



## **MVP Southgate Project**

Docket No. CP19-14-000

## **Post-Application Environmental Information Request #4**

### **Attachments**

October 2019



## **MVP Southgate Project**

Docket No. CP19-14-000

### **Attachment 5-1**

## **Locations of Remaining Biological and Cultural Surveys Along the MVP Southgate Pipeline**

October 2019

**REVISED [Oct 2019] - Table 3-3**

**Locations of Remaining Biological Surveys Along the MVP Southgate Pipeline**

<b>Parcel ID</b>	<b>MP Start</b>	<b>MP End</b>	<b>Length (Feet)</b>	<b>Justification</b>
NC-RO-081.000	37.72	37.76	213	No Access
NC-RO-080.000	37.76	37.84	469	No Access
NC-RO-173.000	49.93 RR	50.13 RR	1,051	Re-Route with No Access
NC-RO-177.000	50.34 RR	50.46 RR	628	Re-Route with No Access
NC-RO-178.000	50.46 RR	50.59 RR	678	Re-Route with No Access
NC-AL-000.020	52.77	52.91	782	Access agreement signed 8-20-2019
NC-AL-050.000	58.23	58.53	1,593	Access agreement signed 10-1-2019
NC-AL-052.000	58.67 RR	58.9	1,433	Re-Route
NC-AL-053.000	58.90 RR	59.22 RR	1,675	Re-Route
NC-AL-055.000	59.22 RR	59.33 RR	631	Re-Route with No Access
NC-AL-054.000.RC	59.33 RR	59.35 RR	66	Re-Route with No Access
NC-AL-061.000	59.35 RR	59.39 RR	206	Re-Route with No Access
NC-AL-062.000	59.39 RR	59.41 RR	109	Re-Route
NC-AL-063.000	59.41 RR	59.46 RR	289	Re-Route with No Access
NC-AL-064.000	59.46 RR	59.52 RR	332	Re-Route with No Access
NC-AL-064.000	59.53 RR	59.72	904	Re-Route with No Access
FA4-AL-002.000	65.99 RR	66.09 RR	505	Re-Route
FA3-AL-007.000	66.50 RR	66.55 RR	243	Re-Route with No Access
FA3-AL-009.000	66.65 RR	66.82 RR	906	Re-Route with No Access
NC-AL-129.000	66.90 RR	67.12 RR	1,136	Re-Route with No Access
NC-AL-128.000	67.12 RR	67.13 RR	77	Re-Route
NC-AL-131.000	67.13 RR	67.21 RR	429	Re-Route with No Access
NC-AL-128.000	67.21 RR	67.26 RR	240	Re-Route with No Access
NC-AL-131.000	67.26 RR	67.27 RR	51	Re-Route
NC-AL-145.000	68.47	68.57	525	Access agreement signed 9-16-2019
NC-AL-144.000	68.57	68.65	415	Access agreement signed 9-16-2019
NC-AL-166.000	69.47	69.56 RR	463	Re-Route with No Access
NC-AL-194.000	71.87	71.93 RR	286	Access Rescinded
NC-AL-196.000	72.11	72.20	451	No Access
NC-AL-206.000	72.84 RR	72.85 RR	19	Re-Route with No Access

REVISED [Oct 2019] - Table 3.4

## Areas along MVP Southgate Pipeline Alignment Where Cultural Survey is Outstanding

Parcel ID	MP Start	MP End	Length (feet)	Justifications
VA-PI-053.000	9.72	9.85	645	Re-Route
VA-PI-090.000	13.53 RR	13.55 RR	91	Re-Route
NC-RO-006.000	27.65 RR	27.67 RR	114	Re-Route
NC-RO-042.000	33.60	33.88	1,465	No Access
NC-RO-081.000	37.72	37.76	213	No Access
NC-RO-080.000	37.76	37.84	469	No Access
NC-RO-143.000	46.01 RR	46.27 RR	1,354	Re-Route with No Access
NC-RO-173.000	49.93 RR	50.13 RR	1,051	Re-Route with No Access
NC-RO-177.000	50.34 RR	50.46 RR	628	Re-Route with No Access
NC-RO-178.000	50.46 RR	50.59 RR	678	Re-Route with No Access
NC-RO-183.000	51.65 RR	51.67 RR	133	Re-Route
NC-GU-001.000	52.42 RR	52.42 RR	25	Re-Route
NC-RO-184.000	52.42 RR	52.43 RR	50	Re-Route
NC-AL-000.020	52.77	52.91	782	Access agreement signed 8-20-2019
NC-AL-004.000	53.89	53.90	56	No Access
NC-AL-046.000	57.86	58.23	1,926	No Access
NC-AL-050.000	58.23	58.53	1,593	Access agreement signed 10-1-2019
NC-AL-052.00	58.67 RR	58.90 RR	1,433	Re-Route
NC-AL-053.00	58.90 RR	59.22 RR	1,675	Re-Route
NC-AL-055.000	59.22 RR	59.33 RR	631	Re-Route with No Access
NC-AL-054.000.RC	59.33 RR	59.35 RR	66	Re-Route with No Access
NC-AL-061.000	59.35 RR	59.39 RR	206	Re-Route with No Access
NC-AL-062.000	59.39 RR	59.41 RR	109	Re-Route
NC-AL-063.000	59.41 RR	59.46 RR	289	Re-Route with No Access
NC-AL-064.000	59.46 RR	59.52 RR	332	Re-Route with No Access
NC-AL-064.000	59.53 RR	59.72	904	Re-Route with No Access
MVF-NC-AL-005.000	64.62	64.68	332	No Access
MVF-NC-AL-006.000	64.68	64.69	46	No Access
MVF-NC-AL-005.000	64.69	64.78	505	No Access
FA4-AL-002.000	65.99 RR	66.09 RR	505	Re-Route
FA3-AL-007.000	66.50 RR	66.55 RR	243	Re-Route with No Access
FA3-AL-009.000	66.65 RR	66.82 RR	906	Re-Route with No Access
NC-AL-129.000	66.90 RR	67.12 RR	1,136	Re-Route with No Access
NC-AL-128.000	67.12 RR	67.13 RR	77	Re-Route with No Access
NC-AL-131.000	67.13 RR	67.21 RR	429	Re-Route
NC-AL-131.000	67.26 RR	67.27 RR	51	Re-Route
NC-AL-145.000	68.47	68.57	525	Access agreement signed 9-16-2019
NC-AL-144.000	68.57	68.65	415	Access agreement signed 9-16-2019



**REVISED [Oct 2019] - Table 3.4****Areas along MVP Southgate Pipeline Alignment Where Cultural Survey is Outstanding**

<b>Parcel ID</b>	<b>MP Start</b>	<b>MP End</b>	<b>Length (feet)</b>	<b>Justifications</b>
NC-AL-166.000	69.47	69.56 RR	463	Re-Route with No Access
NC-AL-166.000	69.74 RR	69.76 RR	101	Re-Route with No Access
NC-AL-182.000	69.76 RR	69.80 RR	173	Re-Route
NC-AL-174.130	69.80 RR	69.82 RR	104	Re-Route (small portion of eastern side of parcel)
NC-AL-194.000	71.91	71.94 RR	137	Access Rescinded
NC-AL-194.000	72.01 RR	72.06	323	Access Rescinded
NC-AL-195.000	72.06	72.11	271	Re-Route
NC-AL-196.000	72.11	72.20	451	No Access
NC-AL-206.000	72.84 RR	72.85 RR	19	Re-Route with No Access

REVISED [Oct 2019] - Table 3.5-1

Federally- and State-Listed Fish, Plant, and Wildlife Species with the Potential to Occur Along the MVP Southgate Project Route

Common Name	Scientific Name	Status			Survey Locations and Status
		Federal <u>a</u> /	VA <u>b</u> /	NC <u>c</u> /	
Arthropods					
Carolina ladle crayfish	<i>Cambarus davidi</i>			SR	Carolina ladle crayfish surveys are complete in North Carolina as of October 2019. No crayfish surveys are required in Virginia. The Project continues to consult with NRWRC regarding Greensboro burrowing crayfish.
Greensboro burrowing crayfish	<i>Cambarus catagius</i>			SC, SGCN	
Amphibians					
Four-toed salamander	<i>Hemidactylum scutatum</i>			SC, SGCN	A desktop habitat assessment for four-toed and mole salamanders will be submitted to NCWRC in October 2019. No salamander surveys are required in Virginia.
Mole salamander	<i>Ambystoma talpoideum</i>		W(II)	SC, SGCN	
Fish					
Cape Fear shiner	<i>Notropis mekistocholas</i>	E <sup>d/</sup>		E, SGCN <sup>d/</sup>	Targeted surveys are not required.
Riverweed Darter	<i>Etheostoma podostemone</i>			SC	
Roanoke logperch	<i>Percina rex</i>	E	E	E, SGCN	
Mammals					
Eastern big-eared bat	<i>Corynorhinus rafinesquii macrotis</i>	SC <sup>d/</sup>	E <sup>d/</sup>	SC, SGCN <sup>d/</sup>	See Appendix 3-A Resource Report 3 for the approved Bat Survey Study Plan and comprehensive Bat Survey Report.
Eastern red bat	<i>Lasiurus borealis</i>		W(IV)		
Eastern small-footed bat	<i>Myotis leibii</i>	SC <sup>d/</sup>	W(I) <sup>d/</sup>	SC, SGCN <sup>d/</sup>	
Northern yellow bat	<i>Lasiurus intermedius</i>			SC, SGCN <sup>d/</sup>	
Gray bat	<i>Myotis grisescens</i>	E <sup>d/</sup>	E <sup>d/</sup>	E, SGCN <sup>d/</sup>	
Hoary bat	<i>Lasiurus cinereus</i>		W(IV)		
Indiana Bat	<i>Myotis sodalis</i>	E <sup>d/</sup>	E <sup>d/</sup>	E, SGCN <sup>d/</sup>	
Little brown bat	<i>Myotis lucifugus</i>		E <sup>d/</sup>	SR, SGCN	
Northern Long-eared bat	<i>Myotis septentrionalis</i>	T	T	T, SGCN	
Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii rafinesqui</i>	SC <sup>d/</sup>	E <sup>d/</sup>	T, SGCN <sup>d/</sup>	
Silver-haired bat	<i>Lasionycteris noctivagans</i>		W(IV)		
Southeastern bat	<i>Myotis austroriparius</i>	SC <sup>d/</sup>	W(I) <sup>d/</sup>	SC, SGCN <sup>d/</sup>	
Tri-colored bat	<i>Perimyotis subflavus</i>		E	SR, SGCN	
Virginia big-eared bat	<i>Corynorhinus townsendii virginianus</i>	E <sup>d/</sup>	E <sup>d/</sup>	E, SGCN <sup>d/</sup>	

REVISED [Oct 2019] - Table 3.5-1

## Federally- and State-Listed Fish, Plant, and Wildlife Species with the Potential to Occur Along the MVP Southgate Project Route

Common Name	Scientific Name	Status			Survey Locations and Status
		Federal <u>a</u> /	VA <u>b</u> /	NC <u>c</u> /	
Mussels					
Atlantic pigtoe	<i>Fusconaia masoni</i>	PT	T	E, SGCN <sup>d/</sup>	Mussel surveys are complete in both VA and NC as of October 2019.
Eastern Creekshell	<i>Villosa delumbis</i>			SR, SGCN	
Eastern Lampmussel	<i>Lampsilis radiata</i>			T, SGCN	
Green Floater	<i>Lasmigona subviridis</i>	SC	T	E, SGCN	
James Spiny mussel	<i>Parvaspina collina</i>	E	E <sup>d/</sup>	E, SGCN	
Savannah lilliput	<i>Toxolasma pullus</i>			E, SGCN <sup>d/</sup>	
Yellow Lampmussel	<i>Lampsilis cariosa</i>	SC	W(II)	E, SGCN	
Yellow Lance	<i>Elliptio lanceolata</i>	T <sup>d/</sup>		E, SGCN <sup>d/</sup>	
Plants					
American Bluehearts	<i>Buchnera americana</i>		R		Surveys were completed in June 2019. Low potential habitat identified within the Project area; no plants identified. Impacts will be avoided by implementing Plan & Procedures and Invasive Species Plan.
Cliff Stonecrop	<i>Sedum glaucophyllum</i>			SR	No survey requested or planned. Potential impacts will be avoided by implementing Plan & Procedures and Invasive Species Plan.
Dow ny phlox	<i>Phlox pilosa</i>		R		Surveys were completed in June 2019. Low potential habitat identified within the Project area; no plants identified. Impacts will be avoided by implementing Plan & Procedures and Invasive Species Plan.
Piedmont Barbara's-button	<i>Marshallia obovate</i> var. <i>obovate</i>		R		Surveys were completed in June 2019. Low potential habitat identified within the Project area; no plants identified. Impacts will be avoided by implementing Plan & Procedures and Invasive Species Plan.
Small whorled pogonia	<i>Isotria medeoloides</i>	T	E <sup>d/</sup>	T	Surveys were completed between June 17 and October 3, 2019. Low suitability habitat was identified within the Project area, no plants identified.
Smooth coneflower	<i>Echinacea laevigata</i>	E	T <sup>d/</sup>	E	Surveys were completed between June 17 and October 3, 2019. No habitat was identified within the Project area, no plants identified.

**REVISED [Oct 2019] - Table 3.5-1**

**Federally- and State-Listed Fish, Plant, and Wildlife Species with the Potential to Occur Along the MVP Southgate Project Route**

Common Name	Scientific Name	Status			Survey Locations and Status
		Federal <u>a/</u>	VA <u>b/</u>	NC <u>c/</u>	
<u>a/</u> Federal Status. E = Listed Endangered; T = Listed Threatened; PT = Proposed Threatened; SC = Species of Concern, a list maintained by USFWS Raleigh Field Office					
<u>b/</u> Virginia Status. E = Listed Endangered; T = Listed Threatened; R = Rare, including both Critically Imperiled and Imperiled state ranking; W (I) = Wildlife Action Plan, Tier I; W (II) = Wildlife Action Plan, Tier II; W (III) = Wildlife Action Plan, Tier III; W (IV) = Wildlife Action Plan, Tier IV					
<u>c/</u> North Carolina Status. E = Listed Endangered; T = Listed Threatened; SC = Species of Special Concern; SR = Significantly Rare; SGCN = Species of Greatest Conservation Need as listed in the Wildlife Action Plan					
<u>d/</u> Species not known to occur within the Project area.					
Sources: Townsend, 2018; Roble, 2016; NCNHP, 2016; NCNHP, 2017; VDGIF, 2015; and NCWRC, 2015					



## **MVP Southgate Project**

Docket No. CP19-14-000

### **Attachment 10-1**

#### **Lambert Compressor Station Ambient Survey Technical Addendum**

October 2019

October 14, 2019

Mr. Neil Florentine  
Manager, Design Engineering  
Equitrans Midstream

Office: (412) 553-5936  
NFlorentine@equitransmidstream.com

**Re: Addendum – Graphical Ambient Sound Level Measurement Results  
Lambert Compressor Station**

Dear Mr. Florentine,

Per your request, SLR International Corporation (SLR) is pleased to provide the graphical presentation of the sound level data collected during the ambient sound level survey in the area of the proposed Lambert Compressor Station (Lambert CS).

SLR performed a sound level survey as part of the Southgate Project for the proposed Lambert CS. Sound levels were measured at locations close to the nearest four NSAs to the proposed Lambert CS site. Three measurement locations were chosen to be representative of ambient levels at the four NSAs. The Resource Report 9 for the project contains the sound level survey details including:

- measurement personnel,
- measurement location map and descriptions,
- equipment used,
- weather conditions,
- audible sources,
- and all other sound level survey information.

The attached **Graphs 1, 2, and 3** provide the graphical sound level measurement results at the three measurement locations. Each graph presents the sound level measurement results at a single location. Each graph is the result of a single night of measurements at a single location. The top section of each graph shows the ten-second  $L_{eq}$ , represented by a solid blue line, the 15-minute  $L_{eq}$ , a stepped red line, and the 15-minute  $L_{90}$ , a stepped green line.

The bottom section of each Graph shows the frequency-based data. Sound frequency is plotted on the vertical axis and time on the horizontal axis. The color indicates the A-weighted sound pressure level at each frequency. The frequency data is useful for determining the presence of any tonal frequencies and helps to characterize the presence of specific noise emissions. For example, the presence of insect noise is clearly visible starting at approximately 9:00 pm on July 18, 2018 on all three Graphs.

Please contact me if you have any questions or comments.

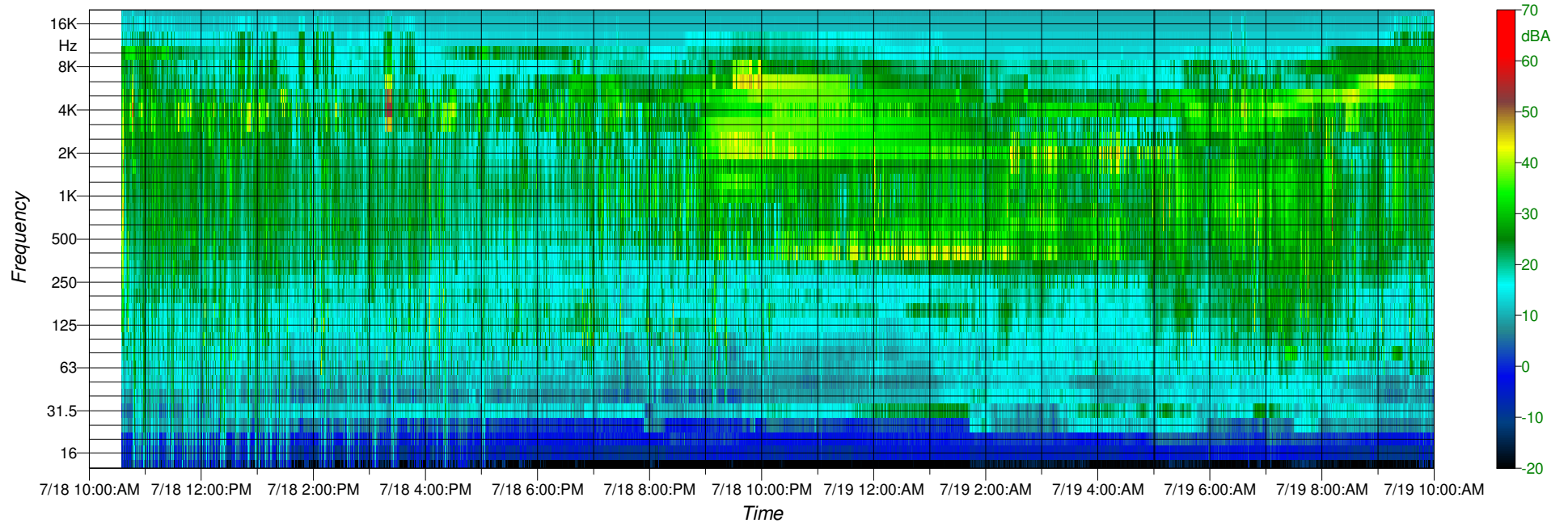
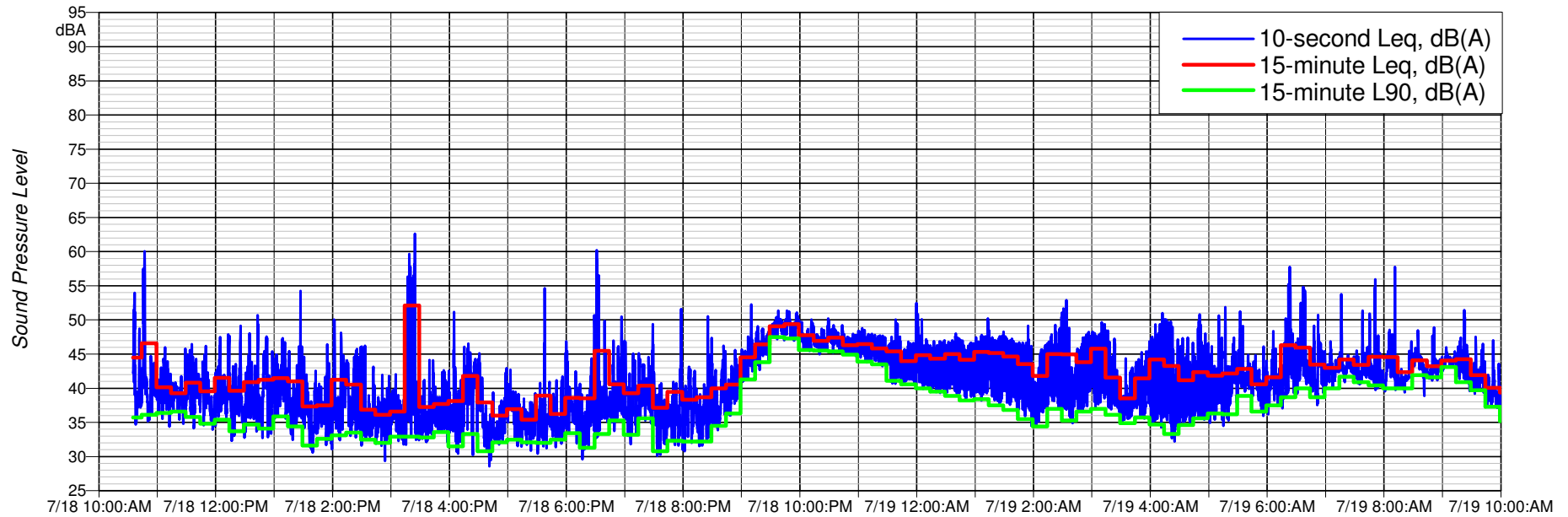
Sincerely,  
**SLR International Corporation**



David M. Jones, P.E., INCE Bd. Cert.  
Principal Engineer

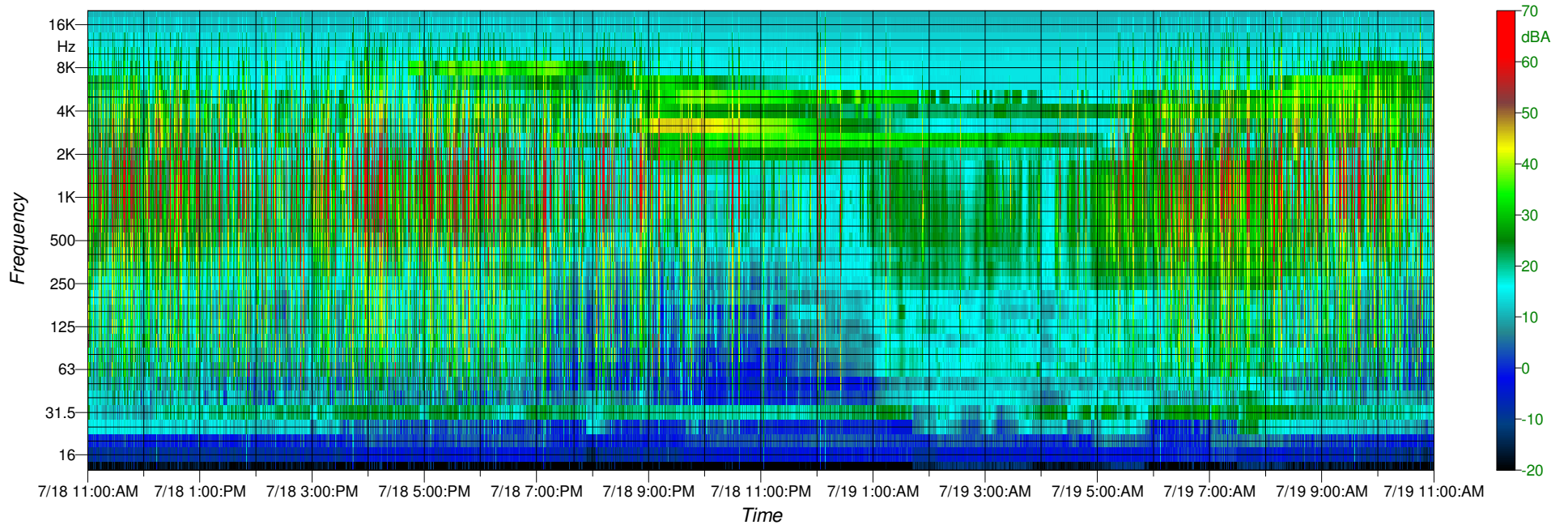
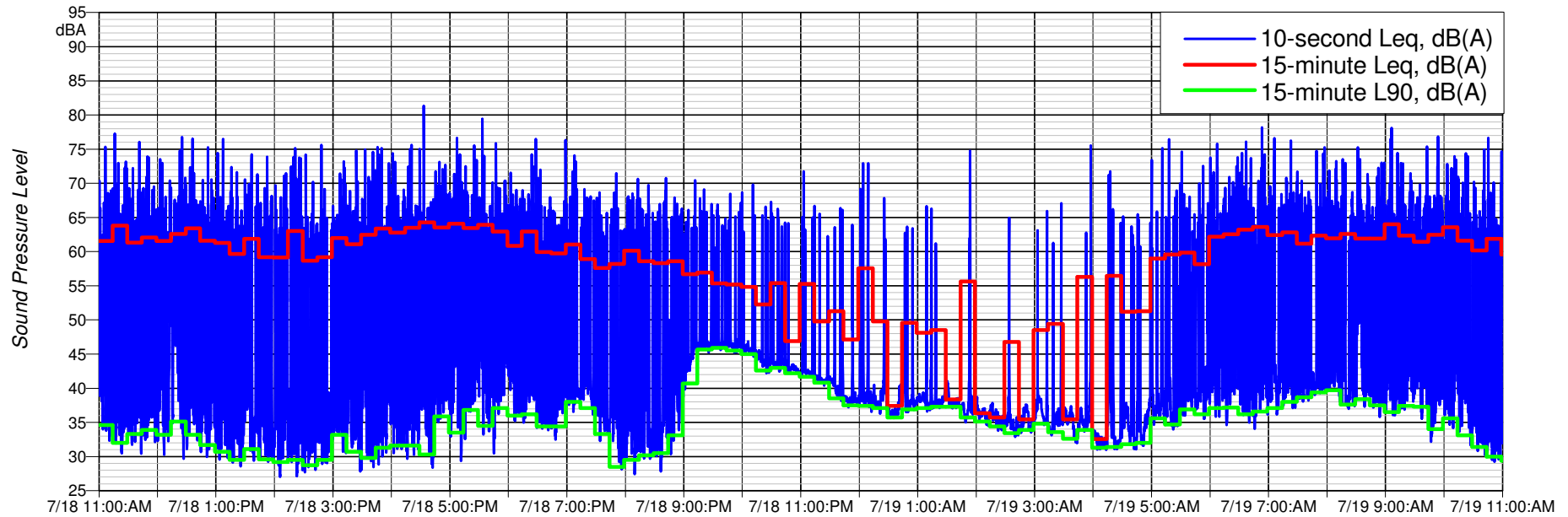
Enc     Graphs 1, 2, and 3

**Graph 1: NSAs 1 & 2  
Lambert CS**

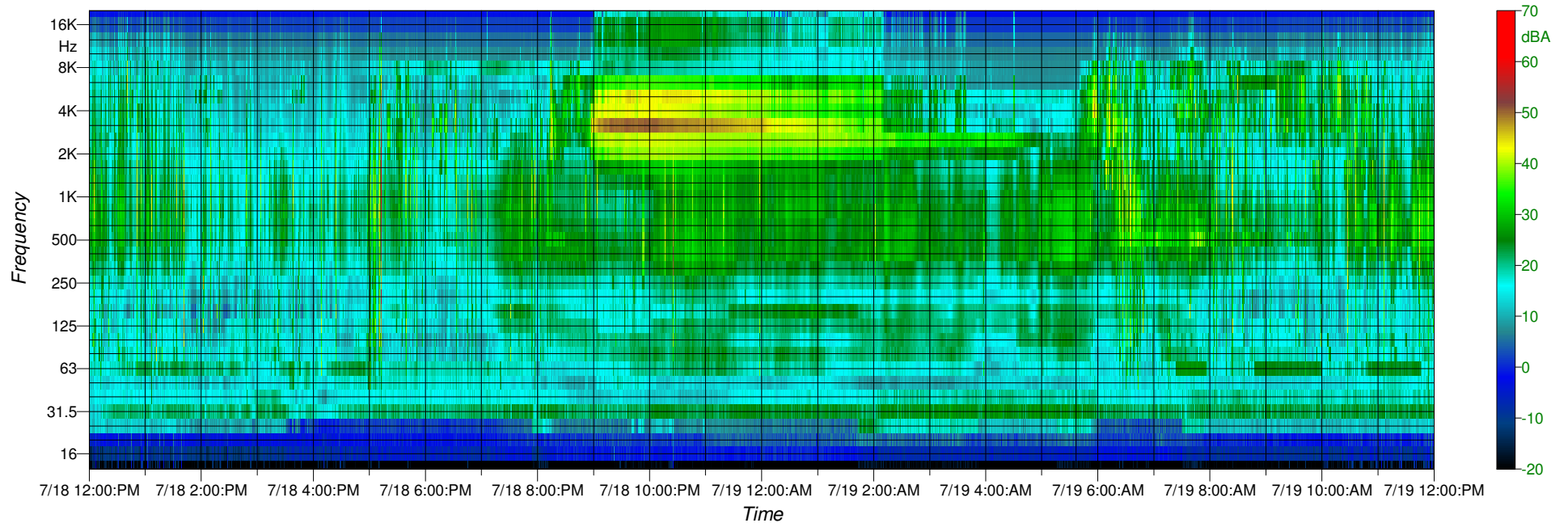
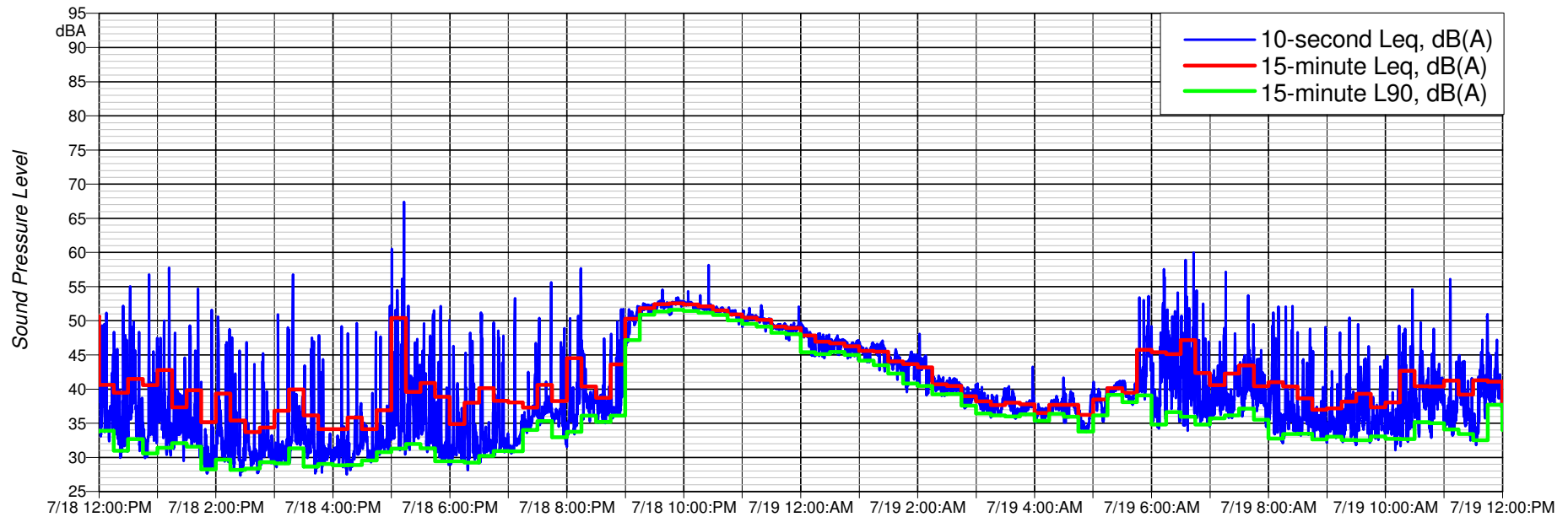




**Graph 2: NSA 3  
Lambert CS**



**Graph 3: NSA 4  
Lambert CS**





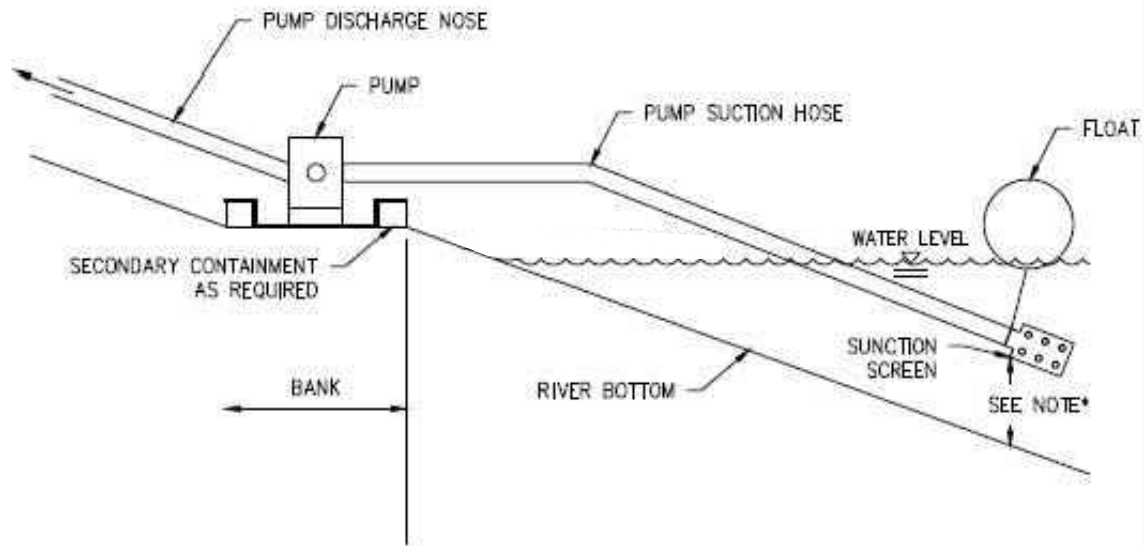
## **MVP Southgate Project**

Docket No. CP19-14-000

### **Attachment 12-1**

**Water Withdrawal – Floating Pump Intake with  
Hose Environmental Typical  
[Drawing No. MVP-SG-ES63 (NC and VA)]**

October 2019



PROFILE  
SCALE: N.T.S.

NOTES:

- \* CONTRACTOR SHALL MAINTAIN A SUFFICIENT DISTANCE FROM THE BOTTOM OF THE WATERBODY TO THE PUMP INTAKE TO PREVENT SEDIMENT FROM ENTERING THE SYSTEM.
- \* WITHDRAW NO MORE THAN 10% OF THE INSTANTANEOUS FLOW RATE FROM THE CHANNEL;
- \* SCREEN INTAKE OPENINGS NO LARGER THAN 1 MILLIMETER AND;
- \* SCREEN FACE INTAKE VELOCITIES MUST BE NO GREATER THAN 0.25 FEET PER SECOND

FLOATING PUMP INTAKE WITH HOSE

DRAWN	DATE
CHECKED	DATE
APP'D	DATE 08/11/17
SCALE N.T.S.	SHEET 1 OF 1
JOB NO.	
PROJECT ID:	
MVP – VA PORTION	



**Mountain**  
**Valley**

PIPELINE

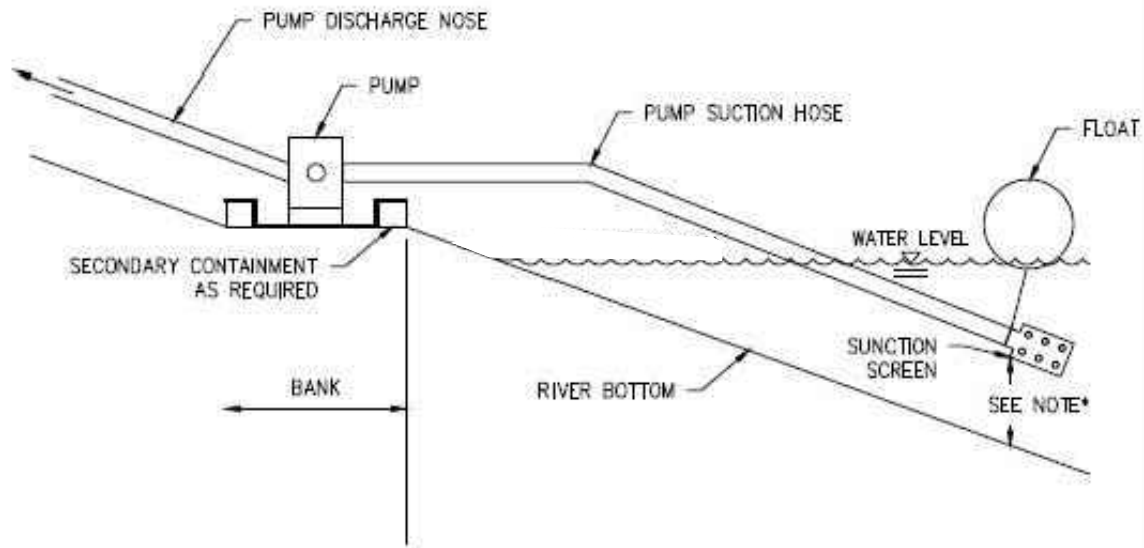
DESIGN ENGINEERING

**ENVIRONMENTAL DETAIL**

WATER WITHDRAWAL –  
FLOATING PUMP INTAKE WITH HOSE

DRAWING NO.  
MVP-SG-ES63

REV.  
P



PROFILE  
SCALE: N.T.S.

NOTES:

- \* CONTRACTOR SHALL MAINTAIN A SUFFICIENT DISTANCE FROM THE BOTTOM OF THE WATERBODY TO THE PUMP INTAKE TO PREVENT SEDIMENT FROM ENTERING THE SYSTEM.
- \* WITHDRAW NO MORE THAN 10% OF THE INSTANTANEOUS FLOW RATE FROM THE CHANNEL;
- \* SCREEN INTAKE OPENINGS NO LARGER THAN 1 MILLIMETER AND;
- \* SCREEN FACE INTAKE VELOCITIES MUST BE NO GREATER THAN 0.25 FEET PER SECOND

FLOATING PUMP INTAKE WITH HOSE

DRAWN	DATE
CHECKED	DATE
APP'D	DATE 08/11/17
SCALE N.T.S.	SHEET 1 OF 1
JOB NO.	
PROJECT ID:	
MVP – NC PORTION	



**Mountain**  
**Valley**

PIPELINE

DESIGN ENGINEERING

**ENVIRONMENTAL DETAIL**

WATER WITHDRAWAL –  
FLOATING PUMP INTAKE WITH HOSE

DRAWING NO.  
MVP-SG-ES63

REV.  
P



## **MVP Southgate Project**

Docket No. CP19-14-000

### **Attachment 15-1**

#### **Table 15-1 - Acreage of Forest Interior and Forest Edge by Co-located Segments along the Project Pipeline Alignment**

October 2019

Table 15-1

## Acreage of Forest Interior and Forest Edge by Co-located Segments along the Project Pipeline Alignment

Facility, Milepost Enter and Exit: Co-located Facility	Interior Forest a/				Forest Edge			
	Upland Deciduous, Evergreen, Mixed <u>b/</u>		Forested Wetland		Upland Deciduous, Evergreen, Mixed <u>b/</u>		Forested Wetland	
	Construction c/	Operation d/	Construction	Operation	Construction	Operation	Construction	Operation
0.0 - 0.0: Mountain Valley Pipeline (Pipeline Transmission)	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
0.0 - 0.3: N/A	1.9	0.6	0.0	0.0	2.6	1.0	0.0	0.0
0.0 RR - 0.1: N/A	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0
0.1 - 1.2: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	5.1	2.1	0.3	<0.1
0.3 - 0.4: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	0.1	<0.1	0.0	0.0
0.4 - 0.47: N/A	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0
1.2 - 1.4: N/A	0.0	0.0	0.0	0.0	1.3	0.4	0.2	0.1
1.4 - 3.4: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	3.0	1.5	0.7	0.4
3.4 - 4.4: N/A	0.0	0.0	0.0	0.0	4.0	1.3	0.1	<0.1
4.4 - 5.0: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	4.2	1.3	0.5	0.3
5.0 - 5.3: N/A	0.0	0.0	0.0	0.0	2.4	0.7	1.2	0.4
5.3 - 9.2: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	22.4	6.5	0.4	0.1
9.4 - 9.7: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	2.6	1.1	0.2	0.1
9.2 - 9.4: N/A	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0
9.7 - 10.1: N/A	0.3	0.0	0.0	0.0	3.5	1.2	0.4	0.2
10.1 - 11.0: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	6.3	3.0	0.0	0.0
11.0 - 11.5: N/A	0.0	0.0	0.0	0.0	3.8	1.4	<0.1	<0.1
11.5 - 11.7: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	2.6	0.9	0.1	<0.1

Table 15-1

## Acreage of Forest Interior and Forest Edge by Co-located Segments along the Project Pipeline Alignment

Facility, Milepost Enter and Exit: Co-located Facility	Interior Forest a/				Forest Edge			
	Upland Deciduous, Evergreen, Mixed <u>b/</u>		Forested Wetland		Upland Deciduous, Evergreen, Mixed <u>b/</u>		Forested Wetland	
	Construction c/	Operation d/	Construction	Operation	Construction	Operation	Construction	Operation
11.7 - 11.8: N/A	0.0	0.0	0.0	0.0	1.2	0.6	0.0	0.0
11.8 - 13.1: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	7.8	3.4	<0.1	<0.1
13.1 - 13.8 RR: N/A	0.0	0.0	0.0	0.0	5.3	1.9	0.2	0.1
13.8 RR - 14.7: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	7.6	3.6	0.1	<0.1
14.7 - 15.6: N/A	0.0	0.0	0.0	0.0	1.8	0.6	0.0	0.0
15.6 - 15.9: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	3.2	1.1	0.0	0.0
15.9 - 16.0: N/A	0.0	0.0	0.0	0.0	1.4	0.4	0.0	0.0
16.0 - 16.5: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	2.5	0.9	<0.1	0.0
16.5 - 17.9: N/A	3.4	1.3	0.2	<0.1	5.9	2.2	0.0	0.0
17.9 - 18.2: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	3.7	1.5	<0.1	0.0
18.2 - 18.4: N/A	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0
18.4 - 22.6 RR: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	28.5	11.6	0.3	0.1
22.6 - 22.7 RR: N/A	0.0	0.0	0.0	0.0	1.5	0.6	0.0	0.0
22.7 RR - 22.8 RR: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	1.4	0.5	0.0	0.0
22.8 RR - 22.9 RR: N/A	0.0	0.0	0.0	0.0	1.2	0.6	0.0	0.0
22.8 RR - 23.0 RR: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	1.4	0.6	0.0	0.0
23.0 RR - 23.1 RR: N/A	0.0	0.0	0.0	0.0	1.0	0.5	<0.1	<0.1
23.1 RR - 23.2 RR: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	1.4	0.5	0.0	0.0



Table 15-1

## Acreage of Forest Interior and Forest Edge by Co-located Segments along the Project Pipeline Alignment

Facility, Milepost Enter and Exit: Co-located Facility	Interior Forest a/				Forest Edge			
	Upland Deciduous, Evergreen, Mixed <u>b/</u>		Forested Wetland		Upland Deciduous, Evergreen, Mixed <u>b/</u>		Forested Wetland	
	Construction c/	Operation d/	Construction	Operation	Construction	Operation	Construction	Operation
23.2 RR - 23.9: N/A	0.1	0.0	0.0	0.0	12.5	4.5	<0.1	0.0
23.9 - 26.1: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	27.6	10.4	0.1	0.1
26.1 - 26.5: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	4.9	1.9	<0.1	<0.1
26.5 - 26.6 RR: N/A	0.0	0.0	0.0	0.0	0.3	0.2	<0.1	<0.1
26.6 RR - 29.3 RR: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	14.2	5.8	0.2	0.1
29.3 RR - 30.0: N/A	0.4	0.1	0.0	0.0	4.5	1.8	2.3	0.6
30.0 - 30.1: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	<0.1	0.0	0.0	0.0
30.1 - 30.3: N/A	0.0	0.0	0.0	0.0	<0.1	0.0	<0.1	0.0
30.3 - 30.4: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	<0.1	0.0	0.0	0.0
30.4 - 30.5: N/A	0.0	0.0	0.0	0.0	<0.1	<0.1	0.5	0.1
30.7 - 31.7: N/A	3.6	1.6	0.0	0.0	6.4	2.9	0.0	0.0
31.7 - 32.0: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	2.6	1.4	0.1	<0.1
32.0 - 32.1: N/A	0.0	0.0	0.0	0.0	1.0	0.4	0.2	0.1
32.1 - 32.8: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	3.1	1.2	<0.1	<0.1
32.8 - 33.2: N/A	0.0	0.0	0.0	0.0	4.4	1.6	0.0	0.0
33.2 - 35.4: Duke Power Co (Electric Transmission)	0.0	0.0	0.0	0.0	27.7	11.2	0.1	<0.1
35.4 - 37.8: N/A	1.5	0.6	0.0	0.0	18.5	8.0	<0.1	<0.1
37.8 - 38.0: Colonial Pipeline (Pipeline Transmission)	0.0	0.0	0.0	0.0	2.9	1.1	0.0	0.0

Table 15-1

## Acreage of Forest Interior and Forest Edge by Co-located Segments along the Project Pipeline Alignment

Facility, Milepost Enter and Exit: Co-located Facility	Interior Forest a/				Forest Edge			
	Upland Deciduous, Evergreen, Mixed <u>b/</u>		Forested Wetland		Upland Deciduous, Evergreen, Mixed <u>b/</u>		Forested Wetland	
	Construction c/	Operation d/	Construction	Operation	Construction	Operation	Construction	Operation
38.0 - 38.3: N/A	0.0	0.0	0.0	0.0	2.2	0.7	0.0	0.0
38.3 - 38.5: Duke Power Co (Electric Transmission)	0.0	0.0	0.0	0.0	2.5	1.1	0.2	0.1
38.5 - 38.9: N/A	0.0	0.0	0.0	0.0	4.3	1.3	0.1	0.1
38.9 - 39.0: Duke Power Co (Electric Transmission)	0.0	0.0	0.0	0.0	1.7	0.5	0.0	0.0
39.0 - 40.7: N/A	0.4	<0.1	0.0	0.0	20.4	8.3	0.1	<0.1
40.7 - 40.7: Duke Power Co (Electric Transmission)	0.0	0.0	0.0	0.0	1.1	0.3	0.0	0.0
40.7 - 40.9: N/A	0.1	0.0	0.0	0.0	2.6	1.0	0.0	0.0
40.9 - 41.6: Duke Power Co (Electric Transmission)	0.0	0.0	0.0	0.0	9.6	3.9	0.1	0.1
41.6 - 41.7: N/A	0.0	0.0	0.0	0.0	1.0	0.4	<0.1	<0.1
41.7 - 41.9: Duke Power Co (Electric Transmission)	0.0	0.0	0.0	0.0	1.6	0.5	0.0	0.0
41.9 - 42.5: N/A	<0.1	0.0	0.0	0.0	4.7	1.8	0.0	0.0
42.5 - 43.0: Duke Power Co (Electric Transmission)	0.0	0.0	0.0	0.0	5.4	2.6	0.0	0.0
43.0 - 43.3: N/A	0.1	0.0	0.0	0.0	3.3	1.4	0.0	0.0
43.3 - 43.3: Duke Power Co (Electric Transmission)	0.0	0.0	0.0	0.0	0.4	0.3	0.0	0.0
43.3 - 44.1: N/A	1.3	0.4	0.0	0.0	8.4	3.0	0.0	0.0
44.1 - 44.8: Duke Power Co (Electric Transmission)	0.0	0.0	0.0	0.0	5.9	2.5	0.0	0.0
44.8 - 45.5: N/A	0.0	0.0	0.0	0.0	1.7	0.5	0.0	0.0
45.5 - 45.7: Duke Power Co (Electric Transmission)	0.0	0.0	0.0	0.0	1.5	0.8	0.0	0.0
45.7 - 46.0 RR: N/A	0.0	0.0	0.0	0.0	1.7	0.6	0.0	0.0

Table 15-1

## Acreage of Forest Interior and Forest Edge by Co-located Segments along the Project Pipeline Alignment

Facility, Milepost Enter and Exit: Co-located Facility	Interior Forest a/				Forest Edge			
	Upland Deciduous, Evergreen, Mixed <u>b/</u>		Forested Wetland		Upland Deciduous, Evergreen, Mixed <u>b/</u>		Forested Wetland	
	Construction c/	Operation d/	Construction	Operation	Construction	Operation	Construction	Operation
46.0 RR - 46.2 RR: Duke Power Co (Electric Transmission)	0.0	0.0	0.0	0.0	3.0	1.1	0.0	0.0
46.2 RR - 49.0: N/A	13.8	5.0	0.0	0.0	12.6	4.8	0.1	<0.1
49.0 - 51.5 RR: Duke Power Co (Electric Transmission)	0.0	0.0	0.0	0.0	21.6	9.4	0.3	0.1
52.0 - 52.2: N/A	0.0	0.0	0.0	0.0	2.9	1.1	0.0	0.0
52.2 - 52.3: Duke Power Co (Electric Transmission)	0.0	0.0	0.0	0.0	0.5	0.3	0.0	0.0
52.3 - 53.1: N/A	0.0	0.0	0.0	0.0	10.3	4.1	0.0	0.0
53.1 - 55.0: Duke Power Co (Electric Transmission)	0.0	0.0	0.0	0.0	9.5	4.2	0.3	0.1
55.0 - 55.5: N/A	3.0	1.5	0.0	0.0	2.0	0.8	0.0	0.0
55.5 - 56.4: Duke Power Co (Electric Transmission)	0.0	0.0	0.0	0.0	5.0	2.2	0.0	0.0
56.4 - 56.5: N/A	0.0	0.0	0.0	0.0	0.8	0.3	0.1	0.1
56.5 - 56.5: Duke Power Co (Electric Transmission)	0.0	0.0	0.0	0.0	0.3	0.2	<0.1	<0.1
56.5 - 56.7: N/A	0.0	0.0	0.0	0.0	2.2	1.0	0.4	0.1
56.7 - 57.3: Duke Power Co (Electric Transmission)	0.0	0.0	0.0	0.0	4.2	2.2	0.4	0.2
57.3 - 57.7: N/A	0.0	0.0	0.0	0.0	1.7	0.7	0.2	0.1
57.7 - 57.9: Duke Power Co (Electric Transmission)	0.0	0.0	0.0	0.0	1.2	0.5	<0.1	<0.1
57.9 - 59.2 RR: N/A	0.0	0.0	0.0	0.0	0.1	<0.1	0.0	0.0
58.2 - 58.2: Duke Power Co (Electric Transmission)	0.0	0.0	0.0	0.0	<0.1	<0.1	0.0	0.0
58.2 - 59.2 RR: N/A	2.7	1.0	0.0	0.0	7.8	3.1	0.0	0.0

Table 15-1

## Acreage of Forest Interior and Forest Edge by Co-located Segments along the Project Pipeline Alignment

Facility, Milepost Enter and Exit: Co-located Facility	Interior Forest <u>a/</u>				Forest Edge			
	Upland Deciduous, Evergreen, Mixed <u>b/</u>		Forested Wetland		Upland Deciduous, Evergreen, Mixed <u>b/</u>		Forested Wetland	
	Construction <u>c/</u>	Operation <u>d/</u>	Construction	Operation	Construction	Operation	Construction	Operation
59.2 RR - 60.1: Williams Transco (Pipeline Transmission)	0.0	0.0	0.0	0.0	1.9	1.0	0.0	0.0
60.1 - 73.0 RR: N/A	15.7	6.7	<0.1	<0.1	93.6	35.3	0.6	0.2
<b>Project Total <u>e/</u></b>	<b>48.3</b>	<b>18.8</b>	<b>0.2</b>	<b>&lt;0.1</b>	<b>534.5</b>	<b>210.5</b>	<b>11.3</b>	<b>4.2</b>

NOTE: N/A = Not applicable (i.e., no co-located facility).

a/ Interior forest is defined as the area within a forested tract greater than 300 feet from the forest edge.

b/ Silviculture is excluded in this analysis.

c/ Construction acres include the area affected by construction for the pipeline facilities (i.e., temporary and additional temporary workspace and the area affected by operation of the Project (i.e., 50-foot pipeline permanent right-of-way). The 50-foot-wide permanent right-of-way between horizontal directional drill entry and exit points and railroad rights-of-way are not included in this acreage. Acreage includes a five-foot path between the HDD entry and exit workspace areas to allow for placement of the HDD guide wire. Contractor yards, aboveground facilities, and additional temporary workspace along access roads is not included in this acreage.

d/ Includes only the operation footprint of the Project facilities, the 50-foot-wide permanent pipeline right-of-way in uplands, except in wetland areas where the operation width has been reduced to 10 feet in emergent wetlands, scrub shrub wetlands, and within 25 feet of waterbodies; and 30 feet in forested wetlands. The 50-foot-wide permanent right-of-way between horizontal directional drill entry and exit points and within railroad rights-of-way are not included in this acreage.

e/ Sums may not equal the total of addends due to rounding.



## **MVP Southgate Project**

Docket No. CP19-14-000

### **Attachment 19-1**

## **Bat Portal Assessment**

October 2019



5540 Centerview Dr.  
Suite 100  
Raleigh, NC 27606

T 919.828.3150  
TRCcompanies.com

October 9<sup>th</sup>, 2019

Mr. John Ellis  
U.S. Fish and Wildlife Service  
Raleigh Field Office  
551F Pylon Drive  
Raleigh, NC 27606

**RE: MVP SOUTHGATE PROJECT BAT PORTAL ASSESSMENTS**

Dear Mr. Ellis,

Mountain Valley Pipeline, LLC (Mountain Valley) is seeking a Certificate of Public Convenience and Necessity from the Federal Energy Regulatory Commission (FERC) pursuant to Section 7(c) of the Natural Gas Act to construct and operate the MVP Southgate Project (Project). The Project will be located in Pittsylvania County, Virginia and Rockingham and Alamance counties, North Carolina. Mountain Valley proposes to construct approximately 73 miles of 24-inch-diameter natural gas pipeline, known as the H-650 pipeline, to provide timely, cost-effective access to new natural gas supplies to meet the growing needs of natural gas users in the southeastern U.S. Subject to receipt of the required permits and regulatory approvals, Mountain Valley anticipates construction of the Project to commence in spring of 2020.

On behalf of the Project, TRC has performed pedestrian searches for bat portals concurrent with wetland and waterway delineation field surveys from June 2018 through August 2019. These surveys assessed a 300 to 400-foot-wide corridor along the 26.9 miles in VA and 48.2 miles in NC for the proposed pipeline route. These surveys also included additional survey of temporary workspaces, above ground facilities, construction yards, staging areas, and access roads. A 50-foot-wide survey corridor was centered over all proposed access roads.

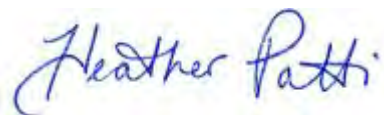
To date, approximately 94% of survey area in Virginia is complete and 92% of survey area in North Carolina is complete. Although additional surveys were performed during the summer of 2019; complete percentage numbers have remained consistent due to reroutes.

The Project is within the range of the federally Threatened Northern long-eared bat (*Myotis septentrionalis*). Northern long-eared bats are "tree bats" in summer and "cave bats" in winter. The use of caves in winter for hibernation of all species also includes spring staging and autumn swarming activities that are typically associated with hibernacula.

Surveys along the Project Right-of-Way (ROW), access roads and ancillary facilities were completed by biologists walking along the proposed corridor.

To date, no suitable bat portals have been observed by the crews in conjunction with the wetland and waterbody survey delineations to date. No sample points were taken, and no voids identified were determined as suitable for bat use.

Sincerely,

A handwritten signature in blue ink that reads "Heather Patti". The signature is written in a cursive, flowing style.

Heather Patti, PWS  
Senior Ecologist/Project Manager  
Email: [HPatti@trccompanies.com](mailto:HPatti@trccompanies.com)

cc:

Laurid Broughton (ESI)  
Troy Anderson (USFWS, VA Field Office)  
Vann Stancil (NCWRC)  
Ernie Ascenbach (VDGIF)  
Rick Reynolds (VDGIF)



## **MVP Southgate Project**

Docket No. CP19-14-000

### **Attachment 20-1**

## **Incidental Take Plan**

October 2019



Mr. Rick Reynolds  
Wildlife Biologist  
Virginia Department of Game and Inland Fisheries  
PO Box 996  
Verona, Virginia 24482

Dear Mr. Reynolds:

**RE: MVP SOUTHGATE PROJECT - Results of bat surveys and recommended voluntary best management practices to avoid or minimize incidental take of the State Endangered tri-colored bat (*Perimyotis subflavus*)**

Mountain Valley Pipeline, LLC (Mountain Valley) is seeking a Certificate of Public Convenience and Necessity (Certificate) from the Federal Energy Regulatory Commission (FERC) pursuant to Section 7(c) of the Natural Gas Act to construct and operate the MVP Southgate Project (Project). The Project will be located in Pittsylvania County, Virginia and Rockingham and Alamance counties, North Carolina. Mountain Valley proposes to construct an approximate 73-mile natural gas pipeline (with associated aboveground facilities and access roads), known as the H-650 pipeline, to provide access to new natural gas supplies to meet the growing needs of natural gas users in the southeastern United States. To the extent practicable, Mountain Valley will collocate the new pipeline parallel to existing utility corridors, trails, and roads. Subject to receipt of the required permits and regulatory approvals, Mountain Valley anticipates construction of the project to commence in spring of 2020.

Since publicly available bat occurrence data within the Project area was significantly limited and the Project involves proposed removal of forest habitat along approximately 16.78 linear miles of the proposed pipeline route and access roads in Virginia, Mountain Valley completed field surveys for bats as a Voluntary Conservation Measure for the Project. This effort included completion of 30 mist net sites (with a minimum of 6 net nights per site) between July 23 and August 15, 2018 in Virginia. Surveys were completed by Environmental Solutions and Innovations, Inc (ESI) under permits from USFWS (Federal Fish and Wildlife [TE02373A-12], and VDGIF (Threatened and Endangered Species [63022] and Scientific Collection [63023]. Of the 220 bats captured, none were federally listed and only one individual tri-colored bat (*Perimyotis subflavus*) was captured. The bat was a juvenile and, as such, no radio transmitter was attached and no roost location information is available.

Based on the known range of federally listed bats and the fact that no federally listed bats were captured during surveys, the Project *May Affect* but is *Not Likely to Adversely Affect*

any federally listed bat species, and Federal requirements for the Project under Section 7(a)(2) of the ESA are met.

According to the VDGIF's ***Special Status Faunal Species in Virginia***, tri-colored bats are listed as State Endangered in Virginia and are currently Under Review for federal listing. Although tri-colored bats are known to occur in Pittsylvania County, the singular capture indicates that the Project has a very low probability of impacting the species. This impact is only anticipated to occur during tree felling and limbing activities required to install the pipeline. No bats are expected to be impacted during the operation of the pipeline.

Through coordination with VDGIF, the Project developed this Incidental Take Plan for the tri-colored bat. This plan includes conservation measures the Project will implement to avoid or minimize potential impacts on the species and establishes additional conservation measures to offset any unavoidable impacts that may result in incidental take. Mountain Valley commits to the following avoidance and minimization measures for the tri-colored bat:

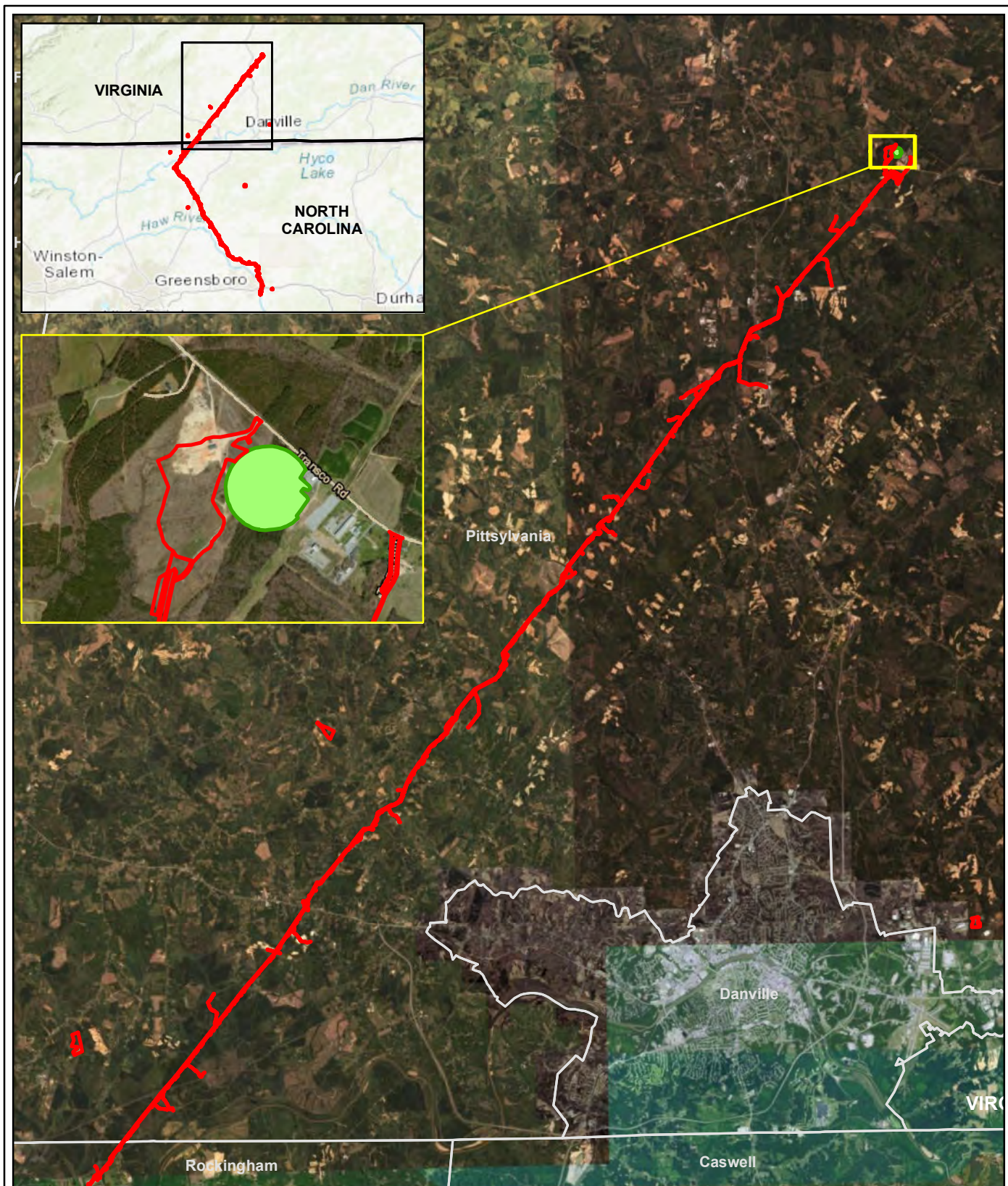
- Minimizing tri-colored bat habitat removal by adjusting the Project limits of disturbance to eliminate all workspace within the Transco Road Net Conservation Area (see Attachment A);
- Restoring temporary access roads;
- Allowing previously forested temporary workspace to naturally revert to its prior forested condition; and
- Structuring the operations and maintenance (O&M) schedule for winter mowing between October 15 and April 1 only in order to optimize habitat values and minimize disturbance for the provision of additional foraging habitat.

Due to the very low probability of Incidental Take of tri-colored bats by the Project and the proposed measures for minimization and avoidance, the Project is not likely to jeopardize the continued existence of the tri-colored bat. As such, Mountain Valley respectfully requests concurrence with this Incidental Take Plan. Please feel free to contact me should you have any questions at [bward@envsi.com](mailto:bward@envsi.com) or 513-451-1777.

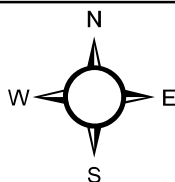
Sincerely,



Beth Ward, Scientist



Project Workspace     Transco Road Net Conservation Site



Attachment A. Location of Transco Road Net Conservation Site relative to the MVP Southgate Project.

Project No. 1219

0      2.25      4.5  
Miles  
Base Map: USGS Topographic Map



**ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.**



## **MVP Southgate Project**

Docket No. CP19-14-000

### **Attachment 23-1**

*Filed Under Separate Cover as CUI//PRIV*

## **Habitat Assessments and Surveys for Rare Plants along the Mountain Valley Pipeline (MVP) Southgate Project in Virginia**

October 2019



## **MVP Southgate Project**

Docket No. CP19-14-000

### **Attachment 24-1**

## **Four-toed salamander and Mole salamander Assessment**

October 2019





---

**ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.**

---

8 Betty Lane  
Scott Depot, WV 25560  
Phone: 304-760-5803 Fax: 513-451-3321

---

P1219.06

18 October 2019

Mr. Jeff Hall  
Wildlife Biologist II  
NC Wildlife Resource Commission  
1751 Varsity Drive  
Raleigh, NC 27606

Dear Mr.Hall:

**RE: MVP SOUTHGATE PROJECT FOUR-TOED SALAMANDER AND MOLE  
SALAMANDER DESKTOP HABITAT ASSESSMENT**

Mountain Valley Pipeline, LLC (Mountain Valley) is seeking a Certificate of Public Convenience and Necessity from the Federal Energy Regulatory Commission (FERC) pursuant to Section 7(c) of the Natural Gas Act to construct and operate the MVP Southgate Project (Project). The Project will be located in Pittsylvania County, Virginia and Rockingham and Alamance counties, North Carolina. Mountain Valley proposes to construct approximately 73 miles of 24-inch-diameter natural gas pipeline, known as the H-650 pipeline, to provide timely, cost-effective access to new natural gas supplies to meet the growing needs of natural gas users in the southeastern U.S. Subject to receipt of the required permits and regulatory approvals, Mountain Valley anticipates construction of the Project to commence in spring of 2020.

The North Carolina Wildlife Resource Commission (NCWRC) administers the North Carolina Endangered Species Act (ESA) (ST § 113 -331-350; 1987). NCWRC defines an endangered species as any native or once-native species of wild animal whose continued existence as a viable component of the state's fauna is determined by NCWRC to be in jeopardy or any species of wild animal determined to be an "endangered species" pursuant to the federal Endangered Species Act (ESA). This statute empowers the NCWRC to list species and outlines criteria for species listing and protection.


On behalf of the Project, Environmental Solutions & Innovations, Inc. (ESI) conducted a desktop habitat assessment of the Project corridor in Rockingham and Alamance counties in North Carolina for two salamander species, the four-toed salamander (*Hemidactylium scutatum*) and the mole salamander (*Ambystoma talpoideum*), both protected by the NCWRC under the provisions of Article 25 as North Carolina Special Species of Concern.

Google Earth imagery was used to assess 157 wetlands and 297 stream features identified within the proposed Project corridor during aquatic resource surveys to determine potential presence of breeding habitat for four-toed salamanders and mole salamanders. Suitable habitat for mole salamanders was characterized by seasonal or permanent ponds and wetlands closely proximate to mature forest with limited previous disturbance from human development, such as roadways or agricultural fields. Because four-toed salamanders prefer a moist environment that tends to remain unsubmerged, suitable habitat was defined by areas with slow moving streams (either perennial or intermittent) connected with or in proximity to wetlands, and large wetland complexes and flood plain areas with forested habitat potentially harboring standing water.

Based on defining characteristics, desktop assessment yielded identification of 34 wetlands, 19 ponds, and 8 streams potentially providing breeding habitat to support mole salamanders and 75 wetlands, 5 ponds, and 55 streams potentially suitable for four-toed salamanders. A map set and table containing the potential habitat areas identified for both species are attached for your review and use.

We look forward to continued consultation with you on this Project.

Sincerely,

A handwritten signature in dark ink, appearing to read "Jeremy M. Alberts". The signature is fluid and cursive, with the first name "Jeremy" and last name "Alberts" clearly distinguishable.

Jeremy Alberts  
Environmental Manager  
Email: [jalberts@envsi.com](mailto:jalberts@envsi.com)  
Mobile: 304-308-0160



Table 1. Summary of desktop habitat assessment results for the four-toed salamander and mole salamander.

Feature ID	County	Feature Type	MP	Four-toed Salamander	Mole Salamander
W-C18-96	Rockingham	PFO Wetland	26.1	X	X
W-B18-98	Rockingham	PFO Wetland	26.5	X	
W-A18-46	Rockingham	PFO Wetland	26.8	X	X
W-A18-44	Rockingham	PFO Wetland	27.3	X	
W-A18-44	Rockingham	PSS Wetland	27.3	X	
W-A18-44	Rockingham	PFO Wetland	27.3	X	
W-A18-44	Rockingham	PSS Wetland	27.3	X	
W-A18-26	Rockingham	PEM Wetland	28.1 RR	X	
S-A18-23	Rockingham	PER Stream	28.3 RR	X	
W-A18-35	Rockingham	PEM Wetland	28.4 RR	X	X
S-A18-37	Rockingham	INT Stream	28.69 RR	X	
W-A18-38	Rockingham	PFO Wetland	28.69 RR	X	
W-A18-38	Rockingham	PEM Wetland	28.69 RR	X	
S-B18-47	Rockingham	EPH Stream	29.1	X	
W-B18-48	Rockingham	PEM Wetland	29.1	X	X
W-B18-48	Rockingham	PFO Wetland	29.1	X	X
W-A18-18	Rockingham	PFO Wetland	29.7	X	
W-A18-18	Rockingham	PEM Wetland	29.9	X	
S-B18-106	Rockingham	PER Stream	30.3	X	
W-B18-36	Rockingham	PFO Wetland	30.3	X	
S-B18-102	Rockingham	PER Stream	31.1	X	
W-B18-103	Rockingham	PEM Wetland	31.1	X	X
S-A18-142	Rockingham	INT Stream	32	X	
W-A18-141	Rockingham	PFO Wetland	32	X	
W-A18-141	Rockingham	PEM Wetland	32	X	
S-C18-44	Rockingham	INT Stream	34.6	X	
W-C18-40	Rockingham	PEM Wetland	34.6	X	X
W-C18-43	Rockingham	PEM Wetland	34.6	X	X
W-C18-37	Rockingham	PEM Wetland	35.5	X	X
S-C18-35	Rockingham	PER Stream	36	X	
W-A19-268	Rockingham	PEM Wetland	36	X	X
S-A18-94	Rockingham	INT Stream	36.9	X	
S-A18-94	Rockingham	PER Stream	37	X	
W-A18-95	Rockingham	PEM Wetland	37	X	
WB-A18-96	Rockingham	POND	37.1	X	
W-A18-98	Rockingham	PFO Wetland	37.2	X	X
W-B19-156	Rockingham	PFO Wetland	37.3	X	
W-S18-1	Rockingham	PFO Wetland	37.3	X	
W-A18-6	Rockingham	PFO Wetland	38.5	X	X

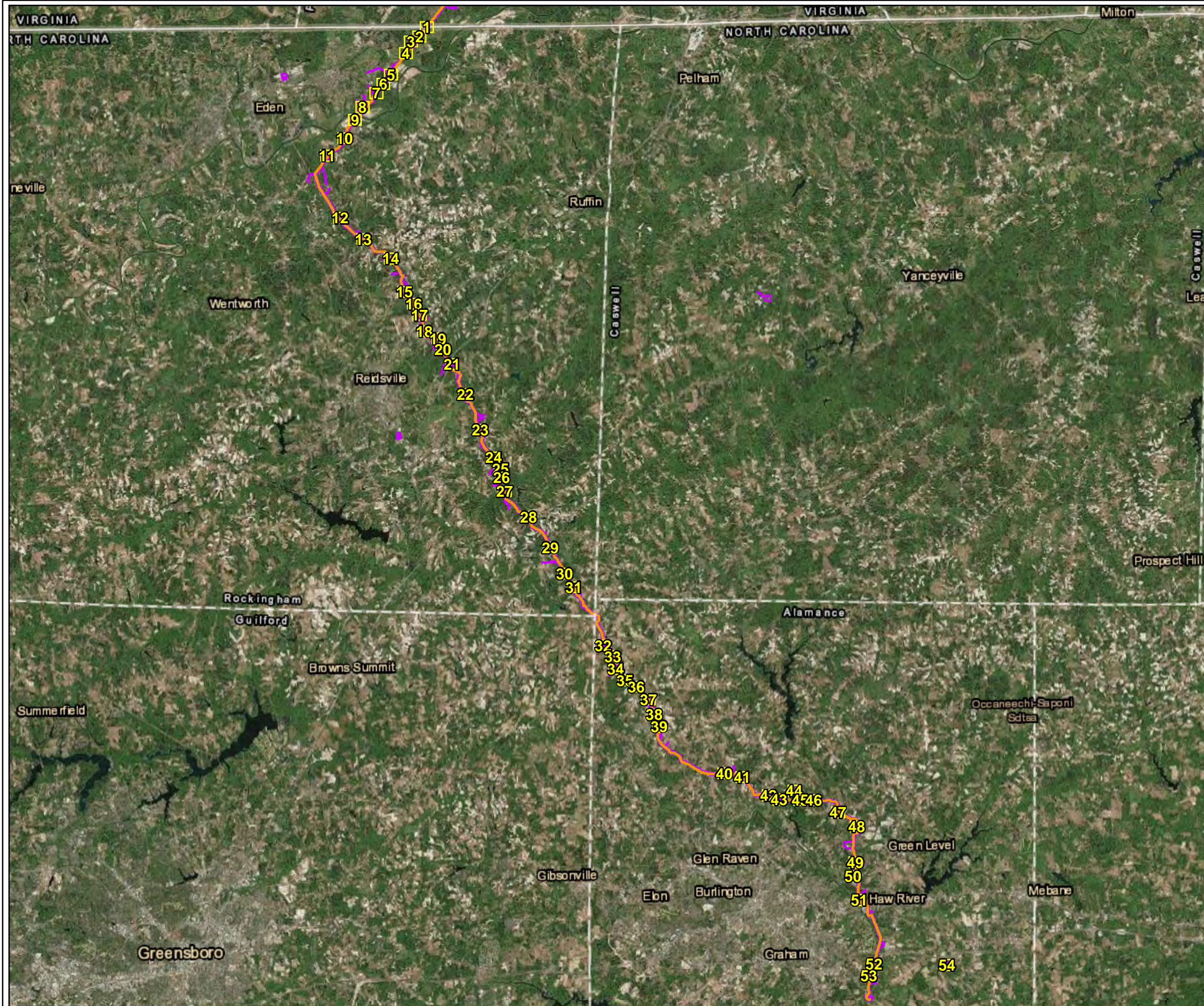


Feature ID	County	Feature Type	MP	Four-toed Salamander	Mole Salamander
W-A18-6	Rockingham	PEM Wetland	38.5	X	X
W-B18-76	Rockingham	PFO Wetland	39.1	X	
W-B18-78	Rockingham	PFO Wetland	39.4	X	X
W-B18-78	Rockingham	PEM Wetland	39.4	X	X
WB-B18-77	Rockingham	POND	39.4		X
S-B18-111	Rockingham	INT Stream	40.1	X	
W-B18-112	Rockingham	PEM Wetland	40.1	X	
W-B18-112	Rockingham	PFO Wetland	40.1	X	
S-B18-109	Rockingham	EPH Stream	40.2	X	
W-B18-110	Rockingham	PFO Wetland	40.2	X	
S-B18-52	Rockingham	PER Stream	40.7	X	
S-B18-54	Rockingham	PER Stream	40.7	X	
W-B18-53	Rockingham	PEM Wetland	40.7	X	
S-B18-57	Rockingham	INT Stream	41.1	X	
W-B18-55	Rockingham	PFO Wetland	41.1	X	
W-B18-55	Rockingham	PEM Wetland	41.1	X	
S-B18-116	Rockingham	INT Stream	41.2	X	
S-B18-56	Rockingham	PER Stream	41.2	X	
W-B18-46	Rockingham	PFO Wetland	41.7		X
S-B18-42	Rockingham	PER Stream	41.8	X	
W-B18-43	Rockingham	PEM Wetland	41.8	X	
W-A18-255	Rockingham	PEM Wetland	43.1	X	
WB-A18-227	Rockingham	POND	44.5		X
W-A18-214	Rockingham	PEM Wetland	45.6	X	
S-A18-212	Rockingham	INT Stream	45.7	X	
S-A19-345	Rockingham	EPH Stream	46.1 RR	X	X
W-A19-346	Rockingham	PEM Wetland	46.1 RR	X	X
S-A19-344	Rockingham	INT Stream	46.2 RR	X	X
W-A19-343	Rockingham	PFO Wetland	46.2 RR	X	X
S-A18-235	Rockingham	PER Stream	46.4	X	
W-A18-236	Rockingham	PSS Wetland	46.5	X	
S-C18-78	Rockingham	INT Stream	47	X	
W-C18-77	Rockingham	PFO Wetland	47	X	
W-A18-241	Rockingham	PEM Wetland	48.3		X
WB-A18-240	Rockingham	POND	48.3		X
W-B18-139	Rockingham	PFO Wetland	48.5		X
W-B19-165	Rockingham	PFO Wetland	49.6		X
W-A18-184	Rockingham	PFO Wetland	49.9	X	
W-A18-184	Rockingham	PEM Wetland	49.9	X	
W-A19-288	Rockingham	PEM Wetland	50.8 RR	X	
WB-C18-19	Rockingham	POND	51.3 RR		X

Feature ID	County	Feature Type	MP	Four-toed Salamander	Mole Salamander
WB-C18-24	Rockingham	POND	51.4 RR		X
W-C18-20	Rockingham	PEM Wetland	51.4 RR	X	
WB-A18-88	Alamance	POND	53.9		X
S-C18-66	Alamance	INT Stream	54.3	X	
W-C18-67	Alamance	PFO Wetland	54.3	X	X
WB-C18-64	Alamance	POND	54.4		X
W-C18-65	Alamance	PSS Wetland	54.4	X	X
WB-A19-341	Alamance	POND	54.7	X	X
S-C18-60	Alamance	PER Stream	54.9	X	
S-C18-61	Alamance	PER Stream	54.9	X	
W-C18-59	Alamance	PFO Wetland	54.9	X	X
S-A18-162	Alamance	INT Stream	55.6	X	
W-A18-163	Alamance	PFO Wetland	55.6	X	
S-B18-59	Alamance	INT Stream	55.6 RR	X	
W-B18-60	Alamance	PSS Wetland	55.6 RR	X	
WB-A18-164	Alamance	POND	55.8	X	X
S-A18-166	Alamance	INT Stream	55.9	X	
W-A18-165	Alamance	PFO Wetland	55.9	X	X
W-A18-167	Alamance	PFO Wetland	56.3	X	
W-A18-167	Alamance	PEM Wetland	56.3	X	
S-A18-120	Alamance	INT Stream	56.4	X	
S-B18-65	Alamance	INT Stream	56.4 RR	X	
WB-A18-121	Alamance	POND	56.5		X
W-A18-119	Alamance	PEM Wetland	56.51	X	
W-A18-119	Alamance	PFO Wetland	56.51	X	
S-A18-123	Alamance	EPH Stream	56.6 RR	X	
S-A18-123	Alamance	EPH Stream	56.6 RR	X	
S-A18-125	Alamance	INT Stream	56.6 RR	X	
S-A18-125	Alamance	INT Stream	56.6 RR	X	
S-A18-125	Alamance	PER Stream	56.6 RR	X	
W-A18-127	Alamance	PEM Wetland	56.6 RR	X	X
S-A18-129	Alamance	INT Stream	56.7 RR	X	X
W-A18-127	Alamance	PFO Wetland	56.7 RR	X	X
WB-A18-128	Alamance	POND	56.7 RR	X	X
S-A18-132	Alamance	PER Stream	57.1	X	
W-A18-133	Alamance	PEM Wetland	57.1	X	
W-A18-133	Alamance	PFO Wetland	57.1	X	
S-A18-134	Alamance	INT Stream	57.2	X	
W-A18-135	Alamance	PEM Wetland	57.2	X	
W-A18-135	Alamance	PFO Wetland	57.2	X	
WB-A18-137	Alamance	POND	57.2		X

Feature ID	County	Feature Type	MP	Four-toed Salamander	Mole Salamander
W-A18-254	Alamance	PFO Wetland	57.5	X	X
S-C18-30	Alamance	PER Stream	60.72	X	
W-C18-29	Alamance	PFO Wetland	60.72	X	X
S-C18-28	Alamance	PER Stream	60.86 RR	X	X
WB-C18-31	Alamance	POND	61		X
S-A19-340	Alamance	INT Stream	61.3	X	
W-A18-79	Alamance	PFO Wetland	61.8	X	
WB-A18-82	Alamance	POND	62.7		X
S-B18-33	Alamance	EPH Stream	62.9	X	
W-A19-348	Alamance	PFO Wetland	63		X
S-A19-349	Alamance	INT Stream	63.4	X	
S-B18-137	Alamance	INT Stream	63.7		X
W-B18-136	Alamance	PFO Wetland	63.7		X
S-B18-20	Alamance	INT Stream	63.8	X	
S-B18-21	Alamance	INT Stream	63.8	X	
W-B18-19	Alamance	PFO Wetland	63.8	X	
S-A19-331	Alamance	PER Stream	64.0 RR	X	X
W-A19-332	Alamance	PFO Wetland	64.1 RR	X	X
WB-A19-333	Alamance	POND	64.3	X	X
S-A19-350	Alamance	PER Stream	64.5	X	
S-B19-160	Alamance	INT Stream	65.5	X	
W-B19-161	Alamance	PFO Wetland	65.5	X	
S-A19-353	Alamance	INT Stream	66.5 RR	X	X
W-A19-352	Alamance	PFO Wetland	66.5 RR	X	X
S-A19-334	Alamance	INT Stream	67.7	X	
S-A19-335	Alamance	INT Stream	67.9	X	X
S-A19-336	Alamance	INT Stream	68.1	X	
WB-B18-1	Alamance	POND	68.2		X
S-B19-145	Alamance	PER Stream	68.3	X	
W-B18-5	Alamance	PFO Wetland	68.4	X	
WB-A18-11	Alamance	POND	69.1		X
WB-A18-12	Alamance	POND	69.1		X
WB-A18-16	Alamance	POND	69.2		X
S-A19-308	Alamance	PER Stream	71.1	X	
W-A18-67	Alamance	PFO Wetland	71.8	X	
W-A18-208	Alamance	PEM Wetland	72.2	X	X

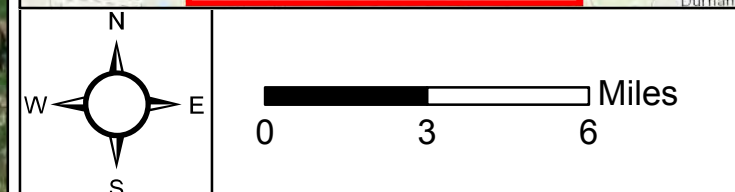




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Key Map

- Project Alignment
- Environmental Survey Corridor



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.  
Project No. 1219

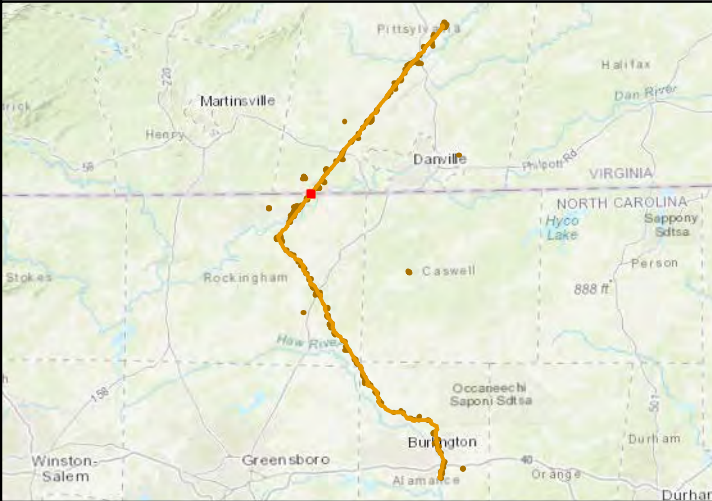




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 1 of 54

- Milepost
- Project Alignment
- Environmental Survey Corridor
- Potential Wetland Habitat**
- Mole Salamander and Four-toe Salamander



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\Desktop\_Analysis\_20191008.mxd; creator: thunter

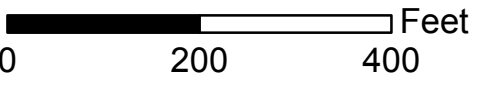
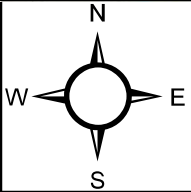
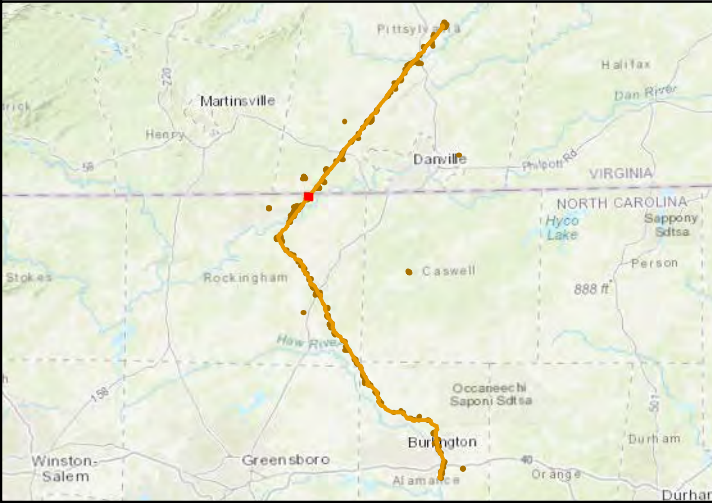




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 2 of 54

- Milepost
- Project Alignment
- Environmental Survey Corridor
- Potential Wetland Habitat**
- Four-toe Salamander Only



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.  
Project No. 1219

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\Desktop\_Analysis\_20191008.mxd; creator: thunter

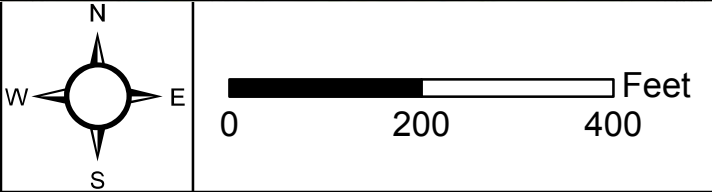
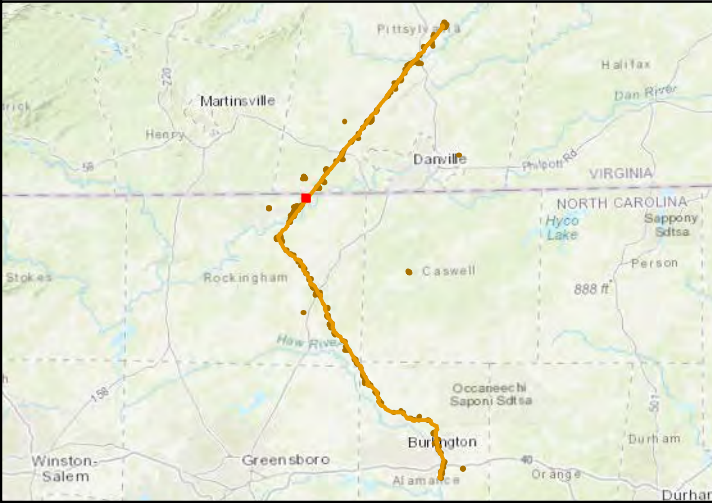




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 3 of 54

- Milepost
  - Project Alignment
  - Access Road
  - Environmental Survey Corridor
- Potential Wetland Habitat**
- Mole Salamander and Four-toe Salamander



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219





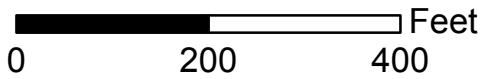
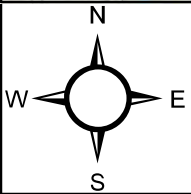
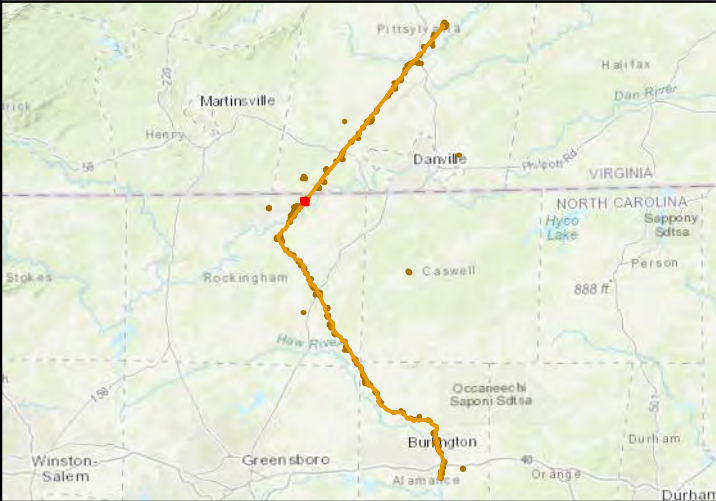
Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 4 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor

**Potential Wetland Habitat**

- Four-toe Salamander Only



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



**ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.**

Project No. 1219

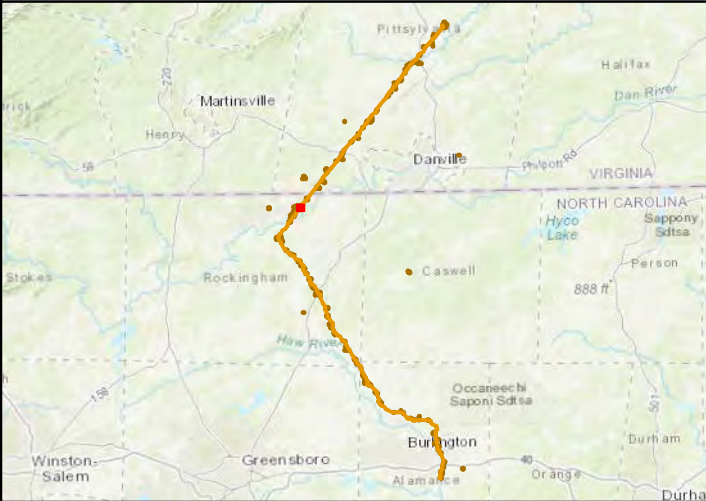




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 5 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Four-toe Salamander Only
- Potential Wetland Habitat**
  - Four-toe Salamander Only
  - Mole Salamander and Four-toe Salamander



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\Desktop\_Analysis\_20191008.mxd; creator: thunter

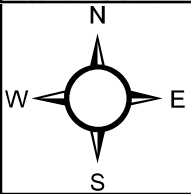
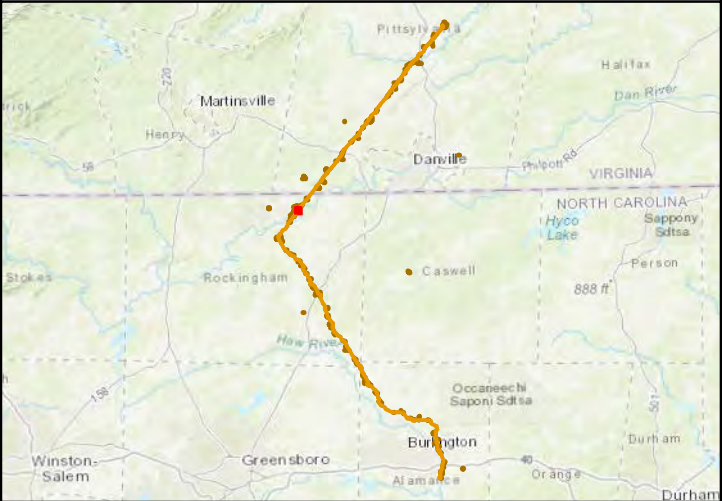




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 6 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Four-toe Salamander Only
- Potential Wetland Habitat**
  - Four-toe Salamander Only



0 200 400 Feet

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

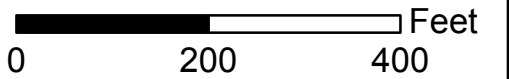
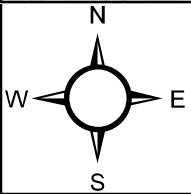
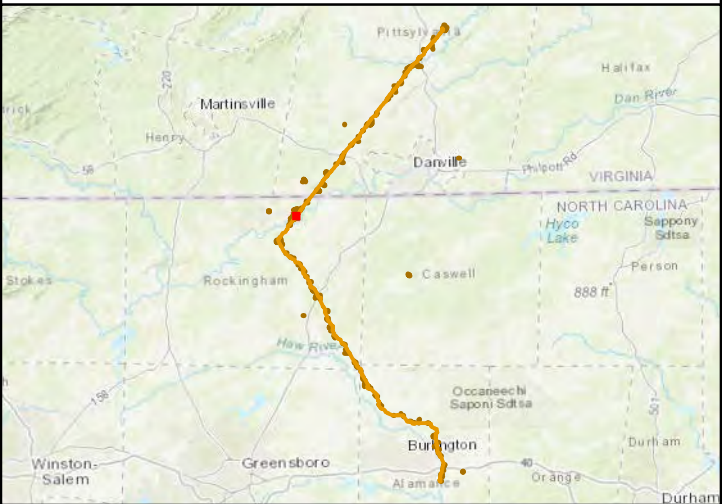




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 7 of 54

- Milepost
  - Project Alignment
  - Access Road
  - Environmental Survey Corridor
- Potential Wetland Habitat**
- Mole Salamander and Four-toe Salamander



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.  
Project No. 1219

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\Desktop\_Analysis\_20191008.mxd; creator: thunter

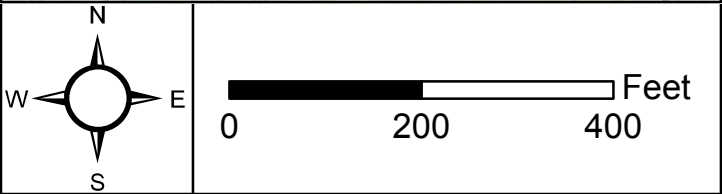
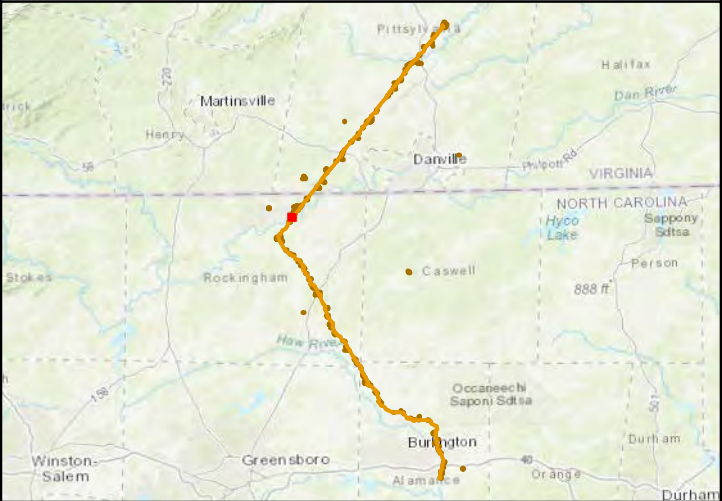




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 8 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Wetland Habitat**
- Four-toe Salamander Only



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.  
Project No. 1219

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\Desktop\_Analysis\_20191008.mxd; creator: thunter

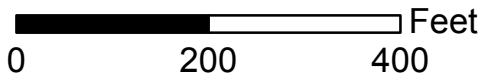
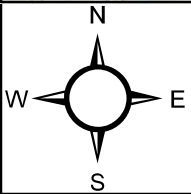
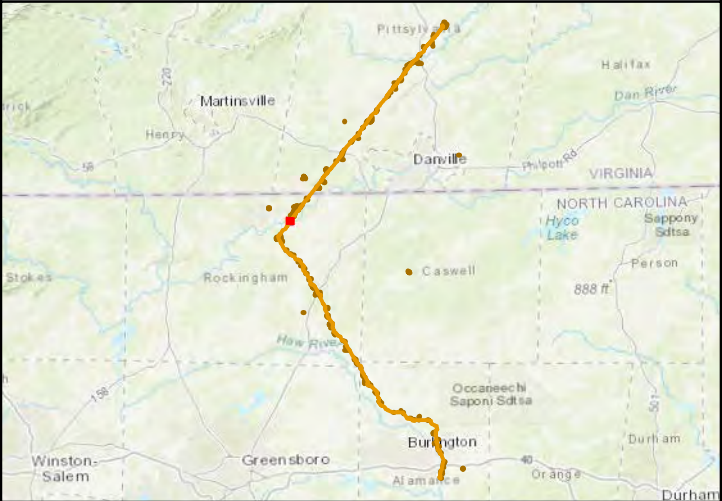




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 9 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Four-toe Salamander Only
- Potential Wetland Habitat**
  - Four-toe Salamander Only



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

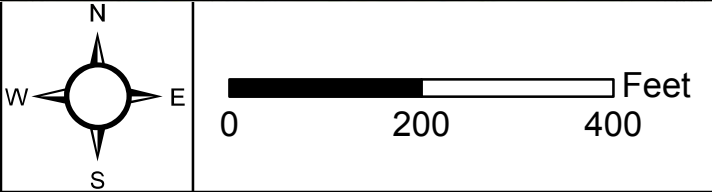
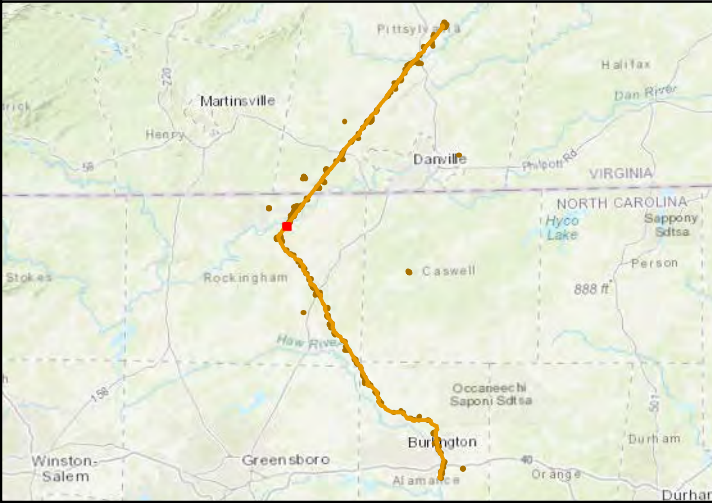




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 10 of 54

- Milepost
- Project Alignment
- Environmental Survey Corridor
- Potential Stream Habitat**
- Four-toe Salamander Only
- Potential Wetland Habitat**
- Mole Salamander and Four-toe Salamander



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.  
Project No. 1219

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\_Desktop\_Analysis\_20191008.mxd; creator: thunter

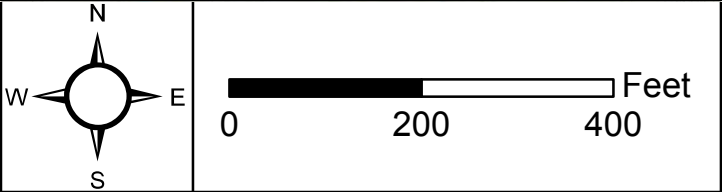
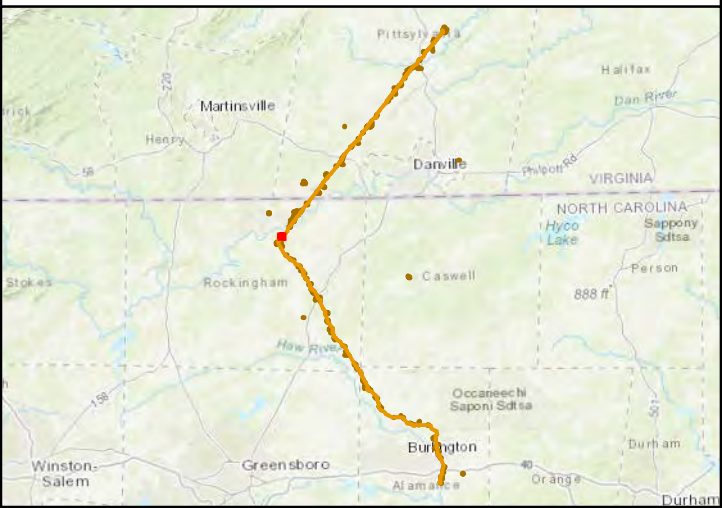




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 11 of 54

- Milepost
- Project Alignment
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Four-toe Salamander Only
- Potential Wetland Habitat**
  - Four-toe Salamander Only



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\Desktop\_Analysis\_20191008.mxd; creator: thunter

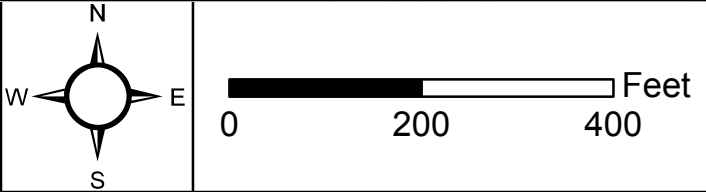
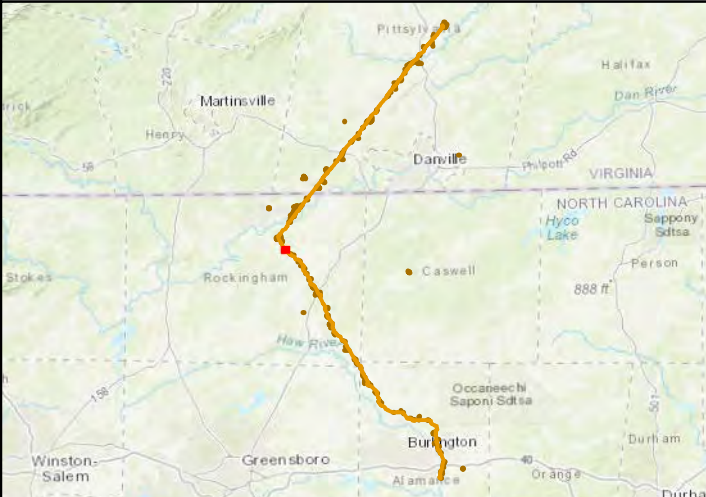




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 12 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Four-toe Salamander Only
- Potential Wetland Habitat**
  - Mole Salamander and Four-toe Salamander



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\Desktop\_Analysis\_20191008.mxd; creator: thunter

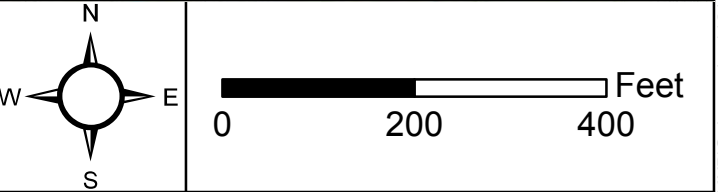
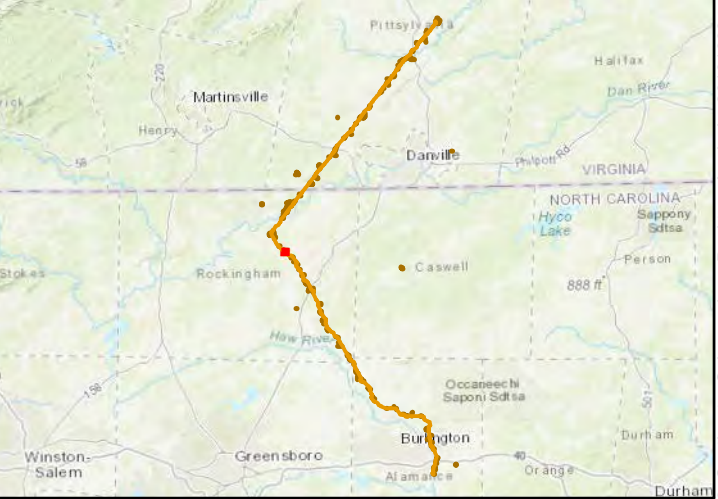




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 13 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Four-toe Salamander Only
- Potential Wetland Habitat**
  - Mole Salamander and Four-toe Salamander



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\_Desktop\_Analysis\_20191008.mxd; creator: thunter

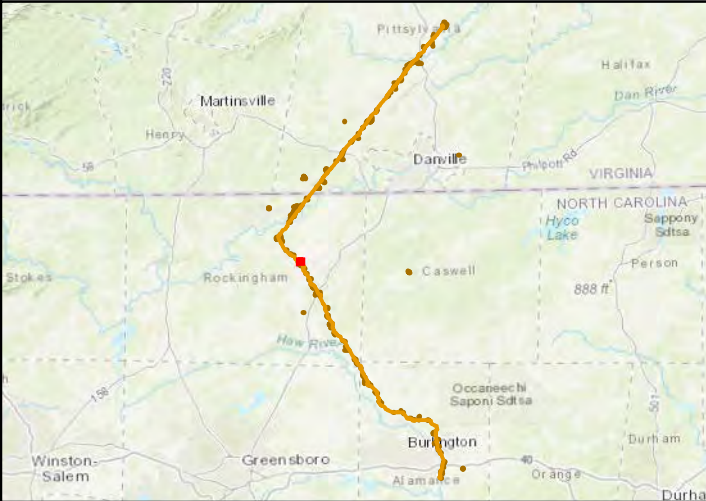




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 14 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Four-toe Salamander Only
- Potential Wetland Habitat**
  - Four-toe Salamander Only
  - Mole Salamander and Four-toe Salamander



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

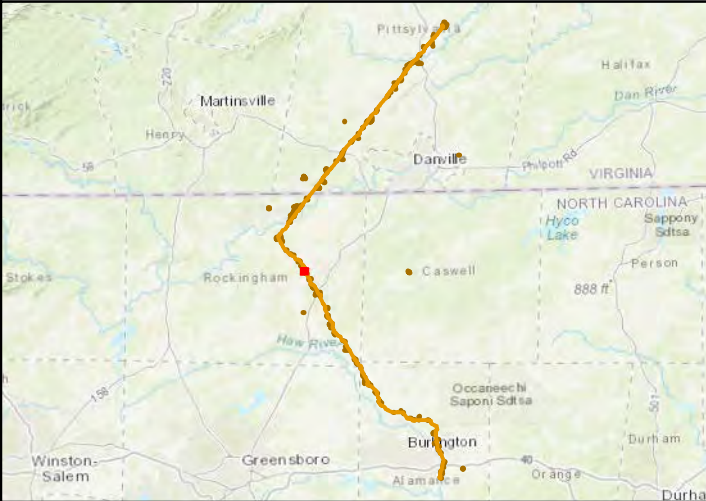




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 15 of 54

- Milepost
- Project Alignment
- Environmental Survey Corridor
- Potential Wetland Habitat**
- Mole Salamander and Four-toe Salamander



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

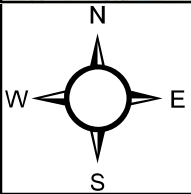
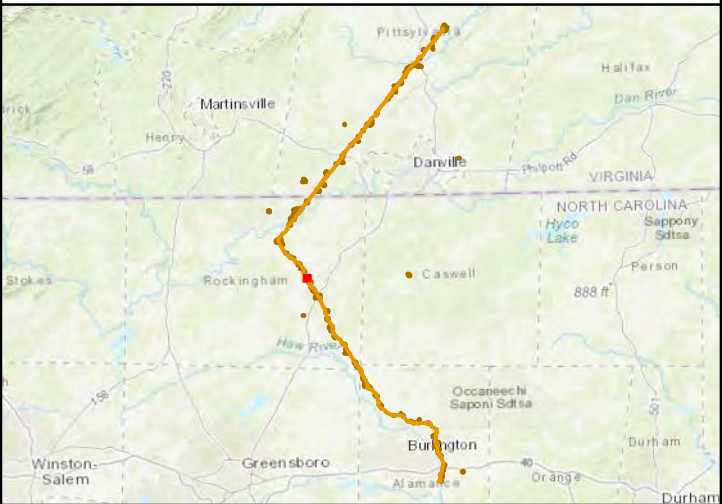




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 16 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Wetland Habitat**
- Four-toe Salamander Only



0 200 400 Feet

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

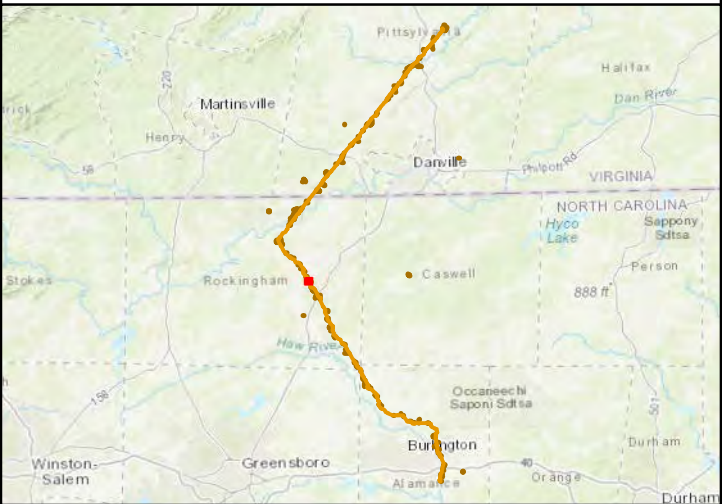
Project No. 1219





Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Mole Salamander Only
- Potential Wetland Habitat**
  - Mole Salamander and Four-toe Salamander



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.  
Project No. 1219

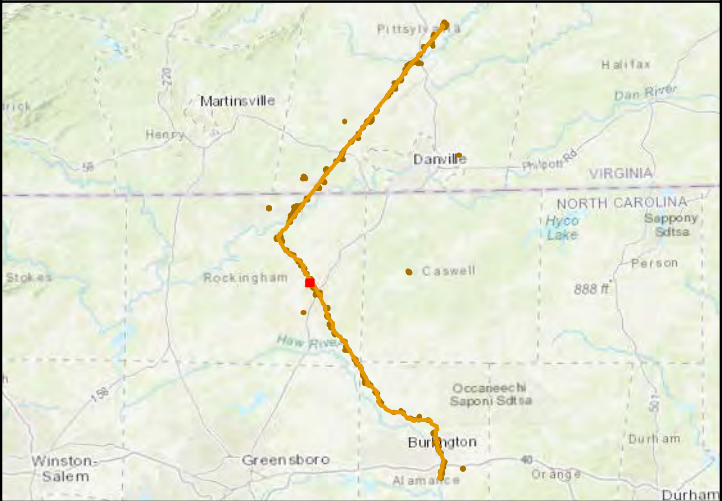




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 18 of 54

- Milepost
- Project Alignment
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Four-toe Salamander Only
- Potential Wetland Habitat**
  - Four-toe Salamander Only

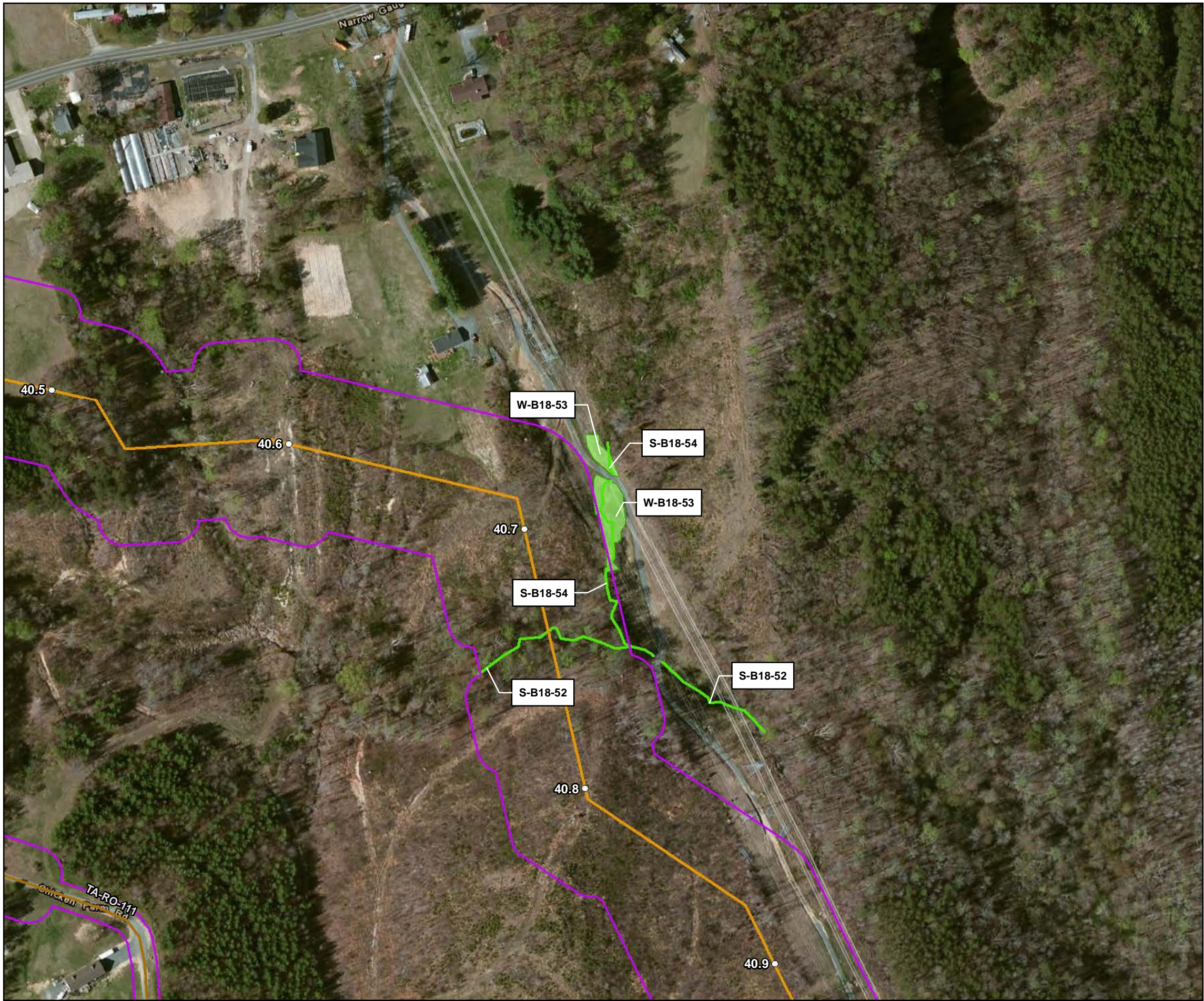


Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



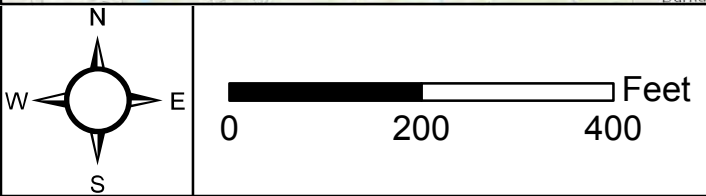
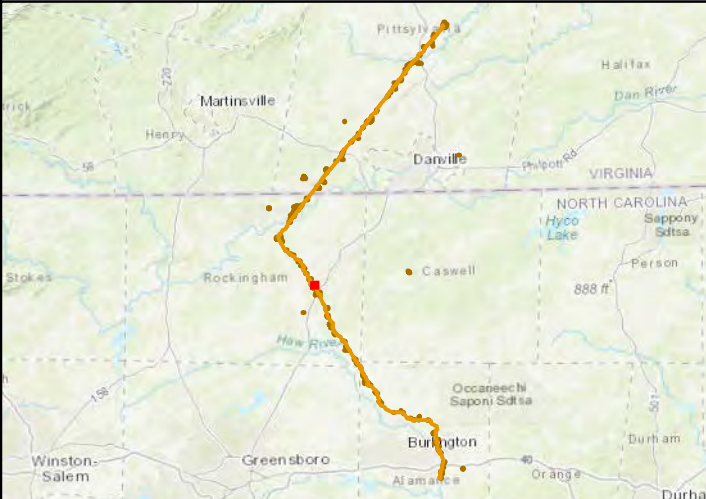
**ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.**  
Project No. 1219





Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Four-toe Salamander Only
- Potential Wetland Habitat**
  - Four-toe Salamander Only



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

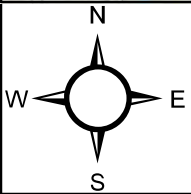
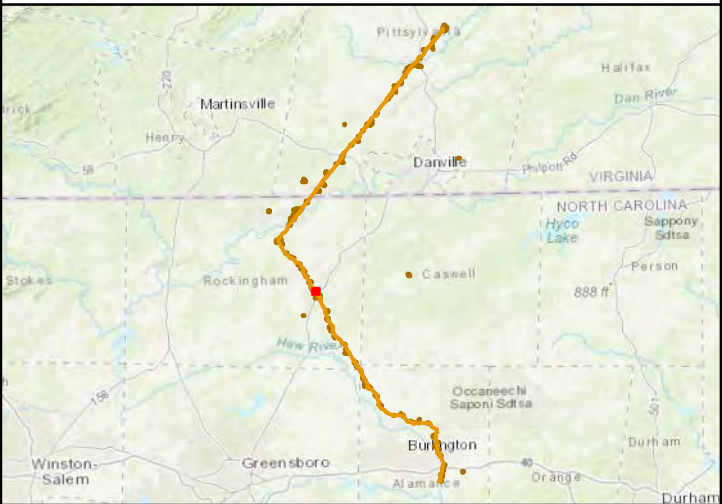




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 20 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Four-toe Salamander Only
- Potential Wetland Habitat**
  - Four-toe Salamander Only



0 200 400 Feet

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

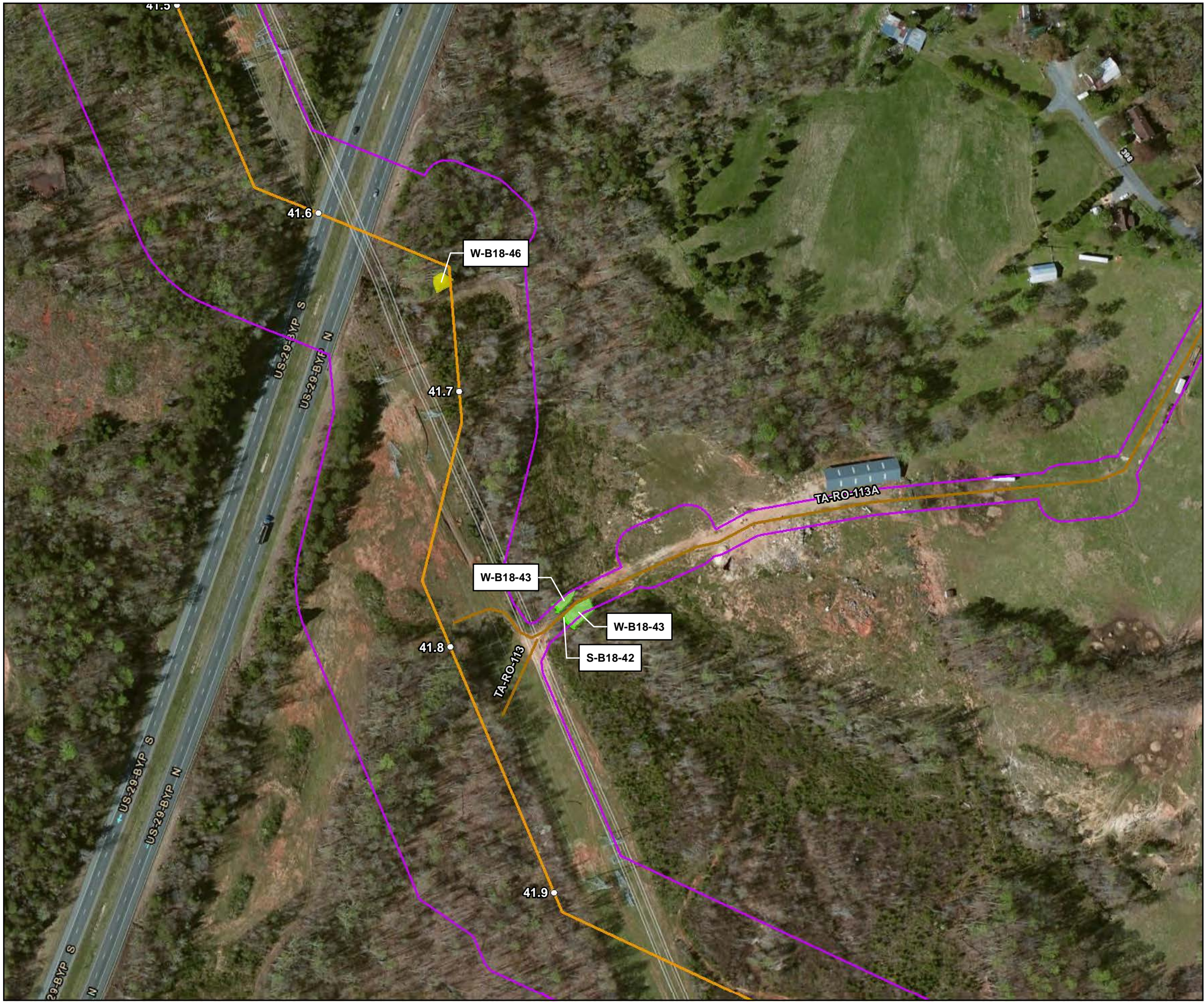


ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\Desktop\_Analysis\_20191008.mxd; creator: thunter





Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 21 of 54

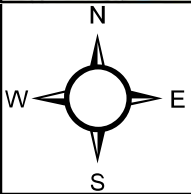
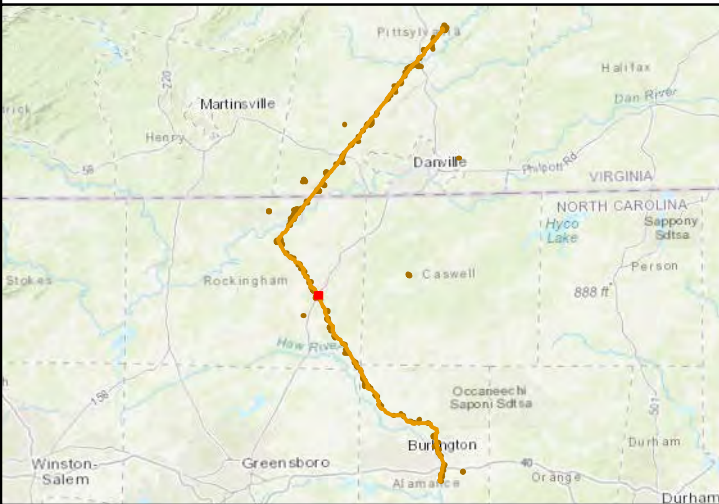
- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor

**Potential Stream Habitat**

- Four-toe Salamander Only

**Potential Wetland Habitat**

- Mole Salamander Only
- Four-toe Salamander Only



0 200 400 Feet

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

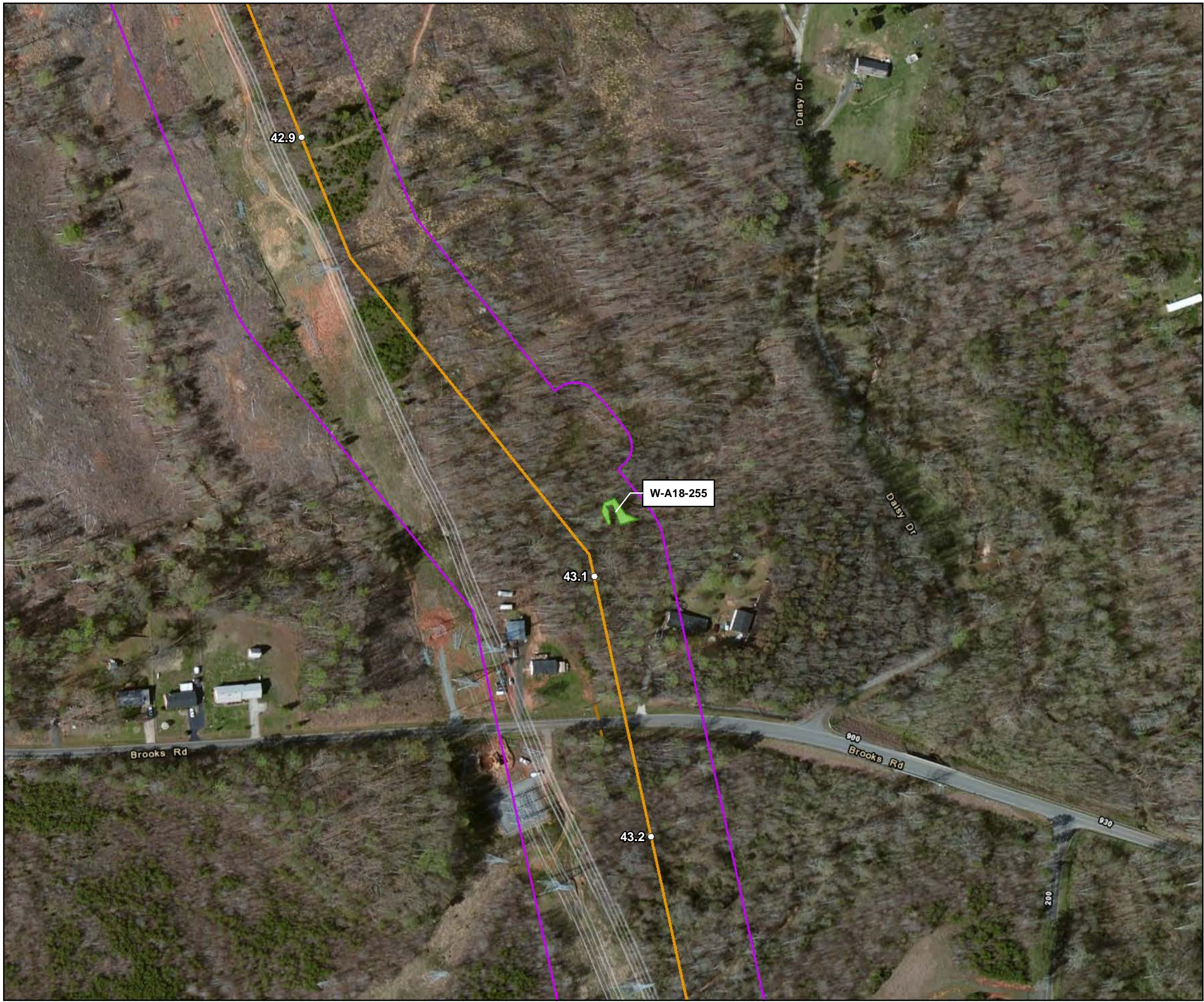


ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\Desktop\_Analysis\_20191008.mxd; creator: thunter





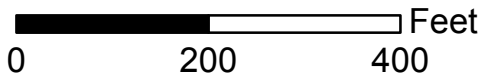
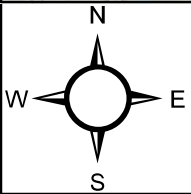
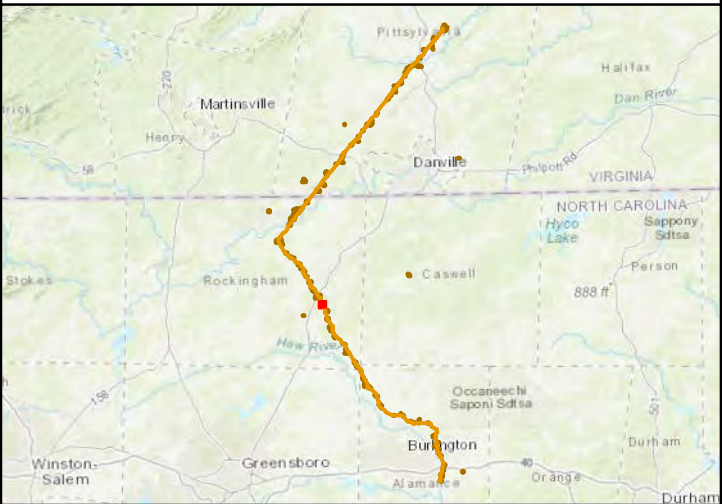
Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 22 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor

**Potential Wetland Habitat**

- Four-toe Salamander Only



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



**ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.**

Project No. 1219

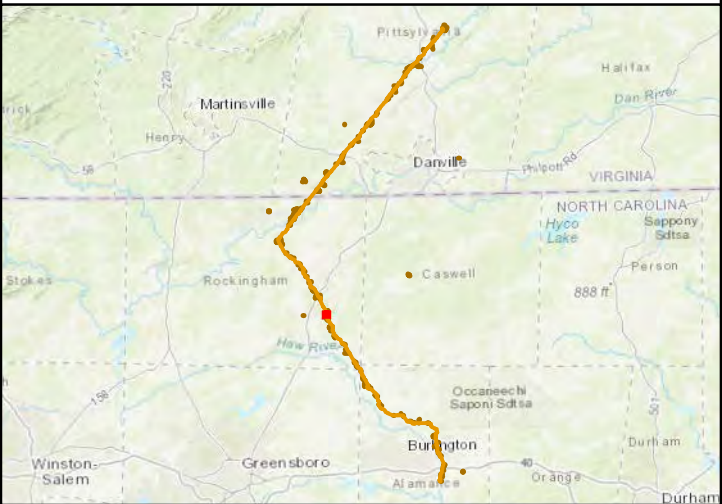




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 23 of 54

- Milepost
- Project Alignment
- Environmental Survey Corridor
- Potential Stream Habitat**
- Mole Salamander Only

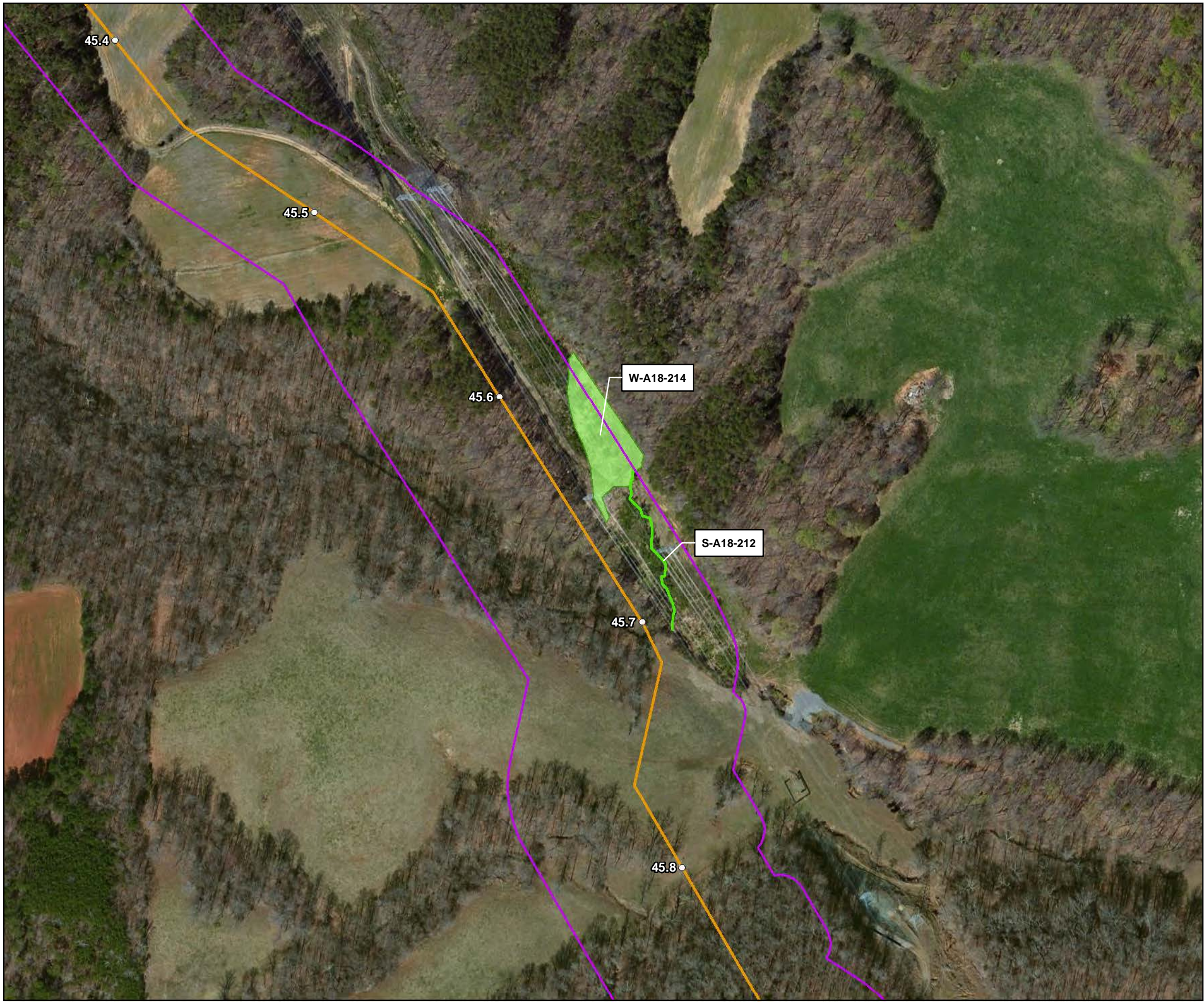


Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.  
Project No. 1219

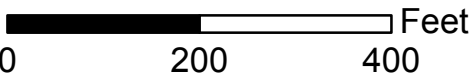
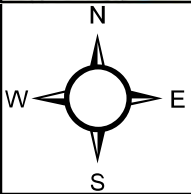
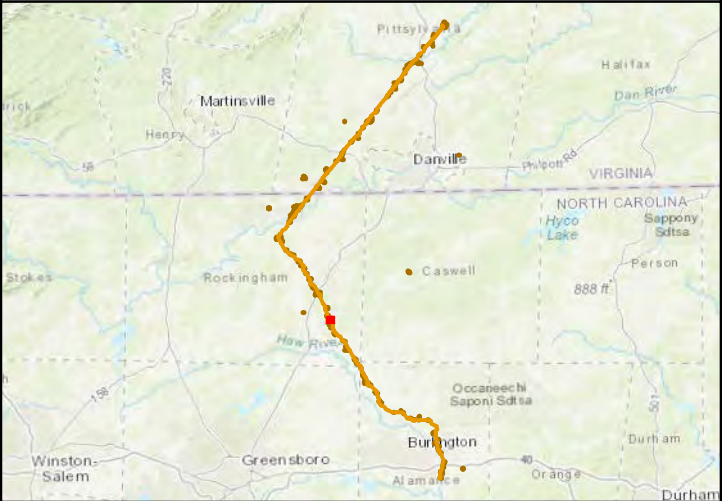




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 24 of 54

- Milepost
- Project Alignment
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Four-toe Salamander Only
- Potential Wetland Habitat**
  - Four-toe Salamander Only



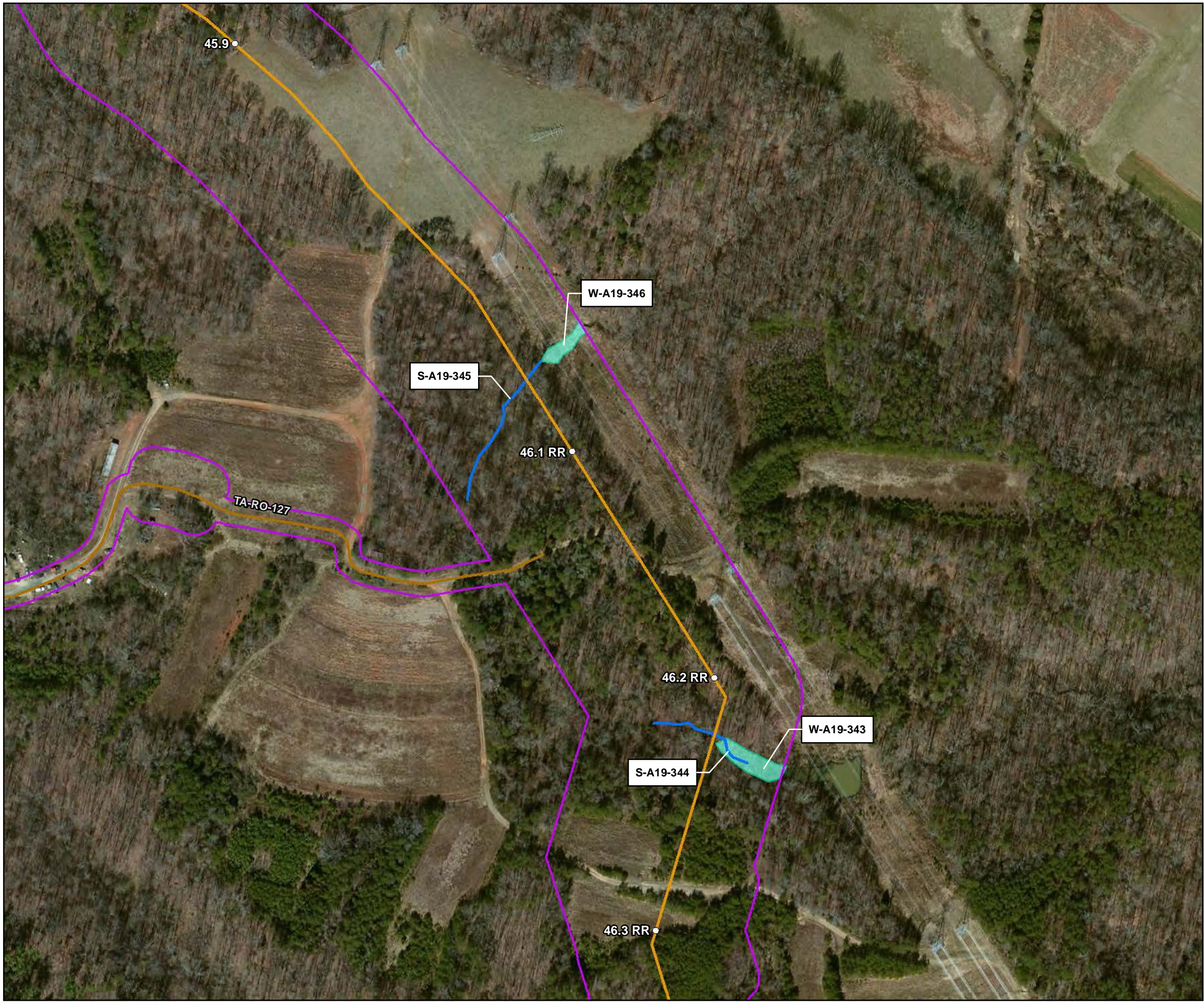
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

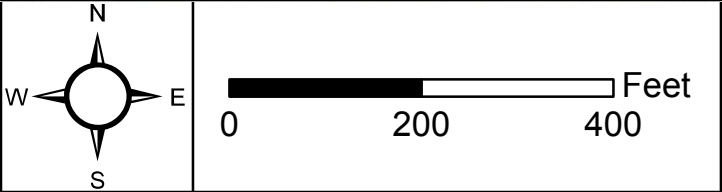
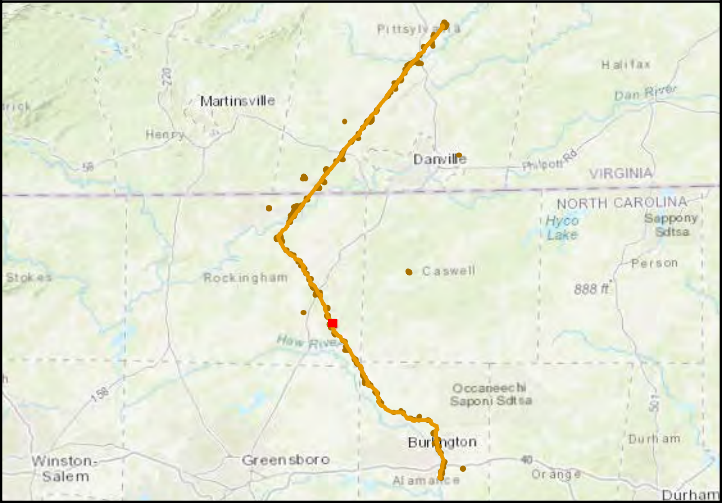




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 25 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Mole Salamander and Four-toe Salamander
- Potential Wetland Habitat**
  - Mole Salamander and Four-toe Salamander



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.  
Project No. 1219

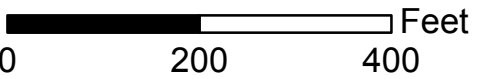
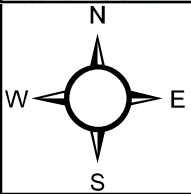
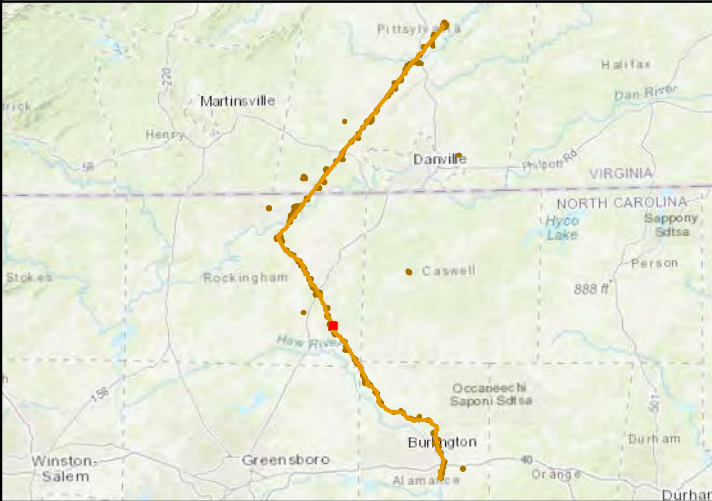




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 26 of 54

- Milepost
- Project Alignment
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Four-toe Salamander Only
- Potential Wetland Habitat**
  - Four-toe Salamander Only



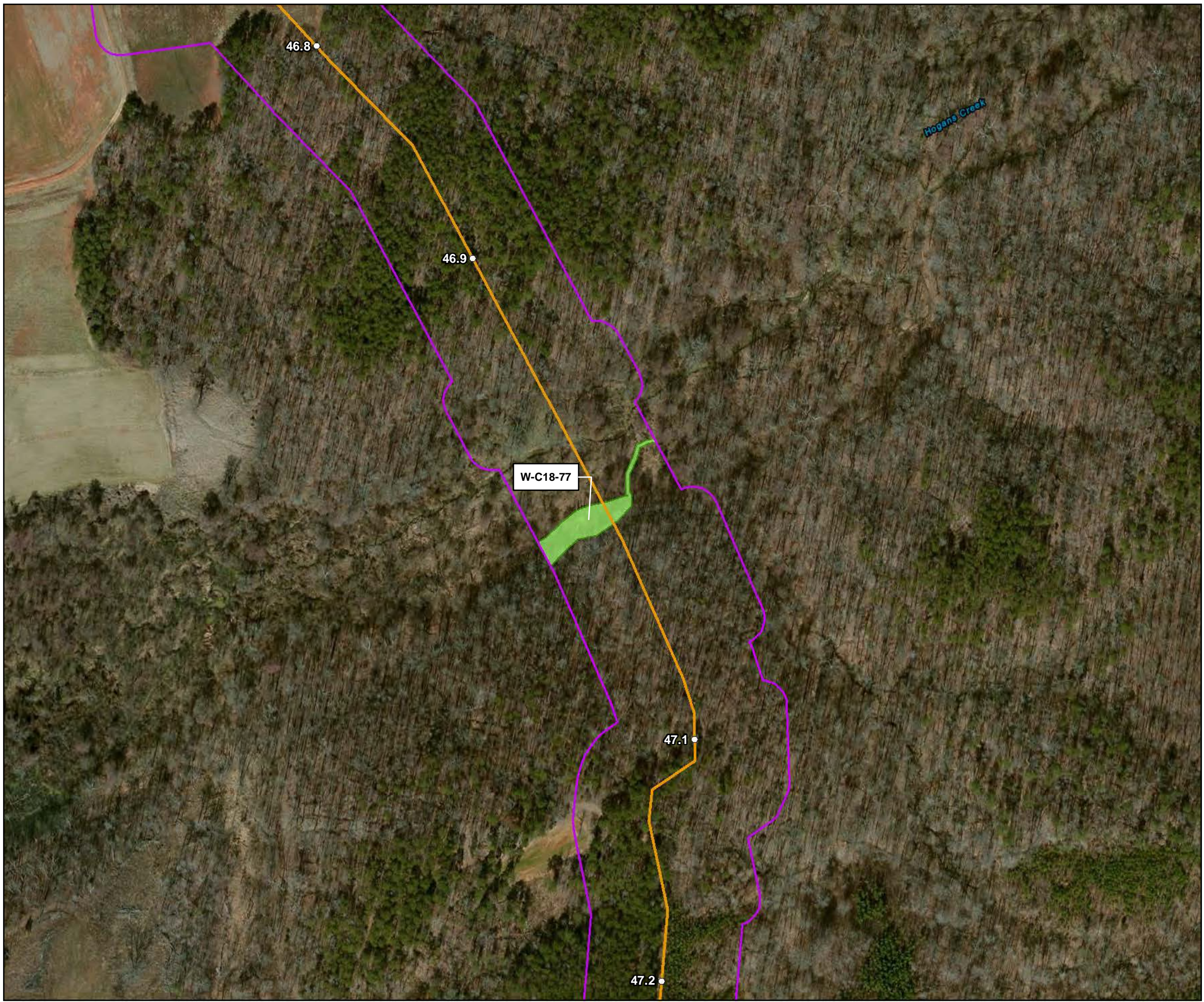
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

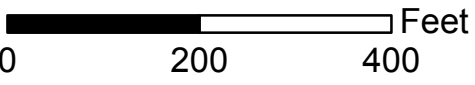
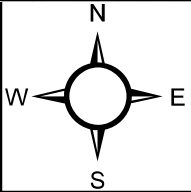
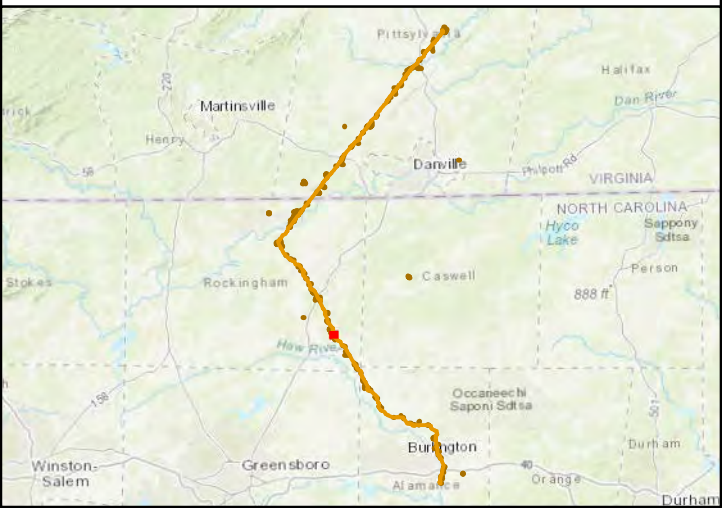




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 27 of 54

- Milepost
- Project Alignment
- Environmental Survey Corridor
- Potential Wetland Habitat**
- Four-toe Salamander Only



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

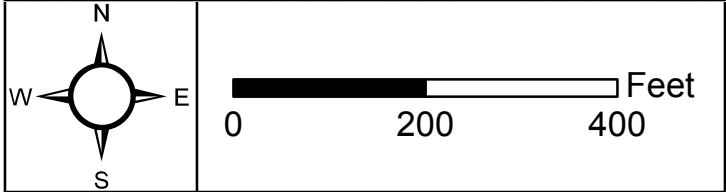
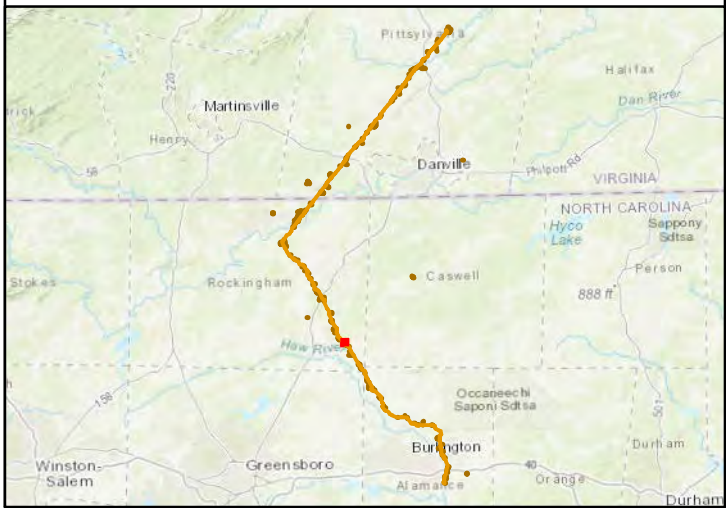




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 28 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Mole Salamander Only
- Potential Wetland Habitat**
  - Mole Salamander Only



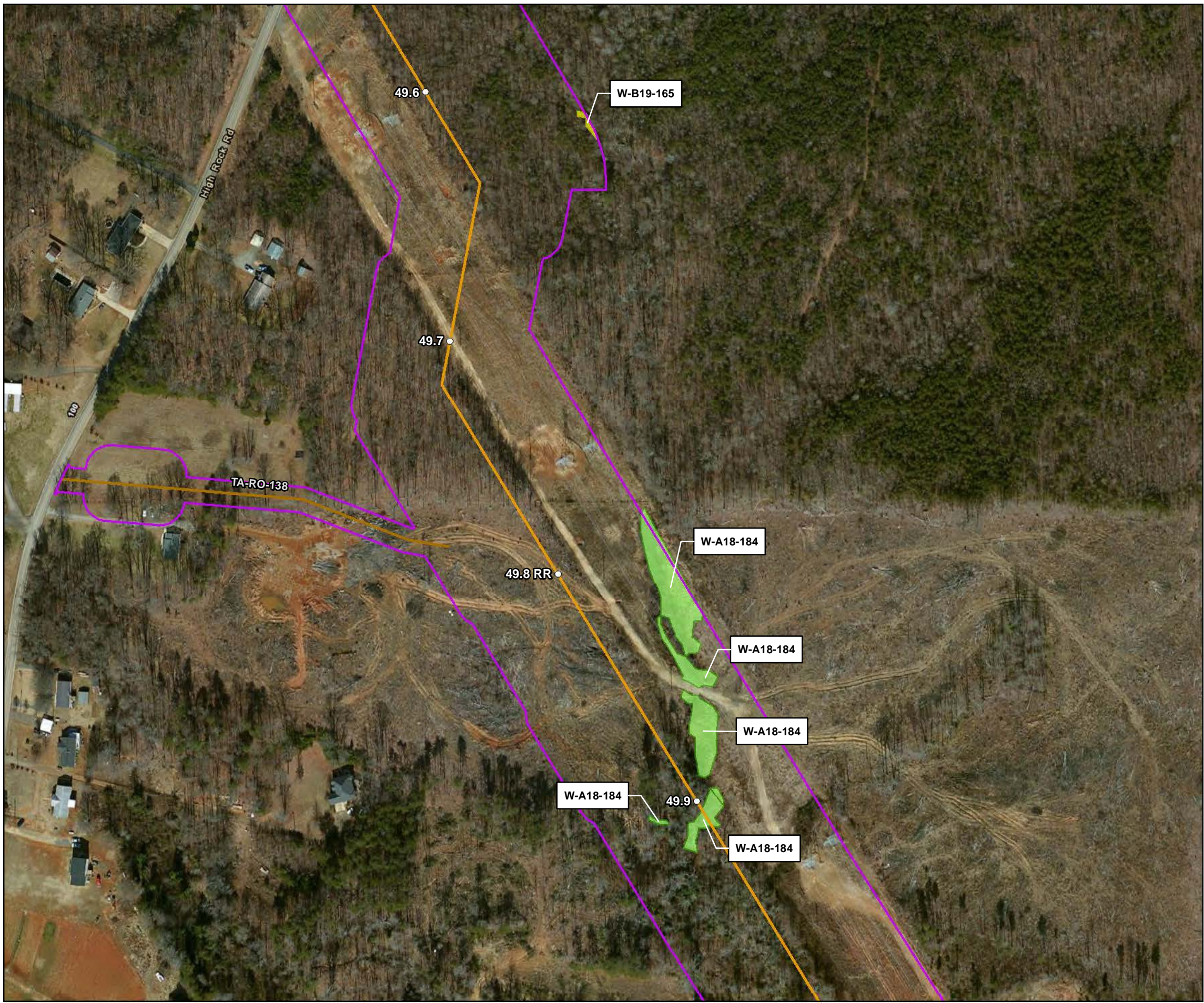
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.  
Project No. 1219

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\_Desktop\_Analysis\_20191008.mxd; creator: thunter

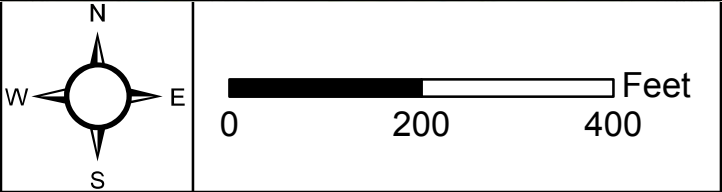
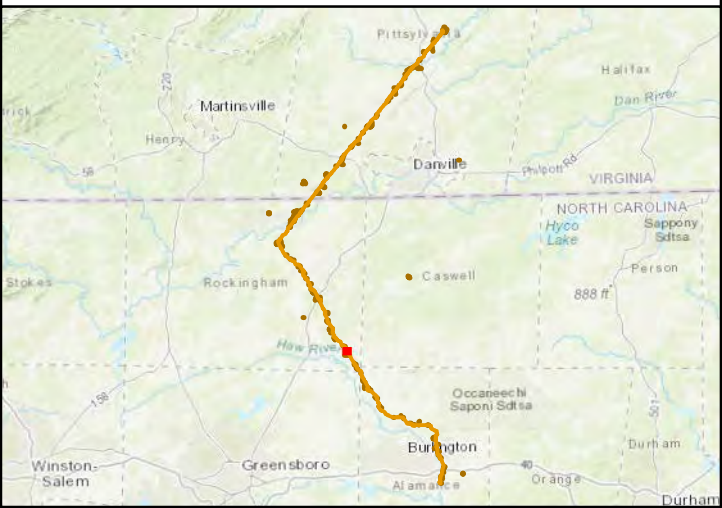




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 29 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Wetland Habitat**
- Mole Salamander Only
- Four-toe Salamander Only



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\Desktop\_Analysis\_20191008.mxd; creator: thunter

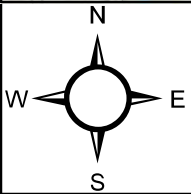
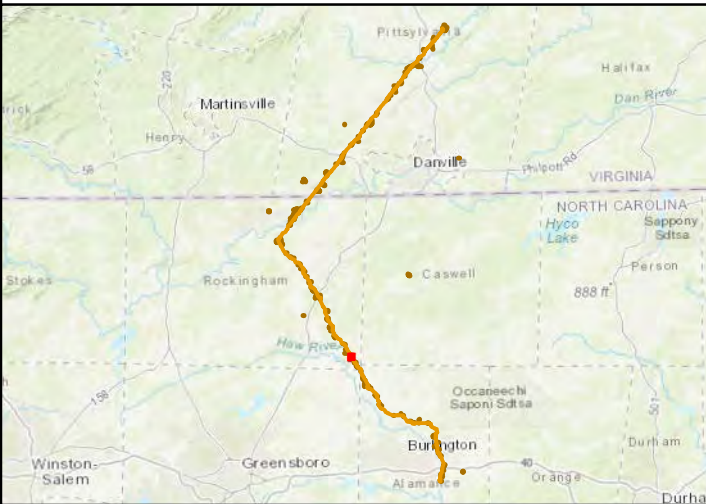




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 30 of 54

- Milepost
- Project Alignment
- Environmental Survey Corridor
- Potential Wetland Habitat**
- Four-toe Salamander Only



0 200 400 Feet

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

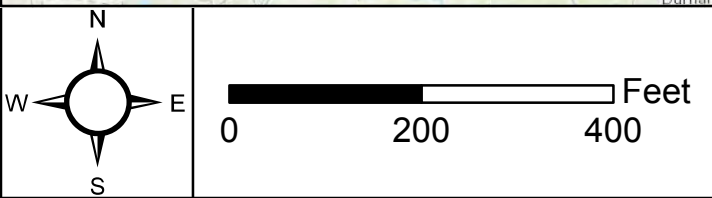
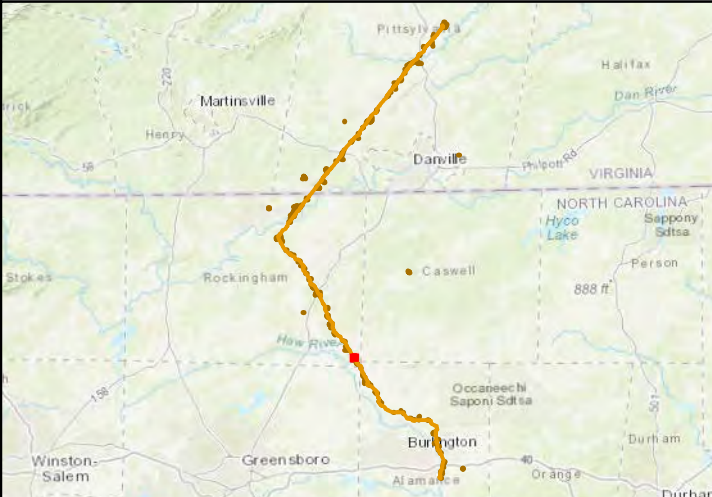




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 31 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Mole Salamander Only
- Potential Wetland Habitat**
  - Four-toe Salamander Only



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

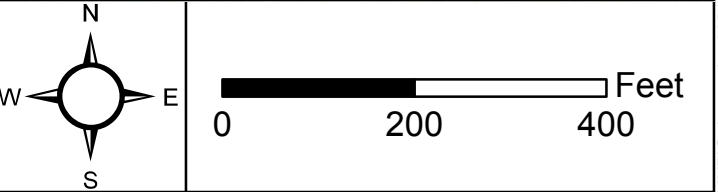
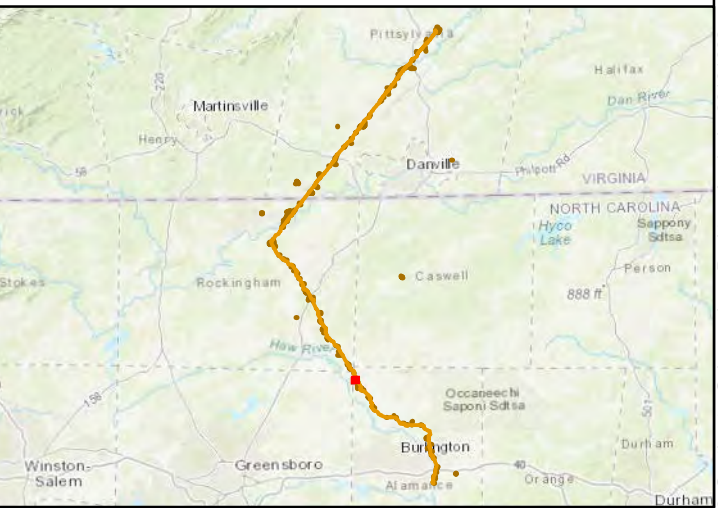




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 32 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
- Mole Salamander Only



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

**ESI** ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.  
Project No. 1219

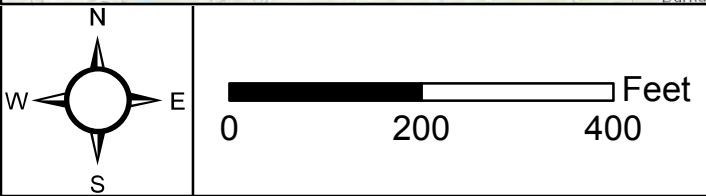
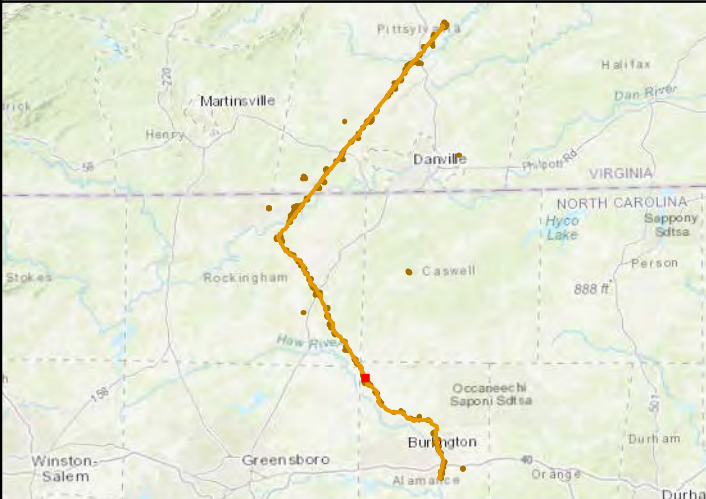




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 33 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Mole Salamander Only
  - Four-toe Salamander Only
- Potential Wetland Habitat**
  - Mole Salamander and Four-toe Salamander



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

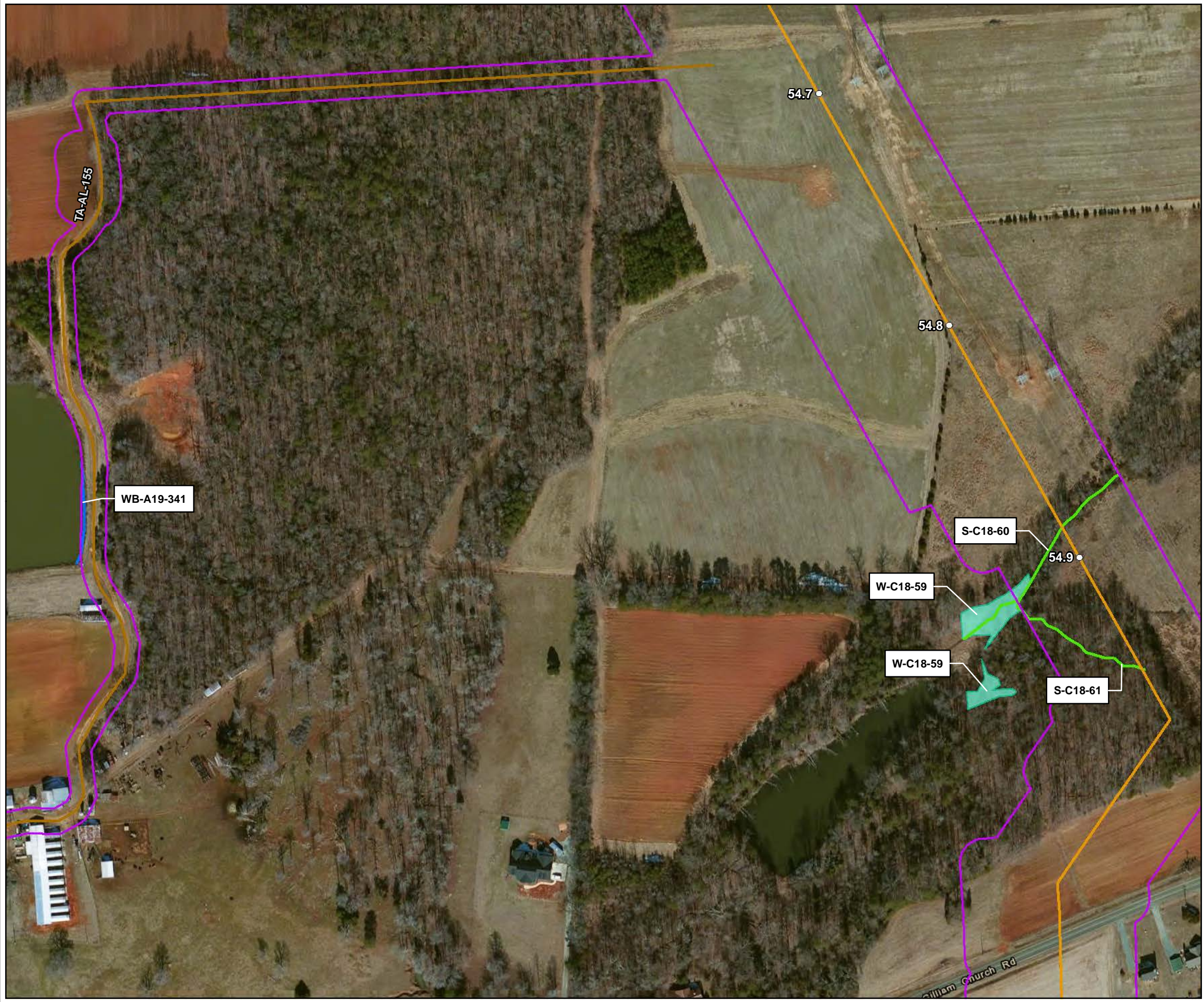


ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\Desktop\_Analysis\_20191008.mxd; creator: thunter

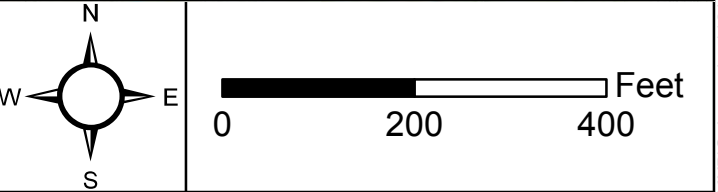
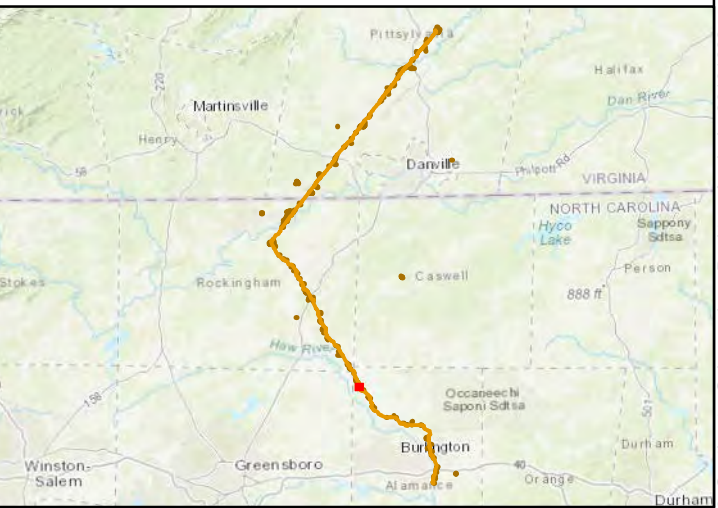




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 34 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Four-toe Salamander Only
  - Mole Salamander and Four-toe Salamander
- Potential Wetland Habitat**
  - Mole Salamander and Four-toe Salamander

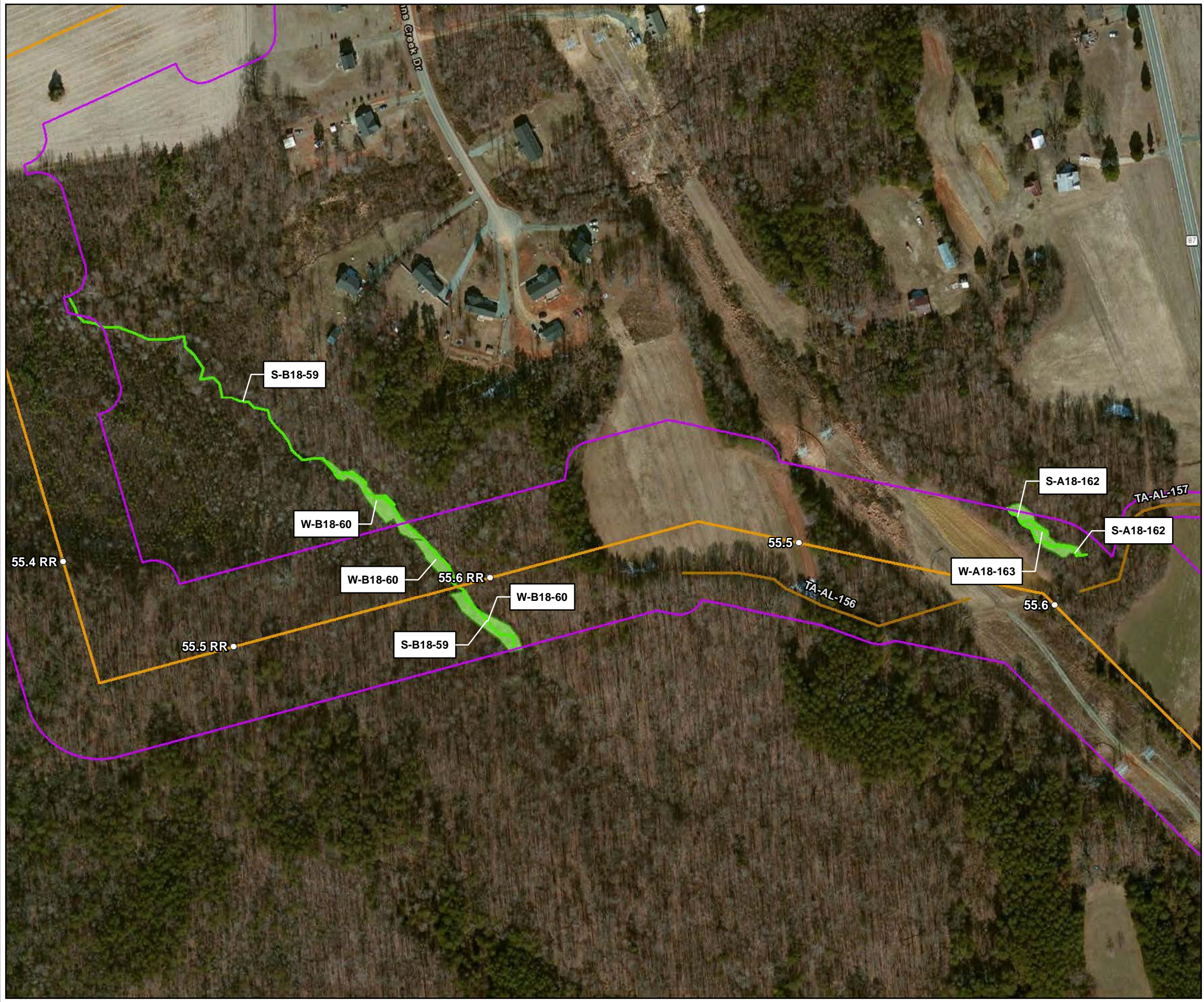


Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

**ESI** ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.  
Project No. 1219

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\Desktop\_Analysis\_20191008.mxd; creator: thunter

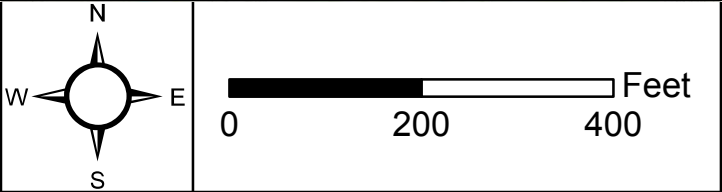
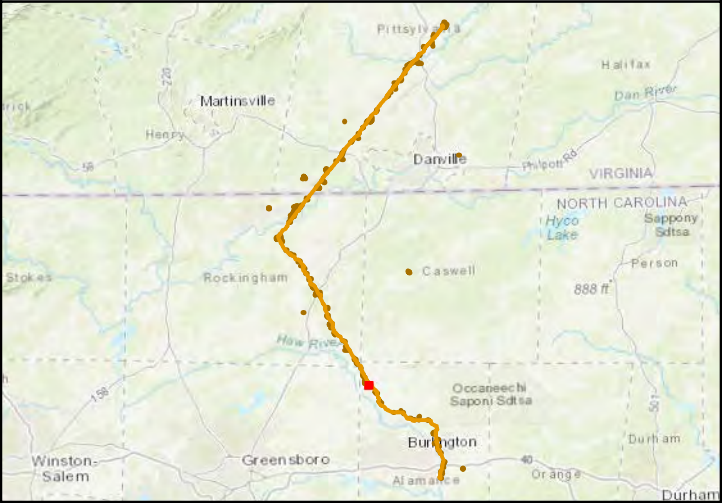




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 35 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Four-toe Salamander Only
- Potential Wetland Habitat**
  - Four-toe Salamander Only



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\Desktop\_Analysis\_20191008.mxd; creator: thunter

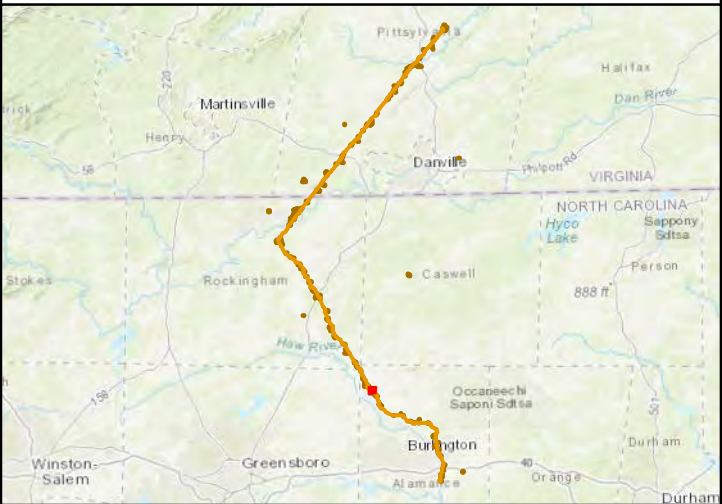




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 36 of 54

- Milepost
- Project Alignment
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Four-toe Salamander Only
  - Mole Salamander and Four-toe Salamander
- Potential Wetland Habitat**
  - Mole Salamander and Four-toe Salamander



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

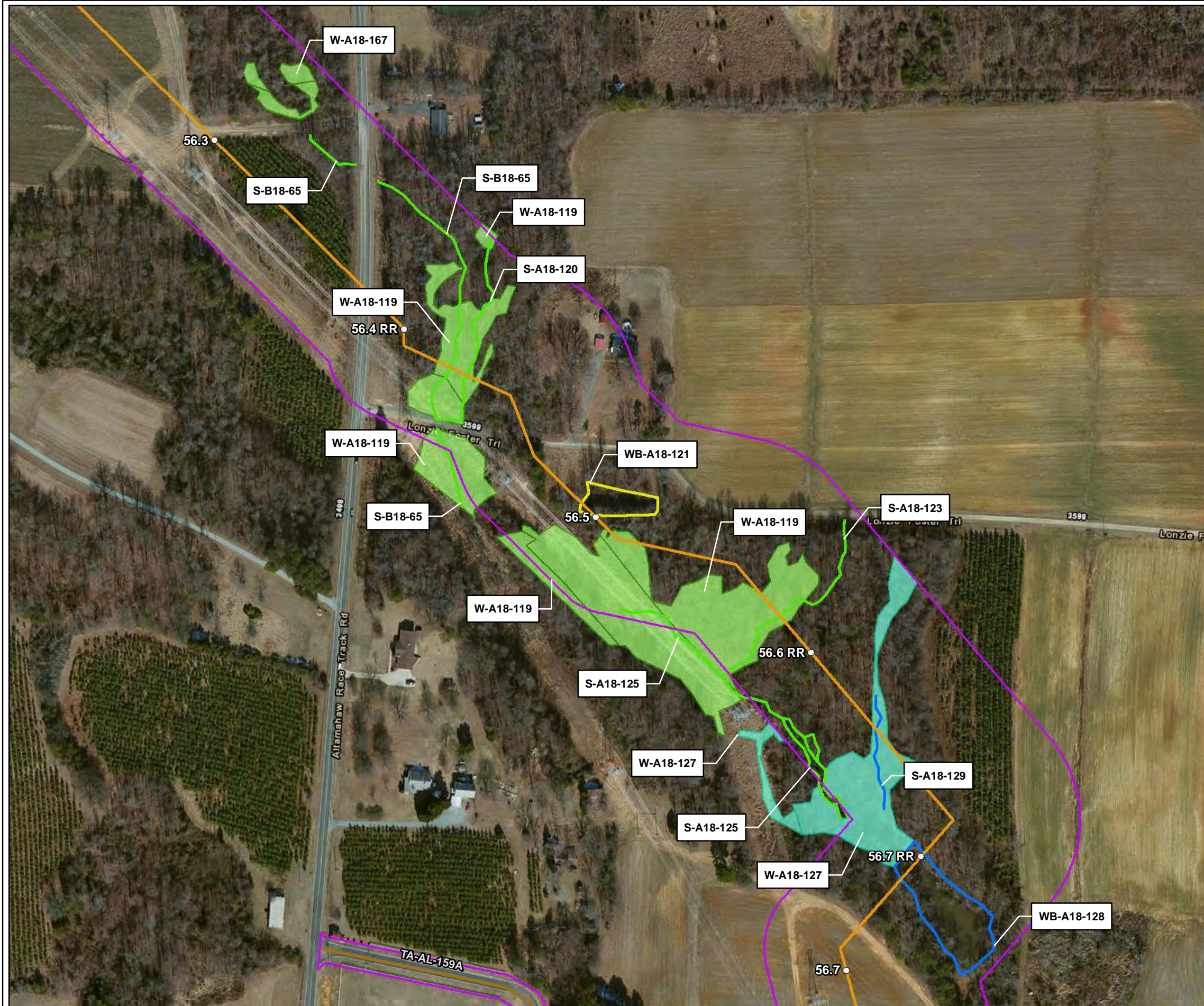


ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\Desktop\_Analysis\_20191008.mxd; creator: thunter

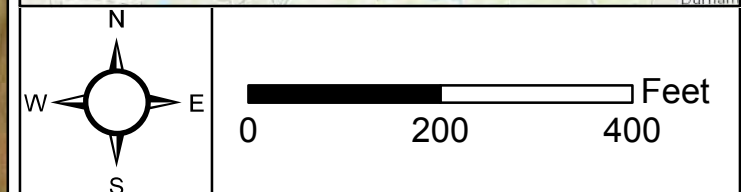
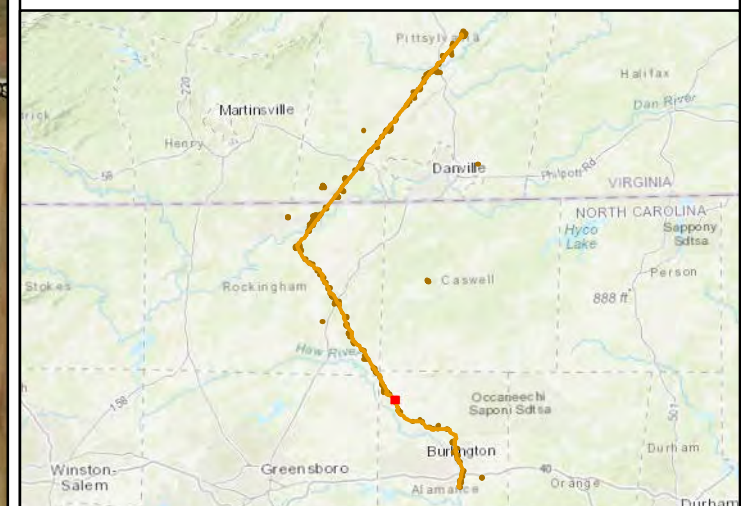




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 37 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Mole Salamander Only
  - Four-toe Salamander Only
  - Mole Salamander and Four-toe Salamander
- Potential Wetland Habitat**
  - Four-toe Salamander Only
  - Mole Salamander and Four-toe Salamander



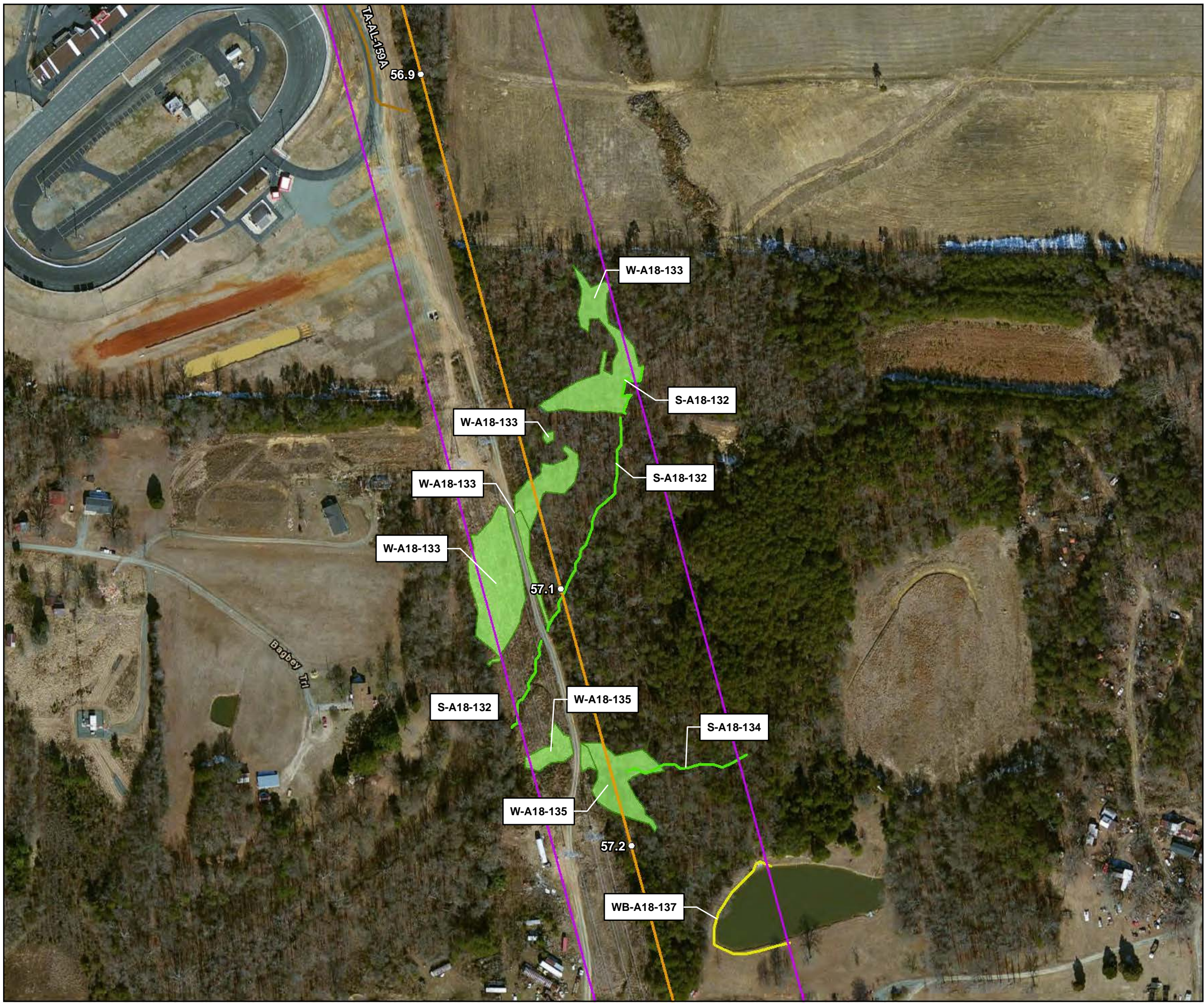
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

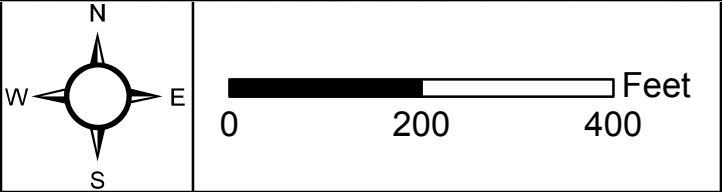
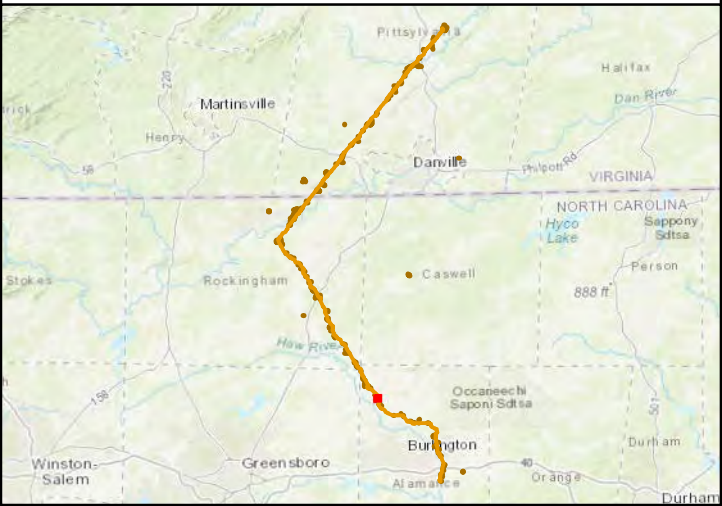




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 38 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Mole Salamander Only
  - Four-toe Salamander Only
- Potential Wetland Habitat**
  - Four-toe Salamander Only



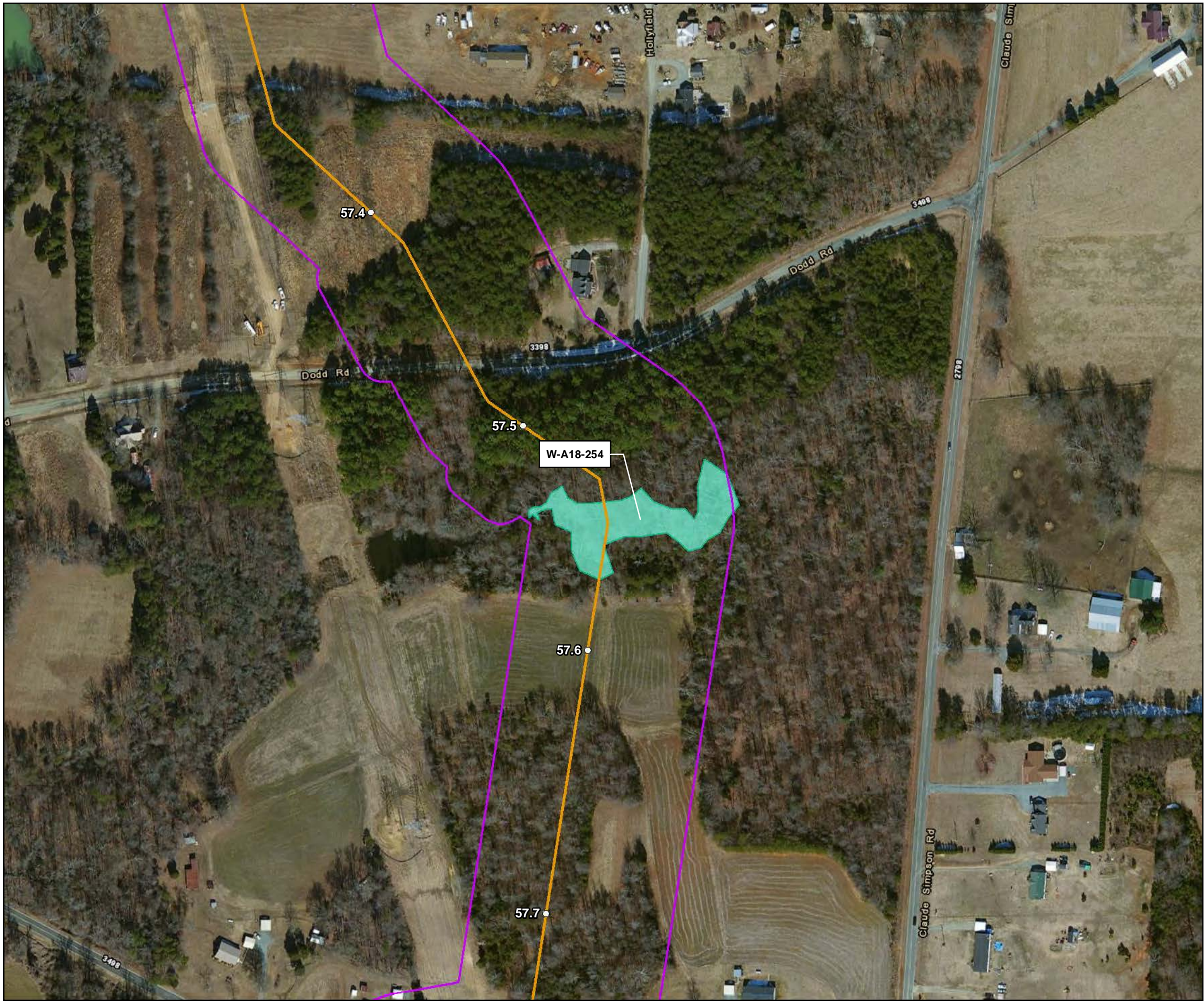
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.  
Project No. 1219

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\Desktop\_Analysis\_20191008.mxd; creator: thunter

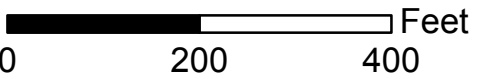
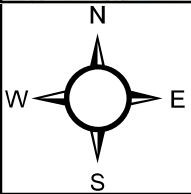
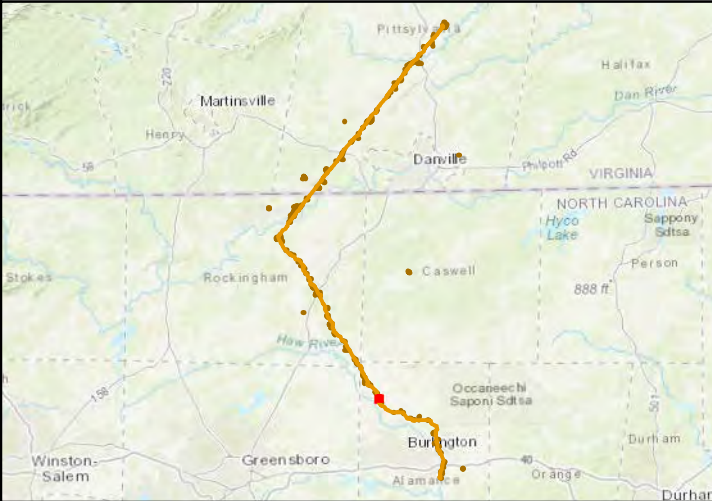




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 39 of 54

- Milepost
- Project Alignment
- Environmental Survey Corridor
- Potential Wetland Habitat**
- Mole Salamander and Four-toe Salamander



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

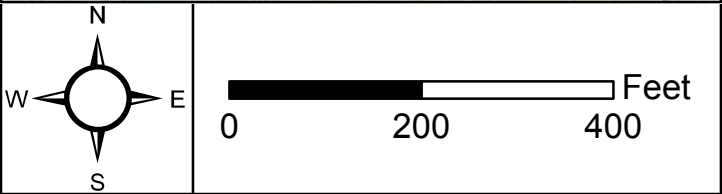
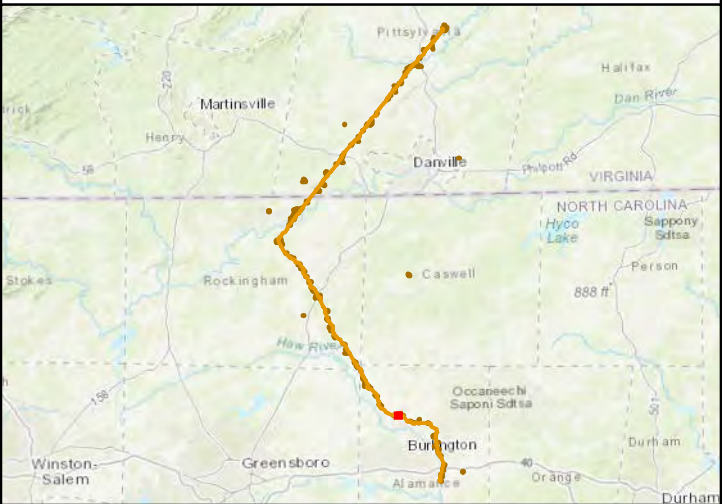




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 40 of 54

- Milepost
- Project Alignment
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Mole Salamander Only
  - Four-toe Salamander Only
  - Mole Salamander and Four-toe Salamander
- Potential Wetland Habitat**
  - Mole Salamander and Four-toe Salamander



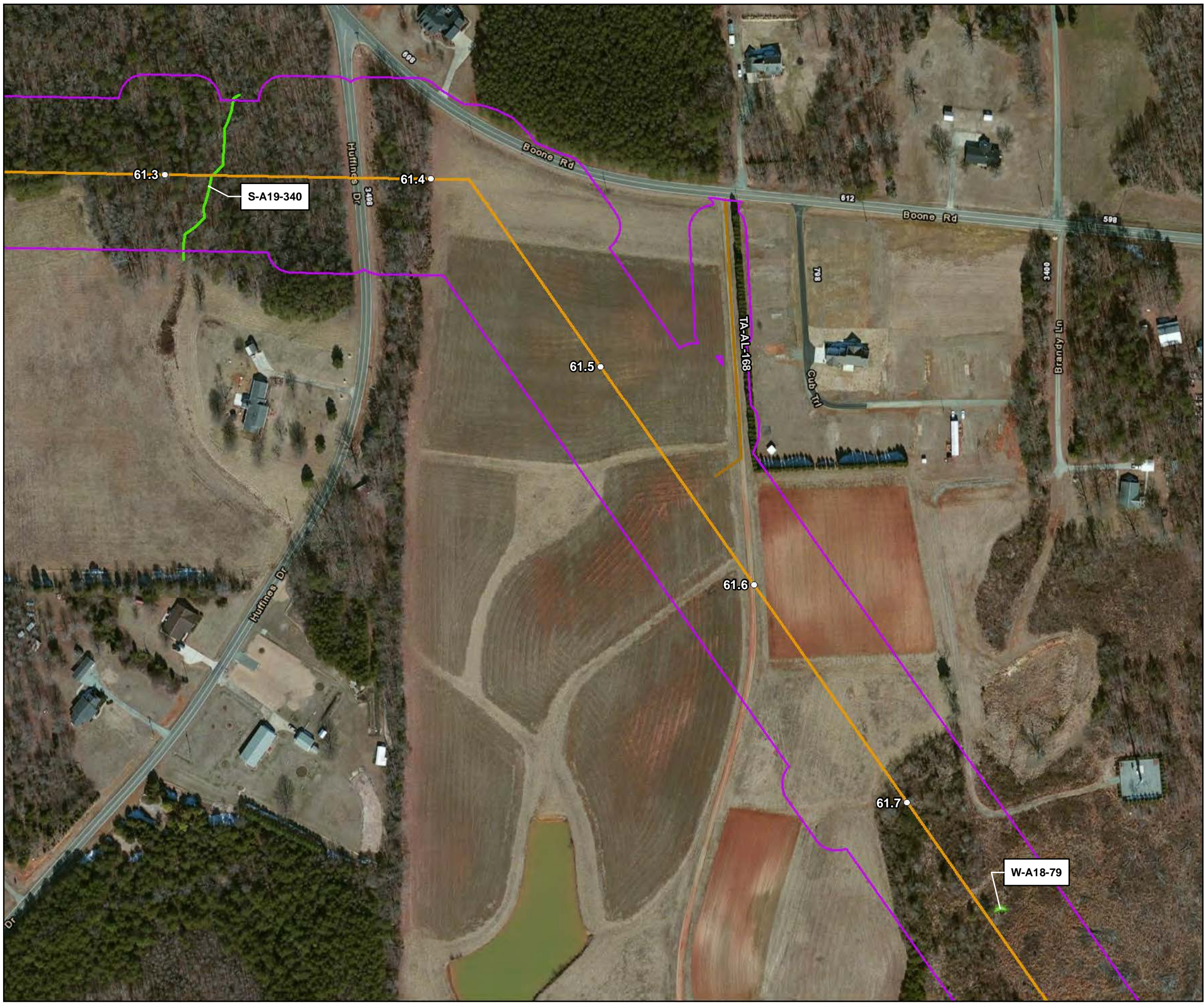
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219





Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 41 of 54

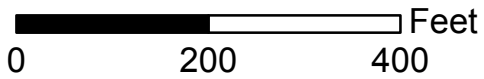
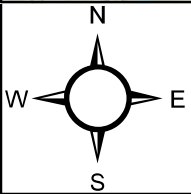
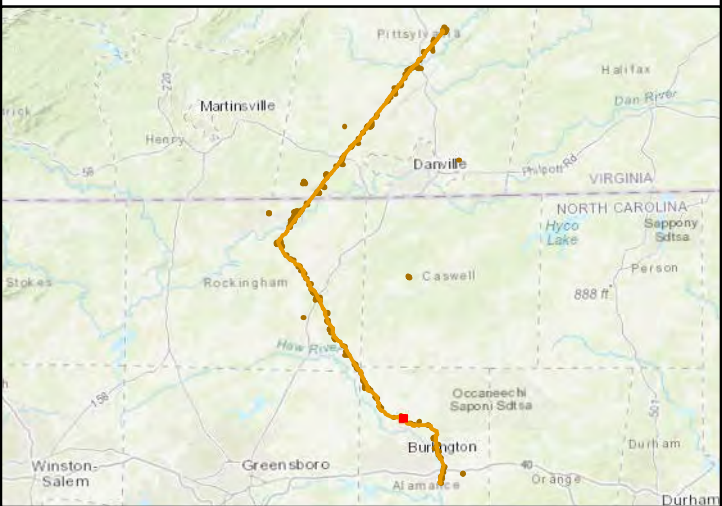
- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor

**Potential Stream Habitat**

- Four-toe Salamander Only

**Potential Wetland Habitat**

- Four-toe Salamander Only



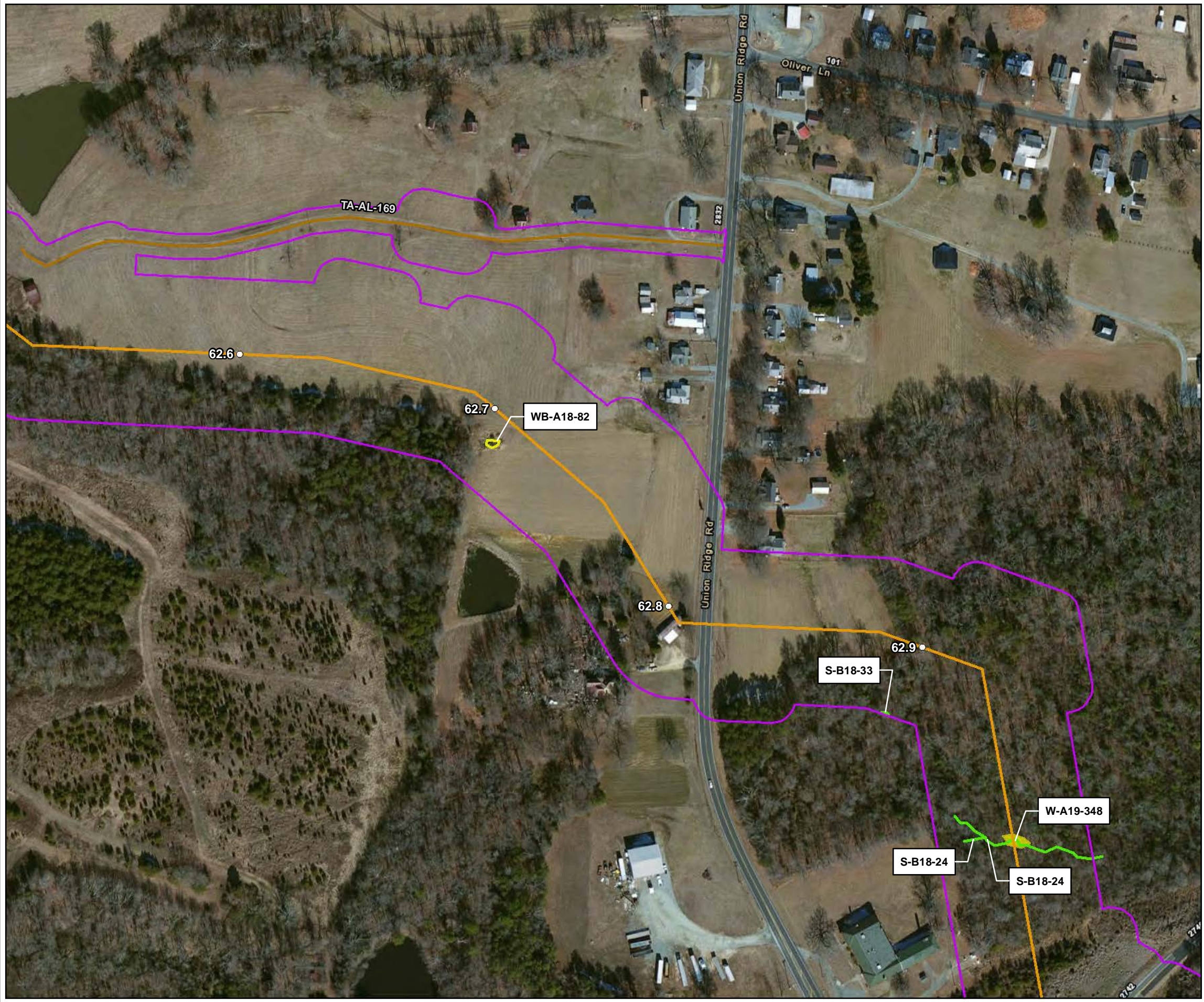
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

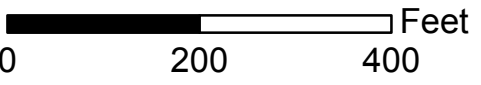
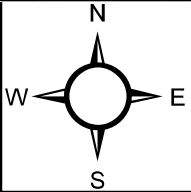
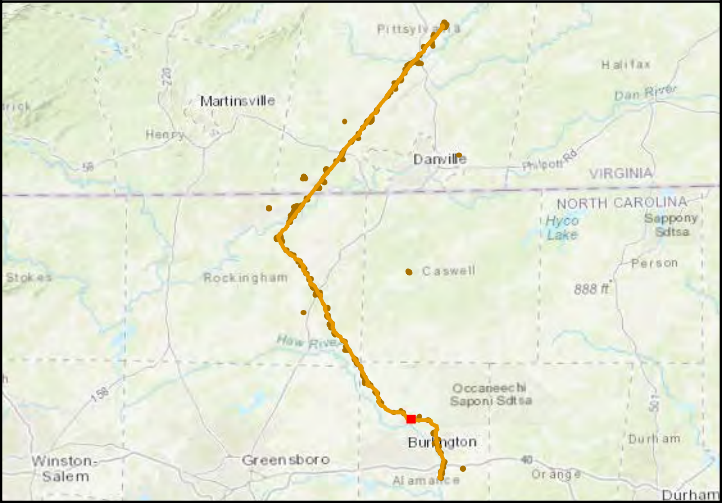




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 42 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Mole Salamander Only
  - Four-toe Salamander Only
- Potential Wetland Habitat**
  - Mole Salamander Only

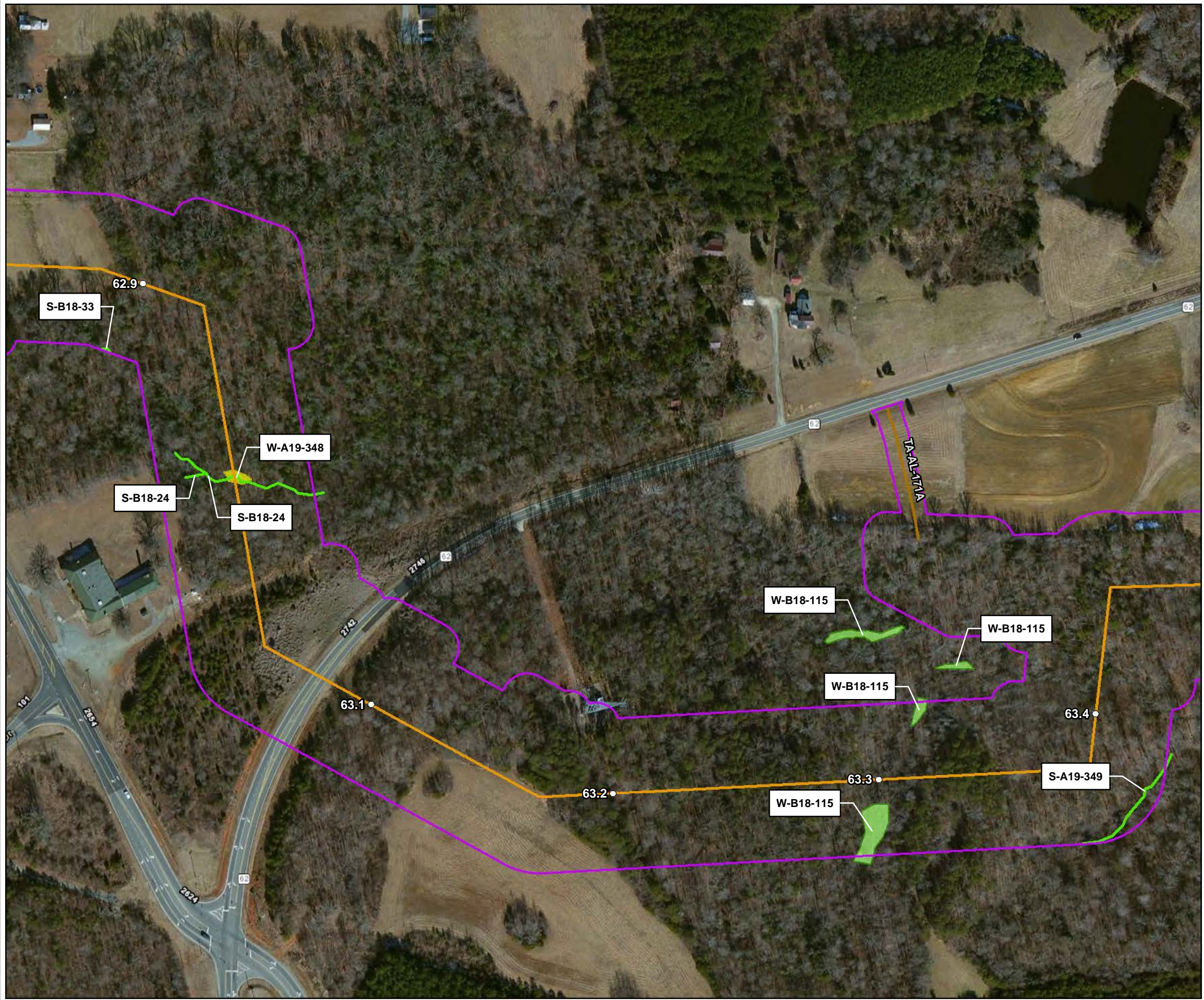


Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.  
Project No. 1219

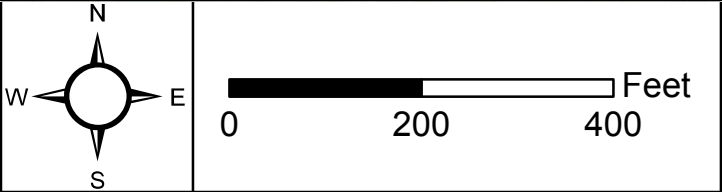
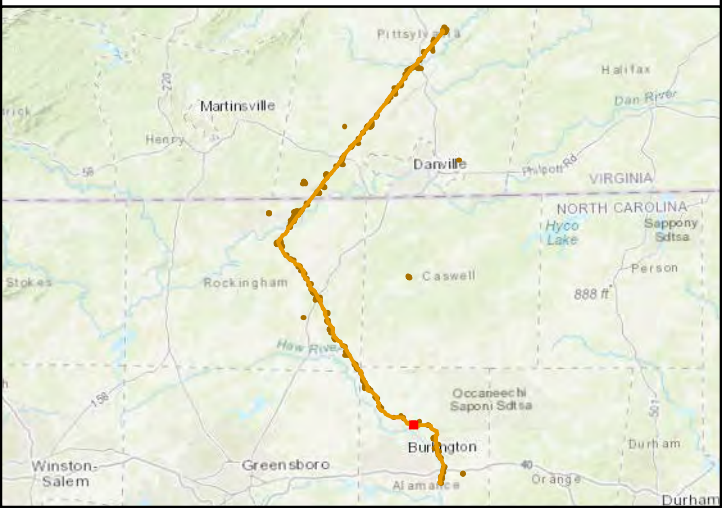




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 43 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Four-toe Salamander Only
- Potential Wetland Habitat**
  - Mole Salamander Only
  - Four-toe Salamander Only



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\Desktop\_Analysis\_20191008.mxd; creator: thunter

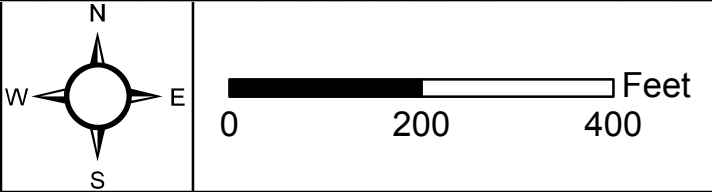
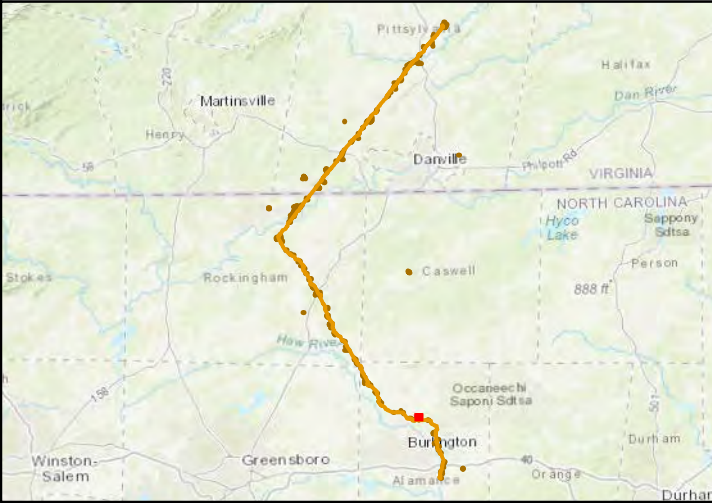




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 44 of 54

- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Mole Salamander Only
- Potential Wetland Habitat**
  - Mole Salamander Only

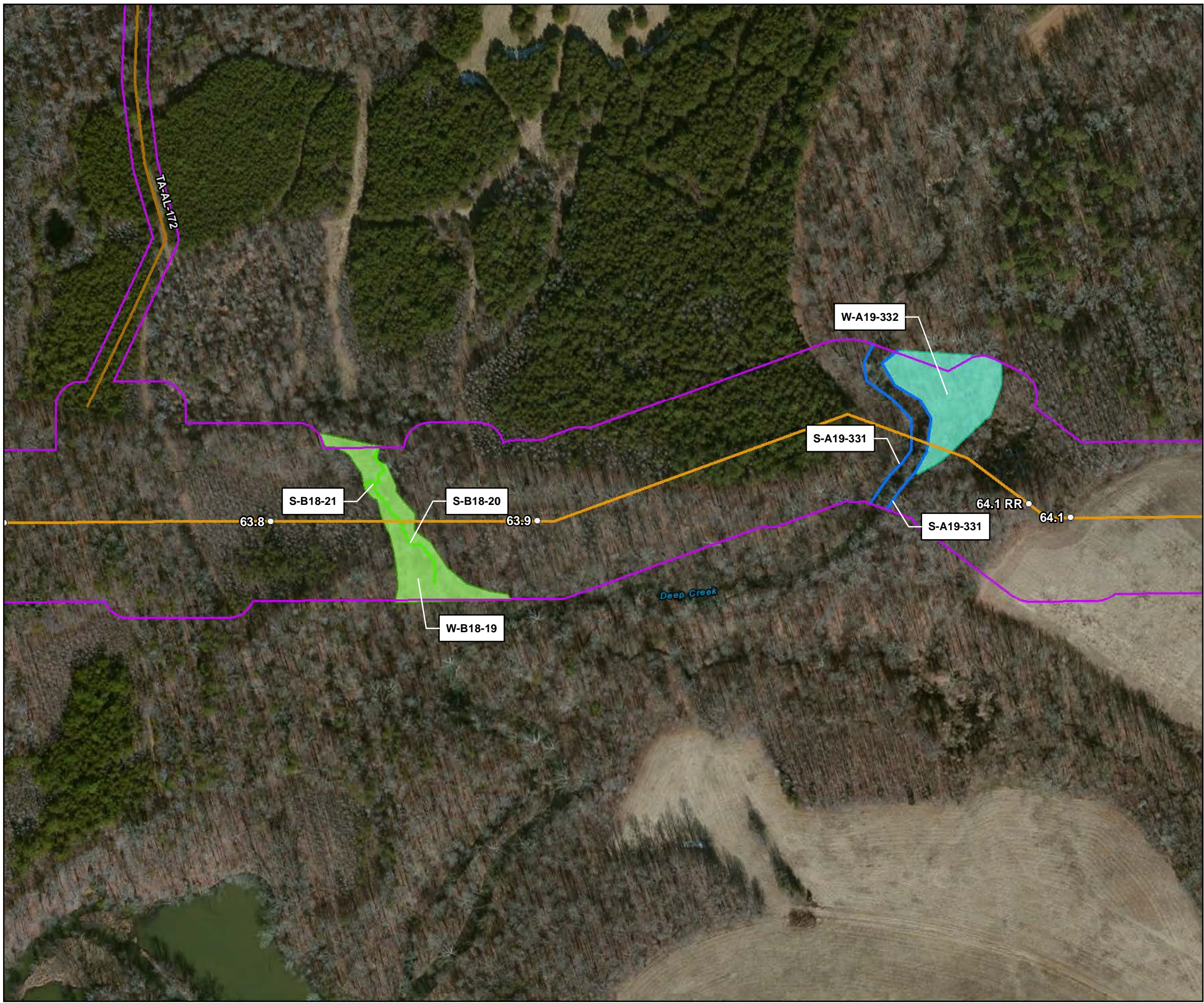


Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.  
Project No. 1219

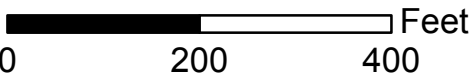
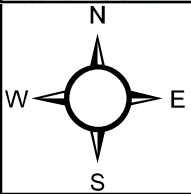
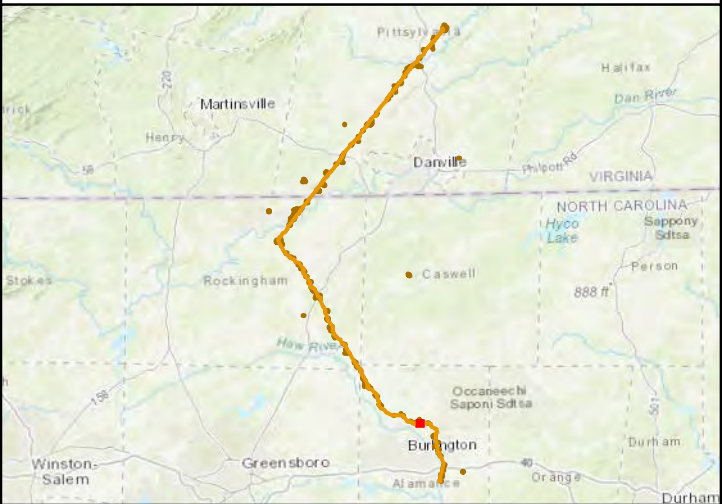




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 45 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Four-toe Salamander Only
  - Mole Salamander and Four-toe Salamander
- Potential Wetland Habitat**
  - Four-toe Salamander Only
  - Mole Salamander and Four-toe Salamander



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\_Desktop\_Analysis\_20191008.mxd; creator: thunter

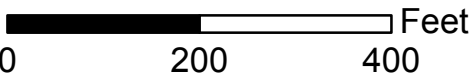
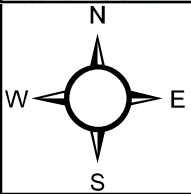
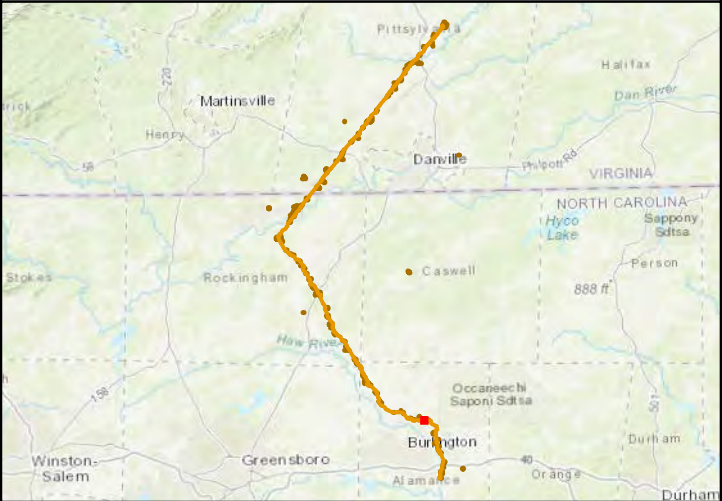




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 46 of 54

- Milepost
- Project Alignment
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Four-toe Salamander Only
  - Mole Salamander and Four-toe Salamander



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

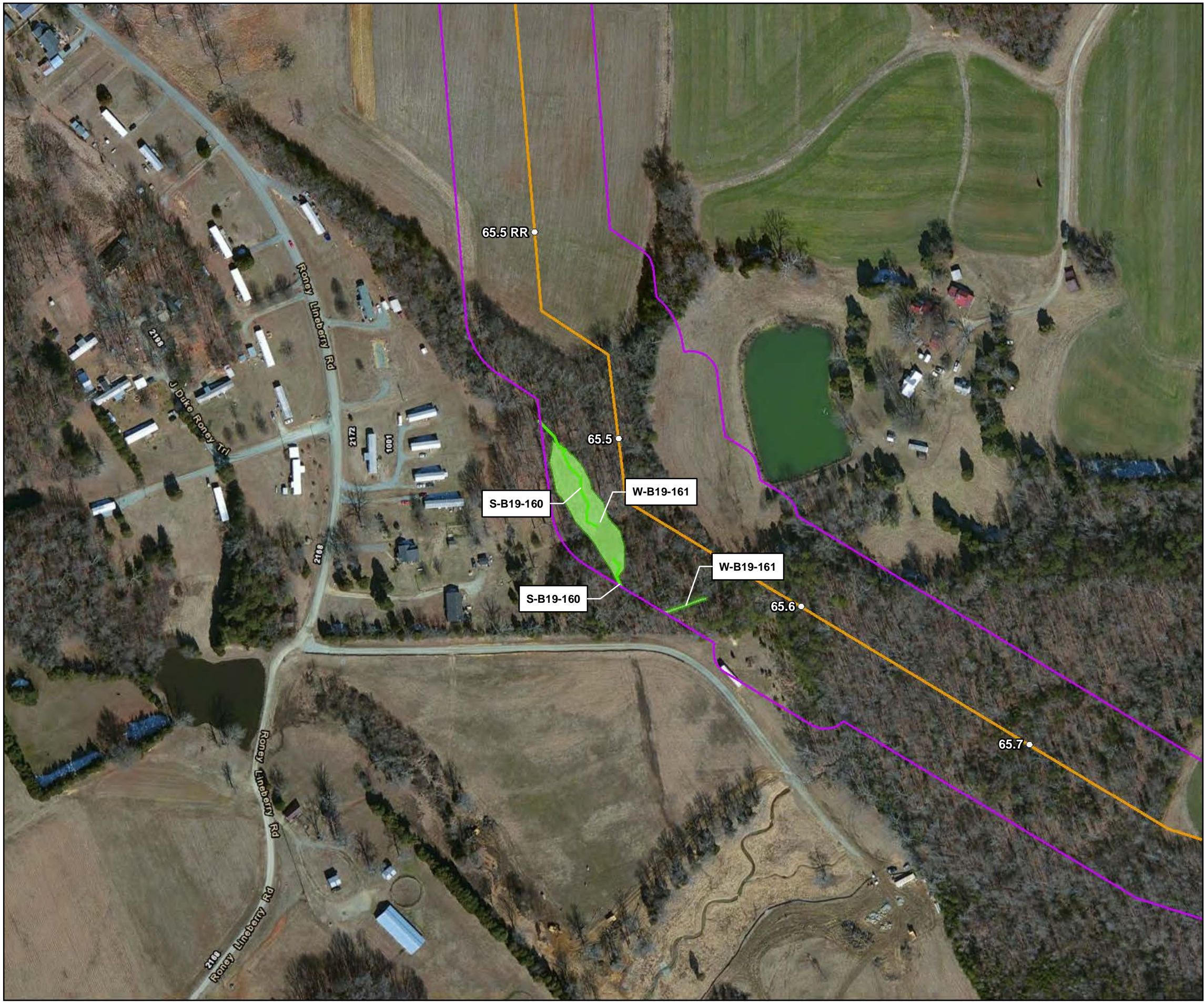


ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\Desktop\_Analysis\_20191008.mxd; creator: thunter

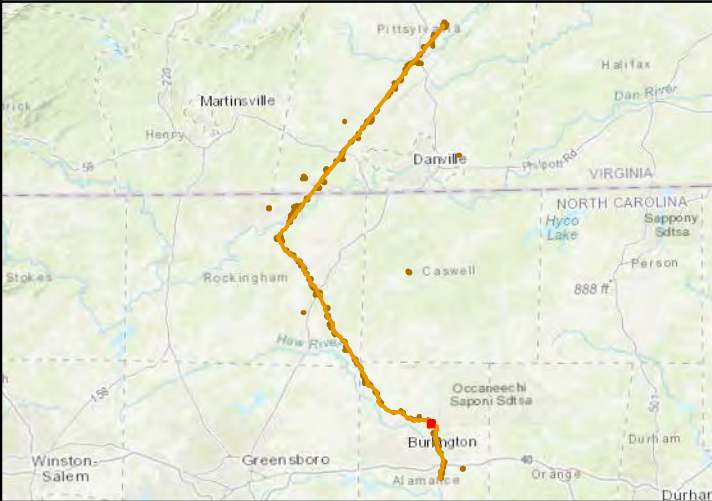




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 47 of 54

- Milepost
- Project Alignment
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Four-toe Salamander Only
- Potential Wetland Habitat**
  - Four-toe Salamander Only



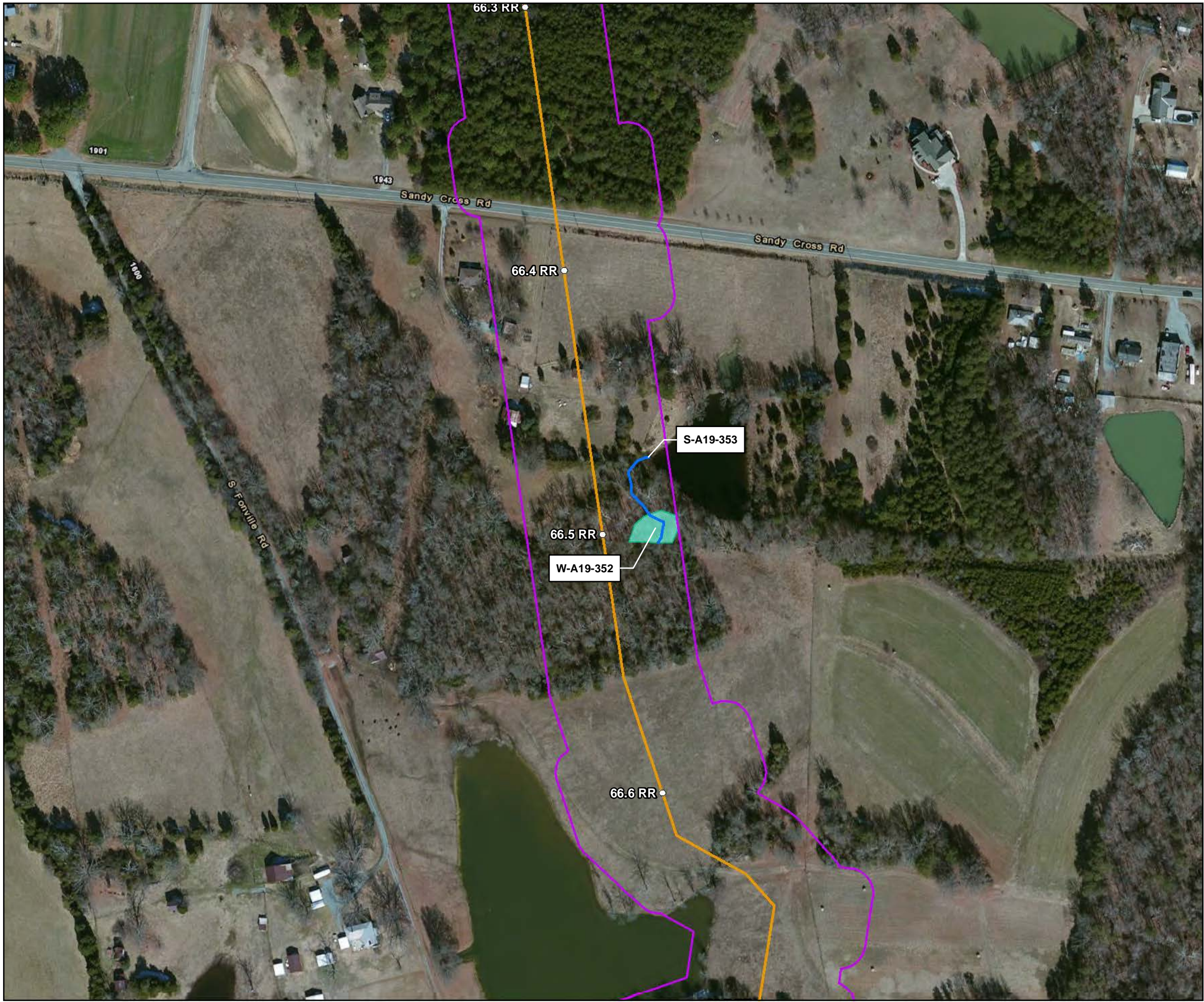
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

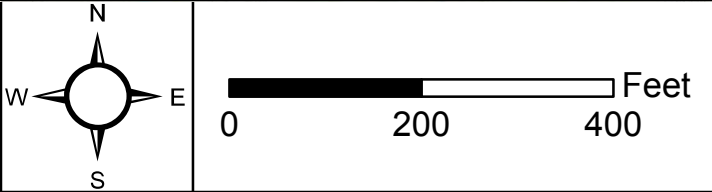
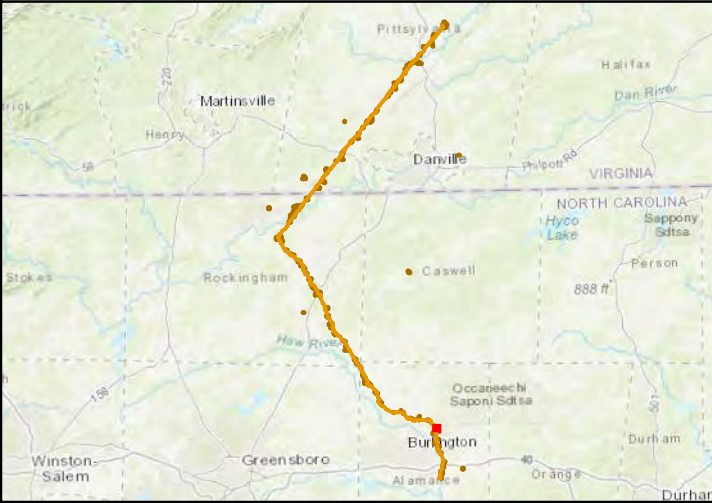




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 48 of 54

- Milepost
- Project Alignment
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Mole Salamander and Four-toe Salamander
- Potential Wetland Habitat**
  - Mole Salamander and Four-toe Salamander



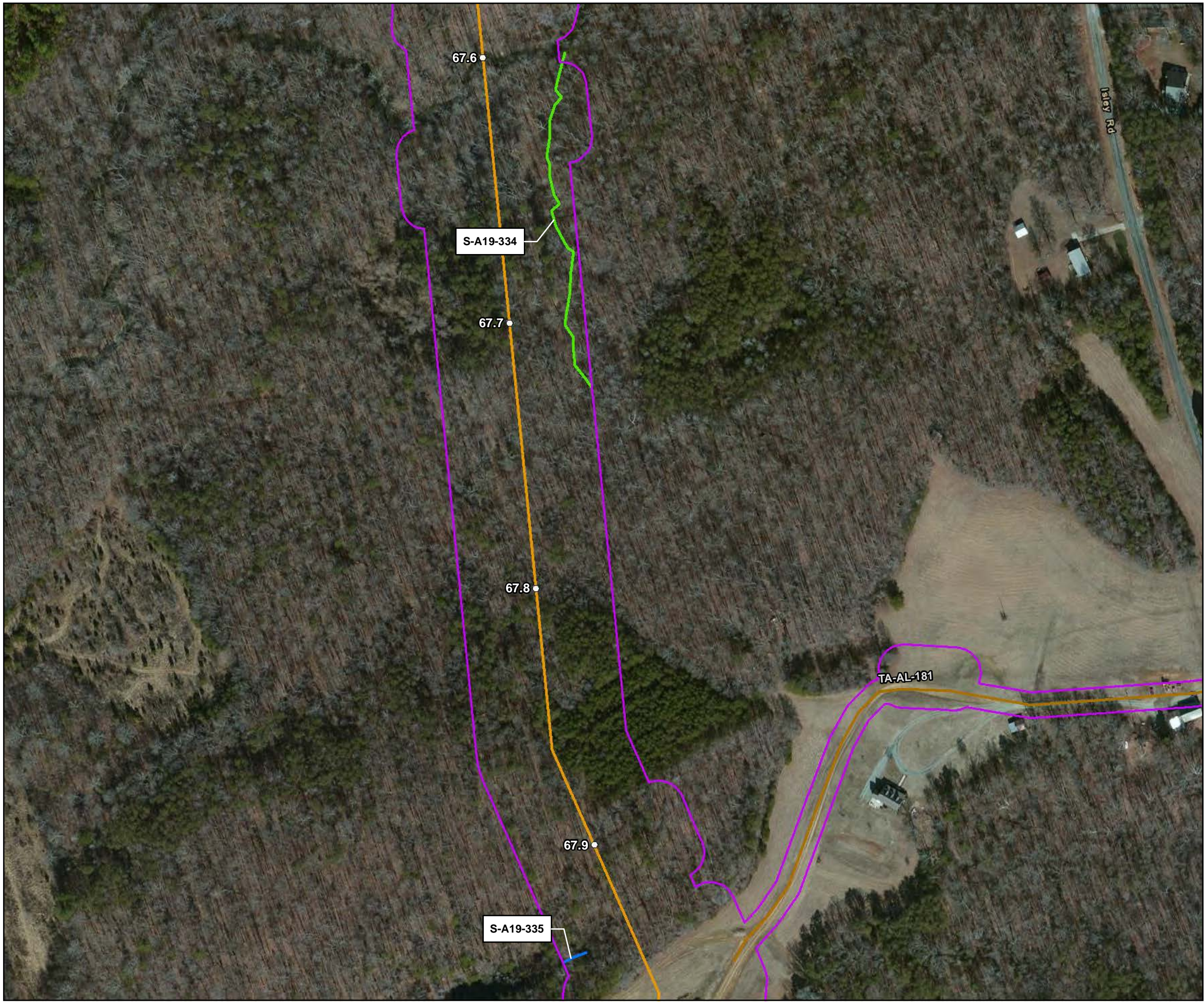
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

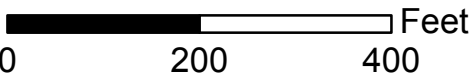
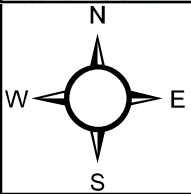
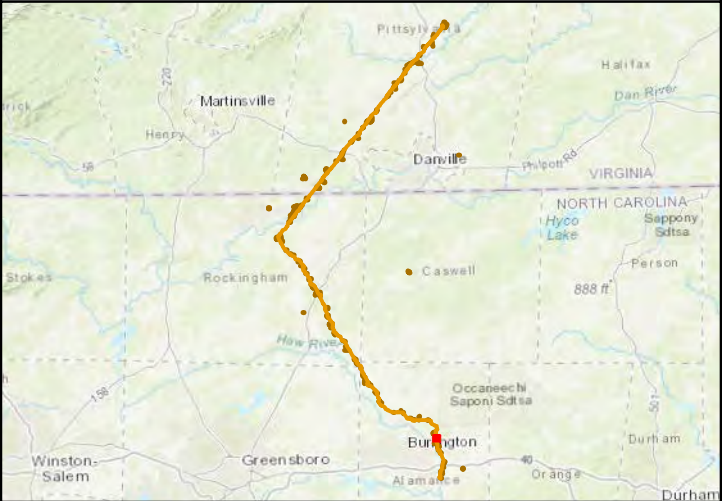




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 49 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
- Four-toe Salamander Only
- Mole Salamander and Four-toe Salamander



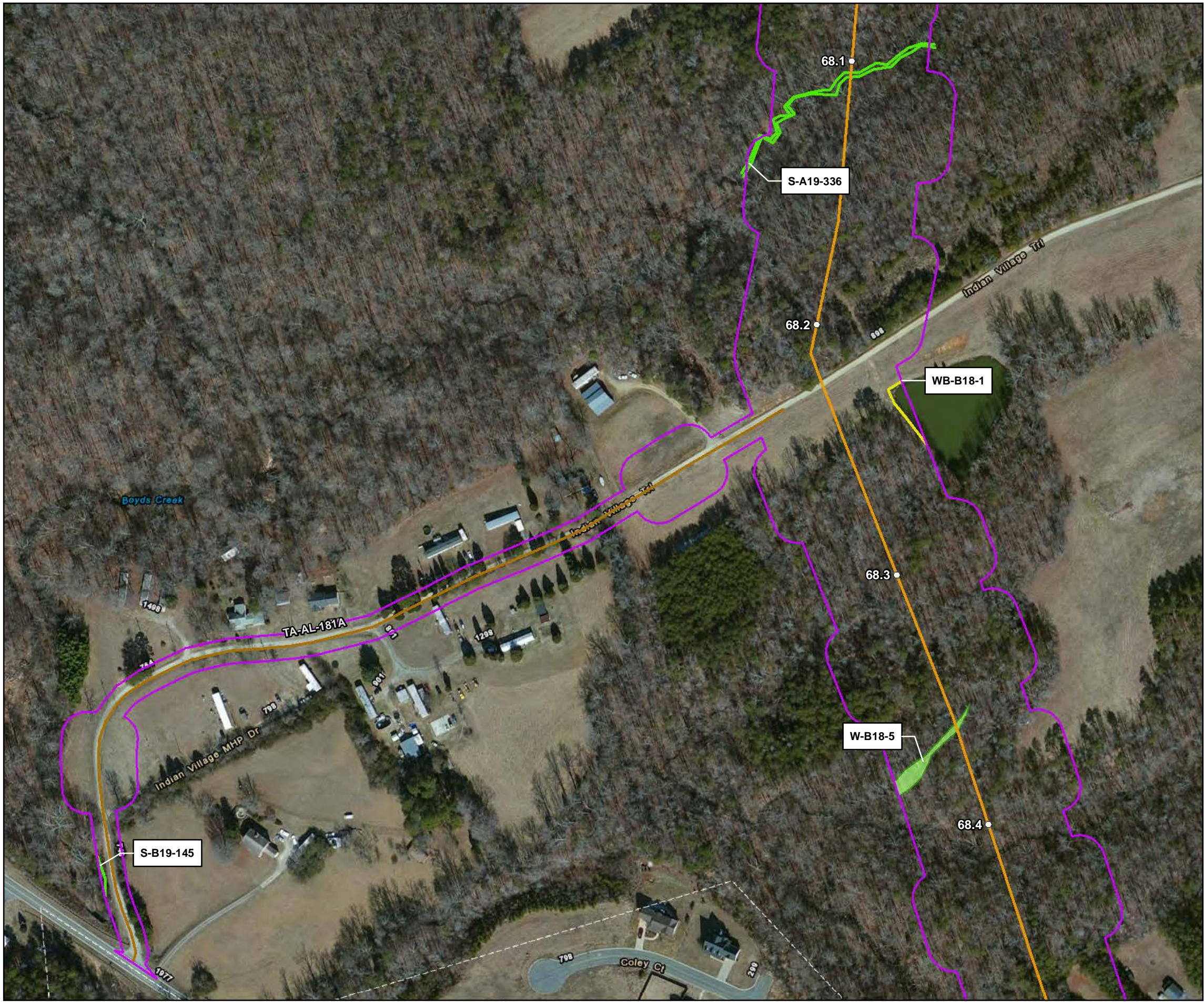
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

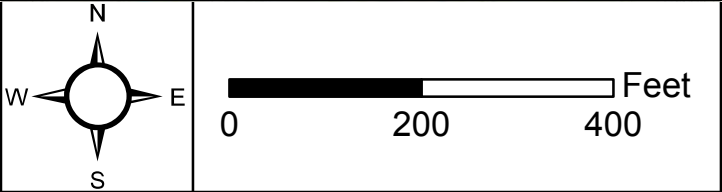
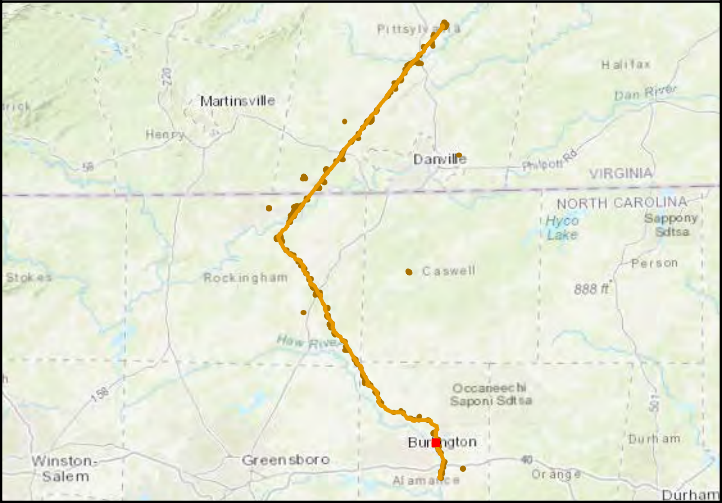




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 50 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
  - Mole Salamander Only
  - Four-toe Salamander Only
- Potential Wetland Habitat**
  - Four-toe Salamander Only

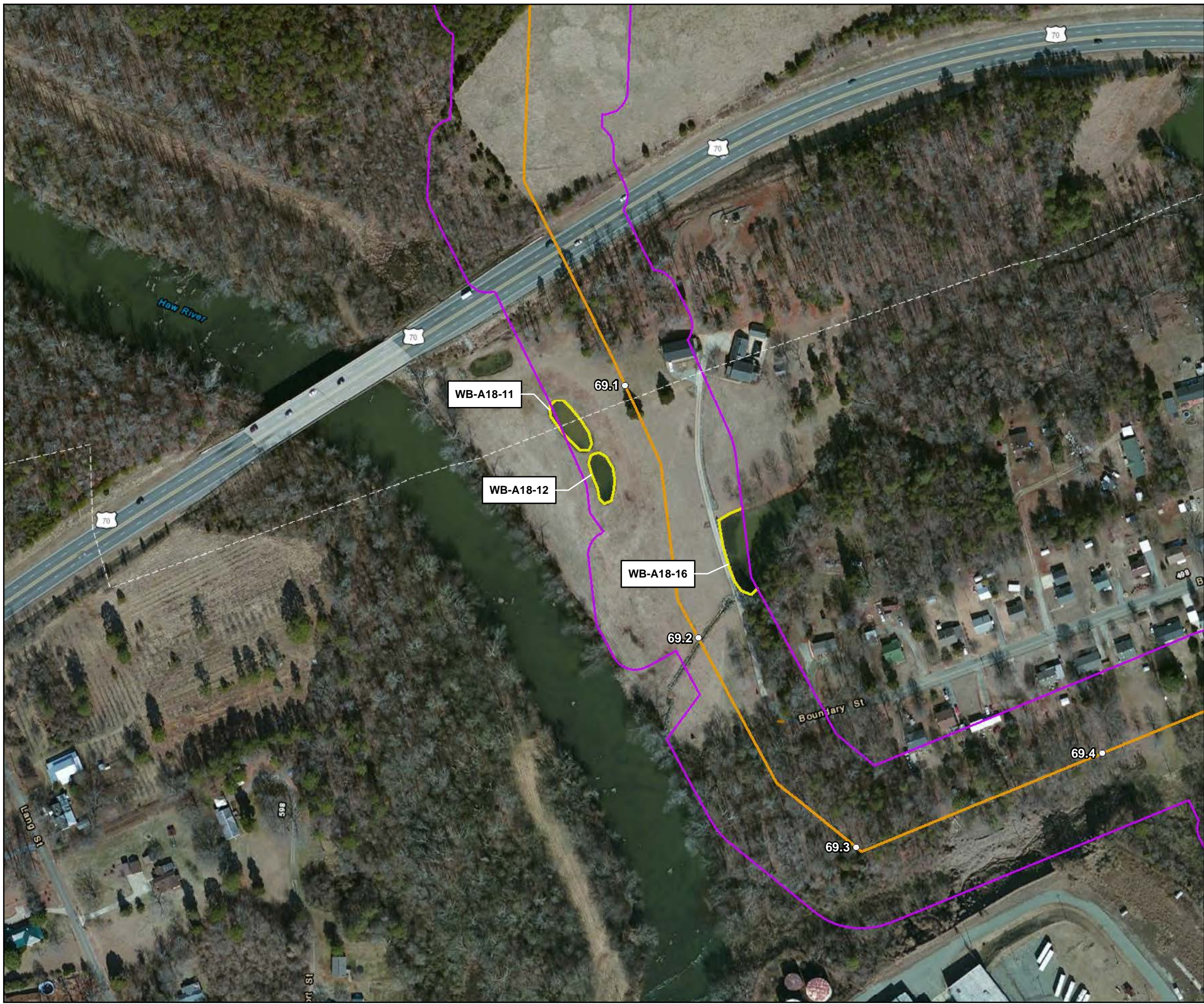


Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



**ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.**  
Project No. 1219

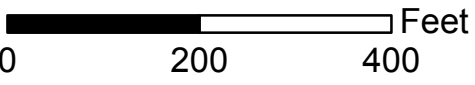
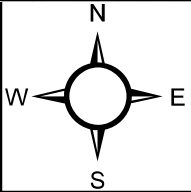
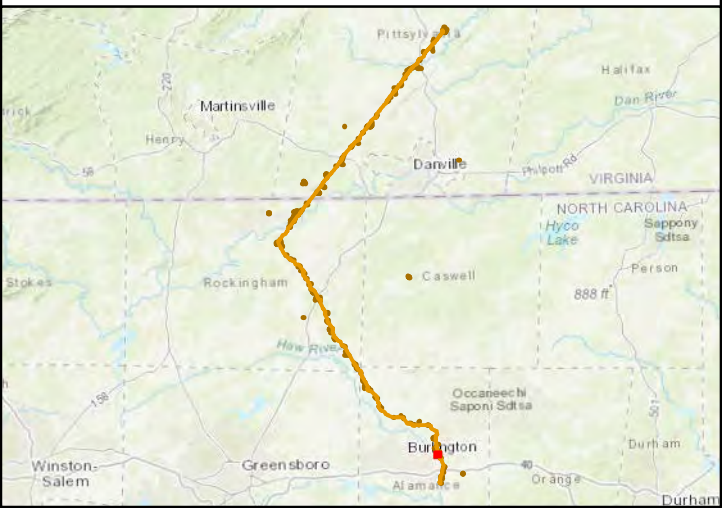




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 51 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat**
- Mole Salamander Only



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

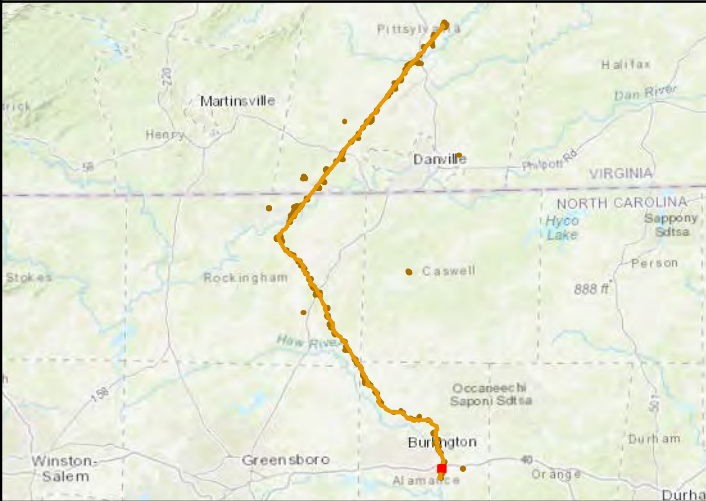




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 52 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Wetland Habitat**
- Four-toe Salamander Only



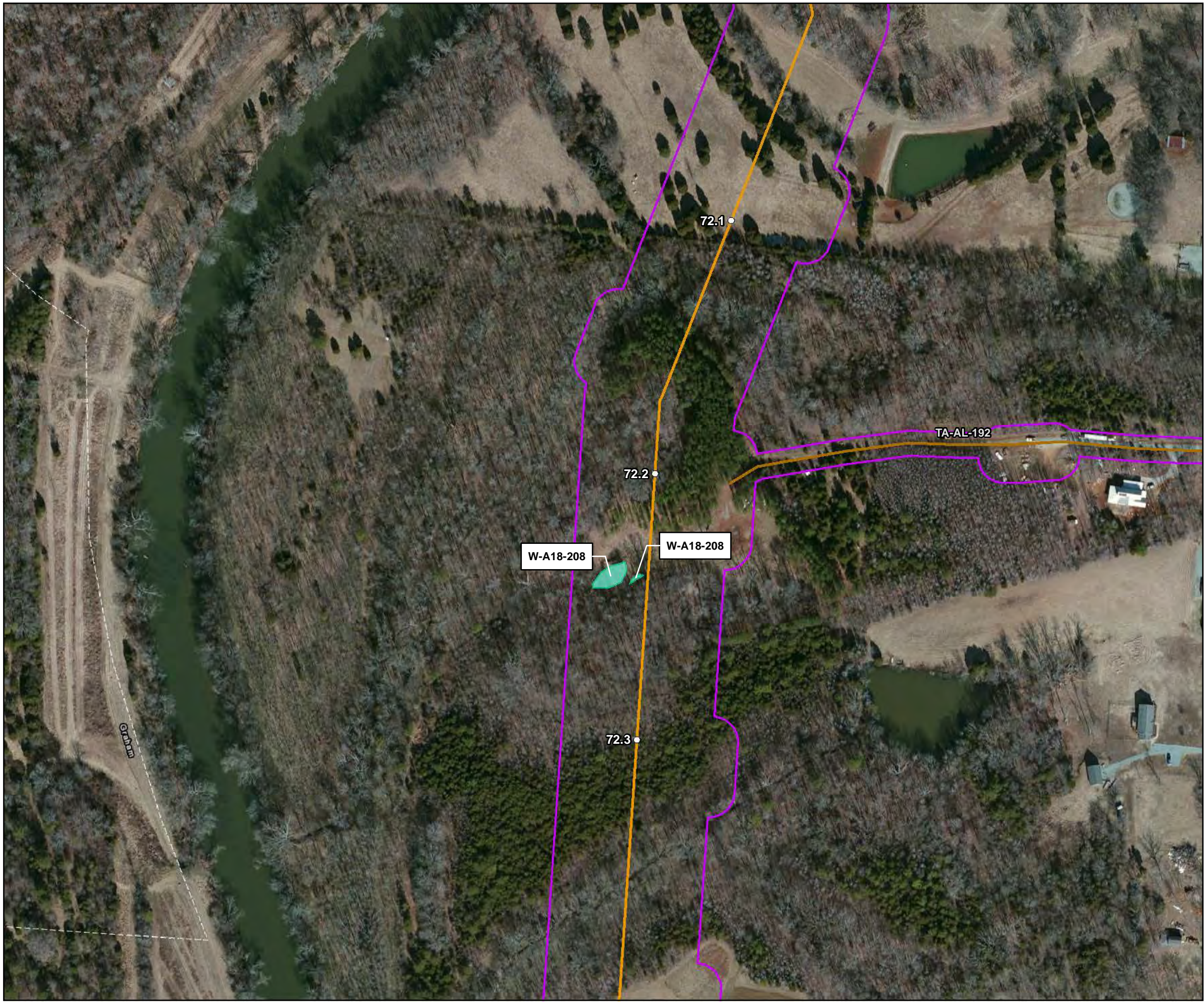
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

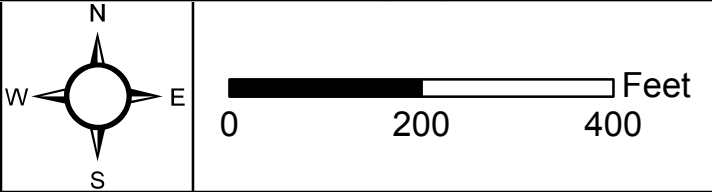
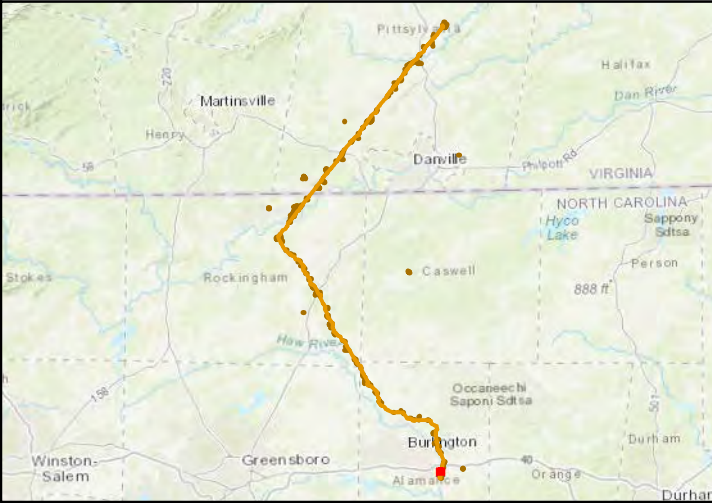




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 53 of 54

- Milepost
- Project Alignment
- Access Road
- Environmental Survey Corridor
- Potential Wetland Habitat**
- Mole Salamander and Four-toe Salamander



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

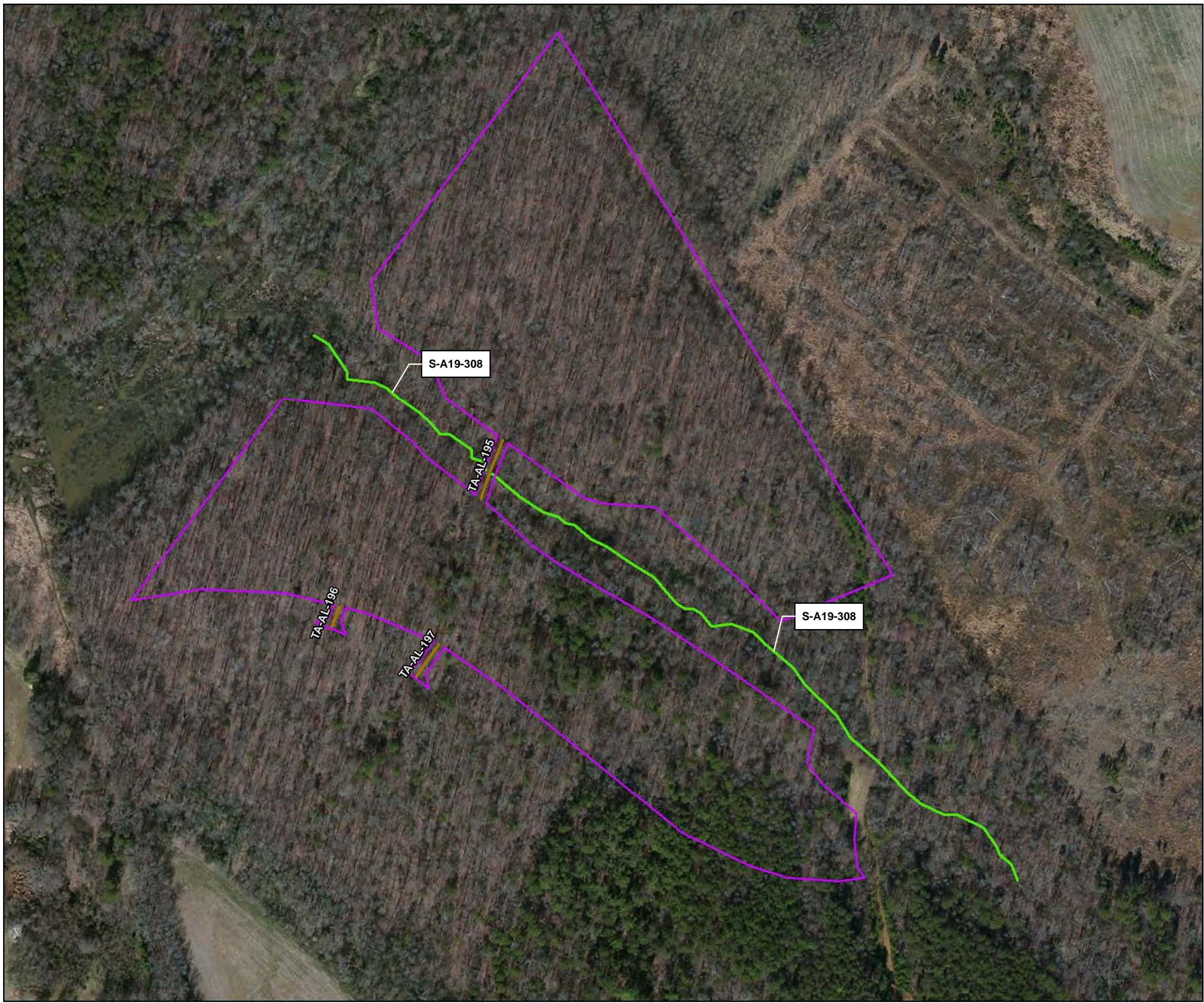


ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.

Project No. 1219

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\Desktop\_Analysis\_20191008.mxd; creator: thunter

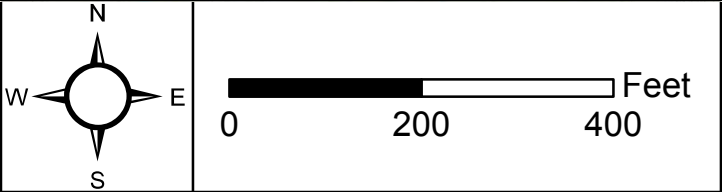
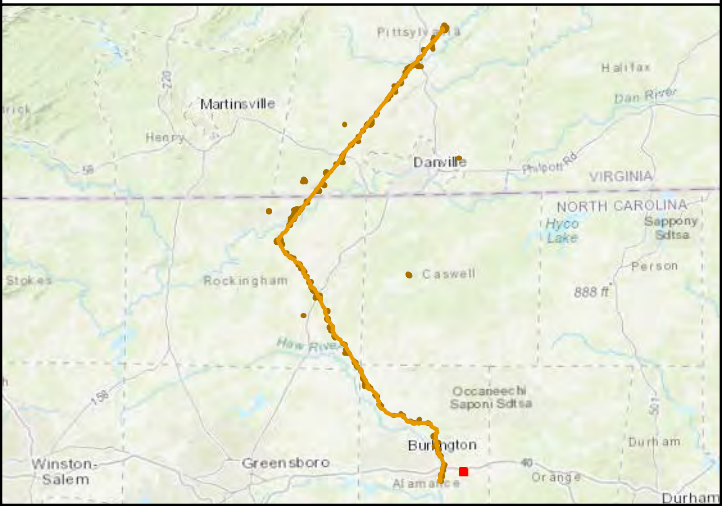




Potential feature habitat for the Four-toe salamander and Mole salamander on the MVP Southgate Pipeline Project in North Carolina.

Map 54 of 54

- Access Road
- Environmental Survey Corridor
- Potential Stream Habitat
- Four-toe Salamander Only



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ENVIRONMENTAL SOLUTIONS  
& INNOVATIONS, INC.  
Project No. 1219

G:\Current\1219\_MVP\_Southgate\MXD\Salamanders\1219\_Southgate\_Salamanders\Desktop\_Analysis\_20191008.mxd; creator: thunter





## **MVP Southgate Project**

Docket No. CP19-14-000

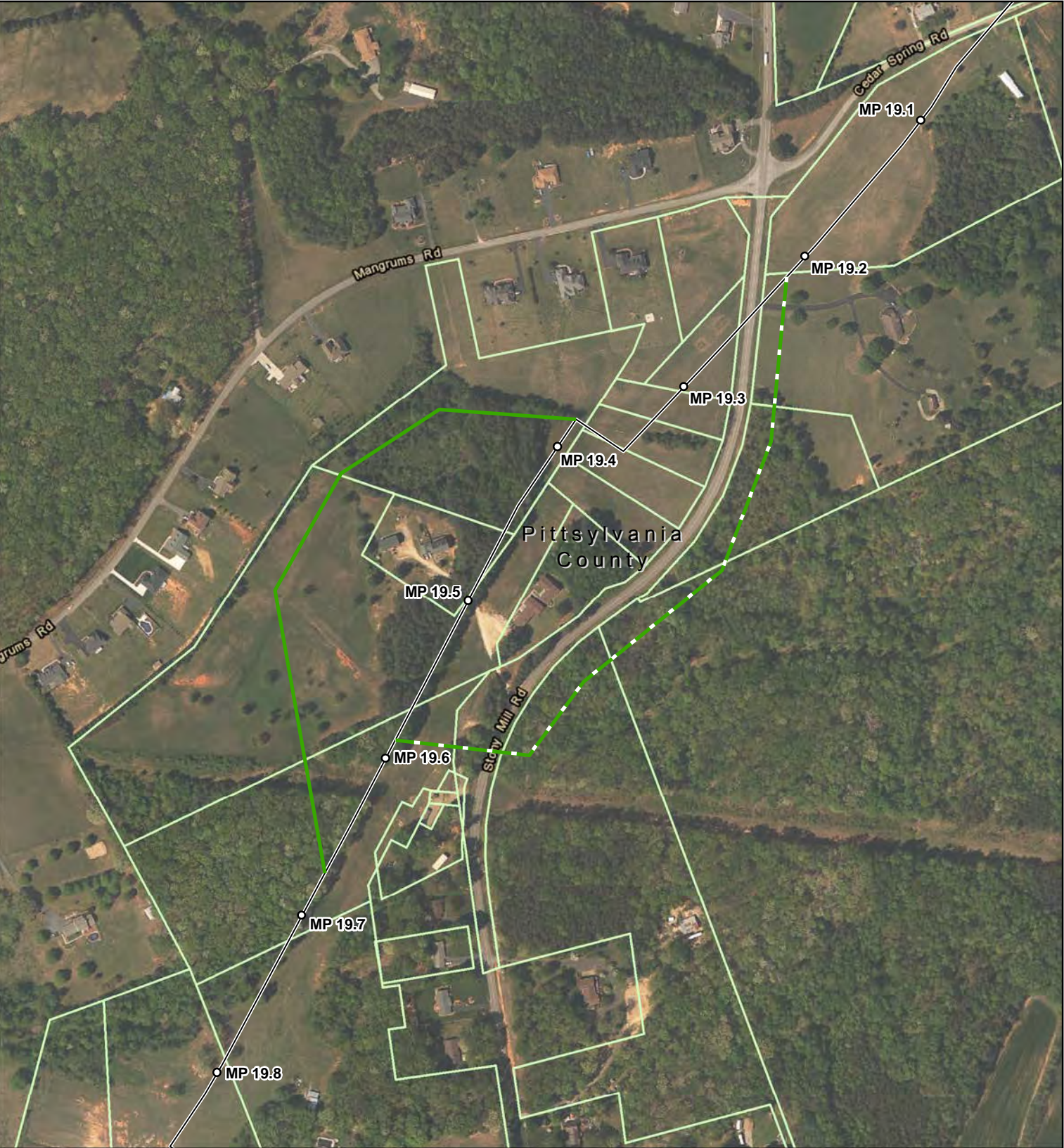
### **Attachment 45-1**

## **Figure 45-1 - Taylor East and West Variations**

October 2019



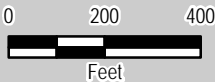
S:\4 PROJECTS\NEXTERA\300423 MVP\_Southgate\6-MXD\B-source Reports\RR10\Attach\_45\_1\_Taylor\_E\_W\_Ver\_Oct\_2019\_Mosaic.mxd



**Legend**

- Mileposts
- Current Pipeline Route
- - - Taylor Variation East
- Taylor Variation West
- Approximate Parcel Boundary
- County Boundary

**Data Sources:** ESRI, EQT



1 inch = 400 feet  
When Printed 8.5x11



Figure 45 - 1  
**Taylor Property  
East & West Variations**

Sheet 1 of 1  
(ESRI World Imagery)



600 Willowbrook Ln  
West Chester, PA 19382  
October 2019





## **MVP Southgate Project**

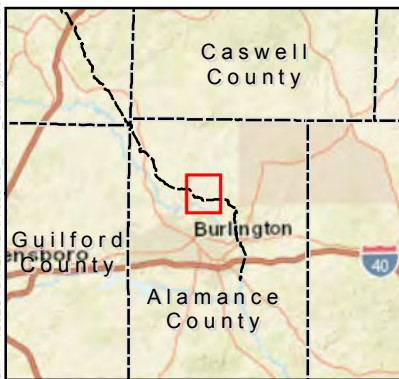
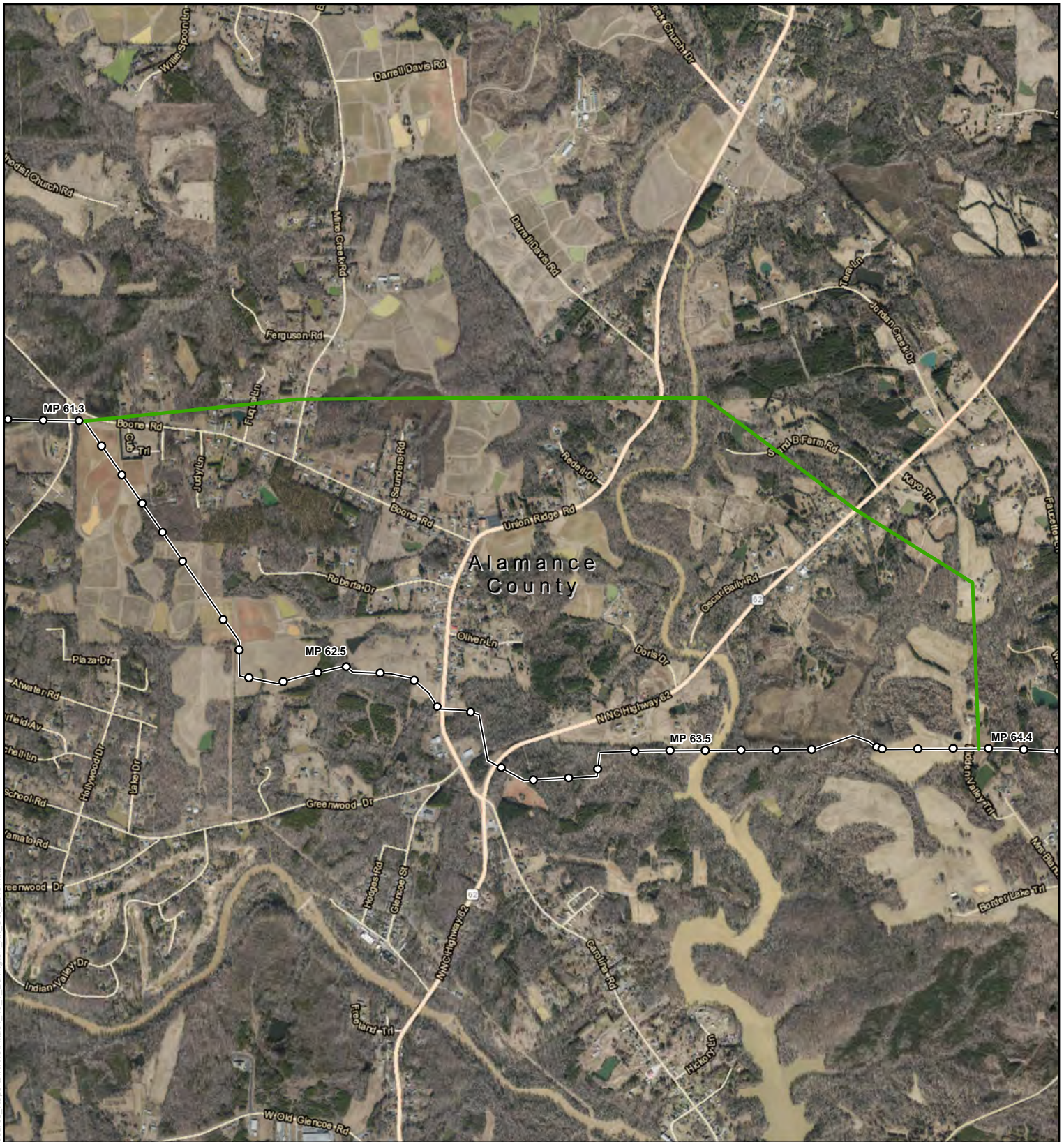
Docket No. CP19-14-000

### **Attachment 48-1**

## **Figure 48-1 - City of Burlington Alternative**

October 2019





### Legend

- Mileposts
- Current Pipeline Route
- City of Burlington Alternative
- County Boundary

Data Sources: ESRI, EQT



0 1,000 2,000  
Feet  
1 inch = 2,000 feet  
When Printed 8.5x11



Figure 48 - 1  
**City of Burlington  
Alternative**

Sheet 1 of 1  
(ESRI World Imagery)



600 Willowbrook Ln  
West Chester, PA 19382  
October 2019





## **MVP Southgate Project**

Docket No. CP19-14-000

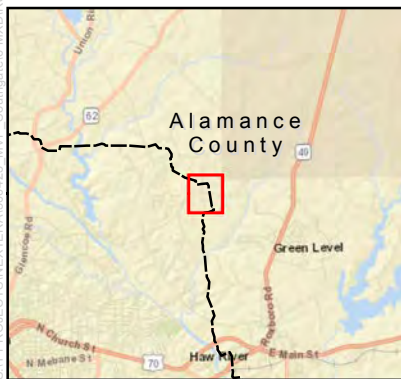
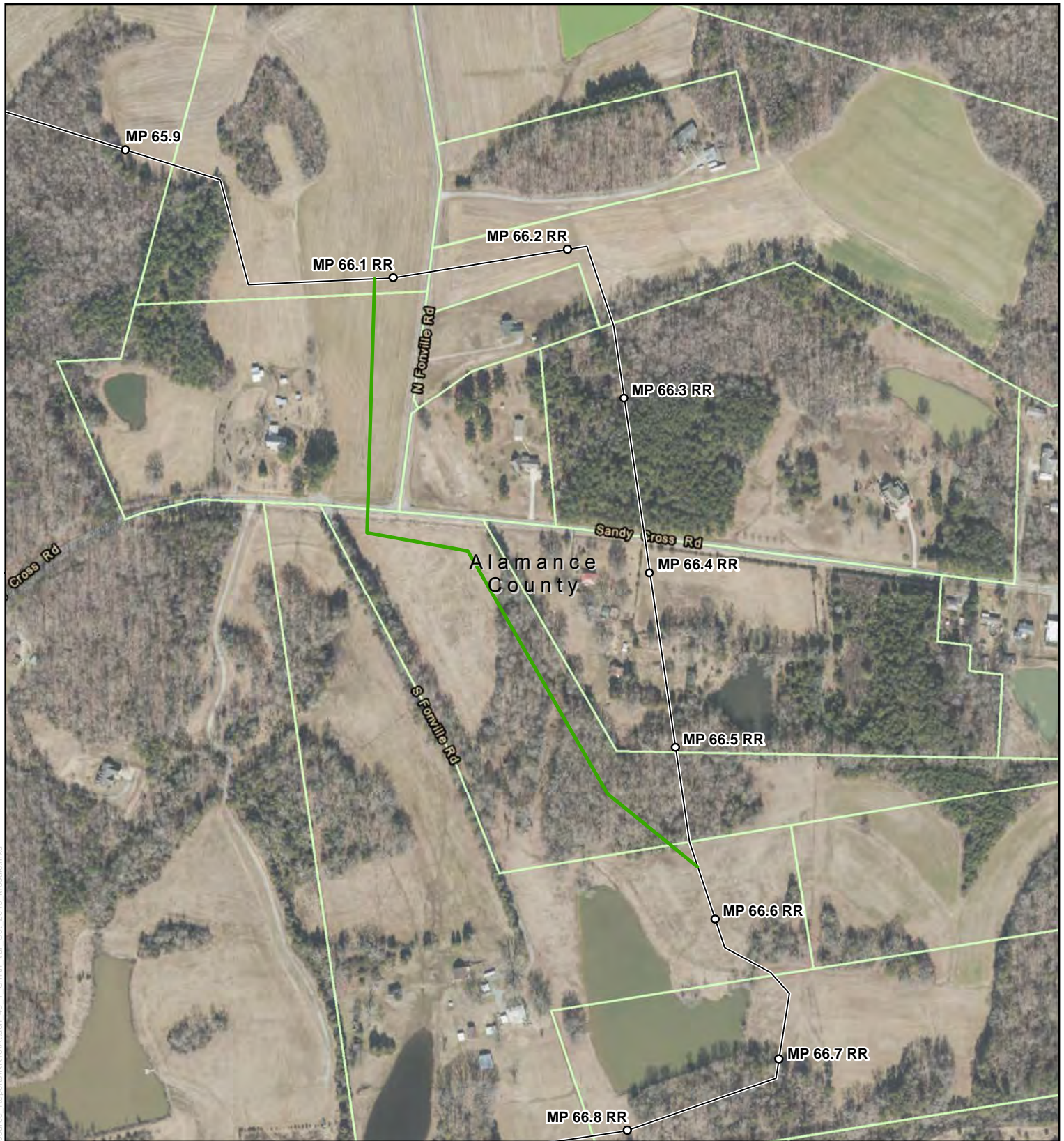
### **Attachment 49-1**

#### **Figure 49-1 – Smith Property Variation**

October 2019



S:\PROJECTS\NEXTERRA\300423 MVP\_Southgate\6-MXD\B-source\_Reports\RR10\A\tech\_49 - 1 Smith\_Var\_Oct 2019\_Mosaic.mxd



### Legend

- Mileposts
- Current Pipeline Route
- Smith Property Variation
- Approximate Parcel Boundary
- County Boundary

Data Sources: ESRI, EQT



0 200 400  
Feet  
1 inch = 400 feet  
When Printed 8.5x11



Figure 49 - 1  
**Smith Property Variation**

Sheet 1 of 1  
(ESRI World Imagery)



600 Willowbrook Ln  
West Chester, PA 19382  
October 2019