

APPENDIX N
AQUATIC BIOLOGY RESULTS

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APPENDIX N

1.0 AQUATIC BIOLOGY RESULTS

RBP HABITAT ASSESSMENT FORM – SALT AND GILA RIVERS BELOW CITY OF PHOENIX 91ST AVENUE WWTP

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference reach	Below 91st Avenue WWTP outfall	Gila River at 115 th Avenue	Gila River at Estrella Parkway	Gila River at Highway 85
Parameters Evaluated in Sampling Reach	Epifaunal Substrate/Available Cover	NA	16	17	13	4
	Pool Substrate Characterization	NA	16	16	10	6
	Pool Variability	NA	8	14	13	12
	Sediment Deposition	NA	18	17	4	8
	Channel Flow Status	0	18	17	8	11
Parameters Evaluated Beyond Sample Reach	Channel Alteration	11	13	12	11	8
	Channel Sinuosity	10	11	11	4	6
	Bank Stability (LB)	1	9	7	8	7
	Bank Stability (RB)	1	9	9	10	7
	Vegetative Protection (LB)	1	10	7	9	5
	Vegetative Protection (RB)	9	10	10	9	6
	Riparian Vegetative Zone Width (LB)	10	8	5	10	4
Riparian Vegetative Zone Width (RB)	10	10	8	10	5	
RBP Habitat Score		53	156	150	119	89

PROJECT HABITAT ASSESSMENT FORM – SALT AND GILA RIVERS BELOW CITY OF PHOENIX 91ST AVENUE WWTP

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Below 91st Avenue WWTP Outfall	Gila River at 115 th Avenue	Gila River at Estrella Parkway	Gila River at Highway 85
Primary – Flow, Substrate, Instream Cover (1-6)	Current Flow Conditions	N/A	5	6	3	3
	Bottom Substrate Type	N/A	5	5	2	1
	Sediment Deposition (Riffles/Runs)	N/A	5	3	N/A	N/A
	Sediment Deposition (Pools)	N/A	4	3	1	1

**PROJECT HABITAT ASSESSMENT FORM – SALT AND GILA RIVERS BELOW
CITY OF PHOENIX 91ST AVENUE WWTP**

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Below 91st Avenue WWTP Outfall	Gila River at 115 th Avenue	Gila River at Estrella Parkway	Gila River at Highway 85
	Undercut Banks, Logs, Roots, Cobble, Boulders (presence)	N/A	5	5	2	1
	Pools/Riffles/Runs (presence)	N/A	6	6	1	1
	Pools/Riffles/Runs (dominance)	N/A	2	1	1	1
	Habitat Diversity (Riffles/Runs)	N/A	5	4	N/A	1
	Habitat Diversity (Pools)	N/A	5	5	5	2
Secondary - Channel Morphology (1-6)	Run/Bend Ratio (distance between bends / stream width)	1	1	1	1	1
	Channelization	3	2	3	3	2
	Instream Structures (dams, weirs, etc.)	6	6	1	4	4
Tertiary - Riparian and Bank Structure (1-3)	% Vegetative Cover (RB)	1	3	3	3	3
	% Vegetative Cover (LB)	1	3	3	3	2
	Predominant Vegetative Cover (RB)	3	3	3	3	2
	Predominant Vegetative Cover (LB)	3	3	3	3	2
	Predominant Non-Vegetative Cover (RB)	1	2	2	2	1
	Predominant Non-Vegetative Cover (LB)	1	2	2	2	1
	Evidence of Erosion (RB)	2	2	2	3	2
	Evidence of Erosion (LB)	2	3	2	3	2
Project Habitat Score		24	72	63	45	33

**RBP HABITAT ASSESSMENT FORM – SANTA CRUZ RIVER BELOW NOGALES
WWTP**

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Below Nogales WWTP Outfall	Santa Cruz River at Rio Rico Road	Santa Cruz River at Bridge Road	Santa Cruz River at Chavez Siding Road
Parameters Evaluated in Sampling Reach	Epifaunal Substrate/Available Cover	N/A	9	8	8	11
	Pool Substrate Characterization	N/A	0	0	0	0
	Pool Variability	N/A	0	0	0	0
	Sediment Deposition	N/A	7	11	11	12
	Channel Flow Status	N/A	13	8	15	9
Parameters Evaluated Beyond Sample Reach	Channel Alteration	13	14	18	12	18
	Channel Sinuosity	7	11	11	11	12
	Bank Stability (LB)	6	6	8	9	9
	Bank Stability (RB)	6	5	8	3	7
	Vegetative Protection (LB)	6	4	9	9	9
	Vegetative Protection (RB)	6	2	9	2	7
	Riparian Vegetative Zone Width (LB)	6	7	9	9	8
Riparian Vegetative Zone Width (RB)	6	6	9	1	6	
RBP Habitat Score		56	84	108	90	108

**PROJECT HABITAT ASSESSMENT FORM – SANTA CRUZ RIVER BELOW
NOGALES WWTP**

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Below Nogales WWTP Outfall	Santa Cruz River at Rio Rico Road	Santa Cruz River at Bridge Road	Santa Cruz River at Chavez Siding Road
Primary - Flow, Substrate, Instream Cover (1-6)	Current Flow Conditions	1	3	3	3	3
	Bottom Substrate Type	3	3	3	3	3
	Sediment Deposition (Riffles/Runs)	N/A	3	2	4	3
	Sediment Deposition (Pools)	N/A	1	1	1	1
	Undercut Banks, Logs, Roots, Cobble, Boulders (presence)	N/A	2	5	3	3
	Pools/Riffles/Runs (presence)	N/A	1	1	1	1
	Pools/Riffles/Runs (dominance)	N/A	1	1	1	2
	Habitat Diversity (Riffles/Runs)	N/A	3	3	3	3

**PROJECT HABITAT ASSESSMENT FORM – SANTA CRUZ RIVER BELOW
NOGALES WWTP**

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Below Nogales WWTP Outfall	Santa Cruz River at Rio Rico Road	Santa Cruz River at Bridge Road	Santa Cruz River at Chavez Siding Road
	Habitat Diversity (Pools)	N/A	1	1	1	1
Secondary - Channel Morphology (1-6)	Run/Bend Ratio (distance between bends / stream width)	1	1	1	1	1
	Channelization	5	4	5	3	5
	Instream Structures (dams, weirs, etc.)	6	6	6	6	6
Tertiary - Riparian and Bank Structure (1-3)	% Vegetative Cover (RB)	2	1	3	1	2
	% Vegetative Cover (LB)	2	2	3	3	3
	Predominant Vegetative Cover (RB)	3	1	3	1	3
	Predominant Vegetative Cover (LB)	3	2	3	3	3
	Predominant Non-Vegetative Cover (RB)	1	1	1	1	1
	Predominant Non-Vegetative Cover (LB)	1	1	1	1	1
	Evidence of Erosion (RB)	2	2	2	1	3
	Evidence of Erosion (LB)	2	2	2	3	3
Project Habitat Score		32	41	50	44	51

**RBP HABITAT ASSESSMENT FORM – SANTA CRUZ RIVER BELOW TUCSON
WWTP**

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach (Dry)	Downstream of Santa Cruz River WWTP Outfall	500 yds Downstream of Ina Road Bridge	Downstream of Cortaro Road Bridge	Downstream of Marana Road Bridge
Parameters Evaluated in Sampling Reach	Epifaunal Substrate/ Available Cover	N/A	10	15	13	11
	Pool Substrate Characterization	N/A	0	0	0	0
	Pool Variability	N/A	0	0	0	0
	Sediment Deposition	N/A	8	7	7	13
	Channel Flow Status	N/A	13	7	12	8
Parameters to Evaluated Beyond	Channel Alteration	7	8	8	14	13
	Channel Sinuosity	2	3	7	12	8

**RBP HABITAT ASSESSMENT FORM – SANTA CRUZ RIVER BELOW TUCSON
WWTP**

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach (Dry)	Downstream of Santa Cruz River WWTP Outfall	500 yds Downstream of Ina Road Bridge	Downstream of Cortaro Road Bridge	Downstream of Marana Road Bridge
Sample Reach	Bank Stability (LB)	4	5	4	6	5
	Bank Stability (RB)	0	2	4	6	4
	Vegetative Protection (LB)	4	4	3	9	4
	Vegetative Protection (RB)	0	0	4	9	4
	Riparian Vegetative Zone Width (LB)	9	9	6	7	6
	Riparian Vegetative Zone Width (RB)	0	0	6	6	6
RBP Habitat Score		26	62	71	101	82

**PROJECT HABITAT ASSESSMENT FORM – SANTA CRUZ RIVER BELOW
TUCSON WWTP**

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach (Dry)	Downstream of Santa Cruz River WWTP Outfall	500 yds Downstream of Ina Road Bridge	Downstream of Cortaro Road Bridge	Downstream of Marana Road Bridge
Primary - Flow, Substrate, Instream Cover (1-6)	Current Flow Conditions	N/A	3	4	3	4
	Bottom Substrate Type	N/A	3	3	3	3
	Sediment Deposition (Riffles/Runs)	N/A	3	2	3	3
	Sediment Deposition (Pools)	N/A	1	1	1	1
	Undercut Banks, Logs, Roots, Cobble, Boulders (presence)	N/A	1	5	2	2
	Pools/Riffles/Runs (presence)	N/A	1	3	1	3
	Pools/Riffles/Runs (dominance)	N/A	1	3	2	2
	Habitat Diversity (Riffles/Runs)	N/A	3	3	3	3
	Habitat Diversity (Pools)	N/A	1	1	1	1
Secondary - Channel Morphology (1-6)	Run/Bend Ratio (distance between bends/stream width)	1	1	3	3	3
	Channelization	1	2	4	5	3
	Instream Structures (dams, weirs, etc.)	6	6	6	6	6
Tertiary - Riparian and	% Vegetative Cover (RB)	1	1	2	3	2

**PROJECT HABITAT ASSESSMENT FORM – SANTA CRUZ RIVER BELOW
TUCSON WWTP**

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach (Dry)	Downstream of Santa Cruz River WWTP Outfall	500 yds Downstream of Ina Road Bridge	Downstream of Cortaro Road Bridge	Downstream of Marana Road Bridge
Bank Structure (1-3)	% Vegetative Cover (LB)	2	3	2	3	2
	Predominant Vegetative Cover (RB)	1	1	2	2	3
	Predominant Vegetative Cover (LB)	2	2	2	2	3
	Predominant Non-Vegetative Cover (RB)	1	1	1	1	1
	Predominant Non-Vegetative Cover (LB)	1	1	1	1	1
	Evidence of Erosion (RB)	1	1	1	2	2
	Evidence of Erosion (LB)	2	2	1	2	2
Project Habitat Score		19	38	50	49	50

**RBP HABITAT ASSESSMENT FORM – SANTA ANA RIVER BELOW SAN
BERNARDINO AND COLTON WWTPS**

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Downstream of WWTP Outfall; Confluence With Rialto Effluent	Upstream of Riverside WWTP Outfall	Downstream of Riverside WWTP Outfall	Upstream of Prado Dam/ Hamner Street Bridge
Parameters Evaluated in Sampling Reach	Epifaunal Substrate/Available Cover	8	13	4	NO ACCESS	5
	Pool Substrate Characterization	0	0	0		0
	Pool Variability	0	0	0		0
	Sediment Deposition	9	16	3		3
	Channel Flow Status	8	6	17		17
Parameters Evaluated Beyond Sample Reach	Channel Alteration	18	13	17		18
	Channel Sinuosity	15	5	8		7
	Bank Stability (LB)	7	4	9		9
	Bank Stability (RB)	9	8	9		9
	Vegetative Protection (LB)	7	2	9		10
	Vegetative Protection (RB)	10	8	9		10
	Riparian Vegetative Zone Width (LB)	10	3	6		10
Riparian Vegetative Zone Width (RB)	10	8	7		9	

**RBP HABITAT ASSESSMENT FORM – SANTA ANA RIVER BELOW SAN
BERNARDINO AND COLTON WWTPS**

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Downstream of WWTP Outfall; Confluence With Rialto Effluent	Upstream of Riverside WWTP Outfall	Downstream of Riverside WWTP Outfall	Upstream of Prado Dam/ Hamner Street Bridge
RBP Habitat Score		111	86	98	0	107

**PROJECT HABITAT ASSESSMENT FORM – SANTA ANA RIVER BELOW SAN
BERNARDINO AND COLTON WWTPS**

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Downstream of WWTP Outfall; Confluence With Rialto Effluent	Upstream of Riverside WWTP Outfall	Downstream of Riverside WWTP outfall	Upstream of Prado Dam/ Hamner Street Bridge
Primary - Flow, Substrate, Instream Cover (1-6)	Current Flow Conditions	4	3	3	NO ACCESS	3
	Bottom Substrate Type	3	4	3		3
	Sediment Deposition (Riffles/Runs)	3	5	2		2
	Sediment Deposition (Pools)	1	1	1		1
	Undercut Banks, Logs, Roots, Cobble, Boulders (presence)	3	2	2		2
	Pools/Riffles/Runs (presence)	1	1	1		1
	Pools/Riffles/Runs (dominance)	1	2	1		1
	Habitat Diversity (Riffles/Runs)	2	3	2		2
	Habitat Diversity (Pools)	1	1	1		1
Secondary - Channel Morphology (1-6)	Run/Bend Ratio (distance between bends / stream width)	3	1	1		3
	Channelization	5	5	5		5
	Instream Structures (dams, weirs, etc.)	6	6	6		6
Tertiary - Riparian and Bank Structure (1-3)	% Vegetative Cover (RB)	3	3	3		3
	% Vegetative Cover (LB)	3	2	3		3
	Predominant Vegetative Cover (RB)	3	3	3		3

PROJECT HABITAT ASSESSMENT FORM – SANTA ANA RIVER BELOW SAN BERNARDINO AND COLTON WWTPS

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Downstream of WWTP Outfall; Confluence With Rialto Effluent	Upstream of Riverside WWTP Outfall	Downstream of Riverside WWTP outfall	Upstream of Prado Dam/ Hamner Street Bridge
	Predominant Vegetative Cover (LB)	3	3	3		3
	Predominant Non-Vegetative Cover (RB)	1	1	1		1
	Predominant Non-Vegetative Cover (LB)	2	1	1		1
	Evidence of Erosion (RB)	3	2	3		2
	Evidence of Erosion (LB)	3	1	3		2
Project Habitat Score		54	50	48	0	48

RBP HABITAT ASSESSMENT FORM – FOUNTAIN CREEK BELOW LAS VEGAS STREET WWTP OUTFALL

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Downstream of WWTP Outfall	Janitell Road	Near Security	Near Fountain
Parameters Evaluated in Sampling Reach	Epifaunal Substrate/Available Cover	6	12	12	8	8
	Pool Substrate Characterization	0	0	0	0	0
	Pool Variability	0	0	0	0	0
	Sediment Deposition	10	12	10	7	6
	Channel Flow Status	18	16	13	14	10
Parameters Evaluated Beyond Sample Reach	Channel Alteration	3	7	13	16	13
	Channel Sinuosity	3	3	5	8	7
	Bank Stability (LB)	2	7	7	8	9
	Bank Stability (RB)	2	4	5	4	4
	Vegetative Protection (LB)	0	6	3	9	9
	Vegetative Protection (RB)	0	4	4	3	4
	Riparian Vegetative Zone Width (LB)	0	6	5	6	10
Riparian Vegetative Zone Width (RB)	0	4	5	2	5	
RBP Habitat Score		44	81	82	85	85

PROJECT HABITAT ASSESSMENT FORM – FOUNTAIN CREEK BELOW LAS VEGAS STREET WWTP OUTFALL

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Downstream of WWTP Outfall	Janitell Road	Near Security	Near Fountain
Primary - Flow, Substrate, Instream Cover (1-6)	Current Flow Conditions	3	5	4	3	3
	Bottom Substrate Type	4	4	3	3	3
	Sediment Deposition (Riffles/Runs)	3	5	3	5	2
	Sediment Deposition (Pools)	1	1	1	1	1
	Undercut Banks, Logs, Roots, Cobble, Boulders (presence)	2	4	3	2	3
	Pools/Riffles/Runs (presence)	3	3	3	3	3
	Pools/Riffles/Runs (dominance)	2	4	3	1	1
	Habitat Diversity (Riffles/Runs)	2	3	3	2	2
	Habitat Diversity (Pools)	1	1	1	1	1
Secondary - Channel Morphology (1-6)	Run/Bend Ratio (distance between bends / stream width)	1	1	1	1	1
	Channelization	1	3	3	5	4
	Instream Structures (dams, weirs, etc.)	1	1	6	6	6
Tertiary - Riparian and Bank Structure (1-3)	% Vegetative Cover (RB)	1	2	2	1	2
	% Vegetative Cover (LB)	1	3	1	3	3
	Predominant Vegetative Cover (RB)	1	2	3	2	3
	Predominant Vegetative Cover (LB)	1	3	3	3	3
	Predominant Non-Vegetative Cover (RB)	1	1	3	1	1
	Predominant Non-Vegetative Cover (LB)	1	1	3	1	1
	Evidence of Erosion (RB)	1	1	2	1	1
	Evidence of Erosion (LB)	1	1	2	2	2
Project Habitat Score		32	49	53	47	46

RBP HABITAT ASSESSMENT FORM – SOUTH PLATTE RIVER BELOW DENVER METRO WWTP

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Below WWTP Outfall	Upstream of Clear Creek Confluence	Upstream of 124 th Avenue Bridge	Upstream of 160 th Avenue Bridge
Parameters Evaluated in Sampling Reach	Epifaunal Substrate/Available Cover	13	4	12	14	11
	Pool Substrate Characterization	16	0	0	16	0
	Pool Variability	9	0	0	9	0
	Sediment Deposition	12	10	9	12	13
	Channel Flow Status	8	15	10	9	8
Parameters Evaluated Beyond Sample Reach	Channel Alteration	12	8	12	17	15
	Channel Sinuosity	8	6	5	7	14
	Bank Stability (LB)	4	4	8	7	7
	Bank Stability (RB)	4	7	6	7	9
	Vegetative Protection (LB)	1	1	5	5	9
	Vegetative Protection (RB)	7	8	8	5	9
	Riparian Vegetative Zone Width (LB)	1	2	4	9	10
Riparian Vegetative Zone Width (RB)	8	7	3	9	9	
RBP Habitat Score		103	72	82	126	114

PROJECT HABITAT ASSESSMENT FORM – SOUTH PLATTE RIVER BELOW DENVER METRO WWTP

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Below WWTP Outfall	Upstream of Clear Creek Confluence	Upstream of 124 th Avenue Bridge	Upstream of 160 th Avenue Bridge
Primary - Flow, Substrate, Instream Cover (1-6)	Current Flow Conditions	4	3	3	5	3
	Bottom Substrate Type	5	3	5	5	4
	Sediment Deposition (Riffles/Runs)	4	1	2	5	3
	Sediment Deposition (Pools)	2	1	1	3	1
	Undercut Banks, Logs, Roots, Cobble, Boulders (presence)	2	1	3	5	1
	Pools/Riffles/Runs (presence)	6	1	3	6	1
	Pools/Riffles/Runs (dominance)	4	1	2	2	1
	Habitat Diversity (Riffles/Runs)	4	2	3	4	2

**PROJECT HABITAT ASSESSMENT FORM – SOUTH PLATTE RIVER BELOW
DENVER METRO WWTP**

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Below WWTP Outfall	Upstream of Clear Creek Confluence	Upstream of 124 th Avenue Bridge	Upstream of 160 th Avenue Bridge
	Habitat Diversity (Pools)	5	1	1	3	1
Secondary - Channel Morphology (1-6)	Run/Bend Ratio (distance between bends / stream width)	1	1	1	3	3
	Channelization	3	2	3	5	5
	Instream Structures (dams, weirs, etc.)	4	1	3	6	6
Tertiary - Riparian and Bank Structure (1-3)	% Vegetative Cover (RB)	3	3	3	2	3
	% Vegetative Cover (LB)	1	2	2	2	3
	Predominant Vegetative Cover (RB)	3	2	3	3	2
	Predominant Vegetative Cover (LB)	3	1	3	3	2
	Predominant Non-Vegetative Cover (RB)	2	1	2	2	1
	Predominant Non-Vegetative Cover (LB)	1	1	2	2	1
	Evidence of Erosion (RB)	2	2	2	2	2
	Evidence of Erosion (LB)	1	1	2	2	2
Project Habitat Score		60	31	49	70	47

**RBP HABITAT ASSESSMENT FORM – LAS VEGAS WASH BELOW CITY OF LAS
VEGAS WWTP OUTFALL**

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Downstream of City of Las Vegas WWTP Outfall	Downstream of Clark County and Henderson WWTPs	Upstream of Lake Las Vegas	Upstream of Lake Mead
Parameters Evaluated in Sampling Reach	Epifaunal Substrate/Available Cover	13	12	13	7	16
	Pool Substrate Characterization	0	0	0	6	0
	Pool Variability	0	0	0	12	0
	Sediment Deposition	11	8	7	5	15
	Channel Flow Status	8	19	14	8	15
Parameters	Channel Alteration	7	13	18	14	19

RBP HABITAT ASSESSMENT FORM – LAS VEGAS WASH BELOW CITY OF LAS VEGAS WWTP OUTFALL

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Downstream of City of Las Vegas WWTP Outfall	Downstream of Clark County and Henderson WWTPs	Upstream of Lake Las Vegas	Upstream of Lake Mead
Evaluated Beyond Sample Reach	Channel Sinuosity	5	4	13	5	14
	Bank Stability (LB)	4	7	8	6	6
	Bank Stability (RB)	6	5	8	5	7
	Vegetative Protection (LB)	5	9	8	4	3
	Vegetative Protection (RB)	9	8	6	3	2
	Riparian Vegetative Zone Width (LB)	2	6	4	5	1
	Riparian Vegetative Zone Width (RB)	6	2	4	5	1
RBP Habitat Score		76	93	103	85	99

PROJECT HABITAT ASSESSMENT FORM – LAS VEGAS WASH BELOW CITY OF LAS VEGAS WWTP OUTFALL

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Downstream of City of Las Vegas WWTP Outfall	Downstream of Clark County and Henderson WWTPs	Upstream of Lake Las Vegas	Upstream of Lake Mead
Primary - Flow, Substrate, Instream Cover (1-6)	Current Flow Conditions	5	3	5	3	5
	Bottom Substrate Type	4	2	4	1	5
	Sediment Deposition (Riffles/Runs)	3	2	3	1	4
	Sediment Deposition (Pools)	1	1	1	1	1
	Undercut Banks, Logs, Roots, Cobble, Boulders (presence)	5	3	3	2	5
	Pools/Riffles/Runs (presence)	3	1	3	3	3
	Pools/Riffles/Runs (dominance)	4	1	3	2	4
	Habitat Diversity (Riffles/Runs)	4	4	4	2	5
	Habitat Diversity (Pools)	1	1	1	3	1
Secondary - Channel Morphology (1-6)	Run/Bend Ratio (distance between bends / stream width)	1	1	3	1	3
	Channelization	2	3	6	4	5

PROJECT HABITAT ASSESSMENT FORM – LAS VEGAS WASH BELOW CITY OF LAS VEGAS WWTP OUTFALL

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Downstream of City of Las Vegas WWTP Outfall	Downstream of Clark County and Henderson WWTPs	Upstream of Lake Las Vegas	Upstream of Lake Mead
	Instream Structures (dams, weirs, etc.)	6	6	6	6	6
Tertiary - Riparian and Bank Structure (1-3)	% Vegetative Cover (RB)	3	3	2	2	1
	% Vegetative Cover (LB)	2	3	2	2	1
	Predominant Vegetative Cover (RB)	2	2	3	1	2
	Predominant Vegetative Cover (LB)	2	2	3	1	2
	Predominant Non-Vegetative Cover (RB)	1	1	1	1	1
	Predominant Non-Vegetative Cover (LB)	1	1	1	1	1
	Evidence of Erosion (RB)	2	2	2	1	2
	Evidence of Erosion (LB)	1	3	2	1	2
Project Habitat Score		53	45	58	39	59

RBP HABITAT ASSESSMENT FORM – SANTA FE RIVER BELOW CITY OF SANTA FE WWTP OUTFALL

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Below WWTP Outfall	Forest Guardians Preserve	Below Cienega Creek Confluence	Upstream of USGS Bajada Gage
Parameters Evaluated in Sampling Reach	Epifaunal Substrate/Available Cover	NA	15	14	15	12
	Pool Substrate Characterization	NA	0	11	16	0
	Pool Variability	NA	0	4	5	0
	Sediment Deposition	NA	17	15	15	18
	Channel Flow Status	0	18	18	16	18
Parameters Evaluated Beyond Sample Reach	Channel Alteration	18	18	18	19	19
	Channel Sinuosity	8	11	7	11	15
	Bank Stability (LB)	2	3	1	7	3
	Bank Stability (RB)	1	3	8	4	4
	Vegetative Protection (LB)	2	1	3	4	1

RBP HABITAT ASSESSMENT FORM – SANTA FE RIVER BELOW CITY OF SANTA FE WWTP OUTFALL

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Below WWTP Outfall	Forest Guardians Preserve	Below Cienega Creek Confluence	Upstream of USGS Bajada Gage
	Vegetative Protection (RB)	2	1	3	4	1
	Riparian Vegetative Zone Width (LB)	1	1	4	1	3
	Riparian Vegetative Zone Width (RB)	1	1	4	1	3
RBP Habitat Score		35	89	110	118	97

PROJECT HABITAT ASSESSMENT FORM – SANTA FE RIVER BELOW CITY OF SANTA FE WWTP OUTFALL

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Below WWTP Outfall	Forest Guardians Preserve	Below Cienega Creek Confluence	Upstream of USGS Bajada Gage
Primary - Flow, Substrate, Instream Cover (1-6)	Current Flow Conditions	NA	4	4	4	5
	Bottom Substrate Type	NA	5	5	5	5
	Sediment Deposition (Riffles/Runs)	NA	5	5	5	2
	Sediment Deposition (Pools)	NA	1	4	5	1
	Undercut Banks, Logs, Roots, Cobble, Boulders (presence)	NA	2	3	2	6
	Pools/Riffles/Runs (presence)	NA	3	6	6	3
	Pools/Riffles/Runs (dominance)	NA	1	2	3	2
	Habitat Diversity (Riffles/Runs)	NA	3	4	3	4
	Habitat Diversity (Pools)	NA	1	4	5	1
Secondary - Channel Morphology (1-6)	Run/Bend Ratio (distance between bends / stream width)	1	1	1	1	3
	Channelization	5	5	6	6	6
	Instream Structures (dams, weirs, etc.)	6	4	6	6	6
Tertiary - Riparian and Bank Structure (1-3)	% Vegetative Cover (RB)	2	1	3	2	2
	% Vegetative Cover (LB)	2	2	2	2	1

**PROJECT HABITAT ASSESSMENT FORM – SANTA FE RIVER BELOW CITY OF
SANTA FE WWTP OUTFALL**

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Below WWTP Outfall	Forest Guardians Preserve	Below Cienega Creek Confluence	Upstream of USGS Bajada Gage
	Predominant Vegetative Cover (RB)	3	3	2	1	3
	Predominant Vegetative Cover (LB)	3	3	2	1	3
	Predominant Non-Vegetative Cover (RB)	1	1	1	1	2
	Predominant Non-Vegetative Cover (LB)	1	1	1	1	2
	Evidence of Erosion (RB)	1	2	2	2	2
	Evidence of Erosion (LB)	1	2	1	1	2
Project Habitat Score		26	50	64	62	61

**RBP HABITAT ASSESSMENT FORM – CARRIZO CREEK BELOW CARRIZO
SPRINGS WWTP OUTFALL**

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Downstream of Carrizo Springs WWTP Outfall	At East Road Crossing	At County Road 1407 Crossing	No Station 5
Parameters Evaluated in Sampling Reach	Epifaunal Substrate/Available Cover	16	16	16	13	
	Pool Substrate Characterization	14	12	13	13	
	Pool Variability	13	4	13	13	
	Sediment Deposition	16	19	16	19	
	Channel Flow Status	19	19	18	19	
Parameters Evaluated Beyond Sample Reach	Channel Alteration	18	19	19	18	
	Channel Sinuosity	6	6	6	6	
	Bank Stability (LB)	10	9	10	10	
	Bank Stability (RB)	10	8	10	10	
	Vegetative Protection (LB)	10	10	10	10	
	Vegetative Protection (RB)	10	10	10	10	
	Riparian Vegetative Zone Width (LB)	8	9	6	10	
Riparian Vegetative Zone Width (RB)	10	2	6	5		

RBP HABITAT ASSESSMENT FORM – CARRIZO CREEK BELOW CARRIZO SPRINGS WWTP OUTFALL

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Downstream of Carrizo Springs WWTP Outfall	At East Road Crossing	At County Road 1407 Crossing	No Station 5
RBP Habitat Score		160	143	153	156	0

PROJECT HABITAT ASSESSMENT FORM – CARRIZO CREEK BELOW CARRIZO SPRINGS WWTP OUTFALL

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Downstream of Carrizo Springs WWTP Outfall	At East Road Crossing	At County Road 1407 Crossing	No Station 5
Primary - Flow, Substrate, Instream Cover (1-6)	Current Flow Conditions	3	5	3	3	
	Bottom Substrate Type	1	2	1	1	
	Sediment Deposition (Riffles/Runs)	0	6	N/A	N/A	
	Sediment Deposition (Pools)	2	2	2	2	
	Undercut Banks, Logs, Roots, Cobble, Boulders (presence)	5	5	3	3	
	Pools/Riffles/Runs (presence)	1	3	1	1	
	Pools/Riffles/Runs (dominance)	0	1	1	1	
	Habitat Diversity (Riffles/Runs)	N/A	4	N/A	N/A	
	Habitat Diversity (Pools)	1	2	2	2	
Secondary - Channel Morphology (1-6)	Run/Bend Ratio (distance between bends / stream width)	1	1	1	1	
	Channelization	6	5	5	5	
	Instream Structures (dams, weirs, etc.)	6	6	3	1	
Tertiary - Riparian and Bank Structure (1-3)	% Vegetative Cover (RB)	3	3	3	3	
	% Vegetative Cover (LB)	3	3	3	3	
	Predominant Vegetative Cover (RB)	3	3	3	3	

PROJECT HABITAT ASSESSMENT FORM – CARRIZO CREEK BELOW CARRIZO SPRINGS WWTP OUTFALL

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Downstream of Carrizo Springs WWTP Outfall	At East Road Crossing	At County Road 1407 Crossing	No Station 5
	Predominant Vegetative Cover (LB)	3	3	3	3	
	Predominant Non-Vegetative Cover (RB)	1	1	1	1	
	Predominant Non-Vegetative Cover (LB)	1	1	1	1	
	Evidence of Erosion (RB)	3	2	3	3	
	Evidence of Erosion (LB)	3	3	3	3	
Project Habitat Score		46	61	42	40	0

RBP HABITAT ASSESSMENT FORM – CROW CREEK BELOW CROW CREEK WWTP OUTFALL

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Downstream of Crow Creek WWTP Outfall	Upstream of First Reservoir Below Crow Creek WWTP Outfall	Upstream of Camp Stool Road	Downstream of Dry Creek WWTP Outfall
Parameters Evaluated in Sampling Reach	Epifaunal Substrate/ Available Cover	14	13	11	13	15
	Pool Substrate Characterization	15	13	13	10	13
	Pool Variability	7	13	7	16	12
	Sediment Deposition	16	11	12	12	13
	Channel Flow Status	15	18	9	14	13
Parameters Evaluated Beyond Sample Reach	Channel Alteration	18	13	18	18	16
	Channel Sinuosity	12	12	10	14	13
	Bank Stability (LB)	4	9	9	3	3
	Bank Stability (RB)	7	9	9	3	6
	Vegetative Protection (LB)	5	10	5	4	3
	Vegetative Protection (RB)	9	10	5	4	5
	Riparian Vegetative Zone Width (LB)	2	7	2	5	2
Riparian Vegetative Zone Width (RB)	7	5	2	3	2	
RBP Habitat Score		131	143	112	119	116

**PROJECT HABITAT ASSESSMENT FORM – CROW CREEK BELOW CROW CREEK
WWTP OUTFALL**

Category	Characteristic	Station 1	Station 2	Station 3	Station 4	Station 5
		Reference Reach	Downstream of Crow Creek WWTP Outfall	Upstream of First Reservoir Below Crow Creek WWTP Outfall	Upstream of Camp Stool Road	Downstream of Dry Creek WWTP Outfall
Primary - Flow, Substrate, Instream Cover (1-6)	Current Flow Conditions	4	3	3	4	5
	Bottom Substrate Type	3	4	3	5	5
	Sediment Deposition (Riffles/Runs)	3	3	1	5	5
	Sediment Deposition (Pools)	4	3	2	2	4
	Undercut Banks, Logs, Roots, Cobble, Boulders (presence)	5	3	2	5	5
	Pools/Riffles/Runs (presence)	6	3	6	6	6
	Pools/Riffles/Runs (dominance)	1	1	1	3	5
	Habitat Diversity (Riffles/Runs)	2	3	2	3	3
	Habitat Diversity (Pools)	4	3	3	3	3
Secondary - Channel Morphology (1-6)	Run/Bend Ratio (distance between bends / stream width)	3	3	3	3	3
	Channelization	6	5	6	5	5
	Instream Structures (dams, weirs, etc.)	6	6	3	6	6
Tertiary - Riparian and Bank Structure (1-3)	% Vegetative Cover (RB)	3	3	3	3	3
	% Vegetative Cover (LB)	2	3	3	3	2
	Predominant Vegetative Cover (RB)	2	3	2	2	2
	Predominant Vegetative Cover (LB)	2	3	2	3	2
	Predominant Non-Vegetative Cover (RB)	1	1	1	1	1
	Predominant Non-Vegetative Cover (LB)	1	1	1	2	1
	Evidence of Erosion (RB)	2	2	3	1	2
	Evidence of Erosion (LB)	1	2	3	2	1
Project Habitat Score		61	58	53	67	69