APPENDIX H

PRELIMINARY GRADING, DRAINAGE AND FLOOD IMPACT ANALYSIS

DIVERSIFIED PROJECT SERVICES INTERNATIONAL

Preliminary Grading, Drainage and Flood Impact Analysis
For
The Tejon Indian Trust Acquisition Casino Project

November 12, 2019

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SITE DESCRIPTION

DPSI has analyzed two sites for the Preliminary Grading, Drainage and Flood Impact Analysis for the Tejon Indian Trust Acquisition Casino Project. The Sites are titled the "Mettler Site" Alternatives A1 and A2 as well as the Maricopa Site.

Mettler Site

The Mettler site is located between Interstate 5, Hwy 99, HWY 166 and Valpredo Avenue in the Central Valley of California. According to the NRCS Web Soil Survey (see Appendix M), the site soils are 95.9% Class B Cerini Loam. The site sits at the foothills below the Los Padres National Forest and slopes northerly at an average natural slope of 1.4%. The site is located in a FEMA Flood Zone A, which is a Special Flood Hazard Area subject to the 100-year flood. A FEMA Firmette is located in the appendix as Figure 1. The site is affected by the Tecuya Creek, a 50 square mile watershed, as well as an unnamed 12.8 square mile creek west of the Tecuya Creek.

Alternative 1

This alternative includes a 52 acre Casino and corresponding parking lot, a 22 acre RV parking lot (future), and 29 acre Community Park (future). A 13 acre storm drain basin is located just northwest of the Casino.

Alternative 2

This alternative also includes a 52 acre Casino and corresponding parking lot, as well as a 13 acre storm drain basin site located just northwest of the Casino. This Alternative has no RV parking lot and a 52 acre community park (future).

Both Mettler sites could eventually include a 40 acre organic farm, 25 acre community center, a 3 acre Kern County Fire Department/Sheriff Department station, and 102 acres of residential.

Maricopa Site

The Maricopa site is located near Interstate 5, at the southeast corner of Hwy 166 (Maricopa Hwy) and Wheeler Ridge Access Road, in the Central Valley of California. According to the NRCS Web Soil Survey (see Appendix N), the site soils are 48.1% Class B Cerini Loam and 51.9% Excelsior Loam. The site sits at the foothills below the Los Padres National Forest and slopes northerly at an average natural slope of 1.4%. The site is located outside of the FEMA Flood Zones. A FEMA Firmette is located in the appendix as Figure 2.

The Maricopa Site includes a 49 acre Casino and corresponding parking lot, as well as 5 acres of RV parking, and a 2 acre storm drain basin. The future construction considerations for this site include 7 acres for a community center, health center and parking, 2.5 acre park, 16 acre residential, a 3 acre Kern County Fire Department/Sheriff Department station, and 30 acres of organic farming.

PRELIMINARY GRADING

DPSI has prepared Preliminary Grading and Drainage Plans of the Mettler Site - Alternatives 1 & 2 and the Maricopa Site. USGS Quad Map contours supplemented with Google LIDAR contours were used for the existing elevations. The base flood elevation discussed in the Hydrology and Flood Modeling section of this report were used to establish finish floor elevations. All three grading and drainage plans include the following:

- Grading impact area, finish floor elevations, and parking lot gradients;
- Estimated earthwork quantities;
- Pre-construction and Post-construction contours;
- Direction of all surface drainage flow;
- Storm drain catch basins, drain inlets, and pipe;
- Storm drain retention basin.

Additionally, a cut and fill exhibit was prepared for each of the Sites and alternatives.
See Appendix D through L for the Preliminary Grading Plans and the Preliminary Cut and Fill Exhibits.

Mettler Site – A1

Due to flood considerations, Alternative 1 needs to be raised approximately 2.5' above existing ground in order to be a minimum of 1.0' above the base flood elevation (see Appendix D). In order to maintain emergency access, the road from the fire station to the main entrance has also been raised above the flood elevation. In order to maintain ADA accessibility and general ease of access, the surrounding parking and walk ways are shown at cross slopes of less than 2% and less than 5% along potential paths of travel. Due to these constraints, the preliminary grading plan currently shows 404,235 cubic yards of import. Additionally, a storm drain system would be required to convey the onsite drainage from the site to the basin for storage and percolation.

By raising the main road, the ADA stalls should also be raised to an elevation similar to the finish floor elevations. However, a final detailed design would need to take longer ADA ramps, switchbacks and strategically placed parking into account to lower the parking lot as compared to the Casino in some limited locations. For example, keeping the ADA stalls in the parking structure and providing access directly into the building could allow the lowering of the parking area. Retaining walls around the Casino would also help to isolate the building, keeping it above the base flood elevations, while allowing the parking to stay lower.

Soil that will be generated by the excavation of foundations and any other ground structures are not taken into account in the earthwork volumes. Any import may potentially come from portions of the future development, such as the organic farm or the community park.

Mettler Site – A2

Like A1, Alternative 2 needs to be raised approximately 2.5' above existing ground in order to be a minimum of 1.0' above the base flood elevation (see Appendix G). The main access road from the fire station to the main entrance has also been raised above the base flood elevation. In order to maintain ADA accessibility and general ease of access, the surrounding parking and walk ways are shown at cross slopes of less than 2% and less than 5% along potential paths of travel. Due to these constraints, the preliminary grading plan currently shows 283,460 cubic yards of import. Additionally, a storm drain system would be required to convey the onsite drainage from the site to the basin for storage and percolation.

A final detailed design would need to take longer ADA ramps, switchbacks and strategically placed parking into account to lower the parking lot as compared to the Casino. Site A2 does not have the benefit of the parking structure, so ADA stalls would work best at the east side of the Casino taking advantage of the

raised main road. Retaining walls around the Casino would also help to isolate the building, keeping it above the base flood elevations, while allowing the parking to stay lower.

Soil that will be generated by the excavation of foundations and any other ground structures are not taken into account in the earthwork volumes. Any import may potentially come from portions of the future development, such as the organic farm or the community park. The community park in A2 is larger than in A1, possibly allowing for additional excavation of soil.

Maricopa Site

The Maricopa Site is not in a 100 year FEMA Flood zone. Due to this, the Casino is kept at an elevation much closer to the existing grade. Because of this, the preliminary grading design shows 6,375 cubic yards of import (see Appendix J). Soil that will be generated by the excavation of foundations and any other ground structure are not taken into account in the earthwork volumes, potentially bringing the site closer to balancing. With a detailed site layout, strategically placed ADA stalls and path of travel, and a detailed topographic survey, it is likely that this site can be design as a balanced earthwork site.

The storm water basin for this site is currently located at the high point of the casino development. The preliminary grading design follows the natural contours of the land, which is sloping away from the basin. A storm drain system would be required to convey the water from the low point back to the basin. The basin as shown would retain 12.85 ac ft of water above ground and an additional 1.77 ac ft would be retained below ground. The water surface elevation would be 492.5' and the bottom of the basin 471.0' for a depth of 21.5'. The issue that this creates is that the lowest drain inlet at the site is at an elevation of 467.8', which is lower than the bottom of the basin. In order for this system to work, the drainage would need to be pumped into the basin, or a backflow preventer type structure installed that would allow the parking lot to detain water but keep the water elevation below that of the Casino.

In order to fully mitigate the issue, it is recommended that the basin be moved to a lower location on the property. Potentially at the Northwest corner of the Casino parking lot, or further towards Wheeler Ridge Access Road. While this could increase the cost of a storm drain system, it would improve the overall drainage at the site.

PAD SUMMARY

WELL PAD NO.	DISTURBED AREA (ac)	CUT (CY)	FILL (CY)	IMPORT (CY)
METTLER SITE A1 (CASINO RESORT ALTERNATIVE)	3,673,705 (84,34AC)±	80,325	484,560	404,235
METTLER SITE A2 (REDUCED CASINO RESORT)	2,861,850 (65.70AC)±	79,030	362,490	283,460
CASINO RESORT ON THE MARICOPA HWY	2,353,315 (54.02AC)±	119,425	125,800	6,375

NOTE:

THE OPINION OF EARTHWORK QUANTITIES SHOWN ABOVE ARE RAW NUMBERS AND ARE FOR REFERENCE AND FEE PURPOSES ONLY. SINCE THE CIVIL ENGINEER CANNOT CONTROL THE EXACT METHOD OR MEANS USED BY THE CONTRACTOR DURING GRADING OPERATIONS, NOR CAN THE CIVIL ENGINEER GUARANTEE THE EXACT SOIL CONDITIONS OVER THE ENTIRE SITE. THE CIVIL ENGINEER ASSUMES NO RESPONSIBILITY FOR FINAL EARTHWORK. THE CONTRACTOR IS ADVISED TO PREPARE HIS OWN ESTIMATES OF EARTHWORK FOR THE PURPOSES OF BIDDING, CONTRACT AND CONSTRUCTION.

HYDROLOGY & FLOOD MODELING

Mettler Site
Early analysis of the site alternatives revealed that the Mettler Site location was located in a FEMA Flood Zone A, which is a Special Flood Hazard Area subject to the 100-year flood. Flood Zone A delineates the 100-year floodplain boundary, but contains no information in regards to base flood elevations (BFE) due to no detailed flood study being completed and approved by FEMA. A flood model was created for the site using FLO-2D for two dimensional flood flows. The construction of the Pre-construction and Post-construction models are described further in the Flood Impact Analysis in Appendix A.

Existing and proposed sites alternatives were modeled using flows of 9,300 cubic-feet per second for Tecuya Creek with the StreamStats flow from the westerly watershed of 886 cfs. No significant increase in water surface elevation overall was observed when comparing the two proposed site alternatives to existing conditions. The greatest increase in elevation was seen approximately 3000 feet north (downstream) of the Mettler Site with a rise in flood water depth of 0.41 feet for the Site Alternative A1 and 0.36 feet for the Site Alternative A2. Changes in flood water depths were observed on the south side of the casino building, which was modeled as an obstruction to calculate an approximation flood water elevation needed to determine the finished floor elevation. Raising the main road created additional ponding in the parking on the south side of the building. Flood water depths increased resulting in a flood water depth of 3.3 feet for Site Alternative A1 and A2. Neither of the alternatives for the Mettler Site layout caused an increase of 1.00 foot when compared to the existing conditions. Finish floor elevations 2.5' above the adjacent grade were used based on the computed base flood elevations.

Maricopa Site
The Maricopa Site is located in a Flood Zone X- meaning it is outside of the 100 year flood zone. No further hydrological analysis is required of this site.

RETENTION VOLUME REQUIREMENT

The storm water volume storage requirement for the site alternatives was determined using Kern County methodology described in Engineering Bulletin 11-02 (see Appendix B). The attached support documents describe the methodology and calculations to determine the volume required to be retained on site. The basins are sized to retain the five day storm event and have a minimum of 1 foot of freeboard. The final basin is required to demonstrate that the basin will completely drain the design volume within 7 days.

Mettler A1
The Mettler basin has been designed to retain the overall required volume for the full development. The basin used under 6 acres of the 13 acres designated for water retention and waste water reclamation.

- Required Volume – 31.96 ac ft
- Provided Volume – 34.17 ac ft

Mettler A2
The Mettler basin has been designed to retain the overall required volume for the full development. The basin used under 5 acres of the 13 acres designated for water retention and waste water reclamation.

- Required Volume – 31.32 ac ft
- Provided Volume – 31.50 ac ft

Maricopa
As currently shown, the Maricopa site would require a combination of above ground and below ground storage to retain the full site building. The basin would take the full 2 acres shown on the plan. The underground storage can be built in the same footprint or in the same approximate area.

- Required Volume – 14.59 ac ft
- Provided Volume – 12.82 ac ft
- Chambers Volume - 1.77 ac ft

STORM DRAIN PIPE SIZING

The storm drain pipe for the site alternatives was determined using the Rational Method and Hydraflow Express extension on AutoCAD Civil 3D, a water-control structure calculator (see Appendix C). The attached support documents describe the methodology and calculations to determine the required size of the storm drain pipe on site. The storm drain pipes are sized to convey the 10-year, 5-day storm event with freeboard. It was determined that 18 inch storm drain pipe made of reinforced concrete pipe (RCP) will adequately convey the storm water generated by the 10-year, 5-day storm to the retention basins.

WATER QUALITY

Potential impacts to water quality caused by storm water runoff after construction is completed during the operation of the facilities may include oil and grease from automobiles, cleaning solutions, fertilizers, refuse and recyclables, pesticides and herbicides, and building maintenance materials. The site is expected to drain towards the retention basin so pollutants will mostly be contained on-site. It would be recommended that the bottom of the basin be dredged every 1 to 2 years prior to the start of the rain season. The material dredged from the basin shall be disposed of properly. This will allow for proper percolation at the basin and will remove any pollutants from the site.

RECOMMENDED MITIGATION MEASURES

Mettler A1, A2
It is recommended that either Mettler Site Alternatives (A1 and A2) storm water runoff be mitigated with an above ground drainage basin sized to retain the 10-year, 5-day storm event per County of Kern standards. Both of these mitigation measures will retain the required volume of storm water runoff per County of Kern standards while also filtering out pollutants through infiltration into native soil, reducing peak flows, and increasing time of concentration.

Maricopa
It is recommended that that Maricopa Site Alternative storm water runoff be mitigated with an underground detention system sized to retain the 10-year, 5-day storm event per County of Kern standards. Both of these mitigation measures will retain the required volume of storm water runoff per County of Kern standards while also filtering out pollutants through infiltration into native soil, reducing peak flows, and increasing time of concentration. Additionally, the underground detention system will allow the basin to remain confined to the 2 acre site.

Finally, the basin is currently shown at a high point within the property. We would recommend moving the basin to the northwest side of the site to make the basin function over the full depth, reduce the amount of grading that would be required, and reduce the amount of underground detention that would be needed. This would also assist in keeping the hydraulic grade line below ground as required.

Below is a table summarizing recommended best management practices (BMPs) to minimize or eliminate potential impacts to water quality during operations of the facility. Mitigation measures such as installing hydrodynamic separators are important for minimizing runoff pollutants entering the drainage basin or detention system.

Table 1: Runoff Pollutants Source and Source Control Recommendations

Potential Source of Runoff Pollutants	**Permanent Source Control BMPs**	**Operational Source Control BMPs**
On-Site storm drain inlets	Mark all inlets with the words "No Dumping!" and install hydrodynamic separators.	Maintain and periodically replace inlet marking.
Elevator shaft sump pump	Elevator shaft pumps will be plumbed to sanitary sewer.	Inspect and maintain drains to prevent blockages and overflow.
Need for future indoor & structural pest control	Building design features to discourage entry of pests.	Integrated pest management will be provided to owners.
Landscape/outdoor pesticide use/grounds maintenance	Stormwater will be retained in above ground and underground basins and infiltrated into the ground.	Maintain landscape with minimal pesticides and herbicides.
Refuse Areas	Designate trash and recyclable area to be properly maintained.	Refuse will be handled per City requirements and CASQA.
Plazas, sidewalks and parking lots	N/A	All areas will be swept and kept clean.

Appendix A:
Preliminary Flood Impact Analysis
For
The Tejon Indian Trust Acquisition Casino Project
Mettler Sites

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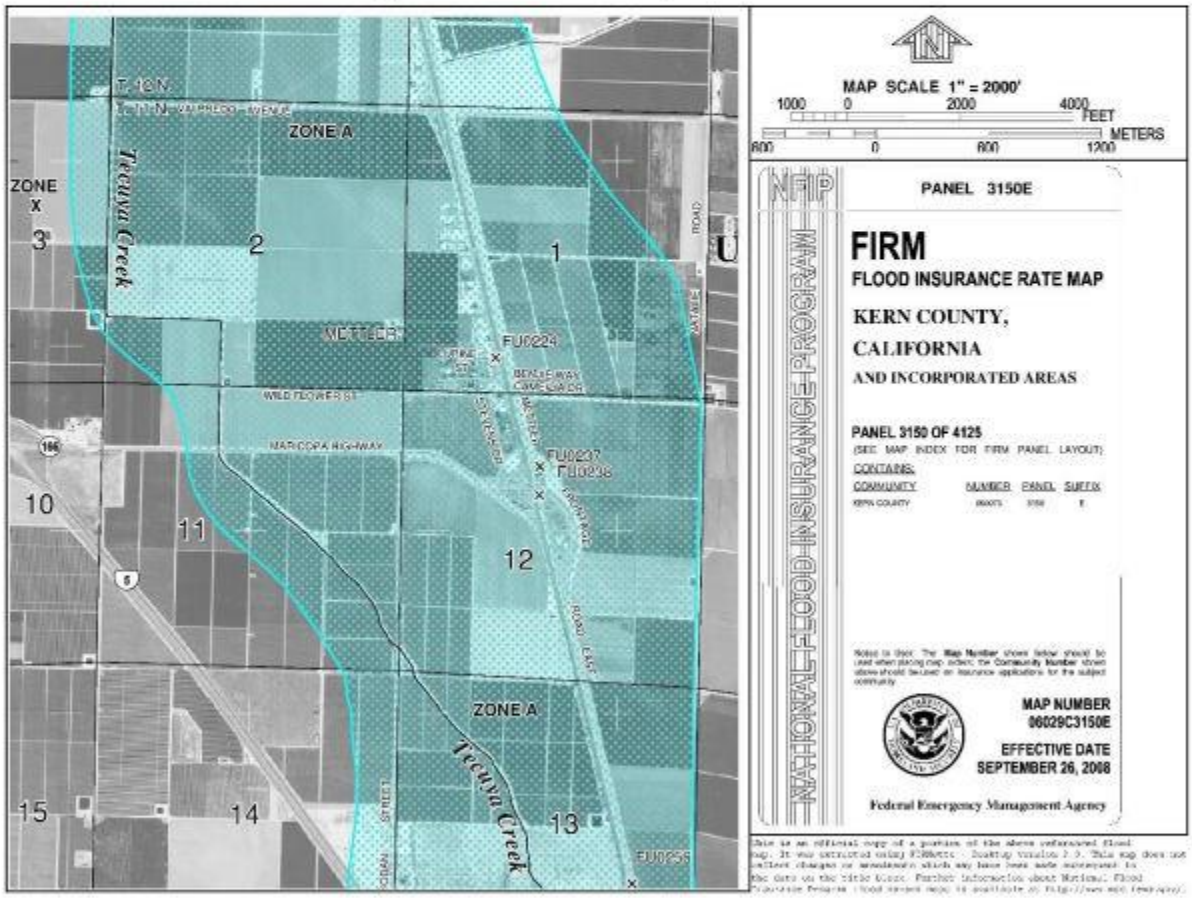
PURPOSE

The purpose of this analysis is to find the base flood elevation for any new construction at the "Mettler" site of the Tejon Casino Project. Additionally, the post construction effects would be analyzed to verify that the water surface would not exceed 1.00' of depth as compared to the encroached model.

BACKGROUND

The Mettler site is located in the California Central Valley generally between Interstate 5, Hwy 166, Hwy 99, and Valpredo Ave. The site is located in a FEMA Flood Zone A, which is a Special Flood Hazard Area subject to the 100-year flood. Flood Zone A delineates the 100-year floodplain boundary, but contains no information in regards to base flood elevations (BFE) due to no detailed flood study being completed and approved by FEMA. The site is affected by the Tecuya Creek, a 50.5 square mile watershed commencing in the Los Padres National Forest. Contributing to the overall flow is a smaller, unnamed creek just west of Tecuya Creek. The unnamed creek was a watershed of 12.8 square miles. In total, the Mettler Site is affected by 63.3 square miles of watershed, which has been analyzed as described below.

Flood Insurance Rate Map over Mettler Site, Firmette of Panel 06029C3150E



HYDROLOGY

In order to properly model the water surface elevations on the Mettler Site over existing conditions and with the two proposed alternative site layouts, a two dimensional mode was created using FLO-2D. The inputs required for this software include topographic information and a hydrograph for the 100-year storm event. For the topographic information, contours from the U.S. Geologic Survey's (USGS) Quad Map were supplemented with Google LIDAR information.

Initial analysis of the peak flows for the 100-year storm event were estimated using StreamStats, a USGS web-based Geographic Information System (GIS) with water-resource analytical tools. The StreamStats peak flow estimates for the 100-year storm event were 886 cubic-feet per second for the westerly watershed and 4050 cubic-feet per second for the Tecuya Creek watershed. For the Mettler Site West Watershed StreamStats Report, see Appendix A. For the East Watershed StreamStats Report, see Appendix B.

Additionally, a flood study prepared by Meyer Civil Engineering, Inc. was revised and approved by the County of Kern in 2009 analyzing the Tecuya Creek watershed that is draining to the Mettler Site location. The purpose of the flood study prepared by Meyer was to develop a hydrograph and model a crossing on Tecuya Creek. The Kern County Unit Hydrograph Method as outlined in the County Hydrology Manual was used to determine rainfall intensities and a hydrograph was developed for the 100-year storm event at the project site just south of the Mettler Site location. It was determined that the 100-year storm event had a peak flow of 9,300 cubic-feet per second. Since the approval of this study using NOAA Atlas 2, the National Oceanic and Atmospheric Administration has published the updated NOAA Atlas 14 containing precipitation frequency estimates. Additionally, a Kern County provided watershed loss determination map was used to determine the SCS Soil Groups and therefore the CNs. This analysis utilizes the NRCS Web Soil Survey to determine the CNs. For the NRCS Web Soil Survey Data, see Appendix C. Both the Meyer study and this study use the County Manual Figures C-1 and C-2 to determine the CNs. For the County Manual Figures C-1 and C-2, see Appendix D.

Table 1: NOAA Atlas 2 versus Atlas 14 Point Precipitation

Duration of 100-year Storm Event	NOAA Atlas 2	NOAA Atlas 14
5-minute point rainfall	0.383"	0.380"
30-minute point rainfall	0.857"	0.878"
60-minute point rainfall	1.170"	1.250"
3-hour point rainfall	1.818"	2.120"
6-hour point rainfall	2.400"	3.030"
24-hour point rainfall	4.700"	5.490"

Table 2.1: Soil Group – Web Soil Survey

Soil Group	Land Use and Condition	Acres- Current	CN
A	Chaparral, Broadleaf (Poor)	4,190	53
B	Chaparral, Broadleaf (Fair)	17,015	63
B	Barren	6,075	86
C	Chaparral, Broadleaf (Poor)	3,590	80
D	Chaparral, Broadleaf (Fair)	1,560	81

Table 2.2: Soil Group – County Watershed Loss Determination Map

Soil Group	Land Use and Condition	Acres- Current	CN
A	Natural	51	49
B	Natural	2,742	69
D	Natural	29,207	84

Due to the differences in the following inputs:

1. Hydrograph from the StreamStats information versus the 2009 Meyer Study,
2. Point Precipitation Depth from NOAA Atlas 14 versus Atlas 2,
3. Soils Group from the NRCS Web Soil Survey versus the County Determination Map;

A new unit hydrograph was calculated using the updated inputs and CivilDesign Hydrology-Hydraulics Program Package.

UNIT HYDROGRAPH

The Kern County Hydrology Manual- Unit Hydrograph Method was used to create an updated hydrograph to verify the flow through the Mettler Site. The initial steps of the Unit Hydrograph Method is to take the information provided by NOAA Atlas 2 and interpolating to the 100-year, 5-min., 30-min., 1-hour, 3-hour, 6-hour, and 24-hour events. These events can now be found online using NOAA Atlas 14. In addition to the ease of use, Atlas 14 includes updated rainfall data. All inputs can be found on the Watershed Information Form (Table 3.0).

Based on the inputs listed in the flowing tables, a flow of 6,270 cfs was found for the 100-year event. The output of the Unit Hydrograph Analysis can be found in the Appendix E. The flow is in line with the 9,300 cfs in the 2009 study taking into account the larger acreage with a CN value of 63 versus the CN value of 84.

Table 3: Watershed Information Form

Watershed Information Form		
Project: Mettler Site		Date: 2/6/19
Engineer: L. Alberto Lopez, RCE 67602		
1. Enter the design storm return frequency (years)		100.00
2. Enter catchment lag (hours)		1.757
3. Enter the catchment area (acres)		32,430
4. Enter baseflow (cfs/square mile)		0.00
5. Enter S-Graph proportions (decimal)		
	Valley: Developed	
	Foothill	
	Mountain	1.00
	Valley: Undeveloped	
F_m	Desert	
6. Enter maximum loss rate, (inch/hour)		0.56
7. Enter low loss fraction, $\bar{Y}$ (decimal)		0.61
8. Enter watershed area-averaged 5-minute point rainfall (inches)*		0.380
Enter watershed area-averaged 30-minute point rainfall (inches)*		0.878
Enter watershed area-averaged 1-hour point rainfall (inches)*		1.250
Enter watershed area-averaged 3-hour point rainfall (inches)*		2.120
Enter watershed area-averaged 6-hour point rainfall (inches)*		3.030
Enter watershed area-averaged 24-hour point rainfall (inches)*		5.490
9. Enter 24-hour storm unit interval (minutes)		5.00
*Note: enter values unadjusted by depth-area factors		

Figure 1: Tecuya Creek Watershed Exhibit

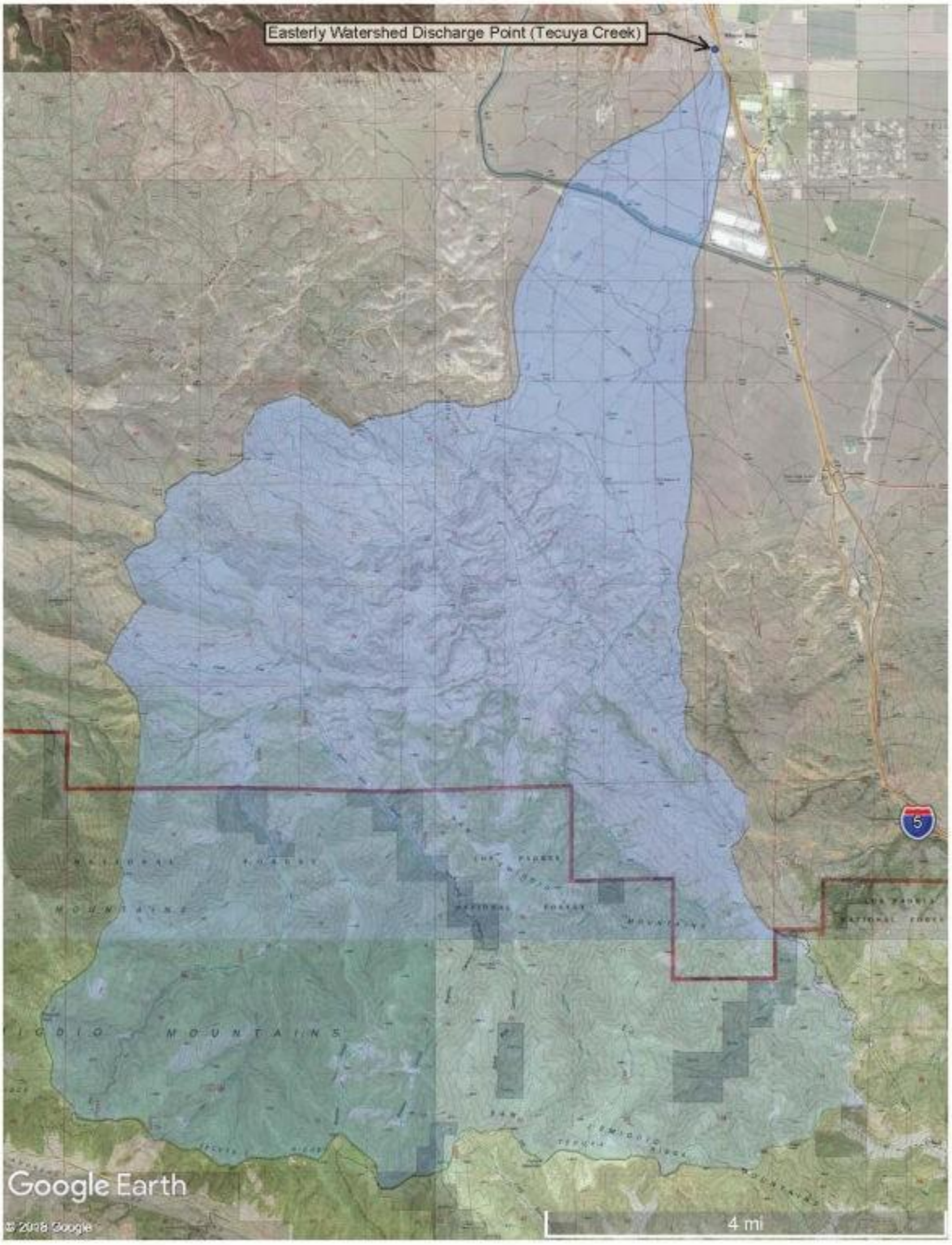


Table 4: Soil Group – County Watershed Loss Determination Map

Watershed Loss 100-year event

Sub Area Number	Acres	Area Fraction	Land Use and Condition	Soil Group	Pervious CN	S	Ia	Y	Af*Y	Fp	ap	Fm	Weighted FM
1	4,190	0.13	Chaparral, Broadleaf (Poor)	A	53	8.87	0.18	0.216	0.03	0.78	1	0.78	0.10
2	17,015	0.52	Chaparral, Broadleaf (Fair)	B	63	5.87	0.12	0.304	0.16	0.66	1	0.66	0.35
3	6,075	0.19	Barren	B	86	1.63	0.03	0.626	0.12	0.27	1	0.27	0.05
4	3,590	0.11	Chaparral, Broadleaf (Poor)	C	80	2.50	0.05	0.518	0.06	0.38	1	0.38	0.04
5	1,560	0.05	Chaparral, Broadleaf (Fair)	D	81	2.35	0.05	0.535	0.03	0.36	1	0.36	0.02
	32,430	1						Y=	0.39			Area Average loss rate =	0.557
								Yb=	0.61				
P24	2.84												

Table 5: Lag

LAG EQUATION: Lag (hours) = 24n[{(L*Lca)/s^0.5}/s^0.5]^m

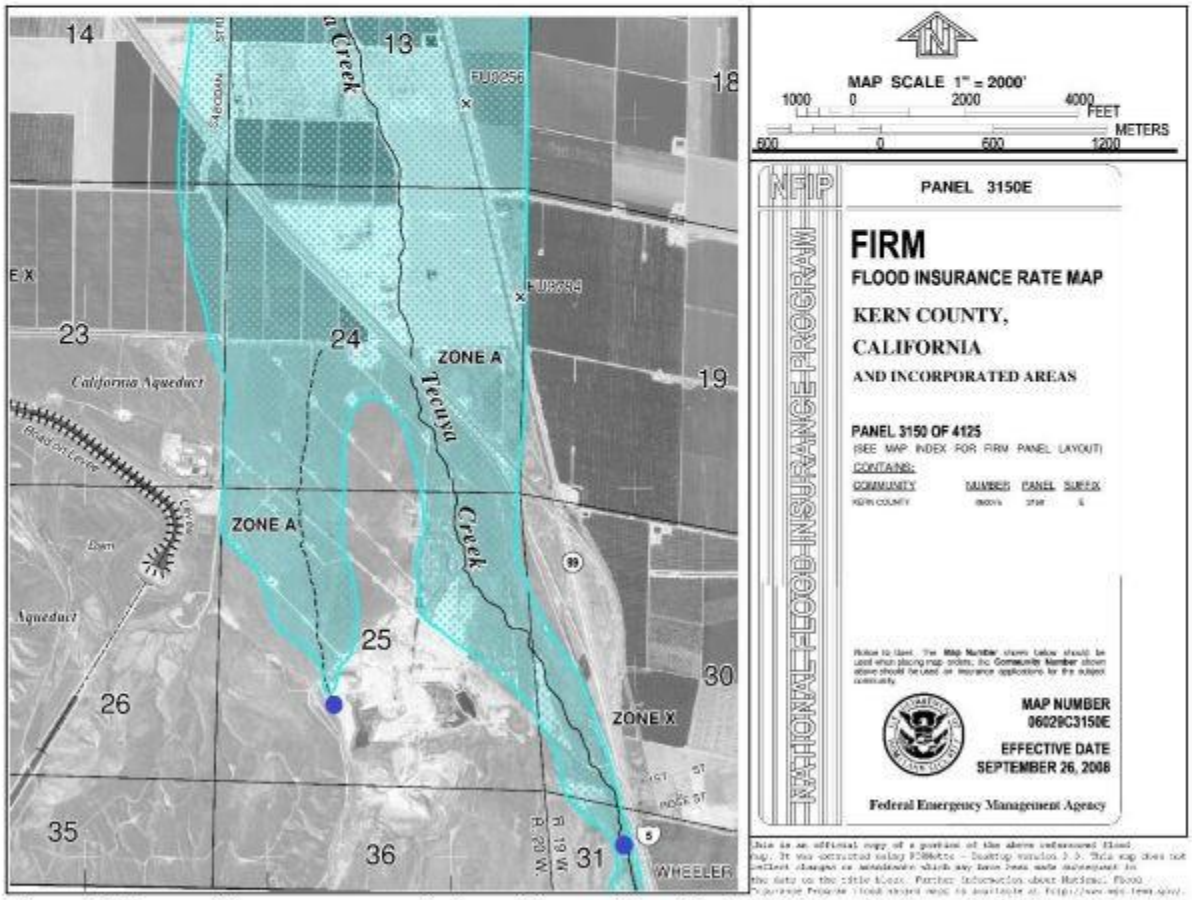
n:	0.0433		Lag = 1.757
L:	15.96	miles	
Lca:	4.63	miles	
elev 1:	6,480	ft	
elev 2:	980	ft	
H:	5,500	ft	
s:	344.61	ft/miles	
m:	0.38		

FLOOD MODELING

Existing and proposed sites alternatives were modeled using FLO-2D with the Meyer study flows of 9,300 cubic-feet per second for Tecuya Creek with the StreamStats flow from the westerly watershed of 886 cfs. Based on the comparison of the StreamStats peak flows, the updated Unit Hydrograph Method, and the Meyer flood study using NOAA Atlas 2 intensities, it is conservative to use the previously approved Meyer flood study peak flow for Tecuya Creek with the StreamStats peak flow for the westerly flow.

Synthetic hydrographs were developed to represent the increase in flow up to the peak flow, which was then held for 12.5 hours. These hydrographs were inserted into the FLO-2D model south of the Mettler Site at the points where the easterly watershed drains to the reach of Tecuya Creek and the westerly watershed drains to the reach of the unnamed creek. Reviewing the FEMA Flood Insurance Rate Map just south of the Mettler Site (see below), the discharge points of the westerly and easterly watersheds are visible concentration points and as the water flows north from the points the floodplain visibly spreads out as the topography flattens. These points were chosen to be the locations of where the peak flows were calculated through analysis of the watersheds and where the synthetic hydrographs representing the peak flow were inserted in the FLO-2D model. These points have been denoted on the watershed exhibits and the FLO-2D model outputs also.

Flood Insurance Rate Map South of Mettler Site, Firmette of Panel 06029C3150E



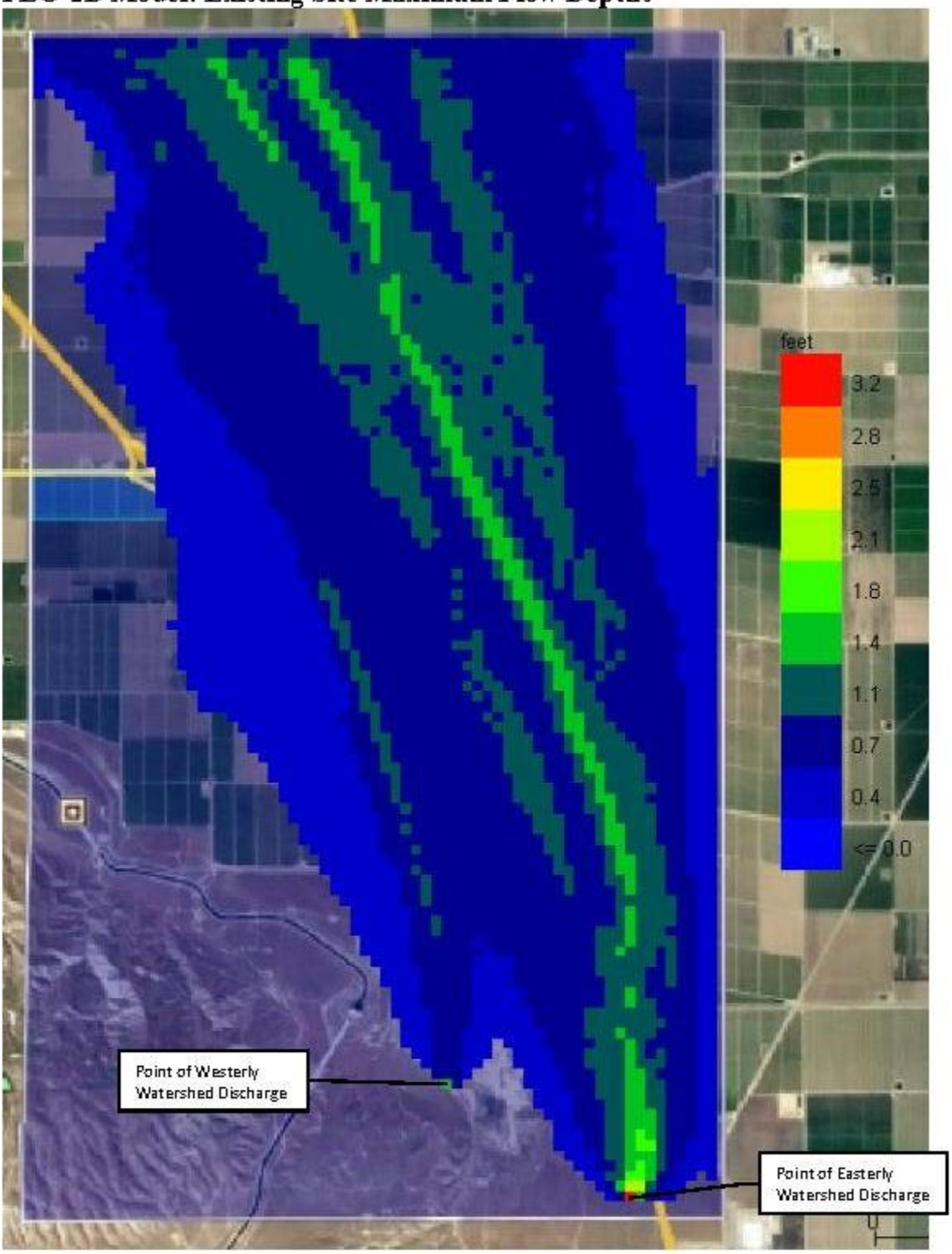
The peak flows of these two watersheds are inserted into the FLO-2D model south of the site to allow for the FLO-2D program to model the flow, depth, and spread of the flood water over the topography of the Mettler Site as well as the surrounding area. This methodology allows for a more realistic prediction of

flood water depths and velocities over the project site since there is no information available that would allow us to accurately estimate flows over the project site alone. Additionally, the FLO-2D model outputs mimicked the FEMA Flood Zone A boundary supporting the decision to place the peak flow hydrographs at the chosen watershed discharge points.

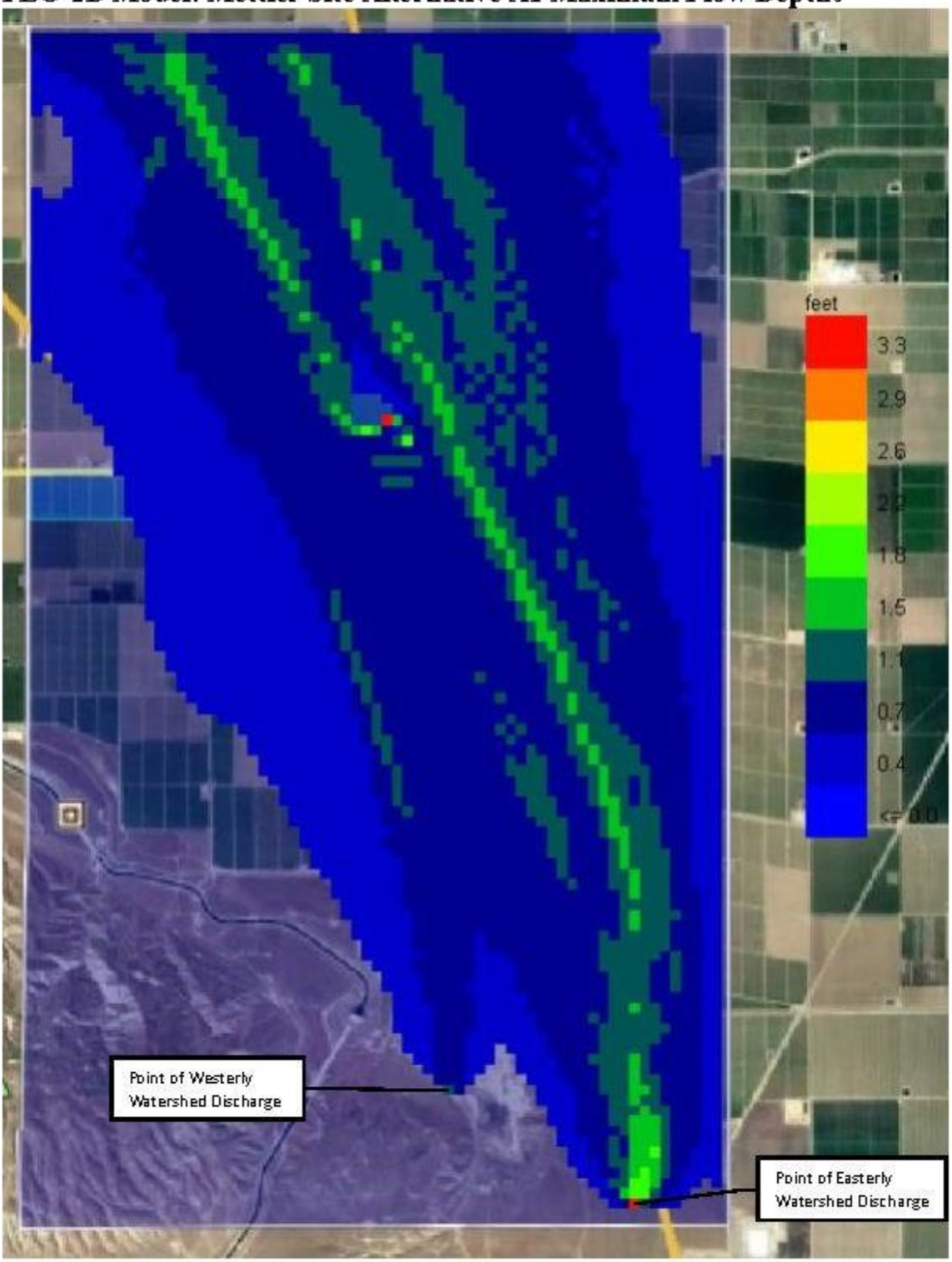
No significant increase in water surface elevation overall was observed when comparing the three proposed site alternatives to existing conditions. The greatest increase in elevation was seen approximately 3,000 feet north (downstream) of the Mettler Site with a rise in flood water depth of 0.41 feet for the Site Alternative A1 and 0.36 feet for the Site Alternative A2. Changes in flood water depths were observed directly on the south side of the casino building, which was modeled as an obstruction to calculate an approximation flood water elevation needed to determine the finished floor elevation. Flood water depths increased 2.6 feet for the Site Alternative A1 and 2.6 feet for Site Alternative A2, resulting in a flood water depth of 3.3 feet for Site Alternative A1 and for Site Alternative A2. Neither of the alternatives for the Mettler Site layout caused an increase of 1.00 feet when compared to the existing conditions on neighboring properties.

The model reflects that access routes from the fire & sheriff's station to the resort remain above the base flood elevation for safety purposes during emergency situations. Additional safety precautions would be to route traffic away from Tecuya Creek. The Mettler sites are small as compared to the overall floodplain. Additionally, the raising of the casino and access aisles serve to slow down the flow on the south side of the structures and road. This in turn slightly increases the floodplain storage at each of the site. Site A1 shows an increase of 1.58 acre-feet, where Site A2 show an increase of 1.29 acre-feet. During final design it is recommended that the increased flows between the road and the casino be routed back into Tecuya Creek or towards the freeway to lower the flood depths and additional floodplain storage.

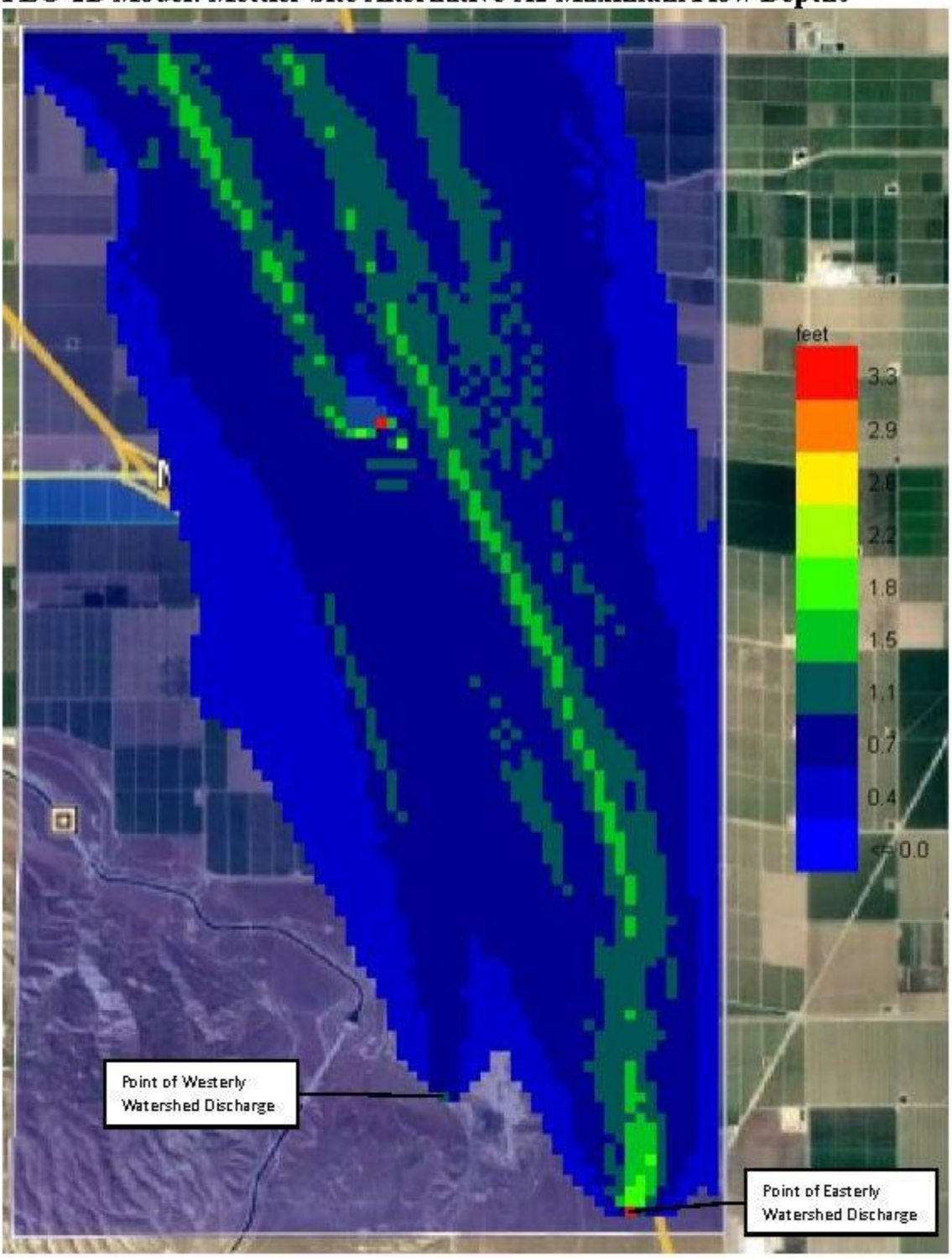
FLO-2D Model: Existing Site Maximum Flow Depths



FLO-2D Model: Mettler Site Alternative A1 Maximum Flow Depths



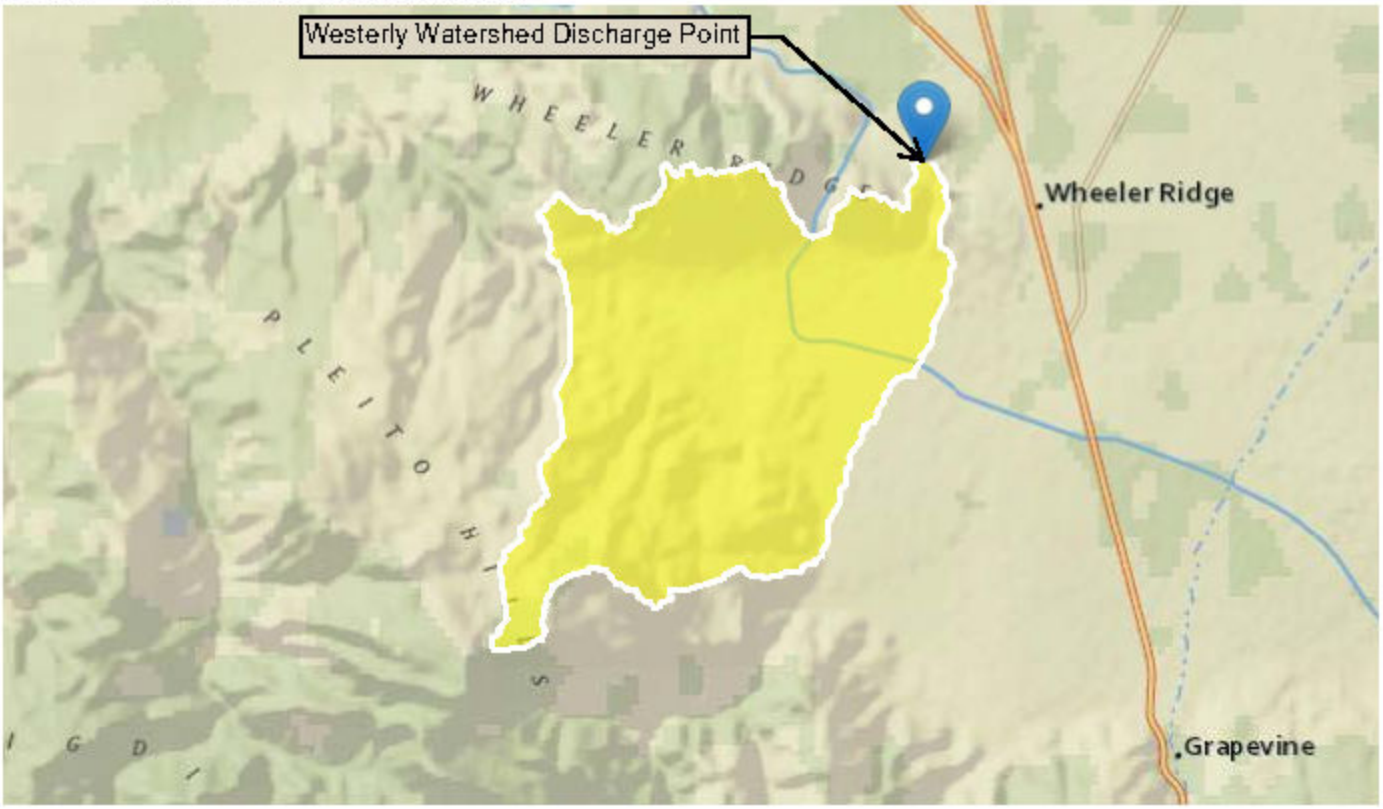
FLO-2D Model: Mettler Site Alternative A2 Maximum Flow Depths



Appendix A

StreamStats Report - Mettler Site West Watershed

Region ID: CA
Workspace ID: CA20181227191824539000
Clicked Point (Latitude, Longitude): 35.01060, -118.96981
Time: 2018-12-27 11:18:38 -0800



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
PRECIP	Mean Annual Precipitation	9.59	inches
RELIEF	Maximum - minimum elevation	3422	feet
LFPLENGTH	Length of longest flow path	8	miles
BASINPERIM	Perimeter of the drainage basin as defined in SIR 2004-5262	24.6	thousand feet
BSLDEM30M	Mean basin slope computed from 30 m DEM	16.3	percent
CENTROIDX	Basin centroid horizontal (x) location in state plane coordinates	-2062594.8	feet

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	12.8	square miles
LAKEAREA	Percentage of Lakes and Ponds	0.85	percent
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	5.5	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	0.3	percent

Peak-Flow Statistics Parameters [2012 5113 Region 4 Central Coast]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	12.8	square miles	0.11	4600
PRECIP	Mean Annual Precipitation	9.59	inches	7	46

Peak-Flow Statistics Flow Report [2012 5113 Region 4 Central Coast]

PII: Prediction Interval-Lower, Piu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	Piu	SEp
2 Year Peak Flood	13.9	ft^3/s	1.96	98.2	162
5 Year Peak Flood	74.2	ft^3/s	17.8	309	97
10 Year Peak Flood	170	ft^3/s	49.1	585	79.4
25 Year Peak Flood	377	ft^3/s	121	1180	69.9
50 Year Peak Flood	610	ft^3/s	204	1820	66.2
100 Year Peak Flood	886	ft^3/s	293	2680	66.9
200 Year Peak Flood	1220	ft^3/s	400	3730	67.6
500 Year Peak Flood	1730	ft^3/s	529	5680	71.5

Peak-Flow Statistics Citations

Gotvald, A.J., Barth, N.A., Veilleux, A.G., and Parrett, Charles,2012, Methods for determining magnitude and frequency of floods in California, based on data through water year 2006: U.S. Geological Survey Scientific Investigations Report 2012–5113, 38 p., 1 pl. (http://pubs.usgs.gov/sir/2012/5113/)

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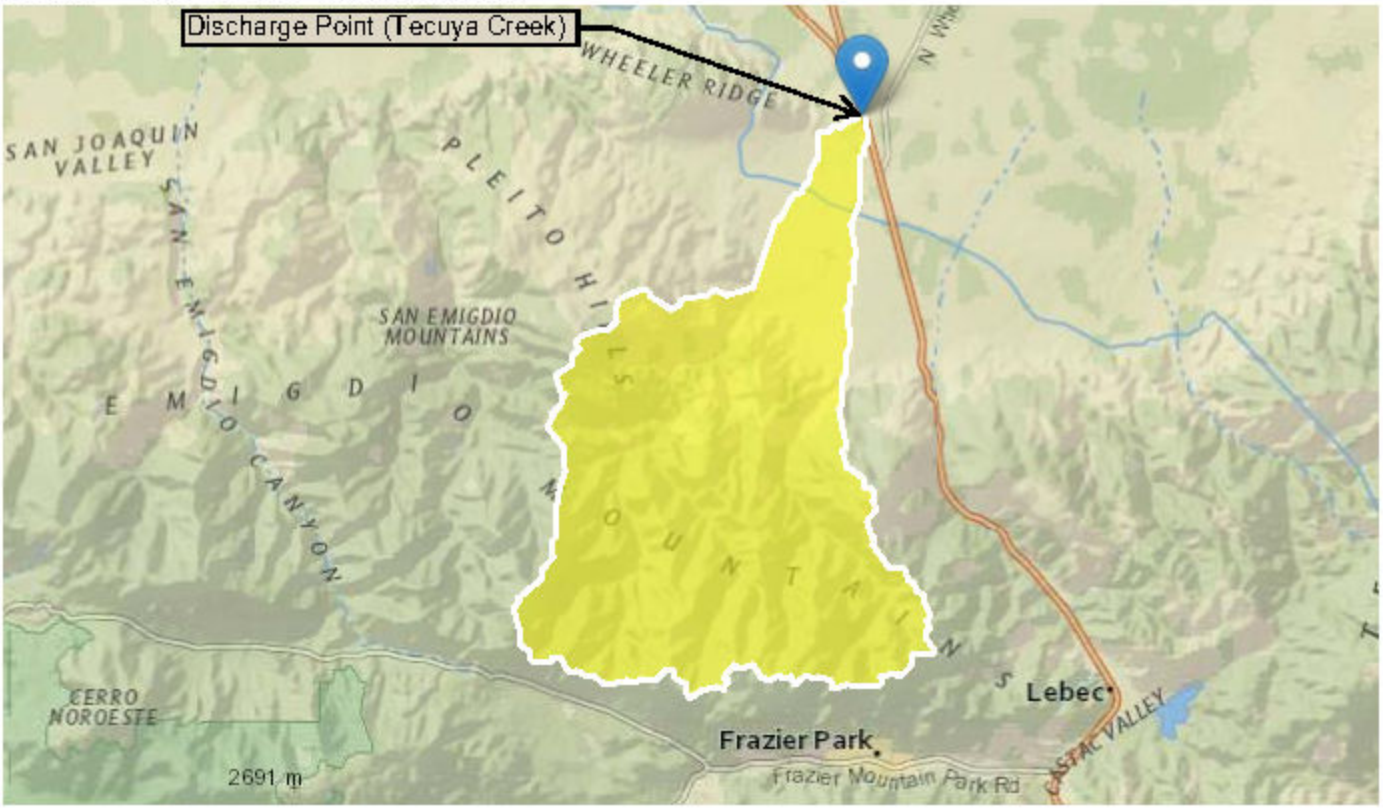
Application Version: 4.3.0

Appendix B

StreamStats Report - East Watershed

Region ID: CA
Workspace ID: CA20181227193553164000
Clicked Point (Latitude, Longitude): 35.00239, -118.95131
Time: 2018-12-27 11:36:06 -0800



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	50.8	square miles
PRECIP	Mean Annual Precipitation	13.8	inches
RELIEF	Maximum - minimum elevation	6178	feet
CENTROIDX	Basin centroid horizontal (x) location in state plane coordinates	-2064095.5	feet
CENTROIDY	Basin centroid vertical (y) location in state plane units	1566577.5	feet

Parameter Code	Parameter Description	Value	Unit
BASINPERIM	Perimeter of the drainage basin as defined in SIR 2004-5262	49	thousand feet

Peak-Flow Statistics Parameters [2012 5113 Region 4 Central Coast]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	50.8	square miles	0.11	4600
PRECIP	Mean Annual Precipitation	13.8	inches	7	46

Peak-Flow Statistics Flow Report [2012 5113 Region 4 Central Coast]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu	SEp
2 Year Peak Flood	116	ft^3/s	17.5	762	162
5 Year Peak Flood	492	ft^3/s	126	1920	97
10 Year Peak Flood	996	ft^3/s	309	3210	79.4
25 Year Peak Flood	1960	ft^3/s	675	5690	69.9
50 Year Peak Flood	2950	ft^3/s	1070	8120	66.2
100 Year Peak Flood	4050	ft^3/s	1460	11200	66.9
200 Year Peak Flood	5330	ft^3/s	1910	14800	67.6
500 Year Peak Flood	7220	ft^3/s	2420	21500	71.5

Peak-Flow Statistics Citations

Gotvald, A.J., Barth, N.A., Veilleux, A.G., and Parrett, Charles,2012, Methods for determining magnitude and frequency of floods in California, based on data through water year 2006: U.S. Geological Survey Scientific Investigations Report 2012–5113, 38 p., 1 pl. (http://pubs.usgs.gov/sir/2012/5113/)

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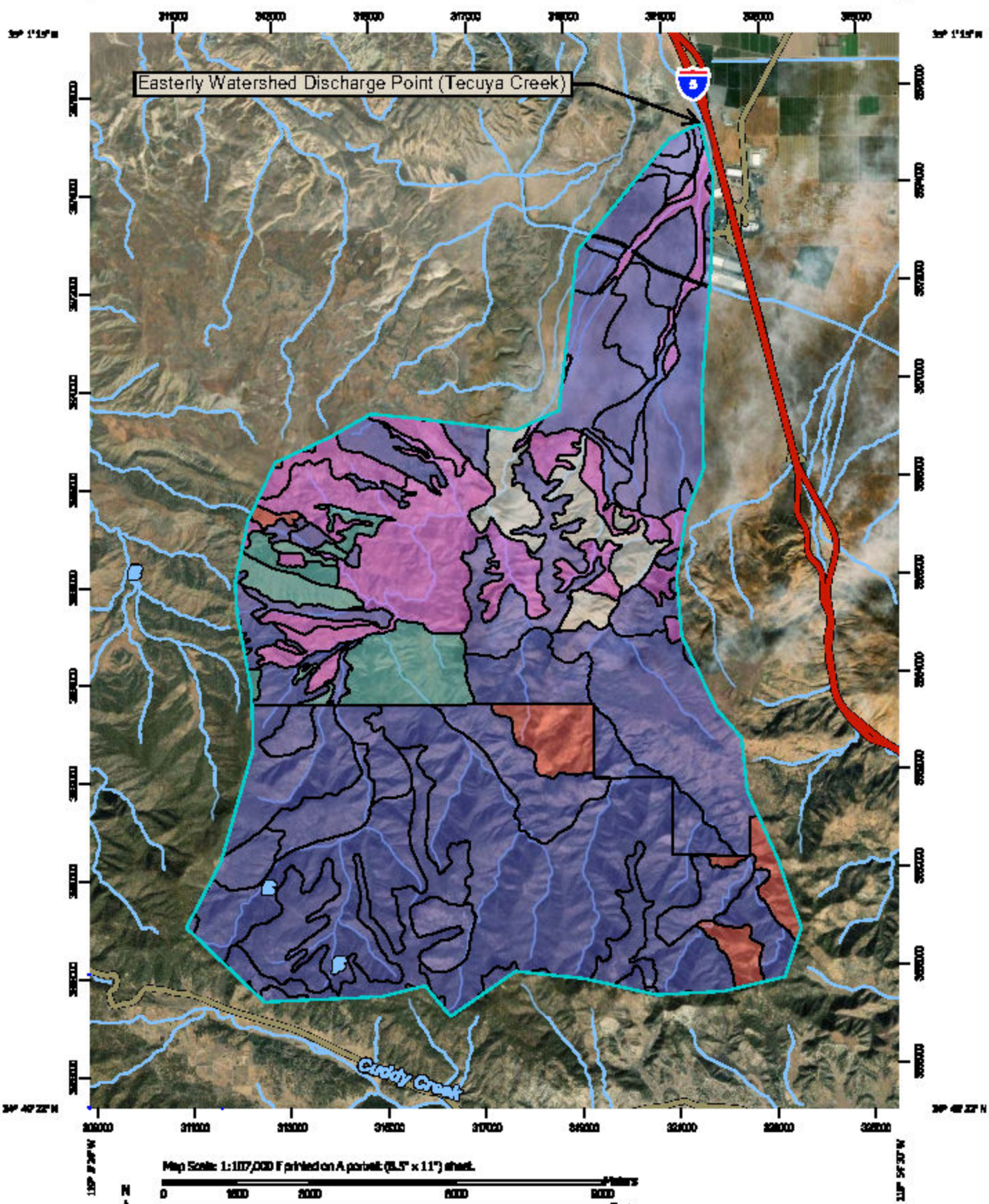
Application Version: 4.3.0

Hydrologic Soil Group—Kern County, California, Southwest Part; and Los Padres National Forest Area, ...



Map Scale: 1:107,000 if printed on A portrait (8.5" x 11") sheet.

Meters
0 1600 3200 6400 9600

Feet
0 5000 10000 20000 30000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N 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 1:24,000.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
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: Kern County, California, Southwest Part
Survey Area Data: Version 9, Sep 12, 2018

Soil Survey Area: Los Padres National Forest Area, California
Survey Area Data: Version 10, Sep 12, 2018

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Dec 31, 2009—Nov 2, 2017

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

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
190	Guijarral sandy loam, 0 to 2 percent slopes	B	782.8	2.4%
191	Guijarral sandy loam, 2 to 9 percent slopes	B	682.2	2.1%
192	Guijarral-Kilpstein complex, 2 to 5 percent slopes	B	1,148.1	3.5%
197	Kilpstein-Guijarral complex, 5 to 15 percent slopes	A	101.8	0.3%
280	Premier sandy loam, 0 to 2 percent slopes	A	34.1	0.1%
331	Cuyama sandy loam, 5 to 15 percent slopes	B	61.1	0.2%
360	Wheelridge gravelly loamy sand, 0 to 2 percent slopes	A	2.5	0.0%
371	Whitewolf loamy sand, 2 to 5 percent slopes	A	33.1	0.1%
389	Xerofluvents-Haplocambids-Riverwash complex, 0 to 15 percent slopes	B	66.5	0.2%
390	Pleito sandy clay loam, 0 to 2 percent slopes	B	316.2	1.0%
391	Pleito sandy clay loam, 2 to 5 percent slopes	B	1,020.9	3.2%
392	Pleito sandy clay loam, 5 to 9 percent slopes	B	109.2	0.3%
393	Pleito sandy clay loam, 9 to 30 percent slopes	B	107.5	0.3%
395	Pleito-Ernidio-Loslobos association, 15 to 75 percent slopes	B	525.2	1.6%
396	Pleito-Loslobos association, 15 to 75 percent slopes	B	1,015.7	3.1%
400	Loslobos-Xeric Torriorthents, very gravelly-Badlands association, 30 to 60 percent slopes		1,235.2	3.8%
402	Loslobos-Walong association, 5 to 30 percent slopes	A	38.1	0.1%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
403	Loslobos-Calleguas association, 30 to 100 percent slopes	A	938.4	2.9%
404	Loslobos sandy loam, moist, 40 to 85 percent slopes	A	195.7	0.6%
460	Geghus-Tecuya association, 9 to 30 percent slopes	B	288.2	0.9%
461	Geghus-Tecuya association, 30 to 75 percent slopes	B	21.3	0.1%
531	Tehachapi gravelly loam, 5 to 30 percent slopes	B	190.5	0.6%
540	Xeric Torriorthents-Badlands complex, 30 to 75 percent slopes	A	3,187.5	9.8%
550	Laval-Plattlo complex, 1 to 5 percent slopes	A	345.8	1.1%
590	Gorman-Typic Xerorthents, mesic-Xerorthents, shallow, complex, 30 to 100 percent slopes	B	2,388.8	7.4%
600	Positas-Elitcreek complex, 2 to 9 percent slopes	C	77.5	0.2%
610	Balcom-Rock outcrop complex, 50 to 75 percent slopes	C	361.6	1.1%
620	Typic Xerorthents, mesic-Haploxeralfs-Xerorthents, sandy, association, 30 to 75 percent slopes	C	1,295.1	4.0%
670	Harrisranch-Rock outcrop complex, 50 to 75 percent slopes	B	199.9	0.6%
690	Dibble-Geghus complex, 50 to 75 percent slopes	D	62.0	0.2%
870	Frazier very gravelly sandy loam, 50 to 75 percent slopes	B	1,166.5	3.6%
951	Bitcreek-Balhud-Ballinger complex, 5 to 30 percent slopes	D	5.2	0.0%
W	Water		21.7	0.1%
Subtotals for Soil Survey Area			17,996.5	55.6%
Totals for Area of Interest			32,374.5	100.0%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
10	Kilburn-Wrentham-Supan families association, 10 to 30 percent slopes	B	1,955.2	6.0%
11	Kilburn-Wrentham-Supan families association, 30 to 60 percent slopes	B	8,186.5	25.3%
18	Lodo-Modjeska-Botella families association, 10 to 70 percent slopes	D	1,091.0	3.4%
20	Los Gatos-Kilburn-Panamint families association, 10 to 30 percent slopes	B	712.1	2.2%
21	Los Gatos-Kilburn-Panamint families association, 30 to 60 percent slopes	B	2,433.3	7.5%
Subtotals for Soil Survey Area			14,376.1	44.4%
Totals for Area of Interest			32,374.6	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

Residential Landscaping (Lawn, Shrubs, etc.) - The pervious portions of commercial establishments, single and multiple family dwellings, trailer parks and schools where the predominant land cover is lawn, shrubbery and trees.

Row Crops - Lettuce, tomatoes, beets, tulips or any field crop planted in rows far enough apart that most of the soil surface is exposed to rainfall impact throughout the growing season. At plowing, planting and harvest times it is equivalent to fallow.

Small Grain - Wheat, oats, barley, flax, etc. planted in rows close enough that the soil surface is not exposed except during planting and shortly thereafter.

Legumes - Alfalfa, sweetclover, timothy, etc. and combinations are either planted in close rows or broadcast.

Fallow - Fallow land is land plowed but not yet seeded or tilled.

Woodland - grass - Areas with an open cover of broadleaf or coniferous trees usually live oak and pines, with the intervening ground space occupied by annual grasses or weeds. The trees may occur singly or in small clumps. Canopy density, the amount of ground surface shaded at high noon, is from 20 to 50 percent.

Woodland - Areas on which coniferous or broadleaf trees predominate. The canopy density is at least 50 percent. Open areas may have a cover of annual or perennial grasses or of brush. Herbaceous plant cover under the trees is usually sparse because of leaf or needle litter accumulation.

Chaparral - Land on which the principal vegetation consists of evergreen shrubs with broad, hard, stiff leaves such as manzonita, ceanothus and scrub oak. The brush cover is usually dense or moderately dense. Diffusely branched evergreen shrubs with fine needle-like leaves, such as chamise and redchank, with dense high growth are also included in this soil cover.

Annual Grass - Land on which the principal vegetation consists of annual grasses and weeds such as annual bromes, wild barley, soft chess, ryegrass and filaree.

Irrigated Pasture - Irrigated land planted to perennial grasses and legumes for production of forage and which is cultivated only to establish or renew the stand of plants. Dry land pasture is considered as annual grass.

Meadow - Land areas with seasonally high water table, locally called cienegas. Principal vegetation consists of sod-forming grasses interspersed with other plants.

Orchard (Deciduous) - Land planted to such deciduous trees as apples, apricots, pears, walnuts, and almonds.

Orchard (Evergreen) - Land planted to evergreen trees which include citrus and avocados and coniferous plantings.

Turf - Golf courses, parks and similar lands where the predominant cover is irrigated mowed close-grown turf grass. Parks in which trees are dense may be classified as woodland.

KERN COUNTY

HYDROLOGY MANUAL

SCS
COVER TYPE
DESCRIPTIONS

 FIGURE C-1

Curve[1] Numbers of Hydrologic Soil-Cover Complexes For Pervious Areas-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		77	86	91	94
Chaparral, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparral, Narrowleaf (Chamise and Redskank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadows or Cienagas (Areas with seasonally high water table, principal vegatation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	71	78
Open Brush (Soft wood shrubs-buckwheat,sage,etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (4) (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawns, shrubs, etc.)	Good	39	61	74	80
Turf (Irrigated and mowed grass)	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80

KERN COUNTY
Hydrology Manual

CURVE NUMBERS FOR PERVIOUS AREAS

Curve[1] Numbers of Hydrologic Soil-Cover Complexes For Pervious Areas-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
AGRICULTURAL COVERS -					
Fallow (Bare Soil)		77	86	91	94
Close Seeded (alfalfa, sweetclover, timothy, etc.)	Poor	66	77	85	89
	Good	58	72	81	85
Orchards, Evergreen (Citrus, avacodos, etc.)	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Pasture (Grassland or range, continuos forage for grazing)	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Row Crops (Straight row, non-contoured)	Poor	72	81	88	91
	Good	67	78	85	89
Small Grain (Straight row, non-contoured)	Poor	65	76	84	88
	Good	63	75	83	87

Notes:

1. Average runoff condition, Ia = 0.2(S)

2. Poor: Heavily grazed, regularly burned areas, or areas of high burn potential. Less than 50 percent of the ground surface is protected by plant cover or brush and tree canopy.

   Fair: Moderate cover with 50 percent to 75 percent of the ground surface protected. In wooded areas the woods are grazed but not burned, and some forest litter covers the soil.

   Good: Heavy or dense cover with more than 75 percent of the ground surface protected. In wooded areas the woods are protected from grazing, litter and brush adequately cover soil.

3. See Figure C-1 for definition of cover types.

KERN COUNTY
Hydrology Manual

CURVE NUMBERS FOR PERVIOUS AREAS

Appendix E: Unit Hydrograph Analysis

Study date 02/06/19

Kern County Synthetic Unit Hydrograph Hydrology Method Manual date - 1992

Program License Serial Number 6442

Storm Event Year = 100
English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used
English Units used in output format

RAINFALL DATA INPUT:
Slope of Intensity-Duration Curve Slope = 0.550

Zone Designation: Coast Ranges Latitude = 35.00

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)

Rainfall data for year 2
32430.00 6 1.21

Rainfall data for year 2
32430.00 24 2.20

Rainfall data for year 100
32430.00 6 3.03

Rainfall data for year 100
32430.00 24 5.49

COAST RANGES area of study
Log-Log Rainfall Intensity Slope = 0.55

******** Area-averaged max loss rate, Fm ********

SCS Curve Number	Area (Ac.)	Area Fraction	Fp (In/Hr)	Ap (dec)	Fm (In/Hr)
53.0	4190.00	0.129	0.784	0.990	0.776
63.0	17015.00	0.525	0.658	0.990	0.651
86.0	6075.00	0.187	0.272	0.990	0.269
80.0	3590.00	0.111	0.380	0.990	0.376
81.0	1560.00	0.048	0.362	0.990	0.358

Area-averaged adjusted loss rate Fm (In/Hr) = 0.551

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	S	Pervious Yield Fr
4148.10	0.128	53.0	8.87	0.200
41.90	0.001	98.0	0.20	0.957
16844.85	0.519	63.0	5.87	0.333
170.15	0.005	98.0	0.20	0.957
6014.25	0.185	86.0	1.63	0.715
60.75	0.002	98.0	0.20	0.957
3554.10	0.110	80.0	2.50	0.606
35.90	0.001	98.0	0.20	0.957
1544.40	0.048	81.0	2.35	0.623
15.60	0.000	98.0	0.20	0.957

Area-averaged catchment yield fraction, Y = 0.437
Area-averaged low loss fraction, Yb = 0.563
Direct entry of lag time by user
++++++++++++++++++++++++++++++++
Watershed area = 32430.00(Ac.)
Catchment Lag time = 1.757 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 4.7429
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.551(In/Hr)
Average low loss rate fraction (Yb) = 0.610 (decimal)
Note: user entry of the Yb value
MOUNTAIN S-Graph Selected
Computed peak 5-minute rainfall = 0.415(In)
Computed peak 30-minute rainfall = 0.930(In)
Specified peak 1-hour rainfall = 1.271(In)
Computed peak 3-hour rainfall = 2.165(In)
Specified peak 6-hour rainfall = 3.030(In)
Specified peak 24-hour rainfall = 5.490(In)

Note: User specified rainfall values used.
Computed peak 5-minute rainfall = 0.380(In)
Computed peak 30-minute rainfall = 0.878(In)
Specified peak 1-hour rainfall = 1.250(In)
Computed peak 3-hour rainfall = 2.120(In)
Specified peak 6-hour rainfall = 3.030(In)
Specified peak 24-hour rainfall = 5.490(In)

Rainfall depth area reduction factors:
Using a total area of 32430.00(Ac.) (Ref: fig. E-4)

5-minute factor = 0.427 Adjusted rainfall = 0.162(In)
30-minute factor = 0.466 Adjusted rainfall = 0.409(In)
1-hour factor = 0.490 Adjusted rainfall = 0.613(In)
3-hour factor = 0.838 Adjusted rainfall = 1.778(In)
6-hour factor = 0.928 Adjusted rainfall = 2.813(In)
24-hour factor = 0.957 Adjusted rainfall = 5.252(In)

Unit Hydrograph

++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))

(K = 392200.31 (CFS))

1	0.527	2066.866	45	70.633	2325.225
2	1.582	4136.444	46	71.225	2325.225
3	2.714	4442.312	47	71.816	2316.517
4	3.934	4784.400	48	72.329	2011.415
5	5.448	5936.002	49	72.803	1860.180
6	7.029	6200.599	50	73.278	1860.180
7	8.920	7416.472	51	73.752	1860.180
8	11.286	9280.626	52	74.206	1779.517
9	13.707	9496.874	53	74.637	1691.118
10	16.705	11757.417	54	75.068	1691.073
11	20.032	13047.440	55	75.499	1691.073
12	23.825	14875.144	56	75.928	1683.011
13	28.271	17440.089	57	76.331	1581.007
14	32.020	14700.798	58	76.727	1550.150
15	35.182	12401.199	59	77.122	1550.150
16	38.197	11826.882	60	77.517	1550.150
17	40.629	9538.276	61	77.910	1541.588
18	42.999	9295.153	62	78.264	1386.406
19	45.098	8230.345	63	78.602	1328.700
20	46.995	7440.719	64	78.941	1328.700
21	48.892	7440.719	65	79.280	1328.700
22	50.657	6920.454	66	79.619	1328.700
23	52.191	6017.296	67	79.956	1322.486
24	53.557	5358.575	68	80.277	1257.445
25	54.800	4876.492	69	80.593	1240.120
26	55.958	4539.538	70	80.909	1240.120
27	56.938	3842.097	71	81.225	1240.120
28	57.886	3720.360	72	81.541	1240.120
29	58.835	3720.360	73	81.857	1239.834
30	59.783	3720.360	74	82.141	1111.516
31	60.732	3720.360	75	82.397	1005.503
32	61.678	3712.106	76	82.654	1005.503
33	62.524	3317.414	77	82.910	1005.503
34	63.315	3100.300	78	83.166	1005.503
35	64.093	3052.509	79	83.423	1005.503
36	64.827	2877.869	80	83.679	1005.503
37	65.556	2861.815	81	83.934	999.993
38	66.265	2780.463	82	84.158	877.253
39	66.943	2658.588	83	84.369	826.747
40	67.621	2657.400	84	84.579	826.747
41	68.261	2510.520	85	84.790	826.747
42	68.854	2325.815	86	85.001	826.747
43	69.447	2325.225	87	85.212	826.747
44	70.040	2325.225	88	85.423	826.747

89	85.633	826.747
90	85.844	826.747
91	86.048	798.621
92	86.234	732.272
93	86.420	729.482
94	86.606	729.482
95	86.792	729.482
96	86.978	729.482
97	87.164	729.482
98	87.350	729.482
99	87.536	729.482
100	87.722	729.482
101	87.908	729.480
102	88.084	690.504
103	88.251	652.695
104	88.417	652.695
105	88.584	652.695
106	88.750	652.695
107	88.917	652.695
108	89.083	652.695
109	89.249	652.695
110	89.416	652.695
111	89.582	652.695
112	89.749	652.695
113	89.915	652.695
114	90.071	613.347
115	90.217	572.367
116	90.363	572.363
117	90.509	572.363
118	90.655	572.363
119	90.801	572.363
120	90.947	572.363
121	91.093	572.363
122	91.239	572.363
123	91.385	572.363
124	91.531	572.363
125	91.677	572.363
126	91.823	572.363
127	91.968	568.736
128	92.097	505.954
129	92.220	483.164
130	92.343	483.164
131	92.466	483.164
132	92.589	483.164
133	92.713	483.164
134	92.836	483.164
135	92.959	483.164
136	93.082	483.164
137	93.205	483.164
138	93.329	483.164
139	93.452	483.164
140	93.575	483.164
141	93.698	483.164
142	93.821	483.164
143	93.945	483.017
144	94.052	420.109
145	94.146	368.352
146	94.240	368.352
147	94.333	368.352
148	94.427	368.352
149	94.521	368.352
150	94.615	368.352
151	94.709	368.352
152	94.803	368.352
153	94.897	368.352
154	94.991	368.352
155	95.085	368.352
156	95.179	368.352
157	95.273	368.352
158	95.367	368.352
159	95.460	368.352
160	95.554	368.352
161	95.648	368.352
162	95.742	368.352
163	95.836	368.352
164	95.930	368.352
165	96.017	339.603
166	96.086	270.658
167	96.154	267.652
168	96.222	267.652
169	96.290	267.652
170	96.359	267.652
171	96.427	267.652
172	96.495	267.652
173	96.563	267.652
174	96.632	267.652
175	96.700	267.652
176	96.768	267.652
177	96.836	267.652
178	96.905	267.652
179	96.973	267.652
180	97.041	267.652
181	97.109	267.652
182	97.178	267.652
183	97.246	267.652
184	97.314	267.652
185	97.382	267.652
186	97.451	267.652
187	97.519	267.652
188	97.587	267.652
189	97.655	267.652
190	97.724	267.652

191	97.792	267.652
192	97.860	267.652
193	97.928	267.652
194	97.992	250.499
195	98.024	123.248
196	98.048	97.392
197	98.073	97.392
198	98.098	97.392
199	98.123	97.392
200	98.148	97.392
201	98.173	97.392
202	98.197	97.392
203	98.222	97.392
204	98.247	97.392
205	98.272	97.392
206	98.297	97.392
207	98.322	97.392
208	98.346	97.392
209	98.371	97.392
210	98.396	97.392
211	98.421	97.392
212	98.446	97.392
213	98.471	97.392
214	98.495	97.392
215	98.520	97.392
216	98.545	97.392
217	98.570	97.392
218	98.595	97.392
219	98.620	97.392
220	98.644	97.392
221	98.669	97.392
222	98.694	97.392
223	98.719	97.392
224	98.744	97.392
225	98.769	97.392
226	98.793	97.392
227	98.818	97.392
228	98.843	97.392
229	98.868	97.392
230	98.893	97.392
231	98.918	97.392
232	98.942	97.392
233	98.967	97.392
234	98.992	97.392
235	99.017	97.392
236	99.042	97.392
237	99.067	97.392
238	99.091	97.392
239	99.116	97.392
240	99.141	97.392
241	99.166	97.392
242	99.191	97.392
243	99.216	97.392
244	99.240	97.392
245	99.265	97.392
246	99.290	97.392
247	99.315	97.392
248	99.340	97.392
249	99.364	97.392
250	99.389	97.392
251	99.414	97.392
252	99.439	97.392
253	99.464	97.392
254	99.489	97.392
255	99.513	97.392
256	99.538	97.392
257	99.563	97.392
258	99.588	97.392
259	99.613	97.392
260	99.638	97.392
261	99.662	97.392
262	99.687	97.392
263	99.712	97.392
264	99.737	97.392
265	99.762	97.392
266	99.787	97.392
267	99.811	97.392
268	99.836	97.392
269	99.861	97.392
270	99.886	97.392
271	99.911	97.392
272	99.936	97.392
273	99.960	97.392
274	100.000	155.047

Rainfall values calculated at 5 minute intervals:
Peak Rainfall, Intensity, Depth, Adjusted Unit Rainfall

Unit Number				(In)
1	4.56	0.38	0.16	0.162
2	3.15	0.53	0.23	0.070
3	2.54	0.64	0.29	0.054
4	2.18	0.73	0.33	0.046
5	1.94	0.81	0.37	0.040
6	1.76	0.88	0.41	0.037
7	1.63	0.95	0.45	0.038
8	1.52	1.02	0.48	0.036
9	1.44	1.08	0.52	0.034
10	1.37	1.14	0.55	0.033
11	1.30	1.20	0.58	0.031
12	1.25	1.25	0.61	0.030
13	1.20	1.30	0.66	0.049
14	1.15	1.35	0.71	0.049
15	1.11	1.39	0.76	0.049
16	1.08	1.44	0.81	0.049
17	1.04	1.48	0.86	0.049
18	1.01	1.52	0.91	0.049
19	0.98	1.56	0.96	0.049
20	0.96	1.60	1.01	0.049
21	0.93	1.64	1.05	0.049
22	0.91	1.67	1.10	0.049
23	0.89	1.71	1.15	0.049
24	0.87	1.74	1.20	0.048
25	0.85	1.78	1.25	0.048
26	0.84	1.81	1.30	0.048
27	0.82	1.85	1.35	0.048
28	0.81	1.88	1.39	0.048
29	0.79	1.91	1.44	0.048
30	0.78	1.94	1.49	0.048
31	0.76	1.97	1.54	0.048
32	0.75	2.00	1.59	0.048
33	0.74	2.03	1.63	0.048
34	0.73	2.06	1.68	0.048
35	0.72	2.09	1.73	0.048
36	0.71	2.12	1.78	0.048

Time = 3.00 Hours Total unit rainfall = 1.78(In)

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0479	0.0292	0.0187
2	0.0479	0.0292	0.0187
3	0.0480	0.0293	0.0187
4	0.0481	0.0293	0.0187
5	0.0482	0.0294	0.0188
6	0.0482	0.0294	0.0188
7	0.0483	0.0295	0.0188
8	0.0484	0.0295	0.0189
9	0.0485	0.0296	0.0189
10	0.0486	0.0296	0.0189
11	0.0487	0.0297	0.0190
12	0.0488	0.0297	0.0190
13	0.0489	0.0298	0.0191
14	0.0490	0.0299	0.0191
15	0.0492	0.0300	0.0192
16	0.0493	0.0301	0.0192
17	0.0303	0.0185	0.0118
18	0.0315	0.0192	0.0123
19	0.0344	0.0210	0.0134
20	0.0362	0.0221	0.0141
21	0.0367	0.0224	0.0143
22	0.0405	0.0247	0.0158
23	0.0540	0.0329	0.0211
24	0.0698	0.0426	0.0272
25	0.1624	0.0459*	0.1165
26	0.0457	0.0279	0.0178
27	0.0385	0.0235	0.0150
28	0.0328	0.0200	0.0128
29	0.0494	0.0302	0.0193
30	0.0491	0.0300	0.0192
31	0.0488	0.0298	0.0191
32	0.0486	0.0297	0.0190
33	0.0484	0.0295	0.0189
34	0.0483	0.0294	0.0188
35	0.0481	0.0293	0.0188
36	0.0480	0.0293	0.0187
	1.7776	1.0312	0.7464

Total soil rain loss = 1.03(In)
Total effective rainfall = 0.75(In)
Peak flow rate in flood hydrograph = 6270.62(CFS)

3 – HOUR STORM Runoff Hydrograph

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m) Volume Ac.Ft Q(CFS)
0 1575.0 3150.0 4725.0 6300.0

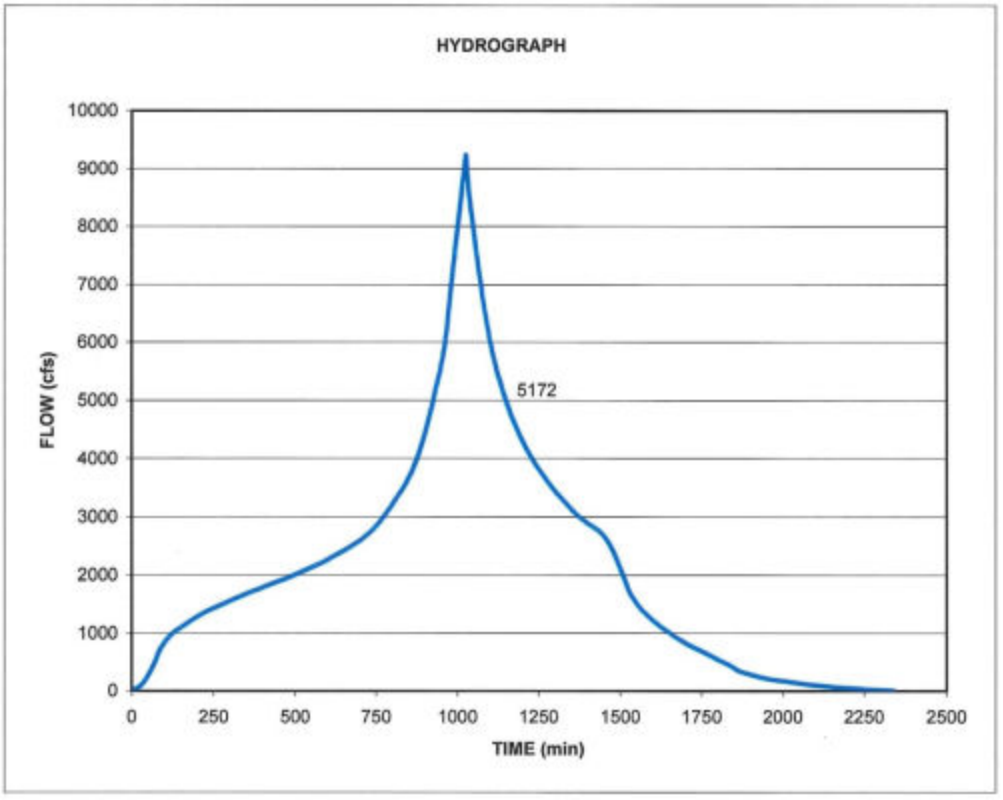
```
0+ 5   0.2658   38.60 Q   |    |    |    |
0+10   1.0638  115.87 Q    |    |    |    |
0+15   2.4341  198.96 VQ   |    |    |    |
0+20   4.4213  288.55 VQ   |    |    |    |
0+25   7.1746  399.78 V Q  |    |    |    |
0+30  10.7291  516.11 V Q  |    |    |    |
0+35  15.2423  655.32 V  Q  |    |    |    |
0+40  20.9555  829.55 V  Q  |    |    |    |
0+45  27.8984 1008.11 V   Q  |    |    |    |
0+50  36.3637 1229.16 V   Q  |    |    |    |
0+55  46.5199 1474.68 V    Q|    |    |    |
1+ 0  58.6049 1754.75 |V   |Q   |    |    |
1+ 5  72.9521 2083.20 |V   | Q  |    |    |
1+10  89.2131 2361.10 |V   | Q  |    |    |
1+15 107.0965 2596.67 | V   |  Q |    |    |
1+20 126.5322 2822.06 | V   |  Q |    |    |
1+25 147.1233 2989.83 | V   |   Q|    |    |
1+30 168.7415 3138.96 | V   |   Q|    |    |
1+35 191.2589 3269.52 | V   |    Q    |    |
1+40 214.5857 3387.06 | V   |    |Q   |    |
1+45 238.6807 3498.59 | V   |    | Q  |    |
1+50 263.4963 3603.22 | V   |    |Q   |    |
1+55 288.9628 3697.73 | V   |    |Q   |    |
2+ 0 315.0784 3791.99 |  V  |    | Q  |    |
2+ 5 343.1614 4077.65 |  V  |    | Q  |    |
2+10 372.9787 4329.47 |  V  |    | Q  |    |
2+15 403.1931 4387.12 |  V  |    | Q  |    |
2+20 433.7189 4432.36 |   V |    |  Q |    |
2+25 465.0531 4549.71 |   V |    |  Q |    |
2+30 496.9446 4630.66 |   V |    |  Q |    |
2+35 530.1905 4827.29 |    V|    |   Q|    |
2+40 565.2170 5085.86 |    |V    |   |Q   |
2+45 601.1066 5211.17 |    |V    |   |Q   |
2+50 639.1593 5525.25 |    | V   |   | Q  |
2+55 678.8163 5758.19 |    | V   |   | Q  |
3+ 0 720.3422 6029.56 |    | V   |   |  Q |
3+ 5 763.5283 6270.62 |    | V   |   |  Q |
3+10 804.5847 5961.39 |    |  V  |   |  Q |
3+15 843.8069 5695.07 |    |  V  |   |  Q  |
3+20 882.3596 5597.85 |    |  V  |   | Q  |
3+25 919.2088 5350.51 |    |   V |   |Q   |
3+30 955.5504 5276.80 |    |   V |   |Q   |
3+35 990.6731 5099.82 |    |   V |   |Q   |
3+40 1024.5582 4920.12 |    |   V |   |Q   |
3+45 1057.5670 4792.88 |    |   V |   Q   |
3+50 1089.0396 4569.82 |    |   |V  Q|   |
3+55 1118.5235 4281.06 |    |   | V Q|   |
4+ 0 1145.8916 3973.84 |    |   | V Q |   |
4+ 5 1170.9546 3639.15 |    |   | Q |    |
4+10 1194.1680 3370.59 |    |   |Q V |    |
4+15 1215.6033 3112.40 |    |   Q| V |    |
4+20 1235.7154 2920.27 |    |   Q | V |    |
4+25 1254.8681 2780.97 |    |  Q | V |    |
4+30 1273.0907 2645.93 |    |  Q | V |    |
4+35 1290.4811 2525.08 |    |  Q | V |    |
4+40 1307.1048 2413.77 |    | Q  | V |    |
4+45 1322.7068 2265.41 |    | Q  |  V |    |
4+50 1337.4861 2145.95 |    |Q   | V |    |
4+55 1351.6751 2060.24 |    |Q   | V |    |
5+ 0 1365.2870 1976.46 |    |Q   | V |    |
5+ 5 1378.4696 1914.11 |    |Q   | V |    |
5+10 1391.1951 1847.74 |    |Q   | V |    |
5+15 1403.5206 1789.65 |    |Q   | V |    |
5+20 1415.5406 1745.31 |    |Q   |  V |    |
5+25 1427.1679 1688.28 |    Q   |  V |    |
5+30 1438.3843 1628.62 |    Q   |  V |    |
5+35 1449.3092 1586.29 |    Q   |  V |    |
5+40 1459.9448 1544.29 |   Q|   |  V |    |
5+45 1470.3368 1508.92 |   Q|   |  V|    |
5+50 1480.4914 1474.45 |   Q|   |  V|    |
5+55 1490.3901 1437.29 |   Q|   |  V|    |
6+ 0 1499.8674 1376.10 |   Q|   |  V|    |
6+ 5 1509.0442 1332.47 |   Q|   |  V|    |
6+10 1518.0208 1303.40 |   Q|   |   V    |
6+15 1526.7990 1274.59 |   Q|   |   V    |
6+20 1535.3134 1236.30 |   Q|   |   V    |
6+25 1543.5770 1199.87 |   Q|   |   V    |
6+30 1551.6820 1176.84 |   Q|   |   V    |
6+35 1559.6296 1154.00 |   Q|   |   V    |
6+40 1567.4060 1129.13 |   Q|   |   |V   |
6+45 1574.9470 1094.95 |   Q |   |   |V  |
6+50 1582.2868 1065.75 |   Q |   |   |V  |
6+55 1589.4419 1038.91 |   Q |   |   |V  |
7+ 0 1596.4500 1017.57 |   Q |   |   |V  |
7+ 5 1603.3132  996.54 |   Q |   |   |V  |
7+10 1609.9375  961.86 |   Q |   |   |V  |
7+15 1616.3928  937.30 |   Q |   |   | V |
7+20 1622.7314  920.37 |   Q |   |   | V |
7+25 1628.9669  905.40 |   Q |   |   | V |
7+30 1635.0971  890.10 |   Q |   |   | V |
7+35 1641.1137  873.61 |   Q |   |   | V |
7+40 1646.9715  850.55 |   Q |   |   | V |
7+45 1652.7156  834.04 |   Q |   |   | V |
7+50 1658.3624  819.92 |   Q |   |   | V |
```

7+55	1663.9117	805.75	Q		V
8+ 0	1669.3549	790.36	Q		V
8+ 5	1674.6834	773.69	Q		V
8+10	1679.8402	748.76	Q		V
8+15	1684.8569	728.42	Q		V
8+20	1689.8069	718.75	Q		V
8+25	1694.6933	709.50	Q		V
8+30	1699.5065	698.87	Q		V
8+35	1704.2362	686.76	Q		V
8+40	1708.8858	675.13	Q		V
8+45	1713.4473	662.33	Q		V
8+50	1717.8468	638.81	Q		V
8+55	1722.1383	623.12	Q		V
9+ 0	1726.3619	613.27	Q		V
9+ 5	1730.5202	603.77	Q		V
9+10	1734.6242	595.90	Q		V
9+15	1738.6850	589.64	Q		V
9+20	1742.7025	583.34	Q		V
9+25	1746.6750	576.81	Q		V
9+30	1750.5939	569.02	Q		V
9+35	1754.4338	557.55	Q		V
9+40	1758.1728	542.91	Q		V
9+45	1761.8557	534.76	Q		V
9+50	1765.5039	529.71	Q		V
9+55	1769.1254	525.84	Q		V
10+ 0	1772.7169	521.49	Q		V
10+ 5	1776.2779	517.06	Q		V
10+10	1779.8081	512.59	Q		V
10+15	1783.3073	508.08	Q		V
10+20	1786.7735	503.30	Q		V
10+25	1790.2039	498.09	Q		V
10+30	1793.5728	489.16	Q		V
10+35	1796.8866	481.17	Q		V
10+40	1800.1723	477.08	Q		V
10+45	1803.4285	472.80	Q		V
10+50	1806.6561	468.64	Q		V
10+55	1809.8553	464.53	Q		V
11+ 0	1813.0258	460.35	Q		V
11+ 5	1816.1670	456.11	Q		V
11+10	1819.2789	451.84	Q		V
11+15	1822.3608	447.50	Q		V
11+20	1825.4111	442.90	Q		V
11+25	1828.4265	437.84	Q		V
11+30	1831.3861	429.74	Q		V
11+35	1834.2963	422.56	Q		V
11+40	1837.1857	419.54	Q		V
11+45	1840.0556	416.72	Q		V
11+50	1842.9050	413.72	Q		V
11+55	1845.7320	410.49	Q		V

Appendix F: Meyer Study (2009) 100-year Project Hydrograph

TIME (min)	TIME (hr)	FLOW (cfs)
0	0.000	0
30	0.500	96
60	1.000	356
90	1.500	740
120	2.000	966
150	2.500	1096
180	3.000	1210
210	3.500	1310
240	4.000	1399
270	4.500	1476
300	5.000	1551
330	5.500	1621
360	6.000	1692
390	6.500	1755
420	7.000	1825
450	7.500	1893
480	8.000	1954
510	8.500	2027
540	9.000	2101
570	9.500	2179
600	10.000	2258
630	10.500	2355
660	11.000	2450
690	11.500	2552
720	12.000	2675
750	12.500	2837
780	13.000	3047
810	13.500	3303
840	14.000	3559
870	14.500	3921
900	15.000	4464
930	15.500	5148
960	16.000	5948
990	16.500	7488
1020	17.000	8978
1025	17.083	9233
1030	17.167	8832
1050	17.500	7869
1080	18.000	6689
1110	18.500	5800
1140	19.000	5172
1170	19.500	4681
1200	20.000	4305
1230	20.500	3996
1260	21.000	3743
1290	21.500	3519
1320	22.000	3322
1350	22.500	3135
1380	23.000	2974
1410	23.500	2846
1440	24.000	2725
1470	24.500	2499
1500	25.000	2116
1530	25.500	1691
1560	26.000	1439
1590	26.500	1274

TIME (min)	TIME (hr)	FLOW (cfs)
1620	27.000	1123
1650	27.500	1004
1680	28.000	887
1710	28.500	790
1740	29.000	705
1770	29.500	624
1800	30.000	532
1830	30.500	456
1860	31.000	353
1890	31.500	291
1920	32.000	244
1950	32.500	208
1980	33.000	178
2010	33.500	159
2040	34.000	136
2070	34.500	114
2100	35.000	95
2130	35.500	78
2160	36.000	61
2190	36.500	49
2220	37.000	37
2250	37.500	25
2280	38.000	15
2310	38.500	8
2340	39.000	0



Appendix B:
Preliminary Basin Sizing
For
The Tejon Indian Trust Acquisition Casino Project

Prepared For:

Analytical Environmental Services
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PURPOSE

The purpose of this analysis is to find the required volume for the Stormwater basins of the Tejon Casino Project. The basins are sized to retain the five day storm event and have a minimum of 1 foot of freeboard. The final basin is required to demonstrate that the basin will completely drain the design volume within 7 days.

RETENTION VOLUME REQUIREMENT

The storm water volume storage requirement for the site alternatives was determined using Kern County methodology described in Engineering Bulletin 11-02 (see Appendix A). The attached support documents describe the methodology and calculations to determine the volume required to be retained on site. The Mettler Site Alternative A1 was determined to require 1,392,340 cubic feet (31.96 acre feet) of storage and Alternative A2 was determined to require 1,364,494 cubic feet (31.32 acre feet) of storage. The increase in required storage is expected for Mettler Site Alternative A1 due to the addition of the RV Parking increasing the impervious area for the site. The Maricopa Site Alternative was determined to require 635,423 cubic feet (14.59 acre-feet) of storage.

The following equation is described in Engineering Bulletin 11-02.

Runoff Volume (cu. ft.) = $[(D_{10yr\text{-}5day})/12](a_i)(\text{Area})$

Where:
$D_{10yr\text{-}5day}$ = 10-yr, 5-day depth of rainfall (in.) obtained from NOAA Atlas 14, Vol. 6, Ver. 2.0
A_i = Average percentage of impervious area
Area = Drainage area of total development (sq. ft.)

For all three basins, the volume provided was calculated using the Civil3D Volume Calculator on AutoCAD.

METTLER SITE ALTERNATIVE VOLUME STORAGE REQUIREMENT

Drainage Area Designation

The two site plans for the Mettler Site have been broken down by drainage area and assigned a percentage of impervious area. The impervious area percentage assigned to each area was determined using the User's Guide for the California Impervious Surface Coefficients (ISC) published by the Office of Environmental Health Hazard Assessment of the California Environmental Protection Agency and the exhibits of the site layout alternatives A1 and A2. A weighted average was calculated for each alternative by dividing the total impervious area over the total area to determine a total percent impervious area.

Table 1: Mettler Site Plan Alternative A1

Drainage Area	**Area (acres)**	**Area (sq. ft.)**	**Percent Impervious**	**Impervious Area (acres)**	**Impervious Area (sq. ft.)**
Residential	102	4,443,120	0.46 (4 du/acre)	46.92	2,043,835
Waste Water Reclamation	13	566,280	0.81 (Light Industry)	10.53	458,687
Organic Farm	40	1,742,400	0.04 (Agriculture)	1.60	69,696
Casino	52	2,265,120	0.86 (Retail)	44.72	1,948,003
RV Parking	22	958,320	0.86 (Mixed Use)	17.60	766,656
Community Park	29	1,263,240	0.25 (Open Space)	0.58	25,265
Heath Center/Tribal Admin./Comm. Center	20	871,200	0.86 (Mixed Use)	16.00	696,960
Fire/Sheriff Station	3	130,680	0.86 (Mixed Use)	2.58	112,385
Total	**281**	**12,240,360**	**0.50**	**140.07**	**6,121,487**

Table 2: Mettler Site Plan Alternative A2

Drainage Area	**Area (acres)**	**Area (sq. ft.)**	**Percent Impervious**	**Impervious Area (acres)**	**Impervious Area (sq. ft.)**
Residential	102	4,443,120	0.46 (4 du/acre)	46.92	2,043,835
Waste Water Reclamation	13	566,280	0.81 (Light Industry)	10.53	458,687
Organic Farm	40	1,742,400	0.04 (Agriculture)	1.60	69,696
Casino	52	2,265,120	0.86 (Retail)	44.72	1,948,003
Community Park	51	2,221,560	0.25 (Open Space)	12.75	555,390
Heath Center/Tribal Admin./Comm. Center	20	871,200	0.86 (Mixed Use)	17.20	749,232
Fire/Sheriff Station	3	130,680	0.86 (Mixed Use)	2.58	112,385
Total	**281**	**12,240,360**	**0.49**	**136.30**	**5,937,228**

Retention Basin Calculations

Runoff Volume Required Equation

$$V_{req} = \left(\frac{D_{10yr-5day}}{12\ \frac{in.}{ft.}} \right)(a_i)(A)$$

$D_{10yr-5day} = depth\ of\ rainfall = 2.73\ in.$
(See Appendix B: Precipitation Frequency)
$a_i = percent\ impervious\ area$
$A = drainage\ area$

Mettler Site Plan Alternative A1

$$V_{req} = \left(\frac{2.73\ in.}{12\ \frac{in.}{ft.}} \right)(0.50)(12{,}240{,}360\ ft^2)$$

$$V_{req} = 1{,}392{,}340\ ft^3 = 31.96\ ac\ ft$$

Volume provided at a water surface elevation of 502.0 ft = 34.17 ac ft. (See Appendix D)

Mettler Site Plan Alternative A2

$$V_{req} = \left(\frac{2.73\ in.}{12\ \frac{in.}{ft.}} \right)(0.49)(12{,}240{,}360\ ft^2)$$

$$V_{req} = 1{,}364{,}494\ ft^3 = 31.32\ ac\ ft$$

Volume provided at a water surface elevation of 502.0 ft = 31.50 ac ft. (See Appendix G)

MARICOPA SITE ALTERNATIVE VOLUME STORAGE REQUIREMENT

Drainage Area Designation

The site plan for the Maricopa Site has been broken down by drainage area and assigned a percentage of impervious area. The impervious area percentage assigned to each area was determined using the User's Guide for the California Impervious Surface Coefficients (ISC) published by the Office of Environmental Health Hazard Assessment of the California Environmental Protection Agency and the exhibit of the site layout. A weighted average was calculated by dividing the total impervious area over the total area to determine a total percent impervious area.

Table 1: Maricopa Site Plan Alternative

Drainage Area	**Area (acres)**	**Area (sq. ft.)**	**Percent Impervious**	**Impervious Area (acres)**	**Impervious Area (sq. ft.)**
Residential	16	696,960	0.46 (4 du/acre)	7.36	320,602
Stormwater Retention	2	87,120	0.02 (Open Space)	0.04	1,742
Organic Farm	30	1,306,800	0.04 (Agriculture)	1.20	52,272
Casino	49	2,134,440	0.86 (Retail)	42.14	1,835,618
RV Parking	5	217,800	0.86 (Mixed Use)	4.30	187,308
Community Park	2.5	108,900	0.25 (Open Space)	0.63	27,225
Heath Center/Tribal Admin./Comm. Center	7	304,920	0.86 (Mixed Use)	6.02	262,231
Fire/Sheriff Station	3	130,680	0.86 (Mixed Use)	2.58	112,385
Total	**114.5**	**4,987,620**	**0.56**	**64.27**	**2,799,383**

Retention Basin Calculations

Runoff Volume Required Equation

$$V_{req} = \left(\frac{D_{10yr-5day}}{12\ \frac{in.}{ft.}} \right)(a_i)(A)$$

$D_{10yr-5day} = depth\ of\ rainfall = \ 2.73\ in.$
(See Appendix B: Precipitation Frequency)
$a_i = percent\ impervious\ area$
$A = drainage\ area$

Maricopa Site Plan Alternative

$$V_{req} = \left(\frac{2.73\ in.}{12\ \frac{in.}{ft.}} \right)(0.56)(4{,}987{,}620\ ft^2)$$

$$V_{req} = 635{,}423\ ft^3 = 14.59\ ac\ ft$$

Due to elevation and site constrains the volume provided above ground at this site is less than the volume required. The difference will need to be detained in underground detention chambers.

Volume provided at a water surface elevation of 492.5ft = 12.82.17 ac ft. (See Appendix J)
Volume provided in underground chambers = 1.77 ac ft.

Appendix A:

ENGINEERING, SURVEYING & PERMIT SERVICES DEPARTMENT
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DEVELOPMENT SERVICES AGENCY
Engineering, Surveying and Permit Services Department
Planning and Community Development Department
Roads Department

Engineering Bulletin 11-02

Subject: Sump Volume Requirements **Date: December 21, 2011**
Application: Kern County Development Standards

Background: In 1995, Kern County revised the standard by which retention basin sizing is based, and published it in the latest edition of the Kern County Development Standards dated August 5, 2010. Division 4 of the Development Standards defined the design volume for basins as runoff from the Intermediate Storm Design Discharge (ISDD) 5-day rainfall event from the impervious area. The equation is;

Runoff Volume = 0.12 (D_{10}) (a_i) (Area) where:

D_{10} = 10 yr 24-hr. depth of rainfall (in.)
a_i = average percentage of impervious area
Area = Drainage area of total development
0.12 = 1.44 x 1/12
1.44 = 5 day mass ratio (KC Hydrology Manual, Table B-1)
1/12 = Conversion of rainfall depth in inches to feet

The revision to the standard was chosen for consistency with the newly created multi-day detention basin sizing standard and to approximate the sump sizing criteria used by the City of Bakersfield in their application of 100yr 24hr rainfall event. The new Development Standards also linked ISDD calculations to the application of rainfall/runoff methodology found in the Kern County Hydrology Manual. Since the Hydrology Manual had adopted rainfall data found in NOAA Atlas 2, Volume XI, retention basin sizing was also tied to that data base.

Data Update: In May of 2011 the National Weather Service published NOAA Atlas 14, Volume 6, Version 2.0 for California. As stated in the introduction of the publication, this document supersedes precipitation-frequency estimates found in NOAA Atlas 2, Volume 11 and NOAA Atlas 14 Volume 1, which covered Kern County's desert region. Gage data used in the precipitation-frequency analysis for NOAA Atlas 14, Volume 6 incorporates the latest, quality-verified rainfall information available up through June, 2010. The precipitation-frequency data is now available to the public, via a graphic interface, at the Hydrometeorological Design Studies Center's web site. (http://hdsc.nws.noaa.gov/hdsc/pfds/). It contains both short and long duration, including multi-day rainfall data in tabular and graphic formats.

Policy: Retention basin sizing shall continue to be based upon runoff from the ISDD 5 day storm event from impervious area. The equation is now;

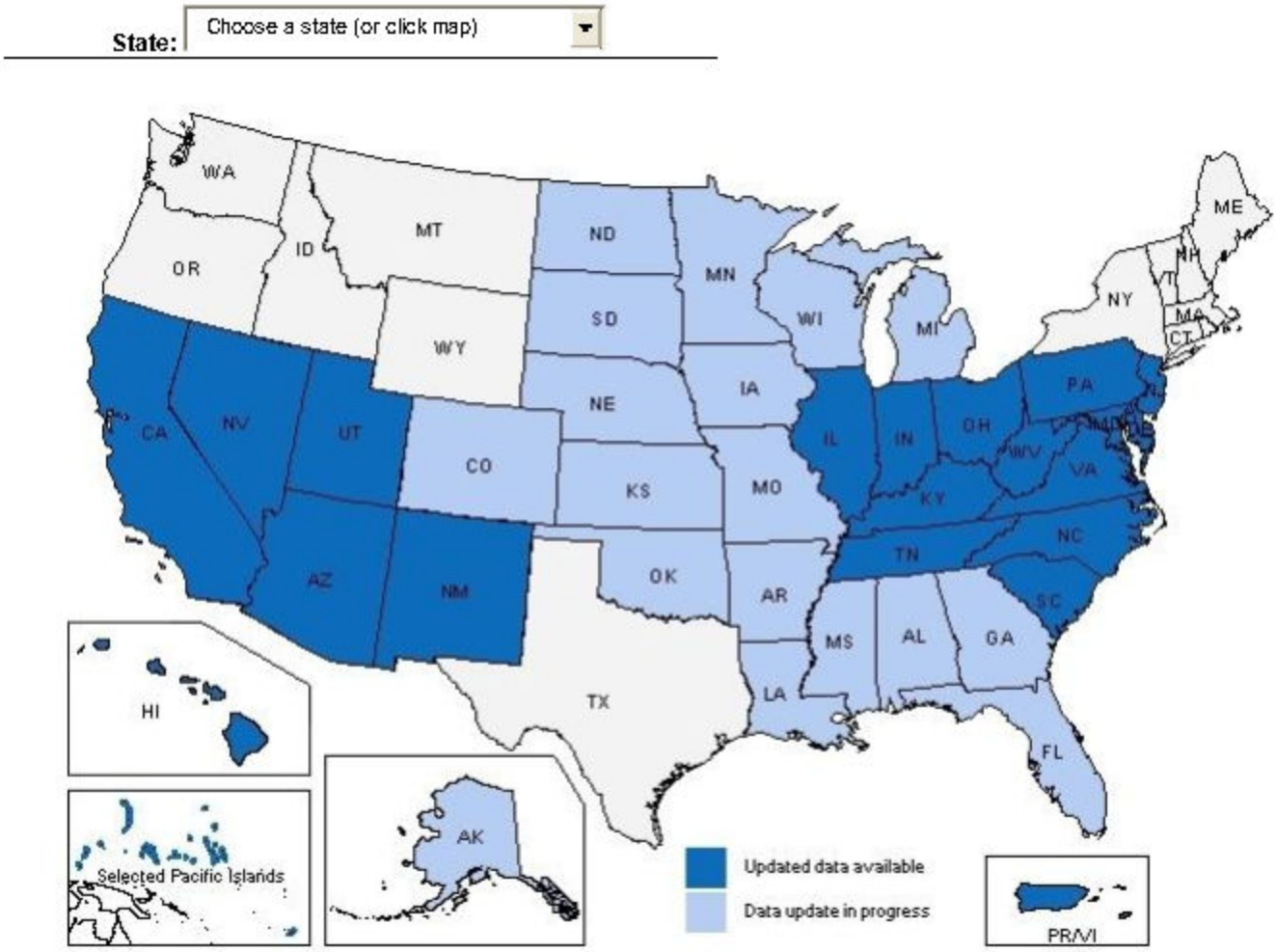
Runoff Volume (cu.ft.) = [($D_{10yr\text{-}5day}$)/12] (a_i) (Area) where;

$D_{10\text{-}5day}$ = 10yr 5 day depth of rainfall (in.) obtained from NOAA Atlas 14, Vol 6, Ver. 2.0
a_i = average percentage of impervious area
Area = Drainage area of total development (sq.ft.)

Example Problem;

Determine the retention basin requirement for a 1.00 acre industrial development located in Bakersfield, CA (Lat. 35.3940 Lon. -119.0505). Assume the development will have 95% imperviousness.

1) Determine the 10yr 5 day depth of rainfall. Connect to the Precipitation Frequency Data Server at http://hdsc.nws.noaa.gov/hdsc/pfds/
2) Click the drop down box and select California or move the cursor onto the map of California and click the left mouse button.



3). Under **Data Description** select Data type (**precipitation depth**), Units (**English**) and Time series type (**partial duration**).
4) **Select Location :** Manually enter Latitude and Longitude.
5) Click submit button.

NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES

DATA DESCRIPTION

Data type: precipitation depth **Units:** english **Time series type:** partial duration

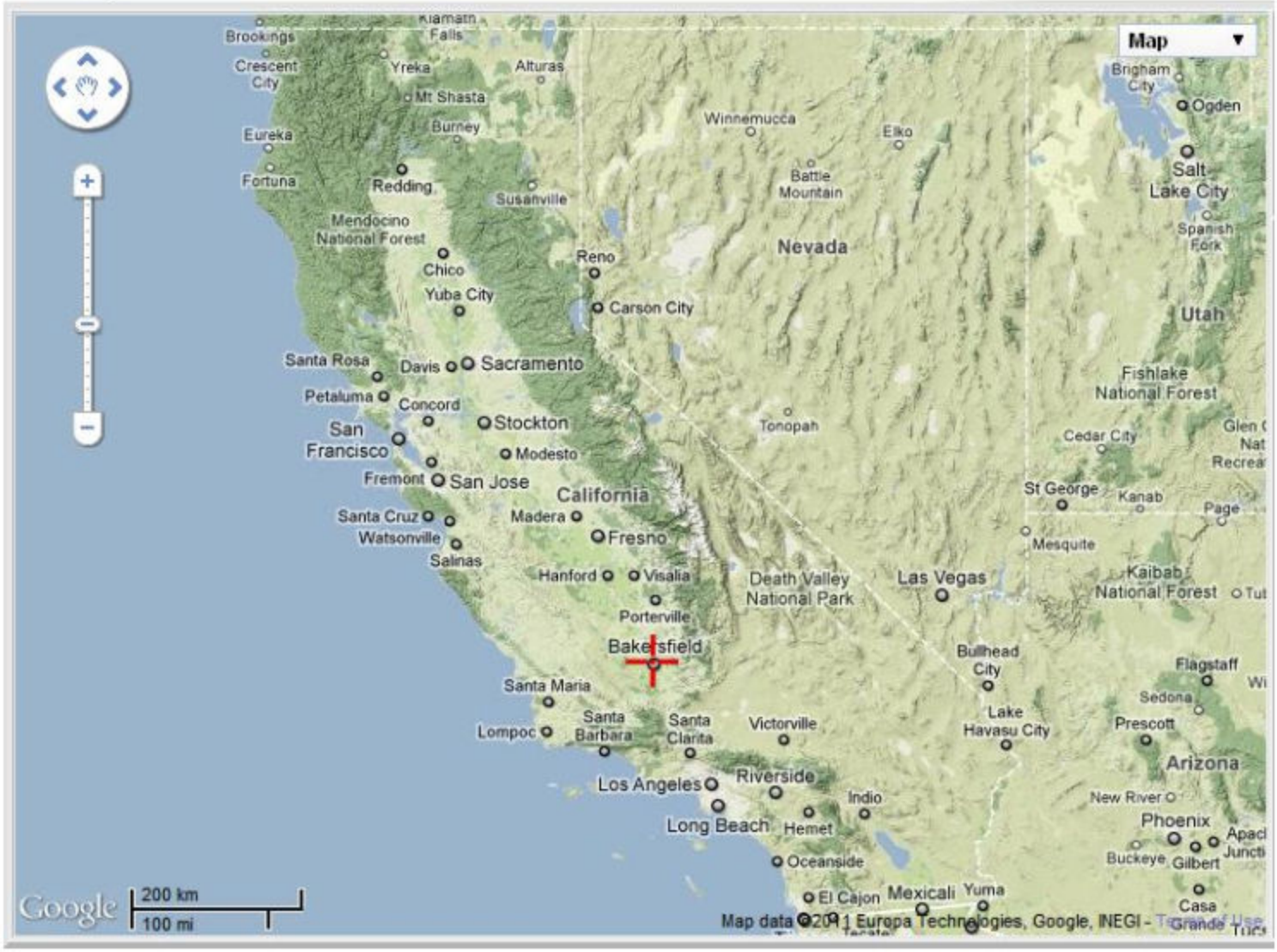
SELECT LOCATION

1. Manually:

a) Enter location (decimal degrees, use "-" for S and W): latitude: 35.3940 longitude: -119.0505 submit

b) Select station: select station

2. Use map:



NOAA Atlas 14, Volume 6, Version 2
Location name: Bakersfield, California, US*
Coordinates: 35.3940, -119.0505
Elevation: 404ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval(years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.077 (0.063–0.095)	0.097 (0.080–0.120)	0.127 (0.104–0.158)	0.154 (0.125–0.193)	0.195 (0.153–0.252)	0.230 (0.177–0.303)	0.269 (0.202–0.362)	0.313 (0.229–0.433)	0.421 (0.296–0.607)	0.580 (0.393–0.863)
10-min	0.110 (0.090–0.136)	0.140 (0.114–0.172)	0.183 (0.149–0.226)	0.221 (0.179–0.276)	0.280 (0.220–0.361)	0.330 (0.254–0.434)	0.386 (0.290–0.519)	0.449 (0.328–0.621)	0.604 (0.424–0.870)	0.831 (0.564–1.24)
15-min	0.133 (0.109–0.164)	0.169 (0.138–0.208)	0.221 (0.180–0.273)	0.268 (0.217–0.334)	0.339 (0.266–0.436)	0.399 (0.307–0.525)	0.467 (0.350–0.628)	0.543 (0.397–0.751)	0.731 (0.513–1.05)	1.01 (0.682–1.50)
30-min	0.182 (0.149–0.224)	0.231 (0.189–0.285)	0.302 (0.247–0.374)	0.366 (0.296–0.456)	0.463 (0.363–0.596)	0.546 (0.420–0.717)	0.638 (0.479–0.859)	0.743 (0.542–1.03)	0.999 (0.701–1.44)	1.37 (0.932–2.05)
60-min	0.256 (0.210–0.315)	0.325 (0.266–0.401)	0.425 (0.347–0.526)	0.515 (0.417–0.642)	0.651 (0.511–0.839)	0.768 (0.590–1.01)	0.898 (0.674–1.21)	1.05 (0.763–1.45)	1.41 (0.986–2.02)	1.93 (1.31–2.88)
2-hr	0.354 (0.290–0.437)	0.446 (0.365–0.550)	0.574 (0.468–0.709)	0.684 (0.554–0.853)	0.846 (0.663–1.09)	0.978 (0.752–1.29)	1.12 (0.842–1.51)	1.28 (0.933–1.77)	1.50 (1.05–2.16)	1.95 (1.33–2.91)
3-hr	0.417 (0.342–0.513)	0.524 (0.429–0.647)	0.673 (0.550–0.833)	0.801 (0.649–0.999)	0.985 (0.773–1.27)	1.14 (0.872–1.49)	1.29 (0.971–1.74)	1.47 (1.07–2.03)	1.71 (1.20–2.46)	1.97 (1.34–2.94)
6-hr	0.520 (0.426–0.641)	0.659 (0.540–0.813)	0.850 (0.694–1.05)	1.01 (0.820–1.26)	1.24 (0.976–1.60)	1.43 (1.10–1.88)	1.63 (1.22–2.19)	1.84 (1.34–2.54)	2.14 (1.50–3.08)	2.38 (1.61–3.54)
12-hr	0.606 (0.497–0.747)	0.780 (0.638–0.962)	1.02 (0.836–1.27)	1.24 (1.00–1.54)	1.54 (1.21–1.99)	1.80 (1.38–2.36)	2.07 (1.55–2.78)	2.37 (1.73–3.27)	2.79 (1.96–4.02)	3.15 (2.14–4.69)
24-hr	0.742 (0.676–0.832)	0.966 (0.878–1.08)	1.29 (1.17–1.45)	1.58 (1.42–1.79)	2.01 (1.74–2.37)	2.38 (2.02–2.86)	2.78 (2.30–3.44)	3.24 (2.60–4.12)	3.92 (3.01–5.21)	4.50 (3.33–6.20)
2-day	0.865 (0.787–0.969)	1.12 (1.02–1.26)	1.50 (1.36–1.69)	1.84 (1.65–2.09)	2.36 (2.05–2.78)	2.81 (2.39–3.38)	3.32 (2.74–4.10)	3.90 (3.13–4.96)	4.78 (3.67–6.35)	5.54 (4.10–7.64)
3-day	0.931 (0.847–1.04)	1.20 (1.09–1.35)	1.61 (1.46–1.81)	1.97 (1.77–2.24)	2.53 (2.19–2.98)	3.01 (2.56–3.63)	3.56 (2.94–4.39)	4.18 (3.35–5.31)	5.13 (3.94–6.82)	5.96 (4.41–8.22)
4-day	0.992 (0.903–1.11)	1.28 (1.17–1.44)	1.71 (1.55–1.93)	2.10 (1.88–2.38)	2.68 (2.32–3.15)	3.18 (2.69–3.82)	3.73 (3.08–4.61)	4.36 (3.50–5.54)	5.31 (4.07–7.05)	6.13 (4.54–8.45)
7-day	1.12 (1.02–1.26)	1.46 (1.33–1.64)	1.94 (1.76–2.18)	2.36 (2.12–2.68)	2.97 (2.58–3.50)	3.48 (2.95–4.18)	4.02 (3.32–4.97)	4.62 (3.70–5.87)	5.49 (4.21–7.29)	6.21 (4.59–8.56)
10-day	1.22 (1.11–1.37)	1.59 (1.45–1.78)	2.11 (1.91–2.38)	2.56 (2.30–2.90)	3.19 (2.77–3.76)	3.71 (3.15–4.46)	4.25 (3.52–5.25)	4.84 (3.88–6.15)	5.67 (4.35–7.53)	6.34 (4.69–8.74)
20-day	1.53 (1.39–1.71)	2.01 (1.83–2.26)	2.67 (2.42–3.01)	3.23 (2.90–3.67)	4.01 (3.48–4.72)	4.63 (3.92–5.57)	5.27 (4.35–6.50)	5.93 (4.76–7.55)	6.85 (5.26–9.10)	7.57 (5.60–10.4)
30-day	1.79 (1.63–2.01)	2.37 (2.15–2.66)	3.15 (2.86–3.55)	3.81 (3.42–4.33)	4.73 (4.11–5.57)	5.46 (4.63–6.57)	6.21 (5.13–7.67)	6.99 (5.60–8.89)	8.05 (6.18–10.7)	8.87 (6.57–12.2)
45-day	2.20 (2.00–2.47)	2.90 (2.64–3.26)	3.86 (3.50–4.35)	4.67 (4.19–5.30)	5.80 (5.03–6.83)	6.70 (5.68–8.06)	7.62 (6.29–9.40)	8.57 (6.87–10.9)	9.87 (7.58–13.1)	10.9 (8.05–15.0)
60-day	2.52 (2.30–2.83)	3.32 (3.02–3.72)	4.41 (3.99–4.96)	5.33 (4.78–6.05)	6.62 (5.74–7.79)	7.64 (6.48–9.19)	8.70 (7.19–10.7)	9.78 (7.85–12.4)	11.3 (8.65–15.0)	12.4 (9.19–17.1)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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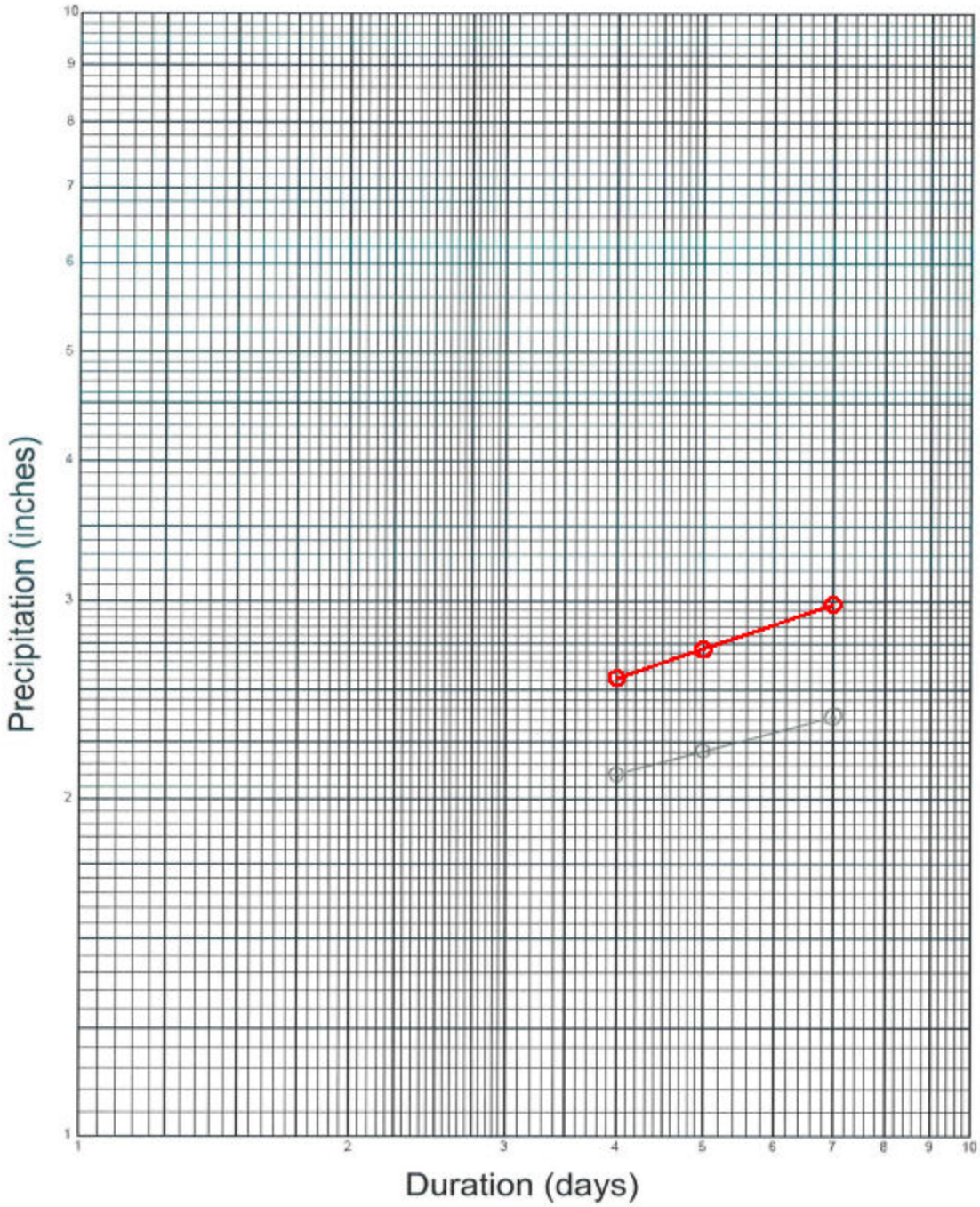
6) Select 10yr 4day rainfall depth – **2.56** and 10yr 7 day rainfall depth – **2.97**
7) Plot points on log–log graph paper.



8) Read the solution for the 10 yr 5 day depth of rainfall– **2.73 inches**

9) Sump volume calculation:

$$\text{Runoff Volume (cu.ft.)} = [(D_{10yr\text{-}5day})/12]\,(a_i)\,(\text{Area})$$
$$= [(2.20)/12](0.95)(1.00 \text{ ac.} \times 43560 \text{ sq.ft/ac})$$
$$= 7{,}586.7 \text{ cu.ft or } 7{,}590 \text{ cu.ft.}$$

Appendix B:

NOAA Atlas 14, Volume 6, Version 2
Location name: Bakersfield, California, USA*
Latitude: 35.0697°, Longitude: -118.98°
Elevation: 394.8 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF tabular | PF graphical | Maps & aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.062 (0.050-0.077)	0.091 (0.066-0.102)	0.110 (0.086-0.138)	0.135 (0.106-0.171)	0.173 (0.134-0.220)	0.205 (0.158-0.273)	0.240 (0.178-0.326)	0.278 (0.202-0.388)	0.336 (0.234-0.485)	0.382 (0.258-0.571)
10-min	0.086 (0.071-0.111)	0.117 (0.094-0.146)	0.158 (0.127-0.198)	0.194 (0.155-0.246)	0.249 (0.192-0.324)	0.294 (0.223-0.391)	0.344 (0.255-0.468)	0.399 (0.289-0.556)	0.480 (0.335-0.695)	0.548 (0.370-0.819)
15-min	0.107 (0.086-0.134)	0.141 (0.113-0.177)	0.191 (0.153-0.240)	0.234 (0.187-0.297)	0.300 (0.232-0.392)	0.355 (0.270-0.472)	0.416 (0.309-0.566)	0.482 (0.349-0.673)	0.580 (0.405-0.841)	0.663 (0.448-0.990)
30-min	0.151 (0.122-0.188)	0.200 (0.161-0.250)	0.270 (0.217-0.340)	0.332 (0.265-0.421)	0.425 (0.329-0.555)	0.503 (0.382-0.668)	0.589 (0.437-0.801)	0.683 (0.495-0.953)	0.822 (0.573-1.18)	0.938 (0.634-1.40)
60-min	0.213 (0.172-0.267)	0.281 (0.225-0.353)	0.381 (0.306-0.478)	0.467 (0.373-0.592)	0.599 (0.463-0.781)	0.708 (0.538-0.942)	0.829 (0.615-1.13)	0.962 (0.697-1.34)	1.16 (0.808-1.66)	1.32 (0.894-1.96)
2-hr	0.316 (0.257-0.399)	0.412 (0.332-0.517)	0.545 (0.439-0.686)	0.666 (0.529-0.838)	0.828 (0.640-1.08)	0.966 (0.734-1.29)	1.11 (0.828-1.52)	1.27 (0.922-1.78)	1.50 (1.05-2.17)	1.69 (1.14-2.52)
3-hr	0.390 (0.314-0.489)	0.502 (0.404-0.630)	0.659 (0.529-0.828)	0.793 (0.632-1.00)	0.987 (0.764-1.29)	1.15 (0.871-1.53)	1.31 (0.978-1.79)	1.49 (1.08-2.06)	1.75 (1.22-2.53)	1.95 (1.32-2.91)
6-hr	0.518 (0.418-0.647)	0.663 (0.534-0.832)	0.864 (0.694-1.09)	1.03 (0.824-1.31)	1.27 (0.987-1.67)	1.47 (1.11-1.95)	1.67 (1.24-2.27)	1.88 (1.36-2.62)	2.17 (1.51-3.14)	2.39 (1.62-3.58)
12-hr	0.633 (0.510-0.794)	0.834 (0.671-1.05)	1.11 (0.888-1.39)	1.33 (1.06-1.68)	1.64 (1.27-2.14)	1.88 (1.43-2.50)	2.13 (1.58-2.90)	2.38 (1.73-3.33)	2.73 (1.90-3.95)	2.98 (2.02-4.48)
24-hr	0.795 (0.718-0.899)	1.05 (0.975-1.23)	1.45 (1.31-1.68)	1.77 (1.58-2.03)	2.19 (1.88-2.61)	2.51 (2.10-3.07)	2.84 (2.31-3.58)	3.18 (2.51-4.11)	3.63 (2.73-4.92)	3.97 (2.88-5.59)
2-day	0.999 (0.820-1.03)	1.26 (1.14-1.43)	1.74 (1.56-1.95)	2.12 (1.89-2.44)	2.64 (2.26-3.15)	3.04 (2.54-3.70)	3.44 (2.80-4.31)	3.84 (3.03-4.97)	4.38 (3.30-5.94)	4.78 (3.46-6.73)
3-day	0.991 (0.886-1.11)	1.30 (1.24-1.66)	1.93 (1.73-2.19)	2.37 (2.11-2.71)	2.96 (2.64-3.52)	3.41 (2.96-4.16)	3.87 (3.16-4.85)	4.34 (3.42-5.61)	4.96 (3.74-6.73)	5.44 (3.94-7.66)
4-day	1.03 (0.934-1.17)	1.47 (1.32-1.66)	2.07 (1.86-2.35)	2.56 (2.28-2.93)	3.22 (2.76-3.83)	3.72 (3.11-4.53)	4.23 (3.44-5.30)	4.75 (3.75-6.15)	5.48 (4.11-7.38)	5.96 (4.33-8.43)
7-day	1.15 (1.04-1.30)	1.66 (1.50-1.86)	2.38 (2.14-2.70)	2.97 (2.64-3.41)	3.76 (3.24-4.50)	4.41 (3.69-5.37)	5.03 (4.09-6.30)	5.66 (4.47-7.35)	6.51 (4.90-8.82)	7.13 (5.17-10.0)
10-day	1.22 (1.10-1.38)	1.78 (1.60-2.02)	2.58 (2.32-2.93)	3.24 (2.88-3.72)	4.17 (3.57-4.97)	4.88 (4.09-5.96)	5.61 (4.56-7.03)	6.34 (5.00-8.20)	7.39 (5.52-9.94)	8.06 (5.84-11.4)
20-day	1.45 (1.30-1.63)	2.17 (1.95-2.45)	3.21 (2.89-3.65)	4.11 (3.66-4.71)	5.41 (4.63-6.44)	6.44 (5.29-7.85)	7.50 (6.10-9.40)	8.60 (6.78-11.1)	10.1 (7.57-13.8)	11.2 (8.09-15.7)
30-day	1.67 (1.50-1.88)	2.51 (2.28-2.84)	3.78 (3.38-4.27)	4.88 (4.33-5.58)	6.49 (5.56-7.73)	7.79 (6.52-9.50)	9.13 (7.44-11.5)	10.5 (8.31-13.8)	12.4 (9.36-18.8)	13.8 (10.0-19.5)
45-day	2.00 (1.81-2.26)	3.01 (2.71-3.40)	4.52 (4.06-5.13)	5.88 (5.23-6.74)	7.92 (6.78-9.43)	9.59 (8.03-11.7)	11.3 (9.23-14.2)	13.2 (10.4-17.0)	15.8 (11.8-21.2)	17.5 (12.7-24.7)
60-day	2.27 (2.05-2.57)	3.49 (3.08-3.84)	5.13 (4.61-5.83)	6.69 (5.96-7.68)	9.05 (7.76-10.8)	11.0 (9.22-13.4)	13.1 (10.7-16.4)	15.3 (12.0-19.7)	18.2 (13.7-24.7)	20.5 (14.9-28.9)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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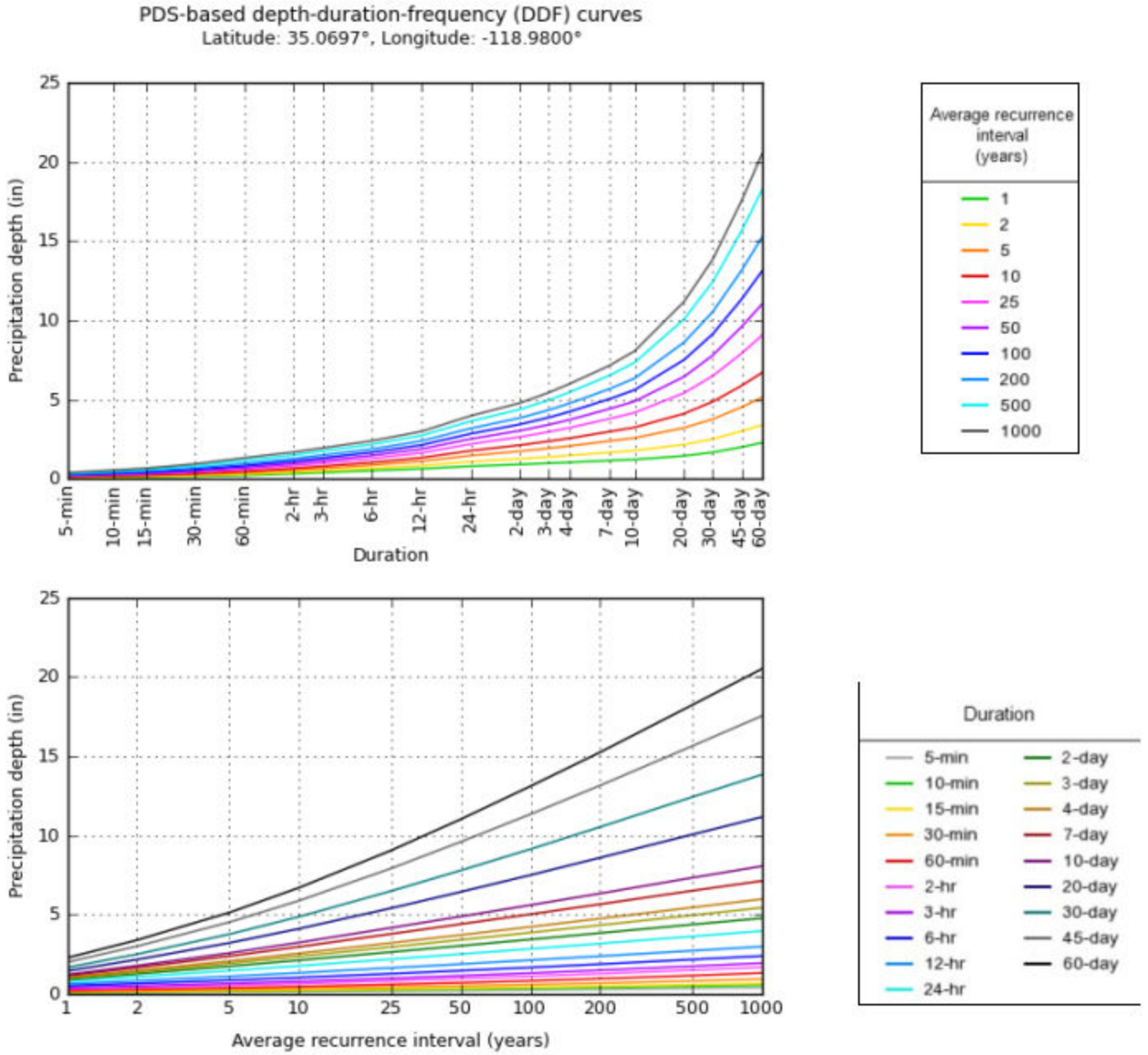
PF graphical



NOAA Atlas 14, Volume 6, Version 2

Created (GMT): Wed Jan 2 17:59:29 2019

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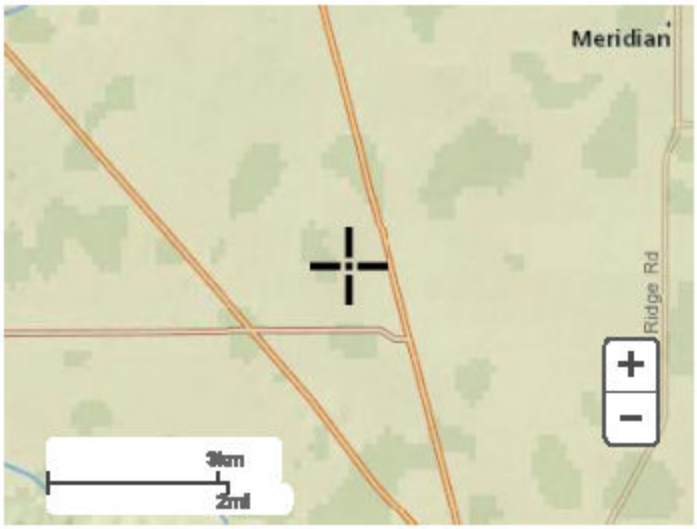
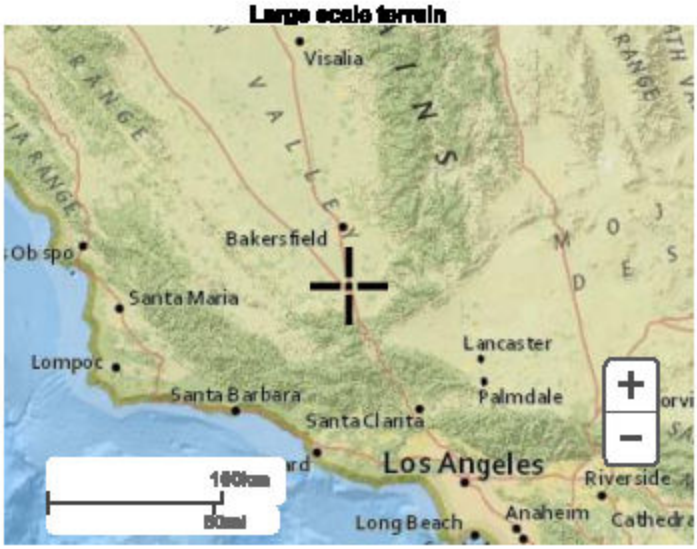
Maps & aerials

Small scale terrain

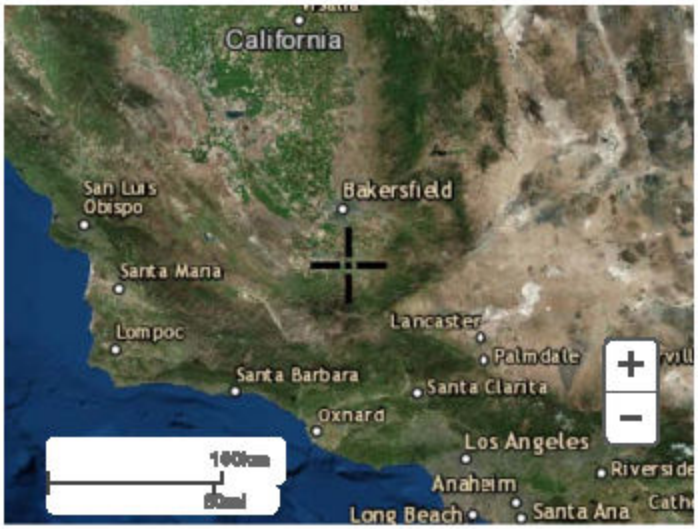


Large scale terrain



Large scale map

Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Appendix C:
Preliminary Storm Drain Pipe Sizing
For
The Tejon Indian Trust Acquisition Casino Project

Prepared For:

Analytical Environmental Services
1801 7th Street, Suite 100
Sacramento, CA 95811
Phone: (916) 447-3479
Fax: (916) 447-1665

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Purpose 65
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Maricopa Site Alternative Pipe Sizing 67
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Appendix B: Hydraflow Express Reports 71
Appendix C: Precipitation Frequency (Intensity) 79

PURPOSE

The purpose of this analysis is to size the storm drain pipe of the Tejon Casino Project. The pipes are sized to convey the 10-year, 5-day storm event with freeboard

STORM DRAIN PIPE SIZING

The storm drain pipe for the site alternatives was determined using the Rational Method and Hydraflow Express extension on AutoCAD Civil 3D, a water-control structure calculator (see Appendix C). The attached support documents describe the methodology and calculations to determine the required size of the storm drain pipe on site. The Mettler Site Alternative A1 and Alternative A2 were determined to require 18 inch storm drain pipe made of reinforced concrete pipe (RCP). The Maricopa Site Alternative was also determined to require 18 inch storm drain pipe made of reinforced concrete pipe (RCP).

The Rational Equation was used to calculate the peak flow (cubic-feet per second) of the five day storm.

Peak Flow (cfs) = ciA

Where:
c = Rational method runoff coefficient
i = Rainfall intensity (inches/hour)
Area = Drainage area of total development (sq. ft.)

For all three site layouts and storm drain systems, the sizing of the pipes was modeled using the Hydraflow Express extension on AutoCAD Civil 3D with a slope of 0.5%. The reports showing the depth of storm water in the pipes along with the velocity of the storm water.

METTLER SITE ALTERNATIVE PEAK FLOW CALCULATION

Drainage Area Designation

The two site plans for the Mettler Site have been broken down by area draining to the specified pipe (see Appendix A) and assumed to have a runoff coefficient of 0.86, which was determined to be representative of a retail area per the User's Guide for the California Impervious Surface Coefficients (ISC) published by the Office of Environmental Health Hazard Assessment of the California Environmental Protection Agency.

Peak Flow Calculations

Rational Equation

$$Q = ciA$$

$c = runoff\ coefficient$ = 0.86
$i = intensity\ of\ rainfall$ = 0.0215 in/hr = 4.98×10^{-7} ft/s
$A = drainage\ area$
(See Appendix A for drainage areas and Appendix B for intensity)

Mettler Site Plan Alternative A1

East Storm Drain Pipe

$$Q = (0.86)\left(4.98 \times \frac{10^{-7} ft}{s}\right)(660{,}680\ ft^2)$$

$$Q = 0.28\ cfs$$

North Storm Drain Pipe

$$Q = (0.86)\left(4.98 \times \frac{10^{-7} ft}{s}\right)(107{,}245\ ft^2)$$

$$Q = 0.05\ cfs$$

West Storm Drain Pipe

$$Q = (0.86)\left(4.98 \times \frac{10^{-7} ft}{s}\right)(1{,}652{,}940\ ft^2)$$

$$Q = 0.71\ cfs$$

RV Park Storm Drain Pipe

$$Q = (0.86)\left(4.98 \times \frac{10^{-7} ft}{s}\right)(1{,}106{,}960\ ft^2)$$

$$Q = 0.47\ cfs$$

Collect Storm Drain Pipe

$$Q = (0.86)\left(4.98 \times \frac{10^{-7} ft}{s}\right)(3{,}557{,}825\ ft^2)$$

$$Q = 1.52\ cf$$

Mettler Site Plan Alternative A2

East Storm Drain Pipe

$$Q = (0.86)\left(4.98 \times \frac{10^{-7} ft}{s}\right)(759{,}290\ ft^2)$$

$$Q = 0.32\ cfs$$

West Storm Drain Pipe

$$Q = (0.86)\left(4.98 \times \frac{10^{-7} ft}{s}\right)(1{,}587{,}125\ ft^2)$$

$$Q = 0.68cfs$$

Collect Storm Drain Pipe

$$Q = (0.86)\left(4.98 \times \frac{10^{-7} ft}{s}\right)(2{,}346{,}415\ ft^2)$$

$$Q = 1.05\ cfs$$

MARICOPA SITE ALTERNATIVE VOLUME STORAGE REQUIREMENT

Drainage Area Designation

The site plan for the Maricopa Site has been broken down by area draining to the specified pipe (see Appendix A) and assumed to have a runoff coefficient of 0.86, which was determined to be representative of a retail area per the User's Guide for the California Impervious Surface Coefficients (ISC) published by the Office of Environmental Health Hazard Assessment of the California Environmental Protection Agency.

Peak Flow Calculations

Rational Equation

$$Q = ciA$$

$c = runoff\ coefficient$ = 0.86
$i = intensity\ of\ rainfall$ = 0.0215 in/hr = 4.98x10^{-7} ft/s
$A = drainage\ area$
(See Appendix A for drainage areas and Appendix B for intensity)

Maricopa Site Plan Alternative

North Storm Drain Pipe

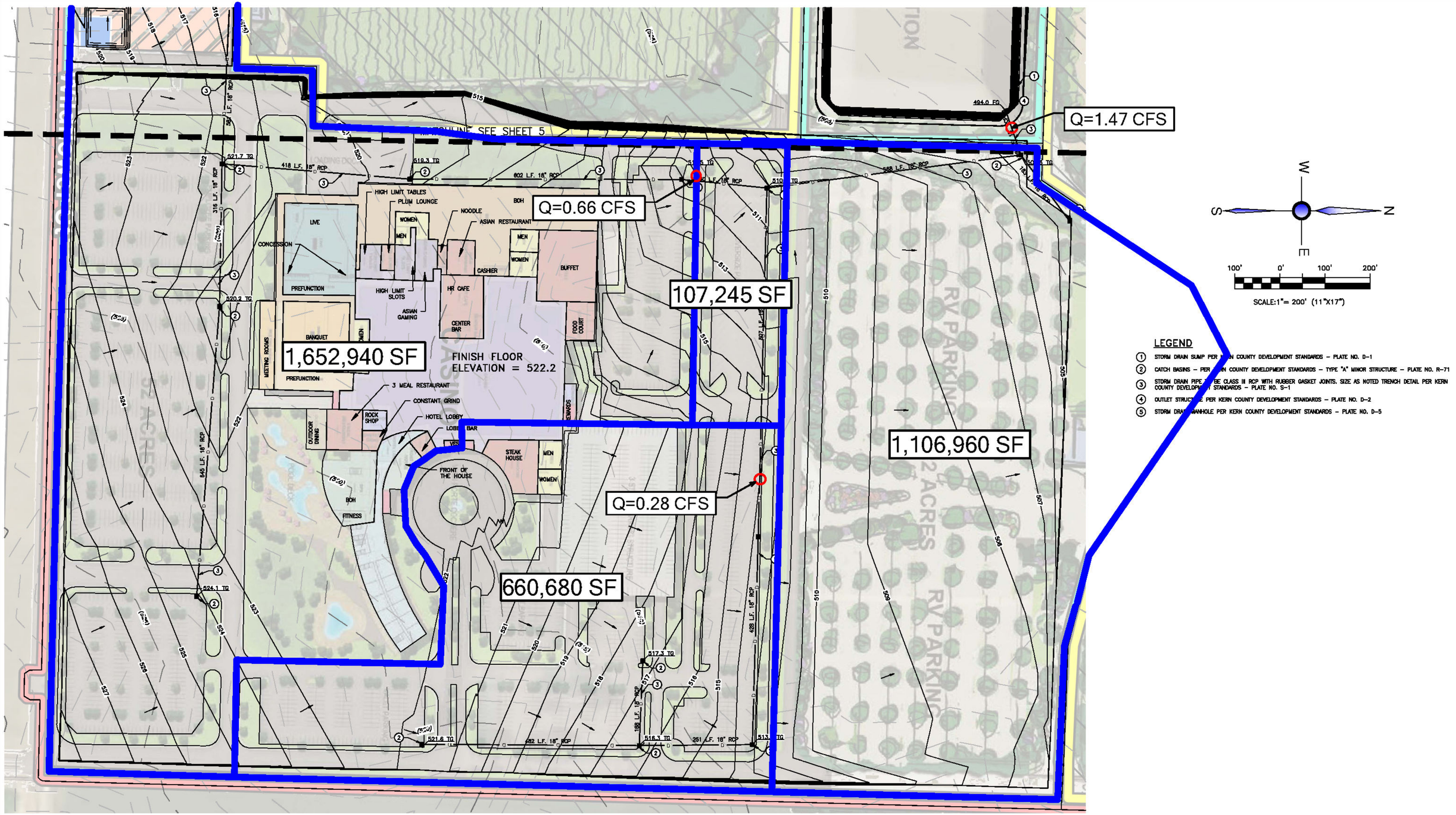
$$Q = (0.86)\left(4.98 \times \frac{10^{-7} ft}{s}\right)(1{,}522{,}950\ ft^2)$$

$$Q = 0.65\ cfs$$

West Storm Drain Pipe

$$Q = (0.86)\left(4.98 \times \frac{10^{-7} ft}{s}\right)(835{,}515\ ft^2)$$

$$Q = 0.36\ cfs$$



LEGEND

1. STORM DRAIN SUMP PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-1
2. CATCH BASINS – PER KERN COUNTY DEVELOPMENT STANDARDS – TYPE "A" MINOR STRUCTURE – PLATE NO. R-71
3. STORM DRAIN PIPE TO BE CLASS III RCP WITH RUBBER GASKET JOINTS. SIZE AS NOTED TRENCH DETAIL PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. S-1
4. OUTLET STRUCTURE PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-2
5. STORM DRAIN MANHOLE PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-5

DWG NUMBER	TITLE
	REFERENCE DRAWINGS

DIVERSIFIED PROJECT SERVICES INTERNATIONAL
San Luis Obispo (805) 250-2981 Bakersfield, CA (661) 371-2800 Long Beach (562) 434-8400

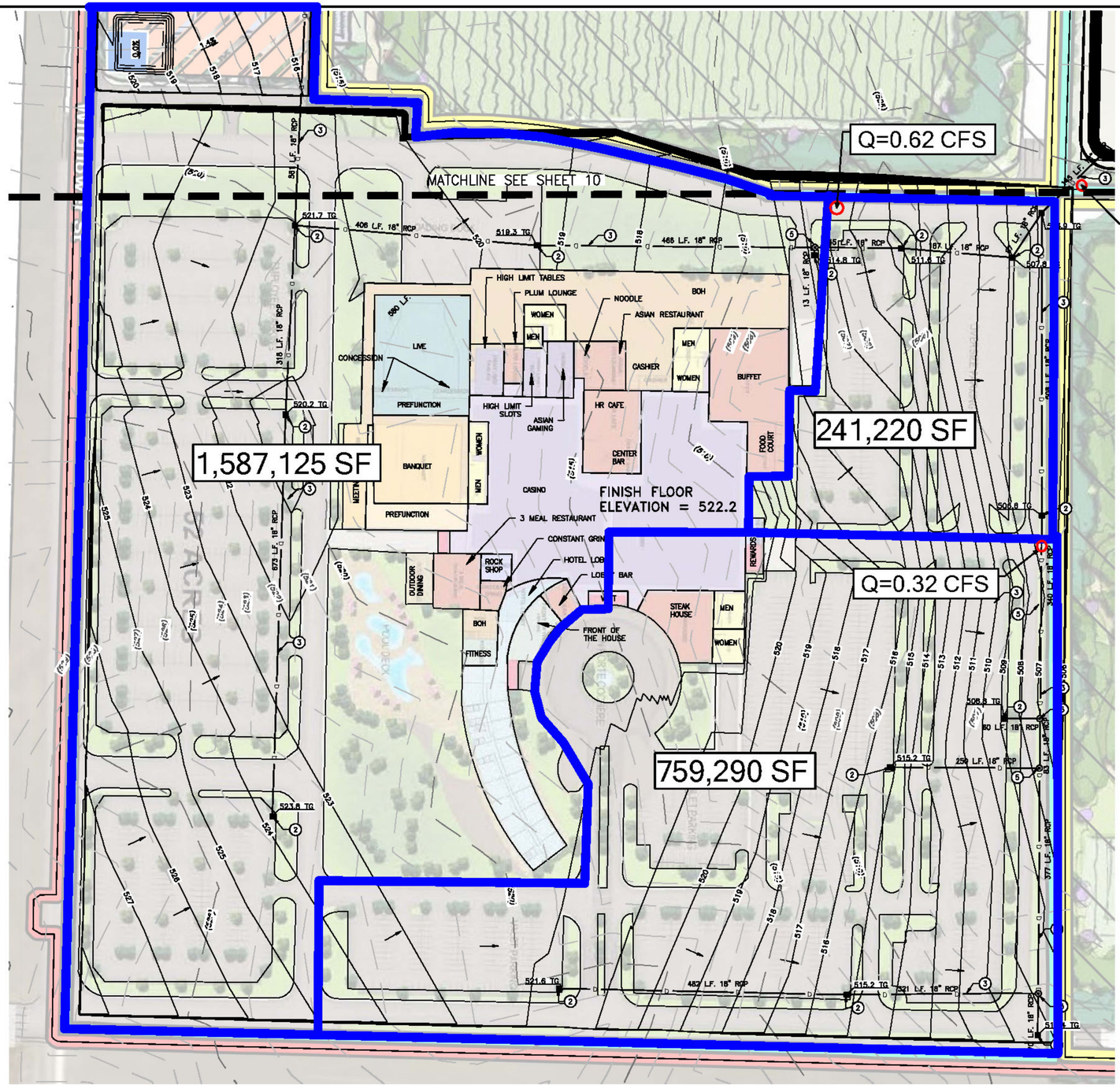
PROJECT: 181059
www.dpsiinc.com

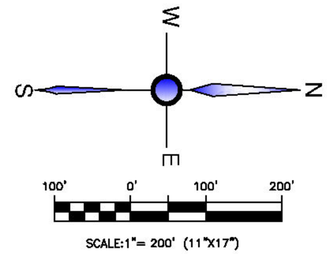
DATE	DESCRIPTION	BY	CKD.	APPR
03/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
05/22/19	ISSUED FOR REVIEW	EP	RJ	LAL

METTLER SITE A1- DRAINAGE PLAN

THE TEJON INDIAN TRUST ACQUISITION CASINO PROJECT
METTLER SITE A1&A2
MARICOPA SITE
COUNTY OF KERN, STATE OF CALIFORNIA

ENGINEER:	LAL	DATE: 05.22.2019	SCALE: AS SHOWN	
CO. SURVEYOR:	DPSI, INC.	ORIGINAL DWG NO.		
PROJ. MGR:	LAL	NO. 4		REV.
COMPILED BY:	RJ			A
DOCUMENT TYPE:	EXHIBIT	CAD FILE NO. CE181059-SD-003A.dwg		





SCALE:1"= 200' (11"X17")

LEGEND

1. STORM DRAIN SUMP PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-1
2. CATCH BASINS – PER KERN COUNTY DEVELOPMENT STANDARDS – TYPE "A" MINOR STRUCTURE – PLATE NO. R-71
3. STORM DRAIN PIPE TO BE CLASS III RCP WITH RUBBER GASKET JOINTS. SIZE AS NOTED TRENCH DETAIL PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. S-1
4. OUTLET STRUCTURE PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-2
5. STORM DRAIN MANHOLE PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-5

DWG NUMBER	TITLE
	REFERENCE DRAWINGS

DIVERSIFIED PROJECT SERVICES INTERNATIONAL
San Luis Obispo (805) 239-2991 | Bakersfield, CA (661) 371-2800 | Long Beach (562) 494-8400

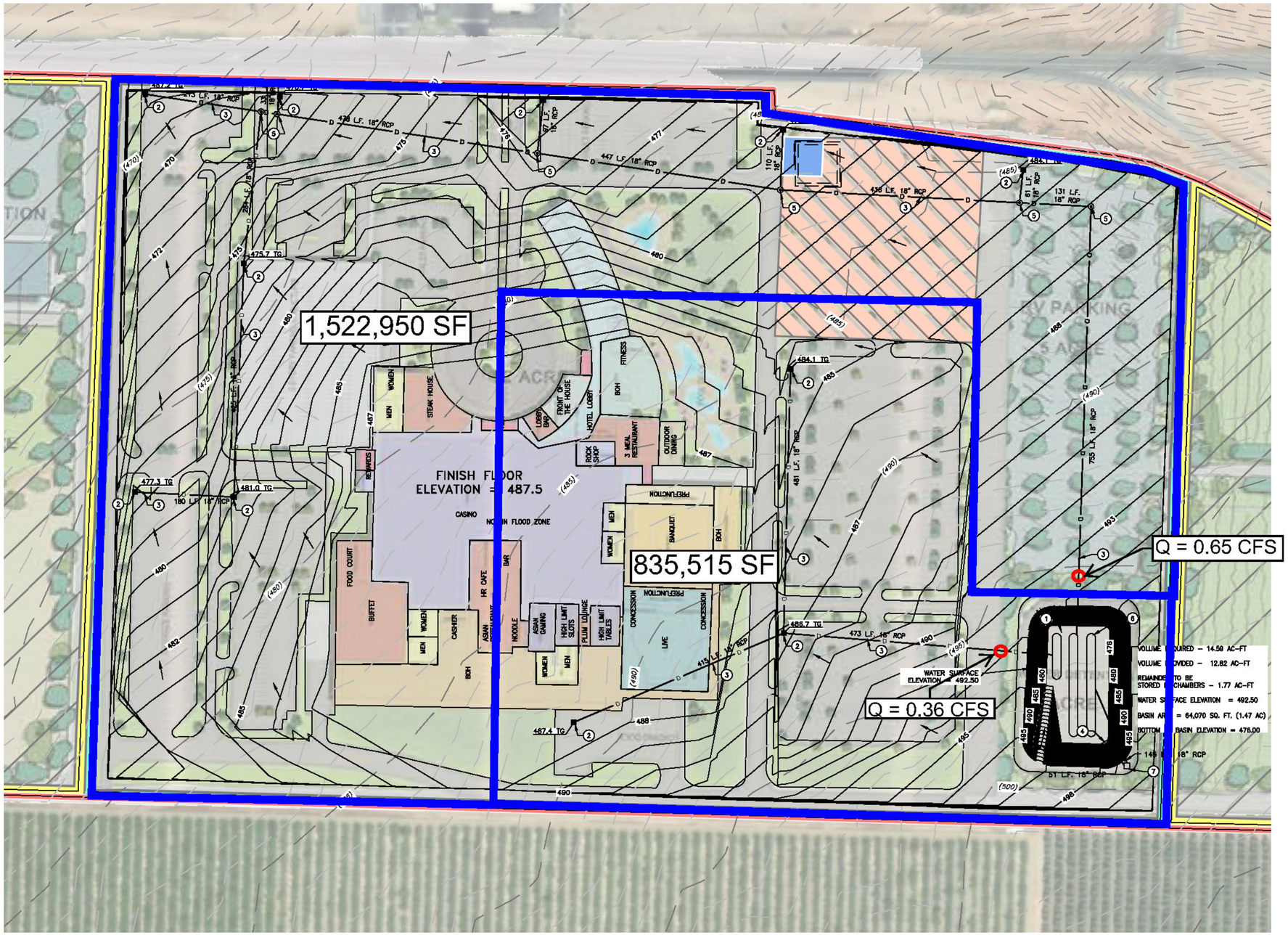
PROJECT: 181059
www.dpsiinc.com

DATE	DESCRIPTION	BY	CKD.	APPR
03/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
05/22/19	ISSUED FOR REVIEW	EP	RJ	LAL

METTLER SITE A2- DRAINAGE PLAN

THE TEJON INDIAN TRUST ACQUISITION CASINO PROJECT
METTLER SITE A1&A2
MARICOPA SITE
COUNTY OF KERN, STATE OF CALIFORNIA

ENGINEER:	LAL	DATE: 05.22.2019	SCALE: AS SHOWN
CO. SURVEYOR:	DPSI, INC.	ORIGINAL DWG NO.	
PROJ. MGR:	LAL	NO. 9	REV. A
COMPILED BY:	RJ		
DOCUMENT TYPE:	EXHIBIT	CAD FILE NO. CE181059-SD-003B.dwg	



LEGEND

1. STORM DRAIN SUMP PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-1
2. CATCH BASINS – PER KERN COUNTY DEVELOPMENT STANDARDS – TYPE "A" MINOR STRUCTURE – PLATE NO. R-71
3. STORM DRAIN PIPE TO BE CLASS III RCP WITH RUBBER GASKET JOINTS. SIZE AS NOTED TRENCH DETAIL PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. S-1
4. OUTLET STRUCTURE PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-2
5. STORM DRAIN MANHOLE PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-5
6. 1.77 AC-FT UNDERGROUND DETENTION CHAMBERS
7. DUPLEX PUMPS PER KERN COUNTY HYDROLOGY MANUAL REQUIREMENTS

DWG NUMBER	TITLE
	REFERENCE DRAWINGS

DIVERSIFIED PROJECT SERVICES INTERNATIONAL
San Luis Obispo (805) 256-2601 Bakersfield, CA (661) 371-3500 Long Beach (562) 424-6400

PROJECT: 181059
www.dpsiinc.com

DATE	DESCRIPTION	BY	CKD.	APPR
03/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
05/22/19	ISSUED FOR PERMIT	EP	RJ	LAL

MARICOPA- DRAINAGE PLAN

THE TEJON INDIAN TRUST ACQUISITION CASINO PROJECT
METTLER SITE A1&A2
MARICOPA SITE
COUNTY OF KERN, STATE OF CALIFORNIA

ENGINEER:	LAL	DATE: 05.22.2019	SCALE: AS SHOWN
CO. SURVEYOR:	DPSI, INC.	ORIGINAL DWG NO.	
PROJ. MGR:	LAL	NO. 13	REV. A
COMPILED BY:	RJ		
DOCUMENT TYPE:	EXHIBIT	CAD FILE NO. CE181059-SD-001A.dwg	

Channel Report

Mettler Alternative A1 East

Circular

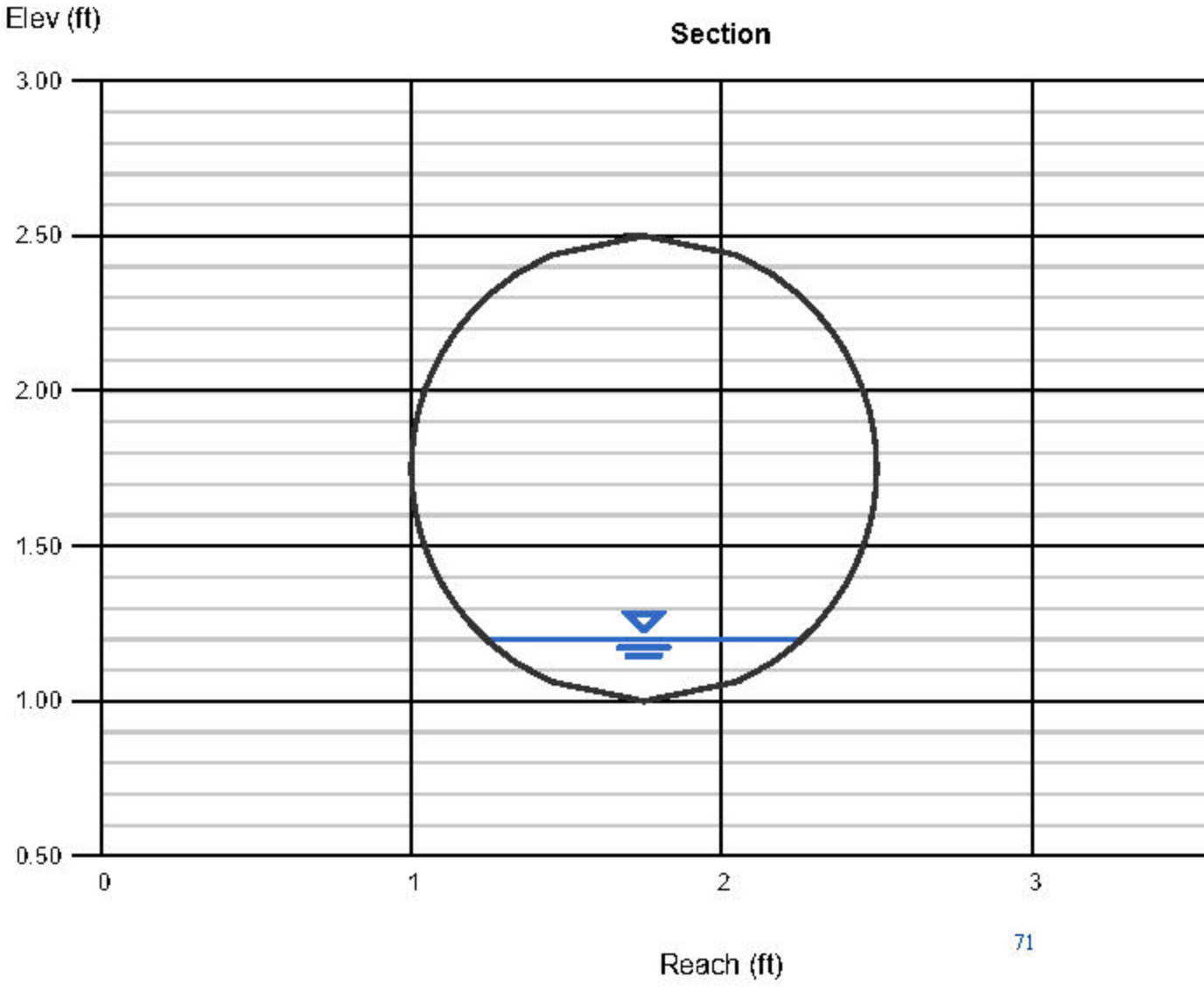
Diameter (ft)	= 1.50
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 0.28

Highlighted

Depth (ft)	= 0.20
Q (cfs)	= 0.280
Area (sqft)	= 0.14
Velocity (ft/s)	= 1.98
Wetted Perim (ft)	= 1.12
Crit Depth, Yc (ft)	= 0.20
Top Width (ft)	= 1.02
EGL (ft)	= 0.26



Channel Report

Mettler Alternative A1 West

Circular

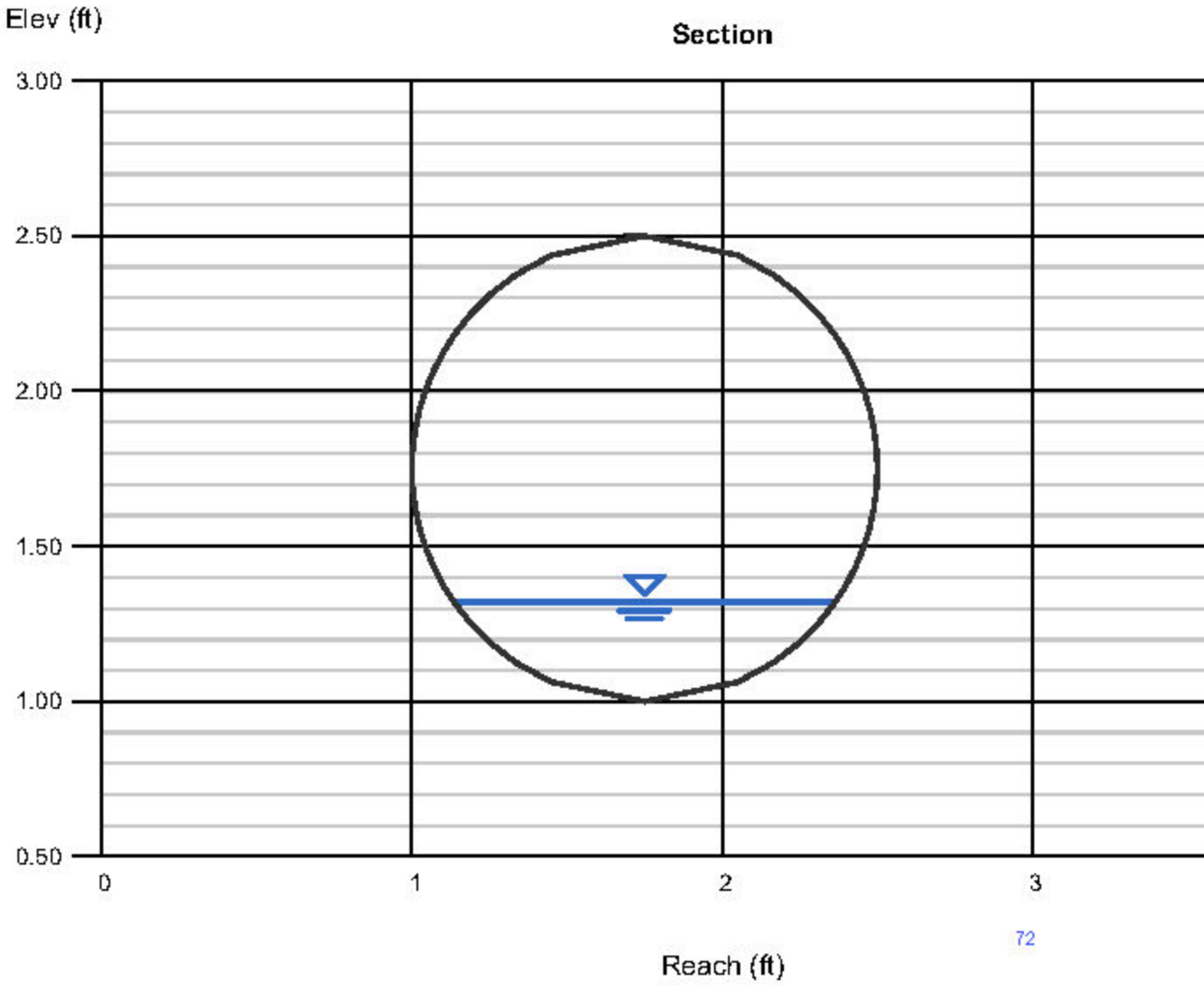
Diameter (ft)	= 1.50
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 0.71

Highlighted

Depth (ft)	= 0.32
Q (cfs)	= 0.710
Area (sqft)	= 0.28
Velocity (ft/s)	= 2.54
Wetted Perim (ft)	= 1.45
Crit Depth, Yc (ft)	= 0.32
Top Width (ft)	= 1.23
EGL (ft)	= 0.42



Channel Report

Mettler Alternative A1 Casino Collect

Circular

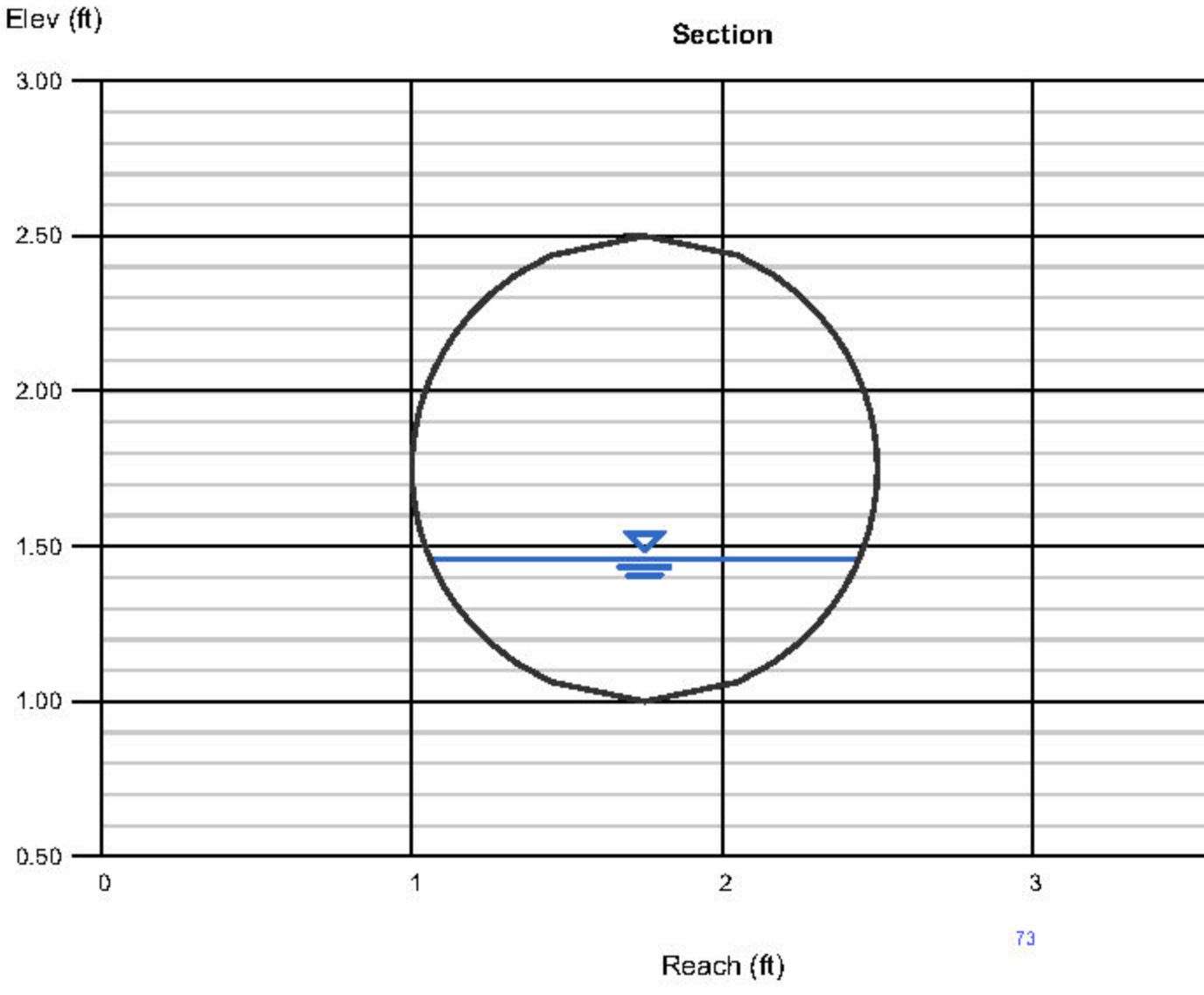
Diameter (ft)	= 1.50
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 1.52

Highlighted

Depth (ft)	= 0.46
Q (cfs)	= 1.520
Area (sqft)	= 0.46
Velocity (ft/s)	= 3.30
Wetted Perim (ft)	= 1.76
Crit Depth, Yc (ft)	= 0.47
Top Width (ft)	= 1.38
EGL (ft)	= 0.63



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Wednesday, Mar 6 2019

Mettler Alternative A2 Storm Drain East

Circular

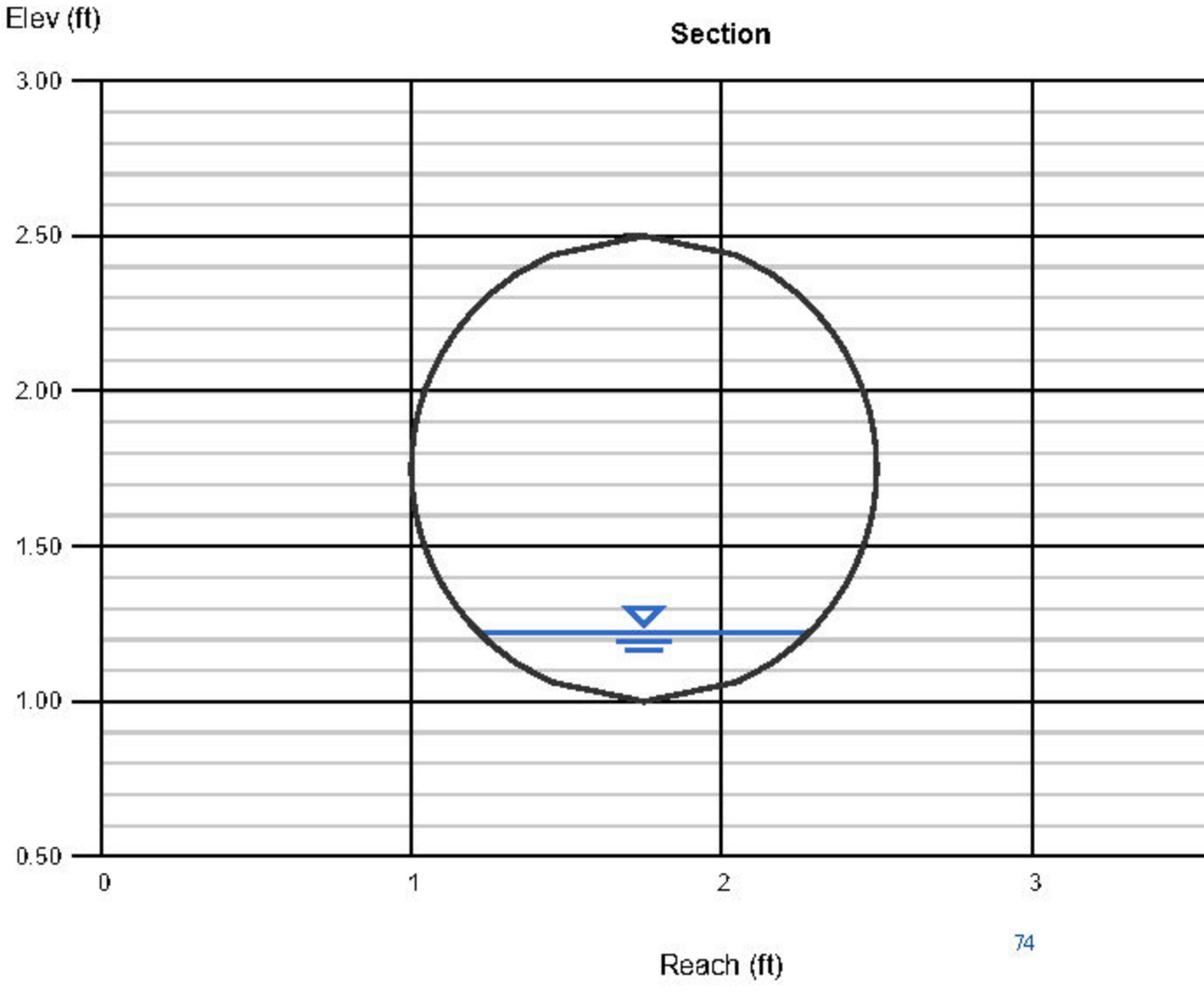
Diameter (ft)	= 1.50
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 0.32

Highlighted

Depth (ft)	= 0.22
Q (cfs)	= 0.320
Area (sqft)	= 0.16
Velocity (ft/s)	= 1.96
Wetted Perim (ft)	= 1.18
Crit Depth, Yc (ft)	= 0.21
Top Width (ft)	= 1.07
EGL (ft)	= 0.28



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, May 20 2019

Mettler Alternative A2 Storm Drain West

Circular

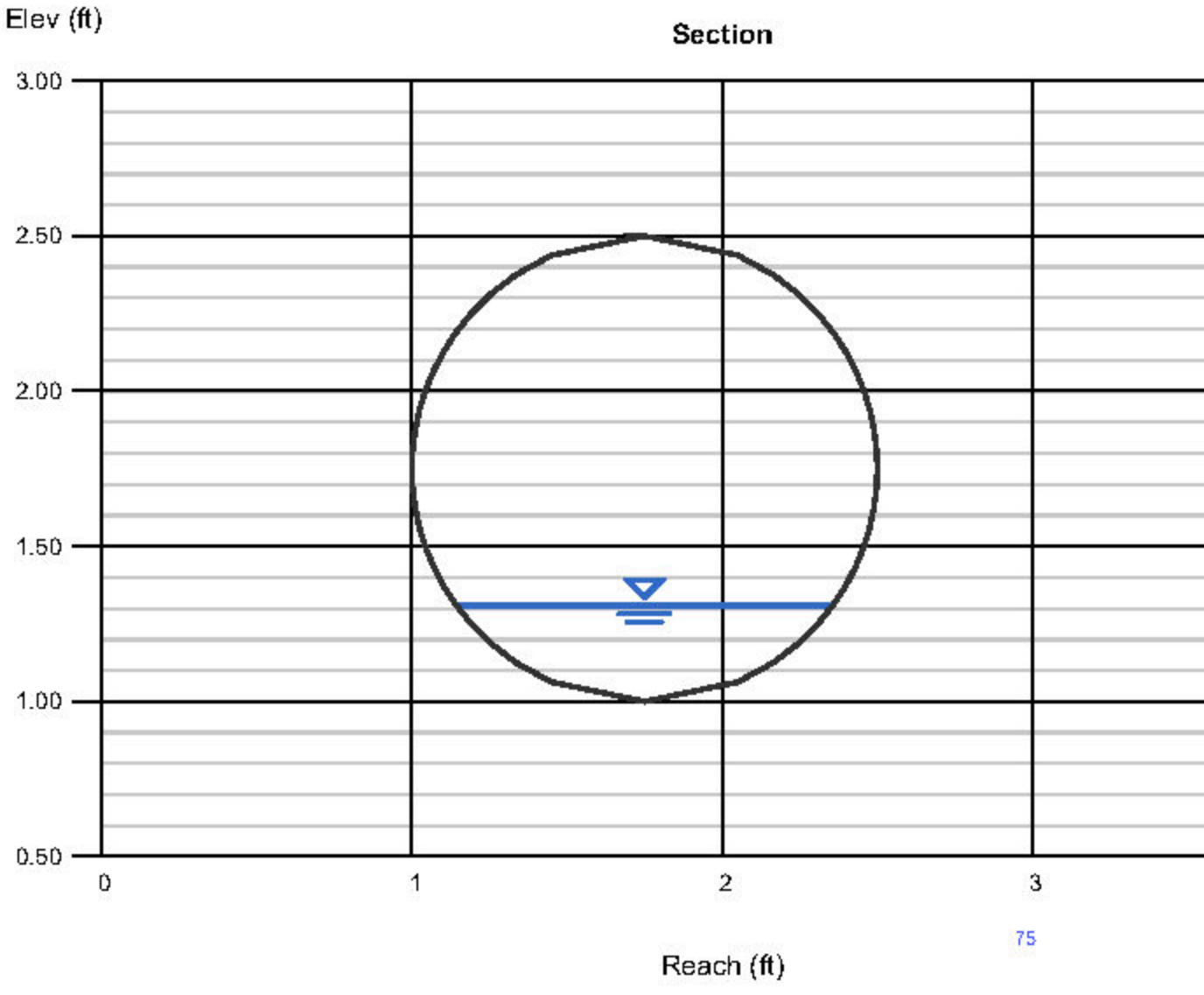
Diameter (ft)	= 1.50
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 0.68

Highlighted

Depth (ft)	= 0.31
Q (cfs)	= 0.680
Area (sqft)	= 0.26
Velocity (ft/s)	= 2.57
Wetted Perim (ft)	= 1.42
Crit Depth, Yc (ft)	= 0.31
Top Width (ft)	= 1.22
EGL (ft)	= 0.41



Channel Report

Mettler Alternative A2 Casino Collect

Circular

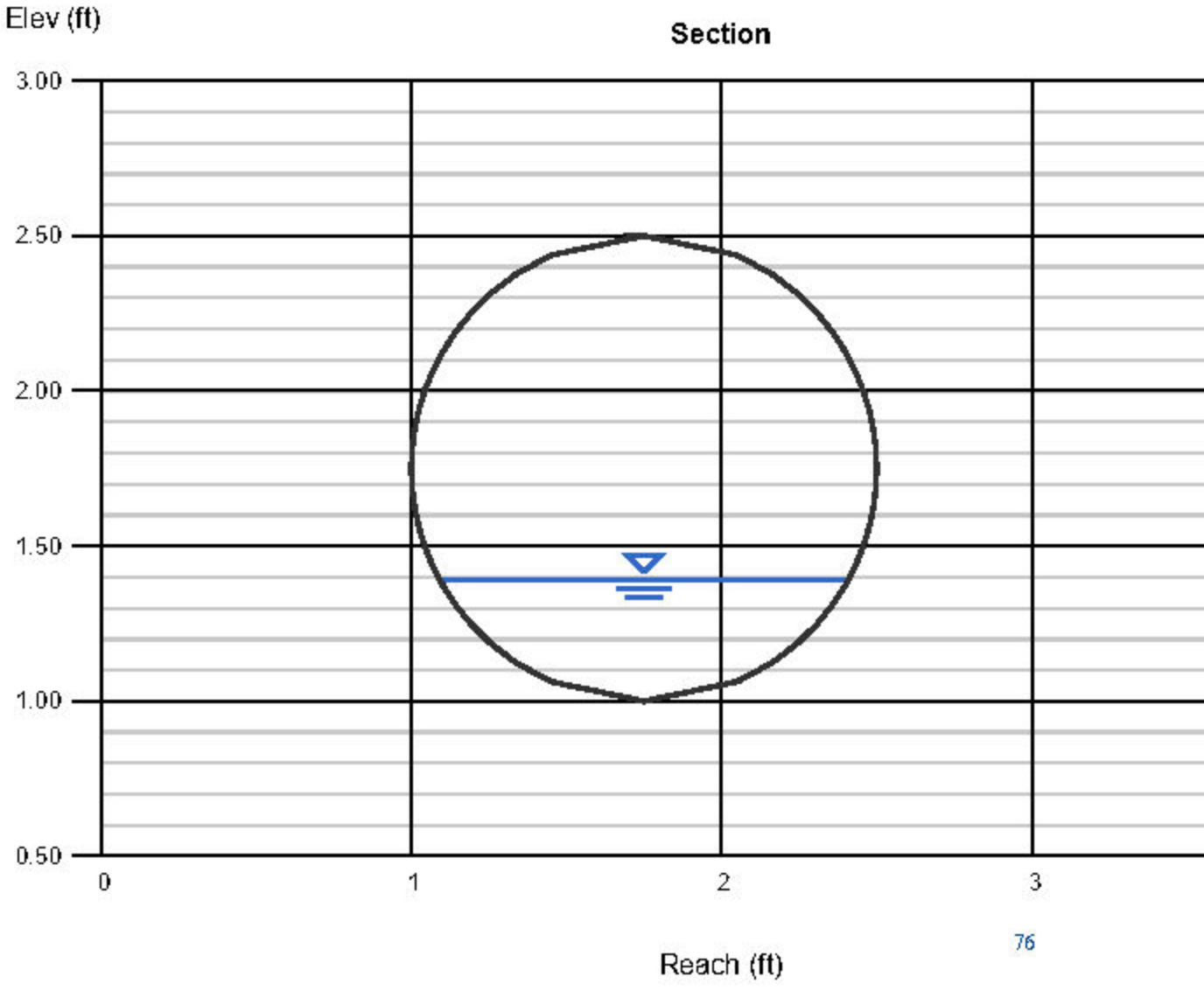
Diameter (ft)	= 1.50
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 1.05

Highlighted

Depth (ft)	= 0.39
Q (cfs)	= 1.050
Area (sqft)	= 0.37
Velocity (ft/s)	= 2.84
Wetted Perim (ft)	= 1.61
Crit Depth, Yc (ft)	= 0.39
Top Width (ft)	= 1.32
EGL (ft)	= 0.52



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Wednesday, Mar 6 2019

Maricopa Storm Drain Pipe North

Circular

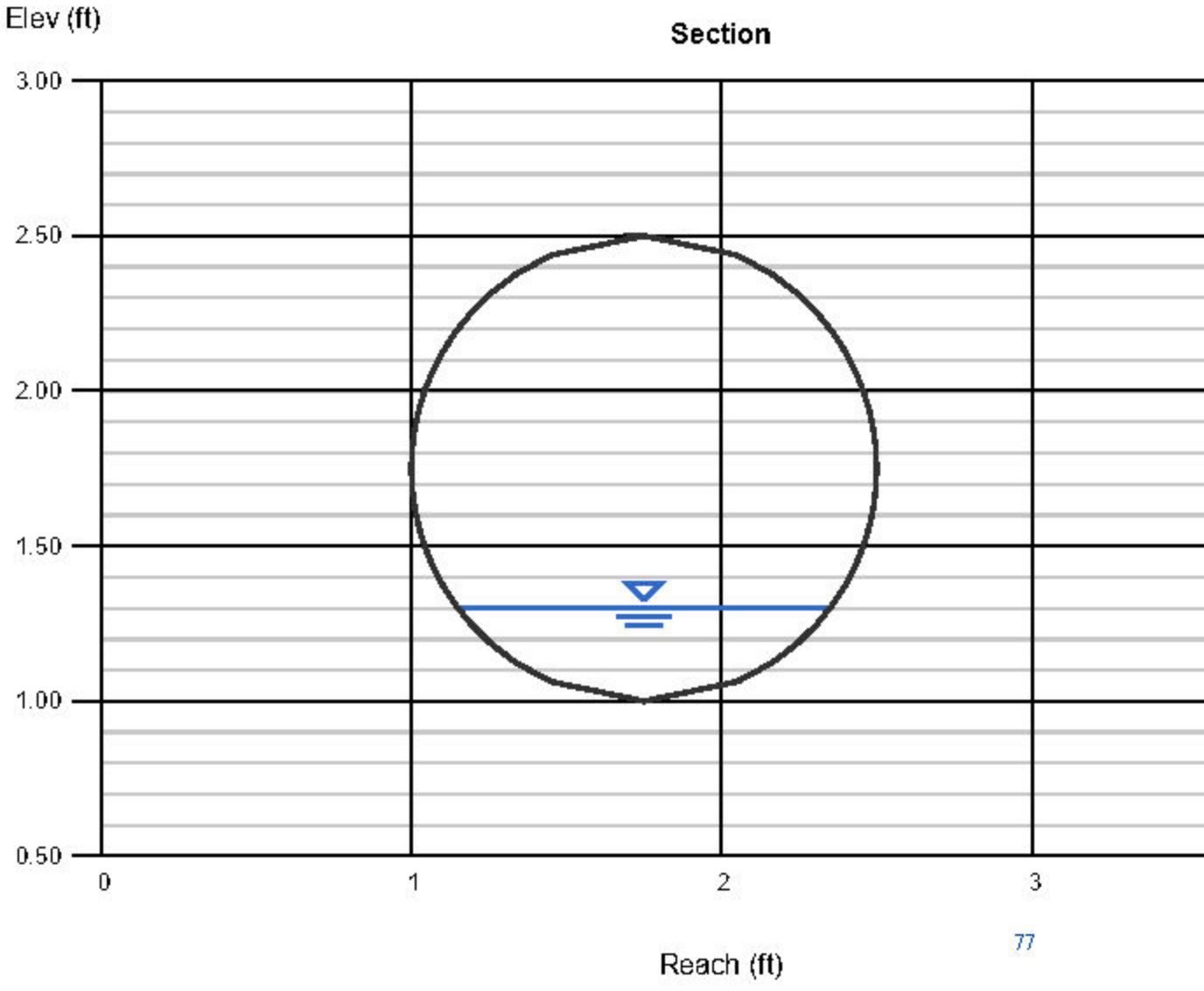
Diameter (ft)	= 1.50
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 0.65

Highlighted

Depth (ft)	= 0.30
Q (cfs)	= 0.650
Area (sqft)	= 0.25
Velocity (ft/s)	= 2.56
Wetted Perim (ft)	= 1.39
Crit Depth, Yc (ft)	= 0.30
Top Width (ft)	= 1.20
EGL (ft)	= 0.40



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Wednesday, Mar 6 2019

Maricopa Storm Drain Pipe South

Circular

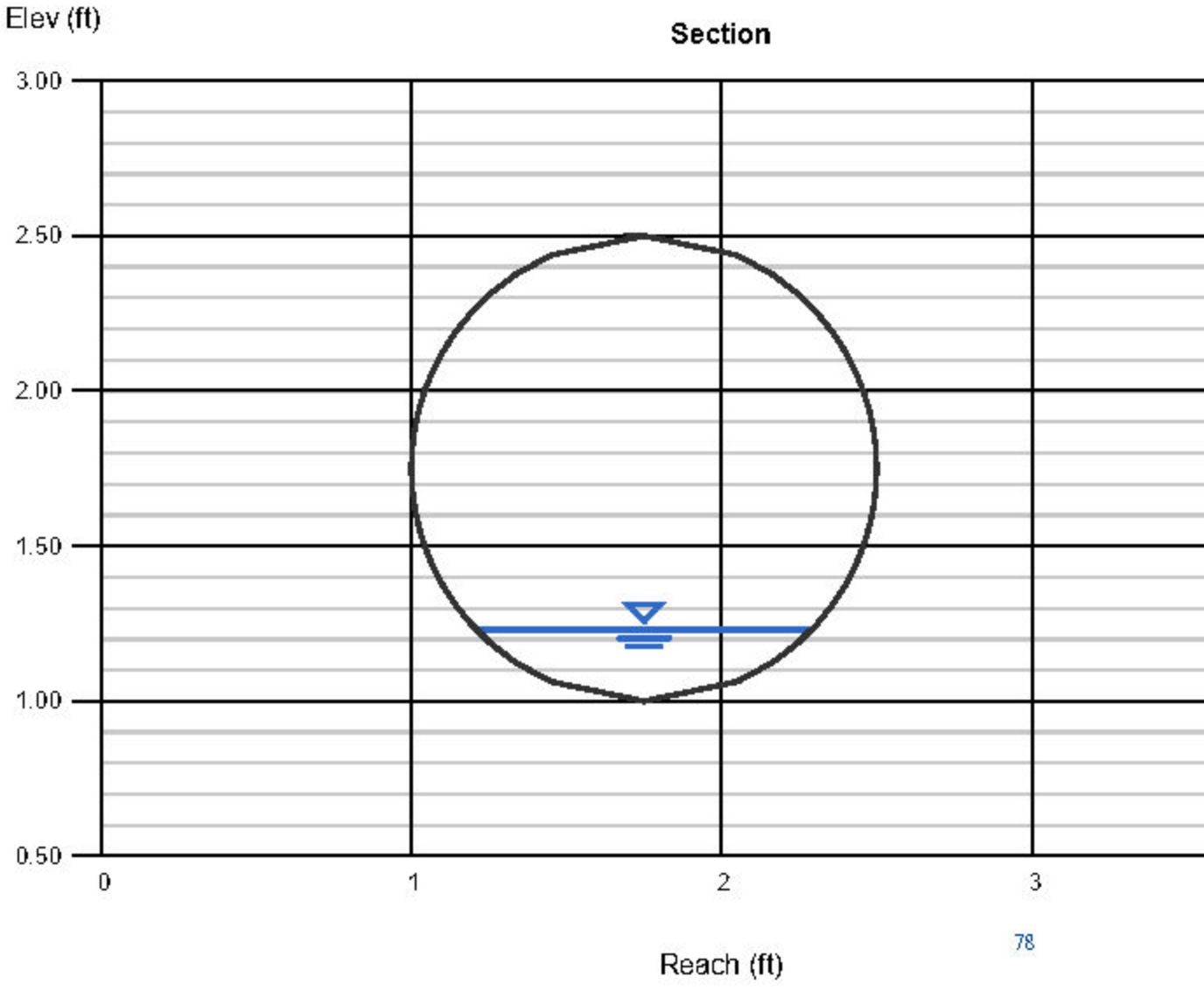
Diameter (ft)	= 1.50
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 0.36

Highlighted

Depth (ft)	= 0.23
Q (cfs)	= 0.360
Area (sqft)	= 0.17
Velocity (ft/s)	= 2.10
Wetted Perim (ft)	= 1.21
Crit Depth, Yc (ft)	= 0.22
Top Width (ft)	= 1.08
EGL (ft)	= 0.30



NOAA Atlas 14, Volume 6, Version 2
Location name: Bakersfield, California, USA*
Latitude: 35.0697°, Longitude: -118.98°
Elevation: 394.8 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF tabular | PF graphical | Maps & aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.744 (0.600-0.924)	0.972 (0.780-1.22)	1.32 (1.06-1.66)	1.62 (1.30-2.05)	2.08 (1.61-2.71)	2.46 (1.87-3.28)	2.88 (2.14-3.91)	3.34 (2.42-4.66)	4.02 (2.81-5.82)	4.66 (3.10-6.86)
10-min	0.528 (0.426-0.656)	0.782 (0.564-0.976)	0.948 (0.762-1.19)	1.16 (0.930-1.45)	1.49 (1.16-1.94)	1.76 (1.34-2.35)	2.06 (1.53-2.81)	2.39 (1.73-3.34)	2.88 (2.01-4.17)	3.29 (2.22-4.91)
15-min	0.428 (0.344-0.536)	0.564 (0.452-0.706)	0.764 (0.612-0.960)	0.936 (0.748-1.19)	1.20 (0.926-1.57)	1.42 (1.08-1.89)	1.66 (1.24-2.26)	1.93 (1.40-2.69)	2.32 (1.62-3.36)	2.65 (1.79-3.96)
30-min	0.302 (0.244-0.378)	0.400 (0.322-0.500)	0.548 (0.434-0.680)	0.664 (0.530-0.842)	0.850 (0.656-1.11)	1.01 (0.764-1.34)	1.18 (0.874-1.60)	1.37 (0.980-1.91)	1.64 (1.15-2.36)	1.88 (1.27-2.80)
60-min	0.213 (0.172-0.267)	0.281 (0.225-0.353)	0.381 (0.306-0.478)	0.467 (0.373-0.592)	0.589 (0.463-0.761)	0.706 (0.536-0.942)	0.829 (0.615-1.13)	0.962 (0.687-1.34)	1.16 (0.808-1.66)	1.32 (0.894-1.96)
2-hr	0.159 (0.128-0.200)	0.206 (0.168-0.258)	0.272 (0.219-0.343)	0.330 (0.263-0.418)	0.414 (0.320-0.540)	0.493 (0.367-0.642)	0.557 (0.414-0.758)	0.636 (0.461-0.888)	0.750 (0.524-1.09)	0.842 (0.570-1.26)
3-hr	0.130 (0.105-0.163)	0.167 (0.135-0.210)	0.219 (0.178-0.276)	0.264 (0.210-0.335)	0.329 (0.254-0.429)	0.382 (0.290-0.508)	0.438 (0.326-0.596)	0.498 (0.360-0.694)	0.591 (0.408-0.842)	0.668 (0.438-0.998)
6-hr	0.089 (0.069-0.108)	0.111 (0.089-0.139)	0.144 (0.118-0.181)	0.173 (0.139-0.219)	0.213 (0.166-0.278)	0.245 (0.186-0.326)	0.278 (0.207-0.379)	0.313 (0.227-0.437)	0.362 (0.253-0.525)	0.400 (0.270-0.597)
12-hr	0.053 (0.042-0.068)	0.069 (0.056-0.087)	0.092 (0.074-0.115)	0.110 (0.088-0.140)	0.136 (0.105-0.178)	0.156 (0.119-0.208)	0.177 (0.131-0.240)	0.198 (0.143-0.278)	0.228 (0.158-0.328)	0.248 (0.167-0.370)
24-hr	0.033 (0.030-0.037)	0.046 (0.041-0.051)	0.061 (0.055-0.069)	0.074 (0.066-0.085)	0.091 (0.078-0.109)	0.105 (0.088-0.128)	0.118 (0.096-0.148)	0.132 (0.104-0.171)	0.151 (0.114-0.206)	0.166 (0.120-0.233)
2-day	0.019 (0.017-0.021)	0.026 (0.024-0.030)	0.036 (0.033-0.041)	0.044 (0.039-0.051)	0.055 (0.047-0.066)	0.063 (0.053-0.077)	0.072 (0.058-0.090)	0.080 (0.063-0.104)	0.091 (0.069-0.124)	0.100 (0.072-0.140)
3-day	0.014 (0.012-0.015)	0.019 (0.017-0.022)	0.027 (0.024-0.030)	0.033 (0.029-0.038)	0.041 (0.035-0.049)	0.047 (0.040-0.058)	0.054 (0.044-0.067)	0.060 (0.048-0.078)	0.069 (0.052-0.093)	0.076 (0.055-0.105)
4-day	0.011 (0.010-0.012)	0.015 (0.014-0.017)	0.022 (0.018-0.025)	0.027 (0.024-0.031)	0.034 (0.029-0.040)	0.039 (0.032-0.047)	0.044 (0.036-0.055)	0.050 (0.039-0.064)	0.057 (0.043-0.077)	0.062 (0.045-0.088)
7-day	0.007 (0.006-0.008)	0.010 (0.009-0.011)	0.014 (0.013-0.016)	0.018 (0.016-0.020)	0.023 (0.019-0.027)	0.026 (0.022-0.032)	0.030 (0.024-0.038)	0.034 (0.027-0.044)	0.039 (0.029-0.053)	0.042 (0.031-0.060)
10-day	0.005 (0.005-0.006)	0.007 (0.007-0.008)	0.011 (0.010-0.012)	0.014 (0.012-0.015)	0.017 (0.015-0.021)	0.020 (0.017-0.025)	0.023 (0.019-0.029)	0.026 (0.021-0.034)	0.031 (0.023-0.041)	0.034 (0.024-0.047)
20-day	0.003 (0.003-0.003)	0.005 (0.004-0.005)	0.007 (0.006-0.008)	0.009 (0.008-0.010)	0.011 (0.010-0.013)	0.013 (0.011-0.016)	0.016 (0.013-0.020)	0.018 (0.014-0.023)	0.021 (0.016-0.028)	0.023 (0.017-0.033)
30-day	0.002 (0.002-0.003)	0.003 (0.003-0.004)	0.005 (0.005-0.006)	0.007 (0.006-0.008)	0.009 (0.008-0.011)	0.011 (0.009-0.013)	0.013 (0.010-0.016)	0.015 (0.012-0.019)	0.017 (0.013-0.023)	0.019 (0.014-0.027)
45-day	0.002 (0.002-0.002)	0.003 (0.003-0.003)	0.004 (0.004-0.005)	0.005 (0.005-0.006)	0.007 (0.006-0.009)	0.009 (0.007-0.011)	0.010 (0.009-0.013)	0.012 (0.010-0.016)	0.014 (0.011-0.020)	0.015 (0.012-0.023)
60-day	0.002 (0.001-0.002)	0.002 (0.002-0.003)	0.004 (0.003-0.004)	0.005 (0.004-0.005)	0.006 (0.005-0.007)	0.008 (0.006-0.009)	0.009 (0.007-0.011)	0.011 (0.008-0.014)	0.013 (0.010-0.017)	0.014 (0.010-0.020)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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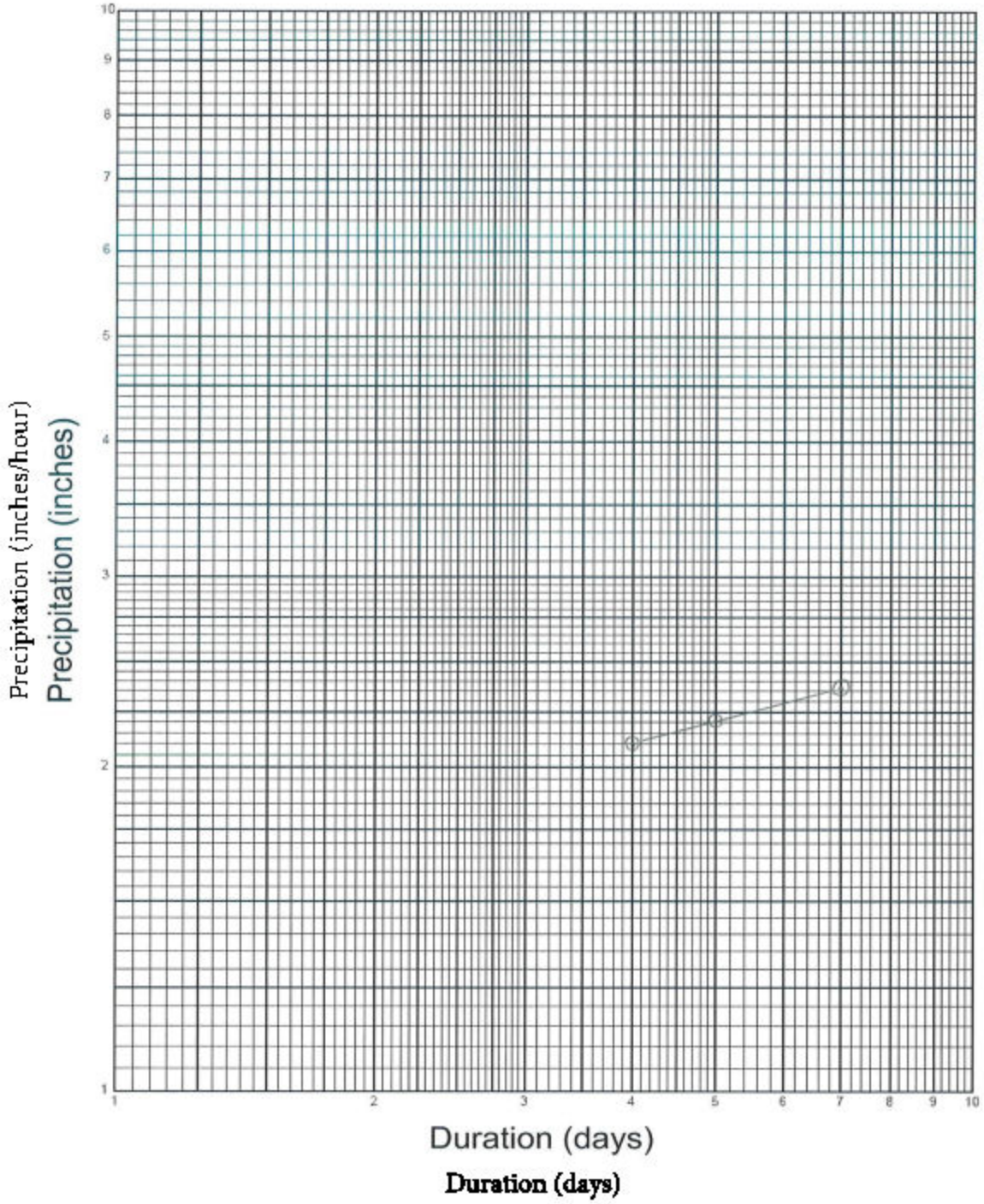
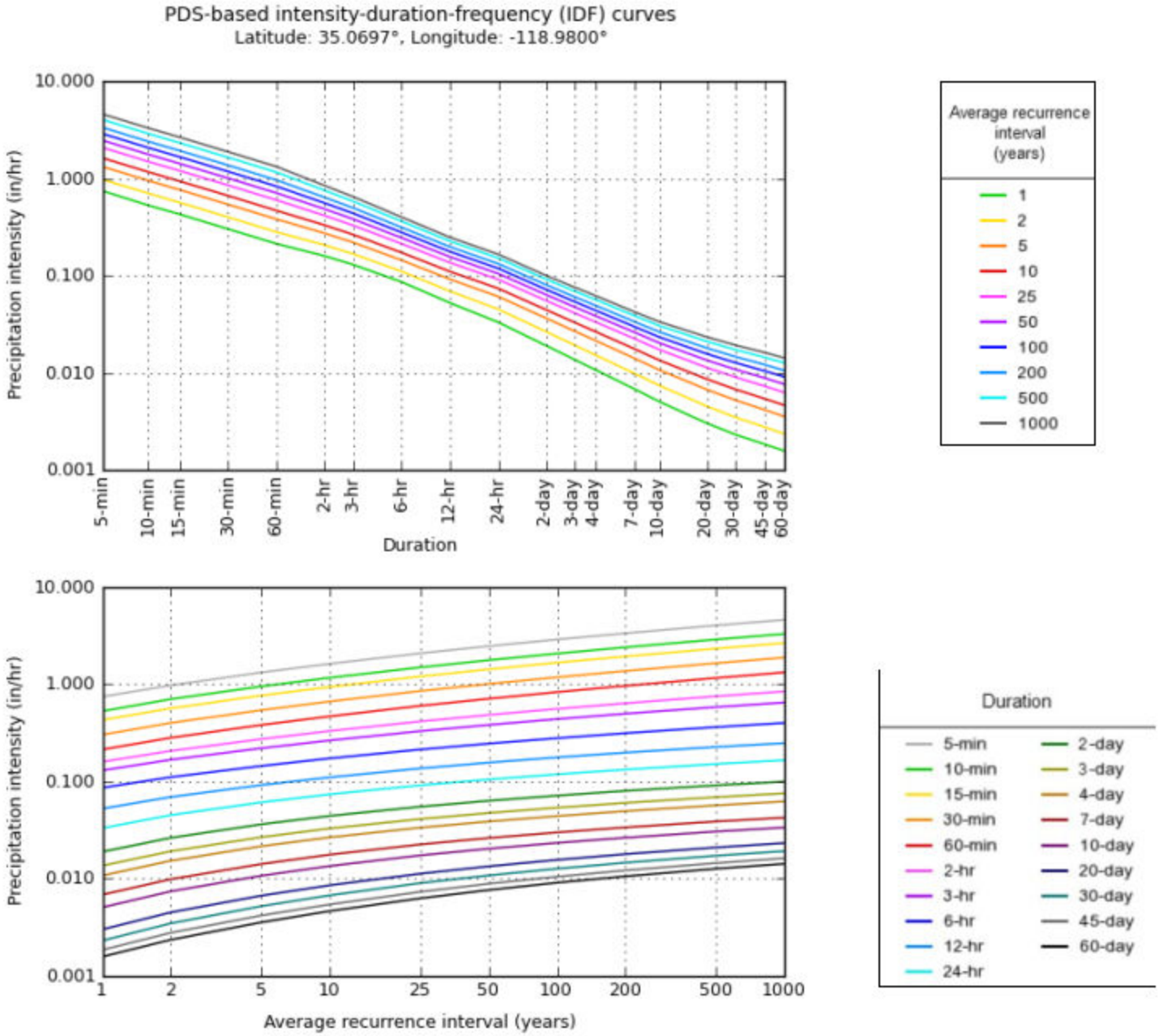
6) Select 10yr 4day rainfall depth – **2.10** and 10yr 7 day rainfall depth – **2.36**
7) Plot points on log–log graph paper.



Duration (days)

8) Read the solution for the 10 yr 5 day depth of rainfall– **2.20 inches**

PF graphical



NOAA Atlas 14, Volume 6, Version 2

Created (GMT): Wed Mar 6 21:53:11 2019

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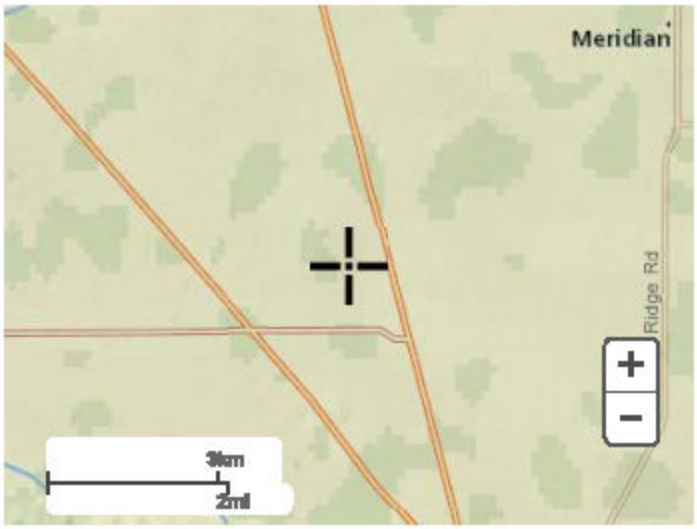
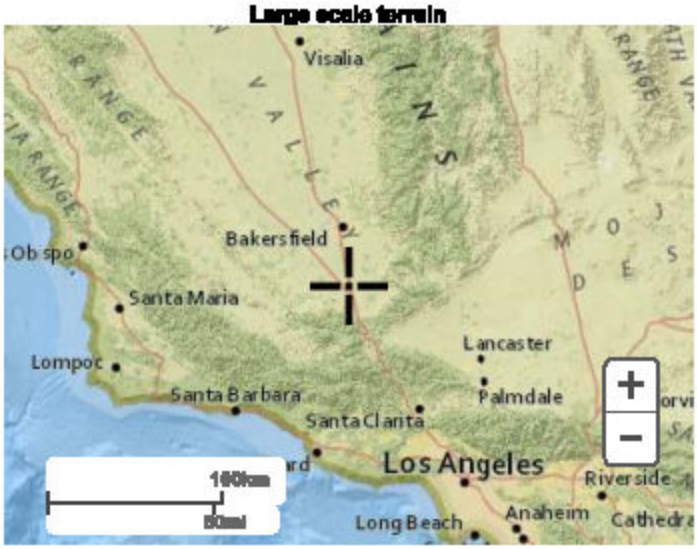
Maps & aerials

Small scale terrain

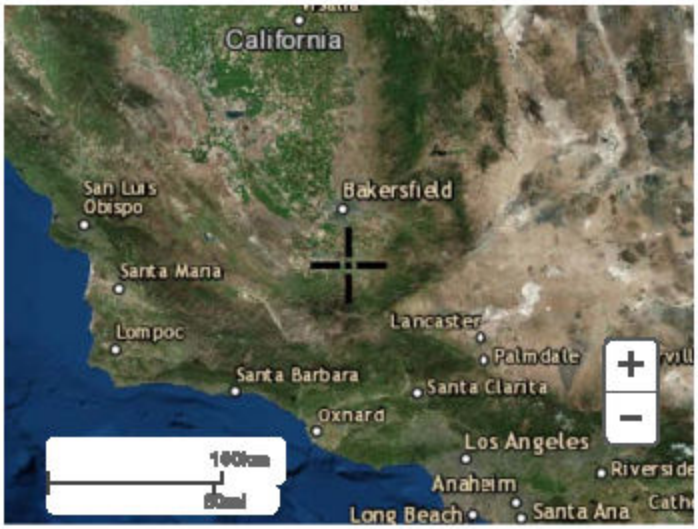


Large scale terrain



Large scale map

Large scale aerial

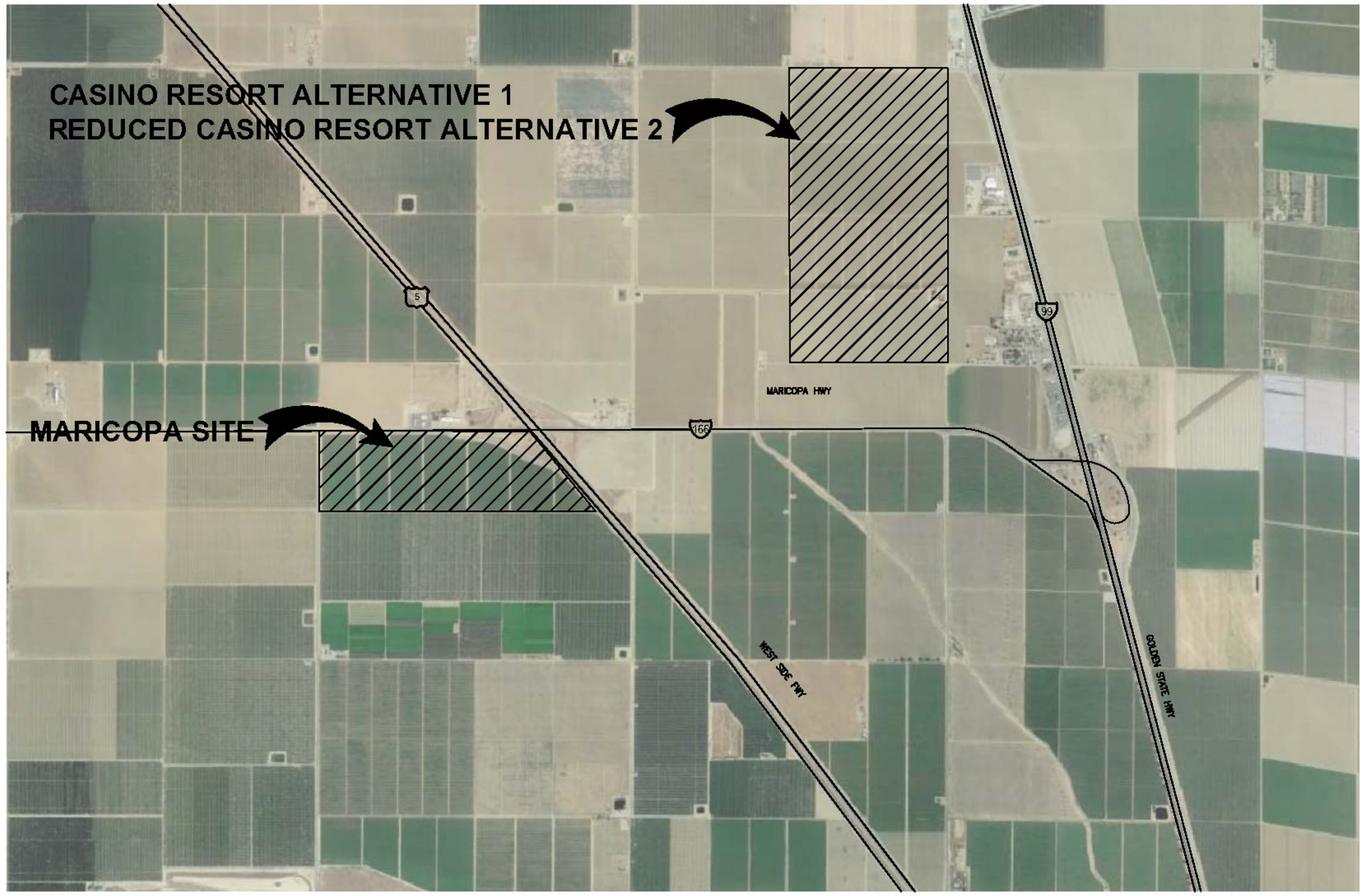


Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

COUNTY OF KERN, STATE OF CALIFORNIA
CONCEPTUAL GRADING AND DRAINAGE PLANS
FOR
THE TEJON INDIAN TRUST ACQUISITION CASINO PROJECT
METTLER SITE A1&A2
MARICOPA SITE



SHEET LIST TABLE

SHEET NO.	REV.	DESCRIPTION
1	A	TITLE SHEET
2	A	METTLER SITE A1- GRADING
3	A	METTLER SITE A1- GRADING PLAN CONT.
4	A	METTLER SITE A1- DRAINAGE PLAN
5	A	METTLER SITE A1- DRAINAGE PLAN CONT.
6	A	METTLER SITE A1- CUT FILL EXHIBIT
7	A	METTLER SITE A2- GRADING PLAN
8	A	METTLER SITE A2- GRADING PLAN CONT.
9	A	METTLER SITE A2- DRAINAGE PLAN
10	A	METTLER SITE A2- DRAINAGE PLAN CONT.
11	A	METTLER SITE A2- CUT FILL EXHIBIT
12	A	MARICOPA- GRADING PLAN
13	A	MARICOPA- DRAINAGE PLAN
14	A	MARICOPA- CUT FILL EXHIBIT
15	A	DETAIL SHEET

LEGEND

- EXISTING PVC RISER
- EXISTING BOLLARD
- EXISTING FIRE HYDRANT
- EXISTING HOSE BIB
- EXISTING ELECTRICAL VAULT
- WV — EXISTING WATER VALVE
- XXX.XX FS/FG — PROPOSED SPOT ELEVATION
- (XXX.XX) EG — EXISTING SPOT ELEVATION
- RIGHT OF WAY
- PROPERTY LINE
- GRADE BREAK
- FLOW LINE
- EXISTING EDGE OF PAVEMENT
- EXISTING STREET CENTERLINE
- EXISTING EDGE OF PAVEMENT
- UGE — EXISTING UNDERGROUND ELECTRIC
- EXISTING BUILDING
- EXISTING CHAIN LINKED FENCE

CIVIL ENGINEER

DIVERSIFIED PROJECT SERVICES INTERNATIONAL, INC.
CONTACT: L. ALBERTO LOPEZ
1998 SANTA BARBARA AVENUE, SUITE 120
SAN LUIS OBISPO, CA 93401
PHONE: (805) 250-2891

ABBREVIATIONS

AVE	AVENUE
CMU	CONCRETE MASONRY UNIT
CONC	CONCRETE
DIM	DIMENSION
EA	EACH
EG	EXISTING GRADE
ELEC	ELECTRICAL
(E)	EXISTING
FF	FINISHED FLOOR
FG	FINISHED GRADE
FS	FINISHED SURFACE
HWY	HIGHWAY
IRR	IRRIGATION
MIN	MINIMUM
NTS	NOT TO SCALE
TELCO	TELECOMMUNICATIONS
TYP	TYPICAL
UND	UNDERGROUND
UTIL	UTILITY

PAD SUMMARY

WELL PAD NO.	DISTURBED AREA (ac)	CUT (CY)	FILL (CY)	IMPORT (CY)
METTLER SITE A1 (CASINO RESORT ALTERNATIVE)	3,673,705 (84.34AC)±	80,325	484,560	404,235
METTLER SITE A2 (REDUCED CASINO RESORT)	2,861,850 (65.70AC)±	79,030	362,490	283,460
CASINO RESORT ON THE MARICOPA HWY	2,353,315 (54.02AC)±	119,425	125,800	6,375

NOTE:
THE OPINION OF EARTHWORK QUANTITIES SHOWN ABOVE ARE RAW NUMBERS AND ARE FOR REFERENCE AND FEE PURPOSES ONLY. SINCE THE CIVIL ENGINEER CANNOT CONTROL THE EXACT METHOD OR MEANS USED BY THE CONTRACTOR DURING GRADING OPERATIONS, NOR CAN THE CIVIL ENGINEER GUARANTEE THE EXACT SOIL CONDITIONS OVER THE ENTIRE SITE. THE CIVIL ENGINEER ASSUMES NO RESPONSIBILITY FOR FINAL EARTHWORK. THE CONTRACTOR IS ADVISED TO PREPARE HIS OWN ESTIMATES OF EARTHWORK FOR THE PURPOSES OF BIDDING, CONTRACT AND CONSTRUCTION.

DECLARATION OF RESPONSIBLE CHARGE

I HEREBY DECLARE THAT I AM THE ENGINEER OF RECORD FOR THIS PROJECT AND THAT I HAVE EXERCISED RESPONSIBLE CHARGE OVER THE PROJECT AS DEFINED IN SECTION 6703 OF THE BUSINESS AND PROFESSIONS CODE. THESE PLANS AND SPECIFICATIONS, TO THE BEST OF MY KNOWLEDGE, COMPLY WITH CURRENT STANDARDS.

ANY ERRORS, OMISSIONS, OR OTHER VIOLATIONS OF THOSE ORDINANCES, STANDARDS OR DESIGN CRITERIA ENCOUNTERED DURING CONSTRUCTION SHALL BE CORRECTED AND SUCH CORRECTIONS REFLECTED ON CORRECTED PLANS.

L. ALBERTO LOPEZ R.C.E. 67602

DIGALERT
DIAL TOLL FREE
811 OR
(1-800-227-2600)
AT LEAST TWO DAYS
BEFORE YOU DIG
UNDERGROUND SERVICE ALERT OF CALIFORNIA

DWG NUMBER	TITLE

REFERENCE DRAWINGS

DIVERSIFIED PROJECT SERVICES INTERNATIONAL
San Luis Obispo (805) 250-2891 Bakersfield, CA (661) 371-2800 Long Beach (562) 424-8400

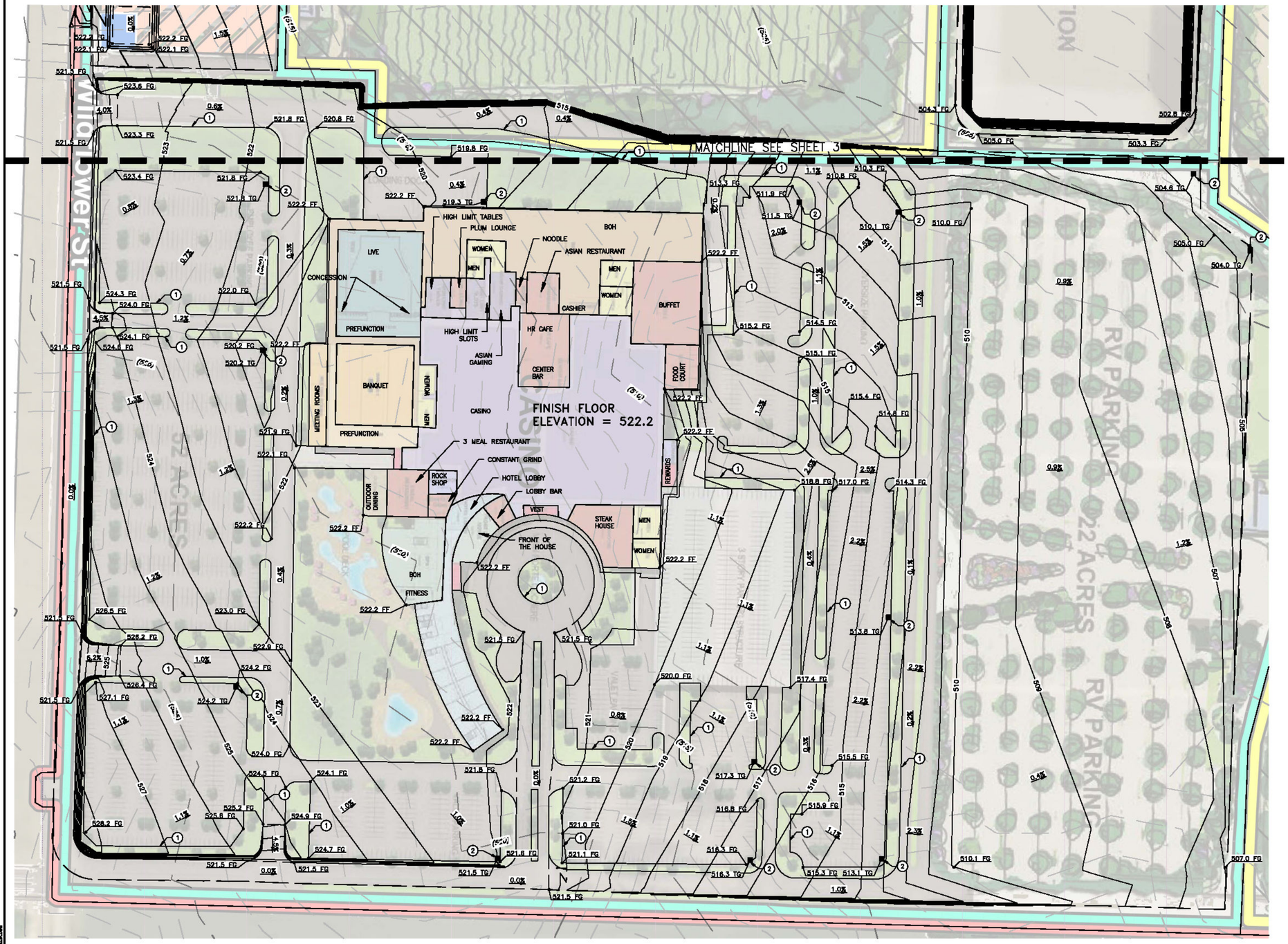
PROJECT: 181059
www.dpsiinc.com

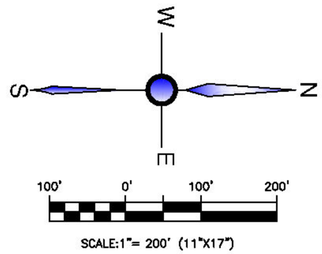
DATE	DESCRIPTION	BY	CKD.	APPR
03/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
05/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
10/28/19	ISSUED FOR REVIEW	EP	RJ	LAL

TITLE SHEET

THE TEJON INDIAN TRUST ACQUISITION CASINO PROJECT
METTLER SITE A1&A2
MARICOPA SITE
COUNTY OF KERN, STATE OF CALIFORNIA

ENGINEER:	LAL	DATE: 05.22.2019	SCALE: AS SHOWN
CO. SURVEYOR:	DPSI, INC.	ORIGINAL DWG NO.	
PROJ. MGR:	LAL	NO. 1	REV. A
COMPILED BY:	RJ		
DOCUMENT TYPE:	EXHIBIT	CAD FILE NO. CE181059-TS001.dwg	





SCALE:1"= 200' (11"X17")

EARTHWORK QUANTITIES

- 80,325 CUT CUBIC YARDS
- 484,560 FILL CUBIC YARDS
- 404,235 IMPORT CUBIC YARDS
- 3,673,705 SQ. FT. (DISTURBED AREA 84.34 AC)

NOTE:
EARTHWORK NUMBERS DO NOT INCLUDE SHRINKAGE

LEGEND

(1) TYPE A2-6 CURB AND GUTTER PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. R-52.

(2) CATCH BASINS – PER KERN COUNTY DEVELOPMENT STANDARDS – TYPE "A" MINOR STRUCTURE – PLATE NO. R-71

DWG NUMBER	TITLE
	REFERENCE DRAWINGS

DIVERSIFIED PROJECT SERVICES INTERNATIONAL
San Luis Obispo (805) 230-2891 Bakersfield, CA (661) 371-2800 Long Beach (562) 424-8400

PROJECT: 181059
www.dpsiinc.com

DATE	DESCRIPTION	BY	CKD.	APPR
03/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
05/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
10/28/19	ISSUED FOR REVIEW	EP	RJ	LAL

METTLER SITE A1- GRADING

THE TEJON INDIAN TRUST ACQUISITION CASINO PROJECT
METTLER SITE A1&A2
MARICOPA SITE
COUNTY OF KERN, STATE OF CALIFORNIA

ENGINEER:	LAL	DATE: 05.22.2019	SCALE: AS SHOWN
CO. SURVEYOR:	DPSI, INC.	ORIGINAL DWG NO.	
PROJ. MGR:	LAL	NO. 2	REV. A
COMPILED BY:	RJ		
DOCUMENT TYPE:	EXHIBIT	CAD FILE NO. CE181059-GP-003A.dwg	

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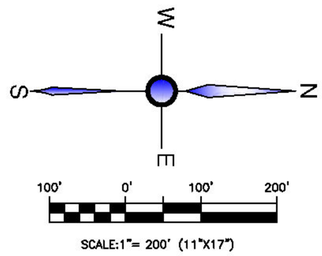

SCALE:1"= 200' (11"X17")

LEGEND

1. TYPE A2-6 CURB AND GUTTER PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. R-52.
2. CATCH BASINS – PER KERN COUNTY DEVELOPMENT STANDARDS – TYPE "A" MINOR STRUCTURE – PLATE NO. R-71

DWG NUMBER	TITLE
	REFERENCE DRAWINGS

DIVERSIFIED PROJECT SERVICES INTERNATIONAL
San Luis Obispo (805) 230-2091 Bakersfield, CA (661) 371-2800 Long Beach (562) 424-8400

PROJECT: 181059
www.dpsiinc.com

DATE	DESCRIPTION	BY	CKD.	APPR
03/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
05/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
10/28/19	ISSUED FOR REVIEW	EP	RJ	LAL

METTLER SITE A1- GRADING PLAN CONT.

THE TEJON INDIAN TRUST ACQUISITION CASINO PROJECT
METTLER SITE A1&A2
MARICOPA SITE
COUNTY OF KERN, STATE OF CALIFORNIA

ENGINEER:	LAL	DATE: 05.22.2019	SCALE: AS SHOWN
CO. SURVEYOR:	DPSI, INC.	ORIGINAL DWG NO.	
PROJ. MGR:	LAL	NO. 3	REV. A
COMPILED BY:	RJ		
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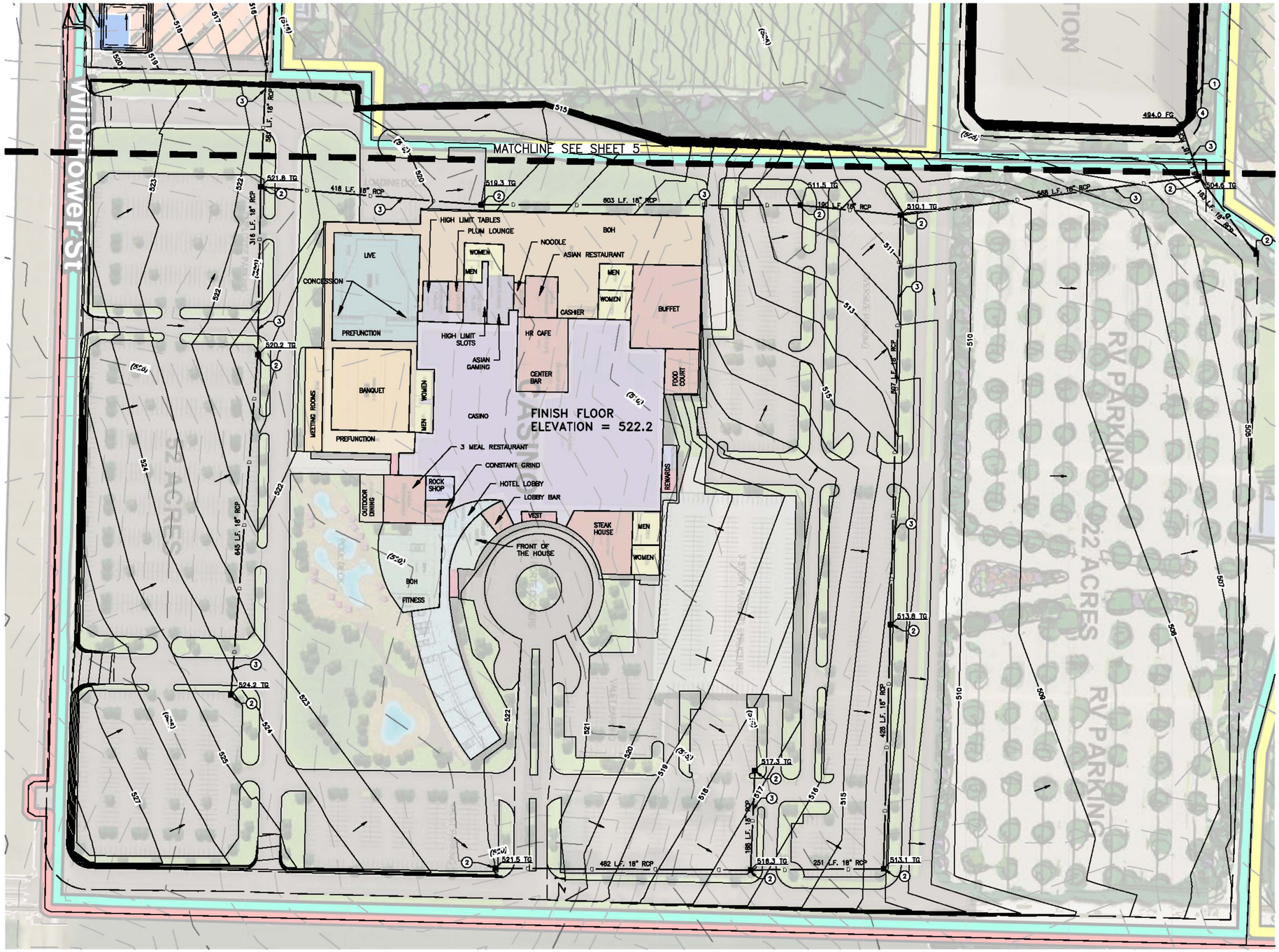
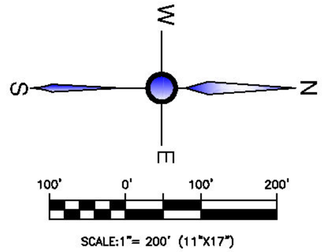




SCALE:1"= 200' (11"X17")

LEGEND

1. STORM DRAIN SUMP PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-1
2. CATCH BASINS – PER KERN COUNTY DEVELOPMENT STANDARDS – TYPE "A" MINOR STRUCTURE – PLATE NO. R-71
3. STORM DRAIN PIPE TO BE CLASS III RCP WITH RUBBER GASKET JOINTS. SIZE AS NOTED TRENCH DETAIL PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. S-1
4. OUTLET STRUCTURE PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-2
5. STORM DRAIN MANHOLE PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-5

DWG NUMBER	TITLE
	REFERENCE DRAWINGS

DIVERSIFIED PROJECT SERVICES INTERNATIONAL
San Luis Obispo (805) 230-2891 Bakersfield, CA (661) 371-2800 Long Beach (562) 424-8400

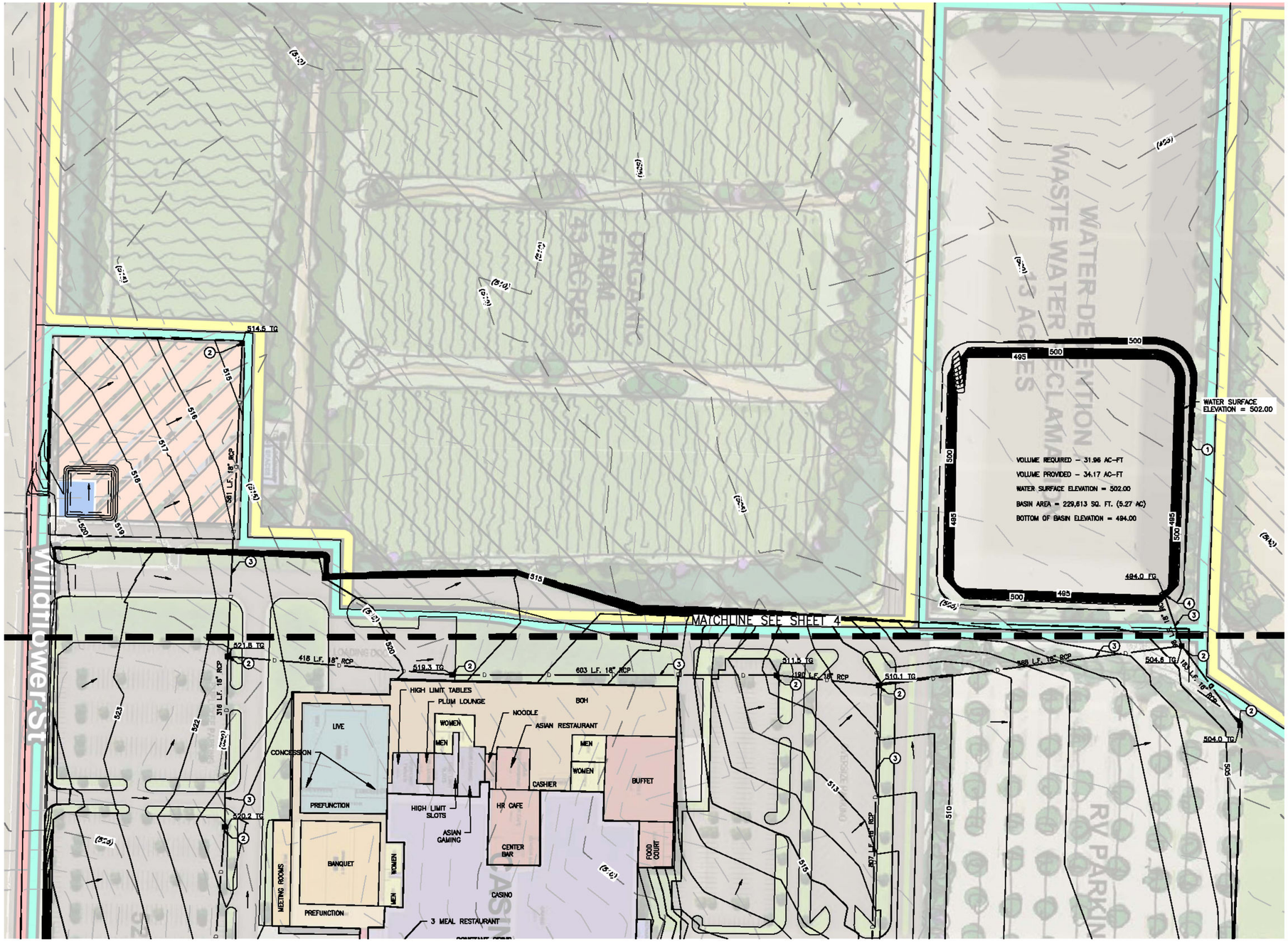
PROJECT: 181059
www.dpsiinc.com

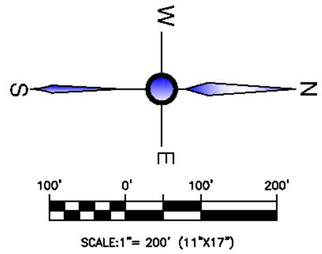
DATE	DESCRIPTION	BY	CKD.	APPR
03/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
05/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
10/28/19	ISSUED FOR REVIEW	EP	RJ	LAL

METTLER SITE A1- DRAINAGE PLAN

THE TEJON INDIAN TRUST ACQUISITION CASINO PROJECT
METTLER SITE A1&A2
MARICOPA SITE
COUNTY OF KERN, STATE OF CALIFORNIA

ENGINEER:	LAL	DATE: 05.22.2019	SCALE: AS SHOWN
CO. SURVEYOR:	DPSI, INC.	ORIGINAL DWG NO.	
PROJ. MGR:	LAL	NO. 4	REV. A
COMPILED BY:	RJ		
DOCUMENT TYPE:	EXHIBIT	CAD FILE NO. CE181059-SD-003A.dwg	





SCALE:1"= 200' (11"X17")

LEGEND

1. STORM DRAIN SUMP PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-1
2. CATCH BASINS – PER KERN COUNTY DEVELOPMENT STANDARDS – TYPE "A" MINOR STRUCTURE – PLATE NO. R-71
3. STORM DRAIN PIPE TO BE CLASS III RCP WITH RUBBER GASKET JOINTS. SIZE AS NOTED TRENCH DETAIL PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. S-1
4. OUTLET STRUCTURE PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-2
5. STORM DRAIN MANHOLE PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-5

DWG NUMBER	TITLE
	REFERENCE DRAWINGS

DIVERSIFIED PROJECT SERVICES INTERNATIONAL
San Luis Obispo (805) 230-2091 Bakersfield, CA (661) 371-2900 Long Beach (562) 424-8400

PROJECT: 181059
www.dpsiinc.com

DATE	DESCRIPTION	BY	CKD.	APPR
03/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
05/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
10/28/19	ISSUED FOR REVIEW	EP	RJ	LAL

METTLER SITE A1- DRAINAGE PLAN CONT.

THE TEJON INDIAN TRUST ACQUISITION CASINO PROJECT
METTLER SITE A1&A2
MARICOPA SITE
COUNTY OF KERN, STATE OF CALIFORNIA

ENGINEER:	LAL	DATE: 05.22.2019	SCALE: AS SHOWN
CO. SURVEYOR:	DPSI, INC.	ORIGINAL DWG NO.	
PROJ. MGR:	LAL	NO. 5	REV. A
COMPILED BY:	RJ		
DOCUMENT TYPE:	EXHIBIT	CAD FILE NO. CE181059-SD-004A.dwg	

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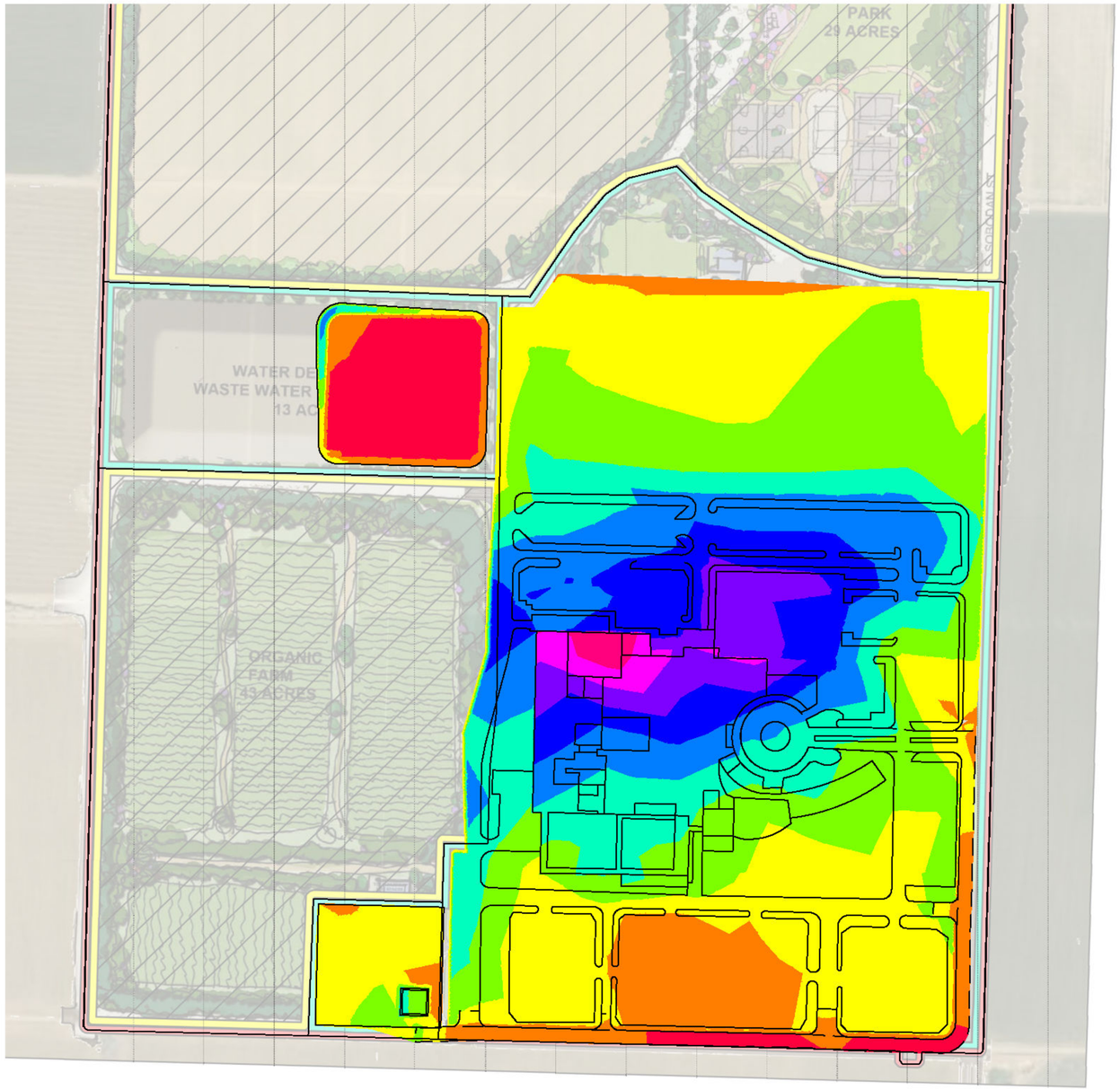

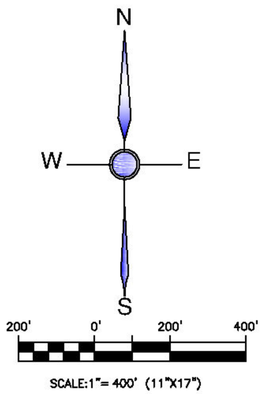

SCALE:1"= 400' (11"X17")

EARTHWORK QUANTITIES

- 80,325 CUT CUBIC YARDS
- 484,560 FILL CUBIC YARDS
- 404,235 IMPORT CUBIC YARDS
- 3,673,705 SQ. FT. (DISTURBED AREA 84.34 AC)

NOTE:
EARTHWORK NUMBERS DO NOT INCLUDE SHRINKAGE

Elevations Table					
Number	Minimum Elevation	Maximum Elevation	VOLUME	AREA	Color
1	−11.0	−5.0	22,020.92	172,286.67	
2	−5.0	0.0	44,415.36	247,371.64	
3	0.0	2.0	192,970.27	995,441.62	
4	2.0	4.0	121,406.09	707,080.21	
5	4.0	6.0	80,290.89	464,456.45	
6	6.0	8.0	50,060.70	398,457.82	
7	8.0	10.0	23,466.18	274,733.18	
8	10.0	12.0	8,018.01	143,786.03	
9	12.0	14.0	2,486.87	36,718.27	
10	14.0	16.0	324.04	15,769.65	

DWG NUMBER	TITLE
	REFERENCE DRAWINGS

DIVERSIFIED PROJECT SERVICES INTERNATIONAL
San Luis Obispo (805) 230-2091 | Bakersfield, CA (661) 371-2900 | Long Beach (562) 424-8400

PROJECT: 181059
www.dpsiinc.com

DATE	DESCRIPTION	BY	CKD.	APPR
03/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
05/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
10/28/19	ISSUED FOR REVIEW	EP	RJ	LAL

METTLER SITE A1- CUT FILL EXHIBIT

THE TEJON INDIAN TRUST ACQUISITION CASINO PROJECT
METTLER SITE A1&A2
MARICOPA SITE
COUNTY OF KERN, STATE OF CALIFORNIA

ENGINEER:	LAL	DATE: 05.22.2019	SCALE: AS SHOWN
CO. SURVEYOR:	DPSI, INC.	ORIGINAL DWG NO.	
PROJ. MGR:	LAL	NO. 6	REV. A
COMPILED BY:	RJ		
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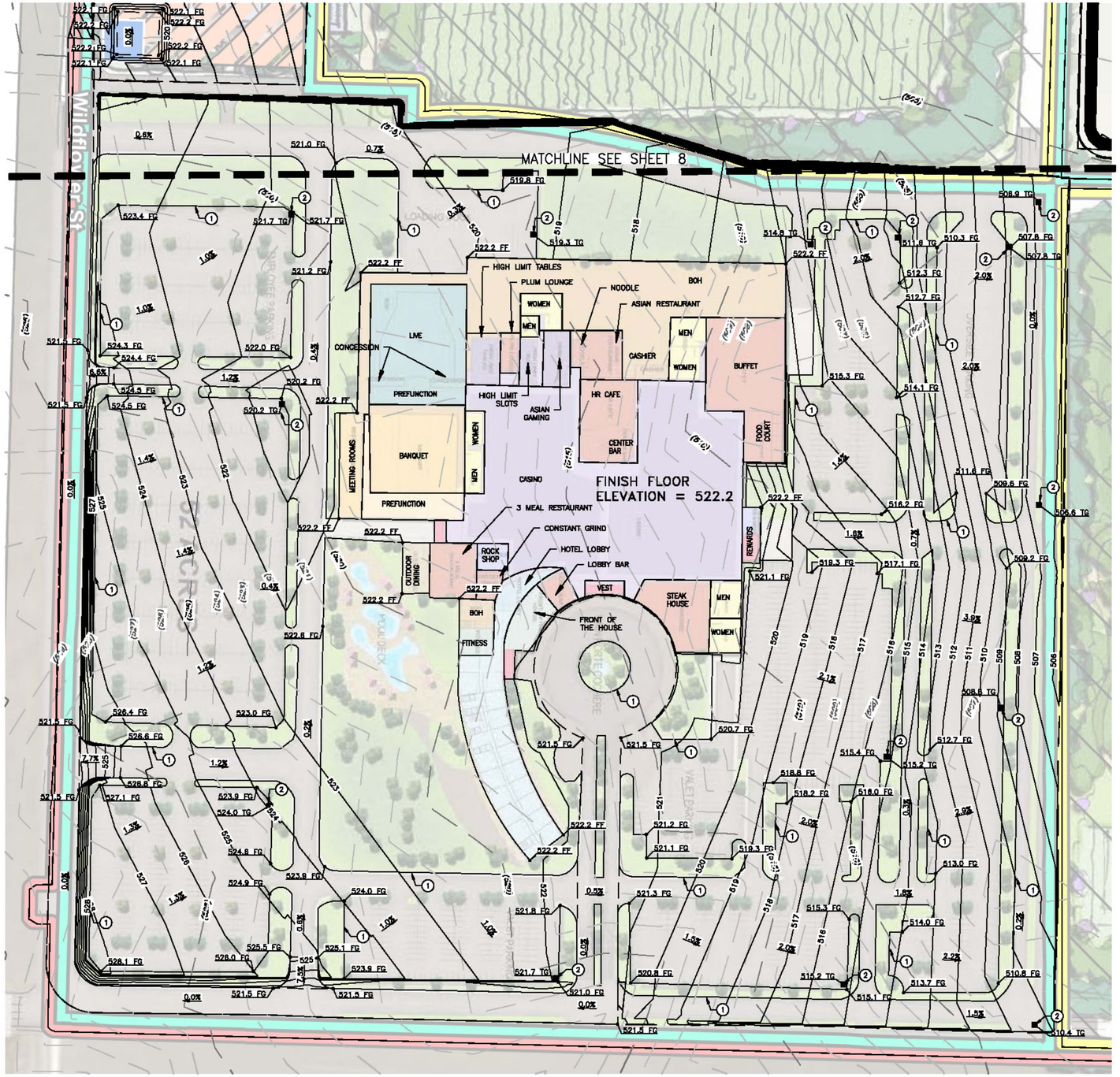

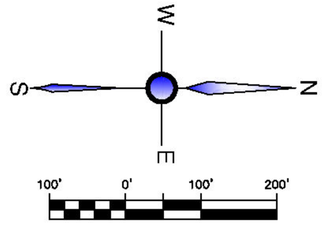

SCALE:1"= 200' (11"X17")

EARTHWORK QUANTITIES

- 79,030 CUT CUBIC YARDS
- 362,490 FILL CUBIC YARDS
- 283,460 IMPORT CUBIC YARDS
- 2,861,850 SQ. FT. (DISTURBED AREA 65.70 AC)

NOTE:
EARTHWORK NUMBERS DO NOT INCLUDE SHRINKAGE

LEGEND

1. TYPE A2-6 CURB AND GUTTER PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. R-52.
2. CATCH BASINS – PER KERN COUNTY DEVELOPMENT STANDARDS – TYPE "A" MINOR STRUCTURE – PLATE NO. R-71

DWG NUMBER	TITLE
REFERENCE DRAWINGS	

DIVERSIFIED PROJECT SERVICES INTERNATIONAL
San Luis Obispo (805) 239-2091 Bakersfield, CA (661) 371-2800 Long Beach (562) 424-8400

PROJECT: 181059
www.dpsiinc.com

DATE	DESCRIPTION	BY	CKD.	APPR
03/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
05/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
10/28/19	ISSUED FOR REVIEW	EP	RJ	LAL

METTLER SITE A2- GRADING PLAN

THE TEJON INDIAN TRUST ACQUISITION CASINO PROJECT
METTLER SITE A1&A2
MARICOPA SITE
COUNTY OF KERN, STATE OF CALIFORNIA

ENGINEER:	LAL	DATE: 05.22.2019	SCALE: AS SHOWN
CO. SURVEYOR:	DPSI, INC.	ORIGINAL DWG NO.	
PROJ. MGR:	LAL	NO. 7	REV. A
COMPILED BY:	RJ		
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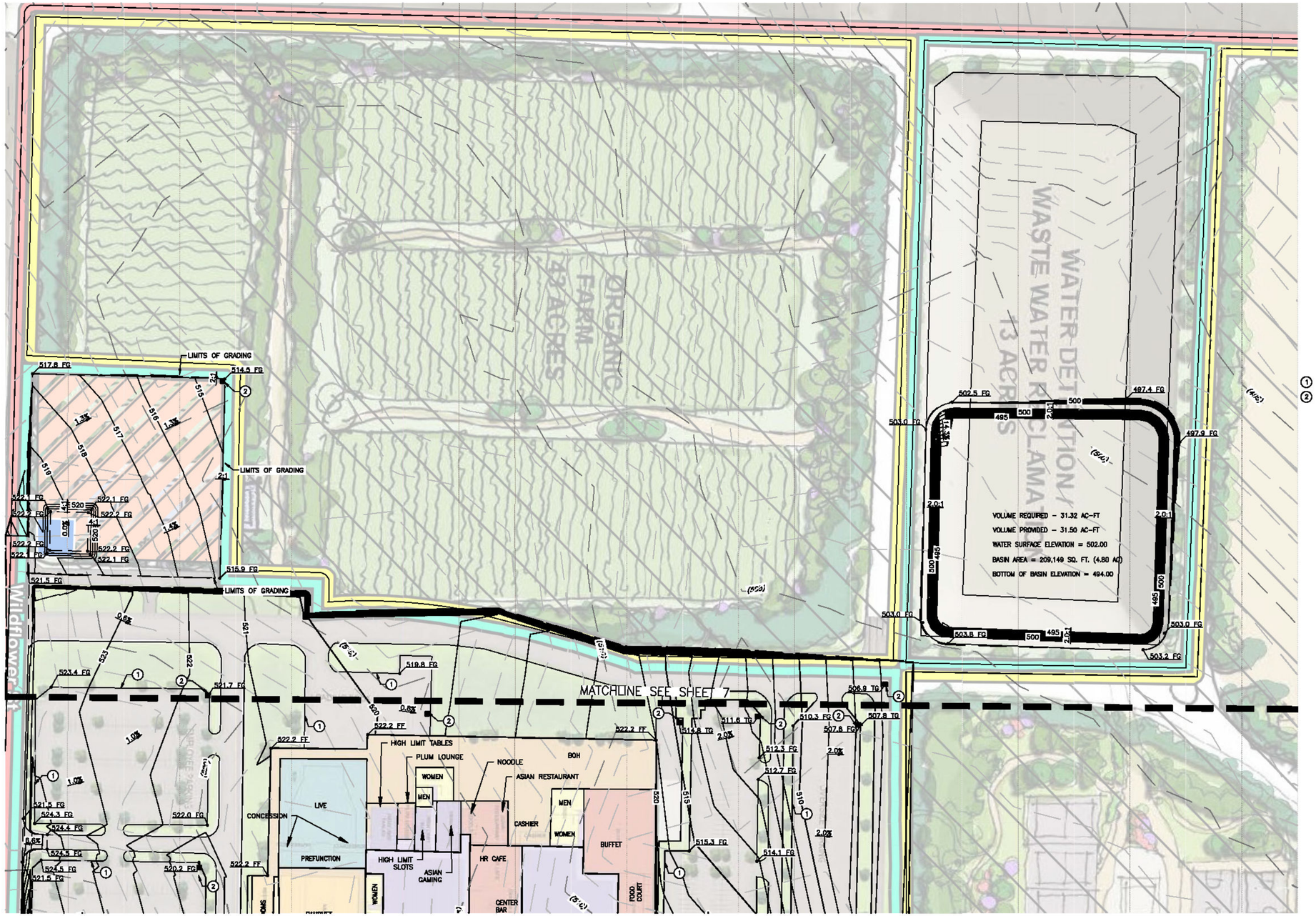
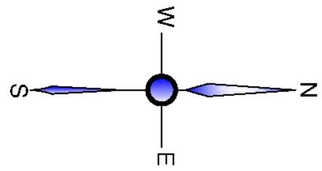




SCALE:1"= 200' (11"X17")

LEGEND

1. TYPE A2-6 CURB AND GUTTER PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. R-52.
2. CATCH BASINS – PER KERN COUNTY DEVELOPMENT STANDARDS – TYPE "A" MINOR STRUCTURE – PLATE NO. R-71

DWG NUMBER	TITLE
	REFERENCE DRAWINGS

DIVERSIFIED PROJECT SERVICES INTERNATIONAL
San Luis Obispo (805) 230-2691 Bakersfield, CA (661) 371-2800 Long Beach (562) 424-8400

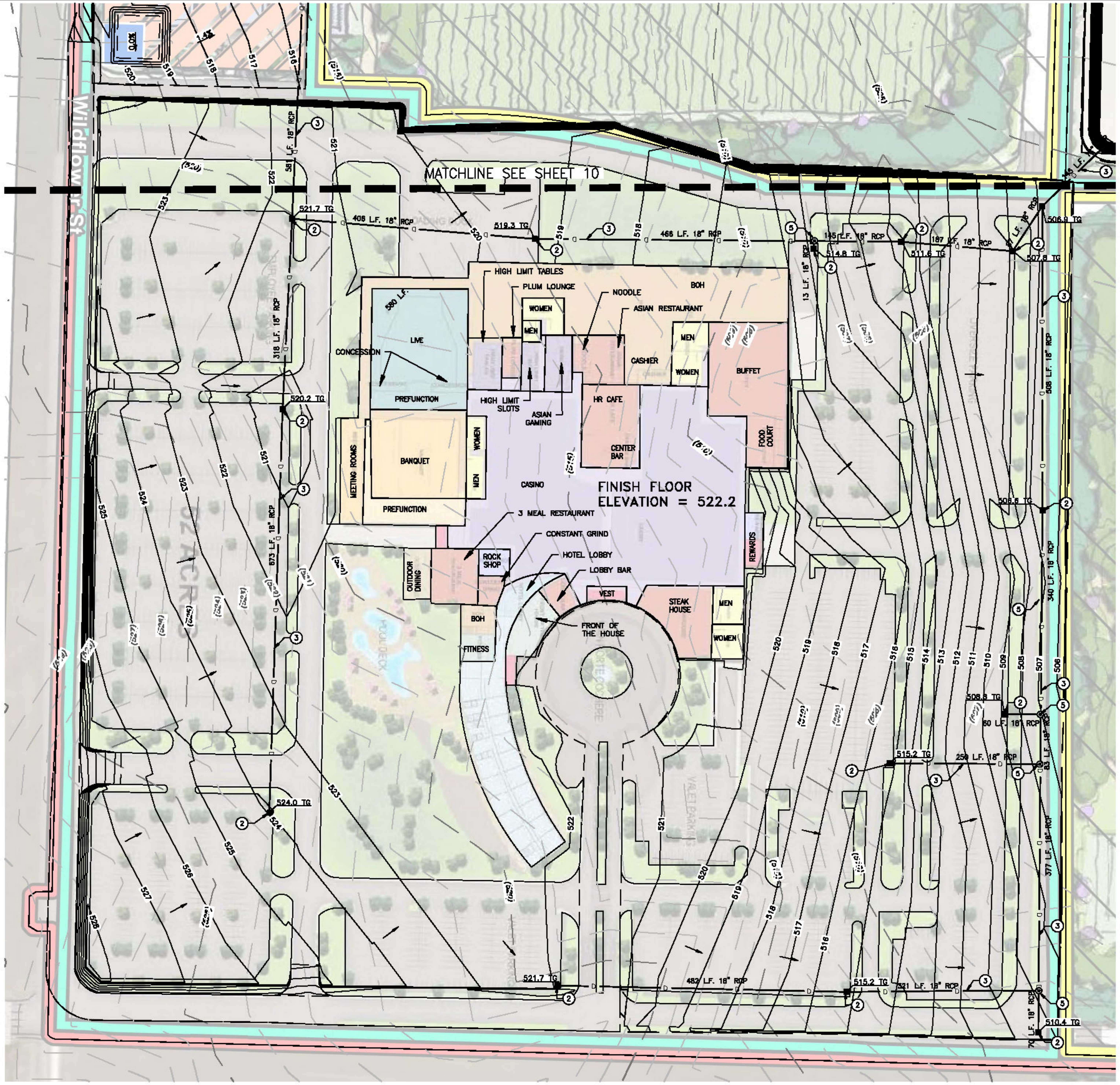
PROJECT: 181059
www.dpsiinc.com

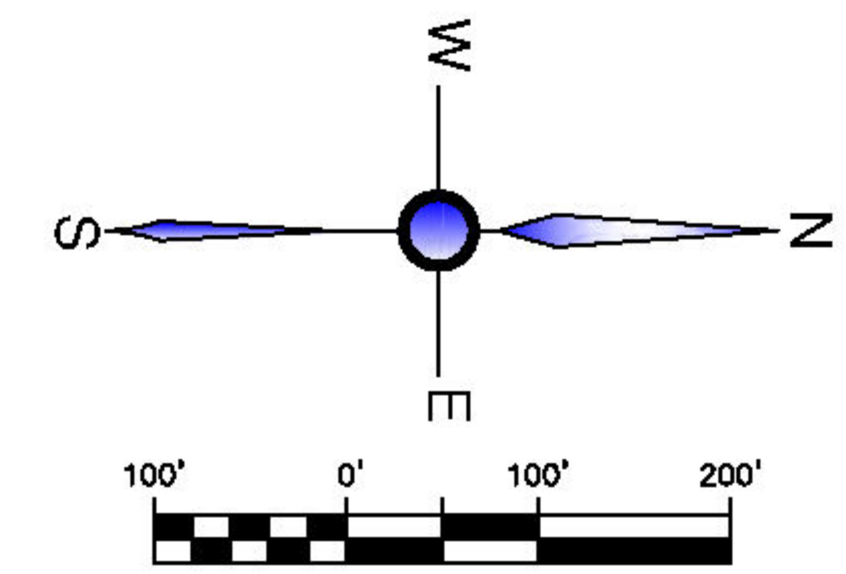
DATE	DESCRIPTION	BY	CKD.	APPR
03/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
05/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
10/28/19	ISSUED FOR REVIEW	EP	RJ	LAL

METTLER SITE A2- GRADING PLAN CONT.

THE TEJON INDIAN TRUST ACQUISITION CASINO PROJECT
METTLER SITE A1&A2
MARICOPA SITE
COUNTY OF KERN, STATE OF CALIFORNIA

ENGINEER:	LAL	DATE: 05.22.2019	SCALE: AS SHOWN
CO. SURVEYOR:	DPSI, INC.	ORIGINAL DWG NO.	
PROJ. MGR:	LAL	NO. 8	REV. A
COMPILED BY:	RJ		
DOCUMENT TYPE:	EXHIBIT	CAD FILE NO. CE181059-GP-004B.dwg	





SCALE:1"= 200' (11"X17")

LEGEND

1. STORM DRAIN SUMP PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-1
2. CATCH BASINS – PER KERN COUNTY DEVELOPMENT STANDARDS – TYPE "A" MINOR STRUCTURE – PLATE NO. R-71
3. STORM DRAIN PIPE TO BE CLASS III RCP WITH RUBBER GASKET JOINTS. SIZE AS NOTED TRENCH DETAIL PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. S-1
4. OUTLET STRUCTURE PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-2
5. STORM DRAIN MANHOLE PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-5

DWG NUMBER	TITLE
REFERENCE DRAWINGS	

DIVERSIFIED PROJECT SERVICES INTERNATIONAL

San Luis Obispo (805) 250-2891 Bakersfield, CA (661) 371-2800 Long Beach (562) 424-8400

PROJECT: 181059

www.dpsiinc.com

DATE	DESCRIPTION	BY	CKD.	APPR
03/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
05/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
10/28/19	ISSUED FOR REVIEW	EP	RJ	LAL

METTLER SITE A2- DRAINAGE PLAN

THE TEJON INDIAN TRUST ACQUISITION CASINO PROJECT
METTLER SITE A1&A2
MARICOPA SITE
COUNTY OF KERN, STATE OF CALIFORNIA

ENGINEER:	LAL	DATE: 05.22.2019	SCALE: AS SHOWN
CO. SURVEYOR:	DPSI, INC.	ORIGINAL DWG NO.	
PROJ. MGR:	LAL	NO. 9	REV. A
COMPILED BY:	RJ		
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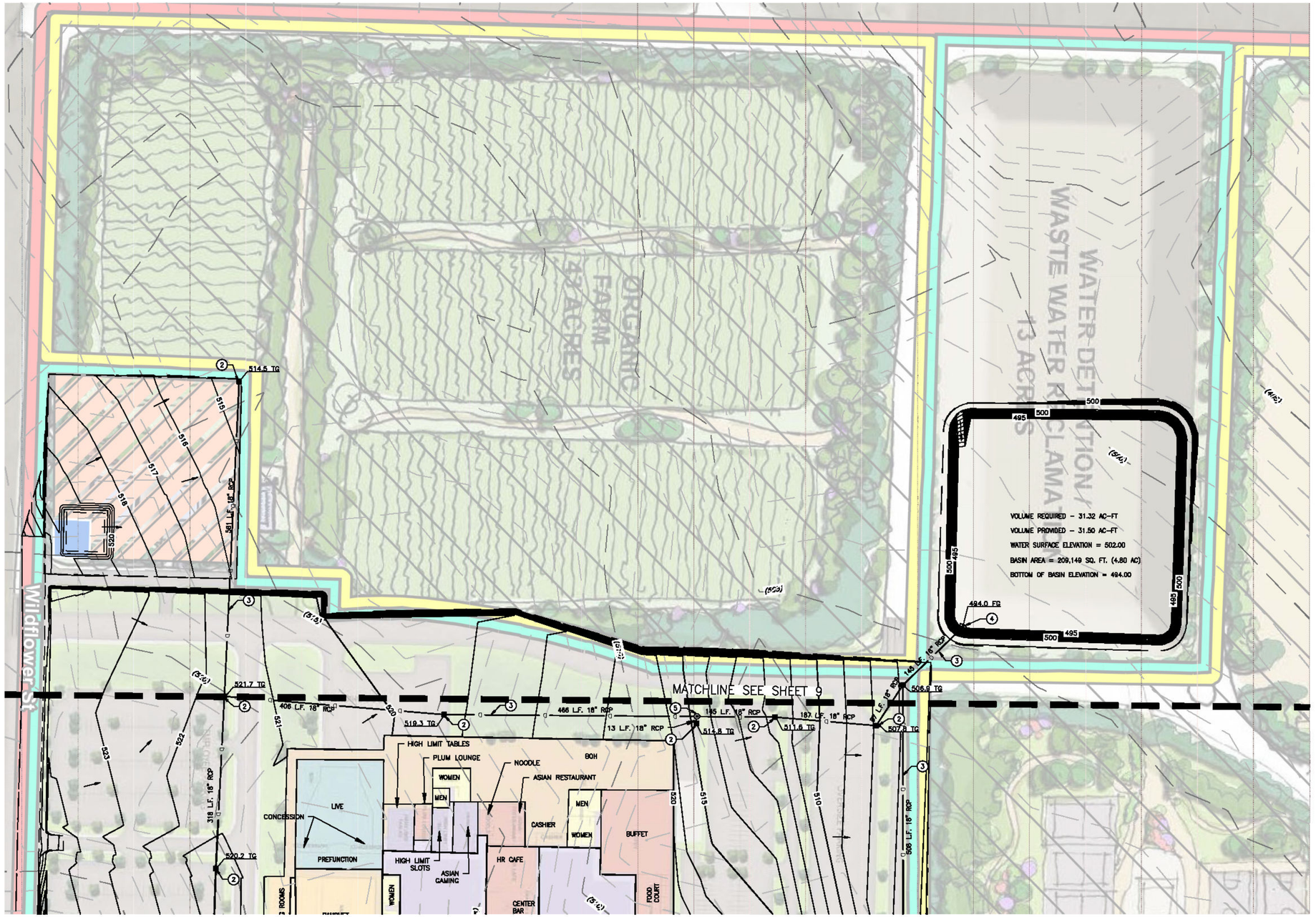

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W E S

100' 0' 100' 200'

SCALE:1"= 200' (11"X17")

LEGEND

1. STORM DRAIN SUMP PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-1
2. CATCH BASINS – PER KERN COUNTY DEVELOPMENT STANDARDS – TYPE "A" MINOR STRUCTURE – PLATE NO. R-71
3. STORM DRAIN PIPE TO BE CLASS III RCP WITH RUBBER GASKET JOINTS. SIZE AS NOTED TRENCH DETAIL PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. S-1
4. OUTLET STRUCTURE PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-2
5. STORM DRAIN MANHOLE PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-5

DWG NUMBER	TITLE
	REFERENCE DRAWINGS

DIVERSIFIED PROJECT SERVICES INTERNATIONAL
San Luis Obispo (805) 230-2691 Bakersfield, CA (661) 371-2800 Long Beach (562) 424-8400

PROJECT: 181059
www.dpsiinc.com

DATE	DESCRIPTION	BY	CKD.	APPR
03/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
05/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
10/28/19	ISSUED FOR REVIEW	EP	RJ	LAL

METTLER SITE A2- DRAINAGE PLAN CONT.

THE TEJON INDIAN TRUST ACQUISITION CASINO PROJECT
METTLER SITE A1&A2
MARICOPA SITE
COUNTY OF KERN, STATE OF CALIFORNIA

ENGINEER:	LAL	DATE: 05.22.2019	SCALE: AS SHOWN
CO. SURVEYOR:	DPSI, INC.	ORIGINAL DWG NO.	
PROJ. MGR:	LAL	NO. 10	REV. A
COMPILED BY:	RJ		
DOCUMENT TYPE:	EXHIBIT	CAD FILE NO. CE181059-SD-004B.dwg	

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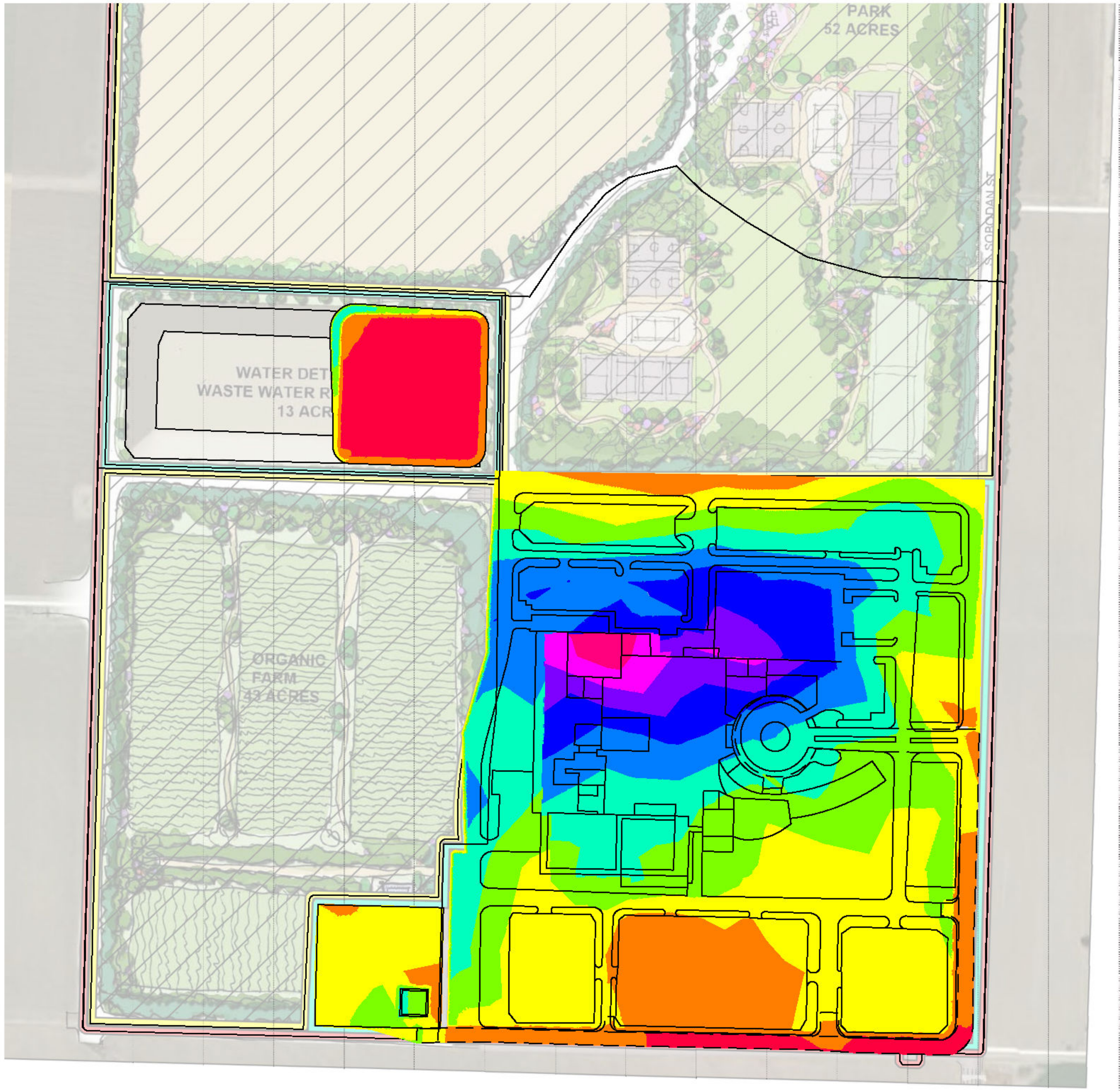
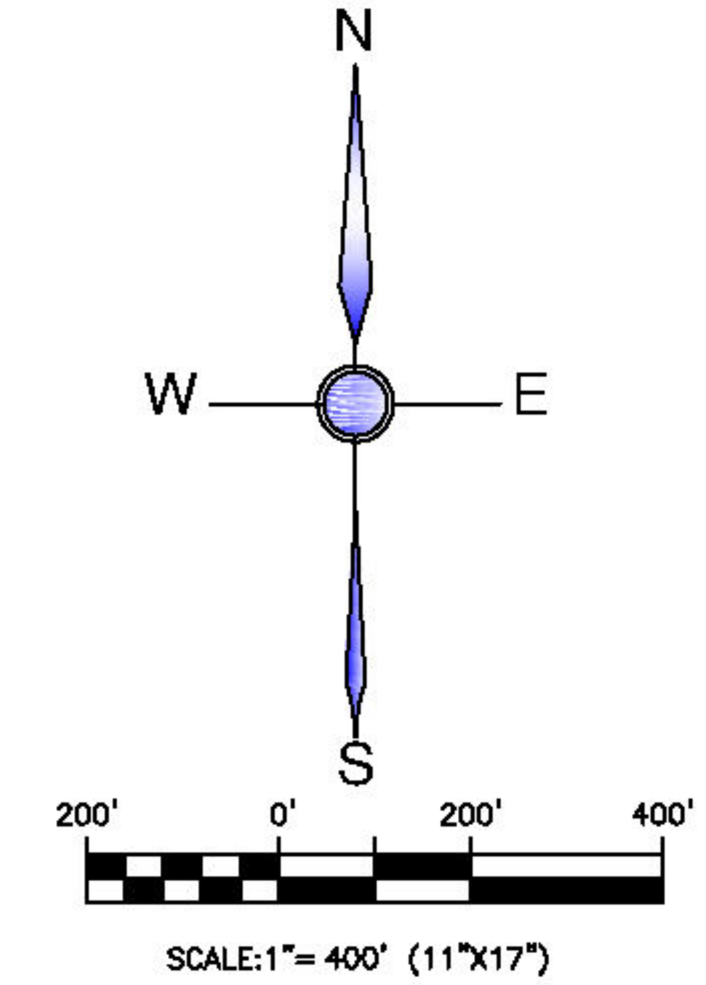




EARTHWORK QUANTITIES

- 79,030 CUT CUBIC YARDS
- 362,490 FILL CUBIC YARDS
- 283,460 IMPORT CUBIC YARDS
- 2,861,850 SQ. FT. (DISTURBED AREA 65.70 AC)

NOTE:
EARTHWORK NUMBERS DO NOT INCLUDE SHRINKAGE

Elevations Table					
Number	Minimum Elevation	Maximum Elevation	VOLUME	AREA	Color
1	−11.0	−5.0	21,053.54	161,626.41	
2	−5.0	0.0	42,497.02	252,674.49	
3	0.0	2.0	139,569.40	697,346.31	
4	2.0	4.0	95,375.17	456,861.81	
5	4.0	6.0	60,812.21	440,447.32	
6	6.0	8.0	36,350.76	294,388.72	
7	8.0	10.0	15,871.32	188,029.23	
8	10.0	12.0	6,655.83	90,091.01	
9	12.0	14.0	2,380.48	34,966.13	
10	14.0	16.0	310.41	15,112.13	

DWG NUMBER	TITLE

REFERENCE DRAWINGS

DIVERSIFIED PROJECT SERVICES INTERNATIONAL
San Luis Obispo (805) 250-2891 Bakersfield, CA (661) 371-2800 Long Beach (562) 424-8400

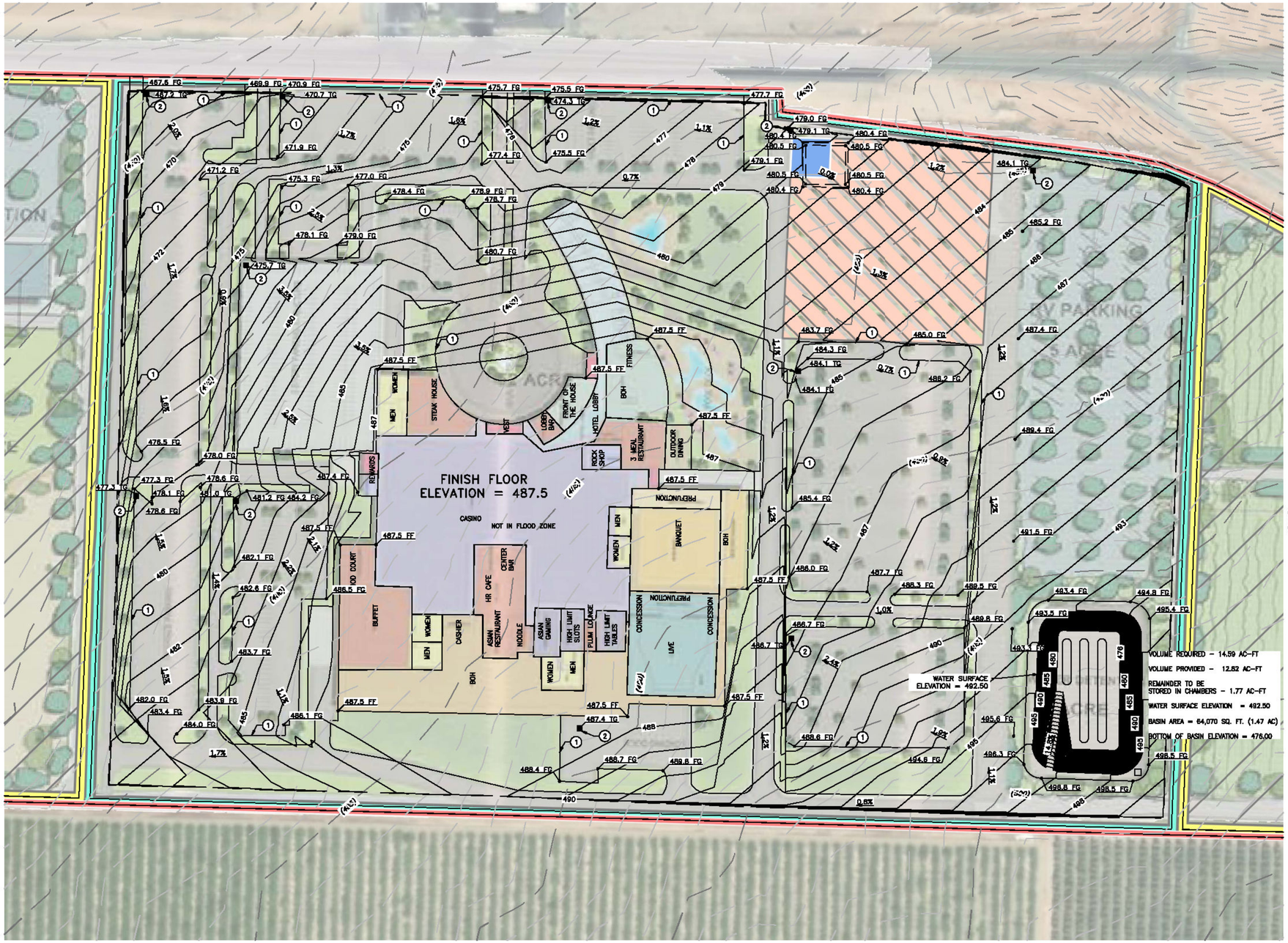
PROJECT: 181059
www.dpsiinc.com

DATE	DESCRIPTION	BY	CKD.	APPR
03/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
05/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
10/28/19	ISSUED FOR REVIEW	EP	RJ	LAL

METTLER SITE A2- CUT FILL EXHIBIT

THE TEJON INDIAN TRUST ACQUISITION CASINO PROJECT
METTLER SITE A1&A2
MARICOPA SITE
COUNTY OF KERN, STATE OF CALIFORNIA

ENGINEER:	LAL	DATE: 05.22.2019	SCALE: AS SHOWN
CO. SURVEYOR:	DPSI, INC.	ORIGINAL DWG NO.	
PROJ. MGR:	LAL	NO. 11	REV. A
COMPILED BY:	RJ		
DOCUMENT TYPE:	EXHIBIT	CAD FILE NO. CE181059-EXHIBIT A2.dwg	



SCALE:1"= 200' (11"X17")

EARTHWORK QUANTITIES

- 119,425 CUT CUBIC YARDS
- 125,800 FILL CUBIC YARDS
- 6,375 IMPORT CUBIC YARDS
- 2,353,315 SQ. FT. (DISTURBED AREA 54.02 AC)

NOTE:
EARTHWORK NUMBERS DO NOT INCLUDE SHRINKAGE

LEGEND

1. TYPE A2-6 CURB AND GUTTER PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. R-32.
2. CATCH BASINS – PER KERN COUNTY DEVELOPMENT STANDARDS – TYPE "A" MINOR STRUCTURE – PLATE NO. R-71

DWG NUMBER	TITLE
	REFERENCE DRAWINGS

DIVERSIFIED PROJECT SERVICES INTERNATIONAL
San Luis Obispo (805) 230-2091 | Bakersfield, CA (661) 371-2900 | Long Beach (562) 424-8400

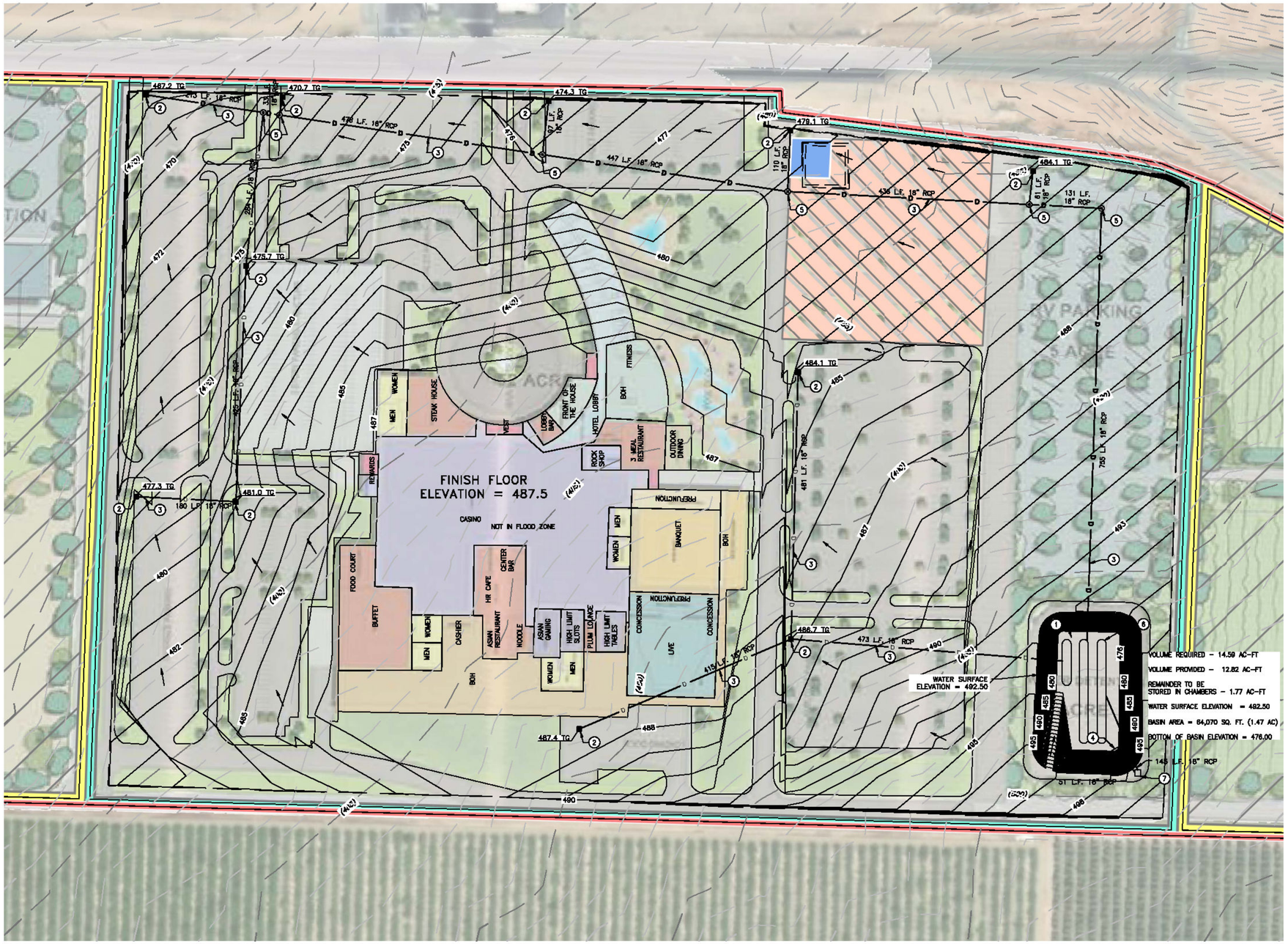
PROJECT: 181059
www.dpsiinc.com

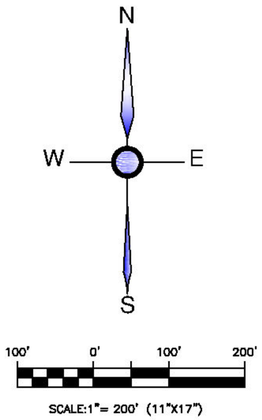
DATE	DESCRIPTION	BY	CKD.	APPR
03/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
05/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
10/28/19	ISSUED FOR REVIEW	EP	RJ	LAL

MARICOPA- GRADING PLAN

THE TEJON INDIAN TRUST ACQUISITION CASINO PROJECT
METTLER SITE A1&A2
MARICOPA SITE
COUNTY OF KERN, STATE OF CALIFORNIA

ENGINEER:	LAL	DATE: 05.22.2019	SCALE: AS SHOWN
CO. SURVEYOR:	DPSI, INC.	ORIGINAL DWG NO.	
PROJ. MGR:	LAL	NO. 12	REV. A
COMPILED BY:	RJ		
DOCUMENT TYPE:	EXHIBIT	CAD FILE NO. CE181059-GP-001A.dwg	





SCALE:1"= 200' (11"X17")

LEGEND

1. STORM DRAIN SUMP PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-1
2. CATCH BASINS – PER KERN COUNTY DEVELOPMENT STANDARDS – TYPE "A" MINOR STRUCTURE – PLATE NO. R-71
3. STORM DRAIN PIPE TO BE CLASS III RCP WITH RUBBER GASKET JOINTS. SIZE AS NOTED TRENCH DETAIL PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. S-1
4. OUTLET STRUCTURE PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-2
5. STORM DRAIN MANHOLE PER KERN COUNTY DEVELOPMENT STANDARDS – PLATE NO. D-5
6. 1.77 AC-FT UNDERGROUND DETENTION CHAMBERS
7. DUPLEX PUMPS PER KERN COUNTY HYDROLOGY MANUAL REQUIREMENTS

DWG NUMBER	TITLE
	REFERENCE DRAWINGS

DIVERSIFIED PROJECT SERVICES INTERNATIONAL
San Luis Obispo (805) 236-2091 Bakersfield, CA (661) 371-2800 Long Beach (562) 424-8400

PROJECT: 181059
www.dpsiinc.com

DATE	DESCRIPTION	BY	CKD.	APPR
03/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
05/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
10/28/19	ISSUED FOR REVIEW	EP	RJ	LAL

MARICOPA- DRAINAGE PLAN

THE TEJON INDIAN TRUST ACQUISITION CASINO PROJECT
METTLER SITE A1&A2
MARICOPA SITE
COUNTY OF KERN, STATE OF CALIFORNIA

ENGINEER:	LAL	DATE: 05.22.2019	SCALE: AS SHOWN
CO. SURVEYOR:	DPSI, INC.	ORIGINAL DWG NO.	
PROJ. MGR:	LAL	NO. 13	REV. A
COMPILED BY:	RJ		
DOCUMENT TYPE:	EXHIBIT	CAD FILE NO. CE181059-SD-001A.dwg	

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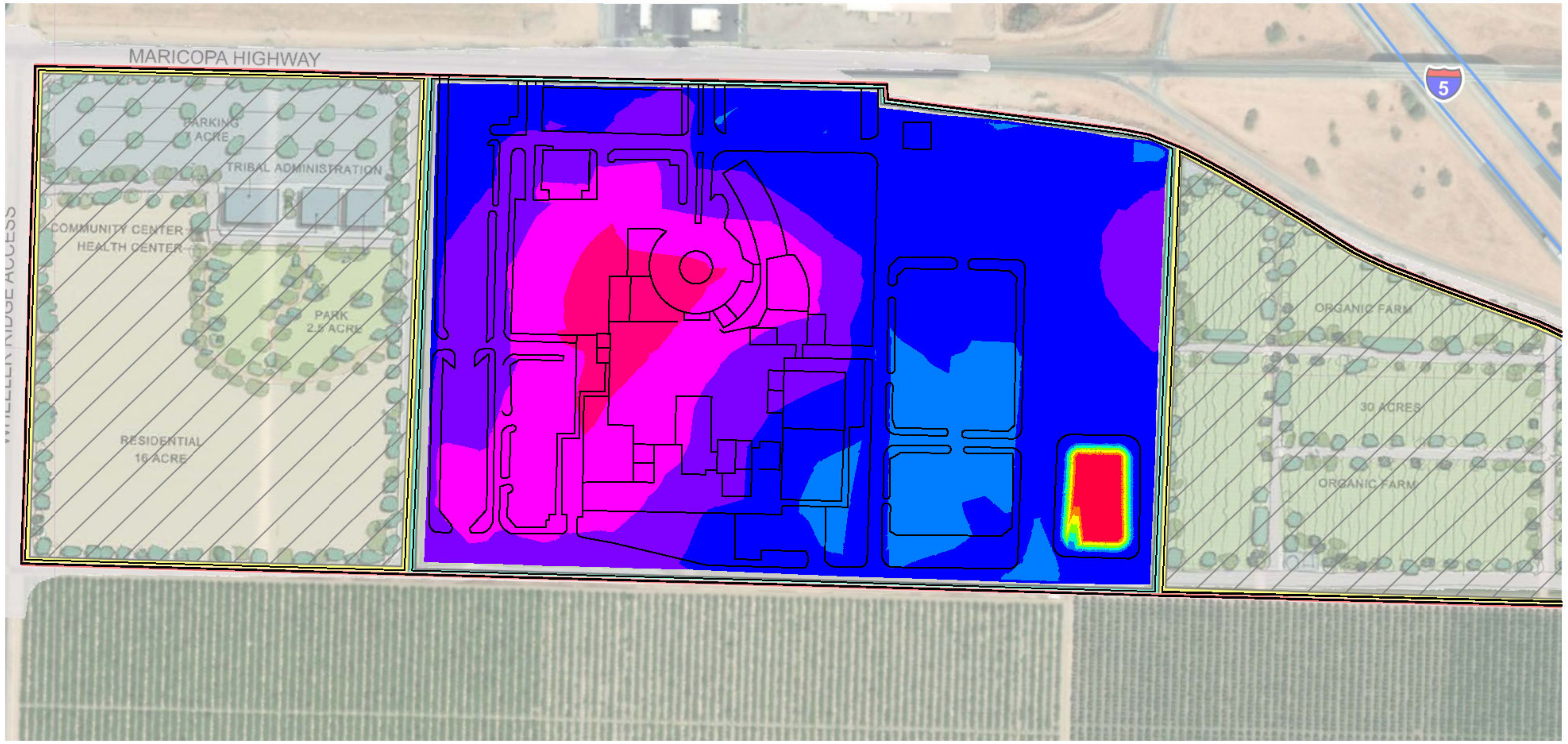
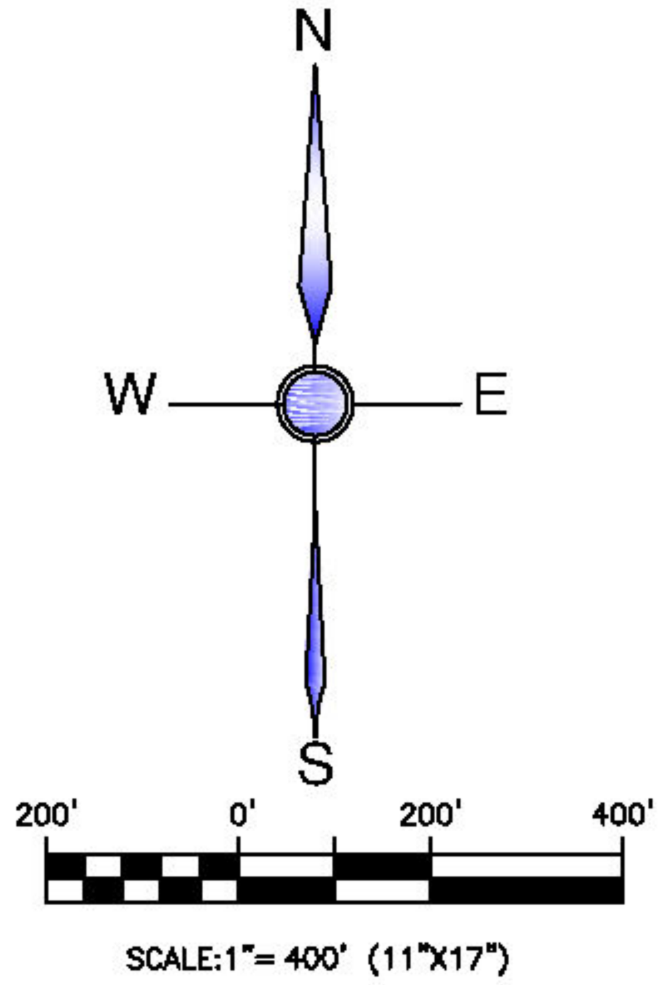




EARTHWORK QUANTITIES

- 119,425 CUT CUBIC YARDS
- 125,800 FILL CUBIC YARDS
- 6,375 IMPORT CUBIC YARDS
- 2,353,315 SQ. FT. (DISTURBED AREA 54.02 AC)

NOTE:
EARTHWORK NUMBERS DO NOT INCLUDE SHRINKAGE

Elevations Table

Number	Minimum Elevation	Maximum Elevation	VOLUME	AREA	Color
1	−23.0	−18.0	3,145.17	26,976.53	
2	−18.0	−15.0	3,249.75	4,608.67	
3	−15.0	−12.0	3,783.31	4,984.59	
4	−12.0	−9.0	4,350.80	5,198.19	
5	−9.0	−6.0	4,935.45	5,320.00	
6	−6.0	−3.0	12,765.16	235,766.55	
7	−3.0	0.0	80,363.89	964,589.93	
8	0.0	3.0	88,103.20	553,868.62	
9	3.0	6.0	31,893.32	447,203.13	
10	6.0	10.0	4,699.95	100,696.23	

DWG NUMBER	TITLE
REFERENCE DRAWINGS	

DIVERSIFIED PROJECT SERVICES INTERNATIONAL
San Luis Obispo (805) 250-2891 Bakersfield, CA (661) 371-2800 Long Beach (562) 424-8400

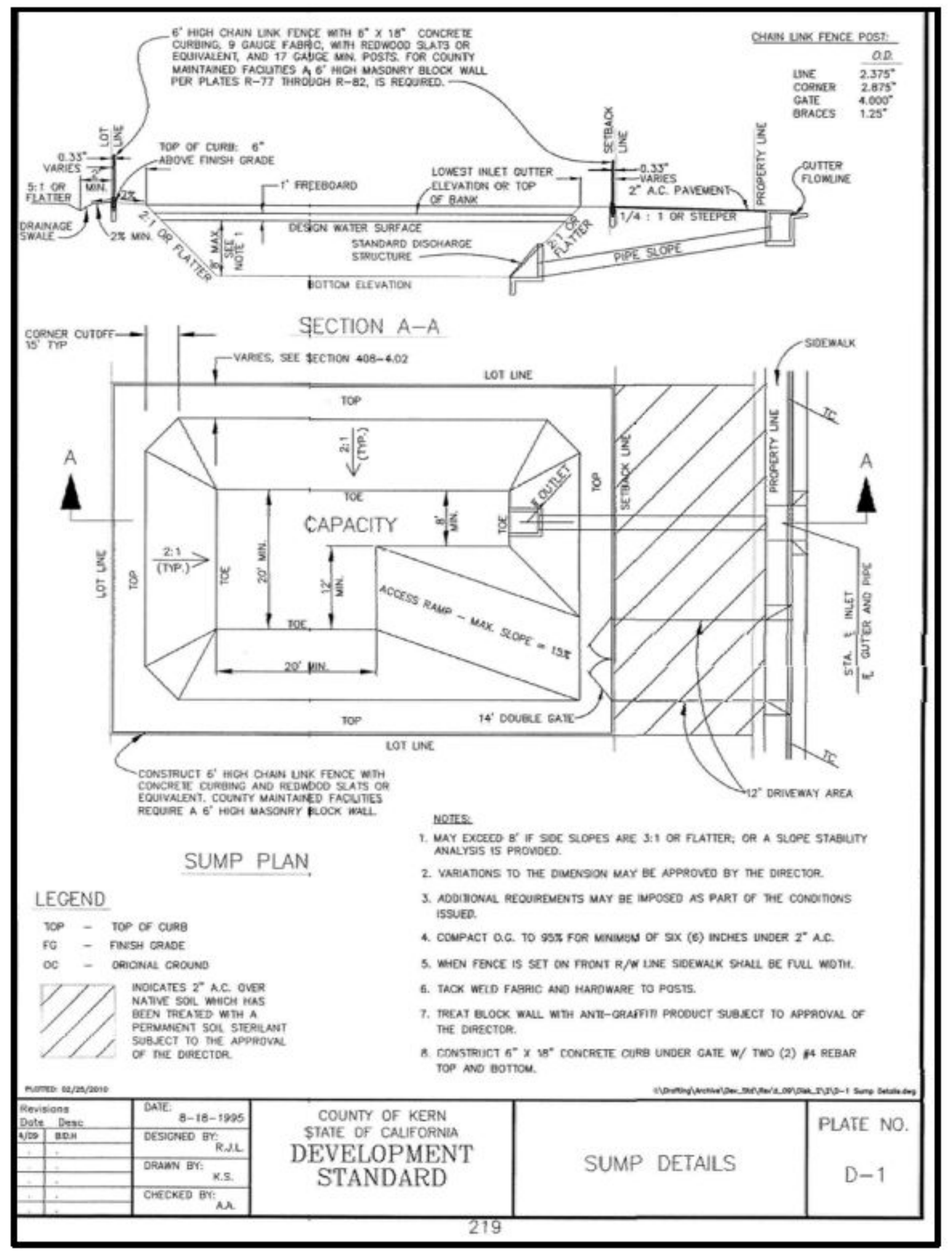
PROJECT: 181059
www.dpsiinc.com

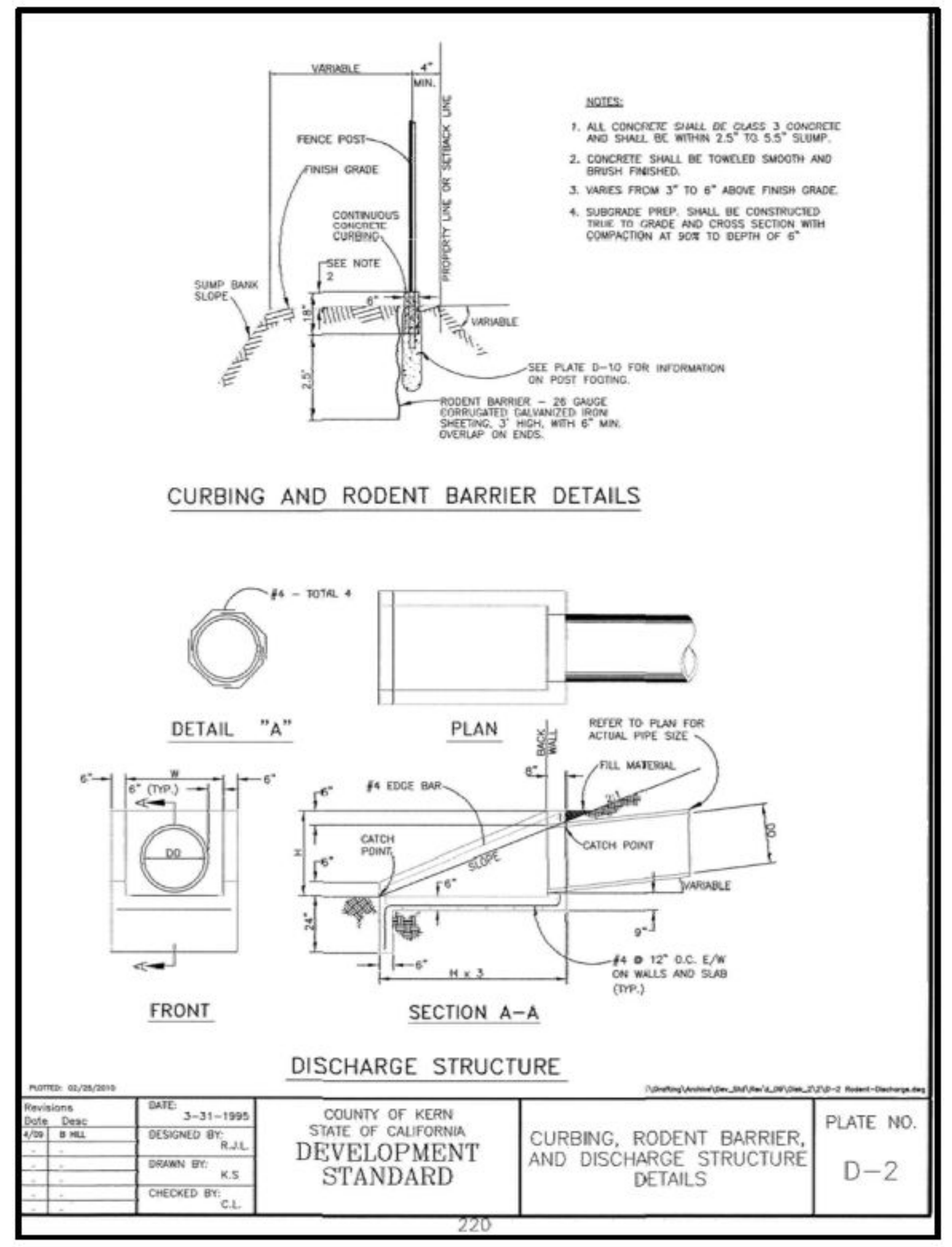
DATE	DESCRIPTION	BY	CKD.	APPR
03/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
05/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
10/28/19	ISSUED FOR REVIEW	EP	RJ	LAL

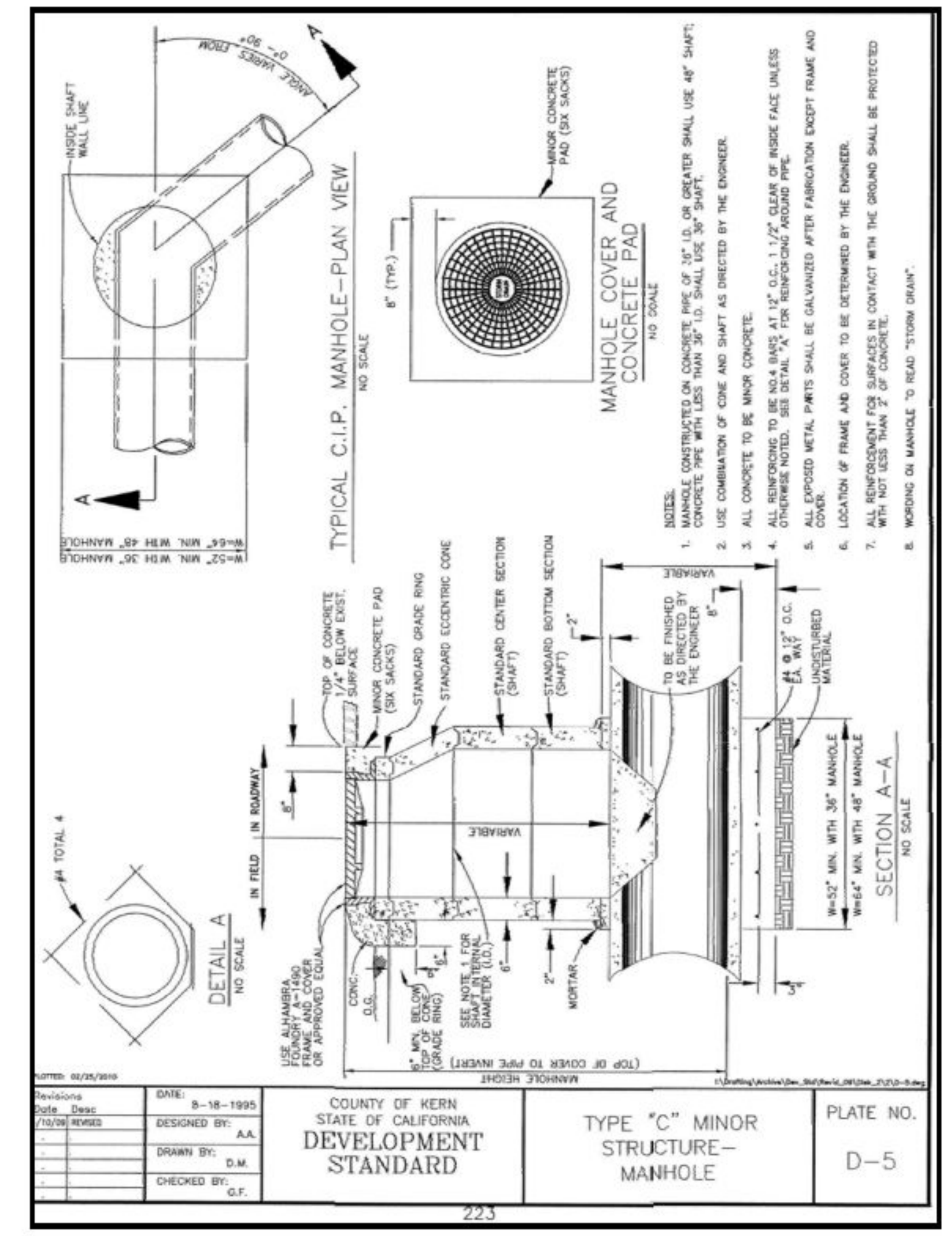
MARICOPA- CUT FILL EXHIBIT

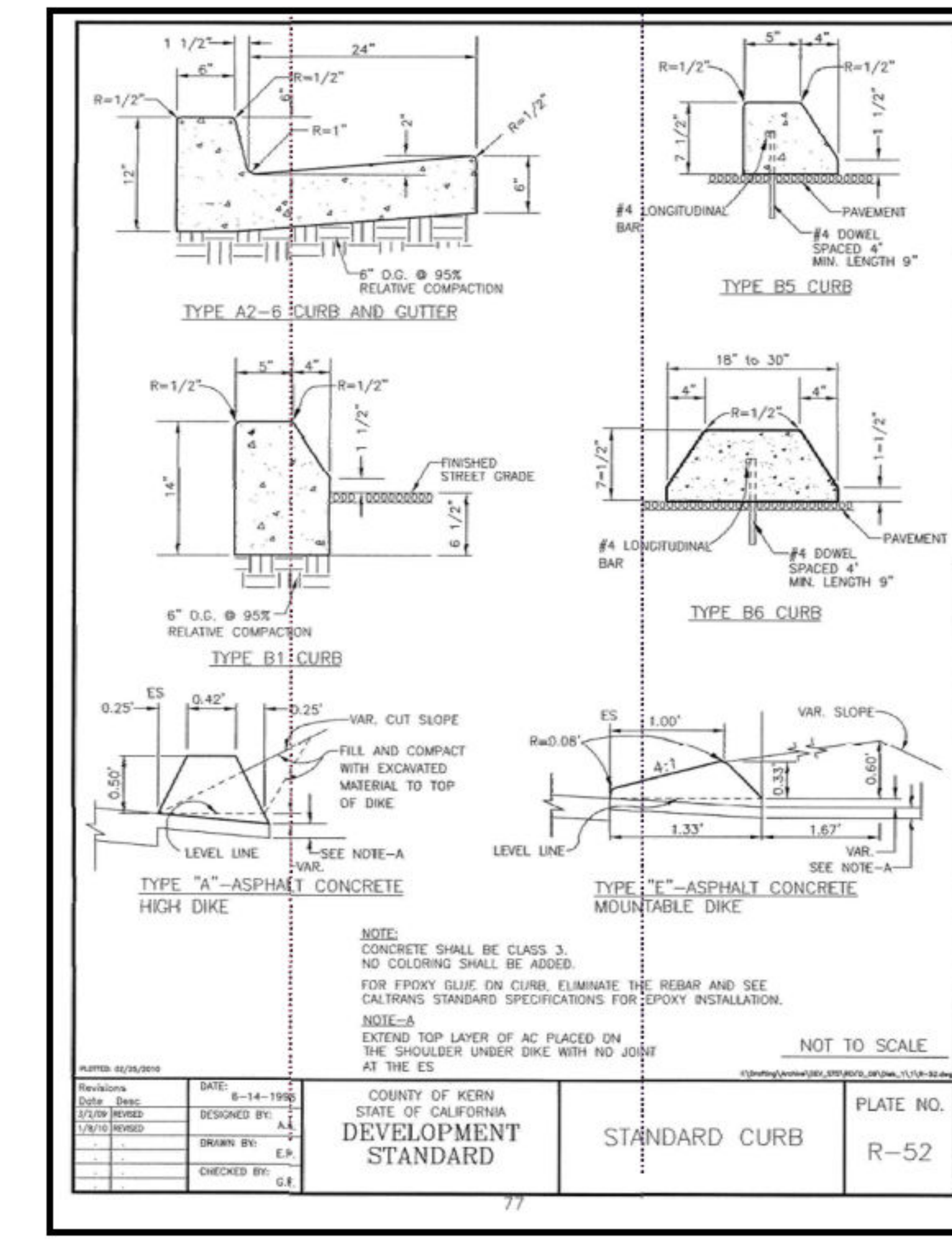
THE TEJON INDIAN TRUST ACQUISITION CASINO PROJECT
METTLER SITE A1&A2
MARICOPA SITE
COUNTY OF KERN, STATE OF CALIFORNIA

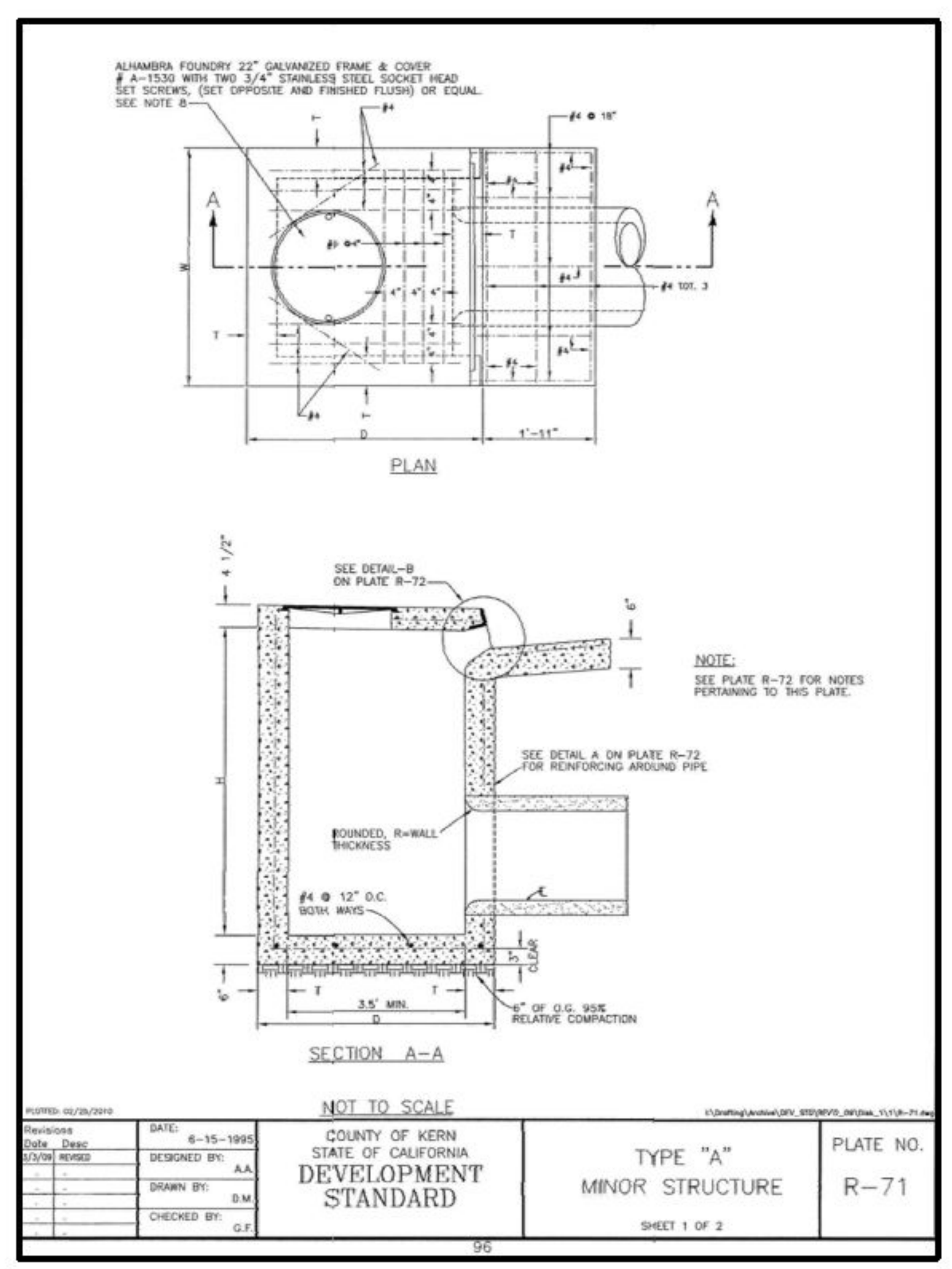
ENGINEER:	LAL	DATE: 05.22.2019	SCALE: AS SHOWN
CO. SURVEYOR:	DPSI, INC.	ORIGINAL DWG NO.	
PROJ. MGR:	LAL	NO. 14	REV.
COMPILED BY:	RJ		
DOCUMENT TYPE:	EXHIBIT	CAD FILE NO. CE181059-EXHIBIT B.dwg	A

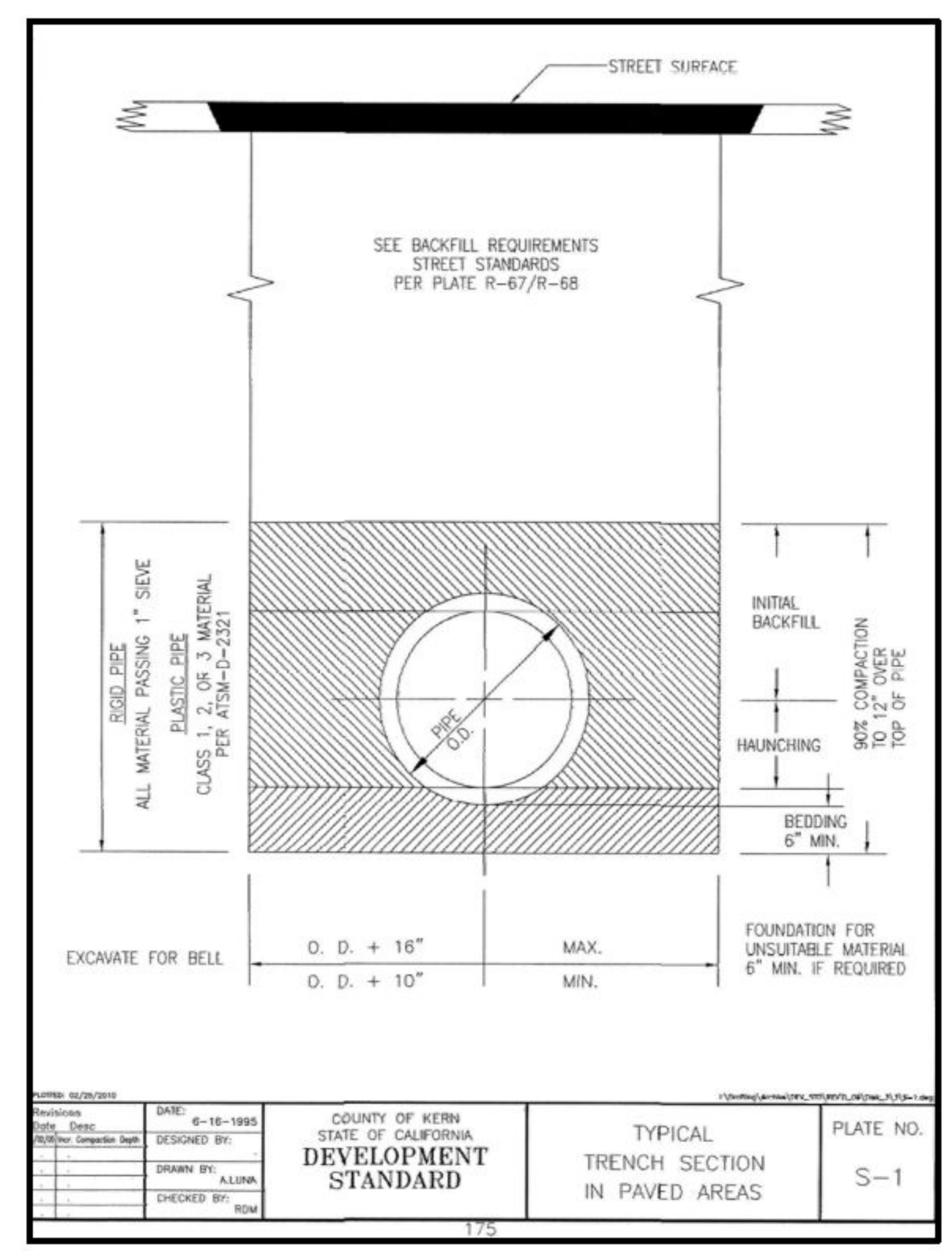












DWG NUMBER	TITLE
	REFERENCE DRAWINGS

DIVERSIFIED PROJECT SERVICES INTERNATIONAL

San Luis Obispo (805) 230-2891 · Bakersfield, CA (661) 371-2800 · Long Beach (562) 424-8400

THE DELIVERY OF THIS DRAWING SHOULD NOT BE CONSTRUED TO PROVIDE AN EXPRESS WARRANTY OR GUARANTEE TO ANYONE THAT ALL DIMENSIONS AND DETAILS ARE EXACT OR TO INDICATE THAT THE USE OF THIS DRAWING IMPLIES THE REVIEW AND APPROVAL OF DPSI OF ANY FUTURE USE. ANY USE OF THIS INFORMATION IS AT THE SOLE RISK OF THE USER.

PROJECT: 181059

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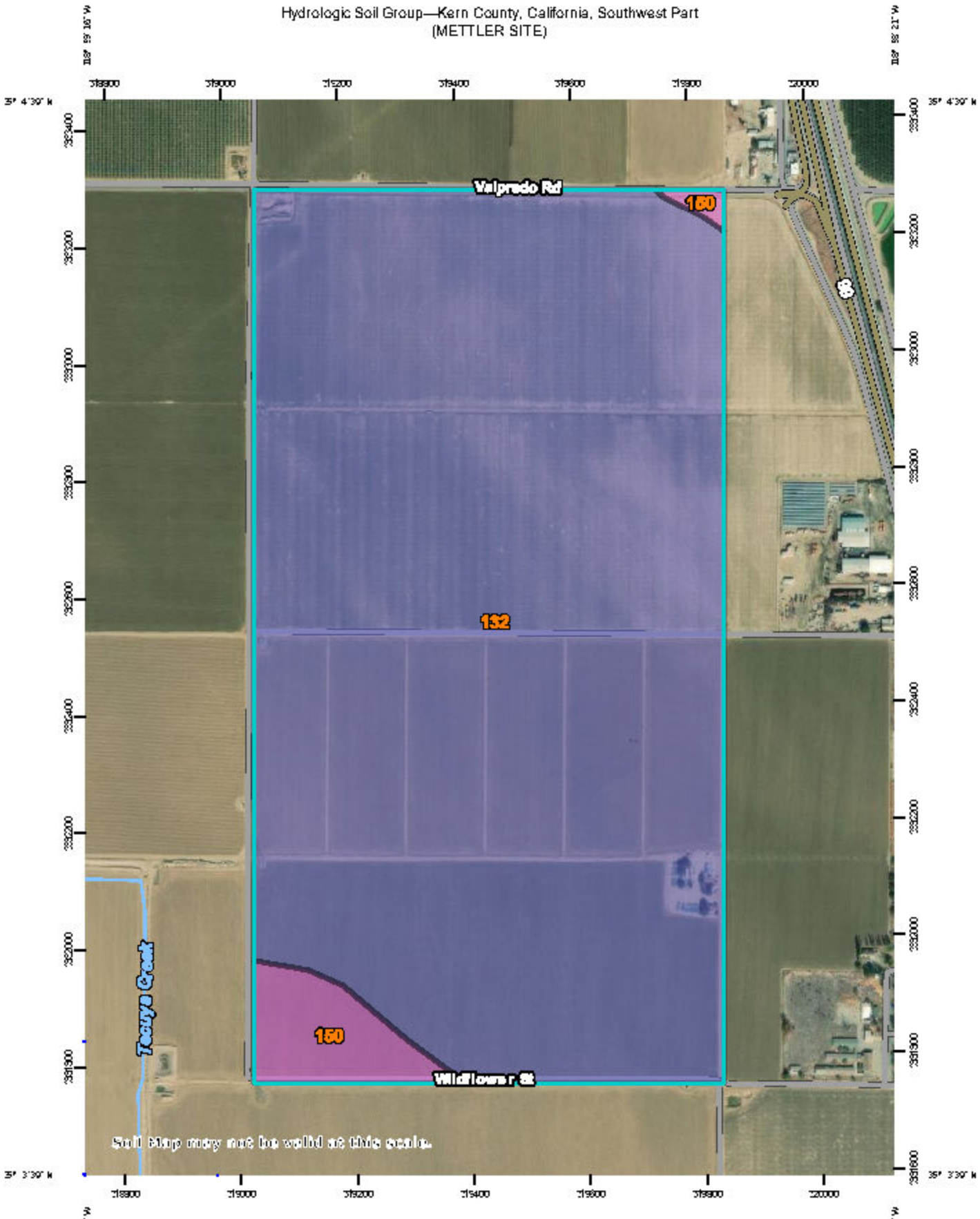
DATE	DESCRIPTION	BY	CKD.	APPR
03/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
05/22/19	ISSUED FOR REVIEW	EP	RJ	LAL
10/28/19	ISSUED FOR REVIEW	EP	RJ	LAL

DETAIL SHEET

THE TEJON INDIAN TRUST ACQUISITION CASINO PROJECT
METTLER SITE A1&A2
MARICOPA SITE
COUNTY OF KERN, STATE OF CALIFORNIA

ENGINEER:	LAL	DATE: 05.22.2019	SCALE: AS SHOWN
CO. SURVEYOR:	DPSI, INC.	ORIGINAL DWG NO.	
PROJ. MGR:	LAL	NO. 15	REV.
COMPILED BY:	RJ		
DOCUMENT TYPE:	EXHIBIT	CAD FILE NO. CE181059-DS001.dwg	A

Hydrologic Soil Group—Kern County, California, Southwest Part
(METTLER SITE)



Map Scale: 1:8,960 if printed on A portrait (8.5" x 11") sheet.

Meters
0 100 200 400 600

Feet
0 400 800 1600 2400

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N 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 1:24,000.

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:
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: Kern County, California, Southwest Part
Survey Area Data: Version 9, Sep 12, 2018

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

Date(s) aerial images were photographed: Mar 30, 2016—Nov 2, 2017

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

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
132	Cerini loam, 0 to 2 percent slopes	B	293.2	95.9%
150	Excelsior sandy loam, 0 to 2 percent slopes, MLRA 17	A	12.6	4.1%
Totals for Area of Interest			305.8	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

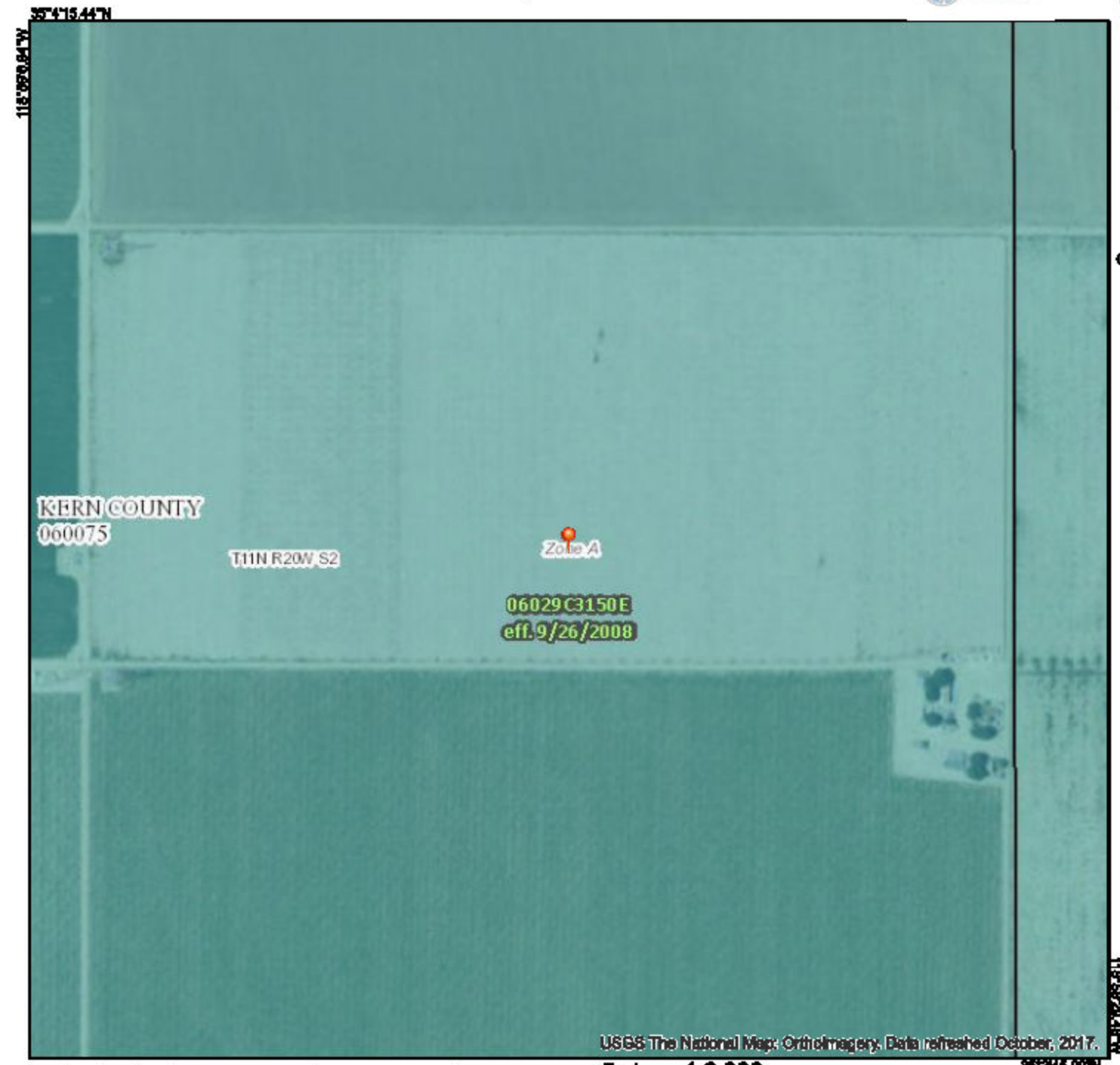
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Figure 1: FEMA FIRMette Mettler Site

National Flood Hazard Layer FIRMette



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- With Base Flood Elevation (BFE)
- With BFE or Depth
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile
- Future Conditions 1% Annual Chance Flood Hazard
- Area with Reduced Flood Risk due to Levee
- Area with Flood Risk due to Levee

OTHER AREAS
- Area of Minimal Flood Hazard
- Effective LOMRs
- Area of Undetermined Flood Hazard

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- Cross Sections with 1% Annual Chance
- Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

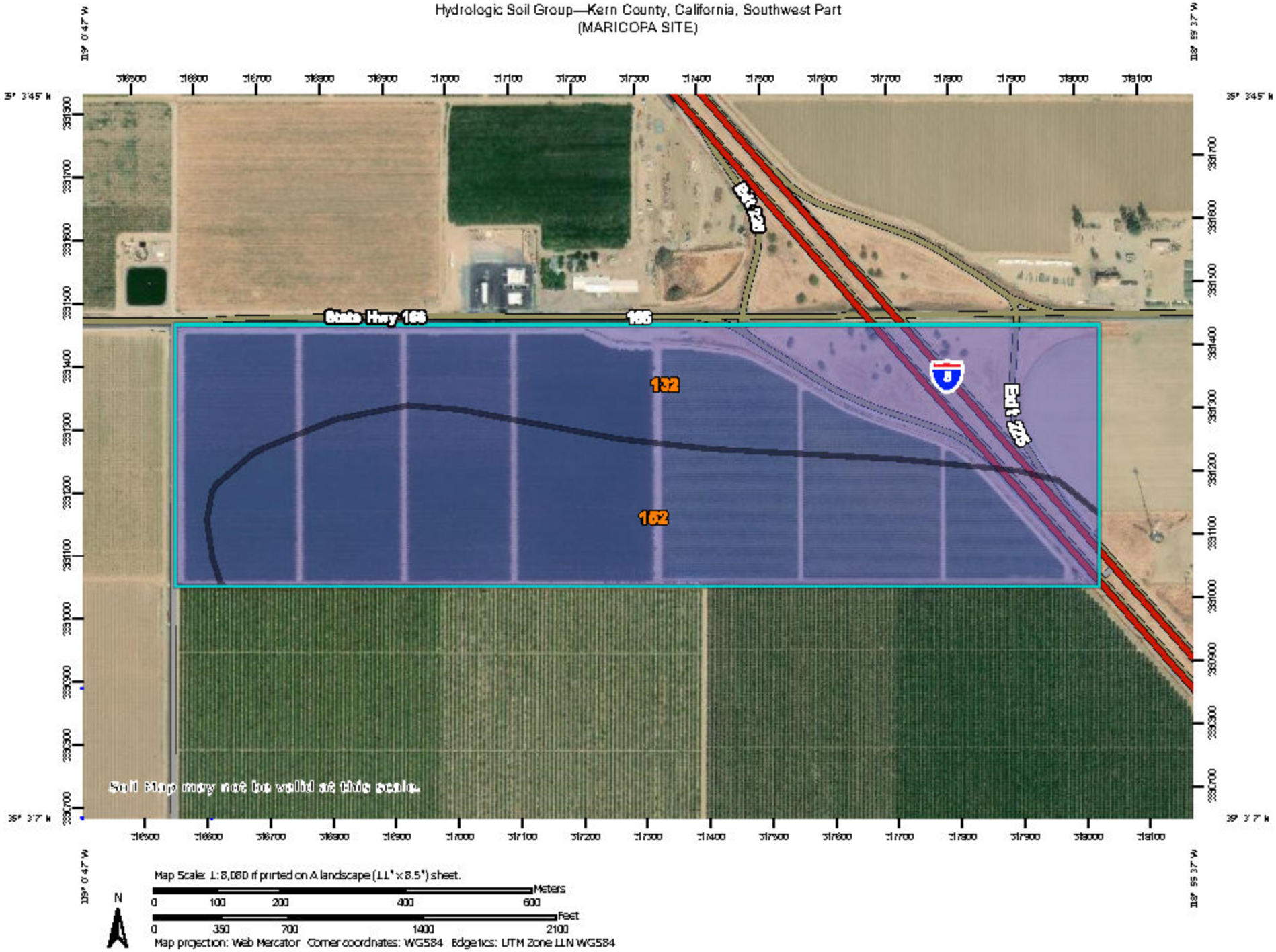
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 12/19/2018 at 1:02:38 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Hydrologic Soil Group—Kern County, California, Southwest Part
(MARICOPA SITE)



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 1:24,000.

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:
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: Kern County, California, Southwest Part
Survey Area Data: Version 9, Sep 12, 2018

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

Date(s) aerial images were photographed: Mar 30, 2016—Nov 2, 2017

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

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
132	Cerini loam, 0 to 2 percent slopes	B	72.7	48.1%
152	Excelsior loam, 0 to 2 percent slopes	B	78.4	51.9%
Totals for Area of Interest			151.1	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

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Figure 2: FEMA FIRMetter Maricopa Site

National Flood Hazard Layer FIRMette

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) Zone A, V, A99
- With BFE or Depth Zone AE, AO, AH, VE, AR
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard. Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with Reduced Flood Risk due to Levee. See Notes. Zone X
- Area with Flood Risk due to Levee Zone D

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard Zone X
- Effective LOMRs
- Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/7/2019 at 5:28:34 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.