DS-13186-117

Preliminary Hydrology Report

For

EAST CAT CANYON FIELD REDEVELOPMENT PROJECT

Prepared for:

Aera Energy LLC
10000 Ming Avenue
Bakersfield, CA 93311-1302
661-665-5000

Project Address:

Sections 19, 20, 29, 30 T9N R32W
East Cat Canyon Field, Santa Barbara County, California

Prepared by:

200 New Stine Road
Bakersfield, CA 93309
Robin S. Dickerson, PE
661-831-8782 Ext. 217

Revision Date

September 17, 2014

Project Description

The East Cat Canyon Field Redevelopment project comprises approximately 2,100 acres of which 290 acres is proposed for disturbance and is located within the Solomon Hills northeast of the Gato Ridge mountain ranges within East Cat Canyon, approximately 10 miles southeast of the communities of Santa Maria and Orcutt located in northern Santa Barbara County, California. The property is owned and developed by Aera Energy LLC. The property consists of eight leases located within Sections 19, 20, 28, 29, 31 and 32 of Township 9N/Range 32W, SBBM and is outline on the attached location map. (See Attached Drawing 072-13-026A).

The proposed development will re-establish oil production in an existing oil field. Prior wells have been abandoned and prior facilities have been removed. There is no active production in the proposed project area. The proposed project will use steam injection to develop an ultra-heavy bituminous resource. Project plans include construction and restoration of approximately 73 well pads, construction and restoration of over nine miles of field access roads and drilling of up to 315 wells. Planned wells include oil/gas production wells, steam injection wells, observation wells, water injection wells, and fresh water wells. The project's well pads and roadways have been designed to use existing well pads and roadways when possible.

New process facilities and field systems will be constructed. Process facilities will include: 1) a production group station for bulk separation of produced gas and liquids, 2) a central processing plant for cleaning and sales of produced oil, for cleaning and softening of produced water and for treatment of produced gas, and 3) a steam generation site (six once through steam generators rated at 85 million BTU/hour each) for production of saturated steam to be used for thermal enhanced oil recovery (TEOR). All project steam will be generated by the recycle of produced water. Field systems will include 1) a production gathering network, 2) a steam distribution network and 3) electrical power distribution and SCADA networks. Project infrastructure will also include an office building, a multipurpose building, a warehouse and maintenance building and a facility control building. A water system with a 3,000 barrel tank and fire water distribution is also planned.

Main access to the project site will be from Cat Canyon Road. Secondary access will be provided from Long Canyon Road. The proposed project will disturb approximately 290 acres. Earthwork volumes are expected to be balanced onsite by project completion. Legacy fill material and excess material will be managed at a new Soil Reclamation Site.

Project construction and well drilling will be phased. Phase I activities will include the development of approximately 25% of the project. In addition to field systems to support well production and injection, Phase I construction will include the initial capacities at a new Group Station, new Central Processing Facility and new Steam Generation Site. The project's water system, primary offices, main roadways and the Soil Reclamation Site will also be part of Phase I. Activities for Phase I are expected to last approximately four years. Phase II will develop the remaining resource and expand capacities at the Group Station, Central Processing Facility and Steam Generation Site. Phase II construction and well drilling will start about three years after Phase I completion. Phase II capacity

additions to processing facilities are expected to take up to two years. Phase II well drilling and construction of field systems are planned to take place over a period of up to ten years. Production from the project is expected to continue for more than 30 years.

Project Site

The topography of the area consists of a series of north-south aligned subdued hills with elevations ranging from about +500 to +1,000 feet above mean sea level (MSL). The project is contained within 6 watersheds which ultimately discharge into the Sisquoc River to the north. (See attached watershed map). The watersheds consist of Cat Canyon (7000 acres), Long Canyon (893 acres), Olivera Canyon (1414 acres), and 3 unnamed blue lines (Unnamed 1&2 800 acres Unnamed #3 218 acres). Cat Canyon is the principal stream in the area. All watersheds are intermittent and flow to the north toward the community of Sisquoc. All 6 creeks are well entrenched along most of their courses. (See Attached drawing 072-13-022A). Watersheds were defined using the available topographical contours from Topo Depot. Each watershed was further divided into both pre and post construction sub-watersheds. (See Attached Drawing 072-13-023A thru 023E for Pre Construction and 072-13-024A thru 024C for Post Construction).

The Hydrological Soils Groups for areas within the project site were obtained from the United States Department of Agriculture, National Resource Conservation Services, Web Soil Survey site. The Hydrological Soils Group appears to be predominantly Group C with some Group A and D dispersed within the watersheds. Group C Soils have a slow infiltration rate when thoroughly wet. These soils also have a slow rate of water transmission. Group A soils have a high infiltration rate and low runoff potential when thoroughly wet. They also have a high rate of water transmission. Group D soils have a very slow infiltration rate and high potential for water runoff. These soils have a very slow rate of water transmission.

Unnamed Blue line #1 is predominantly Group C with Group A located within the channel. A small patch of Group D is located along the southern edge of the watershed. (See Appendix A). Unnamed Blue line #2 is predominantly Group C with Group A located within the channels and along the southern edge of the watershed. A small patch of Group D is located along the southern edge of the watershed. (See Appendix A). Unnamed Blue line #3 is predominantly Group C. A small patch of Group D is located along the eastern edge of the watershed. (See Appendix A). Long Canyon is predominantly Group C with Group A located within the channels and along the southern end of the watershed. A small patch of Group D is located along the northeastern edge of the watershed. (See Appendix A). Olivera Canyon is predominantly Group C with Group A located within the channels. A patch of Group D is dispersed throughout the northern portion of the watershed. (See Appendix A). Cat Canyon is predominantly Group C to the southeast and predominantly Group D to the northwest with Group A located within the northwest portion of the channels. (See Appendix A). These soils groups will be used in determining weighted CN values needed for the final hydrology when design phase plans have been developed.

Methodology

Runoff shall be conveyed safely, to prevent erosion from slopes and channels. Basins have been provided where practical, but have been kept outside of the 6 defined blue line channels. Disturbed slopes shall be revegetated with appropriate native or drought tolerant vegetation. Permanent Channel crossings will be stabilized and energy dissipaters such as rip rap will be used at the outlet of storm drains, culverts or channels that enter unlined channels to minimize erosion potential. There are 2 structures being proposed for creek crossing for this project. Both culverts are sufficiently sized to handle the 100 year post construction flow.(See Figure 1). One is at the entrance of the project site off of Cat Canyon Road crossing over Cat Canyon, which is a proposed 20' x 12' high U-shaped structure with a natural bottom. (See Attached Drawing 072-13-016D). The other structure is on Long Canyon where the new tie-in road is proposed. The box culvert will be a 4' x 4' Concrete Box Culvert. (See Attached Drawing 072-13-016A).

The hydrology was calculated for each watershed using the rational method Q=CIA as required by the Santa Barbara Flood Control District. The runoff coefficients were calculated from the Santa Barbara County Flood Control District Rainfall Intensity/Runoff Coefficient equations Dated August 2003. (See Appendix A) The Pre construction Runoff Coefficients were calculated using the equation for Curve #4 - North County Agriculture, since most of the watershed is in a natural state and the current and proposed zoning is agriculture. For the post construction runoff coefficients an interpolation between Curve #3 and Curve #4 was used for the disturbed area. For facilities a higher C value was used and for the Central Processing Plant the equation for commercial was used, since most of the area will be paved. As reaches were added to the discharge, the runoff coefficients were weighted based on area.

Intensities were calculated using Rainfall Intensity equations from the Santa Barbara County Flood Control District Curve Construction for Sisquoc dated August 2003. Times of Concentration Values were obtained from the nomograph provided by the Santa Barbara County Flood Control District. (See Appendix B).

The flows for the 100, 50, 25, and 10 year pre and post construction events were calculated and provided in Tables 1 - 5 below for each junction of the watershed. Complete spreadsheets for each model run can be found in Appendix C. Where practical and as shown on the field redevelopment plans detention basins will be provided to reduce the peak flows. These basins will be sized to handle the incremental flows. Currently the basins are sized at a minimum of 0.1 acre feet per acre as required by Santa Barbara County Flood Control and Water Conservation District – Standard Conditions of Project Plan Approval. The Santa Barbara Urban Hydrograph will be utilized in designing the final basin sizes based on the flows provided below and the project design documents.

Findings and Conclusions

For Unnamed Blue Line #1 & #2 the project will increase the 100 year property boundary discharge by 88.10 cubic feet/sec. For Unnamed Blue Line #3 and Olivera Canyon there will be no increase, since no development is planned within either watershed. For Long Canyon the 100 year property boundary discharge will increase by 84.6 cubic feet per second and for Cat Canyon the 100 year property boundary discharge will increase by 150.8 cubic feet per second. See Tables 1 though 5 below for pre and post flows for the 100 year, 50 year, 25 year and 10 year at various junction points throughout the project area. A complete copy of the Rational Method calculations can be found in Appendix D and pre and post watershed maps can be found on attached drawings 072-13-022A thru 072-13-024C.

Based on the hydrologic soils group information the project area is predominantly group C and will have a slow infiltration rate and moderate runoff potential. They will also have a slow rate of water transmission. Areas within the existing natural drainage channels are shown as Group A and will have a high infiltration rate and low runoff potential. These soils also have a high rate of water transmission. See Appendix A for Hydrological Soils Maps for each watershed.

Detention Basins have been strategically placed outside of existing blue line channels to reduce the increase in peak flow discharge caused by the development of the project site. Specific design and outflow discharge for post construction have not been determined, however the proposed detention basins are currently sized for a minimum 0.1 acre feet per acre and gravity bleeder lines will be designed for the 100 year 24 hour storm event developed condition to 0.07 cubic feet per second per acre as required by the Santa Barbara County Flood Control and Water Conservation District. The terrain, proximity to existing blue lines and the preservation of existing oak trees had significantly limited size and location of detention basins. Sixteen detention basins are proposed for the project area. Basins typically vary in size from 2100 cubic yards to 7500 cubic yards averaging 3750 cubic yards, except for 3 basins. Two basins exceed this range they are Basin A which is 18250 cubic yards and Basin G which is 14250 cubic yards. The smallest basin is Basin D and it has 725 cubic yard capacity. These basins will be more than sufficiently sized at the time of project development. See drawing 072-13-024A thru C for proposed basin locations.

There are 2 major creek crossings proposed for the project. The main entrance off of Cat Canyon Road will cross Cat Canyon Creek. A 20’ x 12’ U-shaped culvert is proposed for this entrance. The second crossing is proposed where the main road through the project site ties into Long Canyon Road crossing Long Canyon Creek. A 4’ x 4’ box culvert is proposed for this crossing. Both crossings were sized for over a 100 year storm event for the developed condition. Calculations can be found in Figure 1 below and on the attached drawings 072-13-016D and 072-13-016A.

TABLE 1

Unnamed Blue Line #1 & #2								
Junction #		Area (acres)	C	TOC (min)	Q_{100} (cft/sec)	Q_{50} (cft/sec)	Q_{25} (cft/sec)	Q_{10} (cft/sec)
1	Pre	99.92	0.62	8.5	207.2	174.9	138.4	103.1
	Post	96.26	0.82	8.0	311.2	281.7	246.0	208.6
2	Pre	250.35	0.57	17.6	337.0	277.4	214.7	155.2
	Post	243.14	0.61	16.4	396.4	352.1	301.9	247.4
3	Pre	342.72	0.56	21.6	412.4	338.4	261.0	186.7
	Post	335.51	0.59	20.3	463.9	411.1	343.8	272.1
4	Pre	476.95	0.53	24.4	511.9	418.7	321.9	227.9
	Post	472.25	0.56	23.1	580.3	505.6	423.7	335.6
5	Pre	52.04	0.67	7.0	129.1	109.4	86.8	65.3
	Post	52.24	0.83	7.0	160.2	145.0	126.6	107.4
6	Pre	142.75	0.61	10.4	268.0	224.1	175.1	127.9
	Post	143.63	0.71	10.1	312.9	275.2	231.8	187.2
7	Pre	671.94	0.55	26.8	715.2	586.0	451.6	320.2
	Post	668.12	0.59	25.5	817.1	708.4	590.2	463.4
8	Pre	744.66	0.54	30.5	735.9	601.9	463.1	326.5
	Post	740.84	0.58	29.1	832.9	717.8	593.7	460.8
9	Pre	800.64	0.53	36.4	**706.7**	**576.4**	**442.2**	**309.0**
	Post	796.82	0.56	35.0	**794.8**	**681.5**	**560.9**	**430.9**

TABLE 2

Unnamed Blue Line #3 – No Development Pre Q's = Post Q's								
Junction #		Area (acres)	C	TOC (min)	Q_{100} (cft/sec)	Q_{50} (cft/sec)	Q_{25} (cft/sec)	Q_{10} (cft/sec)
10	Pre=Post	18.71	0.73	5.5	56.5	48.1	38.2	29.0
11	Pre=Post	50.56	0.64	13.1	87.6	72.7	56.3	40.5
12	Pre=Post	105.10	0.59	17.2	147.6	121.4	93.2	65.7
13	Pre=Post	145.42	0.58	19.1	191.4	157.3	120.6	84.9
14	Pre=Post	170.12	0.58	20.4	218.4	179.5	137.8	97.0
15	Pre=Post	203.89	0.58	21.8	250.9	206.0	158.1	111.0
End	Pre=Post	218.00	0.57	23.3	**255.0**	**208.9**	**160.0**	**111.9**

TABLE 3

Long Canyon								
Junction #		Area (acres)	C	TOC (min)	Q_{100} (cft/sec)	Q_{50} (cft/sec)	Q_{25} (cft/sec)	Q_{10} (cft/sec)
1	Pre	49.72	0.62	9.0	100.6	85.0	67.3	50.1
	Post	49.72	0.62	9.0	100.6	85.0	67.3	50.1
2	Pre	154.34	0.56	15.1	218.9	181.3	140.5	100.3
	Post	150.31	0.56	15.1	214.8	179.9	141.9	103.8
3	Pre	196.86	0.56	16.5	269.8	223.4	173.2	123.5
	Post	193.26	0.59	16.5	276.7	235.6	190.4	144.3
4	Pre	285.54	0.57	17.7	381.4	315.9	245.1	175.0
	Post	285.65	0.62	17.6	420.0	361.6	297.3	230.3
5	Pre	344.52	0.57	20.4	430.2	355.7	275.6	196.1
	Post	344.63	0.61	20.3	467.0	399.0	324.7	247.8
6	Pre	481.55	0.56	24.3	551.2	454.6	351.5	248.6
	Post	483.14	0.65	24.1	634.6	544.1	446.0	342.5
7	Pre	583.14	0.56	27.9	615.8	506.6	390.9	274.9
	Post	585.22	0.64	27.5	711.6	609.0	498.6	381.4
8	Pre	643.48	0.55	30.4	642.2	527.4	406.2	284.5
	Post	644.92	0.62	30.0	734.8	628.6	514.6	393.3
9	Pre	711.53	0.54	32.8	673.6	552.1	424.5	295.9
	Post	712.97	0.61	32.3	764.1	650.7	529.8	401.3
10	Pre	755.40	0.54	34.0	701.4	574.7	441.7	307.6
	Post	756.84	0.60	33.5	790.9	672.0	545.5	411.4
11	Pre	792.08	0.54	35.3	720.1	589.6	453.0	315.1
	Post	793.52	0.60	34.8	808.4	685.6	555.3	417.1
12	Pre	866.27	0.53	38.2	745.2	609.1	467.2	323.4
	Post	867.71	0.58	37.6	831.4	702.3	566.3	422.0
End	Pre	892.33	0.52	40.1	**741.5**	**605.3**	**463.7**	**320.1**
	Post	893.77	0.57	39.4	**826.1**	**696.7**	**560.8**	**416.5**

TABLE 4

Olivera Canyon – No Development Pre Q's = Post Q's								
Junction #		Area (acres)	C	TOC (min)	Q_{100} (cft/sec)	Q_{50} (cft/sec)	Q_{25} (cft/sec)	Q_{10} (cft/sec)
1	Pre=Post	52.85	0.63	8.0	115.8	97.9	77.5	57.9
2	Pre=Post	131.61	0.61	12.2	228.3	190.6	149.0	108.4
3	Pre=Post	239.48	0.58	15.6	345.9	286.8	222.4	159.2
4	Pre=Post	374.21	0.56	17.0	504.8	417.8	323.7	230.8
5	Pre=Post	450.48	0.55	18.9	568.4	469.4	363.0	257.6
6	Pre=Post	553.10	0.55	19.4	686.9	567.1	438.4	310.8
7	Pre=Post	645.57	0.54	22.8	732.3	602.7	464.7	327.2
8	Pre=Post	729.87	0.53	25.5	772.5	634.1	487.7	341.3
12	Pre=Post	129.72	0.52	14.0	179.6	150.4	118.4	86.1
13	Pre=Post	242.94	0.53	18.0	303.7	252.9	197.8	142.2
14	Pre=Post	273.69	0.54	21.6	318.5	264.5	206.4	147.7
15	Pre=Post	376.01	0.54	24.9	404.5	334.9	260.5	185.1
16	Pre=Post	414.91	0.54	25.8	441.7	365.6	284.3	202.0
9	Pre=Post	1237.61	0.44	29.4	1003.1	812.1	613.8	411.9
10	Pre=Post	1312.69	0.44	30.6	1052.4	852.5	645.0	433.6
18	Pre=Post	57.91	0.58	10.2	103.4	87.1	68.8	50.8
19	Pre=Post	83.20	0.59	11.6	142.7	119.8	94.4	69.3
11	Pre=Post	1414.01	0.45	26.7	**1236.3**	**1005.3**	**763.7**	**518.2**

TABLE 5

Cat Canyon								
Junction #		Area (acres)	C	TOC (min)	Q_{100} (cft/sec)	Q_{50} (cft/sec)	Q_{25} (cft/sec)	Q_{10} (cft/sec)
1	Pre	247.4	0.52	14.0	337.7	282.6	222.2	161.2
	Post	247.4	0.52	14.0	337.7	282.6	222.2	161.2
2	Pre	462.23	0.50	29.9	423.2	346.7	266.5	185.3
	Post	462.23	0.50	29.9	423.2	346.7	266.5	185.3
3	Pre	731.13	0.49	36.1	601.2	490.7	376.1	259.3
	Post	731.13	0.49	35.6	601.2	490.7	376.1	259.3
4	Pre	1026.86	0.46	42.5	737.6	598.8	456.4	310.3
	Post	1026.86	0.46	41.4	737.6	598.8	456.4	310.3
5	Pre	1356.65	0.44	47.2	887.3	717.6	544.7	366.4
	Post	1356.65	0.44	45.6	887.3	717.6	544.7	366.4
6	Pre	1508.66	0.44	48.6	985.0	797.2	605.8	408.3
	Post	1508.66	0.44	46.9	985.0	797.2	605.8	408.3
7	Pre	1970.18	0.44	52.2	1241.8	1004.6	763.4	513.9
	Post	1970.18	0.44	50.1	1241.8	1004.6	763.4	513.9
8	Pre	2218.99	0.43	55.9	1338.4	1080.9	819.9	549.4
	Post	2218.99	0.43	53.4	1338.4	1080.9	819.9	549.4
9A	Pre	339.52	0.55	11.5	543.8	456.6	359.9	263.8
	Post	339.52	0.55	11.5	543.8	456.6	359.9	263.8
9	Pre	2742.25	0.45	60.0	1667.7	1352.1	1028.0	693.7
	Post	2742.25	0.45	56.7	1667.7	1352.1	1028.0	693.7
10	Pre	2913.33	0.45	63.3	1735.0	1406.3	1069.4	721.3
	Post	2913.33	0.45	59.5	1735.0	1406.3	1069.5	721.4
11	Pre	3369.76	0.44	71.3	1877.0	1518.5	1153.0	773.8
	Post	3369.75	0.44	66.3	1877.0	1518.5	1153.0	773.8
13	Pre	210.17	0.55	11.0	342.2	287.2	226.3	165.8
	Post	210.17	0.55	11.0	342.2	287.2	226.3	165.8
12	Pre	3704.27	0.45	72.8	2057.4	1664.9	1264.8	849.6
	Post	3704.26	0.45	67.6	2057.4	1664.9	1264.9	849.6
14	Pre	4026.50	0.44	75.4	2188.2	1769.7	1343.8	901.2
	Post	4026.49	0.44	69.8	2188.2	1769.7	1343.8	901.2

Cat Canyon (con't)								
Junction #		Area (acres)	C	TOC (min)	Q_{100} (cft/sec)	Q_{50} (cft/sec)	Q_{25} (cft/sec)	Q_{10} (cft/sec)
15	Pre	4427.25	0.43	82.7	2227.2	1794.5	1356.8	900.6
	Post	4427.24	0.43	75.8	2227.2	1794.5	1356.8	900.6
24	Pre	359.89	0.53	14.0	504.2	422.4	332.7	242.3
	Post	359.89	0.53	14.0	504.2	422.4	332.7	242.3
25	Pre	460.25	0.54	15.4	630.7	527.5	415.1	301.7
	Post	460.25	0.54	15.4	630.7	527.5	415.1	301.7
16	Pre	5030.80	0.44	86.4	2544.5	2053.9	1557.3	1039.1
	Post	5030.42	0.44	78.9	2555.7	2063.5	1570.0	1051.4
17	Pre	5136.89	0.44	88.8	2592.8	2093.0	1587.5	1059.5
	Post	5138.23	0.45	80.9	2646.7	2144.2	1640.3	1108.2
26	Pre	357.15	0.56	11.0	591.6	497.0	392.0	287.9
	Post	357.15	0.56	11.0	591.6	497.0	392.0	287.9
18	Pre	5674.03	0.44	94.1	2809.5	2268.4	1721.8	1149.8
	Post	5675.28	0.45	85.1	2862.5	2318.5	1773.6	1197.5
28	Pre	107.38	0.73	9.5	247.7	209.3	165.8	123.6
	Post	108.61	1.10	8	413.8	374.5	327.1	277.4
27	Pre	168.44	0.83	10.5	425.0	357.9	282.7	209.3
	Post	176.70	1.14	8.9	664.7	598.5	519.6	436.4
19	Pre	5981.21	0.45	95.4	3030.5	2434.2	1851.2	1240.8
	Post	5990.46	0.48	85.9	3152.3	2569.5	1984.8	1362.0
20	Pre	6045.15	0.46	97.5	3042.4	2443.4	1858.0	1244.8
	Post	6036.78	0.47	87.5	3138.3	2559.0	1977.9	1358.2
21	Pre	6191.49	0.45	99.5	3062.4	2457.8	1867.5	1248.7
	Post	6180.98	0.47	89.4	3170.3	2589.2	2006.4	1383.2
22	Pre	6365.30	0.45	102.7	3080.1	2470.2	1875.3	1251.1
	Post	6369.89	0.47	91.8	3201.7	2613.4	2024.2	1393.4
29	Pre	62.03	0.70	6.1	172.2	147.1	116.0	87.7
	Post	61.14	1.24	6.1	291.8	264.2	230.3	195.7
23	Pre	6995.11	0.44	110.7	**3242.3**	**2598.1**	**1970.3**	**1308.2**
	Post	6998.77	0.47	98.0	**3393.1**	**3066.9**	**2692.7**	**1475.1**

FIGURE 1

Creek Crossing Calculations

Using Manning's Equation

Q = 1.486/n * A * R^2/3 * S^1/2

Q = Discharge
n = Manning's roughness coefficient
A = Cross Sectional Area
R = Hydraulic Radius
S = Slope of Culvert

For Cat Canyon Creek Crossing at Junction 20

Using a 20 x 12 U-Shape Concrete Culvert
Q_{100} = 3138.3 cubic feet per second per Post Construction 100 year Rational method
n = 0.02075
A = 240
R = 3.75
S = .0147

Solve for Q

Q = 5.029.9 cubic feet per second (calc)

Culvert is sufficiently sized for 100 year post construction flow.

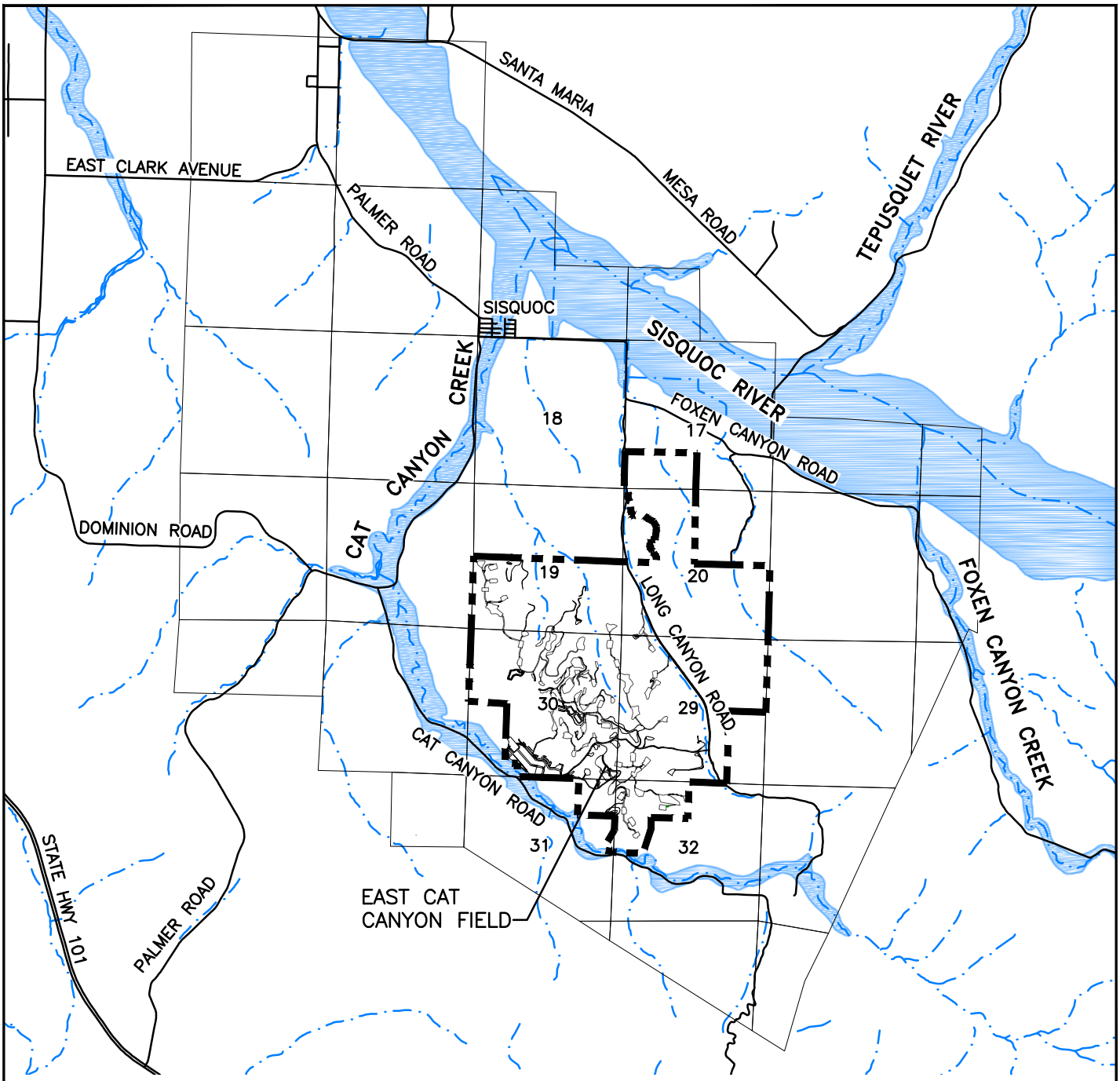
For Long Canyon Creek Crossing at Junction 3

Using a 4 x 4 Concrete Box Culvert
Q_{100} = 276.7 cubic feet per second per Post Construction 100 year Rational method
n = 0.012
A = 15.65
R = 1.04
S = .0259

Solve for Q

Q = 320.2 cubic feet per second (calc)

Culvert is sufficiently sized for 100 year post construction flow.



LEGEND

- AERA PROPERTY BOUNDARY
- SECTION LINES
- INTERMITTENT STREAM
- FLOOD HAZARD LIMITS

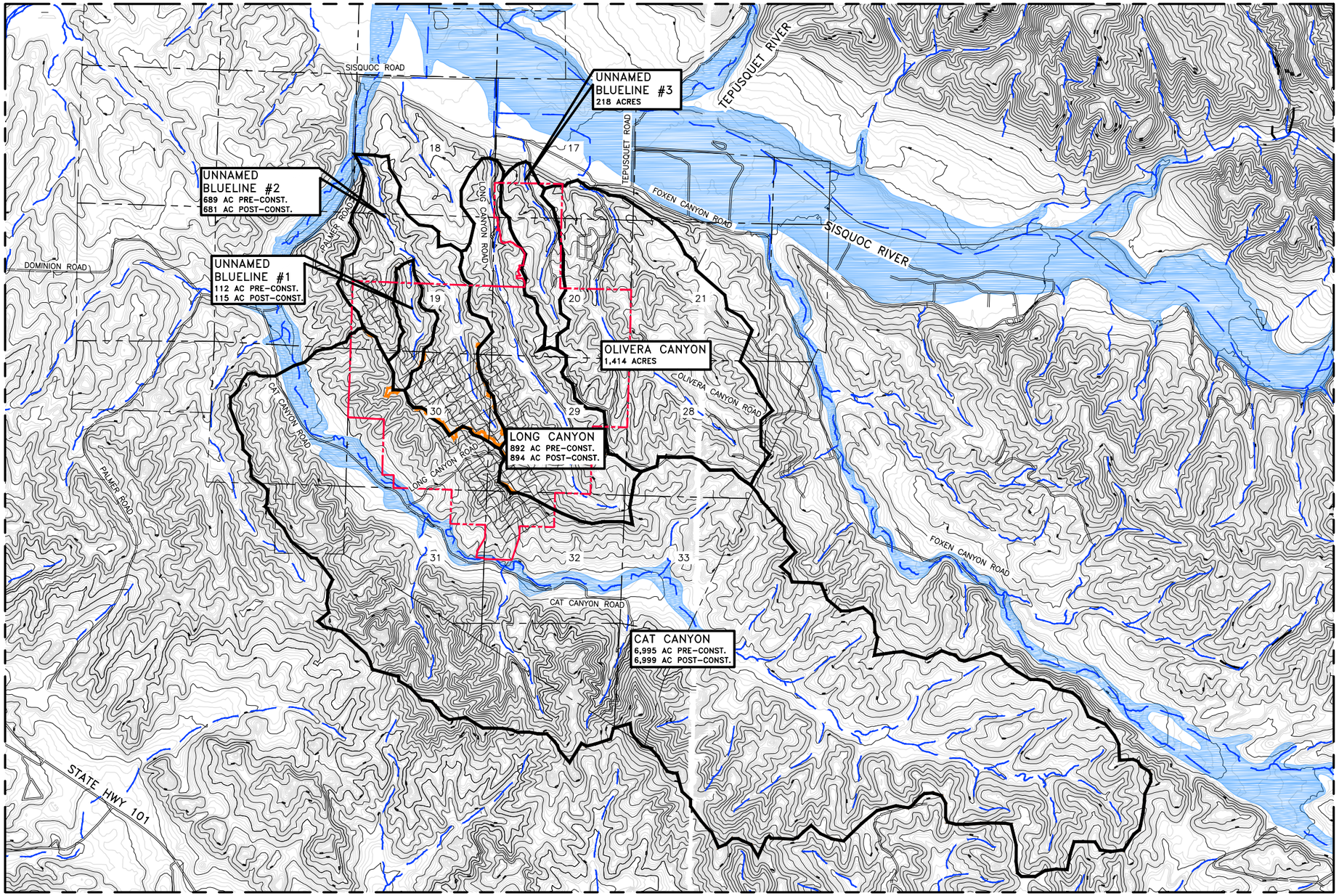
DATE	REV	DESCRIPTION	BY	APPR	AERA ENG
08/20/14	A	ISSUED FOR REVIEW	RAA	RSD	EP

AERA

VICINITY MAP – HYDROLOGY
FIELD REDEVELOPMENT PROJECT
SECTIONS 19/20/29/30/31 & 32
EAST CAT CANYON FIELD – SANTA BARBARA COUNTY – CALIFORNIA

AERA ENGINEER:	ERIC PAULSON	DATE: 08/20/14	SCALE: 1" = 5000'
CO. ENGINEER:	TJCROSS ENGINEERS, INC.	ORIGINAL DWG NO.	
PROJ. MGR:	ALI GOKGOZ	NO. 072–13–026A	REV. A
DESIGNED BY:	ROBIN DICKERSON		
DRAFTED BY:	ROBERT AMARO		
ECCN NO.	EAR99	CAD FILE NO. 072–13–026A	

:FUNCTIONAL LOCATION NO.



N

PRELIMINARY
NOT FOR CONSTRUCTION

LEGEND

- PROPERTY BOUNDARY AND LEASE BOUNDARY
- INTERMITTENT STEAM
- SECTION LINES
- FLOOD HAZARD LIMITS
- PRE-CONSTRUCTION WATERSHED BOUNDARY
- POST-CONSTRUCTION WATERSHED BOUNDARY

GRAPHIC SCALE

2000 0 1000 2000 4000 8000

(IN FEET)
1 inch = 2000ft.

DWG NUMBER	TITLE
REFERENCE DRAWINGS	

TJCROSS ENGINEERS

T.J. CROSS AUTOCAD CONTROL

SCALE: 1"=2000'
PLOT AT: 1=1
ENGINEER: RSD
DATE STARTED: 12/16/13
FILE: 13186/072-13-022A
LAYER(S): .
CHANGED BY: IDU
LAST CHANGED: 09/17/14

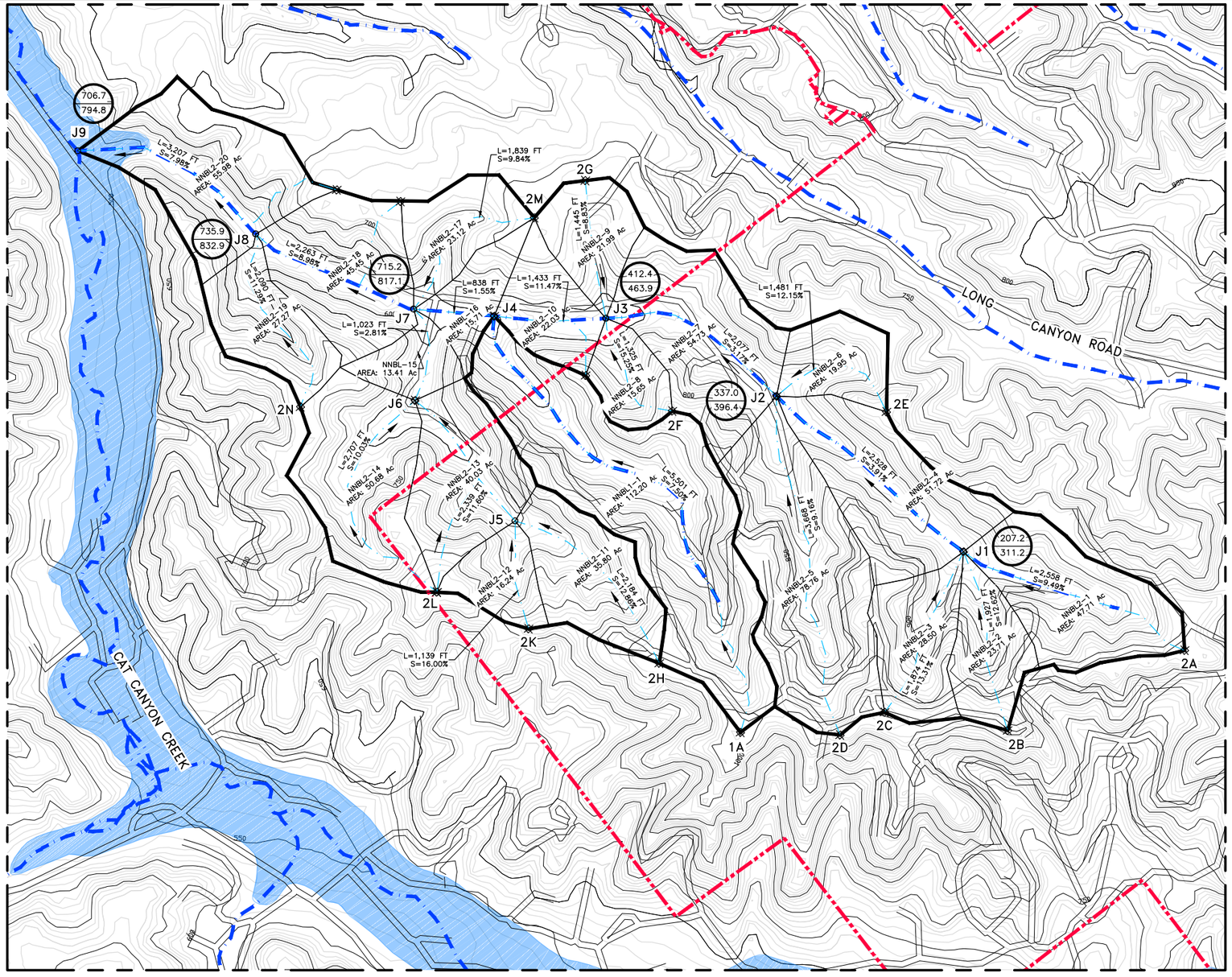
DATE	REV	DESCRIPTION	BY	APPR	AERA ENG
09/17/14	0	ISSUED FOR PERMIT	IDU	RSD	EP
08/20/14	A	ISSUED FOR REVIEW	IDU	RSD	EP

AERA

HYDROLOGY – WATERSHED MAP
FIELD REDEVELOPMENT PROJECT
SECTIONS 19/20/29/30/31 & 32 T9N R32W
EAST CAT CANYON FIELD – SANTA BARBARA COUNTY – CALIFORNIA

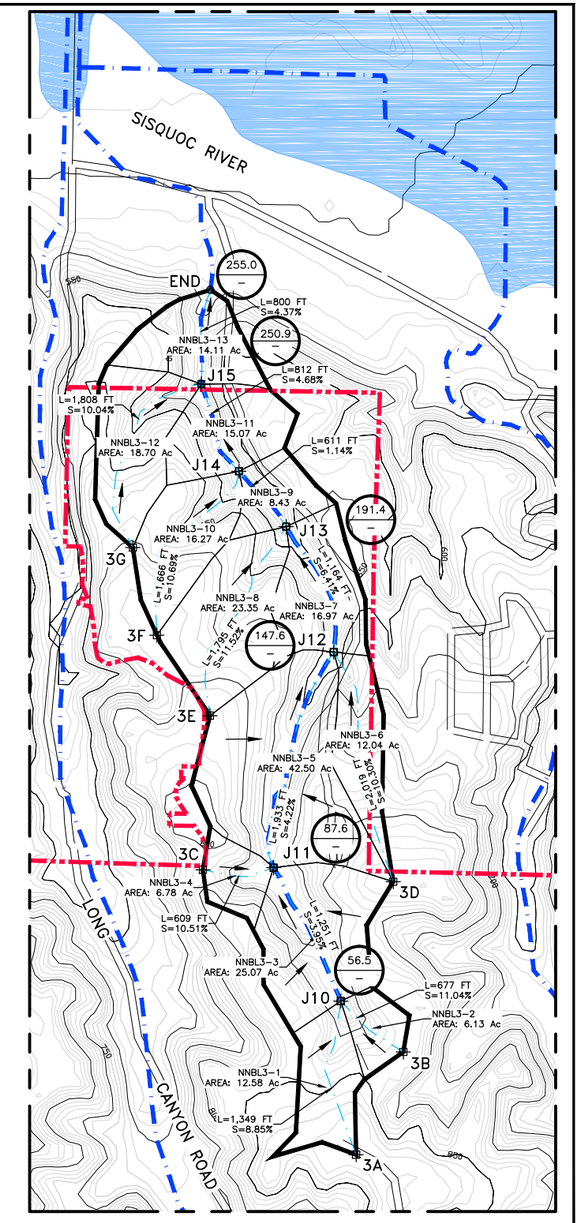
AERA ENGINEER:	ERIC PAULSON	DATE: 09/17/14	SCALE: 1" = 2000'
CO. ENGINEER:	TJCROSS ENGINEERS, INC	ORIGINAL DWG NO.	SK-13186-25
PROJ. MGR:	ALI GOKGOZ	NO. 072-13-022A	REV. 0
DESIGNED BY:	ROBIN DICKERSON		
DRAFTED BY:	ISAC URBINA		
ECCN NO.	EAR99	CAD FILE NO. 072-13-022A	

:FUNCTIONAL LOCATION NO.



UNNAMED BLUE LINE 1 & 2

SCALE: 1" = 600'



UNNAMED BLUE LINE 3

SCALE: 1" = 600'

PRELIMINARY
NOT FOR CONSTRUCTION

N

GRAPHIC SCALE

600 0 300 600 1200 2400

(IN FEET)
1 inch = 600 ft.

LEGEND

207.2 / 311.2 — PRE-CONSTRUCTION Q100 IN CFS / POST-CONSTRUCTION Q100 IN CFS

INTERMITTENT STREAM

FLOOD HAZARD LIMITS

PROPERTY BOUNDARY

FLOW PATH

DRAINAGE FLOW

DWG NUMBER	TITLE
REFERENCE DRAWINGS	

TJCROSS ENGINEERS

T.J. CROSS AUTOCAD CONTROL

SCALE: 1"=600' FILE: 13186/072-13-023MS
PLOT AT: 1=1 LAYER(S): -
ENGINEER: RSD CHANGED BY: IDU
DATE STARTED: 12/16/13 LAST CHANGED: 09/17/14

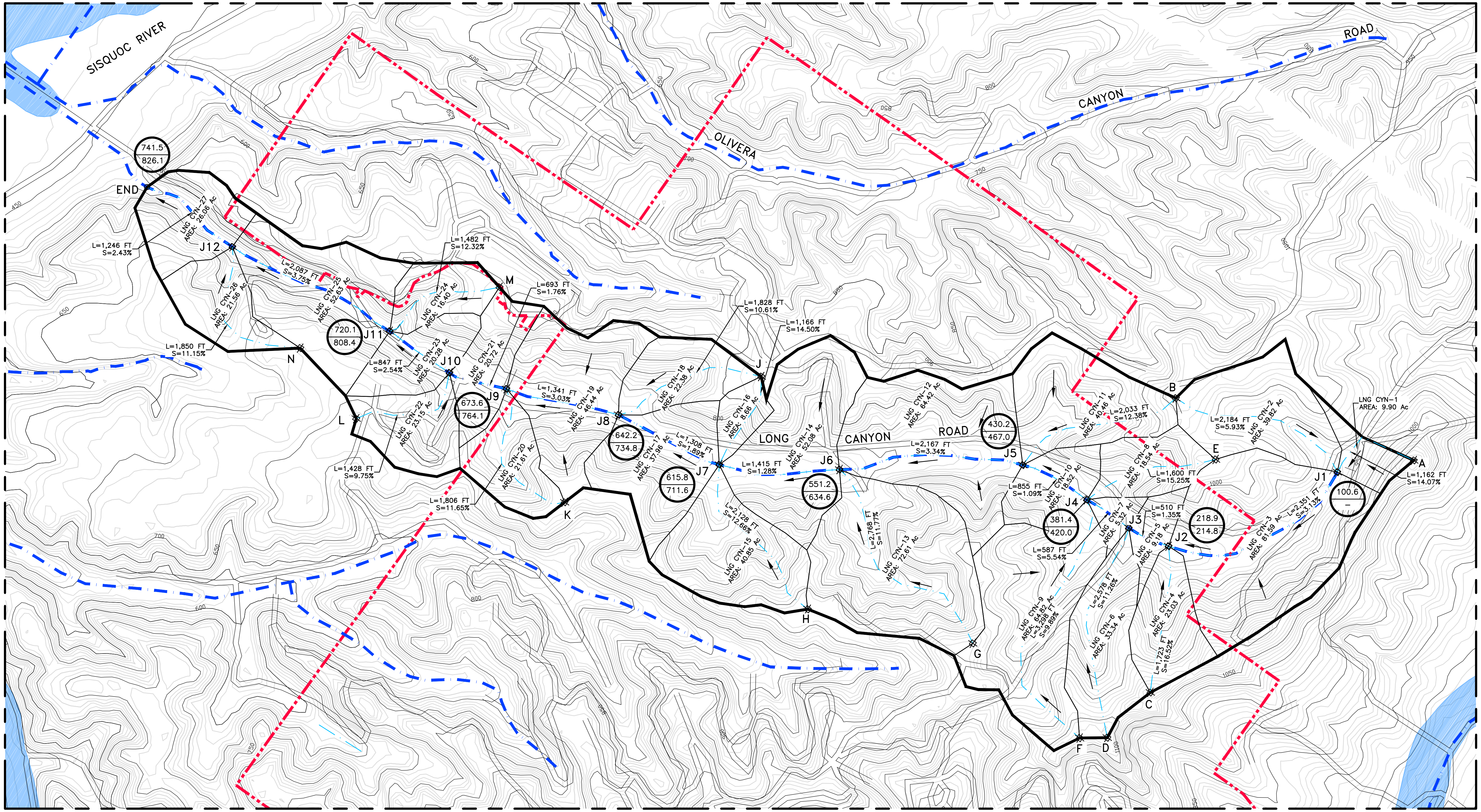
DATE	REV	DESCRIPTION	BY	APPR	AERA ENG
09/17/14	0	ISSUED FOR PERMIT	IDU	RSD	EP
08/20/14	A	ISSUED FOR REVIEW	IDU	RSD	EP

AERA

HYDROLOGY MAP – PRE-CONSTRUCTION WATERSHED – UNNAMED BLUE LINE 1 & 2 & 3
FIELD REDEVELOPMENT PROJECT
SECTIONS 20/29 & 30 T9N R32W
EAST CAT CANYON FIELD – SANTA BARBARA COUNTY – CALIFORNIA

AERA ENGINEER:	ERIC PAULSON	DATE: 09/17/14	SCALE: 1" = 600'
CO. ENGINEER:	TJCROSS ENGINEERS, INC	ORIGINAL DWG NO.	
PROJ. MGR:	ALI GOKGOZ	NO. 072-13-023A	REV. 0
DESIGNED BY:	ROBIN DICKERSON		
DRAFTED BY:	ISAC URBINA		
ECCN NO.	EAR99	CAD FILE NO. 072-13-023MS	

:FUNCTIONAL LOCATION NO.



PRELIMINARY
NOT FOR CONSTRUCTION

LONG CANYON
SCALE: 1" = 600'

N

GRAPHIC SCALE

600 0 300 600 1200 2400

(IN FEET)
1 inch = 600 ft.

LEGEND

207.2 / 311.2 — PRE-CONSTRUCTION Q_{100} IN CFS / POST-CONSTRUCTION Q_{100} IN CFS
INTERMITTENT STREAM
FLOOD HAZARD LIMITS
PROPERTY BOUNDARY
FLOW PATH
DRAINAGE FLOW

DWG NUMBER	TITLE
REFERENCE DRAWINGS	

TJCROSS ENGINEERS

T.J. CROSS AUTOCAD CONTROL

SCALE: 1"=600'	FILE: 13186/072-13-023MS
PLOT AT: 1=1	LAYER(S):
ENGINEER: RSD	CHANGED BY: IDU
DATE STARTED: 12/16/13	LAST CHANGED: 09/17/14

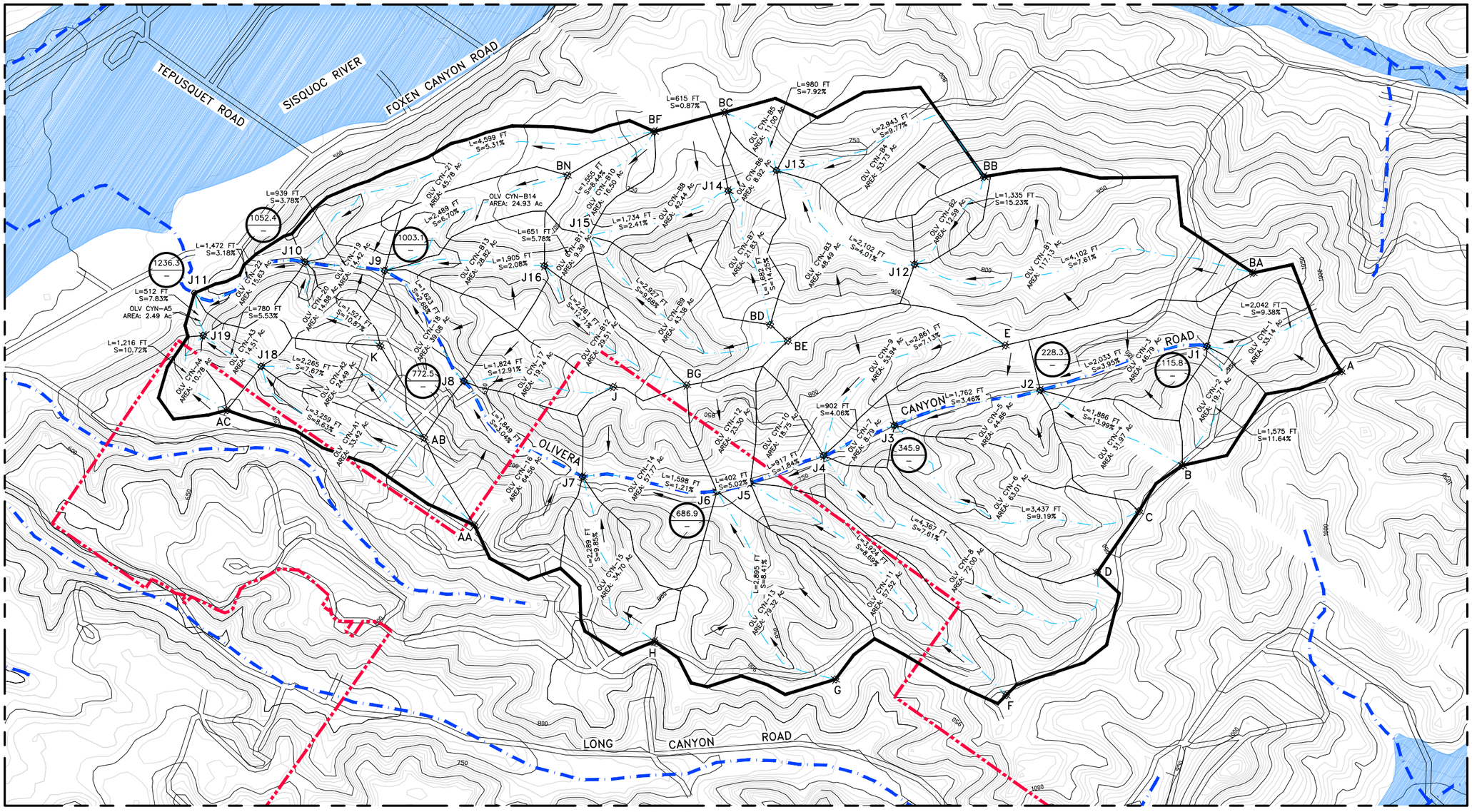
DATE	REV	DESCRIPTION	BY	APPR	AERA ENG
09/17/14	0	ISSUED FOR PERMIT	IDU	RSD	EP
08/20/14	A	ISSUED FOR REVIEW	IDU	RSD	EP

AERA

HYDROLOGY MAP – PRE-CONSTRUCTION WATERSHED – LONG CANYON
FIELD REDEVELOPMENT PROJECT
SECTIONS 20/29 & 30 T9N R32W
EAST CAT CANYON FIELD – SANTA BARBARA COUNTY – CALIFORNIA

AERA ENGINEER:	ERIC PAULSON	DATE: 09/17/14	SCALE: 1" = 600'
CO. ENGINEER:	TJCROSS ENGINEERS, INC	ORIGINAL DWG NO.	
PROJ. MGR:	ALI GOKGOZ	NO. 072-13-023B	REV. 0
DESIGNED BY:	ROBIN DICKERSON		
DRAFTED BY:	ISAC URBINA		
ECCN NO.	EAR99	CAD FILE NO. 072-13-023MS	

:FUNCTIONAL LOCATION NO.



OLIVERA CANYON

SCALE: 1" = 600'

PRELIMINARY
NOT FOR CONSTRUCTION

N

GRAPHIC SCALE

600 0 300 600 1200 2400

(IN FEET)
1 inch = 600 ft.

LEGEND

207.2 / 311.2 — PRE-CONSTRUCTION Q100 IN CFS; POST-CONSTRUCTION Q100 IN CFS

INTERMITTENT STREAM

FLOOD HAZARD LIMITS

PROPERTY BOUNDARY

FLOW PATH

DRAINAGE FLOW

DWG NUMBER	TITLE
REFERENCE DRAWINGS	

TJCROSS ENGINEERS

T.J. CROSS AUTOCAD CONTROL

SCALE: 1"=600' FILE: 13186/072-13-023MS
PLOT AT: 1=1 LAYER(S): .
ENGINEER: RSD CHANGED BY: IDU
DATE STARTED: 12/16/13 LAST CHANGED: 09/17/14

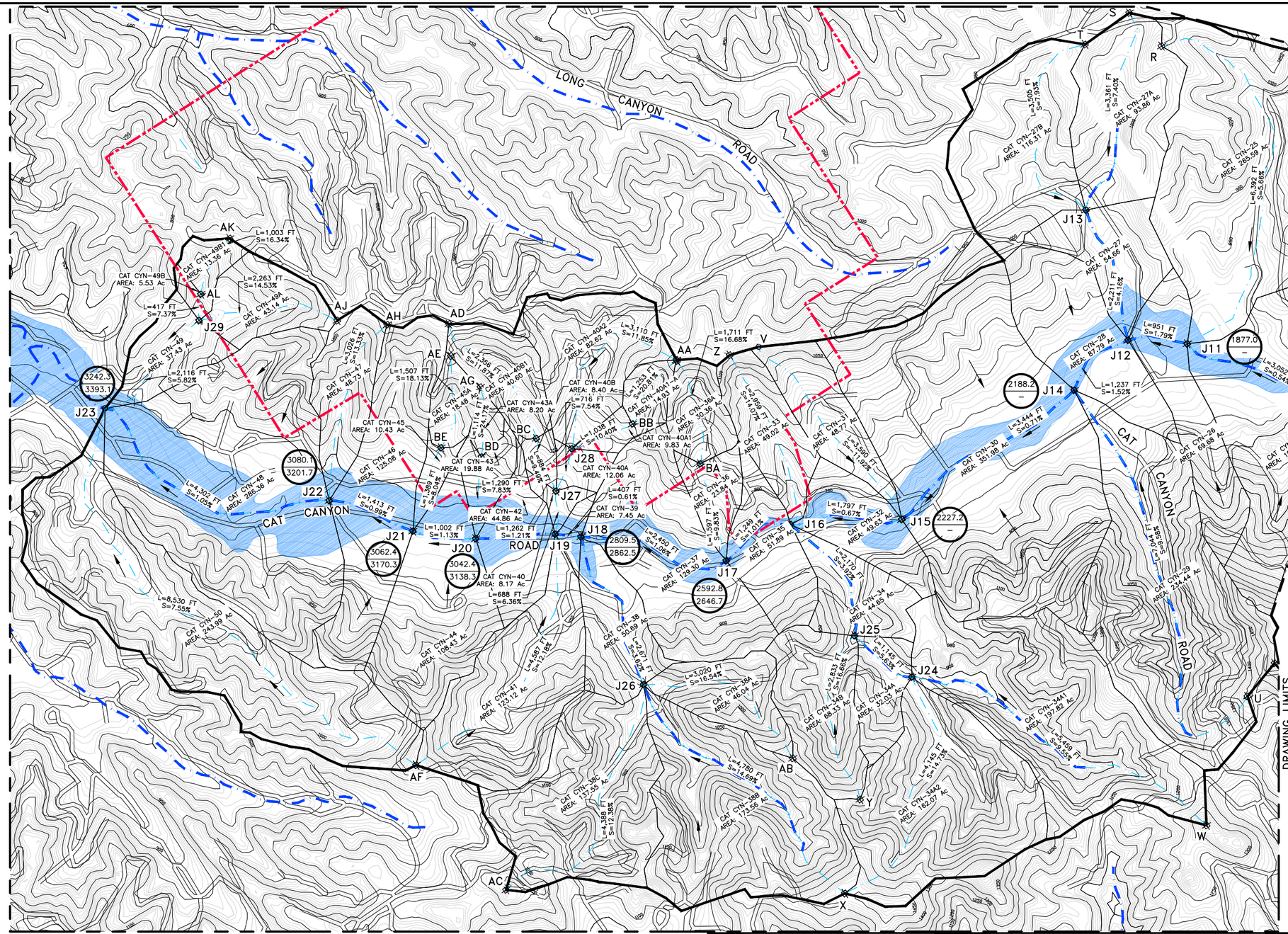
DATE	REV	DESCRIPTION	BY	APPR	AERA ENG
09/17/14	0	ISSUED FOR PERMIT	IDU	RSD	EP
08/20/14	A	ISSUED FOR REVIEW	IDU	RSD	EP

AERA

HYDROLOGY MAP – PRE-CONSTRUCTION WATERSHED – OLIVERA CANYON
FIELD REDEVELOPMENT PROJECT
SECTIONS 20/29 & 30 T9N R32W
EAST CAT CANYON FIELD – SANTA BARBARA COUNTY – CALIFORNIA

AERA ENGINEER:	ERIC PAULSON	DATE: 09/17/14	SCALE: 1" = 600'
CO. ENGINEER:	TJCROSS ENGINEERS, INC	ORIGINAL DWG NO.	
PROJ. MGR:	ALI GOKGOZ	NO. 072-13-023C	REV. 0
DESIGNED BY:	ROBIN DICKERSON		
DRAFTED BY:	ISAC URBINA		
ECCN NO.	EAR99	CAD FILE NO. 072-13-023MS	

:FUNCTIONAL LOCATION NO.



LEGEND

- 207.2 — PRE-CONSTRUCTION Q_{100} IN CFS
- 311.2 — POST-CONSTRUCTION Q_{100} IN CFS
- INTERMITTENT STREAM
- FLOOD HAZARD LIMITS
- PROPERTY BOUNDARY
- FLOW PATH
- DRAINAGE FLOW

PRELIMINARY NOT FOR CONSTRUCTION

GRAPHIC SCALE

800 0 400 800 1600 3200

(IN FEET)
1 inch = 800 ft.

CAT CANYON
SCALE: 1" = 800'

DWG NUMBER	TITLE
REFERENCE DRAWINGS	

TJCROSS ENGINEERS

T.J. CROSS AUTOCAD CONTROL

SCALE: 1"=800' FILE: 13186/072-13-023MS
PLOT AT: 1=1 LAYER(S): .
ENGINEER: RSD CHANGED BY: IDU
DATE STARTED: 12/16/13 LAST CHANGED: 09/17/14

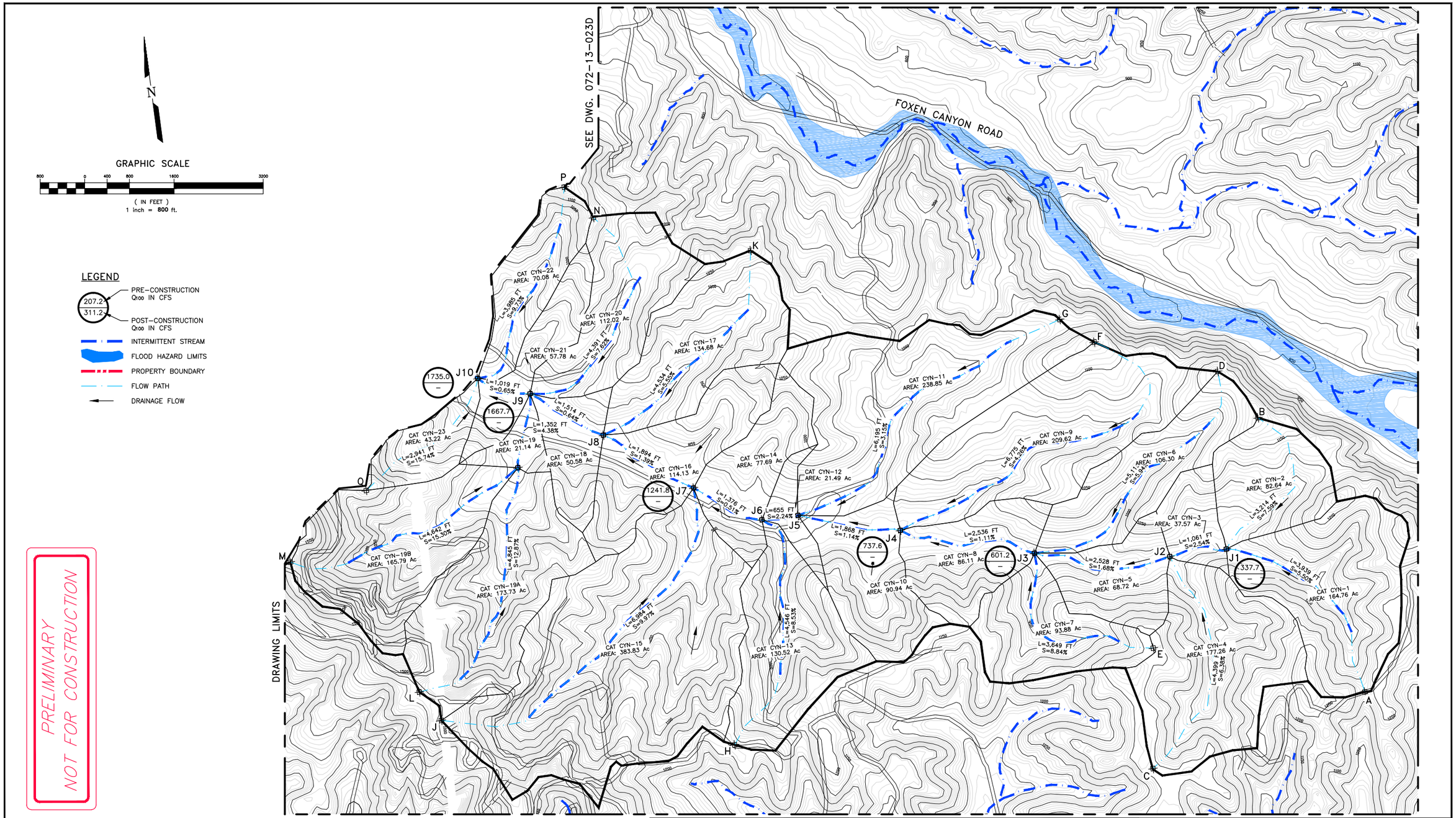
DATE	REV	DESCRIPTION	BY	APPR	AERA ENG
09/17/14	0	ISSUED FOR PERMIT	IDU	RSD	EP
08/20/14	A	ISSUED FOR REVIEW	IDU	RSD	EP

AERA

HYDROLOGY MAP – PRE-CONSTRUCTION WATERSHED – CAT CANYON (NORTH)
FIELD REDEVELOPMENT PROJECT
SECTIONS 20/29 & 30 T9N R32W
EAST CAT CANYON FIELD – SANTA BARBARA COUNTY – CALIFORNIA

AERA ENGINEER:	ERIC PAULSON	DATE: 09/17/14	SCALE: 1" = 800'
CO. ENGINEER:	TJCROSS ENGINEERS, INC	ORIGINAL DWG NO.	
PROJ. MGR:	ALI GOKGOZ	NO. 072-13-023D	REV. 0
DESIGNED BY:	ROBIN DICKERSON		
DRAFTED BY:	ISAC URBINA		
ECCN NO.	EAR99	CAD FILE NO. 072-13-023MS	

:FUNCTIONAL LOCATION NO.



CAT CANYON
SCALE: 1" = 800'

PRELIMINARY
NOT FOR CONSTRUCTION

DWG NUMBER	TITLE
	REFERENCE DRAWINGS

TJCROSS ENGINEERS

T.J. CROSS AUTOCAD CONTROL
SCALE: 1"=800' FILE: 13186/072-13-023MS
PLOT AT: 1=1 LAYER(S): .
ENGINEER: RSD CHANGED BY: IDU
DATE STARTED: 12/16/13 LAST CHANGED: 09/17/14

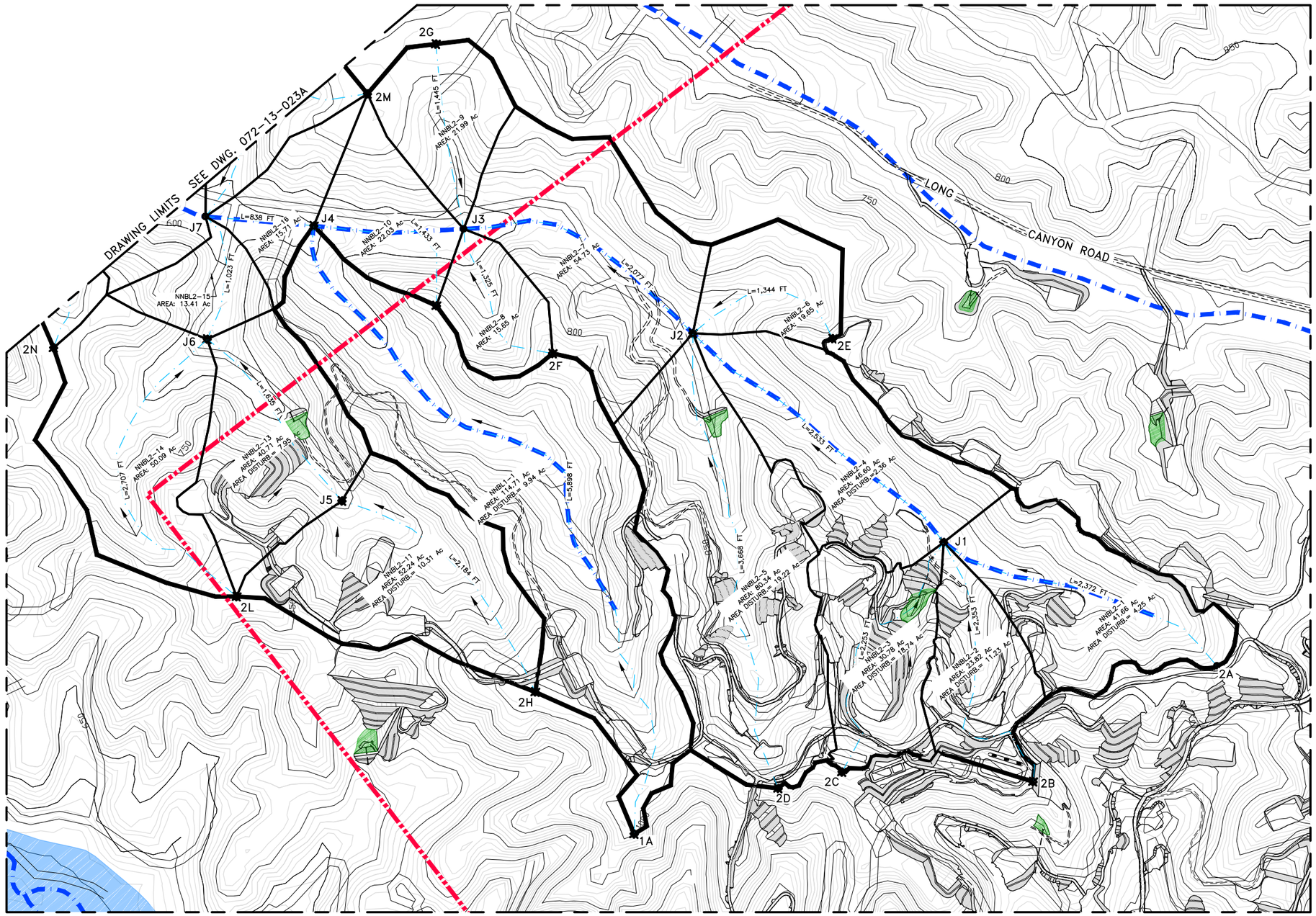
DATE	REV	DESCRIPTION	BY	APPR	AERA ENG
09/17/14	0	ISSUED FOR PERMIT	IDU	RSD	EP
08/20/14	A	ISSUED FOR REVIEW	IDU	RSD	EP

AERA

HYDROLOGY MAP – PRE-CONSTRUCTION WATERSHED – CAT CANYON (SOUTH)
FIELD REDEVELOPMENT PROJECT
SECTIONS 20/29 & 30 T9N R32W
EAST CAT CANYON FIELD – SANTA BARBARA COUNTY – CALIFORNIA

AERA ENGINEER:	ERIC PAULSON	DATE: 09/17/14	SCALE: 1" = 800'
CO. ENGINEER:	TJCROSS ENGINEERS, INC	ORIGINAL DWG NO.	
PROJ. MGR:	ALI GOKGOZ	NO. 072-13-023E	REV. 0
DESIGNED BY:	ROBIN DICKERSON		
DRAFTED BY:	ISAC URBINA		
ECCN NO.	EAR99	CAD FILE NO. 072-13-023MS	

:FUNCTIONAL LOCATION NO.



UNNAMED BLUE LINE 1 & 2

SCALE: 1" = 400'

PROGRESS PRINT
NOT READY FOR ISSUE

DWG NUMBER	TITLE
REFERENCE DRAWINGS	

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

LEGEND

- INTERMITTENT STREAM
- FLOOD HAZARD LIMITS
- PROPERTY BOUNDARY
- FLOW PATH
- DRAINAGE FLOW
- PROP. DETENTION BASIN LOCATION (FINAL DESIGN TO BE DETERMINED)

TJCROSS ENGINEERS

T.J. CROSS AUTOCAD CONTROL

SCALE: 1"=400' FILE: 13186/072-13-024MS
PLOT AT: 1=1 LAYER(S): .
ENGINEER: RSD CHANGED BY: IDU
DATE STARTED: 12/16/13 LAST CHANGED: 09/17/14

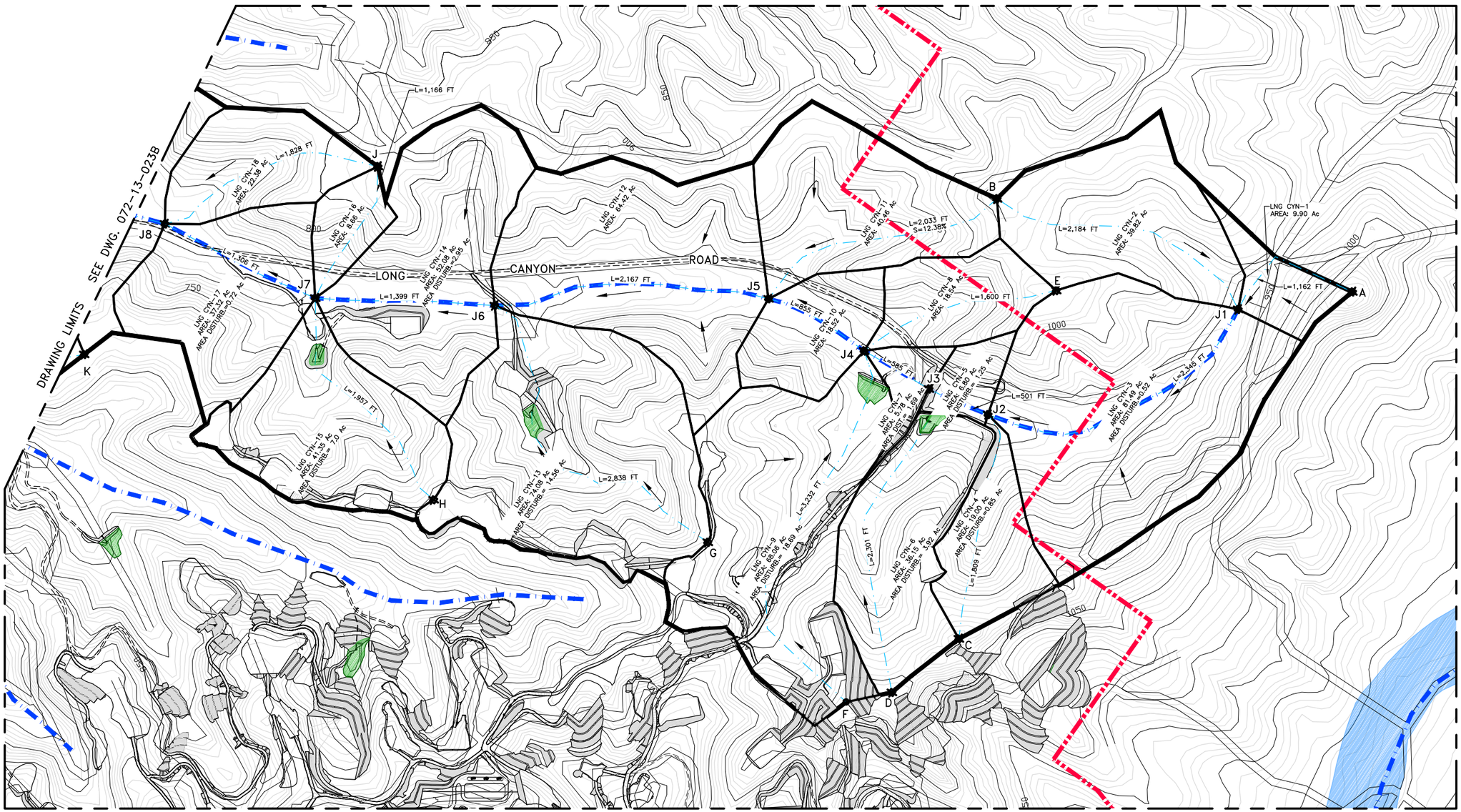
DATE	REV	DESCRIPTION	BY	APPR	AERA ENG
09/17/14	0	ISSUED FOR PERMIT	IDU	RSD	EP
08/20/14	A	ISSUED FOR REVIEW	IDU	RSD	EP

AERA

HYDROLOGY MAP – POST-CONSTRUCTION WATERSHED – UNNAMED BLUE LINE 1 & 2
FIELD REDEVELOPMENT PROJECT
SECTIONS 20/29 & 30 T9N R32W
EAST CAT CANYON FIELD – SANTA BARBARA COUNTY – CALIFORNIA

AERA ENGINEER:	ERIC PAULSON	DATE: 09/17/14	SCALE: 1" = 400'
CO. ENGINEER:	TJCROSS ENGINEERS, INC	ORIGINAL DWG NO.	
PROJ. MGR:	ALI GOKGOZ	NO. 072-13-024A	REV. 0
DESIGNED BY:	ROBIN DICKERSON		
DRAFTED BY:	ISAC URBINA		
ECCN NO.	EAR99	CAD FILE NO. 072-13-024MS	

:FUNCTIONAL LOCATION NO.



LONG CANYON

SCALE: 1" = 400'

PRELIMINARY
NOT FOR CONSTRUCTION

N

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

DWG NUMBER	TITLE
REFERENCE DRAWINGS	

LEGEND

- INTERMITTENT STREAM
- FLOOD HAZARD LIMITS
- PROPERTY BOUNDARY
- FLOW PATH
- DRAINAGE FLOW
- PROP. DETENTION BASIN LOCATION (FINAL DESIGN TO BE DETERMINED)

TJCROSS ENGINEERS

T.J. CROSS AUTOCAD CONTROL

SCALE: 1"=400' FILE: 13186/072-13-024MS
PLOT AT: 1=1 LAYER(S): -
ENGINEER: RSD CHANGED BY: IDU
DATE STARTED: 12/16/13 LAST CHANGED: 09/17/14

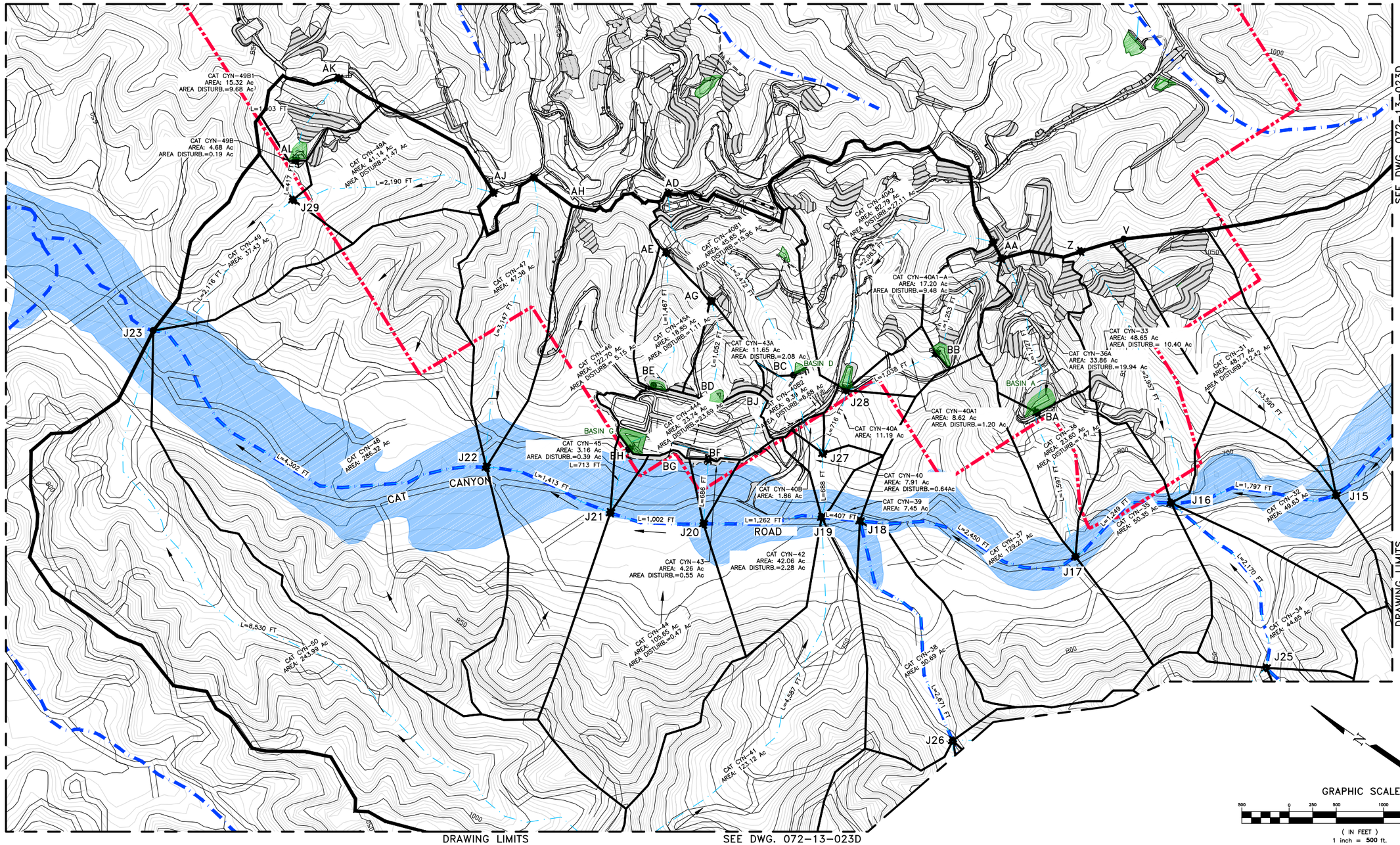
DATE	REV	DESCRIPTION	BY	APPR	AERA ENG
09/17/14	0	ISSUED FOR PERMIT	IDU	RSD	EP
08/20/14	A	ISSUED FOR REVIEW	IDU	RSD	EP

AERA

HYDROLOGY MAP – POST-CONSTRUCTION WATERSHED – LONG CANYON
FIELD REDEVELOPMENT PROJECT
SECTIONS 20/29 & 30 T9N R32W
EAST CAT CANYON FIELD – SANTA BARBARA COUNTY – CALIFORNIA

AERA ENGINEER:	ERIC PAULSON	DATE: 09/17/14	SCALE: 1" = 400'
CO. ENGINEER:	TJCROSS ENGINEERS, INC	ORIGINAL DWG NO.	
PROJ. MGR:	ALI GOKGOZ	NO. 072-13-024B	REV. 0
DESIGNED BY:	ROBIN DICKERSON		
DRAFTED BY:	ISAC URBINA		
ECCN NO.	EAR99	CAD FILE NO. 072-13-024MS	

:FUNCTIONAL LOCATION NO.



PRELIMINARY
NOT FOR CONSTRUCTION

GRAPHIC SCALE

500 0 250 500 1000 2000

(IN FEET)
1 inch = 500 ft.

DWG NUMBER	TITLE
REFERENCE DRAWINGS	

CAT CANYON
SCALE: 1" = 500'

LEGEND

- INTERMITTENT STREAM
- FLOOD HAZARD LIMITS
- PROPERTY BOUNDARY
- FLOW PATH
- DRAINAGE FLOW
- PROP. DETENTION BASIN LOCATION (FINAL DESIGN TO BE DETERMINED)

TJCROSS ENGINEERS

T.J. CROSS AUTOCAD CONTROL

SCALE: 1"=500'	FILE: 13186/072-13-024MS
PLOT AT: 1=1	LAYER(S):
ENGINEER: RSD	CHANGED BY: IDU
DATE STARTED: 12/16/13	LAST CHANGED: 09/17/14

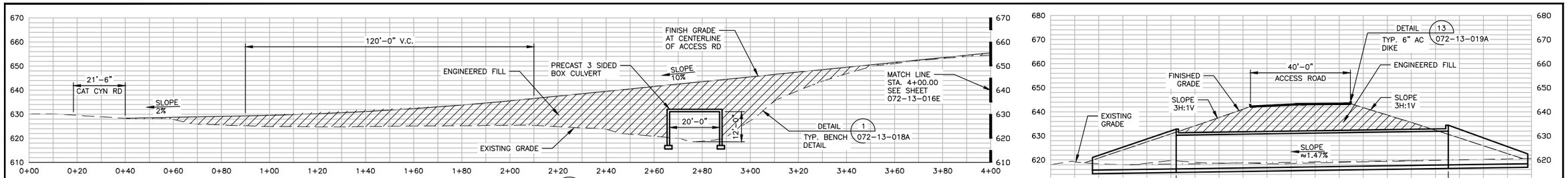
DATE	REV	DESCRIPTION	BY	APPR	AERA ENG
09/17/14	0	ISSUED FOR PERMIT	IDU	RSD	EP
08/20/14	A	ISSUED FOR REVIEW	IDU	RSD	EP

AERA

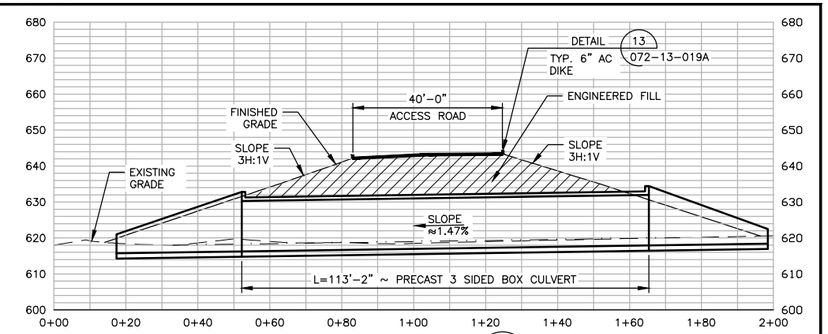
HYDROLOGY MAP – POST-CONSTRUCTION WATERSHED – CAT CANYON (NORTH)
FIELD REDEVELOPMENT PROJECT
SECTIONS 20/29 & 30 T9N R32W
EAST CAT CANYON FIELD – SANTA BARBARA COUNTY – CALIFORNIA

AERA ENGINEER:	ERIC PAULSON	DATE: 09/17/14	SCALE: 1" = 500'
CO. ENGINEER:	TJCROSS ENGINEERS, INC	ORIGINAL DWG NO.	
PROJ. MGR:	ALI GOKGOZ	NO. 072-13-024C	REV. 0
DESIGNED BY:	ROBIN DICKERSON		
DRAFTED BY:	ISAC URBINA		
ECCN NO.	EAR99	CAD FILE NO. 072-13-024MS	

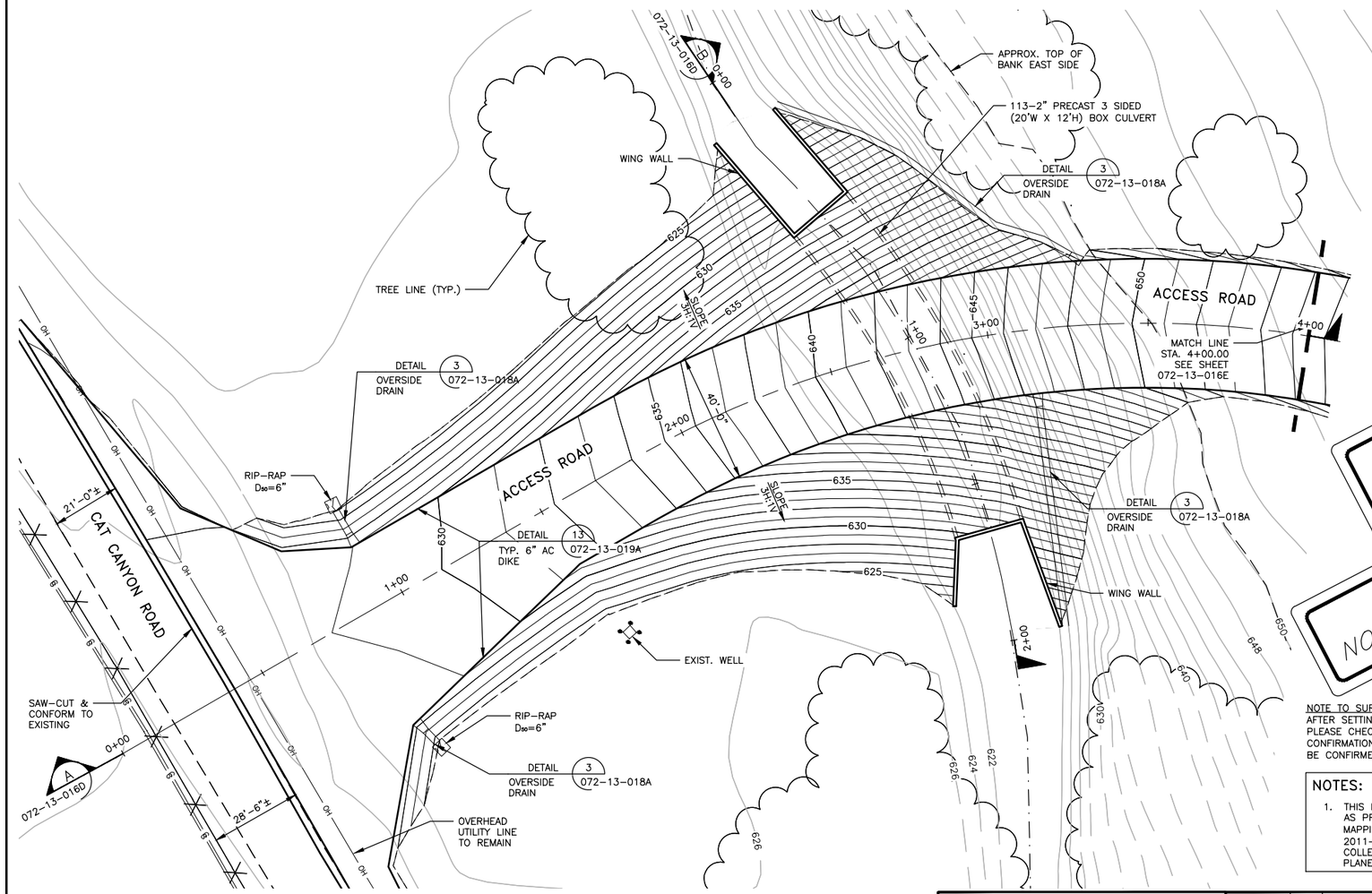
:FUNCTIONAL LOCATION NO.



SECTION A 072-13-016D
VIEW LOOKING NORTHERLY
SCALE: VERT.& HORIZ.(1"=20')



SECTION B 072-13-016D
VIEW LOOKING EASTERLY
SCALE: VERT.& HORIZ.(1"=20')



CAT CANYON ENTRANCE
SCALE:1"=20'

THIS IS FOR LAND USE PERMIT ONLY

PRELIMINARY NOT FOR CONSTRUCTION

QUANTITIES:

ROUGH GRADE QUANTITIES (FOR SHEETS -016D THRU -016G):

CUT (CU. YDS.)	+7,452
FILL* (CU. YDS.)	-18,767
TOTAL CUT (CU. YDS.)	+7,452
TOTAL FILL* (CU. YDS.)	-18,767
NET (CU. YDS.)	-11,315

* INCLUDES 30% SHRINKAGE

PRECAST 3 SIDED (20'Wx12'H) BOX CULVERT	113'-2" L.F.
WING WALLS	2 REQ'D

EARTHWORK NOTES:

A. EARTHWORK QUANTITIES SHOWN FOR PERMIT PURPOSES ONLY.
B. SEE EARTHWORK NOTES B AND C ON SHEET 072-13-014A UNDER EARTHWORK NOTES.

NOTE:

USING A 3 SIDED PRECAST BOX CULVERT WITH A CLEAR SPAN OF 20 FT. WIDE, 12 FT. HIGH.

THE CULVERT WILL BE CENTERED ALONG THE BLUE LINE CHANNEL.

FOOTINGS WILL BE CONSTRUCTED ON BOTH SIDES OF THE BOX CULVERT FOR PLACEMENT OF THE PRECAST 3 SIDED CULVERT.

BOTTOM WILL REMAIN NATURAL.

DESIGN AND INSTALLATION PER MANUFACTURER

THIS PLAN GENERATED FROM AERIAL SURVEY AS PROVIDED BY CENTRAL COAST AERIAL MAPPING, INC., THEIR FILENAME/DATE - 2011-1719/APRIL 16, 2011. THIS SURVEY COLLECTED IN THE NAD 83, ZONE 5 STATE PLANE COORDINATE SYSTEM.

NOTE TO SURVEYOR:
AFTER SETTING UP ON THE NGS MONUMENT IN THIS AREA PLEASE CHECK THE COORDINATES IN THE COORDINATE CONFIRMATION SCHEDULE. IF THE COORDINATES CANNOT BE CONFIRMED, PLEASE CONTACT T.J. CROSS IMMEDIATELY.

NOTES:

1. THIS PLAN GENERATED FROM AERIAL SURVEY AS PROVIDED BY CENTRAL COAST AERIAL MAPPING, INC., THEIR FILENAME/DATE - 2011-1719/APRIL 16, 2011. THIS SURVEY COLLECTED IN THE NAD 83, ZONE 5 STATE PLANE COORDINATE SYSTEM.

N

GRAPHIC SCALE
20 0 10 20 40 100
(IN FEET)
1 inch = 20 ft.

DWG NUMBER	TITLE
REFERENCE DRAWINGS	

EXISTING GRADE CONTOUR INTERVAL = 2'-0"
DESIGN GRADE CONTOUR INTERVAL = 1'-0"

TJCROSS ENGINEERS

T.J. CROSS AUTOCAD CONTROL
SCALE: 1"=20' FILE: 13186/072-13-016D
PLOT AT: 1=1 LAYER(S): .
ENGINEER: RSD CHANGED BY: IDU
DATE STARTED: 04/07/14 LAST CHANGED: 08/01/14

DATE	REV	DESCRIPTION	BY	APPR	AERA ENG
08/01/14	0	ISSUED FOR PERMIT	IDU	RSD	EP
06/03/14	A	ISSUED FOR REVIEW	IDU	RSD	EP

AERA

PLAN & PROFILE - CAT CANYON ENTRANCE
FIELD REDEVELOPMENT PROJECT
SECTIONS 20/29 & 30 T9N R32W
EAST CAT CANYON FIELD - SANTA BARBARA COUNTY - CALIFORNIA

AERA ENGINEER:	ERIC PAULSON	DATE: 08/01/14	SCALE: 1"=20'
CO. ENGINEER:	TJCROSS ENGINEERS, INC	ORIGINAL DWG NO.	
PROJ. MGR:	ALI GOKGOZ	NO. 072-13-016D	REV. 0
DESIGNED BY:	ROBIN DICKERSON		
DRAFTED BY:	ISAC URBINA		
ECCN NO.	EAR99	CAD FILE NO. 072-13-016D	

:FUNCTIONAL LOCATION NO.

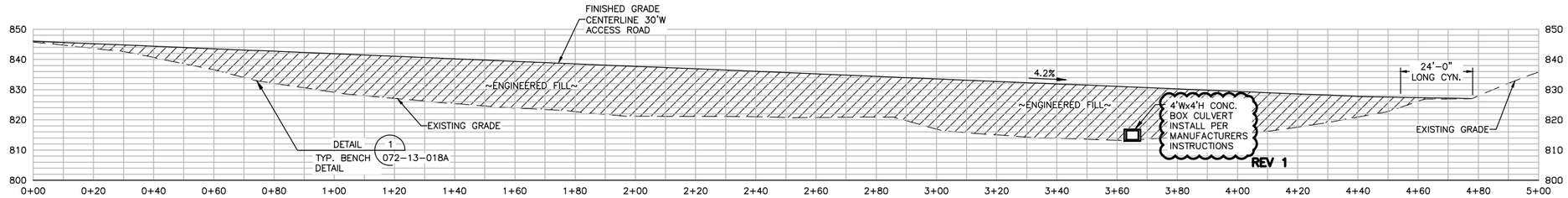
QUANTITIES:

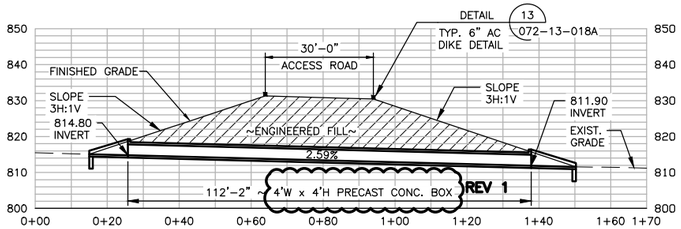
ROUGH GRADE QUANTITIES:

CUT (CU. YDS.)	+1.00
FILL* (CU. YDS.)	−21,626
TOTAL CUT (CU. YDS.)	+1.00
TOTAL FILL* (CU. YDS.)	−21,626
NET (CU. YDS.)	−21,625

* INCLUDES 30% SHRINKAGE

4'W x 4'H CONC. PRECAST BOX CULVERT (REV 1)	112'−2" L.F.
WING WALLS	2 REQ'D





SECTION D
VIEW LOOKING WESTERLY
SCALE: VERT.& HORIZ.(1"=20')
072−13−016A

SECTION C
VIEW LOOKING NORTHERLY
SCALE: VERT.& HORIZ.(1"=20')
072−13−016A

EARTHWORK NOTES:

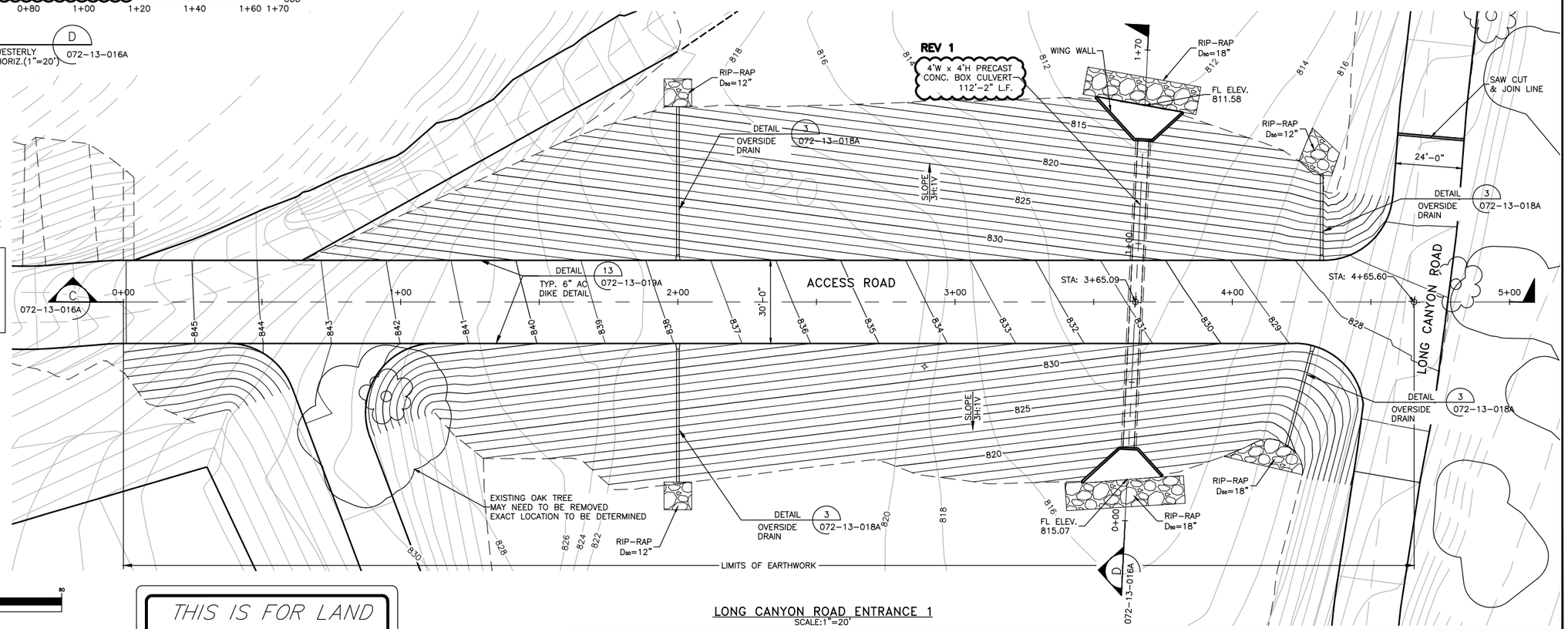
A. EARTHWORK QUANTITIES SHOWN FOR PERMIT PURPOSES ONLY.
B. SEE EARTHWORK NOTES B AND C ON SHEET 072−13−014A UNDER EARTHWORK NOTES.

NOTE TO SURVEYOR:
AFTER SETTING UP ON THE NGS MONUMENT IN THIS AREA PLEASE CHECK THE COORDINATES IN THE COORDINATE CONFIRMATION SCHEDULE. IF THE COORDINATES CANNOT BE CONFIRMED, PLEASE CONTACT T.J. CROSS IMMEDIATELY.

NOTES:

1. THIS PLAN GENERATED FROM AERIAL SURVEY AS PROVIDED BY CENTRAL COAST AERIAL MAPPING, INC., THEIR FILENAME/DATE − 2011−1719/APRIL 16, 2011. THIS SURVEY COLLECTED IN THE NAD 83, ZONE 5 STATE PLANE COORDINATE SYSTEM.

EXISTING GRADE CONTOUR INTERVAL = 2'−0"
DESIGN GRADE CONTOUR INTERVAL = 1'−0"



LONG CANYON ROAD ENTRANCE 1
SCALE:1"=20'

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

DWG NUMBER	TITLE
072−13−015A	SITE LOCATION PLAN
072−13−013A	TITLE SHEET/ DRAWING INDEX/ VICINITY MAP

REFERENCE DRAWINGS

THIS IS FOR LAND USE PERMIT ONLY

PRELIMINARY NOT FOR CONSTRUCTION

TJCROSS ENGINEERS

T.J. CROSS AUTOCAD CONTROL
SCALE: 1"=20' FILE: 13186/072−13−016A
PLOT AT: 1=1 LAYER(S): .
ENGINEER: RSD CHANGED BY: IDU
DATE STARTED: 04/07/14 LAST CHANGED: 09/17/14

DATE	REV	DESCRIPTION	BY	APPR	AERA ENG
09/17/14	1	RE−ISSUED FOR PERMIT (LNG CYN CULVERT SIZE)	IDU	RSD	EP
08/01/14	0	ISSUED FOR PERMIT	IDU	RSD	EP
06/03/14	A	ISSUED FOR REVIEW	IDU	RSD	EP

AERA

PLAN & PROFILE − LONG CANYON ROAD ENTRANCE 1
FIELD REDEVELOPMENT PROJECT
SECTIONS 20/29 & 30 T9N R32W
EAST CAT CANYON FIELD − SANTA BARBARA COUNTY − CALIFORNIA

AERA ENGINEER:	ERIC PAULSON	DATE: 09/17/14	SCALE: 1"=20'
CO. ENGINEER:	TJCROSS ENGINEERS, INC	ORIGINAL DWG NO.	
PROJ. MGR:	ALI GOKGOZ	NO. 072−13−016A	REV. 1
DESIGNED BY:	ROBIN DICKERSON		
DRAFTED BY:	ISAC URBINA		
ECCN NO.	EAR99	CAD FILE NO. 072−13−016A	

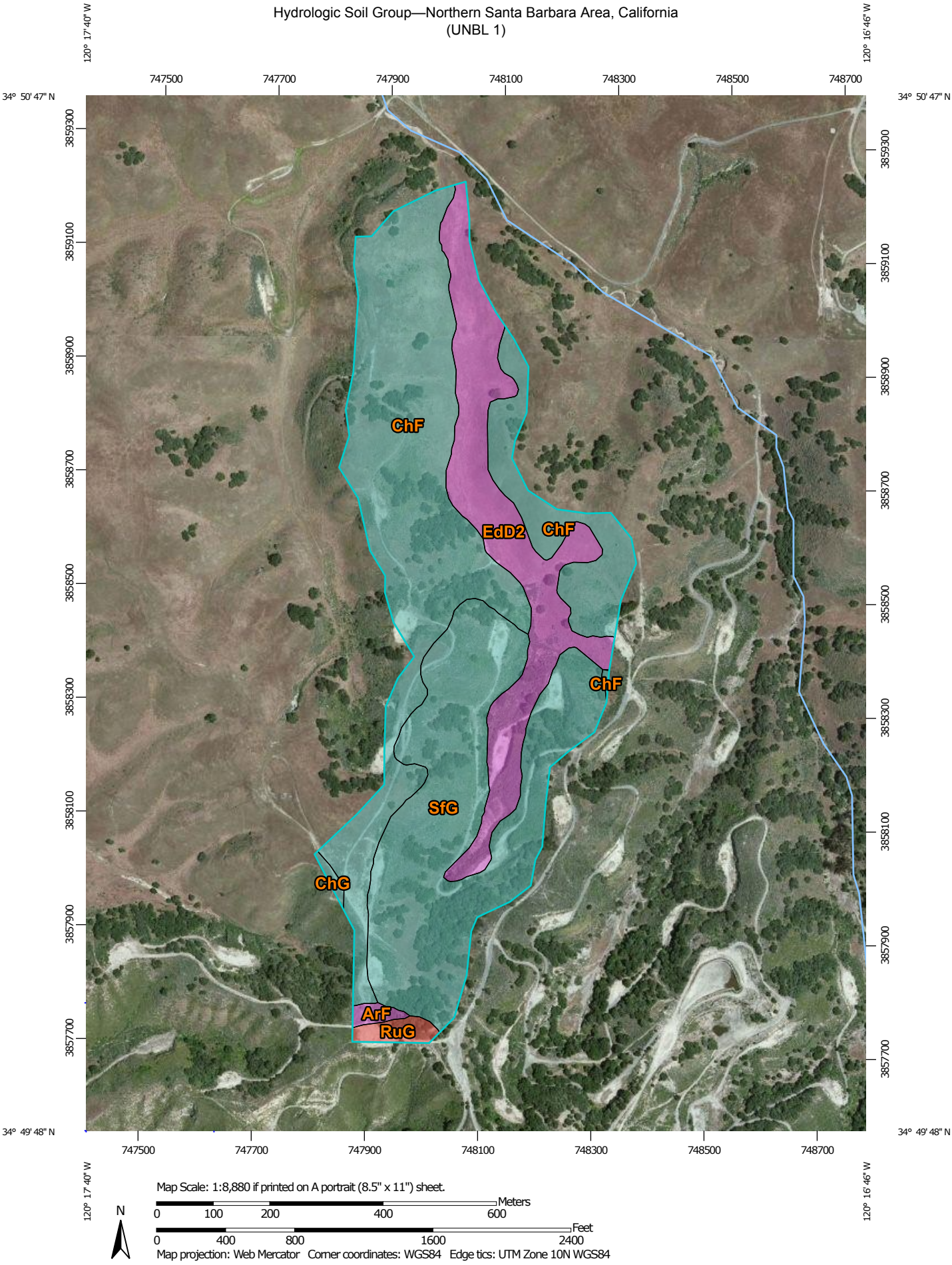
:FUNCTIONAL LOCATION NO.

APPENDIX

Appendix A

Hydrologic Soils Groups

Hydrologic Soil Group—Northern Santa Barbara Area, California
(UNBL 1)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Northern Santa Barbara Area, California
Survey Area Data: Version 8, Dec 7, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 7, 2010—Jun 10, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Northern Santa Barbara Area, California (CA672)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
ArF	Arnold sand, 15 to 45 percent slopes	A	0.7	0.6%
ChF	Chamise shaly loam, 15 to 45 percent slopes	C	50.8	45.2%
ChG	Chamise shaly loam, 45 to 75 percent slopes	C	0.4	0.3%
EdD2	Elder sandy loam, 9 to 15 percent slopes, eroded	A	21.9	19.4%
RuG	Rough broken land	D	1.4	1.2%
SfG	San Andreas-Tierra complex, 30 to 75 percent slopes	C	37.4	33.2%
Totals for Area of Interest			**112.5**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

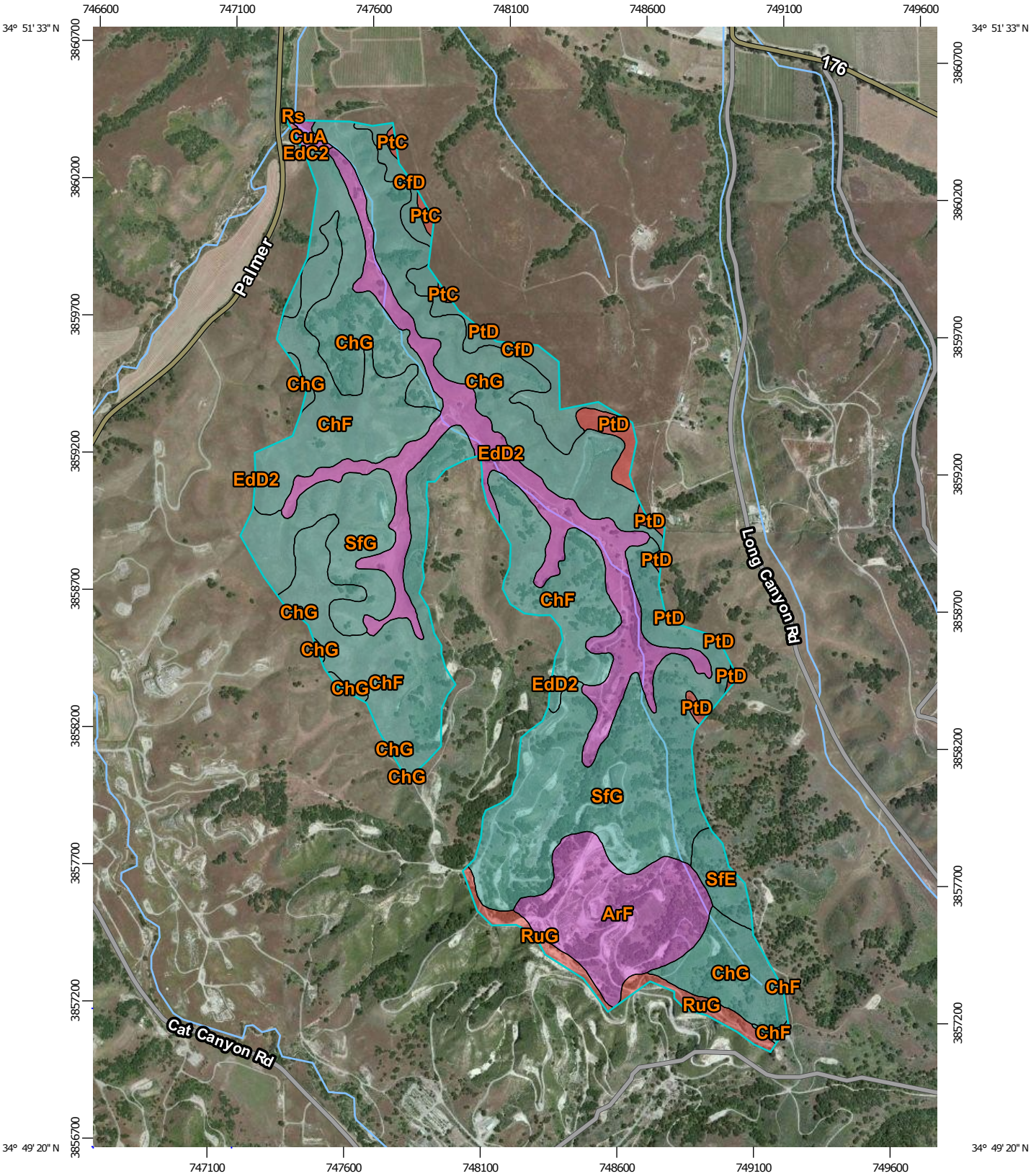
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

Hydrologic Soil Group—Northern Santa Barbara Area, California
(UNBL 2)



Map Scale: 1:19,900 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 250 500 1000 1500

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Northern Santa Barbara Area, California
Survey Area Data: Version 8, Dec 7, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 7, 2010—Jun 10, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Northern Santa Barbara Area, California (CA672)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
ArF	Arnold sand, 15 to 45 percent slopes	A	61.6	8.9%
CfD	Chamise shaly sandy loam, 9 to 15 percent slopes	C	24.1	3.5%
ChF	Chamise shaly loam, 15 to 45 percent slopes	C	166.1	24.1%
ChG	Chamise shaly loam, 45 to 75 percent slopes	C	144.8	21.0%
CuA	Corralitos loamy sand, 0 to 2 percent slopes	A	2.3	0.3%
EdC2	Elder sandy loam, 2 to 9 percent slopes, eroded	A	0.0	0.0%
EdD2	Elder sandy loam, 9 to 15 percent slopes, eroded	A	84.0	12.2%
PtC	Positas fine sandy loam, 2 to 9 percent slopes	D	2.2	0.3%
PtD	Positas fine sandy loam, 9 to 15 percent slopes	D	9.7	1.4%
Rs	Riverwash	D	0.2	0.0%
RuG	Rough broken land	D	13.6	2.0%
SfE	San Andreas-Tierra complex, 15 to 30 percent slopes	C	10.4	1.5%
SfG	San Andreas-Tierra complex, 30 to 75 percent slopes	C	169.6	24.6%
Totals for Area of Interest			**688.6**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

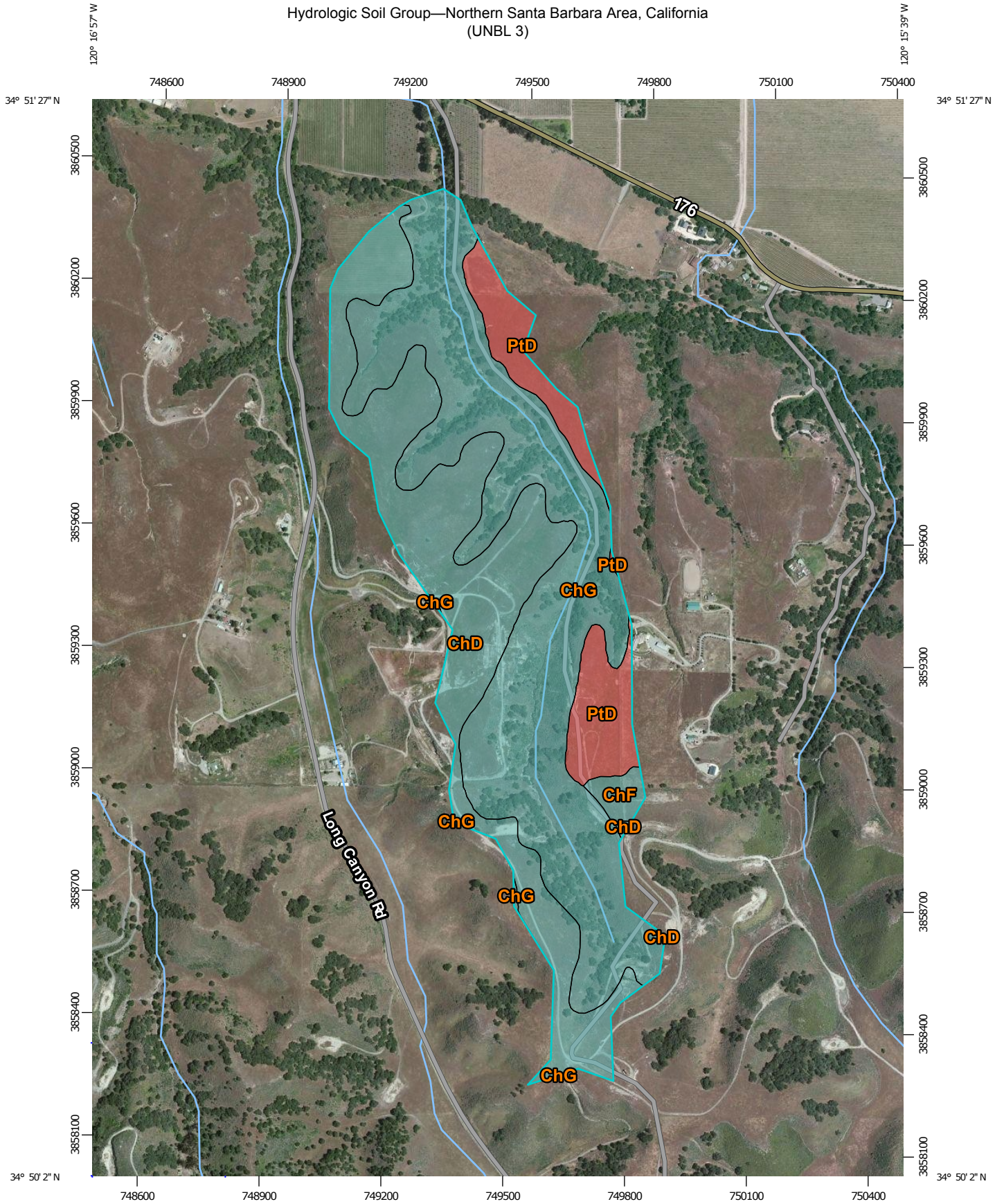
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

Hydrologic Soil Group—Northern Santa Barbara Area, California
(UNBL 3)



Map Scale: 1:12,900 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Northern Santa Barbara Area, California
Survey Area Data: Version 8, Dec 7, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 7, 2010—Jun 10, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Northern Santa Barbara Area, California (CA672)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
ChD	Chamise shaly loam, 9 to 15 percent slopes	C	76.6	35.1%
ChF	Chamise shaly loam, 15 to 45 percent slopes	C	3.2	1.4%
ChG	Chamise shaly loam, 45 to 75 percent slopes	C	114.9	52.7%
PtD	Positas fine sandy loam, 9 to 15 percent slopes	D	23.3	10.7%
Totals for Area of Interest			**218.0**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

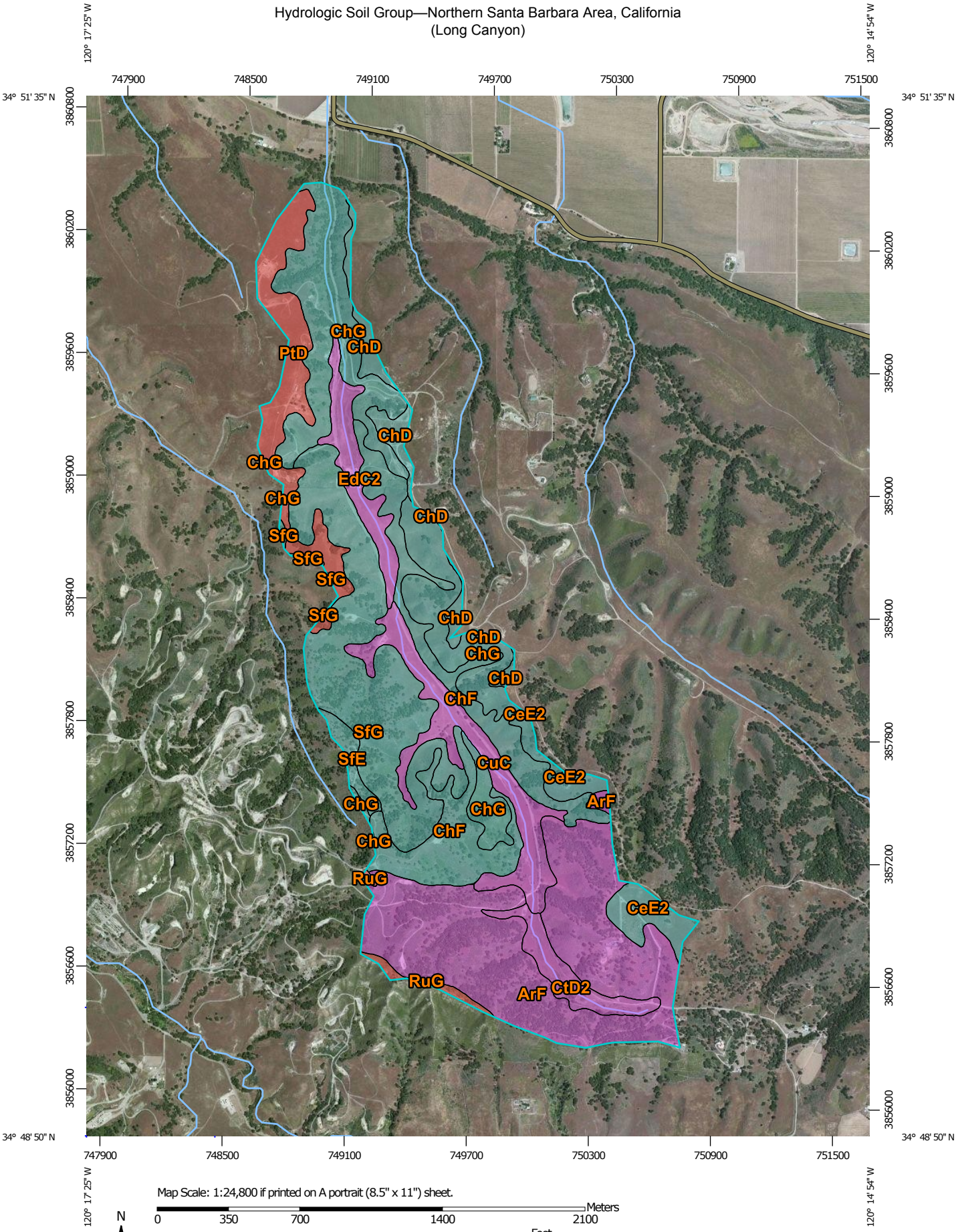
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

Hydrologic Soil Group—Northern Santa Barbara Area, California
(Long Canyon)



Map Scale: 1:24,800 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 350 700 1400 2100

Feet: 0 1000 2000 4000 6000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Northern Santa Barbara Area, California
Survey Area Data: Version 8, Dec 7, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 7, 2010—Jun 10, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Northern Santa Barbara Area, California (CA672)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
ArF	Arnold sand, 15 to 45 percent slopes	A	223.7	25.1%
CeE2	Chamise sandy loam, 5 to 30 percent slopes, eroded	C	19.8	2.2%
ChD	Chamise shaly loam, 9 to 15 percent slopes	C	25.5	2.9%
ChF	Chamise shaly loam, 15 to 45 percent slopes	C	109.5	12.3%
ChG	Chamise shaly loam, 45 to 75 percent slopes	C	165.2	18.5%
CtD2	Corralitos sand, 2 to 15 percent slopes, eroded	A	24.5	2.7%
CuC	Corralitos loamy sand, 2 to 9 percent slopes	A	61.8	6.9%
EdC2	Elder sandy loam, 2 to 9 percent slopes, eroded	A	30.6	3.4%
PtD	Positas fine sandy loam, 9 to 15 percent slopes	D	63.9	7.2%
RuG	Rough broken land	D	5.7	0.6%
SfE	San Andreas-Tierra complex, 15 to 30 percent slopes	C	9.5	1.1%
SfG	San Andreas-Tierra complex, 30 to 75 percent slopes	C	152.9	17.1%
Totals for Area of Interest			**892.6**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

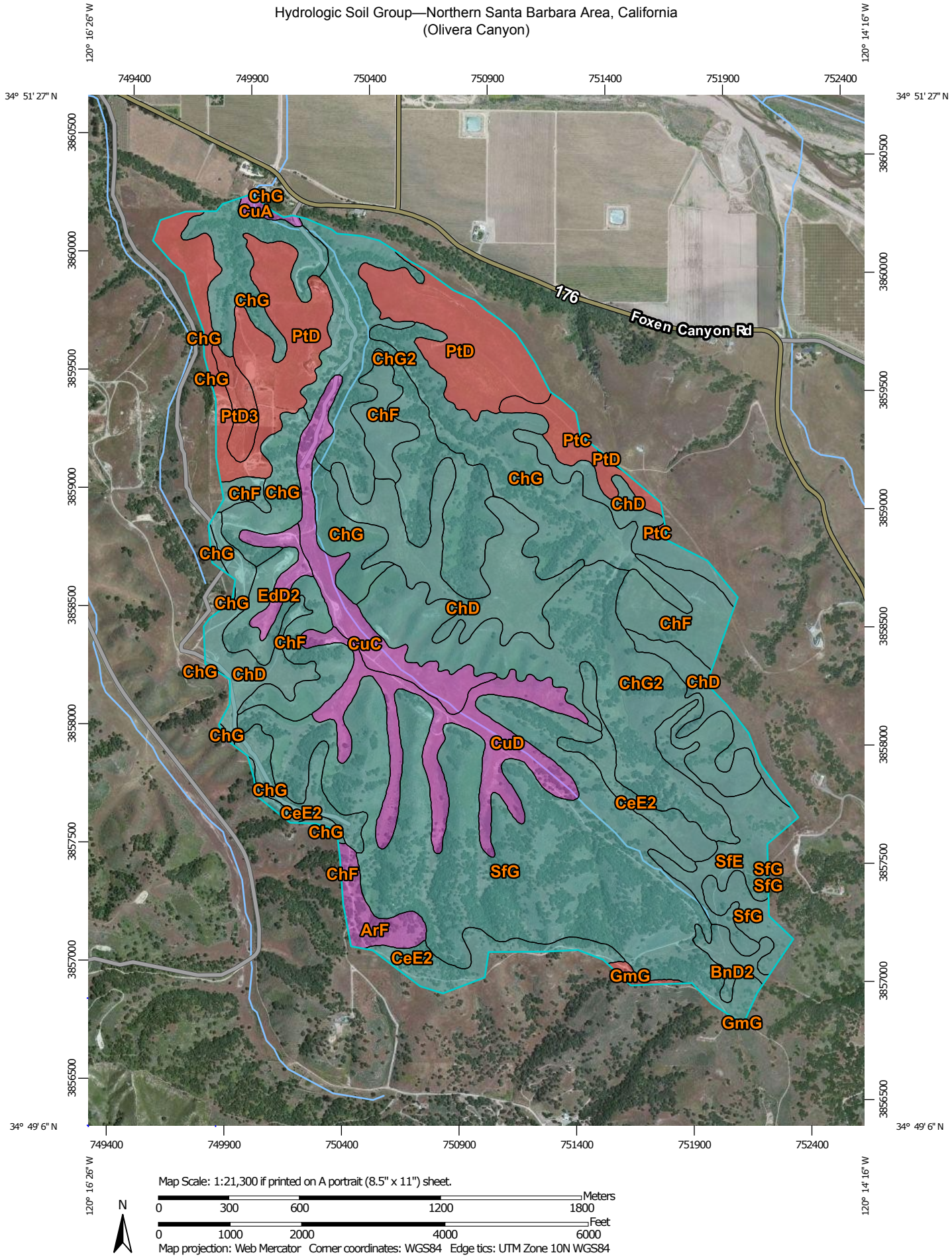
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

Hydrologic Soil Group—Northern Santa Barbara Area, California
(Olivera Canyon)



Map Scale: 1:21,300 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 300 600 1200 1800

Feet: 0 1000 2000 4000 6000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Northern Santa Barbara Area, California
Survey Area Data: Version 8, Dec 7, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 7, 2010—Jun 10, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Northern Santa Barbara Area, California (CA672)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
ArF	Arnold sand, 15 to 45 percent slopes	A	16.9	1.2%
BnD2	Betteravia loamy sand, dark variant, 5 to 15 percent slopes, eroded	C	10.3	0.7%
CeE2	Chamise sandy loam, 5 to 30 percent slopes, eroded	C	62.9	4.4%
ChD	Chamise shaly loam, 9 to 15 percent slopes	C	139.4	9.9%
ChF	Chamise shaly loam, 15 to 45 percent slopes	C	96.8	6.8%
ChG	Chamise shaly loam, 45 to 75 percent slopes	C	174.4	12.3%
ChG2	Chamise shaly loam, 30 to 75 percent slopes, eroded	C	257.1	18.2%
CuA	Corralitos loamy sand, 0 to 2 percent slopes	A	3.1	0.2%
CuC	Corralitos loamy sand, 2 to 9 percent slopes	A	41.1	2.9%
CuD	Corralitos loamy sand, 9 to 15 percent slopes	A	69.7	4.9%
EdD2	Elder sandy loam, 9 to 15 percent slopes, eroded	A	10.5	0.7%
GmG	Gaviota sandy loam, 30 to 75 percent slopes, MLRA 15	D	2.6	0.2%
PtC	Positas fine sandy loam, 2 to 9 percent slopes	D	19.3	1.4%
PtD	Positas fine sandy loam, 9 to 15 percent slopes	D	137.3	9.7%
PtD3	Positas fine sandy loam, 9 to 15 percent slopes, severely eroded	D	11.4	0.8%
SfE	San Andreas-Tierra complex, 15 to 30 percent slopes	C	40.5	2.9%
SfG	San Andreas-Tierra complex, 30 to 75 percent slopes	C	320.9	22.7%
Totals for Area of Interest			**1,414.2**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

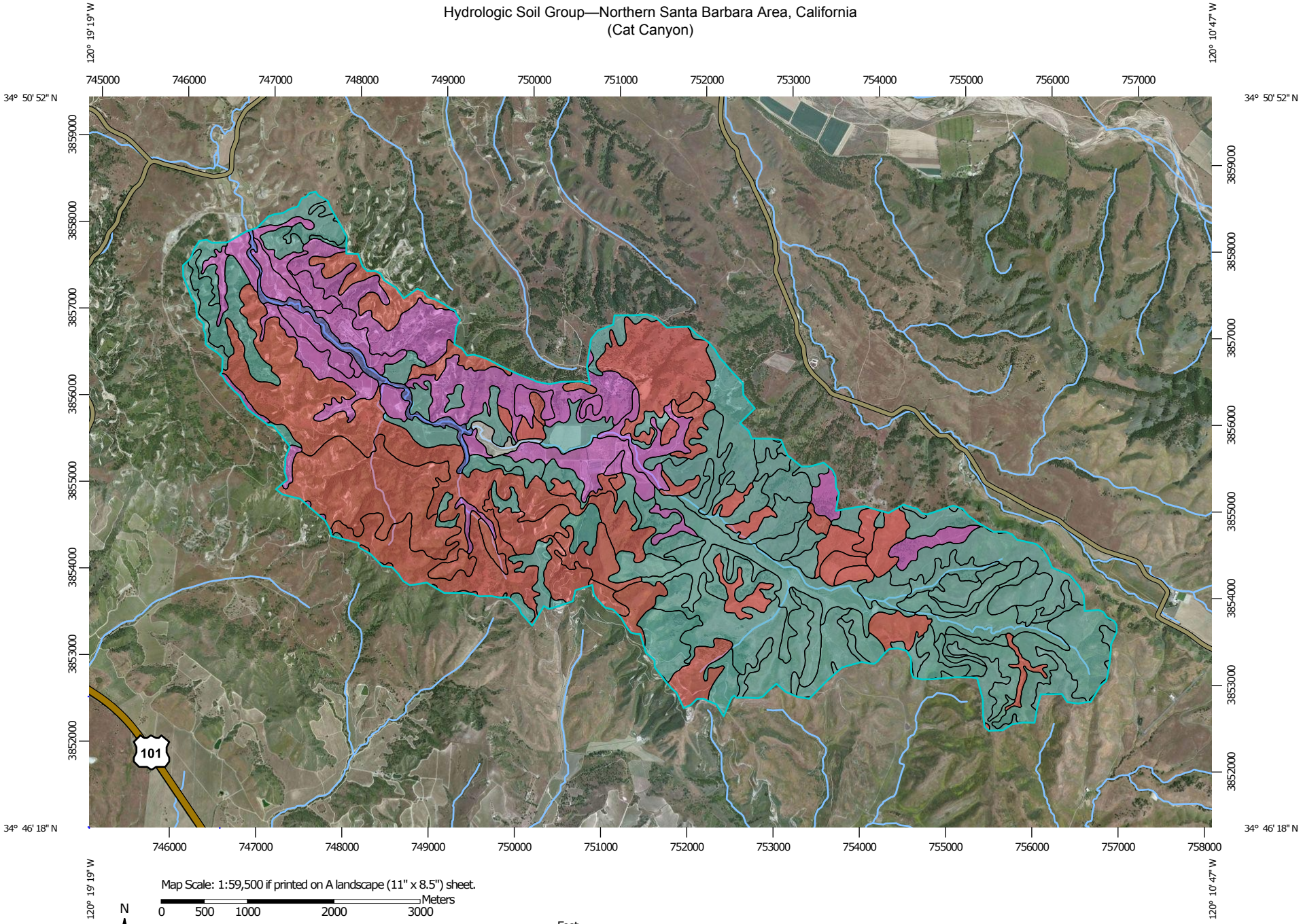
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

Hydrologic Soil Group—Northern Santa Barbara Area, California
(Cat Canyon)



Map Scale: 1:59,500 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 500 1000 2000 3000

Feet: 0 2500 5000 10000 15000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Northern Santa Barbara Area, California
Survey Area Data: Version 8, Dec 7, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 7, 2010—Jun 10, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Northern Santa Barbara Area, California (CA672)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
ArD	Arnold sand, 5 to 15 percent slopes	A	113.8	1.6%
ArF	Arnold sand, 15 to 45 percent slopes	A	498.1	7.1%
BnD2	Betteravia loamy sand, dark variant, 5 to 15 percent slopes, eroded	C	97.0	1.4%
BoD2	Botella loam, 2 to 15 percent slopes, eroded	C	264.5	3.8%
CeE2	Chamise sandy loam, 5 to 30 percent slopes, eroded	C	35.6	0.5%
CfD	Chamise shaly sandy loam, 9 to 15 percent slopes	C	197.6	2.8%
ChF	Chamise shaly loam, 15 to 45 percent slopes	C	106.9	1.5%
ChG	Chamise shaly loam, 45 to 75 percent slopes	C	219.8	3.1%
ChG2	Chamise shaly loam, 30 to 75 percent slopes, eroded	C	70.3	1.0%
CkF	Chamise clay loam, 30 to 45 percent slopes	C	91.2	1.3%
CtA	Corralitos sand, 0 to 2 percent slopes	A	28.0	0.4%
CtD	Corralitos sand, 2 to 15 percent slopes	A	170.3	2.4%
CuC	Corralitos loamy sand, 2 to 9 percent slopes	A	116.7	1.7%
CuD	Corralitos loamy sand, 9 to 15 percent slopes	A	4.8	0.1%
CwE	Crow Hill loam, 15 to 30 percent slopes	C	65.2	0.9%
CwF	Crow Hill loam, 30 to 45 percent slopes	C	385.2	5.5%
CwG	Crow Hill loam, 45 to 75 percent slopes	C	158.3	2.3%
DaF3	Diablo silty clay, 15 to 45 percent slopes, severely eroded	D	1.0	0.0%

Hydrologic Soil Group— Summary by Map Unit — Northern Santa Barbara Area, California (CA672)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
EdA2	Elder sandy loam, 0 to 2 percent slopes, eroded	A	55.0	0.8%
EdC2	Elder sandy loam, 2 to 9 percent slopes, eroded	A	86.7	1.2%
EmC	Elder loam, 2 to 9 percent slopes	A	115.5	1.7%
EnD2	Elder shaly loam, 9 to 15 percent slopes, eroded	A	18.1	0.3%
GmG	Gaviota sandy loam, 30 to 75 percent slopes, MLRA 15	D	1,298.3	18.6%
GsD	Gazos clay loam, 9 to 15 percent slopes	C	33.0	0.5%
GsE	Gazos clay loam, 15 to 30 percent slopes	C	50.3	0.7%
GsF	Gazos clay loam, 30 to 45 percent slopes	C	435.0	6.2%
GsG	Gazos clay loam, 45 to 75 percent slopes	C	17.9	0.3%
LmG	Lopez shaly clay loam, 15 to 75 percent slopes	D	142.6	2.0%
RuG	Rough broken land	D	690.2	9.9%
SfD	San Andreas-Tierra complex, 5 to 15 percent slopes	C	83.0	1.2%
SfE	San Andreas-Tierra complex, 15 to 30 percent slopes	C	426.6	6.1%
SfF3	San Andreas-Tierra complex, 9 to 45 percent slopes, severely eroded	C	140.7	2.0%
SfG	San Andreas-Tierra complex, 30 to 75 percent slopes	C	349.1	5.0%
Sh	Sandy alluvial land	B	76.7	1.1%
SpG	Sedimentary rock land	D	69.6	1.0%
SrG	Shedd silty clay loam, 45 to 75 percent slopes	C	2.3	0.0%
TdF	Terrace escarpments, loamy		26.0	0.4%
TnE2	Tierra sandy loam, 15 to 30 percent slopes, eroded	D	89.8	1.3%

Hydrologic Soil Group— Summary by Map Unit — Northern Santa Barbara Area, California (CA672)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
TrD	Tierra loam, 9 to 15 percent slopes	D	36.7	0.5%
TrE2	Tierra loam, 15 to 30 percent slopes, eroded	D	5.7	0.1%
TrE3	Tierra loam, 5 to 30 percent slopes, severely eroded	D	123.4	1.8%
Totals for Area of Interest			**6,996.4**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

Appendix B

Runoff Coefficient Equations and Curves

Rainfall Intensity/Runoff Coefficient Equations

SBCFCD August, 2003

Curve #1 - Commercial

Equation: C = .60*(RI)^.21

Rainfall Intensity (in/hr)	Runoff Coefficient	Synthetic Value	Variation
1	0.6	0.6	0
1.5	0.66	0.653326711	0.006673289
2	0.7	0.69401291	0.00598709
2.5	0.73	0.727308482	0.002691518
3	0.76	0.755695287	0.004304713
3.5	0.78	0.780558648	-0.000558648
4	0.8	0.802756533	-0.002756533

Curve #2 - South Coast Single Family

Equation: C = -.01643+.6228(RI)-.225(RI)^2+.04115(RI)^3-.002848(RI)^4

Rainfall Intensity (in/hr)	Runoff Coefficient	Synthetic Value	Variation
1	0.42	0.419672	0.000328
1.5	0.535	0.53598325	-0.00098325
2	0.615	0.612802	0.002198
2.5	0.665	0.66603875	-0.00103875
3	0.708	0.707332	0.000668
3.5	0.745	0.74404825	0.00095175
4	0.78	0.779282	0.000718

Curve #3 - North County Single Family, South Coast Agriculture

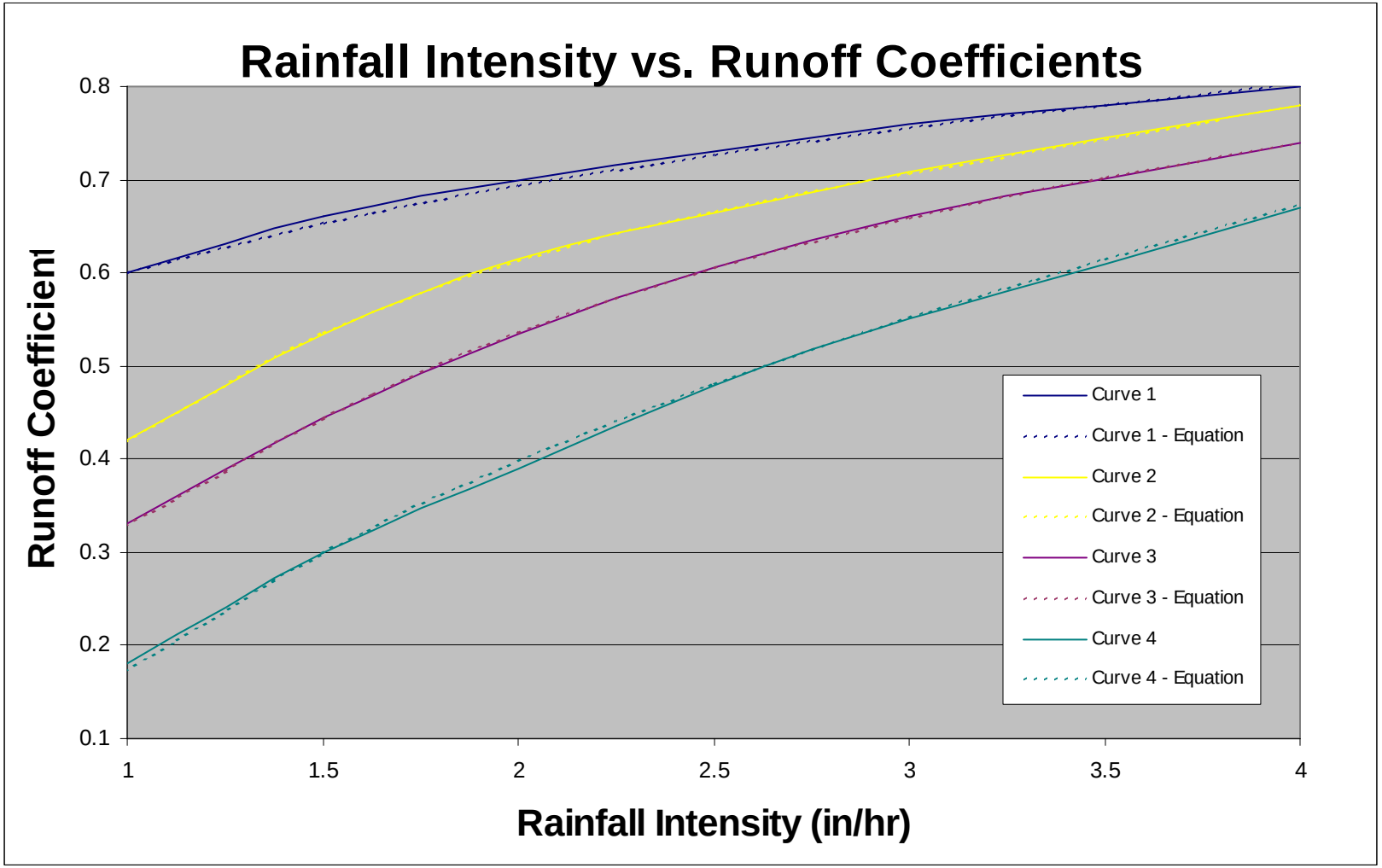
Equation: C = .004071+.3989(RI)-.07952(RI)^2+.006444(RI)^3

Rainfall Intensity (in/hr)	Runoff Coefficient	Synthetic Value	Variation
1	0.33	0.329895	0.000105
1.5	0.445	0.4452495	-0.0002495
2	0.535	0.535343	-0.000343
2.5	0.605	0.6050085	-8.5E-06
3	0.66	0.659079	0.000921
3.5	0.701	0.7023875	-0.0013875
4	0.74	0.739767	0.000233

Curve #4 - North County Agriculture

Equation: C = 1.01*(RI)^.29-.837

Rainfall Intensity (in/hr)	Runoff Coefficient	Synthetic Value	Variation
1	0.18	0.173	0.007
1.5	0.3	0.299024869	0.000975131
2	0.39	0.39786668	-0.00786668
2.5	0.48	0.480419163	-0.000419163
3	0.55	0.551949762	-0.001949762
3.5	0.61	0.615449718	-0.005449718
4	0.67	0.672797741	-0.002797741


Rainfall Intensity vs. Runoff Coefficients
Runoff Coefficient
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
1
1.5
2
2.5
3
3.5
4
Rainfall Intensity (in/hr)
Curve 1
Curve 1 - Equation
Curve 2
Curve 2 - Equation
Curve 3
Curve 3 - Equation
Curve 4
Curve 4 - Equation

Appendix C

Rainfall intensity Equations and Curves

For Siquoc

Curve Construction for Sisquoc

SBCFCD August, 2003

Area:	Sisquoc
Gage #:	256
Elevation:	420
Years of Record:	33

Depth/Duration (mins)

Duration (mins.):	15	30	45	60	75	90	105	120	135	150	165	180
Frequency (yrs):												
10	0.43	0.61	0.750188	0.88	0.98625	1.086	1.19875	1.28	1.338383	1.399428	1.463259	1.53
25	0.51	0.74	0.908477	1.07	1.18875	1.311	1.4385	1.55	1.6201	1.693369	1.769953	1.85
50	0.58	0.83	1.015754	1.2	1.335	1.476	1.60825	1.74	1.819398	1.90242	1.989229	2.08
100	0.64	0.92	1.125281	1.33	1.48125	1.632	1.79025	1.93	2.018696	2.111469	2.208505	2.31

Intensity/Duration

Duration (mins.):	15	30	45	60	75	90	105	120	135	150	165	180
Frequency (yrs):												
10	1.72	1.22	1	0.88	0.789	0.724	0.685	0.64	0.594837	0.559771	0.532094	0.51
25	2.04	1.48	1.211	1.07	0.951	0.874	0.822	0.775	0.720044	0.677348	0.643619	0.616667
50	2.32	1.66	1.354	1.2	1.068	0.984	0.919	0.87	0.808621	0.760968	0.723356	0.693333
100	2.56	1.84	1.5	1.33	1.185	1.088	1.023	0.965	0.897198	0.844587	0.803093	0.77

Synthetic Curve Values:

Duration (mins.):	15	30	45	60	75	90	105	120	135	150	165	180
Frequency (yrs):												
10	1.711732	1.227274	1.010224	0.87992781	0.790552	0.724308	0.672649	0.630889	0.59621	0.566808	0.541461	0.519313
25	2.027831	1.460981	1.206017	1.052585344	0.94715	0.868893	0.807793	0.758351	0.717257	0.682388	0.652308	0.626007
50	2.311384	1.65721	1.364124	1.188182775	1.067496	0.978046	0.908291	0.8519	0.805074	0.765371	0.731145	0.701237
100	2.555429	1.833456	1.509812	1.315458531	1.182108	1.083252	1.006148	0.943808	0.892035	0.848133	0.810283	0.777206

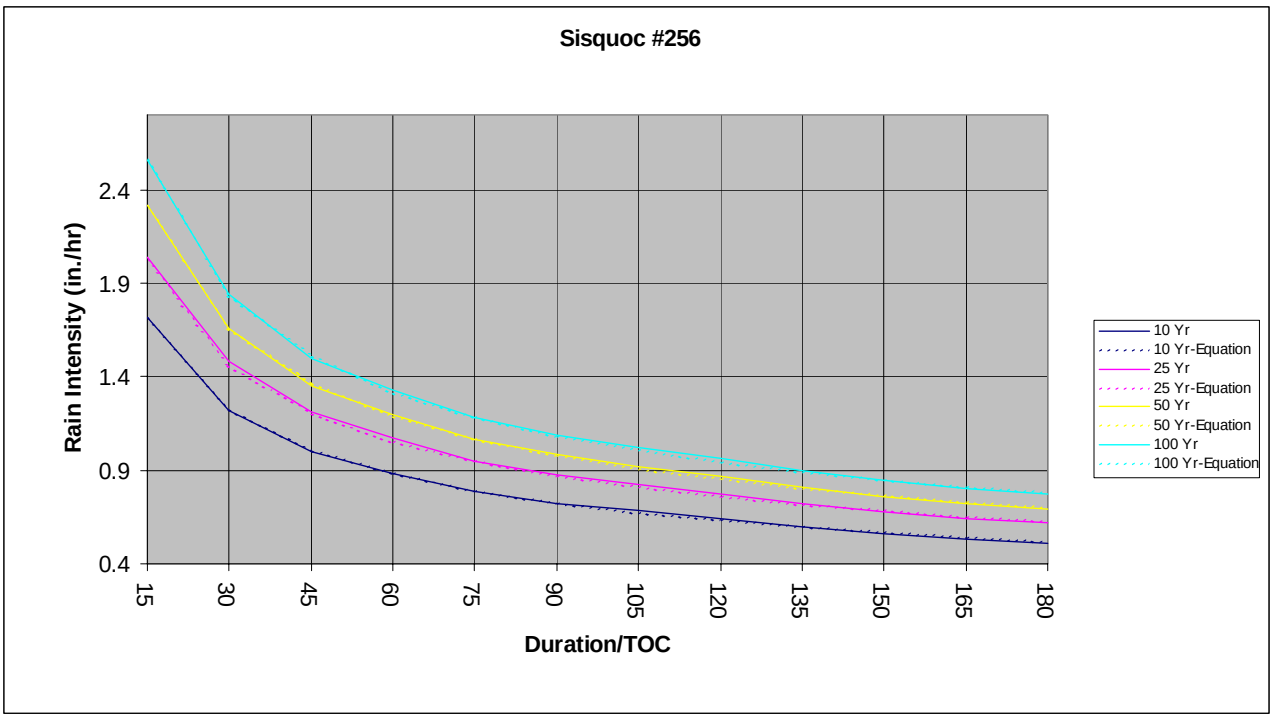
Curve Equations:

Frequency (yrs):		
10	RI = 6.28*(TOC)^-0.48	RI = Rainfall Intensity
25	RI = 7.3*(TOC)^-0.473	TOC = Time of Concentration/Storm Duration
50	RI = 8.48*(TOC)^-0.48	
100	RI = 9.35*(TOC)^-0.479	

Variation (in.):

Duration (mins.):	15	30	45	60	75	90	105	120	135	150	165	180
Frequency (yrs):												
10	-0.008268	0.007274	0.010224	-7.21904E-05	0.001552	0.000308	-0.012351	-0.009111	0.001373	0.007036	0.009367	0.009313
25	-0.012169	-0.019019	-0.004983	-0.017414656	-0.00385	-0.005107	-0.014207	-0.016649	-0.002787	0.005041	0.008689	0.00934
50	-0.008616	-0.00279	0.010124	-0.011817225	-0.000504	-0.005954	-0.010709	-0.0181	-0.003548	0.004403	0.007789	0.007904
100	-0.004571	-0.006544	0.009812	-0.014541469	-0.002892	-0.004748	-0.016852	-0.021192	-0.005164	0.003545	0.007191	0.007206

Note: "Actual" Curves taken from Santa Barbara County Flood Control District Recording Data. Data available for 15, 30, 60, 120 and 180 minutes.
Intermediate values were determined visually and by using Excel "Series" extrapolation.



Appendix D

Rational Method Calculations

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
100 Year Flow - PRE CONSTRUCTION																	
Unnamed Blueline #1 & #2																	
NNBL2-1	2A, J1	Initial Area	230	2558	9.0%		8.5	8.5	3.35	0.60	47.71	47.71	95.7				
NNBL2-2	2B, J1	Initial Area	230	1927	11.9%		7.0	7.0	3.68	0.64	23.71	23.71	55.6				
NNBL2-3	2C, J1	Initial Area	240	1874	12.8%		7.0	7.0	3.68	0.64	28.5	28.50	66.8				
Junction 1								8.5	3.35	0.62		99.92	207.2				
NNBL2-4	J1, J2	J1-J2	100	2528	4.0%	4.63	9.1	17.6	2.37	0.56	51.72	151.64	202.5	0.04	0.49		
NNBL2-5	2D, J2	Initial Area	334	3668	9.1%		11.0	11.0	2.96	0.55	78.76	78.76	127.8				
NNBL2-6	2E, J2	Initial Area	170	1481	11.5%		5.5	5.5	4.13	0.69	19.95	19.95	56.6				
Junction 2	J2							17.6	2.37	0.57		250.35	337.0				
NNBL2-7	J2,J3	J2-J3	70	2077	3.4%	8.71	4.0	21.6	2.15	0.54	54.73	305.08	355.4	0.04	1.44		
NNBL2-8	2F, J3	Initial Area	194	1325	14.7%		4.5	4.5	4.55	0.73	15.65	15.65	52.0				
NNBL2-9	2G, J3	Initial Area	120	1445	8.3%		5.5	5.5	4.13	0.69	21.99	21.99	62.4				
Junction 3	J3							21.6	2.15	0.56		342.72	412.4				
NNBL2-10	J3,J4	J3-J4	40	1433	2.8%	8.40	2.8	24.4	2.02	0.55	22.03	364.75	406.6	0.04	1.57		
NNBL1-1	1A, J4	Initial Area	410	5501	7.4%		17.2	17.2	2.39	0.46	112.2	112.20	124.6				
Junction 4	J4							24.4	2.02	0.53		476.95	511.9				
NNBL2-11	2H,J5	Initial Area	272	2184	12.4%		7.0	7.0	3.68	0.64	35.8	35.80	83.9				
NNBL2-12	2J,J5	Initial Area	192	1139	16.8%		4.0	4.0	4.81	0.76	16.24	16.24	59.1				
Junction 5	J5							7.0	3.68	0.67		52.04	129.1				
NNBL2-13	J5,J6	J5-J6	83	1700	4.9%	8.49	3.3	10.3	3.05	0.62	40.03	92.07	175.5	0.04	1.04		
NNBL2-14	2L, J6	Initial Area	275	2707	10.2%		8.5	8.5	3.35	0.60	50.68	50.68	101.6				
Junction 6								10.3	3.05	0.61		142.75	268.0				
NNBL2-15	J6,J7	J6-J7	15	1000	1.5%	6.47	2.6	12.9	2.75	0.61	13.41	156.16	260.0	0.04	1.70		
NNBL2-16	J4,J7	J4-J7	10	850	1.2%	5.93	2.4	26.8	1.94	0.53	15.71	492.66	501.3	0.04	1.78		
NNBL2-17	2M,J7	Initial Area	179	1839	9.7%		5.5	5.5	4.13	0.69	23.12	23.12	65.6				
Junction 7	J7							26.8	1.94	0.55		671.94	715.2				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Unnamed Blueline #1 & #2 (con't)																	
NNBL2-18	J7,J8	J7-J8	56	2263	2.5%	10.28	3.7	30.5	1.82	0.54	45.45	717.39	702.7	0.04	2.32		
NNBL2-19	2N,J8	Initial Area	226	2090	10.8%		6.0	6.0	3.96	0.67	27.27	27.27	72.3				
Junction 8	J8							30.5	1.82	0.54		744.66	735.9				
NNBL2-20	J8,J9	J8 to J9	54	3207	1.7%	8.93	6.0	36.5	1.67	0.53	55.98	800.64	706.7	0.04	2.52		
Unnamed Blueline #3																	
NNBL3-1	3A, J10	Initial Area	110	1349	8.2%		5.5	5.5	4.13	0.69	12.58	12.58	35.7				
NNBL3-2	3B, J10	Initial Area	70	677	10.3%		3.0	3.0	5.52	0.82	6.13	6.13	27.8				
Junction 10								5.5	4.13	0.73		18.71	56.5				
NNBL3-3	J10,J11	J10-J11	45	2263	2.0%	4.96	7.6	13.1	2.73	0.61	25.07	43.78	72.4	0.04	0.91		
NNBL3-4	3C,J11	Initial Area	55	609	9.1%		3.0	3.0	5.52	0.82	6.78	6.78	30.7				
Junction 11	J11							13.1	2.73	0.64		50.56	87.6				
NNBL3-5	J11,J12	J11-J12	84	1933	4.4%	7.82	4.1	17.2	2.39	0.56	42.5	93.06	124.0	0.04	1.01		
NNBL3-6	3D,J12	Initial Area	199	2019	9.9%		3.0	3.0	5.52	0.82	12.04	12.04	54.6				
Junction 12	J12							17.2	2.39	0.59		105.10	147.6				
NNBL3-7	J12,J13	J12-J13	66	1164	5.6%	10.37	1.9	19.1	2.28	0.57	16.97	122.07	157.7	0.04	1.27		
NNBL3-8	3E,J13	Initial Area	196	2019	9.7%		7.1	7.1	3.66	0.63	23.35	23.35	54.1				
Junction 13	J13							19.1	2.28	0.58		145.42	191.4				
NNBL3-9	J13,J14	J13-J14	15	611	2.4%	8.06	1.3	20.4	2.21	0.57	8.43	153.85	193.7	0.04	1.64		
NNBL3-10	3F,J14	Initial Area	199	1666	12.0%		5.5	5.5	4.13	0.69	16.27	16.27	46.2				
Junction 14	J14							20.4	2.21	0.58		170.12	218.4				
NNBL3-11	J14,J15	J14-J15	36	812	4.4%	9.31	1.5	21.8	2.14	0.57	15.07	185.19	224.9	0.04	1.30		
NNBL3-12	3G,J15	Initial Area	184	1808	10.2%		6.5	6.5	3.81	0.65	18.70	18.70	46.5				
Junction 15	J15							21.8	2.14	0.58		203.89	250.9				
NNBL3-13	J15, end	J15 - end	37	800	4.6%	8.84	1.5	23.3	2.07	0.57	14.11	218.00	255.0	0.04	1.16		

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Long Canyon																	
LNG CYN 1	A, J1	Initial Area	160	1162	13.8%		4.0	4.0	4.81	0.76	9.9	9.90	36.0				
LNG CYN 2	B, J1	Initial Area	120	2184	5.5%		9.0	9.0	3.26	0.59	39.82	39.82	76.2				
Junction 1								9.0	3.26	0.62		49.72	100.6				
LNG CYN 3	J1,J2	J1-J2	77	2351	3.3%	6.40	6.1	15.1	2.55	0.54	81.59	131.31	179.7	0.04	0.92		
LGN CYN 4	C,J2	Initial Area	287	1723	16.7%		6.0	6.0	3.96	0.67	23.03	23.03	61.0				
Junction 2	J2							15.1	2.55	0.56		154.34	218.9				
LGN CYN 5	J2,J3	J2-J3	8	510	1.7%	6.01	1.4	16.5	2.44	0.55	9.18	163.52	220.2	0.04	1.40		
LGN CYN 6	D,J3	Initial Area	285	2578	11.0%		8.0	8.0	3.45	0.61	33.34	33.34	70.2				
Junction 3	J3							16.5	2.44	0.56		196.86	269.8				
LGN CYN 7	J3,J4	J3-J4	33	587	5.6%	8.75	1.1	17.7	2.36	0.56	5.32	202.18	267.3	0.04	0.99		
LGN CYN 8	E,J4	Initial Area	239	1600	14.9%		7.1	7.1	3.66	0.63	18.54	18.54	43.0				
LGN CYN 9	F, J4	Initial Area	321	3298	9.7%		10.1	10.1	3.09	0.56	64.82	64.82	112.9				
Junction 4	J4							17.7	2.36	0.57		285.54	381.4				
LGN CYN 10	J4,J5	J4-J5	5	855	0.6%	5.15	2.8	20.4	2.20	0.56	18.52	304.06	373.4	0.04	2.33		
LGN CYN 11	B,J5	Initial Area	244	2033	12.0%		7.0	7.0	3.68	0.64	40.46	40.46	94.9				
Junction 5	J5							20.4	2.20	0.57		344.52	430.2				
LGN CYN 12	J5,J6	J5-J6	76	2167	3.5%	9.29	3.9	24.3	2.03	0.54	64.42	408.94	448.3	0.04	1.53		
LGN CYN 13	G,J6	Initial Area	320	1808	17.7%		5.2	5.2	4.24	0.70	72.61	72.61	215.4				
Junction 6	J6							24.3	2.03	0.56		481.55	551.2				
LGN CYN 14	J6,J7	J6-J7	17	1415	1.2%	6.64	3.6	27.9	1.90	0.55	52.08	533.63	553.9	0.04	2.09		
LGN CYN 15	H,J7	Initial Area	267	2128	12.5%		6.5	6.5	3.81	0.65	40.85	40.85	101.6				
LGN CYN 16	J, J7	Initial Area	168	1166	14.4%		5.5	5.5	4.13	0.69	8.66	8.66	24.6				
Junction 7	J7							27.9	1.90	0.56		583.14	615.8				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Long Canyon (con't)																	
LGN CYN 17	J7,J8	J7-J8	23	1308	1.8%	8.51	2.6	30.4	1.82	0.54	37.96	621.10	615.6	0.04	2.25		
LGN CYN 18	J,J8	Initial Area	191	1828	10.5%		6.5	6.5	3.81	0.65	22.38	22.38	55.7				
Junction 8	J8							30.4	1.82	0.55		643.48	642.2				
LGN CYN 19	J8,J9	J8-J9	40	1341	3.0%	9.61	2.3	32.8	1.76	0.53	46.44	689.92	648.7	0.04	1.82		
LGN CYN 20	K,J9	Initial Area	200	1806	11.1%		6.4	6.4	3.84	0.66	21.61	21.61	54.4				
Junction 9	J9							32.8	1.76	0.54		711.53	673.6				
LGN CYN 21	J9,J10	J9-J10	15	693	2.2%	9.21	1.3	34.0	1.73	0.53	20.72	732.25	674.0	0.04	2.15		
LGN CYN 22	L,J10	Initial Area	135	1428	9.5%		5.5	5.5	4.13	0.69	23.15	23.15	65.7				
Junction 10	J10							34.0	1.73	0.54		755.40	701.4				
LGN CYN 23	J10,J11	J10-J11	25	847	2.9%	10.56	1.3	35.3	1.69	0.53	20.28	775.68	700.3	0.04	2.14		
LGN CYN 24	M,J11	Initial Area	187	1482	12.6%		4.9	4.9	4.37	0.71	16.4	16.40	51.0				
Junction 11	J11							35.3	1.69	0.54		792.08	720.1				
LGN CYN 25	J11,J12	J11-J12	70	2087	3.4%	12.19	2.9	38.2	1.63	0.52	52.63	844.71	721.9	0.04	2.39		
LGN CYN 26	N,J12	Initial Area	200	1850	10.8%		6.2	6.2	3.90	0.66	21.56	21.56	55.7				
Junction 12	J12							38.2	1.63	0.53		866.27	745.2				
LGN CYN 27	J12, END	J12-END	30	1246	2.4%	10.99	1.9	40.1	1.60	0.52	26.06	892.33	741.5	0.04	2.62		

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon																	
OLV CYN 1	A, J1	Initial Area	185	2042	9.1%		8.0	8.0	3.45	0.61	33.14	33.14	69.8				
OLV CYN 2	B, J1	Initial Area	161	1575	10.2%		5.8	5.8	4.03	0.68	19.71	19.71	53.7				
Junction 1								8.0	3.45	0.63		52.85	115.8				
OLV CYN 3	J1,J2	J1-J2	84	2033	4.1%	8.11	4.2	12.2	2.82	0.58	46.79	99.64	164.4	0.04	1.11		
OLV CYN 4	B,J2	Initial Area	244	1723	14.2%		5.0	5.0	4.33	0.71	31.97	31.97	97.8				
Junction 2	J2							12.2	2.82	0.61		131.61	228.3				
OLV CYN 5	J2,J3	J2-J3	61	1762	3.5%	8.56	3.4	15.6	2.51	0.58	44.86	176.47	256.9	0.04	1.37		
OLV CYN 6	C,J3	Initial Area	313	3437	9.1%		10.1	10.1	3.09	0.56	63.01	63.01	109.7				
Junction 3	J3							15.6	2.51	0.58		239.48	345.9				
OLV CYN 7	J3,J4	J3-J4	40	902	4.4%	11.04	1.4	17.0	2.41	0.57	8.79	248.27	342.2	0.04	1.67		
OLV CYN 8	D,J4	Initial Area	330	4367	7.6%		13.0	13.0	2.74	0.52	72.00	72.00	101.6				
OLV CYN 9	E, J4	Initial Area	197	2861	6.9%		10.1	10.1	3.09	0.56	53.94	53.94	93.9				
Junction 4	J4							17.0	2.41	0.56		374.21	504.8				
OLV CYN 10	J4,J5	J4-J5	13	917	1.4%	7.90	1.9	18.9	2.29	0.55	18.75	392.96	498.6	0.04	2.37		
OLV CYN 11	F,J5	Initial Area	333	3924	8.5%		12.0	12.0	2.84	0.53	57.52	57.52	86.8				
Junction 5	J5							18.9	2.29	0.55		450.48	568.4				
OLV CYN 12	J5,J6	J5-J6	17	402	4.2%	12.26	0.5	19.4	2.26	0.55	23.30	473.78	583.9	0.04	2.03		
OLV CYN 13	G,J6	Initial Area	239	2895	8.3%		9.5	9.5	3.18	0.58	79.32	79.32	145.2				
Junction 6	J6							19.4	2.26	0.55		553.10	686.9				
OLV CYN 14	J6,J7	J6-J7	21	1598	1.3%	7.88	3.4	22.8	2.09	0.54	57.77	610.87	686.1	0.04	2.47		
OLV CYN 15	H,J7	Initial Area	221	2289	9.7%		7.0	7.0	3.68	0.64	34.70	34.70	81.4				
Junction 7	J7							22.8	2.09	0.54		645.57	732.3				
OLV CYN 16	J7,J8	J7-J8	59	1849	3.2%	11.71	2.6	25.5	1.98	0.53	64.56	710.13	745.6	0.04	2.35		
OLV CYN 17	J, J8	Initial Area	168	1166	14.4%		5.5	5.5	4.13	0.69	19.74	19.74	56.0				
Junction 8	J8							25.5	1.98	0.53		729.87	772.5				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon (con't)																	
OLV CYN B1	BA, J12	Initial Area	319	4102	7.8%		14.0	14.0	2.64	0.50	117.13	117.13	155.2				
OLV CYN B2	BB, J12	Initial Area	200	1335	15.0%		4.4	4.4	4.60	0.74	12.59	12.59	42.6				
Junction 12								14.0	2.64	0.52		129.72	179.6				
OLV CYN B3	J12,J13	J12-J13	80	2102	3.8%	8.78	4.0	18.0	2.34	0.51	48.49	178.21	211.1	0.04	1.33		
OLV CYN B4	BB, J13	Initial Area	280	2943	9.5%		9.0	9.0	3.26	0.59	53.73	53.73	102.8				
OLV CYN B5	BC, J13	Initial Area	70	980	7.1%		4.5	4.5	4.55	0.73	11.00	11.00	36.5				
Junction 13	J13							18.0	2.34	0.53		242.94	303.7				
OLV CYN B6	J13,J14	J13-J14	5	980	0.5%	4.53	3.6	21.6	2.15	0.53	8.92	251.86	286.3	0.04	2.22		
OLV CYN B7	BD, J14	Initial Area	235	1682	14.0%		5.5	5.5	4.13	0.69	21.83	21.83	62.0				
Junction 14	J14							21.6	2.15	0.54		273.69	318.5				
OLV CYN B8	J14,J15	J14-J15	45	1734	2.6%	8.78	3.3	24.9	2.00	0.52	42.44	316.13	331.5	0.04	1.77		
OLV CYN B9	BE, J15	Initial Area	288	2927	9.8%		8.6	8.6	3.34	0.60	43.38	43.38	86.1				
OLV CYN B10	BF, J15	Initial Area	130	1555	8.4%		6.8	6.8	3.73	0.64	16.5	16.50	39.6				
Junction 15	J15							24.9	2.00	0.54		376.01	404.5				
OLV CYN B11	J15,J16	J15-J16	30	651	4.6%	11.56	0.9	25.8	1.97	0.53	9.39	385.40	404.7	0.04	1.74		
OLV CYN B12	BG, J16	Initial Area	280	2261	12.4%		7.0	7.0	3.68	0.64	29.51	29.51	69.2				
Junction 16	J16							25.8	1.97	0.54		414.91	441.7				
OLV CYN B13	J16,J9	J16-J9	40	1905	2.1%	8.86	3.6	29.4	1.85	0.53	28.82	443.73	434.8	0.04	2.10		
OLV CYN B14	BH, J9	Initial Area	158	2489	6.3%		7.0	7.0	3.68	0.64	24.93	24.93	58.5				
OLV CYN 18	J8,J9	J8-J9	40	1623	2.5%	10.59	2.6	28.0	1.89	0.38	39.08	768.95	551.6	0.04	2.44		
Junction 9	J9							29.4	1.85	0.44		1237.61	1003.1				
OLV CYN 19	J9,J10	J9-J10	40	939	4.3%	13.68	1.1	30.6	1.82	0.44	14.42	1252.03	994.5	0.04	2.37		
OLV CYN 20	K, J10	Initial Area	160	1521	10.5%		5.8	5.8	4.03	0.68	14.88	14.88	40.5				
OLV CYN 21	BF, J10	Initial Area	240	4599	5.2%		16.0	16.0	2.48	0.48	45.78	45.78	54.1				
Junction 10	J10							30.6	1.82	0.44		1312.69	1052.4				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon (con't)																	
OLV CYN A1	AA, J18	Initial Area	270	3259	8.3%		10.2	10.2	3.07	0.56	33.42	33.42	57.7				
OLV CYN A2	AB, J18	Initial Area	170	2265	7.5%		8.1	8.1	3.43	0.61	24.49	24.49	51.1				
Junction 18	J18							10.2	3.07	0.58		57.91	103.4				
OLV CYN A3	J18,J19	J18-J19	53	780	6.8%	9.60	1.4	11.6	2.90	0.57	14.51	72.42	120.0	0.04	0.98		
OLV CYN A4	AC, J19	Initial Area	133	1216	10.9%		4.6	4.6	4.50	0.73	10.78	10.78	35.2				
Junction 19	J19							11.6	2.90	0.59		83.20	142.7				
OLV CYN 22	J10,J11	J10-J11	47	1472	3.2%	12.41	2.0	13.5	2.68	0.44	15.63	1328.32	1576.0	0.04	2.56		
OLV CYN A5	J19,J11	J19-J11	34	512	6.6%	10.25	0.8	26.7	1.94	0.59	2.49	85.69	97.5	0.04	1.11		
Junction 11	J11							26.7	1.94	0.45		1414.01	1236.3				
Cat Canyon																	
CAT CYN 1	A, J1	Initial Area	220	3939	5.6%		14.0	14.0	2.64	0.50	164.76	164.76	218.3				
CAT CYN 2	B, J1	Initial Area	240	3214	7.5%		11.0	11.0	2.96	0.55	82.64	82.64	134.1				
Junction 1								14.0	2.64	0.52		247.40	337.7				
CAT CYN 3	J1,J2	J1-J2	30	1061	2.9%	9.24	1.9	29.9	1.84	0.50	37.57	284.97	260.0	0.04	1.77		
CAT CYN 4	C,J2	Initial Area	273	4399	6.2%		14.0	14.0	2.64	0.50	177.26	177.26	234.8				
Junction 2	J2							29.9	1.84	0.50		462.23	423.2				
CAT CYN 5	J2,J3	J2-J3	40	2528	1.6%	7.42	5.7	35.6	1.69	0.48	68.72	530.95	428.8	0.04	1.99		
CAT CYN 6	D,J3	Initial Area	300	5119	5.9%		16.0	16.0	2.48	0.48	106.30	106.30	125.6				
CAT CYN 7	E, J3	Initial Area	318	3649	8.7%		11.0	11.0	2.96	0.55	93.88	93.88	152.3				
Junction 3	J3							35.6	1.69	0.49		731.13	601.2				
CAT CYN 8	J3,J4	J3-J4	30	2536	1.2%	7.28	5.8	41.4	1.57	0.47	86.11	817.24	601.8	0.04	2.41		
CAT CYN 9	F,J4	Initial Area	300	6775	4.4%		23.0	23.0	2.08	0.41	209.62	209.62	180.0				
Junction 4	J4							41.4	1.57	0.46		1026.86	737.6				
CAT CYN 10	J4,J5	J4-J5	20	1868	1.1%	7.36	4.2	45.6	1.50	0.44	90.94	1117.80	744.8	0.04	2.64		
CAT CYN 11	G,J5	Initial Area	190	6195	3.1%		25.0	25.0	2.00	0.40	238.85	238.85	190.2				
Junction 5	J5							45.6	1.50	0.44		1356.65	887.3				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 12	J5,J6	J5-J6	10	655	1.5%	8.81	1.2	46.9	1.48	0.43	21.49	1378.14	885.4	0.04	2.65		
CAT CYN 13	H,J6	Initial Area	380	4546	8.4%		13.0	13.0	2.74	0.52	130.52	130.52	184.1				
Junction 6	J6							46.9	1.48	0.44		1508.66	985.0				
CAT CYN 14	J6,J7	J6-J7	10	1376	0.7%	7.02	3.3	50.1	1.43	0.43	77.69	1586.35	985.4	0.04	3.29		
CAT CYN 15	J,J7	Initial Area	670	6984	9.6%		17.0	17.0	2.41	0.47	383.83	383.83	430.5				
Junction 7	J7							50.1	1.43	0.44		1970.18	1241.8				
CAT CYN 16	J7,J8	J7-J8	29	1894	1.5%	9.82	3.2	53.4	1.39	0.43	114.13	2084.31	1249.0	0.04	3.12		
CAT CYN 17	K, J8	Initial Area	249	4534	5.5%		16.0	16.0	2.48	0.48	134.68	134.68	159.2				
Junction 8	J8							53.4	1.39	0.43		2218.99	1338.4				
CAT CYN 19A	L, J9A	Initial Area	620	4845	12.8%		11.5	11.5	2.90	0.54	173.73	173.73	271.6				
CAT CYN 19B	M, J9A	Initial Area	730	4642	15.7%		10.0	10.0	3.10	0.57	165.79	165.79	291.0				
Junction J9A								11.5	2.90	0.55		339.52	543.8				
CAT CYN 19	J9A,J9	J9A-J9	60	1352	4.4%	11.93	1.9	13.4	2.70	0.55	21.14	360.66	534.7	0.04	1.88		
CAT CYN 18	J8,J9	J8-J9	11	1514	0.7%	7.59	3.3	56.7	1.35	0.43	50.58	2269.57	1318.3	0.04	3.68		
CAT CYN 20	N, J9	Initial Area	340	3649	9.3%		11.5	11.5	2.90	0.54	112.02	112.02	175.1				
Junction 9	J9A,J9							56.7	1.35	0.45		2742.25	1667.7				
CAT CYN 21	J9,J10	J9-J10	3	1019	0.3%	5.98	2.8	59.5	1.32	0.45	57.78	2800.03	1648.8	0.04	4.62		
CAT CYN 22	P,J10	Initial Area	383	3985	9.6%		11.0	11.0	2.96	0.55	70.08	70.08	113.7				
CAT CYN 23	Q, J10	Initial Area	463	2941	15.8%		7.5	7.5	3.56	0.62	43.22	43.22	95.9				
Junction 10	J10							59.5	1.32	0.45		2913.33	1735.0				
CAT CYN 24	J10,J11	J10-J11	17	3052	0.6%	7.50	6.8	66.3	1.25	0.44	190.84	3104.17	1705.4	0.04	4.45		
CAT CYN 25	R, J11	Initial Area	360	4534	7.9%		13.0	13.0	2.74	0.52	265.59	265.59	374.6				
Junction 11	J11							66.3	1.25	0.44		3369.76	1877.0				
CAT CYN 27A	S, J13	Initial Area	255	3361	7.6%		11.0	11.0	2.96	0.55	93.86	93.86	152.3				
CAT CYN 27B	T, J13	Initial Area	285	3505	8.1%		10.8	10.8	2.99	0.55	116.31	116.31	191.6				
Junction 13								11.0	2.96	0.55		210.17	342.2				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 27	J13,J12	J13-J12	84	2211	3.8%	10.38	3.6	14.6	2.59	0.54	54.66	264.83	369.3	0.04	1.71		
CAT CYN 26	J11,J12	J11-J12	19	951	2.0%	12.30	1.3	67.6	1.24	0.44	69.68	3439.44	1880.5	0.04	3.62		
Junction 12	J12							67.6	1.24	0.45		3704.27	2057.4				
CAT CYN 28	J12,J14	J12-J14	11	1237	0.9%	9.43	2.2	69.8	1.22	0.44	87.79	3792.06	2051.4	0.04	4.39		
CAT CYN 29	U, J14	Initial Area	670	7044	9.5%		16.0	16.0	2.48	0.48	234.44	234.44	277.1				
Junction 14	J14							69.8	1.22	0.44		4026.50	2188.3				
CAT CYN 30	J14,J15	J14-J15	30	3444	0.9%	9.49	6.0	75.8	1.18	0.43	351.98	4378.48	2194.5	0.04	4.51		
CAT CYN 31	V, J15	Initial Area	430	3590	12.0%		9.8	9.8	3.13	0.57	48.77	48.77	87.0				
Junction 15	J15							75.8	1.18	0.43		4427.25	2227.2				
CAT CYN 34A1	W, J24	Initial Area	510	5459	9.3%		14.0	14.0	2.64	0.50	197.82	197.82	262.1				
CAT CYN 34A2	X, J24	Initial Area	600	4145	14.5%		10.0	10.0	3.10	0.57	162.07	162.07	284.5				
Junction 24	J24							14.0	2.64	0.53		359.89	504.2				
CAT CYN 34A	J24,J25	J24-J25	70	1145	6.1%	13.67	1.4	15.4	2.52	0.53	32.03	391.92	520.9	0.04	1.81		
CAT CYN 34B	Y, J25	Initial Area	470	2833	16.6%		7.0	7.0	3.68	0.64	68.33	68.33	160.2				
Junction 25	J25							15.4	2.52	0.54		460.25	630.7				
CAT CYN 32	J15,J16	J15-J16	17	1797	0.9%	9.77	3.1	78.9	1.15	0.43	49.63	4476.88	2197.7	0.04	4.42		
CAT CYN 34	J25,J16	J25-J16	87	2170	4.0%	12.34	2.9	18.3	2.32	0.54	44.65	504.90	627.1	0.04	2.13		
CAT CYN 33	Z, J16	Initial Area	417	2959	14.1%		7.5	7.5	3.56	0.62	49.02	49.02	108.7				
Junction 16	J16							78.9	1.15	0.44		5030.80	2544.5				
CAT CYN 36A	AA, BA	Initial Area	296	1711	17.3%		5.0	5.0	4.33	0.71	30.36	30.36	92.9				
CAT CYN 36	BA, J17	BA-J17	154	1597	9.6%	10.65	2.5	7.5	3.56	0.67	23.84	54.20	129.4	0.04	0.89		
CAT CYN 35	J16,J17	J16-J17	13	1249	1.0%	10.46	2.0	80.9	1.14	0.44	51.89	5082.69	2526.9	0.04	4.57		
Junction 17	J17							80.9	1.14	0.44		5136.89	2592.8				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 38A	AB, J26	Initial Area	489	3020	16.2%		8.0	8.0	3.45	0.61	46.04	46.04	97.0				
CAT CYN 38B	X, J26	Initial Area	689	4780	14.4%		11.0	11.0	2.96	0.55	173.56	173.56	281.6				
CAT CYN 38C	AC, J26	Initial Area	536	4388	12.2%		10.5	10.5	3.03	0.56	137.55	137.55	231.9				
Junction 26	J26							11.0	2.96	0.56		357.15	591.6				
CAT CYN 37	J17,J18	J17-J18	20	2450	0.8%	9.67	4.2	85.1	1.11	0.44	129.3	5266.19	2559.8	0.04	4.87		
CAT CYN 38	J26,J18	J26-J18	101	2671	3.8%	11.80	3.8	14.8	2.57	0.55	50.69	407.84	577.8	0.04	2.08		
Junction 18	J18							85.1	1.11	0.45		5674.03	2809.6				
CAT CYN 40A1-	AA, BB	Initial Area	270	1253	21.5%		3.5	3.5	5.13	0.79	14.93	14.93	60.2				
CAT CYN 40A1	BB, J28	BB-J28	109	1038	10.5%	9.91	1.7	5.2	4.23	0.75	9.83	24.76	78.6	0.04	0.75		
CAT CYN 40A2	AA,J28	Initial Area	379	3110	12.2%		9.5	9.5	3.18	0.58	82.62	82.62	151.3				
Junction 28	J28							9.5	3.18	0.73		107.38	247.7				
CAT CYN 40B1	AD, BC	Initial Area	288	2356	12.2%		7.5	7.5	3.56	0.62	40.60	40.60	90.1				
CAT CYN 40B	BC, J27	BC-J27	72	884	8.1%	9.99	1.5	9.0	3.27	0.62	8.4	49.00	98.8	0.04	0.91		
CAT CYN 40A	J28,J27	J28-J27	51	716	7.1%	12.12	1.0	10.5	3.03	0.71	12.06	119.44	256.6	0.04	1.35		
Junction 27	J27							10.5	3.03	0.83		168.44	425.0				
CAT CYN 40	J27,J19	J27-J19	40	688	5.8%	12.77	0.9	11.4	2.92	0.82	8.17	176.61	421.5	0.04	1.69		
CAT CYN 39	J18,J19	J18-J19	2	407	0.5%	8.15	0.8	85.9	1.11	0.44	7.45	5681.48	2798.2	0.04	5.52		
CAT CYN 41	AF, J19	Initial Area	550	4587	12.0%		12.0	12.0	2.84	0.53	123.12	123.12	185.8				
Junction 19	J19							85.9	1.11	0.46		5981.21	3030.5				
CAT CYN 43A	AG, BD	Initial Area	269	1114	24.2%		3.2	3.2	5.36	0.81	8.20	8.20	35.4				
CAT CYN 43	BD, J20	BD-J20	101	1290	7.8%	7.75	2.8	6.0	3.97	0.71	19.88	28.08	79.1	0.04	0.64		
CAT CYN 42	J19,J20	J19-J20	20	1262	1.6%	12.88	1.6	87.6	1.10	0.46	44.86	6026.07	3013.2	0.04	4.55		
Junction 20	J20							87.6	1.10	0.46		6054.15	3042.4				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 45A	AE, BE	Initial Area	282	1507	18.7%		4.3	4.3	4.65	0.74	18.48	18.48	63.6				
CAT CYN 45	BE, J21	BE-J21	108	1389	7.8%	8.99	2.6	6.9	3.71	0.70	10.43	28.91	75.6	0.04	0.81		
CAT CYN 44	J20,J21	J20-J21	10	1002	1.0%	10.77	1.6	89.1	1.09	0.45	108.43	6162.58	3040.3	0.04	4.93		
Junction 21	J21							89.1	1.09	0.45		6191.49	3062.4				
CAT CYN 47	AH, J22	Initial Area	403	3026	13.3%		8.2	8.2	3.41	0.60	48.73	48.73	100.6				
CAT CYN 46	J21,J22	J21-J22	10	1413	0.7%	9.48	2.5	91.6	1.07	0.45	125.08	6316.57	3048.4	0.04	5.26		
Junction 22	J22							91.6	1.07	0.45		6365.30	3080.1				
CAT CYN 49B1	AK, J29	Initial Area	165	1003	16.5%		3.1	3.1	5.44	0.81	13.36	13.36	59.1				
CAT CYN 49B	AL, J29		35	417	8.4%	9.08	0.8	3.9	4.89	0.80	5.53	18.89	73.8	0.04	0.77		
CAT CYN 49A	AJ, J29	Initial Area	330	2263	14.6%		6.1	6.1	3.93	0.67	43.14	43.14	112.9				
Junction 29	J29							6.1	3.93	0.71		62.03	172.2				
CAT CYN 49	J29,J23	J29-J23	120	2116	5.7%	10.17	3.5	9.6	3.17	0.66	37.43	99.46	207.0	0.04	1.23		
CAT CYN 48	J22,J23	J22-J23	50	4302	1.2%	11.52	6.2	97.8	1.04	0.44	286.36	6651.66	3039.7	0.04	4.86		
CAT CYN 50	AF, J23	Initial Area	640	8530	7.5%		12.0	12.0	2.84	0.53	243.99	243.99	368.1				
Junction 23	J23							97.8	1.04	0.45		6995.11	3242.3				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
50 Year Flow - PRE CONSTRUCTION																	
Unnamed Blueline #1 & #2																	
NNBL2-1	2A, J1	Initial Area	230	2558	9.0%		8.5	8.5	3.04	0.56	47.71	47.71	80.6				
NNBL2-2	2B, J1	Initial Area	230	1927	11.9%		7.0	7.0	3.33	0.59	23.71	23.71	47.0				
NNBL2-3	2C, J1	Initial Area	240	1874	12.8%		7.0	7.0	3.33	0.59	28.5	28.50	56.5				
Junction 1								8.5	3.04	0.58		99.92	174.9				
NNBL2-4	J1, J2	J1-J2	100	2528	4.0%	4.31	9.8	18.3	2.10	0.52	51.72	151.64	166.4	0.04	0.44		
NNBL2-5	2D, J2	Initial Area	334	3668	9.1%		11.0	11.0	2.68	0.51	78.76	78.76	107.2				
NNBL2-6	2E, J2	Initial Area	170	1481	11.5%		5.5	5.5	3.74	0.64	19.95	19.95	48.1				
Junction 2	J2							18.3	2.10	0.53		250.35	277.4				
NNBL2-7	J2,J3	J2-J3	70	2077	3.4%	8.29	4.2	22.5	1.90	0.50	54.73	305.08	291.0	0.04	1.34		
NNBL2-8	2F, J3	Initial Area	194	1325	14.7%		4.5	4.5	4.12	0.69	15.65	15.65	44.2				
NNBL2-9	2G, J3	Initial Area	120	1445	8.3%		5.5	5.5	3.74	0.64	21.99	21.99	53.0				
Junction 3	J3							22.5	1.90	0.52		342.72	338.4				
NNBL2-10	J3,J4	J3-J4	40	1433	2.8%	7.99	3.0	25.4	1.79	0.51	22.03	364.75	332.9	0.04	1.46		
NNBL1-1	1A, J4	Initial Area	410	5501	7.4%		17.2	17.2	2.16	0.43	112.2	112.20	103.6				
Junction 4	J4							25.4	1.79	0.49		476.95	418.7				
NNBL2-11	2H,J5	Initial Area	272	2184	12.4%		7.0	7.0	3.33	0.59	35.8	35.80	71.0				
NNBL2-12	2J,J5	Initial Area	192	1139	16.8%		4.0	4.0	4.36	0.71	16.24	16.24	50.3				
Junction 5	J5							7.0	3.33	0.63		52.04	109.4				
NNBL2-13	J5,J6	J3-J4	83	1700	4.9%	8.08	3.5	10.5	2.74	0.58	40.03	92.07	146.7	0.04	0.97		
NNBL2-14	2L, J6	Initial Area	275	2707	10.2%		8.5	8.5	3.04	0.56	50.68	50.68	85.7				
Junction 6								10.5	2.74	0.57		142.75	224.1				
NNBL2-15	J6,J7	J6-J7	15	1000	1.5%	6.16	2.7	13.2	2.46	0.56	13.41	156.16	216.3	0.04	1.58		
NNBL2-16	J4,J7	J4-J7	10	850	1.2%	5.65	2.5	27.9	1.71	0.48	15.71	492.66	409.5	0.04	1.65		
NNBL2-17	2M,J7	Initial Area	179	1839	9.7%		5.5	5.5	3.74	0.64	23.12	23.12	55.7				
Junction 7	J7							27.9	1.71	0.51		671.94	586.0				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Unnamed Blueline #1 & #2 (con't)																	
NNBL2-18	J7,J8	J7-J8	56	2263	2.5%	9.78	3.9	31.8	1.61	0.50	45.45	717.39	574.4	0.04	2.15		
NNBL2-19	2N,J8	Initial Area	226	2090	10.8%		6.0	6.0	3.59	0.63	27.27	27.27	61.3				
Junction 8	J8							31.8	1.61	0.50		744.66	601.9				
NNBL2-20	J8,J9	J8 to J9	54	3207	1.7%	8.51	6.3	38.1	1.48	0.49	55.98	800.64	576.4	0.04	2.34		
Unnamed Blueline #3																	
NNBL3-1	3A, J10	Initial Area	110	1349	8.2%		5.5	5.5	3.74	0.64	12.58	12.58	30.3				
NNBL3-2	3B, J10	Initial Area	70	677	10.3%		3.0	3.0	5.00	0.77	6.13	6.13	23.8				
Junction 10								5.5	3.74	0.69		18.71	48.1				
NNBL3-3	J10,J11	J10-J11	45	2263	2.0%	4.72	8.0	13.5	2.43	0.56	25.07	43.78	59.9	0.04	0.85		
NNBL3-4	3C,J11	Initial Area	55	609	9.1%		3.0	3.0	5.00	0.77	6.78	6.78	26.3				
Junction 11	J11							13.5	2.43	0.59		50.56	72.7				
NNBL3-5	J11,J12	J11-J12	84	1933	4.4%	7.44	4.3	17.8	2.13	0.51	42.5	93.06	101.6	0.04	0.93		
NNBL3-6	3D,J12	Initial Area	199	2019	9.9%		3.0	3.0	5.00	0.77	12.04	12.04	46.6				
Junction 12	J12							17.8	2.13	0.54		105.10	121.4				
NNBL3-7	J12,J13	J12-J13	66	1164	5.6%	9.86	2.0	19.8	2.02	0.52	16.97	122.07	129.3	0.04	1.18		
NNBL3-8	3E,J13	Initial Area	196	2019	9.7%		7.1	7.1	3.31	0.59	23.35	23.35	45.8				
Junction 13	J13							19.8	2.02	0.53		145.42	157.3				
NNBL3-9	J13,J14	J13-J14	15	611	2.4%	7.66	1.3	21.1	1.96	0.53	8.43	153.85	158.9	0.04	1.52		
NNBL3-10	3F,J14	Initial Area	199	1666	12.0%		5.5	5.5	3.74	0.64	16.27	16.27	39.2				
Junction 14	J14							21.1	1.96	0.54		170.12	179.5				
NNBL3-11	J14,J15	J14-J15	36	812	4.4%	8.86	1.5	22.6	1.90	0.52	15.07	185.19	184.4	0.04	1.21		
NNBL3-12	3G,J15	Initial Area	184	1808	10.2%		6.5	6.5	3.45	0.61	18.70	18.70	39.4				
Junction 15	J15							22.6	1.90	0.53		203.89	206.0				
NNBL3-13	J15, end	J15 - end	37	800	4.6%	8.41	1.6	24.2	1.84	0.52	14.11	218.00	208.9	0.04	1.07		

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Long Canyon																	
LNG CYN 1	A, J1	Initial Area	160	1162	13.8%		4.0	4.0	4.36	0.71	9.9	9.90	30.7				
LNG CYN 2	B, J1	Initial Area	120	2184	5.5%		9.0	9.0	2.95	0.55	39.82	39.82	64.2				
Junction 1								9.0	2.95	0.58		49.72	85.0				
LNG CYN 3	J1,J2	J1-J2	77	2351	3.3%	6.08	6.4	15.4	2.28	0.50	81.59	131.31	148.5	0.04	0.86		
LGN CYN 4	C,J2	Initial Area	287	1723	16.7%		6.0	6.0	3.59	0.63	23.03	23.03	51.7				
Junction 2	J2							15.4	2.28	0.52		154.34	181.3				
LGN CYN 5	J2,J3	J2-J3	8	510	1.7%	5.72	1.5	16.9	2.18	0.51	9.18	163.52	182.1	0.04	1.30		
LGN CYN 6	D,J3	Initial Area	285	2578	11.0%		8.0	8.0	3.13	0.57	33.34	33.34	59.2				
Junction 3	J3							16.9	2.18	0.52		196.86	223.4				
LGN CYN 7	J3,J4	J3-J4	33	587	5.6%	8.33	1.2	18.1	2.11	0.52	5.32	202.18	221.0	0.04	0.92		
LGN CYN 8	E,J4	Initial Area	239	1600	14.9%		7.1	7.1	3.31	0.59	18.54	18.54	36.3				
LGN CYN 9	F, J4	Initial Area	321	3298	9.7%		10.1	10.1	2.79	0.52	64.82	64.82	94.9				
Junction 4	J4							18.1	2.11	0.52		285.54	315.9				
LGN CYN 10	J4,J5	J4-J5	5	855	0.6%	4.90	2.9	21.0	1.97	0.52	18.52	304.06	308.4	0.04	2.16		
LGN CYN 11	B,J5	Initial Area	244	2033	12.0%		7.0	7.0	3.33	0.59	40.46	40.46	80.2				
Junction 5	J5							21.0	1.97	0.53		344.52	355.7				
LGN CYN 12	J5,J6	J5-J6	76	2167	3.5%	8.84	4.1	25.1	1.81	0.50	64.42	408.94	368.7	0.04	1.42		
LGN CYN 13	G,J6	Initial Area	320	1808	17.7%		5.2	5.2	3.84	0.66	72.61	72.61	182.9				
Junction 6	J6							25.1	1.81	0.52		481.55	454.6				
LGN CYN 14	J6,J7	J6-J7	17	1415	1.2%	6.31	3.7	28.8	1.69	0.50	52.08	533.63	455.1	0.04	1.94		
LGN CYN 15	H,J7	Initial Area	267	2128	12.5%		6.5	6.5	3.45	0.61	40.85	40.85	86.0				
LGN CYN 16	J, J7	Initial Area	168	1166	14.4%		5.5	5.5	3.74	0.64	8.66	8.66	20.9				
Junction 7	J7							28.8	1.69	0.51		583.14	506.6				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Long Canyon (con't)																	
LGN CYN 17	J7,J8	J7-J8	23	1308	1.8%	8.09	2.7	31.5	1.62	0.50	37.96	621.10	505.3	0.04	2.08		
LGN CYN 18	J,J8	Initial Area	191	1828	10.5%		6.5	6.5	3.45	0.61	22.38	22.38	47.1				
Junction 8	J8							31.5	1.62	0.51		643.48	527.4				
LGN CYN 19	J8,J9	J8-J9	40	1341	3.0%	9.14	2.4	34.0	1.56	0.49	46.44	689.92	531.4	0.04	1.69		
LGN CYN 20	K,J9	Initial Area	200	1806	11.1%		6.4	6.4	3.48	0.61	21.61	21.61	46.1				
Junction 9	J9							34.0	1.56	0.50		711.53	552.1				
LGN CYN 21	J9,J10	J9-J10	15	693	2.2%	8.76	1.3	35.3	1.53	0.49	20.72	732.25	551.8	0.04	1.99		
LGN CYN 22	L,J10	Initial Area	135	1428	9.5%		5.5	5.5	3.74	0.64	23.15	23.15	55.8				
Junction 10	J10							35.3	1.53	0.50		755.40	574.7				
LGN CYN 23	J10,J11	J10-J11	25	847	2.9%	10.04	1.4	36.7	1.50	0.49	20.28	775.68	573.2	0.04	1.98		
LGN CYN 24	M,J11	Initial Area	187	1482	12.6%		4.9	4.9	3.95	0.67	16.4	16.40	43.3				
Junction 11	J11							36.7	1.50	0.49		792.08	589.6				
LGN CYN 25	J11,J12	J11-J12	70	2087	3.4%	11.60	3.0	39.7	1.45	0.48	52.63	844.71	589.7	0.04	2.22		
LGN CYN 26	N,J12	Initial Area	200	1850	10.8%		6.2	6.2	3.53	0.62	21.56	21.56	47.2				
Junction 12	J12							39.7	1.45	0.49		866.27	609.1				
LGN CYN 27	J12, END	J12-END	30	1246	2.4%	10.46	2.0	41.7	1.42	0.48	26.06	892.33	605.3	0.04	2.43		

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon																	
OLV CYN 1	A, J1	Initial Area	185	2042	9.1%		8.0	8.0	3.13	0.57	33.14	33.14	58.9				
OLV CYN 2	B, J1	Initial Area	161	1575	10.2%		5.8	5.8	3.65	0.63	19.71	19.71	45.5				
Junction 1								8.0	3.13	0.59		52.85	97.9				
OLV CYN 3	J1,J2	J1-J2	84	2033	4.1%	7.72	4.4	12.4	2.53	0.54	46.79	99.64	136.9	0.04	1.03		
OLV CYN 4	B,J2	Initial Area	244	1723	14.2%		5.0	5.0	3.92	0.66	31.97	31.97	83.1				
Junction 2	J2							12.4	2.53	0.57		131.61	190.6				
OLV CYN 5	J2,J3	J2-J3	61	1762	3.5%	8.15	3.6	16.0	2.24	0.54	44.86	176.47	212.8	0.04	1.27		
OLV CYN 6	C,J3	Initial Area	313	3437	9.1%		10.1	10.1	2.79	0.52	63.01	63.01	92.2				
Junction 3	J3							16.0	2.24	0.53		239.48	286.8				
OLV CYN 7	J3,J4	J3-J4	40	902	4.4%	10.50	1.4	17.4	2.15	0.53	8.79	248.27	283.2	0.04	1.55		
OLV CYN 8	D,J4	Initial Area	330	4367	7.6%		13.0	13.0	2.48	0.48	72.00	72.00	85.0				
OLV CYN 9	E, J4	Initial Area	197	2861	6.9%		10.1	10.1	2.79	0.52	53.94	53.94	78.9				
Junction 4	J4							17.4	2.15	0.52		374.21	417.8				
OLV CYN 10	J4,J5	J4-J5	13	917	1.4%	7.52	2.0	19.5	2.04	0.51	18.75	392.96	411.7	0.04	2.20		
OLV CYN 11	F,J5	Initial Area	333	3924	8.5%		12.0	12.0	2.57	0.49	57.52	57.52	72.7				
Junction 5	J5							19.5	2.04	0.51		450.48	469.4				
OLV CYN 12	J5,J6	J5-J6	17	402	4.2%	11.67	0.6	20.0	2.01	0.51	23.30	473.78	481.6	0.04	1.88		
OLV CYN 13	G,J6	Initial Area	239	2895	8.3%		9.5	9.5	2.88	0.54	79.32	79.32	122.2				
Junction 6	J6							20.0	2.01	0.51		553.10	567.1				
OLV CYN 14	J6,J7	J6-J7	21	1598	1.3%	7.50	3.6	23.6	1.86	0.50	57.77	610.87	564.3	0.04	2.29		
OLV CYN 15	H,J7	Initial Area	221	2289	9.7%		7.0	7.0	3.33	0.59	34.70	34.70	68.8				
Junction 7	J7							23.6	1.86	0.50		645.57	602.7				
OLV CYN 16	J7,J8	J7-J8	59	1849	3.2%	11.14	2.8	26.4	1.76	0.49	64.56	710.13	611.7	0.04	2.18		
OLV CYN 17	J, J8	Initial Area	168	1166	14.4%		5.5	5.5	3.74	0.64	19.74	19.74	47.5				
Junction 8	J8							26.4	1.76	0.49		729.87	634.1				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon (con't)																	
OLV CYN B1	BA, J12	Initial Area	319	4102	7.8%		14.0	14.0	2.39	0.46	117.13	117.13	129.6				
OLV CYN B2	BB, J12	Initial Area	200	1335	15.0%		4.4	4.4	4.16	0.69	12.59	12.59	36.2				
Junction 12								14.0	2.39	0.49		129.72	150.4				
OLV CYN B3	J12,J13	J12-J13	80	2102	3.8%	8.35	4.2	18.2	2.11	0.47	48.49	178.21	175.2	0.04	1.23		
OLV CYN B4	BB, J13	Initial Area	280	2943	9.5%		9.0	9.0	2.95	0.55	53.73	53.73	86.6				
OLV CYN B5	BC, J13	Initial Area	70	980	7.1%		4.5	4.5	4.12	0.69	11.00	11.00	31.1				
Junction 13	J13							18.2	2.11	0.49		242.94	252.9				
OLV CYN B6	J13,J14	J13-J14	5	980	0.5%	4.31	3.8	22.0	1.92	0.49	8.92	251.86	237.5	0.04	2.06		
OLV CYN B7	BD, J14	Initial Area	235	1682	14.0%		5.5	5.5	3.74	0.64	21.83	21.83	52.6				
Junction 14	J14							22.0	1.92	0.50		273.69	264.5				
OLV CYN B8	J14,J15	J14-J15	45	1734	2.6%	8.35	3.5	25.4	1.79	0.48	42.44	316.13	274.0	0.04	1.64		
OLV CYN B9	BE, J15	Initial Area	288	2927	9.8%		8.6	8.6	3.02	0.55	43.38	43.38	72.6				
OLV CYN B10	BF, J15	Initial Area	130	1555	8.4%		6.8	6.8	3.38	0.60	16.5	16.50	33.5				
Junction 15	J15							25.4	1.79	0.50		376.01	334.9				
OLV CYN B11	J15,J16	J15-J16	30	651	4.6%	11.00	1.0	26.4	1.76	0.49	9.39	385.40	334.6	0.04	1.61		
OLV CYN B12	BG, J16	Initial Area	280	2261	12.4%		7.0	7.0	3.33	0.59	29.51	29.51	58.5				
Junction 16	J16							26.4	1.76	0.50		414.91	365.6				
OLV CYN B13	J16,J9	J16-J9	40	1905	2.1%	8.43	3.8	30.2	1.65	0.49	28.82	443.73	358.7	0.04	1.95		
OLV CYN B14	BH, J9	Initial Area	158	2489	6.3%		7.0	7.0	3.33	0.59	24.93	24.93	49.4				
OLV CYN 18	J8,J9	J8-J9	40	1623	2.5%	10.08	2.7	29.0	1.68	0.34	39.08	768.95	437.1	0.04	2.26		
Junction 9	J9							30.2	1.65	0.40		1237.61	812.1				
OLV CYN 19	J9,J10	J9-J10	40	939	4.3%	13.02	1.2	31.4	1.62	0.40	14.42	1252.03	804.6	0.04	2.20		
OLV CYN 20	K, J10	Initial Area	160	1521	10.5%		5.8	5.8	3.65	0.63	14.88	14.88	34.3				
OLV CYN 21	BF, J10	Initial Area	240	4599	5.2%		16.0	16.0	2.24	0.44	45.78	45.78	45.1				
Junction 10	J10							31.4	1.62	0.40		1312.69	852.5				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon (con't)																	
OLV CYN A1	AA, J18	Initial Area	270	3259	8.3%		10.2	10.2	2.78	0.52	33.42	33.42	48.5				
OLV CYN A2	AB, J18	Initial Area	170	2265	7.5%		8.1	8.1	3.11	0.57	24.49	24.49	43.1				
Junction 18	J18							10.2	2.78	0.54		57.91	87.1				
OLV CYN A3	J18,J19	J18-J19	53	780	6.8%	9.14	1.4	11.6	2.61	0.53	14.51	72.42	100.6	0.04	0.91		
OLV CYN A4	AC, J19	Initial Area	133	1216	10.9%		4.6	4.6	4.08	0.68	10.78	10.78	29.9				
Junction 19	J19							11.6	2.61	0.55		83.20	119.8				
OLV CYN 22	J10,J11	J10-J11	47	1472	3.2%	11.80	2.1	13.7	2.41	0.40	15.63	1328.32	1287.0	0.04	2.38		
OLV CYN A5	J19,J11	J19-J11	34	512	6.6%	9.75	0.9	27.3	1.73	0.55	2.49	85.69	81.0	0.04	1.03		
Junction 11	J11							27.3	1.73	0.41		1414.01	1005.3				
Cat Canyon																	
CAT CYN 1	A, J1	Initial Area	220	3939	5.6%		14.0	14.0	2.39	0.46	164.76	164.76	182.3				
CAT CYN 2	B, J1	Initial Area	240	3214	7.5%		11.0	11.0	2.68	0.51	82.64	82.64	112.5				
Junction 1								14.0	2.39	0.48		247.40	282.6				
CAT CYN 3	J1,J2	J1-J2	30	1061	2.9%	8.79	2.0	31.0	1.63	0.46	37.57	284.97	212.8	0.04	1.64		
CAT CYN 4	C,J2	Initial Area	273	4399	6.2%		14.0	14.0	2.39	0.46	177.26	177.26	196.2				
Junction 2	J2							31.0	1.63	0.46		462.23	346.7				
CAT CYN 5	J2,J3	J2-J3	40	2528	1.6%	7.06	6.0	37.0	1.50	0.44	68.72	530.95	349.4	0.04	1.85		
CAT CYN 6	D,J3	Initial Area	300	5119	5.9%		16.0	16.0	2.24	0.44	106.30	106.30	104.6				
CAT CYN 7	E, J3	Initial Area	318	3649	8.7%		11.0	11.0	2.68	0.51	93.88	93.88	127.8				
Junction 3	J3							37.0	1.50	0.45		731.13	490.7				
CAT CYN 8	J3,J4	J3-J4	30	2536	1.2%	6.92	6.1	43.1	1.39	0.43	86.11	817.24	489.0	0.04	2.23		
CAT CYN 9	F,J4	Initial Area	300	6775	4.4%		23.0	23.0	1.88	0.38	209.62	209.62	148.5				
Junction 4	J4							43.1	1.39	0.42		1026.86	598.8				
CAT CYN 10	J4,J5	J4-J5	20	1868	1.1%	7.00	4.4	47.6	1.33	0.41	90.94	1117.80	602.7	0.04	2.45		
CAT CYN 11	G,J5	Initial Area	190	6195	3.1%		25.0	25.0	1.81	0.36	238.85	238.85	156.6				
Junction 5	J5							47.6	1.33	0.40		1356.65	717.6				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 12	J5,J6	J5-J6	10	655	1.5%	8.38	1.3	48.9	1.31	0.40	21.49	1378.14	715.6	0.04	2.46		
CAT CYN 13	H,J6	Initial Area	380	4546	8.4%		13.0	13.0	2.48	0.48	130.52	130.52	154.0				
Junction 6	J6							48.9	1.31	0.40		1508.66	797.2				
CAT CYN 14	J6,J7	J6-J7	10	1376	0.7%	6.68	3.4	52.3	1.27	0.40	77.69	1586.35	795.8	0.04	3.05		
CAT CYN 15	J,J7	Initial Area	670	6984	9.6%		17.0	17.0	2.18	0.43	383.83	383.83	358.0				
Junction 7	J7							52.3	1.27	0.40		1970.18	1004.6				
CAT CYN 16	J7,J8	J7-J8	29	1894	1.5%	9.35	3.4	55.7	1.23	0.39	114.13	2084.31	1008.0	0.04	2.89		
CAT CYN 17	K, J8	Initial Area	249	4534	5.5%		16.0	16.0	2.24	0.44	134.68	134.68	132.6				
Junction 8	J8							55.7	1.23	0.40		2218.99	1080.9				
CAT CYN 19A	L, J9A	Initial Area	620	4845	12.8%		11.5	11.5	2.63	0.50	173.73	173.73	227.8				
CAT CYN 19B	M, J9A	Initial Area	730	4642	15.7%		10.0	10.0	2.81	0.53	165.79	165.79	244.7				
Junction J9A								11.5	2.63	0.51		339.52	456.6				
CAT CYN 19	J9A,J9	J9A-J9	60	1352	4.4%	11.35	2.0	13.5	2.43	0.51	21.14	360.66	447.1	0.04	1.74		
CAT CYN 18	J8,J9	J8-J9	11	1514	0.7%	7.59	3.3	59.0	1.20	0.39	50.58	2269.57	1065.0	0.04	3.68		
CAT CYN 20	N, J9	Initial Area	340	3649	9.3%		11.5	11.5	2.63	0.50	112.02	112.02	146.9				
Junction 9	J9A,J9							59.0	1.20	0.41		2742.25	1352.1				
CAT CYN 21	J9,J10	J9-J10	3	1019	0.3%	5.69	3.0	62.0	1.17	0.41	57.78	2800.03	1335.3	0.04	4.29		
CAT CYN 22	P,J10	Initial Area	383	3985	9.6%		11.0	11.0	2.68	0.51	70.08	70.08	95.4				
CAT CYN 23	Q, J10	Initial Area	463	2941	15.8%		7.5	7.5	3.22	0.58	43.22	43.22	81.0				
Junction 10	J10							62.0	1.17	0.41		2913.33	1406.3				
CAT CYN 24	J10,J11	J10-J11	17	3052	0.6%	7.13	7.1	69.1	1.11	0.40	190.84	3104.17	1378.0	0.04	4.13		
CAT CYN 25	R, J11	Initial Area	360	4534	7.9%		13.0	13.0	2.48	0.48	265.58	265.58	313.4				
Junction 11	J11							69.1	1.11	0.41		3369.75	1518.5				
CAT CYN 27A	S, J13	Initial Area	255	3361	7.6%		11.0	11.0	2.68	0.51	93.86	93.86	127.8				
CAT CYN 27B	T, J13	Initial Area	285	3505	8.1%		10.8	10.8	2.71	0.51	116.31	116.31	160.9				
Junction 13								11.0	2.68	0.51		210.17	287.2				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 27	J13,J12	J13-J12	84	2211	3.8%	9.87	3.7	14.7	2.33	0.50	54.66	264.83	307.5	0.04	1.58		
CAT CYN 26	J11,J12	J11-J12	19	951	2.0%	11.70	1.4	70.5	1.10	0.40	69.68	3439.43	1519.9	0.04	3.36		
Junction 12	J12							70.5	1.10	0.41		3704.26	1664.9				
CAT CYN 28	J12,J14	J12-J14	11	1237	0.9%	8.97	2.3	72.8	1.08	0.40	87.79	3792.05	1658.2	0.04	4.07		
CAT CYN 29	U, J14	Initial Area	670	7044	9.5%		16.0	16.0	2.24	0.44	234.44	234.44	230.8				
Junction 14	J14							72.8	1.08	0.41		4026.49	1769.7				
CAT CYN 30	J14,J15	J14-J15	30	3444	0.9%	9.03	6.4	79.1	1.04	0.39	351.98	4378.47	1767.6	0.04	4.18		
CAT CYN 31	V, J15	Initial Area	430	3590	12.0%		9.8	9.8	2.84	0.53	48.77	48.77	73.2				
Junction 15	J15							79.1	1.04	0.39		4427.24	1794.5				
CAT CYN 34A1	W, J24	Initial Area	510	5459	9.3%		14.0	14.0	2.39	0.46	197.82	197.82	218.9				
CAT CYN 34A2	X, J24	Initial Area	600	4145	14.5%		10.0	10.0	2.81	0.53	162.07	162.07	239.2				
Junction 24	J24							14.0	2.39	0.49		359.89	422.4				
CAT CYN 34A	J24,J25	J24-J25	70	1145	6.1%	13.00	1.5	15.5	2.28	0.49	32.03	391.92	435.2	0.04	1.68		
CAT CYN 34B	Y, J25	Initial Area	470	2833	16.6%		7.0	7.0	3.33	0.59	68.33	68.33	135.5				
Junction 25	J25							15.5	2.28	0.50		460.25	527.8				
CAT CYN 32	J15,J16	J15-J16	17	1797	0.9%	9.29	3.2	82.3	1.02	0.39	49.63	4476.87	1769.5	0.04	4.10		
CAT CYN 34	J25,J16	J25-J16	87	2170	4.0%	11.74	3.1	18.5	2.09	0.50	44.65	504.90	522.2	0.04	1.98		
CAT CYN 33	Z, J16	Initial Area	417	2959	14.1%		7.5	7.5	3.22	0.58	49.02	49.02	91.9				
Junction 16	J16							82.3	1.02	0.40		5030.79	2053.9				
CAT CYN 36A	AA, BA	Initial Area	296	1711	17.3%		5.0	5.0	3.92	0.66	30.36	30.36	78.9				
CAT CYN 36	BA, J17	BA-J17	154	1597	9.6%	10.13	2.6	7.6	3.20	0.63	23.84	54.20	108.5	0.04	0.82		
CAT CYN 35	J16,J17	J16-J17	13	1249	1.0%	9.95	2.1	84.4	1.01	0.40	51.89	5082.68	2038.5	0.04	4.24		
Junction 17	J17							84.4	1.01	0.40		5136.88	2093.0				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 38A	AB, J26	Initial Area	489	3020	16.2%		8.0	8.0	3.13	0.57	46.04	46.04	81.8				
CAT CYN 38B	X, J26	Initial Area	689	4780	14.4%		11.0	11.0	2.68	0.51	173.56	173.56	236.3				
CAT CYN 38C	AC, J26	Initial Area	536	4388	12.2%		10.5	10.5	2.74	0.52	137.55	137.55	194.8				
Junction 26	J26							11.0	2.68	0.52		357.15	497.0				
CAT CYN 37	J17,J18	J17-J18	20	2450	0.8%	9.20	4.4	88.9	0.98	0.40	129.3	5266.18	2063.6	0.04	4.52		
CAT CYN 38	J26,J18	J26-J18	101	2671	3.8%	11.23	4.0	15.0	2.31	0.51	50.69	407.84	481.7	0.04	1.93		
Junction 18	J18							88.9	0.98	0.41		5674.02	2268.4				
CAT CYN 40A1-	AA, BB	Initial Area	270	1253	21.5%		3.5	3.5	4.65	0.74	14.93	14.93	51.3				
CAT CYN 40A1	BB, J28	BB-J28	109	1038	10.5%	9.43	1.8	5.3	3.80	0.70	9.83	24.76	66.2	0.04	0.69		
CAT CYN 40A2	AA,J28	Initial Area	379	3110	12.2%		9.5	9.5	2.88	0.54	82.62	82.62	127.3				
Junction 28	J28							9.5	2.88	0.68		107.38	209.3				
CAT CYN 40B1	AD, BC	Initial Area	288	2356	12.2%		7.5	7.5	3.22	0.58	40.60	40.60	76.1				
CAT CYN 40B	BC, J27	BC-J27	72	884	8.1%	9.51	1.5	9.0	2.95	0.57	8.4	49.00	83.0	0.04	0.85		
CAT CYN 40A	J28,J27	J28-J27	51	716	7.1%	11.53	1.0	10.5	2.74	0.66	12.06	119.44	216.2	0.04	1.25		
Junction 27	J27							10.5	2.74	0.78		168.44	357.9				
CAT CYN 40	J27,J19	J27-J19	40	2450	1.6%	6.44	6.3	16.9	2.18	0.76	8.17	176.61	293.1	0.04	1.57		
CAT CYN 39	J18,J19	J18-J19	101	2671	3.8%	21.51	2.1	91.0	0.97	0.41	7.45	5681.47	2244.7	0.04	5.12		
CAT CYN 41	AF, J19	Initial Area	550	4587	12.0%		12.0	12.0	2.57	0.49	123.12	123.12	155.7				
Junction 19	J19							91.0	0.97	0.42		5981.20	2434.2				
CAT CYN 43A	AG, BD	Initial Area	269	1114	24.2%		3.2	3.2	4.85	0.76	8.20	8.20	30.2				
CAT CYN 43	BD, J20	BD-J20	101	1290	7.8%	7.37	2.9	6.1	3.56	0.66	19.88	28.08	66.1	0.04	0.60		
CAT CYN 42	J19,J20	J19-J20	20	1262	1.6%	12.26	1.7	92.7	0.96	0.42	44.86	6026.06	2419.4	0.04	4.23		
Junction 20	J20							92.7	0.96	0.42		6054.14	2443.4				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 45A	AE, BE	Initial Area	282	1507	18.7%		4.3	4.3	4.21	0.70	18.48	18.48	54.1				
CAT CYN 45	BE, J21	BE-J21	108	1389	7.8%	8.55	2.7	7.0	3.33	0.66	10.43	28.91	63.5	0.04	0.75		
CAT CYN 44	J20,J21	J20-J21	10	1002	1.0%	10.25	1.6	94.3	0.96	0.41	108.43	6162.57	2439.6	0.04	4.57		
Junction 21	J21							94.3	0.96	0.42		6191.48	2457.8				
CAT CYN 47	AH, J22	Initial Area	403	3026	13.3%		8.2	8.2	3.09	0.56	48.73	48.73	84.8				
CAT CYN 46	J21,J22	J21-J22	10	1413	0.7%	9.02	2.6	96.9	0.94	0.41	125.08	6316.56	2444.3	0.04	4.88		
Junction 22	J22							96.9	0.94	0.41		6365.29	2470.2				
CAT CYN 49B1	AK, J29	Initial Area	200	1003	19.9%		3.1	3.1	4.93	0.77	13.36	13.36	50.5				
CAT CYN 49B	AL, J29		35	417	8.4%	8.64	0.8	3.9	4.87	0.77	5.53	18.89	70.4	0.04	0.72		
CAT CYN 49A	AJ, J29	Initial Area	330	2263	14.6%		6.1	6.1	3.56	0.62	43.14	43.14	95.6				
Junction 29	J29							6.1	3.56	0.67		62.03	147.1				
CAT CYN 49	J29,J23	J29-J23	120	2116	5.7%	9.68	3.6	9.7	2.84	0.62	37.43	99.46	173.9	0.04	1.14		
CAT CYN 48	J22,J23	J22-J23	50	4302	1.2%	10.96	6.5	103.5	0.91	0.40	286.36	6651.65	2432.5	0.04	4.51		
CAT CYN 50	AF, J23	Initial Area	640	8530	7.5%		12.0	12.0	2.57	0.49	243.99	243.99	308.5				
Junction 23	J23							103.5	0.91	0.41		6995.10	2598.1				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
25 Year Flow - PRE CONSTRUCTION																	
Unnamed Blueline #1 & #2																	
NNBL2-1	2A, J1	Initial Area	230	2558	9.0%		8.5	8.5	2.65	0.50	47.71	47.71	63.7				
NNBL2-2	2B, J1	Initial Area	230	1927	11.9%		7.0	7.0	2.91	0.54	23.71	23.71	37.2				
NNBL2-3	2C, J1	Initial Area	240	1874	12.8%		7.0	7.0	2.91	0.54	28.5	28.50	44.7				
Junction 1								8.5	2.65	0.52		99.92	138.4				
NNBL2-4	J1, J2	J1-J2	100	2528	4.0%	3.99	10.6	19.1	1.81	0.47	51.72	151.64	128.4	0.04	0.39		
NNBL2-5	2D, J2	Initial Area	334	3668	9.1%		11.0	11.0	2.35	0.46	78.76	78.76	84.5				
NNBL2-6	2E, J2	Initial Area	170	1481	11.5%		5.5	5.5	3.26	0.59	19.95	19.95	38.1				
Junction 2	J2							19.1	1.81	0.47		250.35	214.7				
NNBL2-7	J2,J3	J2-J3	70	2077	3.4%	7.74	4.5	23.5	1.64	0.45	54.73	305.08	223.8	0.04	1.21		
NNBL2-8	2F, J3	Initial Area	194	1325	14.7%		4.5	4.5	3.58	0.63	15.65	15.65	35.1				
NNBL2-9	2G, J3	Initial Area	120	1445	8.3%		5.5	5.5	3.26	0.59	21.99	21.99	42.0				
Junction 3	J3							23.5	1.64	0.46		342.72	261.0				
NNBL2-10	J3,J4	J3-J4	40	1433	2.8%	7.46	3.2	26.7	1.54	0.46	22.03	364.75	256.2	0.04	1.31		
NNBL1-1	1A, J4	Initial Area	410	5501	7.4%		17.2	17.2	1.90	0.38	112.2	112.20	81.0				
Junction 4	J4							26.7	1.54	0.44		476.95	321.9				
NNBL2-11	2H,J5	Initial Area	272	2184	12.4%		7.0	7.0	2.91	0.54	35.8	35.80	56.2				
NNBL2-12	2J,J5	Initial Area	192	1139	16.8%		4.0	4.0	3.79	0.65	16.24	16.24	40.0				
Junction 5	J5							7.0	2.91	0.57		52.04	86.8				
NNBL2-13	J5,J6	J3-J4	83	1700	4.9%	7.54	3.8	10.8	2.37	0.52	40.03	92.07	114.6	0.04	0.87		
NNBL2-14	2L, J6	Initial Area	275	2707	10.2%		8.5	8.5	2.65	0.50	50.68	50.68	67.7				
Junction 6								10.8	2.37	0.52		142.75	175.1				
NNBL2-15	J6,J7	J6-J7	15	1000	1.5%	5.75	2.9	13.7	2.12	0.51	13.41	156.16	168.4	0.04	1.42		
NNBL2-16	J4,J7	J4-J7	10	850	1.2%	5.28	2.7	29.4	1.47	0.43	15.71	492.66	314.5	0.04	1.49		
NNBL2-17	2M,J7	Initial Area	179	1839	9.7%		5.5	5.5	3.26	0.59	23.12	23.12	44.1				
Junction 7	J7							29.4	1.47	0.46		671.94	451.6				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Unnamed Blueline #1 & #2 (con't)																	
NNBL2-18	J7,J8	J7-J8	56	2263	2.5%	9.13	4.1	33.5	1.39	0.44	45.45	717.39	441.6	0.04	1.94		
NNBL2-19	2N,J8	Initial Area	226	2090	10.8%		6.0	6.0	3.13	0.57	27.27	27.27	48.5				
Junction 8	J8							33.5	1.39	0.45		744.66	463.1				
NNBL2-20	J8,J9	J8 to J9	54	3207	1.7%	7.94	6.7	40.3	1.27	0.43	55.98	800.64	442.2	0.04	2.11		
Unnamed Blueline #3																	
NNBL3-1	3A, J10	Initial Area	110	1349	8.2%		5.5	5.5	3.26	0.59	12.58	12.58	24.0				
NNBL3-2	3B, J10	Initial Area	70	677	10.3%		3.0	3.0	4.34	0.71	6.13	6.13	18.9				
Junction 10								5.5	3.26	0.63		18.71	38.2				
NNBL3-3	J10,J11	J10-J11	45	2263	2.0%	4.41	8.6	14.1	2.09	0.50	25.07	43.78	46.2	0.04	0.76		
NNBL3-4	3C,J11	Initial Area	55	609	9.1%		3.0	3.0	4.34	0.71	6.78	6.78	20.9				
Junction 11	J11							14.1	2.09	0.53		50.56	56.3				
NNBL3-5	J11,J12	J11-J12	84	1933	4.4%	6.94	4.6	18.7	1.83	0.46	42.5	93.06	77.6	0.04	0.84		
NNBL3-6	3D,J12	Initial Area	199	2019	9.9%		3.0	3.0	4.34	0.71	12.04	12.04	37.1				
Junction 12	J12							18.7	1.83	0.49		105.10	93.2				
NNBL3-7	J12,J13	J12-J13	66	1164	5.6%	9.21	2.1	20.8	1.74	0.47	16.97	122.07	98.9	0.04	1.06		
NNBL3-8	3E,J13	Initial Area	196	2019	9.7%		7.1	7.1	2.89	0.54	23.35	23.35	36.2				
Junction 13	J13							20.8	1.74	0.48		145.42	120.6				
NNBL3-9	J13,J14	J13-J14	15	611	2.4%	7.15	1.4	22.2	1.68	0.47	8.43	153.85	121.7	0.04	1.37		
NNBL3-10	3F,J14	Initial Area	199	1666	12.0%		5.5	5.5	3.26	0.59	16.27	16.27	31.1				
Junction 14	J14							22.2	1.68	0.48		170.12	137.8				
NNBL3-11	J14,J15	J14-J15	36	812	4.4%	8.27	1.6	23.9	1.63	0.47	15.07	185.19	141.2	0.04	1.09		
NNBL3-12	3G,J15	Initial Area	184	1808	10.2%		6.5	6.5	3.01	0.55	18.70	18.70	31.2				
Junction 15	J15							23.9	1.63	0.48		203.89	158.1				
NNBL3-13	J15, end	J15 - end	37	800	4.6%	7.85	1.7	25.6	1.58	0.47	14.11	218.00	160.0	0.04	0.97		

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Long Canyon																	
LNG CYN 1	A, J1	Initial Area	160	1162	13.8%		4.0	4.0	3.79	0.65	9.9	9.90	24.4				
LNG CYN 2	B, J1	Initial Area	120	2184	5.5%		9.0	9.0	2.58	0.49	39.82	39.82	50.7				
Junction 1								9.0	2.58	0.52		49.72	67.3				
LNG CYN 3	J1,J2	J1-J2	77	2351	3.3%	5.68	6.9	15.9	1.97	0.44	81.59	131.31	114.6	0.04	0.77		
LGN CYN 4	C,J2	Initial Area	287	1723	16.7%		6.0	6.0	3.13	0.57	23.03	23.03	41.0				
Junction 2	J2							15.9	1.97	0.46		154.34	140.5				
LGN CYN 5	J2,J3	J2-J3	8	510	1.7%	5.34	1.6	17.5	1.89	0.46	9.18	163.52	140.8	0.04	1.17		
LGN CYN 6	D,J3	Initial Area	285	2578	11.0%		8.0	8.0	2.73	0.51	33.34	33.34	46.8				
Junction 3	J3							17.5	1.89	0.47		196.86	173.2				
LGN CYN 7	J3,J4	J3-J4	33	587	5.6%	7.77	1.3	18.7	1.82	0.46	5.32	202.18	171.1	0.04	0.83		
LGN CYN 8	E,J4	Initial Area	239	1600	14.9%		7.1	7.1	2.89	0.54	18.54	18.54	28.7				
LGN CYN 9	F, J4	Initial Area	321	3298	9.7%		10.1	10.1	2.44	0.47	64.82	64.82	74.8				
Junction 4	J4							18.7	1.82	0.47		285.54	245.1				
LGN CYN 10	J4,J5	J4-J5	5	855	0.6%	4.57	3.1	21.9	1.70	0.46	18.52	304.06	238.6	0.04	1.95		
LGN CYN 11	B,J5	Initial Area	244	2033	12.0%		7.0	7.0	2.91	0.54	40.46	40.46	63.5				
Junction 5	J5							21.9	1.70	0.47		344.52	275.6				
LGN CYN 12	J5,J6	J5-J6	76	2167	3.5%	8.25	4.4	26.2	1.56	0.45	64.42	408.94	284.0	0.04	1.28		
LGN CYN 13	G,J6	Initial Area	320	1808	17.7%		5.2	5.2	3.35	0.60	72.61	72.61	145.0				
Junction 6	J6							26.2	1.56	0.47		481.55	351.5				
LGN CYN 14	J6,J7	J6-J7	17	1415	1.2%	5.89	4.0	30.2	1.46	0.45	52.08	533.63	350.6	0.04	1.75		
LGN CYN 15	H,J7	Initial Area	267	2128	12.5%		6.5	6.5	3.01	0.55	40.85	40.85	68.1				
LGN CYN 16	J, J7	Initial Area	168	1166	14.4%		5.5	5.5	3.26	0.59	8.66	8.66	16.5				
Junction 7	J7							30.2	1.46	0.46		583.14	390.9				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Long Canyon (con't)																	
LGN CYN 17	J7,J8	J7-J8	23	1308	1.8%	7.56	2.9	33.1	1.39	0.45	37.96	621.10	388.9	0.04	1.88		
LGN CYN 18	J,J8	Initial Area	191	1828	10.5%		6.5	6.5	3.01	0.55	22.38	22.38	37.3				
Junction 8	J8							33.1	1.39	0.45		643.48	406.2				
LGN CYN 19	J8,J9	J8-J9	40	1341	3.0%	8.53	2.6	35.8	1.34	0.44	46.44	689.92	408.3	0.04	1.53		
LGN CYN 20	K,J9	Initial Area	200	1806	11.1%		6.4	6.4	3.03	0.56	21.61	21.61	36.5				
Junction 9	J9							35.8	1.34	0.44		711.53	424.5				
LGN CYN 21	J9,J10	J9-J10	15	693	2.2%	8.18	1.4	37.2	1.32	0.44	20.72	732.25	423.8	0.04	1.80		
LGN CYN 22	L,J10	Initial Area	135	1428	9.5%		5.5	5.5	3.26	0.59	23.15	23.15	44.2				
Junction 10	J10							37.2	1.32	0.44		755.40	441.7				
LGN CYN 23	J10,J11	J10-J11	25	847	2.9%	9.38	1.5	38.7	1.30	0.44	20.28	775.68	440.1	0.04	1.79		
LGN CYN 24	M,J11	Initial Area	187	1482	12.6%		4.9	4.9	3.44	0.61	16.4	16.40	34.4				
Junction 11	J11							38.7	1.30	0.44		792.08	453.0				
LGN CYN 25	J11,J12	J11-J12	70	2087	3.4%	10.83	3.2	41.9	1.25	0.43	52.63	844.71	452.0	0.04	2.00		
LGN CYN 26	N,J12	Initial Area	200	1850	10.8%		6.2	6.2	3.08	0.56	21.56	21.56	37.4				
Junction 12	J12							41.9	1.25	0.43		866.27	467.2				
LGN CYN 27	J12, END	J12-END	30	1246	2.4%	9.77	2.1	44.0	1.22	0.43	26.06	892.33	463.7	0.04	2.20		

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon																	
OLV CYN 1	A, J1	Initial Area	185	2042	9.1%		8.0	8.0	2.73	0.51	33.14	33.14	46.5				
OLV CYN 2	B, J1	Initial Area	161	1575	10.2%		5.8	5.8	3.18	0.58	19.71	19.71	36.0				
Junction 1								8.0	2.73	0.54		52.85	77.5				
OLV CYN 3	J1,J2	J1-J2	84	2033	4.1%	7.20	4.7	12.7	2.19	0.49	46.79	99.64	106.6	0.04	0.93		
OLV CYN 4	B,J2	Initial Area	244	1723	14.2%		5.0	5.0	3.41	0.60	31.97	31.97	65.9				
Junction 2	J2							12.7	2.19	0.52		131.61	149.0				
OLV CYN 5	J2,J3	J2-J3	61	1762	3.5%	7.61	3.9	16.6	1.93	0.48	44.86	176.47	164.9	0.04	1.15		
OLV CYN 6	C,J3	Initial Area	313	3437	9.1%		10.1	10.1	2.44	0.47	63.01	63.01	72.7				
Junction 3	J3							16.6	1.93	0.48		239.48	222.4				
OLV CYN 7	J3,J4	J3-J4	40	902	4.4%	9.80	1.5	18.1	1.86	0.48	8.79	248.27	219.4	0.04	1.40		
OLV CYN 8	D,J4	Initial Area	330	4367	7.6%		13.0	13.0	2.17	0.43	72.00	72.00	66.8				
OLV CYN 9	E, J4	Initial Area	197	2861	6.9%		10.1	10.1	2.44	0.47	53.94	53.94	62.2				
Junction 4	J4							18.1	1.86	0.47		374.21	323.7				
OLV CYN 10	J4,J5	J4-J5	13	917	1.4%	7.02	2.2	20.3	1.76	0.46	18.75	392.96	318.4	0.04	1.99		
OLV CYN 11	F,J5	Initial Area	333	3924	8.5%		12.0	12.0	2.25	0.44	57.52	57.52	57.2				
Junction 5	J5							20.3	1.76	0.46		450.48	363.0				
OLV CYN 12	J5,J6	J5-J6	17	402	4.2%	10.89	0.6	20.9	1.73	0.45	23.30	473.78	372.0	0.04	1.70		
OLV CYN 13	G,J6	Initial Area	239	2895	8.3%		9.5	9.5	2.52	0.48	79.32	79.32	96.4				
Junction 6	J6							20.9	1.73	0.46		553.10	438.4				
OLV CYN 14	J6,J7	J6-J7	21	1598	1.3%	7.00	3.8	24.7	1.60	0.44	57.77	610.87	434.7	0.04	2.06		
OLV CYN 15	H,J7	Initial Area	221	2289	9.7%		7.0	7.0	2.91	0.54	34.70	34.70	54.4				
Junction 7	J7							24.7	1.60	0.45		645.57	464.7				
OLV CYN 16	J7,J8	J7-J8	59	1849	3.2%	10.40	3.0	27.7	1.52	0.44	64.56	710.13	470.2	0.04	1.97		
OLV CYN 17	J, J8	Initial Area	168	1166	14.4%		5.5	5.5	3.26	0.59	19.74	19.74	37.7				
Junction 8	J8							27.7	1.52	0.44		729.87	487.7				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon (con't)																	
OLV CYN B1	BA, J12	Initial Area	319	4102	7.8%		14.0	14.0	2.10	0.41	117.13	117.13	101.7				
OLV CYN B2	BB, J12	Initial Area	200	1335	15.0%		4.4	4.4	3.62	0.63	12.59	12.59	28.7				
Junction 12								14.0	2.10	0.44		129.72	118.4				
OLV CYN B3	J12,J13	J12-J13	80	2102	3.8%	7.80	4.5	18.5	1.84	0.42	48.49	178.21	136.5	0.04	1.11		
OLV CYN B4	BB, J13	Initial Area	280	2943	9.5%		9.0	9.0	2.58	0.49	53.73	53.73	68.4				
OLV CYN B5	BC, J13	Initial Area	70	980	7.1%		4.5	4.5	3.58	0.63	11.00	11.00	24.7				
Junction 13	J13							18.5	1.84	0.44		242.94	197.8				
OLV CYN B6	J13,J14	J13-J14	5	980	0.5%	4.02	4.1	22.6	1.67	0.44	8.92	251.86	185.0	0.04	1.86		
OLV CYN B7	BD, J14	Initial Area	235	1682	14.0%		5.5	5.5	3.26	0.59	21.83	21.83	41.7				
Junction 14	J14							22.6	1.67	0.45		273.69	206.4				
OLV CYN B8	J14,J15	J14-J15	45	1734	2.6%	7.80	3.7	26.3	1.56	0.43	42.44	316.13	212.6	0.04	1.48		
OLV CYN B9	BE, J15	Initial Area	288	2927	9.8%		8.6	8.6	2.64	0.50	43.38	43.38	57.4				
OLV CYN B10	BF, J15	Initial Area	130	1555	8.4%		6.8	6.8	2.95	0.54	16.5	16.50	26.5				
Junction 15	J15							26.3	1.56	0.45		376.01	260.5				
OLV CYN B11	J15,J16	J15-J16	30	651	4.6%	10.27	1.1	27.3	1.53	0.44	9.39	385.40	260.0	0.04	1.46		
OLV CYN B12	BG, J16	Initial Area	280	2261	12.4%		7.0	7.0	2.91	0.54	29.51	29.51	46.3				
Junction 16	J16							27.3	1.53	0.45		414.91	284.3				
OLV CYN B13	J16,J9	J16-J9	40	1905	2.1%	7.87	4.0	31.4	1.43	0.44	28.82	443.73	278.1	0.04	1.76		
OLV CYN B14	BH, J9	Initial Area	158	2489	6.3%		7.0	7.0	2.91	0.54	24.93	24.93	39.1				
OLV CYN 18	J8,J9	J8-J9	40	1623	2.5%	9.41	2.9	30.5	1.45	0.29	39.08	768.95	320.5	0.04	2.04		
Junction 9	J9							31.4	1.43	0.35		1237.61	613.8				
OLV CYN 19	J9,J10	J9-J10	40	939	4.3%	12.15	1.3	32.6	1.40	0.35	14.42	1252.03	607.8	0.04	1.99		
OLV CYN 20	K, J10	Initial Area	160	1521	10.5%		5.8	5.8	3.18	0.58	14.88	14.88	27.2				
OLV CYN 21	BF, J10	Initial Area	240	4599	5.2%		16.0	16.0	1.97	0.39	45.78	45.78	35.3				
Junction 10	J10							32.6	1.40	0.35		1312.69	645.0				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon (con't)																	
OLV CYN A1	AA, J18	Initial Area	270	3259	8.3%		10.2	10.2	2.43	0.47	33.42	33.42	38.2				
OLV CYN A2	AB, J18	Initial Area	170	2265	7.5%		8.1	8.1	2.71	0.51	24.49	24.49	34.0				
Junction 18	J18							10.2	2.43	0.49		57.91	68.8				
OLV CYN A3	J18,J19	J18-J19	53	780	6.8%	8.53	1.5	11.7	2.28	0.48	14.51	72.42	79.1	0.04	0.82		
OLV CYN A4	AC, J19	Initial Area	133	1216	10.9%		4.6	4.6	3.55	0.62	10.78	10.78	23.7				
Junction 19	J19							11.7	2.28	0.50		83.20	94.4				
OLV CYN 22	J10,J11	J10-J11	47	1472	3.2%	11.02	2.2	14.0	2.10	0.35	15.63	1328.32	977.9	0.04	2.14		
OLV CYN A5	J19,J11	J19-J11	34	512	6.6%	9.11	0.9	28.3	1.50	0.49	2.49	85.69	63.4	0.04	0.93		
Junction 11	J11							28.3	1.50	0.36		1414.01	763.7				
Cat Canyon																	
CAT CYN 1	A, J1	Initial Area	220	3939	5.6%		14.0	14.0	2.10	0.41	164.76	164.76	143.1				
CAT CYN 2	B, J1	Initial Area	240	3214	7.5%		11.0	11.0	2.35	0.46	82.64	82.64	88.6				
Junction 1								14.0	2.10	0.43		247.40	222.2				
CAT CYN 3	J1,J2	J1-J2	30	1061	2.9%	8.21	2.2	32.7	1.40	0.41	37.57	284.97	163.4	0.04	1.48		
CAT CYN 4	C,J2	Initial Area	273	4399	6.2%		14.0	14.0	2.10	0.41	177.26	177.26	154.0				
Junction 2	J2							32.7	1.40	0.41		462.23	266.5				
CAT CYN 5	J2,J3	J2-J3	40	2528	1.6%	6.59	6.4	39.1	1.29	0.39	68.72	530.95	267.1	0.04	1.67		
CAT CYN 6	D,J3	Initial Area	300	5119	5.9%		16.0	16.0	1.97	0.39	106.30	106.30	81.9				
CAT CYN 7	E, J3	Initial Area	318	3649	8.7%		11.0	11.0	2.35	0.46	93.88	93.88	100.7				
Junction 3	J3							39.1	1.29	0.40		731.13	376.1				
CAT CYN 8	J3,J4	J3-J4	30	2536	1.2%	6.46	6.5	45.6	1.20	0.38	86.11	817.24	373.0	0.04	2.02		
CAT CYN 9	F,J4	Initial Area	300	6775	4.4%		23.0	23.0	1.66	0.33	209.62	209.62	115.4				
Junction 4	J4							45.6	1.20	0.37		1026.86	456.4				
CAT CYN 10	J4,J5	J4-J5	20	1868	1.1%	6.54	4.8	50.4	1.14	0.36	90.94	1117.80	457.6	0.04	2.21		
CAT CYN 11	G,J5	Initial Area	190	6195	3.1%		25.0	25.0	1.59	0.32	238.85	238.85	121.3				
Junction 5	J5							50.4	1.14	0.35		1356.65	544.7				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 12	J5,J6	J5-J6	10	655	1.5%	7.82	1.4	51.8	1.13	0.35	21.49	1378.14	542.8	0.04	2.21		
CAT CYN 13	H,J6	Initial Area	380	4546	8.4%		13.0	13.0	2.17	0.43	130.52	130.52	121.0				
Junction 6	J6							51.8	1.13	0.36		1508.66	605.8				
CAT CYN 14	J6,J7	J6-J7	10	1376	0.7%	6.24	3.7	55.5	1.09	0.35	77.69	1586.35	603.3	0.04	2.75		
CAT CYN 15	J,J7	Initial Area	670	6984	9.6%		17.0	17.0	1.91	0.38	383.83	383.83	280.0				
Junction 7	J7							55.5	1.09	0.35		1970.18	763.4				
CAT CYN 16	J7,J8	J7-J8	29	1894	1.5%	8.72	3.6	59.1	1.06	0.35	114.13	2084.31	764.0	0.04	2.61		
CAT CYN 17	K, J8	Initial Area	249	4534	5.5%		16.0	16.0	1.97	0.39	134.68	134.68	103.8				
Junction 8	J8							59.1	1.06	0.35		2218.99	819.9				
CAT CYN 19A	L, J9A	Initial Area	620	4845	12.8%		11.5	11.5	2.30	0.45	173.73	173.73	179.3				
CAT CYN 19B	M, J9A	Initial Area	730	4642	15.7%		10.0	10.0	2.46	0.47	165.79	165.79	192.9				
Junction J9A								11.5	2.30	0.46		339.52	359.9				
CAT CYN 19	J9A,J9	J9A-J9	60	1352	4.4%	10.60	2.1	13.6	2.12	0.46	21.14	360.66	351.0	0.04	1.57		
CAT CYN 18	J8,J9	J8-J9	11	1514	0.7%	6.74	3.7	62.8	1.03	0.34	50.58	2269.57	805.9	0.04	3.08		
CAT CYN 20	N, J9	Initial Area	340	3649	9.3%		11.5	11.5	2.30	0.45	112.02	112.02	115.6				
Junction 9	J9A,J9							62.8	1.03	0.36		2742.25	1028.0				
CAT CYN 21	J9,J10	J9-J10	3	1019	0.3%	5.31	3.2	66.0	1.01	0.36	57.78	2800.03	1014.3	0.04	3.87		
CAT CYN 22	P,J10	Initial Area	383	3985	9.6%		11.0	11.0	2.35	0.46	70.08	70.08	75.2				
CAT CYN 23	Q, J10	Initial Area	463	2941	15.8%		7.5	7.5	2.81	0.53	43.22	43.22	64.0				
Junction 10	J10							66.0	1.01	0.36		2913.33	1069.4				
CAT CYN 24	J10,J11	J10-J11	17	3052	0.6%	6.66	7.6	73.7	0.96	0.35	190.84	3104.17	1044.6	0.04	3.73		
CAT CYN 25	R, J11	Initial Area	360	4534	7.9%		13.0	13.0	2.17	0.43	265.58	265.58	246.3				
Junction 11	J11							73.7	0.96	0.36		3369.75	1153.0				
CAT CYN 27A	S, J13	Initial Area	255	3361	7.6%		11.0	11.0	2.35	0.46	93.86	93.86	100.7				
CAT CYN 27B	T, J13	Initial Area	285	3505	8.1%		10.8	10.8	2.37	0.46	116.31	116.31	126.7				
Junction 13								11.0	2.35	0.46		210.17	226.3				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 27	J13,J12	J13-J12	84	2211	3.8%	9.22	4.0	15.0	2.03	0.45	54.66	264.83	240.1	0.04	1.43		
CAT CYN 26	J11,J12	J11-J12	19	951	2.0%	10.92	1.5	75.1	0.95	0.35	69.68	3439.43	1152.8	0.04	3.03		
Junction 12	J12							75.1	0.95	0.36		3704.26	1264.8				
CAT CYN 28	J12,J14	J12-J14	11	1237	0.9%	8.37	2.5	77.6	0.93	0.36	87.79	3792.05	1258.2	0.04	3.67		
CAT CYN 29	U, J14	Initial Area	670	7044	9.5%		16.0	16.0	1.97	0.39	234.44	234.44	180.7				
Junction 14	J14							77.6	0.93	0.36		4026.49	1343.8				
CAT CYN 30	J14,J15	J14-J15	30	3444	0.9%	8.43	6.8	84.4	0.90	0.34	351.98	4378.47	1335.9	0.04	3.77		
CAT CYN 31	V, J15	Initial Area	430	3590	12.0%		9.8	9.8	2.48	0.48	48.77	48.77	57.7				
Junction 15	J15							84.4	0.90	0.34		4427.24	1356.8				
CAT CYN 34A1	W, J24	Initial Area	510	5459	9.3%		14.0	14.0	2.10	0.41	197.82	197.82	171.8				
CAT CYN 34A2	X, J24	Initial Area	600	4145	14.5%		10.0	10.0	2.46	0.47	162.07	162.07	188.6				
Junction 24	J24							14.0	2.10	0.44		359.89	332.7				
CAT CYN 34A	J24,J25	J24-J25	70	1145	6.1%	12.14	1.6	15.6	1.99	0.44	32.03	391.92	341.7	0.04	1.51		
CAT CYN 34B	Y, J25	Initial Area	470	2833	16.6%		7.0	7.0	2.91	0.54	68.33	68.33	107.2				
Junction 25	J25							15.6	1.99	0.45		460.25	415.1				
CAT CYN 32	J15,J16	J15-J16	17	1797	0.9%	8.67	3.5	87.8	0.88	0.34	49.63	4476.87	1337.2	0.04	3.70		
CAT CYN 34	J25,J16	J25-J16	87	2170	4.0%	10.96	3.3	18.9	1.82	0.44	44.65	504.90	408.6	0.04	1.78		
CAT CYN 33	Z, J16	Initial Area	417	2959	14.1%		7.5	7.5	2.81	0.53	49.02	49.02	72.6				
Junction 16	J16							87.8	0.88	0.35		5030.79	1557.3				
CAT CYN 36A	AA, BA	Initial Area	296	1711	17.3%		5.0	5.0	3.41	0.60	30.36	30.36	62.6				
CAT CYN 36	BA, J17	BA-J17	154	1597	9.6%	9.46	2.8	7.8	2.76	0.57	23.84	54.20	84.8	0.04	0.74		
CAT CYN 35	J16,J17	J16-J17	13	1249	1.0%	9.29	2.2	90.1	0.87	0.35	51.89	5082.68	1544.9	0.04	3.83		
Junction 17	J17							90.1	0.87	0.36		5136.88	1587.5				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 38A	AB, J26	Initial Area	489	3020	16.2%		8.0	8.0	2.73	0.51	46.04	46.04	64.7				
CAT CYN 38B	X, J26	Initial Area	689	4780	14.4%		11.0	11.0	2.35	0.46	173.56	173.56	186.1				
CAT CYN 38C	AC, J26	Initial Area	536	4388	12.2%		10.5	10.5	2.40	0.46	137.55	137.55	153.5				
Junction 26	J26							11.0	2.35	0.47		357.15	392.0				
CAT CYN 37	J17,J18	J17-J18	20	2450	0.8%	8.59	4.8	94.8	0.85	0.35	129.3	5266.18	1563.1	0.04	4.07		
CAT CYN 38	J26,J18	J26-J18	101	2671	3.8%	10.48	4.2	15.2	2.01	0.46	50.69	407.84	376.7	0.04	1.74		
Junction 18	J18							94.8	0.85	0.36		5674.02	1721.8				
CAT CYN 40A1-	AA, BB	Initial Area	270	1253	21.5%		3.5	3.5	4.04	0.68	14.93	14.93	40.8				
CAT CYN 40A1	BB, J28	BB-J28	109	1038	10.5%	8.80	2.0	5.5	3.27	0.64	9.83	24.76	51.9	0.04	0.62		
CAT CYN 40A2	AA,J28	Initial Area	379	3110	12.2%		9.5	9.5	2.52	0.48	82.62	82.62	100.4				
Junction 28	J28							9.5	2.52	0.61		107.38	165.8				
CAT CYN 40B1	AD, BC	Initial Area	288	2356	12.2%		7.5	7.5	2.81	0.53	40.60	40.60	60.2				
CAT CYN 40B	BC, J27	BC-J27	72	884	8.1%	8.88	1.7	9.2	2.56	0.52	8.4	49.00	65.3	0.04	0.76		
CAT CYN 40A	J28,J27	J28-J27	51	716	7.1%	10.76	1.1	10.6	2.39	0.60	12.06	119.44	170.7	0.04	1.13		
Junction 27	J27							10.6	2.39	0.70		168.44	282.7				
CAT CYN 40	J27,J19	J27-J19	40	2450	1.6%	6.01	6.8	17.4	1.89	0.69	8.17	176.61	229.5	0.04	1.42		
CAT CYN 39	J18,J19	J18-J19	101	2671	3.8%	20.08	2.2	97.0	0.84	0.36	7.45	5681.47	1703.8	0.04	4.62		
CAT CYN 41	AF, J19	Initial Area	550	4587	12.0%		12.0	12.0	2.25	0.44	123.12	123.12	122.5				
Junction 19	J19							97.0	0.84	0.37		5981.20	1851.2				
CAT CYN 43A	AG, BD	Initial Area	269	1114	24.2%		3.2	3.2	4.21	0.70	8.20	8.20	24.0				
CAT CYN 43	BD, J20	BD-J20	101	1290	7.8%	6.88	3.1	6.3	3.05	0.60	19.88	28.08	51.3	0.04	0.54		
CAT CYN 42	J19,J20	J19-J20	20	1262	1.6%	11.44	1.8	98.9	0.83	0.37	44.86	6026.06	1839.3	0.04	3.81		
Junction 20	J20							98.9	0.83	0.37		6054.14	1858.0				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 45A	AE, BE	Initial Area	282	1507	18.7%		4.3	4.3	3.66	0.63	18.48	18.48	42.9				
CAT CYN 45	BE, J21	BE-J21	108	1389	7.8%	7.98	2.9	7.2	2.87	0.60	10.43	28.91	49.6	0.04	0.67		
CAT CYN 44	J20,J21	J20-J21	10	1002	1.0%	9.57	1.7	100.6	0.82	0.36	108.43	6162.57	1853.3	0.04	4.12		
Junction 21	J21							100.6	0.82	0.37		6191.48	1867.5				
CAT CYN 47	AH, J22	Initial Area	403	3026	13.3%		8.2	8.2	2.70	0.51	48.73	48.73	67.0				
CAT CYN 46	J21,J22	J21-J22	10	1413	0.7%	8.42	2.8	103.4	0.81	0.36	125.08	6316.56	1855.1	0.04	4.40		
Junction 22	J22							103.4	0.81	0.36		6365.29	1875.3				
CAT CYN 49B1	AK, J29	Initial Area	200	1003	19.9%		3.1	3.1	4.27	0.70	13.36	13.36	40.1				
CAT CYN 49B	AL, J29		35	417	8.4%	8.06	0.9	4.0	3.81	0.69	5.53	18.89	49.4	0.04	0.65		
CAT CYN 49A	AJ, J29	Initial Area	330	2263	14.6%		6.1	6.1	3.10	0.57	43.14	43.14	75.7				
Junction 29	J29							6.1	3.10	0.60		62.03	116.0				
CAT CYN 49	J29,J23	J29-J23	120	2116	5.7%	9.04	3.9	10.0	2.46	0.55	37.43	99.46	135.4	0.04	1.03		
CAT CYN 48	J22,J23	J22-J23	50	4302	1.2%	10.23	7.0	110.4	0.79	0.35	286.36	6651.65	1841.9	0.04	4.06		
CAT CYN 50	AF, J23	Initial Area	640	8530	7.5%		12.0	12.0	2.25	0.44	243.99	243.99	242.7				
Junction 23	J23							110.4	0.79	0.36		6995.10	1970.3				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
10 Year Flow - PRE CONSTRUCTION																	
Unnamed Blueline #1 & #2																	
NNBL2-1	2A, J1	Initial Area	230	2558	9.0%		8.5	8.5	2.25	0.44	47.71	47.71	47.2				
NNBL2-2	2B, J1	Initial Area	230	1927	11.9%		7.0	7.0	2.47	0.48	23.71	23.71	27.8				
NNBL2-3	2C, J1	Initial Area	240	1874	12.8%		7.0	7.0	2.47	0.48	28.5	28.50	33.4				
Junction 1								8.5	2.25	0.46		99.92	103.1				
NNBL2-4	J1, J2	J1-J2	100	2528	4.0%	3.82	11.0	19.5	1.51	0.40	51.72	151.64	92.6	0.04	0.37		
NNBL2-5	2D, J2	Initial Area	334	3668	9.1%		11.0	11.0	1.99	0.40	78.76	78.76	61.9				
NNBL2-6	2E, J2	Initial Area	170	1481	11.5%		5.5	5.5	2.77	0.52	19.95	19.95	28.8				
Junction 2	J2							19.5	1.51	0.41		250.35	155.2				
NNBL2-7	J2,J3	J2-J3	70	2077	3.4%	7.14	4.8	24.4	1.36	0.39	54.73	305.08	159.3	0.04	1.07		
NNBL2-8	2F, J3	Initial Area	194	1325	14.7%		4.5	4.5	3.05	0.56	15.65	15.65	26.7				
NNBL2-9	2G, J3	Initial Area	120	1445	8.3%		5.5	5.5	2.77	0.52	21.99	21.99	31.7				
Junction 3	J3							24.4	1.36	0.40		342.72	186.7				
NNBL2-10	J3,J4	J3-J4	40	1433	2.8%	6.89	3.5	27.8	1.27	0.39	22.03	364.75	182.0	0.04	1.16		
NNBL1-1	1A, J4	Initial Area	410	5501	7.4%		17.2	17.2	1.60	0.32	112.2	112.20	57.7				
Junction 4	J4							27.8	1.27	0.38		476.95	227.9				
NNBL2-11	2H,J5	Initial Area	272	2184	12.4%		7.0	7.0	2.47	0.48	35.8	35.80	42.0				
NNBL2-12	2J,J5	Initial Area	192	1139	16.8%		4.0	4.0	3.23	0.58	16.24	16.24	30.5				
Junction 5	J5							7.0	2.47	0.51		52.04	65.3				
NNBL2-13	J5,J6	J3-J4	83	1700	4.9%	6.96	4.1	11.1	1.98	0.46	40.03	92.07	83.7	0.04	0.77		
NNBL2-14	2L, J6	Initial Area	275	2707	10.2%		8.5	8.5	2.25	0.44	50.68	50.68	50.2				
Junction 6								11.1	1.98	0.45		142.75	127.9				
NNBL2-15	J6,J7	J6-J7	15	1000	1.5%	5.30	3.1	14.2	1.76	0.44	13.41	156.16	121.7	0.04	1.26		
NNBL2-16	J4,J7	J4-J7	10	850	1.2%	4.85	2.9	30.8	1.21	0.37	15.71	492.66	221.6	0.04	1.32		
NNBL2-17	2M,J7	Initial Area	179	1839	9.7%		5.5	5.5	2.77	0.52	23.12	23.12	33.3				
Junction 7	J7							30.8	1.21	0.39		671.94	320.2				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Unnamed Blueline #1 & #2 (con't)																	
NNBL2-18	J7,J8	J7-J8	56	2263	2.5%	8.43	4.5	35.2	1.14	0.38	45.45	717.39	310.9	0.04	1.72		
NNBL2-19	2N,J8	Initial Area	226	2090	10.8%		6.0	6.0	2.66	0.50	27.27	27.27	36.5				
Junction 8	J8							35.2	1.14	0.39		744.66	326.5				
NNBL2-20	J8,J9	J8 to J9	54	3207	1.7%	7.32	7.3	42.5	1.04	0.37	55.98	800.64	309.0	0.04	1.87		
Unnamed Blueline #3																	
NNBL3-1	3A, J10	Initial Area	110	1349	8.2%		5.5	5.5	2.77	0.52	12.58	12.58	18.1				
NNBL3-2	3B, J10	Initial Area	70	677	10.3%		3.0	3.0	3.71	0.64	6.13	6.13	14.5				
Junction 10								5.5	2.77	0.56		18.71	29.0				
NNBL3-3	J10,J11	J10-J11	45	2263	2.0%	4.07	9.3	14.8	1.72	0.44	25.07	43.78	33.0	0.04	0.68		
NNBL3-4	3C,J11	Initial Area	55	609	9.1%		3.0	3.0	3.71	0.64	6.78	6.78	16.1				
Junction 11	J11							14.8	1.72	0.46		50.56	40.5				
NNBL3-5	J11,J12	J11-J12	84	1933	4.4%	6.41	5.0	19.8	1.50	0.39	42.5	93.06	54.2	0.04	0.75		
NNBL3-6	3D,J12	Initial Area	199	2019	9.9%		3.0	3.0	3.71	0.64	12.04	12.04	28.5				
Junction 12	J12							19.8	1.50	0.42		105.10	65.7				
NNBL3-7	J12,J13	J12-J13	66	1164	5.6%	8.50	2.3	22.1	1.42	0.40	16.97	122.07	69.2	0.04	0.94		
NNBL3-8	3E,J13	Initial Area	196	2019	9.7%		7.1	7.1	2.45	0.47	23.35	23.35	27.1				
Junction 13	J13							22.1	1.42	0.41		145.42	84.9				
NNBL3-9	J13,J14	J13-J14	15	611	2.4%	6.60	1.5	23.6	1.38	0.40	8.43	153.85	85.3	0.04	1.22		
NNBL3-10	3F,J14	Initial Area	199	1666	12.0%		5.5	5.5	2.77	0.52	16.27	16.27	23.5				
Junction 14	J14							23.6	1.38	0.41		170.12	97.0				
NNBL3-11	J14,J15	J14-J15	36	812	4.4%	7.63	1.8	25.4	1.33	0.40	15.07	185.19	98.9	0.04	0.97		
NNBL3-12	3G,J15	Initial Area	184	1808	10.2%		6.5	6.5	2.56	0.49	18.70	18.70	23.4				
Junction 15	J15							25.4	1.33	0.41		203.89	111.0				
NNBL3-13	J15, end	J15 - end	37	800	4.6%	7.24	1.8	27.2	1.29	0.40	14.11	218.00	111.9	0.04	0.86		
Long Canyon																	
LNG CYN 1	A, J1	Initial Area	160	1162	13.8%		4.0	4.0	3.23	0.58	9.9	9.90	18.6				
LNG CYN 2	B, J1	Initial Area	120	2184	5.5%		9.0	9.0	2.19	0.43	39.82	39.82	37.5				
Junction 1								9.0	2.19	0.46		49.72	50.1				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
LNG CYN 3	J1,J2	J1-J2	77	2351	3.3%	5.24	7.5	16.5	1.64	0.38	81.59	131.31	81.3	0.04	0.68		
LGN CYN 4	C,J2	Initial Area	287	1723	16.7%		6.0	6.0	2.66	0.50	23.03	23.03	30.8				
Junction 2	J2							16.5	1.64	0.40		154.34	100.3				
LGN CYN 5	J2,J3	J2-J3	8	510	1.7%	4.93	1.7	18.2	1.56	0.39	9.18	163.52	100.0	0.04	1.04		
LGN CYN 6	D,J3	Initial Area	285	2578	11.0%		8.0	8.0	2.31	0.45	33.34	33.34	34.8				
Junction 3	J3							18.2	1.56	0.40		196.86	123.5				
LGN CYN 7	J3,J4	J3-J4	33	587	5.6%	7.17	1.4	19.6	1.51	0.40	5.32	202.18	121.7	0.04	0.73		
LGN CYN 8	E,J4	Initial Area	239	1600	14.9%		7.1	7.1	2.45	0.47	18.54	18.54	21.5				
LGN CYN 9	F, J4	Initial Area	321	3298	9.7%		10.1	10.1	2.07	0.41	64.82	64.82	55.0				
Junction 4	J4							19.6	1.51	0.41		285.54	175.0				
LGN CYN 10	J4,J5	J4-J5	5	855	0.6%	4.22	3.4	22.9	1.40	0.40	18.52	304.06	169.2	0.04	1.73		
LGN CYN 11	B,J5	Initial Area	244	2033	12.0%		7.0	7.0	2.47	0.48	40.46	40.46	47.5				
Junction 5	J5							22.9	1.40	0.41		344.52	196.1				
LGN CYN 12	J5,J6	J5-J6	76	2167	3.5%	7.61	4.7	27.7	1.28	0.38	64.42	408.94	199.5	0.04	1.14		
LGN CYN 13	G,J6	Initial Area	320	1808	17.7%		5.2	5.2	2.85	0.53	72.61	72.61	109.7				
Junction 6	J6							27.7	1.28	0.40		481.55	248.6				
LGN CYN 14	J6,J7	J6-J7	17	1415	1.2%	5.44	4.3	32.0	1.19	0.39	52.08	533.63	245.8	0.04	1.55		
LGN CYN 15	H,J7	Initial Area	267	2128	12.5%		6.5	6.5	2.56	0.49	40.85	40.85	51.1				
LGN CYN 16	J, J7	Initial Area	168	1166	14.4%		5.5	5.5	2.77	0.52	8.66	8.66	12.5				
Junction 7	J7							32.0	1.19	0.40		583.14	274.9				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Long Canyon (con't)																	
LGN CYN 17	J7,J8	J7-J8	23	1308	1.8%	6.97	3.1	35.1	1.14	0.39	37.96	621.10	272.0	0.04	1.67		
LGN CYN 18	J,J8	Initial Area	191	1828	10.5%		6.5	6.5	2.56	0.49	22.38	22.38	28.0				
Junction 8	J8							35.1	1.14	0.39		643.48	284.5				
LGN CYN 19	J8,J9	J8-J9	40	1341	3.0%	7.87	2.8	38.0	1.10	0.38	46.44	689.92	284.3	0.04	1.35		
LGN CYN 20	K,J9	Initial Area	200	1806	11.1%		6.4	6.4	2.58	0.49	21.61	21.61	27.4				
Junction 9	J9							38.0	1.10	0.38		711.53	295.9				
LGN CYN 21	J9,J10	J9-J10	15	693	2.2%	7.55	1.5	39.5	1.08	0.37	20.72	732.25	294.7	0.04	1.59		
LGN CYN 22	L,J10	Initial Area	135	1428	9.5%		5.5	5.5	2.77	0.52	23.15	23.15	33.4				
Junction 10	J10							39.5	1.08	0.38		755.40	307.6				
LGN CYN 23	J10,J11	J10-J11	25	847	2.9%	8.65	1.6	41.1	1.05	0.37	20.28	775.68	305.7	0.04	1.59		
LGN CYN 24	M,J11	Initial Area	187	1482	12.6%		4.9	4.9	2.93	0.54	16.4	16.40	26.0				
Junction 11	J11							41.1	1.05	0.38		792.08	315.1				
LGN CYN 25	J11,J12	J11-J12	70	2087	3.4%	9.99	3.5	44.6	1.01	0.36	52.63	844.71	312.5	0.04	1.77		
LGN CYN 26	N,J12	Initial Area	200	1850	10.8%		6.2	6.2	2.62	0.50	21.56	21.56	28.1				
Junction 12	J12							44.6	1.01	0.37		866.27	323.4				
LGN CYN 27	J12, END	J12-END	30	1246	2.4%	9.01	2.3	46.9	0.99	0.36	26.06	892.33	320.1	0.04	1.95		

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon																	
OLV CYN 1	A, J1	Initial Area	185	2042	9.1%		8.0	8.0	2.31	0.45	33.14	33.14	34.6				
OLV CYN 2	B, J1	Initial Area	161	1575	10.2%		5.8	5.8	2.70	0.51	19.71	19.71	27.2				
Junction 1								8.0	2.31	0.47		52.85	57.9				
OLV CYN 3	J1,J2	J1-J2	84	2033	4.1%	6.65	5.1	13.1	1.83	0.42	46.79	99.64	77.0	0.04	0.83		
OLV CYN 4	B,J2	Initial Area	244	1723	14.2%		5.0	5.0	2.90	0.54	31.97	31.97	49.9				
Junction 2	J2							13.1	1.83	0.45		131.61	108.4				
OLV CYN 5	J2,J3	J2-J3	61	1762	3.5%	7.02	4.2	17.3	1.60	0.42	44.86	176.47	117.9	0.04	1.02		
OLV CYN 6	C,J3	Initial Area	313	3437	9.1%		10.1	10.1	2.07	0.41	63.01	63.01	53.5				
Junction 3	J3							17.3	1.60	0.42		239.48	159.2				
OLV CYN 7	J3,J4	J3-J4	40	902	4.4%	9.05	1.7	18.9	1.53	0.41	8.79	248.27	156.5	0.04	1.24		
OLV CYN 8	D,J4	Initial Area	330	4367	7.6%		13.0	13.0	1.83	0.37	72.00	72.00	48.5				
OLV CYN 9	E, J4	Initial Area	197	2861	6.9%		10.1	10.1	2.07	0.41	53.94	53.94	45.8				
Junction 4	J4							18.9	1.53	0.40		374.21	230.8				
OLV CYN 10	J4,J5	J4-J5	13	917	1.4%	6.48	2.4	21.3	1.45	0.40	18.75	392.96	225.9	0.04	1.76		
OLV CYN 11	F,J5	Initial Area	333	3924	8.5%		12.0	12.0	1.91	0.38	57.52	57.52	41.7				
Junction 5	J5							21.3	1.45	0.40		450.48	257.6				
OLV CYN 12	J5,J6	J5-J6	17	402	4.2%	10.05	0.7	22.0	1.43	0.39	23.30	473.78	263.2	0.04	1.50		
OLV CYN 13	G,J6	Initial Area	239	2895	8.3%		9.5	9.5	2.13	0.42	79.32	79.32	71.1				
Junction 6	J6							22.0	1.43	0.39		553.10	310.8				
OLV CYN 14	J6,J7	J6-J7	21	1598	1.3%	6.46	4.1	26.1	1.31	0.38	57.77	610.87	305.5	0.04	1.83		
OLV CYN 15	H,J7	Initial Area	221	2289	9.7%		7.0	7.0	2.47	0.48	34.70	34.70	40.7				
Junction 7	J7							26.1	1.31	0.39		645.57	327.2				
OLV CYN 16	J7,J8	J7-J8	59	1849	3.2%	9.60	3.2	29.3	1.24	0.37	64.56	710.13	328.5	0.04	1.74		
OLV CYN 17	J, J8	Initial Area	168	1166	14.4%		5.5	5.5	2.77	0.52	19.74	19.74	28.5				
Junction 8	J8							29.3	1.24	0.38		729.87	341.3				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon (con't)																	
OLV CYN B1	BA, J12	Initial Area	319	4102	7.8%		14.0	14.0	1.77	0.35	117.13	117.13	73.5				
OLV CYN B2	BB, J12	Initial Area	200	1335	15.0%		4.4	4.4	3.08	0.56	12.59	12.59	21.9				
Junction 12								14.0	1.77	0.37		129.72	86.1				
OLV CYN B3	J12,J13	J12-J13	80	2102	3.8%	7.20	4.9	18.9	1.53	0.36	48.49	178.21	97.3	0.04	0.99		
OLV CYN B4	BB, J13	Initial Area	280	2943	9.5%		9.0	9.0	2.19	0.43	53.73	53.73	50.6				
OLV CYN B5	BC, J13	Initial Area	70	980	7.1%		4.5	4.5	3.05	0.56	11.00	11.00	18.8				
Junction 13	J13							18.9	1.53	0.38		242.94	142.2				
OLV CYN B6	J13,J14	J13-J14	5	980	0.5%	3.71	4.4	23.3	1.39	0.38	8.92	251.86	132.0	0.04	1.65		
OLV CYN B7	BD, J14	Initial Area	235	1682	14.0%		5.5	5.5	2.77	0.52	21.83	21.83	31.5				
Junction 14	J14							23.3	1.39	0.39		273.69	147.7				
OLV CYN B8	J14,J15	J14-J15	45	1734	2.6%	7.20	4.0	27.3	1.28	0.37	42.44	316.13	150.4	0.04	1.31		
OLV CYN B9	BE, J15	Initial Area	288	2927	9.8%		8.6	8.6	2.24	0.44	43.38	43.38	42.5				
OLV CYN B10	BF, J15	Initial Area	130	1555	8.4%		6.8	6.8	2.50	0.48	16.5	16.50	19.9				
Junction 15	J15							27.3	1.28	0.38		376.01	185.1				
OLV CYN B11	J15,J16	J15-J16	30	651	4.6%	9.48	1.1	28.4	1.26	0.38	9.39	385.40	184.3	0.04	1.29		
OLV CYN B12	BG, J16	Initial Area	280	2261	12.4%		7.0	7.0	2.47	0.48	29.51	29.51	34.6				
Junction 16	J16							28.4	1.26	0.39		414.91	202.0				
OLV CYN B13	J16,J9	J16-J9	40	1905	2.1%	7.26	4.4	32.8	1.18	0.38	28.82	443.73	196.1	0.04	1.56		
OLV CYN B14	BH, J9	Initial Area	158	2489	6.3%		7.0	7.0	2.47	0.48	24.93	24.93	29.3				
OLV CYN 18	J8,J9	J8-J9	40	1623	2.5%	8.68	3.1	32.4	1.18	0.22	39.08	768.95	203.0	0.04	1.81		
Junction 9	J9							32.8	1.18	0.28		1237.61	411.9				
OLV CYN 19	J9,J10	J9-J10	40	939	4.3%	11.21	1.4	34.2	1.15	0.28	14.42	1252.03	407.3	0.04	1.76		
OLV CYN 20	K, J10	Initial Area	160	1521	10.5%		5.8	5.8	2.70	0.51	14.88	14.88	20.5				
OLV CYN 21	BF, J10	Initial Area	240	4599	5.2%		16.0	16.0	1.66	0.33	45.78	45.78	25.3				
Junction 10	J10							34.2	1.15	0.29		1312.69	433.6				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon (con't)																	
OLV CYN A1	AA, J18	Initial Area	270	3259	8.3%		10.2	10.2	2.06	0.41	33.42	33.42	28.1				
OLV CYN A2	AB, J18	Initial Area	170	2265	7.5%		8.1	8.1	2.30	0.45	24.49	24.49	25.3				
Junction 18	J18							10.2	2.06	0.43		57.91	50.8				
OLV CYN A3	J18,J19	J18-J19	53	780	6.8%	7.87	1.7	11.9	1.92	0.42	14.51	72.42	57.9	0.04	0.73		
OLV CYN A4	AC, J19	Initial Area	133	1216	10.9%		4.6	4.6	3.02	0.55	10.78	10.78	18.0				
Junction 19	J19							11.9	1.92	0.43		83.20	69.3				
OLV CYN 22	J10,J11	J10-J11	47	1472	3.2%	10.17	2.4	14.3	1.75	0.29	15.63	1328.32	669.4	0.04	1.90		
OLV CYN A5	J19,J11	J19-J11	34	512	6.6%	8.40	1.0	29.4	1.24	0.43	2.49	85.69	45.5	0.04	0.83		
Junction 11	J11							29.4	1.24	0.30		1414.01	518.2				
Cat Canyon																	
CAT CYN 1	A, J1	Initial Area	220	3939	5.6%		14.0	14.0	1.77	0.35	164.76	164.76	103.4				
CAT CYN 2	B, J1	Initial Area	240	3214	7.5%		11.0	11.0	1.99	0.40	82.64	82.64	64.9				
Junction 1								14.0	1.77	0.37		247.40	161.2				
CAT CYN 3	J1,J2	J1-J2	30	1061	2.9%	7.57	2.3	34.8	1.14	0.35	37.57	284.97	113.4	0.04	1.31		
CAT CYN 4	C,J2	Initial Area	273	4399	6.2%		14.0	14.0	1.77	0.35	177.26	177.26	111.3				
Junction 2	J2							34.8	1.14	0.35		462.23	185.3				
CAT CYN 5	J2,J3	J2-J3	40	2528	1.6%	6.08	6.9	41.7	1.05	0.33	68.72	530.95	183.3	0.04	1.48		
CAT CYN 6	D,J3	Initial Area	300	5119	5.9%		16.0	16.0	1.66	0.33	106.30	106.30	58.7				
CAT CYN 7	E, J3	Initial Area	318	3649	8.7%		11.0	11.0	1.99	0.40	93.88	93.88	73.7				
Junction 3	J3							41.7	1.05	0.34		731.13	259.3				
CAT CYN 8	J3,J4	J3-J4	30	2536	1.2%	5.96	7.1	48.8	0.97	0.32	86.11	817.24	254.2	0.04	1.79		
CAT CYN 9	F,J4	Initial Area	300	6775	4.4%		23.0	23.0	1.39	0.28	209.62	209.62	80.4				
Junction 4	J4							48.8	0.97	0.31		1026.86	310.3				
CAT CYN 10	J4,J5	J4-J5	20	1868	1.1%	6.03	5.2	53.9	0.93	0.30	90.94	1117.80	308.4	0.04	1.96		
CAT CYN 11	G,J5	Initial Area	190	6195	3.1%		25.0	25.0	1.34	0.26	238.85	238.85	83.9				
Junction 5	J5							53.9	0.93	0.29		1356.65	366.4				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 12	J5,J6	J5-J6	10	655	1.5%	7.22	1.5	55.4	0.91	0.29	21.49	1378.14	364.5	0.04	1.96		
CAT CYN 13	H,J6	Initial Area	380	4546	8.4%		13.0	13.0	1.83	0.37	130.52	130.52	87.9				
Junction 6	J6							55.4	0.91	0.30		1508.66	408.3				
CAT CYN 14	J6,J7	J6-J7	10	1376	0.7%	5.76	4.0	59.4	0.88	0.29	77.69	1586.35	404.3	0.04	2.44		
CAT CYN 15	J,J7	Initial Area	670	6984	9.6%		17.0	17.0	1.61	0.32	383.83	383.83	199.8				
Junction 7	J7							59.4	0.88	0.30		1970.18	513.9				
CAT CYN 16	J7,J8	J7-J8	29	1894	1.5%	8.05	3.9	63.3	0.86	0.29	114.13	2084.31	511.0	0.04	2.31		
CAT CYN 17	K, J8	Initial Area	249	4534	5.5%		16.0	16.0	1.66	0.33	134.68	134.68	74.4				
Junction 8	J8							63.3	0.86	0.29		2218.99	549.4				
CAT CYN 19A	L, J9A	Initial Area	620	4845	12.8%		11.5	11.5	1.94	0.39	173.73	173.73	131.0				
CAT CYN 19B	M, J9A	Initial Area	730	4642	15.7%		10.0	10.0	2.08	0.41	165.79	165.79	142.0				
Junction J9A								11.5	1.94	0.40		339.52	263.8				
CAT CYN 19	J9A,J9	J9A-J9	60	1352	4.4%	9.78	2.3	13.8	1.78	0.40	21.14	360.66	255.1	0.04	1.39		
CAT CYN 18	J8,J9	J8-J9	11	1514	0.7%	6.22	4.1	67.4	0.83	0.29	50.58	2269.57	538.4	0.04	2.73		
CAT CYN 20	N, J9	Initial Area	340	3649	9.3%		11.5	11.5	1.94	0.39	112.02	112.02	84.5				
Junction 9	J9A,J9							67.4	0.83	0.30		2742.25	693.7				
CAT CYN 21	J9,J10	J9-J10	3	1019	0.3%	4.90	3.5	70.9	0.81	0.30	57.78	2800.03	682.6	0.04	3.43		
CAT CYN 22	P,J10	Initial Area	383	3985	9.6%		11.0	11.0	1.99	0.40	70.08	70.08	55.1				
CAT CYN 23	Q, J10	Initial Area	463	2941	15.8%		7.5	7.5	2.39	0.46	43.22	43.22	47.8				
Junction 10	J10							70.9	0.81	0.30		2913.33	721.3				
CAT CYN 24	J10,J11	J10-J11	17	3052	0.6%	6.15	8.3	79.1	0.77	0.29	190.84	3104.17	698.7	0.04	3.30		
CAT CYN 25	R, J11	Initial Area	360	4534	7.9%		13.0	13.0	1.83	0.37	265.58	265.58	178.8				
Junction 11	J11							79.1	0.77	0.30		3369.75	773.8				
CAT CYN 27A	S, J13	Initial Area	255	3361	7.6%		11.0	11.0	1.99	0.40	93.86	93.86	73.7				
CAT CYN 27B	T, J13	Initial Area	285	3505	8.1%		10.8	10.8	2.00	0.40	116.31	116.31	92.9				
Junction 13								11.0	1.99	0.40		210.17	165.8				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 27	J13,J12	J13-J12	84	2211	3.8%	8.50	4.3	15.3	1.69	0.39	54.66	264.83	172.8	0.04	1.27		
CAT CYN 26	J11,J12	J11-J12	19	951	2.0%	10.08	1.6	80.7	0.76	0.29	69.68	3439.43	771.7	0.04	2.68		
Junction 12	J12							80.7	0.76	0.30		3704.26	849.6				
CAT CYN 28	J12,J14	J12-J14	11	1237	0.9%	7.73	2.7	83.4	0.75	0.30	87.79	3792.05	842.5	0.04	3.26		
CAT CYN 29	U, J14	Initial Area	670	7044	9.5%		16.0	16.0	1.66	0.33	234.44	234.44	129.5				
Junction 14	J14							83.4	0.75	0.30		4026.49	901.2				
CAT CYN 30	J14,J15	J14-J15	30	3444	0.9%	7.78	7.4	90.8	0.72	0.28	351.98	4378.47	886.0	0.04	3.35		
CAT CYN 31	V, J15	Initial Area	430	3590	12.0%		9.8	9.8	2.10	0.42	48.77	48.77	42.5				
Junction 15	J15							90.8	0.72	0.28		4427.24	900.6				
CAT CYN 34A1	W, J24	Initial Area	510	5459	9.3%		14.0	14.0	1.77	0.35	197.82	197.82	124.2				
CAT CYN 34A2	X, J24	Initial Area	600	4145	14.5%		10.0	10.0	2.08	0.41	162.07	162.07	138.8				
Junction 24	J24							14.0	1.77	0.38		359.89	242.3				
CAT CYN 34A	J24,J25	J24-J25	70	1145	6.1%	11.20	1.7	15.7	1.67	0.38	32.03	391.92	247.3	0.04	1.34		
CAT CYN 34B	Y, J25	Initial Area	470	2833	16.6%		7.0	7.0	2.47	0.48	68.33	68.33	80.2				
Junction 25	J25							15.7	1.67	0.39		460.25	301.7				
CAT CYN 32	J15,J16	J15-J16	17	1797	0.9%	8.00	3.7	94.5	0.71	0.28	49.63	4476.87	886.0	0.04	3.28		
CAT CYN 34	J25,J16	J25-J16	87	2170	4.0%	10.12	3.6	19.3	1.52	0.38	44.65	504.90	293.9	0.04	1.58		
CAT CYN 33	Z, J16	Initial Area	417	2959	14.1%		7.5	7.5	2.39	0.46	49.02	49.02	54.2				
Junction 16	J16							94.5	0.71	0.29		5030.79	1039.1				
CAT CYN 36A	AA, BA	Initial Area	296	1711	17.3%		5.0	5.0	2.90	0.54	30.36	30.36	47.4				
CAT CYN 36	BA, J17	BA-J17	154	1597	9.6%	8.73	3.1	8.1	2.31	0.50	23.84	54.20	62.5	0.04	0.66		
CAT CYN 35	J16,J17	J16-J17	13	1249	1.0%	8.57	2.4	96.9	0.70	0.29	51.89	5082.68	1029.2	0.04	3.39		
Junction 17	J17							96.9	0.70	0.30		5136.88	1059.5				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 38A	AB, J26	Initial Area	489	3020	16.2%		8.0	8.0	2.31	0.45	46.04	46.04	48.1				
CAT CYN 38B	X, J26	Initial Area	689	4780	14.4%		11.0	11.0	1.99	0.40	173.56	173.56	136.3				
CAT CYN 38C	AC, J26	Initial Area	536	4388	12.2%		10.5	10.5	2.03	0.40	137.55	137.55	112.7				
Junction 26	J26							11.0	1.99	0.41		357.15	287.9				
CAT CYN 37	J17,J18	J17-J18	20	2450	0.8%	7.92	5.2	102.1	0.68	0.29	129.3	5266.18	1039.4	0.04	3.61		
CAT CYN 38	J26,J18	J26-J18	101	2671	3.8%	9.67	4.6	15.6	1.68	0.40	50.69	407.84	272.1	0.04	1.54		
Junction 18	J18							102.1	0.68	0.30		5674.02	1149.8				
CAT CYN 40A1-	AA, BB	Initial Area	270	1253	21.5%		3.5	3.5	3.44	0.61	14.93	14.93	31.3				
CAT CYN 40A1	BB, J28	BB-J28	109	1038	10.5%	8.12	2.1	5.6	2.74	0.57	9.83	24.76	38.8	0.04	0.55		
CAT CYN 40A2	AA,J28	Initial Area	379	3110	12.2%		9.5	9.5	2.13	0.42	82.62	82.62	74.1				
Junction 28	J28							9.5	2.13	0.54		107.38	123.6				
CAT CYN 40B1	AD, BC	Initial Area	288	2356	12.2%		7.5	7.5	2.39	0.46	40.60	40.60	44.9				
CAT CYN 40B	BC, J27	BC-J27	72	884	8.1%	8.19	1.8	9.3	2.15	0.46	8.4	49.00	48.2	0.04	0.68		
CAT CYN 40A	J28,J27	J28-J27	51	716	7.1%	9.93	1.2	10.7	2.01	0.53	12.06	119.44	126.5	0.04	1.00		
Junction 27	J27							10.7	2.01	0.62		168.44	209.3				
CAT CYN 40	J27,J19	J27-J19	40	2450	1.6%	5.54	7.4	18.1	1.57	0.60	8.17	176.61	166.8	0.04	1.26		
CAT CYN 39	J18,J19	J18-J19	101	2671	3.8%	18.53	2.4	104.5	0.67	0.30	7.45	5681.47	1137.4	0.04	4.09		
CAT CYN 41	AF, J19	Initial Area	550	4587	12.0%		12.0	12.0	1.91	0.38	123.12	123.12	89.3				
Junction 19	J19							104.5	0.67	0.31		5981.20	1240.8				
CAT CYN 43A	AG, BD	Initial Area	269	1114	24.2%		3.2	3.2	3.59	0.63	8.20	8.20	18.5				
CAT CYN 43	BD, J20	BD-J20	101	1290	7.8%	6.35	3.4	6.6	2.54	0.53	19.88	28.08	37.6	0.04	0.48		
CAT CYN 42	J19,J20	J19-J20	20	1262	1.6%	10.56	2.0	106.5	0.67	0.31	44.86	6026.06	1231.5	0.04	3.38		
Junction 20	J20							106.5	0.67	0.31		6054.14	1244.8				

DS-13186-114							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 45A	AE, BE	Initial Area	282	1507	18.7%		4.3	4.3	3.12	0.57	18.48	18.48	32.7				
CAT CYN 45	BE, J21	BE-J21	108	1389	7.8%	7.37	3.1	7.4	2.40	0.53	10.43	28.91	36.7	0.04	0.60		
CAT CYN 44	J20,J21	J20-J21	10	1002	1.0%	8.83	1.9	108.4	0.66	0.30	108.43	6162.57	1238.6	0.04	3.65		
Junction 21	J21							108.4	0.66	0.30		6191.48	1248.7				
CAT CYN 47	AH, J22	Initial Area	403	3026	13.3%		8.2	8.2	2.29	0.45	48.73	48.73	49.8				
CAT CYN 46	J21,J22	J21-J22	10	1413	0.7%	7.77	3.0	111.4	0.65	0.30	125.08	6316.56	1236.9	0.04	3.90		
Junction 22	J22							111.4	0.65	0.30		6365.29	1251.1				
CAT CYN 49B1	AK, J29	Initial Area	200	1003	19.9%		3.1	3.1	3.65	0.63	13.36	13.36	30.9				
CAT CYN 49B	AL, J29		35	417	8.4%	7.44	0.9	4.0	3.22	0.62	5.53	18.89	37.5	0.04	0.57		
CAT CYN 49A	AJ, J29	Initial Area	330	2263	14.6%		6.1	6.1	2.64	0.50	43.14	43.14	57.0				
Junction 29	J29							6.1	2.64	0.54		62.03	87.7				
CAT CYN 49	J29,J23	J29-J23	120	2116	5.7%	8.34	4.2	10.3	2.05	0.49	37.43	99.46	99.3	0.04	0.91		
CAT CYN 48	J22,J23	J22-J23	50	4302	1.2%	9.44	7.6	119.0	0.63	0.29	286.36	6651.65	1220.8	0.04	3.60		
CAT CYN 50	AF, J23	Initial Area	640	8530	7.5%		12.0	12.0	1.91	0.38	243.99	243.99	176.9				
Junction 23	J23							119.0	0.63	0.30		6995.10	1310.3				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
100 Year Flow - POST CONSTRUCTION																	
Unnamed Blueline #1 & #2																	
NNBL2-1	2A, J1	Initial Area	229	2372	9.7%		8.0	8.0	3.45	0.71	41.66	41.66	102.6				
NNBL2-2	2B, J1	Initial Area	218	2353	9.3%		7.5	7.5	3.56	1.07	23.82	23.82	90.7				
NNBL2-3	2C, J1	Initial Area	240	2253	10.7%		8.0	8.0	3.45	1.14	30.78	30.78	120.6				
Junction 1								8.0	3.45	0.94		96.26	311.2				
NNBL2-4	J1, J2	J1-J2	100	2528	4.0%	5.41	7.8	15.8	2.49	0.63	46.6	142.86	226.0	0.04	0.62		
NNBL2-5	2D, J2	Initial Area	334	3668	9.1%		11.0	11.0	2.96	0.68	80.33	80.33	162.0				
NNBL2-6	2E, J2	Initial Area	170	1481	11.5%		5.5	5.5	4.13	0.69	19.95	19.95	56.6				
Junction 2	J2							15.8	2.49	0.65		243.14	396.4				
NNBL2-7	J2,J3	J2-J3	70	2077	3.4%	9.28	3.7	19.5	2.25	0.61	54.73	297.87	412.5	0.04	1.59		
NNBL2-8	2F, J3	Initial Area	194	1325	14.7%		4.5	4.5	4.55	0.73	15.65	15.65	52.0				
NNBL2-9	2G, J3	Initial Area	120	1445	8.3%		5.5	5.5	4.13	0.69	21.99	21.99	62.4				
Junction 3	J3							19.5	2.25	0.62		335.51	472.3				
NNBL2-10	J3,J4	J3-J4	40	1433	2.8%	8.68	2.8	22.3	2.11	0.61	22.03	357.54	462.9	0.04	1.65		
NNBL1-1	1A, J4	Initial Area	410	5898	7.0%		17.2	17.2	2.39	0.48	114.71	114.71	132.9				
Junction 4	J4							22.3	2.11	0.58		472.25	580.3				
NNBL2-11	2H,J5	Initial Area	272	2184	12.4%		7.0	7.0	3.68	0.83	52.24	52.24	160.2				
NNBL2-13	J5,J6	J5-J6	83	1700	4.9%	9.01	3.1	10.1	3.08	0.77	40.71	92.95	219.5	0.04	1.14		
NNBL2-14	2L, J6	Initial Area	275	2707	10.2%		8.5	8.5	3.35	0.60	50.68	50.68	101.6				
Junction 6								10.1	3.08	0.71		143.63	312.9				
NNBL2-15	J6,J7	J6-J7	15	1000	1.5%	6.73	2.5	12.6	2.78	0.69	13.41	157.04	301.2	0.04	1.80		
NNBL2-16	J4,J7	J4-J7	10	850	1.2%	6.12	2.3	24.6	2.02	0.58	15.71	487.96	566.1	0.04	1.86		
NNBL2-17	2M,J7	Initial Area	179	1839	9.7%		5.5	5.5	4.13	0.69	23.12	23.12	65.6				
Junction 7	J7							24.6	2.02	0.61		668.12	817.1				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Unnamed Blueline #1 & #2 (con't)																	
NNBL2-18	J7,J8	J7-J8	56	2263	2.5%	10.62	3.6	28.1	1.89	0.59	45.45	713.57	798.4	0.04	2.43		
NNBL2-19	2N,J8	Initial Area	226	2090	10.8%		6.0	6.0	3.96	0.67	27.27	27.27	72.3				
Junction 8	J8							28.1	1.89	0.59		740.84	832.9				
NNBL2-20	J8,J9	J8 to J9	54	3207	1.7%	9.21	5.8	33.9	1.73	0.58	55.98	796.82	794.8	0.04	2.64		
Unnamed Blueline #3																	
NNBL3-1	3A, J10	Initial Area	110	1349	8.2%		5.5	5.5	4.13	0.69	12.58	12.58	35.7				
NNBL3-2	3B, J10	Initial Area	70	677	10.3%		3.0	3.0	5.52	0.82	6.13	6.13	27.8				
Junction 10								5.5	4.13	0.73		18.71	56.5				
NNBL3-3	J10,J11	J10-J11	45	2263	2.0%	4.96	7.6	13.1	2.73	0.61	25.07	43.78	72.4	0.04	0.91		
NNBL3-4	3C,J11	Initial Area	55	609	9.1%		3.0	3.0	5.52	0.82	6.78	6.78	30.7				
Junction 11	J11							13.1	2.73	0.64		50.56	87.6				
NNBL3-5	J11,J12	J11-J12	84	1933	4.4%	7.82	4.1	17.2	2.39	0.56	42.5	93.06	124.0	0.04	1.01		
NNBL3-6	3D,J12	Initial Area	199	2019	9.9%		3.0	3.0	5.52	0.82	12.04	12.04	54.6				
Junction 12	J12							17.2	2.39	0.59		105.10	147.6				
NNBL3-7	J12,J13	J12-J13	66	1164	5.6%	10.37	1.9	19.1	2.28	0.57	16.97	122.07	157.7	0.04	1.27		
NNBL3-8	3E,J13	Initial Area	196	2019	9.7%		7.1	7.1	3.66	0.63	23.35	23.35	54.1				
Junction 13	J13							19.1	2.28	0.58		145.42	191.4				
NNBL3-9	J13,J14	J13-J14	15	611	2.4%	8.06	1.3	20.4	2.21	0.57	8.43	153.85	193.7	0.04	1.64		
NNBL3-10	3F,J14	Initial Area	199	1666	12.0%		5.5	5.5	4.13	0.69	16.27	16.27	46.2				
Junction 14	J14							20.4	2.21	0.58		170.12	218.4				
NNBL3-11	J14,J15	J14-J15	36	812	4.4%	9.31	1.5	21.8	2.14	0.57	15.07	185.19	224.9	0.04	1.30		
NNBL3-12	3G,J15	Initial Area	184	1808	10.2%		6.5	6.5	3.81	0.65	18.70	18.70	46.5				
Junction 15	J15							21.8	2.14	0.58		203.89	250.9				
NNBL3-13	J15, end	J15 - end	37	800	4.6%	8.84	1.5	23.3	2.07	0.57	14.11	218.00	255.0	0.04	1.16		

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Long Canyon																	
LNG CYN 1	A, J1	Initial Area	160	1162	13.8%		4.0	4.0	4.81	0.76	9.9	9.90	36.0				
LNG CYN 2	B, J1	Initial Area	120	2184	5.5%		9.0	9.0	3.26	0.59	39.82	39.82	76.2				
Junction 1								9.0	3.26	0.62		49.72	100.6				
LNG CYN 3	J1,J2	J1-J2	77	2351	3.3%	6.40	6.1	15.1	2.55	0.54	81.59	131.31	179.7	0.04	0.92		
LGN CYN 4	C,J2	Initial Area	287	1809	15.9%		6.0	6.0	3.96	0.73	19	19.00	54.7				
Junction 2	J2							15.1	2.55	0.56		150.31	214.8				
LGN CYN 5	J2,J3	J2-J3	8	501	1.7%	6.06	1.4	16.5	2.44	0.56	6.8	157.11	214.6	0.04	1.40		
LGN CYN 6	D,J3	Initial Area	286	2301	12.4%		8.0	8.0	3.45	0.70	36.15	36.15	87.8				
Junction 3	J3							16.5	2.44	0.59		193.26	276.7				
LGN CYN 7	J3,J4	J3-J4	33	585	5.6%	8.81	1.1	17.6	2.37	0.58	5.78	199.04	274.5	0.04	0.99		
LGN CYN 8	E,J4	Initial Area	239	1600	14.9%		7.1	7.1	3.66	0.63	18.54	18.54	43.0				
LGN CYN 9	F, J4	Initial Area	239	3803	6.3%		10.1	10.1	3.09	0.73	68.07	68.07	153.6				
Junction 4	J4							17.6	2.37	0.62		285.65	420.0				
LGN CYN 10	J4,J5	J4-J5	5	855	0.6%	5.28	2.7	20.3	2.21	0.61	18.52	304.17	410.0	0.04	2.42		
LGN CYN 11	B,J5	Initial Area	244	2033	12.0%		7.0	7.0	3.68	0.64	40.46	40.46	94.9				
Junction 5	J5							20.3	2.21	0.61		344.63	467.0				
LGN CYN 12	J5,J6	J5-J6	76	2167	3.5%	9.50	3.8	24.1	2.04	0.58	64.42	409.05	483.1	0.04	1.59		
LGN CYN 13	G,J6	Initial Area	296	2838	10.4%		5.2	5.2	4.24	1.00	74.09	74.09	315.8				
Junction 6	J6							24.1	2.04	0.65		483.14	634.6				
LGN CYN 14	J6,J7	J6-J7	17	1415	1.2%	6.87	3.4	27.5	1.91	0.62	52.08	535.22	633.3	0.04	2.20		
LGN CYN 15	H,J7	Initial Area	257	2259	11.4%		6.5	6.5	3.81	0.85	41.34	41.34	133.7				
LGN CYN 16	J, J7	Initial Area	168	1166	14.4%		5.5	5.5	4.13	0.69	8.66	8.66	24.6				
Junction 7	J7							27.5	1.91	0.64		585.22	711.6				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Long Canyon (con't)																	
LGN CYN 17	J7,J8	J7-J8	23	1308	1.8%	8.81	2.5	30.0	1.83	0.62	37.32	622.54	708.1	0.04	2.37		
LGN CYN 18	J,J8	Initial Area	191	1828	10.5%		6.5	6.5	3.81	0.65	22.38	22.38	55.7				
Junction 8	J8							30.0	1.83	0.62		644.92	734.8				
LGN CYN 19	J8,J9	J8-J9	40	1341	3.0%	9.95	2.2	32.3	1.77	0.60	46.44	691.36	739.0	0.04	1.92		
LGN CYN 20	K,J9	Initial Area	200	1806	11.1%		6.4	6.4	3.84	0.66	21.61	21.61	54.4				
Junction 9	J9							32.3	1.77	0.61		712.97	764.1				
LGN CYN 21	J9,J10	J9-J10	15	693	2.2%	9.47	1.2	33.5	1.74	0.60	20.72	733.69	763.2	0.04	2.24		
LGN CYN 22	L,J10	Initial Area	135	1428	9.5%		5.5	5.5	4.13	0.69	23.15	23.15	65.7				
Junction 10	J10							33.5	1.74	0.60		756.84	790.9				
LGN CYN 23	J10,J11	J10-J11	25	847	2.9%	10.87	1.3	34.8	1.71	0.59	20.28	777.12	788.5	0.04	2.24		
LGN CYN 24	M,J11	Initial Area	187	1482	12.6%		4.9	4.9	4.37	0.71	16.4	16.40	51.0				
Junction 11	J11							34.8	1.71	0.60		793.52	808.4				
LGN CYN 25	J11,J12	J11-J12	70	2087	3.4%	12.55	2.8	37.6	1.65	0.58	52.63	846.15	807.9	0.04	2.50		
LGN CYN 26	N,J12	Initial Area	200	1850	10.8%		6.2	6.2	3.90	0.66	21.56	21.56	55.7				
Junction 12	J12							37.6	1.65	0.58		867.71	831.4				
LGN CYN 27	J12, END	J12-END	30	1246	2.4%	11.30	1.8	39.4	1.61	0.57	26.06	893.77	826.1	0.04	2.73		

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon																	
OLV CYN 1	A, J1	Initial Area	185	2042	9.1%		8.0	8.0	3.45	0.61	33.14	33.14	69.8				
OLV CYN 2	B, J1	Initial Area	161	1575	10.2%		5.8	5.8	4.03	0.68	19.71	19.71	53.7				
Junction 1								8.0	3.45	0.63		52.85	115.8				
OLV CYN 3	J1,J2	J1-J2	84	2033	4.1%	8.11	4.2	12.2	2.82	0.58	46.79	99.64	164.4	0.04	1.11		
OLV CYN 4	B,J2	Initial Area	244	1723	14.2%		5.0	5.0	4.33	0.71	31.97	31.97	97.8				
Junction 2	J2							12.2	2.82	0.61		131.61	228.3				
OLV CYN 5	J2,J3	J2-J3	61	1762	3.5%	8.56	3.4	15.6	2.51	0.58	44.86	176.47	256.9	0.04	1.37		
OLV CYN 6	C,J3	Initial Area	313	3437	9.1%		10.1	10.1	3.09	0.56	63.01	63.01	109.7				
Junction 3	J3							15.6	2.51	0.58		239.48	345.9				
OLV CYN 7	J3,J4	J3-J4	40	902	4.4%	11.04	1.4	17.0	2.41	0.57	8.79	248.27	342.2	0.04	1.67		
OLV CYN 8	D,J4	Initial Area	330	4367	7.6%		13.0	13.0	2.74	0.52	72.00	72.00	101.6				
OLV CYN 9	E, J4	Initial Area	197	2861	6.9%		10.1	10.1	3.09	0.56	53.94	53.94	93.9				
Junction 4	J4							17.0	2.41	0.56		374.21	504.8				
OLV CYN 10	J4,J5	J4-J5	13	917	1.4%	7.90	1.9	18.9	2.29	0.55	18.75	392.96	498.6	0.04	2.37		
OLV CYN 11	F,J5	Initial Area	333	3924	8.5%		12.0	12.0	2.84	0.53	57.52	57.52	86.8				
Junction 5	J5							18.9	2.29	0.55		450.48	568.4				
OLV CYN 12	J5,J6	J5-J6	17	402	4.2%	12.26	0.5	19.4	2.26	0.55	23.30	473.78	583.9	0.04	2.03		
OLV CYN 13	G,J6	Initial Area	239	2895	8.3%		9.5	9.5	3.18	0.58	79.32	79.32	145.2				
Junction 6	J6							19.4	2.26	0.55		553.10	686.9				
OLV CYN 14	J6,J7	J6-J7	21	1598	1.3%	7.88	3.4	22.8	2.09	0.54	57.77	610.87	686.1	0.04	2.47		
OLV CYN 15	H,J7	Initial Area	221	2289	9.7%		7.0	7.0	3.68	0.64	34.70	34.70	81.4				
Junction 7	J7							22.8	2.09	0.54		645.57	732.3				
OLV CYN 16	J7,J8	J7-J8	59	1849	3.2%	11.71	2.6	25.5	1.98	0.53	64.56	710.13	745.6	0.04	2.35		
OLV CYN 17	J, J8	Initial Area	168	1166	14.4%		5.5	5.5	4.13	0.69	19.74	19.74	56.0				
Junction 8	J8							25.5	1.98	0.53		729.87	772.5				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon (con't)																	
OLV CYN B1	BA, J12	Initial Area	319	4102	7.8%		14.0	14.0	2.64	0.50	117.13	117.13	155.2				
OLV CYN B2	BB, J12	Initial Area	200	1335	15.0%		4.4	4.4	4.60	0.74	12.59	12.59	42.6				
Junction 12								14.0	2.64	0.52		129.72	179.6				
OLV CYN B3	J12,J13	J12-J13	80	2102	3.8%	8.78	4.0	18.0	2.34	0.51	48.49	178.21	211.1	0.04	1.33		
OLV CYN B4	BB, J13	Initial Area	280	2943	9.5%		9.0	9.0	3.26	0.59	53.73	53.73	102.8				
OLV CYN B5	BC, J13	Initial Area	70	980	7.1%		4.5	4.5	4.55	0.73	11.00	11.00	36.5				
Junction 13	J13							18.0	2.34	0.53		242.94	303.7				
OLV CYN B6	J13,J14	J13-J14	5	980	0.5%	4.53	3.6	21.6	2.15	0.53	8.92	251.86	286.3	0.04	2.22		
OLV CYN B7	BD, J14	Initial Area	235	1682	14.0%		5.5	5.5	4.13	0.69	21.83	21.83	62.0				
Junction 14	J14							21.6	2.15	0.54		273.69	318.5				
OLV CYN B8	J14,J15	J14-J15	45	1734	2.6%	8.78	3.3	24.9	2.00	0.52	42.44	316.13	331.5	0.04	1.77		
OLV CYN B9	BE, J15	Initial Area	288	2927	9.8%		8.6	8.6	3.34	0.60	43.38	43.38	86.1				
OLV CYN B10	BF, J15	Initial Area	130	1555	8.4%		6.8	6.8	3.73	0.64	16.5	16.50	39.6				
Junction 15	J15							24.9	2.00	0.54		376.01	404.5				
OLV CYN B11	J15,J16	J15-J16	30	651	4.6%	11.56	0.9	25.8	1.97	0.53	9.39	385.40	404.7	0.04	1.74		
OLV CYN B12	BG, J16	Initial Area	280	2261	12.4%		7.0	7.0	3.68	0.64	29.51	29.51	69.2				
Junction 16	J16							25.8	1.97	0.54		414.91	441.7				
OLV CYN B13	J16,J9	J16-J9	40	1905	2.1%	8.86	3.6	29.4	1.85	0.53	28.82	443.73	434.8	0.04	2.10		
OLV CYN B14	BH, J9	Initial Area	158	2489	6.3%		7.0	7.0	3.68	0.64	24.93	24.93	58.5				
OLV CYN 18	J8,J9	J8-J9	40	1623	2.5%	10.59	2.6	28.0	1.89	0.38	39.08	768.95	551.6	0.04	2.44		
Junction 9	J9							29.4	1.85	0.44		1237.61	1003.1				
OLV CYN 19	J9,J10	J9-J10	40	939	4.3%	13.68	1.1	30.6	1.82	0.44	14.42	1252.03	994.5	0.04	2.37		
OLV CYN 20	K, J10	Initial Area	160	1521	10.5%		5.8	5.8	4.03	0.68	14.88	14.88	40.5				
OLV CYN 21	BF, J10	Initial Area	240	4599	5.2%		16.0	16.0	2.48	0.48	45.78	45.78	54.1				
Junction 10	J10							30.6	1.82	0.44		1312.69	1052.4				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon (con't)																	
OLV CYN A1	AA, J18	Initial Area	270	3259	8.3%		10.2	10.2	3.07	0.56	33.42	33.42	57.7				
OLV CYN A2	AB, J18	Initial Area	170	2265	7.5%		8.1	8.1	3.43	0.61	24.49	24.49	51.1				
Junction 18	J18							10.2	3.07	0.58		57.91	103.4				
OLV CYN A3	J18,J19	J18-J19	53	780	6.8%	9.60	1.4	11.6	2.90	0.57	14.51	72.42	120.0	0.04	0.98		
OLV CYN A4	AC, J19	Initial Area	133	1216	10.9%		4.6	4.6	4.50	0.73	10.78	10.78	35.2				
Junction 19	J19							11.6	2.90	0.59		83.20	142.7				
OLV CYN 22	J10,J11	J10-J11	47	1472	3.2%	12.41	2.0	13.5	2.68	0.44	15.63	1328.32	1576.0	0.04	2.56		
OLV CYN A5	J19,J11	J19-J11	34	512	6.6%	10.25	0.8	26.7	1.94	0.59	2.49	85.69	97.5	0.04	1.11		
Junction 11	J11							26.7	1.94	0.45		1414.01	1236.3				
Cat Canyon																	
CAT CYN 1	A, J1	Initial Area	220	3939	5.6%		14.0	14.0	2.64	0.50	164.76	164.76	218.3				
CAT CYN 2	B, J1	Initial Area	240	3214	7.5%		11.0	11.0	2.96	0.55	82.64	82.64	134.1				
Junction 1								14.0	2.64	0.52		247.40	337.7				
CAT CYN 3	J1,J2	J1-J2	30	1061	2.9%	9.24	1.9	29.9	1.84	0.50	37.57	284.97	260.0	0.04	1.77		
CAT CYN 4	C,J2	Initial Area	273	4399	6.2%		14.0	14.0	2.64	0.50	177.26	177.26	234.8				
Junction 2	J2							29.9	1.84	0.50		462.23	423.2				
CAT CYN 5	J2,J3	J2-J3	40	2528	1.6%	7.42	5.7	35.6	1.69	0.48	68.72	530.95	428.8	0.04	1.99		
CAT CYN 6	D,J3	Initial Area	300	5119	5.9%		16.0	16.0	2.48	0.48	106.30	106.30	125.6				
CAT CYN 7	E, J3	Initial Area	318	3649	8.7%		11.0	11.0	2.96	0.55	93.88	93.88	152.3				
Junction 3	J3							35.6	1.69	0.49		731.13	601.2				
CAT CYN 8	J3,J4	J3-J4	30	2536	1.2%	7.28	5.8	41.4	1.57	0.47	86.11	817.24	601.8	0.04	2.41		
CAT CYN 9	F,J4	Initial Area	300	6775	4.4%		23.0	23.0	2.08	0.41	209.62	209.62	180.0				
Junction 4	J4							41.4	1.57	0.46		1026.86	737.6				
CAT CYN 10	J4,J5	J4-J5	20	1868	1.1%	7.36	4.2	45.6	1.50	0.44	90.94	1117.80	744.8	0.04	2.64		
CAT CYN 11	G,J5	Initial Area	190	6195	3.1%		25.0	25.0	2.00	0.40	238.85	238.85	190.2				
Junction 5	J5							45.6	1.50	0.44		1356.65	887.3				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 12	J5,J6	J5-J6	10	655	1.5%	8.81	1.2	46.9	1.48	0.43	21.49	1378.14	885.4	0.04	2.65		
CAT CYN 13	H,J6	Initial Area	380	4546	8.4%		13.0	13.0	2.74	0.52	130.52	130.52	184.1				
Junction 6	J6							46.9	1.48	0.44		1508.66	985.0				
CAT CYN 14	J6,J7	J6-J7	10	1376	0.7%	7.02	3.3	50.1	1.43	0.43	77.69	1586.35	985.4	0.04	3.29		
CAT CYN 15	J,J7	Initial Area	670	6984	9.6%		17.0	17.0	2.41	0.47	383.83	383.83	430.5				
Junction 7	J7							50.1	1.43	0.44		1970.18	1241.8				
CAT CYN 16	J7,J8	J7-J8	29	1894	1.5%	9.82	3.2	53.4	1.39	0.43	114.13	2084.31	1249.0	0.04	3.12		
CAT CYN 17	K, J8	Initial Area	249	4534	5.5%		16.0	16.0	2.48	0.48	134.68	134.68	159.2				
Junction 8	J8							53.4	1.39	0.43		2218.99	1338.4				
CAT CYN 19A	L, J9A	Initial Area	620	4845	12.8%		11.5	11.5	2.90	0.54	173.73	173.73	271.6				
CAT CYN 19B	M, J9A	Initial Area	730	4642	15.7%		10.0	10.0	3.10	0.57	165.79	165.79	291.0				
Junction J9A								11.5	2.90	0.55		339.52	543.8				
CAT CYN 19	J9A,J9	J9A-J9	60	1352	4.4%	11.93	1.9	13.4	2.70	0.55	21.14	360.66	534.7	0.04	1.88		
CAT CYN 18	J8,J9	J8-J9	11	1514	0.7%	7.59	3.3	56.7	1.35	0.43	50.58	2269.57	1318.3	0.04	3.68		
CAT CYN 20	N, J9	Initial Area	340	3649	9.3%		11.5	11.5	2.90	0.54	112.02	112.02	175.1				
Junction 9	J9A,J9							56.7	1.35	0.45		2742.25	1667.7				
CAT CYN 21	J9,J10	J9-J10	3	1019	0.3%	5.98	2.8	59.5	1.32	0.45	57.78	2800.03	1648.8	0.04	4.63		
CAT CYN 22	P,J10	Initial Area	383	3985	9.6%		11.0	11.0	2.96	0.55	70.08	70.08	113.7				
CAT CYN 23	Q, J10	Initial Area	463	2941	15.8%		7.5	7.5	3.56	0.62	43.22	43.22	95.9				
Junction 10	J10							59.5	1.32	0.45		2913.33	1735.0				
CAT CYN 24	J10,J11	J10-J11	17	3052	0.6%	7.50	6.8	66.3	1.25	0.44	190.84	3104.17	1705.4	0.04	4.45		
CAT CYN 25	R, J11	Initial Area	360	4534	7.9%		13.0	13.0	2.74	0.52	265.58	265.58	374.6				
Junction 11	J11							66.3	1.25	0.44		3369.75	1877.1				
CAT CYN 27A	S, J13	Initial Area	255	3361	7.6%		11.0	11.0	2.96	0.55	93.86	93.86	152.3				
CAT CYN 27B	T, J13	Initial Area	285	3505	8.1%		10.8	10.8	2.99	0.55	116.31	116.31	191.6				
Junction 13								11.0	2.96	0.55		210.17	342.2				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 27	J13,J12	J13-J12	84	2211	3.8%	10.38	3.6	14.6	2.59	0.54	54.66	264.83	369.3	0.04	1.71		
CAT CYN 26	J11,J12	J11-J12	19	951	2.0%	12.30	1.3	67.6	1.24	0.44	69.68	3439.43	1880.5	0.04	3.62		
Junction 12	J12							67.6	1.24	0.45		3704.26	2057.5				
CAT CYN 28	J12,J14	J12-J14	11	1237	0.9%	9.43	2.2	69.8	1.22	0.44	87.79	3792.05	2051.4	0.04	4.39		
CAT CYN 29	U, J14	Initial Area	670	7044	9.5%		16.0	16.0	2.48	0.48	234.44	234.44	277.1				
Junction 14	J14							69.8	1.22	0.44		4026.49	2188.3				
CAT CYN 30	J14,J15	J14-J15	30	3444	0.9%	9.49	6.0	75.8	1.18	0.43	351.98	4378.47	2194.6	0.04	4.51		
CAT CYN 31	V, J15	Initial Area	430	3590	12.0%		9.8	9.8	3.13	0.57	48.77	48.77	87.0				
Junction 15	J15							75.8	1.18	0.43		4427.24	2227.2				
CAT CYN 34A1	W, J24	Initial Area	510	5459	9.3%		14.0	14.0	2.64	0.50	197.82	197.82	262.1				
CAT CYN 34A2	X, J24	Initial Area	600	4145	14.5%		10.0	10.0	3.10	0.57	162.07	162.07	284.5				
Junction 24	J24							14.0	2.64	0.53		359.89	504.2				
CAT CYN 34A	J24,J25	J24-J25	70	1145	6.1%	13.67	1.4	15.4	2.52	0.53	32.03	391.92	520.9	0.04	1.81		
CAT CYN 34B	Y, J25	Initial Area	470	2833	16.6%		7.0	7.0	3.68	0.64	68.33	68.33	160.2				
Junction 25	J25							15.4	2.52	0.54		460.25	630.7				
CAT CYN 32	J15,J16	J15-J16	17	1797	0.9%	9.77	3.1	78.9	1.15	0.43	49.63	4476.87	2197.7	0.04	4.42		
CAT CYN 34	J25,J16	J25-J16	87	2170	4.0%	12.34	2.9	18.3	2.32	0.54	44.65	504.90	627.1	0.04	2.13		
CAT CYN 33	Z, J16	Initial Area	417	2957	14.1%		7.5	7.5	3.56	0.83	48.65	48.65	143.0				
Junction 16	J16							78.9	1.15	0.44		5030.42	2555.7				
CAT CYN 36A	AA, BA	Initial Area	296	1727	17.1%		5.0	5.0	4.33	1.67	33.86	33.86	244.5				
CAT CYN 36	BA, J17	BA-J17	154	1597	9.6%	13.41	2.0	7.0	3.69	0.68	23.6	57.46	144.5	0.04	1.25		
CAT CYN 35	J16,J17	J16-J17	13	1249	1.0%	10.46	2.0	80.9	1.14	0.44	50.35	5080.77	2537.6	0.04	4.58		
Junction 17	J17							80.9	1.14	0.45		5138.23	2646.7				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 38A	AB, J26	Initial Area	489	3020	16.2%		8.0	8.0	3.45	0.61	46.04	46.04	97.0				
CAT CYN 38B	X, J26	Initial Area	689	4780	14.4%		11.0	11.0	2.96	0.55	173.56	173.56	281.6				
CAT CYN 38C	AC, J26	Initial Area	536	4388	12.2%		10.5	10.5	3.03	0.56	137.55	137.55	231.9				
Junction 26	J26							11.0	2.96	0.56		357.15	591.6				
CAT CYN 37	J17,J18	J17-J18	20	2450	0.8%	9.72	4.2	85.1	1.11	0.45	129.21	5267.44	2612.7	0.04	4.91		
CAT CYN 38	J26,J18	J26-J18	101	2671	3.8%	11.80	3.8	14.8	2.57	0.55	50.69	407.84	577.8	0.04	2.08		
Junction 18	J18							85.1	1.11	0.45		5675.28	2862.5				
CAT CYN 40A1-	AA, BB	Initial Area	270	1253	21.5%		3.5	3.5	5.13	2.19	17.20	17.20	193.3				
CAT CYN 40A1	BB, J28	BB-J28	121	1038	11.6%	13.78	1.3	4.8	4.43	1.78	8.62	25.82	203.6	0.04	1.13		
CAT CYN 40A2	AA,J28	Initial Area	357	2963	12.0%		8.0	8.0	3.45	0.89	82.79	82.79	255.1				
Junction 28	J28							8.0	3.45	1.10		108.61	413.8				
CAT CYN 40B1	AD, BC	Initial Area	279	2472	11.3%		7.1	7.1	3.66	1.38	45.65	45.65	229.9				
CAT CYN 40B2	BC, BC1	BC-BC1	136	846	16.0%	17.56	0.8	7.9	3.47	1.36	9.39	55.04	259.3	0.04	1.28		
CAT CYN 40B	BC1, J27	BC-J27	19	377	4.9%	9.72	0.6	8.5	3.35	1.33	1.86	56.90	253.5	0.04	1.28		
CAT CYN 40A	J28,J27	J28-J27	51	716	7.1%	13.80	0.9	8.9	3.29	1.06	11.19	119.80	415.6	0.04	1.64		
Junction 27	J27							8.9	3.29	1.14		176.70	664.7				
CAT CYN 40	J27,J19	J27-J19	40	688	5.8%	14.28	0.8	9.7	3.15	1.12	7.91	184.61	652.0	0.04	2.00		
CAT CYN 39	J18,J19	J18-J19	2	407	0.5%	8.19	0.8	85.9	1.11	0.45	7.45	5682.73	2850.9	0.04	5.55		
CAT CYN 41	AF, J19	Initial Area	550	4587	12.0%		12.0	12.0	2.84	0.53	123.12	123.12	185.8				
Junction 19	J19							85.9	1.11	0.48		5990.46	3152.2				
CAT CYN 43	BF, J20	Initial Area	51	686	7.4%		3.9	3.9	4.87	1.05	4.26	4.26	21.8	0.04	0.93		
CAT CYN 42	J19,J20	J19-J20	20	1262	1.6%	13.01	1.6	87.5	1.10	0.47	42.06	6032.52	3133.3	0.04	4.62		
Junction 20	J20							87.5	1.10	0.47		6036.78	3138.3				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 43A	AG, BD	Initial Area	283	1052	26.9%		2.8	2.8	5.71	1.43	11.65	11.65	95.2				
CAT CYN 44	J20,J21	J20-J21	10	1002	1.0%	9.13	1.8	89.4	1.09	0.47	105.65	6142.43	3130.3	0.04	3.84		
CAT CYN 44A	BJ,BH	Initial Area	77	1919	4.0%		10.0	10.0	3.10	0.76	23.74	23.74	56.1				
CAT CYN 45	BH,J21	BH-J21	59	713	8.3%	8.84	1.3	11.3	3.08	0.75	3.16	26.90	61.9	0.04	0.75		
Junction 21	J21							89.4	1.09	0.47		6180.98	3170.3				
CAT CYN 45A	AE, BE	Initial Area	298	1467	20.3%		4.3	4.3	4.65	0.80	18.85	18.85	70.1				
CAT CYN 47	AH, J22	Initial Area	403	3026	13.3%		8.2	8.2	3.41	0.60	47.36	47.36	97.8				
CAT CYN 46	J21,J22	J21-J22	10	1413	0.7%	9.56	2.5	91.8	1.07	0.47	122.7	6303.68	3154.8	0.04	5.33		
Junction 22	J22							91.8	1.07	0.47		6369.89	3201.7				
CAT CYN 49B1	AK,AL	Initial Area	165	1003	16.5%		3.1	3.1	5.44	2.68	15.32	15.32	223.1				
CAT CYN 49B	AL, J29		35	417	8.4%	12.56	0.6	4.9	4.39	2.25	4.68	20.00	197.4	0.04	1.26		
CAT CYN 49A	AJ, J29	Initial Area	330	2190	15.1%		6.1	6.1	3.93	0.71	41.14	41.14	114.9				
Junction 29	J29							6.1	3.93	1.21		61.14	291.8				
CAT CYN 49	J29,J23	J29-J23	120	2116	5.7%	11.59	3.0	9.1	3.24	0.97	37.43	98.57	311.1	0.04	1.49		
CAT CYN 48	J22,J23	J22-J23	50	4302	1.2%	11.63	6.2	98.0	1.04	0.46	286.32	6656.21	3158.6	0.04	4.93		
CAT CYN 50	AF, J23	Initial Area	640	8530	7.5%		12.0	12.0	2.84	0.53	243.99	243.99	368.1				
Junction 23	J23							98.0	1.04	0.47		6998.77	3393.1				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
50 Year Flow - POST CONSTRUCTION																	
Unnamed Blueline #1 & #2																	
NNBL2-1	2A, J1	Initial Area	229	2372	9.7%		8.0	8.0	3.13	0.71	41.66	41.66	92.9				
NNBL2-2	2B, J1	Initial Area	218	2353	9.3%		7.5	7.5	3.22	1.07	23.82	23.82	82.1				
NNBL2-3	2C, J1	Initial Area	240	2253	10.7%		8.0	8.0	3.13	1.14	30.78	30.78	109.2				
Junction 1								8.0	3.13	0.94		96.26	281.7				
NNBL2-4	J1, J2	J1-J2	100	2528	4.0%	5.14	8.2	16.2	2.23	0.63	46.6	142.86	201.8	0.04	0.58		
NNBL2-5	2D, J2	Initial Area	334	3668	9.1%		11.0	11.0	2.68	0.68	80.33	80.33	146.5				
NNBL2-6	2E, J2	Initial Area	170	1481	11.5%		5.5	5.5	3.74	0.64	19.95	19.95	48.1				
Junction 2	J2							16.2	2.23	0.65		243.14	352.1				
NNBL2-7	J2,J3	J2-J3	70	2077	3.4%	8.83	3.9	20.1	2.01	0.60	54.73	297.87	361.2	0.04	1.47		
NNBL2-8	2F, J3	Initial Area	194	1325	14.7%		4.5	4.5	4.12	0.69	15.65	15.65	44.2				
NNBL2-9	2G, J3	Initial Area	120	1445	8.3%		5.5	5.5	3.74	0.64	21.99	21.99	53.0				
Junction 3	J3							20.1	2.01	0.61		335.51	411.1				
NNBL2-10	J3,J4	J3-J4	40	1433	2.8%	8.26	2.9	23.0	1.88	0.60	22.03	357.54	401.1	0.04	1.53		
NNBL1-1	1A, J4	Initial Area	410	5898	7.0%		17.2	17.2	2.16	0.48	114.71	114.71	120.2				
Junction 4	J4							23.0	1.88	0.57		472.25	505.6				
NNBL2-11	2H,J5	Initial Area	272	2184	12.4%		7.0	7.0	3.33	0.83	52.24	52.24	145.0				
NNBL2-13	J5,J6	J5-J6	83	1700	4.9%	8.57	3.3	10.3	2.77	0.77	40.71	92.95	197.1	0.04	1.06		
NNBL2-14	2L, J6	Initial Area	275	2707	10.2%		8.5	8.5	3.04	0.56	50.68	50.68	85.7				
Junction 6								10.3	2.77	0.69		143.63	275.2				
NNBL2-15	J6,J7	J6-J7	15	1000	1.5%	6.41	2.6	12.9	2.48	0.67	13.41	157.04	263.0	0.04	1.67		
NNBL2-16	J4,J7	J4-J7	10	850	1.2%	5.82	2.4	25.4	1.79	0.56	15.71	487.96	491.9	0.04	1.73		
NNBL2-17	2M,J7	Initial Area	179	1839	9.7%		5.5	5.5	3.74	0.64	23.12	23.12	55.7				
Junction 7	J7							25.4	1.79	0.59		668.12	708.4				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Unnamed Blueline #1 & #2 (con't)																	
NNBL2-18	J7,J8	J7-J8	56	2263	2.5%	10.10	3.7	29.2	1.68	0.58	45.45	713.57	689.1	0.04	2.26		
NNBL2-19	2N,J8	Initial Area	226	2090	10.8%		6.0	6.0	3.59	0.63	27.27	27.27	61.3				
Junction 8	J8							29.2	1.68	0.58		740.84	717.8				
NNBL2-20	J8,J9	J8 to J9	54	3207	1.7%	8.76	6.1	35.3	1.53	0.56	55.98	796.82	681.5	0.04	2.45		
Unnamed Blueline #3																	
NNBL3-1	3A, J10	Initial Area	110	1349	8.2%		5.5	5.5	3.74	0.64	12.58	12.58	30.3				
NNBL3-2	3B, J10	Initial Area	70	677	10.3%		3.0	3.0	5.00	0.77	6.13	6.13	23.8				
Junction 10								5.5	3.74	0.69		18.71	48.1				
NNBL3-3	J10,J11	J10-J11	45	2263	2.0%	4.72	8.0	13.5	2.43	0.56	25.07	43.78	59.9	0.04	0.85		
NNBL3-4	3C,J11	Initial Area	55	609	9.1%		3.0	3.0	5.00	0.77	6.78	6.78	26.3				
Junction 11	J11							13.5	2.43	0.59		50.56	72.7				
NNBL3-5	J11,J12	J11-J12	84	1933	4.4%	7.44	4.3	17.8	2.13	0.51	42.5	93.06	101.6	0.04	0.93		
NNBL3-6	3D,J12	Initial Area	199	2019	9.9%		3.0	3.0	5.00	0.77	12.04	12.04	46.6				
Junction 12	J12							17.8	2.13	0.54		105.10	121.4				
NNBL3-7	J12,J13	J12-J13	66	1164	5.6%	9.86	2.0	19.8	2.02	0.52	16.97	122.07	129.3	0.04	1.18		
NNBL3-8	3E,J13	Initial Area	196	2019	9.7%		7.1	7.1	3.31	0.59	23.35	23.35	45.8				
Junction 13	J13							19.8	2.02	0.53		145.42	157.3				
NNBL3-9	J13,J14	J13-J14	15	611	2.4%	7.66	1.3	21.1	1.96	0.53	8.43	153.85	158.9	0.04	1.52		
NNBL3-10	3F,J14	Initial Area	199	1666	12.0%		5.5	5.5	3.74	0.64	16.27	16.27	39.2				
Junction 14	J14							21.1	1.96	0.54		170.12	179.5				
NNBL3-11	J14,J15	J14-J15	36	812	4.4%	8.86	1.5	22.6	1.90	0.52	15.07	185.19	184.4	0.04	1.21		
NNBL3-12	3G,J15	Initial Area	184	1808	10.2%		6.5	6.5	3.45	0.61	18.70	18.70	39.4				
Junction 15	J15							22.6	1.90	0.53		203.89	206.0				
NNBL3-13	J15, end	J15 - end	37	800	4.6%	8.41	1.6	24.2	1.84	0.52	14.11	218.00	208.9	0.04	1.07		

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Long Canyon																	
LNG CYN 1	A, J1	Initial Area	160	1162	13.8%		4.0	4.0	4.36	0.71	9.9	9.90	30.7				
LNG CYN 2	B, J1	Initial Area	120	2184	5.5%		9.0	9.0	2.95	0.55	39.82	39.82	64.2				
Junction 1								9.0	2.95	0.58		49.72	85.0				
LNG CYN 3	J1,J2	J1-J2	77	2351	3.3%	6.08	6.4	15.4	2.28	0.50	81.59	131.31	148.5	0.04	0.86		
LGN CYN 4	C,J2	Initial Area	287	1809	15.9%		6.0	6.0	3.59	0.73	19	19.00	49.5				
Junction 2	J2							15.4	2.28	0.53		150.31	179.9				
LGN CYN 5	J2,J3	J2-J3	8	501	1.7%	5.77	1.4	16.9	2.18	0.52	6.8	157.11	180.0	0.04	1.30		
LGN CYN 6	D,J3	Initial Area	286	2301	12.4%		8.0	8.0	3.13	0.70	36.15	36.15	79.5				
Junction 3	J3							16.9	2.18	0.56		193.26	235.6				
LGN CYN 7	J3,J4	J3-J4	33	585	5.6%	8.38	1.2	18.1	2.11	0.55	5.78	199.04	233.2	0.04	0.92		
LGN CYN 8	E,J4	Initial Area	239	1600	14.9%		7.1	7.1	3.31	0.59	18.54	18.54	36.3				
LGN CYN 9	F, J4	Initial Area	239	3803	6.3%		10.1	10.1	2.79	0.73	68.07	68.07	139.0				
Junction 4	J4							18.1	2.11	0.60		285.65	361.6				
LGN CYN 10	J4,J5	J4-J5	5	855	0.6%	5.02	2.8	20.9	1.97	0.59	18.52	304.17	351.5	0.04	2.24		
LGN CYN 11	B,J5	Initial Area	244	2033	12.0%		7.0	7.0	3.33	0.59	40.46	40.46	80.2				
Junction 5	J5							20.9	1.97	0.59		344.63	399.0				
LGN CYN 12	J5,J6	J5-J6	76	2167	3.5%	9.04	4.0	24.9	1.81	0.55	64.42	409.05	409.2	0.04	1.47		
LGN CYN 13	G,J6	Initial Area	296	2838	10.4%		5.2	5.2	3.84	1.00	74.09	74.09	285.9				
Junction 6	J6							24.9	1.81	0.62		483.14	544.1				
LGN CYN 14	J6,J7	J6-J7	17	1415	1.2%	6.54	3.6	28.5	1.70	0.59	52.08	535.22	540.0	0.04	2.04		
LGN CYN 15	H,J7	Initial Area	257	2259	11.4%		6.5	6.5	3.45	0.85	41.34	41.34	121.0				
LGN CYN 16	J, J7	Initial Area	168	1166	14.4%		5.5	5.5	3.74	0.64	8.66	8.66	20.9				
Junction 7	J7							28.5	1.70	0.61		585.22	609.0				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Long Canyon (con't)																	
LGN CYN 17	J7,J8	J7-J8	23	1308	1.8%	8.39	2.6	31.1	1.63	0.60	37.32	622.54	606.4	0.04	2.20		
LGN CYN 18	J,J8	Initial Area	191	1828	10.5%		6.5	6.5	3.45	0.61	22.38	22.38	47.1				
Junction 8	J8							31.1	1.63	0.60		644.92	628.6				
LGN CYN 19	J8,J9	J8-J9	40	1341	3.0%	9.47	2.4	33.5	1.57	0.58	46.44	691.36	629.9	0.04	1.78		
LGN CYN 20	K,J9	Initial Area	200	1806	11.1%		6.4	6.4	3.48	0.61	21.61	21.61	46.1				
Junction 9	J9							33.5	1.57	0.58		712.97	650.7				
LGN CYN 21	J9,J10	J9-J10	15	693	2.2%	9.01	1.3	34.7	1.54	0.57	20.72	733.69	648.9	0.04	2.08		
LGN CYN 22	L,J10	Initial Area	135	1428	9.5%		5.5	5.5	3.74	0.64	23.15	23.15	55.8				
Junction 10	J10							34.7	1.54	0.57		756.84	672.0				
LGN CYN 23	J10,J11	J10-J11	25	847	2.9%	10.34	1.4	36.1	1.52	0.57	20.28	777.12	669.0	0.04	2.07		
LGN CYN 24	M,J11	Initial Area	187	1482	12.6%		4.9	4.9	3.95	0.67	16.4	16.40	43.3				
Junction 11	J11							36.1	1.52	0.57		793.52	685.6				
LGN CYN 25	J11,J12	J11-J12	70	2087	3.4%	11.94	2.9	39.0	1.46	0.55	52.63	846.15	682.8	0.04	2.32		
LGN CYN 26	N,J12	Initial Area	200	1850	10.8%		6.2	6.2	3.53	0.62	21.56	21.56	47.2				
Junction 12	J12							39.0	1.46	0.55		867.71	702.3				
LGN CYN 27	J12, END	J12-END	30	1246	2.4%	10.75	1.9	40.9	1.43	0.55	26.06	893.77	696.7	0.04	2.54		

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon																	
OLV CYN 1	A, J1	Initial Area	185	2042	9.1%		8.0	8.0	3.13	0.57	33.14	33.14	58.9				
OLV CYN 2	B, J1	Initial Area	161	1575	10.2%		5.8	5.8	3.65	0.63	19.71	19.71	45.5				
Junction 1								8.0	3.13	0.59		52.85	97.9				
OLV CYN 3	J1,J2	J1-J2	84	2033	4.1%	7.72	4.4	12.4	2.53	0.54	46.79	99.64	136.9	0.04	1.03		
OLV CYN 4	B,J2	Initial Area	244	1723	14.2%		5.0	5.0	3.92	0.66	31.97	31.97	83.1				
Junction 2	J2							12.4	2.53	0.57		131.61	190.6				
OLV CYN 5	J2,J3	J2-J3	61	1762	3.5%	8.15	3.6	16.0	2.24	0.54	44.86	176.47	212.8	0.04	1.27		
OLV CYN 6	C,J3	Initial Area	313	3437	9.1%		10.1	10.1	2.79	0.52	63.01	63.01	92.2				
Junction 3	J3							16.0	2.24	0.53		239.48	286.8				
OLV CYN 7	J3,J4	J3-J4	40	902	4.4%	10.50	1.4	17.4	2.15	0.53	8.79	248.27	283.2	0.04	1.55		
OLV CYN 8	D,J4	Initial Area	330	4367	7.6%		13.0	13.0	2.48	0.48	72.00	72.00	85.0				
OLV CYN 9	E, J4	Initial Area	197	2861	6.9%		10.1	10.1	2.79	0.52	53.94	53.94	78.9				
Junction 4	J4							17.4	2.15	0.52		374.21	417.8				
OLV CYN 10	J4,J5	J4-J5	13	917	1.4%	7.52	2.0	19.5	2.04	0.51	18.75	392.96	411.7	0.04	2.20		
OLV CYN 11	F,J5	Initial Area	333	3924	8.5%		12.0	12.0	2.57	0.49	57.52	57.52	72.7				
Junction 5	J5							19.5	2.04	0.51		450.48	469.4				
OLV CYN 12	J5,J6	J5-J6	17	402	4.2%	11.67	0.6	20.0	2.01	0.51	23.30	473.78	481.6	0.04	1.88		
OLV CYN 13	G,J6	Initial Area	239	2895	8.3%		9.5	9.5	2.88	0.54	79.32	79.32	122.2				
Junction 6	J6							20.0	2.01	0.51		553.10	567.1				
OLV CYN 14	J6,J7	J6-J7	21	1598	1.3%	7.50	3.6	23.6	1.86	0.50	57.77	610.87	564.3	0.04	2.29		
OLV CYN 15	H,J7	Initial Area	221	2289	9.7%		7.0	7.0	3.33	0.59	34.70	34.70	68.8				
Junction 7	J7							23.6	1.86	0.50		645.57	602.7				
OLV CYN 16	J7,J8	J7-J8	59	1849	3.2%	11.14	2.8	26.4	1.76	0.49	64.56	710.13	611.7	0.04	2.18		
OLV CYN 17	J, J8	Initial Area	168	1166	14.4%		5.5	5.5	3.74	0.64	19.74	19.74	47.5				
Junction 8	J8							26.4	1.76	0.49		729.87	634.1				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon (con't)																	
OLV CYN B1	BA, J12	Initial Area	319	4102	7.8%		14.0	14.0	2.39	0.46	117.13	117.13	129.6				
OLV CYN B2	BB, J12	Initial Area	200	1335	15.0%		4.4	4.4	4.16	0.69	12.59	12.59	36.2				
Junction 12								14.0	2.39	0.49		129.72	150.4				
OLV CYN B3	J12,J13	J12-J13	80	2102	3.8%	8.35	4.2	18.2	2.11	0.47	48.49	178.21	175.2	0.04	1.23		
OLV CYN B4	BB, J13	Initial Area	280	2943	9.5%		9.0	9.0	2.95	0.55	53.73	53.73	86.6				
OLV CYN B5	BC, J13	Initial Area	70	980	7.1%		4.5	4.5	4.12	0.69	11.00	11.00	31.1				
Junction 13	J13							18.2	2.11	0.49		242.94	252.9				
OLV CYN B6	J13,J14	J13-J14	5	980	0.5%	4.31	3.8	22.0	1.92	0.49	8.92	251.86	237.5	0.04	2.06		
OLV CYN B7	BD, J14	Initial Area	235	1682	14.0%		5.5	5.5	3.74	0.64	21.83	21.83	52.6				
Junction 14	J14							22.0	1.92	0.50		273.69	264.5				
OLV CYN B8	J14,J15	J14-J15	45	1734	2.6%	8.35	3.5	25.4	1.79	0.48	42.44	316.13	274.0	0.04	1.64		
OLV CYN B9	BE, J15	Initial Area	288	2927	9.8%		8.6	8.6	3.02	0.55	43.38	43.38	72.6				
OLV CYN B10	BF, J15	Initial Area	130	1555	8.4%		6.8	6.8	3.38	0.60	16.5	16.50	33.5				
Junction 15	J15							25.4	1.79	0.50		376.01	334.9				
OLV CYN B11	J15,J16	J15-J16	30	651	4.6%	11.00	1.0	26.4	1.76	0.49	9.39	385.40	334.6	0.04	1.61		
OLV CYN B12	BG, J16	Initial Area	280	2261	12.4%		7.0	7.0	3.33	0.59	29.51	29.51	58.5				
Junction 16	J16							26.4	1.76	0.50		414.91	365.6				
OLV CYN B13	J16,J9	J16-J9	40	1905	2.1%	8.43	3.8	30.2	1.65	0.49	28.82	443.73	358.7	0.04	1.95		
OLV CYN B14	BH, J9	Initial Area	158	2489	6.3%		7.0	7.0	3.33	0.59	24.93	24.93	49.4				
OLV CYN 18	J8,J9	J8-J9	40	1623	2.5%	10.08	2.7	29.0	1.68	0.34	39.08	768.95	437.1	0.04	2.26		
Junction 9	J9							30.2	1.65	0.40		1237.61	812.1				
OLV CYN 19	J9,J10	J9-J10	40	939	4.3%	13.02	1.2	31.4	1.62	0.40	14.42	1252.03	804.6	0.04	2.20		
OLV CYN 20	K, J10	Initial Area	160	1521	10.5%		5.8	5.8	3.65	0.63	14.88	14.88	34.3				
OLV CYN 21	BF, J10	Initial Area	240	4599	5.2%		16.0	16.0	2.24	0.44	45.78	45.78	45.1				
Junction 10	J10							31.4	1.62	0.40		1312.69	852.5				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon (con't)																	
OLV CYN A1	AA, J18	Initial Area	270	3259	8.3%		10.2	10.2	2.78	0.52	33.42	33.42	48.5				
OLV CYN A2	AB, J18	Initial Area	170	2265	7.5%		8.1	8.1	3.11	0.57	24.49	24.49	43.1				
Junction 18	J18							10.2	2.78	0.54		57.91	87.1				
OLV CYN A3	J18,J19	J18-J19	53	780	6.8%	9.14	1.4	11.6	2.61	0.53	14.51	72.42	100.6	0.04	0.91		
OLV CYN A4	AC, J19	Initial Area	133	1216	10.9%		4.6	4.6	4.08	0.68	10.78	10.78	29.9				
Junction 19	J19							11.6	2.61	0.55		83.20	119.8				
OLV CYN 22	J10,J11	J10-J11	47	1472	3.2%	11.80	2.1	13.7	2.41	0.40	15.63	1328.32	1287.0	0.04	2.38		
OLV CYN A5	J19,J11	J19-J11	34	512	6.6%	9.75	0.9	27.3	1.73	0.55	2.49	85.69	81.0	0.04	1.03		
Junction 11	J11							27.3	1.73	0.41		1414.01	1005.3				
Cat Canyon																	
CAT CYN 1	A, J1	Initial Area	220	3939	5.6%		14.0	14.0	2.39	0.46	164.76	164.76	182.3				
CAT CYN 2	B, J1	Initial Area	240	3214	7.5%		11.0	11.0	2.68	0.51	82.64	82.64	112.5				
Junction 1								14.0	2.39	0.48		247.40	282.6				
CAT CYN 3	J1,J2	J1-J2	30	1061	2.9%	8.79	2.0	31.0	1.63	0.46	37.57	284.97	212.8	0.04	1.64		
CAT CYN 4	C,J2	Initial Area	273	4399	6.2%		14.0	14.0	2.39	0.46	177.26	177.26	196.2				
Junction 2	J2							31.0	1.63	0.46		462.23	346.7				
CAT CYN 5	J2,J3	J2-J3	40	2528	1.6%	7.06	6.0	37.0	1.50	0.44	68.72	530.95	349.4	0.04	1.85		
CAT CYN 6	D,J3	Initial Area	300	5119	5.9%		16.0	16.0	2.24	0.44	106.30	106.30	104.6				
CAT CYN 7	E, J3	Initial Area	318	3649	8.7%		11.0	11.0	2.68	0.51	93.88	93.88	127.8				
Junction 3	J3							37.0	1.50	0.45		731.13	490.7				
CAT CYN 8	J3,J4	J3-J4	30	2536	1.2%	6.92	6.1	43.1	1.39	0.43	86.11	817.24	489.0	0.04	2.23		
CAT CYN 9	F,J4	Initial Area	300	6775	4.4%		23.0	23.0	1.88	0.38	209.62	209.62	148.5				
Junction 4	J4							43.1	1.39	0.42		1026.86	598.8				
CAT CYN 10	J4,J5	J4-J5	20	1868	1.1%	7.00	4.4	47.6	1.33	0.41	90.94	1117.80	602.7	0.04	2.45		
CAT CYN 11	G,J5	Initial Area	190	6195	3.1%		25.0	25.0	1.81	0.36	238.85	238.85	156.6				
Junction 5	J5							47.6	1.33	0.40		1356.65	717.6				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 12	J5,J6	J5-J6	10	655	1.5%	8.38	1.3	48.9	1.31	0.40	21.49	1378.14	715.6	0.04	2.46		
CAT CYN 13	H,J6	Initial Area	380	4546	8.4%		13.0	13.0	2.48	0.48	130.52	130.52	154.0				
Junction 6	J6							48.9	1.31	0.40		1508.66	797.2				
CAT CYN 14	J6,J7	J6-J7	10	1376	0.7%	6.68	3.4	52.3	1.27	0.40	77.69	1586.35	795.8	0.04	3.05		
CAT CYN 15	J,J7	Initial Area	670	6984	9.6%		17.0	17.0	2.18	0.43	383.83	383.83	358.0				
Junction 7	J7							52.3	1.27	0.40		1970.18	1004.6				
CAT CYN 16	J7,J8	J7-J8	29	1894	1.5%	9.35	3.4	55.7	1.23	0.39	114.13	2084.31	1008.0	0.04	2.89		
CAT CYN 17	K, J8	Initial Area	249	4534	5.5%		16.0	16.0	2.24	0.44	134.68	134.68	132.6				
Junction 8	J8							55.7	1.23	0.40		2218.99	1080.9				
CAT CYN 19A	L, J9A	Initial Area	620	4845	12.8%		11.5	11.5	2.63	0.50	173.73	173.73	227.8				
CAT CYN 19B	M, J9A	Initial Area	730	4642	15.7%		10.0	10.0	2.81	0.53	165.79	165.79	244.7				
Junction J9A								11.5	2.63	0.51		339.52	456.6				
CAT CYN 19	J9A,J9	J9A-J9	60	1352	4.4%	11.35	2.0	13.5	2.43	0.51	21.14	360.66	447.1	0.04	1.74		
CAT CYN 18	J8,J9	J8-J9	11	1514	0.7%	7.22	3.5	59.2	1.20	0.39	50.58	2269.57	1063.5	0.04	3.42		
CAT CYN 20	N, J9	Initial Area	340	3649	9.3%		11.5	11.5	2.63	0.50	112.02	112.02	146.9				
Junction 9	J9A,J9							59.2	1.20	0.41		2742.25	1350.3				
CAT CYN 21	J9,J10	J9-J10	3	1019	0.3%	5.69	3.0	62.2	1.17	0.41	57.78	2800.03	1333.6	0.04	4.29		
CAT CYN 22	P,J10	Initial Area	383	3985	9.6%		11.0	11.0	2.68	0.51	70.08	70.08	95.4				
CAT CYN 23	Q, J10	Initial Area	463	2941	15.8%		7.5	7.5	3.22	0.58	43.22	43.22	81.0				
Junction 10	J10							62.2	1.17	0.41		2913.33	1404.5				
CAT CYN 24	J10,J11	J10-J11	17	3052	0.6%	7.13	7.1	69.3	1.11	0.40	190.84	3104.17	1376.3	0.04	4.13		
CAT CYN 25	R, J11	Initial Area	360	4534	7.9%		13.0	13.0	2.48	0.48	265.58	265.58	313.4				
Junction 11	J11							69.3	1.11	0.41		3369.75	1516.6				
CAT CYN 27A	S, J13	Initial Area	255	3361	7.6%		11.0	11.0	2.68	0.51	93.86	93.86	127.8				
CAT CYN 27B	T, J13	Initial Area	285	3505	8.1%		10.8	10.8	2.71	0.51	116.31	116.31	160.9				
Junction 13								11.0	2.68	0.51		210.17	287.2				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 27	J13,J12	J13-J12	84	2211	3.8%	9.87	3.7	14.7	2.33	0.50	54.66	264.83	307.5	0.04	1.58		
CAT CYN 26	J11,J12	J11-J12	19	951	2.0%	11.70	1.4	70.6	1.10	0.40	69.68	3439.43	1518.0	0.04	3.36		
Junction 12	J12							70.6	1.10	0.41		3704.26	1662.9				
CAT CYN 28	J12,J14	J12-J14	11	1237	0.9%	8.97	2.3	72.9	1.08	0.40	87.79	3792.05	1656.2	0.04	4.07		
CAT CYN 29	U, J14	Initial Area	670	7044	9.5%		16.0	16.0	2.24	0.44	234.44	234.44	230.8				
Junction 14	J14							72.9	1.08	0.41		4026.49	1767.6				
CAT CYN 30	J14,J15	J14-J15	30	3444	0.9%	9.03	6.4	79.3	1.04	0.39	351.98	4378.47	1765.5	0.04	4.18		
CAT CYN 31	V, J15	Initial Area	430	3590	12.0%		9.8	9.8	2.84	0.53	48.77	48.77	73.2				
Junction 15	J15							79.3	1.04	0.39		4427.24	1792.4				
CAT CYN 34A1	W, J24	Initial Area	510	5459	9.3%		14.0	14.0	2.39	0.46	197.82	197.82	218.9				
CAT CYN 34A2	X, J24	Initial Area	600	4145	14.5%		10.0	10.0	2.81	0.53	162.07	162.07	239.2				
Junction 24	J24							14.0	2.39	0.49		359.89	422.4				
CAT CYN 34A	J24,J25	J24-J25	70	1145	6.1%	13.00	1.5	15.5	2.28	0.49	32.03	391.92	435.2	0.04	1.68		
CAT CYN 34B	Y, J25	Initial Area	470	2833	16.6%		7.0	7.0	3.33	0.59	68.33	68.33	135.5				
Junction 25	J25							15.5	2.28	0.50		460.25	527.8				
CAT CYN 32	J15,J16	J15-J16	17	1797	0.9%	9.29	3.2	82.5	1.02	0.39	49.63	4476.87	1767.5	0.04	4.10		
CAT CYN 34	J25,J16	J25-J16	87	2170	4.0%	11.74	3.1	18.5	2.09	0.50	44.65	504.90	522.2	0.04	1.98		
CAT CYN 33	Z, J16	Initial Area	417	2957	14.1%		7.5	7.5	3.22	0.83	48.65	48.65	129.4				
Junction 16	J16							82.5	1.02	0.40		5030.42	2063.5				
CAT CYN 36A	AA, BA	Initial Area	296	1727	17.1%		5.0	5.0	3.92	1.67	33.86	33.86	221.4				
CAT CYN 36	BA, J17	BA-J17	154	1597	9.6%	12.76	2.1	7.1	3.31	0.68	23.6	57.46	129.9	0.04	1.16		
CAT CYN 35	J16,J17	J16-J17	13	1249	1.0%	9.96	2.1	84.6	1.01	0.40	50.35	5080.77	2047.7	0.04	4.25		
Junction 17	J17							84.6	1.01	0.41		5138.23	2144.2				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 38A	AB, J26	Initial Area	489	3020	16.2%		8.0	8.0	3.13	0.57	46.04	46.04	81.8				
CAT CYN 38B	X, J26	Initial Area	689	4780	14.4%		11.0	11.0	2.68	0.51	173.56	173.56	236.3				
CAT CYN 38C	AC, J26	Initial Area	536	4388	12.2%		10.5	10.5	2.74	0.52	137.55	137.55	194.8				
Junction 26	J26							11.0	2.68	0.52		357.15	497.0				
CAT CYN 37	J17,J18	J17-J18	20	2450	0.8%	9.25	4.4	89.0	0.98	0.41	129.21	5267.44	2113.8	0.04	4.55		
CAT CYN 38	J26,J18	J26-J18	101	2671	3.8%	11.23	4.0	15.0	2.31	0.51	50.69	407.84	481.7	0.04	1.93		
Junction 18	J18							89.0	0.98	0.42		5675.28	2318.5				
CAT CYN 40A1-	AA, BB	Initial Area	270	1253	21.5%		3.5	3.5	4.65	2.19	17.20	17.20	175.1				
CAT CYN 40A1	BB, J28	BB-J28	121	1038	11.6%	13.11	1.3	4.8	3.99	1.78	8.62	25.82	183.2	0.04	1.05		
CAT CYN 40A2	AA,J28	Initial Area	357	2963	12.0%		8.0	8.0	3.13	0.89	82.79	82.79	230.9				
Junction 28	J28							8.0	3.13	1.10		108.61	374.5				
CAT CYN 40B1	AD, BC	Initial Area	279	2472	11.3%		7.1	7.1	3.31	1.38	45.65	45.65	208.1				
CAT CYN 40B2	BC, BC1	BC-BC1	136	846	16.0%	16.71	0.8	7.9	3.14	1.36	9.39	55.04	234.1	0.04	1.19		
CAT CYN 40B	BC1, J27	BC-J27	19	377	4.9%	9.25	0.7	8.6	3.01	1.33	1.86	56.90	228.2	0.04	1.19		
CAT CYN 40A	J28,J27	J28-J27	51	716	7.1%	13.12	0.9	8.9	2.97	1.05	11.19	119.80	373.9	0.04	1.52		
Junction 27	J27							8.9	2.97	1.14		176.70	598.5				
CAT CYN 40	J27,J19	J27-J19	40	688	5.8%	13.58	0.8	9.8	2.84	1.12	7.91	184.61	585.0	0.04	1.86		
CAT CYN 39	J18,J19	J18-J19	2	407	0.5%	7.79	0.9	89.9	0.98	0.42	7.45	5682.73	2308.9	0.04	5.15		
CAT CYN 41	AF, J19	Initial Area	550	4587	12.0%		12.0	12.0	2.57	0.49	123.12	123.12	155.7				
Junction 19	J19							89.9	0.98	0.44		5990.46	2569.5				
CAT CYN 43	BF, J20	Initial Area	51	686	7.4%		3.9	3.9	4.41	1.05	4.26	4.26	19.7	0.04	0.86		
CAT CYN 42	J19,J20	J19-J20	20	1262	1.6%	12.38	1.7	91.6	0.97	0.44	42.06	6032.52	2554.6	0.04	4.29		
Junction 20	J20							91.6	0.97	0.44		6036.78	2558.9				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 43A	AG, BD	Initial Area	283	1052	26.9%		2.8	2.8	5.17	1.43	11.65	11.65	86.3				
CAT CYN 44	J20,J21	J20-J21	10	1002	1.0%	8.69	1.9	93.5	0.96	0.43	105.65	6142.43	2553.9	0.04	3.57		
CAT CYN 44A	BJ,BH	Initial Area	77	1919	4.0%		10.0	10.0	2.81	0.76	23.74	23.74	50.7				
CAT CYN 45	BH,J21	BH-J21	59	713	8.3%	8.41	1.4	11.4	2.64	0.75	3.16	26.90	52.9	0.04	0.70		
Junction 21	J21							93.5	0.96	0.44		6180.98	2589.2				
CAT CYN 45A	AE, BE	Initial Area	298	1467	20.3%		4.3	4.3	4.21	0.80	18.85	18.85	63.5				
CAT CYN 47	AH, J22	Initial Area	403	3026	13.3%		8.2	8.2	3.09	0.56	47.36	47.36	82.5				
CAT CYN 46	J21,J22	J21-J22	10	1413	0.7%	9.10	2.6	96.1	0.95	0.43	122.7	6303.68	2573.8	0.04	4.95		
Junction 22	J22							96.1	0.95	0.43		6369.89	2613.4				
CAT CYN 49B1	AK, J29	Initial Area	200	1003	19.9%		3.1	3.1	4.93	2.68	15.32	15.32	202.1				
CAT CYN 49B	AL, J29		35	417	8.4%	11.95	0.6	4.9	3.96	2.25	4.68	20.00	178.2	0.04	1.17		
CAT CYN 49A	AJ, J29	Initial Area	330	2190	15.1%		6.1	6.1	3.56	0.71	41.14	41.14	104.0				
Junction 29	J29							6.1	3.56	1.21		61.14	264.2				
CAT CYN 49	J29,J23	J29-J23	120	2116	5.7%	11.02	3.2	9.3	2.91	0.96	37.43	98.57	274.5	0.04	1.39		
CAT CYN 48	J22,J23	J22-J23	50	4302	1.2%	11.07	6.5	102.6	0.92	0.42	286.32	6656.21	2571.8	0.04	4.58		
CAT CYN 50	AF, J23	Initial Area	640	8530	7.5%		12.0	12.0	2.57	0.49	243.99	243.99	308.5				
Junction 23	J23							102.6	1.02	0.43		6998.77	3066.9				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
25 Year Flow - POST CONSTRUCTION																	
Unnamed Blueline #1 & #2																	
NNBL2-1	2A, J1	Initial Area	229	2372	9.7%		8.0	8.0	2.73	0.71	41.66	41.66	81.1				
NNBL2-2	2B, J1	Initial Area	218	2353	9.3%		7.5	7.5	2.81	1.07	23.82	23.82	71.7				
NNBL2-3	2C, J1	Initial Area	240	2253	10.7%		8.0	8.0	2.73	1.14	30.78	30.78	95.4				
Junction 1								8.0	2.73	0.94		96.26	246.0				
NNBL2-4	J1, J2	J1-J2	100	2528	4.0%	4.81	8.8	16.8	1.92	0.63	46.6	142.86	174.3	0.04	0.52		
NNBL2-5	2D, J2	Initial Area	334	3668	9.1%		11.0	11.0	2.35	0.68	80.33	80.33	128.3				
NNBL2-6	2E, J2	Initial Area	170	1481	11.5%		5.5	5.5	3.26	0.59	19.95	19.95	38.1				
Junction 2	J2							16.8	1.92	0.65		243.14	301.9				
NNBL2-7	J2,J3	J2-J3	70	2077	3.4%	8.24	4.2	21.0	1.73	0.59	54.73	297.87	304.5	0.04	1.33		
NNBL2-8	2F, J3	Initial Area	194	1325	14.7%		4.5	4.5	3.58	0.63	15.65	15.65	35.1				
NNBL2-9	2G, J3	Initial Area	120	1445	8.3%		5.5	5.5	3.26	0.59	21.99	21.99	42.0				
Junction 3	J3							21.0	1.73	0.59		335.51	343.8				
NNBL2-10	J3,J4	J3-J4	40	1433	2.8%	7.71	3.1	24.1	1.62	0.58	22.03	357.54	333.7	0.04	1.38		
NNBL1-1	1A, J4	Initial Area	410	5898	7.0%		17.2	17.2	1.90	0.48	114.71	114.71	105.5				
Junction 4	J4							24.1	1.62	0.55		472.25	423.7				
NNBL2-11	2H,J5	Initial Area	272	2184	12.4%		7.0	7.0	2.91	0.83	52.24	52.24	126.6				
NNBL2-13	J5,J6	J5-J6	83	1700	4.9%	8.00	3.5	10.5	2.40	0.77	40.71	92.95	170.7	0.04	0.95		
NNBL2-14	2L, J6	Initial Area	275	2707	10.2%		8.5	8.5	2.65	0.50	50.68	50.68	67.7				
Junction 6								10.5	2.40	0.67		143.63	231.8				
NNBL2-15	J6,J7	J6-J7	15	1000	1.5%	5.98	2.8	13.3	2.14	0.65	13.41	157.04	219.6	0.04	1.51		
NNBL2-16	J4,J7	J4-J7	10	850	1.2%	5.44	2.6	26.7	1.54	0.55	15.71	487.96	411.1	0.04	1.56		
NNBL2-17	2M,J7	Initial Area	179	1839	9.7%		5.5	5.5	3.26	0.59	23.12	23.12	44.1				
Junction 7	J7							26.7	1.54	0.57		668.12	590.2				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Unnamed Blueline #1 & #2 (con't)																	
NNBL2-18	J7,J8	J7-J8	56	2263	2.5%	9.43	4.0	30.7	1.45	0.55	45.45	713.57	571.3	0.04	2.04		
NNBL2-19	2N,J8	Initial Area	226	2090	10.8%		6.0	6.0	3.13	0.57	27.27	27.27	48.5				
Junction 8	J8							30.7	1.45	0.55		740.84	593.7				
NNBL2-20	J8,J9	J8 to J9	54	3207	1.7%	8.18	6.5	37.2	1.32	0.53	55.98	796.82	560.9	0.04	2.21		
Unnamed Blueline #3																	
NNBL3-1	3A, J10	Initial Area	110	1349	8.2%		5.5	5.5	3.26	0.59	12.58	12.58	24.0				
NNBL3-2	3B, J10	Initial Area	70	677	10.3%		3.0	3.0	4.34	0.71	6.13	6.13	18.9				
Junction 10								5.5	3.26	0.63		18.71	38.2				
NNBL3-3	J10,J11	J10-J11	45	2263	2.0%	4.41	8.6	14.1	2.09	0.50	25.07	43.78	46.2	0.04	0.76		
NNBL3-4	3C,J11	Initial Area	55	609	9.1%		3.0	3.0	4.34	0.71	6.78	6.78	20.9				
Junction 11	J11							14.1	2.09	0.53		50.56	56.3				
NNBL3-5	J11,J12	J11-J12	84	1933	4.4%	6.94	4.6	18.7	1.83	0.46	42.5	93.06	77.6	0.04	0.84		
NNBL3-6	3D,J12	Initial Area	199	2019	9.9%		3.0	3.0	4.34	0.71	12.04	12.04	37.1				
Junction 12	J12							18.7	1.83	0.49		105.10	93.2				
NNBL3-7	J12,J13	J12-J13	66	1164	5.6%	9.21	2.1	20.8	1.74	0.47	16.97	122.07	98.9	0.04	1.06		
NNBL3-8	3E,J13	Initial Area	196	2019	9.7%		7.1	7.1	2.89	0.54	23.35	23.35	36.2				
Junction 13	J13							20.8	1.74	0.48		145.42	120.6				
NNBL3-9	J13,J14	J13-J14	15	611	2.4%	7.15	1.4	22.2	1.68	0.47	8.43	153.85	121.7	0.04	1.37		
NNBL3-10	3F,J14	Initial Area	199	1666	12.0%		5.5	5.5	3.26	0.59	16.27	16.27	31.1				
Junction 14	J14							22.2	1.68	0.48		170.12	137.8				
NNBL3-11	J14,J15	J14-J15	36	812	4.4%	8.27	1.6	23.9	1.63	0.47	15.07	185.19	141.2	0.04	1.09		
NNBL3-12	3G,J15	Initial Area	184	1808	10.2%		6.5	6.5	3.01	0.55	18.70	18.70	31.2				
Junction 15	J15							23.9	1.63	0.48		203.89	158.1				
NNBL3-13	J15, end	J15 - end	37	800	4.6%	7.85	1.7	25.6	1.58	0.47	14.11	218.00	160.0	0.04	0.97		

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Long Canyon																	
LNG CYN 1	A, J1	Initial Area	160	1162	13.8%		4.0	4.0	3.79	0.65	9.9	9.90	24.4				
LNG CYN 2	B, J1	Initial Area	120	2184	5.5%		9.0	9.0	2.58	0.49	39.82	39.82	50.7				
Junction 1								9.0	2.58	0.52		49.72	67.3				
LNG CYN 3	J1,J2	J1-J2	77	2351	3.3%	5.68	6.9	15.9	1.97	0.44	81.59	131.31	114.6	0.04	0.77		
LGN CYN 4	C,J2	Initial Area	287	1809	15.9%		6.0	6.0	3.13	0.73	19	19.00	43.2				
Junction 2	J2							15.9	1.97	0.48		150.31	141.9				
LGN CYN 5	J2,J3	J2-J3	8	501	1.7%	5.39	1.6	17.4	1.89	0.48	6.8	157.11	142.4	0.04	1.17		
LGN CYN 6	D,J3	Initial Area	286	2301	12.4%		8.0	8.0	2.73	0.70	36.15	36.15	69.4				
Junction 3	J3							17.4	1.89	0.52		193.26	190.4				
LGN CYN 7	J3,J4	J3-J4	33	585	5.6%	7.82	1.2	18.7	1.83	0.52	5.78	199.04	188.2	0.04	0.83		
LGN CYN 8	E,J4	Initial Area	239	1600	14.9%		7.1	7.1	2.89	0.54	18.54	18.54	28.7				
LGN CYN 9	F, J4	Initial Area	239	3803	6.3%		10.1	10.1	2.44	0.73	68.07	68.07	121.6				
Junction 4	J4							18.7	1.83	0.57		285.65	297.2				
LGN CYN 10	J4,J5	J4-J5	5	855	0.6%	4.69	3.0	21.7	1.70	0.56	18.52	304.17	287.5	0.04	2.02		
LGN CYN 11	B,J5	Initial Area	244	2033	12.0%		7.0	7.0	2.91	0.54	40.46	40.46	63.5				
Junction 5	J5							21.7	1.70	0.55		344.63	324.7				
LGN CYN 12	J5,J6	J5-J6	76	2167	3.5%	8.44	4.3	26.0	1.56	0.52	64.42	409.05	329.7	0.04	1.33		
LGN CYN 13	G,J6	Initial Area	296	2838	10.4%		5.2	5.2	3.35	1.00	74.09	74.09	249.0				
Junction 6	J6							26.0	1.56	0.59		483.14	446.0				
LGN CYN 14	J6,J7	J6-J7	17	1415	1.2%	6.10	3.9	29.9	1.46	0.56	52.08	535.22	439.9	0.04	1.84		
LGN CYN 15	H,J7	Initial Area	257	2259	11.4%		6.5	6.5	3.01	0.85	41.34	41.34	105.5				
LGN CYN 16	J, J7	Initial Area	168	1166	14.4%		5.5	5.5	3.26	0.59	8.66	8.66	16.5				
Junction 7	J7							29.9	1.46	0.58		585.22	498.6				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Long Canyon (con't)																	
LGN CYN 17	J7,J8	J7-J8	23	1308	1.8%	7.83	2.8	32.7	1.40	0.57	37.32	622.54	497.3	0.04	1.98		
LGN CYN 18	J,J8	Initial Area	191	1828	10.5%		6.5	6.5	3.01	0.55	22.38	22.38	37.3				
Junction 8	J8							32.7	1.40	0.57		644.92	514.6				
LGN CYN 19	J8,J9	J8-J9	40	1341	3.0%	8.84	2.5	35.2	1.35	0.55	46.44	691.36	513.5	0.04	1.61		
LGN CYN 20	K,J9	Initial Area	200	1806	11.1%		6.4	6.4	3.03	0.56	21.61	21.61	36.5				
Junction 9	J9							35.2	1.35	0.55		712.97	529.8				
LGN CYN 21	J9,J10	J9-J10	15	693	2.2%	8.41	1.4	36.6	1.33	0.54	20.72	733.69	527.5	0.04	1.87		
LGN CYN 22	L,J10	Initial Area	135	1428	9.5%		5.5	5.5	3.26	0.59	23.15	23.15	44.2				
Junction 10	J10							36.6	1.33	0.54		756.84	545.5				
LGN CYN 23	J10,J11	J10-J11	25	847	2.9%	9.66	1.5	38.0	1.31	0.53	20.28	777.12	542.2	0.04	1.87		
LGN CYN 24	M,J11	Initial Area	187	1482	12.6%		4.9	4.9	3.44	0.61	16.4	16.40	34.4				
Junction 11	J11							38.0	1.31	0.54		793.52	555.3				
LGN CYN 25	J11,J12	J11-J12	70	2087	3.4%	11.15	3.1	41.2	1.26	0.52	52.63	846.15	551.0	0.04	2.09		
LGN CYN 26	N,J12	Initial Area	200	1850	10.8%		6.2	6.2	3.08	0.56	21.56	21.56	37.4				
Junction 12	J12							41.2	1.26	0.52		867.71	566.3				
LGN CYN 27	J12, END	J12-END	30	1246	2.4%	10.04	2.1	43.2	1.23	0.51	26.06	893.77	560.8	0.04	2.29		

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon																	
OLV CYN 1	A, J1	Initial Area	185	2042	9.1%		8.0	8.0	2.73	0.51	33.14	33.14	46.5				
OLV CYN 2	B, J1	Initial Area	161	1575	10.2%		5.8	5.8	3.18	0.58	19.71	19.71	36.0				
Junction 1								8.0	2.73	0.54		52.85	77.5				
OLV CYN 3	J1,J2	J1-J2	84	2033	4.1%	7.20	4.7	12.7	2.19	0.49	46.79	99.64	106.6	0.04	0.93		
OLV CYN 4	B,J2	Initial Area	244	1723	14.2%		5.0	5.0	3.41	0.60	31.97	31.97	65.9				
Junction 2	J2							12.7	2.19	0.52		131.61	149.0				
OLV CYN 5	J2,J3	J2-J3	61	1762	3.5%	7.61	3.9	16.6	1.93	0.48	44.86	176.47	164.9	0.04	1.15		
OLV CYN 6	C,J3	Initial Area	313	3437	9.1%		10.1	10.1	2.44	0.47	63.01	63.01	72.7				
Junction 3	J3							16.6	1.93	0.48		239.48	222.4				
OLV CYN 7	J3,J4	J3-J4	40	902	4.4%	9.80	1.5	18.1	1.86	0.48	8.79	248.27	219.4	0.04	1.40		
OLV CYN 8	D,J4	Initial Area	330	4367	7.6%		13.0	13.0	2.17	0.43	72.00	72.00	66.8				
OLV CYN 9	E, J4	Initial Area	197	2861	6.9%		10.1	10.1	2.44	0.47	53.94	53.94	62.2				
Junction 4	J4							18.1	1.86	0.47		374.21	323.7				
OLV CYN 10	J4,J5	J4-J5	13	917	1.4%	7.02	2.2	20.3	1.76	0.46	18.75	392.96	318.4	0.04	1.99		
OLV CYN 11	F,J5	Initial Area	333	3924	8.5%		12.0	12.0	2.25	0.44	57.52	57.52	57.2				
Junction 5	J5							20.3	1.76	0.46		450.48	363.0				
OLV CYN 12	J5,J6	J5-J6	17	402	4.2%	10.89	0.6	20.9	1.73	0.45	23.30	473.78	372.0	0.04	1.70		
OLV CYN 13	G,J6	Initial Area	239	2895	8.3%		9.5	9.5	2.52	0.48	79.32	79.32	96.4				
Junction 6	J6							20.9	1.73	0.46		553.10	438.4				
OLV CYN 14	J6,J7	J6-J7	21	1598	1.3%	7.00	3.8	24.7	1.60	0.44	57.77	610.87	434.7	0.04	2.06		
OLV CYN 15	H,J7	Initial Area	221	2289	9.7%		7.0	7.0	2.91	0.54	34.70	34.70	54.4				
Junction 7	J7							24.7	1.60	0.45		645.57	464.7				
OLV CYN 16	J7,J8	J7-J8	59	1849	3.2%	10.40	3.0	27.7	1.52	0.44	64.56	710.13	470.2	0.04	1.97		
OLV CYN 17	J, J8	Initial Area	168	1166	14.4%		5.5	5.5	3.26	0.59	19.74	19.74	37.7				
Junction 8	J8							27.7	1.52	0.44		729.87	487.7				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon (con't)																	
OLV CYN B1	BA, J12	Initial Area	319	4102	7.8%		14.0	14.0	2.10	0.41	117.13	117.13	101.7				
OLV CYN B2	BB, J12	Initial Area	200	1335	15.0%		4.4	4.4	3.62	0.63	12.59	12.59	28.7				
Junction 12								14.0	2.10	0.44		129.72	118.4				
OLV CYN B3	J12,J13	J12-J13	80	2102	3.8%	7.80	4.5	18.5	1.84	0.42	48.49	178.21	136.5	0.04	1.11		
OLV CYN B4	BB, J13	Initial Area	280	2943	9.5%		9.0	9.0	2.58	0.49	53.73	53.73	68.4				
OLV CYN B5	BC, J13	Initial Area	70	980	7.1%		4.5	4.5	3.58	0.63	11.00	11.00	24.7				
Junction 13	J13							18.5	1.84	0.44		242.94	197.8				
OLV CYN B6	J13,J14	J13-J14	5	980	0.5%	4.02	4.1	22.6	1.67	0.44	8.92	251.86	185.0	0.04	1.86		
OLV CYN B7	BD, J14	Initial Area	235	1682	14.0%		5.5	5.5	3.26	0.59	21.83	21.83	41.7				
Junction 14	J14							22.6	1.67	0.45		273.69	206.4				
OLV CYN B8	J14,J15	J14-J15	45	1734	2.6%	7.80	3.7	26.3	1.56	0.43	42.44	316.13	212.6	0.04	1.48		
OLV CYN B9	BE, J15	Initial Area	288	2927	9.8%		8.6	8.6	2.64	0.50	43.38	43.38	57.4				
OLV CYN B10	BF, J15	Initial Area	130	1555	8.4%		6.8	6.8	2.95	0.54	16.5	16.50	26.5				
Junction 15	J15							26.3	1.56	0.45		376.01	260.5				
OLV CYN B11	J15,J16	J15-J16	30	651	4.6%	10.27	1.1	27.3	1.53	0.44	9.39	385.40	260.0	0.04	1.46		
OLV CYN B12	BG, J16	Initial Area	280	2261	12.4%		7.0	7.0	2.91	0.54	29.51	29.51	46.3				
Junction 16	J16							27.3	1.53	0.45		414.91	284.3				
OLV CYN B13	J16,J9	J16-J9	40	1905	2.1%	7.87	4.0	31.4	1.43	0.44	28.82	443.73	278.1	0.04	1.76		
OLV CYN B14	BH, J9	Initial Area	158	2489	6.3%		7.0	7.0	2.91	0.54	24.93	24.93	39.1				
OLV CYN 18	J8,J9	J8-J9	40	1623	2.5%	9.41	2.9	30.5	1.45	0.29	39.08	768.95	320.5	0.04	2.04		
Junction 9	J9							31.4	1.43	0.35		1237.61	613.8				
OLV CYN 19	J9,J10	J9-J10	40	939	4.3%	12.15	1.3	32.6	1.40	0.35	14.42	1252.03	607.8	0.04	1.99		
OLV CYN 20	K, J10	Initial Area	160	1521	10.5%		5.8	5.8	3.18	0.58	14.88	14.88	27.2				
OLV CYN 21	BF, J10	Initial Area	240	4599	5.2%		16.0	16.0	1.97	0.39	45.78	45.78	35.3				
Junction 10	J10							32.6	1.40	0.35		1312.69	645.0				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon (con't)																	
OLV CYN A1	AA, J18	Initial Area	270	3259	8.3%		10.2	10.2	2.43	0.47	33.42	33.42	38.2				
OLV CYN A2	AB, J18	Initial Area	170	2265	7.5%		8.1	8.1	2.71	0.51	24.49	24.49	34.0				
Junction 18	J18							10.2	2.43	0.49		57.91	68.8				
OLV CYN A3	J18,J19	J18-J19	53	780	6.8%	8.53	1.5	11.7	2.28	0.48	14.51	72.42	79.1	0.04	0.82		
OLV CYN A4	AC, J19	Initial Area	133	1216	10.9%		4.6	4.6	3.55	0.62	10.78	10.78	23.7				
Junction 19	J19							11.7	2.28	0.50		83.20	94.4				
OLV CYN 22	J10,J11	J10-J11	47	1472	3.2%	11.02	2.2	14.0	2.10	0.35	15.63	1328.32	977.9	0.04	2.14		
OLV CYN A5	J19,J11	J19-J11	34	512	6.6%	9.11	0.9	28.3	1.50	0.49	2.49	85.69	63.4	0.04	0.93		
Junction 11	J11							28.3	1.50	0.36		1414.01	763.7				
Cat Canyon																	
CAT CYN 1	A, J1	Initial Area	220	3939	5.6%		14.0	14.0	2.10	0.41	164.76	164.76	143.1				
CAT CYN 2	B, J1	Initial Area	240	3214	7.5%		11.0	11.0	2.35	0.46	82.64	82.64	88.6				
Junction 1								14.0	2.10	0.43		247.40	222.2				
CAT CYN 3	J1,J2	J1-J2	30	1061	2.9%	8.21	2.2	32.7	1.40	0.41	37.57	284.97	163.4	0.04	1.48		
CAT CYN 4	C,J2	Initial Area	273	4399	6.2%		14.0	14.0	2.10	0.41	177.26	177.26	154.0				
Junction 2	J2							32.7	1.40	0.41		462.23	266.5				
CAT CYN 5	J2,J3	J2-J3	40	2528	1.6%	6.59	6.4	39.1	1.29	0.39	68.72	530.95	267.1	0.04	1.67		
CAT CYN 6	D,J3	Initial Area	300	5119	5.9%		16.0	16.0	1.97	0.39	106.30	106.30	81.9				
CAT CYN 7	E, J3	Initial Area	318	3649	8.7%		11.0	11.0	2.35	0.46	93.88	93.88	100.7				
Junction 3	J3							39.1	1.29	0.40		731.13	376.1				
CAT CYN 8	J3,J4	J3-J4	30	2536	1.2%	6.46	6.5	45.6	1.20	0.38	86.11	817.24	373.0	0.04	2.02		
CAT CYN 9	F,J4	Initial Area	300	6775	4.4%		23.0	23.0	1.66	0.33	209.62	209.62	115.4				
Junction 4	J4							45.6	1.20	0.37		1026.86	456.4				
CAT CYN 10	J4,J5	J4-J5	20	1868	1.1%	6.54	4.8	50.4	1.14	0.36	90.94	1117.80	457.6	0.04	2.21		
CAT CYN 11	G,J5	Initial Area	190	6195	3.1%		25.0	25.0	1.59	0.32	238.85	238.85	121.3				
Junction 5	J5							50.4	1.14	0.35		1356.65	544.7				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 12	J5,J6	J5-J6	10	655	1.5%	7.82	1.4	51.8	1.13	0.35	21.49	1378.14	542.8	0.04	2.21		
CAT CYN 13	H,J6	Initial Area	380	4546	8.4%		13.0	13.0	2.17	0.43	130.52	130.52	121.0				
Junction 6	J6							51.8	1.13	0.36		1508.66	605.8				
CAT CYN 14	J6,J7	J6-J7	10	1376	0.7%	6.24	3.7	55.5	1.09	0.35	77.69	1586.35	603.3	0.04	2.75		
CAT CYN 15	J,J7	Initial Area	670	6984	9.6%		17.0	17.0	1.91	0.38	383.83	383.83	280.0				
Junction 7	J7							55.5	1.09	0.35		1970.18	763.4				
CAT CYN 16	J7,J8	J7-J8	29	1894	1.5%	8.72	3.6	59.1	1.06	0.35	114.13	2084.31	764.0	0.04	2.61		
CAT CYN 17	K, J8	Initial Area	249	4534	5.5%		16.0	16.0	1.97	0.39	134.68	134.68	103.8				
Junction 8	J8							59.1	1.06	0.35		2218.99	819.9				
CAT CYN 19A	L, J9A	Initial Area	620	4845	12.8%		11.5	11.5	2.30	0.45	173.73	173.73	179.3				
CAT CYN 19B	M, J9A	Initial Area	730	4642	15.7%		10.0	10.0	2.46	0.47	165.79	165.79	192.9				
Junction J9A								11.5	2.30	0.46		339.52	359.9				
CAT CYN 19	J9A,J9	J9A-J9	60	1352	4.4%	10.60	2.1	13.6	2.12	0.46	21.14	360.66	351.0	0.04	1.57		
CAT CYN 18	J8,J9	J8-J9	11	1514	0.7%	6.74	3.7	62.8	1.03	0.34	50.58	2269.57	805.9	0.04	3.08		
CAT CYN 20	N, J9	Initial Area	340	3649	9.3%		11.5	11.5	2.30	0.45	112.02	112.02	115.6				
Junction 9	J9A,J9							62.8	1.03	0.36		2742.25	1028.0				
CAT CYN 21	J9,J10	J9-J10	3	1019	0.3%	5.31	3.2	66.0	1.01	0.36	57.78	2800.03	1014.4	0.04	3.87		
CAT CYN 22	P,J10	Initial Area	383	3985	9.6%		11.0	11.0	2.35	0.46	70.08	70.08	75.2				
CAT CYN 23	Q, J10	Initial Area	463	2941	15.8%		7.5	7.5	2.81	0.53	43.22	43.22	64.0				
Junction 10	J10							66.0	1.01	0.36		2913.33	1069.5				
CAT CYN 24	J10,J11	J10-J11	17	3052	0.6%	6.66	7.6	73.6	0.96	0.35	190.84	3104.17	1044.6	0.04	3.73		
CAT CYN 25	R, J11	Initial Area	360	4534	7.9%		13.0	13.0	2.17	0.43	265.58	265.58	246.3				
Junction 11	J11							73.6	0.96	0.36		3369.75	1153.0				
CAT CYN 27A	S, J13	Initial Area	255	3361	7.6%		11.0	11.0	2.35	0.46	93.86	93.86	100.7				
CAT CYN 27B	T, J13	Initial Area	285	3505	8.1%		10.8	10.8	2.37	0.46	116.31	116.31	126.7				
Junction 13								11.0	2.35	0.46		210.17	226.3				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 27	J13,J12	J13-J12	84	2211	3.8%	9.22	4.0	15.0	2.03	0.45	54.66	264.83	240.1	0.04	1.43		
CAT CYN 26	J11,J12	J11-J12	19	951	2.0%	10.92	1.5	75.1	0.95	0.35	69.68	3439.43	1152.8	0.04	3.03		
Junction 12	J12							75.1	0.95	0.36		3704.26	1264.9				
CAT CYN 28	J12,J14	J12-J14	11	1237	0.9%	8.37	2.5	77.6	0.93	0.36	87.79	3792.05	1258.2	0.04	3.67		
CAT CYN 29	U, J14	Initial Area	670	7044	9.5%		16.0	16.0	1.97	0.39	234.44	234.44	180.7				
Junction 14	J14							77.6	0.93	0.36		4026.49	1343.8				
CAT CYN 30	J14,J15	J14-J15	30	3444	0.9%	8.43	6.8	84.4	0.90	0.34	351.98	4378.47	1335.9	0.04	3.77		
CAT CYN 31	V, J15	Initial Area	430	3590	12.0%		9.8	9.8	2.48	0.48	48.77	48.77	57.7				
Junction 15	J15							84.4	0.90	0.34		4427.24	1356.8				
CAT CYN 34A1	W, J24	Initial Area	510	5459	9.3%		14.0	14.0	2.10	0.41	197.82	197.82	171.8				
CAT CYN 34A2	X, J24	Initial Area	600	4145	14.5%		10.0	10.0	2.46	0.47	162.07	162.07	188.6				
Junction 24	J24							14.0	2.10	0.44		359.89	332.7				
CAT CYN 34A	J24,J25	J24-J25	70	1145	6.1%	12.14	1.6	15.6	1.99	0.44	32.03	391.92	341.7	0.04	1.51		
CAT CYN 34B	Y, J25	Initial Area	470	2833	16.6%		7.0	7.0	2.91	0.54	68.33	68.33	107.2				
Junction 25	J25							15.6	1.99	0.45		460.25	415.1				
CAT CYN 32	J15,J16	J15-J16	17	1797	0.9%	8.67	3.5	87.8	0.88	0.34	49.63	4476.87	1337.2	0.04	3.70		
CAT CYN 34	J25,J16	J25-J16	87	2170	4.0%	10.96	3.3	18.9	1.82	0.44	44.65	504.90	408.6	0.04	1.78		
CAT CYN 33	Z, J16	Initial Area	417	2957	14.1%		7.5	7.5	2.81	0.83	48.65	48.65	113.0				
Junction 16	J16							87.8	0.88	0.36		5030.42	1570.0				
CAT CYN 36A	AA, BA	Initial Area	296	1727	17.1%		5.0	5.0	3.41	1.67	33.86	33.86	192.7				
CAT CYN 36	BA, J17	BA-J17	154	1597	9.6%	11.91	2.2	7.2	2.86	0.68	23.6	57.46	112.2	0.04	1.05		
CAT CYN 35	J16,J17	J16-J17	13	1249	1.0%	9.29	2.2	90.1	0.87	0.35	50.35	5080.77	1557.2	0.04	3.83		
Junction 17	J17							90.1	0.87	0.37		5138.23	1640.3				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 38A	AB, J26	Initial Area	489	3020	16.2%		8.0	8.0	2.73	0.51	46.04	46.04	64.7				
CAT CYN 38B	X, J26	Initial Area	689	4780	14.4%		11.0	11.0	2.35	0.46	173.56	173.56	186.1				
CAT CYN 38C	AC, J26	Initial Area	536	4388	12.2%		10.5	10.5	2.40	0.46	137.55	137.55	153.5				
Junction 26	J26							11.0	2.35	0.47		357.15	392.0				
CAT CYN 37	J17,J18	J17-J18	20	2450	0.8%	8.63	4.7	94.8	0.85	0.36	129.21	5267.44	1614.9	0.04	4.11		
CAT CYN 38	J26,J18	J26-J18	101	2671	3.8%	10.48	4.2	15.2	2.01	0.46	50.69	407.84	376.7	0.04	1.74		
Junction 18	J18							94.8	0.85	0.37		5675.28	1773.6				
CAT CYN 40A1-	AA, BB	Initial Area	270	1253	21.5%		3.5	3.5	4.04	2.19	17.20	17.20	152.1				
CAT CYN 40A1	BB, J28	BB-J28	121	1038	11.6%	12.24	1.4	4.9	3.44	1.78	8.62	25.82	158.0	0.04	0.95		
CAT CYN 40A2	AA,J28	Initial Area	357	2963	12.0%		8.0	8.0	2.73	0.89	82.79	82.79	201.7				
Junction 28	J28							8.0	2.73	1.10		108.61	327.1				
CAT CYN 40B1	AD, BC	Initial Area	279	2472	11.3%		7.1	7.1	2.89	1.38	45.65	45.65	181.6				
CAT CYN 40B2	BC, BC1	BC-BC1	136	846	16.0%	15.60	0.9	8.0	2.73	1.36	9.39	55.04	203.8	0.04	1.07		
CAT CYN 40B	BC1, J27	BC-J27	19	377	4.9%	8.63	0.7	8.7	2.62	1.33	1.86	56.90	198.0	0.04	1.07		
CAT CYN 40A	J28,J27	J28-J27	51	716	7.1%	12.25	1.0	9.0	2.59	1.05	11.19	119.80	324.1	0.04	1.37		
Junction 27	J27							9.0	2.59	1.14		176.70	519.6				
CAT CYN 40	J27,J19	J27-J19	40	688	5.8%	12.68	0.9	9.9	2.47	1.11	7.91	184.61	505.8	0.04	1.68		
CAT CYN 39	J18,J19	J18-J19	2	407	0.5%	7.27	0.9	95.7	0.84	0.37	7.45	5682.73	1766.1	0.04	4.65		
CAT CYN 41	AF, J19	Initial Area	550	4587	12.0%		12.0	12.0	2.25	0.44	123.12	123.12	122.5				
Junction 19	J19							95.7	0.84	0.39		5990.46	1984.8				
CAT CYN 43	BF, J20	Initial Area	51	686	7.4%		3.9	3.9	3.83	1.05	4.26	4.26	17.2	0.04	0.77		
CAT CYN 42	J19,J20	J19-J20	20	1262	1.6%	11.56	1.8	97.5	0.84	0.39	42.06	6032.52	1974.1	0.04	3.87		
Junction 20	J20							97.5	0.84	0.39		6036.78	1977.9				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 43A	AG, BD	Initial Area	283	1052	26.9%		2.8	2.8	4.49	1.43	11.65	11.65	74.8				
CAT CYN 44	J20,J21	J20-J21	10	1002	1.0%	8.11	2.1	99.6	0.83	0.39	105.65	6142.43	1975.9	0.04	3.22		
CAT CYN 44A	BJ,BH	Initial Area	77	1919	4.0%		10.0	10.0	2.46	0.76	23.74	23.74	44.4				
CAT CYN 45	BH,J21	BH-J21	59	713	8.3%	7.85	1.5	11.5	2.30	0.75	3.16	26.90	46.2	0.04	0.63		
Junction 21	J21							99.6	0.83	0.39		6180.98	2006.4				
CAT CYN 45A	AE, BE	Initial Area	298	1467	20.3%		4.3	4.3	3.66	0.80	18.85	18.85	55.2				
CAT CYN 47	AH, J22	Initial Area	403	3026	13.3%		8.2	8.2	2.70	0.51	47.36	47.36	65.2				
CAT CYN 46	J21,J22	J21-J22	10	1413	0.7%	8.49	2.8	102.4	0.82	0.39	122.7	6303.68	1992.1	0.04	4.46		
Junction 22	J22							102.4	0.82	0.39		6369.89	2024.2				
CAT CYN 49B1	AK, J29	Initial Area	200	1003	19.9%		3.1	3.1	4.27	2.68	15.32	15.32	175.3				
CAT CYN 49B	AL, J29		35	417	8.4%	11.15	0.6	4.9	3.43	2.25	4.68	20.00	154.5	0.04	1.05		
CAT CYN 49A	AJ, J29	Initial Area	330	2190	15.1%		6.1	6.1	3.10	0.71	41.14	41.14	90.7				
Junction 29	J29							6.1	3.10	1.21		61.14	230.3				
CAT CYN 49	J29,J23	J29-J23	120	2116	5.7%	10.29	3.4	9.5	2.51	0.94	37.43	98.57	231.9	0.04	1.25		
CAT CYN 48	J22,J23	J22-J23	50	4302	1.2%	10.33	6.9	109.3	0.79	0.38	286.32	6656.21	1986.7	0.04	4.13		
CAT CYN 50	AF, J23	Initial Area	640	8530	7.5%		12.0	12.0	2.84	0.53	243.99	243.99	368.1				
Junction 23	J23							109.3	0.99	0.39		6998.77	2692.7				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
10 Year Flow - POST CONSTRUCTION																	
Unnamed Blueline #1 & #2																	
NNBL2-1	2A, J1	Initial Area	229	2372	9.7%		8.0	8.0	2.31	0.71	41.66	41.66	68.8				
NNBL2-2	2B, J1	Initial Area	218	2353	9.3%		7.5	7.5	2.39	1.07	23.82	23.82	60.8				
NNBL2-3	2C, J1	Initial Area	240	2253	10.7%		8.0	8.0	2.31	1.14	30.78	30.78	80.9				
Junction 1								8.0	2.31	0.94		96.26	208.6				
NNBL2-4	J1, J2	J1-J2	100	2528	4.0%	4.44	9.5	17.5	1.59	0.63	46.6	142.86	144.0	0.04	0.46		
NNBL2-5	2D, J2	Initial Area	334	3668	9.1%		11.0	11.0	1.99	0.68	80.33	80.33	108.5				
NNBL2-6	2E, J2	Initial Area	170	1481	11.5%		5.5	5.5	2.77	0.52	19.95	19.95	28.8				
Junction 2	J2							17.5	1.59	0.64		243.14	247.4				
NNBL2-7	J2,J3	J2-J3	70	2077	3.4%	7.61	4.6	22.0	1.42	0.57	54.73	297.87	243.4	0.04	1.18		
NNBL2-8	2F, J3	Initial Area	194	1325	14.7%		4.5	4.5	3.05	0.56	15.65	15.65	26.7				
NNBL2-9	2G, J3	Initial Area	120	1445	8.3%		5.5	5.5	2.77	0.52	21.99	21.99	31.7				
Junction 3	J3							22.0	1.42	0.57		335.51	272.1				
NNBL2-10	J3,J4	J3-J4	40	1433	2.8%	7.11	3.4	25.4	1.33	0.55	22.03	357.54	261.8	0.04	1.22		
NNBL1-1	1A, J4	Initial Area	410	5898	7.0%		17.2	17.2	1.60	0.48	114.71	114.71	89.0				
Junction 4	J4							25.4	1.33	0.53		472.25	335.6				
NNBL2-11	2H,J5	Initial Area	272	2184	12.4%		7.0	7.0	2.47	0.83	52.24	52.24	107.4				
NNBL2-13	J5,J6	J5-J6	83	1700	4.9%	7.38	3.8	10.8	2.00	0.77	40.71	92.95	142.5	0.04	0.85		
NNBL2-14	2L, J6	Initial Area	275	2707	10.2%		8.5	8.5	2.25	0.44	50.68	50.68	50.2				
Junction 6								10.8	2.00	0.65		143.63	187.2				
NNBL2-15	J6,J7	J6-J7	15	1000	1.5%	5.52	3.0	13.9	1.78	0.63	13.41	157.04	174.8	0.04	1.34		
NNBL2-16	J4,J7	J4-J7	10	850	1.2%	5.02	2.8	28.2	1.26	0.53	15.71	487.96	323.9	0.04	1.38		
NNBL2-17	2M,J7	Initial Area	179	1839	9.7%		5.5	5.5	2.77	0.52	23.12	23.12	33.3				
Junction 7	J7							28.2	1.26	0.55		668.12	463.4				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Unnamed Blueline #1 & #2 (con't)																	
NNBL2-18	J7,J8	J7-J8	56	2263	2.5%	8.70	4.3	32.6	1.18	0.53	45.45	713.57	444.6	0.04	1.80		
NNBL2-19	2N,J8	Initial Area	226	2090	10.8%		6.0	6.0	2.66	0.50	27.27	27.27	36.5				
Junction 8	J8							32.6	1.18	0.53		740.84	460.8				
NNBL2-20	J8,J9	J8 to J9	54	3207	1.7%	7.54	7.1	39.6	1.07	0.50	55.98	796.82	430.9	0.04	1.96		
Unnamed Blueline #3																	
NNBL3-1	3A, J10	Initial Area	110	1349	8.2%		5.5	5.5	2.77	0.52	12.58	12.58	18.1				
NNBL3-2	3B, J10	Initial Area	70	677	10.3%		3.0	3.0	3.71	0.64	6.13	6.13	14.5				
Junction 10								5.5	2.77	0.56		18.71	29.0				
NNBL3-3	J10,J11	J10-J11	45	2263	2.0%	4.07	9.3	14.8	1.72	0.44	25.07	43.78	33.0	0.04	0.68		
NNBL3-4	3C,J11	Initial Area	55	609	9.1%		3.0	3.0	3.71	0.64	6.78	6.78	16.1				
Junction 11	J11							14.8	1.72	0.46		50.56	40.5				
NNBL3-5	J11,J12	J11-J12	84	1933	4.4%	6.41	5.0	19.8	1.50	0.39	42.5	93.06	54.2	0.04	0.75		
NNBL3-6	3D,J12	Initial Area	199	2019	9.9%		3.0	3.0	3.71	0.64	12.04	12.04	28.5				
Junction 12	J12							19.8	1.50	0.42		105.10	65.7				
NNBL3-7	J12,J13	J12-J13	66	1164	5.6%	8.50	2.3	22.1	1.42	0.40	16.97	122.07	69.2	0.04	0.94		
NNBL3-8	3E,J13	Initial Area	196	2019	9.7%		7.1	7.1	2.45	0.47	23.35	23.35	27.1				
Junction 13	J13							22.1	1.42	0.41		145.42	84.9				
NNBL3-9	J13,J14	J13-J14	15	611	2.4%	6.60	1.5	23.6	1.38	0.40	8.43	153.85	85.3	0.04	1.22		
NNBL3-10	3F,J14	Initial Area	199	1666	12.0%		5.5	5.5	2.77	0.52	16.27	16.27	23.5				
Junction 14	J14							23.6	1.38	0.41		170.12	97.0				
NNBL3-11	J14,J15	J14-J15	36	812	4.4%	7.63	1.8	25.4	1.33	0.40	15.07	185.19	98.9	0.04	0.97		
NNBL3-12	3G,J15	Initial Area	184	1808	10.2%		6.5	6.5	2.56	0.49	18.70	18.70	23.4				
Junction 15	J15							25.4	1.33	0.41		203.89	111.0				
NNBL3-13	J15, end	J15 - end	37	800	4.6%	7.24	1.8	27.2	1.29	0.40	14.11	218.00	111.9	0.04	0.86		

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Long Canyon																	
LNG CYN 1	A, J1	Initial Area	160	1162	13.8%		4.0	4.0	3.23	0.58	9.9	9.90	18.6				
LNG CYN 2	B, J1	Initial Area	120	2184	5.5%		9.0	9.0	2.19	0.43	39.82	39.82	37.5				
Junction 1								9.0	2.19	0.46		49.72	50.1				
LNG CYN 3	J1,J2	J1-J2	77	2351	3.3%	5.24	7.5	16.5	1.64	0.38	81.59	131.31	81.3	0.04	0.68		
LGN CYN 4	C,J2	Initial Area	287	1809	15.9%		6.0	6.0	2.66	0.73	19	19.00	36.7				
Junction 2	J2							16.5	1.64	0.42		150.31	103.8				
LGN CYN 5	J2,J3	J2-J3	8	501	1.7%	4.97	1.7	18.2	1.56	0.43	6.8	157.11	104.6	0.04	1.04		
LGN CYN 6	D,J3	Initial Area	286	2301	12.4%		8.0	8.0	2.31	0.70	36.15	36.15	58.9				
Junction 3	J3							18.2	1.56	0.48		193.26	144.3				
LGN CYN 7	J3,J4	J3-J4	33	585	5.6%	7.22	1.4	19.5	1.51	0.47	5.78	199.04	142.1	0.04	0.74		
LGN CYN 8	E,J4	Initial Area	239	1600	14.9%		7.1	7.1	2.45	0.47	18.54	18.54	21.5				
LGN CYN 9	F, J4	Initial Area	239	3803	6.3%		10.1	10.1	2.07	0.73	68.07	68.07	102.9				
Junction 4	J4							19.5	1.51	0.53		285.65	230.3				
LGN CYN 10	J4,J5	J4-J5	5	855	0.6%	4.33	3.3	22.8	1.40	0.52	18.52	304.17	220.9	0.04	1.79		
LGN CYN 11	B,J5	Initial Area	244	2033	12.0%		7.0	7.0	2.47	0.48	40.46	40.46	47.5				
Junction 5	J5							22.8	1.40	0.51		344.63	247.8				
LGN CYN 12	J5,J6	J5-J6	76	2167	3.5%	7.79	4.6	27.4	1.28	0.47	64.42	409.05	247.2	0.04	1.18		
LGN CYN 13	G,J6	Initial Area	296	2838	10.4%		5.2	5.2	2.85	1.00	74.09	74.09	211.8				
Junction 6	J6							27.4	1.28	0.55		483.14	342.5				
LGN CYN 14	J6,J7	J6-J7	17	1415	1.2%	5.63	4.2	31.6	1.20	0.52	52.08	535.22	334.1	0.04	1.63		
LGN CYN 15	H,J7	Initial Area	257	2259	11.4%		6.5	6.5	2.56	0.85	41.34	41.34	89.6				
LGN CYN 16	J, J7	Initial Area	168	1166	14.4%		5.5	5.5	2.77	0.52	8.66	8.66	12.5				
Junction 7	J7							31.6	1.20	0.54		585.22	381.4				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Long Canyon (con't)																	
LGN CYN 17	J7,J8	J7-J8	23	1308	1.8%	7.22	3.0	34.6	1.15	0.53	37.32	622.54	380.8	0.04	1.76		
LGN CYN 18	J,J8	Initial Area	191	1828	10.5%		6.5	6.5	2.56	0.49	22.38	22.38	28.0				
Junction 8	J8							34.6	1.15	0.53		644.92	393.3				
LGN CYN 19	J8,J9	J8-J9	40	1341	3.0%	8.15	2.7	37.4	1.10	0.51	46.44	691.36	389.6	0.04	1.43		
LGN CYN 20	K,J9	Initial Area	200	1806	11.1%		6.4	6.4	2.58	0.49	21.61	21.61	27.4				
Junction 9	J9							37.4	1.10	0.51		712.97	401.4				
LGN CYN 21	J9,J10	J9-J10	15	693	2.2%	7.76	1.5	38.9	1.08	0.50	20.72	733.69	398.3	0.04	1.66		
LGN CYN 22	L,J10	Initial Area	135	1428	9.5%		5.5	5.5	2.77	0.52	23.15	23.15	33.4				
Junction 10	J10							38.9	1.08	0.50		756.84	411.4				
LGN CYN 23	J10,J11	J10-J11	25	847	2.9%	8.91	1.6	40.5	1.06	0.49	20.28	777.12	407.7	0.04	1.66		
LGN CYN 24	M,J11	Initial Area	187	1482	12.6%		4.9	4.9	2.93	0.54	16.4	16.40	26.0				
Junction 11	J11							40.5	1.06	0.49		793.52	417.1				
LGN CYN 25	J11,J12	J11-J12	70	2087	3.4%	10.29	3.4	43.8	1.02	0.47	52.63	846.15	411.0	0.04	1.85		
LGN CYN 26	N,J12	Initial Area	200	1850	10.8%		6.2	6.2	2.62	0.50	21.56	21.56	28.1				
Junction 12	J12							43.8	1.02	0.48		867.71	422.0				
LGN CYN 27	J12, END	J12-END	30	1246	2.4%	9.26	2.2	46.1	1.00	0.47	26.06	893.77	416.5	0.04	2.03		

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon																	
OLV CYN 1	A, J1	Initial Area	185	2042	9.1%		8.0	8.0	2.31	0.45	33.14	33.14	34.6				
OLV CYN 2	B, J1	Initial Area	161	1575	10.2%		5.8	5.8	2.70	0.51	19.71	19.71	27.2				
Junction 1								8.0	2.31	0.47		52.85	57.9				
OLV CYN 3	J1,J2	J1-J2	84	2033	4.1%	6.65	5.1	13.1	1.83	0.42	46.79	99.64	77.0	0.04	0.83		
OLV CYN 4	B,J2	Initial Area	244	1723	14.2%		5.0	5.0	2.90	0.54	31.97	31.97	49.9				
Junction 2	J2							13.1	1.83	0.45		131.61	108.4				
OLV CYN 5	J2,J3	J2-J3	61	1762	3.5%	7.02	4.2	17.3	1.60	0.42	44.86	176.47	117.9	0.04	1.02		
OLV CYN 6	C,J3	Initial Area	313	3437	9.1%		10.1	10.1	2.07	0.41	63.01	63.01	53.5				
Junction 3	J3							17.3	1.60	0.42		239.48	159.2				
OLV CYN 7	J3,J4	J3-J4	40	902	4.4%	9.05	1.7	18.9	1.53	0.41	8.79	248.27	156.5	0.04	1.24		
OLV CYN 8	D,J4	Initial Area	330	4367	7.6%		13.0	13.0	1.83	0.37	72.00	72.00	48.5				
OLV CYN 9	E, J4	Initial Area	197	2861	6.9%		10.1	10.1	2.07	0.41	53.94	53.94	45.8				
Junction 4	J4							18.9	1.53	0.40		374.21	230.8				
OLV CYN 10	J4,J5	J4-J5	13	917	1.4%	6.48	2.4	21.3	1.45	0.40	18.75	392.96	225.9	0.04	1.76		
OLV CYN 11	F,J5	Initial Area	333	3924	8.5%		12.0	12.0	1.91	0.38	57.52	57.52	41.7				
Junction 5	J5							21.3	1.45	0.40		450.48	257.6				
OLV CYN 12	J5,J6	J5-J6	17	402	4.2%	10.05	0.7	22.0	1.43	0.39	23.30	473.78	263.2	0.04	1.50		
OLV CYN 13	G,J6	Initial Area	239	2895	8.3%		9.5	9.5	2.13	0.42	79.32	79.32	71.1				
Junction 6	J6							22.0	1.43	0.39		553.10	310.8				
OLV CYN 14	J6,J7	J6-J7	21	1598	1.3%	6.46	4.1	26.1	1.31	0.38	57.77	610.87	305.5	0.04	1.83		
OLV CYN 15	H,J7	Initial Area	221	2289	9.7%		7.0	7.0	2.47	0.48	34.70	34.70	40.7				
Junction 7	J7							26.1	1.31	0.39		645.57	327.2				
OLV CYN 16	J7,J8	J7-J8	59	1849	3.2%	9.60	3.2	29.3	1.24	0.37	64.56	710.13	328.5	0.04	1.74		
OLV CYN 17	J, J8	Initial Area	168	1166	14.4%		5.5	5.5	2.77	0.52	19.74	19.74	28.5				
Junction 8	J8							29.3	1.24	0.38		729.87	341.3				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon (con't)																	
OLV CYN B1	BA, J12	Initial Area	319	4102	7.8%		14.0	14.0	1.77	0.35	117.13	117.13	73.5				
OLV CYN B2	BB, J12	Initial Area	200	1335	15.0%		4.4	4.4	3.08	0.56	12.59	12.59	21.9				
Junction 12								14.0	1.77	0.37		129.72	86.1				
OLV CYN B3	J12,J13	J12-J13	80	2102	3.8%	7.20	4.9	18.9	1.53	0.36	48.49	178.21	97.3	0.04	0.99		
OLV CYN B4	BB, J13	Initial Area	280	2943	9.5%		9.0	9.0	2.19	0.43	53.73	53.73	50.6				
OLV CYN B5	BC, J13	Initial Area	70	980	7.1%		4.5	4.5	3.05	0.56	11.00	11.00	18.8				
Junction 13	J13							18.9	1.53	0.38		242.94	142.2				
OLV CYN B6	J13,J14	J13-J14	5	980	0.5%	3.71	4.4	23.3	1.39	0.38	8.92	251.86	132.0	0.04	1.65		
OLV CYN B7	BD, J14	Initial Area	235	1682	14.0%		5.5	5.5	2.77	0.52	21.83	21.83	31.5				
Junction 14	J14							23.3	1.39	0.39		273.69	147.7				
OLV CYN B8	J14,J15	J14-J15	45	1734	2.6%	7.20	4.0	27.3	1.28	0.37	42.44	316.13	150.4	0.04	1.31		
OLV CYN B9	BE, J15	Initial Area	288	2927	9.8%		8.6	8.6	2.24	0.44	43.38	43.38	42.5				
OLV CYN B10	BF, J15	Initial Area	130	1555	8.4%		6.8	6.8	2.50	0.48	16.5	16.50	19.9				
Junction 15	J15							27.3	1.28	0.38		376.01	185.1				
OLV CYN B11	J15,J16	J15-J16	30	651	4.6%	9.48	1.1	28.4	1.26	0.38	9.39	385.40	184.3	0.04	1.29		
OLV CYN B12	BG, J16	Initial Area	280	2261	12.4%		7.0	7.0	2.47	0.48	29.51	29.51	34.6				
Junction 16	J16							28.4		0.39		414.91	0.0				
OLV CYN B13	J16,J9	J16-J9	40	1905	2.1%	7.26	4.4	32.8	1.18	0.38	28.82	443.73	196.1	0.04	1.56		
OLV CYN B14	BH, J9	Initial Area	158	2489	6.3%		7.0	7.0	2.47	0.48	24.93	24.93	29.3				
OLV CYN 18	J8,J9	J8-J9	40	1623	2.5%	8.68	3.1	32.4	1.18	0.22	39.08	768.95	203.0	0.04	1.81		
Junction 9	J9							32.8	1.18	0.28		1237.61	411.9				
OLV CYN 19	J9,J10	J9-J10	40	939	4.3%	11.21	1.4	34.2	1.15	0.28	14.42	1252.03	407.3	0.04	1.76		
OLV CYN 20	K, J10	Initial Area	160	1521	10.5%		5.8	5.8	2.70	0.51	14.88	14.88	20.5				
OLV CYN 21	BF, J10	Initial Area	240	4599	5.2%		16.0	16.0	1.66	0.33	45.78	45.78	25.3				
Junction 10	J10							34.2	1.15	0.29		1312.69	433.6				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Olivera Canyon (con't)																	
OLV CYN A1	AA, J18	Initial Area	270	3259	8.3%		10.2	10.2	2.06	0.41	33.42	33.42	28.1				
OLV CYN A2	AB, J18	Initial Area	170	2265	7.5%		8.1	8.1	2.30	0.45	24.49	24.49	25.3				
Junction 18	J18							10.2	2.06	0.43		57.91	50.8				
OLV CYN A3	J18,J19	J18-J19	53	780	6.8%	7.87	1.7	11.9	1.92	0.42	14.51	72.42	57.9	0.04	0.73		
OLV CYN A4	AC, J19	Initial Area	133	1216	10.9%		4.6	4.6	3.02	0.55	10.78	10.78	18.0				
Junction 19	J19							11.9	1.92	0.43		83.20	69.3				
OLV CYN 22	J10,J11	J10-J11	47	1472	3.2%	10.17	2.4	14.3	1.75	0.29	15.63	1328.32	669.4	0.04	1.90		
OLV CYN A5	J19,J11	J19-J11	34	512	6.6%	8.40	1.0	29.4	1.24	0.43	2.49	85.69	45.5	0.04	0.83		
Junction 11	J11							29.4	1.24	0.30		1414.01	518.2				
Cat Canyon																	
CAT CYN 1	A, J1	Initial Area	220	3939	5.6%		14.0	14.0	1.77	0.35	164.76	164.76	103.4				
CAT CYN 2	B, J1	Initial Area	240	3214	7.5%		11.0	11.0	1.99	0.40	82.64	82.64	64.9				
Junction 1								14.0	1.77	0.37		247.40	161.2				
CAT CYN 3	J1,J2	J1-J2	30	1061	2.9%	7.57	2.3	34.8	1.14	0.35	37.57	284.97	113.4	0.04	1.31		
CAT CYN 4	C,J2	Initial Area	273	4399	6.2%		14.0	14.0	1.77	0.35	177.26	177.26	111.3				
Junction 2	J2							34.8	1.14	0.35		462.23	185.3				
CAT CYN 5	J2,J3	J2-J3	40	2528	1.6%	6.08	6.9	41.7	1.05	0.33	68.72	530.95	183.3	0.04	1.48		
CAT CYN 6	D,J3	Initial Area	300	5119	5.9%		16.0	16.0	1.66	0.33	106.30	106.30	58.7				
CAT CYN 7	E, J3	Initial Area	318	3649	8.7%		11.0	11.0	1.99	0.40	93.88	93.88	73.7				
Junction 3	J3							41.7	1.05	0.34		731.13	259.3				
CAT CYN 8	J3,J4	J3-J4	30	2536	1.2%	5.96	7.1	48.8	0.97	0.32	86.11	817.24	254.2	0.04	1.79		
CAT CYN 9	F,J4	Initial Area	300	6775	4.4%		23.0	23.0	1.39	0.28	209.62	209.62	80.4				
Junction 4	J4							48.8	0.97	0.31		1026.86	310.3				
CAT CYN 10	J4,J5	J4-J5	20	1868	1.1%	6.03	5.2	53.9	0.93	0.30	90.94	1117.80	308.4	0.04	1.96		
CAT CYN 11	G,J5	Initial Area	190	6195	3.1%		25.0	25.0	1.34	0.26	238.85	238.85	83.9				
Junction 5	J5							53.9	0.93	0.29		1356.65	366.4				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 12	J5,J6	J5-J6	10	655	1.5%	7.22	1.5	55.4	0.91	0.29	21.49	1378.14	364.5	0.04	1.96		
CAT CYN 13	H,J6	Initial Area	380	4546	8.4%		13.0	13.0	1.83	0.37	130.52	130.52	87.9				
Junction 6	J6							55.4	0.91	0.30		1508.66	408.3				
CAT CYN 14	J6,J7	J6-J7	10	1376	0.7%	5.76	4.0	59.4	0.88	0.29	77.69	1586.35	404.3	0.04	2.44		
CAT CYN 15	J,J7	Initial Area	670	6984	9.6%		17.0	17.0	1.61	0.32	383.83	383.83	199.8				
Junction 7	J7							59.4	0.88	0.30		1970.18	513.9				
CAT CYN 16	J7,J8	J7-J8	29	1894	1.5%	8.05	3.9	63.3	0.86	0.29	114.13	2084.31	511.0	0.04	2.31		
CAT CYN 17	K, J8	Initial Area	249	4534	5.5%		16.0	16.0	1.66	0.33	134.68	134.68	74.4				
Junction 8	J8							63.3	0.86	0.29		2218.99	549.4				
CAT CYN 19A	L, J9A	Initial Area	620	4845	12.8%		11.5	11.5	1.94	0.39	173.73	173.73	131.0				
CAT CYN 19B	M, J9A	Initial Area	730	4642	15.7%		10.0	10.0	2.08	0.41	165.79	165.79	142.0				
Junction J9A								11.5	1.94	0.40		339.52	263.8				
CAT CYN 19	J9A,J9	J9A-J9	60	1352	4.4%	9.78	2.3	13.8	1.78	0.40	21.14	360.66	255.1	0.04	1.39		
CAT CYN 18	J8,J9	J8-J9	11	1514	0.7%	6.22	4.1	67.4	0.83	0.29	50.58	2269.57	538.4	0.04	2.73		
CAT CYN 20	N, J9	Initial Area	340	3649	9.3%		11.5	11.5	1.94	0.39	112.02	112.02	84.5				
Junction 9	J9A,J9							67.4	0.83	0.30		2742.25	693.7				
CAT CYN 21	J9,J10	J9-J10	3	1019	0.3%	4.90	3.5	70.9	0.81	0.30	57.78	2800.03	682.6	0.04	3.43		
CAT CYN 22	P,J10	Initial Area	383	3985	9.6%		11.0	11.0	1.99	0.40	70.08	70.08	55.1				
CAT CYN 23	Q, J10	Initial Area	463	2941	15.8%		7.5	7.5	2.39	0.46	43.22	43.22	47.8				
Junction 10	J10							70.9	0.81	0.30		2913.33	721.4				
CAT CYN 24	J10,J11	J10-J11	17	3052	0.6%	6.15	8.3	79.1	0.77	0.29	190.84	3104.17	698.7	0.04	3.30		
CAT CYN 25	R, J11	Initial Area	360	4534	7.9%		13.0	13.0	1.83	0.37	265.58	265.58	178.8				
Junction 11	J11							79.1	0.77	0.30		3369.75	773.8				
CAT CYN 27A	S, J13	Initial Area	255	3361	7.6%		11.0	11.0	1.99	0.40	93.86	93.86	73.7				
CAT CYN 27B	T, J13	Initial Area	285	3505	8.1%		10.8	10.8	2.00	0.40	116.31	116.31	92.9				
Junction 13								11.0	1.99	0.40		210.17	165.8				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 27	J13,J12	J13-J12	84	2211	3.8%	8.50	4.3	15.3	1.69	0.39	54.66	264.83	172.8	0.04	1.27		
CAT CYN 26	J11,J12	J11-J12	19	951	2.0%	10.08	1.6	80.7	0.76	0.29	69.68	3439.43	771.7	0.04	2.68		
Junction 12	J12							80.7	0.76	0.30		3704.26	849.6				
CAT CYN 28	J12,J14	J12-J14	11	1237	0.9%	7.73	2.7	83.4	0.75	0.30	87.79	3792.05	842.5	0.04	3.26		
CAT CYN 29	U, J14	Initial Area	670	7044	9.5%		16.0	16.0	1.66	0.33	234.44	234.44	129.5				
Junction 14	J14							83.4	0.75	0.30		4026.49	901.2				
CAT CYN 30	J14,J15	J14-J15	30	3444	0.9%	7.78	7.4	90.8	0.72	0.28	351.98	4378.47	886.0	0.04	3.35		
CAT CYN 31	V, J15	Initial Area	430	3590	12.0%		9.8	9.8	2.10	0.42	48.77	48.77	42.5				
Junction 15	J15							90.8	0.72	0.28		4427.24	900.6				
CAT CYN 34A1	W, J24	Initial Area	510	5459	9.3%		14.0	14.0	1.77	0.35	197.82	197.82	124.2				
CAT CYN 34A2	X, J24	Initial Area	600	4145	14.5%		10.0	10.0	2.08	0.41	162.07	162.07	138.8				
Junction 24	J24							14.0	1.77	0.38		359.89	242.3				
CAT CYN 34A	J24,J25	J24-J25	70	1145	6.1%	11.20	1.7	15.7	1.67	0.38	32.03	391.92	247.3	0.04	1.34		
CAT CYN 34B	Y, J25	Initial Area	470	2833	16.6%		7.0	7.0	2.47	0.48	68.33	68.33	80.2				
Junction 25	J25							15.7	1.67	0.39		460.25	301.7				
CAT CYN 32	J15,J16	J15-J16	17	1797	0.9%	8.00	3.7	94.5	0.71	0.28	49.63	4476.87	886.0	0.04	3.28		
CAT CYN 34	J25,J16	J25-J16	87	2170	4.0%	10.12	3.6	19.3	1.52	0.38	44.65	504.90	293.9	0.04	1.58		
CAT CYN 33	Z, J16	Initial Area	417	2957	14.1%		7.5	7.5	2.39	0.83	48.65	48.65	95.8				
Junction 16	J16							94.5	0.71	0.30		5030.42	1051.4				
CAT CYN 36A	AA, BA	Initial Area	296	1727	17.1%		5.0	5.0	2.90	1.67	33.86	33.86	163.9				
CAT CYN 36	BA, J17	BA-J17	154	1597	9.6%	10.99	2.4	7.4	2.40	0.68	23.6	57.46	94.1	0.04	0.93		
CAT CYN 35	J16,J17	J16-J17	13	1249	1.0%	8.58	2.4	96.9	0.70	0.29	50.35	5080.77	1041.3	0.04	3.40		
Junction 17	J17							96.9	0.70	0.31		5138.23	1108.2				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 38A	AB, J26	Initial Area	489	3020	16.2%		8.0	8.0	2.31	0.45	46.04	46.04	48.1				
CAT CYN 38B	X, J26	Initial Area	689	4780	14.4%		11.0	11.0	1.99	0.40	173.56	173.56	136.3				
CAT CYN 38C	AC, J26	Initial Area	536	4388	12.2%		10.5	10.5	2.03	0.40	137.55	137.55	112.7				
Junction 26	J26							11.0	1.99	0.41		357.15	287.9				
CAT CYN 37	J17,J18	J17-J18	20	2450	0.8%	7.96	5.1	102.1	0.68	0.30	129.21	5267.44	1087.0	0.04	3.64		
CAT CYN 38	J26,J18	J26-J18	101	2671	3.8%	9.67	4.6	15.6	1.68	0.40	50.69	407.84	272.1	0.04	1.54		
Junction 18	J18							102.1	0.68	0.31		5675.28	1197.5				
CAT CYN 40A1-	AA, BB	Initial Area	270	1253	21.5%		3.5	3.5	3.44	2.19	17.20	17.20	129.7				
CAT CYN 40A1	BB, J28	BB-J28	121	1038	11.6%	11.30	1.5	5.0	2.89	1.78	8.62	25.82	132.9	0.04	0.84		
CAT CYN 40A2	AA,J28	Initial Area	357	2963	12.0%		8.0	8.0	2.31	0.89	82.79	82.79	171.0				
Junction 28	J28							8.0	2.31	1.10		108.61	277.4				
CAT CYN 40B1	AD, BC	Initial Area	279	2472	11.3%		7.1	7.1	2.45	1.38	45.65	45.65	154.1				
CAT CYN 40B2	BC, BC1	BC-BC1	136	846	16.0%	14.39	1.0	8.1	2.30	1.36	9.39	55.04	172.0	0.04	0.95		
CAT CYN 40B	BC1, J27	BC-J27	19	377	4.9%	7.97	0.8	8.9	2.20	1.33	1.86	56.90	166.2	0.04	0.95		
CAT CYN 40A	J28,J27	J28-J27	51	716	7.1%	11.31	1.1	9.1	2.18	1.04	11.19	119.80	271.8	0.04	1.22		
Junction 27	J27							9.1	2.18	1.13		176.70	436.4				
CAT CYN 40	J27,J19	J27-J19	40	688	5.8%	11.70	1.0	10.0	2.08	1.10	7.91	184.61	422.2	0.04	1.49		
CAT CYN 39	J18,J19	J18-J19	2	407	0.5%	6.71	1.0	103.1	0.68	0.31	7.45	5682.73	1192.2	0.04	4.12		
CAT CYN 41	AF, J19	Initial Area	550	4587	12.0%		12.0	12.0	1.91	0.38	123.12	123.12	89.3				
Junction 19	J19							103.1	0.68	0.33		5990.46	1362.0				
CAT CYN 43	BF, J20	Initial Area	51	686	7.4%		3.9	3.9	3.27	1.05	4.26	4.26	14.6	0.04	0.69		
CAT CYN 42	J19,J20	J19-J20	20	1262	1.6%	10.67	2.0	105.0	0.67	0.33	42.06	6032.52	1355.2	0.04	3.43		
Junction 20	J20							105.0	0.67	0.33		6036.78	1358.2				

DS-13186-115							TOC (min)				Area						
Point of Concentration		Area Description	Delta H (ft)	L (ft)	S (%)	V (fps)	Δ	Total	I	C	Delta	Total	Q (cfs)	Mannings n	Hydraulic Radius R		
Cat Canyon (con't)																	
CAT CYN 43A	AG, BD	Initial Area	283	1052	26.9%		2.8	2.8	3.83	1.43	11.65	11.65	63.9				
CAT CYN 44	J20,J21	J20-J21	10	1002	1.0%	7.48	2.2	107.3	0.67	0.33	105.65	6142.43	1358.7	0.04	2.85		
CAT CYN 44A	BJ,BH	Initial Area	77	1919	4.0%		10.0	10.0	2.08	0.76	23.74	23.74	37.6				
CAT CYN 45	BH,J21	BH-J21	59	713	8.3%	7.25	1.6	11.6	1.93	0.75	3.16	26.90	38.8	0.04	0.56		
Junction 21	J21							107.3	0.67	0.34		6180.98	1383.2				
CAT CYN 45A	AE, BE	Initial Area	298	1467	20.3%		4.3	4.3	3.12	0.80	18.85	18.85	47.0				
CAT CYN 47	AH, J22	Initial Area	403	3026	13.3%		8.2	8.2	2.29	0.45	47.36	47.36	48.4				
CAT CYN 46	J21,J22	J21-J22	10	1413	0.7%	7.84	3.0	110.3	0.66	0.33	122.7	6303.68	1369.6	0.04	3.95		
Junction 22	J22							110.3	0.66	0.33		6369.89	1393.4				
CAT CYN 49B1	AK, J29	Initial Area	200	1003	19.9%		3.1	3.1	3.65	2.68	15.32	15.32	149.6				
CAT CYN 49B	AL, J29		35	417	8.4%	10.29	0.7	5.0	2.91	2.25	4.68	20.00	130.8	0.04	0.93		
CAT CYN 49A	AJ, J29	Initial Area	330	2190	15.1%		6.1	6.1	2.64	0.71	41.14	41.14	77.0				
Junction 29	J29							6.1	2.64	1.21		61.14	195.7				
CAT CYN 49	J29,J23	J29-J23	120	2116	5.7%	9.50	3.7	9.8	2.10	0.91	37.43	98.57	188.3	0.04	1.11		
CAT CYN 48	J22,J23	J22-J23	50	4302	1.2%	9.54	7.5	117.8	0.64	0.32	286.32	6656.21	1358.9	0.04	3.66		
CAT CYN 50	AF, J23	Initial Area	640	8530	7.5%		12.0	12.0	1.91	0.38	243.99	243.99	176.9				
Junction 23	J23							117.8	0.64	0.33		6998.77	1475.1				