Appendix E

Wetland and Stream Impacts

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Appendix E

Wetland and Stream Impacts

TABLE E-1
Summary of Temporary Construction Impacts on Wetlands by FWLE Alternative and Option

Alternative	Wetland Name	Wetland Category	Wetland Area Affected (acres)[a]
SR 99 Alternative			
	Wetland 6-2	IV	0
	Wetland 6-3	IV	0
	Wetland 6-4	IV	0
	Wetland 11-1	III	0
	Wetland 12-1	II	<0.1
	Wetland 12-2	III	<0.1
	Wetland 17-1	III/NA	<0.1
S 216th Station Options			
S 216th West Station Option	No change in impacts		
S 216th East Station Option	No change in impacts		
Kent/Des Moines Station Options			
Kent/Des Moines HC Campus Station Option	Wetland 6-2	IV	+ <0.1
	Wetland 6-3	IV	+ <0.1
	Wetland 6-4	IV	+ <0.1
Kent/Des Moines HC from S 216th West Station Option	Wetland 6-2	IV	+ 0.1
	Wetland 6-4	IV	+ <0.1
Kent/Des Moines SR 99 Median Station Option	No change in impacts		
Kent/Des Moines SR 99 East Station Option	No change in impacts		
S 260th Station Options			
S 260th West Station Option	Wetland 11-1	III	+ <0.1
	Wetland 12-1	II	+ 0.1
S 260th Station East Option	Wetland 12-1	II	+ 0.3
	Wetland 12-2	III	- <0.1
S 272nd Redondo Trench Station Option			
	Wetland 12-1	II	+ 0.2
	Wetland 12-2	III	- <0.1
	Wetland 17-1	III/NA	- <0.1

TABLE E-1
Summary of Temporary Construction Impacts on Wetlands by FWLE Alternative and Option

Alternative	Wetland Name	Wetland Category	Wetland Area Affected (acres)[a]
Federal Way SR 99 Station Option			
	No change in impacts		
I-5 Alternative			
	Wetland 12-1	II	<0.1
	Wetland 25-2	III/III	0.2
	Wetland 25-2a	IV/NA	<0.1
Kent/Des Moines Station Options			
Kent/Des Moines At-Grade Station Option	No change in impacts		
Kent/Des Moines SR 99 East Station Option	No change in impacts		
Landfill Median Alignment Option			
	No change in impacts		
Federal Way City Center Station Options			
Federal Way I-5 Station Option	No change in impacts		
Federal Way S 320th Park-and-Ride Station Option	No change in impacts		
SR 99 to I-5 Alternative			
	Wetland 12-1	II	<0.1
	Wetland 25-2	III/III	0.2
	Wetland 25-2a	IV/NA	<0.1
S 216th Station Options			
S 216th West Station Option	No change in impacts		
S 216th East Station Option	No change in impacts		
Landfill Median Alignment Option			
	No change in impacts		
Federal Way City Center Station Options			
Federal Way I-5 Station Option	No change in impacts		
Federal Way S 320th Park-and-Ride Station Option	No change in impacts		
I-5 to SR 99 Alternative			
	Wetland 11-1	III	0
	Wetland 12-1	II	<0.1
	Wetland 12-2	III	<0.1
	Wetland 17-1	III/NA	<0.1

TABLE E-1

Summary of Temporary Construction Impacts on Wetlands by FWLE Alternative and Option

Alternative	Wetland Name	Wetland Category	Wetland Area Affected (acres)[a]
S 260th Station Options			
S 260th West Station Option	Wetland 11-1	III	+ <0.1
	Wetland 12-1	II	+ 0.1
S 260th Station East Option	Wetland 12-1	II	+ 0.3
S 272nd Redondo Trench Station Option			
	Wetland 12-1	II	+ 0.2
	Wetland 17-1	III/NA	- <0.1
Federal Way SR 99 Station Option			
	No change in impacts		

[a] Totals for each alternative rounded to the nearest 0.1 acre.

TABLE E-2
Summary of Temporary Construction Impacts on Wetland Buffers by FWLE Alternative and Option

Alternative	Wetland Name	Wetland Category	Wetland Buffer Area Affected (acres)[a]
SR 99 Alternative			
	Wetland 11-1	III	0.1
	Wetland 12-1	II	0.1
	Wetland 12-2	III	0.1
	Wetland 12-3	IV	<0.1
	Wetland 13-1	IV	<0.1
	Wetland 15-1	II/II	<0.1
	Wetland 16-1	IV/III	0
S 216th Station Options			
S 216th West Station Option	No change in impacts		
S 216th East Station Option	No change in impacts		
Kent/Des Moines Station Options			
Kent/Des Moines HC Campus Station Option	No change in impacts		
Kent/Des Moines HC from S 216th West Station Option	No change in impacts		
Kent/Des Moines SR 99 Median Station Option	No change in impacts		
Kent/Des Moines SR 99 East Station Option	No change in impacts		
S 260th Station Options			
S 260th West Station Option	No change in impacts		
S 260th Station East Option	Wetland 12-1	II	+ 0.3
	Wetland 12-2	III	- 0.1
	Wetland 12-3	IV	- <0.1
	Wetland 13-1	IV	- <0.1
S 272nd Redondo Trench Station Option			
	Wetland 12-1	II	+ 0.1
	Wetland 12-2	III	- 0.1
	Wetland 12-3	IV	- <0.1
	Wetland 13-1	IV	- <0.1
	Wetland 16-1	IV/III	+ <0.1
Federal Way SR 99 Station Option			
	No change in impacts		

TABLE E-2
Summary of Temporary Construction Impacts on Wetland Buffers by FWLE Alternative and Option

Alternative	Wetland Name	Wetland Category	Wetland Buffer Area Affected (acres)[a]
I-5 Alternative			
	Wetland 12-1	II	0.7
	Wetland 20-2	III	0.3
	Wetland 25-2	III/III	0.1
	Wetland 27-1	III/III	0.2
	Wetland 5-1	III/III	<0.1
Kent/Des Moines Station Options			
Kent/Des Moines At-Grade Station Option	Wetland 20-2	III	- 0.1
Kent/Des Moines SR 99 East Station Option	Wetland 20-2	III	- 0.3
Landfill Median Alignment Option			
	Wetland 20-2	III	- 0.1
Federal Way City Center Station Options			
Federal Way I-5 Station Option	No change in impacts		
Federal Way S 320th Park-and-Ride Station Option	No change in impacts		
SR 99 to I-5 Alternative			
	Wetland 12-1	II	0.7
	Wetland 25-2	III/III	0.1
	Wetland 27-1	III/III	0.2
S 216th Station Options			
S 216th West Station Option	No change in impacts		
S 216th East Station Option	No change in impacts		
Landfill Median Alignment Option			
	No change in impacts		
Federal Way City Center Station Options			
Federal Way I-5 Station Option	No change in impacts		
Federal Way S 320th Park-and-Ride Station Option	No change in impacts		
I-5 to SR 99 Alternative			
	Wetland 11-1	III	0.1
	Wetland 12-1	II	0.1
	Wetland 12-2	III	0.1
	Wetland 12-3	IV	<0.1
	Wetland 13-1	IV	<0.1

TABLE E-2
Summary of Temporary Construction Impacts on Wetland Buffers by FWLE Alternative and Option

Alternative	Wetland Name	Wetland Category	Wetland Buffer Area Affected (acres)[a]
	Wetland 15-1	II/II	<0.1
	Wetland 16-1	IV/III	0
S 260th Station Options			
S 260th West Station Option	Wetland 11-1	III	- 0.1
S 260th Station East Option	Wetland 12-1	II	+ 0.3
	Wetland 12-2	III	- 0.1
	Wetland 12-3	IV	- <0.1
	Wetland 13-1	IV	- <0.1
S 272nd Redondo Trench Station Option			
	Wetland 12-1	II	+ 0.1
	Wetland 12-2	III	- 0.1
	Wetland 12-3	IV	- <0.1
	Wetland 13-1	IV	- <0.1
	Wetland 16-1	IV/III	+ <0.1
Federal Way SR 99 Station Option			
	No change in impacts		

[a] Totals for each alternative rounded to the nearest 0.1 acre.

TABLE E-3
Summary of Long-Term Direct Impacts on Wetlands by FWLE Alternative and Option

Alternative	Wetland Name	Wetland Category	Wetland Area Affected (acres)[a,b]
SR 99 Alternative			
	Wetland 6-2	IV	0
	Wetland 6-3	IV	0
	Wetland 6-4	IV	0
	Wetland 11-1	III	0
	Wetland 12-1	II	<0.1
	Wetland 16-1	IV/III	0
	Wetland 17-1	III/NA	<0.1
S 216th Station Options			
S 216th West Station Option	No change in impacts		
S 216th East Station Option	No change in impacts		
Kent/Des Moines Station Options			
Kent/Des Moines HC Campus Station Option	Wetland 6-2	IV	+ 0.2
	Wetland 6-4	IV	+ <0.1
Kent/Des Moines HC from S 216th West Station Option	Wetland 6-2	IV	+ 0.1
	Wetland 6-3	IV	+ <0.1
	Wetland 6-4	IV	+ <0.1
Kent/Des Moines SR 99 Median Station Option	No change in impacts		
Kent/Des Moines SR 99 East Station Option	No change in impacts		
S 260th Station Options			
S 260th West Station Option	Wetland 11-1	III	+ 0.1
S 260th Station East Option	Wetland 12-1	II	+ 0.4
S 272nd Redondo Trench Station Option			
	Wetland 12-1	II	+ 0.4
	Wetland 16-1	IV/III	+ 0.1
	Wetland 17-1	III/NA	- <0.1
Federal Way SR 99 Station Option			
	No change in impacts		
I-5 Alternative			
	Wetland 12-1	II	<0.1
	Wetland 20-2	III	0.6
	Wetland 25-2	III/III	0.1
	Wetland 25-2a	IV/NA	<0.1
	Wetland 27-1	III/III	0.3

TABLE E-3
Summary of Long-Term Direct Impacts on Wetlands by FWLE Alternative and Option

Alternative	Wetland Name	Wetland Category	Wetland Area Affected (acres)[a,b]
	Wetland 30-3	III/III	0
Kent/Des Moines Station Options			
Kent/Des Moines At-Grade Station Option	No change in impacts		
Kent/Des Moines SR 99 East Station Option	Wetland 20-2	III	- 0.6
Landfill Median Alignment Option			
	No change in impacts		
Federal Way City Center Station Options			
Federal Way I-5 Station Option	No change in impacts		
Federal Way S 320th Park-and-Ride Station Option	Wetland 30-3	III/III	+ 0.1
SR 99 to I-5 Alternative			
	Wetland 12-1	II	<0.1
	Wetland 20-2	III	0
	Wetland 25-2	III/III	0.1
	Wetland 25-2a	IV/NA	<0.1
	Wetland 27-1	III/III	0.3
	Wetland 30-3	III/III	0
S 216th Station Options			
S 216th West Station Option	No change in impacts		
S 216th East Station Option	No change in impacts		
Landfill Median Alignment Option			
	No change in impacts		
Federal Way City Center Station Options			
Federal Way I-5 Station Option	No change in impacts		
Federal Way S 320th Park-and-Ride Station Option	Wetland 20-2	III	+ 0.6
	Wetland 30-3	III/III	+ 0.1
I-5 to SR 99 Alternative			
	Wetland 11-1	III	0
	Wetland 12-1	II	<0.1
	Wetland 16-1	IV/III	0
	Wetland 17-1	III/NA	<0.1
S 260th Station Options			
S 260th West Station Option	Wetland 11-1	III	+ 0.1
S 260th Station East Option	Wetland 12-1	II	+ 0.4

TABLE E-3

Summary of Long-Term Direct Impacts on Wetlands by FWLE Alternative and Option

Alternative	Wetland Name	Wetland Category	Wetland Area Affected (acres)[a,b]
S 272nd Redondo Trench Station Option			
	Wetland 12-1	II	+ 0.4
	Wetland 16-1	IV/III	+ 0.1
	Wetland 17-1	III/NA	- <0.1
Federal Way SR 99 Station Option			
	No change in impacts		

[a] Totals for each alternative rounded to the nearest 0.1 acre.
[b] Long-term footprints would bisect Wetlands 16-1, 20-2, and 27-1. Because of the small size of these wetlands (under one acre) and likely substantial degradation of wetland functions, the entirety of these wetlands were included in impact calculations.

TABLE E-4
Summary of Long-Term Direct Impacts on Wetland Buffers by FWLE Alternative and Option

Alternative	Wetland Name	Wetland Category	Wetland Buffer Area Affected (acres)[a]
SR 99 Alternative			
	Wetland 11-1	III	0.1
	Wetland 12-1	II	0.2
	Wetland 12-2	III	<0.1
	Wetland 12-3	IV	<0.1
	Wetland 6-2	IV	0
	Wetland 6-3	IV	0
	Wetland 6-4	IV	0
	Wetland 15-1	II/II	0
	Wetland 16-1	IV/III	0
S 216th Station Options			
S 216th West Station Option	No change in impacts		
S 216th East Station Option	No change in impacts		
Kent/Des Moines Station Options			
Kent/Des Moines HC Campus Station Option	Wetland 6-2	IV	+ <0.1
	Wetland 6-3	IV	+ <0.1
	Wetland 6-4	IV	+ 0.1
Kent/Des Moines HC from S 216th West Station Option	Wetland 6-2	IV	+ 0.1
	Wetland 6-3	IV	+ <0.1
	Wetland 6-4	IV	+ 0.1
Kent/Des Moines SR 99 Median Station Option	No change in impacts		
Kent/Des Moines SR 99 East Station Option	No change in impacts		
S 260th Station Options			
S 260th West Station Option	Wetland 11-1	III	+ 0.2
S 260th Station East Option	Wetland 12-1	II	+ 0.2
	Wetland 12-2	III	- <0.1
	Wetland 12-3	IV	- <0.1
S 272nd Redondo Trench Station Option			
	Wetland 12-1	II	+ 0.3
	Wetland 12-2	III	- <0.1
	Wetland 12-3	IV	- <0.1
	Wetland 15-1	II/II	+ 0.1
	Wetland 16-1	IV/III	+ 0.1

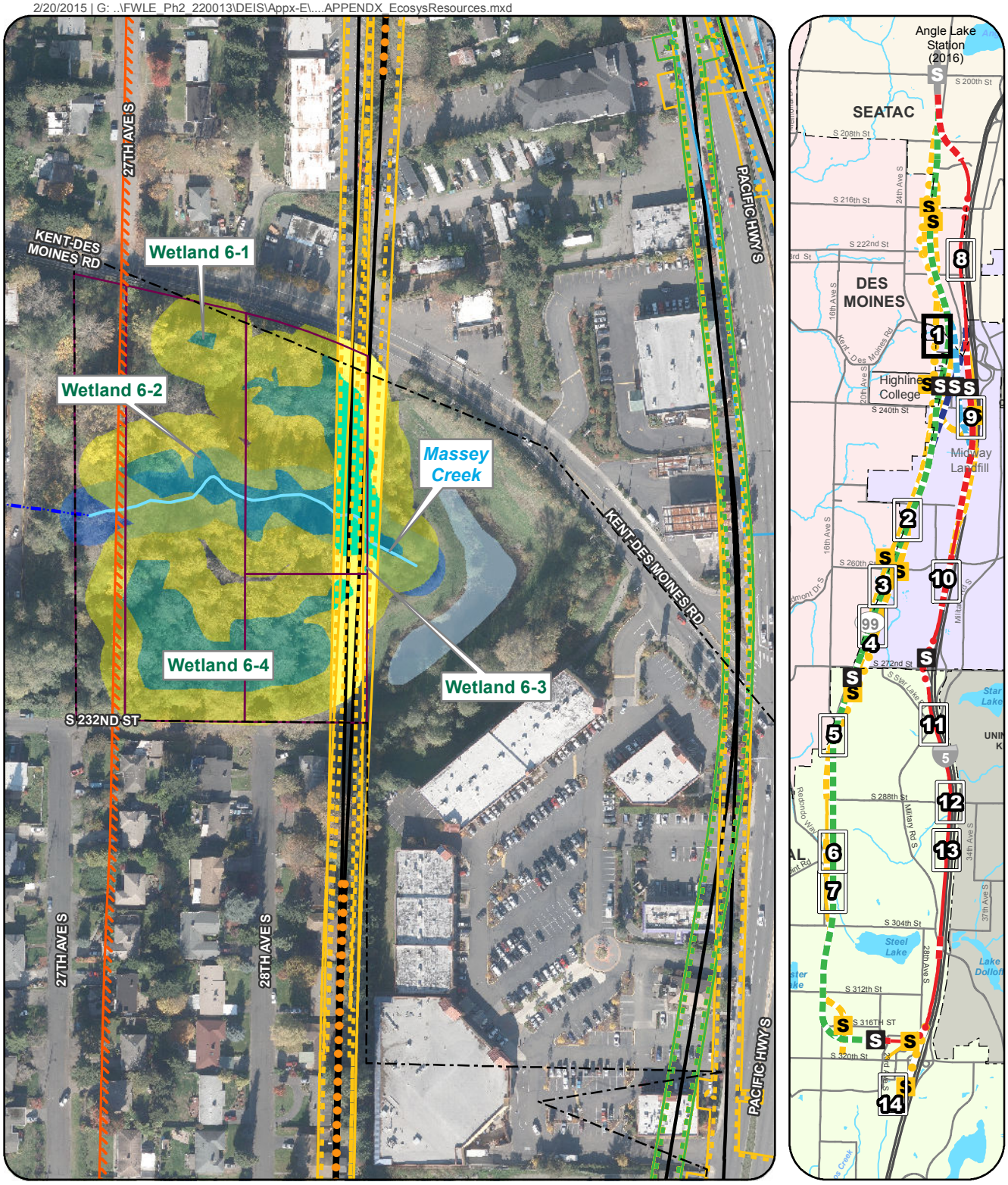
TABLE E-4
Summary of Long-Term Direct Impacts on Wetland Buffers by FWLE Alternative and Option

Alternative	Wetland Name	Wetland Category	Wetland Buffer Area Affected (acres)[a]
Federal Way SR 99 Station Option			
	No change in impacts		
I-5 Alternative			
	Wetland 12-1	II	0.5
	Wetland 20-2	III	0.2
	Wetland 25-2	III/III	<0.1
	Wetland 27-1	III/III	0.3
	Wetland 30-3	III/III	0
Kent/Des Moines Station Options			
Kent/Des Moines At-Grade Station Option	Wetland 20-2	III	+ 1.0
Kent/Des Moines SR 99 East Station Option	Wetland 20-2	III	- 0.2
Landfill Median Alignment Option			
	No change in impacts		
Federal Way City Center Station Options			
Federal Way I-5 Station Option	No change in impacts		
Federal Way S 320th Park-and-Ride Station Option	Wetland 30-3	III/III	+ 0.2
SR 99 to I-5 Alternative			
	Wetland 12-1	II	0.5
	Wetland 20-2	III	0
	Wetland 25-2	III/III	<0.1
	Wetland 27-1	III/III	0.3
	Wetland 30-3	III/III	0
S 216th Station Options			
S 216th West Station Option	No change in impacts		
S 216th East Station Option	No change in impacts		
Landfill Median Alignment Option			
	No change in impacts		
Federal Way City Center Station Options			
Federal Way I-5 Station Option	No change in impacts		
Federal Way S 320th Park-and-Ride Station Option	Wetland 20-2	III	+ 0.2
	Wetland 30-3	III/III	+ 0.2

TABLE E-4
Summary of Long-Term Direct Impacts on Wetland Buffers by FWLE Alternative and Option

Alternative	Wetland Name	Wetland Category	Wetland Buffer Area Affected (acres)[a]
I-5 to SR 99 Alternative			
	Wetland 11-1	III	0.1
	Wetland 12-1	II	0.2
	Wetland 12-2	III	<0.1
	Wetland 12-3	IV	<0.1
	Wetland 15-1	II/II	0
	Wetland 16-1	IV/III	0
S 260th Station Options			
S 260th West Station Option	Wetland 11-1	III	+ 0.2
S 260th Station East Option	Wetland 12-1	II	+ 0.2
	Wetland 12-2	III	- <0.1
	Wetland 12-3	IV	- <0.1
S 272nd Redondo Trench Station Option			
	Wetland 12-1	II	+ 0.3
	Wetland 12-2	III	- <0.1
	Wetland 12-3	IV	- <0.1
	Wetland 15-1	II/II	+ 0.1
	Wetland 16-1	IV/III	+ 0.1
Federal Way SR 99 Station Option			
	No change in impacts		

[a] Totals for each alternative rounded to the nearest 0.1 acre.



Station
Elevated Centerline
At-Grade I-5 Centerline
Trench I-5 Centerline
At-Grade Option Centerline
Trench Option Centerline

Construction Footprints
I-5
SR 99
I-5 to SR 99
SR 99 to I-5
Options

Permanent Footprint (colors vary by alternative / option)
City Boundary
Parcels / ROW Accessed During Field Reconnaissance Survey 2013-2014
300' Wetland Study Area

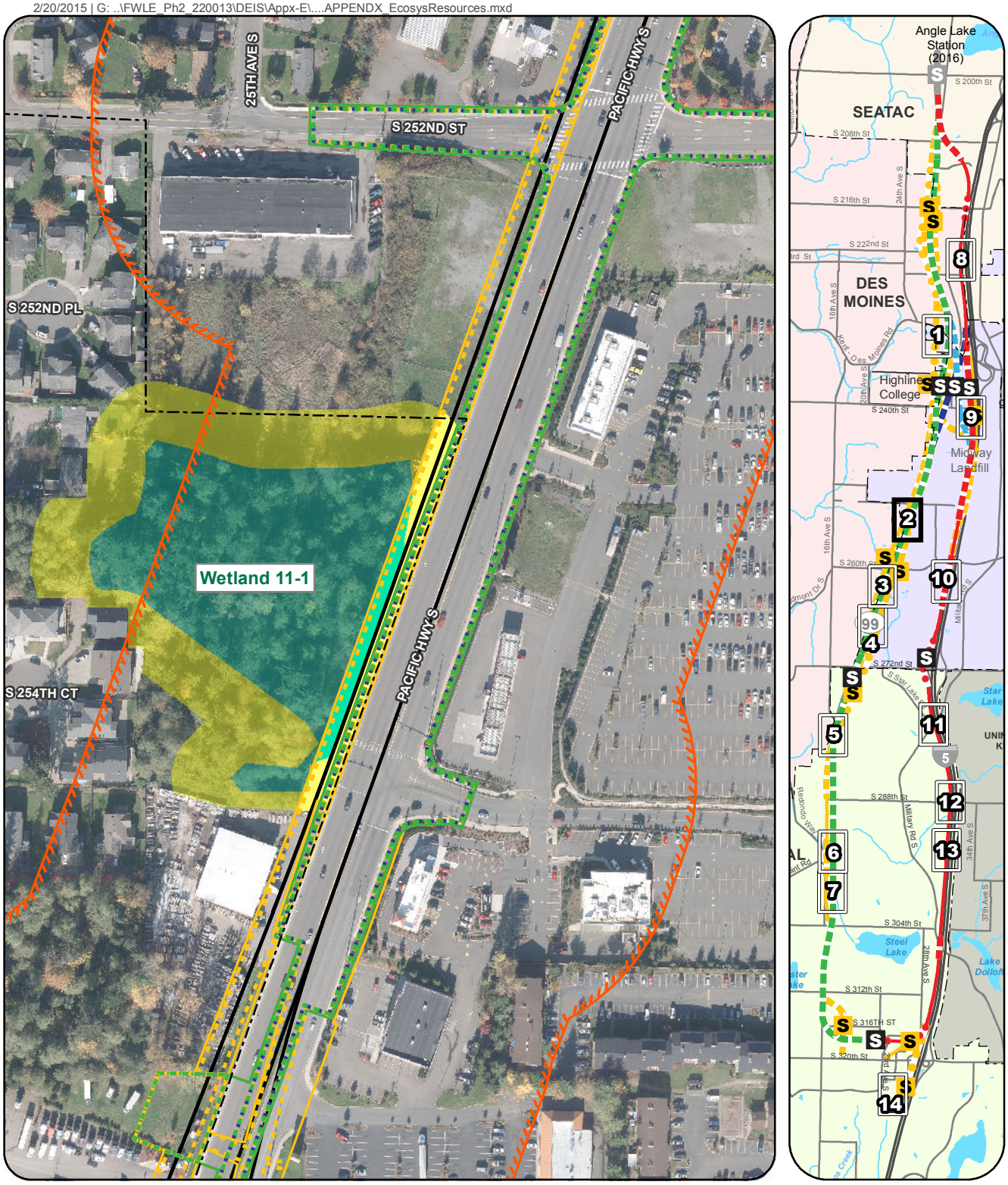
Piped Stream
Stream
Stream Buffer
Wetland
Wetland Buffer
Waterbody

Data Sources: King County, Cities of Des Moines, Federal Way, Kent, SeaTac, AeroMetric (2013). WDFW (2014).

N

0 100 200 300 Feet

Appendix E: 1 of 14
Ecosystems Resources
Wetland and Stream Impacts within the Study Area
Federal Way Link Extension



Station
Elevated Centerline
At-Grade I-5 Centerline
Trench I-5 Centerline
At-Grade Option Centerline
Trench Option Centerline

Construction Footprints
I-5
SR 99
I-5 to SR 99
SR 99 to I-5
Options

Permanent Footprint (colors vary by alternative / option)
City Boundary
Parcels / ROW Accessed During Field Reconnaissance Survey 2013-2014
300' Wetland Study Area

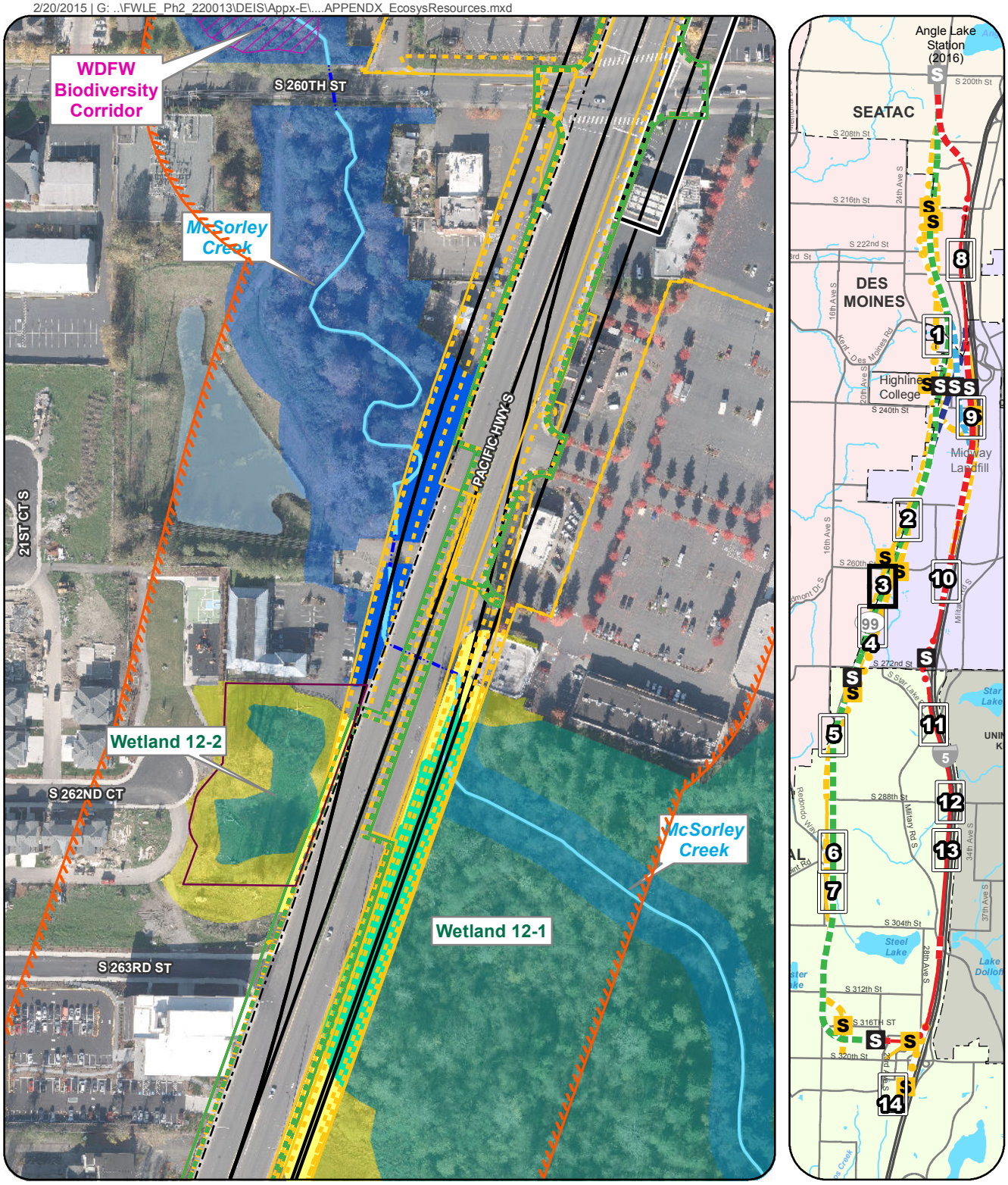
Piped Stream
Stream
Stream Buffer
Wetland
Wetland Buffer
Waterbody

Data Sources: King County, Cities of Des Moines, Federal Way, Kent, SeaTac, AeroMetric (2013). WDFW (2014).

N

0 100 200 300 Feet

Appendix E: 2 of 14
Ecosystems Resources
Wetland and Stream Impacts within the Study Area
Federal Way Link Extension



Station
Elevated Centerline
At-Grade I-5 Centerline
Trench I-5 Centerline
At-Grade Option Centerline
Trench Option Centerline

Construction Footprints
I-5
SR 99
I-5 to SR 99
SR 99 to I-5
Options

Permanent Footprint (colors vary by alternative / option)
City Boundary
Parcels / ROW Accessed During Field Reconnaissance Survey 2013-2014
300' Wetland Study Area

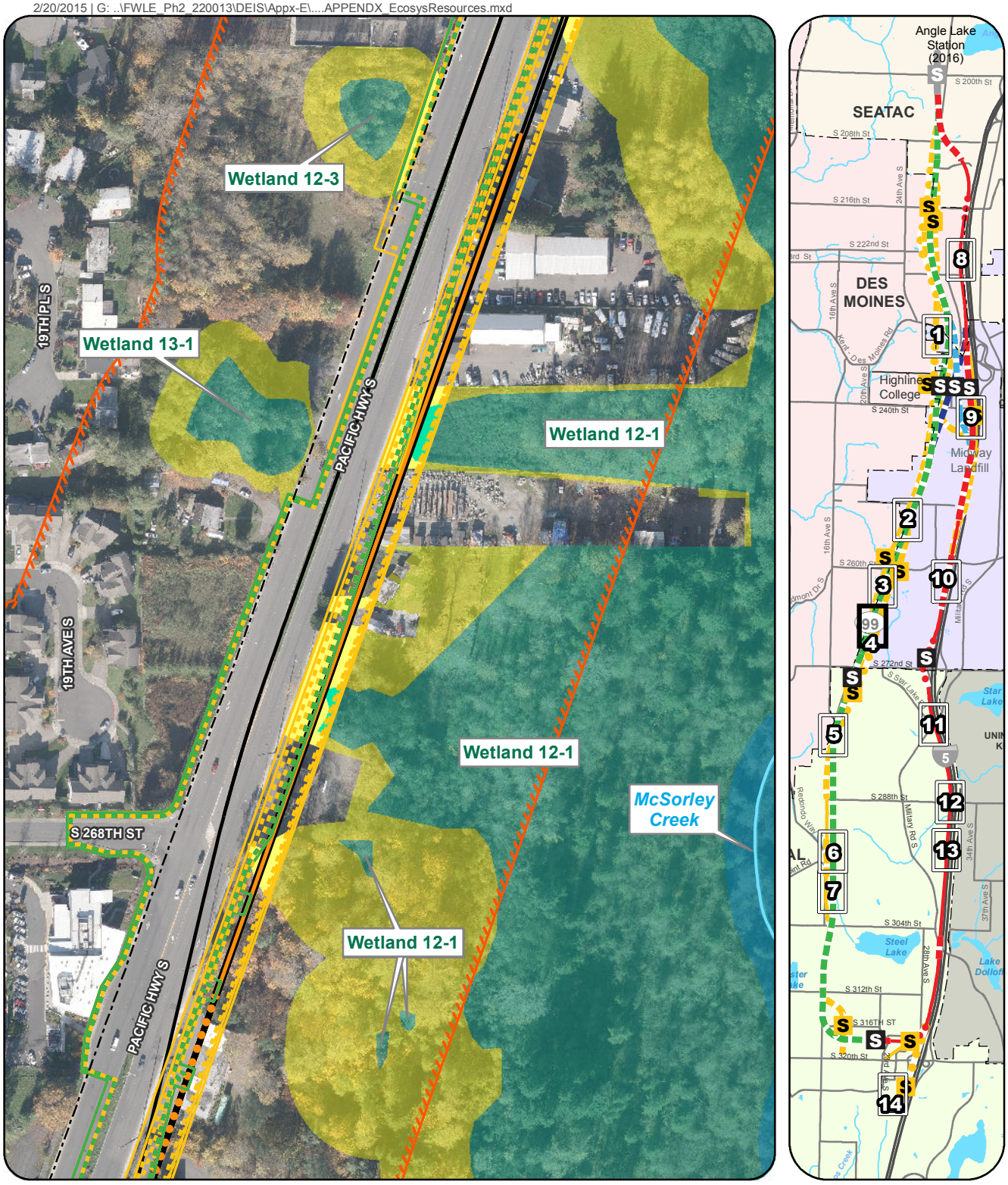
Piped Stream
Stream
Stream Buffer
Wetland
Wetland Buffer
Waterbody

Data Sources: King County, Cities of Des Moines, Federal Way, Kent, SeaTac, AeroMetric (2013). WDFW (2014).

N

0 100 200 300 Feet

Appendix E: 3 of 14
Ecosystems Resources
Wetland and Stream Impacts within the Study Area
Federal Way Link Extension



Station
Elevated Centerline
At-Grade I-5 Centerline
Trench I-5 Centerline
At-Grade Option Centerline
Trench Option Centerline

Construction Footprints
I-5
SR 99
I-5 to SR 99
SR 99 to I-5
Options

Permanent Footprint (colors vary by alternative / option)
City Boundary
Parcels / ROW Accessed During Field Reconnaissance Survey 2013-2014
300' Wetland Study Area

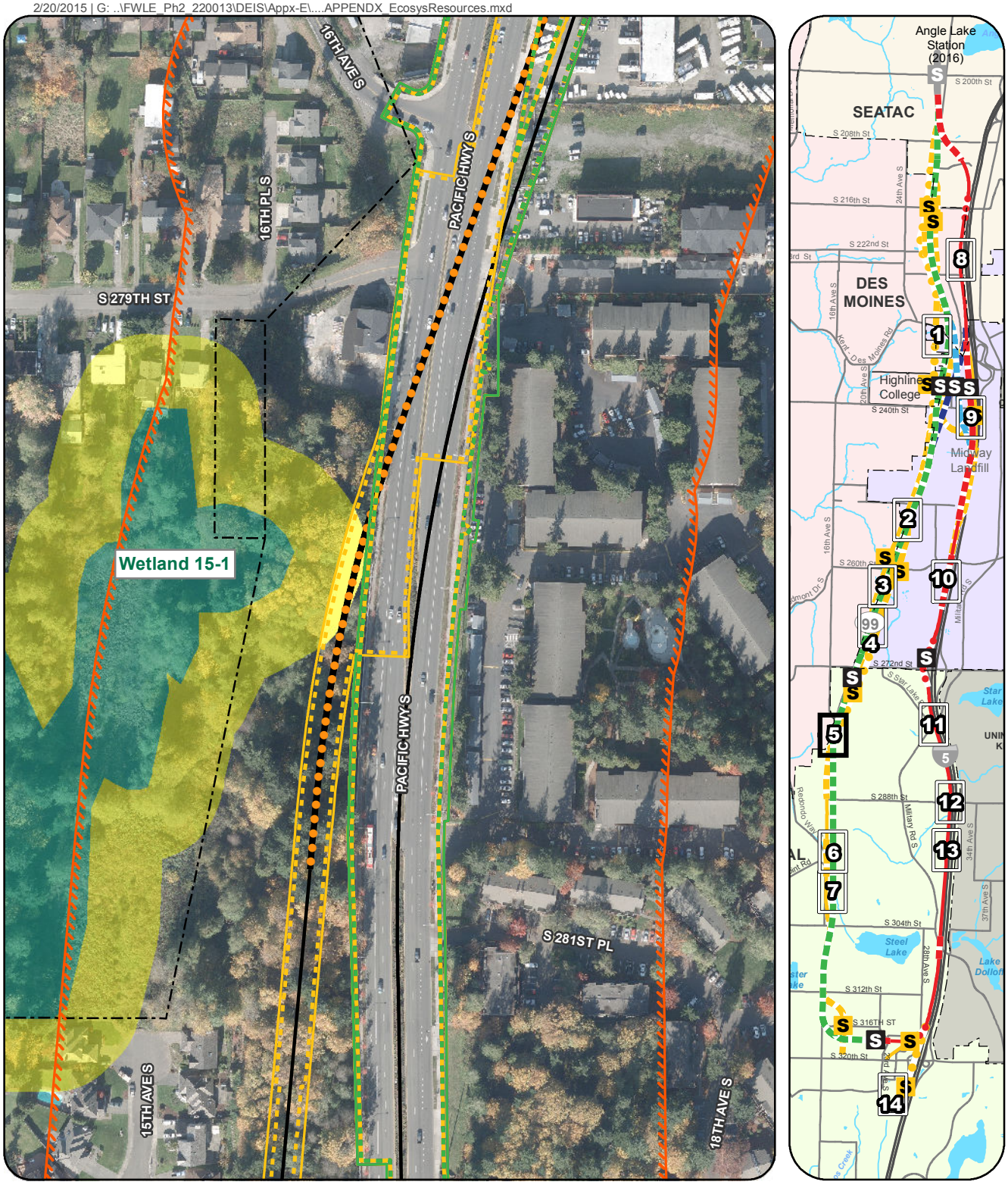
Piped Stream
Stream
Stream Buffer
Wetland
Wetland Buffer
Waterbody

Data Sources: King County, Cities of Des Moines, Federal Way, Kent, SeaTac, AeroMetric (2013). WDFW (2014).

N

0 100 200 300 Feet

Appendix E: 4 of 14
Ecosystems Resources
Wetland and Stream Impacts within the Study Area
Federal Way Link Extension



Station
Elevated Centerline
At-Grade I-5 Centerline
Trench I-5 Centerline
At-Grade Option Centerline
Trench Option Centerline

Construction Footprints
I-5
SR 99
I-5 to SR 99
SR 99 to I-5
Options

Permanent Footprint (colors vary by alternative / option)
City Boundary
Parcels / ROW Accessed During Field Reconnaissance Survey 2013-2014
300' Wetland Study Area

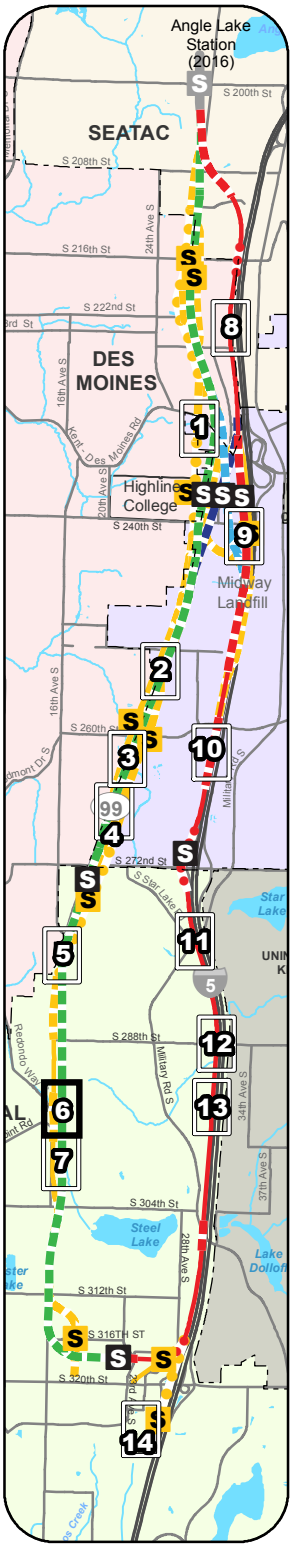
Piped Stream
Stream
Stream Buffer
Wetland
Wetland Buffer
Waterbody

Data Sources: King County, Cities of Des Moines, Federal Way, Kent, SeaTac, AeroMetric (2013). WDFW (2014).

N

0 100 200 300 Feet

Appendix E: 5 of 14
Ecosystems Resources
Wetland and Stream Impacts within the Study Area
Federal Way Link Extension



Station
Elevated Centerline
At-Grade I-5 Centerline
Trench I-5 Centerline
At-Grade Option Centerline
Trench Option Centerline

Construction Footprints
I-5
SR 99
I-5 to SR 99
SR 99 to I-5
Options

Permanent Footprint (colors vary by alternative / option)
City Boundary
Parcels / ROW Accessed During Field Reconnaissance Survey 2013-2014
300' Wetland Study Area

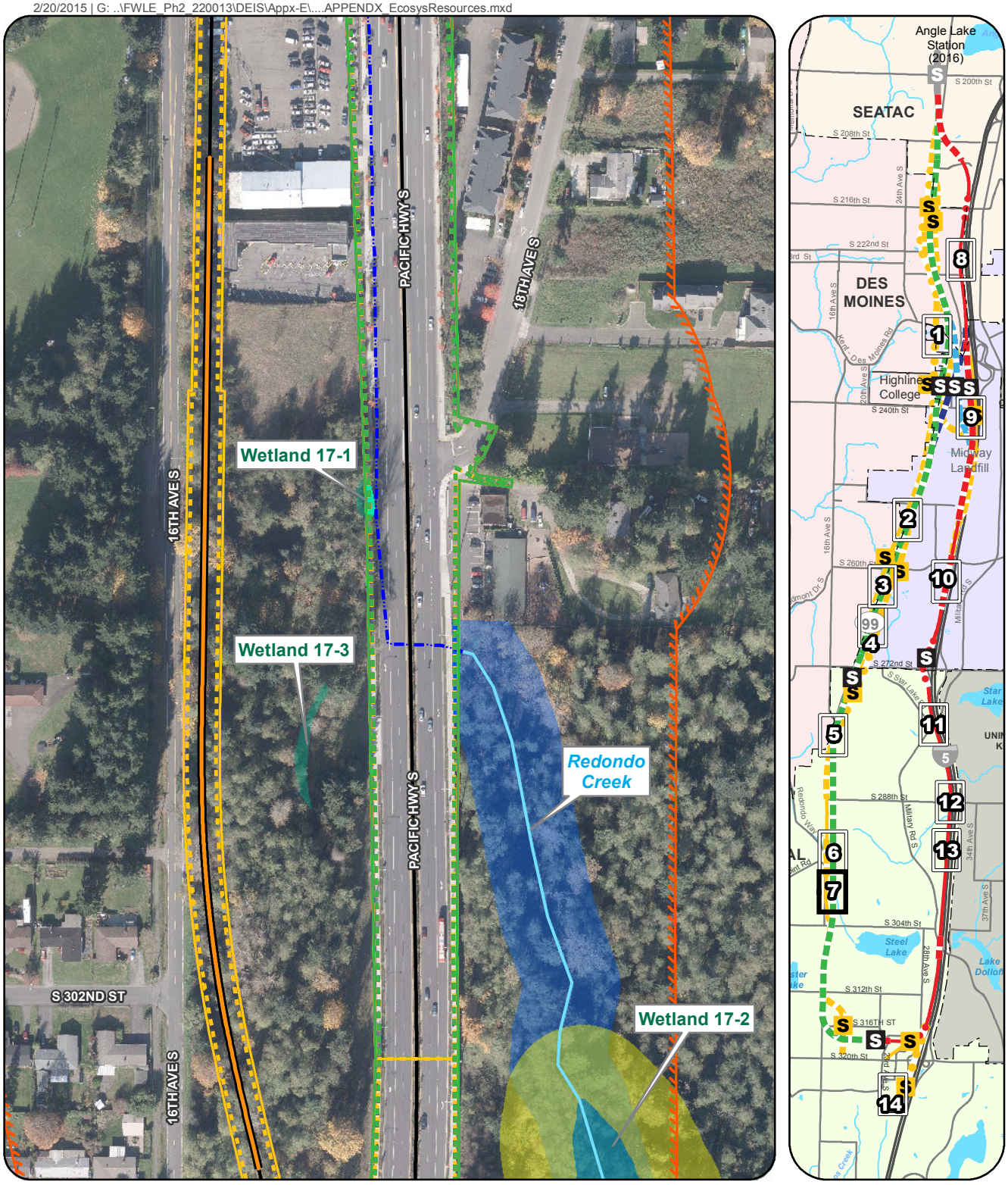
Piped Stream
Stream
Stream Buffer
Wetland
Wetland Buffer
Waterbody

Data Sources: King County, Cities of Des Moines, Federal Way, Kent, SeaTac, AeroMetric (2013). WDFW (2014).

N

0 100 200 300 Feet

Appendix E: 6 of 14
Ecosystems Resources
Wetland and Stream Impacts within the Study Area
Federal Way Link Extension



Station
Elevated Centerline
At-Grade I-5 Centerline
Trench I-5 Centerline
At-Grade Option Centerline
Trench Option Centerline

Construction Footprints
I-5
SR 99
I-5 to SR 99
SR 99 to I-5
Options

Permanent Footprint (colors vary by alternative / option)
City Boundary
Parcels / ROW Accessed During Field Reconnaissance Survey 2013-2014
300' Wetland Study Area

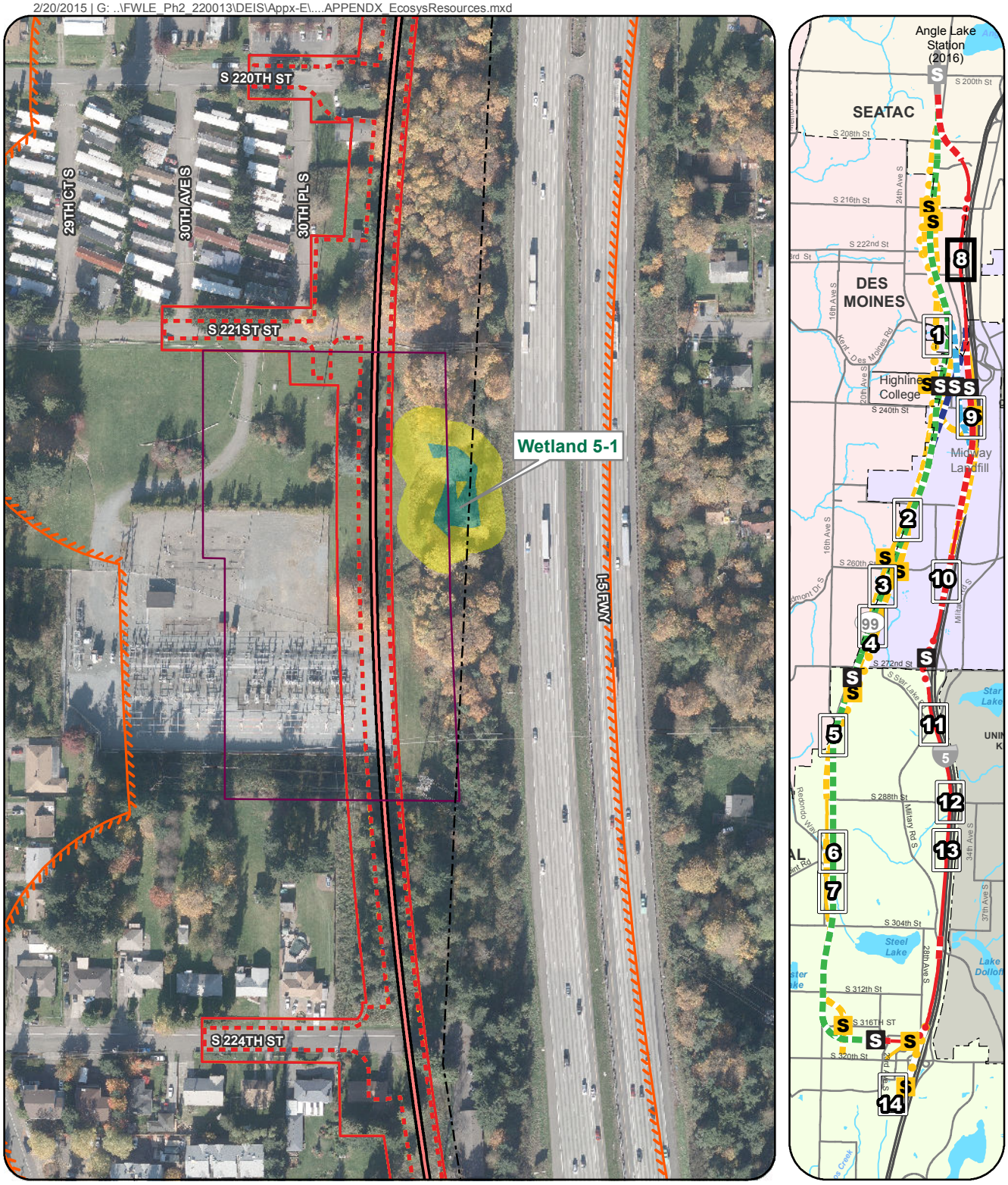
Piped Stream
Stream
Stream Buffer
Wetland
Wetland Buffer
Waterbody

Data Sources: King County, Cities of Des Moines, Federal Way, Kent, SeaTac, AeroMetric (2013). WDFW (2014).

N

0 100 200 300 Feet

Appendix E: 7 of 14
Ecosystems Resources
Wetland and Stream Impacts within the Study Area
Federal Way Link Extension



Station	Construction Footprints	Permanent Footprint (colors vary by alternative / option)	Piped Stream
Elevated Centerline	I-5	City Boundary	Stream
At-Grade I-5 Centerline	SR 99	Parcels / ROW Accessed During Field Reconnaissance Survey 2013-2014	Stream Buffer
Trench I-5 Centerline	I-5 to SR 99	300' Wetland Study Area	Wetland
At-Grade Option Centerline	SR 99 to I-5		Wetland Buffer
Trench Option Centerline	Options		Waterbody

Data Sources: King County, Cities of Des Moines, Federal Way, Kent, SeaTac, AeroMetric (2013). WDFW (2014).

N

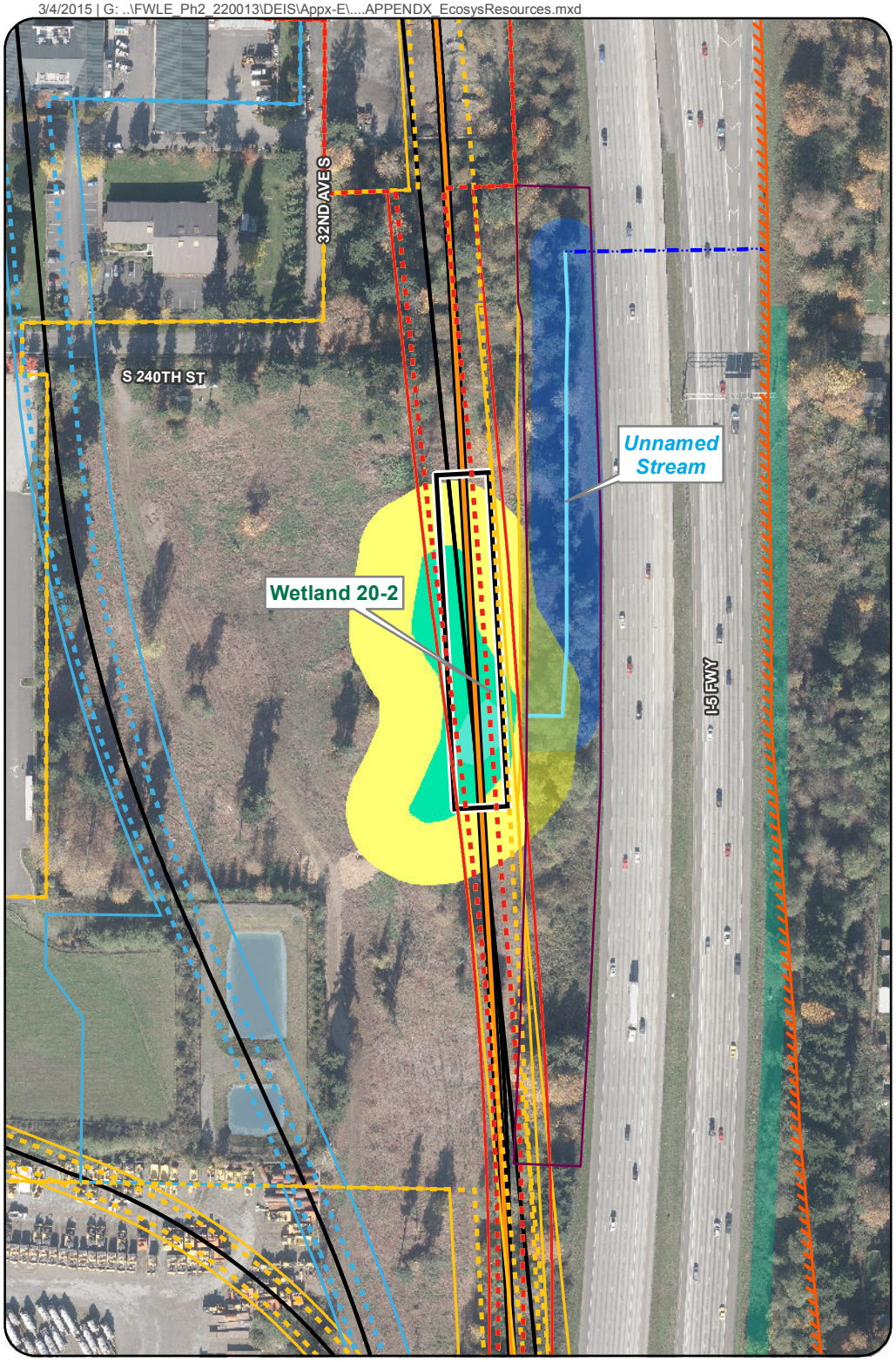
0 100 200 300 Feet

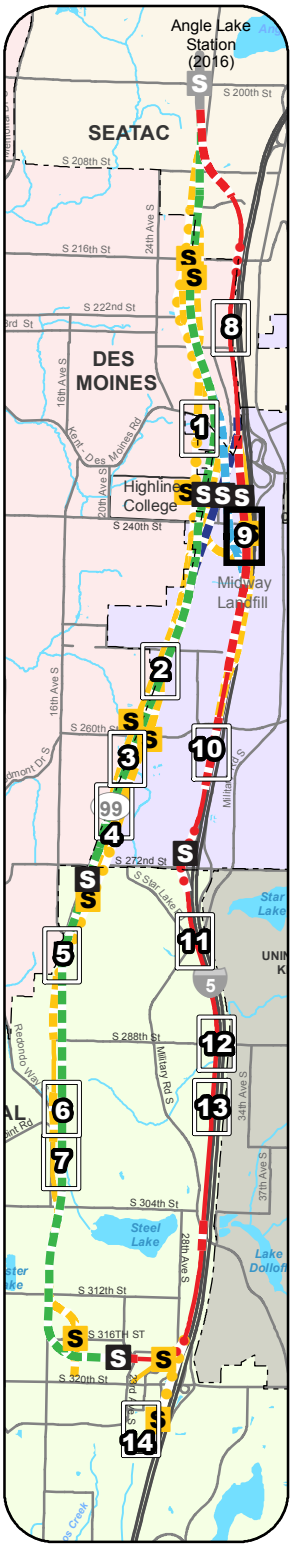
Appendix E: 8 of 14

Ecosystems Resources

Wetland and Stream Impacts within the Study Area

Federal Way Link Extension





Station
Elevated Centerline
At-Grade I-5 Centerline
Trench I-5 Centerline
At-Grade Option Centerline
Trench Option Centerline

Construction Footprints
I-5
SR 99
I-5 to SR 99
SR 99 to I-5
Options

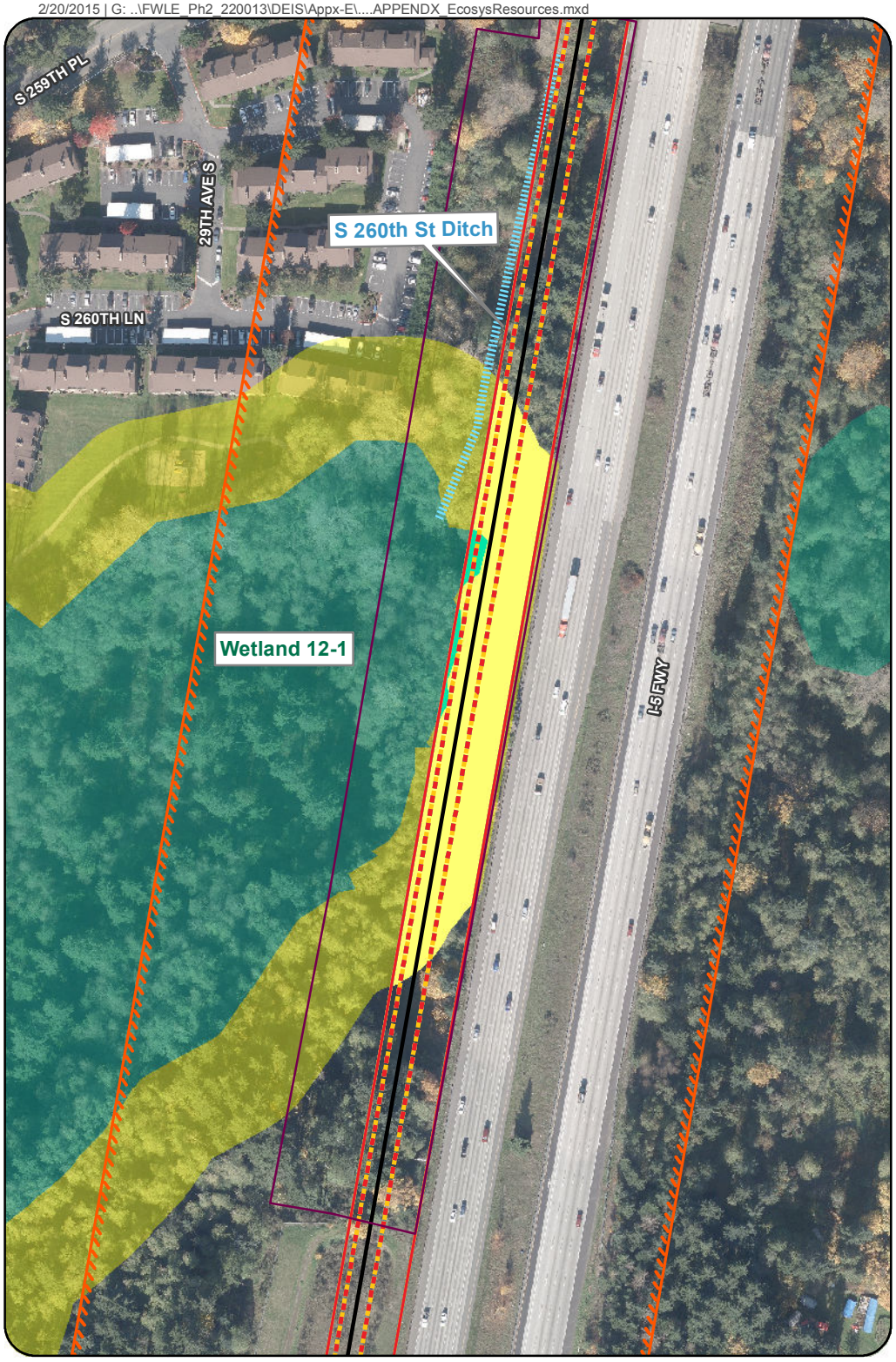
Permanent Footprint (colors vary by alternative / option)
City Boundary
Parcels / ROW Accessed During Field Reconnaissance Survey 2013-2014
300' Wetland Study Area

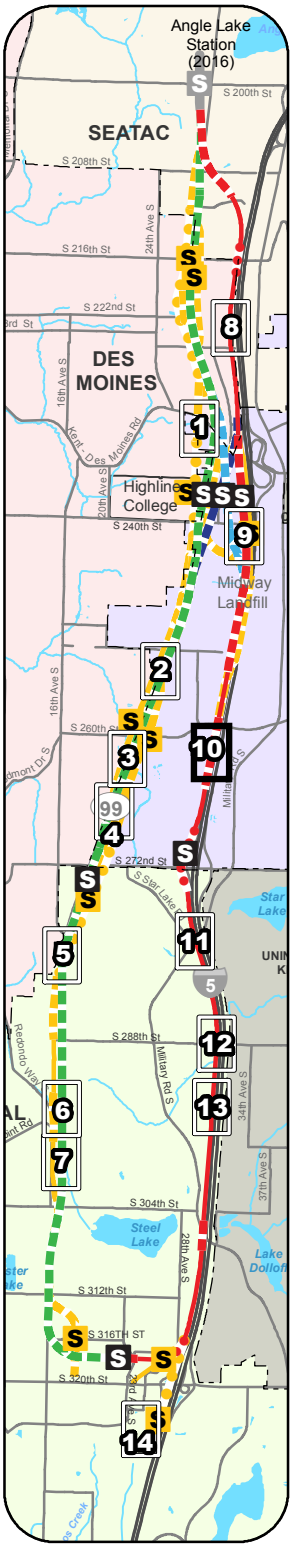
Piped Stream
Stream
Stream Buffer
Wetland
Wetland Buffer
Waterbody

Data Sources: King County, Cities of Des Moines, Federal Way, Kent, SeaTac, AeroMetric (2013). WDFW (2014).

N
0 100 200 300 Feet

Appendix E: 9 of 14
Ecosystems Resources
Wetland and Stream Impacts within the Study Area
Federal Way Link Extension





Station
Elevated Centerline
At-Grade I-5 Centerline
Trench I-5 Centerline
At-Grade Option Centerline
Trench Option Centerline

Construction Footprints
I-5
SR 99
I-5 to SR 99
SR 99 to I-5
Options

Permanent Footprint (colors vary by alternative / option)
City Boundary
Parcels / ROW Accessed During Field Reconnaissance Survey 2013-2014
300' Wetland Study Area

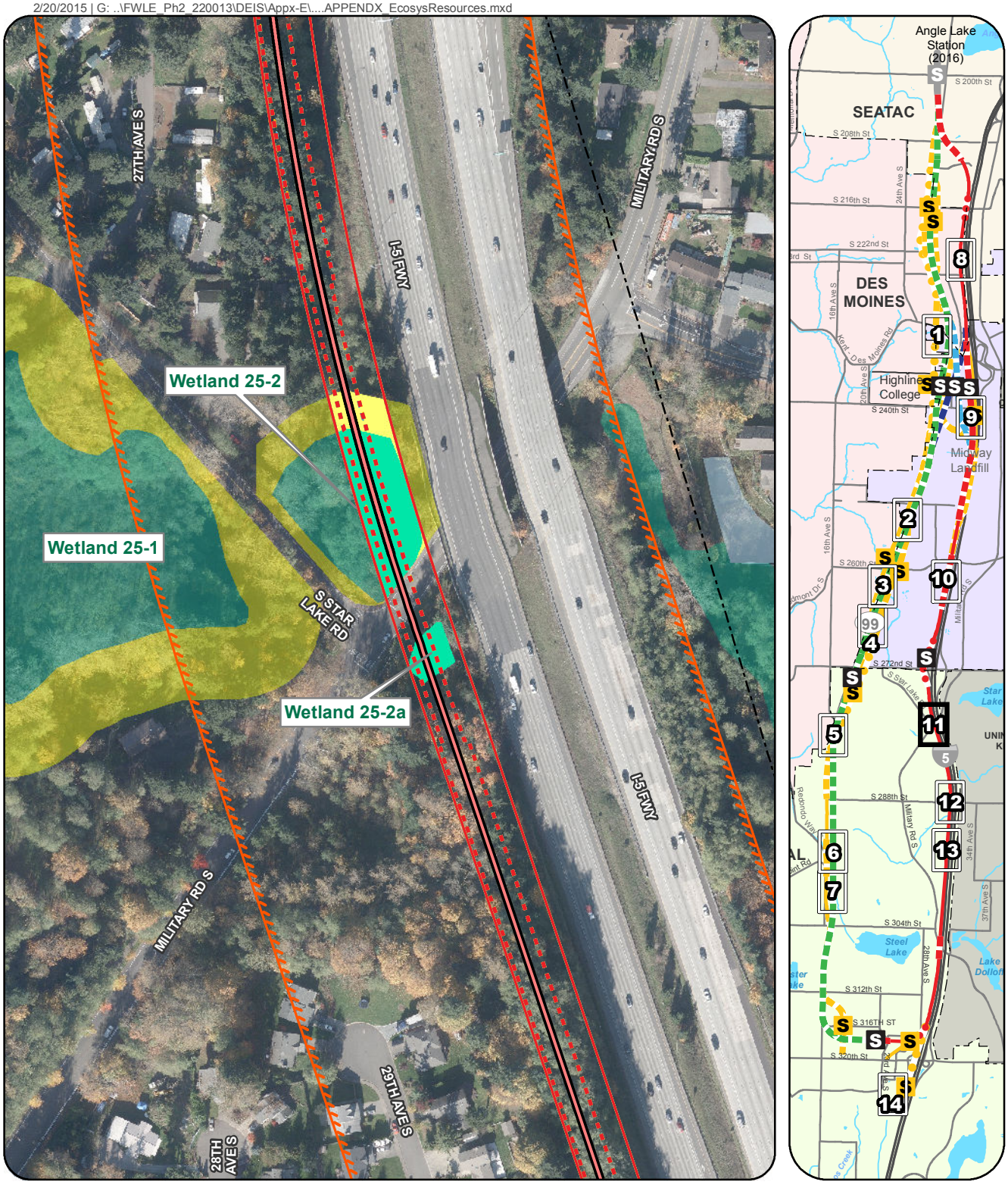
Piped Stream
Stream
Stream Buffer
Wetland
Wetland Buffer
Waterbody

Data Sources: King County, Cities of Des Moines, Federal Way, Kent, SeaTac, AeroMetric (2013). WDFW (2014).

N

0 100 200 300 Feet

Appendix E: 10 of 14
Ecosystems Resources
Wetland and Stream Impacts within the Study Area
Federal Way Link Extension



Station
Elevated Centerline
At-Grade I-5 Centerline
Trench I-5 Centerline
At-Grade Option Centerline
Trench Option Centerline

Construction Footprints
I-5
SR 99
I-5 to SR 99
SR 99 to I-5
Options

Permanent Footprint (colors vary by alternative / option)
City Boundary
Parcels / ROW Accessed During Field Reconnaissance Survey 2013-2014
300' Wetland Study Area

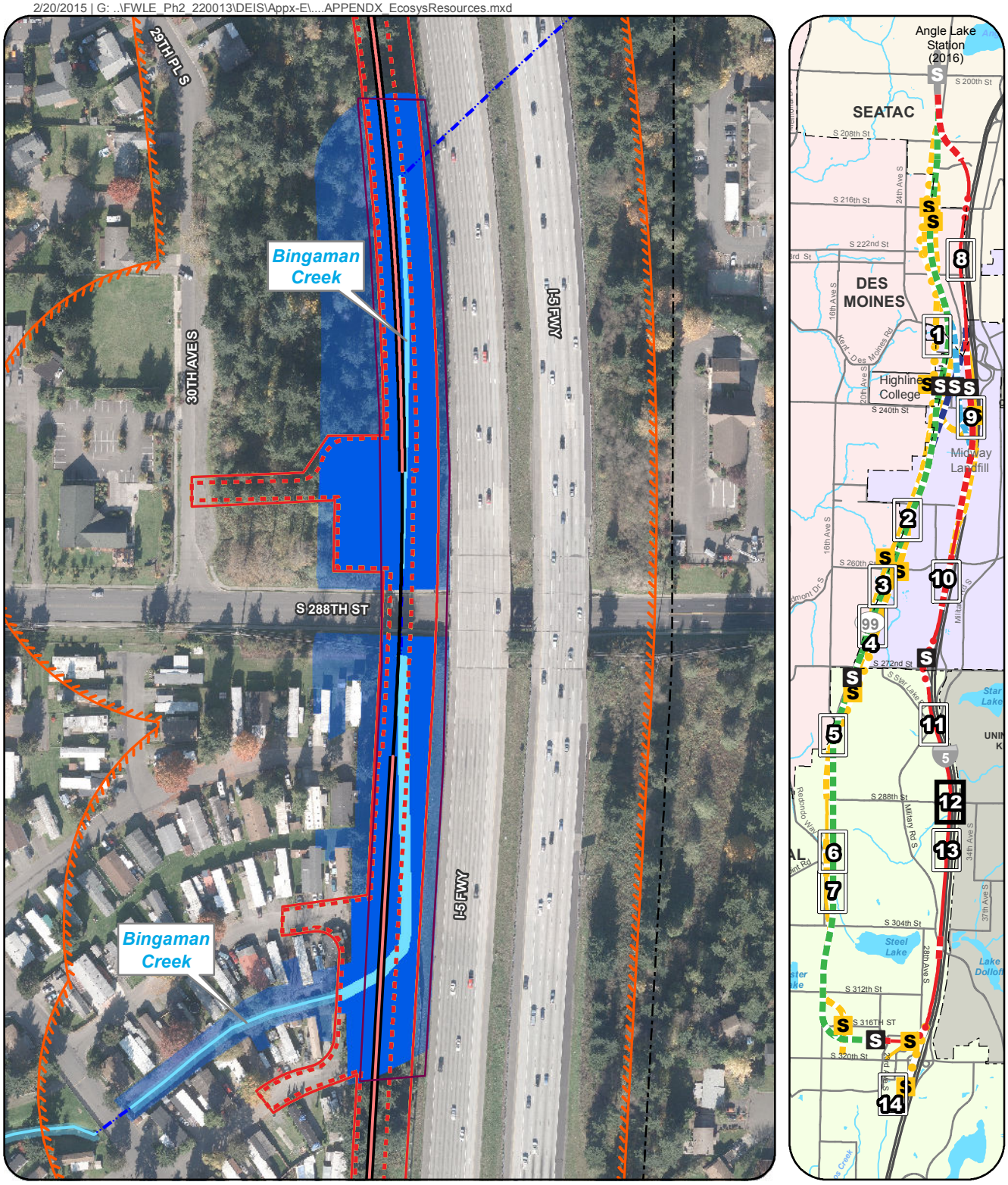
Piped Stream
Stream
Stream Buffer
Wetland
Wetland Buffer
Waterbody

Data Sources: King County, Cities of Des Moines, Federal Way, Kent, SeaTac, AeroMetric (2013). WDFW (2014).

N

0 100 200 300 Feet

Appendix E: 11 of 14
Ecosystems Resources
Wetland and Stream Impacts within the Study Area
Federal Way Link Extension



Station
Elevated Centerline
At-Grade I-5 Centerline
Trench I-5 Centerline
At-Grade Option Centerline
Trench Option Centerline

Construction Footprints
I-5
SR 99
I-5 to SR 99
SR 99 to I-5
Options

Permanent Footprint (colors vary by alternative / option)
City Boundary
Parcels / ROW Accessed During Field Reconnaissance Survey 2013-2014
300' Wetland Study Area

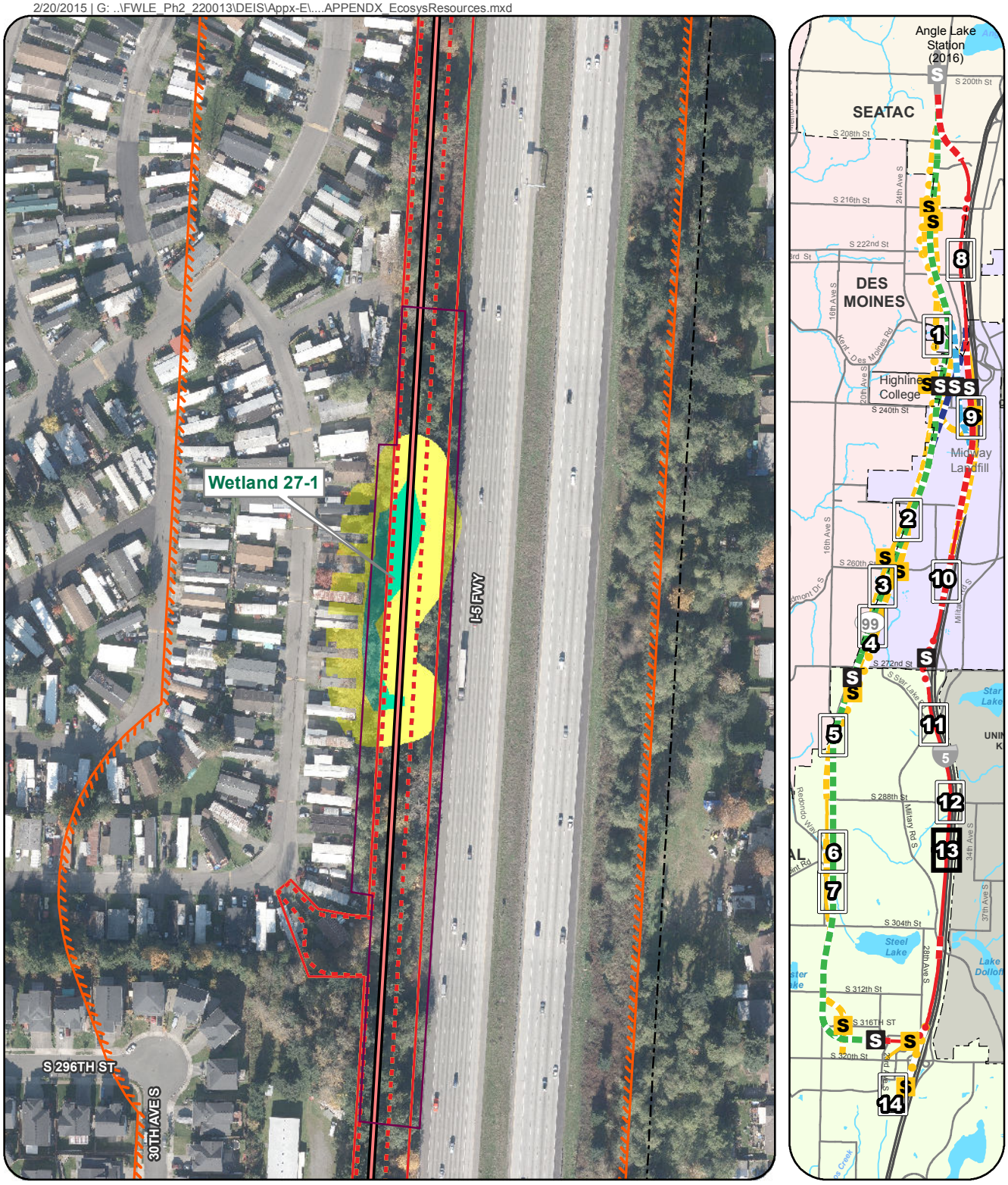
Piped Stream
Stream
Stream Buffer
Wetland
Wetland Buffer
Waterbody

Data Sources: King County, Cities of Des Moines, Federal Way, Kent, SeaTac, AeroMetric (2013). WDFW (2014).

N

0 100 200 300 Feet

Appendix E: 12 of 14
Ecosystems Resources
Wetland and Stream Impacts within the Study Area
Federal Way Link Extension



Station
Elevated Centerline
At-Grade I-5 Centerline
Trench I-5 Centerline
At-Grade Option Centerline
Trench Option Centerline

Construction Footprints
I-5
SR 99
I-5 to SR 99
SR 99 to I-5
Options

Permanent Footprint (colors vary by alternative / option)
City Boundary
Parcels / ROW Accessed During Field Reconnaissance Survey 2013-2014
300' Wetland Study Area

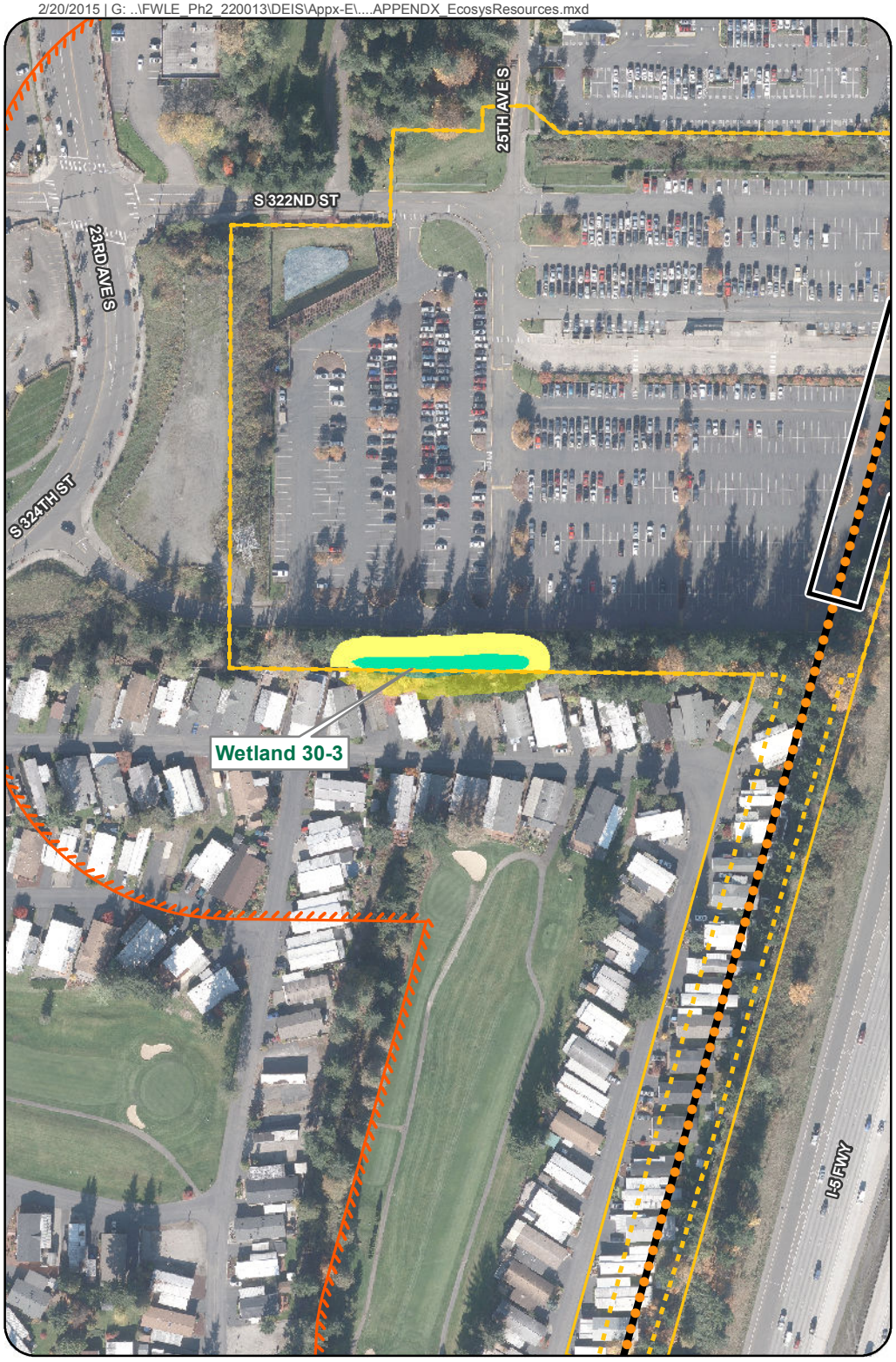
Piped Stream
Stream
Stream Buffer
Wetland
Wetland Buffer
Waterbody

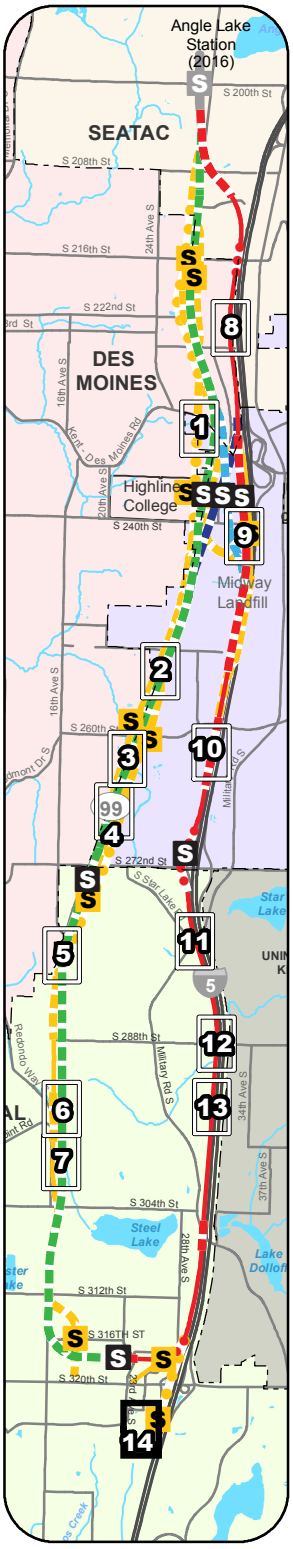
Data Sources: King County, Cities of Des Moines, Federal Way, Kent, SeaTac, AeroMetric (2013). WDFW (2014).

N

0 100 200 300 Feet

Appendix E: 13 of 14
Ecosystems Resources
Wetland and Stream Impacts within the Study Area
Federal Way Link Extension





Station
Elevated Centerline
At-Grade I-5 Centerline
Trench I-5 Centerline
At-Grade Option Centerline
Trench Option Centerline

Construction Footprints
I-5
SR 99
I-5 to SR 99
SR 99 to I-5
Options

Permanent Footprint (colors vary by alternative / option)
City Boundary
Parcels / ROW Accessed During Field Reconnaissance Survey 2013-2014
300' Wetland Study Area

Piped Stream
Stream
Stream Buffer
Wetland
Wetland Buffer
Waterbody

Data Sources: King County, Cities of Des Moines, Federal Way, Kent, SeaTac, AeroMetric (2013). WDFW (2014).

N

0 100 200 300 Feet

Appendix E: 14 of 14
Ecosystems Resources
Wetland and Stream Impacts within the Study Area
Federal Way Link Extension

Appendix F

Best Management Practices for Ecosystems Resources

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Appendix F

Best Management Practices for Ecosystems Resources

The following list of measures is a compilation of best management practices (BMPs) that can be used to avoid and minimize short- and long-term impacts on ecosystem resources during design, construction, and post-construction activities for the Federal Way Link Extension (FWLE). These BMPs are either required by federal, state, or local agencies to obtain permits necessary for the project, or they may be required in order to comply with typical permit conditions. They are based on Sound Transit's knowledge of permit requirements and experience with conducting environmental compliance and permitting for numerous other projects in the Puget Sound Region.

F.1 Design and Operation BMPs

F.1.1 Wetlands and Streams

Sound Transit would avoid and minimize adverse long-term effects of the FWLE on wetlands through design to the greatest extent practicable. Design aspects that would be incorporated into the project include elevated guideways, siting support columns and other elevated guideway features to span and avoid direct impacts on wetlands, and using retaining walls to reduce the footprint of at-grade guideway sections, thus reducing the extent of fill in wetlands.

Sound Transit would also design permanent stormwater treatment facilities and flow-control measures to minimize impacts on stream water quality and flow. The proposed stormwater management for the FWLE follows the Sound Transit *Link Design Criteria Manual* (Sound Transit, 2012), which requires stormwater design for Sound Transit projects to conform to the requirements of the local jurisdictions.

Mitigation for unavoidable impacts on streams and stream buffers that are protected under federal, state, and local regulations would also be provided in accordance with requirements. With the exception of Bingaman Creek, the project design would avoid impacts on existing streams, but some unavoidable impacts on stream riparian areas would be mitigated by improving stream habitat and riparian function by replanting affected areas with native vegetation.

F.1.2 Upland Vegetation and Wildlife Resources

Project effects on vegetation, wildlife, and wildlife habitat would be minimized to the greatest extent practicable by minimizing the footprint of light rail alignments through large blocks of forests and connected riparian corridors.

F.2 Construction-Related BMPs

Sound Transit would implement construction BMPs that would apply to all work in or around valued habitats and sensitive areas. Prior to construction, Sound Transit would mark work limits with

perimeter fencing and signage to prevent unintended impacts on ecosystems designated for protection (for example, riparian vegetation, wetlands, woodlands and other sensitive sites).

Sound Transit would implement a Stormwater Pollution Prevention Plan (SWPPP) and develop a temporary erosion and sediment control plan to assure that turbidity plumes and pollutants from equipment and runoff would not enter streams and wetlands. If discharge of treated construction or process water to a sanitary sewer were proposed, approval would be obtained from the King County Industrial Waste Division and the local jurisdiction. For construction within and over streams or other water bodies, a Hydraulic Project Approval would be obtained from the Washington Department of Fish and Wildlife before work began. Through compliance with these requirements, an approved construction SWPPP would be developed and implemented for the project. The SWPPP would serve as the overall construction stormwater mitigation plan by describing overall procedural and structural pollution prevention and flow control BMPs, including location, size, maintenance requirements and monitoring. In addition, the SWPPP would include each of the following plans:

- Temporary Erosion and Sediment Control Plan – This plan would outline the design and construction specifications for BMPs to be used to identify, reduce, eliminate or prevent sediment and erosion problems.
- Spill Prevention, Control, and Countermeasures Plan – This plan would outline requirements for and implementation of spill prevention, inspection protocols, equipment, material containment measures, and spill response procedures.
- Concrete Containment and Disposal Plan – This plan would outline the management, containment, and disposal of concrete debris, slurry, and dust, and would discuss BMPs that would be used to reduce high pH.
- Dewatering Plan – This plan would outline procedures for pumping groundwater away from the construction area and for storing (as necessary), testing, treating (as necessary), and discharging or disposing of the dewatering water.

Seasonal work restrictions (i.e., work windows) would apply to work conducted below the ordinary high water mark of certain fish-bearing streams and for certain clearing activities during the migratory bird nesting season. If any culverts needed to be installed or extended on fish-bearing or potentially fish-bearing streams, design and construction methods would comply with Washington Administrative Code (WAC) 220-110-070 regarding fish passage. Any stream beds and stream banks affected by construction would be restored after in-water work.

Potential BMPs include the following:

- Minimizing the amount of cleared area at a construction site
- Washing truck tires at construction entrances, as necessary
- Constructing silt fences downslope from exposed soils
- Protecting catch basins from sediment

- Containing and controlling concrete and hazardous materials onsite
- Installing temporary ditches to route runoff around or through construction sites, with periodic straw bales or rock check dams to slow and settle runoff
- Using straw wattles to reduce the length of unbroken slopes and minimize runoff concentration
- Using temporary erosion-control blankets or mulch on exposed steep slopes to minimize erosion before vegetation is established
- Constructing temporary sedimentation ponds to remove solids from concentrated runoff, and dewatering them before they are discharged
- Conducting vehicle fueling and maintenance activities no closer than 100 feet from a water body or ditch

Examples of avoidance and minimization measures that would be implemented before and during project construction include minimizing vegetation clearing, restoring temporarily affected areas, preparing and implementing a revegetation plan, and preventing injury to migratory birds. In accordance with the Migratory Bird Treaty Act, Sound Transit would consult with the U.S. Fish and Wildlife Service on measures to conserve migratory birds and their nests. Sound Transit would also implement a weed control plan to minimize the risk of introducing and spreading noxious and invasive species, including restoring temporarily disturbed areas immediately following construction.

F.3 References

Sound Transit. 2012. *Link Design Criteria Manual.* Revision 1. February.

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