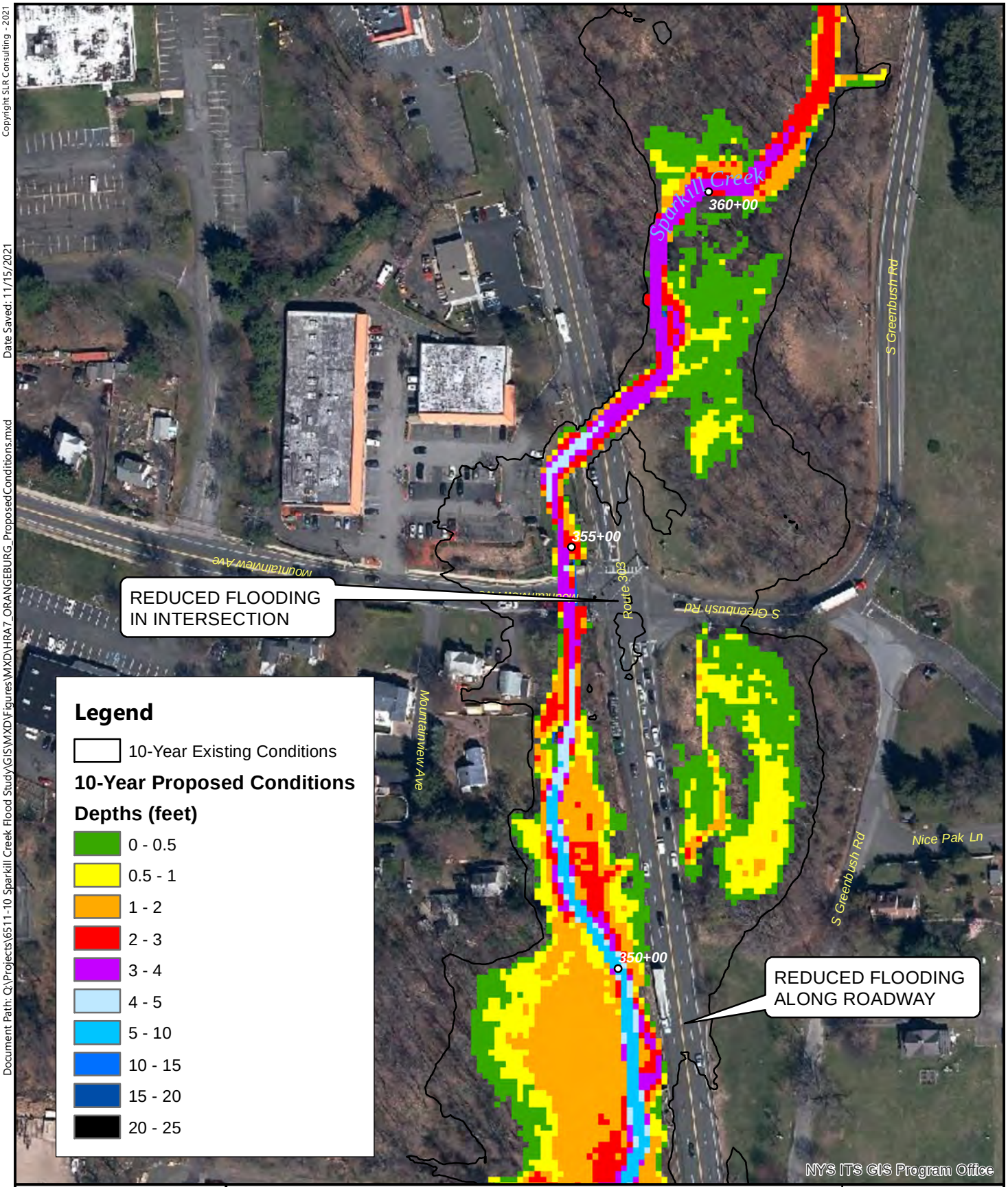
SCALE 1 " = 150 '
DATE 11/9/2021
PROJ. NO. 16511.00010

FIG. 4-61

SOURCE: 2016 AERIAL PHOTO, NYS ITS GIS Program Office

Date Saved: 11/15/2021

Document Path: Q:\Projects\6511-10 Sparkill Creek Flood Study\GIS\MXD\Figures\MXD\HRA7_ORANGEBURG_ProposedConditions.mxd



SLR

231 MAIN STREET
SUITE 102
NEW PALTZ, NY 12561
845.633.8153

HRA #7.1 - 10-YEAR PROPOSED CONDITIONS FLOOD DEPTHS

SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

N

0 150
Feet

SCALE 1 " = 150 '

DATE 11/15/2021

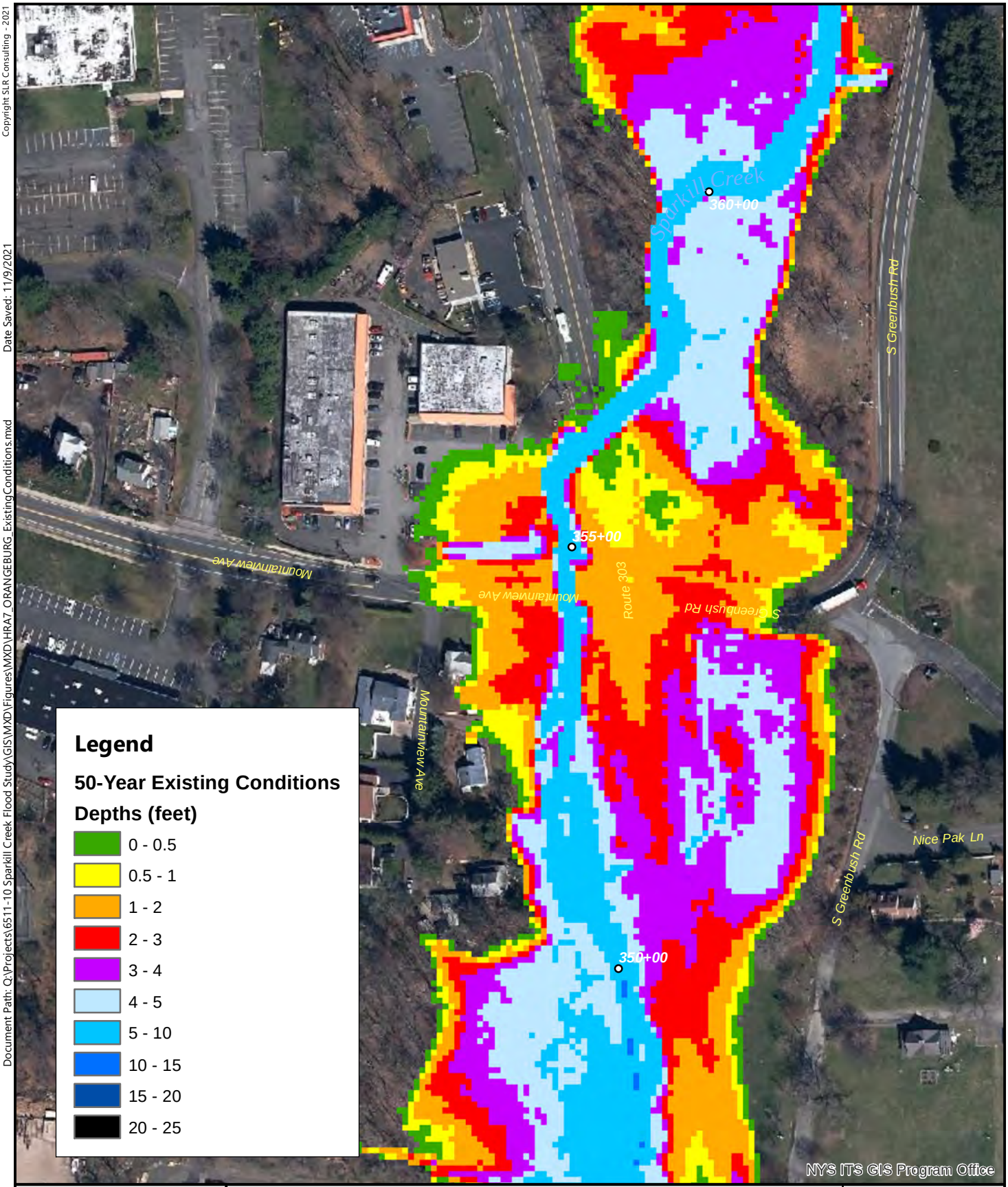
PROJ. NO. 16511.00010

FIG. 4-62

SOURCE: 2016 AERIAL PHOTO, NYS ITS GIS Program Office

Date Saved: 11/9/2021

Document Path: Q:\Projects\6511-10 Sparkill Creek Flood Study\GIS\MXD\Figures\MXD\HRA7_ORANGEBURG_ExistingConditions.mxd



Legend

50-Year Existing Conditions Depths (feet)

- 0 - 0.5
- 0.5 - 1
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 10
- 10 - 15
- 15 - 20
- 20 - 25

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231 MAIN STREET
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NEW PALTZ, NY 12561
845.633.8153

HRA #7.1 - 50-YEAR EXISTING CONDITIONS FLOOD DEPTHS

SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

N

0 150
Feet

SCALE 1 " = 150 '

DATE 11/9/2021

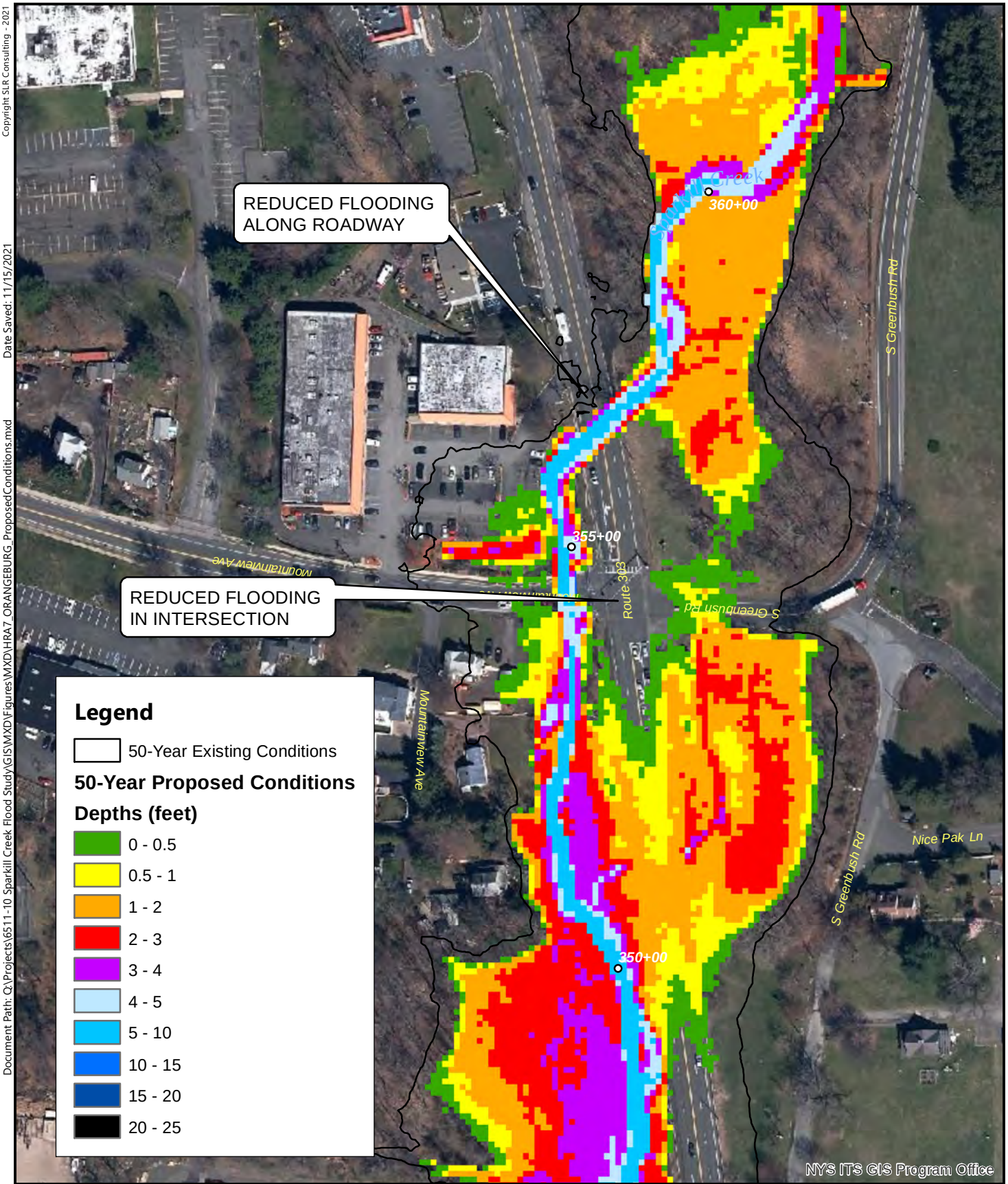
PROJ. NO. 16511.00010

FIG. 4-63

SOURCE: 2016 AERIAL PHOTO, NYS ITS GIS Program Office

Date Saved: 11/15/2021

Document Path: Q:\Projects\6511-10 Sparkill Creek Flood Study\GIS\MXD\Figures\MXD\HRA7_ORANGEBURG_ProposedConditions.mxd



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SUITE 102
NEW PALTZ, NY 12561
845.633.8153

HRA #7.1 - 50-YEAR PROPOSED CONDITIONS FLOOD DEPTHS

SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

N

0 150
Feet

SCALE 1 " = 150 '

DATE 11/15/2021

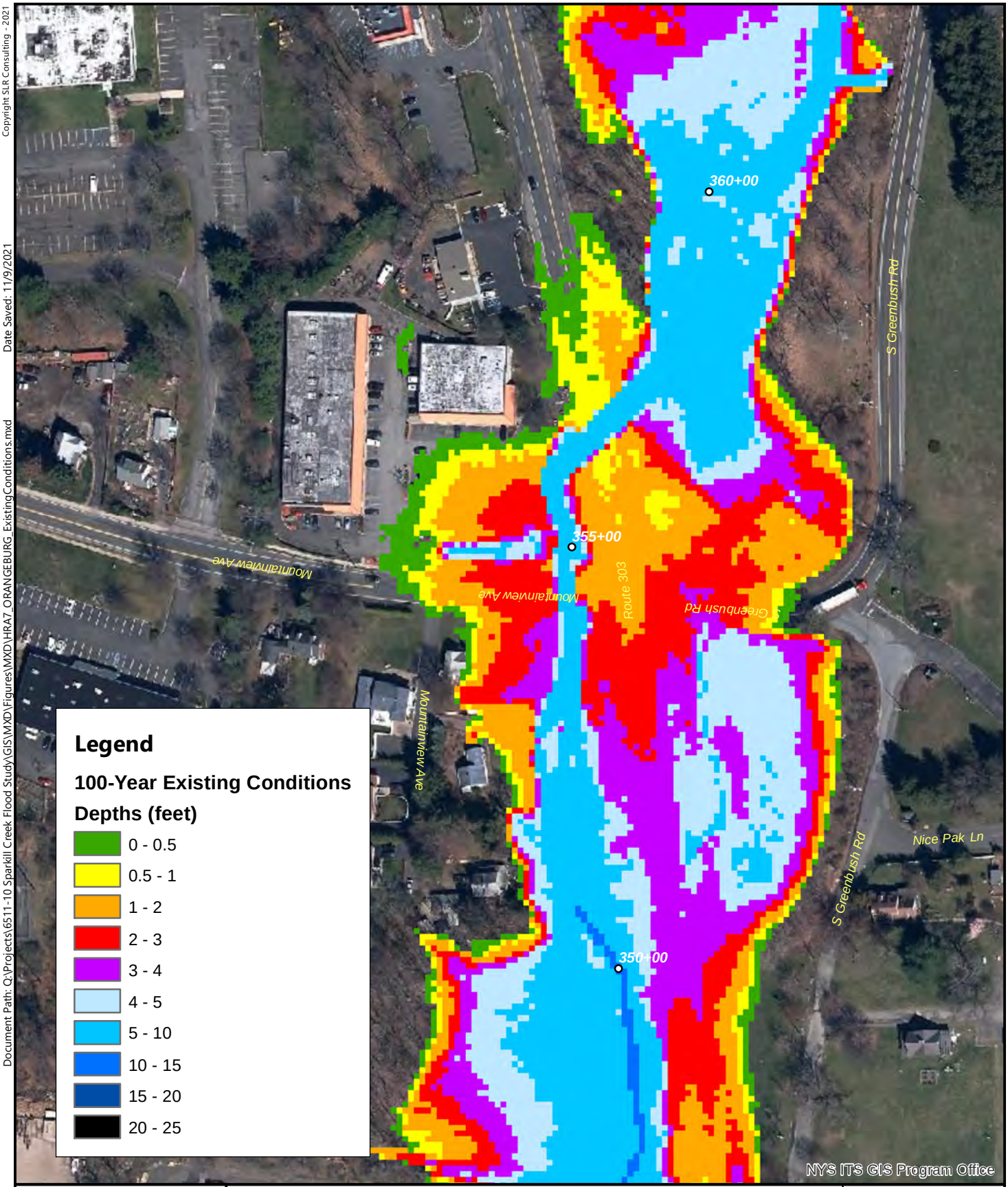
PROJ. NO. 16511.00010

FIG. 4-64

SOURCE: 2016 AERIAL PHOTO, NYS ITS GIS Program Office

Date Saved: 11/9/2021

Document Path: Q:\Projects\6511-10 Sparkill Creek Flood Study\GIS\MXD\Figures\MXD\HRA7_ORANGEBURG_ExistingConditions.mxd



SLR

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SUITE 102
NEW PALTZ, NY 12561
845.633.8153

HRA #7.1 - 100-YEAR EXISTING CONDITIONS FLOOD DEPTHS

SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

N

0 150
Feet

SOURCE: 2016 AERIAL PHOTO, NYS ITS GIS Program Office

SCALE 1 " = 150 '

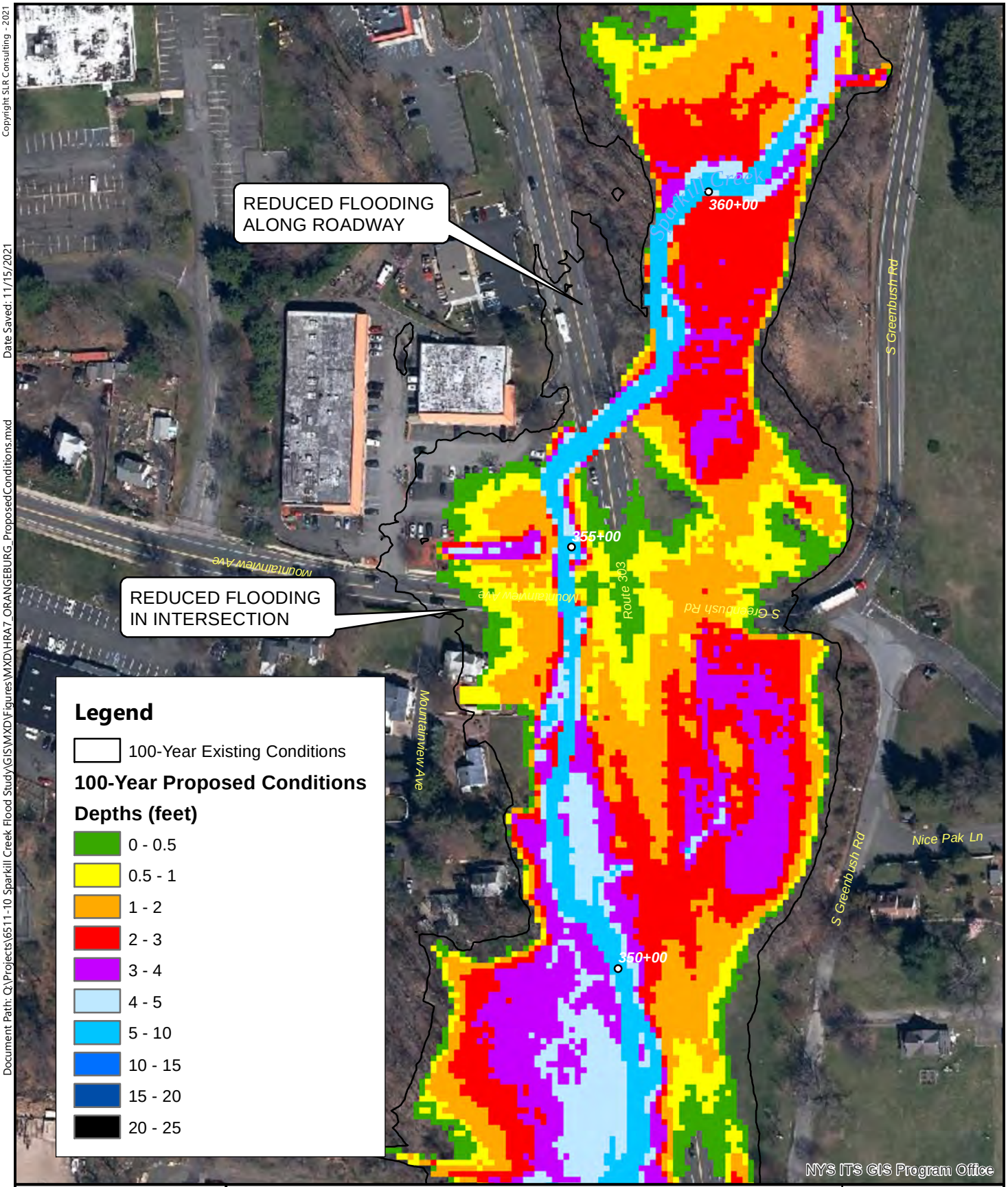
DATE 11/9/2021

PROJ. NO. 16511.00010

FIG. 4-65

Date Saved: 11/15/2021

Document Path: Q:\Projects\6511-10 Sparkill Creek Flood Study\GIS\MXD\Figures\MXD\HRA7_ORANGEBURG_ProposedConditions.mxd



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231 MAIN STREET
SUITE 102
NEW PALTZ, NY 12561
845.633.8153

HRA #7.1 - 100-YEAR PROPOSED CONDITIONS FLOOD DEPTHS

SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

N

0 150
Feet

SCALE 1 " = 150 '
DATE 11/15/2021
PROJ. NO. 16511.00010

FIG. 4-66

SOURCE: 2016 AERIAL PHOTO, NYS ITS GIS Program Office

4.7.2 INNOVATIVE PLASTICS BRIDGE/OLD SCHOOL LANE AND ORANGEBURG ROAD CULVERT

A privately owned 16-foot bridge spans Sparkill Creek at the private drive to Innovative Plastics (Figure 4-67). This bridge gets overtopped at a depth of nearly 3.5 feet in the 10-year flood event and contributes to flooding of State Route 303. Hydraulic modeling was used to evaluate the crossing if the bridge were to be removed and the channel widened to the bankfull width of 31 feet for a linear distance of 500 feet, from STA 340+30 to STA 345+30. A reduction in the water surface elevation of over 1.5 feet was observed during the modeled 100-year flood event, and the effects extended nearly 1,000 feet upstream to near Mountain View Avenue, from STA 344+65 to STA 354+56. Access to Innovative Plastics can be gained by an alternate route down Old School Lane. Removal of the bridge and widening of the channel to the bankfull width of 31 feet from STA 340+30 to STA 345+30 are recommended.

Figure 4-67: Looking Downstream at the Private Bridge to Innovative Plastics

Twin-barreled, 15-foot-wide, 135-foot long concrete culverts, owned by Rockland County, cross the creek at Old School Lane and Orangeburg Road (Figure 4-68). The structure currently passes up to the 500-year flows and does not create a substantial backwater. It is recommended that debris be cleared from the inlet and the left bank be widened immediately upstream of the structure to optimize culvert capacity.

Figure 4-68 Looking Upstream at the Old School Lane/Orangeburg Road Culvert Outlets

A concept map of this area is depicted in Figure 4-69. Flood reductions during the 100-year flood event are illustrated in Figure 4-70 (existing conditions) and Figure 4-71 (with the Innovative Plastics bridge removed and the channel widened).

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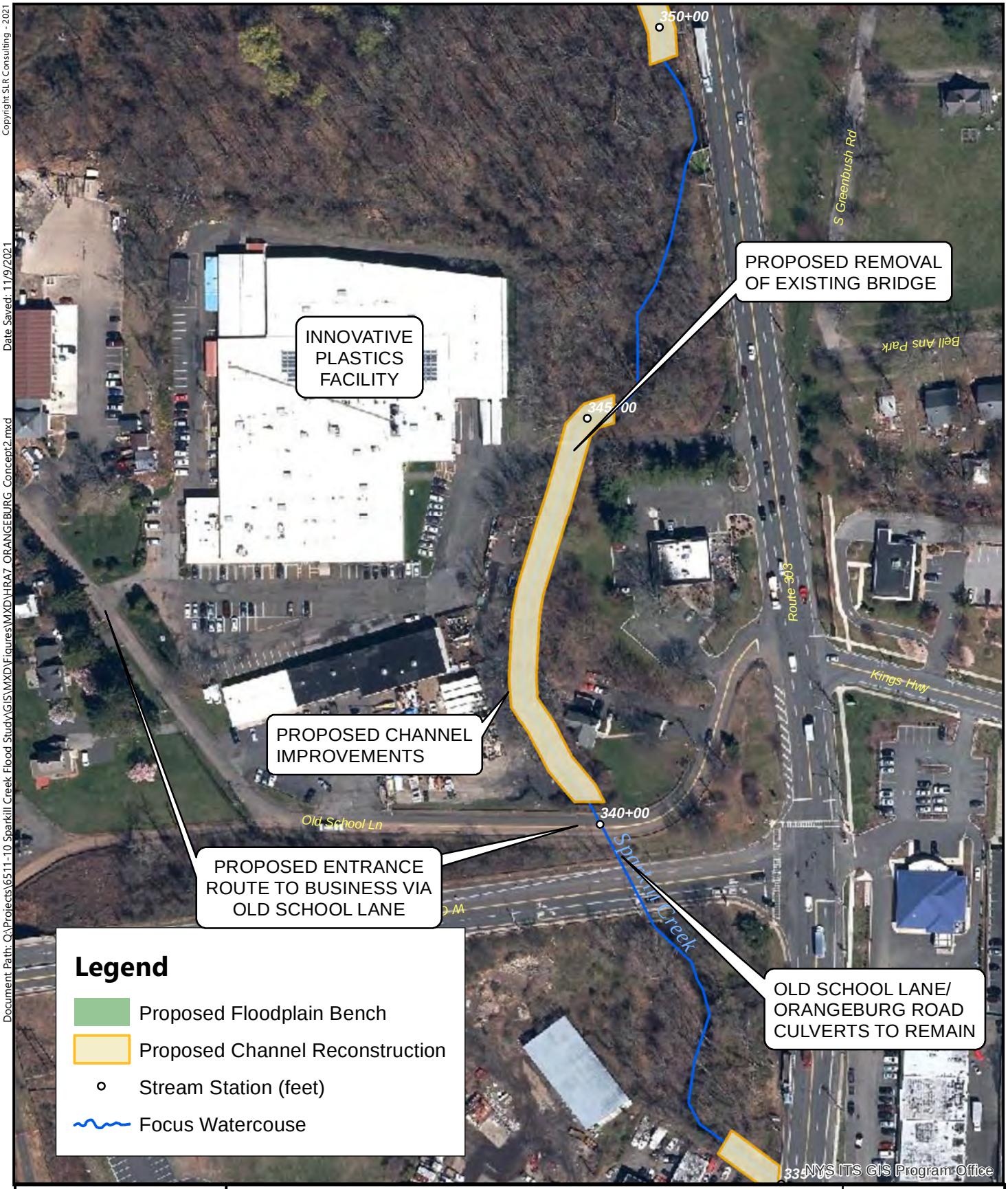
Document Path: Q:\Projects\6511-10 Sparkill Creek Flood Study\GIS\MXD\Figures\MXD\HRA7 ORANGEBURG Concept2.mxd



SLR

231 MAIN STREET
SUITE 102
NEW PALTZ, NY 12561
845.633.8153

HRA#7.2 - CONCEPT MAP

SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

N

0 150
Feet

SOURCE: 2016 AERIAL PHOTO, NYS ITS GIS Program Office

SCALE 1 " = 150 '

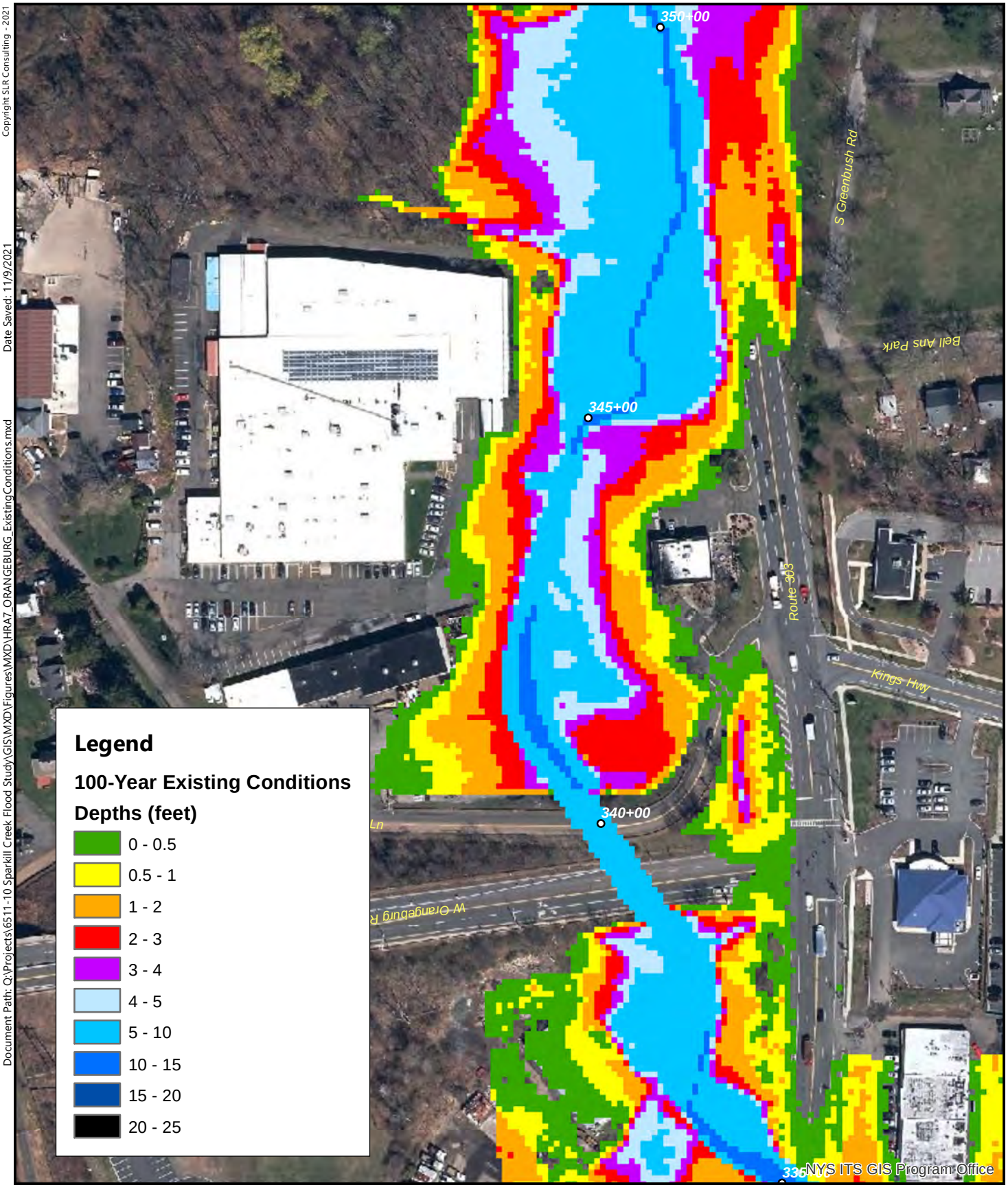
DATE 11/9/2021

PROJ. NO. 16511.00010

FIG. 4-69

Date Saved: 11/9/2021

Document Path: Q:\Projects\6511-10 Sparkill Creek Flood Study\GIS\MXD\Figures\MXD\HRA7_ORANGEBURG_ExistingConditions.mxd



Legend

100-Year Existing Conditions Depths (feet)

- 0 - 0.5
- 0.5 - 1
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 10
- 10 - 15
- 15 - 20
- 20 - 25

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231 MAIN STREET
SUITE 102
NEW PALTZ, NY 12561
845.633.8153

HRA #7.2 - 100-YEAR EXISTING CONDITIONS FLOOD DEPTHS

SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

N

0 150
Feet

SOURCE: 2016 AERIAL PHOTO, NYS ITS GIS Program Office

SCALE 1 " = 150 '

DATE 11/9/2021

PROJ. NO. 16511.00010

FIG. 4-70

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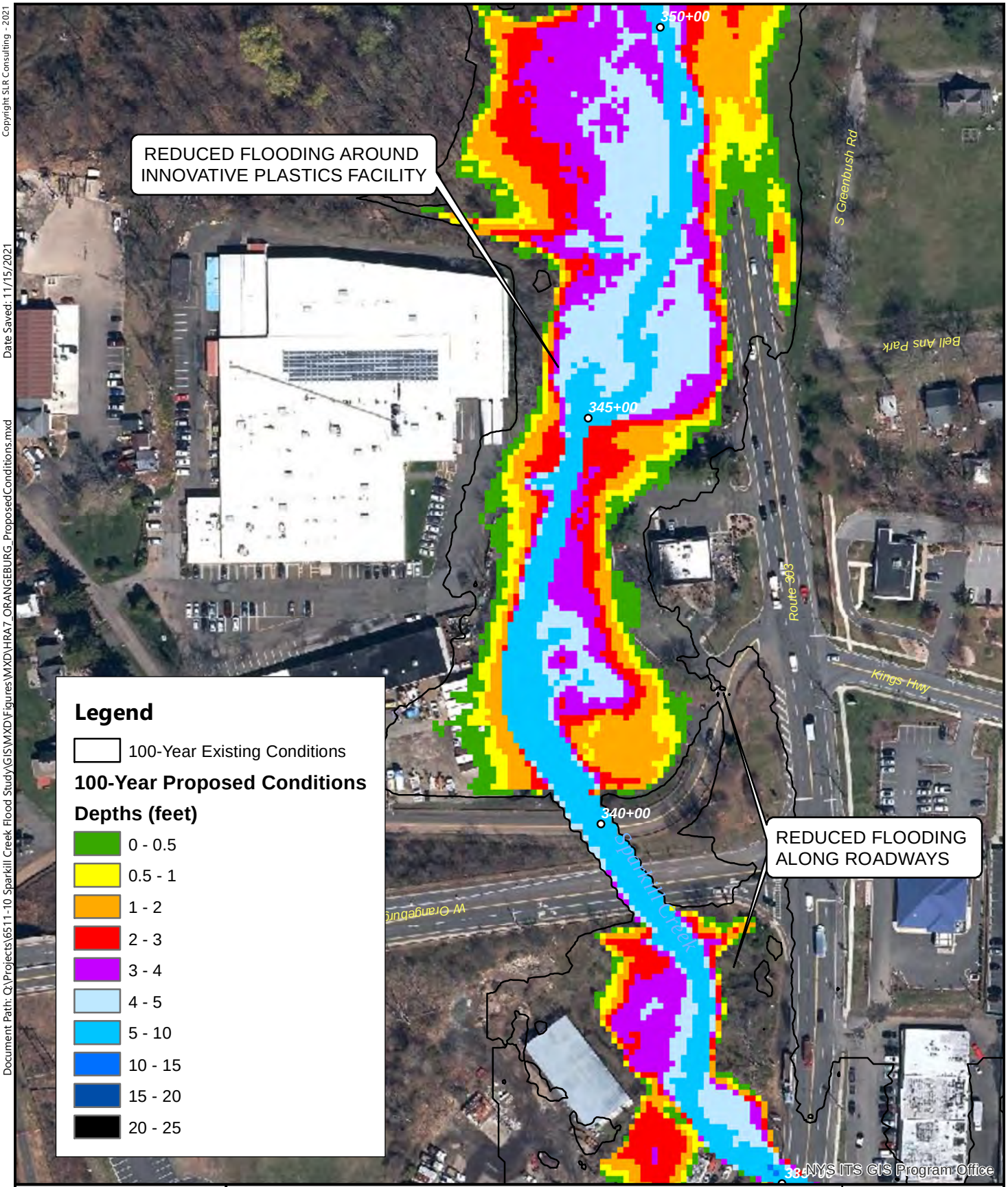

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HRA #7.2 - 100-YEAR PROPOSED CONDITIONS FLOOD DEPTHS

SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

N
0 150
Feet

SCALE 1 " = 150 '
DATE 11/15/2021
PROJ. NO. 16511.00010

FIG. 4-71

SOURCE: 2016 AERIAL PHOTO, NYS ITS GIS Program Office

4.7.3 ROUTE 303 BRIDGE/ROUTE 340 CULVERTS/ROCKLAND COUNTY SEWER

Three crossings complete the downstream end of HRA #7 in the area of State Route 303 (Figure 4-72), State Route 340 (Figure 4-73), both owned by NYSDOT, and the Rockland County Sewer Facility crossing. These crossings currently only pass up to the 10-year flood event and influence flooding across the roads and at the sewer facility.

Replacement of the existing crossings with new structures with spans of 40 feet, increasing the floodplain on the left bank upstream and downstream of the sewer facility driveway, and widening the channel to the bankfull width of 31 feet would result in reductions in flooding.

Figure 4-74 shows a conceptual layout of these flood mitigation alternatives. With these improvements, all three crossings can pass up to the 100-year flows. Flood reductions during the 10-year flood event are illustrated in Figure 4-75 (existing conditions) and Figure 4-76 (with proposed improvements implemented at the three crossings). Flood reductions during the 50-year flood event are illustrated in Figure 4-77 (existing conditions) and Figure 4-78 (proposed conditions). Flood reductions during the 100-year flood event are illustrated in Figure 4-79 (existing conditions) and Figure 4-80 (proposed conditions).

A summary of the proposed replacement structures and the findings of the hydraulic analysis, evaluated under current conditions and under future conditions projecting for changes in hydrology due to climate change, are listed on Table 4-3.

Figure 4-72: Looking Upstream at the Route 303 Bridge

Figure 4-73: Looking Downstream at the Route 340 Culverts, Large Woody Debris Accumulated at the Culvert Inlet

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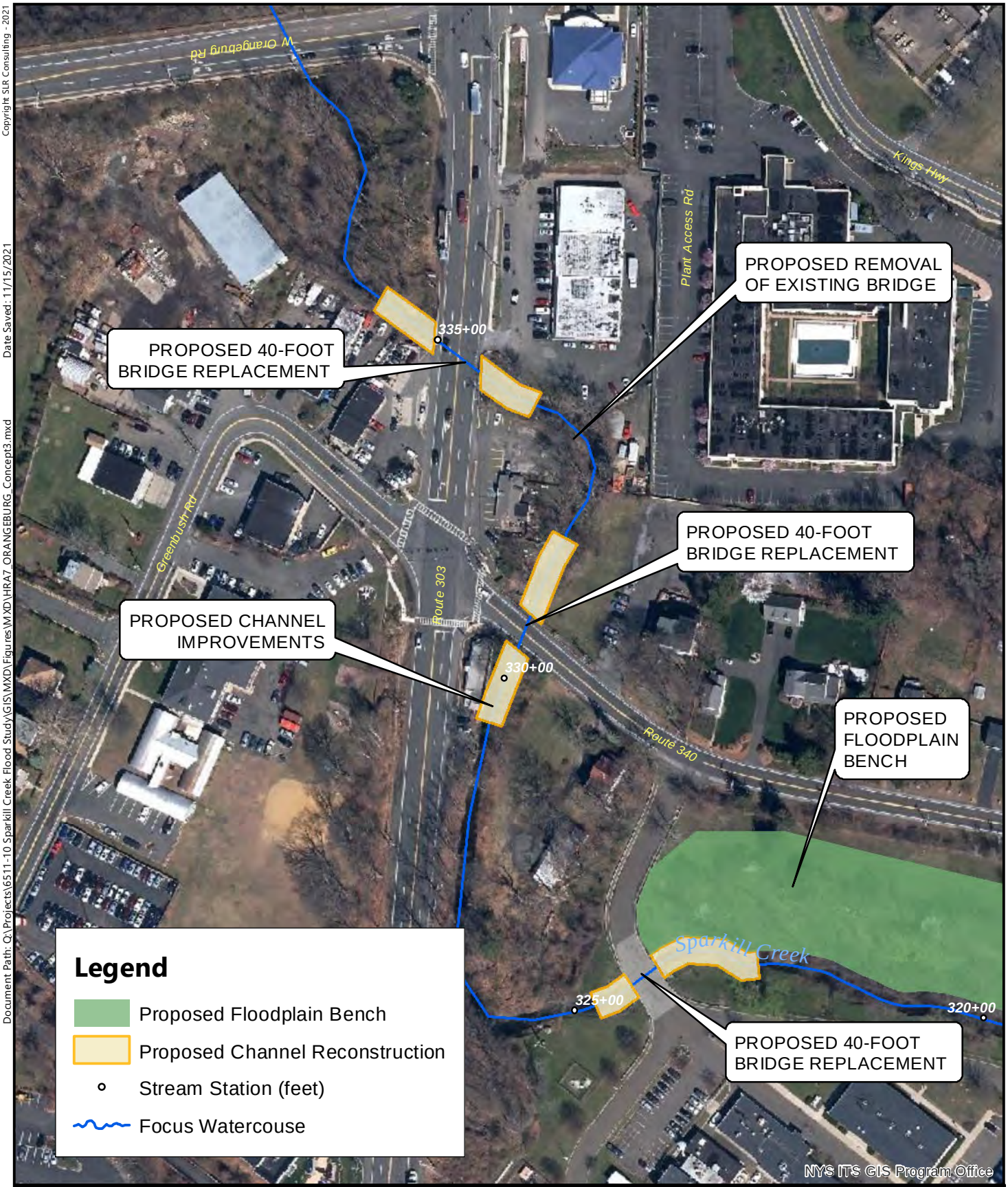

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HRA#7.3 - CONCEPT MAP

SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

N
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Feet

SCALE 1 " = 150 '
DATE 11/15/2021
PROJ. NO. 16511.00010

FIG. 4-74

SOURCE: 2016 AERIAL PHOTO, NYS ITS GIS Program Office

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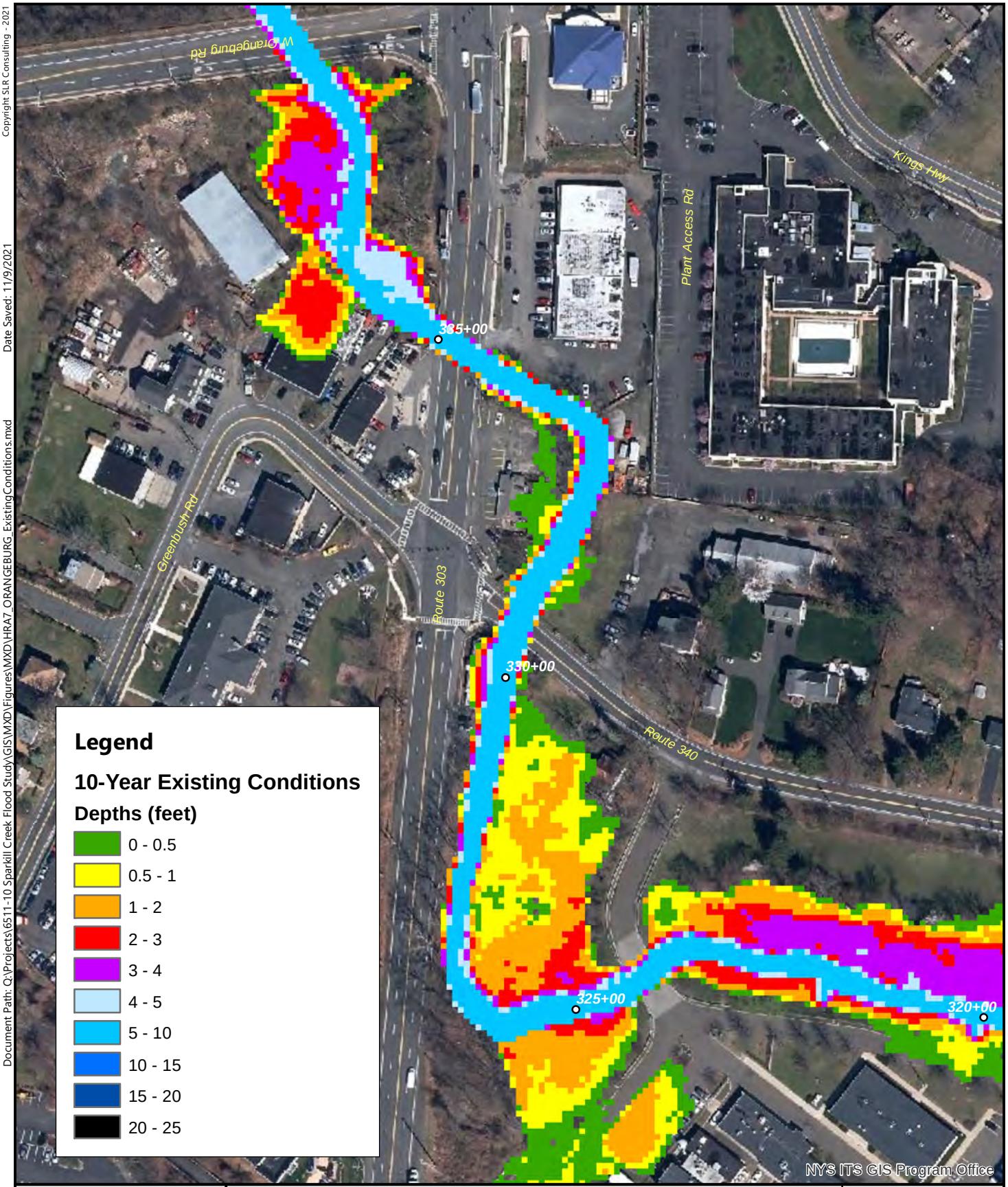

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HRA #7.3 - 10-YEAR EXISTING CONDITIONS FLOOD DEPTHS

SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

N
0 150
Feet

SCALE 1 " = 150 '
DATE 11/9/2021
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FIG. 4-75

SOURCE: 2016 AERIAL PHOTO, NYS ITS GIS Program Office

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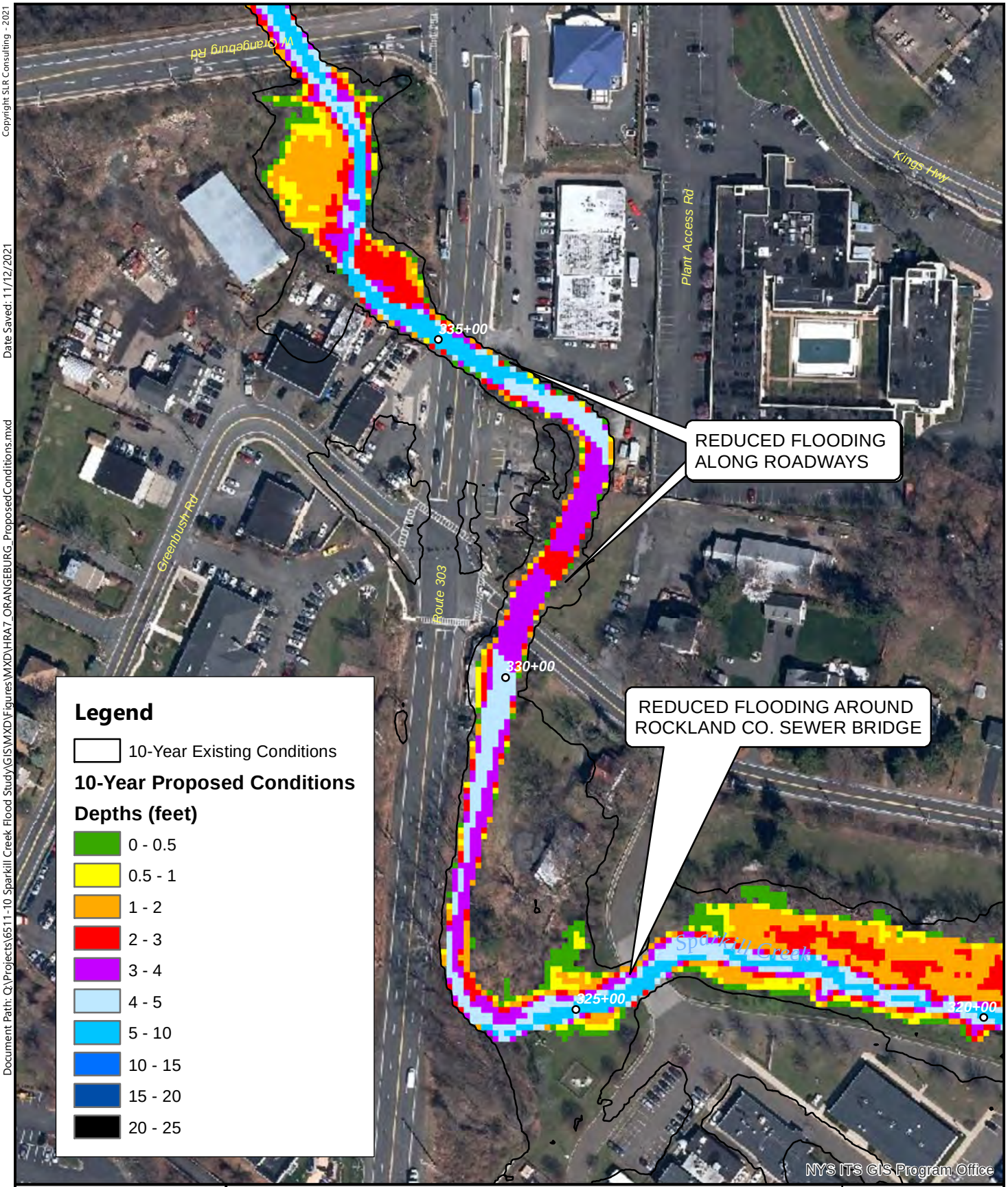

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HRA #7.3 - 10-YEAR PROPOSED CONDITIONS FLOOD DEPTHS

SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

N
0 150
Feet

SCALE 1 " = 150 '
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FIG. 4-76

SOURCE: 2016 AERIAL PHOTO, NYS ITS GIS Program Office

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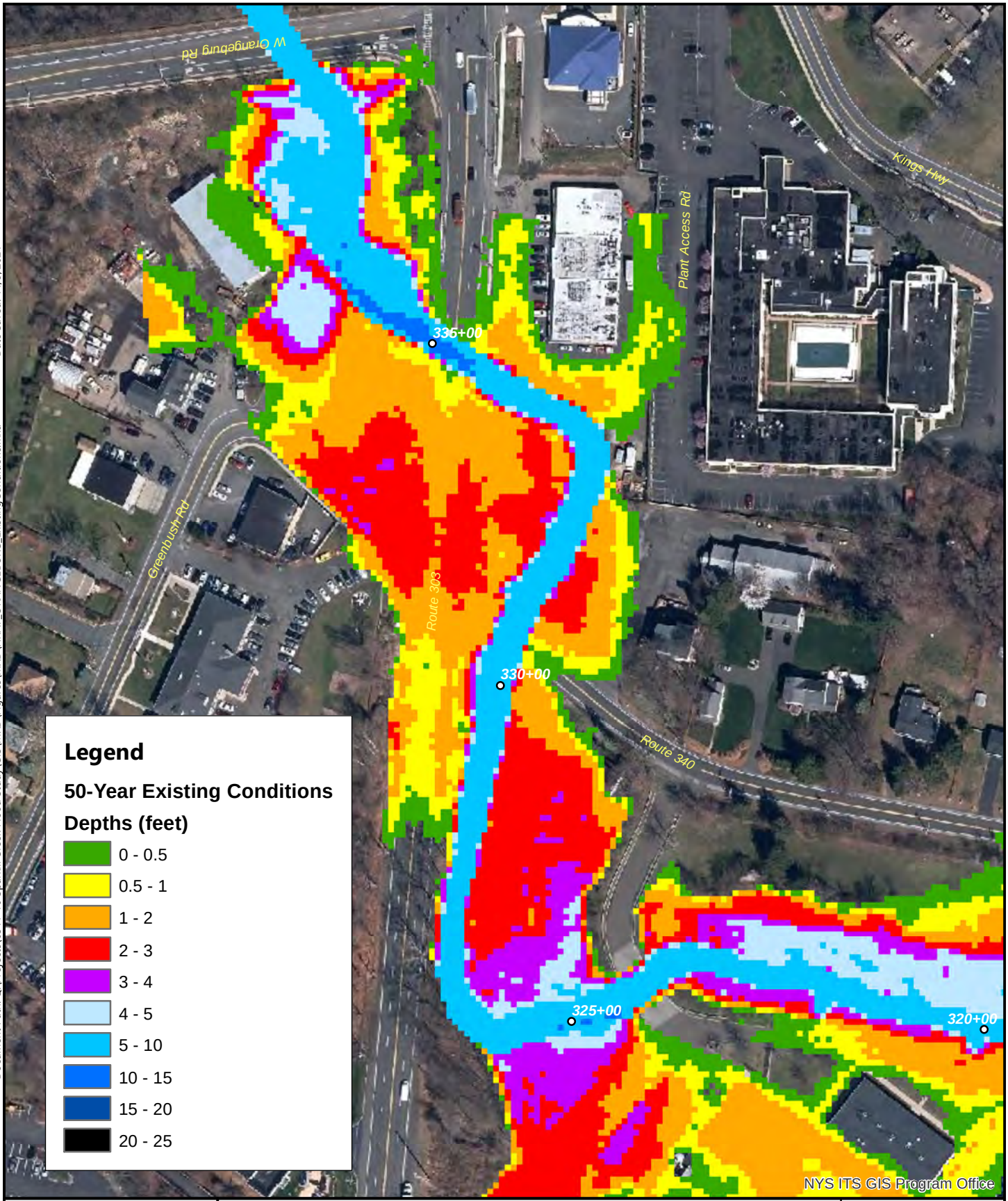

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HRA #7.3 - 50-YEAR EXISTING CONDITIONS FLOOD DEPTHS

SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

N
0 150
Feet

SOURCE: 2016 AERIAL PHOTO, NYS ITS GIS Program Office

SCALE 1 " = 150 '
DATE 11/9/2021
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FIG. 4-77

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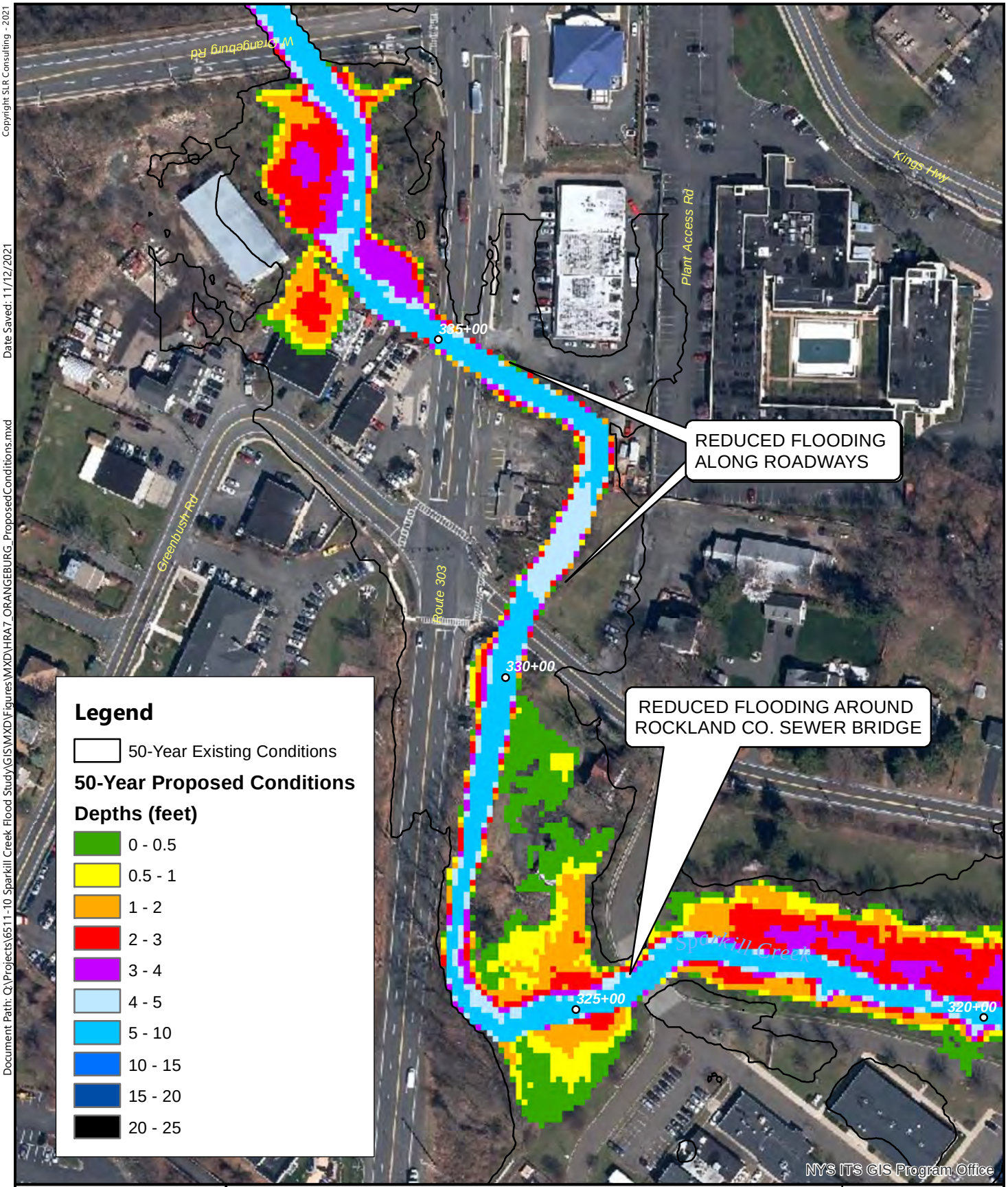

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HRA #7.3 - 50-YEAR PROPOSED CONDITIONS FLOOD DEPTHS

SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

N
0 150
Feet

SCALE 1 " = 150 '
DATE 11/15/2021
PROJ. NO. 16511.00010

FIG. 4-78

SOURCE: 2016 AERIAL PHOTO, NYS ITS GIS Program Office

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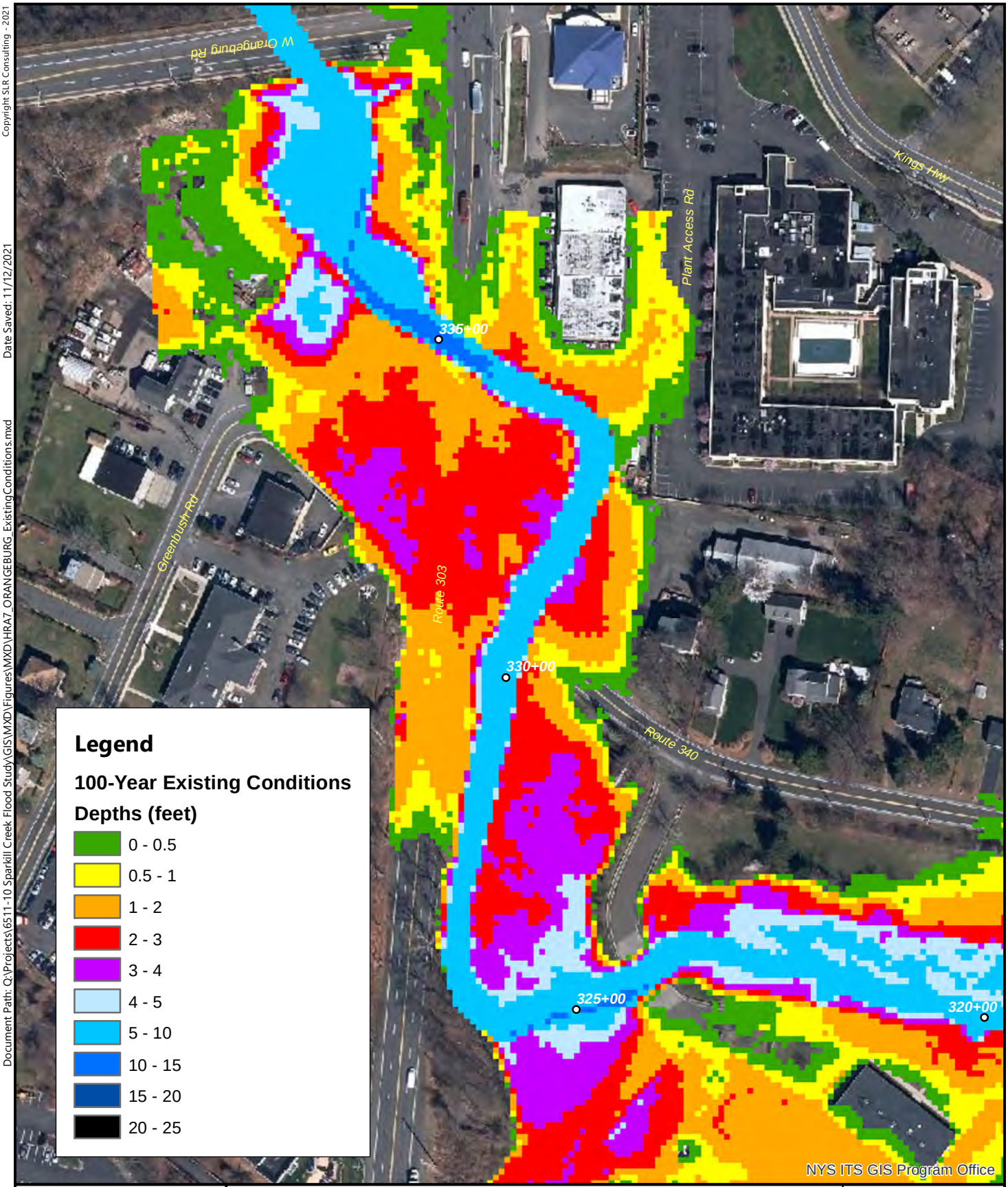

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HRA #7.3 - 100-YEAR EXISTING CONDITIONS FLOOD DEPTHS

SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

N

0 150
Feet

SOURCE: 2016 AERIAL PHOTO, NYS ITS GIS Program Office

SCALE 1 " = 150 '

DATE 11/15/2021

PROJ. NO. 16511.00010

FIG. 4-79

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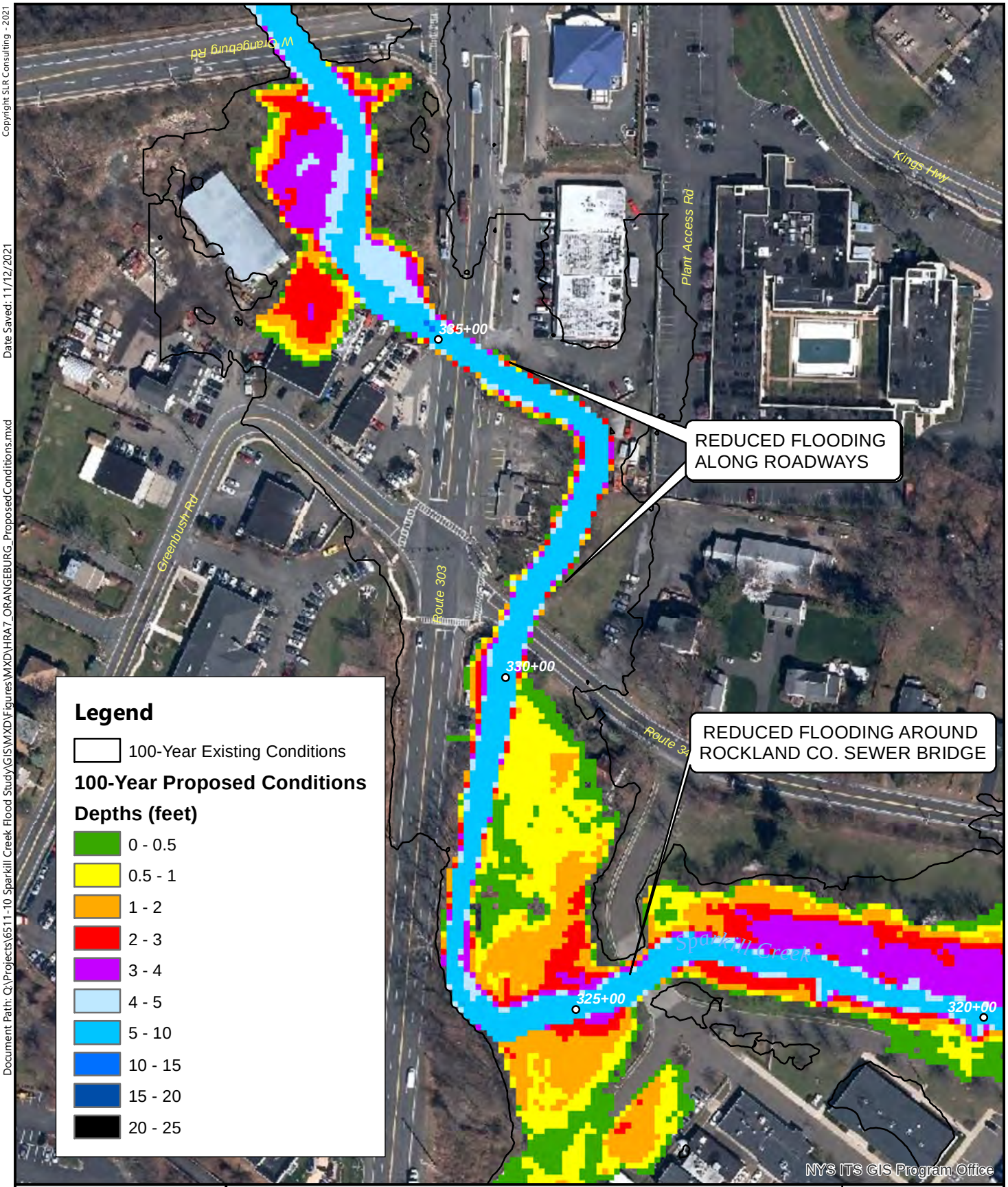

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HRA #7.3 - 100-YEAR PROPOSED CONDITIONS FLOOD DEPTHS

SPARKILL CREEK FLOOD & RESILIENCE STUDY
SD115
ROCKLAND COUNTY
NEW YORK

N

0 150
Feet

SCALE 1 " = 150 '

DATE 11/15/2021

PROJ. NO. 16511.00010

FIG. 4-80

SOURCE: 2016 AERIAL PHOTO, NYS ITS GIS Program Office

Table 4-3 Summary of Hydraulic Modeling Analysis for HRA 7

Stream Crossing	Existing Structure	NAACC Crossing Code / Aquatic Passability Score	Existing Flood Capacity	Modeled Replacement Structure	Replacement Structure Flood Capacity	
					Current Hydrology	Projected Future Flows to Account for Climate Change
Route 303	20' Span x ~5' Rise Concrete Slab Bridge	*xy4105106373945879* / 0.97 out of 1.0 *insignificant barrier*	10-Year	50' Span x ~6' Rise Bridge	100-Year	100-Year
Mountain View Road	17' Span x ~5' Rise Concrete Slab Bridge	*xy4105060573945976* / 0.97 out of 1.0 *insignificant barrier*	<10-Year	50' Span x ~5' Rise Bridge	10-Year	10-Year
Innovative Plastics Private Road	16' Span x ~5' Rise Concrete Slab Bridge	*N/A* No NAACC Assessment Available	<10-Year	Recommended Removal	N/A	N/A
Old School Lane/Orangeburg Road	Twin-Barrel 15' Span x ~8' Rise Concrete Box Culverts	*xy4104696873946447* / 0.84 out of 1.0, an *insignificant barrier*	500-Year	Hydraulically Adequate	500-Year	500-Year
Route 303	19' Span X ~9' Rise Concrete Slab Bridge	*xy4104577673945265* / 0.88 out of 1.0 *insignificant barrier*	10-Year	40' Span x ~9' Rise Bridge	100-year	100-Year
Route 340	Four 5'-Diameter Corrugated Metal Pipes	*xy4104491073944955* / 0.59 out of 1.0 *moderate barrier*	10-Year	40' Span x 5' Rise Bridge	100-Year	100-Year
Rockland County Sewer Bridge	22' Span x ~10' Rise Concrete Slab Bridge	*N/A* No NAACC Assessment Available	10-Year	40' Span x ~10 Rise Bridge	100-Year	100-Year

4.8 HIGH RISK AREA #8 - HEADWATERS

HRA 8 is located near the headwaters of Sparkill Creek in the hamlet of Orangeburg and is depicted in Figure 4-81. The watershed of the creek at this location is less than 1 square mile. For this analysis, HRA 8 is broken into two subareas. The first includes Sparkill Creek as it flows through the neighborhood along the west side of Greenbush Road between Spruce Street and Erie Street. The second includes two small, unnamed tributaries to Sparkill Creek that pass under South Greenbush Road and Greenbush Road.

4.8.1 GREENBUSH ROAD NEIGHBORHOOD

The crossings in the Greenbush Road Neighborhood include several small, private driveway culverts as well as the public roadway crossings at Erie, Hickory, and Spruce Streets. Of the nine crossings assessed in the Greenbush Road neighborhood, only Spruce Street passes the 10-year flood event, and no structure passes flows greater than the 10-year flood event. There is no hydraulic model available for this section of Sparkill Creek; therefore, stream stationing is not used in specifying the location of the crossings within HRA 8.

Replacement of all nine crossings described above with new structures with spans of 28 feet and widening the channel to the bankfull width of 22 feet would result in substantial reductions in flooding. Increasing the rise of the Hickory Street culvert from 2 feet to 4 feet and removing the pedestrian bridge just upstream of this crossing would further reduce flooding. Because many of the crossings are privately owned culverts under residential driveways, close cooperation with residents will be required.

A concept map showing the improvements described above is shown in Figure 4-82. A summary of the proposed replacement structures and the findings of the hydraulic analysis, evaluated under current conditions and under future conditions projecting for changes in hydrology due to climate change, are listed on Table 4-4. Flood reductions during the 10-year flood event are illustrated in Figure 4-83 (existing conditions) and Figure 4-84 (with proposed improvements implemented at all nine crossings). Flood reductions during the 50-year flood event are illustrated in Figure 4-85 (existing conditions) and Figure 4-86 (proposed conditions). Flood reductions during the 100-year flood event are illustrated in Figure 4-87 (existing conditions) and Figure 4-88 (proposed conditions).