Appendix A

Air Quality/Greenhouse Gas Analysis

ALBERT A. WEBB ASSOCIATES

Technical Memorandum

To: Evan James, Banning Lincoln Street Partners, LP

From: Eliza Laws, Senior Environmental Analyst
Noemi Avila, Assistant Environmental Analyst

Date: March 31, 2020

Re: Air Quality/Greenhouse Gas Analysis for the Lincoln Street Industrial Warehouse in the City of Banning

The following air quality assessment was prepared to evaluate whether the expected criteria air pollutant emissions generated as a result of construction and operation of the proposed Project would cause exceedances of the South Coast Air Quality Management District's (SCAQMD) thresholds for air quality in the Project area. The greenhouse gas (GHG) assessment was prepared to evaluate whether the expected criteria GHG emissions generated as a result of construction and operation of the proposed Project would exceed the SCAQMD draft screening significance thresholds. This assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000 et seq.). The methodology follows the *CEQA Air Quality Handbook* prepared by the SCAQMD for quantification of emissions and evaluation of potential impacts to air resources. As recommended by SCAQMD staff, the **Cal**ifornia **E**missions **E**stimator **Mod**el® version 2016.3.2 (CalEEMod) was used to quantify Project-related emissions.

The Project proposes development of a 21,000 square foot non-refrigerated warehouse for use as a cannabis grow facility on approximately 1.8 gross acres at the southeast corner of Eighth Street and Lincoln Street in the City of Banning, California. The Project also proposes installation of solar panels to offset some of the Project's electrical demand. Off-site improvements associated with the Project include half-width roadway improvements including sidewalk, curb and gutter along the Project frontage along South Eighth Street and Lincoln Street. Water and sewer pipelines will connect to existing pipelines along the Project frontage. A detention basin will be located on the southeast corner of the Project site.

▪ Regional Significance Thresholds

The thresholds contained in the *SCAQMD CEQA Air Quality Handbook*[1] (SCAQMD 1993) are considered regional thresholds and are shown in **Table 1 – SCAQMD CEQA Daily Regional Significance Thresholds**, below. These regional thresholds were developed based on the SCAQMD's treatment of a major stationary source.

[1] South Coast Air Quality Management District, *CEQA Air Quality Handbook*, November 1993. (Available at SCAQMD.)

Table 1 – SCAQMD CEQA Daily Regional Significance Thresholds

Emission Threshold	Units	VOC	NO_X	CO	SO_X	PM-10	PM-2.5
Construction	lbs/day	75	100	550	150	150	55
Operation	lbs/day	55	55	550	150	150	55

Air quality impacts can be described in a short- and long-term perspective. Short-term impacts occur during site grading and Project construction and consist of fugitive dust and other particulate matter, as well as exhaust emissions generated by construction-related vehicles. Long-term air quality impacts occur once the Project is in operation.

The Project will be required to comply with existing SCAQMD rules for the reduction of fugitive dust emissions. SCAQMD Rule 403 establishes these procedures. Compliance with this rule is achieved through application of standard best management practices in construction and operation activities, such as application of water or chemical stabilizers to disturbed soils, managing haul road dust by application of water, covering haul vehicles, restricting vehicle speeds on unpaved roads to 15 mph, sweeping loose dirt from paved site access roadways, cessation of construction activity when winds exceed 25 mph and establishing a permanent, stabilizing ground cover on finished sites. In addition, projects that disturb 50 or more acres or more of soil or move 5,000 cubic yards of materials per day are required to submit a Fugitive Dust Control Plan or a Large Operation Notification Form to SCAQMD. Based on the size of this Project's disturbance area (approximately 2.24 gross acres), a Fugitive Dust Control Plan or a Large Operation Notification Form would not be required.

Short-Term Analysis

Short-term emissions from Project construction were evaluated using the CalEEMod version 2016.3.2 program. The estimated construction period for the proposed Project is approximately 10 months, beginning no sooner than June 2020. The default parameters within CalEEMod were used, except as identified below, and these default values generally reflect a worst-case scenario, which means that Project emissions are expected to be equal to or less than the estimated emissions. In addition to the default values used, Project-specific assumptions relevant to model inputs for short-term construction emission estimates used are:

- Construction is anticipated to begin in June 2020 with grading and end with paving activities in April 2021:

Construction Activity	Start Date	End Date	Total Working Days
Grading	June 1, 2020	June 12, 2020	10 days
Building Construction	June 15, 2020	April 15, 2021	219 days
Paving	April 9, 2021	April 15, 2021	5 days

- The equipment to be used for each activity is shown below based on Applicant-provided estimates and CalEEMod defaults. Each piece of equipment is assumed to operate 8 hours per day:

Construction Activity	Off-Road Equipment	Unit Amount
Grading	Graders	1
	Rubber Tired Dozers	1
	Tractors/Loaders/Backhoes	1
Building Construction	Cranes	1
	Forklifts	1
	Generator Sets	1
	Tractors/Loaders/Backhoes	1

	Welders	3
Paving	Pavers	1
	Paving Equipment	1
	Rollers	1
	Tractor/Loader/Backhoes	1
	Cement and Mortar Mixers	1

- To evaluate Project compliance with SCAQMD Rule 403 for fugitive dust control, the Project utilized the mitigation option of watering the Project site three times daily which achieves a control efficiency of 61 percent for PM-10 and PM-2.5 emissions. Two (2) one-way vendor trips per day were added to the grading and paving activities to account for water truck trips.

- Approximately 3,960 cubic yards (cy) of soil will be imported during grading operations, of which 500 cy will be obtained from the on-site basin. Truck capacity is assumed to be 16 cubic yards, resulting in approximately 216 truckloads of import over a 10-day period, or approximately 22 truckloads per day. The import site is currently unknown. Therefore, the CalEEMod default was utilized which assumes a hauling trip length of 20 miles per trip.

- Off-site infrastructure improvements will also be required for water and sewer pipeline connections in South Eighth Street within the proposed street improvements along the Project frontage of South Eighth Street and Lincoln Street. The off-site improvements will disturb approximately 0.44 acres.

- The warehouse will be constructed with a prefinished metal building; therefore, an architectural coating (painting) phase is not required.

The results of this analysis are summarized below.

Table 2 – Unmitigated Estimated Maximum Daily Construction Emissions

Activity	Peak Daily Emissions (lb/day)					
	VOC	NO_X	CO	SO_2	PM-10	PM-2.5
SCAQMD Daily Construction Thresholds	**75**	**100**	**550**	**150**	**150**	**55**
Grading-2020	2.05	**30.32**	10.07	**0.05**	**4.25**	**2.39**
Building Construction-2020	2.49	18.76	16.54	0.03	1.48	1.04
Building Construction-2021	**2.23**	17.21	16.03	0.03	1.35	0.91
Paving-2021	**1.38**	8.94	10.41	0.02	0.62	0.47
Maximum[1]	**3.61**	**30.32**	**26.44**	**0.05**	**4.25**	**2.39**
Exceeds Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Note: [1]Maximum emissions are the greater of either Grading or Building Construction 2020 alone or the sum of Building Construction 2021 and Paving in 2021.

As shown in the table above, the emissions from construction of the Project are below the SCAQMD daily construction thresholds for all the criteria pollutants.

Long-Term Analysis

Long-term emissions are evaluated at build-out of a project. The Project is assumed to be operational in 2021. Mobile source emissions refer to on-road motor vehicle emissions generated from the Project's traffic and based on the trip generation provided in the Project-specific Traffic Memorandum.[2]

Area source emissions include the use of consumer products, residential hearths (fireplaces), yard and landscape maintenance, and an average building square footage to be repainted each year. Energy source emissions are associated with building electricity and natural gas usage (non-hearth). CalEEMod computes area and energy source emissions based upon default factors and land use assumptions. CalEEMod defaults were modified with utility-specific information from the City of Banning. The Project will not require natural gas usage and therefore was not modeled. The estimated Project specific energy use rates were used based on annual electricity consumption estimates provided by the Applicant.[3]

Separate emissions were computed for both the summer and winter.

Table 3 – Unmitigated Estimated Daily Project Operation Emissions (Summer)

Source	Peak Daily Emissions (lb/day)					
	VOC	NO_X	CO	SO_2	PM-10	PM-2.5
SCAQMD Daily Thresholds	**55**	**55**	**550**	**150**	**150**	**55**
Area	0.50	0.00	0.01	0.00	0.00	0.00
Energy	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.18	1.35	2.50	0.01	0.79	0.22
Total	**0.68**	**1.35**	**2.51**	**0.01**	**0.79**	**0.22**
Exceeds Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Note: Emissions reported as zero are rounded and not necessarily equal to zero.

Table 4 – Unmitigated Estimated Daily Project Operation Emissions (Winter)

Source	Peak Daily Emissions (lb/day)					
	VOC	NO_X	CO	SO_2	PM-10	PM-2.5
SCAQMD Daily Thresholds	**55**	**55**	**550**	**150**	**150**	**55**
Area	0.50	0.00	0.01	0.00	0.00	0.00
Energy	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.16	1.36	2.13	0.01	0.79	0.22
Total	**0.66**	**1.36**	**2.14**	**0.01**	**0.79**	**0.22**
Exceeds Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Note: Emissions reported as zero are rounded and not necessarily equal to zero.

Evaluation of the data presented on the above tables indicates that criteria pollutant emissions from operation of this Project will not exceed the SCAQMD regional daily thresholds for any pollutant during summer or winter.

[2] Albert A. Webb Associates, *Trip generation for proposed cannabis development at 8th Street and Lincoln Street*, February 25, 2020.

[3] Project is estimated to use 3,000,000 kilowatt-hours per year (kwh/yr). Although the Project proposes solar panels to offset some of this consumption, these reductions were not quantified to provide a more conservative analysis.

▪ Localized Significance Threshold Analysis

Background

As part of the SCAQMD's environmental justice program, attention has been focused on localized effects of air quality. Staff at SCAQMD has developed localized significance threshold (LST) methodology[4] that can be used by public agencies to determine whether or not a project may generate significant adverse localized air quality impacts (both short- and long-term). LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the state ambient air quality standard, and are developed based on the ambient concentrations of that pollutant for each source receptor area (SRA). The Project is located in SRA 29.

Short-Term Analysis

According to the LST methodology, only on-site emissions need to be analyzed. Emissions associated with vendor and worker trips are mobile source emissions that occur off site. The emissions analyzed under the LST methodology are NO_2, CO, PM-10, and PM-2.5. SCAQMD has provided LST lookup tables[5] to allow users to readily determine if the daily emissions for proposed construction or operational activities could result in significant localized air quality impacts for projects five acres or smaller. Although the Project site disturbs approximately 2.25 acres total, it is anticipated that an area of approximately one acre would be disturbed per day during construction of the Project site.[6] Consistent with SCAQMD guidance, the LST for the one-acre site was used.[7] The LST threshold and tables can be used as a screening tool to determine if dispersion modeling would be necessary.

The LST thresholds are estimated using the maximum daily disturbed area (in acres) and the distance of the Project to the nearest sensitive receptors (in meters). The closest sensitive receptor to the Project construction site is the existing residence approximately 102 meters (335 feet) to the south of the Project site. Therefore, a receptor distance of 100 meters (328 feet) was used. The one-acre LST and a receptor distance of 100 meters was utilized for the maximum daily construction emissions. The results are summarized below.

Table 5 – LST Results for Daily Construction Emissions

Pollutant	Peak Daily Emissions (lb/day)			
	NO_x	CO	PM-10	PM-2.5
LST for 1-acre at 100 meters	**189**	**2,623**	**55**	**14**
Grading-2020	19.76	8.23	**3.33**	**2.12**
Building Construction 2020	16.99	14.58	0.91	0.87
Building Construction 2021	**15.62**	**14.25**	**0.78**	0.75
Paving-2021	**8.72**	**9.90**	**0.47**	0.43
Maximum[1]	**24.34**	**24.15**	**3.33**	**2.12**
Exceeds Threshold?	**No**	**No**	**No**	**No**

Note: [1]Maximum emissions are the greater of either Grading or Building Construction 2020 alone or the sum of Building Construction 2021 and Paving in 2021.

[4] South Coast Air Quality Management District, *Final Localized Significance Threshold Methodology*, Revised July 2008. (Available at http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/localized-significance-thresholds, accessed March 2020.)

[5] http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/localized-significance-thresholds

[6] http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/caleemod-guidance.pdf?sfvrsn=2

[7] http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/caleemod-guidance.pdf?sfvrsn=2

Emissions from construction of the Project will be below the LST established by SCAQMD for the Project.

Long-Term Analysis

According to the LST methodology, LSTs only apply to the operational phase if a project includes stationary sources or attracts mobile sources that may spend long periods of time idling at the site, such as warehouse/transfer facilities. The proposed Project does not include such uses. Therefore, due to the lack of stationary source emissions, no long-term LST analysis is needed.

▪ Greenhouse Gas Analysis

Greenhouse gases (GHG) are not presented in lbs/day like criteria pollutants; they are typically evaluated on an annual basis using the metric system. Several agencies, at various levels, have proposed draft GHG significance thresholds for use in CEQA documents. SCAQMD has been working on GHG thresholds for development projects. In December 2008, the SCAQMD adopted a threshold of 10,000 metric tonnes per year of carbon dioxide equivalents ($MTCO_2E$/yr) for stationary source projects where SCAQMD is the lead agency. The most recent draft proposal was in September 2010[8] and included screening significance thresholds for residential, commercial, and mixed-use projects at 3,500, 1,400, and 3,000 $MTCO_2E$/yr, respectively. Alternatively, a lead agency has the option to use 3,000 $MTCO_2E$/yr as a threshold for all non-industrial projects. Although both options are recommended by SCAQMD, a lead agency is advised to use only one option and to use it consistently. If emissions are above the screening level threshold, additional analysis may be required. These screening thresholds are widely used by City of Banning and various other agencies in the South Coast Air Basin. The SCAQMD significance thresholds also evaluate construction emissions by amortizing them over an expected project life of 30 years.

Short-Term Analysis

Construction-Related Emissions

The CalEEMod model calculates GHG emissions from fuel usage by construction equipment and construction-related activities, like construction worker trips, for the Project. The CalEEMod estimate does not analyze emissions from construction-related electricity or natural gas. Construction-related electricity and natural gas emissions vary based on the amount of electric power used during construction and other unknown factors which make them too speculative to quantify. The CalEEMod output results for construction-related GHG emissions present the GHG emissions estimates for the Project for CO_2, methane (CH_4), nitrous oxide (N_2O), and CO_2E.[9]

Table 6 – Project Construction Equipment GHG Emissions

Year	Metric Tons per year (MT/yr)			
	Total CO_2	Total CH_4	Total N_2O	Total CO_2E
2020	227.04	0.04	0.00	227.94
2021	108.67	0.02	0.00	109.10
Total	335.71	0.06	0.00	337.04
			Amortized[1]	**11.23**

Note:[1]Construction emissions were amortized over a 30-year period, as recommended by SCAQMD.

Evaluation of **Table 6** indicates that an estimated 337.04 $MTCO_2E$ will occur from Project construction equipment over the course of the estimated approximately 10 months construction period. Since the

[8] http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/year-2008-2009/ghg-meeting-15/ghg-meeting-15-main-presentation.pdf?sfvrsn=2

[9] CO_2E is the sum of CO_2 emissions estimated plus the sum of CH_4 and N_2O emissions estimated multiplied by their respective global warming potential (GWP).

draft SCAQMD GHG threshold guidance document released in October 2008[10] recommends that construction emissions be amortized for a project lifetime of 30 years to ensure that GHG reduction measures address construction GHG emissions as part of the operational reduction strategies, the total GHG emissions from Project construction were amortized and are included in **Table 8**, below.

Vegetation Change

CalEEMod estimates the GHG emissions associated with the one-time change in vegetation resulting from development and the GHG emissions sequestered as a result of planting new trees on a project site. Planting trees as part of the Project will sequester CO_2 while they are actively growing. Approximately 43 trees from miscellaneous species are estimated to be planted as part of this Project based on the number of trees on the conceptual landscaping plan.[11] As shown in the CalEEMod output (attached), the estimated one-time sequestration of CO_2 from the planting of Project trees is 30.44 $MTCO_2E$. Assuming a Project life of 30 years, this equates to a net reduction of 1.01 $MTCO_2E$ annually. These results were included in the analysis of the Project's total operational emissions below in **Table 8**.

Long-Term Analysis

Area Source Emissions

CalEEMod estimates the GHG emissions associated with area sources which include landscape equipment emissions, architectural coating, consumer products, and hearths. Landscape equipment servicing the Project site create CO_2 resulting from fuel combustion based on the Project's land uses. Consumer products consist of consumer use of solvents and personal care products and architectural coatings consist of an average building square footage to be repainted each year. The CalEEMod output contained in the attached output shows that the GHG emissions from area sources are negligible and are reported at zero.

Energy-Related Emissions

CalEEMod estimates the GHG emissions associated with building electricity and natural gas usage (non-hearth) for each land use type. Electricity and natural gas used in buildings is typically generated at an off-site power plant which indirectly generates GHG emissions. The Project-specific energy usage values used in CalEEMod were provided by the Applicant; natural gas will not be used, and the Project is estimated to use 3,000,000 kilowatt-hours per year (kwh/yr). As stated above, the emissions have been adjusted to incorporate utility-specific information from the Banning Electric Utility.[12] Although the Project proposes solar panels to offset some of this consumption, these reductions were not quantified to provide a more conservative analysis. **Table 7** summarizes the GHG emissions estimates reported by CalEEMod for the Project.

Table 7 – Energy-Related GHG Emissions

Source	Metric Tons per year (MT/yr)			
	CO_2	CH_4	N_2O	Total CO_2E
Electricity	931.61	0.04	0.01	936.65
Total	**931.61**	**0.04**	**0.01**	**936.65**

Note: Emissions reported as zero are rounded and not necessarily equal to zero.

Mobile Source Emissions

CalEEMod estimates the annual GHG emissions from Project-related vehicle usage based on trip generation data contained in defaults or in a project-specific traffic analyses. The trip generation rate and fleet mix were adjusted based on the rates and ratios found in the Project-specific Traffic

[10] http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/year-2008-2009/ghg-meeting-6/ghg-meeting-6-guidance-document-discussion.pdf?sfvrsn=2

[11] Conceptual Landscaping Plan by SPLA, dated October 22, 2019.

[12] Per WRCOG Subregional CAP.

Memorandum prepared by Albert A. Webb Associates in February 2020. **Table 8** shows the mobile source emissions of GHG from the Project.

Solid Waste Emissions

CalEEMod also calculates the GHG emissions associated with the disposal of solid waste into landfills based on default data contained within the model for waste disposal rates, composition, and the characteristics of landfills throughout the state. A large percentage of this waste will be diverted from landfills by a variety of means, such as reducing the amount of waste generated, recycling, and/or composting. The remainder of the waste not diverted will be disposed of at a landfill. **Table 8** shows the solid waste GHG emissions from the Project.

Water-Related Energy Usage

Electricity is also indirectly used in water supply, treatment, and distribution, as well as wastewater treatment in Southern California and plays a large role in GHG production. There are three processes necessary to supply potable water to urban users (i.e., residential, commercial, and industrial): (1) supply and conveyance of the water from the source; (2) treatment of the water to potable standards; and (3) distribution of the water to individual users. After use, the wastewater is treated and either reused as reclaimed/recycled water or returned to the environment. CalEEMod calculates the GHG emissions from these processes based on default emissions factors and water/wastewater generation rates for a project's location. Default values were used for electricity intensity factor associated with the supply and conveyance of water from its source which assumes that the water is being imported from Northern California. Water demand was obtained from the Applicant.[13] **Table 8** shows the GHG emissions from water-related energy usage for the Project.

Total Project GHG Emissions

As shown in **Table 8 – Total Project-Related GHG Emissions**, using all the emissions quantified above, the total GHG emissions generated from the Project is approximately 1,127.75 $MTCO_2E$/yr which includes construction-related emissions and carbon sequestration amortized over a typical project life of 30 years.

Table 8 – Total Project-Related GHG Emissions

Source	Metric Tons per year (MT/yr)			
	CO_2	CH_4	N_2O	Total CO_2E
Amortized Construction	--	--	--	11.23
Vegetation Change	--	--	--	-1.01
Energy	931.61	0.04	0.01	936.65
Mobile	166.12	0.01	0.00	166.31
Solid Waste	5.29	0.31	0.00	13.10
Water	1.23	0.01	0.00	1.47
Total	1,104.25	0.37	0.01	1,127.75

Note: Emissions reported as zero are rounded and not necessarily equal to zero.

The total GHG emissions from the Project are below the SCAQMD interim screening threshold level of 10,000 $MTCO_2E$/yr for industrial projects.

[13] Indoor water demand provided by the Applicant; outdoor water demand provided by SPLA

Conclusion

The conclusion of this analysis indicates that construction of the proposed Project will not exceed criteria pollutant thresholds established by SCAQMD on a regional or localized level and no mitigation is required. The analysis also concludes that operation of the proposed Project will not exceed criteria pollutant thresholds established by SCAQMD on a regional level. The Project's GHG emissions will not exceed the SCAQMD interim threshold of 10,000 $MTCO_2E/yr$.

Should you have any questions, please contact me at (951) 686-1070.

CALEEMOD OUTPUT FILES

Lincoln Industrial Warehouse Project

Riverside-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Manufacturing	21.00	1000sqft	0.48	21,000.00	0
Other Asphalt Surfaces	36.53	1000sqft	0.84	36,530.00	0
Other Non-Asphalt Surfaces	40.05	1000sqft	0.92	40,048.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2021
Utility Company	User Defined				
CO2 Intensity (lb/MWhr)	684.6	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.01

1.3 User Entered Comments & Non-Default Data

Lincoln Industrial Warehouse Project - Riverside-South Coast County, Summer

Project Characteristics - Banning Electric Utility 33%RPS included.

Land Use - Per Grading Plan and off-site improvements.

Construction Phase - Per Applicant

Off-road Equipment -

Off-road Equipment - Per Applicant. 8hr work day.

Off-road Equipment - Per Applicant. 8hr work day.

Off-road Equipment - Per Applicant. 8hr. work day.

Trips and VMT - 2 daily vendor truck trips added for water per rule 403.

Grading - Per Conceptual Grading Plan

Vehicle Trips - Weekend trip rates assumed to be same as weekday. Per Traffic Memo

Energy Use - Estimated Energy usage per Applicant. No natural gas usage.

Water And Wastewater - Per Applicant

Sequestration - Per Landscape Plan

Construction Off-road Equipment Mitigation - Per rule 403.

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	220.00	219.00
tblConstructionPhase	NumDays	6.00	10.00
tblConstructionPhase	NumDays	10.00	5.00
tblEnergyUse	LightingElect	2.93	0.00
tblEnergyUse	NT24E	5.02	142.86
tblEnergyUse	NT24NG	17.13	0.00
tblEnergyUse	T24E	2.20	0.00
tblEnergyUse	T24NG	15.36	0.00
tblGrading	AcresOfGrading	5.00	1.80
tblGrading	MaterialImported	0.00	3,460.00

tblLandUse	LandUseSquareFeet	40,050.00	40,048.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblProjectCharacteristics	CH4IntensityFactor	0	0.029
tblProjectCharacteristics	CO2IntensityFactor	0	684.6
tblProjectCharacteristics	N2OIntensityFactor	0	0.01
tblSequestration	NumberOfNewTrees	0.00	43.00
tblTripsAndVMT	HaulingTripNumber	433.00	432.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	8.00	10.00
tblVehicleTrips	ST_TR	1.49	3.93
tblVehicleTrips	SU_TR	0.62	3.93
tblVehicleTrips	WD_TR	3.82	3.93
tblWater	IndoorWaterUseRate	4,856,250.00	225,000.00
tblWater	OutdoorWaterUseRate	0.00	73,000.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	2.4855	30.2280	16.5363	0.0528	7.1371	0.9248	8.0619	3.5780	0.8843	4.4300	0.0000	5,425.6219	5,425.6219	0.7876	0.0000	5,445.3127
2021	3.6069	26.1522	26.4410	0.0503	0.7189	1.2541	1.9730	0.1933	1.1862	1.3795	0.0000	4,774.9766	4,774.9766	0.9471	0.0000	4,798.6548
Maximum	**3.6069**	**30.2280**	**26.4410**	**0.0528**	**7.1371**	**1.2541**	**8.0619**	**3.5780**	**1.1862**	**4.4300**	**0.0000**	**5,425.6219**	**5,425.6219**	**0.9471**	**0.0000**	**5,445.3127**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	2.4855	30.2280	16.5363	0.0528	3.3205	0.9248	4.2452	1.5421	0.8843	2.3941	0.0000	5,425.6219	5,425.6219	0.7876	0.0000	5,445.3127
2021	3.6069	26.1522	26.4410	0.0503	0.7189	1.2541	1.9730	0.1933	1.1862	1.3795	0.0000	4,774.9766	4,774.9766	0.9471	0.0000	4,798.6548
Maximum	**3.6069**	**30.2280**	**26.4410**	**0.0528**	**3.3205**	**1.2541**	**4.2452**	**1.5421**	**1.1862**	**2.3941**	**0.0000**	**5,425.6219**	**5,425.6219**	**0.9471**	**0.0000**	**5,445.3127**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**48.58**	**0.00**	**38.03**	**53.98**	**0.00**	**35.04**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.5030	9.0000e-005	0.0100	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0214	0.0214	6.0000e-005		0.0228
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.1830	1.3540	2.5027	0.0105	0.7794	7.2400e-003	0.7867	0.2086	6.7900e-003	0.2154		1,065.5909	1,065.5909	0.0466		1,066.7549
Total	**0.6860**	**1.3541**	**2.5127**	**0.0105**	**0.7794**	**7.2800e-003**	**0.7867**	**0.2086**	**6.8300e-003**	**0.2154**		**1,065.6123**	**1,065.6123**	**0.0466**	**0.0000**	**1,066.7777**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.5030	9.0000e-005	0.0100	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0214	0.0214	6.0000e-005		0.0228
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.1830	1.3540	2.5027	0.0105	0.7794	7.2400e-003	0.7867	0.2086	6.7900e-003	0.2154		1,065.5909	1,065.5909	0.0466		1,066.7549
Total	**0.6860**	**1.3541**	**2.5127**	**0.0105**	**0.7794**	**7.2800e-003**	**0.7867**	**0.2086**	**6.8300e-003**	**0.2154**		**1,065.6123**	**1,065.6123**	**0.0466**	**0.0000**	**1,066.7777**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	6/1/2020	6/12/2020	5	10	
2	Building Construction	Building Construction	6/15/2020	4/15/2021	5	219	
3	Paving	Paving	4/9/2021	4/15/2021	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1.8

Acres of Paving: 1.76

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	1	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	3	10.00	2.00	432.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	41.00	16.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	2.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.2568	0.0000	6.2568	3.3375	0.0000	3.3375			0.0000			0.0000
Off-Road	1.7648	19.7629	8.2258	0.0183		0.8903	0.8903		0.8191	0.8191		1,770.8297	1,770.8297	0.5727		1,785.1477
Total	**1.7648**	**19.7629**	**8.2258**	**0.0183**	**6.2568**	**0.8903**	**7.1471**	**3.3375**	**0.8191**	**4.1566**		**1,770.8297**	**1,770.8297**	**0.5727**		**1,785.1477**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2222	10.2292	1.2621	0.0329	0.7557	0.0326	0.7883	0.2072	0.0312	0.2384		3,489.5546	3,489.5546	0.2080		3,494.7535
Vendor	5.5700e-003	0.2058	0.0377	5.2000e-004	0.0128	1.1700e-003	0.0140	3.6900e-003	1.1200e-003	4.8100e-003		55.0782	55.0782	4.1300e-003		55.1815
Worker	0.0509	0.0301	0.4032	1.1100e-003	0.1118	6.8000e-004	0.1125	0.0296	6.2000e-004	0.0303		110.1595	110.1595	2.8200e-003		110.2301
Total	**0.2786**	**10.4650**	**1.7030**	**0.0345**	**0.8803**	**0.0344**	**0.9148**	**0.2405**	**0.0329**	**0.2734**		**3,654.7922**	**3,654.7922**	**0.2149**		**3,660.1650**

3.2 Grading - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.4402	0.0000	2.4402	1.3016	0.0000	1.3016			0.0000			0.0000
Off-Road	1.7648	19.7629	8.2258	0.0183		0.8903	0.8903		0.8191	0.8191	0.0000	1,770.8297	1,770.8297	0.5727		1,785.1477
Total	**1.7648**	**19.7629**	**8.2258**	**0.0183**	**2.4402**	**0.8903**	**3.3305**	**1.3016**	**0.8191**	**2.1207**	**0.0000**	**1,770.8297**	**1,770.8297**	**0.5727**		**1,785.1477**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2222	10.2292	1.2621	0.0329	0.7557	0.0326	0.7883	0.2072	0.0312	0.2384		3,489.5546	3,489.5546	0.2080		3,494.7535
Vendor	5.5700e-003	0.2058	0.0377	5.2000e-004	0.0128	1.1700e-003	0.0140	3.6900e-003	1.1200e-003	4.8100e-003		55.0782	55.0782	4.1300e-003		55.1815
Worker	0.0509	0.0301	0.4032	1.1100e-003	0.1118	6.8000e-004	0.1125	0.0296	6.2000e-004	0.0303		110.1595	110.1595	2.8200e-003		110.2301
Total	**0.2786**	**10.4650**	**1.7030**	**0.0345**	**0.8803**	**0.0344**	**0.9148**	**0.2405**	**0.0329**	**0.2734**		**3,654.7922**	**3,654.7922**	**0.2149**		**3,660.1650**

3.3 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2322	16.9868	14.5819	0.0246		0.9090	0.9090		0.8728	0.8728		2,253.0567	2,253.0567	0.4530		2,264.3807
Total	**2.2322**	**16.9868**	**14.5819**	**0.0246**		**0.9090**	**0.9090**		**0.8728**	**0.8728**		**2,253.0567**	**2,253.0567**	**0.4530**		**2,264.3807**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0446	1.6463	0.3012	4.1800e-003	0.1025	9.3600e-003	0.1118	0.0295	8.9600e-003	0.0385		440.6255	440.6255	0.0331		441.4517
Worker	0.2086	0.1234	1.6532	4.5300e-003	0.4583	2.7800e-003	0.4611	0.1215	2.5600e-003	0.1241		451.6538	451.6538	0.0116		451.9432
Total	**0.2532**	**1.7697**	**1.9544**	**8.7100e-003**	**0.5607**	**0.0121**	**0.5729**	**0.1510**	**0.0115**	**0.1626**		**892.2792**	**892.2792**	**0.0446**		**893.3949**

3.3 Building Construction - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2322	16.9868	14.5819	0.0246		0.9090	0.9090		0.8728	0.8728	0.0000	2,253.0567	2,253.0567	0.4530		2,264.3807
Total	**2.2322**	**16.9868**	**14.5819**	**0.0246**		**0.9090**	**0.9090**		**0.8728**	**0.8728**	**0.0000**	**2,253.0567**	**2,253.0567**	**0.4530**		**2,264.3807**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0446	1.6463	0.3012	4.1800e-003	0.1025	9.3600e-003	0.1118	0.0295	8.9600e-003	0.0385		440.6255	440.6255	0.0331		441.4517
Worker	0.2086	0.1234	1.6532	4.5300e-003	0.4583	2.7800e-003	0.4611	0.1215	2.5600e-003	0.1241		451.6538	451.6538	0.0116		451.9432
Total	**0.2532**	**1.7697**	**1.9544**	**8.7100e-003**	**0.5607**	**0.0121**	**0.5729**	**0.1510**	**0.0115**	**0.1626**		**892.2792**	**892.2792**	**0.0446**		**893.3949**

3.3 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9949	15.6171	14.2521	0.0247		0.7824	0.7824		0.7510	0.7510		2,253.1374	2,253.1374	0.4387		2,264.1060
Total	**1.9949**	**15.6171**	**14.2521**	**0.0247**		**0.7824**	**0.7824**		**0.7510**	**0.7510**		**2,253.1374**	**2,253.1374**	**0.4387**		**2,264.1060**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0374	1.4806	0.2642	4.1500e-003	0.1025	2.8200e-003	0.1053	0.0295	2.6900e-003	0.0322		437.2016	437.2016	0.0313		437.9836
Worker	0.1944	0.1107	1.5158	4.3800e-003	0.4583	2.7000e-003	0.4610	0.1215	2.4900e-003	0.1240		436.5479	436.5479	0.0104		436.8081
Total	**0.2317**	**1.5914**	**1.7800**	**8.5300e-003**	**0.5607**	**5.5200e-003**	**0.5663**	**0.1510**	**5.1800e-003**	**0.1562**		**873.7495**	**873.7495**	**0.0417**		**874.7917**

3.3 Building Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9949	15.6171	14.2521	0.0247		0.7824	0.7824		0.7510	0.7510	0.0000	2,253.1374	2,253.1374	0.4387		2,264.1060
Total	**1.9949**	**15.6171**	**14.2521**	**0.0247**		**0.7824**	**0.7824**		**0.7510**	**0.7510**	**0.0000**	**2,253.1374**	**2,253.1374**	**0.4387**		**2,264.1060**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0374	1.4806	0.2642	4.1500e-003	0.1025	2.8200e-003	0.1053	0.0295	2.6900e-003	0.0322		437.2016	437.2016	0.0313		437.9836
Worker	0.1944	0.1107	1.5158	4.3800e-003	0.4583	2.7000e-003	0.4610	0.1215	2.4900e-003	0.1240		436.5479	436.5479	0.0104		436.8081
Total	**0.2317**	**1.5914**	**1.7800**	**8.5300e-003**	**0.5607**	**5.5200e-003**	**0.5663**	**0.1510**	**5.1800e-003**	**0.1562**		**873.7495**	**873.7495**	**0.0417**		**874.7917**

3.4 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8738	8.7235	9.8952	0.0152		0.4650	0.4650		0.4289	0.4289		1,455.0218	1,455.0218	0.4595		1,466.5091
Paving	0.4402					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.3140**	**8.7235**	**9.8952**	**0.0152**		**0.4650**	**0.4650**		**0.4289**	**0.4289**		**1,455.0218**	**1,455.0218**	**0.4595**		**1,466.5091**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	4.6700e-003	0.1851	0.0330	5.2000e-004	0.0128	3.5000e-004	0.0132	3.6900e-003	3.4000e-004	4.0200e-003		54.6502	54.6502	3.9100e-003		54.7480
Worker	0.0616	0.0351	0.4806	1.3900e-003	0.1453	8.6000e-004	0.1462	0.0385	7.9000e-004	0.0393		138.4176	138.4176	3.3000e-003		138.5001
Total	**0.0663**	**0.2202**	**0.5137**	**1.9100e-003**	**0.1581**	**1.2100e-003**	**0.1593**	**0.0422**	**1.1300e-003**	**0.0434**		**193.0678**	**193.0678**	**7.2100e-003**		**193.2481**

3.4 Paving - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8738	8.7235	9.8952	0.0152		0.4650	0.4650		0.4289	0.4289	0.0000	1,455.0218	1,455.0218	0.4595		1,466.5091
Paving	0.4402					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.3140**	**8.7235**	**9.8952**	**0.0152**		**0.4650**	**0.4650**		**0.4289**	**0.4289**	**0.0000**	**1,455.0218**	**1,455.0218**	**0.4595**		**1,466.5091**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	4.6700e-003	0.1851	0.0330	5.2000e-004	0.0128	3.5000e-004	0.0132	3.6900e-003	3.4000e-004	4.0200e-003		54.6502	54.6502	3.9100e-003		54.7480
Worker	0.0616	0.0351	0.4806	1.3900e-003	0.1453	8.6000e-004	0.1462	0.0385	7.9000e-004	0.0393		138.4176	138.4176	3.3000e-003		138.5001
Total	**0.0663**	**0.2202**	**0.5137**	**1.9100e-003**	**0.1581**	**1.2100e-003**	**0.1593**	**0.0422**	**1.1300e-003**	**0.0434**		**193.0678**	**193.0678**	**7.2100e-003**		**193.2481**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1830	1.3540	2.5027	0.0105	0.7794	7.2400e-003	0.7867	0.2086	6.7900e-003	0.2154		1,065.5909	1,065.5909	0.0466		1,066.7549
Unmitigated	0.1830	1.3540	2.5027	0.0105	0.7794	7.2400e-003	0.7867	0.2086	6.7900e-003	0.2154		1,065.5909	1,065.5909	0.0466		1,066.7549

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Manufacturing	82.53	82.53	82.53	365,466	365,466
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	82.53	82.53	82.53	365,466	365,466

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Manufacturing	16.60	8.40	6.90	59.00	28.00	13.00	92	5	3
Other Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Manufacturing	0.542116	0.037578	0.185203	0.118503	0.016241	0.005141	0.017392	0.068695	0.001383	0.001183	0.004582	0.000945	0.001038
Other Asphalt Surfaces	0.542116	0.037578	0.185203	0.118503	0.016241	0.005141	0.017392	0.068695	0.001383	0.001183	0.004582	0.000945	0.001038
Other Non-Asphalt Surfaces	0.542116	0.037578	0.185203	0.118503	0.016241	0.005141	0.017392	0.068695	0.001383	0.001183	0.004582	0.000945	0.001038

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Manufacturing	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Manufacturing	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.5030	9.0000e-005	0.0100	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0214	0.0214	6.0000e-005		0.0228
Unmitigated	0.5030	9.0000e-005	0.0100	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0214	0.0214	6.0000e-005		0.0228

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0592					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.4429					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.3000e-004	9.0000e-005	0.0100	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0214	0.0214	6.0000e-005		0.0228
Total	**0.5030**	**9.0000e-005**	**0.0100**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0214**	**0.0214**	**6.0000e-005**		**0.0228**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0592					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.4429					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.3000e-004	9.0000e-005	0.0100	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0214	0.0214	6.0000e-005		0.0228
Total	**0.5030**	**9.0000e-005**	**0.0100**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0214**	**0.0214**	**6.0000e-005**		**0.0228**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Lincoln Industrial Warehouse Project

Riverside-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Manufacturing	21.00	1000sqft	0.48	21,000.00	0
Other Asphalt Surfaces	36.53	1000sqft	0.84	36,530.00	0
Other Non-Asphalt Surfaces	40.05	1000sqft	0.92	40,048.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2021
Utility Company	User Defined				
CO2 Intensity (lb/MWhr)	684.6	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.01

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Banning Electric Utility 33%RPS included.

Land Use - Per Grading Plan and off-site improvements.

Construction Phase - Per Applicant

Off-road Equipment -

Off-road Equipment - Per Applicant. 8hr work day.

Off-road Equipment - Per Applicant. 8hr work day.

Off-road Equipment - Per Applicant. 8hr. work day.

Trips and VMT - 2 daily vendor truck trips added for water per rule 403.

Grading - Per Conceptual Grading Plan

Vehicle Trips - Weekend trip rates assumed to be same as weekday. Per Traffic Memo

Energy Use - Estimated Energy usage per Applicant. No natural gas usage.

Water And Wastewater - Per Applicant

Sequestration - Per Landscape Plan

Construction Off-road Equipment Mitigation - Per rule 403.

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	220.00	219.00
tblConstructionPhase	NumDays	6.00	10.00
tblConstructionPhase	NumDays	10.00	5.00
tblEnergyUse	LightingElect	2.93	0.00
tblEnergyUse	NT24E	5.02	142.86
tblEnergyUse	NT24NG	17.13	0.00
tblEnergyUse	T24E	2.20	0.00
tblEnergyUse	T24NG	15.36	0.00
tblGrading	AcresOfGrading	5.00	1.80
tblGrading	MaterialImported	0.00	3,460.00

tblLandUse	LandUseSquareFeet	40,050.00	40,048.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblProjectCharacteristics	CH4IntensityFactor	0	0.029
tblProjectCharacteristics	CO2IntensityFactor	0	684.6
tblProjectCharacteristics	N2OIntensityFactor	0	0.01
tblSequestration	NumberOfNewTrees	0.00	43.00
tblTripsAndVMT	HaulingTripNumber	433.00	432.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	8.00	10.00
tblVehicleTrips	ST_TR	1.49	3.93
tblVehicleTrips	SU_TR	0.62	3.93
tblVehicleTrips	WD_TR	3.82	3.93
tblWater	IndoorWaterUseRate	4,856,250.00	225,000.00
tblWater	OutdoorWaterUseRate	0.00	73,000.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.1878	1.5048	1.2247	2.6300e-003	0.0753	0.0710	0.1463	0.0286	0.0679	0.0965	0.0000	227.0363	227.0363	0.0361	0.0000	227.9398
2021	0.0863	0.6684	0.6195	1.2700e-003	0.0211	0.0307	0.0518	5.6800e-003	0.0294	0.0351	0.0000	108.6657	108.6657	0.0174	0.0000	109.1011
Maximum	**0.1878**	**1.5048**	**1.2247**	**2.6300e-003**	**0.0753**	**0.0710**	**0.1463**	**0.0286**	**0.0679**	**0.0965**	**0.0000**	**227.0363**	**227.0363**	**0.0361**	**0.0000**	**227.9398**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.1878	1.5048	1.2247	2.6300e-003	0.0563	0.0710	0.1272	0.0184	0.0679	0.0863	0.0000	227.0361	227.0361	0.0361	0.0000	227.9396
2021	0.0863	0.6684	0.6195	1.2700e-003	0.0211	0.0307	0.0518	5.6800e-003	0.0294	0.0351	0.0000	108.6656	108.6656	0.0174	0.0000	109.1010
Maximum	**0.1878**	**1.5048**	**1.2247**	**2.6300e-003**	**0.0563**	**0.0710**	**0.1272**	**0.0184**	**0.0679**	**0.0863**	**0.0000**	**227.0361**	**227.0361**	**0.0361**	**0.0000**	**227.9396**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**19.79**	**0.00**	**9.63**	**29.71**	**0.00**	**7.73**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	6-1-2020	8-31-2020	0.7300	0.7300
2	9-1-2020	11-30-2020	0.6902	0.6902
3	12-1-2020	2-28-2021	0.6444	0.6444
4	3-1-2021	5-31-2021	0.3450	0.3450
		Highest	0.7300	0.7300

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0918	1.0000e-005	1.2500e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4200e-003	2.4200e-003	1.0000e-005	0.0000	2.5800e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	931.6066	931.6066	0.0395	0.0136	936.6484
Mobile	0.0286	0.2524	0.4016	1.7900e-003	0.1395	1.3200e-003	0.1409	0.0374	1.2400e-003	0.0386	0.0000	166.1186	166.1186	7.6400e-003	0.0000	166.3095
Waste						0.0000	0.0000		0.0000	0.0000	5.2859	0.0000	5.2859	0.3124	0.0000	13.0956
Water						0.0000	0.0000		0.0000	0.0000	0.0714	1.1616	1.2330	7.3800e-003	1.9000e-004	1.4742
Total	**0.1204**	**0.2524**	**0.4028**	**1.7900e-003**	**0.1395**	**1.3200e-003**	**0.1409**	**0.0374**	**1.2400e-003**	**0.0386**	**5.3573**	**1,098.8893**	**1,104.2465**	**0.3669**	**0.0138**	**1,117.5302**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0918	1.0000e-005	1.2500e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4200e-003	2.4200e-003	1.0000e-005	0.0000	2.5800e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	931.6066	931.6066	0.0395	0.0136	936.6484
Mobile	0.0286	0.2524	0.4016	1.7900e-003	0.1395	1.3200e-003	0.1409	0.0374	1.2400e-003	0.0386	0.0000	166.1186	166.1186	7.6400e-003	0.0000	166.3095
Waste						0.0000	0.0000		0.0000	0.0000	5.2859	0.0000	5.2859	0.3124	0.0000	13.0956
Water						0.0000	0.0000		0.0000	0.0000	0.0714	1.1616	1.2330	7.3800e-003	1.9000e-004	1.4742
Total	**0.1204**	**0.2524**	**0.4028**	**1.7900e-003**	**0.1395**	**1.3200e-003**	**0.1409**	**0.0374**	**1.2400e-003**	**0.0386**	**5.3573**	**1,098.8893**	**1,104.2465**	**0.3669**	**0.0138**	**1,117.5302**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.3 Vegetation

Vegetation

	CO2e
Category	MT
New Trees	30.4440
Total	**30.4440**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	6/1/2020	6/12/2020	5	10	
2	Building Construction	Building Construction	6/15/2020	4/15/2021	5	219	
3	Paving	Paving	4/9/2021	4/15/2021	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1.8

Acres of Paving: 1.76

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	1	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	3	10.00	2.00	432.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	41.00	16.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	2.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0313	0.0000	0.0313	0.0167	0.0000	0.0167	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.8200e-003	0.0988	0.0411	9.0000e-005		4.4500e-003	4.4500e-003		4.1000e-003	4.1000e-003	0.0000	8.0324	8.0324	2.6000e-003	0.0000	8.0973
Total	**8.8200e-003**	**0.0988**	**0.0411**	**9.0000e-005**	**0.0313**	**4.4500e-003**	**0.0357**	**0.0167**	**4.1000e-003**	**0.0208**	**0.0000**	**8.0324**	**8.0324**	**2.6000e-003**	**0.0000**	**8.0973**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.1400e-003	0.0524	6.7800e-003	1.6000e-004	3.7200e-003	1.6000e-004	3.8900e-003	1.0200e-003	1.6000e-004	1.1800e-003	0.0000	15.6620	15.6620	9.8000e-004	0.0000	15.6866
Vendor	3.0000e-005	1.0400e-003	2.0000e-004	0.0000	6.0000e-005	1.0000e-005	7.0000e-005	2.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.2459	0.2459	2.0000e-005	0.0000	0.2464
Worker	2.3000e-004	1.6000e-004	1.7200e-003	1.0000e-005	5.5000e-004	0.0000	5.5000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4598	0.4598	1.0000e-005	0.0000	0.4601
Total	**1.4000e-003**	**0.0536**	**8.7000e-003**	**1.7000e-004**	**4.3300e-003**	**1.7000e-004**	**4.5100e-003**	**1.1900e-003**	**1.7000e-004**	**1.3500e-003**	**0.0000**	**16.3677**	**16.3677**	**1.0100e-003**	**0.0000**	**16.3930**

3.2 Grading - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0122	0.0000	0.0122	6.5100e-003	0.0000	6.5100e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.8200e-003	0.0988	0.0411	9.0000e-005		4.4500e-003	4.4500e-003		4.1000e-003	4.1000e-003	0.0000	8.0323	8.0323	2.6000e-003	0.0000	8.0973
Total	**8.8200e-003**	**0.0988**	**0.0411**	**9.0000e-005**	**0.0122**	**4.4500e-003**	**0.0167**	**6.5100e-003**	**4.1000e-003**	**0.0106**	**0.0000**	**8.0323**	**8.0323**	**2.6000e-003**	**0.0000**	**8.0973**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.1400e-003	0.0524	6.7800e-003	1.6000e-004	3.7200e-003	1.6000e-004	3.8900e-003	1.0200e-003	1.6000e-004	1.1800e-003	0.0000	15.6620	15.6620	9.8000e-004	0.0000	15.6866
Vendor	3.0000e-005	1.0400e-003	2.0000e-004	0.0000	6.0000e-005	1.0000e-005	7.0000e-005	2.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.2459	0.2459	2.0000e-005	0.0000	0.2464
Worker	2.3000e-004	1.6000e-004	1.7200e-003	1.0000e-005	5.5000e-004	0.0000	5.5000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4598	0.4598	1.0000e-005	0.0000	0.4601
Total	**1.4000e-003**	**0.0536**	**8.7000e-003**	**1.7000e-004**	**4.3300e-003**	**1.7000e-004**	**4.5100e-003**	**1.1900e-003**	**1.7000e-004**	**1.3500e-003**	**0.0000**	**16.3677**	**16.3677**	**1.0100e-003**	**0.0000**	**16.3930**

3.3 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1607	1.2231	1.0499	1.7700e-003		0.0655	0.0655		0.0628	0.0628	0.0000	147.1636	147.1636	0.0296	0.0000	147.9032
Total	**0.1607**	**1.2231**	**1.0499**	**1.7700e-003**		**0.0655**	**0.0655**		**0.0628**	**0.0628**	**0.0000**	**147.1636**	**147.1636**	**0.0296**	**0.0000**	**147.9032**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.2700e-003	0.1198	0.0234	3.0000e-004	7.2800e-003	6.8000e-004	7.9500e-003	2.1000e-003	6.5000e-004	2.7500e-003	0.0000	28.3263	28.3263	2.2600e-003	0.0000	28.3829
Worker	0.0136	9.5100e-003	0.1015	3.0000e-004	0.0325	2.0000e-004	0.0327	8.6200e-003	1.8000e-004	8.8000e-003	0.0000	27.1464	27.1464	6.8000e-004	0.0000	27.1634
Total	**0.0168**	**0.1293**	**0.1249**	**6.0000e-004**	**0.0397**	**8.8000e-004**	**0.0406**	**0.0107**	**8.3000e-004**	**0.0116**	**0.0000**	**55.4726**	**55.4726**	**2.9400e-003**	**0.0000**	**55.5462**

3.3 Building Construction - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1607	1.2231	1.0499	1.7700e-003		0.0655	0.0655		0.0628	0.0628	0.0000	147.1634	147.1634	0.0296	0.0000	147.9031
Total	**0.1607**	**1.2231**	**1.0499**	**1.7700e-003**		**0.0655**	**0.0655**		**0.0628**	**0.0628**	**0.0000**	**147.1634**	**147.1634**	**0.0296**	**0.0000**	**147.9031**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.2700e-003	0.1198	0.0234	3.0000e-004	7.2800e-003	6.8000e-004	7.9500e-003	2.1000e-003	6.5000e-004	2.7500e-003	0.0000	28.3263	28.3263	2.2600e-003	0.0000	28.3829
Worker	0.0136	9.5100e-003	0.1015	3.0000e-004	0.0325	2.0000e-004	0.0327	8.6200e-003	1.8000e-004	8.8000e-003	0.0000	27.1464	27.1464	6.8000e-004	0.0000	27.1634
Total	**0.0168**	**0.1293**	**0.1249**	**6.0000e-004**	**0.0397**	**8.8000e-004**	**0.0406**	**0.0107**	**8.3000e-004**	**0.0116**	**0.0000**	**55.4726**	**55.4726**	**2.9400e-003**	**0.0000**	**55.5462**

3.3 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0748	0.5856	0.5345	9.2000e-004		0.0293	0.0293		0.0282	0.0282	0.0000	76.6505	76.6505	0.0149	0.0000	77.0236
Total	**0.0748**	**0.5856**	**0.5345**	**9.2000e-004**		**0.0293**	**0.0293**		**0.0282**	**0.0282**	**0.0000**	**76.6505**	**76.6505**	**0.0149**	**0.0000**	**77.0236**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.4300e-003	0.0560	0.0108	1.5000e-004	3.7900e-003	1.1000e-004	3.9000e-003	1.0900e-003	1.0000e-004	1.2000e-003	0.0000	14.6384	14.6384	1.1200e-003	0.0000	14.6663
Worker	6.5900e-003	4.4400e-003	0.0484	1.5000e-004	0.0169	1.0000e-004	0.0170	4.4900e-003	9.0000e-005	4.5800e-003	0.0000	13.6660	13.6660	3.2000e-004	0.0000	13.6740
Total	**8.0200e-003**	**0.0604**	**0.0592**	**3.0000e-004**	**0.0207**	**2.1000e-004**	**0.0209**	**5.5800e-003**	**1.9000e-004**	**5.7800e-003**	**0.0000**	**28.3044**	**28.3044**	**1.4400e-003**	**0.0000**	**28.3403**

3.3 Building Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0748	0.5856	0.5345	9.2000e-004		0.0293	0.0293		0.0282	0.0282	0.0000	76.6504	76.6504	0.0149	0.0000	77.0235
Total	**0.0748**	**0.5856**	**0.5345**	**9.2000e-004**		**0.0293**	**0.0293**		**0.0282**	**0.0282**	**0.0000**	**76.6504**	**76.6504**	**0.0149**	**0.0000**	**77.0235**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.4300e-003	0.0560	0.0108	1.5000e-004	3.7900e-003	1.1000e-004	3.9000e-003	1.0900e-003	1.0000e-004	1.2000e-003	0.0000	14.6384	14.6384	1.1200e-003	0.0000	14.6663
Worker	6.5900e-003	4.4400e-003	0.0484	1.5000e-004	0.0169	1.0000e-004	0.0170	4.4900e-003	9.0000e-005	4.5800e-003	0.0000	13.6660	13.6660	3.2000e-004	0.0000	13.6740
Total	**8.0200e-003**	**0.0604**	**0.0592**	**3.0000e-004**	**0.0207**	**2.1000e-004**	**0.0209**	**5.5800e-003**	**1.9000e-004**	**5.7800e-003**	**0.0000**	**28.3044**	**28.3044**	**1.4400e-003**	**0.0000**	**28.3403**

3.4 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.1800e-003	0.0218	0.0247	4.0000e-005		1.1600e-003	1.1600e-003		1.0700e-003	1.0700e-003	0.0000	3.2999	3.2999	1.0400e-003	0.0000	3.3260
Paving	1.1000e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.2800e-003**	**0.0218**	**0.0247**	**4.0000e-005**		**1.1600e-003**	**1.1600e-003**		**1.0700e-003**	**1.0700e-003**	**0.0000**	**3.2999**	**3.2999**	**1.0400e-003**	**0.0000**	**3.3260**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-005	4.7000e-004	9.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1220	0.1220	1.0000e-005	0.0000	0.1222
Worker	1.4000e-004	9.0000e-005	1.0200e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.2889	0.2889	1.0000e-005	0.0000	0.2890
Total	**1.5000e-004**	**5.6000e-004**	**1.1100e-003**	**0.0000**	**3.9000e-004**	**0.0000**	**3.9000e-004**	**1.0000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**0.4109**	**0.4109**	**2.0000e-005**	**0.0000**	**0.4113**

3.4 Paving - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.1800e-003	0.0218	0.0247	4.0000e-005		1.1600e-003	1.1600e-003		1.0700e-003	1.0700e-003	0.0000	3.2999	3.2999	1.0400e-003	0.0000	3.3260
Paving	1.1000e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.2800e-003**	**0.0218**	**0.0247**	**4.0000e-005**		**1.1600e-003**	**1.1600e-003**		**1.0700e-003**	**1.0700e-003**	**0.0000**	**3.2999**	**3.2999**	**1.0400e-003**	**0.0000**	**3.3260**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-005	4.7000e-004	9.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1220	0.1220	1.0000e-005	0.0000	0.1222
Worker	1.4000e-004	9.0000e-005	1.0200e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.2889	0.2889	1.0000e-005	0.0000	0.2890
Total	**1.5000e-004**	**5.6000e-004**	**1.1100e-003**	**0.0000**	**3.9000e-004**	**0.0000**	**3.9000e-004**	**1.0000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**0.4109**	**0.4109**	**2.0000e-005**	**0.0000**	**0.4113**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0286	0.2524	0.4016	1.7900e-003	0.1395	1.3200e-003	0.1409	0.0374	1.2400e-003	0.0386	0.0000	166.1186	166.1186	7.6400e-003	0.0000	166.3095
Unmitigated	0.0286	0.2524	0.4016	1.7900e-003	0.1395	1.3200e-003	0.1409	0.0374	1.2400e-003	0.0386	0.0000	166.1186	166.1186	7.6400e-003	0.0000	166.3095

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Manufacturing	82.53	82.53	82.53	365,466	365,466
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	82.53	82.53	82.53	365,466	365,466

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Manufacturing	16.60	8.40	6.90	59.00	28.00	13.00	92	5	3
Other Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Manufacturing	0.542116	0.037578	0.185203	0.118503	0.016241	0.005141	0.017392	0.068695	0.001383	0.001183	0.004582	0.000945	0.001038
Other Asphalt Surfaces	0.542116	0.037578	0.185203	0.118503	0.016241	0.005141	0.017392	0.068695	0.001383	0.001183	0.004582	0.000945	0.001038
Other Non-Asphalt Surfaces	0.542116	0.037578	0.185203	0.118503	0.016241	0.005141	0.017392	0.068695	0.001383	0.001183	0.004582	0.000945	0.001038

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	931.6066	931.6066	0.0395	0.0136	936.6484
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	931.6066	931.6066	0.0395	0.0136	936.6484
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Manufacturing	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Manufacturing	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Manufacturing	3.00006e +006	931.6066	0.0395	0.0136	936.6484
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**931.6066**	**0.0395**	**0.0136**	**936.6484**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Manufacturing	3.00006e +006	931.6066	0.0395	0.0136	936.6484
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**931.6066**	**0.0395**	**0.0136**	**936.6484**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0918	1.0000e-005	1.2500e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4200e-003	2.4200e-003	1.0000e-005	0.0000	2.5800e-003
Unmitigated	0.0918	1.0000e-005	1.2500e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4200e-003	2.4200e-003	1.0000e-005	0.0000	2.5800e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0108					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0808					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.2000e-004	1.0000e-005	1.2500e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4200e-003	2.4200e-003	1.0000e-005	0.0000	2.5800e-003
Total	**0.0918**	**1.0000e-005**	**1.2500e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.4200e-003**	**2.4200e-003**	**1.0000e-005**	**0.0000**	**2.5800e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0108					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0808					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.2000e-004	1.0000e-005	1.2500e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4200e-003	2.4200e-003	1.0000e-005	0.0000	2.5800e-003
Total	**0.0918**	**1.0000e-005**	**1.2500e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.4200e-003**	**2.4200e-003**	**1.0000e-005**	**0.0000**	**2.5800e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	1.2330	7.3800e-003	1.9000e-004	1.4742
Unmitigated	1.2330	7.3800e-003	1.9000e-004	1.4742

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Manufacturing	0.225 / 0.073	1.2330	7.3800e-003	1.9000e-004	1.4742
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**1.2330**	**7.3800e-003**	**1.9000e-004**	**1.4742**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Manufacturing	0.225 / 0.073	1.2330	7.3800e-003	1.9000e-004	1.4742
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**1.2330**	**7.3800e-003**	**1.9000e-004**	**1.4742**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	5.2859	0.3124	0.0000	13.0956
Unmitigated	5.2859	0.3124	0.0000	13.0956

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Manufacturing	26.04	5.2859	0.3124	0.0000	13.0956
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**5.2859**	**0.3124**	**0.0000**	**13.0956**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Manufacturing	26.04	5.2859	0.3124	0.0000	13.0956
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**5.2859**	**0.3124**	**0.0000**	**13.0956**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

	Total CO2	CH4	N2O	CO2e
Category	MT			
Unmitigated	30.4440	0.0000	0.0000	30.4440

11.2 Net New Trees

Species Class

	Number of Trees	Total CO2	CH4	N2O	CO2e
		MT			
Miscellaneous	43	30.4440	0.0000	0.0000	30.4440
Total		**30.4440**	**0.0000**	**0.0000**	**30.4440**

Appendix B.1

Western Riverside County
Multiple Species Habitat Conservation Plan
Consistency Analysis

Western Riverside County
Multiple Species Habitat Conservation Plan
Consistency Analysis
8th Street and Lincoln Street Industrial Building Project



Submitted to:
Albert A. Webb Associates
3788 McCray Street
Riverside, California 92506
Contact: Cheryl DeGano, Principal Environmental Analyst
cheryl.degano@webbassociates.com

Prepared By:
Wood Environment & Infrastructure Solutions, Inc.
1845 Chicago Avenue, Suite D
Riverside, California 92507
Principal Investigator: Lisa Wadley, Project Coordinator/Biologist
lisa.wadley@woodplc.com

February 12, 2020

This page initially left blank

EXECUTIVE SUMMARY

Wood Environment & Infrastructure Solutions, Inc. (Wood) conducted a biological resources assessment and prepared a Western Riverside County Multiple Species Habitat Conservation Plan (WRCMSHCP) consistency analysis for a 4.13-acre project site located at the southeast corner of the intersection of 8th Street and Lincoln Street in the city of Banning, Riverside County, California. The proposed project includes the development of the northeast one-third of the parcel for an industrial building and associated parking.

The project site lies within Assessor Parcel Number (APN) 540-250-001 and is currently undeveloped, with no existing structures, and appears to be regularly mowed for weed abatement and fire control purposes. It is dominated by disturbed non-native grassland vegetation. Surrounding land use includes existing residential development, industrial development, and vacant land adjacent to the project site

Tasks performed by Wood included a literature review, a general biological field assessment, and analysis of the project relative to the Western Riverside County Multiple Species Habitat Conservation Plan (WRCMSHCP). The assessment also included a burrowing owl (*Athene cunicularia*) habitat assessment and an evaluation of the site for other WRCMSHCP sensitive biological resources and/or habitat. The general biological field assessment was completed on 26 November 2019.

The project site is located within the WRCMSHCP designated burrowing owl survey area. Suitable habitat (low growing, non-native grasslands, small mammal activity and burrows) was found to be present on-site. The nearest known burrowing owl occurrence is over five miles southwest of the project site. Due to the presence of suitable habitat, a focused burrowing owl survey is required to determine presence or absence of this species.

The project site is located within the WRCMSHCP designated narrow endemic plant species survey area. Suitable habitat (clay soils within chaparral and/or coastal sage scrub habitat) was not found to be present on-site for the two narrow endemic plant species: Yucaipa onion (*Allium marvinii*) or many stemmed dudleya (*Dudleya multicaulis*). Additionally, the nearest recorded occurrence of the Yucaipa onion is over ten miles northwest of the project area; and the nearest recorded occurrence of the many stemmed dudleya is over ten miles southwest of the project area. Both species listed above are considered absent due to lack of suitable habitat and/or soils on-site are not present for either plant to occur; therefore, no focused narrow endemic plant survey is required.

The project site is in the Pass Area Plan of the WRCMSHCP and does not lie within any WRCMSHCP Criteria Cells. The RCA MSHCP Information Map Generator indicates that the project area does not require a habitat assessment for Criteria Area Plant Species, Sensitive Mammals Surveys or Sensitive Amphibian surveys.

The RCA MSHCP Information Map Generator indicates that the project area does not lie within or adjacent to any riparian/riverine areas or vernal pools. Following a site visit/assessment on 26 November 2019 the project site was found to not support any wetlands adjacent to rivers, streams, or vernal pool habitat, and therefore no additional focused surveys and/or mitigation measures are required for riparian/riverine species.

The project site is not located within any United States Fish and Wildlife Service (USFWS) designated Critical Habitat for any species.

The area of the project site proposed for development does not have any evidence of riparian/riverine areas or jurisdictional water features. No areas were found on-site that may be considered jurisdictional by Army Corps of Engineers, Regional Water Quality Control Board, and California Department of Fish and Wildlife. A jurisdictional delineation is not required to assess any impacts to potential drainage areas onsite and/or adjacent to the project site by the proposed project.

According to the WRCMSHCP, the Urban/Wildlands Interface Guidelines are intended to address indirect effects associated with locating development in proximity to the WRCMSHCP Conservation Areas (WRCMSHCP, pages 6-42). The project site is not within or immediately adjacent to any conservation areas or WRCMSHCP Core Linkages; therefore, the project will not need to incorporate Urban/Wildlife Interface Guidelines during construction.

CONTENTS

EXECUTIVE SUMMARY 3
1 INTRODUCTION 1
1.1 Project Area 1
1.2 Project Description 1
1.3 General Setting 2
2 RESERVE ASSEMBLY ANALYSIS 2
2.1 Public Quasi-Public Lands 2
2.1.1 Public Quasi-Public Lands in Reserve Assembly Analysis 2
3 VEGETATION MAPPING 12
4 PROTECTION OF SPECIES ASSOCIATED WITH RIPARIAN/RIVERINE AREAS AND VERNAL POOLS (SECTION 6.1.2) 12
5 PROTECTION OF NARROW ENDEMIC PLANT SPECIES (SECTION 6.1.3) 13
6 *Methods* 15
6.1 Existing Conditions and Results 15
7 ADDITIONAL SURVEY NEEDS AND PROCEDURES (SECTION 6.3.2) 21
7.1 Criteria Area Survey Species 21
7.2 Amphibians 22
7.3 Burrowing Owl 22
7.3.1 Methods 23
7.4 Mammals 23
8 INFORMATION ON OTHER SPECIES 23
8.1 Delhi Sands Flower Loving Fly 23
8.2 Species Not Adequately Conserved 27
8.3 Drainages and/or Jurisdictional Waters 30
8.4 Migratory Bird Treaty Act and Section 3503 of California Fish and Game Code 30
9 GUIDELINES PERTAINING TO THE URBAN/WILDLANDS INTERFACE (SECTION 6.1.4) 31
10 BEST MANAGEMENT PRACTICES (VOLUME I, APPENDIX C) 31
11 REFERENCES 32

LIST OF FIGURES

Figure 1 – Vicinity and Location 4
Figure 2 – Topographic Maps 6
Figure 3 – Local Vicinity Map 8
Figure 4 - Site Plan 10
Figure 5 – Vegetation Map 17

Figure 6 – MSHCP Survey Areas 19
Figure 7 - Soil Types 25

LIST OF TABLES

Table 1 – Narrow Endemic Plant Species 13
Table 2 – Species Not Adequately Conserved under the WRCMSHCP 27

LIST OF APPENDICES

APPENDIX A PLANT AND WILDLIFE SPECIES LIST
APPENDIX B PHOTOGRAPHIC EXHIBITS

ACRONYMS AND ABBREVIATIONS

APN	Assessor's Parcel Number
BLM	Bureau of Land Management
CASSA	Criteria Area Species Survey Area
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
CWA	Clean Water Act
ESA	Endangered Species Act
FESA	Federal Endangered Species Act
GIS	Geographic Information System
GPS	Global Positioning System
HMU	Habitat Management Unit
I-10	Interstate 10
MBTA	Migratory Bird Treaty Act
MSHCP	Multiple Species Habitat Conservation Plan
NEPSSA	Narrow Endemic Plant Species Survey Area
PQP	Public Quasi-Public Lands
RCA	Western Riverside County Regional Conservation Authority
RWQCB	Regional Water Quality Control Board
SSC	Species of Special Concern
USACE	United States Army Corps of Engineers
USDA NRCS	United States Department of Agriculture, Natural Resources Conservation Service
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
Wood	Wood Environment & Infrastructure Solutions, Inc.
WRCMSHCP	Western Riverside County Multiple Species Habitat Conservation Plan

This page intentionally left blank

1 INTRODUCTION

Wood Environment & Infrastructure Solutions, Inc. (Wood) was contracted by Albert A. Webb Associates (Webb) to conduct a biological resources assessment and a Western Riverside County Multiple Species Habitat Conservation Plan (WRCMSHCP) consistency analysis for a 4.13-acre project site located at the southeast corner of West Lincoln Street and South 8th Street , in the city of Banning, Riverside County, California. The proposed project involves the development of a parcel located north of Barbour Avenue, south of Lincoln Street, west of 4th Street, and east of 8th Street. The proposed project includes the development of the parcel for an industrial building.

The city of Banning requires a biological resources assessment in compliance with the WRCMSHCP as part of the California Environmental Quality Act (CEQA) requirements.

1.1 Project Area

Assessor Parcel Number (APN) 540-250-001 encompasses 4.13 acres located at the southeast corner of 8th Street and Lincoln Street; and is currently undeveloped with no existing structures. Disturbed non-native grassland vegetation dominates the site. The parcel shows evidence of disking of the boundary and some areas within the project site. Surrounding land use includes existing residential development to the south, abandoned commercial development to the north, and vacant lots to the east and west. The proposed project may include offsite improvements to 8th Street, Lincoln Street (State Highway 243), and/or Barbour Street. The proposed project footprint lies within the north one-third of the parcel and total acreage (permanent impact) will not exceed approximately 1.5-acres. Although the remaining lower portion of the parcel (approximately 2.63 acres) is not proposed for development at this time, it is included in the analysis assessment.

1.2 Project Description

The project site is generally located east of 8th Street and south of I-10 (Figure 1). The site is specifically located south of Lincoln Street, north of Barbour Avenue, east of 8th Street, and west of 4th Street (Figure 2). It can be found in the south half of Section 9 of Township 3 South and Range 1 East, as shown on the *Beaumont, California,* United States Geological Survey (USGS) 7.5-minute quadrangle. The elevation of the project site ranges from 2,316 to 2,340 feet above sea level. The geographic coordinates near the middle of the site are 33.5515.18° North latitude and -116.535.30° West longitude (see Appendix A, Figure 3).

1.3 General Setting

The 4.13-acre parcel is currently undeveloped with no existing structures. Disturbed non-native grassland dominates the parcel. The borders of the project site and some areas within the project site appear to have been disked for weed abatement and fire control purposes. The proposed project will be within approximately the top one-third of the parcel, just south of Lincoln Street (Figure 4).

2 RESERVE ASSEMBLY ANALYSIS

The project site lies within the Pass Area Plan and the Badlands Habitat Management Unit (HMU). The nearest criteria cell (#1609) is approximately 2.69 miles southwest, therefore, the project site does not lie within and/or adjacent to any WRCMSHCP cell group or criteria cell. Thus, the project site is not subject to any conservation of land within the site boundary.

2.1 Public Quasi-Public Lands

2.1.1 Public Quasi-Public Lands in Reserve Assembly Analysis

The nearest Public/Quasi-Public Lands (PQP Lands) are 1.26 miles northeast of the proposed project site. Therefore, the project site does not lie within and/or adjacent to any PQP Lands. Thus, the project will not have any impacts, directly or indirectly to PQP lands.

This page initially left blank

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)



Path: Q:\3554_NaturalResources\LincolnIndustrialBuilding_1955400789\MXD\ReportFigures\MSHCP\Fig1_Regional.mxd, chris.nixon 12/3/2019

1 inch = 1 miles
0 0.5 1 Miles

wood.

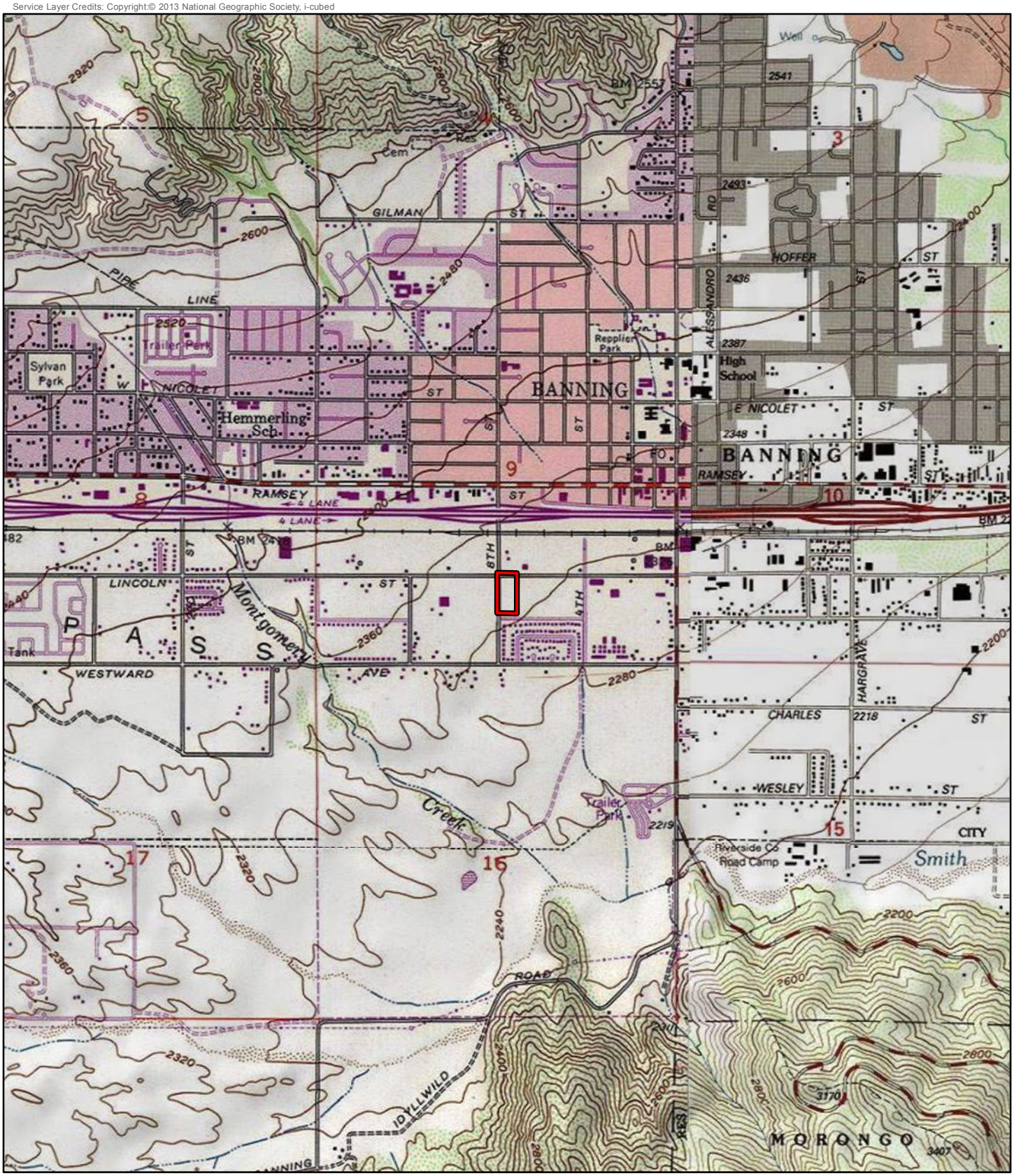
Project Boundary

FIGURE 1

Regional Location
MSHCP Consistency Report
8th & Lincoln Industrial Building
Banning, CA.

This page initially left blank

Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed



Path: Q:\3554_NaturalResources\LincolnIndustrialBuilding_1955400789\MXD\ReportFigures\MSHCP\Fig2_Topo.mxd, chris.nixon 12/3/2019

1 inch = 2,000 feet
0 1,000 2,000 Feet

wood.

Project Boundary

FIGURE 2

Topographic Map
MSHCP Consistency Report
8th & Lincoln Industrial Building
Banning, CA.

This page initially left blank



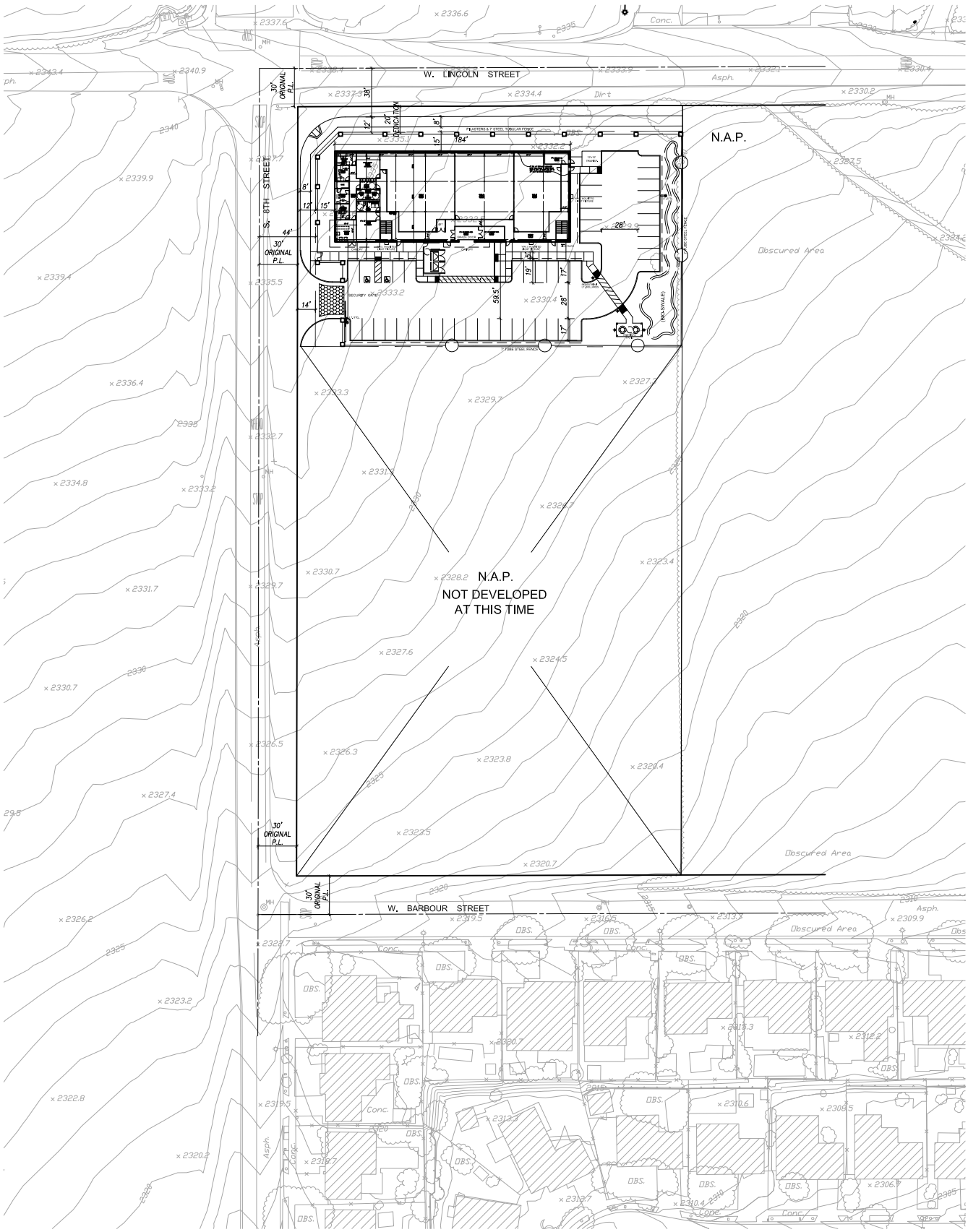
wood.

FIGURE 3

Local Vicinity Map
MSHCP Consistency Report
8th & Lincoln Industrial Building
Banning, CA.

This page initially left blank

Credits: Architects Orange, 2019



Path: Q:\3554_NaturalResources\LincolnIndustrialBuilding_1955400789\Graphics\Fig4_SitePlan.ai, chris.nixon 12/11/2019

wood.

FIGURE 4

Site Plan
MSHCP Consistency Report
8th & Lincoln Industrial Building
Banning, CA.

This page initially left blank

3 VEGETATION MAPPING

As shown in the Photographic Exhibits (Appendix A), the site is considered disturbed and is best described as a non-native grassland. The plant list compiled by Wood during the assessment consists of ten species. This number does not reflect the total number of plant species likely to occur on the site, as surveys were conducted during the winter when many species are dormant and/or undetectable. Vegetation on-site consists of non-native grasslands. Dominate non-native vegetation observed on-site include Russian thistle (*Salsola tragus*), short podded mustard *(Hirschfeldia incana*), an unknown oat species (*Avena sp.*), ripgut brome (*Bromus diandrus),* and red brome (*Bromus madritensis* ssp. *rubens*). A few trees and shrubs are present within the northeast and east boundary of the parcel. Tree's identified on-site include Chinaberry (*Melia azedarach*), pomegranate (*Punica granatum*), and scarlet firethorn (*Pyracantha coccinea*). The project site showed evidence of disking around the borders of the project site during the site visit on 26 Novemeber 2019.

4 PROTECTION OF SPECIES ASSOCIATED WITH RIPARIAN/RIVERINE AREAS AND VERNAL POOLS (SECTION 6.1.2)

The Western Riverside County Regional Conservation Authority (RCA) WRCMSHCP Information Map Generator indicates that the project area does not have mapped areas of riparian/riverine areas and thus potentially vernal pools. Current site conditions observed during the site visit on 26 November 2019 by Wood senior biologist Lisa Wadley did not identify any riparian/riverine areas and/or vernal pool areas. The project site also does not support or lie adjacent to riparian/riverine areas; and therefore, no suitable habitat for least bell's vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax traillii extimus*), yellow-billed cuckoo (*Coccyzus americanus*) or fairy shrimp species occurs within the project site. Due to a lack of suitable habitat, additional focused surveys and/or mitigation measures are not required for riparian/riverine species. The riparian avian species mentioned above are commonly associated with moderate to dense riparian habitat with willows as the dominant plant species. This habitat is not found within the project site or immediate vicinity. Also, fairy shrimp habitat is characterized under the MSHCP as any area that ponds water long enough to support fairy shrimp species. The project site does not contain any areas that pond water or areas that have evidence of ponding. Therefore, the habitat associated with fairy shrimp species does not occur on or adjacent to the project site. The project site contains two soil types, Greenfield sandy loamy (GyC2) and Hanford coarse sandy loam (HcC). These soils types do allow for the rapid percolation of water (i.e. they do not hold water); and therefore, will not provide the necessary ponding required for fairy shrimp.

5 PROTECTION OF NARROW ENDEMIC PLANT SPECIES (SECTION 6.1.3)

The RCA MSHCP Information Map Generator indicates that the project area lies within the Narrow Endemic Plant Species Survey Area (NEPSSA) (Figure 5) for two (2) narrow endemic plant species: Yucaipa onion (*Allium marvinii*) and many stemmed dudleya (*Dudleya multicaulis*). Table 1 below describes the narrow endemic plants and their habitat requirements. Both species listed below are considered absent due to lack of suitable habitat and/or soils on-site are not consistent for either plant to occur. Additionally, the nearest recorded occurrence of the Yucaipa onion is over ten miles northwest of the project area; and the nearest recorded occurrence of the many stemmed dudleya is over ten miles southwest of the project area.

Table 1 – Narrow Endemic Plant Species

Scientific/Common Name	Federal / State / CNPS Status Codes	Suitable Habitat	Soils	Blooming Period	Potential to Occur
Allium marvinii **Yucaipa onion**	None / None / 1B.2	Openings in chaparral habitat with clay openings at elevations between 760 to 1,065 meters (2,490 to 3,495 feet).	Clay soils	April to May	**Absent:** Suitable habitat (chaparral and/or clay soils) are not present on site for this species. Additionally, the project site is below elevation requirements for this species.
Dudleya multicaulis **Many-stemmed dudleya**	None / None/ 1B	Clay soils in barrens, rocky places, and ridgelines as well as thinly vegetated openings in chaparral, coastal sage scrub, and southern needlegrass grasslands. Found in elevations between 15 to 790 meters (49 to 2,591 feet).	Clay soils	May to June although flowering can take place as early as March in coastal locations.	**Absent:** Suitable habitat (openings in chaparral, coastal sage scrub, and/or southern needlegrass grasslands or clay soils) are not present on site for this species.

Definitions of status designations and occurrence probabilities.

Federal designations: (federal Endangered Species Act, USFWS):
- END: Federally listed, Endangered.
- THR: Federally listed, Threatened.
- BCC: Birds of Conservation Concern
- C: Candidate for Federal listing
- ND: Not designated.
- BCC: Bird of Conservation Concern.
- USFS:S USDA Forest Service Regional Forester's Sensitive Plant Species

State designations: (California Endangered Species Act, California Dept. of Fish and Game)
- END: State listed, Endangered.
- THR: State listed, Threatened.

RARE: State listed as Rare (Listed "Rare" animals have been re-designated as Threatened, but Rare plants have retained the Rare designation.)
CSC: California Special Concern Species.
WL: Watch List Species.
ND: Not designated.

California Native Plant Society (CNPS) designations: (Non-regulatory, compilation by a non-profit organization which tracks rare plants)
CNPS California Rare Plant Ranks (CRPR) Note: According to the CNPS (http://www.cnps.org/programs/Rare_Plant/inventory/names.htm), ALL plants on Lists 1A, 1B, 2A, and 2B meet definitions for state listing as threatened or endangered under Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code. Certain plants on Lists 3 and 4 do as well.
The CDFW (http://www.dfg.ca.gov/hcpb/species/t_e_spp/nat_plnt_consv.shtml) states that plants on Lists 1A, 1B, 2A, and 2B of the CNPS Inventory consist of plants that may qualify for listing, and recommends they be addressed in CEQA projects (CEQA Guidelines Section 15380). However, a plant need not be in the Inventory to be considered a rare, threatened, or endangered species under CEQA. In addition, CDFW recommends, and local governments may require, protection of plants which are regionally significant, such as locally rare species, disjunct populations of more common plants, or plants on the CNPS Lists 3 and 4.
List 1A: Plants presumed extinct in California.
List 1B: Plants rare and endangered in California and throughout their range.
List 2A: Plants presumed extirpated in California, but more common elsewhere.
List 2B: Plants rare, threatened, or endangered in California, but more common elsewhere.
List 3: Plants for which more information is needed.
List 4: Plants of limited distribution; a "watch list."
CA Endemic: Taxa that occur only in California
CNPS Threat Code:
.1 - Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 – Fairly endangered in California (20-80% occurrences threatened)
.3 – Not very endangered in California (<20% of occurrences threatened, or no current threats known)
Note: All List 1A (presumed extinct in California) and some List 3 (need more information- a review list) plants lacking any threat information receive no threat code extension. Also, these Threat Code guidelines represent a starting point in the assessment of threat level. Other factors, such as habitat vulnerability and specificity, distribution, and condition of occurrences, are also considered in setting the Threat Code.

Definitions of occurrence probability:
Occurs: Observed on the site by AMEC personnel, or recorded on-site by other qualified biologists.
High: Observed in similar habitat in region by qualified biologists, or habitat on the site is a type often utilized by the species and the site is within the known range of the species.
Moderate: Reported sightings in surrounding region, or site is within the known range of the species and habitat on the site is a type occasionally used by the species.
Low: Site is within the known range of the species but habitat on the site is rarely used by the species.
Absent: A focused study failed to detect the species, or, no suitable habitat is present.

CDFW CNDDB rankings: Plants
S1 = Less than 6 viable occurrences OR less than 1,000 individuals OR less than 2,000 acres
S1.1 = very threatened
S1.2 = threatened
S1.3 = no current threats known
S2 = 6-20 viable occurrences OR 1,000-3,000 individuals OR 2,000-10,000 acres
S2.1 = very threatened
S2.2 = threatened
S2.3 = no current threats known
S3 = 21-80 viable occurrences or 3,000-10,000 individuals OR 10,000-50,000 acres
S3.1 = very threatened
S3.2 = threatened
S3.3 = no current threats known
S4 = Apparently secure within California; this rank is clearly lower than S3, but factors exist to cause some concern; i.e. there is some threat, or somewhat narrow habitat.
S5 = Demonstrably secure to ineradicable in California.

6 *Methods*

Prior to the field visit, a literature review was conducted of the environmental and regulatory setting for the biological project site. The literature review provides a baseline from which to evaluate the biological resources potentially occurring within the study area, and within the local and regional vicinity.

Wood senior biologist Lisa Wadley conducted a reconnaissance-level field survey on 26 November 2019 from 11:40 a.m. to 12:45 p.m. Weather conditions during the survey consisted of clear skies with temperatures ranging from 52°F to 54°F (degrees Fahrenheit) and winds between 5 and 8 mph with wind gusts up to 15 mph. The habitat was assessed based on the presence and/or absence of key constituent elements of suitable habitat (e.g., soils, vegetation and topography) that are characteristic of potentially occurring special status species determined by the literature review/database search. All flora and vertebrate fauna observed or otherwise detected (e.g., vocalizations, presence of scat, tracks, and/or bones) on the project site during this assessment were recorded and are included in Appendix A.

6.1 Existing Conditions and Results

The 4.13-acre project site encompasses one parcel APN 540-250-001 and is currently undeveloped with no existing structures. The site consists of sandy soils, and non-native grasslands dominate the project site. There are a few non-native trees present in the northeast corner of the proposed project site (Figure 4). The site is bordered on the north by Lincoln Street, on the west by 8th Street, and by Barbour Street on the south (all of which are paved), and open land lies to the east. The general area is made up of residential housing to the south and abandoned businesses to the north.

Suitable habitat for the two NEPSSA plant species identified in the literature search (i.e. clay soils, chaparral, coastal sage scrub, and/or vernal pools, meadows, seeps, marshes and swamps or riparian forests etc.) were not found on and/or adjacent to the project site. Therefore, these species are considered absent due to a lack of suitable habitat and/or soils consistent with their growing preferences. Therefore, no additional focused surveys are required for narrow endemic plant species.

This page initially left blank

Service Layer Credits: Nearmap, Esri, HERE, Garmin, (c) OpenStreetMap contributors



Path: Q:\3554_NaturalResources\LincolnIndustrialBuilding_1955400789\MXD\ReportFigures\MSHCP\Fig5_Vegetation.mxd, chris.nixon 12/11/2019

1 inch = 77 feet

0 50 100 Feet

Project Boundary

Vegetation

- Bare Ground
- Non-Native Grassland
- Trees

wood.

FIGURE 5

Vegetation
MSHCP Consistency Report
8th & Lincoln Industrial Building
Banning, CA.

This page initially left blank



wood.

FIGURE 6

WRCMSHCP Survey Areas
MSHCP Consistency Report
8th & Lincoln Industrial Building
Banning, CA.

This page initially left blank

7 ADDITIONAL SURVEY NEEDS AND PROCEDURES (SECTION 6.3.2)

A literature review was conducted of the environmental setting for the project site. The literature review provides a baseline from which to evaluate the biological resources potentially occurring within the study area, and within the local and regional vicinity. A list of special status plant and wildlife species and their habitats known to occur near the project site was compiled. The primary source for this data was the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB 2019), which is a sensitive species and plant community database. Wood conducted a query of the CNDDB records based on a 5-mile radius surrounding the project site that included the *Beaumont*, *Cabazon, El Casco, Forest Falls, and San Jacinto, California* USGS 7.5-minute topographic quadrangle maps.

Additionally, a review of pertinent literature and data was conducted, including records from the California Native Plant Society (CNPS 2019) on-line inventory database that are known for the project site and vicinity. The CNPS on-line inventory provided additional sensitive species information for many species that have not been reported to the CNDDB database. The on-line Web Soil Survey (United States Department of Agriculture, Natural Resources Conservation Service [USDA NRCS] 2019), and the RCA MSHCP Information Map Generator and website (Western Riverside County 2019) were also queried for the project site and vicinity. The collective knowledge of Wood staff was also utilized. Scientific nomenclature for this report is from the following standard reference sources: plant communities, Sawyer Keeler Wolf (1995); flora, Baldwin et al (2012) and Munz (1974).;mammals, California Department of Fish and Game, The California Natural Diversity Database; and, birds, American Ornithologists Union (2013).

7.1 Criteria Area Survey Species

The RCA MSHCP Information Map Generator indicates that the project area does not lie within WRCMSHCP Criteria Area plant species survey area (CASSA) (Figure 6). Wood senior biologist Lisa Wadley conducted a site visit on 26 November 2019 and site conditions confirmed that the project site does not have vernal pools present within the project site. Additionally, based on historical soils mapping, the project site does not support any suitable soils for any of the CASSA plants; including the San Jacinto Valley crownscale (*Atriplex coronata* var. *notatior*), Parish's brittlescale (*Atriplex parishii*), Davidson's saltscale (*Atriplex serenana* var. *davidsonii*), thread-leaved brodiaea (*Brodiaea filifolia*), smooth tarplant (*Centromadia pungens* ssp. *laevis*), round-leaved filaree (*California* (*Erodium*) *macrophylla*), Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*), little mousetail (*Myosurus minimus* ssp. *apus*), and mud nama (*Nama stenocarpum*). Therefore, no additional focused surveys are required for criteria area plant species.

7.2 Amphibians

The RCA MSHCP Information Map Generator indicates that the project area is not within a sensitive amphibian survey area. Additionally, there is no suitable habitat (i.e. ponds, marshes, rivers, streams, and/or irrigation ditches with aquatic vegetation) present on-site for amphibian species. Therefore, no additional focused surveys are required for amphibian species.

7.3 Burrowing Owl

The project site is located within the WRCMSHCP designated burrowing owl (*Athene cunicularia*) survey area (Figure 6). Wood conducted a habitat assessment and analysis of the project site to determine if burrowing owl habitat is present. The survey (habitat assessment) was conducted in accordance with WRCMSHCP Burrowing Owl Survey Instructions (RCA 2006).

The burrowing owl is classified as a California Species of Special Concern (SSC) by the California Department of Fish and Wildlife (CDFW) and as sensitive by the Bureau of Land Management (BLM) and is protected under the federal Migratory Bird Treaty Act (MBTA). Burrowing owl habitat can be found in annual and perennial grasslands, deserts, and scrublands characterized by low-growing vegetation and flat to moderate slopes with less than 30 percent canopy cover of trees and shrubs. In southern California, burrowing owls are not only found in undisturbed natural areas, but also fallow agricultural fields, margins of active agricultural areas, livestock farms, airports, and vacant lots. Burrows are the essential component of burrowing owl habitat. Both natural and artificial burrows provide protection, shelter, and nests for burrowing owls. Burrowing owls typically use burrows made by fossorial mammals, such as ground squirrels or badgers, but also may use manmade structures (also known as 'burrow surrogates'), such as cement culverts; cement, asphalt, or wood debris piles; or openings beneath cement or asphalt pavement. In California, the species often occurs in association with colonies of the California ground squirrel (*Otospermophilus beecheyi*), where it makes use of the squirrel's burrows. The entrance of the burrow is often adorned with animal dung, feathers, debris, and other small objects. The species is active both day and night and may be seen perching conspicuously on fence posts or standing at the entrance of their burrows. Due to the characteristic fossorial habits of burrowing owls, nest burrows are a critical component of their habitat.

7.3.1 Methods

Step I – Habitat Assessment

Wood senior wildlife biologist Lisa Wadley conducted a habitat assessment survey on 26 November 2019. Moderate quality suitable habitat was found (low-growing, non-native grassland field with small mammal burrows and remnant concrete foundation) on the project site. California ground squirrels (Otospermophilus beecheyi) and their burrows were observed along the east boundary and within the 500 buffer (i.e. fallow fields east and west of the parcel). A focused survey to determine presence or absence of this species on the proposed project site and a pre-construction survey are required.

7.4 Mammals

The RCA MSHCP Information Map Generator indicates that the project site does not lie within any mammal species survey area (i.e. Los Angeles pocket mouse, San Bernardino kangaroo rat and Aguanga kangaroo rat). Therefore, no additional focused surveys are required for these sensitive mammal species.

8 INFORMATION ON OTHER SPECIES

8.1 Delhi Sands Flower Loving Fly

The site does not occur within areas with mapped Delhi Sand soils. The United States Department of Agriculture National Resources Conservation Service (USDA NCRS) maintains an on-line searchable soils database: the Web Soil Survey (USDA 2015), which was consulted during the project literature search in order to determine the soil associations and soil types occurring on the project site. Two soil types, Greenfield sandy loamy (GyC2) and Hanford coarse sandy loam (HcC) (2 to 8 percent slopes) are mapped on the project site (Figure 7).

This page initially left blank



wood.

FIGURE 7

Soil Types
MSHCP Consistency Report
8th & Lincoln Industrial Building
Banning, CA.

This page initially left blank

8.2 Species Not Adequately Conserved

Of the 146 Covered Species addressed in the WRCMSHCP (Section 2.1.4 of the MSHCP), 128 species are adequately conserved (MSHCP, 2015). The remaining eighteen (18) Covered Species will be adequately conserved when conservation requirements are met as identified in the species-specific conservation objectives for those species. For ten (10) of the eighteen (18) species, (identified in WRCMSHCP Table 9-3), species-specific conservation objectives must be satisfied to shift those species to the list of 'Covered Species Adequately Conserved'. For the remaining eight (8) species, a Memorandum of Understanding must be executed with the Forest Service that addresses management for these species on Forest Service Land in order to shift these species to the list of 'Covered Species Adequately Conserved'. The project site does not lie within and/or adjacent to USFS land.

It is presumed that seventeen of these eighteen species are absent and have no potential to occur on the project site due to lack of suitable habitat. One bird species has a low potential to occur within the project area: the grasshopper sparrow (*Ammodramus savannarum*). Foraging habitat is present on-site for this species. The grasshopper sparrow prefers grasslands, old fields, and grassy slopes. This habitat has been mapped to occur onsite. However, the nearest know location is over 15 miles southeast of the project site within San Diego County.

Table 2 lists the Species Not Adequately Conserved, summarizes habitat requirements for each species, and potential for occurrence on the project site.

Table 2 – Species Not Adequately Conserved under the WRCMSHCP

Species*	Status	Habitat and Distribution	Occurrence Probability
Plants			
Deinandra mohavensis **Mojave tarplant**	F: None S: END CNPS RPR: 1B WRCMSHCP: P	Low sand bars in riverbeds, mostly in riparian areas or in ephemeral grassy areas, in riparian scrub and mesic chaparral at 850 to 1,600 meters (2,800 to 5,200 feet) elevation. Known from the San Jacinto Mountains in Riverside County, and from San Diego and Kern Counties. Believed extirpated from San Bernardino County.	**Absent:** Suitable habitat (sand bars in riverbeds) is not present on site for this species. Project site is below elevation requirements for this species.
Dudleya viscida **Sticky-leaved dudleya**	F: None C: CSC CNPS RPR: 1B MSHCP: P	Perennial herb found in rocky areas in coastal bluff scrub, chaparral, coastal sage scrub; below 550 meters (1,800 feet) elevation. Orange and San Diego Counties	**Absent:** Suitable habitat (chaparral, coastal bluff scrub or coastal sage scrub) is not present on site for this species.

Galium californicum ssp. *primum* **California bedstraw**	F: None C: CSC CNPS RPR: 1B WRCMSHCP: P	Perennial herb found in granitic soils in chaparral and lower montane coniferous forest; 1,350 to 1,700 meters (4,400 to 5,600 feet).	**Absent:** Suitable habitat (chaparral, montane conifer forest) is not present on site for this species. Project site is below elevation requirements for this species.
Heuchera hirsutissima **Shaggy-haired alumroot**	F: None C: CSC CNPS RPR: 1B WRCMSHCP: P	Rocky areas in upper montane and subalpine coniferous forest 1,830 to 3,500 meters (6,000 to 11,500 feet) elevation in Riverside County.	**Absent:** Suitable habitat (rocky areas in montane or subalpine conifer forest) is not present on site for this species. Project site is below elevation requirements for this species.
Lilium humboldtii ssp. *oscellatum* **Ocellated Humboldt lily**	F: None S: None CNPS RPR: 4.2 WRCMSHCP: No	Found in openings within chaparral, cismontane woodland, coastal scrub, yellow pine forest, and riparian woodland at 30-1,800-meter (98 to 5,910) elevation.	**Absent:** Suitable habitat (woodlands, coastal scrub, yellow pine forest or riparian woodlands) is not present on site for this species.
Lilium parryi **Lemon lily**	F: None S: CSC CNPS RPR: 1B WRCMSHCP: P	Bulbiferous perennial herb of wet areas in meadows and riparian and montane coniferous forests at 1,300 to 2,790 meters (4,300 to 9,200 feet) elevation. In California, known from Los Angeles, Riverside, San Bernardino, and San Diego Counties.	**Absent:** Suitable habitat (meadows, riparian and montane conifer forests) is not present on site for this species. Project site is below elevation requirements for this species.
Muhlenbergia californica **California muhly**	F: None C: CSC CNPS RPR: 1B WRCMSHCP: P	Streambanks, canyons, and other moist sites in chaparral, coastal sage scrub, coniferous forest, and meadows; 100 to 2,000 meters (300 to 6,600 feet) elevation; San Gabriel, San Bernardino, and San Jacinto Mountains.	**Absent:** Suitable habitat (chaparral, coastal sage scrub, conifer forest) is not present on site for this species.
Mimulus clevelandii **Cleveland's bush monkeyflower**	F: None C: None CNPS RPR: 4.2	Found in chaparral, lower montane coniferous forest, and yellow pine forest habitats at 450 to 200 meters (1,475 to 6,600 feet elevation).	**Absent:** Suitable habitat (chaparral, montane conifer or yellow pine forests) is not present on site for this species.
Potentilla rimicola **Cliff cinquefoil**	F: None S: CSC CNPS RPR: 2 WRCMSHCP: P	Granitic crevices and rocky slopes in subalpine coniferous forest and upper montane coniferous forest at 2,400 to 2,800 meters (7,900 to 9,200 feet) elevation. In California, known only from the San Jacinto Mountains, Riverside County.	**Absent:** Suitable habitat (granitic crevices, rocky slopes) is not present on site for this species. Project site is below elevation requirements for this species.
Birds			
Ammodramus savannarum (nesting) **Grasshopper sparrow**	F: None S: CSC WRCMSHCP: P	Grasslands, agricultural fields, prairie, old fields and open savanna. Uncommon and local summer resident on grassy slopes and mesas west of the deserts. Only rarely in migration and in winter. Coastal Southern California.	**Low:** Marginally suitable habitat (disturbed, fallow agricultural field, non-native grassland) is present on site for this species. Nearest known occurrence is greater than 15 miles southeast of site in San Diego County.

Melospiza lincolnii (breeding) **Lincoln's sparrow**	F: None S: CSC WRCMSHCP: P	Occurs in bogs, wet meadows, and riparian thickets, mostly in northern and montane areas. Winters in brushy areas, thickets, hedgerows, understory of open woodlands, forest edges, clearings, and scrubby areas.	**Absent:** Suitable habitat (bogs, wet meadows, and riparian thickets) is not present on site for this species.
Sphyrapicus thyroideus **Williamson's sapsucker**	US: None WRCMSHCP: P	Occurs primarily in conifer forests (spruce, fir, and lodge pole pine). Winters in mostly pine and pine-oak woodlands in the mountains. Cavity nesters.	**Absent:** Suitable habitat (conifer forests) is not present on site for this species.
Strix occidentalis **California spotted owl**	US: TH CA: CSC WRCMSHCP: P	Resident of old-growth forests. Cavity Nester.	**Absent:** Suitable habitat (old growth forests) is not present on site for this species.
Reptiles			
Charina umbratica **Southern rubber boa**	US: – CA: ST WRCMSHCP: P	Found in montane conifer forest; near rock outcrops and woody debris in the San Bernardino and San Jacinto Mountains at 1,525 to 2,440 meters (5,000 to 8,000 feet) elevation.	**Absent:** Suitable habitat (montane conifer forest, rocky outcrops) is not present on site for this species.
Lampropeltis zonata (parvirubra) **California mountain kingsnake** (San Bernardino population)	F: None S: CSC WRCMSHCP: P	Occurs in well-illuminated canyons with rocky outcrops or rock talus in association with big cone spruce and various canyon chaparral species at lower elevations, and with black oak, incense cedar, Jeffrey pine, and ponderosa pine at higher elevations. Generally, occurs above 1,500 meters (4,900 feet) elevation in inland areas, but documented from elevations as low as 370 meters (1,200 feet.)	**Absent:** Suitable habitat (canyons with rocky outcrops, chaparral, or mountain habitats) is not present on site for this species.
Lampropeltis zonata (pulchra) **San Diego mountain kingsnake**	F: None S: CSC WRCMSHCP: P	Occurs in the interior mountain ranges, this subspecies occurs primarily in associations of ponderosa, Jeffrey, and Coulter pine, and black oak. At lower elevations and in the coastal ranges, it occurs in riparian woodlands, usually in canyon bottoms, that have western sycamore, Fremont's cottonwood, coast live oak, willows, wild rose, poison oak, and blackberries. Found most commonly in the vicinity of rocks or boulders near streams or lake shores. Species has been documented from sea level to about 1,800 meters (5,900 feet) elevation.	**Absent:** Suitable habitat (mountain or pine and riparian habitats) is not present on site for this species.
Sceloporus graciosus vandenburgianus **Southern sagebrush lizard**	F: None S: None WRCMSHCP: P	Lives in shrub lands such as chaparral, manzanita, and ceaothus, as well as open pine and Douglas fir forests, mainly in the mountains. Prefers open areas with scattered low bushes, logs, rocks, or brush piles, and found basking on rocks and logs in full sun.	**Absent:** Suitable habitat (shrub lands, chaparral, pine or Douglas fir forests) is not present on site for this species.

Mammals			
Glaucomys sabrinus californicus **San Bernardino flying squirrel**	US: – CA: CSC WRCMSHCP: P	Inhabits a wide variety of woodland habitats primarily consisting of conifers, mixed coniferous-deciduous forest and occasionally broad-leaf-deciduous forest. Commonly found in white fir, coulter pine, Jeffrey pine, sugar pine, lodge pole pine forests, and ponderosa pine forest. May occur in hardwoods where old or dead trees have numerous woodpecker-type nesting holes. Requires nearby water. Occurs at elevations between 1,200 to 2,560 meters (4,000 to 8,400 feet) in the San Bernardino and San Jacinto Mountains.	**Absent:** Suitable habitat (woodland habitats) is not present on site for this species

8.3 Drainages and/or Jurisdictional Waters

The proposed project area does not have any evidence of riparian/riverine areas or jurisdictional water features. There are no drainage features on-site or adjacent to the site that have evidence of bed and bank and may be considered jurisdictional by Army Corps of Engineers, Regional Water Quality Control Board, and California Department of Fish and Wildlife. Therefore, a jurisdictional delineation is not required.

8.4 Migratory Bird Treaty Act and Section 3503 of California Fish and Game Code

The project site contains suitable nesting habitat for nesting birds protected under the MBTA and Section 6.1.6 of the MSHCP. There are two ornamental trees present within the northeast corner of the site: a Chinaberry (*Melia azedarach*) and scarlet firethorn (*Pyracantha coccinea*), as well as a pomegranate (*Punica granatum*) on the east boundary of the project site. These trees are suitable for tree nesting bird species. These trees provide potentially suitable nesting habitat fora variety of species covered under the MBTA. Additionally, the project site also contains suitable nesting habitat for ground nesting birds protected under the MBTA, such as killdeer (*Charadrius vociferous*) and horned lark (*Eremophila alpestris*). Impacts to nesting birds, both direct and indirect, can be minimized and/or eliminated by conducting work activities outside of the breeding season. Although some nesting by native birds can occur year-round in Southern California, the typical avian breeding season is from February 1 through August 31, so it is recommended to schedule work between September 1 and January 31 to avoid nesting activity. If work must be done during the nesting season, the project site and adjacent areas (500-foot buffer) should be examined by a qualified biologist within 30-days prior to any ground disturbance or vegetation removal, especially where there could be any direct impacts to suitable nesting habitat. If active nests are found, the nests should be avoided, and a "no disturbance" buffer zone established around the nest. A qualified biologist should monitor the nest until young

have fledged. While there is no established protocol for nest avoidance and buffer zones, when consulted, the CDFW generally recommends avoidance buffers of 500 feet for raptors and listed species and 100–300 feet for other unlisted birds. Nest avoidance and buffer zones are decided on a case by case basis by the biological monitor and can sometimes be reduced depending on a variety of factors including topography, vegetation structure, the species in question, and avian behavior. Construction activity may encroach into the buffer area at the discretion of the biological monitor with CDFW concurrence.

9 GUIDELINES PERTAINING TO THE URBAN/WILDLANDS INTERFACE (SECTION 6.1.4)

According to the WRCMSHCP, the Urban/Wildlands Interface Guidelines are intended to address indirect effects associated with locating development in proximity to the WRCMSHCP Conservation Areas (WRCMSHCP, pages 6-42). The nearest proposed Core Linkage is over ten miles northeast of the project site. Thus, the project will not require design features to minimize potentially significant impacts associated with the Urban/Wildlands interface and/or will not need to incorporate Urban/Wildlife Interface Guidelines during construction.

10 BEST MANAGEMENT PRACTICES (VOLUME I, APPENDIX C)

Standard best management practices (BMP) should be implemented to avoid impacts to biological resources. The project site is currently an undeveloped parcel that is regularly disked for weed abatement; and lacking any significant biological resources (i.e. riparian/riverine, wetlands, etc.). No impacts to the goals of the MSHCP, special status biological resources, and other protected biological resources are expected. A pre-construction survey for burrowing owl by a qualified biologist prior to construction activities would ensure no direct impacts to any owl or owls that may occupy the site. Pre-construction nesting bird surveys will be required if construction occurs during the nesting season. Other standard best management practices (BMP) should be implemented to avoid indirect impacts. These would include trash management, project speed limits, and dust control measures as well as standard BMPs for road maintenance such as curb and gutter and/or periodic street sweeping during construction activities

11 REFERENCES

American Ornithologists' Union. 2015. Checklist of North American Birds, 7th edition + supplements. Online at: http://checklist.aou.org/.

Baldwin, B.D., et al. 2012. The Jepson Manual: Higher Plants of California. Univ. Calif. Press, Berkeley.

California Department of Fish and Game. 2006. Complete List of Amphibians, Reptiles, Birds, and Mammals in California. Online at: http://www.dfg.ca.gov/biogeodata/cwhr/pdfs/species_list.pdf.

California Department of Fish and Game, CNDDB. 2019. Special Animals List. Online at: http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPAnimals.pdf .

California Native Plant Society. 2019; Inventory of Rare and Endangered Plants. California Native Plant Society. Sacramento, CA. Online at: http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi.

Riverside County Transportation & Land Management Agency. Western Riverside County Multiple Species Habitat Conservation Plan (website) and Conservation Summary Generator. 2019. Online at: http://www.rctlma.org/mshcp/.

Sawyer, J.O., T. Keeler-Wolf and J. M. Evans, 2009, A Manual of California Vegetation, Second Ed., California Native Plant Society Press, Sacramento, CA.

United States Department of Agriculture Natural Resources Conservation Service. 2019. Web Soil Survey. Online at: http://websoilsurvey.nrcs.usda.gov/app/.

United State Fish and Wildlife Service. 1997. Bird Laws and Treaties. Online at; http://migratorybirds.fws.gov/intrnltr/tblcont.html.

United States Geological Survey (USGS). 1979. *Beaumont, Cabazon, El Casco, Forest Falls, and San Jacinto* California 7.5-Minute Topographic Quadrangle Map. Department of the Interior. U.S. Government Printing Office Washington, D.C.

This page initially left blank

APPENDIX A

PHOTOGRAPHIC EXHIBITS

8th Street and Lincoln Street Industrial Building Project
Banning, Riverside County, California



Photo 1. View of northeast corner of the project site facing south. Representative condition of typical non-native grassland habitat throughout the site.



Photo 2. View of southwest corner of the project site facing east. Representative condition of typical mowed, non-native grassland habitat throughout the site.



Photo 3. View of southwest corner of the project site facing north. Representative condition of typical mowed, non-native grassland habitat throughout the site.



Photo 4. Photo of the remnant (concrete) foundation found along the east boundary of the parcel. View as seen facing northwest with Lincoln Street in the background. California ground squirrel activity and burrows abundant in this area.

This page initially left blank

APPENDIX B

PLANT AND WILDLIFE SPECIES LIST

PLANTS	
Asteraceae	**Sunflower family**
Conyza canadensis	Canadian horseweed
Brassicaceae	**Mustard family**
*Hirschfeldia incana**	Shortpod mustard
Chenopodiaceae	**Saltbush family**
*Salsola tragus**	Russian thistle
Meliaceae	**Mahogany family**
*Melia azedarach**	Persian lilac, Chinaberry
Punicaceae	**Pomegranate Family**
*Punica granatum**	Pomegranate
Rosaceae	**Rose family**
Pyracantha coccinea	Scarlett firethorn
Pyracantha sp.*	Firethorn
Poaceae	**Grass family**
Avena sp.*	Oat
*Bromus diandrus**	Ripgut brome
Bromus madritensis ssp. *rubens**	Red brome
Typhaceae	**Cattail family**
Helianthus annuus	Sunflower
WILDLIFE	
AVES	**BIRDS**
Accipitridae	**Kites, Hawks, and Eagles**
Buteo jamaicensis	Red-tailed hawk
Corvidae	**Crows and Ravens**
Corvus brachyrhynchos	American crow
Icteridae	**Blackbirds, Orioles and Allies**
Sturnella neglecta	Western meadowlark
MAMMALIA	**MAMMALS**
LAGOMORPHA	***RABBITS, HARES AND PIKA***
Leporidae	**Rabbits and Hares**
Sylvilagus audubonii	Desert cottontail
Sciuridae	**Squirrels**
Otospermophilus beecheyi	California ground squirrel

This page initially left blank

Appendix B.2

Focused Survey for Burrowing Owl



8th Street and Lincoln Street Industrial Building Project
Assessor's Parcel Number 540-250-001
Focused Survey for Burrowing Owl

Submitted to:
Albert A. Webb Associates
3788 McCray Street
Riverside, California 92506
Contact: Stephanie Standerfer, Vice President
stephanie.standerfer@webbassociates.com

Prepared By:
Wood Environment & Infrastructure Solutions, Inc.
1845 Chicago Avenue, Suite D
Riverside, California 92507

Principal Investigator: Michael D. Wilcox, Senior Biologist
michael.wilcox@woodplc.com

22 May 2020

TABLE OF CONTENTS

PAGE

1.0 INTRODUCTION 1

2.0 SITE DESCRIPTION 1

3.0 SPECIES BACKGROUND INFORMATION 4

4.0 METHODS 7

5.0 RESULTS 8

6.0 LITERATURE CITED AND REFERENCES 10

LIST OF MAPS, TABLES, AND PHOTOS

Figure 1. Regional Location 2
Figure 2. Topography 3
Figure 3. Burrow Survey Results 6

Table 1. Survey Data. 7

LIST OF APPENDICES

Appendix A. Species List
Appendix B. Site Photographs

1.0 INTRODUCTION

Wood Environment & Infrastructure Solutions, Inc. (Wood) was contracted by Albert A. Webb Associates (Webb) to conduct a burrow search and focused survey for the burrowing owl (*Athene cunicularia*) in accordance with Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Burrowing Owl Survey Instructions. The project site encompasses 4.13-acre project site located on Assessor's Parcel Number (APN) 540-250-001. The proposed project involves the development of a new industrial building located south of Interstate 10, north of Barbour Avenue, west of 4th Street, and east of 8th Street.

This report was prepared under the standards and survey requirements (criteria) of the MSHCP. The City of Banning is a signatory to this plan, which provides incidental take permit coverage for threatened and endangered species and unlisted species, including the burrowing owl, throughout western Riverside County. The project site is within the specified burrowing owl survey area shown on Figure 6-4 of the MSHCP. A two-step process of surveys is utilized for detection of this species. An initial habitat assessment is performed, and if suitable habitat is present, a focused protocol survey is conducted. These two steps were combined for this study.

2.0 SITE DESCRIPTION

The 4.13-acre project site occurs on Assessor's Parcel Number (APN) 540-250-001 in the City of Banning, Riverside County, California (Figure 1). Specifically, the project site is located at the southeast corner of West Lincoln Street and South 8th Street. It can be found in the south half of Section 9 of Township 3 South and Range 1 East, as shown on the *Beaumont, California,* United States Geological Survey (USGS) 7.5-minute quadrangle (Figure 2).

The site is currently vacant with no existing structures. The on-site plant community is entirely non-native grassland. The parcel shows evidence of disking of the boundary and some areas within the project site. The topography of the site is relatively flat with elevations ranging from 2,316 to 2,340 feet above mean sea level. The geographic coordinates near the middle of the site are 33.5515.18° North latitude and -116.535.30° West longitude.

Surrounding land use includes existing residential development to the south, abandoned commercial development to the north, and vacant lots to the east and west. The proposed project may include offsite improvements to 8th Street, Lincoln Street (State Highway 243), and/or Barbour Street. The proposed project footprint lies within the north one-third of the parcel and total acreage (permanent impact) will not exceed approximately 1.5-acres. remaining lower portion of the parcel (approximately 2.63 acres) is not a part of the current project and will not be developed at this time.

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)



Path: Q:\3554_NaturalResources\LincolnIndustrialBuilding_1955400789\MXD\ReportFigures\BUOW\Fig1_Regional.mxd, chris.nixon 5/15/2020

1 inch = 1 miles
0 0.5 1 Miles

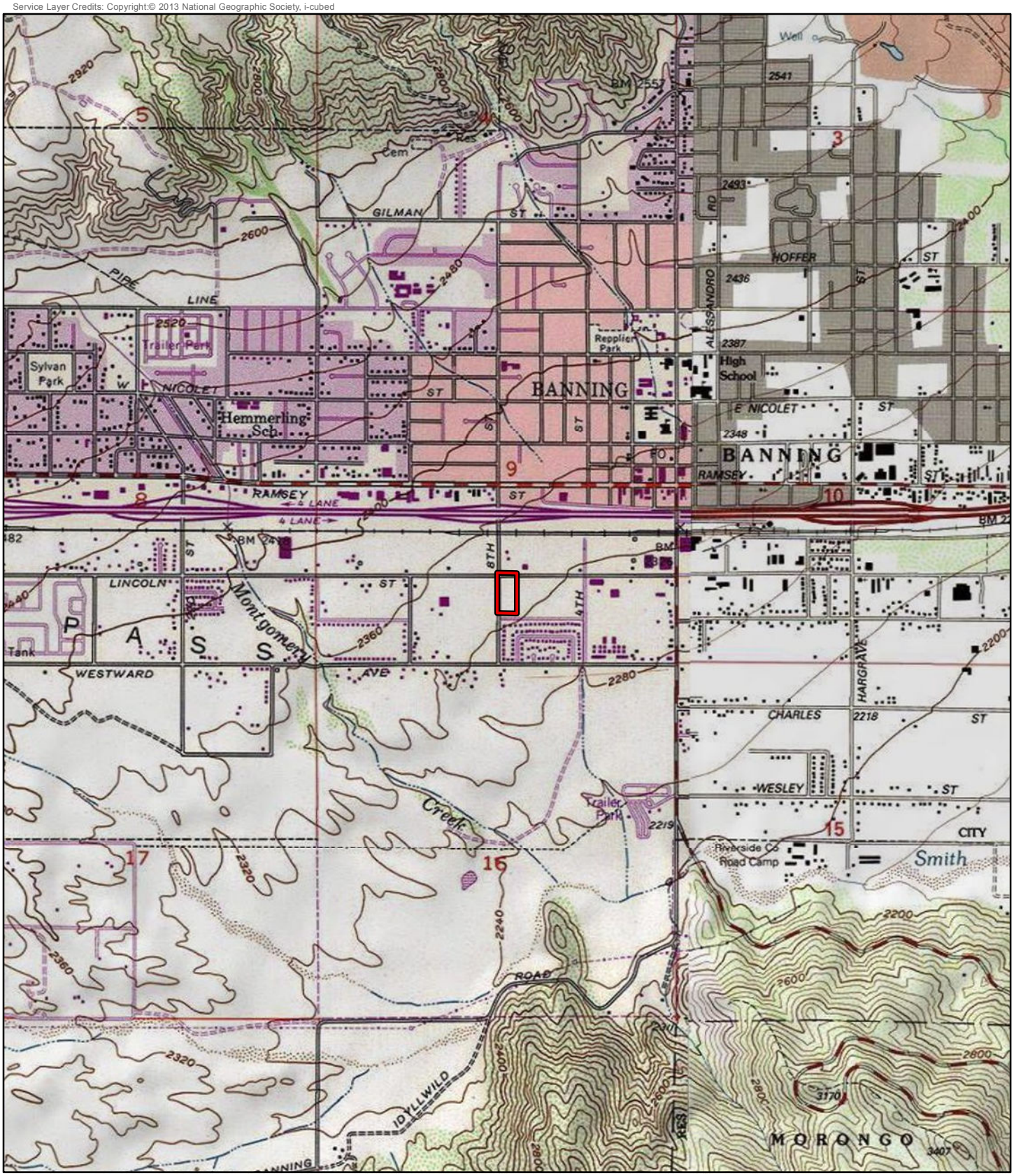
wood.

Project Boundary

FIGURE 1

Regional Location
BUOW Survey Report
8th & Lincoln Industrial Building
Banning, CA.

Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed



Path: Q:\3554_NaturalResources\LincolnIndustrialBuilding_1955400789\MXD\ReportFigures\BUOW\Fig2_Topo.mxd, chris.nixon 5/15/2020

1 inch = 2,000 feet

0 1,000 2,000 Feet

wood.

Project Boundary

FIGURE 2

Topographic Map
BUOW Survey Report
8th & Lincoln Industrial Building
Banning, CA.

3.0 SPECIES BACKGROUND INFORMATION

The burrowing owl is a small, tan, short-tailed, ground-dwelling owl that occupies underground burrows. A member of the Strigidae (typical owls family), this species is associated with grasslands and other arid open terrain, including Sonoran creosote bush scrub, throughout much of the western United States. Burrowing owls are opportunistic in their selection of burrows, typically utilizing the burrows of small mammals (*e.g.*, ground squirrels, kit fox), but also use desert tortoise (*Gopherus agassizii*) burrows, drain pipes, culverts, and other suitable natural or manmade cavities at or below ground level. In California, the species often occurs in association with colonies of the California ground squirrel, where it makes use of the squirrel's burrows. The entrance of the burrow is often adorned with animal dung, feathers, debris, and other small objects. The species is active both day and night and may be seen perching conspicuously on fence posts or standing at the entrance of their burrows. Due to the characteristic fossorial habits of burrowing owls, nest burrows are a critical component of their habitat.

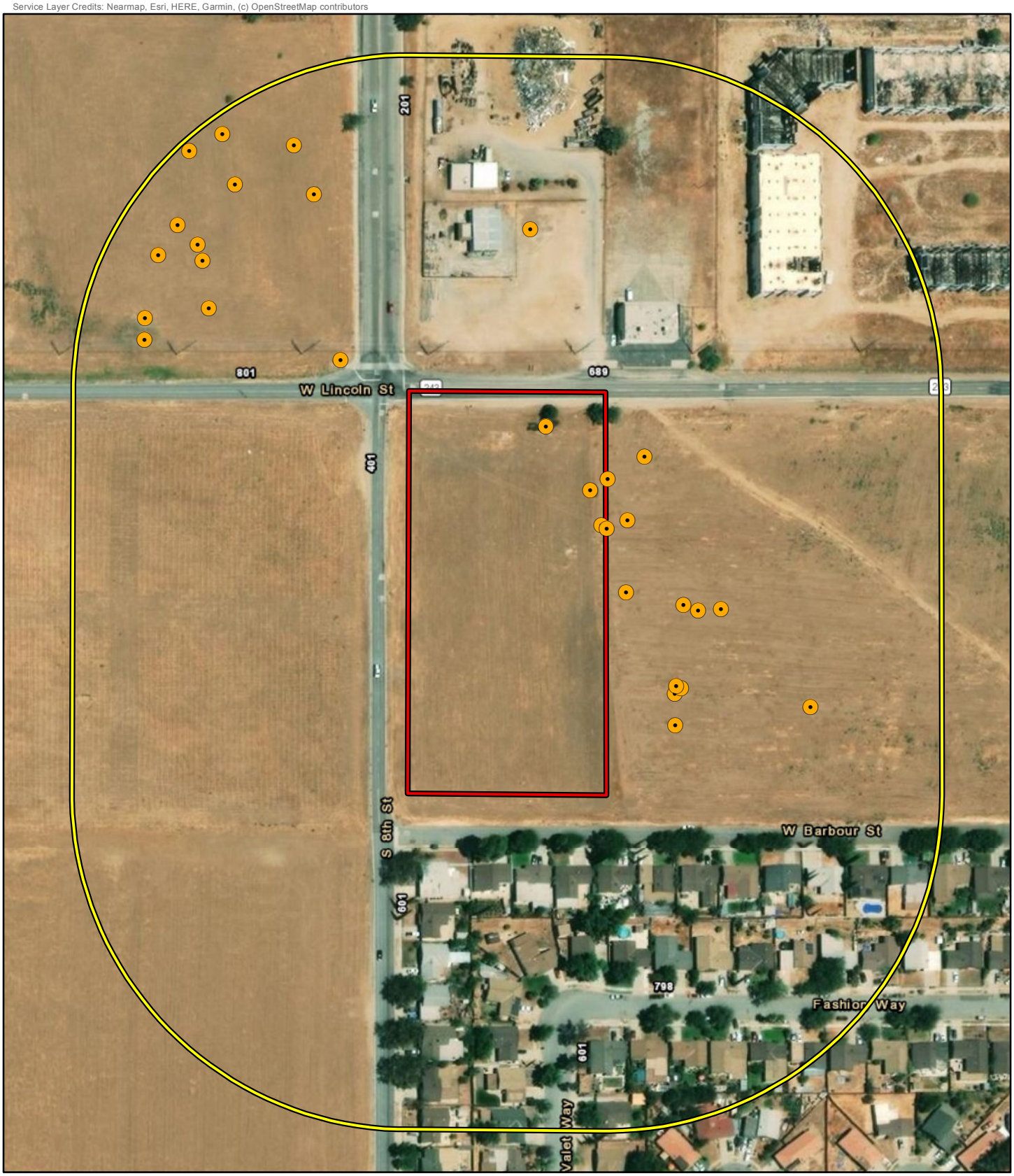
In southern California, burrowing owls are not only found in undisturbed natural areas, but also fallow agricultural fields, margins of active agricultural areas, livestock farms, airports, and vacant lots. Despite their apparent tolerance to human activities, burrowing owl populations in California are clearly declining and, if declines continue, the species may qualify for listing under the state and/or federal Endangered Species Acts (CDFG 1995). The declines in burrowing owl populations are attributed to loss and degradation of habitat, to ongoing residential and commercial development, and to rodent control programs. The burrowing owl is currently designated a California Species of Concern (CSC) by the California Department of Fish and Wildlife (CDFW 2020), managed as a Bird of Conservation Concern by the United States Fish and Wildlife Service (USFWS), is considered "sensitive" by the U. S. Bureau of Land Management (BLM), and protected by the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code Sections 3503, 3503.5, 3513, and 3800.

The California Burrowing Owl Consortium (CBOC) developed the Burrowing Owl Survey Protocol and Mitigation Guidelines to meet the need of uniform standards when surveying burrowing owl populations and evaluating impacts from development projects (CBOC 1997). In 1995 the CDFG issued the Staff Report on Burrowing Owl Mitigation to all its regional managers to ensure consistency in standards, policies, and regulatory mandates relating to the burrowing owl (CDFG 1995). Due to the continued decline of burrowing owl populations statewide and as an attempt to reverse this trend, the CDFG issued more effective, viable, coordinated and concerted approach to burrowing owl conservation actions with the release of an updated Staff

Report on Burrowing Owl Mitigation (CDFG 2012). In the MSHCP planning area, the Western Riverside County Regional Conservation Authority (RCA), in coordination with the Riverside County wildlife agencies and the CDFW, developed the Western Riverside County Burrowing Owl Survey Instructions that burrowing owl surveys must follow for MSCHP compliance (RCA 2006).

The sparse non-native grassland vegetation and California ground squirrel and other mammal burrows on and immediately adjacent to the project site provides suitable habitat for burrowing owls (Figure 3; Appendix B). Photos included in Appendix B are representative of the general site conditions at the time of the focused surveys.

Service Layer Credits: Nearmap, Esri, HERE, Garmin, (c) OpenStreetMap contributors



Path: Q:\3554_NaturalResources\LincolnIndustrialBuilding_1955400789\MXD\ReportFigures\BUOW\Fig3_SurveyResults.mxd, chris.nixon 5/15/2020

1 inch = 200 feet
0 100 200 Feet

wood.

California Ground Squirrel Burrows
Project Boundary
Survey Area

FIGURE 3

Survey Results
BUOW Survey Report
8th & Lincoln Industrial Building
Banning, CA.

4.0 METHODS

A burrow search was conducted on 6 March 2020 by Wood senior biologists Nathan T. Moorhatch and Michael D. Wilcox. Focused burrowing owl surveys commenced on 2 April 2020 and were completed on 7 May 2020. A total of four focused surveys were conducted after completion of the burrow search and mapping. The site and immediately adjacent undeveloped areas within a 500-foot buffer zone area were surveyed on foot, mapping the locations of small mammal burrows that are suitable for burrowing owl use. The surveys were conducted via pre-dawn/early morning pedestrian transects spread approximately 60 feet apart over 100% of the site in accordance with protocol established by the California Burrowing Owl Consortium (1997), the CDFW and RCA. Binoculars were used to visually inspect potential perching locations (i.e., rocks, debris, dirt mounds) as well as the entrances to all on-site mammal burrows and debris providing potential shelter (i.e., piles of concrete slabs, cement drainpipes). Mammal burrows were carefully examined for evidence of burrowing owl occupation (i.e., animal dung, feathers, whitewash, pellets, debris, etc.). Table 1 presents information on each survey (i.e., date, surveyor, survey duration, and weather variables). All wildlife detected was recorded in field notes.

Table 1. Survey Data.

Date	Surveyor	Time	Weather, Wind	Temp.
6 March 20*	NM & MW	0750-0915	Partly cloudy (10% cloud cover), winds ~ 0-3 mph	60-73°F
2 April 20	MW	0715-0915	Overcast (100% cloud cover), winds ~ 1-4 mph	54-55°F
23 April 20	LW	0545-0805	Clear (0% cloud cover), winds ~ 1-5 mph	58-68°F
29 April 20	LW	0545-0805	Clear (0% cloud cover), winds ~ 2-4 mph	60-68°F
7 May 20	NM	0601-0805	Clear-Partly cloudy (0-20% cloud cover), winds ~0-2 mph	67-72°F

*** –** Burrow Search Only
NM – Nathan Moorhatch
LW – Lisa Wadley
MW – Michael Wilcox

5.0 RESULTS

California ground squirrel burrows suitable for burrowing owls were detected and mapped on-site and within the adjacent buffer zone areas during the burrow search. No burrowing owls, or evidence thereof, were observed on the project site or within the adjacent 500-foot buffer zone area during the focused surveys. One special status species, a migrating yellow warbler (*Setophaga petechia*) was observed on-site during the surveys. Nesting yellow warblers are designated as a CSC by the CDFW. Yellow warblers nest in riparian habitats, which are not present on the project site. For these reasons, impacts to yellow warbler are not anticipated to occur as a result of project implementation. A total of 20 bird species, 2 mammals and 1 reptile were detected. Appendix A provides a list of all the wildlife species detected during the surveys. The relatively low total number of wildlife species observed on the site is an indication of the disturbed nature of the site.

Although not detected on the project site during the protocol level surveys, burrowing owls are highly mobile, and suitable habitat is present throughout the project site and on adjacent lands. For this reason, burrowing owls may colonize the site at any time in the foreseeable future. Therefore, additional focused surveys may be required if construction is not initiated within one year of completion of this survey. In addition, the MSHCP states:

> "*Pre-construction presence/absence surveys for burrowing owls within the survey area where suitable habitat is present will be conducted for all Covered Activities through the life of the permit. Surveys will be conducted within 30 days prior to disturbance. Take of active nests will be avoided. Passive relocation (use of one-way doors and collapse of burrows) will occur when owls are present outside the nesting season."*

In compliance with the MSCHP, a pre-construction survey for the burrowing owl will need to be conducted within 30-days of any proposed vegetation removal, grading, or any other disturbance of the site to ensure take of burrowing owls is avoided.

Also, if grading and/or vegetation clearance is scheduled to be conducted during the nesting season, which is generally from 1 February through 31 August, a nesting bird clearance survey should be completed immediately prior (within approximately 7 days) to commencement of the scheduled work. If nesting birds protected by the MBTA and/or Fish and Game Code are detected on-site, an Environmentally Sensitive Area (ESA) will need to be established and monitored until the completion of nesting activities and young have fledged. CDFW generally recommends ESA's to be a 300-foot radius around nest(s) for unlisted passerines (songbirds) and 500-foot radius around nests of listed species and raptors (i.e., hawks, falcons, kites and owls). If timed appropriately, the preconstruction survey for burrowing owl and nesting birds can be conducted concurrently.

A total of twenty (20) bird species, two (2) mammals, and one (1) reptile were detected during the surveys on- and/or immediately adjacent to the site. Appendix A provides a list of all the wildlife species detected during the surveys. The relatively low total number of wildlife species observed on the site is an indication of the disturbed nature of the site.

6.0 LITERATURE CITED AND REFERENCES

California Bird Records Committee. 2019. Official California Checklist. Accessed online at: http://californiabirds.org/ca_list.asp.

California Burrowing Owl Consortium. 1997. Burrowing Owl Survey Protocol and Mitigation Guidelines. Journal of Raptor Research Report, The Raptor Research Foundation, Inc.

California Department of Fish and Game (CDFG). 2012. Staff report on Burrowing Owl Mitigation. CDFG, Sacramento, CA.

CDFG. 1995. Staff report on Burrowing Owl Mitigation. CDFG, Sacramento, CA.

CDFG. 2012. Staff report on Burrowing Owl Mitigation. CDFG, Sacramento, CA.

California Department of Fish and Wildlife (CDFW). 2020. Special Animals List. July. Periodic publication. Sacramento, CA. Accessed online at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406&inline

CDFW. 2016. Complete List of Amphibian, Reptile, Bird and Mammal Species in California. Accessed online at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=87155&inline

Riverside County Transportation and Land Management Agency. 2003. Western Riverside County Multiple Species Habitat Conservation Plan (website).

Western Riverside County Regional Conservation Authority (RCA). 2005. Burrowing Owl Survey Instructions for the Western Riverside County Multiple Species Habitat Conservation Plan.

Wood. 2019. Western Riverside County Multiple Species Habitat Conservation Plan Consistency Analysis, City of Banning, 8th Street & Lincoln Street Industrial Building Project. Unpublished technical report submitted to Albert A. Webb Associates on 5 December 2019.

APPENDIX A
WILDLIFE SPECIES LIST

This list reports only the wildlife observed to on the project site by this study. Other species may have been overlooked or undetectable due to their activity seasons. Unless noted otherwise, nomenclature and systematics follow California Bird Records Committee (2020) for avifauna, and CDFW (2016) for herpetofauna and mammals.

SYMBOLS AND ABBREVIATIONS:
* Nonnative species.
** Sensitive species (see text).

I. VERTEBRATA	**VERTEBRATE WILDLIFE**
HERPETOFAUNA	REPTILES & AMPHIBIANS
Phrynosomatidae	**Spiny Lizards & Relatives**
Sceloporus occidentalis	western fence lizard
AVIFAUNA	BIRDS
Accipitridae	**Hawks, Old World Vultures, Harriers**
Buteo jamaicenisis	red-tailed hawk
Ardeidae	**Egrets, Herons & Bitterns**
Egretta thula	snowy egret
Columbidae	**Pigeons and Doves**
**Columba livia*	rock dove
**Streptopelia decaocto*	Eurasian collared dove
Zenaida macroura	mourning dove
Corvidae	**Jays, Magpies, and Crows**
Corvus brachyrhynchos	American crow
Corvus corax	common raven
Emberizidae	**Wood Warblers, Sparrows, Blackbirds**
Passerculus sandwichensis	savannah sparrow
Zonotrichia leucophrys	white-crowned sparrow

Icteridae	**Blackbirds & Relatives**
Sturnella neglecta	western meadowlark
Sturnidae	**Starlings**
**Sturnus vulgaris*	European starling
Trochilidae	**Hummingbirds**
Calypte anna	Anna's hummingbird
Tyrannidae	**Tyrant Flycatchers**
Sayornis saya	Say’s phoebe
Tyrannus verticalis	western kingbird
Tyrannus vociferans	Cassin’s kingbird
Falconidae	**Caracaras and Falcons**
Falco sparverius	American kestrel
Fringillidae	**Fringilline and Cardueline Finches**
Carpodacus mexicanus	house finch
Mimidae	**Mockingbirds and Thrashers**
Mimus polyglottos	northern mockingbird
Parulidae	**Wood Warblers**
***Setophaga petechia*	yellow warbler
Passeridae	**Old World Sparrows**
**Passer domesticus*	house sparrow

MAMMALS

Sciuridae	**Squirrels**
Otospermophilus beecheyi	California ground squirrel
Geomyidae	**Pocket Gophers**
Thomomys bottae	Botta’s pocket gopher

APPENDIX B
Site Photographs

8th & Lincoln Industrial Building Project
Banning, Riverside County California



Photo 1. View of southwest corner of the project site facing east. Representative conditions of proposed project site during the habitat assessment and burrow search.



Photo 2. View of southwest corner of the project site facing north. Representative conditions of proposed project site during the habitat assessment and burrow search.



Photo 3. Representative example of California ground squirrel burrows found on-site that were potentially suitable for burrowing owl occupation.

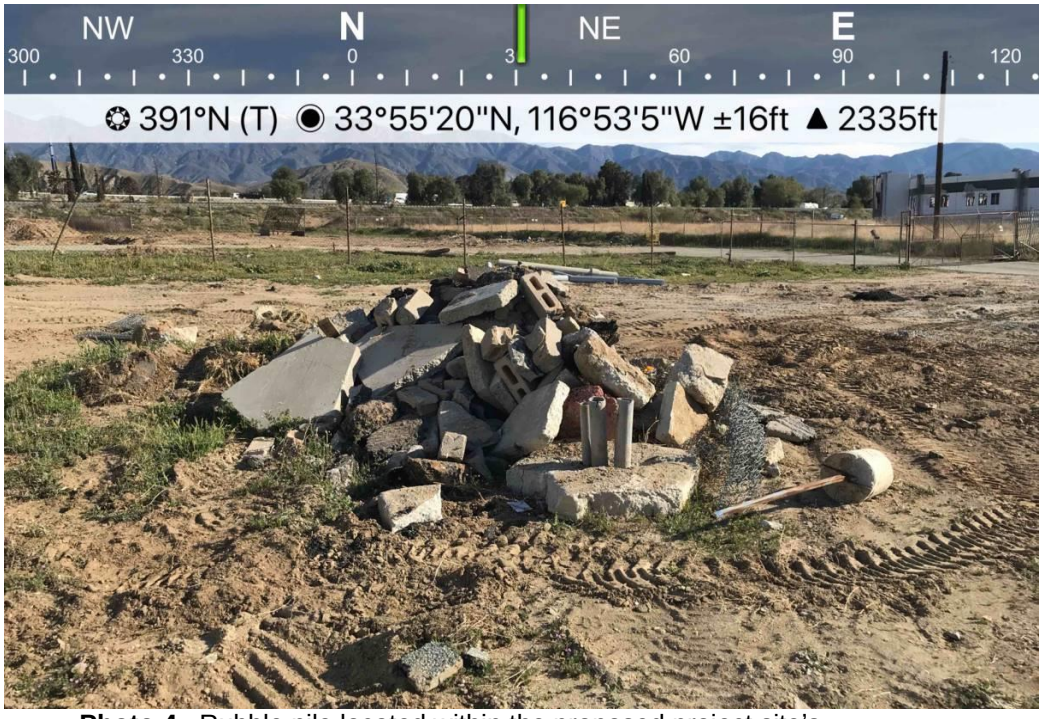


Photo 4. Rubble pile located within the proposed project site's 500-foot buffer zone that was surveyed for potential burrowing owls and/or burrowing owl sign.

Appendix C

Phase I Cultural Resource Assessment

Phase I Cultural Resource Assessment for the Banning 8th and Lincoln Industrial Building Project in the City of Banning, Riverside County, California

Andrew DeLeon, M.A., RPA and Susan Wood, Ph.D.

Prepared By

Applied EarthWorks, Inc.
3550 East Florida Avenue, Suite H
Hemet, CA 92544-4937

Prepared For
Albert A. Webb Associates
3788 McCray Street
Riverside, CA 92506

January 2020

Draft

USGS 7.5' Topographic Quadrangle: Beaumont (1996), CA
Level of Investigation: CEQA Phase I
Key Words: Riverside County; CEQA; 4 acres

MANAGEMENT SUMMARY

Dominion Property Partners, LLC proposes the construction of an industrial, non-refrigerated warehouse for use as a cannabis growth facility on approximately 4 acres (Project) in the City of Banning, Riverside County, California. Development is planned on the northernmost 1.6 acres of the parcel. The Project area is located on the southeast corner of West Lincoln Street and South 8th Street in Section 9, Township 3 South, Range 1 East on the Beaumont (1996) U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle map. Under contract to Albert A. Webb Associates, Applied EarthWorks, Inc. (Æ) conducted a Phase I cultural resource investigation of the Project in accordance with the California Environmental Quality Act (CEQA). The City of Banning is the lead agency for compliance with CEQA.

This report summarizes the methods and results of the Phase I cultural resource investigation of the Project area. Æ's assessment included a records search and literature review, communication with Native American tribal representatives, and an archaeological survey of the Project area. The purpose of the investigation was to determine the potential for the proposed Project to impact historical resources eligible for or listed on the California Register of Historical Resources (CRHR).

The literature and records search at the Eastern Information Center (EIC) of the California Historical Resources Information System (CHRIS) indicates 15 previous cultural resource investigations and 158 cultural resources are documented within a 1-mile-wide buffer of the Project area (Study Area). One of these previously documented cultural resources, remnants of a pre-1949 residence (CA-RIV-8229H), is located within the Project area.

As part of the cultural resource investigation, Æ sent a request to the Native American Heritage Commission (NAHC) for a search of their Sacred Lands File (SLF). Results of the SLF search indicate no known Native American cultural resources within the Project area. Æ also contacted 13 Native American individuals and organizations to elicit information on Native American resources or concerns within the Project area, if any. At the time this report was written, Æ had received responses from the Agua Caliente Band of Cahuilla Indians, the Cabazon Band of Mission Indians, the Morongo Band of Mission Indians, and the San Manuel Band of Mission Indians.

Æ Archaeologist Evan Mills, M.A., completed an intensive pedestrian surface survey of the Project area on November 20, 2019. Æ's fieldwork confirmed CA-RIV-8229H is within the Project area. This resource (remnants of a pre-1949 residence) was found to be in worse condition than originally reported. This resource was evaluated against CRHR significance criteria and found ineligible for listing. No additional cultural resources were encountered within the Project area during the Phase I survey.

The terrain throughout the entire Project area has been disturbed by previous agricultural activity and modern grading. Geological data indicate undisturbed sediments within the Project area are characterized by alluvial deposits with a high potential for buried archaeological sites. However,

no buried horizon is described for the soil series within the Project area. In addition, one of the previous investigations that involved the Project area conducted a sensitivity assessment for archaeological resources. This assessment concluded the Project is within an area of low archaeological sensitivity. Therefore, intact and significant buried archaeological deposits are considered unlikely, and no further cultural resource management of the Project area is recommended. However, if unanticipated resources are encountered during construction, work should be halted and a qualified archaeologist notified to evaluation the discovery.

Field notes documenting the current investigation are on file at Æ's Hemet office. A copy of this report also will be submitted to the EIC.

CONTENTS

1 INTRODUCTION 1
1.1 PROJECT LOCATION AND DESCRIPTION 1
1.2 REGULATORY CONTEXT 1
1.3 REPORT ORGANIZATION 4

2 SETTING 5
2.1 ENVIRONMENTAL SETTING 5
2.2 PREHISTORIC SETTING 6
2.2.1 Early Archaic Period (ca. 9500–7000 B.P.) 7
2.2.2 Middle Archaic Period (ca. 7000–4000 B.P.) 7
2.2.3 Late Archaic Period (ca. 4000–1500 B.P.) 7
2.2.4 Saratoga Springs Period (ca. 1500–750 B.P.) 8
2.2.5 Protohistoric Period (ca. 410–180 B.P.) 8
2.3 ETHNOGRAPHIC SETTING 8
2.3.1 Cahuilla 8
2.3.2 Serrano 11
2.3.3 Cupeño 12
2.4 HISTORICAL SETTING 13
2.4.1 Spanish Exploration and Mission Period: 1769 to 1821 13
2.4.2 Mexican (Rancho) Period: 1821 to 1848 14
2.4.3 American Period: 1848 to Present 15
2.4.4 City of Banning 17

3 CULTURAL RESOURCE LITERATURE AND RECORDS SEARCH 20
3.1 HISTORICAL MAP REVIEW 26

4 NATIVE AMERICAN COMMUNICATIONS 27

5 CULTURAL RESOURCE SURVEY METHODS AND RESULTS 29
5.1 SURVEY METHODS 29
5.2 SURVEY RESULTS 29

6 SIGNIFICANCE EVALUATION 33
6.1.1 Evaluation of Significance 33
6.1.1.1 Application of the Criteria for Evaluation 34
6.1.1.2 Integrity Assessment and Conclusion 36

7 MANAGEMENT RECOMMENDATIONS 37

8 REFERENCES 38

APPENDICES

A Confidential DPR Forms
B Native American Communication

FIGURES

1-1 Project vicinity in Riverside County, California 2
1-2 Project location map 3
5-1 Overview from the northwest corner of the Project area (facing southeast) 30
5-2 Overview from the center of the Project area (facing north) 30
5-3 Cultural Resources within the Project area 31
5-4 Overview from east end of concrete pad (CA-RIV-8229H) (facing west) 32
5-5 Rubble on northeast corner of pad 32
6-1 Banning Land Company Subdivision showing Lot 290 on the southeast corner of Lincoln and 8th Streets in Banning, Ca. (County of Riverside 2020) 34
6-2 Parade during the Colorado Aqueduct celebration in downtown Banning, October 1931 (Banning Library District 1931) 35

TABLES

3-1 Previous Cultural Resource Investigations in the Study Area 20
3-2 Cultural Resources in the Study Area 22

1
INTRODUCTION

Dominion Property Partners, LLC proposes the development of an industrial building on approximately 4 acres of vacant land within Assessor's Parcel Number (APN) 540-250-001 (Project) in the City of Banning, Riverside County, California. Albert A. Webb Associates retained Applied EarthWorks, Inc. (Æ) to conduct a Phase I cultural resource investigation of the Project area for compliance with the California Environmental Quality Act (CEQA). The City of Banning (City) is the lead agency for the purposes of CEQA. Æ Managing Principal, Amy L. Ollendorf, Ph.D., M.S., RPA (#12588), served as Æ's principal investigator and was responsible for overall quality control. Æ Associate Archaeologist Joan George, B.S., served as project manager, and Æ Associate Archaeologist Evan Mills, M.A., RPA (18026) conducted the fieldwork.

1.1 PROJECT LOCATION AND DESCRIPTION

The Project is in the western portion of Riverside County near the base of the San Bernardino Mountains (Figure 1-1). Specifically, the Project is located on the southeast corner of West Lincoln Street and South 8th Street in Section 9, Township 3 South, Range 1 East, San Bernardino Baseline and Meridian, as shown on the Beaumont, California 7.5-minute U.S. Geological Survey (USGS) topographic quadrangle map (Figure 1-2). Elevation is approximately 2,330 feet above mean sea level (amsl).

The footprint of the proposed warehouse will cover approximately 21,000 square feet which includes the following approximate square footage: 2,500 square feet of offices and an employee breakroom; 12,469 square feet of grow rooms; 6,031 square feet for the mother clone room, dry room packing, and vegetation room; and a loading area with a single 12 foot by 14 foot roll-up door. A paved parking lot with 37 automobile parking spaces is also planned. Construction of the proposed Project would involve mass grading of 1.6 acres to be developed.

The Project includes 7-foot tube steel fencing on all four sides of the development site. On the southern side, the tube steel fence will sit atop a 3-foot retaining wall. The eastern and southern boundaries include a retention basin that will drain into a basin to the south. Construction of a 6-inch-diameter sewer line from the building frontage to an existing sewer line in South 8th Street is planned along with a subsurface storm drain line running east and south to convey flows to the detention basin on the southeast corner of the Project area. A waterline will be constructed to tie into an existing 12-inch-diameter water line in South 8th Street. The maximum depth of ground disturbance for all construction will be 6 feet.

1.2 REGULATORY CONTEXT

The Project requires discretionary approval from the City and is therefore subject to CEQA. The CEQA Statute and Guidelines direct lead agencies to determine whether a project will have a significant impact on historical resources. A historically significant resource is considered a



Figure 1-1 Project vicinity in Riverside County, California.

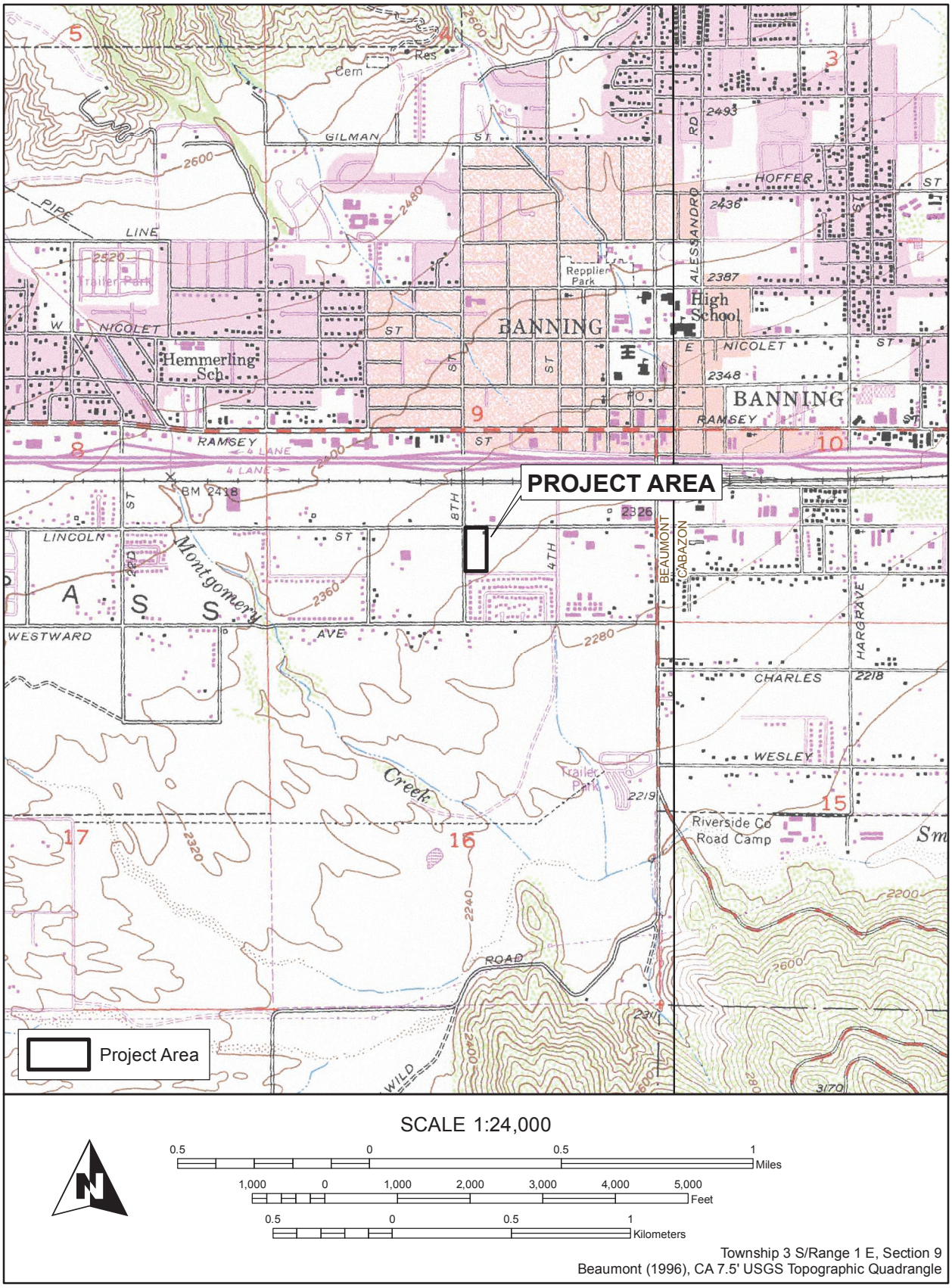


Figure 1-2 Project location map.

"historical resource," if it is included in a local register of historical resources, is listed in or determined eligible for listing on the California Register of Historical Resources (CRHR), or if it meets the requirements for listing on the CRHR under any one of the following criteria of historical significance (Title 14, California Code of Regulations [CCR], § 15064.5):

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or,
4. Has yielded, or may be likely to yield, information important in prehistory or history.

Compliance with CEQA's cultural resource provisions typically involves several steps. Briefly, archival research and field surveys are conducted, and identified cultural resources are inventoried and evaluated in prescribed ways. Prehistoric and historical archaeological sites, as well as standing structures, buildings, and objects deemed historically significant and sufficiently intact (i.e., historical resources), must be considered in project planning and development.

A project with an effect that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment (14 CCR § 15064.5[b]). The lead agency is responsible for identifying potentially feasible measures to mitigate significant adverse changes in the significance of a historical resource (14 CCR § 15064.5[b]4).

1.3 REPORT ORGANIZATION

This report documents the results of a cultural resource investigation of the proposed Project area. Chapter 1 has described the Project and its location, defined the scope of the cultural resource investigation, and stated the regulatory context. Chapter 2 summarizes the natural and cultural setting of the Project area and surrounding region. Chapter 3 presents the results of the archaeological literature and records search. Chapter 4 summarizes the Sacred Lands File (SLF) search with the Native American Heritage Commission (NAHC) and Native American communications. The cultural resource survey methods and results are discussed in Chapter 5. Resource evaluations are included in Chapter 6. Cultural resource management recommendations are provided in Chapter 7 and bibliographic references are cited in Chapter 8. California Department of Parks and Recreation (DPR) 523 recording forms are included in Appendix A. The results of the SLF search and correspondence with Native Americans are included in Appendix B.

2
SETTING

This chapter describes the prehistoric, ethnographic, and historical setting of the Project to provide a context for understanding the nature and significance of cultural resources identified throughout the region. Prehistorically, ethnographically, and historically, the nature and distribution of human activities in the region have been affected by such factors as topography and the availability of water and natural resources. Therefore, prior to a discussion of the cultural setting, the environmental setting of the area is summarized below.

2.1 ENVIRONMENTAL SETTING

The Project is in western Riverside County and is situated on the interfluvial plain immediately north of Smith Creek. Annual precipitation in the area ranges from 18 to 20 inches. Surrounding sediments are composed of older Quaternary Alluvium deposits, derived as fan deposits from the San Bernardino Mountains to the north and possibly from the San Jacinto Mountains to the south. The Project lies within the South Coast Bioregion and is sparsely vegetated with scrub brush and grasses. A variety of reptiles, small mammals, birds, and insects coexist within the Project area.

The natural setting of the Project area has been summarized by McLean et al. (2006). The Project is located in the San Gorgonio Pass (elevation 2,616 feet), which forms a natural break between the San Bernardino Mountains to the north and the San Jacinto Mountains to the south. It is an east-west trending lowland between the two mountain ranges. The surface of the lowland is composed of alluvial fan deposits, mainly from the San Bernardino Mountains. The northern foothills are underlain by upper Cenozoic nonmarine and marine sedimentary deposits (Morton 1999).

The San Bernardino Mountains are in the Transverse Ranges geomorphic province (Norris and Webb 1990:330). The Transverse Ranges are an east-west trending mountain range at the northeast end of the Los Angeles Basin. This range has some of the highest peaks south of the Sierra Nevada range (Norris and Webb 1990:330). The San Bernardino Mountains are about 65 miles long and 30 miles wide at their widest point. The San Jacinto Mountains are the northernmost of the Peninsular Ranges, which run 900 miles from Southern California to the southern tip of the Baja California Peninsula. At an elevation of 10,834 feet, San Jacinto Peak is the highest peak in the range (California State Parks 2019).

Soils in the Project area as mapped by the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) consist of two series—Hanford and Greenfield (Web Soil Survey 2019). The majority of the Project area is mapped as Hanford soils—coarse sandy loams (74.1 percent) with Greenfield sandy loams covering the remainder (Web Soil Survey 2019). The Hanford series consists of very deep, well-drained soils that formed in moderately coarse-textured alluvium derived primarily from granite sources. Hanford soils are Entisols that formed on slopes of 0 to 15 percent in stream bottoms, or on floodplains and alluvial fans at

elevations of 150 to 3,500 feet amsl (USDA 2019a). Both the Hanford coarse sandy loams and fine sandy loams occur on 0 to 15 percent slopes. The official series description for the Hanford soil series pertains to the fine sandy loams with the typical pedon consisting of a 12-inch-thick, very friable, slightly acidic, pale brown (10YR 6/3) A1 horizon with weak fine granular structure over a 24-inch-thick, very friable, pH-neutral, pale brown (10YR 6/3) C1 horizon with massive structure over a very friable, slightly alkaline, yellowish-brown (10YR 6/4) C2 horizon massive structure (USDA 2019a). Sandy loam is mixed with fine sandy loam in the C2 horizon. Although Hanford soils are distributed on landforms with high potential for buried archaeological sites, no buried A (Ab) horizon is described for the Hanford soil series.

The Greenwood series consists of deep, well-drained soils that formed in moderately coarse and coarse-textured alluvium derived from granitic and mixed rock sources. Greenwood soils are Alfisols that formed on slopes of 0 to 30 percent on alluvial fans and terraces (USDA 2019b). The official series description states the typical pedon consists of a very friable, slightly acidic, pale brown (10YR 6/3) coarse sandy loam A1 horizon with massive structure that is 8–30 inches thick over a very friable, pH-neutral, light yellowish-brown (10YR 6/4), sandy loam B1 horizon with weak fine subangular blocky structure that is 10–20 inches thick over a very friable, pH neutral, yellowish-brown (10YR 6/4), fine sandy loam B2t horizon with weak medium subangular blocky structure that is 10–20 inches thick over a very friable, pH neutral, brownish-yellow (10YR 6/6) and yellow (10YR 7/6) stratified loamy sand, sandy loam, fine sandy loam C horizon with massive structure (USDA 2019b). Although alluvial fans have high potential for buried archaeological sites, no Ab horizon is described for the Greenwood soil series.

The maximum depth of proposed disturbance (6 feet) will penetrate the typical pedons of all soils mapped in the Project area. None of the mapped soil series has a buried A (Ab) horizon; therefore, intact and significant buried cultural deposits are unlikely. Recent land use has been agricultural cultivation; intact and significant archaeological materials and features may be preserved below the plow zone.

2.2 PREHISTORIC SETTING

The prehistory of inland Southern California is less thoroughly understood than in the adjacent desert and coastal regions. This is partially a result of historical circumstances, such as ease of access, the location of universities, and public versus private land ownership, and partly due to the nature of archaeological research in these interior valleys and mountains of Southern California (Goldberg and Arnold 1988). In the absence of absolute chronological indicators for inland sites, researchers generally employ typological cross-dating from either coastal or desert sequences, often as the sole means for assigning age to archaeological sites within the interior valleys, including the Project area.

Two large reservoir projects, Perris Reservoir (O'Connell et al. 1974) and Eastside Reservoir Project (ESRP) (Goldberg et al. 2001), generated large data sets to provide a basis for resolving some of these regional problems. It is difficult to extrapolate the geographic extent of the prehistoric cultural patterns discerned from excavations at these two reservoirs, which are 12 miles apart in central western Riverside County. The ESRP is 16 miles southeast of the Project, and it is almost certain that prehistoric patterns are similar to those discerned for the ESRP studies.

This discussion of the Project's prehistoric cultural setting is drawn from the cultural sequence developed for the ESRP. This chronology was based first on artifact cross-dating, and then refined with radiocarbon and obsidian hydration dates (Onken and Horne 2001; Robinson 1998, 2001); however, the ESRP chronology draws heavily on a cultural sequence defined by Warren (1984) for Southern California, which is based largely on archaeological work conducted in the Colorado and Mojave deserts. Because Warren's chronology used period names that suggest links to the Mojave, these were replaced in the ESRP chronology by value-neutral terms. Because no sites dating to the Paleoindian Period (ca. 12,000–9500 before present [B.P.]) have been documented within the region, the discussion below begins with the Early Archaic Period.

2.2.1 Early Archaic Period (ca. 9500–7000 B.P.)

The environmental transition from the Pleistocene to the Early Holocene (10,000 to 7500 B.P.) appears to have been gradual, with modern vegetation communities appear to have been established in the region sometime after 8000 B.P. (Sutton 1996). During this period, the environment of the interior deserts was more favorable for human occupation than the cismontane valleys of Southern California, where the Project is located. Populations in the interior valleys would have been tethered to the few reliable, drought-resistant water sources such as Lake Elsinore, Mystic Lake, and possibly the Cajalco Basin. In general, small, highly mobile groups traveled widely, utilizing highly portable tool kits to procure and process critical resources, with brief and anticipated intervals of seasonal sedentism near predictable water locations. Due to isolated locations where the conditions for occupation were met, Early Archaic sites are rare compared to later periods of prehistory (Goldberg et al. 2001; Grenda 1997; Horne and McDougall 2008; McDougall 1995).

2.2.2 Middle Archaic Period (ca. 7000–4000 B.P.)

A gradual transition from pluvial conditions to desert conditions during the Early Holocene marks the transition to the Middle Archaic Period. Middle Archaic sites in Southern California include two in the ESRP, one at Lake Elsinore, the Stahl Site in Owens Valley, desert sites in Death Valley, Salt Springs, and in Pinto Basin in Joshua Tree National Park. Middle Archaic sites are associated with the margins of pluvial lakes and with now-extinct springs. Pinto-series projectile points, a type of basally notched or bifurcate base dart point, are the most distinctive artifact type of this period (Justice 2002). Other artifacts found at Middle Archaic sites include leaf-shaped bifacial knives; split cobble choppers and scrapers; scraper-planes; and small milling slabs and manos. With a few exceptions in the ESRP area and the Stahl Site, most sites of this age are small surface deposits of lithic artifacts, suggestive of temporary and perhaps seasonal occupation by small groups of people.

2.2.3 Late Archaic Period (ca. 4000–1500 B.P.)

In the Late Holocene (after 4000 B.P.), the climate was generally somewhat cooler and wetter than modern times, although a series of wet and dry episodes occurred, particularly within the last 2,000 years in at least the western portion of the Mojave Desert (Sutton 1996). This period of climatic variability includes a Neoglacial episode yielding more surface water in the Mojave (Sutton 1996). Sedentism likely increased during this period, with large occupation sites located adjacent to permanent water sources such as perennial springs and streams. Projectile points

diagnostic of this period includes Humboldt, Gypsum, and Elko-series dart points (Warren 1984), though Rose Spring arrow points appeared late within this period in the deserts. The mortar and pestle, used for processing acorns and hard seeds, also first appeared. A warming and drying trend began around 2100 B.P., leading to intensification of use of certain resources (Goldberg et al. 2001).

2.2.4 Saratoga Springs Period (ca. 1500–750 B.P.)

Occupants of the region continued to adapt to the arid environment in the deserts (Warren 1984). Lake Cahuilla likely refilled the Coachella Valley around 1450 B.P. and was the focus of exploitation of fish and wetland resources. Occupation around large local water sources declined as these dried, however, and people became tethered to springs (Goldberg et al. 2001). Cultural trends continued from the Late Archaic Period, as Saratoga Springs projectile points, also associated with early use of the bow and arrow, appeared. The sparse assemblages found within the region, however, obscure the timing of local adoption of the bow and arrow (Goldberg et al. 2001). Shoshonean language speakers likely moved into Southern California at this time. Brownware and buffware pottery first appeared on the lower Colorado River at about 1200 B.P. and started to diffuse across the California deserts by about 1100 B.P. (Moratto 1984). The warmer and drier Medieval Warm Period set in throughout the Southwest by about 1060 B.P. (Stine 1994; Warren 1984) and led to the withdrawal of Native American populations from marginal desert areas.

2.2.5 Protohistoric Period (ca. 410–180 B.P.)

Sedentism intensified during the Protohistoric Period. Increased hunting with bow and arrow and widespread exploitation of acorns, other hard nuts, and berries (indicated by the abundance of mortars and pestles) provided reliable and storable food resources. Reliable food sources likely prompted the establishment of small, completely sedentary villages with resource catchment areas around them (True 1966, 1970). Ceramic technology first appeared in the region around 350 B.P. Cottonwood Triangular points were supplemented by Desert Side-notched points. This period ended in 1769 A.D. when Spanish settlement began in Upper California.

2.3 ETHNOGRAPHIC SETTING

The Project area lies immediately west and north of the Morongo Indian Reservation. The Morongo Band of Mission Indians are a mixture of several different groups of California Native Americans, including Cahuilla, Serrano, and Cupeño. The native languages spoken by these groups are all part of the larger Takic family of Uto-Aztecan languages. An ethnographic overview of each of these groups if provided below.

2.3.1 Cahuilla

Ethnographically, the Project area lies within the traditional territory of the Pass (or *Wanakik*) Cahuilla. A wealth of information exists regarding traditional and historic Cahuilla society and culture (Bean 1978; Bean and Toenjes 2011). The Cahuilla language, divided into Desert, Pass, and Mountain dialects, has been assigned to the Cupan subfamily of the Takic branch of the Uto-Aztecan linguistic family. Territory traditionally claimed by the Cahuilla was topographically

complex, including mountain ranges, passes, canyons, valleys, and desert. Bean (1978:375) described it as, "…from the summit of the San Bernardino Mountains in the north to Borrego Springs and the Chocolate Mountains in the south, a portion of the Colorado Desert west of Orocopia Mountain to the east, and the San Jacinto Plain near Riverside and the eastern slopes of Palomar Mountain to the west."

The Cahuilla in precontact times had nonpolitical, nonterritorial patrimoieties that governed marriage patterns, as well as patrilineal clans and lineages. The Cahuilla words for these moieties mean "Coyote" and "Wildcat." The Cahuilla had "political-ritual-corporate units (clans) composed of 3 to 10 lineages, dialectically different, named, claiming a common genitor, with one lineage recognized as the founding one" (Bean 1978:580). Clans owned a large territory in which each lineage owned a village site with specific resource areas. Clan lineages cooperated in defense, in large communal subsistence activities, and in performing rituals. Founding lineages often owned the office of ceremonial leader, the ceremonial house, and a ceremonial bundle (Bean 1978:580). Settlements, occupied by one or more lineages, could be politically autonomous or allied with several villages under one chief. The hereditary chiefs had religious, economic, and military power and were role models for their people. They were aided in their duties by one or more assistants. The chiefs and their families, along with the very wealthy, were the elites of the society. The acquisition of wealth was important, but the acquisition of extreme material wealth was prevented by the custom of burning or burying the possessions of the deceased.

The Cahuilla were, for the most part, hunting, collecting, harvesting, and proto-agricultural peoples. Clans were apt to own land in valley, foothill, and mountain areas, providing them with the resources of many different ecological niches. Individual lineages or families owned specific resource areas within the clan territory. Although any given village had access to a wide array of necessary resources, briskly flourishing systems of trade and exchange gave them access to the resources of their neighboring villages and of distant peoples. Rules that forbade marriage to anyone related within five generations or belonging to the same moiety ensured that everyone had relatives living in many ecozones, an important arrangement because relatives were invited to ceremonies. The ceremonial exchange of gifts between hosts and guests under the direction of the chiefs and shamans at such events provided a way for drought-stricken groups to get food in exchange for treasure goods. Thus, oscillations in the subsistence goods supply were dampened by "banking" human effort in the production of treasure goods.

As in most of California, acorns were a major staple, but the roots, leaves, seeds, and fruit of many other plants also were used. Fish, birds, insects, and large and small mammals were available. Mountain sheep, deer, and antelope were some of the large mammals hunted. When filled, Lake Cahuilla was on the Pacific Flyway for migratory birds; hence, ducks, geese, and other migratory birds would have been caught. Mountain lion, black bear, grizzly bear, deer, and wild boar also were hunted in historic times.

To gather and prepare various food resources, the Cahuilla had an extensive inventory of equipment. Bows and arrows were the most important hunting tools, but traps, nets, disguises, blinds, throwing sticks, and slings were also part of the hunting technology. For fishing, nets, traps, spears, hooks and lines, and fish poisons were used. Gathering required few tools: poles for shaking down pine nuts and acorns, cactus pickers, chia hooks, seed beaters, digging sticks,

weights for digging sticks, and pry bars. Materials associated with transportation mainly were used to move food and include burden baskets, carrying nets, game bags, and saddle pads. Some food was stored in large baskets. Pottery ollas and baskets treated with asphaltum were used to store and carry water and seeds. Wood, clay, and steatite were used to make jars, bowls, and trays. Skin and woven grass were used to make bags. Food processing required hammers and anvils for cracking nuts; mortars and pestles for grinding acorns; manos and metates for grinding seeds and berries; winnowing shells and baskets; strainers; leaching baskets and bowls; knives of stone, bone, wood, and carrizo cane; bone saws; and drying racks made of wooden poles to dry fish. Basket mortars, with asphaltum or pine pitch used to attach an open-bottomed basket to a mortar, were important for food processing. Food was served in wooden and gourd dishes and cups and in basket bowls that were sometimes tarred. Wood, shell, and horn were used for spoons.

Cahuilla shelters were often made of brush, fan palm fronds, or arrow weed. In prehistoric times they were dome-shaped; later they tended to be rectangular. Near such dwellings usually stood brush-covered ramadas under which domestic chores were done. Earth-covered sweathouses for purification and curing rituals and ceremonial houses with fenced areas for ceremonial use were found in most villages. The chief's house was the largest and was usually next to the ceremonial house. Each village also had several granaries (Bean 1978:578).

The Cahuilla, like other California Indians, understand the universe in terms of power. They assume power to be the principal causative agent for all phenomena. Power is believed to be sentient and to have will. Unusual natural phenomena are viewed as especially sacred, being the repositories of concentrations of power. Mountaintops, and especially particular mountaintops, are held sacred, as are unusual rock formations, springs, and streams. Rock art sites are sacred, having been the sites of ceremonies. Burial and cremation sites are also sacred, as are many other places of residual power. Various birds, especially eagles, condors, hawks, and other birds of prey are revered as sacred beings of great power and sometimes were killed ritually and mourned in mortuary ceremonies similar to those for important individuals. For this reason, bird cremation sites are sacred.

As part of his doctoral research, Wilke (1976) examined Cahuilla oral tradition as it related to the prehistoric lakeside adaptation of Lake Cahuilla. Ethnographic sources indicate that during the 1853 Pacific Railroad Survey expedition, W. P. Blake, while encamped at a Cahuilla village about 10 mi south of the present City of Indio, inquired if the Indians had any knowledge of the lake that formerly stood in the Salton Basin. The head man of the village related to Blake a tradition of a great water which filled the basin and abounded in fish and waterfowl (Wilke 1976:7). The head man stated that his people's ancestors then lived in the mountains (presumably the Santa Rosa Mountains to the west) and came down to the lake to fish and hunt. After a time, the water receded, and they moved their villages down from the mountains onto the exposed lakebed (Wilke 1976:8). Later, the Cahuillas told ethnographer Stephen Bowers that their ancestors had formerly caught fish in the lake with "stone fish traps" along the foot of the San Jacinto and Santa Rosa mountains (Wilke 1976:8). As well, Bowers was informed that when the lake receded, Coyote (a mythical character to many Native American groups) came down from the mountains and planted mesquite beans on the lakebed so that mesquite thickets would grow and help feed the people (Wilke 1976:9). These fragments of oral literature, coupled with

archaeological data collected over the years, attest to the economically rich resource base that Lake Cahuilla offered to the local inhabitants of the region.

European contact with the Cahuilla was by the Juan Bautista de Anza expedition, which passed through the region in 1774. Initially, the Indians were hostile to the Europeans. Subsequently, the Europeans used sea routes to populate California because the land route had been closed by the Quechan Indians in 1781. The Cahuilla, therefore, had little direct contact with Europeans except for those baptized at missions in San Gabriel, San Luis Rey, and San Diego and, thus, integrated into the mission system. In 1819, several *asistencias* were established near the Cahuilla area; Cahuillas became partially involved with the Spanish and adopted some Spanish economic practices such as cattle raising, agriculture, trade, and wage labor, as well as cultural traits such as clothing styles, language, and religion. Some Cahuilla worked seasonally for the Spaniards and lived for the remainder of the year in their villages. At the time of the American invasion of California, the Cahuilla still maintained their political and economic autonomy.

2.3.2 Serrano

The Project area lies within the ethnographic territory of the Serrano. The name Serrano comes from a Spanish word meaning "mountaineer" or "highlander." The Serrano language is considered part of the Takic subfamily of the larger Uto-Aztecan language family that includes a number of language groups. Other Takic speakers include the Gabrielino, Luiseño, and Cahuilla, whose territories share borders with the Serrano. The Serrano culture area extends from the San Bernardino Mountains, south to Yucaipa Valley, east to the Mojave River watershed, and north to the Twentynine Palms region (Bean and Smith 1978:570). Most Serrano village sites were located in the foothills of the upper Sonoran zone with a few outliers located near permanent water sources on the desert floor, or in the forest transition zone.

Traditional Serrano territory includes areas occupied by three clan groups, the Kitanemuk, Allikik and the Vanyume. The Kitanemuk were located on the upper Tejon and Paso creeks near the Tehachapis and extended into the western portion of the Mojave Desert. The Allikik were located on the upper Santa Clara River and the Vanyume were located along the Mojave River (Johnston 1965:1). These politically independent clan groups also belonged to one of two basic subdivisions or exogamous moieties, the Coyotes and Wildcats. The clans were divided into land holding lineages. Each of these lineages had a chief determined by heredity called the *kika*. The chief's assistant was the *paha*, who assisted him in ceremonial, political and economic affairs (Bean and Smith 1978:572).

The Serrano traded with the Mojave to the east and the Gabrielino to the west. They also traded with their close neighbors, the Cahuilla and Chemehuevi. Obsidian source analysis has shown that traders traveled from the California coast to Arizona, probably reaching Nevada, and areas north of the Mojave Desert. Family members usually exchanged goods at trade feasts, social events, and ceremonial occasions (Bean and Vane 2002:14).

Prior to European contact, the Serrano were primarily hunters and gatherers. Women were responsible for most of the gathering and acorns, piñon nuts, and mesquite beans were collected as staple foods. Other resources included roots, bulbs, shoots, and seeds. Digging sticks were frequently used to dig for plants and roots for subsistence and medicinal purposes (Johnston

1965:8). One main seed resource was chia. Stands of chia were periodically burned in order to increase yield. Desert groups moved seasonally from the desert into the foothills to collect nuts and trade for resources that were not available in the desert (Bean and Smith 1978:570; Bean and Vane 2002:13). The Serrano also hunted large game animals such as deer, mountain sheep and antelope. Hunting was usually done by men using bows and arrows, although smaller game like rabbits, rodents, and various birds, were hunted with throwing sticks, nets, and snares.

When the Spanish arrived in 1769, Serrano population levels were fairly high. By 1790, the westernmost Serrano groups began to enter Mission San Gabriel. After an attempted revolt in 1810, most of the San Bernardino Mountains and the western Mojave Desert Native groups were brought into the mission. The Serrano in the easternmost desert, beyond the San Bernardino Mountains and Little San Bernardino Mountains, were beyond the reach of the mission, and absorbed a number of those who fled the missions (Bean and Vane 2002:18). It has been suggested that the Serrano left the area in the early 1860s when a smallpox epidemic struck the Indians of southern California, although the isolation of the area should have protected them.

The Maringa were the most important Serrano clan and they occupied a large area in the Morongo Valley. The Maringa exerted a powerful ceremonial influence in the region (Johnston 1965:4). The Maringa were presumably living in the Mission Creek area before the 1870s. According to Cahuilla traditions, the Maringa replaced the Cahuilla who had been living there. Members of the Maringa clan intermarried with the Gabriel family (the ceremonial leader of the Wanikik Cahuilla), and had moved to the Potrero, or Malki, by the 1870s. John Morongo, a leader of the group, played a leading role in the affairs of the newly established Morongo Indian Reservation. It is believed that the Serrano left the Mara (Twentynine Palms) area because of pressure from settlers and miners. Many Serrano settled in Mission Creek and Potrero, on what is now the Morongo Indian Reservation. These areas were relatively richer in plant and animal resources than areas farther east in the desert. They were also closer to job opportunities with Anglo employers (Bean and Vane 2002:18).

2.3.3 Cupeño

The Cupeño are considered one of the smallest linguistic groups in Southern California (Bean and Smith 1978). The traditional territory of the Cupeño is located near the headwaters of the San Luis Rey River in northern San Diego County. Today, there are several Native American groups (Pala Band of Luiseño Indians, the Morongo Band of Mission Indians, and the Los Coyotes Band of Cahuilla and Cupeño Indians) that include Cupeño members. As discussed by Bean and Smith (1978:588), Cupeño social organization reflects an amalgamation of several different groups that dates back at least 800 years. Cahuilla elements of social organization found among the Cupeño include exogamous moieties, patrilineal clans, and ceremonial exchange parties. The Cupeño also practice some Chingichngish religious rituals that were acquired from the Luiseño, with additional ceremonies adopted from the Ipai.

Ethnographic information on the Cupeño indicates that clans owned the most productive food-gathering spots with communal ownership of intervening areas for hunting and gathering. The head of each clan lived in the clan's ceremonial dance house and was responsible for keeping the clan bundle. A hereditary office that usually passed from father to eldest son, the duties of the clan leader included controlling trade with non-Cupeño groups, overseeing the production and

distribution of goods, regulating intra- and interclan relationships, and organizing ceremonies (Bean and Smith 1978:588–589). Clan leaders could also be shamans.

In terms of ritual, the most significant ceremonies for the Cupeño were those held in connection with deaths in the clan. Immediately following the death of an individual, the body was burned. This was followed by the burning of the deceased's possession a few weeks to several months later. An annual or biannual image-burning ceremony was held at a later point in which images of all those who had died since the last ceremony were burned (Bean and Smith 1978:589). Another ceremony held in memory of the dead was the eagle-killing ritual, which was held once a year.

2.4 HISTORICAL SETTING

The history of the Project vicinity and surrounding region provides a context for understanding local settlement from the time that Spanish explorers first laid claim to the territory, to the development of the modern landscape. Context is the basis for the identification of the historic site types constructed, and the evaluation of their significance as historical resources. Today, as it was in the past, the City of Banning, located in the San Gorgonio Pass, is important in Southern California for its geographical position as an important travel corridor and resource procurement area including still-open land. The following historic context was developed by Æ and is taken primarily from George and Chasteen (2017).

2.4.1 Spanish Exploration and Mission Period: 1769 to 1821

Exploration of the California coastline by ship during the sixteenth and seventeenth centuries was the basis for the Spanish claim to most of Alta and Baja California at that time. While a number of explorers and their men came ashore periodically, they did not venture a great distance inland. In the eighteenth century, Spain recognized that to strengthen its claim to the region, it would have to establish settlements along the northern coastline of Alta California to preclude encroachment by the Russian and British fur-traders entering the region from the north. Therefore, in the latter half of the eighteenth century, Spain and the Franciscan Order founded a series of presidios, or military camps, and missions along the California coast, beginning with the founding of Mission San Diego de Alcala in 1769. They proceeded to establish a military presidio at Monte Rey (present-day Monterey) in northern California in 1770, their fourth mission at San Gabriel in 1771, and a fifth mission at San Luis Obispo by 1772. However, providing supplies, animals, and colonists to the Spanish missions and presidios by way of ship was difficult, time-consuming, expensive, and dangerous. Thus, an overland route was necessary to initiate a strong colonizing effort in Alta California.

In 1774, Captain Juan Bautista de Anza crossed the San Jacinto plains with a small party of soldiers and servants. Anza's expeditionary force crossed the Cahuilla Valley, skirted the Santa Rosa Mountains, made their way up through Coyote Canyon, descended into the San Jacinto Valley via Bautista Creek, and trekked northwest across the San Jacinto Valley into Moreno Valley. From there, the expedition passed through the Riverside area and crossed the Santa Ana River near present-day Jurupa, then continued northwest to reach the mission at San Gabriel.

Riverside County lacked a mission proper but remained connected to the California presidio and mission system through Franciscan outposts known as ranchos and *asistencias*. The Riverside area was considered to be a part of the San Diego District, a military designation associated with the San Diego presidio; most of the territory fell under the authority of the Mission San Luis Rey. Founded in 1798, Mission San Luis Rey was the eighteenth of California's 21 missions. During much of the Spanish Exploration and Mission Period, European settlement in Riverside County was slow and sporadic. By the end of the Spanish Exploration and Mission Period, few Europeans had settled permanently within the region. The cattle grazing lands associated with Mission San Luis Rey encompassed most of the San Jacinto Valley. The broad grasslands of these areas were used to graze the Mission's livestock.

The San Timoteo Canyon and San Gorgonio Pass were once under the jurisdiction of the Mission San Gabriel's San Bernardino Rancho (Gunther 1984:458, 487–488). The Canyon and Pass areas provided fresh water and grassland ideal for cattle grazing. An outpost, or *estancia*, for cattle grazing activities was established near the mouth of San Timoteo Canyon in 1819. Native American labor was used to dig an irrigation ditch, or *zanja*, to divert water from Mill Creek to the outpost to support farming and horticulture. The majordomo, Juan Alvarado, relocated the *estancia* to a new site approximately one mile to the east in 1830, where he constructed a 14-room complex of adobe and timber.

2.4.2 Mexican Ranchos (1821 to 1848)

In 1821, after 10 years of intermittent rebellion and warfare, Mexico and the territory of California won independence from Spain. On December 15 of that same year, the Mexican *Cortes* (the legislative body of the Mexican government) ended the older regime's strict isolationist policies that were designed to protect the traditional Spanish monopoly on trade and decreed that California ports (namely San Diego and Monterey) be open to foreign merchants (Dallas 1955:14).

Following the Secularization Act of 1833, which called for the immediate privatization of Franciscan lands, the Mexican government secularized all of the California missions. During the two-year period of 1834 to 1836, this radical process quickly and effectively reduced the missions to parish churches. Although the original secularization schemes called for redistribution of mission lands to those Native Americans who were responsible for the physical construction of the mission empire, the vast mission land and livestock holdings were redistributed by the Mexican government into several hundred land grants privately owned by Mexican citizens (Langum 1987:15–18). These landowners subsequently released their Native American "workers" to fend for themselves. The Mexican Ranchos spread and characterized the landscape between 1834 and1848. Livestock and horticulture dominated the economics of Southern California. Ranchos were predominately devoted to the cattle industry and these vast tracts of land were used for grazing.

Banning was never part of any Mexican Rancho; the nearest occurrence of these Rancho lands was at nearby San Timoteo Canyon and in the San Jacinto Valley. The vast grazing lands of the Mission San Luis Rey, comprising over 133,000 acres covering the San Jacinto Valley and beyond, were divided among members of the Estudillo family into three Mexican Ranchos: Rancho San Jacinto Viejo was granted to José Antonio Estudillo in 1842; Rancho San Jacinto

Sobrante to his daughter, María del Rosario Estudillo, in 1846; and Rancho San Jacinto Nuevo y Potrero to his son-in-law, Miguel Pedrorena, in 1846 (Robinson 1997:143–161).

Jose del Carmen Lugo, Jose Maria Lugo, Vincente Lugo, and Diego Sepulveda were granted title to the Mission San Gabriel's San Bernardino Rancho by the Mexican Governor of California in 1842. Jose del Carmen Lugo repaired the abandoned *estancia* near Redlands, which included the adobe and timber residence, a grist mill, a tile kiln, and a lime kiln, and resided there until 1851 (San Bernardino County Museum 2014). James "Santiago" Johnson, an Englishman, requested and received the grant of the lands in San Timoteo Canyon from Mexican Governor Manuel Micheltorena in 1843 (Gunther 1984:488). The 4,440-acre area was known as the Rancho San Timoteo or "Rancho San Jacinto y San Gorgonio." Johnson sold the land two years later to Louis Rubidoux, although local cattle ranchers Isaac "Julian" Williams and Powell "Paulino" Weaver argued to Governor Pio Pico in 1845 that Johnson was not making proper use of the land, never occupying it, and never improving it (Gunther 1984:459).

2.4.3 American Period Intrusion

With the signing of the Treaty of Guadalupe Hidalgo in 1848, which ended the Mexican-American War, California experienced an intrusion of American fur trappers and settlers. In 1850, California became a state. During the late 1840-1860s, there began a gradual decline of old California's cattle ranching industry, which for over half a century represented the currency and staple of the rancho system. The ranchos changed ownership regularly. Through the years, settlement continued to develop across the inland valleys of what would eventually become western Riverside County. With the influx of new settlers and decline of the cattle industry, some of the larger ranchos were subsequently subdivided into smaller parcels. In 1852, San Diego organized into a county; in 1853, San Bernardino followed suit. Riverside County would be formed in 1893, carved out of portions of San Bernardino and San Diego county Railways.

The completion of the Southern Pacific Railroad's transcontinental railroad in 1869 opened California to agricultural settlement and brought the previous era of large-scale ranching to a close. The arrival of the Southern Pacific across the San Gorgonio Pass and into the San Bernardino Valley resulted in a dramatic influx of new settlers into what is now western Riverside County. The Riverside Colony was founded in 1870, and agricultural lands in the region quickly began to be settled by homesteaders. The Riverside Land and Irrigating Company soon established a series of canal systems, tapping water from the Santa Ana River. With a much-needed, reliable water supply, the settlers could focus on irrigation and agriculture. Perhaps one of the most influential early settlers in western Riverside County during this period was Eliza Tibbets who planted the first two navel orange trees, acquired from Brazil, in the Riverside Colony. Mrs. Tibbets' oranges flourished and provided the bud grafts for the Washington Navel Orange, setting the foundation for western Riverside County's highly successful citrus industry.

During the 1880s and 1890s, similar to the phenomena occurring in the area surrounding the Riverside Colony, irrigation canals were built and the regional citrus industry took root in the fertile valleys of the surrounding region. The arrival of reliable water sources coincided with the arrival of a second transcontinental railroad; in 1882, construction of a competing rail line into Southern California was underway, financed by the Atchison, Topeka, and Santa Fe Railway

Company. The line of a Santa Fe subsidiary, the California Southern, was built from San Diego to the site of Perris and on to Riverside and San Bernardino in 1882. A second Santa Fe subsidiary, the Atlantic and Pacific Railroad, extended a line west from Albuquerque, then connected San Bernardino and Los Angeles; this connection was opened as of May 1887. The eastern United States was now readily accessible via Los Angeles. The establishment of a second competing railroad line from the Midwest to Los Angeles in 1886 triggered a land boom in Southern California during the late 1880s, which finally brought substantial settlement to the region.

Population rose dramatically as railroads, citriculture, ranching, and readily available land enticed more Americans and Europeans to settle in Southern California. By the late 1880s and early 1890s, conflicts and discontent between the cities of Riverside and San Bernardino led to the establishment of a new county. Portions of the Temecula and San Jacinto valleys, then in San Diego County, joined with the residents of Riverside to form a new county seat in May 1893, leading to the formation of Riverside County (Greenwood et al. 1993:34).

During the years from about 1908 through American entry into World War I in 1917, there was renewed interest in farm settlement and farming in California and elsewhere in the western U.S. This was reflected in a sharp surge in Homestead filings on remaining public lands in rural California at that time. There was an increase in the turnover of property during that time, including the purchase of farms by individuals making a move from the city to the country. Two factors that helped contribute to this kind of move were the increased use of the automobile, which decreased the isolation of rural living, and the brighter financial prospects for farming during the World War I years. The outbreak of war in Europe in 1914 drove international commodity prices sharply upward, providing a bonanza for grain farmers.

The decade of the 1920s offered regional urban growth in Southern California that was helpful to many farmers in the region. However, it also brought sustained national declines in the prices of many agricultural commodities due to major increases in agricultural production in the U.S. and elsewhere. Turnover in land ownership during the 1930s and the eventual recovery of agricultural prices by the eve of World War II was followed by the disruptions of the exodus of younger people into military service or leaving to work in urban areas. Water from the Colorado River Aqueduct was piped to the region beginning in the early 1940s. Alfalfa, potatoes, watermelons, and sugar beets soon after became the mainstay of farming in many parts of the region.

The post-World War II era ushered in a boom in commercial, industrial, and residential development in and near the region's urban centers, followed by the construction of several freeways linking urban areas to one another. As urban areas were spread outward by development, once-rural areas took on a more semi-rural character, dotted by small "mini-ranch" subdivisions. In more recent years, housing and urban development have spread outward from urban areas and swallowed up former agricultural land at an exponential rate, forever changing the character of the region. Substantial growth over the last few decades has necessitated the construction of numerous artificial lakes, reservoirs, and other forms of municipal water storage. During the first decade of 2000, inexpensive land and housing transformed many of the towns in southwestern Riverside County into "bedroom" communities for those working in Los Angeles and San Diego counties. Increased population and automobile traffic has resulted in the need for

construction of new roads, as well as expansion and improved safety of many of the pre-existing roads throughout the region. The over-expansion of the housing market, and ultimate crash in 2007, led to a shift in the region's development trend in recent years to increase infrastructure projects to support the population growth.

2.4.4 City of Banning

Banning is located in the San Gorgonio Pass, the principle opening between the San Bernardino Mountains to the north and the San Jacinto Mountains to the south that allows east-west travel between the coast and desert regions. As such, it was the route of early trails and stage roads, as well as the Southern Pacific Railroad and Interstate 10 (I-10).

The Land Office survey map from 1855 depicts no settlement in the area, but a wagon road is shown traversing Sections 9 and 10 and joins an "Old Indian Trail" in the southwest corner of Section 12, just north of what is now Smith Creek. One habitation, labeled as Holt's House, was located to the northwest of the area where Banning would later be located (General Land Office [GLO] 1880).

In the 1870s, the construction of the Southern Pacific Railroad through the San Gorgonio Pass drew further settlement to the area. In 1875, Milton Sanders Hall contracted with the Southern Pacific to grade the railroad route through the San Gorgonio Pass. In the same year, he agreed to provide the wood needed for the railroad ties, and also to power the steam engines used by the construction crews. Timber was available in the San Jacinto Mountains. Hall found a location for a lumber camp (Hall's Camp) near what is now called Hurley Flats. He laid out a road from the camp to the base of the mountain, which became Hall's Grade. It was a steep, narrow road with several switchbacks. A small town, Hall's City, was established at the base of the road. The lumber operation was initially successful, but the road was extremely dangerous for the men and teams hauling the logs down the mountain:

> Several teamsters hauled lumber down the grade to the railroad. This was rather a daredevil job, for besides the regular brakes and roughlocks they had to tie logs and trees on behind loads to drag in the dirt and thus keep the loads off the rumps of the horses. Yet even then there were accidents. At least two men lost their lives on the downward trip, and several teams and wagons were dashed to destruction [Hughes, in Lech 2004:252].

Ultimately the operation failed. The costs to harvest and transport the timber were too high for any profits to be made. Hall then began a second venture, the San Gorgonio Fluming Company, to bring lumber to the railroad from Moore Canyon, approximately 12 miles north of the railroad grade. A "massive, eighteen-inch V-shaped flume" was constructed to bring the lumber to the railroad (Lech 2004:253).

Banning, originally Moore City, was founded in early 1877, near the "confluence" of the railroad and the flume (Lech 2004:254). By July of the same year, the name was changed to Banning. The 1886 Land Office map clearly shows Banning located north of the Southern Pacific Railroad, as a town of about four blocks east-west and three blocks north-south. The Banning Land and Water Company flume is depicted traveling north from town along what is now San Gorgonio Avenue. Grain fields and isolated cabins and houses are depicted around Banning,

particularly southwest of town. The Bradshaw Stage Route, which was located north of Banning, is no longer shown on the map (GLO 1886). The first commercial grain crop was barley; subsequently both oats and wheat were also successful cash crops (Hughes 1938:205). At the same time that farmers and ranchers settled in Banning, it also became known as a health resort. In 1888, the town was described as "unsurpassed" as a resort, with water "as pure as ever flowed from Nature's fountain" (quoted in Lech 2004:259). In 1890, the Sisters of St. Joseph founded the St. Boniface Indian School near Banning (Deferrari 1942:541).

Incorporated in 1913, Banning was similar to many other small towns throughout Southern California and the country, proud of every achievement, eager for further growth and development in a positive way, and full of hope for the future. Banning continued to grow both as an agricultural area and as a resort. In the 1920s, Banning's population was around 3,000 (Banning Chamber of Commerce 1927). In that decade, almond trees, at the peak of their success in California, were grown on approximately 1,000 acres in and around Banning; the area was considered the largest almond-growing region in Southern California (Holtzclaw 2005:25, 41). At the same time, Banning had maintained its reputation as a "health haven…as attested by the sanitariums and private rest homes in and near the city" (Hughes 1938:205).

In 1931, the news of the construction of the Colorado River Aqueduct (CRA) by the Metropolitan Water District of Southern California (MWD) was well received in Banning. In anticipation of the economic boost the city would receive, "Banning staged a victory jubilee in celebration of the voting of bonds for aqueduct construction" (Hughes 1938:59). The MWD field headquarters were located at the intersection of San Gorgonio Avenue and the Union Pacific Railroad. Construction work for MWD headquarters began in 1932.

Through the years of the Great Depression, Banning was home to the MWD engineer's field office. In addition, the concrete testing laboratory was located in Banning. Boring the San Jacinto Tunnel began in 1933 and continued until the "holing through" on November 18, 1938. The tunnel was then lined with concrete; on October 14, 1939, a ceremony marking the official completion of the aqueduct was held at the West Portal of the San Jacinto Tunnel (Gruen 1998). During these seven years, the headquarters provided a boost to the local economy, as did the construction workers who lived in the town and commuted to work.

At the beginning of World War II, General George C. Patton established the Desert Training Center in the Mojave Desert in eastern Riverside and San Bernardino counties. In Banning, a 1,000-bed hospital, aid station, and artillery range contributed to the training effort. During the war, 1.6 million people moved to California to work in war industries, and many of the servicemen trained in the state settled in Banning after the war was over (Starr 2005:237). By 1962, California had the highest population of any state. The region experienced a boom in housing subdivisions, commerce, and industry. The City of Banning, positioned along the Southern Pacific Railroad and U.S. Highway 60/70/99, grew substantially during the post-war boom period (USGS 1956). Banning also appealed to the elderly and became known as a retirement community during the 1960s. Sun Lakes Country Club, a large retirement village, is home to about 6,000 residents (Holtzclaw 2005:8).

Banning's growth continues to rise into the present day due to investments in capital improvements projects which include over 4,000 new housing units (City of Banning 2019).

Currently, the city of Banning is home to an estimated population of 31,253 according to the United States Census Bureau (2018).

3
CULTURAL RESOURCE LITERATURE AND RECORDS SEARCH

On November 15, 2019, prior to the field survey of the Project area, Æ conducted a literature and records search at the Eastern Information Center (EIC) of the California Historical Resource Information System (CHRIS), housed at the University of California, Riverside. The objective of this records search was to determine whether any prehistoric or historical cultural resources had been recorded previously within the Project area and a 1-mile-wide buffer (Study Area). The records search indicated 15 cultural resource investigations have been conducted previously within the Study Area. Three of these investigations specifically involved a portion of the Project area (Table 3-1), and as a result, 100 percent of the Project area has been previously surveyed. In addition, one of the previous investigations that involved the Project area (Table 3-1; RI-08449) conducted a sensitivity assessment for archaeological resources. This assessment concluded the Project is within an area of low archaeological sensitivity.

Table 3-1
Previous Cultural Resource Investigations in the Study Area

Author(s)	Date	EIC Reference #	Title
Desautels, Roger J.	1980	RI-00924	Archaeological Survey Report on the Vista Idyllwild Property Located in the City of Banning, California
Underwood, J.; J. Cleland; C. M. Wood; R. Apple	1991	RI-02210	Preliminary Cultural Resources Survey Report for the US Telecom Fiber Optic Cable Project, From San Timoteo Canyon to Socoroo, Texas; The California Segment
Apple, R. M.; J. E. Wooley	1988	RI-02350	MCI Rialto to El Paso Fiber Optics Project - Intensive Cultural Resource Survey - San Bernardino and Riverside Counties, California
Brock, James	2000	RI-04317	Phase I Cultural Resources Assessment for Tentative Tract Number 29150, Thousand Palms Area of Unincorporated Riverside County, California (EA No. 37843)
Taniguchi, Christeen	2004	RI-06099	Letter Report: Records Search Results and Site Visit for Sprint Telecommunications Facility Candidate RV60XC847A (Creeken Property) 60 South Aola Street, Banning, Riverside County, California
Tang, Bai "Tom", Josh Smallwood, and Melissa Hernandez	2007	RI-07339*	Identification and Evaluation of Historic Properties: Wastewater Treatment Plant Expansion and Recycled Water System, City of Banning, Riverside, California
McLean, Roderic, Shannon Carmack, Jay Michalsky, and Judith Marvin	2006	RI-07970	A Study of the Past in San Timoteo Canyon and San Gorgonio Pass: Cultural Resource Assessment Oak Valley Substation Project, Riverside County
McLean, Roderic, Shannon Carmack, Phil Fulton, Maria Aron, Jay Michalsky, Daniel	2008	RI-08012*	Supplemental Cultural Resource Assessment, Oak Valley Substation Project, San Bernardino and Riverside Counties

Table 3-1
Previous Cultural Resource Investigations in the Study Area

Author(s)	Date	EIC Reference #	Title
Ewers, Casey Tibbet, and Brook Smith			
Tang, Bai "Tom", Michael Hogan, Josh Smallwood, and Terri Jacquemain	2004	RI-08449*	Cultural Resources Technical Report City of Banning General Plan
Crawford, Kathleen A.	2010	RI-08578	Letter Report: Cultural Resource Records Search and Site Visit Results for T-Mobile Candidate IE24909-F (Repplier Park), 201 West George Street, Banning, Riverside County, California
Bonner, Wayne H. and Arabesque Said	2011	RI-08668	Letter Report: Cultural Resources Records Search and Site Visit Results for T-Mobile USA Candidates IE24909-H
Wills, Carrie D.	2014	RI-09317	Cultural Resources Records Search and Site Visit Results for Verizon Wireless Candidate 'Monroe', 1170 West Ramsey Street, Banning, Riverside County, California, EBI Project No. 61140883
Brunzell, David	2013	RI-09540	Cultural Resources Assessment Rancho San Gorgonio Planned Community Project City of Banning, Riverside County, Riverside County, California
Mason, Roger D. and Wayne H. Bonner	1998	RI-09998	Cultural resources record search and literature review for a pacific bell mobile services telecommunications facility: cm 453-11
Wills, Carrie D., Sarah A. Williams, Bonnie Bruce, and Kathleen A. Crawford	2018	RI-10588	Cultural Resource Records Search and Site Visit Results for Cellco Partnership and its Controlled Affiliates doing business as Verizon Wireless Candidate 'Hays', 150 West Wilson Street, Banning, Riverside County, California

*Investigations that involved portions of the Project area

These previous investigations resulted in the identification of a total of 158 previously recorded cultural resources in the Study Area (Table 3-2).

Twenty of the resources are archaeological and 138 are built-environment resources. The archaeological resources consist of 2 prehistoric archaeological sites, 13 historical archaeological sites, 2 isolated prehistoric artifacts, and 3 isolated historical artifacts. The prehistoric archaeological sites are bedrock milling features. The historical archaeological sites are surface refuse scatters, foundations, and other remnants of historical residences. The isolated finds are a prehistoric olla, a metate, two historical glass bottles, and a scatter of amethyst glass.

Of the 138 built-environment resources identified within the Study Area, there are 112 historical residential structures, 13 commercial buildings, 3 churches, 2 school buildings, 2 hotels, 2 public buildings, 1 substation, 1 transmission line, 1 road, and 1 rail line. One of the 158 previously documented cultural resources (CA-RIV-8229H) is located within the Project area. This resource is described below and in more detail in Appendix A.

CA-RIV-8229H/33-015849 was documented in 2007 as the remnants of a pre-1949 residence that included a foundation pad, water conveyance system, fence posts, and historical trash scatter (Aron and Ewers 2007).

Table 3-2
Cultural Resources in the Study Area

Primary	Trinomial	Description
Prehistoric Archaeological Sites		
33-014967	CA-RIV-9190	Prehistoric bedrock milling features, at least 15 slicks
33-017291	CA-RIV-8991	Bedrock milling station with 3 features. Feature 1 has 2 slicks, Feature 2 has a possible slick, and Feature 3 has 1 slick.
Isolated Prehistoric Artifacts		
33-000254	CA-RIV-254	Isolated olla
33-025809		Isolated metate
Historic Archaeological Sites		
33-001701	CA-RIV-1701	Gilman Ranch Historic Park
33-003444	CA-RIV-3444H	Refuse scatter
33-014368	CA-RIV-7817	Refuse scatter
33-014367	CA-RIV-7816	Concrete foundations
33-015847		Remains of a historic residence with 2 concrete driveways connected by an asphalt pad. The site has been disturbed by disking
33-015848		Remains of a historic residence, in situ concrete pad, a portion of a concrete and cobble retaining wall, and poured concrete steps. The site has been disturbed by modern debris
33-015849 [a]	CA-RIV-8229H	Remnants of pre 1949 residence
33-016025		Rock and cement-lined flood control canal, remnant of a much larger system
33-016026		1950s Concrete brick and white washed outdoor oven
33-025807		Structural concrete and masonry rubble
33-025812		Concrete footing with steel bars, associated with livestock
33-025813		Structural concrete rubble with rebar pre 1949
33-025815		Concrete and rock wall reservoir
Isolated Historic Artifacts		
33-018645		Isolated cobalt blue medicine/cosmetic bottle.
33-012626		Isolated Amethyst glass scatter
33-025816		Isolated glass bottle
Built-Environment Resources		
33-007879 [b]		1884 One story manor wooden structure
33-007880 [b]		1880s Vernacular wood frame house
33-008332 [b]		1890 Vernacular wood frame house
33-008333 [b]		1892 Vernacular wood frame house
33-008334 [b]		1900 Vernacular National Folk style house
33-008335 [b]		1920 Mediterranean/Spanish style house
33-008336 [b]		1895 Vernacular wood frame house
33-008345 [b]		1923 Vernacular style wood frame house
33-008346 [b]		1900 Bungalow style house
33-008351 [b]		1915 Classical Revival style building which houses the Banning Women's Club
33-008352 [b]	CA-RIV-6381	1900 Vernacular wood frame house

Table 3-2
Cultural Resources in the Study Area

Primary	Trinomial	Description
33-008356 [b]		1884 San Gorgonio Inn building
33-008357 [b]		1928 Art Deco style commercial building
33-008358 [b]		1928 Hotel Banning
33-008360 [b]		1935 Modern style high school built as a WPA project
33-008362 [b]		1900 Holcomb Building
33-008363 [b]		1910 Vernacular wood frame house
33-008399		1920s Vernacular wood frame house, no longer exists
33-008400 [b]		1888 Vernacular wood frame house and associated barn
33-009096 [b]		1918 Vernacular wood frame house with Classical Revival elements
33-009097 [b]		1908 Banning Unified School District offices
33-009098 [b]		1897 Vernacular wood frame house
33-009099		1902 Vernacular wood frame house
33-009104 [b]		1906 Bungalow style house
33-009105 [b]		1932 Vernacular wood frame house
33-009106 [b]		1920 Bungalow style house
33-009107 [b]		1910 Vernacular wood frame house
33-009108 [b]		1910 Bungalow style house
33-009109 [b]		1930 Mission Revival style church
33-009110 [b]		1890 Vernacular wood frame house
33-009111 [b]		1928 Mediterranean/Spanish Revival style church
33-009112 [b]		1900 Vernacular wood frame house
33-009113 [b]		1897 Vernacular wood frame house
33-009115 [b]		1908 Vernacular wood frame house
33-009116		1910 Vernacular wood frame house
33-009117 [b]		1887 Vernacular wood frame house
33-009118 [b]		1923 Vernacular wood frame house
33-009119 [b]		1912 Vernacular wood frame house
33-009124 [b]		1915 Vernacular wood frame house
33-009125 [b]		1915 Vernacular wood frame house
33-009126 [b]		1925 Mediterranean/Spanish Revival style house
33-009127 [b]		1925 Mediterranean/Spanish Revival style house
33-009128 [b]		1932 Mediterranean/Spanish Revival style house
33-009129 [b]		1930 Commercial building with Art Deco elements
33-009130 [b]		1930 Commercial building
33-009131 [b]		1928 Commercial building
33-009132 [b]		1930 Mediterranean/Spanish revival style commercial building
33-009133 [b]		1921 Vernacular wood frame house with colonial revival elements
33-009134 [b]		1920 Classical Revival style building
33-009135 [b]		1930 Mediterranean/Spanish Revival style house
33-009136 [b]		1930 Tudor Revival style house
33-009137 [b]		1930 Vernacular wood frame house

Table 3-2
Cultural Resources in the Study Area

Primary	Trinomial	Description
33-009138 [b]		1930 Vernacular wood frame house
33-009139 [b]		1925 Vernacular wood frame house
33-009140 [b]		1925 Vernacular wood frame house
33-009141 [b]		1920 Vernacular wood frame house
33-009142 [b]		1925 Mediterranean/Spanish Revival house
33-009149 [b]		1920 Bungalow Style house
33-009150 [b]		1925 Vernacular wood frame house
33-009153 [b]		1930s Spanish Colonial Revival style commercial building
33-009157 [b]		1920s Craftsman Bungalow style house
33-009154 [b]		Banning City Hall
33-009155 [b]		1925 Brick and stucco commercial building
33-009156 [b]		1908 Vernacular wood frame house
33-009163 [b]		1928 commercial building with Art Deco characteristics
33-009164 [b]		1935 Spanish Revival style commercial building
33-009165 [b]		1932 Commercial building
33-009166 [b]		1915 Craftsman style bungalow
33-009177 [b]		1930 Vernacular style wood frame house
33-009178 [b]		1925 Spanish Revival house
33-009179 [b]		1925 Bungalow style house
33-009498		Segment of Union Pacific and Southern Pacific rail line
33-011280		Old Banning-Idyllwild road
33-015183		1950 Modern California Ranch style house
33-015184		1949 Modern California Ranch style house
33-015185		1952 Modern California Ranch style house
33-015186		1920s Craftsman style house
33-015187		1946 Minimal Traditional style house
33-015188		1927 Minimal Traditional style house
33-015189		1940s Modern California Ranch style house
33-015190 [b]		1930s Spanish Revival style house
33-015191		1930 Minimal Traditional style house
33-015192		1920s Craftsman style house, later converted into a church.
33-015193		1920s Craftsman style house
33-015194		1947 Minimal Traditional style house
33-015195		1940s Modern California Ranch style apartment complex
33-015196		1920s Single-story Craftsman style house
33-015197		1938 Minimal Traditional style house
33-015198		1936 Minimal Traditional style house
33-015199		1936 Modern California Ranch style house
33-015200		1935 Minimal Traditional style house
33-015208		1920 Minimal Traditional style house
33-015209		1936 Modern California Ranch style house

Table 3-2
Cultural Resources in the Study Area

Primary	Trinomial	Description
33-015210		1946 Modern California Ranch style house
33-015211		1950s Modern California Ranch style house
33-015224		1954 Modern California Ranch style house
33-015225		1939 Minimal Traditional style house
33-015226		1954 Modern California Ranch style house
33-015227		1953 Modern California Ranch style house
33-015237		1950s Modern California Ranch style house
33-015290		1935 Minimal Traditional style house
33-015802		1955 Buildings associated with the City of Banning Public Works Department
33-015809		1950 California Ranch style house
33-015811		1947 Single-story house
33-015813		1947 Spanish Eclectic style house
33-015814		1947 Vernacular wood frame house
33-015817		1960 California Ranch style house
33-015818		1956 California Ranch style house
33-015819		1959 California Ranch style house
33-015820		1921 Craftsman Bungalow style house
33-015821		1959 California Ranch style house
33-015822		1961 California Ranch style house
33-015823		1957 California Ranch style house
33-015824		1950 California Ranch style house
33-015825		1961 California Ranch style house
33-015826		1961 California Ranch style house
33-015827		1961 California Ranch style house
33-015828 [b]		1947 California Ranch style house
33-015829		1960 California Ranch style house
33-015830		1961 California Ranch style house
33-015831		1961 California Ranch style house
33-015843		1954 Electrical substation
33-017729		Vernacular wood frame house
33-017731		1962 California Ranch style house
33-017732		1962 Single-family house
33-017733		1926 Single-family house
33-017734		1959 Single-family house
33-023484		Portions of a telecommunications line associated with the existing Southern California Edison transmission and distribution lines. The poles range in age from 1929 to 2011
33-023524		Pre-1967 house. Visible on a 1967 aerial photo
33-023532		Pre-1967 California Ranch style house. Visible on a 1967 aerial photo
33-023533		Pre-1967 Commercial building. Visible on a 1967 aerial photo
33-023534		Pre-1967 Commercial building. Visible on a 1967 aerial photo
33-023535		Pre-1967 Commercial building. Visible on a 1967 aerial photo

Table 3-2
Cultural Resources in the Study Area

Primary	Trinomial	Description
33-023536		Pre-1967 House. Visible on a 1967 aerial photo
33-023537		Pre-1967 Houses on a single parcel. Visible on a 1967 aerial photo
33-023538		1955 Apartment building
33-023550		1967 California Ranch style house
33-023553		1949 Single-story house

[a] within or immediately adjacent to Project area
[b] properties listed on the Historic Properties Directory

Additional sources consulted during the literature and records search include the National Register of Historic Places (NRHP), the Office of Historic Preservation's (OHP) Archaeological Determinations of Eligibility (ADOE); and the OHP's Historic Properties Directory. Seventy properties within the Study Area, as indicated in Table 3-2, are listed in the OHP's Historic Properties Directory, but none within the Project area, or immediately adjacent, have been evaluated for the NRHP.

3.1 HISTORICAL MAP REVIEW

In addition to the EIC research, Æ also consulted the 1901 San Jacinto 30-minute USGS topographic quadrangle map, the 1943 and 1956 Banning 15-minute USGS topographic quadrangle map, and the 1953, 1979, 1988, 1996 Beaumont 7.5-minute USGS topographic quadrangle maps (USGS 1901, 1943, 1953, 1956, 1979, 1988, 1996). A single building on the northwest corner of the Project area is present on the 1943 Banning 15-minute USGS topographic quadrangle map and on all subsequent maps, but it appears to be demolished prior to 1996, according to Google Earth Images. A modern housing tract immediately south of the Project area is present on the 1979 Beaumont 7.5-minute USGS topographic map and is still present today. No other buildings, structures, or features of interest are shown within Project area on any of the historical maps.

4
NATIVE AMERICAN COMMUNICATIONS

Æ contacted the NAHC on November 11, 2019 for a review of the SLF to determine if any known Native American cultural properties (e.g., traditional use or gathering areas, places of religious or sacred activity) are present within or adjacent to the Project area. The NAHC responded on November 13, 2019, stating the SLF search was completed with negative results. The NAHC requested Æ contact Native American individuals and organizations to elicit information regarding cultural resource issues related to the Project, if any.

Upon review of the Native American contact list and after removing redundancies, Æ narrowed the list to 13 individuals and organizations traditionally and culturally affiliated with the geographic area where the Project is located. Æ sent a letter via electronic mail on November 22, 2019 describing the Project and asking these individuals and organizations for their input. Copies of the letters, the list of contacts, and received responses are included in Appendix B. Æ sent follow-up email correspondence on December 6, 2019 to the organizations who had not responded to the initial request on November 22, 2019.

Individuals/organizations contacted include:

- Patricia Garcia-Plotkin, Tribal Historic Preservation Officer for the Agua Caliente
- Amanda Vance, Chairperson of the Augustine Band of Cahuilla Mission Indians
- Doug Welmas, Chairperson of the Cabazon Band of Mission Indians
- Daniel Salgado, Chairperson of the Cahuilla Band of Indians
- Shane Chapparosa, Chairperson for the Los Coyotes Band of Cahuilla and Cupeño Indians
- Travis Armstrong, Tribal Historic Preservation Officer for the Morongo Band of Mission Indians
- Ebru Ozdil, Cultural Resource Manager for the Pechanga Band of Luiseño Indians
- Joseph Hamilton, Chairman of the Ramona Band of Cahuilla
- Jessica Mauck, Cultural Resources Analyst for the San Manuel Band of Mission Indians
- Steven Estrada, Chairman of the Santa Rosa Band of Cahuilla Indians
- Mark Cochrane/Wayne Walker, Co-Chairperson for the Serrano Nation of Mission Indians
- Joseph Ontiveros, Tribal Historic Preservation Officer for the Soboba Band of Luiseño Indians
- Thomas Tortez, Chairperson of the Torres-Martinez Desert Cahuilla Indians

As of the date of this report, four responses have been received. The Morongo Band of Mission Indians requested copies of any cultural resource documentation (report and site records) generated in connection with the Project. The San Manuel Band of Mission Indians will not be participating in consultation, scoping, development, or review as the Project is outside of their ancestral territory. The Cabazon Band of Mission Indians has no knowledge of cultural resources

in the Project area which is located outside of their reservation boundaries, but they wish to collaborate. The Agua Caliente Band of Cahuilla Indians requests a copy of the project description, the records search with associated survey reports and records, and copies of any cultural resource documentation (report and site records) generated in connection with the Project.

5
CULTURAL RESOURCE SURVEY METHODS AND RESULTS

5.1 SURVEY METHODS

Æ Associate Archaeologist Evan Mills performed an intensive pedestrian field survey of the Project area on November 20, 2019. The survey began in the northwest corner of the Project area and was completed from west to east along transects oriented north-south and spaced 10 meters apart. All portions of the Project area were accessible and surveyed systematically.

5.2 SURVEY RESULTS

The entire Project area has been subjected to extensive plowing and tilling in recent history (Figures 5-1 and 5-2). Surface visibility within the Project area was 0 to 10 percent (poor) due to extensive weed growth throughout. Mills observed evidence of extensive previous disturbance within the Project area (i.e., soil mounds, deeply plowed/tilled agricultural rows, and scars from heavy equipment) along with modern refuse encountered throughout.

Soils within the Project area were difficult to assess, due to the rainy conditions at the time of survey. Mills revisited and identified the previously recorded cultural resource (Figure 5-3; CA-RIV-8229H) and noted that only the concrete pad (Figure 5-4) and associated refuse scatter (Figure 5-5) were still present from the attributes listed in the original California Department of Parks and Recreation (DPR) form (Aron and Ewers 2007). No additional archaeological materials or features and no built-environment resources were observed during Æ's survey of the Project area.



Figure 5-1 Overview from the northwest corner of the Project area (facing southeast).



Figure 5-2 Overview from the center of the Project area (facing north).

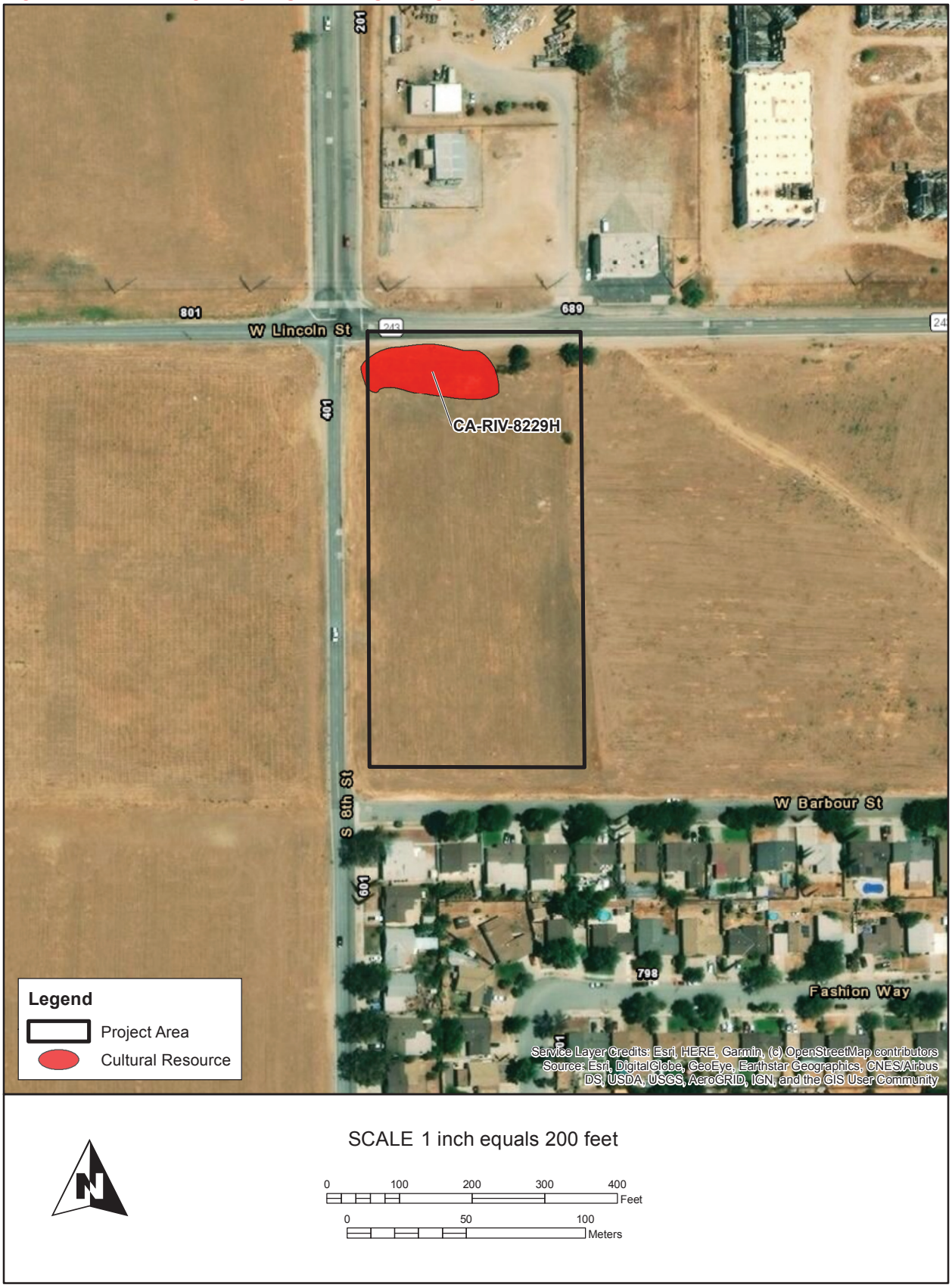


Figure 5-3 Cultural resources in the Project area.



Figure 5-4 Overview from east end of concrete pad (CA-RIV-8229H) (facing west).



Figure 5-5 Rubble on northeast corner of pad.

6
SIGNIFICANCE EVALUATION

In 2007, Maria Aron and Daniel Ewers of LSA Associates recorded CA-RIV-8229H as "the remnants of a historic residence dating to pre 1940s" (Aron and Ewers 2007). The extant site features noted by the recorders were an in situ concrete structure pad, a fence line, water conveyance system, and a historic refuse scatter that was spread over the remaining foundation (Aron and Ewers 2007). They also included a list of historical artifacts including two pieces of ceramic transferware, rusted metal pieces, and shards of clear and green glass. The temporal analysis of artifacts provided on the site record was that materials most likely dated to the pre-1940s; the structure was visible on a USGS 1943 Banning map. By 1988, it no longer appeared on the USGS Banning map (Aron and Ewers 2007). Already at the time of recording in 2007, the site was described as "disturbed by discing and dumping of modern debris" (Aron and Ewers 2007).

During the current cultural resource survey for the Banning 8th and Lincoln Industrial Building Project, recorders noted the site shows evidence of recent plowing/tilling and the vegetation has overgrown the area (see Figures 5-1 through 5-4). The concrete structure pad was the only extant feature remaining, and an abundance of modern refuse was noted across the site. The previously documented ceramic transferware sherds could not be located, and the other previously documented artifacts (rusted metal pieces, green and clear glass sherds) could not be distinguished from the modern refuse that has accumulated at the site.

6.1.1 Evaluation of Significance

The Project area is 4 acres of vacant land within APN 540-250-001 located on the southwestern corner of West Lincoln Street and South 8th Street in the City of Banning. A review of easily available property owner records at the Riverside County Archives showed that the Banning Land Company subdivided this area of Banning, including APN 540-250-001, between 1892 and 1913 (County of Riverside 2020). The Project area was denoted as Lot 290 of the subdivision (Figure 6-1); however, the county records show no legal ownership of this lot during this early period (County of Riverside 2020). Landowner records for this subdivision for the period between 1913 and 1925 are currently not available for review at the archives; therefore, the lot may have been purchased during this time.

The records between 1926 and 1935 show the lot was owned by Floretta Fraser, and no improvements were taxed during this period suggesting it was a vacant lot during her ownership (County of Riverside 2020). Floretta Fraser was a prominent Banning resident most closely associated with the ownership of Banning House Inn, later called the San Gorgonio Inn (Holmes 1912:685–686; Lech 2016). In 1889, Thomas and Floretta Fraser purchased the Bryant House Inn, the first hotel built in Banning (1884), and renamed it the Banning House Inn. Thomas Fraser died in 1891, and Floretta continued to run the hotel until 1923 when she sold the property (Holmes 1912:685–686; Lech 2016). Floretta Fraser is remembered in a biographical sketch of important persons in Riverside County this way: "Possessed of both courage and perseverance,

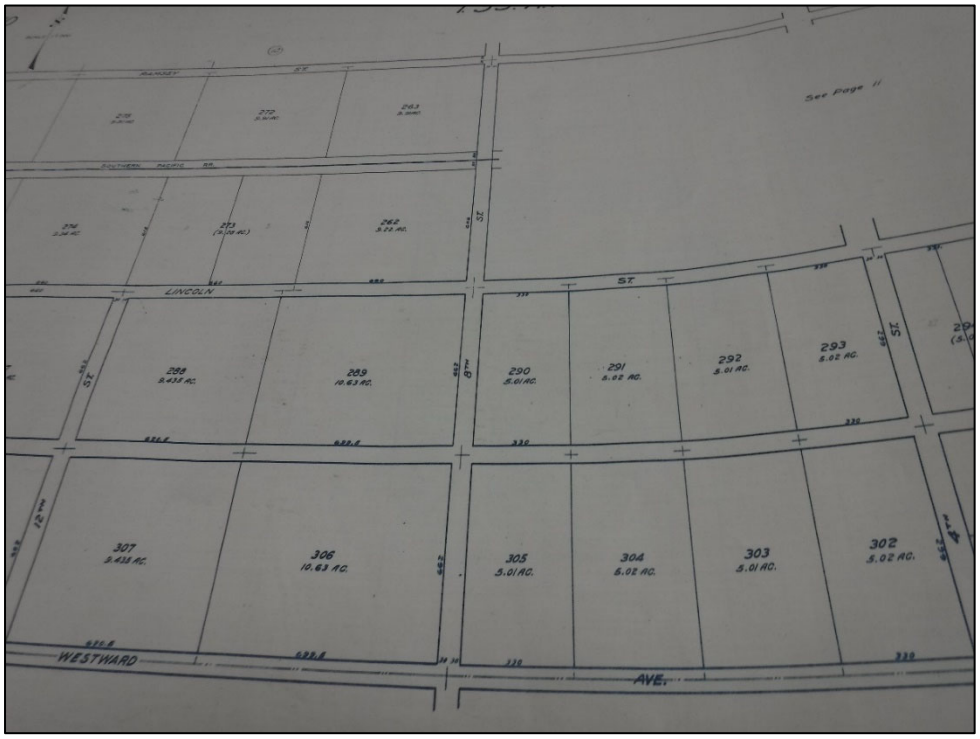


Figure 6-1 Banning Land Company Subdivision showing Lot 290 on the southeast corner of Lincoln and 8th Streets in Banning, California (County of Riverside 2020).

Mrs. Fraser has unquestionably proven her exceptional ability as a thorough business-woman, her excellent judgement in control of her affairs since the death of her husband in 1891 having placed her among the most influential citizens of Banning" (Holmes 1912:685–686). The archival record is suggestive that Mrs. Fraser may have purchased the lot as a business investment, and held onto the property until the local economy was boosted by the construction of the MWD field headquarters for the CRA in Banning starting in 1932. Sometime in 1935, Fraser sold the vacant lot to Louis W. Willman (County of Riverside 2020).

Willman immediately, according to ownership tax records, made improvements to the land. None of the artifacts listed and described in the initial recordation provide temporally diagnostic certainty; however, the development of the lot by Willman in 1935 supports the assertion in the original site recordation that the structural remnants represent a pre-1940s residential site. Willman owned the lot until 1954 when he sold the property to Arsenio and Lupe Armijo. Available records indicate that the Armijos owned the property until at least 1962 with no additional land improvements (County of Riverside 2020). A 1966 aerial image shows no extant, standing structure on the location of the cement pad (NETROnline 2020).

6.1.1.1 Application of the Criteria for Evaluation

Criterion 1

The development of Banning in the early twentieth century is consistent with the pattern of growth in other small California towns in this region. The railroad, agricultural opportunities,

and weather-related health benefits spurred settlement and tourism in Southern California, including Banning. Additionally, in 1931, news arrived in Banning of the proposed construction of the CRA aqueduct with plans to locate the field headquarters in town. This news brought promise of commerce and growth, and was celebrated with a parade (Figure 6-2) (Banning Library District 1931).



Figure 6-2 Parade during the Colorado Aqueduct celebration in downtown Banning, October 1931 (Banning Library District 1931).

The promise of growth and prosperity for Banning in the early part of the twentieth century may have spurred the development of this subdivision by the Banning Land Company, and the purchase and development of Lot 290 in 1935 by Mr. Willman; this growth and development was happening across the region. This site, if extant, may have been representative of broad patterns of growth and settlement in Southern California history and Banning history during this era. However, little to nothing remained of the site when it was originally recorded in 2007, and what does remain today has been significantly altered. This lack of evidence of the original site constituents prevents the evaluation of the significance of the site to important regional development. The remaining remnants of the site cannot communicate association with regional residential growth during the early twentieth century in Banning. Therefore, CA-RIV-8229H is not a historically significant resource under Criterion 1.

Criterion 2

Lot 290 of the Banning Land Company subdivision was owned by Floretta Fraser, a prominent citizen of Banning, from at least 1926 to 1935. Archival records suggest that Mrs. Fraser never developed the property, and that it was still a vacant lot at the time of sale. The features at CA-RIV-8229H appear to remain from later development after her sale of the property in 1935, and cannot be associated with her significance as a local important personage. Archival research for CA-RIV-8229H did not identify an association with the lives of any other specific person(s)

significant in our past at the national, state, or local level. As a result, CA-RIV-8229H is not significant under Criterion 2.

Criterion 3

CA-RIV-8229H is not a significant resource under Criterion 3, which is commonly used to assess the significance of architectural resources. While archival evidence documents the site contained built structures in the past, at the time of recordation in 2007 nothing remained but one concrete slab, and the site lacks any distinct architectural, technological, or engineering qualities that set it apart as a type or work of a master. As a result, CA-RIV-8229H is not significant under Criterion 3.

Criterion 4

Criterion 4 generally applies to sites that contain, or are likely to contain, information bearing on an important archaeological research question. For this report, an important archaeological research question would pertain to historical growth and settlement in the region.

The archival record does suggest the site was the location of residential occupation. The information available from the artifacts indicates a possible age range between the early twentieth century through the present. The artifact assemblage lacks focus, and no clear association can be established that could provide additional information bearing on important research questions. As such, CA-RIV-8229H is not significant under Criterion 4.

6.1.1.2 Integrity Assessment and Conclusion

Because CA-RIV-8229H does not qualify as a significant historical resource under any of the four CRHR criteria, assessment of integrity is not necessary. Due to a lack of significance, the site is recommended ineligible for inclusion in the CRHR.

7
MANAGEMENT RECOMMENDATIONS

The cultural resource assessment identified one previously documented historical archaeological site (CA-RIV-8229H) within the Project area. An evaluation of the historical archaeological site suggests the resource does not meet any criteria for listing on the CRHR; therefore, no further management of CA-RIV-8229H is recommended at this time. Æ did not encounter any additional cultural resources at least 50 years old within the Project area during the intensive pedestrian survey.

The ground surface throughout the entire Project area has been disturbed by plowing, tilling and modern dumping. Geological data indicate undisturbed sediments within the Project area are characterized by alluvial deposits with a high potential for buried archaeological sites. However, no Ab (buried) horizon is described for the soil series within the Project area. In addition, one of the previous investigations that involved the Project area conducted a sensitivity assessment for archaeological resources. This assessment concluded the Project is within an area of low archaeological sensitivity. Therefore, intact and significant buried archaeological deposits are unlikely, and no further cultural resource management of the Project area is recommended.

It should be noted that the Agua Caliente Band of Cahuilla Indians requested a project description, a copy of the records search with associated reports and records from the EIC, and copies of cultural resource documentation (report and site records) generated from Æ. The Morongo Band of Mission Indians also requested copies of all cultural resource documentation generated from Æ. In addition, the Cabazon Band of Mission Indians wish to collaborate as they have no data on sites in the Project area which is outside of the tribe's current reservation boundaries. Lastly, The San Manuel Band of Mission Indians will not be requesting consulting party status or participation in the scoping, development, and/or review of documents since the Project is outside of their ancestral territory.

In the event that potentially significant archaeological materials are encountered during construction, all work must be halted in the vicinity of the discovery until a qualified archaeologist can visit the site of discovery and assess the significance and integrity of the find. If intact and significant archaeological remains are encountered, the impacts of the Project must be mitigated appropriately. Any such discoveries, and subsequent evaluation and treatment, should be documented in a cultural resource report, which would be submitted to the EIC for archival purposes.

Additionally, Health and Safety Code Section 7050.5, CEQA Guidelines Section 15064.5(e), and Public Resources Code Section 5097.98 mandate the process to be followed in the unlikely event of an accidental discovery of human remains in a location other than a dedicated cemetery.

Finally, if the Project area is expanded to include areas not covered by this survey or other recent cultural resource investigations in the Study Area, additional cultural resource investigations may be required.

8
REFERENCES

Aron, Maria, and Daniel Ewers
2007 California DPR (Primary Record and Archaeological Site Record) CA-RIV-8229 (33-015849). LSA Associates, Irvine, California. On File, Eastern Information Center (EIC), housed at University of California, Riverside.

Banning Chamber of Commerce
1927 *Banning, California*. Banning, California. On file, Hemet Public Library.Banning Library District

Banning Library District
1931 "Parade during the Colorado Aqueduct celebration in downtown Banning, California." Banning Library District Local History Collection. City of Banning History. Found at Calisphere, electronic document: https://calisphere.org/item/ark:/13030/c80863b8/. Accessed January 22, 2020.

Bean, Lowell J.
1978 Cahuilla. In *California,* edited by Robert F. Heizer, pp. 575–587. Handbook of North American Indians, Volume 8, W. C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Bean, Lowell J., and Charles R. Smith
1978 Cupeño. In *California*, edited by Robert F. Heizer, pp. 588–591. Handbook of North American Indians, Vol. 8, W. C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Bean, Lowell J., and James Toenjes
2011 Native American Ethnographic Context. In *Draft Chuckwalla Valley Prehistoric Trails Network Cultural Landscape: Historic Context, Research Questions, and Resource Evaluation Criteria*. ASM Affiliates, Inc., Carlsbad, California, under contract with the Aspen Environmental Group, Agoura Hills, California. Prepared for California Energy Commission, Sacramento, California. Prepared by

Bean, Lowell J., and Sylvia B. Vane
2002 *The Native American Ethnography and Ethnohistory of Joshua Tree National Park: An Overview*. Cultural Systems Research, Inc., Menlo Park, California.

Brackett, Robert W.
1939 *A History of the Ranchos of San Diego County, California*. Union Title and Trust Company, San Diego, California.

California State Parks
2019 [online]: https://www.parks.ca.gov. Accessed December 2.

City of Banning
2019 City of Banning History. Electronic document: http://www.banning.ca.us/314/City-of-Banning-History Accessed November 27, 2019.

County of Riverside, Robert J. Fitch Archives
2020 County of Riverside. Property Owner Records. Book 24: 1892-1962.

Dallas, S. F.
1955 *The Hide and Tallow Trade in Alta California 1822–1848*. Ph.D. Dissertation, Indiana University [no city].

Deferrari, Roy. J.
1942 *Essays on Catholic Education in the United States*. Catholic University of America Press, Washington, D. C.

George, Joan, and Carrie Chasteen
2017 *Cultural Resource Assessment for Phase I of the Banning Water Canyon Main Replacement Project, City of Banning, Riverside County, California*. Applied EarthWorks, Inc., Hemet, California. Prepared for Albert A. Webb Associates for submission to the City of Banning and the San Bernardino National Forest, San Bernardino, California

GLO (U.S. General Land Office)
1880 Township No. 3 South, Range No. 1 East, San Bernardino Meridian. Surveyed 1852–1879. U.S. Surveyor General's Office, San Francisco, California.

1886 Township No. 3 South, Range No. 1 East, San Bernardino Meridian. Surveyed 1885. U.S. Surveyor General's Office, San Francisco, California.

Goldberg, Susan K., and Jeanne E. Arnold
1988 *Prehistoric Sites in the Prado Basin, California: Regional Context and Significance Evaluation*. INFOTEC Research, Inc., Sonora, California. Submitted to the U.S. Army Corps of Engineers, Los Angeles District, Los Angeles, California.

Goldberg, Susan K., Cynthia J. Klink, Jill A. Onken, W. Geoffrey Spaulding, Mark C. Robinson, Melinda C. Horne, and Rebecca L. McKim
2001 *Metropolitan Water District of Southern California Eastside Reservoir Project Final Report of Archaeological Investigations, Vol. IV: Synthesis of Findings*. Report prepared by Applied EarthWorks, Inc., Hemet, California. Report submitted to the Metropolitan Water District of Southern California, Los Angeles.

Grenda, Donn R.
1997 *Continuity & Change: 8,500 Years of Lacustrine Adaptation on the Shores of Lake Elsinore.* Technical Series 59, Statistical Research, Inc., Tucson, Arizona. Submitted to the U. S. Army Corps of Engineers, Los Angeles District, Los Angeles, California.

Greenwood, R. S., J. M. Foster, and M. Swanson
1993 *History and Historical Archaeology of the Domenigoni Valle, Volume I: Historical Overview and Research Implications, Final Report.* Submitted to Metropolitan Water District of Southern California. Submitted by Greenwood and Associates, Pacific Palisades, CA.

Gruen, J. Philip
1998 *Colorado River Aqueduct Recording Project*. Groucho Publications, Los Angeles.

Gunther, Jane Davies
1984 *Riverside County, California, Place Names: Their Origins and Their Stories*. Rubidoux Printing Company, Riverside, California.

Holmes, Elmer Wallace.
1912 *History of Riverside County, with biographical sketches of the leading men and women of the county who have been identified with its growth and development from the early days to the present*. Historic Record Company, Los Angeles, California.

Holtzclaw, Kenneth. M.
2005 *Images of America: Banning*. Arcadia Publishing, Charleston, South Carolina.

Horne, Melinda C., and Dennis P. McDougall
2008 *CA-RIV-6069: Early Archaic Settlement and Subsistence in the San Jacinto Valley, Western Riverside County, California.* Applied EarthWorks, Inc., Hemet, California. Prepared for Inland Feeder Pipeline Project, The Metropolitan Water District of Southern California, Los Angeles.

Hughes, Tom
1938 *History of Banning and San Gorgonio Pass, in Two Parts*. Banning Record Print, Banning, California.

Johnston, Frank J.
1965 *The Serrano Indians of Southern California*. Malki Museum Press, Banning, California.

Justice, Noel D.
2002 *Stone Age Spear and Arrow Points of California and the Great Basin*. Indiana University Press. Bloomington.

Langum, David J.
1987 *Law and Community on the Mexican California Frontier: Anglo-American Expatriates and the Clash of Legal Traditions, 1821–1846*. University of Oklahoma Press, Norman.

Lech, Steve
2004 *Along The Old Roads: A History of the Portion of Southern California That Became Riverside County, 1772–1893*. Published by the Author, Riverside, California.

2016 Back in the Day: San Gorgonio Inn was Banning Landmark for 126 Years. *The Press-Enterprise*, October 22. Electronic document, https://www.pe.com/2016/10/22/back-in-the-day-san-gorgonio-inn-was-banning-landmark-for-126-years/, accessed January 22, 2019 at pe.com.

McLean, Roderic, Shannon Carmack, Jay Michalsky, and Judith Marvin
2006 *A Study of the Past in San Timoteo Canyon and San Gorgonio Pass: Cultural Resources Assessment of the Oak Valley Substation Project, Riverside County, California*. Prepared by LSA Associates, Inc.

McDougall, Dennis P.
1995 *Metropolitan Water District Eastside Reservoir Project, Summary of Emergency Investigations of Historic Properties, Prehistoric Site CA-RIV-5786*. Applied EarthWorks, Inc., Hemet, California. Submitted to Metropolitan Water District of Southern California, Los Angeles.

Moratto, Michael J.
1984 *California Archaeology*. Academic Press, New York.

Morton, D. M.
1999 *Preliminary Digital Geological Map of the Santa Ana 30' x 60' Quadrangle, Southern California*. United States Geological Survey, Open File Report 99-172.

NETROnline
2020 Historic aerial photographs dated, 1966. Electronic document: www.historicaerials.com. Accessed December 2019 and January 2020.

Norris, Robert M., and Robert W. Webb
1990 *Geology of California*, Second Edition. John Wiley and Sons, New York.

O'Connell, J. F., P. J. Wilke, T. F. King, and C. L. Mix (editors)
1974 *Perris Reservoir Archaeology: Late Prehistoric Demographic Change in Southeastern California*. California Department of Parks and Recreation Archaeological Reports 14.

Onken, Jill A., and Melinda C. Horne
2001 Chronosequencing. In *Metropolitan Water District of Southern California Eastside Reservoir Project Archaeological Investigations*, Vol. IV: Chapter 3. Susan K. Goldberg, general editor. Applied EarthWorks, Inc., Hemet, California. Report submitted to Metropolitan Water District of Southern California, Los Angeles.

Robinson, John W.
1997 "Rancho San Jacinto Viejo and the Estudillo Family." In *Rancho Days in Southern California*. Published by Los Angeles Corral of the Westerners, Los Angeles, CA.

Robinson, Mark C.
1998 *Arrow Points from the Eastside Reservoir Project: Typology and Chronology in the Late Prehistoric of Riverside County, California*. Unpublished Master's thesis, University of Oregon, Eugene.

2001 Units of Analysis. In *Metropolitan Water District of Southern California Eastside Reservoir Project Archaeological Investigations*, Vol. IV: Chapter 4. Susan K. Goldberg, general editor. Applied EarthWorks, Inc., Hemet, California. Report submitted to Metropolitan Water District of Southern California, Los Angeles.

San Bernardino County Museum
2014 The *Asistencia*, California Historical Landmark No. 42. Electronic document, http://www.sbcounty.gov/museum/branches/asist.htm.

Starr, Kevin
2005 *California: A History*. The Modern Library, New York.

Stine, Scott
1994 "Extreme And Persistent Drought In California And Patagonia During Mediaeval Time." *Nature* 369:546–549.

Sutton, Mark Q.
1996 The Current Status of Archaeological Research in the Mojave Desert. *Journal of California and Great Basin Anthropology* 18(2):221–257.

True, Donald L.
1966 *Archaeological Differentiation of Shoshonean and Yuman Speaking Groups in Southern California*. Unpublished Ph.D. dissertation, Department of Anthropology, University of California, Los Angeles.

1970 *Investigations of a Late Prehistoric Complex in Cuyamaca State Park, San Diego County, California*. Archaeological Survey Monographs No. 1, University of California, Los Angeles.

United States Census Bureau
2018 QuickFacts Banning city, California. https://www.census.gov/quickfacts/banningcitycalifornia Accessed November 27, 2019

United States Department of Agriculture (USDA)
2019a Natural Resource Conservation Service (NRCS) Official Series Description (OSD): Hanford Series. Electronic document available at https://soilseries.sc.egov.usda.gov/OSD_Docs/H/HANFORD.html. Accessed November 27, 2019.

2019b Natural Resource Conservation Service (NRCS) Official Series Description (OSD): Greenfield Series. Electronic document,

https://soilseries.sc.egov.usda.gov/OSD_Docs/G/GREENFIELD.html. Accessed November 27, 2019.

United States Geological Survey (USGS)
1901 *Elsinore, Calif. 1:125,000/30-minute topographic quadrangle*.

1943 *Banning, Calif 1:62,500/15-minute topographic quadrangle*.

1953 *Beaumont, Calif. 1:24,000/7.5-minute topographic quadrangle*.

1956 *Banning, Calif 1:62,500/15-minute topographic quadrangle*.

1979 *Beaumont, Calif. 1:24,000/7.5-minute topographic quadrangle*.

1988 *Beaumont, Calif. 1:24,000/7.5-minute topographic quadrangle*.

1996 *Beaumont, Calif. 1:24,000/7.5-minute topographic quadrangle*.

Warren, Claude N.
1984 "The Desert Region." In *California Archaeology*, pp. 339–430, by Michael J. Moratto. Academic Press, New York and London.

Web Soil Survey
2019 Soil Map: Banning, California (Banning 8th and Lincoln) Project area Soils). Electronic document, created as https://websoilsurvey.sc.egov.usda.gov/WssProduct/4wa51ax2enr3pcvtwx3ywyyn/4wa51ax2enr3pcvtwx3ywyyn/20190806_10212310981_66_Soil_Map.pdf. Created on November 27, 2019.

Wilke, Philip J.
1976 *Late Prehistoric Human Ecology at Lake Cahuilla, Coachella Valley, California*. Unpublished Ph.D. dissertation, Department of Anthropology, University of California, Riverside.

APPENDIX A

Confidential DPR Forms

Deleted for Public Review, bound separately

APPENDIX B

Native American Communication

LIST OF NATIVE AMERICAN CONTACTS AND RECORD OF RESPONSES

Name	Date	Responses
Patricia Garcia-Plotkin THPO Agua Caliente Band of Cahuilla Indians	November 22, 2019 December 6, 2019	Scoping letter sent via email. Follow up sent via email. Email response received 12/12 from Arysa Gonzalez Romero-Historic Preservation Technician. The tribe is requesting a description of the proposed project, a copy of the records search with associated reports and records from the EIC, and copies of cultural resource documentation (report and site records) generated from AE.
Amanda Vance Chairperson Augustine Band of Cahuilla Mission Indians	November 22, 2019 December 6, 2019	Scoping letter sent via email. Follow up sent via email. No Response received.
Doug Welmas Chairperson Cabazon Band of Mission Indians	November 22, 2019 December 6, 2019	Scoping letter sent via email. Follow up sent via email. Email response received 12/9 from Judy Stapp. The project is located outside of the Tribe's current reservation boundaries and the Tribe has no information on the site indicating that it may be sacred/religious or have other Native American cultural value within the project area. They look forward to collaborating.
Daniel Salgado Chairperson Cahuilla Band of Indians	November 22, 2019 December 6, 2019	Scoping letter sent via email. Follow up sent via email. No response received.
Shane Chapparosa Chairperson Los Coyotes Band of Cahuilla and Cupeno Indians	November 22, 2019 December 6, 2019	Scoping letter sent via email. Follow up sent via email. No Response received.
Travis Armstrong Tribal Historic Preservation Officer Morongo Band of Mission Indians	November 22, 2019 December 6, 2019	Scoping letter sent via email. Follow up sent via email. Email response received 12/6 from Travis Armstrong. The Tribe is requesting a copy of the report, copies of all site records, and Mr. Armstrong stated that the tribe should have been notified of the survey, and will bring the issue up with the lead agency regarding re-survey with Tribal participation.

Name	Date	Responses
Ebru Ozdil Chairperson Pechanga Band of Luiseno Indians	November 22, 2019 December 6, 2019	Scoping letter sent via email. Follow up sent via email. No response received.
Joseph Hamilton Chairperson Ramona Band of Cahuilla	November 22, 2019 December 6, 2019	Scoping letter sent via email. Follow up sent via email. No response received.
Jessica Mauck Cultural Resources San Manuel Band of Mission Indians	November 22, 2019 December 6, 2019	Scoping letter sent via email. Follow up sent via email. Email response received 12/6 from Tribal Archaeologist Alexandra McCleary. Since the Project is outside of ancestral territory, the Tribe will not be requesting consulting party status or participation in the scoping, development, and/or review of documents.
Steven Estrada Chairperson Santa Rosa Band of Cahuilla Indians	November 22, 2019 December 6, 2019	Scoping letter sent via email. Follow up sent via email. No response received.
Mark Cochrane Co-Chairperson Wayne Walker Co-Chairperson Serrano Nation of Mission Indians	November 22, 2019 December 6, 2019	Scoping letter sent via email. Follow up sent via email. No response received.
Joseph Ontiveros Tribal Historic Preservation Officer Soboba Band of Luiseno Indians	November 22, 2019 December 6, 2019	Scoping letter sent via email. Follow up sent via email. No response received.
Thomas Tortez Chairperson Torres-Martinez Desert Cahuilla Indians	November 22, 2019 December 6, 2019	Scoping letter sent via email. Follow up sent via email. No response received.

Sacred Lands File & Native American Contacts List Request

Native American Heritage Commission
1550 Harbor Boulevard, Suite 100
West Sacramento, CA 95691
916-373-3710
916-657-5390 – Fax
nahc@nahc.ca.gov

Information Below is Required for a Sacred Lands File Search

Date: 11/11/2019

Project: Banning 8th and Lincoln Industrial Project (AE# 4118)

County: Riverside

USGS Quadrangle Name: Beaumont (1996)

Township: 3S **Range:** 1E **Section(s):** 9

Company/Firm/Agency: Applied EarthWorks, Inc.

Contact Person: Andrew DeLeon

Street Address: 3550 East Florida Avenue, Suite H

City: Hemet **Zip:** 92544

Phone: (951) 766-2000

Fax: (951) 766-0020

Email: adeleon@appliedearthworks.com

Project Description:

The proposed Project will develop Assessor's Parcel Number (APN) 540-250-001 in the City of Banning, Riverside County, California. and will result in ground disturbance. Applied EarthWorks, Inc. has been contracted to conduct a cultural resource study of the Project area for compliance with the California Environmental Quality Act (CEQA).

NATIVE AMERICAN HERITAGE COMMISSION
Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691 Phone: (916) 373-3710
Email: nahc@nahc.ca.gov
Website: http://www.nahc.ca.gov

November 13, 2019

Andrew DeLeon
Applied EarthWorks, Inc.

VIA Email to: adeleon@appliedearthworks.com

RE: Native American Tribal Consultation, Pursuant to the Assembly Bill 52 (AB 52), Amendments to the California Environmental Quality Act (CEQA) (Chapter 532, Statutes of 2014), Public Resources Code Sections 5097.94 (m), 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2 and 21084.3, Banning 8th and Lincoln Industrial Project, Riverside County

Dear Mr. DeLeon:

Pursuant to Public Resources Code section 21080.3.1 (c), attached is a consultation list of tribes that are traditionally and culturally affiliated with the geographic area of the above-listed project. Please note that the intent of the AB 52 amendments to CEQA is to avoid and/or mitigate impacts to tribal cultural resources, (Pub. Resources Code §21084.3 (a)) ("Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.")

Public Resources Code sections 21080.3.1 and 21084.3(c) require CEQA lead agencies to consult with California Native American tribes that have requested notice from such agencies of proposed projects in the geographic area that are traditionally and culturally affiliated with the tribes on projects for which a Notice of Preparation or Notice of Negative Declaration or Mitigated Negative Declaration has been filed on or after July 1, 2015. Specifically, Public Resources Code section 21080.3.1 (d) provides:

> Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section.

The AB 52 amendments to CEQA law does not preclude initiating consultation with the tribes that are culturally and traditionally affiliated within your jurisdiction prior to receiving requests for notification of projects in the tribe's areas of traditional and cultural affiliation. The Native American Heritage Commission (NAHC) recommends, but does not require, early consultation as a best practice to ensure that lead agencies receive sufficient information about cultural resources in a project area to avoid damaging effects to tribal cultural resources.

The NAHC also recommends, but does not require that agencies should also include with their notification letters, information regarding any cultural resources assessment that has been completed on the area of potential effect (APE), such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

- A listing of any and all known cultural resources that have already been recorded on or adjacent to the APE, such as known archaeological sites;

- Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;

- Whether the records search indicates a low, moderate, or high probability that unrecorded cultural resources are located in the APE; and

- If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

   - Any report that may contain site forms, site significance, and suggested mitigation measures.

     All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure in accordance with Government Code section 6254.10.

3. The result of any Sacred Lands File (SLF) check conducted through the Native American Heritage Commission was negative.
4. Any ethnographic studies conducted for any area including all or part of the APE; and
5. Any geotechnical reports regarding all or part of the APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS are not exhaustive and a negative response to these searches does not preclude the existence of a tribal cultural resource. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the event that they do, having the information beforehand will help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our consultation list remains current.

If you have any questions or need additional information, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green

Andrew Green
Staff Services Analyst

Attachment

NATIVE AMERICAN HERITAGE COMMISSION
Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691 Phone: (916) 373-3710
Email: nahc@nahc.ca.gov
Website: http://www.nahc.ca.gov

November 13, 2019

Andrew DeLeon
Applied EarthWorks, Inc.

VIA Email to: adeleon@appliedearthworks.com

RE: Native American Tribal Consultation, Pursuant to the Assembly Bill 52 (AB 52), Amendments to the California Environmental Quality Act (CEQA) (Chapter 532, Statutes of 2014), Public Resources Code Sections 5097.94 (m), 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2 and 21084.3, Banning 8th and Lincoln Industrial Project, Riverside County

Dear Mr. DeLeon:

Pursuant to Public Resources Code section 21080.3.1 (c), attached is a consultation list of tribes that are traditionally and culturally affiliated with the geographic area of the above-listed project. Please note that the intent of the AB 52 amendments to CEQA is to avoid and/or mitigate impacts to tribal cultural resources, (Pub. Resources Code §21084.3 (a)) ("Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.")

Public Resources Code sections 21080.3.1 and 21084.3(c) require CEQA lead agencies to consult with California Native American tribes that have requested notice from such agencies of proposed projects in the geographic area that are traditionally and culturally affiliated with the tribes on projects for which a Notice of Preparation or Notice of Negative Declaration or Mitigated Negative Declaration has been filed on or after July 1, 2015. Specifically, Public Resources Code section 21080.3.1 (d) provides:

> Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section.

The AB 52 amendments to CEQA law does not preclude initiating consultation with the tribes that are culturally and traditionally affiliated within your jurisdiction prior to receiving requests for notification of projects in the tribe's areas of traditional and cultural affiliation. The Native American Heritage Commission (NAHC) recommends, but does not require, early consultation as a best practice to ensure that lead agencies receive sufficient information about cultural resources in a project area to avoid damaging effects to tribal cultural resources.

The NAHC also recommends, but does not require that agencies should also include with their notification letters, information regarding any cultural resources assessment that has been completed on the area of potential effect (APE), such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

- A listing of any and all known cultural resources that have already been recorded on or adjacent to the APE, such as known archaeological sites;

- Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;

- Whether the records search indicates a low, moderate, or high probability that unrecorded cultural resources are located in the APE; and

- If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

   - Any report that may contain site forms, site significance, and suggested mitigation measures.

     All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure in accordance with Government Code section 6254.10.

3. The result of any Sacred Lands File (SLF) check conducted through the Native American Heritage Commission was negative.
4. Any ethnographic studies conducted for any area including all or part of the APE; and
5. Any geotechnical reports regarding all or part of the APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS are not exhaustive and a negative response to these searches does not preclude the existence of a tribal cultural resource. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the event that they do, having the information beforehand will help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our consultation list remains current.

If you have any questions or need additional information, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green

Andrew Green
Staff Services Analyst

Attachment

Native American Heritage Commission
Tribal Consultation List
Riverside County
11/13/2019

Agua Caliente Band of Cahuilla Indians
Jeff Grubbe, Chairperson
5401 Dinah Shore Drive — Cahuilla
Palm Springs, CA, 92264
Phone: (760) 699 - 6800
Fax: (760) 699-6919

Augustine Band of Cahuilla Mission Indians
Amanda Vance, Chairperson
P.O. Box 846 — Cahuilla
Coachella, CA, 92236
Phone: (760) 398 - 4722
Fax: (760) 369-7161
hhaines@augustinetribe.com

Cabazon Band of Mission Indians
Doug Welmas, Chairperson
84-245 Indio Springs Parkway — Cahuilla
Indio, CA, 92203
Phone: (760) 342 - 2593
Fax: (760) 347-7880
jstapp@cabazonindians-nsn.gov

Cahuilla Band of Indians
Daniel Salgado, Chairperson
52701 U.S. Highway 371 — Cahuilla
Anza, CA, 92539
Phone: (951) 763 - 5549
Fax: (951) 763-2808
Chairman@cahuilla.net

Campo Band of Diegueno Mission Indians
Ralph Goff, Chairperson
36190 Church Road, Suite 1 — Diegueno
Campo, CA, 91906
Phone: (619) 478 - 9046
Fax: (619) 478-5818
rgoff@campo-nsn.gov

Ewiiaapaayp Tribe
Robert Pinto, Chairperson
4054 Willows Road — Diegueno
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
wmicklin@leaningrock.net

Ewiiaapaayp Tribe
Michael Garcia, Vice Chairperson
4054 Willows Road — Diegueno
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
michaelg@leaningrock.net

Jamul Indian Village
Lisa Cumper, Tribal Historic Preservation Officer
P.O. Box 612 — Diegueno
Jamul, CA, 91935
Phone: (619) 669 - 4855
lcumper@jiv-nsn.gov

Jamul Indian Village
Erica Pinto, Chairperson
P.O. Box 612 — Diegueno
Jamul, CA, 91935
Phone: (619) 669 - 4785
Fax: (619) 669-4817
epinto@jiv-nsn.gov

La Posta Band of Diegueno Mission Indians
Gwendolyn Parada, Chairperson
8 Crestwood Road — Diegueno
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
LP13boots@aol.com

La Posta Band of Diegueno Mission Indians
Javaughn Miller, Tribal Administrator
8 Crestwood Road — Diegueno
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
jmiller@LPtribe.net

Los Coyotes Band of Cahuilla and Cupeño Indians
Shane Chapparosa, Chairperson
P.O. Box 189 — Cahuilla
Warner Springs, CA, 92086-0189
Phone: (760) 782 - 0711
Fax: (760) 782-0712

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and section 5097.98 of the Public Resources Code.

This list is only applicable for consultation with Native American tribes under Public Resources Code Sections 21080.3.1 for the proposed Banning 8th and Lincoln Industrial Project, Riverside County.

Native American Heritage Commission
Tribal Consultation List
Riverside County
11/13/2019

Manzanita Band of Kumeyaay Nation
Angela Elliott Santos, Chairperson
P.O. Box 1302 — Diegueno
Boulevard, CA, 91905
Phone: (619) 766 - 4930
Fax: (619) 766-4957

Mesa Grande Band of Diegueno Mission Indians
Michael Linton, Chairperson
P.O Box 270 — Diegueno
Santa Ysabel, CA, 92070
Phone: (760) 782 - 3818
Fax: (760) 782-9092
mesagrandeband@msn.com

Morongo Band of Mission Indians
Robert Martin, Chairperson
12700 Pumarra Rroad — Cahuilla
Banning, CA, 92220 — Serrano
Phone: (951) 849 - 8807
Fax: (951) 922-8146
dtorres@morongo-nsn.gov

Pechanga Band of Luiseno Indians
Mark Macarro, Chairperson
P.O. Box 1477 — Luiseno
Temecula, CA, 92593
Phone: (951) 770 - 6000
Fax: (951) 695-1778
epreston@pechanga-nsn.gov

Ramona Band of Cahuilla
Joseph Hamilton, Chairperson
P.O. Box 391670 — Cahuilla
Anza, CA, 92539
Phone: (951) 763 - 4105
Fax: (951) 763-4325
admin@ramona-nsn.gov

San Fernando Band of Mission Indians
Donna Yocum, Chairperson
P.O. Box 221838 — Kitanemuk
Newhall, CA, 91322 — Vanyume
Phone: (503) 539 - 0933 — Tataviam
Fax: (503) 574-3308
ddyocum@comcast.net

San Manuel Band of Mission Indians
Lee Clauss, Director of Cultural Resources
26569 Community Center Drive — Serrano
Highland, CA, 92346
Phone: (909) 864 - 8933
Fax: (909) 864-3370
lclauss@sanmanuel-nsn.gov

San Pasqual Band of Diegueno Mission Indians
Allen Lawson, Chairperson
P.O. Box 365 — Diegueno
Valley Center, CA, 92082
Phone: (760) 749 - 3200
Fax: (760) 749-3876
allenl@sanpasqualtribe.org

Santa Rosa Band of Cahuilla Indians
Steven Estrada, Chairperson
P.O. Box 391820 — Cahuilla
Anza, CA, 92539
Phone: (951) 659 - 2700
Fax: (951) 659-2228
mflaxbeard@santarosacahuilla-nsn.gov

Serrano Nation of Mission Indians
Mark Cochrane, Co-Chairperson
P. O. Box 343 — Serrano
Patton, CA, 92369
Phone: (909) 528 - 9032
serranonation1@gmail.com

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and section 5097.98 of the Public Resources Code.

This list is only applicable for consultation with Native American tribes under Public Resources Code Sections 21080.3.1 for the proposed Banning 8th and Lincoln Industrial Project, Riverside County.

Serrano Nation of Mission Indians
Wayne Walker, Co-Chairperson
P. O. Box 343 Serrano
Patton, CA, 92369
Phone: (253) 370 - 0167
serranonation1@gmail.com

Soboba Band of Luiseno Indians
Scott Cozart, Chairperson
P. O. Box 487 Cahuilla
San Jacinto, CA, 92583 Luiseno
Phone: (951) 654 - 2765
Fax: (951) 654-4198
jontiveros@soboba-nsn.gov

Sycuan Band of the Kumeyaay Nation
Cody Martinez, Chairperson
1 Kwaaypaay Court Kumeyaay
El Cajon, CA, 92019
Phone: (619) 445 - 2613
Fax: (619) 445-1927
ssilva@sycuan-nsn.gov

Torres-Martinez Desert Cahuilla Indians
Thomas Tortez, Chairperson
P.O. Box 1160 Cahuilla
Thermal, CA, 92274
Phone: (760) 397 - 0300
Fax: (760) 397-8146
tmchair@torresmartinez.org

Viejas Band of Kumeyaay Indians
John Christman, Chairperson
1 Viejas Grade Road Diegueno
Alpine, CA, 91901
Phone: (619) 445 - 3810
Fax: (619) 445-5337

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and section 5097.98 of the Public Resources Code.

This list is only applicable for consultation with Native American tribes under Public Resources Code Sections 21080.3.1 for the proposed Banning 8th and Lincoln Industrial Project, Riverside County.

Applied EARTHWORKS Inc.

3550 E. Florida Ave., Suite H
Hemet, CA 92544-4937
O: (951) 766-2000 | F: (951) 766-0020

November 22, 2019

Patricia Garcia Plotkin
Tribal Historic Preservation Officer
Agua Caliente Band of Cahuilla Indians
5401 Dinah Shore Drive,
Palm Springs, CA, 92264

Re: Cultural Resource Assessment for the Banning 8th and Lincoln Industrial Project, City of Banning, Riverside County, California.

Dear Ms. Garcia-Plotkin:

On behalf of Albert A. Webb Associates, Applied EarthWorks, Inc. (Æ) is conducting a cultural resource study for the Banning 8th and Lincoln Industrial Project (Project). The Project involves the proposed development of Assessor's Parcel Number (APN) 540-250-001 on approximately 4 acres of vacant land in the City of Banning. The Project is subject to the California Environmental Quality Act (CEQA) and the City of Banning is the lead CEQA agency. As indicated on the attached map, the Project is located on the Beaumont (1996), CA 7.5' USGS quadrangle map within Section 9, Township 3S / Range 1E, San Bernardino Baseline and Meridian (S.B.B.M.).

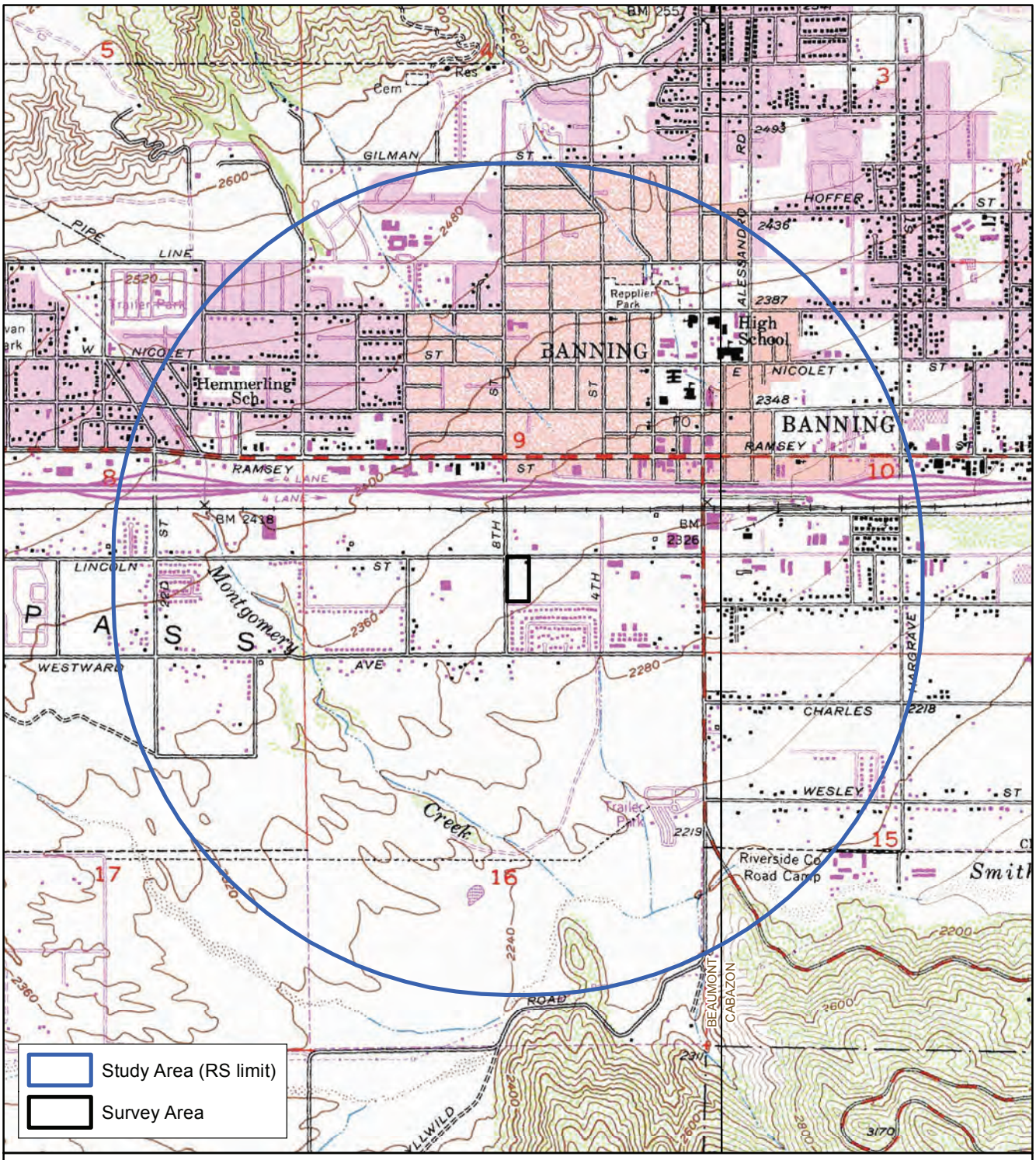
The archaeological literature and records search conducted at the Eastern Information Center housed at the University of California, Riverside, indicates that 15 cultural resources studies have been conducted within a one-mile radius of the Project area. Three of these studies involved the Project area. One hundred and fifty-eight cultural resource sites have been recorded within a one-mile radius of the Project area. One of these was a historic resource documented within the Project area. Æ was contracted to perform an archaeological survey of the Project area. The survey was completed on November 20, 2019. Transects spacing was 10 meters. No cultural resources were observed during the survey aside from the previously recorded resource.

As part of the cultural resource assessment of the Project area, Æ requested a search of the *Sacred Lands File* by the Native American Heritage Commission (NAHC) on November 11, 2019. The NAHC responded on November 13, 2019 noting that *Sacred Lands File* search was completed with negative results. Should your records show that cultural properties exist within or near the Project area shown on the enclosed map, or if you have any concerns regarding Native American issues related to the overall Project, please contact me at (951) 766-2000 or via letter expressing your concerns. You may also e-mail me at adeleon@appliedearthworks.com. If I do not hear from you within the next two weeks, I will contact you with a follow-up phone call or email.

Please be aware that your comments and concerns are very important to us, as well as to the successful completion of this Project. I look forward to hearing from you in the near future. Thank you, in advance, for taking the time to review this request.

Respectfully yours,

Andrew DeLeon, MA, RPA
Staff Archaeologist
Applied EarthWorks, Inc.



SCALE 1:24,000

0.5 0 0.5 1 Miles

1,000 0 1,000 2,000 3,000 4,000 5,000 Feet

0.5 0 0.5 1 Kilometers

Township 3 S/Range 1 E, Section 9
Beaumont (1996), CA 7.5' USGS Topographic Quadrangle

Location map for the *Banning 8th and Lincoln Industrial Project - AE4118.*

Applied EARTHWORKS Inc.

3550 E. Florida Ave., Suite H
Hemet, CA 92544-4937
O: (951) 766-2000 | F: (951) 766-0020

November 22, 2019

Amanda Vance
Chairperson
Augustine Band of Cahuilla Mission Indians
P.O. Box 846
Coachella, CA, 92236

Re: Cultural Resource Assessment for the Banning 8th and Lincoln Industrial Project, City of Banning, Riverside County, California.

Dear Ms. Vance:

On behalf of Albert A. Webb Associates, Applied EarthWorks, Inc. (Æ) is conducting a cultural resource study for the Banning 8th and Lincoln Industrial Project (Project). The Project involves the proposed development of Assessor's Parcel Number (APN) 540-250-001 on approximately 4 acres of vacant land in the City of Banning. The Project is subject to the California Environmental Quality Act (CEQA) and the City of Banning is the lead CEQA agency. As indicated on the attached map, the Project is located on the Beaumont (1996), CA 7.5' USGS quadrangle map within Section 9, Township 3S / Range 1E, San Bernardino Baseline and Meridian (S.B.B.M.).

The archaeological literature and records search conducted at the Eastern Information Center housed at the University of California, Riverside, indicates that 15 cultural resources studies have been conducted within a one-mile radius of the Project area. Three of these studies involved the Project area. One hundred and fifty-eight cultural resource sites have been recorded within a one-mile radius of the Project area. One of these was a historic resource documented within the Project area. Æ was contracted to perform an archaeological survey of the Project area. The survey was completed on November 20, 2019. Transects spacing was 10 meters. No cultural resources were observed during the survey aside from the previously recorded resource.

As part of the cultural resource assessment of the Project area, Æ requested a search of the *Sacred Lands File* by the Native American Heritage Commission (NAHC) on November 11, 2019. The NAHC responded on November 13, 2019 noting that *Sacred Lands File* search was completed with negative results. Should your records show that cultural properties exist within or near the Project area shown on the enclosed map, or if you have any concerns regarding Native American issues related to the overall Project, please contact me at (951) 766-2000 or via letter expressing your concerns. You may also e-mail me at adeleon@appliedearthworks.com. If I do not hear from you within the next two weeks, I will contact you with a follow-up phone call or email.

Please be aware that your comments and concerns are very important to us, as well as to the successful completion of this Project. I look forward to hearing from you in the near future. Thank you, in advance, for taking the time to review this request.

Respectfully yours,

Andrew DeLeon, MA, RPA
Staff Archaeologist
Applied EarthWorks, Inc.

Applied EARTHWORKS Inc.

3550 E. Florida Ave., Suite H
Hemet, CA 92544-4937
O: (951) 766-2000 | F: (951) 766-0020

November 22, 2019

Doug Welmas
Chairperson
Cabazon Band of Mission Indians
84-245 Indio Springs Parkway,
Indio, CA, 92203

Re: Cultural Resource Assessment for the Banning 8th and Lincoln Industrial Project, City of Banning, Riverside County, California.

Dear Mr. Welmas:

On behalf of Albert A. Webb Associates, Applied EarthWorks, Inc. (Æ) is conducting a cultural resource study for the Banning 8th and Lincoln Industrial Project (Project). The Project involves the proposed development of Assessor's Parcel Number (APN) 540-250-001 on approximately 4 acres of vacant land in the City of Banning. The Project is subject to the California Environmental Quality Act (CEQA) and the City of Banning is the lead CEQA agency. As indicated on the attached map, the Project is located on the Beaumont (1996), CA 7.5' USGS quadrangle map within Section 9, Township 3S / Range 1E, San Bernardino Baseline and Meridian (S.B.B.M.).

The archaeological literature and records search conducted at the Eastern Information Center housed at the University of California, Riverside, indicates that 15 cultural resources studies have been conducted within a one-mile radius of the Project area. Three of these studies involved the Project area. One hundred and fifty-eight cultural resource sites have been recorded within a one-mile radius of the Project area. One of these was a historic resource documented within the Project area. Æ was contracted to perform an archaeological survey of the Project area. The survey was completed on November 20, 2019. Transects spacing was 10 meters. No cultural resources were observed during the survey aside from the previously recorded resource.

As part of the cultural resource assessment of the Project area, Æ requested a search of the *Sacred Lands File* by the Native American Heritage Commission (NAHC) on November 11, 2019. The NAHC responded on November 13, 2019 noting that *Sacred Lands File* search was completed with negative results. Should your records show that cultural properties exist within or near the Project area shown on the enclosed map, or if you have any concerns regarding Native American issues related to the overall Project, please contact me at (951) 766-2000 or via letter expressing your concerns. You may also e-mail me at adeleon@appliedearthworks.com. If I do not hear from you within the next two weeks, I will contact you with a follow-up phone call or email.

Please be aware that your comments and concerns are very important to us, as well as to the successful completion of this Project. I look forward to hearing from you in the near future. Thank you, in advance, for taking the time to review this request.

Respectfully yours,

Andrew DeLeon, MA, RPA
Staff Archaeologist
Applied EarthWorks, Inc.

Applied EARTHWORKS Inc.

3550 E. Florida Ave., Suite H
Hemet, CA 92544-4937
O: (951) 766-2000 | F: (951) 766-0020

November 22, 2019

Daniel Salgado
Chairperson
Cahuilla Band of Indians
52701 U.S. Highway 371,
Anza, CA, 92539

Re: Cultural Resource Assessment for the Banning 8th and Lincoln Industrial Project, City of Banning, Riverside County, California.

Dear Mr. Salgado:

On behalf of Albert A. Webb Associates, Applied EarthWorks, Inc. (Æ) is conducting a cultural resource study for the Banning 8th and Lincoln Industrial Project (Project). The Project involves the proposed development of Assessor's Parcel Number (APN) 540-250-001 on approximately 4 acres of vacant land in the City of Banning. The Project is subject to the California Environmental Quality Act (CEQA) and the City of Banning is the lead CEQA agency. As indicated on the attached map, the Project is located on the Beaumont (1996), CA 7.5' USGS quadrangle map within Section 9, Township 3S / Range 1E, San Bernardino Baseline and Meridian (S.B.B.M.).

The archaeological literature and records search conducted at the Eastern Information Center housed at the University of California, Riverside, indicates that 15 cultural resources studies have been conducted within a one-mile radius of the Project area. Three of these studies involved the Project area. One hundred and fifty-eight cultural resource sites have been recorded within a one-mile radius of the Project area. One of these was a historic resource documented within the Project area. Æ was contracted to perform an archaeological survey of the Project area. The survey was completed on November 20, 2019. Transects spacing was 10 meters. No cultural resources were observed during the survey aside from the previously recorded resource.

As part of the cultural resource assessment of the Project area, Æ requested a search of the *Sacred Lands File* by the Native American Heritage Commission (NAHC) on November 11, 2019. The NAHC responded on November 13, 2019 noting that *Sacred Lands File* search was completed with negative results. Should your records show that cultural properties exist within or near the Project area shown on the enclosed map, or if you have any concerns regarding Native American issues related to the overall Project, please contact me at (951) 766-2000 or via letter expressing your concerns. You may also e-mail me at adeleon@appliedearthworks.com. If I do not hear from you within the next two weeks, I will contact you with a follow-up phone call or email.

Please be aware that your comments and concerns are very important to us, as well as to the successful completion of this Project. I look forward to hearing from you in the near future. Thank you, in advance, for taking the time to review this request.

Respectfully yours,

Andrew DeLeon, MA, RPA
Staff Archaeologist
Applied EarthWorks, Inc.

Applied EARTHWORKS Inc.

3550 E. Florida Ave., Suite H
Hemet, CA 92544-4937
O: (951) 766-2000 | F: (951) 766-0020

November 22, 2019

Shane Chapparosa
Chairperson
Los Coyotes Band of Cahuilla and Cupeno Indians
P.O. Box 189,
Warner Springs, CA, 92086-0189

Re: Cultural Resource Assessment for the Banning 8th and Lincoln Industrial Project, City of Banning, Riverside County, California.

Dear Mr. Chapparosa:

On behalf of Albert A. Webb Associates, Applied EarthWorks, Inc. (Æ) is conducting a cultural resource study for the Banning 8th and Lincoln Industrial Project (Project). The Project involves the proposed development of Assessor's Parcel Number (APN) 540-250-001 on approximately 4 acres of vacant land in the City of Banning. The Project is subject to the California Environmental Quality Act (CEQA) and the City of Banning is the lead CEQA agency. As indicated on the attached map, the Project is located on the Beaumont (1996), CA 7.5' USGS quadrangle map within Section 9, Township 3S / Range 1E, San Bernardino Baseline and Meridian (S.B.B.M.).

The archaeological literature and records search conducted at the Eastern Information Center housed at the University of California, Riverside, indicates that 15 cultural resources studies have been conducted within a one-mile radius of the Project area. Three of these studies involved the Project area. One hundred and fifty-eight cultural resource sites have been recorded within a one-mile radius of the Project area. One of these was a historic resource documented within the Project area. Æ was contracted to perform an archaeological survey of the Project area. The survey was completed on November 20, 2019. Transects spacing was 10 meters. No cultural resources were observed during the survey aside from the previously recorded resource.

As part of the cultural resource assessment of the Project area, Æ requested a search of the *Sacred Lands File* by the Native American Heritage Commission (NAHC) on November 11, 2019. The NAHC responded on November 13, 2019 noting that *Sacred Lands File* search was completed with negative results. Should your records show that cultural properties exist within or near the Project area shown on the enclosed map, or if you have any concerns regarding Native American issues related to the overall Project, please contact me at (951) 766-2000 or via letter expressing your concerns. You may also e-mail me at adeleon@appliedearthworks.com. If I do not hear from you within the next two weeks, I will contact you with a follow-up phone call or email.

Please be aware that your comments and concerns are very important to us, as well as to the successful completion of this Project. I look forward to hearing from you in the near future. Thank you, in advance, for taking the time to review this request.

Respectfully yours,

Andrew DeLeon, MA, RPA
Staff Archaeologist
Applied EarthWorks, Inc.

Applied EARTHWORKS Inc.

3550 E. Florida Ave., Suite H
Hemet, CA 92544-4937
O: (951) 766-2000 | F: (951) 766-0020

November 22, 2019

Travis Armstrong
Tribal Historic Preservation Officer
Morongo Band of Mission Indians
12700 Pumarra Road,
Banning, CA, 92220

Re: Cultural Resource Assessment for the Banning 8th and Lincoln Industrial Project, City of Banning, Riverside County, California.

Dear Mr. Armstrong:

On behalf of Albert A. Webb Associates, Applied EarthWorks, Inc. (Æ) is conducting a cultural resource study for the Banning 8th and Lincoln Industrial Project (Project). The Project involves the proposed development of Assessor's Parcel Number (APN) 540-250-001 on approximately 4 acres of vacant land in the City of Banning. The Project is subject to the California Environmental Quality Act (CEQA) and the City of Banning is the lead CEQA agency. As indicated on the attached map, the Project is located on the Beaumont (1996), CA 7.5' USGS quadrangle map within Section 9, Township 3S / Range 1E, San Bernardino Baseline and Meridian (S.B.B.M.).

The archaeological literature and records search conducted at the Eastern Information Center housed at the University of California, Riverside, indicates that 15 cultural resources studies have been conducted within a one-mile radius of the Project area. Three of these studies involved the Project area. One hundred and fifty-eight cultural resource sites have been recorded within a one-mile radius of the Project area. One of these was a historic resource documented within the Project area. Æ was contracted to perform an archaeological survey of the Project area. The survey was completed on November 20, 2019. Transects spacing was 10 meters. No cultural resources were observed during the survey aside from the previously recorded resource.

As part of the cultural resource assessment of the Project area, Æ requested a search of the *Sacred Lands File* by the Native American Heritage Commission (NAHC) on November 11, 2019. The NAHC responded on November 13, 2019 noting that *Sacred Lands File* search was completed with negative results. Should your records show that cultural properties exist within or near the Project area shown on the enclosed map, or if you have any concerns regarding Native American issues related to the overall Project, please contact me at (951) 766-2000 or via letter expressing your concerns. You may also e-mail me at adeleon@appliedearthworks.com. If I do not hear from you within the next two weeks, I will contact you with a follow-up phone call or email.

Please be aware that your comments and concerns are very important to us, as well as to the successful completion of this Project. I look forward to hearing from you in the near future. Thank you, in advance, for taking the time to review this request.

Respectfully yours,

Andrew DeLeon, MA, RPA
Staff Archaeologist
Applied EarthWorks, Inc.

Applied EARTHWORKS Inc.

3550 E. Florida Ave., Suite H
Hemet, CA 92544-4937
O: (951) 766-2000 | F: (951) 766-0020

November 22, 2019

Ebru Ozdil
Chairperson
Pechanga Band of Luiseno Indians
P.O. Box 1477,
Temecula, CA, 92593

Re: Cultural Resource Assessment for the Banning 8th and Lincoln Industrial Project, City of Banning, Riverside County, California.

Dear Mr. Ozdil:

On behalf of Albert A. Webb Associates, Applied EarthWorks, Inc. (Æ) is conducting a cultural resource study for the Banning 8th and Lincoln Industrial Project (Project). The Project involves the proposed development of Assessor's Parcel Number (APN) 540-250-001 on approximately 4 acres of vacant land in the City of Banning. The Project is subject to the California Environmental Quality Act (CEQA) and the City of Banning is the lead CEQA agency. As indicated on the attached map, the Project is located on the Beaumont (1996), CA 7.5' USGS quadrangle map within Section 9, Township 3S / Range 1E, San Bernardino Baseline and Meridian (S.B.B.M.).

The archaeological literature and records search conducted at the Eastern Information Center housed at the University of California, Riverside, indicates that 15 cultural resources studies have been conducted within a one-mile radius of the Project area. Three of these studies involved the Project area. One hundred and fifty-eight cultural resource sites have been recorded within a one-mile radius of the Project area. One of these was a historic resource documented within the Project area. Æ was contracted to perform an archaeological survey of the Project area. The survey was completed on November 20, 2019. Transects spacing was 10 meters. No cultural resources were observed during the survey aside from the previously recorded resource.

As part of the cultural resource assessment of the Project area, Æ requested a search of the *Sacred Lands File* by the Native American Heritage Commission (NAHC) on November 11, 2019. The NAHC responded on November 13, 2019 noting that *Sacred Lands File* search was completed with negative results. Should your records show that cultural properties exist within or near the Project area shown on the enclosed map, or if you have any concerns regarding Native American issues related to the overall Project, please contact me at (951) 766-2000 or via letter expressing your concerns. You may also e-mail me at adeleon@appliedearthworks.com. If I do not hear from you within the next two weeks, I will contact you with a follow-up phone call or email.

Please be aware that your comments and concerns are very important to us, as well as to the successful completion of this Project. I look forward to hearing from you in the near future. Thank you, in advance, for taking the time to review this request.

Respectfully yours,

Andrew DeLeon, MA, RPA
Staff Archaeologist
Applied EarthWorks, Inc.

Applied EARTHWORKS Inc.

3550 E. Florida Ave., Suite H
Hemet, CA 92544-4937
O: (951) 766-2000 | F: (951) 766-0020

November 22, 2019

Joseph Hamilton
Chairperson
Ramona Band of Cahuilla
P.O. Box 391670,
Anza, CA, 92539

Re: Cultural Resource Assessment for the Banning 8th and Lincoln Industrial Project, City of Banning, Riverside County, California.

Dear Mr. Hamilton:

On behalf of Albert A. Webb Associates, Applied EarthWorks, Inc. (Æ) is conducting a cultural resource study for the Banning 8th and Lincoln Industrial Project (Project). The Project involves the proposed development of Assessor's Parcel Number (APN) 540-250-001 on approximately 4 acres of vacant land in the City of Banning. The Project is subject to the California Environmental Quality Act (CEQA) and the City of Banning is the lead CEQA agency. As indicated on the attached map, the Project is located on the Beaumont (1996), CA 7.5' USGS quadrangle map within Section 9, Township 3S / Range 1E, San Bernardino Baseline and Meridian (S.B.B.M.).

The archaeological literature and records search conducted at the Eastern Information Center housed at the University of California, Riverside, indicates that 15 cultural resources studies have been conducted within a one-mile radius of the Project area. Three of these studies involved the Project area. One hundred and fifty-eight cultural resource sites have been recorded within a one-mile radius of the Project area. One of these was a historic resource documented within the Project area. Æ was contracted to perform an archaeological survey of the Project area. The survey was completed on November 20, 2019. Transects spacing was 10 meters. No cultural resources were observed during the survey aside from the previously recorded resource.

As part of the cultural resource assessment of the Project area, Æ requested a search of the *Sacred Lands File* by the Native American Heritage Commission (NAHC) on November 11, 2019. The NAHC responded on November 13, 2019 noting that *Sacred Lands File* search was completed with negative results. Should your records show that cultural properties exist within or near the Project area shown on the enclosed map, or if you have any concerns regarding Native American issues related to the overall Project, please contact me at (951) 766-2000 or via letter expressing your concerns. You may also e-mail me at adeleon@appliedearthworks.com. If I do not hear from you within the next two weeks, I will contact you with a follow-up phone call or email.

Please be aware that your comments and concerns are very important to us, as well as to the successful completion of this Project. I look forward to hearing from you in the near future. Thank you, in advance, for taking the time to review this request.

Respectfully yours,

Andrew DeLeon, MA, RPA
Staff Archaeologist
Applied EarthWorks, Inc.

Applied EARTHWORKS Inc.

3550 E. Florida Ave., Suite H
Hemet, CA 92544-4937
O: (951) 766-2000 | F: (951) 766-0020

November 22, 2019

Jessica Mauck
Cultural Resources
San Manuel Band of Mission Indians
P.O. Box 391670,
Anza, CA, 92539

Re: Cultural Resource Assessment for the Banning 8th and Lincoln Industrial Project, City of Banning, Riverside County, California.

Dear Ms. Mauck:

On behalf of Albert A. Webb Associates, Applied EarthWorks, Inc. (Æ) is conducting a cultural resource study for the Banning 8th and Lincoln Industrial Project (Project). The Project involves the proposed development of Assessor's Parcel Number (APN) 540-250-001 on approximately 4 acres of vacant land in the City of Banning. The Project is subject to the California Environmental Quality Act (CEQA) and the City of Banning is the lead CEQA agency. As indicated on the attached map, the Project is located on the Beaumont (1996), CA 7.5' USGS quadrangle map within Section 9, Township 3S / Range 1E, San Bernardino Baseline and Meridian (S.B.B.M.).

The archaeological literature and records search conducted at the Eastern Information Center housed at the University of California, Riverside, indicates that 15 cultural resources studies have been conducted within a one-mile radius of the Project area. Three of these studies involved the Project area. One hundred and fifty-eight cultural resource sites have been recorded within a one-mile radius of the Project area. One of these was a historic resource documented within the Project area. Æ was contracted to perform an archaeological survey of the Project area. The survey was completed on November 20, 2019. Transects spacing was 10 meters. No cultural resources were observed during the survey aside from the previously recorded resource.

As part of the cultural resource assessment of the Project area, Æ requested a search of the *Sacred Lands File* by the Native American Heritage Commission (NAHC) on November 11, 2019. The NAHC responded on November 13, 2019 noting that *Sacred Lands File* search was completed with negative results. Should your records show that cultural properties exist within or near the Project area shown on the enclosed map, or if you have any concerns regarding Native American issues related to the overall Project, please contact me at (951) 766-2000 or via letter expressing your concerns. You may also e-mail me at adeleon@appliedearthworks.com. If I do not hear from you within the next two weeks, I will contact you with a follow-up phone call or email.

Please be aware that your comments and concerns are very important to us, as well as to the successful completion of this Project. I look forward to hearing from you in the near future. Thank you, in advance, for taking the time to review this request.

Respectfully yours,

Andrew DeLeon, MA, RPA
Staff Archaeologist
Applied EarthWorks, Inc.

Applied EARTHWORKS Inc.

3550 E. Florida Ave., Suite H
Hemet, CA 92544-4937
O: (951) 766-2000 | F: (951) 766-0020

November 22, 2019

Steven Estrada
Chairperson
Santa Rosa Band of Cahuilla Indians
P.O. Box 391820,
Anza, CA, 92539

Re: Cultural Resource Assessment for the Banning 8th and Lincoln Industrial Project, City of Banning, Riverside County, California.

Dear Mr. Estrada:

On behalf of Albert A. Webb Associates, Applied EarthWorks, Inc. (Æ) is conducting a cultural resource study for the Banning 8th and Lincoln Industrial Project (Project). The Project involves the proposed development of Assessor's Parcel Number (APN) 540-250-001 on approximately 4 acres of vacant land in the City of Banning. The Project is subject to the California Environmental Quality Act (CEQA) and the City of Banning is the lead CEQA agency. As indicated on the attached map, the Project is located on the Beaumont (1996), CA 7.5' USGS quadrangle map within Section 9, Township 3S / Range 1E, San Bernardino Baseline and Meridian (S.B.B.M.).

The archaeological literature and records search conducted at the Eastern Information Center housed at the University of California, Riverside, indicates that 15 cultural resources studies have been conducted within a one-mile radius of the Project area. Three of these studies involved the Project area. One hundred and fifty-eight cultural resource sites have been recorded within a one-mile radius of the Project area. One of these was a historic resource documented within the Project area. Æ was contracted to perform an archaeological survey of the Project area. The survey was completed on November 20, 2019. Transects spacing was 10 meters. No cultural resources were observed during the survey aside from the previously recorded resource.

As part of the cultural resource assessment of the Project area, Æ requested a search of the *Sacred Lands File* by the Native American Heritage Commission (NAHC) on November 11, 2019. The NAHC responded on November 13, 2019 noting that *Sacred Lands File* search was completed with negative results. Should your records show that cultural properties exist within or near the Project area shown on the enclosed map, or if you have any concerns regarding Native American issues related to the overall Project, please contact me at (951) 766-2000 or via letter expressing your concerns. You may also e-mail me at adeleon@appliedearthworks.com. If I do not hear from you within the next two weeks, I will contact you with a follow-up phone call or email.

Please be aware that your comments and concerns are very important to us, as well as to the successful completion of this Project. I look forward to hearing from you in the near future. Thank you, in advance, for taking the time to review this request.

Respectfully yours,

Andrew DeLeon, MA, RPA
Staff Archaeologist
Applied EarthWorks, Inc.

Applied EARTHWORKS Inc.

3550 E. Florida Ave., Suite H
Hemet, CA 92544-4937
O: (951) 766-2000 | F: (951) 766-0020

November 22, 2019

Mark Cochrane
Co-Chairperson
Wayne Walker
Co-Chairperson
Serrano Nation of Mission Indians
P.O. Box 343,
Patton, CA, 92369

Re: Cultural Resource Assessment for the Banning 8th and Lincoln Industrial Project, City of Banning, Riverside County, California.

Dear Mr. Cochrane and Mr. Walker:

On behalf of Albert A. Webb Associates, Applied EarthWorks, Inc. (Æ) is conducting a cultural resource study for the Banning 8th and Lincoln Industrial Project (Project). The Project involves the proposed development of Assessor's Parcel Number (APN) 540-250-001 on approximately 4 acres of vacant land in the City of Banning. The Project is subject to the California Environmental Quality Act (CEQA) and the City of Banning is the lead CEQA agency. As indicated on the attached map, the Project is located on the Beaumont (1996), CA 7.5' USGS quadrangle map within Section 9, Township 3S / Range 1E, San Bernardino Baseline and Meridian (S.B.B.M.).

The archaeological literature and records search conducted at the Eastern Information Center housed at the University of California, Riverside, indicates that 15 cultural resources studies have been conducted within a one-mile radius of the Project area. Three of these studies involved the Project area. One hundred and fifty-eight cultural resource sites have been recorded within a one-mile radius of the Project area. One of these was a historic resource documented within the Project area. Æ was contracted to perform an archaeological survey of the Project area. The survey was completed on November 20, 2019. Transects spacing was 10 meters. No cultural resources were observed during the survey aside from the previously recorded resource.

As part of the cultural resource assessment of the Project area, Æ requested a search of the *Sacred Lands File* by the Native American Heritage Commission (NAHC) on November 11, 2019. The NAHC responded on November 13, 2019 noting that *Sacred Lands File* search was completed with negative results. Should your records show that cultural properties exist within or near the Project area shown on the enclosed map, or if you have any concerns regarding Native American issues related to the overall Project, please contact me at (951) 766-2000 or via letter expressing your concerns. You may also e-mail me at adeleon@appliedearthworks.com. If I do not hear from you within the next two weeks, I will contact you with a follow-up phone call or email.

Please be aware that your comments and concerns are very important to us, as well as to the successful completion of this Project. I look forward to hearing from you in the near future. Thank you, in advance, for taking the time to review this request.

Respectfully yours,

Andrew DeLeon, MA, RPA
Staff Archaeologist
Applied EarthWorks, Inc.

Applied EARTHWORKS Inc.

3550 E. Florida Ave., Suite H
Hemet, CA 92544-4937
O: (951) 766-2000 | F: (951) 766-0020

November 22, 2019

Joseph Ontiveros
Tribal Historic Preservation Officer
Soboba Band of Luiseno Indians
P.O. Box 487,
San Jacinto, CA, 92583

Re: Cultural Resource Assessment for the Banning 8th and Lincoln Industrial Project, City of Banning, Riverside County, California.

Dear Mr. Ontiveros:

On behalf of Albert A. Webb Associates, Applied EarthWorks, Inc. (Æ) is conducting a cultural resource study for the Banning 8th and Lincoln Industrial Project (Project). The Project involves the proposed development of Assessor's Parcel Number (APN) 540-250-001 on approximately 4 acres of vacant land in the City of Banning. The Project is subject to the California Environmental Quality Act (CEQA) and the City of Banning is the lead CEQA agency. As indicated on the attached map, the Project is located on the Beaumont (1996), CA 7.5' USGS quadrangle map within Section 9, Township 3S / Range 1E, San Bernardino Baseline and Meridian (S.B.B.M.).

The archaeological literature and records search conducted at the Eastern Information Center housed at the University of California, Riverside, indicates that 15 cultural resources studies have been conducted within a one-mile radius of the Project area. Three of these studies involved the Project area. One hundred and fifty-eight cultural resource sites have been recorded within a one-mile radius of the Project area. One of these was a historic resource documented within the Project area. Æ was contracted to perform an archaeological survey of the Project area. The survey was completed on November 20, 2019. Transects spacing was 10 meters. No cultural resources were observed during the survey aside from the previously recorded resource.

As part of the cultural resource assessment of the Project area, Æ requested a search of the *Sacred Lands File* by the Native American Heritage Commission (NAHC) on November 11, 2019. The NAHC responded on November 13, 2019 noting that *Sacred Lands File* search was completed with negative results. Should your records show that cultural properties exist within or near the Project area shown on the enclosed map, or if you have any concerns regarding Native American issues related to the overall Project, please contact me at (951) 766-2000 or via letter expressing your concerns. You may also e-mail me at adeleon@appliedearthworks.com. If I do not hear from you within the next two weeks, I will contact you with a follow-up phone call or email.

Please be aware that your comments and concerns are very important to us, as well as to the successful completion of this Project. I look forward to hearing from you in the near future. Thank you, in advance, for taking the time to review this request.

Respectfully yours,

Andrew DeLeon, MA, RPA
Staff Archaeologist
Applied EarthWorks, Inc.

Applied EARTHWORKS Inc.

3550 E. Florida Ave., Suite H
Hemet, CA 92544-4937
O: (951) 766-2000 | F: (951) 766-0020

November 22, 2019

Thomas Tortez
Chairperson
Torres-Martinez Desert Cahuilla Indians
P.O. Box 1160,
Thermal, CA, 92274

Re: Cultural Resource Assessment for the Banning 8th and Lincoln Industrial Project, City of Banning, Riverside County, California.

Dear Mr. Tortez:

On behalf of Albert A. Webb Associates, Applied EarthWorks, Inc. (Æ) is conducting a cultural resource study for the Banning 8th and Lincoln Industrial Project (Project). The Project involves the proposed development of Assessor's Parcel Number (APN) 540-250-001 on approximately 4 acres of vacant land in the City of Banning. The Project is subject to the California Environmental Quality Act (CEQA) and the City of Banning is the lead CEQA agency. As indicated on the attached map, the Project is located on the Beaumont (1996), CA 7.5' USGS quadrangle map within Section 9, Township 3S / Range 1E, San Bernardino Baseline and Meridian (S.B.B.M.).

The archaeological literature and records search conducted at the Eastern Information Center housed at the University of California, Riverside, indicates that 15 cultural resources studies have been conducted within a one-mile radius of the Project area. Three of these studies involved the Project area. One hundred and fifty-eight cultural resource sites have been recorded within a one-mile radius of the Project area. One of these was a historic resource documented within the Project area. Æ was contracted to perform an archaeological survey of the Project area. The survey was completed on November 20, 2019. Transects spacing was 10 meters. No cultural resources were observed during the survey aside from the previously recorded resource.

As part of the cultural resource assessment of the Project area, Æ requested a search of the *Sacred Lands File* by the Native American Heritage Commission (NAHC) on November 11, 2019. The NAHC responded on November 13, 2019 noting that *Sacred Lands File* search was completed with negative results. Should your records show that cultural properties exist within or near the Project area shown on the enclosed map, or if you have any concerns regarding Native American issues related to the overall Project, please contact me at (951) 766-2000 or via letter expressing your concerns. You may also e-mail me at adeleon@appliedearthworks.com. If I do not hear from you within the next two weeks, I will contact you with a follow-up phone call or email.

Please be aware that your comments and concerns are very important to us, as well as to the successful completion of this Project. I look forward to hearing from you in the near future. Thank you, in advance, for taking the time to review this request.

Respectfully yours,

Andrew DeLeon, MA, RPA
Staff Archaeologist
Applied EarthWorks, Inc.

AGUA CALIENTE BAND OF CAHUILLA INDIANS

TRIBAL HISTORIC PRESERVATION

03-020-2019-008

December 12, 2019

[VIA EMAIL TO:adeleon@appliedearthworks.com]
Applied Earthworks
Mr. Andrew DeLeon
3550 E. Florida Ave., Suite H
Hemet, California 92544-4937

Re: Banning 8th and Lincoln Industrial Project, City of Banning, Riverside County, California

Dear Mr. Andrew DeLeon,

The Agua Caliente Band of Cahuilla Indians (ACBCI) appreciates your efforts to include the Tribal Historic Preservation Office (THPO) in the 8th and Lincoln Industrial project. The project area is not located within the boundaries of the ACBCI Reservation. However, it is within the Tribe's Traditional Use Area. For this reason, the ACBCI THPO requests the following:

*A description of the proposed project. Please include information about any ground disturbing activities that may take place.

*A copy of the records search with associated survey reports and site records from the information center.

*Copies of any cultural resource documentation (report and site records) generated in connection with this project.

Again, the Agua Caliente appreciates your interest in our cultural heritage. If you have questions or require additional information, please call me at (760)883-1327. You may also email me at ACBCI-THPO@aguacaliente.net.

Cordially,

Arysa Gonzalez Romero
Historic Preservation Technician
Tribal Historic Preservation Office
AGUA CALIENTE BAND
OF CAHUILLA INDIANS

December 9, 2019

Andrew DeLeon, MA, RPA
Staff Archaeologist
Applied EarthWorks, Inc.
3550 E. Florida Ave., Suite H
Hemet, CA 92544-4937

Re.: Cultural Resource Assessment for the **Banning 8th and Lincoln Industrial Project**
City of Banning
Riverside County, California

Dear Mr. DeLeon,

Thank you for contacting the Cabazon Band of Mission Indians concerning cultural resource information relative to the above referenced project.

The project is located outside of the Tribe's current reservation boundaries. The Tribe has no specific archival information on the site indicating that it may be a sacred/religious site or other site of Native American traditional cultural value within the project area.

We look forward to continued collaboration in the preservation of cultural resources or areas of traditional cultural importance in the Project area.

Best regards,

Judy Stapp

Judy Stapp
Director of Cultural Affairs

From: Travis Armstrong
To: "Andrew DeLeon"
Subject: RE: Banning 8th and Lincoln Industrial Project
Date: Friday, December 06, 2019 9:27:09 AM

Hello Andrew,

Thank you for your letter.

The proposed project is within a highly sensitive, including less than .25 miles from an ancient Cahuilla trail. Additionally, there are significant resources related to the Morongo people within the one-mile buffer, as well as a larger archaeological complex of village and occupations sites nearby in Sections 15, 16 and 20.

Our office looks forward to your report that uses professional archaeological standards to review the patterning of these resources.

Please send us copies of all the site records.

Lastly, our office should have been notified of the survey and invited to participate, which we will bring up with the lead agency during the AB 52 consultation process regarding the need to re-survey with tribal participation.

Thank you.

Sincerely,

Travis Armstrong
Tribal Historic Preservation Officer
Morongo Band of Mission Indians
951-755-5259
Email: thpo@morongo-nsn.gov



From: Andrew DeLeon [mailto:adeleon@appliedearthworks.com]

From:	Alexandra McCleary
To:	adeleon@appliedearthworks.com
Subject:	FW: Banning 8th and Lincoln Industrial Project
Date:	Friday, December 06, 2019 11:36:10 AM
Attachments:	image002.png image89b3c0.PNG Mauck_Banning 8th and Lincoln.pdf Banning 8th and Lincoln location map_.pdf

Dear Andrew,

Thank you for contacting the San Manuel Band of Mission Indians (SMBMI) regarding the above-referenced project. I write to you on behalf of Lee Clauss, Director of the Cultural Resources Management Department. SMBMI appreciates the opportunity to review the project documentation. The proposed project is located outside of Serrano ancestral territory and, as such, SMBMI will not be requesting consulting party status with the lead agency or requesting to participate in the scoping, development, and/or review of documents created pursuant to legal and regulatory mandates.

Kind regards,
Alexandra McCleary

Alexandra McCleary
TRIBAL ARCHAEOLOGIST
O: (909) 864-8933 x502023
M: (909) 633-0054
26569 Community Center Drive Highland CA 92346
SAN MANUEL
BAND OF MISSION INDIANS

From: Jessica Mauck <JMauck@sanmanuel-nsn.gov>
Sent: Friday, December 6, 2019 9:20 AM
To: Alexandra McCleary <Alexandra.McCleary@sanmanuel-nsn.gov>
Subject: FW: Banning 8th and Lincoln Industrial Project

He is following up on the project I forwarded to you on 11/25

Jessica Mauck
CULTURAL RESOURCES ANALYST
O: (909) 864-8933 x3249

Appendix D

Energy Calculations

Table 1 – Total Construction-Related Fuel Consumption

Lincoln Industrial Building Project

Fuel	Consumption	
Diesel		
On-Road Construction Trips[1]	4,194	Gallons
Off-Road Construction Equipment[2]	22,649	Gallons
Diesel Total	**26,843**	**Gallons**
Gasoline		
On-Road Construction Trips[1]	4,936	Gallons
Off-Road Construction Equipment[3]	-	Gallons
Gasoline Total	**4,936**	**Gallons**

Notes:

1. On-road mobile source fuel use based on vehicle miles traveled (VMT) from CalEEMod for construction in 2020 and fleet-average fuel consumption in gallons per mile from EMFAC2017 web based data for Riverside County. See Table 2 for calculation details.
2. Off-road mobile source fuel usage based on a fuel usage rate of 0.05 gallons of diesel per horsepower (HP)-hour, based on SCAQMD CEQA Air Quality Handbook, Table A9-3E.
3. All emissions from off-road construction equipment were assumed to be diesel.

Table 2 – On-Road Construction Trip Estimates

Lincoln Industrial Building Project

Trip Type	Trips	Trip length	Vehicle Miles Traveled (VMT)	Fuel Efficiency	Annual Fuel Usage[1]	
	(trips)	(miles)	(miles)	(mpg)	(Fuel)	(gallon)
Worker[2,3]	9,144	14.7	134,417	26.6	Gasoline	4,936
Vendor[4]	3,534	6.9	24,385	8.7	Diesel	2,934
Hauling[5]	432	20	8,640	6.9	Diesel	1,260

Notes:

1. On-road mobile source fuel use based on vehicle miles traveled (VMT) from CalEEMod output (See Air Quality/GHG Memo) for construction and fleet-average fuel consumption in gallons per mile from EMFAC2017 web based data for 2020 in Riverside County.
2. Worker trips were assumed to be 100% gasoline powered vehicles.
3. Per CalEEMod, worker Trips were assumed to be 50% LDA, 25% LDT1, and 25% LDT2.
4. Vendor trips were assumed to be 50% MHDT and 50% HHDT, split evenly between the MHDT and HHDT construction categories.
5. Per CalEEMod, hauling trips were assumed to be 100% HHDT.

Table 3 – Annual Energy Consumption from Operation

Lincoln Industrial Building Project

Fuel Type	Energy Consumption	Units	Natural Gas	Units
Electricity				
Building[1]	3,000,060	kWh/year	**0**	kBTU/yr
Water[2]	3,741	kWh/year		
Total Electricity	**3,003,801**	kWh/year		
Mobile[3]				
Gasoline	**11,894**	gallons/year		
Diesel	**4,575**	gallons/year		

Notes:

1. Building electricity use from CalEEMod output (See Air Quality/GHG Memo).
2. Calculated based on the Project's annual water consumption using CalEEMod SCAQMD energy intensity of 0.0111 kWhr per gallon for supply, distribution, and treatment of water and .013021 kWhr per gallon for supply, distribution, and treatment of water and wastewater treatment.
3. Mobile source fuel use based on annual vehicle miles traveled (VMT) from CalEEMod output for operational year 2021 and fleet-average fuel consumption in gallons per mile from EMFAC2017 web based data in Riverside County.

Appendix E.1

Airport Land Use Commission (ALUC)
Development Review Director's Determination

AIRPORT LAND USE COMMISSION
RIVERSIDE COUNTY

April 16, 2020

Mr. Mark De Manincor, Project Planner
City of Banning Community Development Department – Planning Division
99 E. Ramsey Street
Banning, CA 92220

RE: AIRPORT LAND USE COMMISSION (ALUC) DEVELOPMENT REVIEW – DIRECTOR'S DETERMINATION

File No.:	ZAP1040BA20
Related File No.:	CUP19-8008 (Conditional Use Permit)
APN:	540-250-001

Dear Mr. Manincor:

Under the delegation of the Riverside County Airport Land Use Commission (ALUC) pursuant to ALUC's general delegation as per Policy 1.5.2(d) of the Countywide Policies of the 2004 Riverside County Airport Land Use Compatibility Plan, staff reviewed City of Banning Case No. CUP19-8008 (Conditional Use Permit), a proposal to construct a 21,000 square foot industrial manufacturing building for the purposes of a cannabis growth facility on 1.8 acres, located on the southeast corner of Lincoln Street and 8th Street.

The site is located within Airport Compatibility Zone D of the Banning Municipal Airport Influence Area (AIA). Zone D restricts nonresidential intensity to 200 people per average acre and 800 people per single acre. The project proposes a 21,000 square foot industrial manufacturing building, which accommodates 105 people, resulting in an average acre intensity of 58 people per acre and single acre intensity of 218 people, both of which are consistent with the Zone D intensity criteria.

Land use practices that attract or sustain hazardous wildlife populations on or near airports significantly increase the potential of Bird Aircraft Strike Hazards (BASH). The FAA strongly recommends that storm water management systems located within 5,000 or 10,000 feet of the Airport Operations Area, depending on the type of aircraft, be designed and operated so as not to create above-ground standing water. To facilitate the control of hazardous wildlife, the FAA recommends the use of steep-sided, rip-rap lined, narrow, linearly shaped water detention basins. All vegetation in and around detention basins that provide food or cover for hazardous wildlife should be eliminated. (FAA Advisory Circular 5200-33B). The project is located 7,600 feet from the runway, and therefore would be subject to the above requirement. The project includes approximately 8,000 square feet of detention basin area that is greater than 100 feet in length and 50 feet in width. Detention basins are not recommended in the vicinity of airports due to the potential that such areas could provide food, water, and shelter for hazardous wildlife. Pursuant to the study "Wildlife Hazard Management at Riverside County Airports: Background and Policy", October 2018, by Mead & Hunt, which is the basis of the brochure titled "Airports, Wildlife and Stormwater Management", such basins are potentially suitable within 10,000 feet of the airport only if less than 30 feet in length and width and if "vegetation is selected to discourage

CHAIR
Steve Manos
Lake Elsinore

VICE CHAIR
Russell Betts
Desert Hot Springs

COMMISSIONERS

Arthur Butler
Riverside

John Lyon
Riverside

Russell Betts
Desert Hot Springs

Steven Stewart
Palm Springs

Richard Stewart
Moreno Valley

Gary Youmans
Temecula

STAFF

Director
Simon A. Housman

John Guerin
Paul Rull
Barbara Santos

County Administrative Center
4080 Lemon St., 14th Floor
Riverside, CA 92501
(951) 955-5132

www.rcaluc.org

hazardous wildlife and reviewed by a qualified biologist." The applicant has agreed to the following conditions, in order to reduce bird attractant: 1) new basins are to be designed so as to provide for a maximum 48-hour detention period following the conclusion of a storm event, and to remain totally dry between rainfalls, and 2) any landscaping proposed in the detention basin shall be in accordance with the ALUC "Landscaping Near Airports" and "Airports, Wildlife and Stormwater Management" brochures.

The elevation of Runway 8-26 at its westerly terminus is 2,212 feet above mean sea level (AMSL). At a distance of approximately 7,600 feet from the runway to the site, Federal Aviation Administration Obstruction Evaluation Service (FAA OES) review would be required for any structures with top of roof exceeding 2,288 feet AMSL. The site's finished floor elevation is 2,335 feet AMSL and the proposed building height is 24 feet, for a top point elevation of 2,359 feet AMSL. Therefore, FAA Obstruction Evaluation Service review for height/elevation reasons was required. The applicant submitted Form 7460-1 to the FAA OES. A "Determination of No Hazard to Air Navigation" letter for Aeronautical Study No. 2019-AWP-2134-OE was issued on March 17, 2020. The study revealed that the proposed facility would not exceed obstruction standards and would not be a hazard to air navigation provided conditions are met. These FAA OES conditions have been incorporated into this finding.

As ALUC Director, I hereby find the above-referenced project **CONSISTENT** with the 2004 Banning Municipal Airport Land Use Compatibility Plan, as amended in 2016, provided that the City of Banning applies the following recommended conditions:

CONDITIONS:

1. Any outdoor lighting installed shall be hooded or shielded to prevent either the spillage of lumens or reflection into the sky. Outdoor lighting shall be downward facing.

2. The following uses shall be prohibited:

   (a) Any use which would direct a steady light or flashing light of red, white, green, or amber colors associated with airport operations toward an aircraft engaged in an initial straight climb following takeoff or toward an aircraft engaged in a straight final approach toward a landing at an airport, other than an FAA-approved navigational signal light or visual approach slope indicator.

   (b) Any use which would cause sunlight to be reflected towards an aircraft engaged in an initial straight climb following takeoff or towards an aircraft engaged in a straight final approach towards a landing at an airport.

   (c) Any use which would generate smoke or water vapor or which would attract large concentrations of birds, or which may otherwise affect safe air navigation within the area. (Such uses include landscaping utilizing water features, aquaculture, outdoor production of cereal grains, sunflower, and row crops, artificial marshes, trash transfer stations that are open on one or more sides, recycling centers containing putrescible wastes, and construction and demolition debris facilities.)

   (d) Any use which would generate electrical interference that may be detrimental to the operation of aircraft and/or aircraft instrumentation.

3. The attached Notice of Airport in Vicinity shall be provided to all potential purchasers of the property and to the tenants of the buildings, and be recorded as a deed notice.

4. Any proposed detention basins or facilities shall be designed and maintained to provide for a maximum 48-hour detention period following the design storm, and remain totally dry between rainfalls. Vegetation in and around the detention basins that would provide food or cover for birds would be incompatible with airport operations and shall not be utilized in project landscaping. Trees shall be spaced so as to prevent large expanses of contiguous canopy, when mature. Landscaping in and around the detention basin(s) shall not include trees or shrubs that produce seeds, fruits, or berries.

   Landscaping in the detention basin, if not rip-rap, should be in accordance with the guidance provided in ALUC "LANDSCAPING NEAR AIRPORTS" brochure, and the "AIRPORTS, WILDLIFE AND STORMWATER MANAGEMENT" brochure available at RCALUC.ORG which list acceptable plants from Riverside County Landscaping Guide or other alternative landscaping as may be recommended by a qualified wildlife hazard biologist.

   A notice sign, in a form similar to that attached hereto, shall be permanently affixed to the stormwater basin with the following language: "There is an airport nearby. This stormwater basin is designed to hold stormwater for only 48 hours and not attract birds. Proper maintenance is necessary to avoid bird strikes". The sign will also include the name, telephone number or other contact information of the person or entity responsible to monitor the stormwater basin.

5. This project has been evaluated as a 21,000 square foot industrial manufacturing building for the purposes of a cannabis growth facility. Any increase in building area or change in use will require an amended review by the Airport Land Use Commission.

6. The Federal Aviation Administration has conducted aeronautical studies of the proposed structure (Aeronautical Study No. 2020-AWP-2134-OE) and has determined that neither marking nor lighting of the structures is necessary for aviation safety. However, if marking and/or lighting for aviation safety are accomplished on a voluntary basis, such marking and/or lighting (if any) shall be installed in accordance with FAA Advisory Circular 70/7460-1 L Change 2 and shall be maintained in accordance therewith for the life of the project.

7. The maximum height of the proposed structures to top point shall not exceed 24 feet above ground level, and the maximum elevation at the top of the structures shall not exceed 2,359 feet above mean sea level.

8. The specific coordinates, height, and top point elevation of the proposed structures shall not be amended without further review by the Airport Land Use Commission and the Federal Aviation Administration; provided, however, that reduction in structure height or elevation shall not require further review by the Airport Land Use Commission.

9. Temporary construction equipment used during actual construction of the structures shall not exceed 24 feet in height and a maximum elevation of 2,359 feet above mean sea level, unless separate notice is provided to the Federal Aviation Administration through the Form 7460-1 process.

10. Within five (5) days after construction of each structure reaches its greatest height, FAA Form 7460-2 (Part II), Notice of Actual Construction or Alteration, shall be completed by the project proponent or his/her designee and e-filed with the Federal Aviation Administration. (Go to https://oeaaa.faa.gov for instructions.) This requirement is also applicable in the event the project is abandoned or a decision is made not to construct the applicable structure.

If you have any questions, please contact Paul Rull, ALUC Principal Planner, at (951) 955-6893.

Sincerely,
RIVERSIDE COUNTY AIRPORT LAND USE COMMISSION

Simon A. Housman, ALUC Director

Attachment: Notice of Airport in Vicinity
Aeronautical Study No. 2020-AWP-2134-OE

cc: Dominion Property Partners, LLC (applicant)
Albert A. Webb Associates, Cheryl Degano (representative)
Banning Lincoln Partners, LP (property owner)
Art Vela, P.E., City of Banning Director of Public Works
Carl Szoyka, Manager, Banning Municipal Airport
ALUC Case File

Y:\AIRPORT CASE FILES\Banning\ZAP1040BA20\ZAP1040BA20.LTR.doc

NOTICE OF AIRPORT IN VICINITY

This property is presently located in the vicinity of an airport, within what is known as an airport influence area. For that reason, the property may be subject to some of the annoyances or inconveniences associated with proximity to airport operations (for example: noise, vibration, or odors). Individual sensitivities to those annoyances [can vary from person to person. You may wish to consider what airport annoyances], if any, are associated with the property before you complete your purchase and determine whether they are acceptable to you. Business & Professions Code Section 11010 (b)(13)(A)

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-AWP-2134-OE

Issued Date: 03/17/2020

Evan James
Dominion Property Partners LLC
2811 Wilshire Blvd
Suite 400
Santa Monica, CA 90403

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Building 8th Street and Lincoln Street Warehouse
Location:	Banning, CA
Latitude:	33-55-16.65N NAD 83
Longitude:	116-53-05.56W
Heights:	2335 feet site elevation (SE)
	24 feet above ground level (AGL)
	2359 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 09/17/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

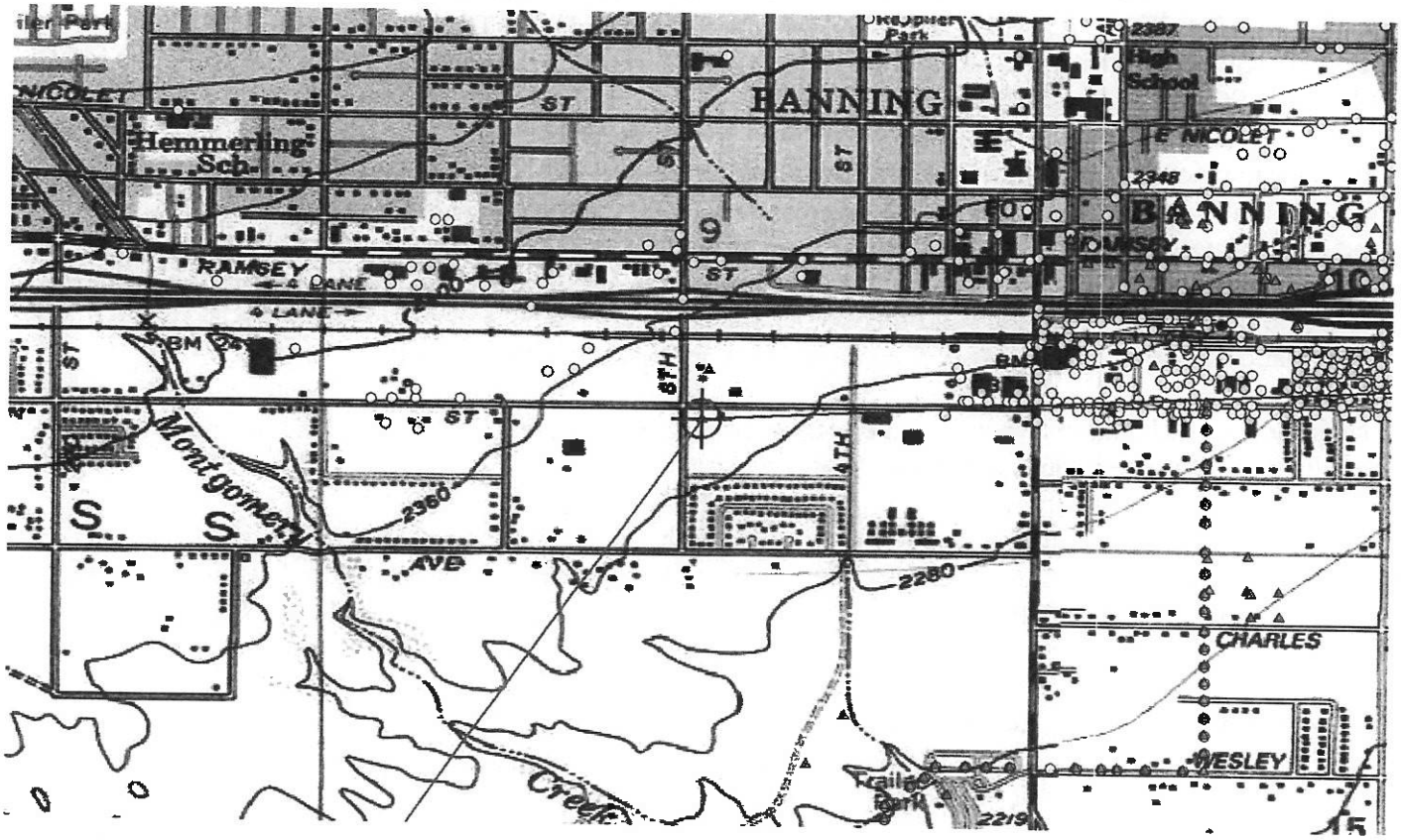
This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (816) 329-2525, or natalie.schmalbeck@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-AWP-2134-OE.

Signature Control No: 431260803-433794601 (DNE)
Natalie Schmalbeck
Technician

Attachment(s)
Map(s)

Verified Map for ASN 2020-AWP-2134-OE



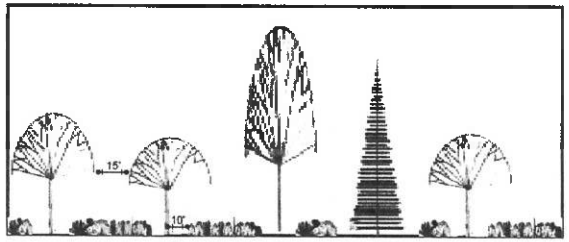


Figure 1. Selection of shrubs should be a mix of deciduous and coniferous species with no more than 50 percent evergreen species.

Plant Selection, Irrigation, and Wildlife Management. Riverside County requires landscaping for proposed development and redevelopment projects, and it is also committed to the use of native and drought-tolerant plants to reduce landscape-related water use. The County of Riverside Guide to California Friendly provides a lengthy plant palette to help landscape architects, planners, and the public select pant materials that will reduce water use in accordance with local and state goals: (http://rctlma.org/Portals/7/documents/landscaping_guidelines/Guide_to_California_Friendly_Landscaping.pdf.)

Many of the plants on the "County of Riverside California Friendly Plant List" could attract potentially hazardous wildlife species. **Table 2** provides a reduced species list, nearly all of which were excerpted from the Friendly Plant List, but are less likely to support potentially hazardous wildlife. Project sponsors should use this list for projects within an AIA.

The list is not meant to be exhaustive, and other species may be appropriate based on the project location or other project-related circumstances. Sponsors who wish to propose plant materials that are not included in **Table 1** will need to demonstrate to the ALUC that proposed species will be unlikely to attract hazardous wildlife to the AIA.

General Guidelines. Other factors can affect wildlife behavior. Landscaping can provide a food source, opportunities for shelter, nesting and perching. Proposed landscaping can help to discourage wildlife through the application of the following guidelines summarized below and described in **Table 1**.

- **Close the Restaurant!** Do not use plant material that produce a food source, such as edible fruit, seeds, berries, drupes, or palatable forage for grazing wildlife. When possible, select a non-fruiting variety or male cultivar.
- **No Vacancy!** Avoid densely branched or foliated trees; they provide ideal nesting habitat and shelter.
- **Prevent Loitering!** Select tree species that exhibit a vertical branching structure to minimize nesting and perching opportunities (**Figure 1**).

Mead & Hunt

Table 1. Design Guidance for Plant Materials

TREES

Avoid/Prevent Contiguous Canopy

1. Prevent overlapping crown structures. Contiguous crowns can provide safe passage for wildlife. Provide sufficient distance between plants to ensure that at least 15 feet of open space will remain between mature crowns (**Figure 1**).
2. Prevent homogenous canopy types and tree height. Variable canopy height will reduce thermal cover and protection from predators.

- Provide significant variation between the type of canopy and height of the species, both at planting and at maturity.
- Provide no more than 20% evergreen species on site, and never plant evergreens in mass or adjacent to each other.

SHRUBS/ACCENTS/GRASSES

Limit Coverage

Limit the amount of cover and avoid massing to prevent the creation of habitat for birds or small mammals.

- Mix deciduous, herbaceous, and evergreen species.
- Do not plant species in mass. At a minimum, provide sufficient spacing to equal the width of each species at maturity. Avoid species with the potential to creep near shrubs (Figure 2).
- Provide at least 10 feet between trees and other species greater than 1 foot in height.

GROUNDCOVER/TURF

Prevent the natural succession of landscape!

Groundcover plays a transitional role between shrubs, grasses, and trees, and this succession creates an ideal habitat for diverse wildlife (see **Figure 2**).

1. Provide a buffer and sharp edges between groundcover, turf, shrubs and trees, using hardscape or mulching.
2. When possible, use alternative groundcovers, such as decorative paving and hardscapes instead of planted groundcover/turf.
3. The use of groundcover/turf may be impractical or undesirable based on irrigation needs or site-specific conditions. Consider using the following:

- Artificial turf in place of groundcover, which can reduce maintenance and eliminate irrigation needs (**Figure 2A**).
- Porous concrete to cover smaller areas (**Figure 2B**).
- Permeable pavers to provide visual interest while promoting drainage (**Figure 2C**).

VINES

Limit Coverage

Limit the amount of cover and avoid massing to prevent the creation of habitat for birds or small mammals.

- Do not use vines to create overhead canopy or to cover structures.
- Do not plant vines to grow on the trunk or branches of trees.
- Minimize vines to areas of 5 feet or less in width. Vines require considerably more maintenance than other plant materials.

Acceptable plants from the Riverside County Landscaping Guide



Chinese Elm | Heavenly Bamboo | California Fuchsia | Deer Grass | Society Garlic

LANDSCAPING NEAR AIRPORTS:

Special Considerations for Preventing or Reducing Wildlife Hazards to Aircraft

Landscaping makes a visual statement that helps to define a sense of space by complementing architectural designs and contributing to an attractive, inviting facility. In some cases, a landscaping plan can be used to restore previously disturbed areas. However, such landscape plans are not always appropriate near airports.

Wildlife can pose hazards to aircraft operations, and more than 150 wildlife strikes have been recorded at Riverside County. The Riverside County Airport Land Use Commission (ALUC) prepared this guidance for the preparation of landscape designs to support FAA's efforts to reduce wildlife hazards to aircraft. This guidance should be considered for projects within the Airport Influence Area (AIA) for Riverside County Airports. The following landscape guidance was developed by planners, landscape architects and biologists to help design professionals, airport staff, and other County departments and agencies promote sustainable landscaping while minimizing wildlife hazards at Riverside County's public-use airports.

Discouraging Hazardous Wildlife. Plant selections, density, and the configuration of proposed landscaping can influence wildlife use and behavior. Landscaping that provides a food source, perching habitat, nesting opportunities, or shelter can attract raptors, flocking birds, mammals and their prey, resulting in subsequent risks to aviators and the traveling public.

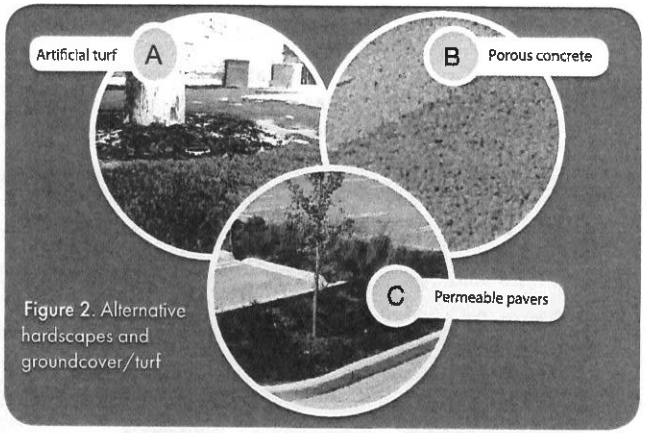


Figure 2. Alternative hardscapes and groundcover/turf

Riverside County Airport Land Use Commission



Acceptable.
The trees above have a vertical branching structure that minimizes perching and nesting opportunities.



Not acceptable.
Examples of trees that are attractive to birds because of horizontal branching structure.



Not acceptable.
Trees, shrubs and plants that produce wildlife edible fruit and seeds should be avoided.

Landscaping needs to be aesthetically pleasing, but it must coincide with the responsibility for aviation safety.

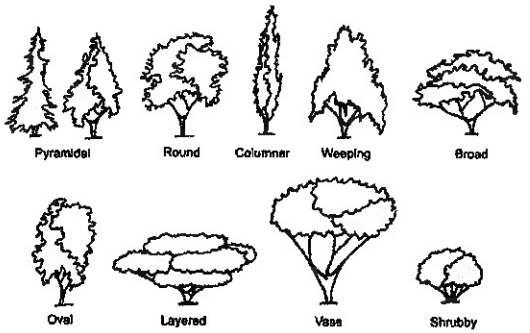
TABLE 2. Acceptable Plants from Riverside County Landscaping Guide

	Scientific Name	Common Name	WOCOLS Region 1, 2	Sunset Zone
TREES	*Cercis occidentalis*	Western Redbud	VL: 1, 2, L: 3,4	2-24
	Olea europaea 'Swan Hill'	Fruitless Olive	GL: 1,2; L: 3, 4, M: 5,6	8,9; 11-24
	Pinus spp.	Pine, various species	Varies by species	Varies by species
	Rhus lancea	African Sumac	L: 1-4; M: 5-6	8-9; 12-24
	*Robinia neomexicana**	Desert Locust	L: 1-4; M: 5-6	2-3, 7-11, 14, 18-24
	Robinia x ambgua	Locust	L: 1-4; M: 5-6	2-24
	Ulmus parvifolia	Chinese Elm	M: 1-6	3-24
SHRUBS	*Aloysia triphylla*	Lemon Verbena	L: 1-6	9-10;12-21
	Cistus spp.	Rockrose	L: 1-6	6-9, 14-24
	Dalea pulchra	Bush Dalea	L:6	12,13
	Encelia farinosa	Brittlebush	VL:3; L:3-6	
	Gravellia Noelli	Noel's Grevellia	L: 1-4; M: 6	
	Justicia californica	Chuparosa	M: 1,6; VL: 3; L: 4-5	
	Langana camara	Busn lantana	L: 1-4; M: 6	
	Lavendula spp.	Lavender	L: 105; M: 5-6	2-24; varies
	Nandina domestica species	Heavenly Bamboo	L: 1-4; M: 5-6	
	Rosmarinus officinalis 'Tuscan Blue'	Tuscan Blue Rosemary	L: 1-4; M: 5-6	
	Salvia greggia	Autumn sage	L: 1-4; M: 5-6	
GROUND COVER	*Artemisia pycnocephala*	Sandhill Sage	VL:1	
	Oenothera caespitosa	White Evening Primrose	L: 1-2, 3-5	103,7-14, 18-21
	Oenothera stubbei	Baja Evening Primrose	L:1-6	10-13
	Penstemon baccharifolious	Del Rio	L: 4-6	10-13
	Trachelospermum jasminoides	Star Jasmine	M:1-6	8024
	Zauschneria californica	California Fuchsia	L: 1,2,4; VL: 3; M.5-6	2011, 14-24
GRASSES	*Cortaderia dioica [syn. C. selloana]*	Pampass Grass	N/A	N/A
	Festuca spp.	Fescue	Varies by Species	Varies by Species
	Zoysia 'Victoria'	Zoylsia Grass	60% of ETO	8-9, 12-24
ACCENT GRASSES	*Agave species*	Agave	L: 1-4, 6	10, 12-24 (Varies)
	Aloe species	Aloe	L: 1-4, 6	8-9, 12-24
	Chondropetalum Itectorum	Cape Rush	H:1; M:3	8-9, 12-24
	Dasylirion species	Desert Spoon	VL: 1, 4-6	10-24
	Deschampsia caespitosa	Tufted Hair Grass	L: 1-4	2-24
	Festuca (ovina) glauca	Blue Fescue	L: 1-2; M:3-6	1-24
	Dietes bicolor	Fortnight Lily		VL:1, L:3-6
	Echinocactus grusonii	Golden Barrel Cactus	VL:1-2, L: 3-4, 6	12-24
	Fouquieria splendens	Ocotillio	L: 1, 4-6; VL: 3	10-13, 18-20
	Hesperaloe parviflora	Red / Yellow Yucca	VL:3, L: 4-6	2b, 3, 7-16, 18-24
	Muhlenbergia rigens	Deer Grass	L: 1,3; M: 2, 4-6	4-24
	Opuntia species	Prickly Pear, Cholla	VL: 1-3; L: 4-6	Varies by Species
	Penstemon parryi	Parry's Beardtongue	L:1-6	10-13
	Penstemon superbus	Superb Beardtongue	L: 1-6	10-13
	Tulbaghia violacea	Society garlic	M:1-4, 6	13-24
	Yucca species	Yucca	L:1-6	Varies by Species

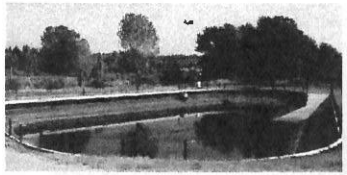


Not recommended are trees that overlap, allowing birds to move safely from tree to tree without exposure to the weather or predators.

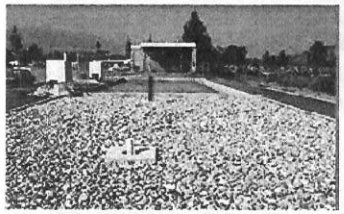
Tree species should be selected and planted so that, at maturity, overlapping crown structures will be minimized.



Trees approved for planting should have varied canopy types and varied heights, both at time of planting and at maturity. A combination of the styles illustrated above is recommended.



Adaptive measures such as liners, a concrete basin, and overhead wire grid can make extended detention strategies less attractive to hazardous wildlife.



Infiltration basins with rock bottoms are less attractive to birds because they mask water and do not provide vegetation.



Vegetated bioswales improve water quality and prevent water accumulation. However, dense and tall vegetation may be attractive to hazardous wildlife.

STORMWATER BEST MANAGEMENT PRACTICES

Riverside County and its incorporated cities require water quality/stormwater management controls for development and redevelopment projects. The Riverside Conservation District has prepared a separate Water Quality Management Plan for each watershed in the County that identifies treatment control Best Management Practices (BMPs) for improving water quality and managing stormwater volumes/flows following the design storm (i.e., 24-hour storm). Structural BMPs identified in Riverside County guidance and their compatibility within the AIA are summarized in **Table 1**.

ADDITIONAL RESOURCES/MORE INFORMATION:

- Riverside County Flood Control and Water Conservation District, Water Quality Management Webpage. Available at: http://rcflood.org/npdes.
- FAA Advisory Circular 150/5200-33, "Wildlife Hazard Attractants On and Near Airports": https://www.faa.gov/documentLibrary/media/advisory_circular/150-5200-33B/150_5200_33b.pdf.
- Airport Cooperative Research Program, Balancing Airport Stormwater and Bird Hazard Management: https://www.nap.edu/login.php?action=guest&record_id=22216.

Mead & Hunt

Table 2. Recommended Measures to Reduce Wildlife Attraction Associated with Stormwater BMPs

BMP Characteristic	Recommended Design Measure
Exposed Surface Water • Especially attractive to waterfowl, shorebirds, and flocking birds. • Provides source for drinking and nest building. • More attractive when constructed near other open water features or ponds.	• Reduce availability by providing 48-hour drawdown following a design storm (i.e., 24-hour storm). • Cover using bird balls. • Consider earth-bottom culverts, French drains, trench covers, and underground storage options. • Avoid within 8 km (5 miles) of other open water features or facilities.
Vegetation and Landscaping • Provides food. • Tall vegetation provides shelter and nesting opportunities. • Diverse vegetation attracts more diverse wildlife.	• Eliminate vegetation (concrete banks, steep slopes, etc.). • If necessary, provide a monoculture or decreased diversity. • Never use species that provide a food source (seeds, berries, nuts, and drupes). • Provide regular maintenance to prevent seeding and shelter.
Aspect/Geometry • Slopes can provide opportunities for nesting and loafing.	Avoid or reduce available shoreline: • Implement narrow, linear trenches rather than open water or regular circles as pond shapes. • Create steep slopes (<3:1). • Avoid irregular shapes for basins. • Avoid vegetation.

WHAT YOU CAN DO:

Airport operators, developers and communities must work together to manage stormwater in the airport vicinity to reduce hazards to air travelers and the public while addressing site-specific challenges.

- Identify whether your project is near an airport and in an AIA or critical area. (http://www.rcaluc.org/Plans/New-Compatibility-Plan).
- Work with the airport operator, ALUC, and city/county staff to identify an acceptable water quality management strategy.
- Contact the applicable airport to review your stormwater plans or request plan review by a FAA-qualified wildlife biologist. The form is available at: http://www.rcaluc.org/Portals/0/PDFGeneral/form/Wildlife%20Attractants%20-%20FAA%20Review.pdf.



AIRPORTS, WILDLIFE AND STORMWATER MANAGEMENT

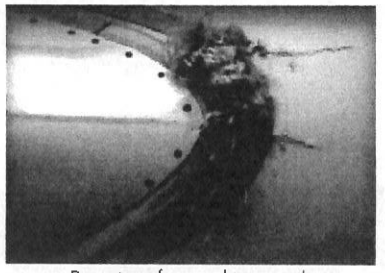
GUIDANCE FOR PROPOSED PROJECTS IN AN AIRPORT INFLUENCE AREA

Riverside County includes diverse topography and is home to three watersheds and a portion of the Salton Sea, an important stop along the Pacific Flyway for migrating bird species. The County's arid climate makes water quality management and water conservation paramount.

The County is also the home to Palm Springs International Airport, 12 public use general aviation airports, and the March Air Reserve Base, whose operations can be challenged by the presence of hazardous wildlife such as raptors, water-fowl, doves/pigeons, gulls, flocking birds, and mammals (coyote and deer). Since 1990, more than 150 wildlife strikes with aircraft have occurred in Riverside County, some of which have led to substantial aircraft damage. Most strikes occur at low altitude (less than 3,500 feet above runway height). Much of the geographic area associated with these altitudes coincides with an Airport Influence Area (AIA) as defined in the Riverside County Airport Land Use Compatibility Plan (ALUCP).

AIRPORTS, WILDLIFE AND STORMWATER MANAGEMENT

The Federal Aviation Administration (FAA) identifies stormwater management facilities on and near airports as one of the greatest attractants to hazardous wildlife. Many species are attracted to open water features and associated vegetation that offers water, food, and shelter. The FAA warns against the construction of new open water bodies or mitigation sites within 10,000 feet of aircraft movement areas and within 5 miles of approach/departure surfaces (FAA Advisory Circular 150/5200-33B).



Remains of an owl ingested by an aircraft engine.

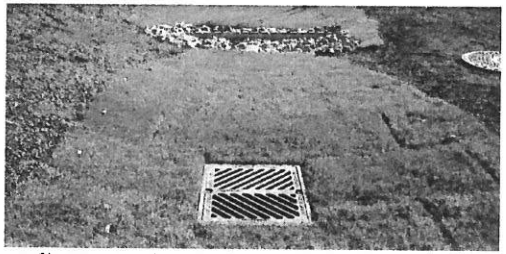
Riverside County
Airport Land Use Commission

Low-Impact Development. In recent years, Riverside County has focused on Low-Impact Development (LID), which includes techniques to filter, store and retain runoff on-site. LID BMPs retain runoff to optimize infiltration/recharge, and many promote the use of vegetation to provide for the uptake of pollutants. Although LID BMPs can provide environmental, economic and community benefits, they can retain open water for prolonged periods and attract hazardous wildlife. Many LID BMPs are incompatible with aircraft operations and must be considered with caution within the AIA.

Aviation-Specific Stormwater Management. FAA acknowledges that project-related BMPs must consider many non-aviation factors, such as soil types, space requirements, maintenance, constructability, etc. United States Department of Agriculture (USDA) and FAA have identified specific design characteristics that should be considered during BMP design and incorporated to make most BMPs less attractive to wildlife (**Table 2**).

ADAPTIVE MEASURES

When open water detention ponds must be used within the AIA, the ponds may be equipped with bird balls, floating covers, nets, or overhead wires to cover open water and discourage use by hazardous wildlife. For example, concrete basins are unlikely to attract wildlife, and pond liners can prevent the development of hydrophytic vegetation. These technologies must be used with caution and only in areas with controlled access.



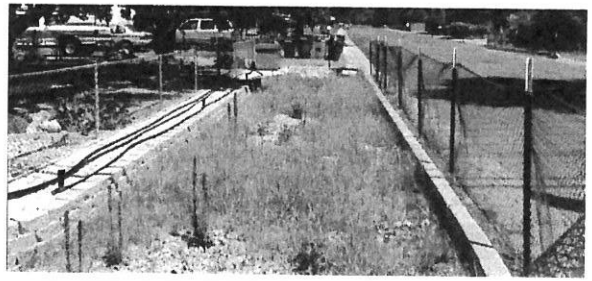
Infiltration trenches detain water for brief periods. This trench at Seattle-Tacoma Airport includes vegetation appropriate for an airport environment.



Bioretention facilities can provide food and shelter for potentially hazardous wildlife, but may be suitable with modification.

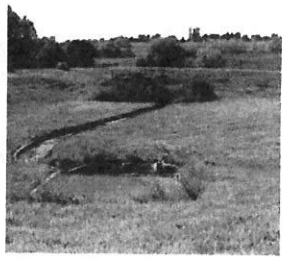
Table 1. Structural Best Management Practices (BMPs) and Compatibility in an Airport Influence Area (AIA)

BMP	Compatibility within the AIA
Infiltration trenches Recommended	■ Suitable because water accumulates below ground surface. ■ Vegetation must be selected and reviewed by a FAA-qualified Airport Wildlife Hazard Biologist (qualified biologist) to discourage wildlife.
Permeable Pavement Recommended	Does not include water storage. Appropriate for parking lots and other paved surfaces that are not high-traffic areas.
Harvest and Use (RWH) Recommended	Suitable as long as water is stored in enclosed areas.
Sand Filter Basins Recommended	Desirable because standing water is treated through an underdrain system.
Vegetated Filter Strips and Vegetated Swales Recommended	Desirable because neither BMP involves ponded water. However, vegetation must be selected to discourage hazardous wildlife and reviewed by a qualified biologist.
Water Quality Inlets Recommended	Desirable because they do not provide ponded water. Associated vegetation must be selected to discourage hazardous wildlife and reviewed by a qualified biologist.
Infiltration Basins Not recommended without Modification. Suitable only if design addresses wildlife hazards	■ Unsuitable in ALUCP Compatibility Zone A. ■ Suitable in Zones B and C with appropriate modifications, such as: Drawdown within 48 hours or manufactured cover to prevent view and availability of open water; and absence of landscape or landscaping approved by a qualified biologist. ■ Steep slopes (steeper than 3:1).
Bioretention Facilities Not Recommended without Modification (also known as rain gardens bioretention basins, infiltration basins, landscaped filter basins)	Although bioretention can mask open water, BMP is not recommended for airports based on its potential to provide food, water, and shelter for hazardous wildlife. ■ Unsuitable in Compatibility Zone A. ■ Potentially suitable in Zones B and C only when small in size (e.g., parking islands, site entrances, planter boxes, etc.) and when vegetation is selected to discourage hazardous wildlife and reviewed by a qualified biologist. ■ Potentially suitable in Zones D and E when basin is less than 30 feet in length/width; and vegetation is selected to discourage hazardous wildlife and reviewed by a qualified biologist.
Extended Detention Basin Not Recommended	■ Unsuitable in Zones A through C. ■ Should be avoided in Zones D and E. If necessary, modify detention period to provide no visible water within 48 hours; provide steep slopes (1:1), provide hardscape for walls and sides; and do not provide vegetation within or adjacent to the pond.



Small bioretention facilities that provide sparse vegetation may be suitable in an aviation environment.

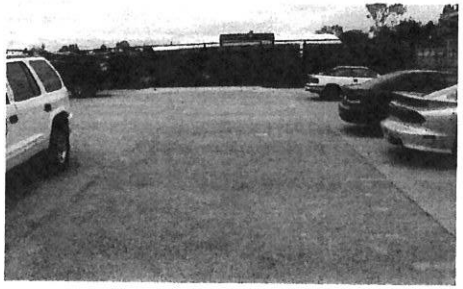




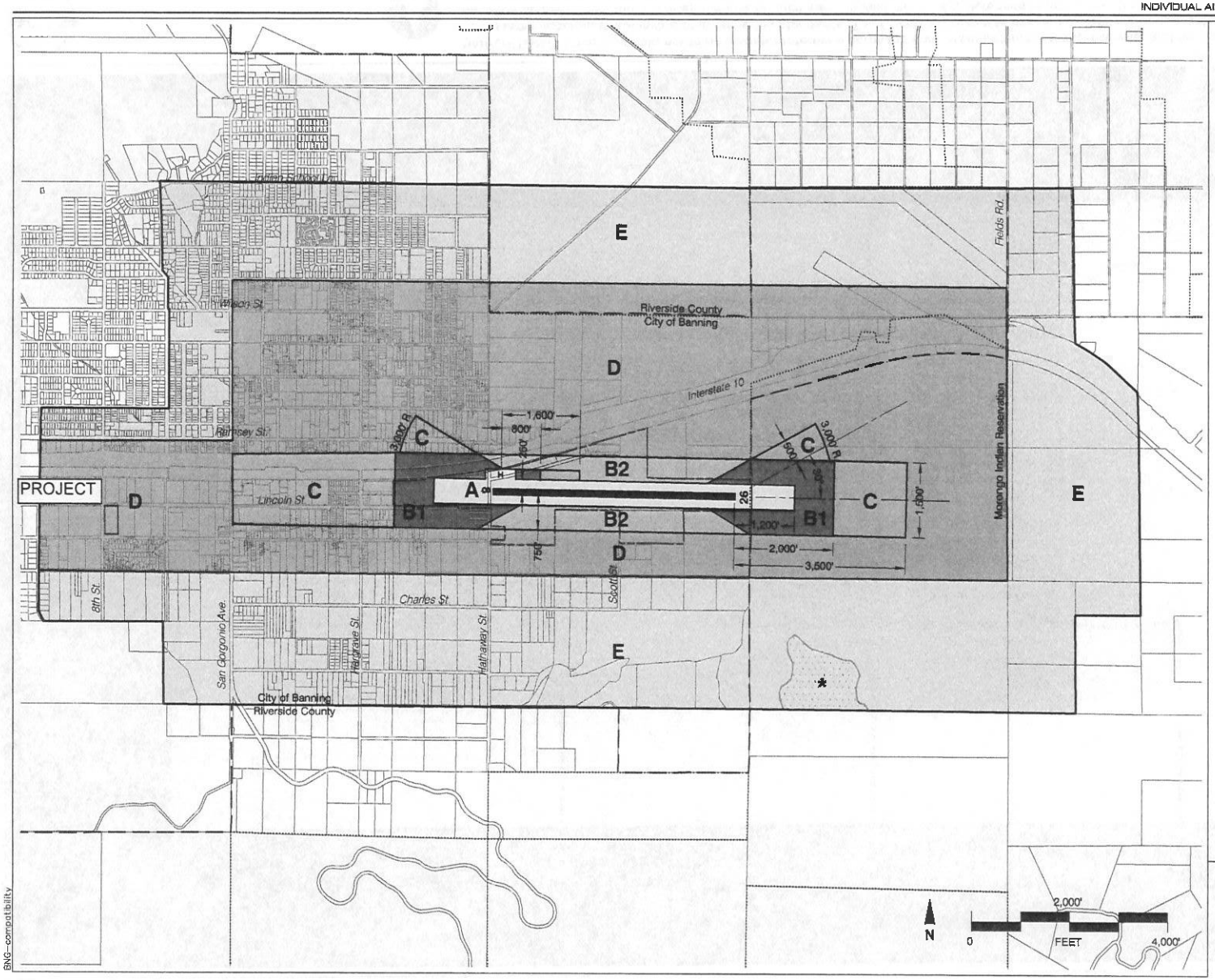
Extended detention basins are frequently used to serve both water quality management and to provide amenities. These basins hold water and would not be appropriate within an AIA because of the open water.



Sand filter at the base of the bioswale promotes infiltration.



Porous pavements allow water to infiltrate to a soil layer below the surface.



Legend

Compatibility Zones

- Airport Influence Area Boundary
- Zone A
- Zone B1
- Zone B2
- Zone C
- Zone D
- Zone E
- Height Review Overlay Zone

Boundary Lines

- Airport Property Line
- City Limits
- Morongo Indian Reservation

Note

Dimensions measured from runway ends and centerlines.

See Chapter 2, Table 2A for compatibility criteria associated with this map.

Riverside County
Airport Land Use Commission

Riverside County
Airport Land Use Compatibility Plan
Policy Document

(Adopted October 2004)

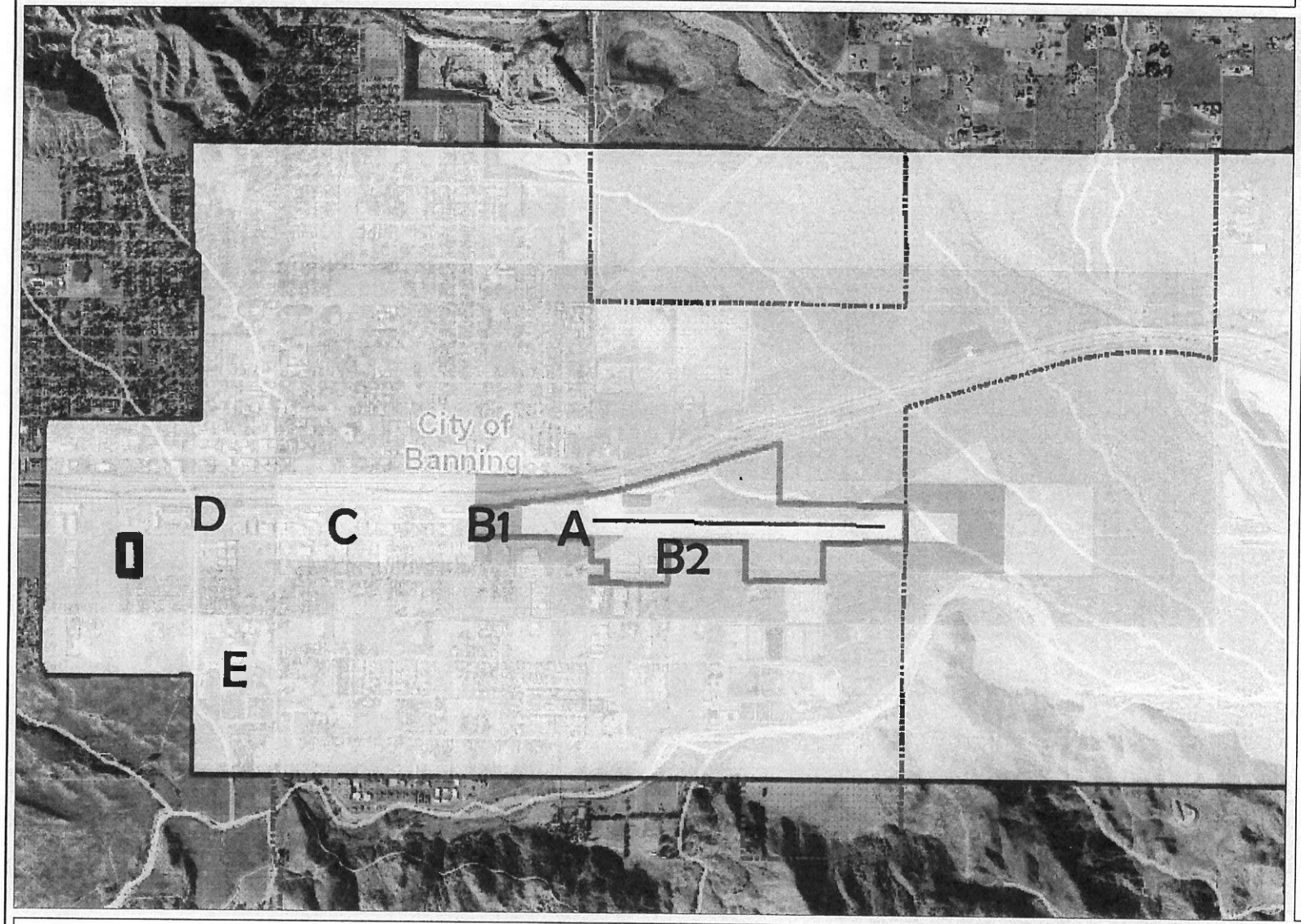
Map BN-1

Compatibility Map

Banning Municipal Airport

BNG-compatibility

Map My County Map





Legend

- Runways
- Airports
- Airport Influence Areas

Airport Compatibility Zones

- OTHER COMPATIBILITY ZONE
- A
- A-EXC1
- B1
- B1-APZ I
- B1-APZ I-EXC1
- B1-APZ II
- B1-APZ II-EXC1
- B1-EXC1
- B2
- B2-EXC1
- C
- C1
- C1-EXC1
- C1-EXC3
- C1-EXC4
- C1-HIGHT
- C2
- C2-EXC1
- C2-EXC2
- C2-EXC3
- C2-EXC5
- C2-EXC6

RCIT

0 3,079 6,157 Feet

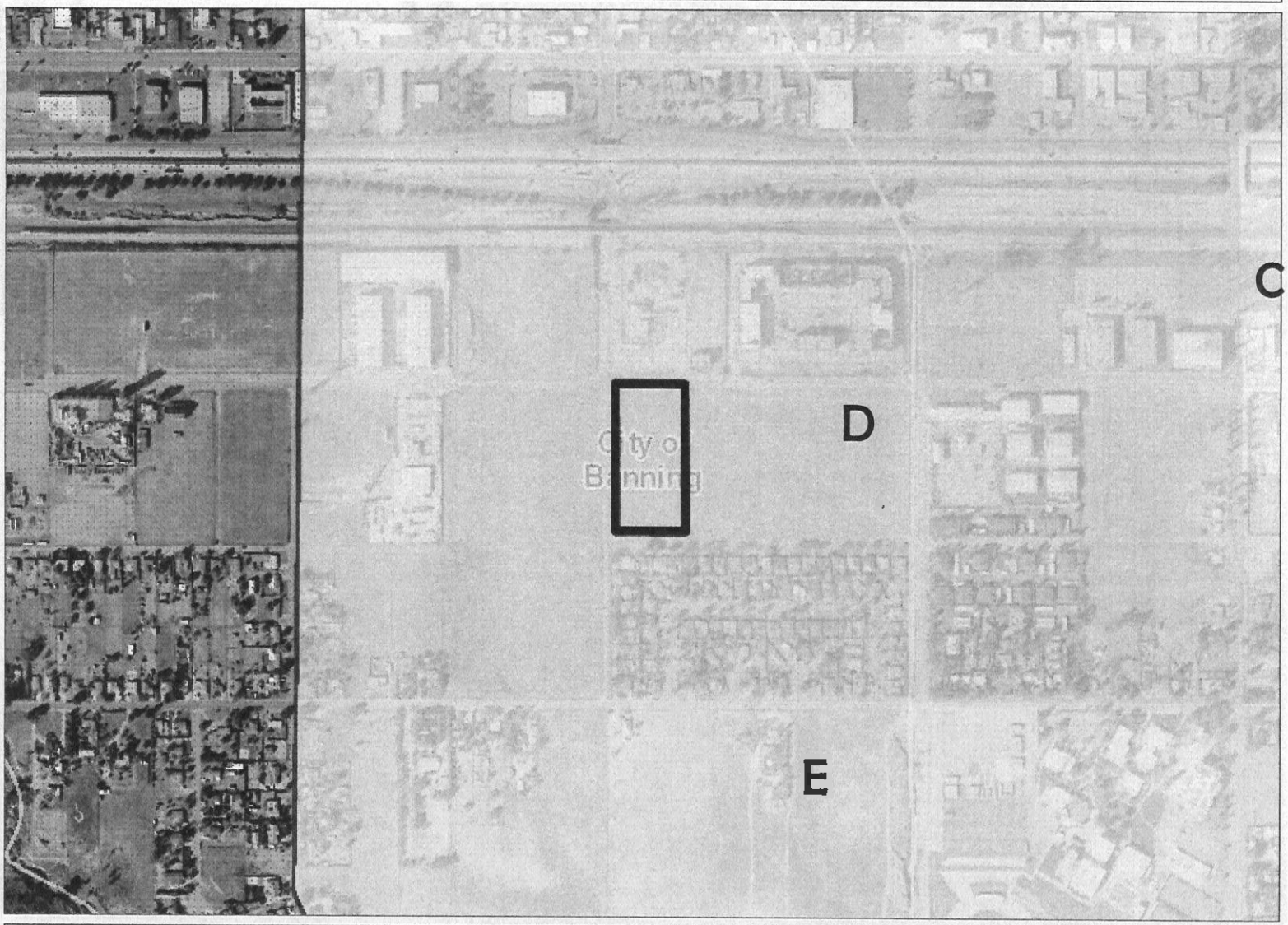
IMPORTANT Maps and data are to be used for reference purposes only. Map features are approximate, and are not necessarily accurate to surveying or engineering standards. The County of Riverside makes no warranty or guarantee as to the content (the source is often third party), accuracy, timeliness, or completeness of any of the data provided, and assumes no legal responsibility for the information contained on this map. Any use of this product with respect to accuracy and precision shall be the sole responsibility of the user.

REPORT PRINTED ON... 2/3/2020 8:28:31 AM

© Riverside County GIS

Notes

Map My County Map





Legend

- Runways
- Airports
- Airport Influence Areas
- Airport Compatibility Zones
  - OTHER COMPATIBILITY ZONE
  - A
  - A-EXC1
  - B1
  - B1-APZ I
  - B1-APZ I-EXC1
  - B1-APZ II
  - B1-APZ II-EXC1
  - B1-EXC1
  - B2
  - B2-EXC1
  - C
  - C1
  - C1-EXC1
  - C1-EXC3
  - C1-EXC4
  - C1-HIGHT
  - C2
  - C2-EXC1
  - C2-EXC2
  - C2-EXC3
  - C2-EXC5
  - C2-EXC6

RCIT

0 770 1,539 Feet

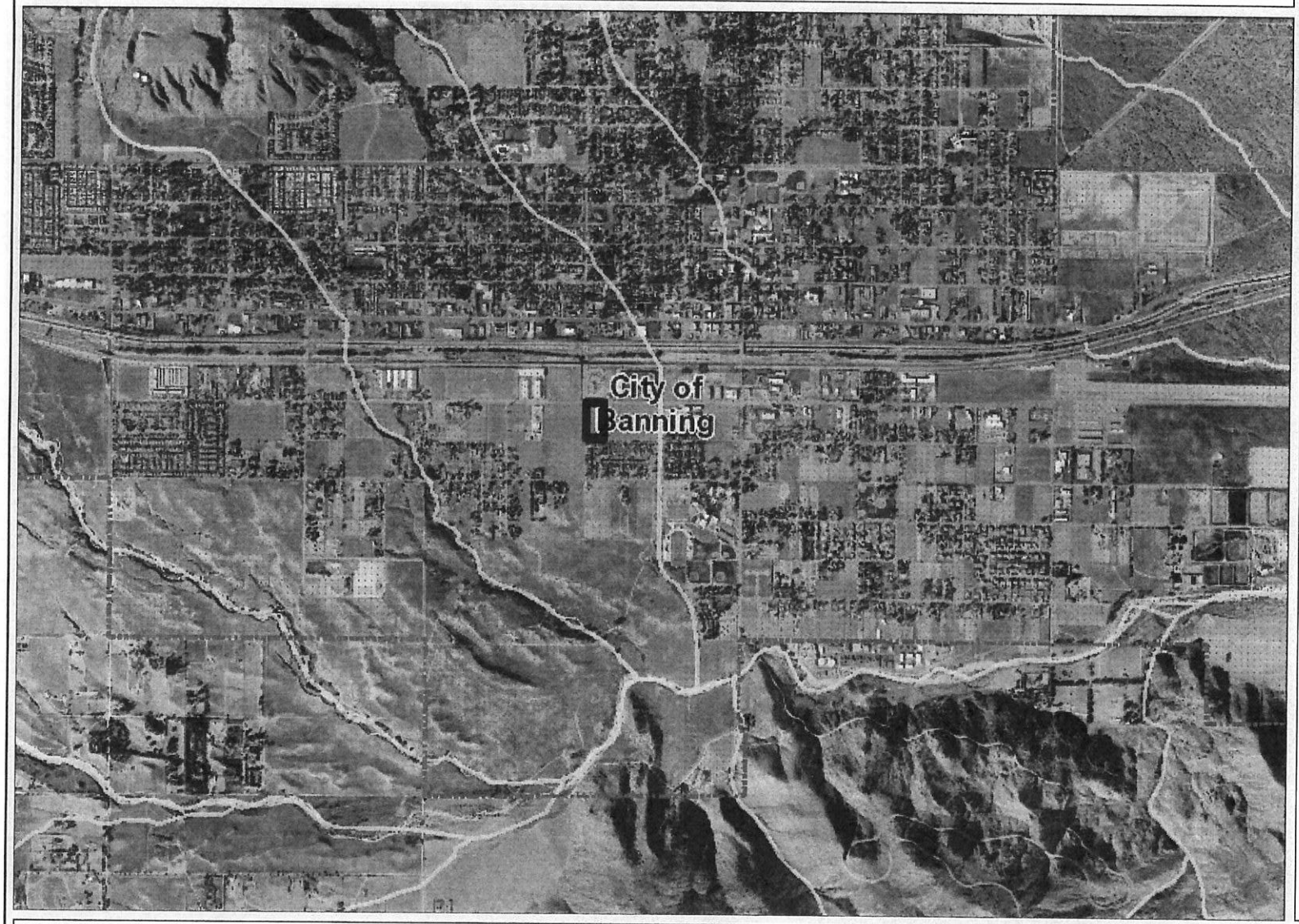
IMPORTANT Maps and data are to be used for reference purposes only. Map features are approximate, and are not necessarily accurate to surveying or engineering standards. The County of Riverside makes no warranty or guarantee as to the content (the source is often third party), accuracy, timeliness, or completeness of any of the data provided, and assumes no legal responsibility for the information contained on this map. Any use of this product with respect to accuracy and precision shall be the sole responsibility of the user.

REPORT PRINTED ON... 2/3/2020 8:26:41 AM

© Riverside County GIS

Notes

Map My County Map





Legend

- Blueline Streams
- City Areas
- World Street Map

RCIT

0 3,079 6,157 Feet

IMPORTANT Maps and data are to be used for reference purposes only. Map features are approximate, and are not necessarily accurate to surveying or engineering standards. The County of Riverside makes no warranty or guarantee as to the content (the source is often third party), accuracy, timeliness, or completeness of any of the data provided, and assumes no legal responsibility for the information contained on this map. Any use of this product with respect to accuracy and precision shall be the sole responsibility of the user.

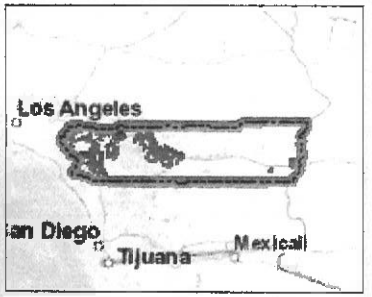
REPORT PRINTED ON... 2/3/2020 8:29:21 AM

© Riverside County GIS

Notes

Map My County Map





Legend

- Blueline Streams
- City Areas
- World Street Map

RCIT

0 770 1,539 Feet

IMPORTANT Maps and data are to be used for reference purposes only. Map features are approximate, and are not necessarily accurate to surveying or engineering standards. The County of Riverside makes no warranty or guarantee as to the content (the source is often third party), accuracy, timeliness, or completeness of any of the data provided, and assumes no legal responsibility for the information contained on this map. Any use of this product with respect to accuracy and precision shall be the sole responsibility of the user.

REPORT PRINTED ON... 2/3/2020 8:27:22 AM

© Riverside County GIS

Notes

Map My County Map





Legend

- Parcels
- Blueline Streams
- City Areas
- World Street Map

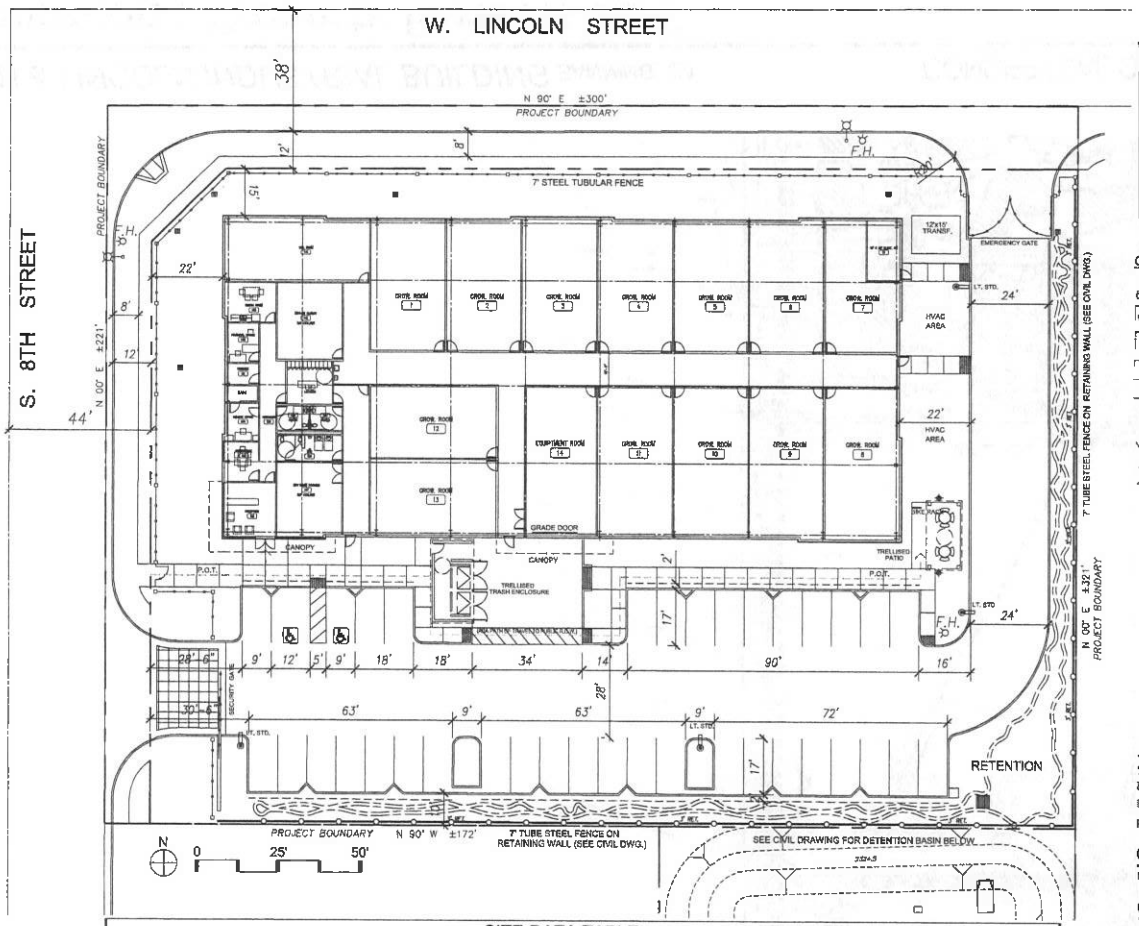
Notes

IMPORTANT Maps and data are to be used for reference purposes only. Map features are approximate, and are not necessarily accurate to surveying or engineering standards. The County of Riverside makes no warranty or guarantee as to the content (the source is often third party), accuracy, timeliness, or completeness of any of the data provided, and assumes no legal responsibility for the information contained on this map. Any use of this product with respect to accuracy and precision shall be the sole responsibility of the user.

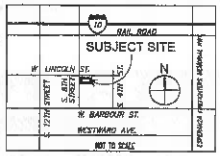
0 385 770 Feet

REPORT PRINTED ON... 2/3/2020 8:30:02 AM

© Riverside County GIS



VICINITY MAP:



GRAPHIC LEGEND:

- = OFFICE ENTRY
- G.D. = GRADE DOOR (14'X14')
- = A.D.A. ACCESSIBLE PRKG.
- = PROPERTY LINE (SEE CIVIL)
- = CANOPY OR OVERHANG
- = CENTERLINE OR GRID LINE
- = EASEMENT (SEE CIVIL)
- = TRASH ENCLOSURE WITH SOLID ROOF, A.D.A ACCESIBLE
- = WB-67' TRACTOR TRAILER
- = ADA PATH OF TRAVEL
- = STEEL TUBULAR FENCE

SHEET # SHEET DESCRIPTION:

A1 SITE PLAN & PROJECT DATA
A2 OVER ALL MASTER PLAN
A3 ENLARGED FIRST FLOOR PLAN
A4 ENLARGED OFFICE PLAN & FENCE ELEV.
A5 CONCEPT BUILDING ELAVATIONS
L1 CONCEPT LANDSCAPE PLAN
C1 CONCEPTUAL GRADING PLAN

COLOR EXHIBITS

CONCEPT COLOR BUILDING ELAVATIONS
CONCEPT COLOR LANDSCAPE PLAN

PROJECT TEAM:

ARCHITECT:
ARCHITECTS ORANGE
144 NORTH ORANGE STREET
ORANGE, CALIFORNIA 92866
CONTACT: DAN MACDAVID
714-639-9860 - PRINCIPAL
OR STEPHEN PRZYBYLOWSKI
714-417-1122 - SENIOR DESIGNER

CIVIL ENGINEER:
HUNSAKER & ASSOCIATES IRVINE,INC.
JESSE GREEN
3 HUGHES IRVINE, CA 92618
OFFICE 949-583-1010 MOBILE 714-812-1058
swalvil@gmail.com

LANDSCAPE ARCHITECT:
SPLA
SCOTT PETERSON LANDSCAPE ARCHITECT
2883 VIA RANCHEROS WAY
FALLBROOK, CA 92028
CONTACT: SCOTT-(760) 842-9993
ANGELA-(714) 398-4879 scott@splain.com

OWNER REPRESENTATIVE:
EVAN JAMES
CHIEF OPERATING OFFICER
DOMINION PROPERTY PARTNERS LLC
2811 WILSHIRE BLVD. SUITE 400
SANTA MONICA, CA 90403
O:(310)-654-7144 M:(310)458-0069
ej@dominionllc.com

ZONING / LAND USE:

EXISTING ZONING - INDUSTRIAL
EXISTING: - VACANT
PROPOSED: - OFFICE / WAREHOUSE / MANUFACTURING

ZONING / LAND USE:

APN 540-250-001

OCCUPANCY CLASSIFICATION:

BUILDING: BS1, F1

GENERAL NOTES:

THE LIGHT INDUSTRIAL (IL) ZONE ONLY REQUIRES A 10' SET BACK ON ALL FRONTAGES. THE PROPOSED INDUSTRIAL WAREHOUSE FACILITY SHALL BE DEVELOPED ON ACCORDANCE (DEVELOPMENT STANDARDS) OF THE CITY BANNING DEVELOPMENT CODE.

ALL PROPOSED SIGNAGE SHALL BE IN COMPLIANCE TO CITY OF BANNING DEVELOPMENT CODE.

SITE DATA TABLE

BUILDING	GROSS LAND AREA AC	GROSS LAND AREA SF	FAR %	BLDG. FOOT PRINT	BLDG. MEZZ.	TOTAL BLDG. S.F.	OFFICE S.F.	WAREHOUSE S.F.	OFFICE PARKING	WAREHOUSE PRKG.	PARKING REQ.	PARKING PROV.
1	1.84AC±	78,408±	26.7%	21,000	~	21,000	2,500	17,500	~	~	37	37

NET LAND AREA WITHOUT DETENTON AREA = 57,585± LANDSCAPE AREA = 19,500SF± OR 24.8% OF GROSS LAND AREA PARKING = 1/600 + 2 STALLS

DRIVE PAVING AREA = 10,490SF± DRIVE PAVING AREA + PARKING = 17,360SF±

PROJECT DESCRIPTION:

THE BUILDING IS TO BE CONSTRUCTED ON THE NORTH 1.59AC PORTION OF THE SITE. THE PROPOSED BUILDING IS 21,000SF FOOT PRINT. THE BUILDING WILL BE USED AS A CANNABIS GROW / DISTRIBUTION FACILITY.

DISCLAIMER:

ALL INFORMATION CONTAINED HEREIN MAY BE SUBJECT TO CHANGE PENDING OWNER AND OR AGENCY REVIEW AND IS FOR INFORMATION ONLY

8TH & LINCOLN INDUSTRIAL BUILDING BANNING, CA

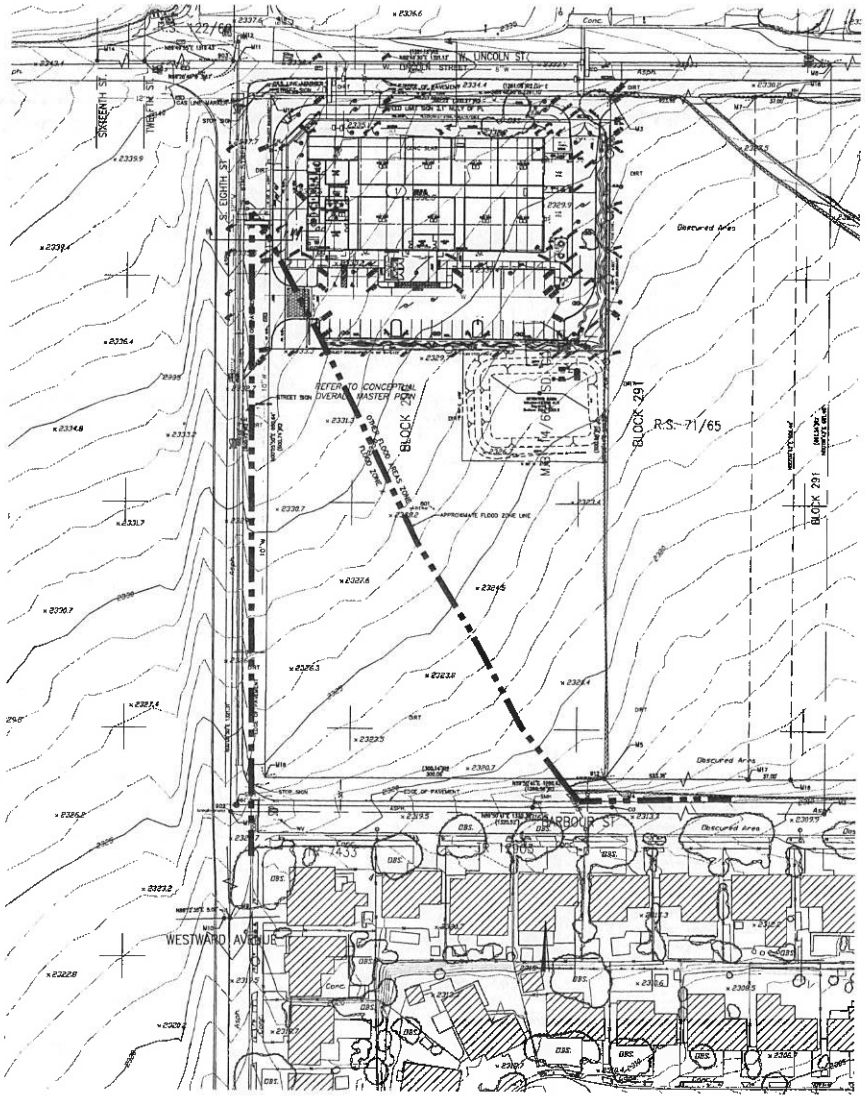
CONCEPTUAL SITE PLAN & FIRST FLOOR PLAN 01-22-2020

AOR: 2019

Architects Orange

Dominion | Property Partners LLC

A-1 144 North Orange St. Orange, CA 92866 (714) 639-9860



DISCLAIMER:
ALL INFORMATION CONTAINED HEREIN MAY BE SUBJECT TO CHANGE PENDING OWNER AND OR AGENCY REVIEW AND IS FOR INFORMATION ONLY

8TH & LINCOLN INDUSTRIAL BUILDING *BANNING, CA*

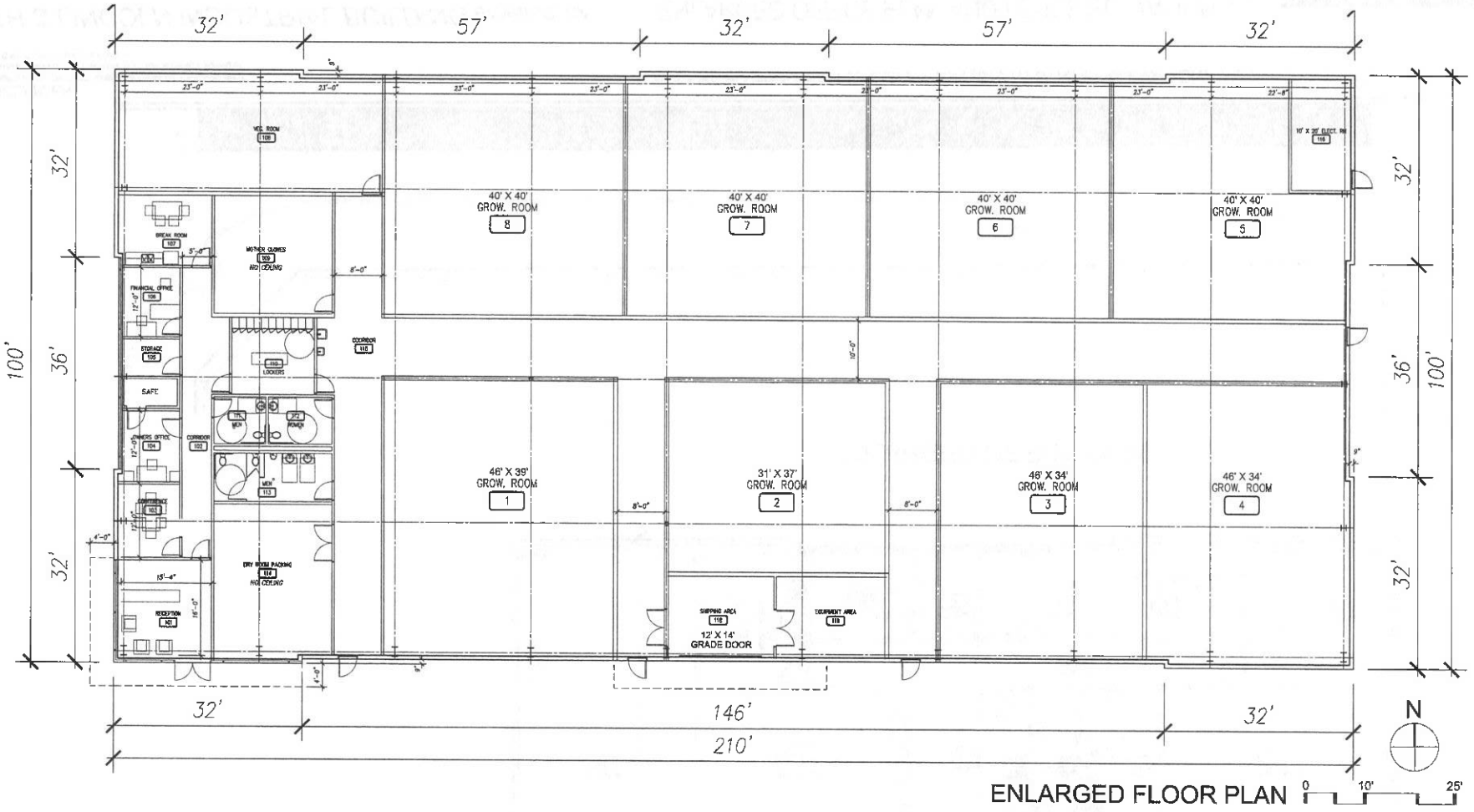
CONCEPTUAL OVERALL MASTER PLAN 10-24-2019

AO#: 2019

Dominion | Property Partners LLC

A-2

Architects Orange
144 North Orange St. Orange, CA 92866 (714) 639-9860



ENLARGED FLOOR PLAN 0 10' 25'

DISCLAIMER:
ALL INFORMATION CONTAINED HEREIN MAY BE SUBJECT TO CHANGE PENDING OWNER AND OR AGENCY REVIEW AND IS FOR INFORMATION ONLY

8TH & LINCOLN INDUSTRIAL BUILDING BANNING, CA

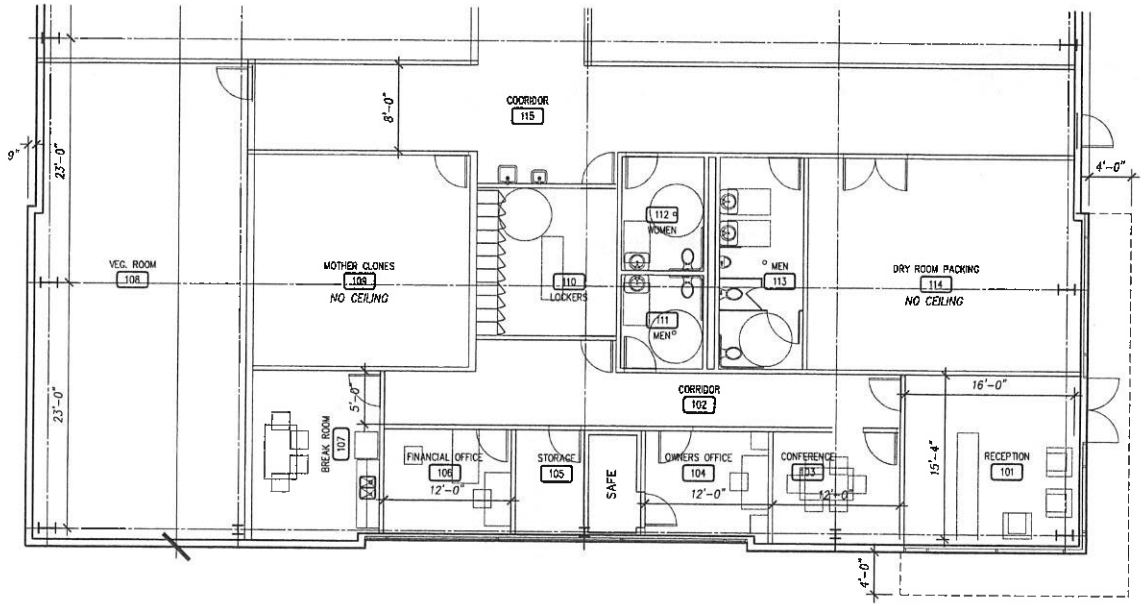
CONCEPTUAL FIRST FLOOR PLAN 10-24-2019

AOR: 2019

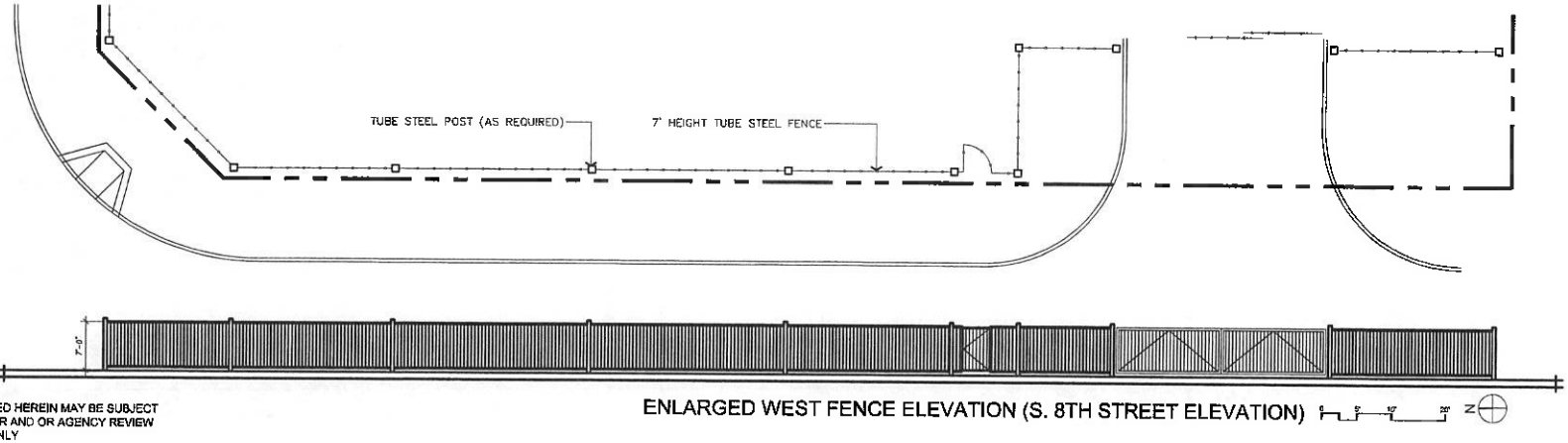
Architects Orange

Dominion | Property Partners LLC

A-3 144 North Orange St. Orange, CA 92866 (714) 639-9860



ENLARGED OFFICE PLAN 0 5' 10' 20' N



ENLARGED WEST FENCE ELEVATION (S. 8TH STREET ELEVATION)

DISCLAIMER:
ALL INFORMATION CONTAINED HEREIN MAY BE SUBJECT TO CHANGE PENDING OWNER AND OR AGENCY REVIEW AND IS FOR INFORMATION ONLY

8TH & LINCOLN INDUSTRIAL BUILDING BANNING, CA

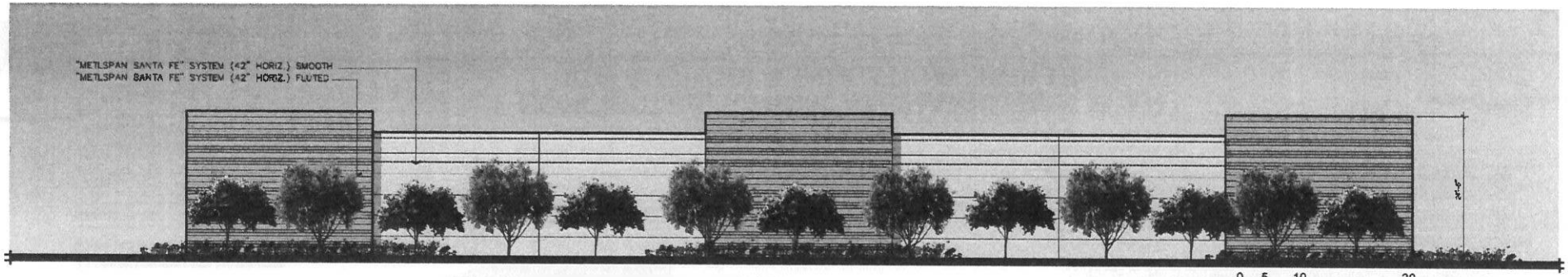
ENLARGED OFFICE PLAN AND FENCE ELEVATION 10-24-2019

AQ# 2019

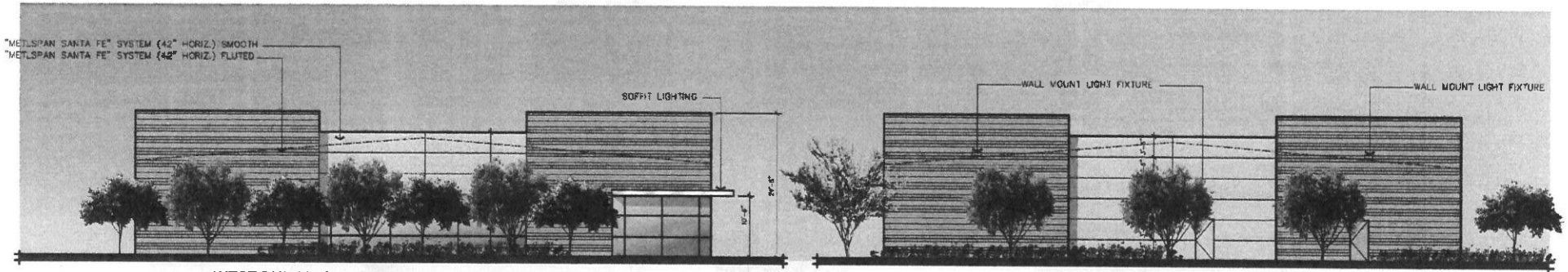
Dominion | Property Partners LLC

A-4

Architects Orange
144 North Orange St. Orange, CA 92866 (714) 639-9860

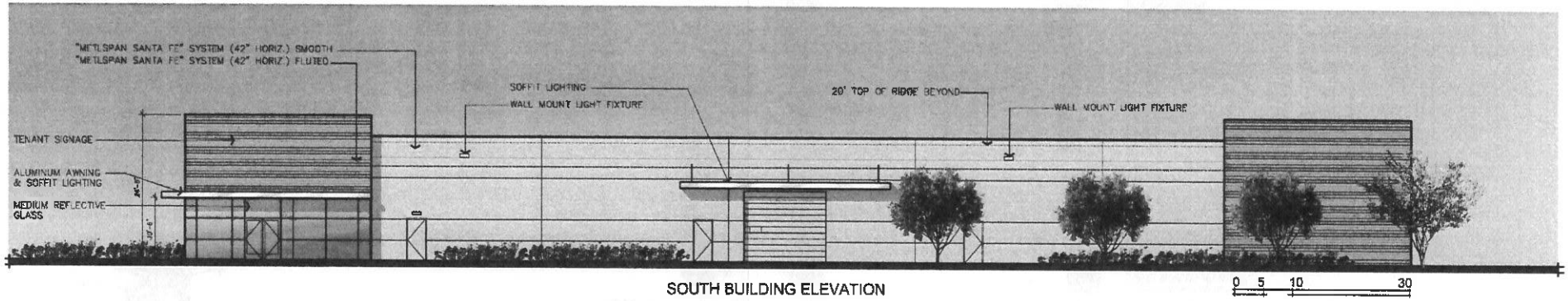


NORTH BUILDING ELEVATION (LINCOLN STREET ELEVATION)



WEST BUILDING ELEVATION (8TH STREET ELEVATION)

EAST BUILDING ELEVATION



SOUTH BUILDING ELEVATION

DISCLAIMER:
ALL INFORMATION CONTAINED HEREIN MAY BE SUBJECT TO CHANGE PENDING OWNER AND OR AGENCY REVIEW AND IS FOR INFORMATION ONLY

AOM: 2019

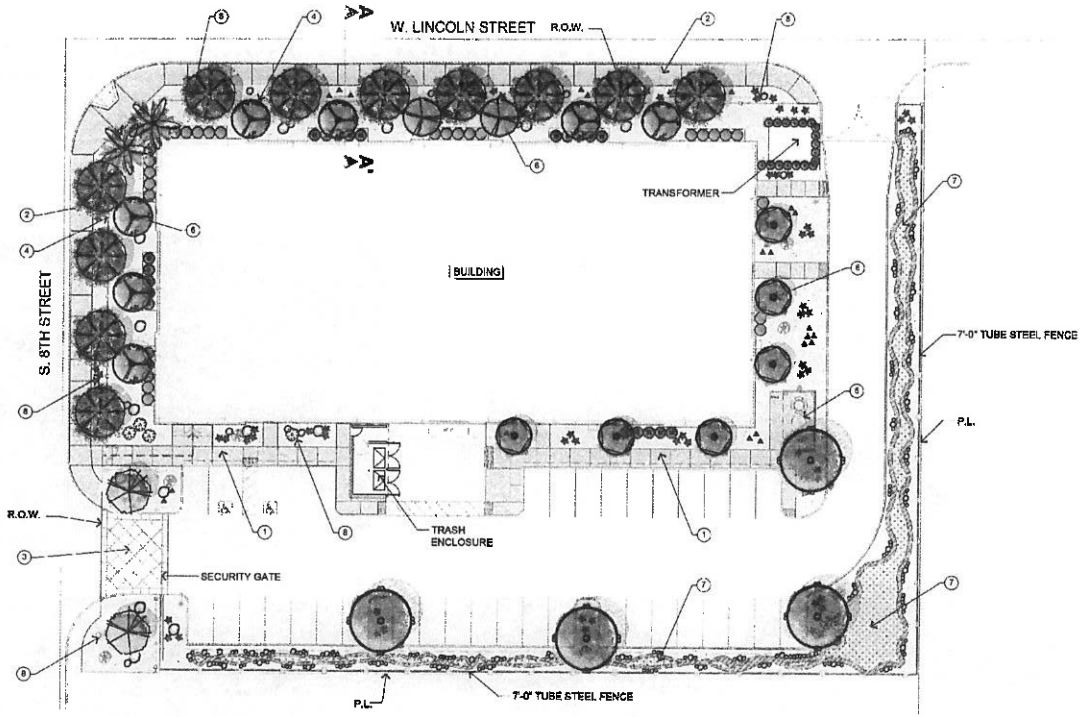
8TH & LINCOLN INDUSTRIAL BUILDING BANNING, CA

CONCEPTUAL ELEVATION 10-24-2019

Dominion | Property Partners LLC

Architects Orange

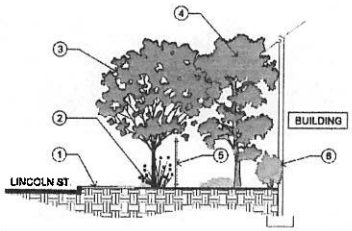
A-5 144 North Orange St. Orange, CA 92866 (714) 639-9860



DESIGN KEY NOTES:

1. TYP. CONCRETE PAVING WITH MEDIUM BROOM FINISH.
2. TYP. PUBLIC SIDEWALK PER CIVIL PLANS.
3. ENHANCED VEHICULAR ENTRY PAVING CONSISTING OF NATURAL GRAY CONCRETE WITH 4'X4' GRID PATTERN WITH MEDIUM SAND BLAST FINISH. 24" CONCRETE BAND SURROUNDING PAVING.
4. TYP. 7'-0" HIGH TUBE STEEL FENCE.
5. TYP. BREAK CONCRETE PATIO WITH TRELLIS SHADE STRUCTURE ABOVE.
6. VERTICAL TREE AGAINST BUILDING PER LEGEND
7. PROPOSED BIO-SWALE AREA PER CIVIL DWGS.
8. D.G. AREA WITH ASSORTED SUCCULENTS AND BOULDERS.

LANDSCAPE AREA = 19,500 SQ. FT.



SECTION 'A-A'

SECTION 'A-A' KEY NOTES:

1. EXISTING SIDEWALK PER CIVIL DWGS.
2. ASSORTED SUCCULENTS AND BOULDERS PER LEGEND.
3. NEW STREET TREE ALONG LINCOLN ST. PER LEGEND.
4. VERTICAL TREE ALONG BUILDING PER LEGEND.
5. 7'-0" HIGH TUBE STEEL FENCE PER ARCH. DWGS.
6. DROUGHT TOLERANT SHRUB ALONG BUILDING PER LEGEND.

PLANTING LEGEND

TREES

SYMBOL	TREE NAME	QTY.	WUCOLS
	ACCENT PALMS PHOENIX DACYLIFERA, DATE PALM 16'-0" BTH	2	L
	NEW STREET TREE ALONG LINCOLN ST. & S. 8TH ST. LAGERSTROEMIA I. 'WATERMELON RED', CRAPE MYRTLE 24" BOX SIZE.	11	M
	EVERGREEN SCREEN TREE ALONG BUILDING QUERCUS ILEX, HOLLY OAK 15 GAL. SIZE.	7	L
	EVERGREEN SCREEN TREE ALONG BUILDING ACACIA STENOPHYLLA, SHOESTRING ACACIA 15 GAL. SIZE.	2	L
	VERTICAL TREE ALONG BUILDING BRACHYCHITON POPULNEUS, BOTTLE TREE 15 GAL. SIZE.	8	L
	CANOPY PARKING LOT TREE PROSOPIS CHILENSIS, CHILEAN MESQUITE 24" BOX SIZE.	4	L
	FLOWERING ACCENT TREE CERCIDIUM X 'DESERT MUSEUM', BLUE PALO VERDE 36" BOX SIZE.	11	L

SHRUBS

SYMBOL	SHRUB NAME	WUCOLS
	LEUCOPHYLLUM FRUTESCENS, TEXAS RANGER 5 GAL. SIZE	L
	WESTRINGIA FRUTICOSA, COAST ROSEMARY 5 GAL. SIZE	L

ACCENT SUCCULENTS

SYMBOL	SHRUB NAME	WUCOLS
	HESPERALOE PARVIFOLIA, RED YUCCA 5 GAL. SIZE.	L
	AGAVE AMERICANA, CENTURY AGAVE 5 GAL. SIZE.	L
	BOUGAINVILLEA GROUNDCOVER 5 GAL. SIZE.	L
	EROSION CONTROL GROUND COVER AT BASIN SLOPES BACCHARIS PILULARIS, COYOTE BRUSH 1 GAL. SIZE @ 36" O.C.	L
	PROPOSED BIO-SWALE AREA WITH CAREX GRASS	L
	3" MIN. THICK DECOMPOSED GRANITE	

GENERAL NOTES:

- SLOPES GREATER THAN 3:1 SHALL BE STABILIZED WITH EROSION CONTROL GROUND COVER PER LEGEND, AND MULCH MATERIAL WITH BINDER MATERIAL SHALL BE APPLIED FOR EROSION CONTROL.
- ROCK RIP-RAP MATERIAL SHALL BE INSTALLED WHERE DRAIN LINES CONNECT TO INFILTRATION AREAS.
- ALL UTILITY EQUIPMENT SUCH AS BACKFLOW UNITS, FIRE DETECTOR CHECKS AND FIRE CHECK VALVES WILL BE SCREENED WITH EVERGREEN PLANT MATERIAL ONCE FINAL LOCATIONS HAVE BEEN DETERMINED.

CONCEPTUAL PLAN NOTE:

THIS IS A CONCEPTUAL LANDSCAPE PLAN. IT IS BASED ON PRELIMINARY INFORMATION WHICH IS NOT FULLY VERIFIED AND MAY BE INCOMPLETE. IT IS MEANT AS A COMPARATIVE AID IN EXAMINING ALTERNATE DEVELOPMENT STRATEGIES AND ANY QUANTITIES INDICATED ARE SUBJECT TO REVISION AS MORE RELIABLE INFORMATION BECOMES AVAILABLE.

IRRIGATION NOTE:

THE PROJECT WILL BE EQUIPPED WITH A LOW FLOW IRRIGATION SYSTEM CONSISTING OF ET WEATHER BASED SMART CONTROLLER, LOW FLOW ROTORS, BUBBLER AND/OR DRIP SYSTEMS USED THROUGHOUT. THE IRRIGATION WATER EFFICIENCY WILL MEET OR SURPASS THE CURRENT STATE MANDATED AB-1881 WATER ORDINANCE.

WUCOLS PLANT FACTOR

THIS PROJECT IS LOCATED IN 'WUCOLS' REGION 4-SOUTH INLAND VALLEY'.

H = HIGH WATER NEEDS
M = MODERATE WATER NEEDS
L = LOW WATER NEEDS
VL= VERY LOW WATER NEEDS

SPLA
SCOTT PETERSON LANDSCAPE ARCHITECT, INC.
2883 VIA RANCHEROS WAY
FALLBROOK, CA 92028
PH: 760-842-8593

CONCEPTUAL LANDSCAPE/HARDSCAPE PLAN
8TH & LINCOLN INDUSTRIAL BUILDING

BANNING, CALIFORNIA

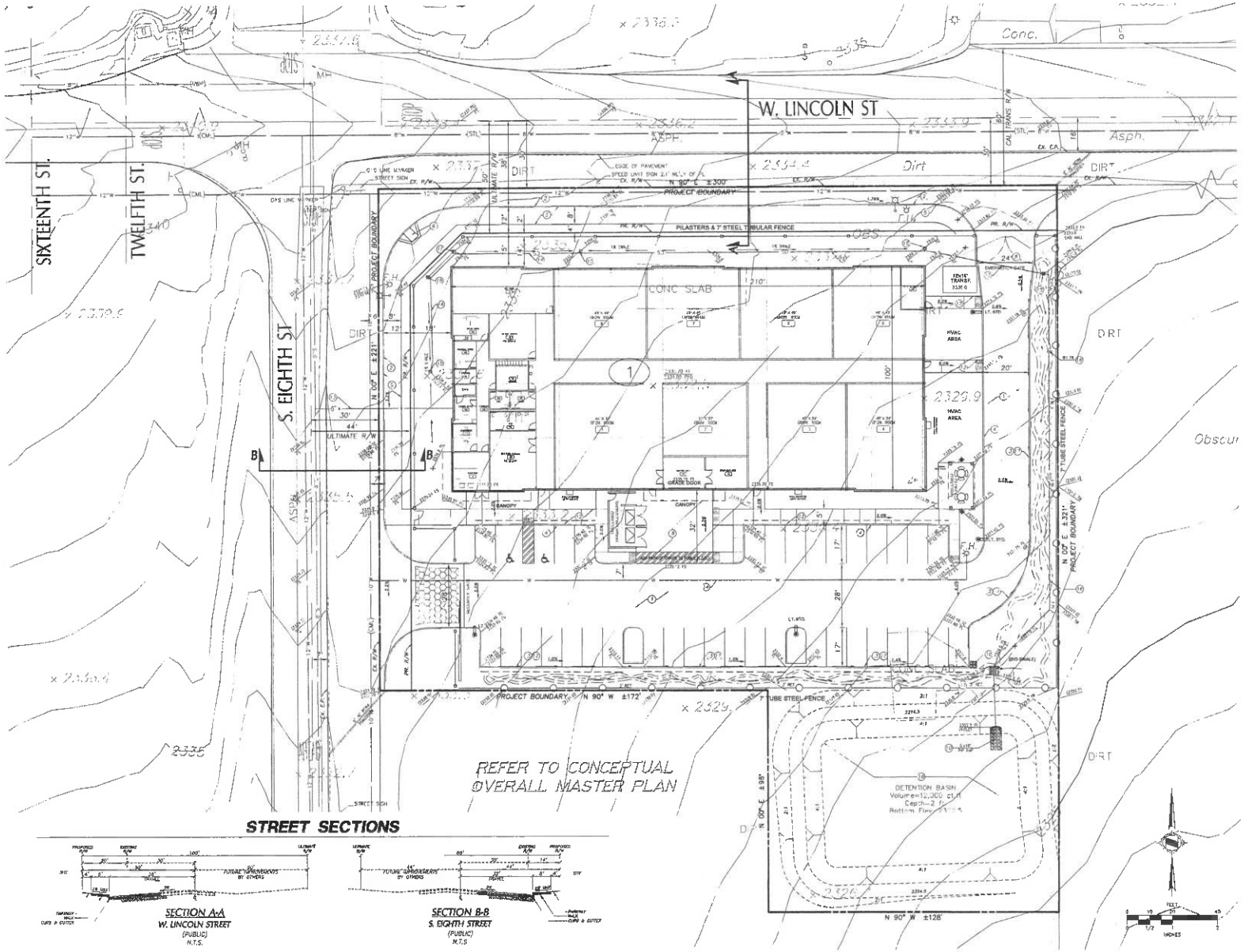
NORTH

0 20' 40' 80'

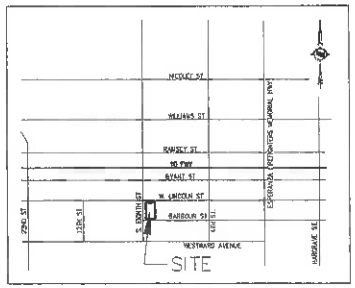
SCALE: 1" = 20'-0"

OCTOBER 22, 2019

L-1



VICINITY MAP



NOTES

1. CONSTRUCT 4"AC/8"AB (PRELIMINARY DESIGN)
2. CONSTRUCT 8" CURB & GUTTER PER CITY STD. C-201
3. CONSTRUCT 6" CURB & GUTTER PER CITY STD. C-200
4. CONSTRUCT 6" CURB ONLY PER CITY STD. C-202
5. CONSTRUCT PCC SIDEWALK PER CITY STD. C-213
6. CONSTRUCT ACCESS RAMP TYPE 1 PER CITY STD. C-214
7. CONSTRUCT 28' WIDE COMMERCIAL DRIVEWAY PER CITY STD. C-209
8. CONSTRUCT 24' WIDE COMMERCIAL DRIVEWAY PER CITY STD. C-209
9. CONSTRUCT 6" THICK PCC PAVEMENT
10. INSTALL AGGREGATE RIP-RAP
11. INSTALL 4'x4' GRATE INLET
12. CONSTRUCT 4" THICK PCC SIDEWALK (ON-SITE)
13. CONSTRUCT 6" SEWER LATERAL
14. CONSTRUCT FIRE HYDRANT PER CITY STD. W-18
15. CONSTRUCT 18"X18" GRATE INLET
16. CONSTRUCT 8" PVC PIPE (SDR 35)
17. CONSTRUCT SLOTTED CURB/SLOTS SHALL BE 12" WIDE EVERY 10' O.C.
18. CONSTRUCT DETENTION BASIN

EARTHWORK QUANTITIES

CUT	1,280 CYS
FILL	5,240 CYS
IMPORT	3,960 CYS

LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT OF WAY
- STREET CENTER LINE
- BIO-SWALE
- EXISTING EDGE OF PAVEMENT
- EXISTING WATER LINE
- EXISTING SEWER LINE
- PROPOSED WATER LINE
- PROPOSED WATER LINE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED SIDEWALK
- PROPOSED CURB
- PROPOSED PARKING
- PROPOSED TUBE STEEL FENCE
- PROPOSED PILASTER AND TUBE STEEL FENCE
- PROPOSED FIRE HYDRANT
- PROPOSED STREET LIGHT

STREET SECTIONS

DATE	10-18-2019
W.O.	4100-4
GROSS AREA	1.8±
CONTOUR INTERVAL	1'
NUMBERED LOTS	1
LETTERED LOTS	-

8TH & LINCOLN INDUSTRIAL BUILDING BANNING, CA

CONCEPTUAL GRADING PLAN

HUNSAKER & ASSOCIATES
IRVINE, INC.
PLANNING ▪ ENGINEERING ▪ SURVEYING
Three Hughes ▪ Irvine, CA 92618 ▪ PH: (949) 583-1010 ▪ FX: (949) 583-0759

Dominion | Property Partners LLC

C-1

Appendix E.2

Notice of Airport in Vicinity

NOTICE OF AIRPORT IN VICINITY

This property is presently located in the vicinity of an airport, within what is known as an airport influence area. For that reason, the property may be subject to some of the annoyances or inconveniences associated with proximity to airport operations (for example: noise, vibration, or odors). Individual sensitivities to those annoyances [can vary from person to person. You may wish to consider what airport annoyances], if any, are associated with the property before you complete your purchase and determine whether they are acceptable to you. Business & Professions Code Section 11010 (b)(13)(A)

Appendix E.3

Basin Notice

NOTICE

THERE IS AN AIRPORT NEARBY.

THIS STORM WATER BASIN IS DESIGNED TO HOLD STORM WATER FOR ONLY 48 HOURS AND NOT TO ATTRACT BIRDS

PROPER MAINTENANCE IS NECESSARY TO AVOID BIRD STRIKES

RIVERSIDE COUNTY AIRPORT LAND USE COMMISSION ALUC

IF THIS BASIN IS OVERGROWN, PLEASE CONTACT:

Name: _____ Phone: _____

PRELIMINARY HYDROLOGY ANALYSIS

FOR

8TH & LINCOLN INDUSTRIAL BUILDING

City of Banning

County of Riverside

PREPARED FOR:
DOMINION | PROPERTY PARTNERS LLC

PREPARED BY:
HUNSAKER & ASSOCIATES IRVINE, INC.
3 HUGHES
IRVINE, CA 92618
(949) 583-1010

FEBRUARY 18, 2020

W.O. #4100-4

Appendix F.1

Preliminary Hydrology Analysis

PRELIMINARY HYDROLOGY ANALYSIS

FOR

8TH & LINCOLN INDUSTRIAL BUILDING

City of Banning

County of Riverside



PREPARED UNDER THE SUPERVISION OF:

TU TRINH, R.C.E. 71555 DATE:

TABLE OF CONTENTS

INTRODUCTION ---------- **SECTION 1**
PROJECT LOCATION
STUDY PURPOSE
METHODOLOGY
DISCUSSION
SOIL MAP
VICINITY MAP

HYDROLOGY CALCULATIONS – EXISTING CONDITION ---------- **SECTION 2**
RATIONAL _ 100-YR, 10-YR, 5-YR, AND 2-YR STUDY
UNIT HYDROGRAPH 100-YR _ 1-HR, 3-HR, 6-HR, AND 24HR STUDY

HYDROLOGY CALCULATIONS – PROPOSED CONDITION ---------- **SECTION 3**
RATIONAL _ 100-YR, 10-YR, 5-YR, AND 2-YR STUDY
UNIT HYDROGRAPH 100-YR _ 1-HR, 3-HR, 6-HR, AND 24HR STUDY

HYDROLOGY MAPS ---------- **SECTION 4**

SECTION 1

INTRODUCTION

A. PROJECT LOCATION

The approximate 1.32 acre project site "8th and Lincoln Industrial Building" is located on the southwest corner of West Lincoln Street and South 8th Street in the City of Banning (City).

B. STUDY PURPOSE

This Hydrology Analysis report is preliminary and to accompany the submittal of a site plan. Hydraulic Analysis and details of a proposed Detention Basin Study will be submitted at a later time. The purpose of this hydrology study is to determine the flow rates produced from the project site in the existing and proposed conditions. It also serves as the basis for analyzing and designing storm drainage system to accommodate site runoff in the proposed condition and mitigate any potential impacts to adjacent property owners and downstream drainages and storm drain facilities.

C. METHODOLOGY

This hydrology study was prepared in accordance with the Riverside County Flood Control and Water Conservation District (RCFC&WCD) criteria and Hydrology Manual. All pertinent information is included on the hydrology map contained in this report.

D. DISCUSSION

This hydrology study is preliminary and limited within the property boundary for both the existing and proposed conditions.

Existing Condition
The existing site is currently vacant. Runoff produced from the site will sheet flow in the southeast direction toward 4th Street and discharges into the Gilman Home Channel Stage II. The 100-yr, 10-yr, 5-yr, and 2-yr storm runoff produced from the site in the Rational Method is 4.00cfs, 2.05cfs, 1.20cfs, and 0.69cfs, respectively. Runoff volumes and flow rates produced from the project site in the Unit Hydrograph Method are summarized in a table and included in this section.

Proposed Condition
The project site will consist of the development of an industrial building and parking spaces. Runoff produced from the proposed site will also drain in the southeast direction as in the existing condition to a proposed detention basin. Slotted curb is proposed along the east and south sides with 12" wide slot at every 10' to convey flows to the proposed swales. The 100-yr, 10-yr, 5-yr, and 2-yr storm runoff produced from the site in the Rational Method is 5.53cfs, 3.32cfs, 2.62cfs, and 1.78cfs, respectively. Runoff volumes and flow rates produced from the project site in the Unit Hydrograph Method are summarized in a table and included in this section.

In the proposed condition the runoff volume and flow rate produced from the site are increased due to the improvement compared to the existing condition with the same drainage area. To keep the runoff produced from the site at the existing level, we have proposed a detention basin at the southeast corner of the site as shown on the Hydrology Map for the Proposed Condition.

First flush and dry weather flows produced from the developed site will be treated with proposed bio-swale along the south and east of the site as shown on the hydrology map.

8th and LINCOLN INDUSTRIAL BUILDING
W.O. #4100-4
1/15/2020

SUMMARY TABLE

	1	2	3	4	5	6	7	8	9	10	11	12
	Existing Condition			Proposed Condition			Basin Vol.	V overflow	V overflow	Delta V	Q overflow	Delta Q
STORM	Q	V	V	Q	V	V	designed	(6) - (7)	(8) ÷ 43560	(8) - (3)	see U.H. calcs	(11) - (1)
EVENT	(cfs)	(ac.ft)	(cu.ft)	(cfs)	(ac.ft)	(cu.ft)	(cu.ft)	(cu.ft)	(ac.ft)	(cu.ft)	(cfs)	(cfs)
100-yr 1-hr	6.143	0.1734	7553	6.658	0.1883	8202	11051	-2849	-0.0654	-10402	0	-6.143
100-yr 3-hr	3.070	0.2299	10014	3.283	0.2748	11970	11051	919	0.0211	-9095	0.64	-2.430
100-yr 6-hr	2.793	0.2775	12088	3.017	0.3671	15991	11051	4940	0.1134	-7148	0.61	-2.183
100-yr 24-hr	1.079	0.4235	18448	1.235	0.6999	30488	11051	19437	0.4462	989	1.24	0.161

NOTE:
In the 100-yr 24-hr storm event, Vpro exceeds Vexist by 989 cu.ft
In the 100-yr 24-hr storm event, Qpro exceeds Qexist by 0.161 cfs

NOAA Atlas 14, Volume 6, Version 2
Location name: Banning, California, USA*
Latitude: 33.9254°, Longitude: -116.8763°
Elevation: 2346.46 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	0.120 (0.100-0.146)	0.154 (0.128-0.187)	0.203 (0.169-0.248)	0.249 (0.205-0.306)	0.320 (0.255-0.407)	0.383 (0.298-0.497)	0.454 (0.345-0.605)	0.537 (0.396-0.736)	0.667 (0.471-0.953)	0.783 (0.534-1.16)
10-min	0.173 (0.144-0.209)	0.220 (0.183-0.267)	0.292 (0.242-0.355)	0.357 (0.294-0.438)	0.459 (0.365-0.583)	0.549 (0.427-0.712)	0.651 (0.494-0.867)	0.770 (0.568-1.06)	0.956 (0.676-1.37)	1.12 (0.765-1.66)
15-min	0.209 (0.174-0.253)	0.266 (0.222-0.323)	0.353 (0.293-0.429)	0.432 (0.355-0.530)	0.555 (0.441-0.705)	0.664 (0.516-0.861)	0.788 (0.598-1.05)	0.931 (0.687-1.28)	1.16 (0.817-1.65)	1.36 (0.926-2.01)
30-min	0.311 (0.259-0.377)	0.398 (0.331-0.483)	0.526 (0.437-0.641)	0.644 (0.530-0.791)	0.828 (0.659-1.05)	0.990 (0.770-1.29)	1.18 (0.892-1.56)	1.39 (1.02-1.90)	1.73 (1.22-2.47)	2.03 (1.38-3.00)
60-min	0.470 (0.391-0.569)	0.600 (0.499-0.728)	0.794 (0.659-0.966)	0.972 (0.800-1.19)	1.25 (0.993-1.59)	1.49 (1.16-1.94)	1.77 (1.35-2.36)	2.10 (1.55-2.87)	2.60 (1.84-3.72)	3.05 (2.08-4.52)
2-hr	0.676 (0.563-0.819)	0.854 (0.711-1.04)	1.11 (0.921-1.35)	1.34 (1.10-1.64)	1.67 (1.33-2.13)	1.96 (1.52-2.54)	2.27 (1.72-3.02)	2.62 (1.93-3.59)	3.14 (2.22-4.48)	3.58 (2.44-5.30)
3-hr	0.830 (0.692-1.01)	1.05 (0.871-1.27)	1.35 (1.12-1.65)	1.62 (1.33-1.98)	2.00 (1.59-2.54)	2.32 (1.81-3.02)	2.67 (2.03-3.55)	3.05 (2.25-4.18)	3.60 (2.55-5.15)	4.07 (2.77-6.02)
6-hr	1.19 (0.989-1.44)	1.50 (1.25-1.82)	1.93 (1.60-2.35)	2.29 (1.89-2.81)	2.81 (2.24-3.57)	3.23 (2.51-4.19)	3.67 (2.79-4.89)	4.15 (3.06-5.68)	4.83 (3.41-6.90)	5.38 (3.67-7.97)
12-hr	1.62 (1.35-1.96)	2.08 (1.73-2.52)	2.70 (2.24-3.28)	3.21 (2.64-3.94)	3.94 (3.13-5.00)	4.51 (3.51-5.85)	5.11 (3.88-6.80)	5.74 (4.23-7.87)	6.63 (4.68-9.47)	7.34 (5.00-10.9)
24-hr	2.14 (1.89-2.46)	2.81 (2.48-3.24)	3.71 (3.27-4.29)	4.46 (3.90-5.21)	5.51 (4.67-6.64)	6.34 (5.26-7.79)	7.19 (5.83-9.06)	8.10 (6.39-10.5)	9.36 (7.09-12.6)	10.4 (7.59-14.4)
2-day	2.58 (2.28-2.97)	3.49 (3.08-4.02)	4.73 (4.17-5.47)	5.78 (5.06-6.75)	7.28 (6.17-8.77)	8.49 (7.05-10.4)	9.77 (7.92-12.3)	11.1 (8.78-14.4)	13.1 (9.91-17.6)	14.7 (10.7-20.4)
3-day	2.77 (2.45-3.19)	3.79 (3.35-4.38)	5.22 (4.61-6.04)	6.46 (5.65-7.53)	8.24 (6.98-9.93)	9.70 (8.05-11.9)	11.3 (9.13-14.2)	13.0 (10.2-16.8)	15.4 (11.7-20.8)	17.5 (12.8-24.4)
4-day	2.99 (2.64-3.44)	4.11 (3.63-4.74)	5.69 (5.02-6.58)	7.06 (6.17-8.23)	9.05 (7.67-10.9)	10.7 (8.88-13.1)	12.5 (10.1-15.7)	14.4 (11.4-18.6)	17.2 (13.1-23.2)	19.6 (14.3-27.3)
7-day	3.45 (3.06-3.98)	4.72 (4.17-5.45)	6.51 (5.74-7.53)	8.06 (7.05-9.40)	10.3 (8.75-12.4)	12.2 (10.1-15.0)	14.2 (11.5-17.9)	16.4 (12.9-21.2)	19.6 (14.9-26.4)	22.3 (16.3-31.0)
10-day	3.76 (3.33-4.33)	5.12 (4.53-5.91)	7.04 (6.21-8.14)	8.70 (7.61-10.1)	11.1 (9.42-13.4)	13.1 (10.9-16.1)	15.3 (12.4-19.2)	17.6 (13.9-22.8)	21.1 (15.9-28.4)	23.9 (17.5-33.3)
20-day	4.64 (4.11-5.35)	6.33 (5.60-7.31)	8.70 (7.67-10.1)	10.8 (9.41-12.5)	13.7 (11.6-16.6)	16.2 (13.4-19.9)	18.8 (15.3-23.7)	21.7 (17.1-28.1)	25.9 (19.6-34.8)	29.3 (21.5-40.8)
30-day	5.46 (4.83-6.29)	7.46 (6.59-8.61)	10.3 (9.04-11.9)	12.7 (11.1-14.8)	16.2 (13.7-19.5)	19.0 (15.8-23.4)	22.1 (17.9-27.8)	25.4 (20.1-32.9)	30.3 (22.9-40.8)	34.2 (25.1-47.7)
45-day	6.50 (5.76-7.50)	8.91 (7.88-10.3)	12.3 (10.8-14.2)	15.1 (13.2-17.7)	19.3 (16.3-23.2)	22.7 (18.8-27.9)	26.3 (21.3-33.1)	30.2 (23.8-39.0)	35.8 (27.1-48.2)	40.4 (29.6-56.3)
60-day	7.50 (6.64-8.65)	10.3 (9.08-11.9)	14.1 (12.4-16.3)	17.4 (15.2-20.3)	22.1 (18.7-26.6)	26.0 (21.5-31.9)	30.0 (24.3-37.8)	34.4 (27.2-44.5)	40.7 (30.8-54.9)	45.9 (33.6-63.9)

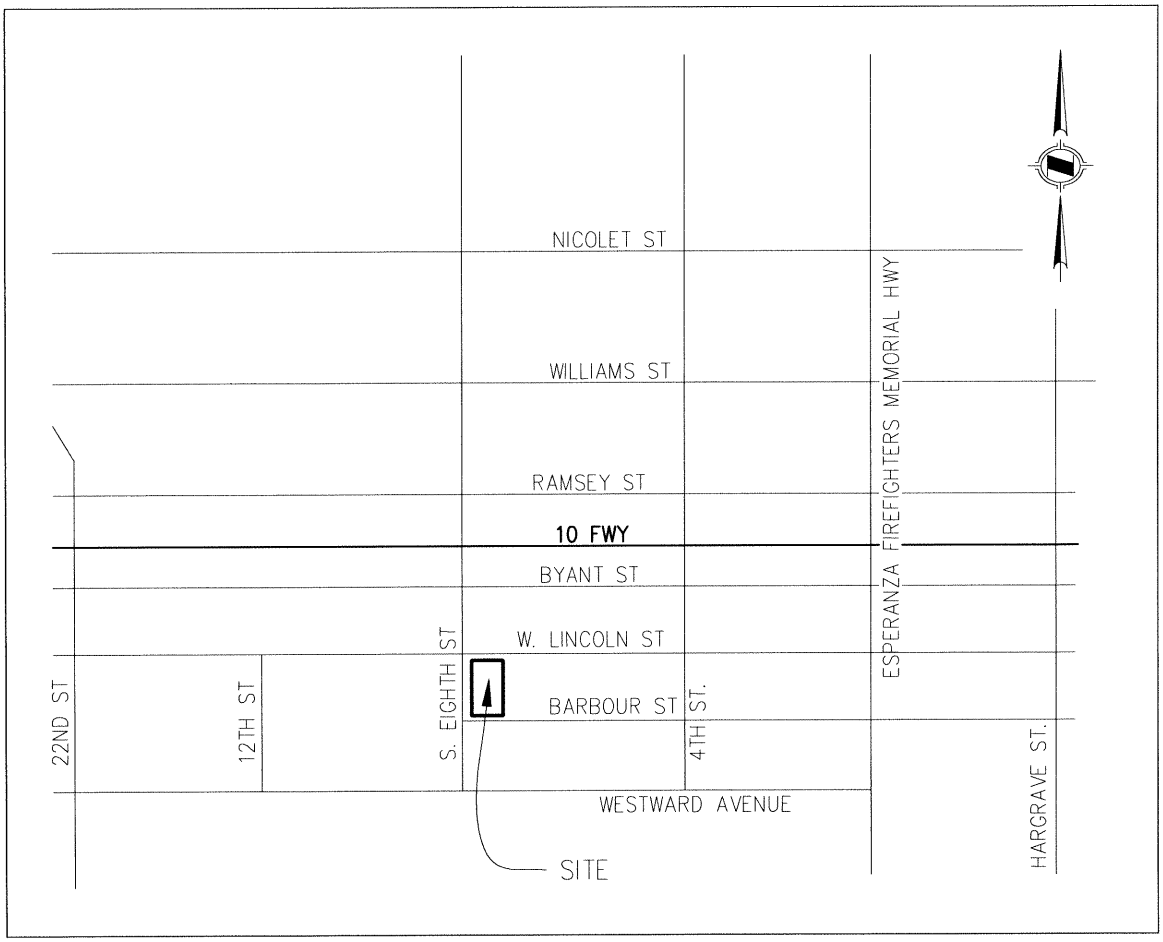
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

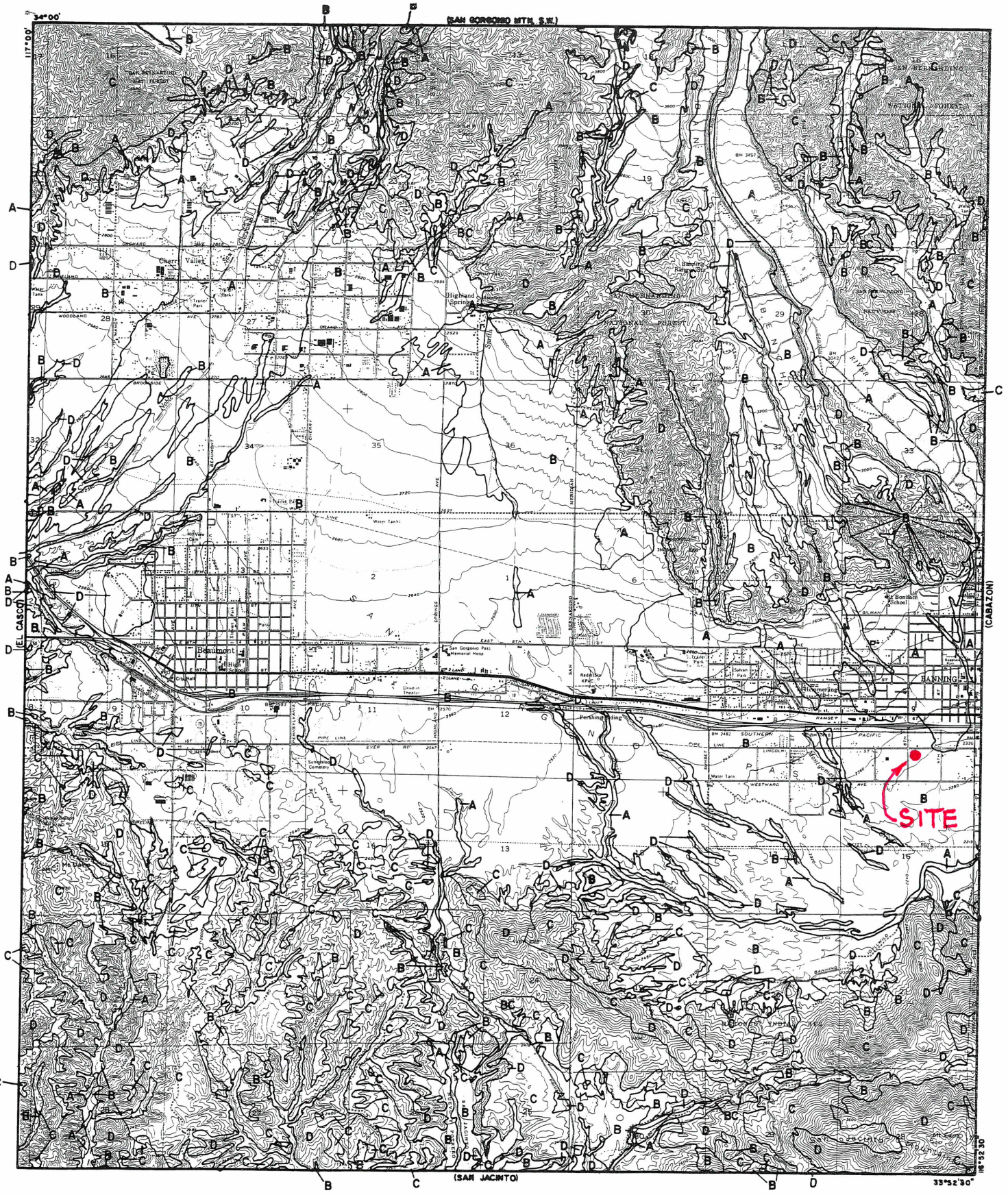
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper 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.

Back to Top

VICINITY MAP





LEGEND

—— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

RCFC&WCD

HYDROLOGY MANUAL

0 FEET 5000

HYDROLOGIC SOILS GROUP MAP FOR BEAUMONT

PLATE C-1.10

RUNOFF INDEX 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)		78	86	91	93
Chaparrel, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparrel, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	72	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 (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	28	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		76	85	90	92

RCFC & WCD
HYDROLOGY MANUAL

RUNOFF INDEX NUMBERS FOR PERVIOUS AREAS

ACTUAL IMPERVIOUS COVER

Land Use (1)	Range-Percent	Recommended Value For Average Conditions-Percent(2)
Natural or Agriculture	0 - 10	0
Single Family Residential: (3)		
40,000 S. F. (1 Acre) Lots	10 - 25	20
20,000 S. F. (½ Acre) Lots	30 - 45	40
7,200 - 10,000 S. F. Lots	45 - 55	50
Multiple Family Residential:		
Condominiums	45 - 70	65
Apartments	65 - 90	80
Mobile Home Park	60 - 85	75
Commercial, Downtown Business or Industrial	80 -100	90

Notes:

1. Land use should be based on ultimate development of the watershed. Long range master plans for the County and incorporated cities should be reviewed to insure reasonable land use assumptions.

2. Recommended values are based on average conditions which may not apply to a particular study area. The percentage impervious may vary greatly even on comparable sized lots due to differences in dwelling size, improvements, etc. Landscape practices should also be considered as it is common in some areas to use ornamental gravels underlain by impervious plastic materials in place of lawns and shrubs. A field investigation of a study area should always be made, and a review of aerial photos, where available may assist in estimating the percentage of impervious cover in developed areas.

3. For typical horse ranch subdivisions increase impervious area 5 percent over the values recommended in the table above.

RCFC & WCD
HYDROLOGY MANUAL

IMPERVIOUS COVER FOR DEVELOPED AREAS

R7W R6W R5W R4W R3W R2W R1W R1E R2E R3E R4E R5E R6E R7E R8E

T1S T2S T3S T4S T5S T6S T7S T8S T9S

.50 .55 .45 .60 .58 .63 .53

SITE

SAN BERNARDINO RIVERSIDE RIALTO Highland Redlands Yucaipa Beaumont Banning Calimesa Loma Linda Grand Terrace Colton Rubidoux Mira Loma Ontario Chino Corona Norco Fontana Rancho Cucamonga Upland Claremont Pomona Montclair Jurupa Valley Eastvale Edgemont Sunnymead Moreno Valley March Field Perris Lake Elsinore Canyon Lake Murrieta Temecula Wildomar Menifee Hemet San Jacinto Sun City Homeland Winchester Valle Vista Idyllwild Banning Cabazon Desert Hot Springs Palm Springs Cathedral City Rancho Mirage Palm Desert Indian Wells La Quinta Indio Coachella Thermal Mecca Oasis Joshua Tree Yucca Valley Twentynine Palms Landers Pioneertown Morongo Valley Whitewater Canyon Little Morongo Canyon Big Morongo Canyon Painted Hill Mountain Little San Bernardino Mountains San Bernardino Mountains San Gorgonio Wilderness San Gorgonio Mountain Little San Gorgonio Mountain Quail Mountain Queen Mountain Ryan Mountain Lost Horse Valley Lost Horse Mountain Pleasant Valley Indian Cove Twentynine Palms Indian Reservation Joshua Tree National Monument Santa Ana River Wash Santa Ana River Santa Ana Mountains Box Spring Mountains Reche Canyon Badlands Slover Mountain Jurupa Mountains Pedley Agua Mansa Industrial Park Fontana Industrial Area Bloomington Glen Avon Mira Loma Airport Chino Airport Ontario International Airport Norton AFB Redlands Municipal Airport Riverside Municipal Airport March Air Force Base Flabob Airport Corona Municipal Airport Skypark Airport Perris Valley Airport Hemet-Ryan Airport Elsinore Municipal Airport Agua Caliente Indian Reservation Morongo Indian Reservation San Manuel Indian Reservation Soboba Indian Reservation Pechanga Indian Reservation Cahuilla Indian Reservation Santa Rosa Indian Reservation Ramona Indian Reservation Los Coyotes Indian Reservation Mission Indian Reservation Pala Indian Reservation San Bernardino National Forest Cleveland National Forest Santa Rosa Plateau Ecological Reserve Lake Perris State Recreation Area Lake Elsinore State Recreation Area Santa Margarita Ecological Reserve Box Canyon Reche Canyon Cajon Pass Temescal Canyon Santa Ana Canyon Bautista Canyon Santa Rosa Mountains Santa Rosa Plateau Lakeview Mountains Double Butte Steele Peak Bernasconi Hills Badlands Black Mountain Cahuilla Mountain Tahquitz Peak Toro Peak Santa Rosa Peak Martinez Mountain Agua Tibia Mountain Palomar Mountain Mount Palomar Observatory Mount Olympus Tourmaline Queen Mine Oakridge Mine Elsinore Peak Stetson Peak Sitton Peak Elsmore Peak Lookout Mountain Red Mountain Black Mountain Bachelor Mountain Haystack Mountain Indian Mountain Palm Mesa Mountain Tahquitz Valley Palm Canyon Indian Canyon Andreas Canyon Murray Hill Tahquitz Peak Lookout Mountain Lookout Tower Fire Station Ranger Station Radio Tower Windmill Water Tank Quarry Mine Ranch Camp Cemetery Golf Course Hospital Landing Strip Power Plant Power Line Pipeline Aqueduct Railroad Freeway Interstate 10 Interstate 15 Interstate 215 Interstate 5 Interstate 8 Interstate 210 Interstate 110 Interstate 405 Interstate 605 Interstate 710 Interstate 105 Interstate 91 Interstate 15 Interstate 10 Interstate 215 Interstate 5 Interstate 8 Interstate 210 Interstate 110 Interstate 405 Interstate 605 Interstate 710 Interstate 105 Interstate 91

30,000 20 10 0 30,000

NOTES

1. Slope of Intensity-Duration Curve based on District analysis of automatic recording rain gage records.

RCFC & WCD

HYDROLOGY MANUAL

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

SLOPE OF INTENSITY DURATION CURVE

APPROVED CHIEF ENGINEER R.E. NO. 8822	DRAWN BY R.A.S.	SHEET NO.
DATE	CHECKED BY	DR. NO
REVISED	DATE DRAWN:	

SECTION 2

HYDROLOGY CALCULATIONS
EXISTING CONDITION

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 12/30/19 File:BanEx100.out

W.O. 4100-4, BANNING INDUSTRIAL
100-YR STUDY
EXISTING CONDITION
FILE: BanEx100.rrv

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6406

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 3

2 year, 1 hour precipitation = 0.600(In.)
100 year, 1 hour precipitation = 1.770(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.770(In/Hr)
Slope of intensity duration curve = 0.5000

++

Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 340.000(Ft.)
Top (of initial area) elevation = 2337.000(Ft.)
Bottom (of initial area) elevation = 2326.000(Ft.)
Difference in elevation = 11.000(Ft.)
Slope = 0.03235 s(percent)= 3.24
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 14.517 min.
Rainfall intensity = 3.598(In/Hr) for a 100.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.842
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3) = 84.40
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 4.001(CFS)
Total initial stream area = 1.320(Ac.)
Pervious area fraction = 1.000
End of computations, total study area = 1.32 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 69.0

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 12/30/19 File:BanEx10.out

W.O. 4100-4, BANNING INDUSTRIAL
10-YR STUDY
EXISTING CONDITION
FILE: BanEx10.rrv

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6406

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.600(In.)
100 year, 1 hour precipitation = 1.770(In.)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 1.081(In/Hr)
Slope of intensity duration curve = 0.5000

++

Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 340.000(Ft.)
Top (of initial area) elevation = 2337.000(Ft.)
Bottom (of initial area) elevation = 2326.000(Ft.)
Difference in elevation = 11.000(Ft.)
Slope = 0.03235 s(percent)= 3.24
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 14.517 min.
Rainfall intensity = 2.198(In/Hr) for a 10.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.707
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 69.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 2.052(CFS)
Total initial stream area = 1.320(Ac.)
Pervious area fraction = 1.000
End of computations, total study area = 1.32 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 69.0

```
                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
        Rational Hydrology Study        Date: 12/30/19  File:BanEx5.out
------------------------------------------------------------------------
W.O. 4100-4, BANNING INDUSTRIAL
5-YR STUDY
EXISTING CONDITION
FILE: BanEx5.rrv
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 6406

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =    5.00 Antecedent Moisture Condition = 1

2 year, 1 hour precipitation =  0.600(In.)
100 year, 1 hour precipitation =  1.770(In.)

Storm event year =   5.0
Calculated rainfall intensity data:
1 hour intensity =  0.874(In/Hr)
Slope of intensity duration curve = 0.5000




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________________
Initial area flow distance =   340.000(Ft.)
Top (of initial area) elevation =  2337.000(Ft.)
Bottom (of initial area) elevation =  2326.000(Ft.)
Difference in elevation =    11.000(Ft.)
Slope =    0.03235  s(percent)=       3.24
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.517 min.
Rainfall intensity =      1.777(In/Hr) for a     5.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.512
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  49.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      1.202(CFS)
Total initial stream area =        1.320(Ac.)
Pervious area fraction = 1.000
End of computations, total study area =            1.32 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  69.0
```

```
                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
       Rational Hydrology Study        Date: 12/30/19  File:BanEx2.out
------------------------------------------------------------------------
W.O. 4100-4, BANNING INDUSTRIAL
2-YR STUDY
EXISTING CONDITION
FILE: BanEx2.rrv
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 6406

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =    2.00 Antecedent Moisture Condition = 1

2 year, 1 hour precipitation =  0.600(In.)
100 year, 1 hour precipitation =  1.770(In.)

Storm event year =   2.0
Calculated rainfall intensity data:
1 hour intensity =  0.600(In/Hr)
Slope of intensity duration curve = 0.5000




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________________
Initial area flow distance =   340.000(Ft.)
Top (of initial area) elevation =  2337.000(Ft.)
Bottom (of initial area) elevation =  2326.000(Ft.)
Difference in elevation =    11.000(Ft.)
Slope =    0.03235  s(percent)=       3.24
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.517 min.
Rainfall intensity =      1.220(In/Hr) for a     2.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.428
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  49.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      0.689(CFS)
Total initial stream area =        1.320(Ac.)
Pervious area fraction = 1.000
End of computations, total study area =            1.32 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  69.0
```

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
Study date 12/31/19 File: BE1100.out

++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

W.O. 4100-4, BANNING INDUSTRIAL
100-YR 1-HR
EXISTING CONDITION
FILE: BE.UM1

Drainage Area = 1.32(Ac.) = 0.002 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 1.32(Ac.) = 0.002 Sq. Mi.
Length along longest watercourse = 340.00(Ft.)
Length along longest watercourse measured to centroid = 170.00(Ft.)
Length along longest watercourse = 0.064 Mi.
Length along longest watercourse measured to centroid = 0.032 Mi.
Difference in elevation = 11.00(Ft.)
Slope along watercourse = 170.8235 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.026 Hr.
Lag time = 1.55 Min.
25% of lag time = 0.39 Min.
40% of lag time = 0.62 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.32	0.60	0.79

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.32	1.77	2.34

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.600(In)
Area Averaged 100-Year Rainfall = 1.770(In)

Point rain (area averaged) = 1.770(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.770(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
1.320	69.00	0.000

Total Area Entered = 1.32(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
69.0	84.4	0.194	0.000	0.194	1.000	0.194
					Sum (F) =	0.194

Area averaged mean soil loss (F) (In/Hr) = 0.194
Minimum soil loss rate ((In/Hr)) = 0.097
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

Slope of intensity-duration curve for a 1 hour storm =0.5300

U n i t H y d r o g r a p h
DESERT S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	321.617	58.376	0.777
2	0.167	643.235	37.382	0.497
3	0.250	964.852	4.243	0.056
			Sum = 100.000 Sum=	1.330

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	3.40	0.722	0.194	(0.650)	0.528
2	0.17	4.70	0.998	0.194	(0.898)	0.804
3	0.25	4.70	0.998	0.194	(0.898)	0.804
4	0.33	5.10	1.083	0.194	(0.975)	0.889
5	0.42	5.80	1.232	0.194	(1.109)	1.038
6	0.50	5.90	1.253	0.194	(1.128)	1.059
7	0.58	7.10	1.508	0.194	(1.357)	1.314
8	0.67	8.70	1.848	0.194	(1.663)	1.654
9	0.75	13.20	2.804	0.194	(2.523)	2.610
10	0.83	29.70	6.308	0.194	(5.677)	6.114
11	0.92	7.70	1.635	0.194	(1.472)	1.442
12	1.00	4.00	0.850	0.194	(0.765)	0.656
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	18.9

Flood volume = Effective rainfall 1.58(In)
times area 1.3(Ac.)/[(In)/(Ft.)] = 0.2(Ac.Ft)
Total soil loss = 0.19(In)
Total soil loss = 0.021(Ac.Ft)
Total rainfall = 1.77(In)
Flood volume = 7552.2 Cubic Feet
Total soil loss = 928.8 Cubic Feet

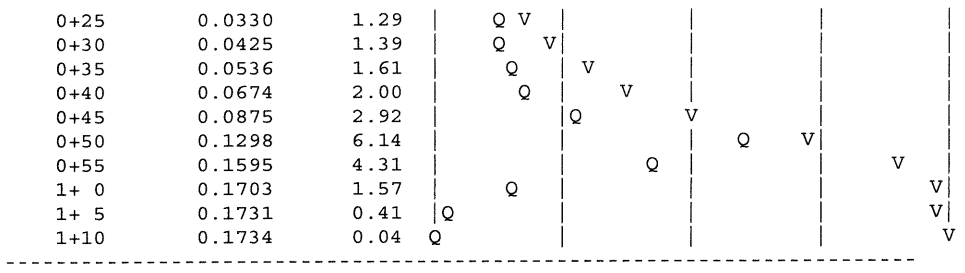
Peak flow rate of this hydrograph = 6.143(CFS)

++

1 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0028	0.41	VQ				
0+10	0.0089	0.89	VQ				
0+15	0.0162	1.06	VQ				
0+20	0.0240	1.14	QV				


0+25 0.0330 1.29
0+30 0.0425 1.39
0+35 0.0536 1.61
0+40 0.0674 2.00
0+45 0.0875 2.92
0+50 0.1298 6.14
0+55 0.1595 4.31
1+ 0 0.1703 1.57
1+ 5 0.1731 0.41
1+10 0.1734 0.04

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
              Study date  12/31/19 File: BE3100.out

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
------------------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6406

------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



------------------------------------------------------------------------
W.O. 4100-4, BANNING INDUSTRIAL
100-YR 3-HR
EXISTING CONDITION
FILE: BE.UM1
------------------------------------------------------------------------
Drainage Area =       1.32(Ac.)  =      0.002 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       1.32(Ac.)  =      0.002 Sq. Mi.
Length along longest watercourse =     340.00(Ft.)
Length along longest watercourse measured to centroid =     170.00(Ft.)
Length along longest watercourse =      0.064 Mi.
Length along longest watercourse measured to centroid =      0.032 Mi.
Difference in elevation =      11.00(Ft.)
Slope along watercourse =    170.8235 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.026 Hr.
Lag time =     1.55 Min.
25% of lag time =     0.39 Min.
40% of lag time =     0.62 Min.
Unit time =     5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        1.32            1.05                 1.39

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        1.32            2.67                 3.52

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.050(In)
Area Averaged 100-Year Rainfall =    2.670(In)

Point rain (area averaged) =    2.670(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    2.670(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     1.320           69.00          0.000
 Total Area Entered =      1.32(Ac.)
```

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
69.0	84.4	0.194	0.000	0.194	1.000	0.194
					Sum (F) =	0.194

Area averaged mean soil loss (F) (In/Hr) = 0.194
Minimum soil loss rate ((In/Hr)) = 0.097
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
DESERT S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	321.617	58.376	0.777
2	0.167	643.235	37.382	0.497
3	0.250	964.852	4.243	0.056
			Sum = 100.000 Sum=	1.330

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.417	0.194	(0.375)	0.223
2	0.17	1.30	0.417	0.194	(0.375)	0.223
3	0.25	1.10	0.352	0.194	(0.317)	0.159
4	0.33	1.50	0.481	0.194	(0.433)	0.287
5	0.42	1.50	0.481	0.194	(0.433)	0.287
6	0.50	1.80	0.577	0.194	(0.519)	0.383
7	0.58	1.50	0.481	0.194	(0.433)	0.287
8	0.67	1.80	0.577	0.194	(0.519)	0.383
9	0.75	1.80	0.577	0.194	(0.519)	0.383
10	0.83	1.50	0.481	0.194	(0.433)	0.287
11	0.92	1.60	0.513	0.194	(0.461)	0.319
12	1.00	1.80	0.577	0.194	(0.519)	0.383
13	1.08	2.20	0.705	0.194	(0.634)	0.511
14	1.17	2.20	0.705	0.194	(0.634)	0.511
15	1.25	2.20	0.705	0.194	(0.634)	0.511
16	1.33	2.00	0.641	0.194	(0.577)	0.447
17	1.42	2.60	0.833	0.194	(0.750)	0.639
18	1.50	2.70	0.865	0.194	(0.779)	0.671
19	1.58	2.40	0.769	0.194	(0.692)	0.575
20	1.67	2.70	0.865	0.194	(0.779)	0.671
21	1.75	3.30	1.057	0.194	(0.952)	0.863
22	1.83	3.10	0.993	0.194	(0.894)	0.799
23	1.92	2.90	0.929	0.194	(0.836)	0.735
24	2.00	3.00	0.961	0.194	(0.865)	0.767
25	2.08	3.10	0.993	0.194	(0.894)	0.799
26	2.17	4.20	1.346	0.194	(1.211)	1.152
27	2.25	5.00	1.602	0.194	(1.442)	1.408
28	2.33	3.50	1.121	0.194	(1.009)	0.928
29	2.42	6.80	2.179	0.194	(1.961)	1.985
30	2.50	7.30	2.339	0.194	(2.105)	2.145
31	2.58	8.20	2.627	0.194	(2.365)	2.433
32	2.67	5.90	1.890	0.194	(1.701)	1.697
33	2.75	2.00	0.641	0.194	(0.577)	0.447
34	2.83	1.80	0.577	0.194	(0.519)	0.383
35	2.92	1.80	0.577	0.194	(0.519)	0.383
36	3.00	0.60	0.192	(0.194)	0.173	0.019
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	25.1

Flood volume = Effective rainfall 2.09(In)

```
 times area       1.3(Ac.)/[(In)/(Ft.)] =       0.2(Ac.Ft)
Total soil loss =      0.58(In)
Total soil loss =     0.064(Ac.Ft)
Total rainfall =      2.67(In)
Flood volume =       10015.4 Cubic Feet
Total soil loss =        2778.1 Cubic Feet
---------------------------------------------------------------------
 Peak flow rate of this hydrograph =      3.070(CFS)
---------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    3 - H O U R    S T O R M
               R u n o f f      H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

---------------------------------------------------------------------
```

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 2.5 5.0 7.5 10.0
0+ 5	0.0012	0.17	Q
0+10	0.0031	0.28	VQ
0+15	0.0048	0.25	Q
0+20	0.0070	0.31	|Q
0+25	0.0096	0.37	|Q
0+30	0.0127	0.46	|QV
0+35	0.0157	0.43	|QV
0+40	0.0189	0.46	|Q V
0+45	0.0223	0.50	| QV
0+50	0.0253	0.43	|Q V
0+55	0.0282	0.41	|Q V
1+ 0	0.0314	0.47	|Q V
1+ 5	0.0356	0.61	| Q V
1+10	0.0402	0.67	| Q V
1+15	0.0449	0.68	| Q V
1+20	0.0493	0.63	| Q V
1+25	0.0544	0.75	| Q V
1+30	0.0604	0.86	| Q V
1+35	0.0660	0.82	| Q |V
1+40	0.0718	0.85	| Q | V
1+45	0.0790	1.04	| Q | V
1+50	0.0865	1.09	| Q | V
1+55	0.0935	1.02	| Q | V
2+ 0	0.1004	1.01	| Q | V
2+ 5	0.1076	1.04	| Q | V
2+10	0.1168	1.34	| Q | V
2+15	0.1286	1.71	| Q | V
2+20	0.1388	1.49	| Q | V
2+25	0.1532	2.08	| Q | V
2+30	0.1718	2.71	| Q | V
2+35	0.1930	3.07	| Q | V
2+40	0.2112	2.65	| Q | V
2+45	0.2204	1.33	| Q | V
2+50	0.2246	0.62	| Q | V
2+55	0.2281	0.51	| Q | V
3+ 0	0.2297	0.23	Q | V
3+ 5	0.2299	0.03	Q | V
3+10	0.2299	0.00	Q | V

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
Study date 12/31/19 File: BE6100.out

++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

W.O. 4100-4, BANNING INDUSTRIAL
100-YR 6-HR
EXISTING CONDITION
FILE: BE.UM1

Drainage Area = 1.32(Ac.) = 0.002 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 1.32(Ac.) = 0.002 Sq. Mi.
Length along longest watercourse = 340.00(Ft.)
Length along longest watercourse measured to centroid = 170.00(Ft.)
Length along longest watercourse = 0.064 Mi.
Length along longest watercourse measured to centroid = 0.032 Mi.
Difference in elevation = 11.00(Ft.)
Slope along watercourse = 170.8235 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.026 Hr.
Lag time = 1.55 Min.
25% of lag time = 0.39 Min.
40% of lag time = 0.62 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.32	1.50	1.98

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.32	3.67	4.84

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.500(In)
Area Averaged 100-Year Rainfall = 3.670(In)

Point rain (area averaged) = 3.670(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 3.670(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
1.320	69.00	0.000

Total Area Entered = 1.32(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
69.0	84.4	0.194	0.000	0.194	1.000	0.194
					Sum (F) =	0.194

Area averaged mean soil loss (F) (In/Hr) = 0.194
Minimum soil loss rate ((In/Hr)) = 0.097
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
DESERT S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	321.617	58.376	0.777
2	0.167	643.235	37.382	0.497
3	0.250	964.852	4.243	0.056
			Sum = 100.000	Sum= 1.330

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.220	0.194	(0.198)	0.026
2	0.17	0.60	0.264	0.194	(0.238)	0.070
3	0.25	0.60	0.264	0.194	(0.238)	0.070
4	0.33	0.60	0.264	0.194	(0.238)	0.070
5	0.42	0.60	0.264	0.194	(0.238)	0.070
6	0.50	0.70	0.308	0.194	(0.277)	0.114
7	0.58	0.70	0.308	0.194	(0.277)	0.114
8	0.67	0.70	0.308	0.194	(0.277)	0.114
9	0.75	0.70	0.308	0.194	(0.277)	0.114
10	0.83	0.70	0.308	0.194	(0.277)	0.114
11	0.92	0.70	0.308	0.194	(0.277)	0.114
12	1.00	0.80	0.352	0.194	(0.317)	0.158
13	1.08	0.80	0.352	0.194	(0.317)	0.158
14	1.17	0.80	0.352	0.194	(0.317)	0.158
15	1.25	0.80	0.352	0.194	(0.317)	0.158
16	1.33	0.80	0.352	0.194	(0.317)	0.158
17	1.42	0.80	0.352	0.194	(0.317)	0.158
18	1.50	0.80	0.352	0.194	(0.317)	0.158
19	1.58	0.80	0.352	0.194	(0.317)	0.158
20	1.67	0.80	0.352	0.194	(0.317)	0.158
21	1.75	0.80	0.352	0.194	(0.317)	0.158
22	1.83	0.80	0.352	0.194	(0.317)	0.158
23	1.92	0.80	0.352	0.194	(0.317)	0.158
24	2.00	0.90	0.396	0.194	(0.357)	0.203
25	2.08	0.80	0.352	0.194	(0.317)	0.158
26	2.17	0.90	0.396	0.194	(0.357)	0.203
27	2.25	0.90	0.396	0.194	(0.357)	0.203
28	2.33	0.90	0.396	0.194	(0.357)	0.203
29	2.42	0.90	0.396	0.194	(0.357)	0.203
30	2.50	0.90	0.396	0.194	(0.357)	0.203
31	2.58	0.90	0.396	0.194	(0.357)	0.203
32	2.67	0.90	0.396	0.194	(0.357)	0.203
33	2.75	1.00	0.440	0.194	(0.396)	0.247
34	2.83	1.00	0.440	0.194	(0.396)	0.247
35	2.92	1.00	0.440	0.194	(0.396)	0.247
36	3.00	1.00	0.440	0.194	(0.396)	0.247
37	3.08	1.00	0.440	0.194	(0.396)	0.247
38	3.17	1.10	0.484	0.194	(0.436)	0.291
39	3.25	1.10	0.484	0.194	(0.436)	0.291

40	3.33	1.10	0.484	0.194	(0.436)	0.291
41	3.42	1.20	0.528	0.194	(0.476)	0.335
42	3.50	1.30	0.573	0.194	(0.515)	0.379
43	3.58	1.40	0.617	0.194	(0.555)	0.423
44	3.67	1.40	0.617	0.194	(0.555)	0.423
45	3.75	1.50	0.661	0.194	(0.595)	0.467
46	3.83	1.50	0.661	0.194	(0.595)	0.467
47	3.92	1.60	0.705	0.194	(0.634)	0.511
48	4.00	1.60	0.705	0.194	(0.634)	0.511
49	4.08	1.70	0.749	0.194	(0.674)	0.555
50	4.17	1.80	0.793	0.194	(0.713)	0.599
51	4.25	1.90	0.837	0.194	(0.753)	0.643
52	4.33	2.00	0.881	0.194	(0.793)	0.687
53	4.42	2.10	0.925	0.194	(0.832)	0.731
54	4.50	2.10	0.925	0.194	(0.832)	0.731
55	4.58	2.20	0.969	0.194	(0.872)	0.775
56	4.67	2.30	1.013	0.194	(0.912)	0.819
57	4.75	2.40	1.057	0.194	(0.951)	0.863
58	4.83	2.40	1.057	0.194	(0.951)	0.863
59	4.92	2.50	1.101	0.194	(0.991)	0.907
60	5.00	2.60	1.145	0.194	(1.031)	0.951
61	5.08	3.10	1.365	0.194	(1.229)	1.171
62	5.17	3.60	1.585	0.194	(1.427)	1.392
63	5.25	3.90	1.718	0.194	(1.546)	1.524
64	5.33	4.20	1.850	0.194	(1.665)	1.656
65	5.42	4.70	2.070	0.194	(1.863)	1.876
66	5.50	5.60	2.466	0.194	(2.220)	2.272
67	5.58	1.90	0.837	0.194	(0.753)	0.643
68	5.67	0.90	0.396	0.194	(0.357)	0.203
69	5.75	0.60	0.264	0.194	(0.238)	0.070
70	5.83	0.50	0.220	0.194	(0.198)	0.026
71	5.92	0.30	0.132	(0.194)	0.119	0.013
72	6.00	0.20	0.088	(0.194)	0.079	0.009

(Loss Rate Not Used)

Sum = 100.0 Sum = 30.3

Flood volume = Effective rainfall 2.52(In)
times area 1.3(Ac.)/[(In)/(Ft.)] = 0.3(Ac.Ft)

Total soil loss = 1.15(In)
Total soil loss = 0.126(Ac.Ft)
Total rainfall = 3.67(In)
Flood volume = 12087.9 Cubic Feet
Total soil loss = 5497.2 Cubic Feet

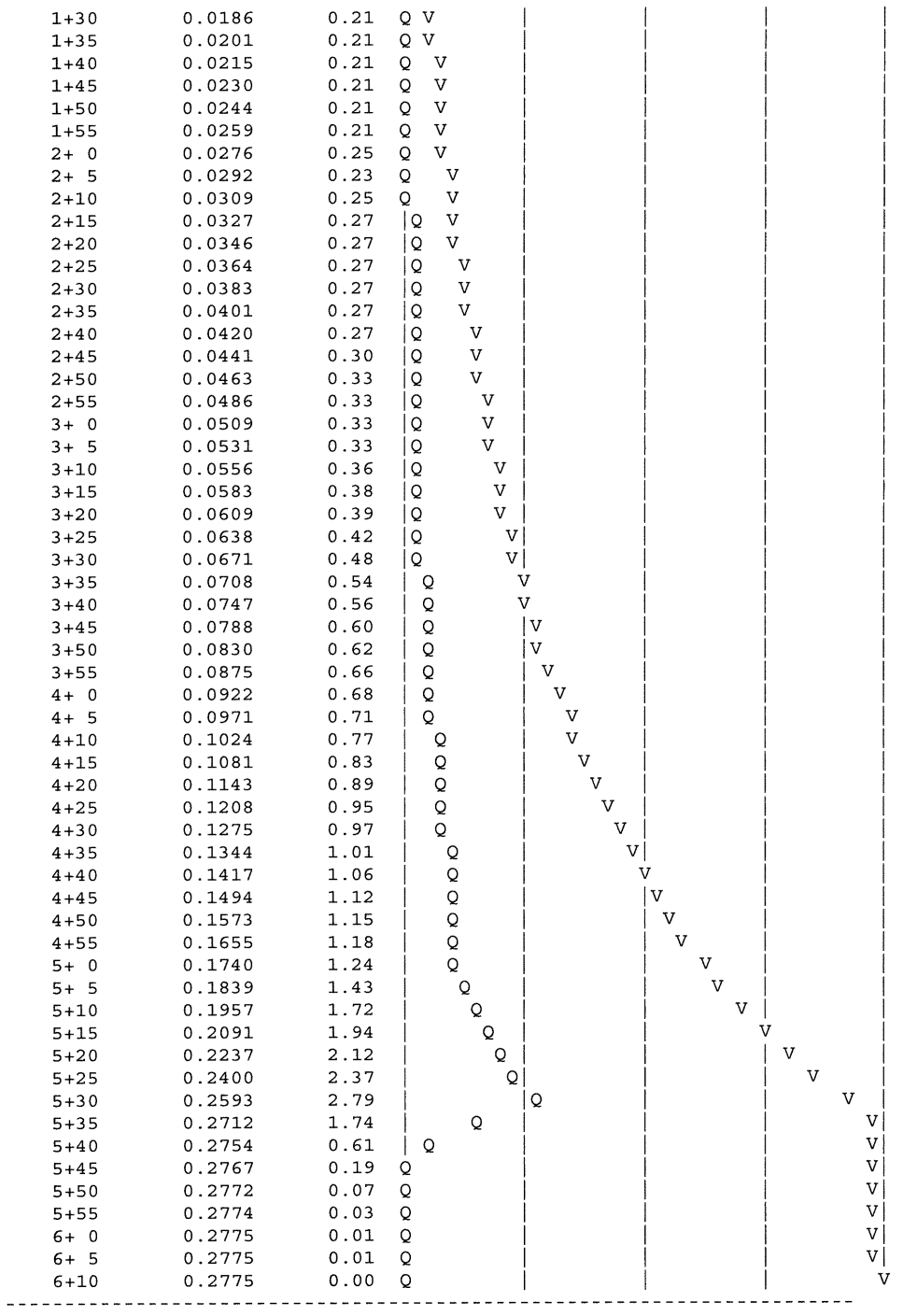
Peak flow rate of this hydrograph = 2.793(CFS)

++

6 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0001	0.02	Q				
0+10	0.0006	0.07	Q				
0+15	0.0012	0.09	Q				
0+20	0.0019	0.09	Q				
0+25	0.0025	0.09	Q				
0+30	0.0034	0.13	Q				
0+35	0.0044	0.15	Q				
0+40	0.0055	0.15	Q				
0+45	0.0065	0.15	Q				
0+50	0.0076	0.15	QV				
0+55	0.0086	0.15	QV				
1+ 0	0.0099	0.19	QV				
1+ 5	0.0114	0.21	QV				
1+10	0.0128	0.21	QV				
1+15	0.0143	0.21	Q V				
1+20	0.0157	0.21	Q V				
1+25	0.0172	0.21	Q V				



U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
Study date 12/31/19 File: BE24100.out

++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

W.O. 4100-4, BANNING INDUSTRIAL
100-YR 24-HR
EXISTING CONDITION
FILE: BE.UM1

Drainage Area = 1.32(Ac.) = 0.002 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 1.32(Ac.) = 0.002 Sq. Mi.
Length along longest watercourse = 340.00(Ft.)
Length along longest watercourse measured to centroid = 170.00(Ft.)
Length along longest watercourse = 0.064 Mi.
Length along longest watercourse measured to centroid = 0.032 Mi.
Difference in elevation = 11.00(Ft.)
Slope along watercourse = 170.8235 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.026 Hr.
Lag time = 1.55 Min.
25% of lag time = 0.39 Min.
40% of lag time = 0.62 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.32	2.81	3.71

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.32	7.19	9.49

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 2.810(In)
Area Averaged 100-Year Rainfall = 7.190(In)

Point rain (area averaged) = 7.190(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 7.190(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
1.320	69.00	0.000

Total Area Entered = 1.32(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
69.0	84.4	0.194	0.000	0.194	1.000	0.194
					Sum (F) =	0.194

Area averaged mean soil loss (F) (In/Hr) = 0.194
Minimum soil loss rate ((In/Hr)) = 0.097
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
DESERT S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.250	964.852	100.000	1.330
		Sum = 100.000	Sum= 1.330

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.058	(0.342)	0.052	0.006
2	0.50	0.30	0.086	(0.338)	0.078	0.009
3	0.75	0.30	0.086	(0.334)	0.078	0.009
4	1.00	0.40	0.115	(0.330)	0.104	0.012
5	1.25	0.30	0.086	(0.327)	0.078	0.009
6	1.50	0.30	0.086	(0.323)	0.078	0.009
7	1.75	0.30	0.086	(0.319)	0.078	0.009
8	2.00	0.40	0.115	(0.315)	0.104	0.012
9	2.25	0.40	0.115	(0.311)	0.104	0.012
10	2.50	0.40	0.115	(0.307)	0.104	0.012
11	2.75	0.50	0.144	(0.304)	0.129	0.014
12	3.00	0.50	0.144	(0.300)	0.129	0.014
13	3.25	0.50	0.144	(0.296)	0.129	0.014
14	3.50	0.50	0.144	(0.293)	0.129	0.014
15	3.75	0.50	0.144	(0.289)	0.129	0.014
16	4.00	0.60	0.173	(0.285)	0.155	0.017
17	4.25	0.60	0.173	(0.282)	0.155	0.017
18	4.50	0.70	0.201	(0.278)	0.181	0.020
19	4.75	0.70	0.201	(0.274)	0.181	0.020
20	5.00	0.80	0.230	(0.271)	0.207	0.023
21	5.25	0.60	0.173	(0.267)	0.155	0.017
22	5.50	0.70	0.201	(0.264)	0.181	0.020
23	5.75	0.80	0.230	(0.260)	0.207	0.023
24	6.00	0.80	0.230	(0.257)	0.207	0.023
25	6.25	0.90	0.259	(0.254)	0.233	0.026
26	6.50	0.90	0.259	(0.250)	0.233	0.026
27	6.75	1.00	0.288	0.247	(0.259)	0.041
28	7.00	1.00	0.288	0.244	(0.259)	0.044
29	7.25	1.00	0.288	0.240	(0.259)	0.047
30	7.50	1.10	0.316	0.237	(0.285)	0.079
31	7.75	1.20	0.345	0.234	(0.311)	0.111
32	8.00	1.30	0.374	0.230	(0.336)	0.143
33	8.25	1.50	0.431	0.227	(0.388)	0.204
34	8.50	1.50	0.431	0.224	(0.388)	0.207
35	8.75	1.60	0.460	0.221	(0.414)	0.239
36	9.00	1.70	0.489	0.218	(0.440)	0.271
37	9.25	1.90	0.546	0.215	(0.492)	0.332
38	9.50	2.00	0.575	0.212	(0.518)	0.363
39	9.75	2.10	0.604	0.209	(0.544)	0.395
40	10.00	2.20	0.633	0.206	(0.569)	0.427
41	10.25	1.50	0.431	0.203	(0.388)	0.229

42	10.50	1.50	0.431		0.200	(0.388)	0.232
43	10.75	2.00	0.575		0.197	(0.518)	0.378
44	11.00	2.00	0.575		0.194	(0.518)	0.381
45	11.25	1.90	0.546		0.191	(0.492)	0.355
46	11.50	1.90	0.546		0.188	(0.492)	0.358
47	11.75	1.70	0.489		0.186	(0.440)	0.303
48	12.00	1.80	0.518		0.183	(0.466)	0.335
49	12.25	2.50	0.719		0.180	(0.647)	0.539
50	12.50	2.60	0.748		0.177	(0.673)	0.570
51	12.75	2.80	0.805		0.175	(0.725)	0.631
52	13.00	2.90	0.834		0.172	(0.751)	0.662
53	13.25	3.40	0.978		0.169	(0.880)	0.808
54	13.50	3.40	0.978		0.167	(0.880)	0.811
55	13.75	2.30	0.661		0.164	(0.595)	0.497
56	14.00	2.30	0.661		0.162	(0.595)	0.500
57	14.25	2.70	0.777		0.159	(0.699)	0.617
58	14.50	2.60	0.748		0.157	(0.673)	0.591
59	14.75	2.60	0.748		0.155	(0.673)	0.593
60	15.00	2.50	0.719		0.152	(0.647)	0.567
61	15.25	2.40	0.690		0.150	(0.621)	0.540
62	15.50	2.30	0.661		0.148	(0.595)	0.514
63	15.75	1.90	0.546		0.145	(0.492)	0.401
64	16.00	1.90	0.546		0.143	(0.492)	0.403
65	16.25	0.40	0.115	(0.141)		0.104	0.012
66	16.50	0.40	0.115	(0.139)		0.104	0.012
67	16.75	0.30	0.086	(0.137)		0.078	0.009
68	17.00	0.30	0.086	(0.135)		0.078	0.009
69	17.25	0.50	0.144	(0.133)		0.129	0.014
70	17.50	0.50	0.144	(0.131)		0.129	0.014
71	17.75	0.50	0.144		0.129	(0.129)	0.015
72	18.00	0.40	0.115	(0.127)		0.104	0.012
73	18.25	0.40	0.115	(0.125)		0.104	0.012
74	18.50	0.40	0.115	(0.123)		0.104	0.012
75	18.75	0.30	0.086	(0.121)		0.078	0.009
76	19.00	0.20	0.058	(0.120)		0.052	0.006
77	19.25	0.30	0.086	(0.118)		0.078	0.009
78	19.50	0.40	0.115	(0.116)		0.104	0.012
79	19.75	0.30	0.086	(0.115)		0.078	0.009
80	20.00	0.20	0.058	(0.113)		0.052	0.006
81	20.25	0.30	0.086	(0.112)		0.078	0.009
82	20.50	0.30	0.086	(0.110)		0.078	0.009
83	20.75	0.30	0.086	(0.109)		0.078	0.009
84	21.00	0.20	0.058	(0.107)		0.052	0.006
85	21.25	0.30	0.086	(0.106)		0.078	0.009
86	21.50	0.20	0.058	(0.105)		0.052	0.006
87	21.75	0.30	0.086	(0.104)		0.078	0.009
88	22.00	0.20	0.058	(0.103)		0.052	0.006
89	22.25	0.30	0.086	(0.102)		0.078	0.009
90	22.50	0.20	0.058	(0.101)		0.052	0.006
91	22.75	0.20	0.058	(0.100)		0.052	0.006
92	23.00	0.20	0.058	(0.099)		0.052	0.006
93	23.25	0.20	0.058	(0.098)		0.052	0.006
94	23.50	0.20	0.058	(0.098)		0.052	0.006
95	23.75	0.20	0.058	(0.097)		0.052	0.006
96	24.00	0.20	0.058	(0.097)		0.052	0.006

(Loss Rate Not Used)

Sum = 100.0 Sum = 15.4

Flood volume = Effective rainfall 3.85(In)
times area 1.3(Ac.)/[(In)/(Ft.)] = 0.4(Ac.Ft)
Total soil loss = 3.34(In)
Total soil loss = 0.367(Ac.Ft)
Total rainfall = 7.19(In)
Flood volume = 18446.1 Cubic Feet
Total soil loss = 16005.4 Cubic Feet

Peak flow rate of this hydrograph = 1.079(CFS)

++

24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0002	0.01	Q				
0+30	0.0004	0.01	Q				
0+45	0.0006	0.01	Q				
1+ 0	0.0009	0.02	Q				
1+15	0.0012	0.01	Q				
1+30	0.0014	0.01	Q				
1+45	0.0017	0.01	Q				
2+ 0	0.0020	0.02	Q				
2+15	0.0023	0.02	Q				
2+30	0.0026	0.02	Q				
2+45	0.0030	0.02	Q				
3+ 0	0.0034	0.02	Q				
3+15	0.0038	0.02	Q				
3+30	0.0042	0.02	Q				
3+45	0.0046	0.02	Q				
4+ 0	0.0051	0.02	Q				
4+15	0.0055	0.02	Q				
4+30	0.0061	0.03	Q				
4+45	0.0066	0.03	Q				
5+ 0	0.0073	0.03	Q				
5+15	0.0078	0.02	Q				
5+30	0.0083	0.03	Q				
5+45	0.0089	0.03	Q				
6+ 0	0.0096	0.03	Q				
6+15	0.0103	0.03	Q				
6+30	0.0110	0.03	QV				
6+45	0.0121	0.05	QV				
7+ 0	0.0133	0.06	QV				
7+15	0.0146	0.06	QV				
7+30	0.0168	0.11	QV				
7+45	0.0199	0.15	QV				
8+ 0	0.0238	0.19	Q V				
8+15	0.0294	0.27	QV				
8+30	0.0351	0.28	Q V				
8+45	0.0417	0.32	Q V				
9+ 0	0.0492	0.36	Q V				
9+15	0.0583	0.44	Q V				
9+30	0.0683	0.48	Q V				
9+45	0.0792	0.53	Q V				
10+ 0	0.0909	0.57	Q V				
10+15	0.0972	0.30	Q V				
10+30	0.1036	0.31	Q V				
10+45	0.1140	0.50	Q V				
11+ 0	0.1244	0.51	Q V				
11+15	0.1342	0.47	Q V				
11+30	0.1441	0.48	Q V				
11+45	0.1524	0.40	Q V				
12+ 0	0.1616	0.45	Q V				
12+15	0.1764	0.72	Q V				
12+30	0.1921	0.76	Q V				
12+45	0.2095	0.84	Q V				
13+ 0	0.2277	0.88	Q V				
13+15	0.2499	1.08	Q V				
13+30	0.2722	1.08	Q V				
13+45	0.2859	0.66	Q V				
14+ 0	0.2996	0.67	Q V				
14+15	0.3166	0.82	Q V				
14+30	0.3328	0.79	Q V				
14+45	0.3491	0.79	Q V				
15+ 0	0.3647	0.75	Q V				
15+15	0.3796	0.72	Q V				
15+30	0.3937	0.68	Q V				
15+45	0.4048	0.53	Q V				
16+ 0	0.4159	0.54	Q V				
16+15	0.4162	0.02	Q V				
16+30	0.4165	0.02	Q V				

```
  16+45       0.4167      0.01  Q          |          |          |          V|
  17+ 0       0.4170      0.01  Q          |          |          |          V|
  17+15       0.4174      0.02  Q          |          |          |          V|
  17+30       0.4177      0.02  Q          |          |          |          V|
  17+45       0.4182      0.02  Q          |          |          |          V|
  18+ 0       0.4185      0.02  Q          |          |          |          V|
  18+15       0.4188      0.02  Q          |          |          |          V|
  18+30       0.4191      0.02  Q          |          |          |          V|
  18+45       0.4194      0.01  Q          |          |          |          V|
  19+ 0       0.4195      0.01  Q          |          |          |          V|
  19+15       0.4197      0.01  Q          |          |          |          V|
  19+30       0.4201      0.02  Q          |          |          |          V|
  19+45       0.4203      0.01  Q          |          |          |          V|
  20+ 0       0.4205      0.01  Q          |          |          |          V|
  20+15       0.4207      0.01  Q          |          |          |          V|
  20+30       0.4209      0.01  Q          |          |          |          V|
  20+45       0.4212      0.01  Q          |          |          |          V|
  21+ 0       0.4213      0.01  Q          |          |          |          V|
  21+15       0.4216      0.01  Q          |          |          |          V|
  21+30       0.4217      0.01  Q          |          |          |          V|
  21+45       0.4220      0.01  Q          |          |          |          V|
  22+ 0       0.4221      0.01  Q          |          |          |          V|
  22+15       0.4224      0.01  Q          |          |          |          V|
  22+30       0.4225      0.01  Q          |          |          |          V|
  22+45       0.4227      0.01  Q          |          |          |          V|
  23+ 0       0.4228      0.01  Q          |          |          |          V|
  23+15       0.4230      0.01  Q          |          |          |          V|
  23+30       0.4231      0.01  Q          |          |          |          V|
  23+45       0.4233      0.01  Q          |          |          |          V|
  24+ 0       0.4235      0.01  Q          |          |          |           V
-------------------------------------------------------------------------------
```

SECTION 3

HYDROLOGY CALCULATIONS
PROPOSED CONDITION

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 12/30/19 File:BanPro100.out

BANNING INDUSTRIAL
100-YR STUDY
PROPOSED CONDITION
W.O. 4100-4

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6406

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 3

2 year, 1 hour precipitation = 0.600(In.)
100 year, 1 hour precipitation = 1.770(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.770(In/Hr)
Slope of intensity duration curve = 0.5000

++

Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 550.000(Ft.)
Top (of initial area) elevation = 2335.000(Ft.)
Bottom (of initial area) elevation = 2326.000(Ft.)
Difference in elevation = 9.000(Ft.)
Slope = 0.01636 s(percent)= 1.64
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 8.521 min.
Rainfall intensity = 4.697(In/Hr) for a 100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.892
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3) = 74.80
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 5.531(CFS)
Total initial stream area = 1.320(Ac.)
Pervious area fraction = 0.100
End of computations, total study area = 1.32 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number = 56.0

```
                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
       Rational Hydrology Study        Date: 12/30/19  File:BanPro10.out
------------------------------------------------------------------------
BANNING INDUSTRIAL
10-YR STUDY
PROPOSED CONDITION
W.O. 4100-4
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 6406

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =   10.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation =  0.600(In.)
100 year, 1 hour precipitation =  1.770(In.)

Storm event year =  10.0
Calculated rainfall intensity data:
1 hour intensity =  1.081(In/Hr)
Slope of intensity duration curve = 0.5000




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________________
Initial area flow distance =   550.000(Ft.)
Top (of initial area) elevation =  2335.000(Ft.)
Bottom (of initial area) elevation =  2326.000(Ft.)
Difference in elevation =     9.000(Ft.)
Slope =    0.01636  s(percent)=       1.64
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.521 min.
Rainfall intensity =      2.869(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.876
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      3.318(CFS)
Total initial stream area =        1.320(Ac.)
Pervious area fraction = 0.100
End of computations, total study area =            1.32 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number =  56.0
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 12/30/19 File:BanPro5.out

BANNING INDUSTRIAL
5-YR STUDY
PROPOSED CONDITION
W.O. 4100-4

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6406

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 5.00 Antecedent Moisture Condition = 1

2 year, 1 hour precipitation = 0.600(In.)
100 year, 1 hour precipitation = 1.770(In.)

Storm event year = 5.0
Calculated rainfall intensity data:
1 hour intensity = 0.874(In/Hr)
Slope of intensity duration curve = 0.5000

++

Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 550.000(Ft.)
Top (of initial area) elevation = 2335.000(Ft.)
Bottom (of initial area) elevation = 2326.000(Ft.)
Difference in elevation = 9.000(Ft.)
Slope = 0.01636 s(percent)= 1.64
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 8.521 min.
Rainfall intensity = 2.319(In/Hr) for a 5.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.855
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1) = 36.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 2.616(CFS)
Total initial stream area = 1.320(Ac.)
Pervious area fraction = 0.100
End of computations, total study area = 1.32 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number = 56.0

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 12/30/19 File:BanPro2.out

BANNING INDUSTRIAL
2-YR STUDY
PROPOSED CONDITION
W.O. 4100-4

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6406

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 2.00 Antecedent Moisture Condition = 1

2 year, 1 hour precipitation = 0.600(In.)
100 year, 1 hour precipitation = 1.770(In.)

Storm event year = 2.0
Calculated rainfall intensity data:
1 hour intensity = 0.600(In/Hr)
Slope of intensity duration curve = 0.5000

++

Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 550.000(Ft.)
Top (of initial area) elevation = 2335.000(Ft.)
Bottom (of initial area) elevation = 2326.000(Ft.)
Difference in elevation = 9.000(Ft.)
Slope = 0.01636 s(percent)= 1.64
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 8.521 min.
Rainfall intensity = 1.592(In/Hr) for a 2.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.846
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1) = 36.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 1.778(CFS)
Total initial stream area = 1.320(Ac.)
Pervious area fraction = 0.100
End of computations, total study area = 1.32 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number = 56.0

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
Study date 12/31/19 File: BP1100.out

++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

W.O. 4100-4, BANNING INDUSTRIAL
100-YR 1-HR
PROPOSED CONDITION
FILE: BP.UM1

Drainage Area = 1.32(Ac.) = 0.002 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 1.32(Ac.) = 0.002 Sq. Mi.
Length along longest watercourse = 550.00(Ft.)
Length along longest watercourse measured to centroid = 275.00(Ft.)
Length along longest watercourse = 0.104 Mi.
Length along longest watercourse measured to centroid = 0.052 Mi.
Difference in elevation = 9.00(Ft.)
Slope along watercourse = 86.4000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.021 Hr.
Lag time = 1.28 Min.
25% of lag time = 0.32 Min.
40% of lag time = 0.51 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.32	0.60	0.79

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.32	1.77	2.34

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.600(In)
Area Averaged 100-Year Rainfall = 1.770(In)

Point rain (area averaged) = 1.770(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.770(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
1.320	56.00	0.900

Total Area Entered = 1.32(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	74.8	0.305	0.900	0.058	1.000	0.058
					Sum (F) =	0.058

Area averaged mean soil loss (F) (In/Hr) = 0.058
Minimum soil loss rate ((In/Hr)) = 0.029
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.180

Slope of intensity-duration curve for a 1 hour storm =0.5300

U n i t H y d r o g r a p h
DESERT S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	392.077	64.396	0.857
2	0.167	784.154	35.604	0.474
			Sum = 100.000 Sum=	1.330

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	3.40	0.722	0.058	(0.130)	0.664
2	0.17	4.70	0.998	0.058	(0.180)	0.940
3	0.25	4.70	0.998	0.058	(0.180)	0.940
4	0.33	5.10	1.083	0.058	(0.195)	1.025
5	0.42	5.80	1.232	0.058	(0.222)	1.174
6	0.50	5.90	1.253	0.058	(0.226)	1.195
7	0.58	7.10	1.508	0.058	(0.271)	1.450
8	0.67	8.70	1.848	0.058	(0.333)	1.790
9	0.75	13.20	2.804	0.058	(0.505)	2.746
10	0.83	29.70	6.308	0.058	(1.135)	6.250
11	0.92	7.70	1.635	0.058	(0.294)	1.577
12	1.00	4.00	0.850	0.058	(0.153)	0.792
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	20.5

Flood volume = Effective rainfall 1.71(In)
times area 1.3(Ac.)/[(In)/(Ft.)] = 0.2(Ac.Ft)
Total soil loss = 0.06(In)
Total soil loss = 0.006(Ac.Ft)
Total rainfall = 1.77(In)
Flood volume = 8203.0 Cubic Feet
Total soil loss = 278.0 Cubic Feet

Peak flow rate of this hydrograph = 6.658(CFS)

++

1 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0039	0.57	V Q				
0+10	0.0116	1.12	| V Q				
0+15	0.0203	1.25	| VQ				
0+20	0.0294	1.32	| QV				
0+25	0.0397	1.49	| Q V				

```
    0+30       0.0505      1.58  |      Q   V          |          |          |
    0+35       0.0630      1.81  |       Q  |  V       |          |          |
    0+40       0.0783      2.22  |        Q |     V    |          |          |
    0+45       0.1003      3.20  |          | Q        |V         |          |
    0+50       0.1462      6.66  |          |          |     Q    |V         |
    0+55       0.1759      4.31  |          |       Q  |          |       V  |
    1+ 0       0.1857      1.43  |    Q     |          |          |         V|
    1+ 5       0.1883      0.38  |Q         |          |          |          V
-------------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
Study date 12/31/19 File: BP3100.out

++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

W.O. 4100-4, BANNING INDUSTRIAL
100-YR 3-HR
PROPOSED CONDITION
FILE: BP.UM1

Drainage Area = 1.32(Ac.) = 0.002 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 1.32(Ac.) = 0.002 Sq. Mi.
Length along longest watercourse = 550.00(Ft.)
Length along longest watercourse measured to centroid = 275.00(Ft.)
Length along longest watercourse = 0.104 Mi.
Length along longest watercourse measured to centroid = 0.052 Mi.
Difference in elevation = 9.00(Ft.)
Slope along watercourse = 86.4000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.021 Hr.
Lag time = 1.28 Min.
25% of lag time = 0.32 Min.
40% of lag time = 0.51 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.32	1.05	1.39

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.32	2.67	3.52

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.050(In)
Area Averaged 100-Year Rainfall = 2.670(In)

Point rain (area averaged) = 2.670(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.670(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
1.320	56.00	0.900

Total Area Entered = 1.32(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	74.8	0.305	0.900	0.058	1.000	0.058
					Sum (F) =	0.058

Area averaged mean soil loss (F) (In/Hr) = 0.058
Minimum soil loss rate ((In/Hr)) = 0.029
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.180

U n i t H y d r o g r a p h
DESERT S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	392.077	64.396	0.857
2	0.167	784.154	35.604	0.474
			Sum = 100.000 Sum=	1.330

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.417	0.058	(0.075)	0.358
2	0.17	1.30	0.417	0.058	(0.075)	0.358
3	0.25	1.10	0.352	0.058	(0.063)	0.294
4	0.33	1.50	0.481	0.058	(0.087)	0.423
5	0.42	1.50	0.481	0.058	(0.087)	0.423
6	0.50	1.80	0.577	0.058	(0.104)	0.519
7	0.58	1.50	0.481	0.058	(0.087)	0.423
8	0.67	1.80	0.577	0.058	(0.104)	0.519
9	0.75	1.80	0.577	0.058	(0.104)	0.519
10	0.83	1.50	0.481	0.058	(0.087)	0.423
11	0.92	1.60	0.513	0.058	(0.092)	0.455
12	1.00	1.80	0.577	0.058	(0.104)	0.519
13	1.08	2.20	0.705	0.058	(0.127)	0.647
14	1.17	2.20	0.705	0.058	(0.127)	0.647
15	1.25	2.20	0.705	0.058	(0.127)	0.647
16	1.33	2.00	0.641	0.058	(0.115)	0.583
17	1.42	2.60	0.833	0.058	(0.150)	0.775
18	1.50	2.70	0.865	0.058	(0.156)	0.807
19	1.58	2.40	0.769	0.058	(0.138)	0.711
20	1.67	2.70	0.865	0.058	(0.156)	0.807
21	1.75	3.30	1.057	0.058	(0.190)	0.999
22	1.83	3.10	0.993	0.058	(0.179)	0.935
23	1.92	2.90	0.929	0.058	(0.167)	0.871
24	2.00	3.00	0.961	0.058	(0.173)	0.903
25	2.08	3.10	0.993	0.058	(0.179)	0.935
26	2.17	4.20	1.346	0.058	(0.242)	1.288
27	2.25	5.00	1.602	0.058	(0.288)	1.544
28	2.33	3.50	1.121	0.058	(0.202)	1.063
29	2.42	6.80	2.179	0.058	(0.392)	2.121
30	2.50	7.30	2.339	0.058	(0.421)	2.281
31	2.58	8.20	2.627	0.058	(0.473)	2.569
32	2.67	5.90	1.890	0.058	(0.340)	1.832
33	2.75	2.00	0.641	0.058	(0.115)	0.583
34	2.83	1.80	0.577	0.058	(0.104)	0.519
35	2.92	1.80	0.577	0.058	(0.104)	0.519
36	3.00	0.60	0.192	(0.058)	0.035	0.158
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	30.0

Flood volume = Effective rainfall 2.50(In)
times area 1.3(Ac.)/[(In)/(Ft.)] = 0.3(Ac.Ft)

```
 Total soil loss =      0.17(In)
 Total soil loss =     0.019(Ac.Ft)
 Total rainfall =      2.67(In)
 Flood volume =       11968.8 Cubic Feet
 Total soil loss =         824.7 Cubic Feet
 ---------------------------------------------------------------------
  Peak flow rate of this hydrograph =      3.283(CFS)
 ---------------------------------------------------------------------
 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    3 - H O U R    S T O R M
                 R u n o f f     H y d r o g r a p h
 ---------------------------------------------------------------------
             Hydrograph in   5   Minute intervals ((CFS))

 ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
---------------------------------------------------------------------------
  0+ 5       0.0021      0.31  VQ        |         |         |         |
  0+10       0.0054      0.48  VQ        |         |         |         |
  0+15       0.0083      0.42  |Q        |         |         |         |
  0+20       0.0118      0.50  |VQ       |         |         |         |
  0+25       0.0156      0.56  | Q       |         |         |         |
  0+30       0.0201      0.64  | Q       |         |         |         |
  0+35       0.0243      0.61  | QV      |         |         |         |
  0+40       0.0287      0.64  | Q V     |         |         |         |
  0+45       0.0335      0.69  | Q V     |         |         |         |
  0+50       0.0377      0.61  | Q  V    |         |         |         |
  0+55       0.0417      0.59  | Q   V   |         |         |         |
  1+ 0       0.0463      0.66  | Q   V   |         |         |         |
  1+ 5       0.0518      0.80  |  Q   V  |         |         |         |
  1+10       0.0577      0.86  |  Q    V |         |         |         |
  1+15       0.0636      0.86  |  Q     V|         |         |         |
  1+20       0.0692      0.81  |  Q      V         |         |         |
  1+25       0.0757      0.94  |  Q      |V        |         |         |
  1+30       0.0830      1.06  |   Q     | V       |         |         |
  1+35       0.0898      0.99  |  Q      |  V      |         |         |
  1+40       0.0969      1.03  |   Q     |   V     |         |         |
  1+45       0.1054      1.24  |   Q     |    V    |         |         |
  1+50       0.1142      1.28  |    Q    |     V   |         |         |
  1+55       0.1224      1.19  |   Q     |      V  |         |         |
  2+ 0       0.1305      1.19  |   Q     |       V |         |         |
  2+ 5       0.1390      1.23  |   Q     |         V         |         |
  2+10       0.1497      1.55  |     Q   |         |V        |         |
  2+15       0.1630      1.93  |      Q  |         |  V      |         |
  2+20       0.1743      1.64  |     Q   |         |    V    |         |
  2+25       0.1903      2.32  |        Q|         |      V  |         |
  2+30       0.2107      2.96  |         |Q        |         V         |
  2+35       0.2333      3.28  |         |  Q      |         |  V      |
  2+40       0.2525      2.79  |         |Q        |         |    V    |
  2+45       0.2619      1.37  |    Q    |         |         |      V  |
  2+50       0.2669      0.72  | Q       |         |         |      V  |
  2+55       0.2716      0.69  | Q       |         |         |       V |
  3+ 0       0.2743      0.38  |Q        |         |         |       V |
  3+ 5       0.2748      0.07  Q         |         |         |         V
---------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
Study date 12/31/19 File: BP6100.out

++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

W.O. 4100-4, BANNING INDUSTRIAL
100-YR 6-HR
PROPOSED CONDITION
FILE: BP.UM1

Drainage Area = 1.32(Ac.) = 0.002 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 1.32(Ac.) = 0.002 Sq. Mi.
Length along longest watercourse = 550.00(Ft.)
Length along longest watercourse measured to centroid = 275.00(Ft.)
Length along longest watercourse = 0.104 Mi.
Length along longest watercourse measured to centroid = 0.052 Mi.
Difference in elevation = 9.00(Ft.)
Slope along watercourse = 86.4000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.021 Hr.
Lag time = 1.28 Min.
25% of lag time = 0.32 Min.
40% of lag time = 0.51 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.32	1.50	1.98

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.32	3.67	4.84

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.500(In)
Area Averaged 100-Year Rainfall = 3.670(In)

Point rain (area averaged) = 3.670(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 3.670(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
1.320	56.00	0.900

Total Area Entered = 1.32(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	74.8	0.305	0.900	0.058	1.000	0.058
					Sum (F) =	0.058

Area averaged mean soil loss (F) (In/Hr) = 0.058
Minimum soil loss rate ((In/Hr)) = 0.029
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.180

U n i t H y d r o g r a p h
DESERT S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	392.077	64.396	0.857
2	0.167	784.154	35.604	0.474
			Sum = 100.000 Sum=	1.330

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.220	(0.058)	0.040	0.181
2	0.17	0.60	0.264	(0.058)	0.048	0.217
3	0.25	0.60	0.264	(0.058)	0.048	0.217
4	0.33	0.60	0.264	(0.058)	0.048	0.217
5	0.42	0.60	0.264	(0.058)	0.048	0.217
6	0.50	0.70	0.308	(0.058)	0.055	0.253
7	0.58	0.70	0.308	(0.058)	0.055	0.253
8	0.67	0.70	0.308	(0.058)	0.055	0.253
9	0.75	0.70	0.308	(0.058)	0.055	0.253
10	0.83	0.70	0.308	(0.058)	0.055	0.253
11	0.92	0.70	0.308	(0.058)	0.055	0.253
12	1.00	0.80	0.352	0.058	(0.063)	0.294
13	1.08	0.80	0.352	0.058	(0.063)	0.294
14	1.17	0.80	0.352	0.058	(0.063)	0.294
15	1.25	0.80	0.352	0.058	(0.063)	0.294
16	1.33	0.80	0.352	0.058	(0.063)	0.294
17	1.42	0.80	0.352	0.058	(0.063)	0.294
18	1.50	0.80	0.352	0.058	(0.063)	0.294
19	1.58	0.80	0.352	0.058	(0.063)	0.294
20	1.67	0.80	0.352	0.058	(0.063)	0.294
21	1.75	0.80	0.352	0.058	(0.063)	0.294
22	1.83	0.80	0.352	0.058	(0.063)	0.294
23	1.92	0.80	0.352	0.058	(0.063)	0.294
24	2.00	0.90	0.396	0.058	(0.071)	0.338
25	2.08	0.80	0.352	0.058	(0.063)	0.294
26	2.17	0.90	0.396	0.058	(0.071)	0.338
27	2.25	0.90	0.396	0.058	(0.071)	0.338
28	2.33	0.90	0.396	0.058	(0.071)	0.338
29	2.42	0.90	0.396	0.058	(0.071)	0.338
30	2.50	0.90	0.396	0.058	(0.071)	0.338
31	2.58	0.90	0.396	0.058	(0.071)	0.338
32	2.67	0.90	0.396	0.058	(0.071)	0.338
33	2.75	1.00	0.440	0.058	(0.079)	0.382
34	2.83	1.00	0.440	0.058	(0.079)	0.382
35	2.92	1.00	0.440	0.058	(0.079)	0.382
36	3.00	1.00	0.440	0.058	(0.079)	0.382
37	3.08	1.00	0.440	0.058	(0.079)	0.382
38	3.17	1.10	0.484	0.058	(0.087)	0.426
39	3.25	1.10	0.484	0.058	(0.087)	0.426
40	3.33	1.10	0.484	0.058	(0.087)	0.426

41	3.42	1.20	0.528		0.058	(0.095)	0.470
42	3.50	1.30	0.573		0.058	(0.103)	0.514
43	3.58	1.40	0.617		0.058	(0.111)	0.559
44	3.67	1.40	0.617		0.058	(0.111)	0.559
45	3.75	1.50	0.661		0.058	(0.119)	0.603
46	3.83	1.50	0.661		0.058	(0.119)	0.603
47	3.92	1.60	0.705		0.058	(0.127)	0.647
48	4.00	1.60	0.705		0.058	(0.127)	0.647
49	4.08	1.70	0.749		0.058	(0.135)	0.691
50	4.17	1.80	0.793		0.058	(0.143)	0.735
51	4.25	1.90	0.837		0.058	(0.151)	0.779
52	4.33	2.00	0.881		0.058	(0.159)	0.823
53	4.42	2.10	0.925		0.058	(0.166)	0.867
54	4.50	2.10	0.925		0.058	(0.166)	0.867
55	4.58	2.20	0.969		0.058	(0.174)	0.911
56	4.67	2.30	1.013		0.058	(0.182)	0.955
57	4.75	2.40	1.057		0.058	(0.190)	0.999
58	4.83	2.40	1.057		0.058	(0.190)	0.999
59	4.92	2.50	1.101		0.058	(0.198)	1.043
60	5.00	2.60	1.145		0.058	(0.206)	1.087
61	5.08	3.10	1.365		0.058	(0.246)	1.307
62	5.17	3.60	1.585		0.058	(0.285)	1.527
63	5.25	3.90	1.718		0.058	(0.309)	1.660
64	5.33	4.20	1.850		0.058	(0.333)	1.792
65	5.42	4.70	2.070		0.058	(0.373)	2.012
66	5.50	5.60	2.466		0.058	(0.444)	2.408
67	5.58	1.90	0.837		0.058	(0.151)	0.779
68	5.67	0.90	0.396		0.058	(0.071)	0.338
69	5.75	0.60	0.264	(0.058)		0.048	0.217
70	5.83	0.50	0.220	(0.058)		0.040	0.181
71	5.92	0.30	0.132	(0.058)		0.024	0.108
72	6.00	0.20	0.088	(0.058)		0.016	0.072

(Loss Rate Not Used)

Sum = 100.0 Sum = 40.0

Flood volume = Effective rainfall 3.34(In)
times area 1.3(Ac.)/[(In)/(Ft.)] = 0.4(Ac.Ft)
Total soil loss = 0.33(In)
Total soil loss = 0.037(Ac.Ft)
Total rainfall = 3.67(In)
Flood volume = 15989.2 Cubic Feet
Total soil loss = 1595.9 Cubic Feet

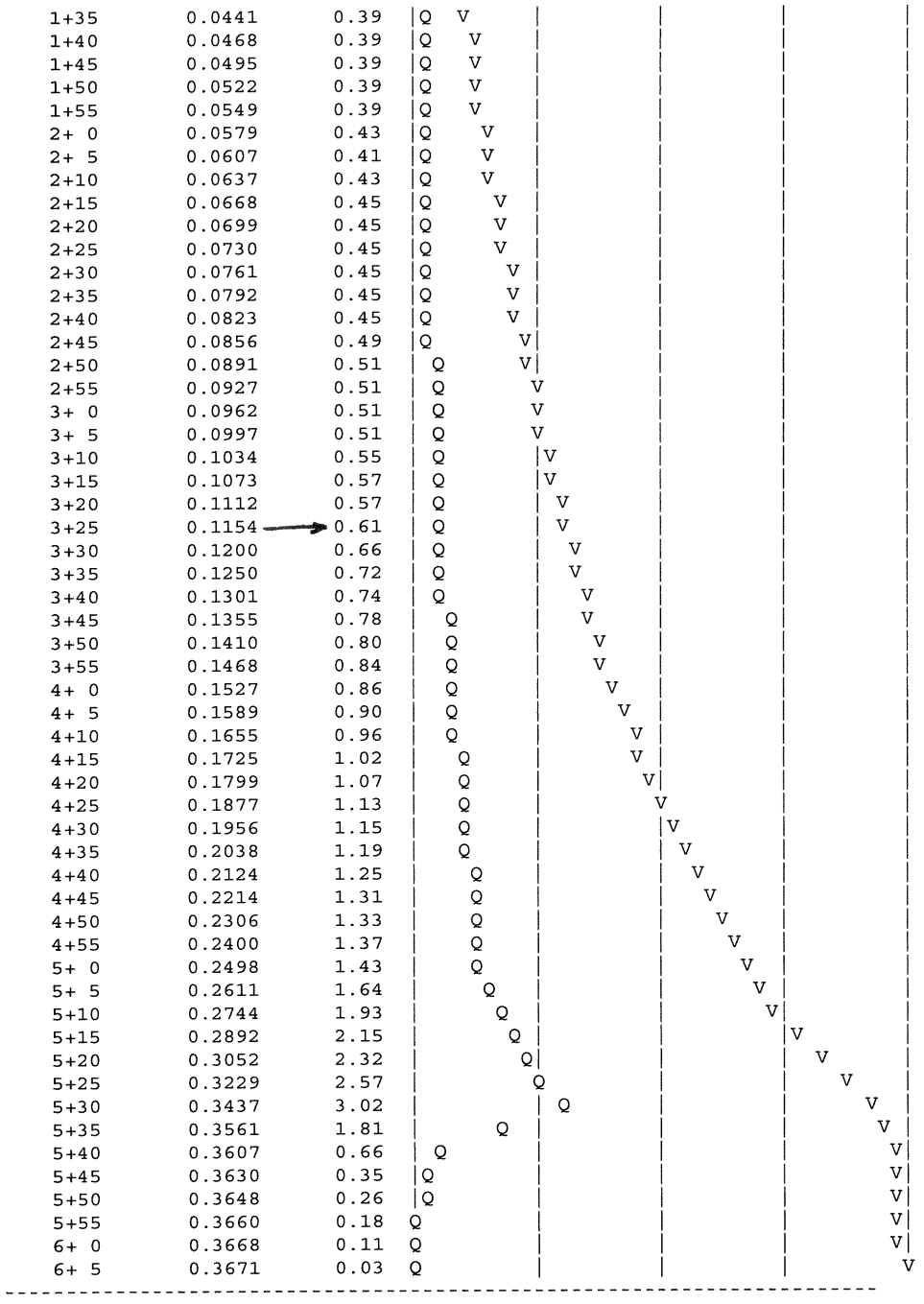
Peak flow rate of this hydrograph = 3.017(CFS)

++

6 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0011	0.15	Q				
0+10	0.0029	0.27	VQ				
0+15	0.0049	0.29	VQ				
0+20	0.0069	0.29	VQ				
0+25	0.0089	0.29	VQ				
0+30	0.0111	0.32	|Q				
0+35	0.0134	0.34	|Q				
0+40	0.0157	0.34	|Q				
0+45	0.0180	0.34	|Q				
0+50	0.0204	0.34	|QV				
0+55	0.0227	0.34	|QV				
1+ 0	0.0252	0.37	|QV				
1+ 5	0.0279	0.39	|Q V				
1+10	0.0306	0.39	|Q V				
1+15	0.0333	0.39	|Q V				
1+20	0.0360	0.39	|Q V				
1+25	0.0387	0.39	|Q V				
1+30	0.0414	0.39	|Q V				


1+35 0.0441 0.39
1+40 0.0468 0.39
1+45 0.0495 0.39
1+50 0.0522 0.39
1+55 0.0549 0.39
2+ 0 0.0579 0.43
2+ 5 0.0607 0.41
2+10 0.0637 0.43
2+15 0.0668 0.45
2+20 0.0699 0.45
2+25 0.0730 0.45
2+30 0.0761 0.45
2+35 0.0792 0.45
2+40 0.0823 0.45
2+45 0.0856 0.49
2+50 0.0891 0.51
2+55 0.0927 0.51
3+ 0 0.0962 0.51
3+ 5 0.0997 0.51
3+10 0.1034 0.55
3+15 0.1073 0.57
3+20 0.1112 0.57
3+25 0.1154 0.61
3+30 0.1200 0.66
3+35 0.1250 0.72
3+40 0.1301 0.74
3+45 0.1355 0.78
3+50 0.1410 0.80
3+55 0.1468 0.84
4+ 0 0.1527 0.86
4+ 5 0.1589 0.90
4+10 0.1655 0.96
4+15 0.1725 1.02
4+20 0.1799 1.07
4+25 0.1877 1.13
4+30 0.1956 1.15
4+35 0.2038 1.19
4+40 0.2124 1.25
4+45 0.2214 1.31
4+50 0.2306 1.33
4+55 0.2400 1.37
5+ 0 0.2498 1.43
5+ 5 0.2611 1.64
5+10 0.2744 1.93
5+15 0.2892 2.15
5+20 0.3052 2.32
5+25 0.3229 2.57
5+30 0.3437 3.02
5+35 0.3561 1.81
5+40 0.3607 0.66
5+45 0.3630 0.35
5+50 0.3648 0.26
5+55 0.3660 0.18
6+ 0 0.3668 0.11
6+ 5 0.3671 0.03

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
Study date 12/31/19 File: BP24100.out

++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

W.O. 4100-4, BANNING INDUSTRIAL
100-YR 24-HR
PROPOSED CONDITION
FILE: BP.UM1

Drainage Area = 1.32(Ac.) = 0.002 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 1.32(Ac.) = 0.002 Sq. Mi.
Length along longest watercourse = 550.00(Ft.)
Length along longest watercourse measured to centroid = 275.00(Ft.)
Length along longest watercourse = 0.104 Mi.
Length along longest watercourse measured to centroid = 0.052 Mi.
Difference in elevation = 9.00(Ft.)
Slope along watercourse = 86.4000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.021 Hr.
Lag time = 1.28 Min.
25% of lag time = 0.32 Min.
40% of lag time = 0.51 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.32	2.81	3.71

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.32	7.19	9.49

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 2.810(In)
Area Averaged 100-Year Rainfall = 7.190(In)

Point rain (area averaged) = 7.190(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 7.190(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
1.320	56.00	0.900

Total Area Entered = 1.32(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	74.8	0.305	0.900	0.058	1.000	0.058
					Sum (F) =	0.058

Area averaged mean soil loss (F) (In/Hr) = 0.058
Minimum soil loss rate ((In/Hr)) = 0.029
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.180

U n i t H y d r o g r a p h
DESERT S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.250	1176.231	100.000	1.330
		Sum = 100.000	Sum= 1.330

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.058	(0.102)	0.010	0.047
2	0.50	0.30	0.086	(0.101)	0.016	0.071
3	0.75	0.30	0.086	(0.100)	0.016	0.071
4	1.00	0.40	0.115	(0.099)	0.021	0.094
5	1.25	0.30	0.086	(0.098)	0.016	0.071
6	1.50	0.30	0.086	(0.097)	0.016	0.071
7	1.75	0.30	0.086	(0.095)	0.016	0.071
8	2.00	0.40	0.115	(0.094)	0.021	0.094
9	2.25	0.40	0.115	(0.093)	0.021	0.094
10	2.50	0.40	0.115	(0.092)	0.021	0.094
11	2.75	0.50	0.144	(0.091)	0.026	0.118
12	3.00	0.50	0.144	(0.090)	0.026	0.118
13	3.25	0.50	0.144	(0.089)	0.026	0.118
14	3.50	0.50	0.144	(0.088)	0.026	0.118
15	3.75	0.50	0.144	(0.086)	0.026	0.118
16	4.00	0.60	0.173	(0.085)	0.031	0.141
17	4.25	0.60	0.173	(0.084)	0.031	0.141
18	4.50	0.70	0.201	(0.083)	0.036	0.165
19	4.75	0.70	0.201	(0.082)	0.036	0.165
20	5.00	0.80	0.230	(0.081)	0.041	0.189
21	5.25	0.60	0.173	(0.080)	0.031	0.141
22	5.50	0.70	0.201	(0.079)	0.036	0.165
23	5.75	0.80	0.230	(0.078)	0.041	0.189
24	6.00	0.80	0.230	(0.077)	0.041	0.189
25	6.25	0.90	0.259	(0.076)	0.047	0.212
26	6.50	0.90	0.259	(0.075)	0.047	0.212
27	6.75	1.00	0.288	(0.074)	0.052	0.236
28	7.00	1.00	0.288	(0.073)	0.052	0.236
29	7.25	1.00	0.288	(0.072)	0.052	0.236
30	7.50	1.10	0.316	(0.071)	0.057	0.259
31	7.75	1.20	0.345	(0.070)	0.062	0.283
32	8.00	1.30	0.374	(0.069)	0.067	0.307
33	8.25	1.50	0.431	0.068	(0.078)	0.363
34	8.50	1.50	0.431	0.067	(0.078)	0.364
35	8.75	1.60	0.460	0.066	(0.083)	0.394
36	9.00	1.70	0.489	0.065	(0.088)	0.424
37	9.25	1.90	0.546	0.064	(0.098)	0.482
38	9.50	2.00	0.575	0.063	(0.104)	0.512
39	9.75	2.10	0.604	0.062	(0.109)	0.541
40	10.00	2.20	0.633	0.062	(0.114)	0.571
41	10.25	1.50	0.431	0.061	(0.078)	0.371

42	10.50	1.50	0.431		0.060	(0.078)	0.372
43	10.75	2.00	0.575		0.059	(0.104)	0.516
44	11.00	2.00	0.575		0.058	(0.104)	0.517
45	11.25	1.90	0.546		0.057	(0.098)	0.489
46	11.50	1.90	0.546		0.056	(0.098)	0.490
47	11.75	1.70	0.489		0.056	(0.088)	0.433
48	12.00	1.80	0.518		0.055	(0.093)	0.463
49	12.25	2.50	0.719		0.054	(0.129)	0.665
50	12.50	2.60	0.748		0.053	(0.135)	0.695
51	12.75	2.80	0.805		0.052	(0.145)	0.753
52	13.00	2.90	0.834		0.051	(0.150)	0.783
53	13.25	3.40	0.978		0.051	(0.176)	0.927
54	13.50	3.40	0.978		0.050	(0.176)	0.928
55	13.75	2.30	0.661		0.049	(0.119)	0.612
56	14.00	2.30	0.661		0.048	(0.119)	0.613
57	14.25	2.70	0.777		0.048	(0.140)	0.729
58	14.50	2.60	0.748		0.047	(0.135)	0.701
59	14.75	2.60	0.748		0.046	(0.135)	0.702
60	15.00	2.50	0.719		0.046	(0.129)	0.673
61	15.25	2.40	0.690		0.045	(0.124)	0.645
62	15.50	2.30	0.661		0.044	(0.119)	0.617
63	15.75	1.90	0.546		0.043	(0.098)	0.503
64	16.00	1.90	0.546		0.043	(0.098)	0.504
65	16.25	0.40	0.115	(0.042)		0.021	0.094
66	16.50	0.40	0.115	(0.042)		0.021	0.094
67	16.75	0.30	0.086	(0.041)		0.016	0.071
68	17.00	0.30	0.086	(0.040)		0.016	0.071
69	17.25	0.50	0.144	(0.040)		0.026	0.118
70	17.50	0.50	0.144	(0.039)		0.026	0.118
71	17.75	0.50	0.144	(0.038)		0.026	0.118
72	18.00	0.40	0.115	(0.038)		0.021	0.094
73	18.25	0.40	0.115	(0.037)		0.021	0.094
74	18.50	0.40	0.115	(0.037)		0.021	0.094
75	18.75	0.30	0.086	(0.036)		0.016	0.071
76	19.00	0.20	0.058	(0.036)		0.010	0.047
77	19.25	0.30	0.086	(0.035)		0.016	0.071
78	19.50	0.40	0.115	(0.035)		0.021	0.094
79	19.75	0.30	0.086	(0.034)		0.016	0.071
80	20.00	0.20	0.058	(0.034)		0.010	0.047
81	20.25	0.30	0.086	(0.033)		0.016	0.071
82	20.50	0.30	0.086	(0.033)		0.016	0.071
83	20.75	0.30	0.086	(0.033)		0.016	0.071
84	21.00	0.20	0.058	(0.032)		0.010	0.047
85	21.25	0.30	0.086	(0.032)		0.016	0.071
86	21.50	0.20	0.058	(0.031)		0.010	0.047
87	21.75	0.30	0.086	(0.031)		0.016	0.071
88	22.00	0.20	0.058	(0.031)		0.010	0.047
89	22.25	0.30	0.086	(0.030)		0.016	0.071
90	22.50	0.20	0.058	(0.030)		0.010	0.047
91	22.75	0.20	0.058	(0.030)		0.010	0.047
92	23.00	0.20	0.058	(0.030)		0.010	0.047
93	23.25	0.20	0.058	(0.029)		0.010	0.047
94	23.50	0.20	0.058	(0.029)		0.010	0.047
95	23.75	0.20	0.058	(0.029)		0.010	0.047
96	24.00	0.20	0.058	(0.029)		0.010	0.047

(Loss Rate Not Used)

Sum = 100.0 Sum = 25.5

Flood volume = Effective rainfall 6.36(In)
times area 1.3(Ac.)/[(In)/(Ft.)] = 0.7(Ac.Ft)
Total soil loss = 0.83(In)
Total soil loss = 0.091(Ac.Ft)
Total rainfall = 7.19(In)
Flood volume = 30488.3 Cubic Feet
Total soil loss = 3963.2 Cubic Feet

Peak flow rate of this hydrograph = 1.235(CFS)

++

24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

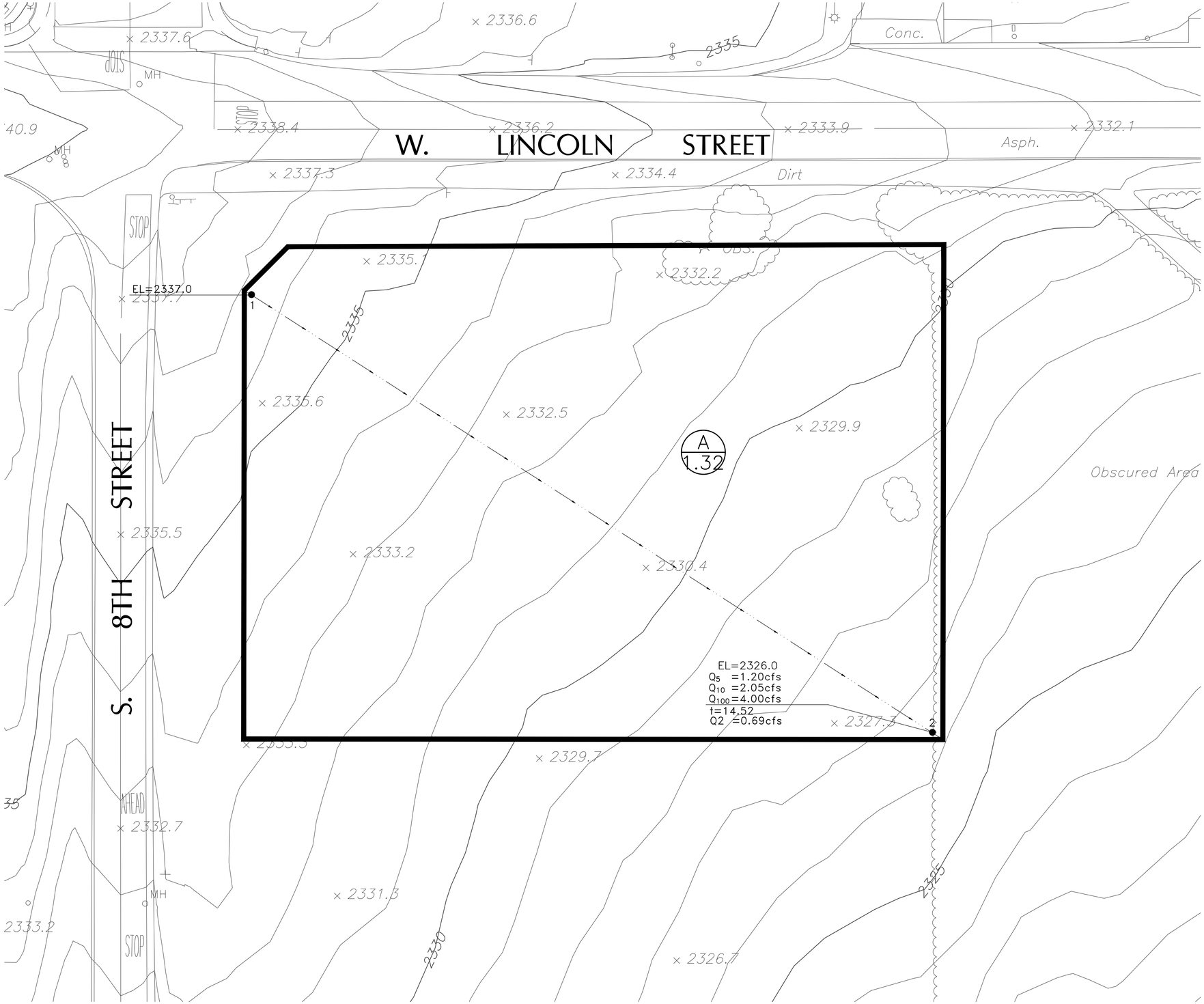
Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0013	0.06	Q				
0+30	0.0032	0.09	Q				
0+45	0.0052	0.09	Q				
1+ 0	0.0078	0.13	Q				
1+15	0.0097	0.09	Q				
1+30	0.0117	0.09	Q				
1+45	0.0136	0.09	Q				
2+ 0	0.0162	0.13	Q				
2+15	0.0188	0.13	QV				
2+30	0.0214	0.13	QV				
2+45	0.0246	0.16	QV				
3+ 0	0.0279	0.16	QV				
3+15	0.0311	0.16	QV				
3+30	0.0344	0.16	QV				
3+45	0.0376	0.16	Q V				
4+ 0	0.0415	0.19	Q V				
4+15	0.0454	0.19	Q V				
4+30	0.0499	0.22	Q V				
4+45	0.0545	0.22	Q V				
5+ 0	0.0597	0.25	Q V				
5+15	0.0636	0.19	Q V				
5+30	0.0681	0.22	Q V				
5+45	0.0733	0.25	Q V				
6+ 0	0.0785	0.25	Q V				
6+15	0.0843	0.28	Q V				
6+30	0.0901	0.28	Q V				
6+45	0.0966	0.31	Q V				
7+ 0	0.1031	0.31	Q V				
7+15	0.1096	0.31	Q V				
7+30	0.1167	0.35	Q V				
7+45	0.1245	0.38	Q V				
8+ 0	0.1329	0.41	Q V				
8+15	0.1429	0.48	Q V				
8+30	0.1530	0.48	Q V				
8+45	0.1638	0.52	Q V				
9+ 0	0.1754	0.56	Q V				
9+15	0.1887	0.64	Q V				
9+30	0.2028	0.68	Q V				
9+45	0.2177	0.72	Q V				
10+ 0	0.2334	0.76	Q V				
10+15	0.2436	0.49	Q V				
10+30	0.2538	0.49	Q V				
10+45	0.2680	0.69	Q V				
11+ 0	0.2822	0.69	Q V				
11+15	0.2957	0.65	Q V				
11+30	0.3091	0.65	Q V				
11+45	0.3211	0.58	Q V				
12+ 0	0.3338	0.62	Q V				
12+15	0.3521	0.89	Q V				
12+30	0.3712	0.92	Q V				
12+45	0.3919	1.00	Q V				
13+ 0	0.4134	1.04	Q V				
13+15	0.4389	1.23	Q V				
13+30	0.4644	1.24	Q V				
13+45	0.4813	0.81	Q V				
14+ 0	0.4981	0.82	Q V				
14+15	0.5182	0.97	Q V				
14+30	0.5374	0.93	Q V				
14+45	0.5567	0.93	Q V				
15+ 0	0.5753	0.90	Q V				
15+15	0.5930	0.86	Q V				
15+30	0.6100	0.82	Q V				
15+45	0.6238	0.67	Q V				
16+ 0	0.6377	0.67	Q V				
16+15	0.6403	0.13	Q V				
16+30	0.6428	0.13	Q V				

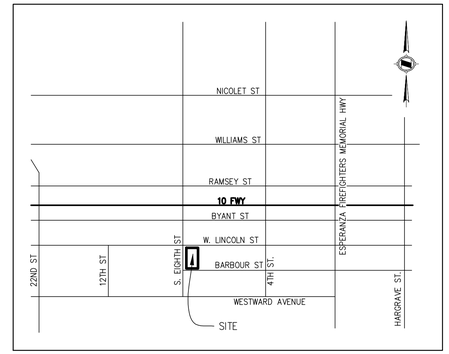
```
   16+45       0.6448      0.09  Q          |          |          |     V    |
   17+ 0       0.6467      0.09  Q          |          |          |     V    |
   17+15       0.6500      0.16  Q          |          |          |      V   |
   17+30       0.6532      0.16  Q          |          |          |      V   |
   17+45       0.6565      0.16  Q          |          |          |      V   |
   18+ 0       0.6591      0.13  Q          |          |          |      V   |
   18+15       0.6617      0.13  Q          |          |          |      V   |
   18+30       0.6642      0.13  Q          |          |          |      V   |
   18+45       0.6662      0.09  Q          |          |          |       V  |
   19+ 0       0.6675      0.06  Q          |          |          |       V  |
   19+15       0.6694      0.09  Q          |          |          |       V  |
   19+30       0.6720      0.13  Q          |          |          |       V  |
   19+45       0.6740      0.09  Q          |          |          |       V  |
   20+ 0       0.6753      0.06  Q          |          |          |       V  |
   20+15       0.6772      0.09  Q          |          |          |       V  |
   20+30       0.6792      0.09  Q          |          |          |       V  |
   20+45       0.6811      0.09  Q          |          |          |       V  |
   21+ 0       0.6824      0.06  Q          |          |          |       V  |
   21+15       0.6844      0.09  Q          |          |          |        V |
   21+30       0.6856      0.06  Q          |          |          |        V |
   21+45       0.6876      0.09  Q          |          |          |        V |
   22+ 0       0.6889      0.06  Q          |          |          |        V |
   22+15       0.6908      0.09  Q          |          |          |        V |
   22+30       0.6921      0.06  Q          |          |          |        V |
   22+45       0.6934      0.06  Q          |          |          |        V |
   23+ 0       0.6947      0.06  Q          |          |          |        V |
   23+15       0.6960      0.06  Q          |          |          |        V |
   23+30       0.6973      0.06  Q          |          |          |        V |
   23+45       0.6986      0.06  Q          |          |          |        V |
   24+ 0       0.6999      0.06  Q          |          |          |         V
-------------------------------------------------------------------------------
```

SECTION 4

HYDROLOGY MAPS



VICINITY MAP



LEGEND

———	MAJOR DRAINAGE BOUNDARY
1 ●	NODE NUMBER
EL=1000.00	NODE ELEVATION
A / 1.0	AREA DESIGNATION / AREA ACREAGE (IN ACRES)
Q_{10} =6.0cfs Q_{100}=8.0cfs t=15.0	PEAK FLOW RATE TIME OF CONCENTRATION
B	SOIL GROUP

SCALE: 1" = 20'

20 10 0 20 60

GRAPHIC SCALE 1"=20'

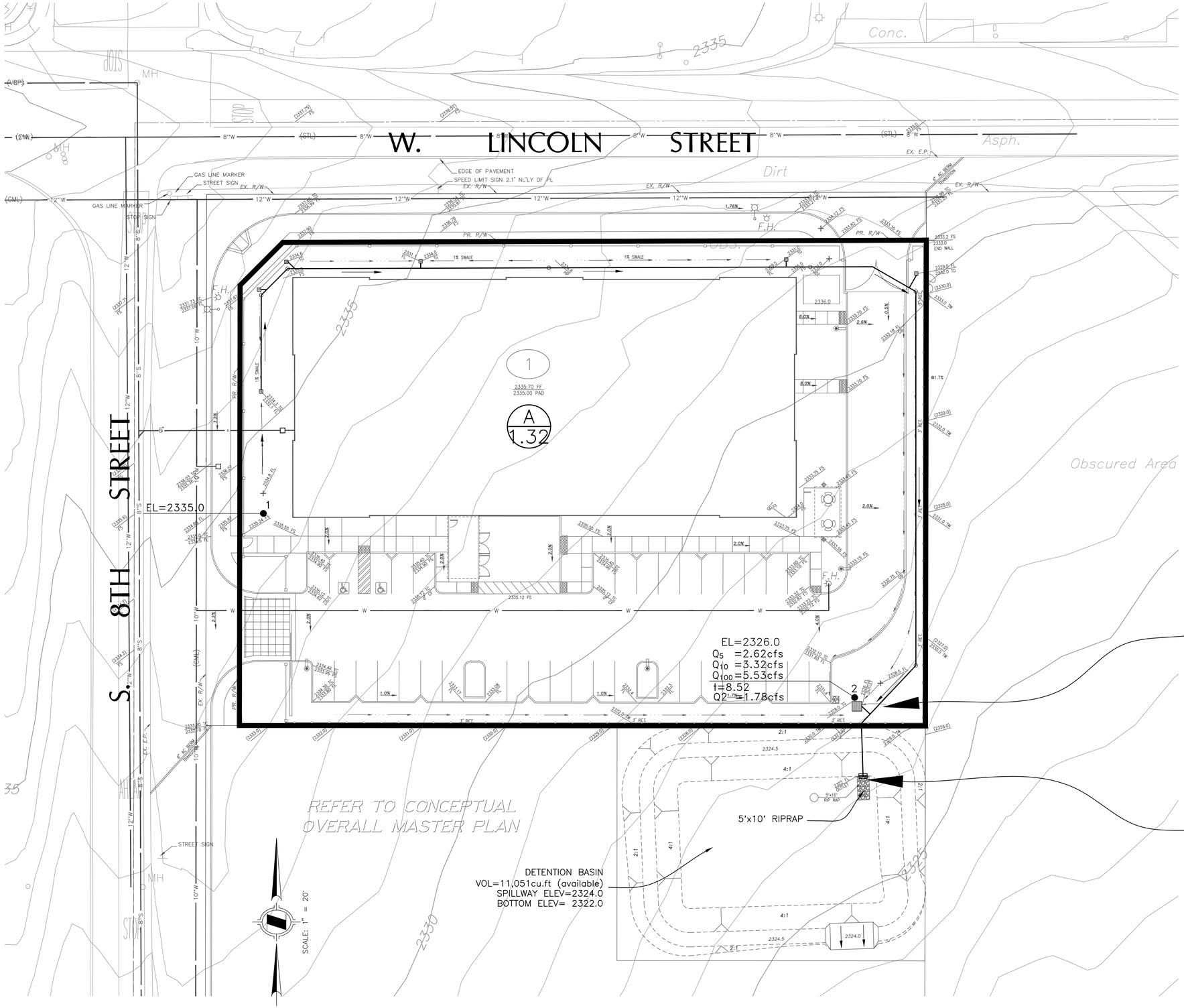
PREPARED BY:
HUNSAKER & ASSOCIATES
IRVINE, INC.
PLANNING ▪ ENGINEERING ▪ SURVEYING
Three Hughes ▪ Irvine, CA 92618 ▪ PH: (949) 583-1010 ▪ FX: (949) 583-0759

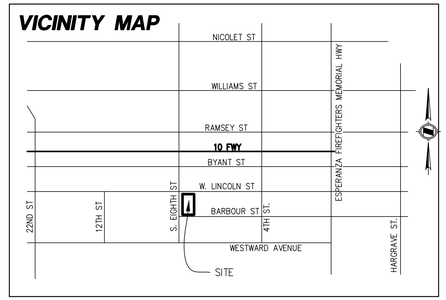
PREPARED FOR:
Dominion | Property Partners LLC

PRELIMINARY HYDROLOGY MAP
8TH & LINCOLN INDUSTRIAL BUILDING
BANNING, CA

EXISTING CONDITION

W.O. #4344-1

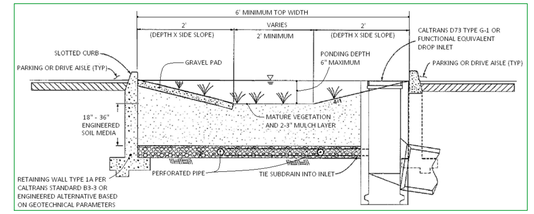


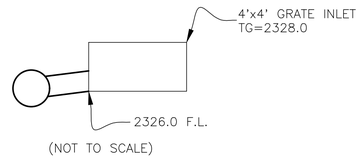


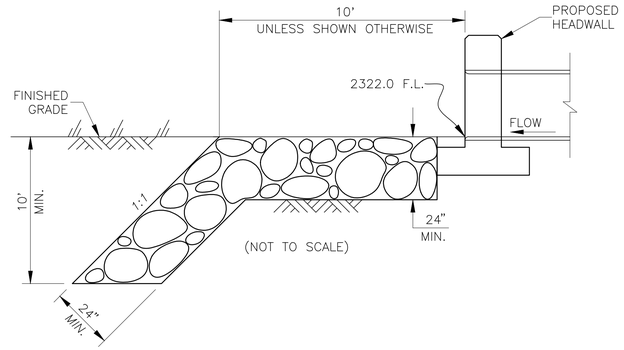
LEGEND

- MAJOR DRAINAGE BOUNDARY
- 1 ● NODE NUMBER
- EL=1000.00 NODE ELEVATION
- A / 1.0 AREA DESIGNATION / AREA ACREAGE (IN ACRES)
- Q_{10} =6.0cfs, Q_{100}=8.0cfs, t=15.0 PEAK FLOW RATE / TIME OF CONCENTRATION
- STORM DRAIN LINE
- □ INLET
- ○ CLEANOUT
- B SOIL GROUP

BIO-SWALE DETAIL







PRELIMINARY HYDROLOGY MAP
8TH & LINCOLN INDUSTRIAL BUILDING
BANNING, CA

PROPOSED CONDITION

PREPARED BY:
HUNSAKER & ASSOCIATES IRVINE, INC.
PLANNING ▪ ENGINEERING ▪ SURVEYING
Three Hughes ▪ Irvine, CA 92618 ▪ PH: (949) 583-1010 ▪ FX: (949) 583-0759

PREPARED FOR:
Dominion | Property Partners LLC

W.O. #4344-1

PLOTTED BY: Tu Trinh DATE: Feb. 17, 2020 02:01:32 PM FILE: F:\1098\Engineering\SY_Hydrology\Banning-Industrial-Pro.dwg

Appendix F.2

Preliminary Water Quality Control Plan

PRELIMINARY WATER QUALITY MANAGEMENT PLAN

"8TH & LINCOLN INDUSTRIAL BUILDING"

Project Address:

Southeast Corner of S. Eighth Street and W. Lincoln Street

City of Banning, CA

Prepared for:

BANNING LINCOLN STREET PARTNERS LP C/O DOMINION PROPERTY PARTNERS LLC.

2811 Wilshire Blvd. Suite 400

Santa Monica, CA 90403

(310) 664-7144

Prepared by:

Hunsaker & Associates Irvine, Inc.

3 Hughes

Irvine, CA 92618

(949) 583-1010

Preparation Date:

October 7, 2019

Revision Date:

February 14, 2020

W.O. 4100-4

Project Specific
Water Quality Management Plan

For: **8th & Lincoln Industrial Building**

Southeast Corner of S. Eighth Street and W. Lincoln Street

DEVELOPMENT NO. **CUP 19-8008**
DESIGN REVIEW NO. **TBD**

Prepared for:

Banning Lincoln Street Partners LP c/o Dominion Property Partners LLC.
2811 Wilshire Blvd. Suite 400
Santa Monica, CA 90403
Telephone: (310) 664-7144

Prepared by:
Hunsaker & Associates Irvine, Inc.
3 Hughes
Irvine, CA 92618
Telephone: (949) 583-1010
Martin Parker

Original Date Prepared: October 7, 2019

Revision Date(s): February 14, 2020

OWNER'S CERTIFICATION

This project-specific Water Quality Management Plan (WQMP) has been prepared for:

Banning Lincoln Street Partners LP c/o Dominion Property Partners LLC.
by **Hunsaker & Associates Irvine, Inc.**
for the project known as 8th and Lincoln Industrial Building at the SE Corner of S. Eighth Street and W. Lincoln Street

This WQMP is intended to comply with the requirements of **City of Banning** for **8TH & LINCOLN INDUSTRIAL BUILDING**, which includes the requirement for the preparation and implementation of a project-specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity.

The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under **City of Banning** Water Quality Ordinance (Municipal Code Section 1388).

If the undersigned transfers its interest in the subject property/project, the undersigned shall notify the successor in interest of its responsibility to implement this WQMP.

"I, the undersigned, certify under penalty of law that I am the owner of the property that is the subject of this WQMP, and that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

_____
Owner's Signature

_____
Owner's Printed Name

_____
Owner's Title/Position

_____
Date

ATTEST

_____
Notary Signature

_____
Printed Name

_____
Title/Position

_____
Date

THIS FORM SHALL BE NOTARIZED BEFORE ACCEPTANCE OF THE FINAL PROJECT SPECIFIC WQMP

Contents

SECTION **PAGE**

I. Project Description 1
II. Site Characterization 5
III. Pollutants of Concern 7
IV. Hydrologic Conditions of Concern 8
V. Best Management Practices 9
V.1 Site Design BMP Concepts, LID/Site Design and Treatment Control BMPs 9
V.1.A Site Design BMP Concepts and LID/Site Design BMPs 11
V.1.B Treatment Control BMPs 18
V.1.C Measurable Goal Summary 20
V.2 Source Control BMPs 21
V.3 Equivalent Treatment Control BMP Alternatives 23
V.4 Regionally-Based BMPs 23
VI. Operation and Maintenance Responsibility for BMPs 24
VII. Funding 27

TABLES

Table 1. Pollutant of Concern Summary 7
Table 2. BMP Selection Matrix Based Upon Pollutant of Concern Removal Efficiency 10
Table 3. Implementation of Site Design BMP Concepts 12
Table 4. LID/Site Design BMPs Meeting the LID/Site Design Measurable Goal 17
Table 5: Treatment Control BMP Summary 19
Table 6: Measurable Goal Summary 20
Table 7. Source Control BMPs 21

APPENDICES

A. Conditions of Approval
B. Vicinity Map, WQMP Site Plan, and Receiving Waters Map
C. Supporting Detail Related to Hydrologic Conditions of Concern (If Applicable)
D. Educational Materials
E. Soils Report (if applicable)
F. Structural BMP and/or Retention Facility Sizing Calculations and Design Details
G. Agreements – CC&Rs, Covenant and Agreements, BMP Maintenance Agreements and/or Other Mechanisms for ensuring ongoing Operation, Maintenance, Funding and Transfer of Requirements for this project-specific WQMP
H. Phase 1 Environmental Site Assessment – Summary of Site Remediation Conducted and Use Restrictions
I. Project-Specific WQMP Summary Data Form

I. Project Description

Project Owner: Banning Lincoln Street Partners LP c/o Dominion Property Partners LLC.
2811 Wilshire Blvd., Suite 400
(310) 664-7144

WQMP Preparer: Hunsaker & Associates Irvine, Inc.
3 Hughes
Irvine, CA 92618
(949) 583-1010

Project Site Address:	**Southeast Corner of S. Eighth Street and W. Lincoln Street Banning, CA 92220**
Planning Area/ Community Name/ Development Name:	8th & Lincoln Industrial Building
APN Number(s):	**540-250-001**
Latitude & Longitude:	**33.921433, -116.884898**
Receiving Water:	**Smith Creek Channel**
Project Site Size:	**1.32 acres**

Standard Industrial Classification (SIC) Code: **N/A**

Formation of Home Owners' Association (HOA) or Property Owners Association (POA): POA Y ☐ N ☐

Additional Permits/Approvals required for the Project:

AGENCY	Permit required
State Department of Fish and Wildlife, Fish and Game Code §1602 Streambed Alteration Agreement	Y ☐ N☒
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Certification	Y ☐ N☒
US Army Corps of Engineers, CWA Section 404 permit	Y ☐ N☒
US Fish and Wildlife, Endangered Species Act Section 7 biological opinion	Y ☐ N☒
Statewide Construction General Permit Coverage	Y ☒ N☐
Statewide Industrial General Permit Coverage	Y ☐ N☒
Other *(please list in the space below as required)* City of Banning Grading Permit, Construction Permits and Encroachment Permit.	

The proposed project, "Banning Industrial", an approximately 1.3 acre rectangular parcel of land located just southeast of W. Lincoln Street and S. 8th Street. The project site is bordered by W. Lincoln Street to the north, vacant land to the south, vacant land to the east and S. 8th Street to the west.

The project proposes to construct a new industrial building for cannabis cultivation on a vacant parcel, with related improvements including drive-aisles, parking, wet and dry utilities, storm drain improvements, walkways and landscaping.

Paved and other impervious areas of the site include the project's drive aisle, walkways, drive approaches and gutter improvements, building structures and other exposed paved surfaces.

The site is relatively flat with sparse vegetation. The site gently slopes to the southeast, with an elevation of approximately 2335 amsl at the northwest corner and an elevation of approximately 2327 at the southeast corner of the site. Existing drainage patterns are to the south towards Montgomery Creek, then east to the San Gorgonio River, Whitewater River, Coachella Valley Storm Channel and eventually discharge into the Salton Sea.

Post-development onsite drainage will convey flows to grated inlets via swales and be directed to the southerly end of the project site to a detention basin. Storm flows will also be conveyed towards the east and south of the project site towards the proposed bioretention facilities via curb cuts for water quality treatment. The detention basin has been sized to store runoff from rainfall events up to and including the 100-year, 3-hour duration storm event, onsite, in the post-development condition.

Appendix A of this project-specific WQMP includes a complete copy of the final Conditions of Approval. Appendix B of this project-specific WQMP includes:

a. A Vicinity Map identifying the project site and surrounding planning areas in sufficient detail; and

b. A Site Plan for the project. The Site Plan included as part of Appendix B depicts the following project features:

- Location and identification of all structural BMPs, including Source Control, LID/Site Design and Treatment Control BMPs.
- Landscaped areas.
- Paved areas and intended uses (i.e., parking, outdoor work area, outdoor material storage area, sidewalks, patios, tennis courts, etc.).
- Number and type of structures and intended uses (i.e., buildings, tenant spaces, dwelling units, community facilities such as pools, recreation facilities, tot lots, etc.).
- Infrastructure (i.e., streets, storm drains, etc.) that will revert to public agency ownership and operation.
- Location of existing and proposed public and private storm drainage facilities (i.e., storm drains, channels, basins, etc.), including catch basins and other inlets/outlet structures. Existing and proposed drainage facilities should be clearly differentiated.

- Location(s) of Receiving Waters to which the project directly or indirectly discharges.
- Location of points where onsite (or tributary offsite) flows exit the property/project site.
- Delineation of proposed drainage area boundaries, including tributary offsite areas, for each location where flows exit the project site and existing site (where existing site flows are required to be addressed). Each tributary area should be clearly denoted.
- Pre- and post-project topography.

Appendix I is a one page form that summarizes pertinent information relative to this project-specific WQMP.

II. Site Characterization

Land Use Designation or Zoning: Industrial

Current Property Use: Undeveloped vacant land.

Proposed Property Use: Industrial Building.

Availability of Soils Report: Y ☒ N ☐ *Note: A soils report is required if infiltration BMPs are utilized. Attach report in Appendix E.*

Phase 1 Site Assessment: Y ☐ N ☒ *Note: If prepared, attached remediation summary and use restrictions in Appendix H.*

Receiving Waters for Urban Runoff from Site

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use Designated Receiving Waters
Gilman Home Channel (5-0170)	N/A	N/A	N/A
Smith Creek Channel (5-0090)	N/A	N/A	N/A
San Gorgonio River	N/A	MUN, AGR, GWR, RECI, RECII, COLD, WILD	N/A
Whitewater River	N/A	MUN, AGR, GWR, RECI, RECII, WARM, COLD, WILD, POW	N/A
Coachella Valley Storm Water Channel	DDT, Dieldrin, PCBs, Pathogens	FRSH, RECI, RECII, WARM, WILD, RARE	45 miles
Salton Sea	Arsenic, Chloride, Clorpyrifos, DDT, Enterococcus, Nutrients, Salinity, Low Dissolved Oxygen, Nitrogen-Ammonia, Toxicity	AQUA, RECI, RECII, WARM, WILD, RARE	65 miles

III. Pollutants of Concern

Table 1. Pollutant of Concern Summary

Pollutant Category	Potential for Project and/or Existing Site	Causing Receiving Water Impairment
Bacteria/Virus	No	Yes
Heavy Metals	Yes	No
Nutrients	Yes	Yes
Toxic Organic Compounds	Yes	Yes
Sediment/Turbidity	Yes	No
Trash & Debris	Yes	No
Oil & Grease	Yes	No
Other (specify pollutant):		
Other (specify pollutant):		

IV. Hydrologic Conditions of Concern

Local Jurisdiction Requires On-Site Retention of Urban Runoff:

Yes ☒ The project will be required to retain urban runoff onsite in conformance with local ordinance (See Table 6 of the WQMP Guidance document, "Local Land use Authorities Requiring Onsite Retention of Stormwater"). This section does not need to be completed; however, retention facility design details and sizing calculations must be included in Appendix F.

No ☐ This section must be completed.

This Project meets the following condition:

☐ **Condition A**: 1) Runoff from the Project is discharged directly to a publicly-owned, operated and maintained MS4 or engineered and maintained channel, 2) the discharge is in full compliance with local land use authority requirements for connections and discharges to the MS4 (including both quality and quantity requirements), 3) the discharge would not significantly impact stream habitat in proximate Receiving Waters, **and** 4) the discharge is authorized by the local land use authority.

☐ **Condition B**: The project disturbs less than 1 acre and is not part of a larger common plan of development that exceeds 1 acre of disturbance. The disturbed area calculation must include all disturbances associated with larger plans of development.

☐ **Condition C**: The project's runoff flow rate, volume, velocity and duration for the post-development condition do not exceed the pre-development condition for the 2-year, 24-hour and 10-year 24-hour rainfall events. This condition can be achieved by, where applicable, complying with the local land use authority's on-site retention ordinance, or minimizing impervious area on a site and incorporating other Site-Design BMP concepts and LID/Site Design BMPs that assure non-exceedance of pre-development conditions. This condition must be substantiated by hydrologic modeling methods acceptable to the local land use authority.

☐ **None:** Refer to Section 3.4 of the Whitewater River Region WQMP Guidance document for additional requirements.

Supporting engineering studies, calculations, and reports are included in Appendix C.

	2 year – 24 hour		10 year – 24 hour	
	Precondition	**Post-condition**	**Precondition**	**Post-condition**
Discharge (cfs)				
Velocity (fps)				
Volume (cubic feet)				
Duration (minutes)				

V. Best Management Practices

This project implements Best Management Practices (BMPs) to address the Pollutants of Concern that may potentially be generated from the use of the Choose one: 'project site' or 'project site plus existing site area(s)'. These BMPs have been selected and implemented to comply with Section 3.5 of the WQMP Guidance document, and consist of Site Design BMP concepts, Source Control, LID/Site Design and, if/where necessary, Treatment Control BMPs as described herein.

V.1 Site Design BMP Concepts, LID/Site Design and Treatment Control BMPs

Local Jurisdiction Requires On-Site Retention of Urban Runoff:

Yes ☒ The project will be required to retain Urban Runoff onsite in conformance with local ordinance (See Table 6 of the WQMP Guidance document, "Local Land use Authorities Requiring Onsite Retention of Stormwater). **The LID/Site Design measurable goal has thus been met (100%), and Sections V.1.A and V.1.B do not need to be completed**; however, retention facility design details and sizing calculations must be included in Appendix F, and '100%' should be entered into Column 3 of Table 6 below.

No ☐ Section V.1 must be completed.

This section of the Project-Specific WQMP documents the LID/Site Design BMPs and, if/where necessary, the Treatment Control BMPs that will be implemented on the project to meet the requirements detailed within Section 3.5.1 of the WQMP Guidance document. Section 3.5.1 includes requirements to implement Site Design Concepts and BMPs, and includes requirements to address Pollutants of Concern with BMPs. Further, sub-section 3.5.1.1 specifically requires that Pollutants of Concern be addressed with LID/Site Design BMPs to the extent feasible.

LID/Site Design BMPs are those BMPs listed within Table 2 below which promote retention and/or feature a natural treatment mechanism; off-site and regionally-based BMPs are also LID/Site Design BMPs, and therefore count towards the measurable goal, if they fit these criteria. This project incorporates LID/Site Design BMPs to fully address the Treatment Control BMP requirement where and to the extent feasible. If and where it has been acceptably demonstrated to the local land use authority that it is infeasible to fully meet this requirement with LID/Site Design BMPs, Section V.1.B (below) includes a description of the conventional Treatment Control BMPs that will be substituted to meet the same requirements.

In addressing Pollutants of Concern, BMPs are selected using Table 2 below.

Table 2. BMP Selection Matrix Based Upon Pollutant of Concern Removal Efficiency (1)

(Sources: Riverside County Flood Control & Water Conservation District Design Handbook for Low Impact Development Best Management Practices, dated September 2011, the Orange County Technical Guidance Document for Water Quality Management Plans, dated May 19, 2011, and the Caltrans Treatment BMP Technology Report, dated April 2010 and April 2008)

Pollutant of Concern	Landscape Swale[2, 3]	Landscape Strip[2, 3]	Biofiltration (with underdrain)[2, 3]	Extended Detention Basin[2]	Sand Filter Basin[2]	Infiltration Basin[2]	Infiltration Trench[2]	Permeable Pavement[2]	Bioretention (w/o underdrain)[2, 3]	Other BMPs Including Proprietary BMPs[4, 6]
Sediment & Turbidity	M	M	H	M	H	H	H	H	H	Varies by Product[5]
Nutrients	L/M	L/M	M	L/M	L/M	H	H	H	H	
Toxic Organic Compounds	M/H	M/H	M/H	L	L/M	H	H	H	H	
Trash & Debris	L	L	H	H	H	H	H	L	H	
Bacteria & Viruses (also: Pathogens)	L	M	H	L	M	H	H	H	H	
Oil & Grease	M	M	H	M	H	H	H	H	H	
Heavy Metals	M	M/H	M/H	L/M	M	H	H	H	H	

Abbreviations:

L: Low removal efficiency M: Medium removal efficiency H: High removal efficiency

Notes:

(1) Periodic performance assessment and updating of the guidance provided by this table may be necessary.

(2) Expected performance when designed in accordance with the most current edition of the document, "Riverside County, Whitewater River Region Stormwater Quality Best Management Practice Design Handbook".

(3) Performance dependent upon design which includes implementation of thick vegetative cover. Local water conservation and/or landscaping requirements should be considered; approval is based on the discretion of the local land use authority.

(4) Includes proprietary stormwater treatment devices as listed in the CASQA Stormwater Best Management Practices Handbooks, other stormwater treatment BMPs not specifically listed in this WQMP (including proprietary filters, hydrodynamic separators, inserts, etc.), or newly developed/emerging stormwater treatment technologies.

(5) Expected performance should be based on evaluation of unit processes provided by BMP and available testing data. Approval is based on the discretion of the local land use authority.

(6) When used for primary treatment as opposed to pre-treatment, requires site-specific approval by the local land use authority.

V.1.A SITE DESIGN BMP CONCEPTS AND LID/SITE DESIGN BMPS

This section documents the Site Design BMP concepts and LID/Site Design BMPs that will be implemented on this project to comply with the requirements detailed in Section 3.5.1 of the WQMP Guidance document.

- Table 3 herein documents the implementation of the Site Design BMP Concepts described in sub-sections 3.5.1.3 and 3.5.1.4.
- Table 4 herein documents the extent to which this project has implemented the LID/Site Design goals described in sub-section 3.5.1.1.

Table 3. Implementation of Site Design BMP Concepts

Design Concept	Technique	Specific BMP	Included			Brief Reason for BMPs Indicated as No or N/A
			Yes	No	N/A	
Site Design BMP Concept 1	**Minimize Urban Runoff, Minimize Impervious Footprint, and Conserve Natural Areas** **(See WQMP Section 3.5.1.3)**	Conserve natural areas by concentrating or clustering development on the least environmentally sensitive portions of a site while leaving the remaining land in a natural, undisturbed condition.	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Conserve natural areas by incorporating the goals of the Multi-Species Habitat Conservation Plan or other natural resource plans.	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Preserve natural drainage features and natural depressional storage areas on the site.	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Use natural drainage systems.	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Where applicable, incorporate Self-Treating Areas	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Where applicable, incorporate Self-Retaining Areas	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Increase the building floor to area ratio (i.e., number of stories above or below ground).	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Construct streets, sidewalks and parking lot aisles to minimum widths necessary, provided that public safety and a walkable environment for pedestrians are not compromised.	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Reduce widths of streets where off-street parking is available.	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Minimize the use of impervious surfaces, such as decorative concrete, in the landscape design.	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.

		Other comparable and equally effective Site Design BMP concept(s) as approved by the local land use authority (Note: Additional narrative required to describe BMP and how it addresses site design concept).	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.

Table 3. Site Design BMP Concepts (continued)

Design Concept	Technique	Specific BMP	Included: Yes	Included: No	Included: N/A	Brief Reason for Each BMP Indicated as No or N/A
Site Design BMP Concept 2	**Minimize Directly Connected Impervious Area (See WQMP Section 3.5.1.4)**	Design residential and commercial sites to contain and infiltrate roof runoff, or direct roof runoff to landscaped swales or buffer areas.	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Drain impervious sidewalks, walkways, trails, and patios into adjacent landscaping.	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Incorporate landscaped buffer areas between sidewalks and streets.	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Use natural or landscaped drainage swales in lieu of underground piping or imperviously lined swales.	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Where soil conditions are suitable, use perforated pipe or gravel filtration pits for low flow infiltration.	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Maximize the permeable area by constructing walkways, trails, patios, overflow parking, alleys, driveways, low-traffic streets, and other low-traffic areas with open-jointed paving materials or permeable surfaces such as pervious concrete, porous asphalt, unit pavers, and granular materials.	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Use one or more of the following:				
		Rural swale system: street sheet flows to landscaped swale or gravel shoulder, curbs used at street corners, and culverts used under driveways and street crossings.	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Urban curb/swale system: street slopes to curb; periodic swale inlets drain to landscaped swale or biofilter.	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Dual drainage system: first flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder; high flows connect directly to MS4s.	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Other comparable and equally effective Site Design BMP concept(s) as approved by the local land use authority (Note: Additional narrative required to describe BMP and how it addresses site design concept).	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Use one or more of the following for design of driveways and private residential parking areas:				
		Design driveways with shared access, flared (single lane at street), or wheel strips (paving only under the tires).	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Uncovered temporary or guest parking on residential lots paved with a permeable surface, or designed to drain into landscaping.	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.

Table 3. Site Design BMP Concepts (continued)

Design Concept	Technique	Specific BMP	Included: Yes	Included: No	Included: N/A	Brief Reason for Each BMP Indicated as No or N/A
Site Design BMP Concept 2 (cont'd)	**Minimize Directly Connected Impervious Area (See WQMP Section 3.5.1.4)**	Other comparable and equally effective Site Design BMP concept(s) as approved by the local land use authority (Note: Additional narrative required to describe BMP and how it addresses site design concept).	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Use one or more of the following for design of parking areas:				
		Where landscaping is proposed in parking areas, incorporate parking area landscaping into the drainage design.	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Overflow parking (parking stalls provided in excess of the Permittee's minimum parking requirements) may be constructed with permeable pavement.	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.
		Other comparable and equally effective Site Design BMP (or BMPs) as approved by the local land use authority (Note: Additional narrative required describing BMP and how it addresses site design concept).	☐	☐	☒	Not applicable – LID/Site Design measurable goal has been met.

Project Site Design BMP Concepts:

A Bioretention Basin will be implemented to treat the required design capture volume for the project site. In addition, a detention basin is provided to capture the 100-year, 3-hour event required storm runoff, in the post-development condition and then discharge it off-site at a rate not to exceed pre-development peak urban runoff discharge rates.

Based on the site's percolation testing to evaluate infiltration feasibility for the project, two percolation tests were conducted on June 25, 2019 at two locations. The estimated infiltration rate measured at 0.18 inches per hour for the site. Therefore, based on these results, infiltration type BMPs were not considered feasible.

Table 4. LID/Site Design BMPs Meeting the LID/Site Design Measurable Goal

(1) DRAINAGE SUB-AREA ID OR NO.	(2) LID/SITE DESIGN BMP TYPE* (See Table 2)	(3) POTENTIAL POLLUTANTS OF CONCERN WITHIN DRAINAGE SUB-AREA (Refer to Table 1)	(4) POTENTIAL POLLUTANTS WITHIN SUB-AREA CAUSING RECEIVING WATER IMPAIRMENTS (Refer to Table 1)	(5) EFFECTIVENESS OF LID/SITE DESIGN BMP AT ADDRESSING IDENTIFIED POTENTIAL POLLUTANTS (U, L, M, H/M, H; see Table 2)	(6) BMP MEETS WHICH DESIGN CRITERIA? (Identify as V_{BMP} OR Q_{BMP})	(7) TOTAL AREA WITHIN DRAINAGE SUB-AREA (Nearest 0.1 acre)
1						
TOTAL PROJECT AREA TREATED WITH LID/SITE DESIGN BMPs (NEAREST 0.1 ACRE)						

*** LID/Site Design BMPs listed in this table are those that <u>completely</u> address the 'Treatment Control BMP requirement' for their drainage sub-area.**

Justification of infeasibility for sub-areas not addressed with LID/Site Design BMPs

Not applicable, the site proposes a bioretention facility to address LID/Site Design BMPs.

V.1.B TREATMENT CONTROL BMPS

Conventional Treatment Control BMPs shall be implemented to address the project's Pollutants of Concern as required in WQMP Section 3.5.1 where, and to the extent that, Section V.1.A has demonstrated that it is infeasible to meet these requirements through implementation of LID/Site Design BMPs.

☐ The LID/Site Design BMPs described in Section V.1.A of this project-specific WQMP completely address the 'Treatment Control BMP requirement' for the entire project site (and where applicable, entire existing site) as required in Section 3.5.1.1 of the WQMP Guidance document. Supporting documentation for the sizing of these LID/Site Design BMPs is included in Appendix F. ***Section V.1.B does not need to be completed**.

☐ The LID/Site Design BMPs described in Section V.1.A of this project-specific WQMP do **NOT** completely address the 'Treatment Control BMP requirement' for the entire project site (or where applicable, entire existing site) as required in Section 3.5.1.1 of the WQMP. ***Section V.1.B must be completed.**

The Treatment Control BMPs identified in this section are selected, sized and implemented to treat the design criteria of V_{BMP} and/or Q_{BMP} for all project (and if required, existing site) drainage sub-areas which were not fully addressed using LID/Site Design BMPs. Supporting documentation for the sizing of these Treatment Control BMPs is included in Appendix F.

Table 5: Treatment Control BMP Summary

(1) DRAINAGE SUB-AREA ID OR NO.	(2) TREATMENT CONTROL BMP TYPE* (See Table 2)	(3) POTENTIAL POLLUTANTS OF CONCERN WITHIN DRAINAGE SUB-AREA (Refer to Table 1)	(4) POTENTIAL POLLUTANTS WITHIN SUB-AREA CAUSING RECEIVING WATER IMPAIRMENTS (Refer to Table 1)	(5) EFFECTIVENESS OF TREATMENT CONTROL BMP AT ADDRESSING IDENTIFIED POTENTIAL POLLUTANTS (U, L, M, H/M, H; see Table 2)	(6) BMP MEETS WHICH DESIGN CRITERIA? (Identify as V_{BMP} OR Q_{BMP})	(7) TOTAL AREA WITHIN DRAINAGE SUB-AREA (Nearest 0.1 acre)
1	BIORETENTION	TOXIC ORGANIC COMPOUNTDS	TOXIC ORGANIC COMPOUNTDS	H	VBMP	1.32
	TOTAL PROJECT AREA TREATED WITH TREATMENT CONTROL BMPs (NEAREST 0.1 ACRE)					

V.1.C MEASURABLE GOAL SUMMARY

This section documents the extent to which this project has met the measurable goal described in WQMP Section 3.5.1.1 of addressing 100% of the project's 'Treatment Control BMP requirement' with LID/Site Design BMPs. Projects required to retain Urban Runoff onsite in conformance with local ordinance are considered to have met the measurable goal; for these instances, '100%' is entered into Column 3 of the Table.

Table 6: Measurable Goal Summary

(1) Total Area Treated with LID/Site Design BMPs (Last row of Table 4)	(2) Total Area Treated with Treatment Control BMPs (Last row of Table 5)	(3) % of Treatment Control BMP Requirement addressed with LID/Site Design BMPs
1.32 acres	N/A	100

V.2 SOURCE CONTROL BMPS

This section identifies and describes the Source Control BMPs applicable and implemented on this project.

Table 7. Source Control BMPs

BMP Name	Check One		If not applicable, state brief reason
	Included	Not Applicable	
Non-Structural Source Control BMPs			
Education for Property Owners, Operators, Tenants, Occupants, or Employees	☒	☐	
Activity Restrictions	☒	☐	
Irrigation System and Landscape Maintenance	☒	☐	
Common Area Litter Control	☐	☒	No 'common' areas proposed.
Street Sweeping Private Streets and Parking Lots	☒	☐	
Drainage Facility Inspection and Maintenance	☒	☐	
Structural Source Control BMPs			
Storm Drain Inlet Stenciling and Signage	☐	☒	No catch basin in paved areas.
Landscape and Irrigation System Design	☒	☐	
Protect Slopes and Channels	☐	☒	None proposed.
Provide Community Car Wash Racks	☐	☒	None proposed.
Properly Design*:			
Fueling Areas	☐	☒	None proposed.
Air/Water Supply Area Drainage	☐	☒	None proposed.
Trash Storage Areas	☒	☐	
Loading Docks	☐	☒	None proposed.
Maintenance Bays	☐	☒	None proposed.
Vehicle and Equipment Wash Areas	☐	☒	None proposed.
Outdoor Material Storage Areas	☐	☒	None proposed.
Outdoor Work Areas or Processing Areas	☐	☒	None proposed.
Provide Wash Water Controls for Food Preparation Areas	☐	☒	None proposed.

*Details demonstrating proper design must be included in Appendix F.

Education for Property Owners, Tenants and Occupants – The owner shall be familiar with the contents of the WQMP and shall provide educational materials to tenants at close of escrow by the owner and periodically thereafter by the owner to inform them of their potential impacts to downstream water quality. Materials include those described in Section VII of this WQMP and provided in the Final WQMP.

Activity Restrictions – Activity restrictions to minimize potential impacts to water quality and with the purpose of protecting water quality will be prescribed by the Owner in Lease Agreements.

Use Efficient Irrigation Systems and Landscape Design – In conjunction with routine landscaping maintenance activities, inspect irrigation for signs of leaks, overspray and repair or adjust accordingly. Adjust system cycle to accommodate seasonal fluctuations in water demand and temperatures or use weather-based sprinkler controllers. Ensure use of native or drought tolerant/non-invasive plant species to minimize water consumption.

Street Sweeping Private Streets and Parking Lots – The project's parking lot shall be vacuum swept, at minimum, on a weekly basis.

Designated Trash Enclosure – Designated trash enclosure areas shall be covered with a solid roof and designed to preclude trash and pad area from run-on, run-off and wind. Any drains within area shall be connected to the sanitary sewer system, with proper approval from the sewer agency. Site shall be inspected with use to ensure all materials are disposed of properly.

Appendix D includes copies of the educational materials (described in Section 3.5.2.1 of the WQMP Guidance document) that will be used in implementing this project-specific WQMP.

V.3 EQUIVALENT TREATMENT CONTROL BMP ALTERNATIVES

Not applicable.

V.4 REGIONALLY-BASED BMPS

Not applicable.

VI. Operation and Maintenance Responsibility for BMPs

Appendix G of this project-specific WQMP includes copies of CC&Rs, Covenant and Agreements, BMP Maintenance Agreement and/or other mechanisms used to ensure the ongoing operation, maintenance, funding, transfer and implementation of the project-specific WQMP requirements.

Inspection/ Maintenance Activities Required		Minimum Frequency	Reponsible Party(s)
Impervious Area Dispersion	Inspect for standing water and that water infiltrates into underlying soil or evaporates completely.	After significant storm events and monthly with landscaping	Owner
Bioretention Basin	Inspect basin areas for accumulated debris and sediment and plant health; remove trash from catch basin filer insert; trim vegetation. Keep adjacent landscape areas maintained. Remove clippings from landscape maintenance activities. Remove trash and debris. Replace damaged landscaping and/or plants. Replace surface mulch layer as needed to maintain a 2-3 inch soil cover.	Ongoing	Owner
Education for Property Owners, Tenants and Occupants	BMP Educational materials will be provided by the owner to any tenant or occupant at occupancy and thereafter on an annual basis. Materials shall include those provided in Appendix D of this WQMP and any updated materials.	Annually	Owner
Activity Restrictions	The Owner will prescribe activity restrictions to protect surface water quality, through Leasing Agreements, or other equally effective measure, for the property.	Ongoing	Owner

Inspection/ Maintenance Activities Required		Minimum Frequency	Reponsible Party(s)
Common Area Landscape Management	Maintenance shall be consistent with County requirements, plus fertilizer and/or pesticide usages shall be consistent with City, County and manufacturer guidelines for use of fertilizers and pesticides (OC DAMP Section 5.5). Maintenance includes mowing, weeding, and debris removal on a monthly basis. Trimming, replanting and replacement of mulch shall be performed on an as-needed basis. Trimmings, clippings, and other waste shall be properly disposed of off-site in accordance with local regulations. Materials temporarily stockpiled during maintenance activities shall be placed away from water courses and drain inlets.	Monthly	Owner
BMP Maintenance	Maintenance of BMPs implemented at the project site shall be performed at the frequency prescribed in this WQMP. Records of inspections and BMP maintenance shall be maintained by the responsible party and documented with the WQMP, and shall be available for review upon request.	Ongoing	Owner
Employee Training	All staff and employees of the Owner shall receive initial training upon hire and annually thereafter on the importance of their actions on storm water quality. Training shall include educational materials provided by the County as well as other materials in Appendix D.	Upon hire and annually	Owner
Street Sweeping Private Streets and Parking Lots	Parking lots shall be vacuum swept on a weekly basis, at minimum.	Weekly	Owner

Inspection/ Maintenance Activities Required		Minimum Frequency	Reponsible Party(s)
Designated Trash Enclosure	Designated trash enclosure areas shall be covered with a solid roof and designed to preclude trash and pad area from run-on, run-off and wind. Any drains within area shall be connected to the sanitary sewer system, with proper approval from the sewer company. Site shall be inspected with use to ensure all materials are disposed of properly.	Daily with Use	Owner
Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control	In conjunction with routine maintenance activities, verify that landscape design continues to function properly by adjusting properly to eliminate overspray to hardscape areas, and to verify that irrigation timing and cycle lengths are adjusted in accordance with water demands, given time of year, weather, day or night time temperatures based on system specifications and local climate patterns.	Monthly	Owner
Detention Basin	Remove debris and litter from the basin. Inspect hydraulic facilities. Examine the basin outlet for clogging, the spillway integrity, as well as damage to any structural element. Check for erosion, slumping and overgrowth, repair as needed. Remove accumulated sediment from the bottom of the basin. Removal should extend to original basin depth.	Annually	Owner

VII. Funding

Funding for all O&M for site design and treatment control BMPs will be provided by the owner.

Appendix A

Conditions of Approval not available, but will be provided prior to Final WQMP.

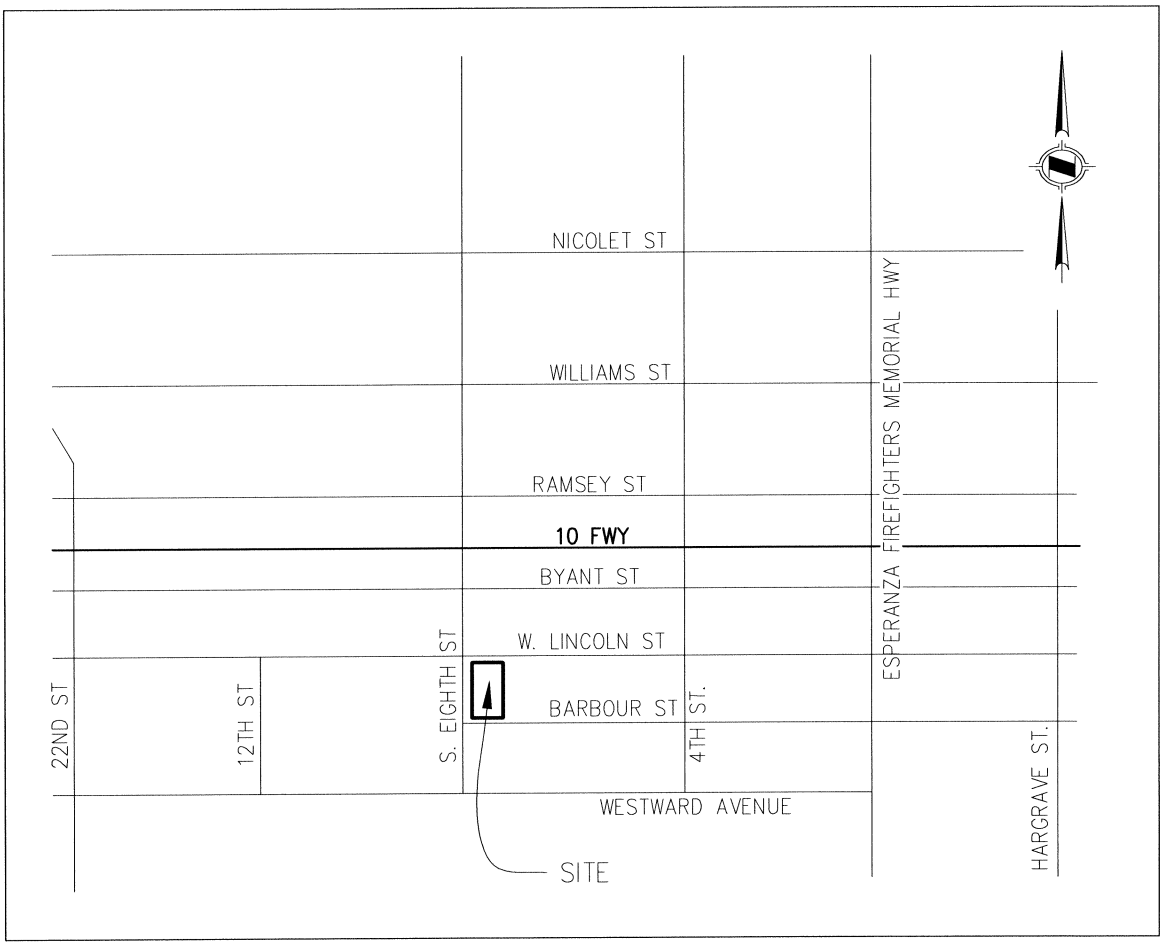
Planning Commission Resolution _____

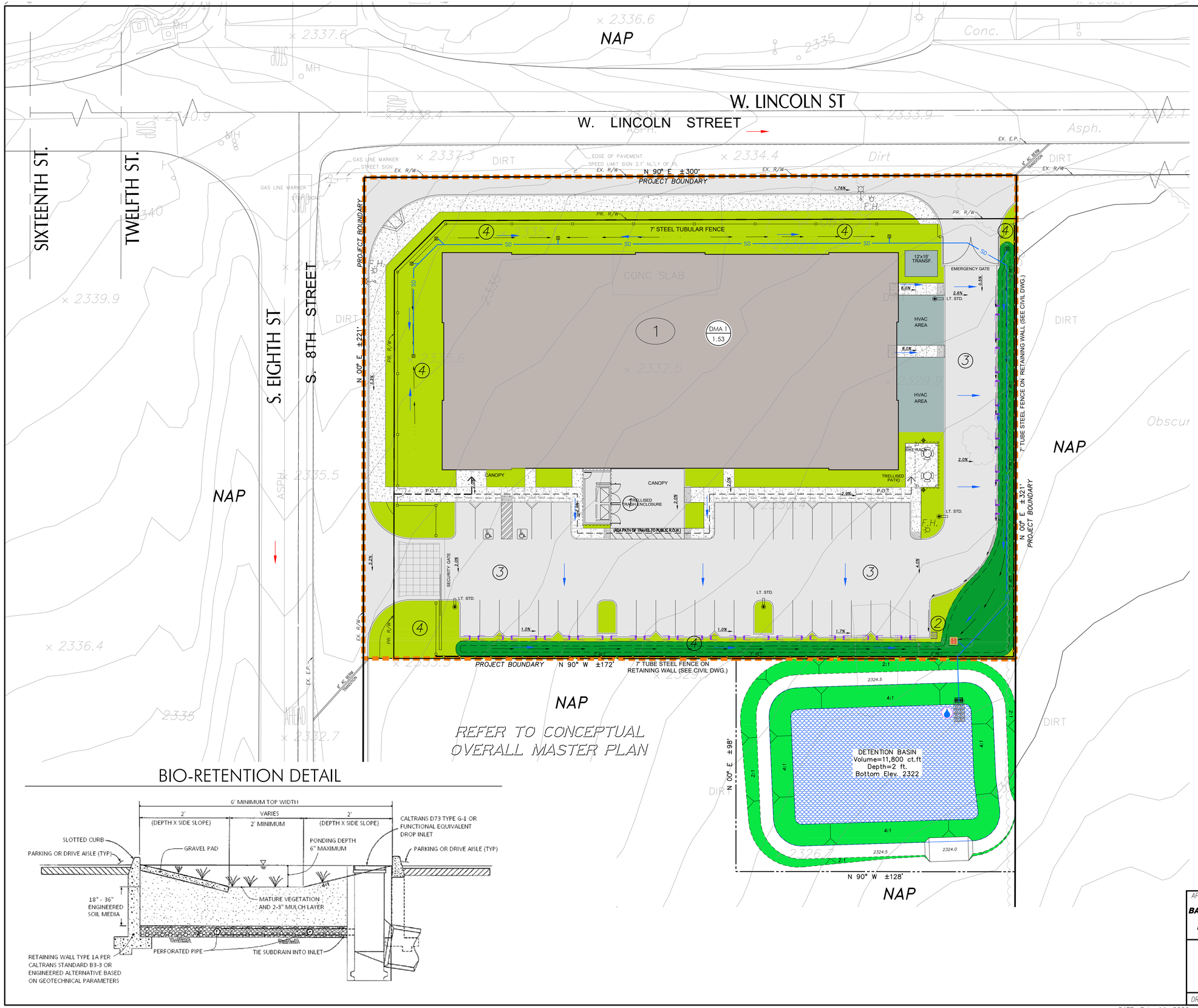
Dated _____

Appendix B

Vicinity Map, WQMP Site Plan, and Receiving Waters Map

VICINITY MAP





LEGEND

- PROJECT BOUNDARY
- DMA / ACRE — DMA DESIGNATION AND ACREAGE
- DRAINAGE MANAGEMENT AREA (DMA) LIMITS
- NAP — NOT A PART
- DIRECTION OF SURFACE FLOW (ONSITE)
- DIRECTION OF SURFACE FLOW (OFFSITE)
- SD — PROPOSED STORM DRAIN
- LANDSCAPE AREA WITH BMP EFFICIENT LANDSCAPE AND IRRIGATION SYSTEM
- BIO-RETENTION
- SLOPES
- DETENTION BASIN
- DRIVE AISLE/PARKING
- WALKWAY/SIDEWALK AREAS
- HVAC / TRANSFORMER AREA
- PROPOSED BUILDING
- 4'x4' GRATE INLET WITH DEBRIS FILTER INSERT
- SLOTTED CURB/SLOTS SHALL BE 12" WIDE EVERY 10' O.C.
- DISCHARGE POINT
- (1) ROOFED TRASH ENCLOSURE
- (2) CATCH BASIN FILTER INSERT
- (3) PARKING LOT SWEEPING
- (4) LANDSCAPING/IRRIGATION MAINTENANCE

BIO-RETENTION DETAIL

FEET: 0 10 20 40
INCHES: 0 1/2 1 2

PRELIMINARY WATER QUALITY MANAGEMENT PLAN - SITE PLAN

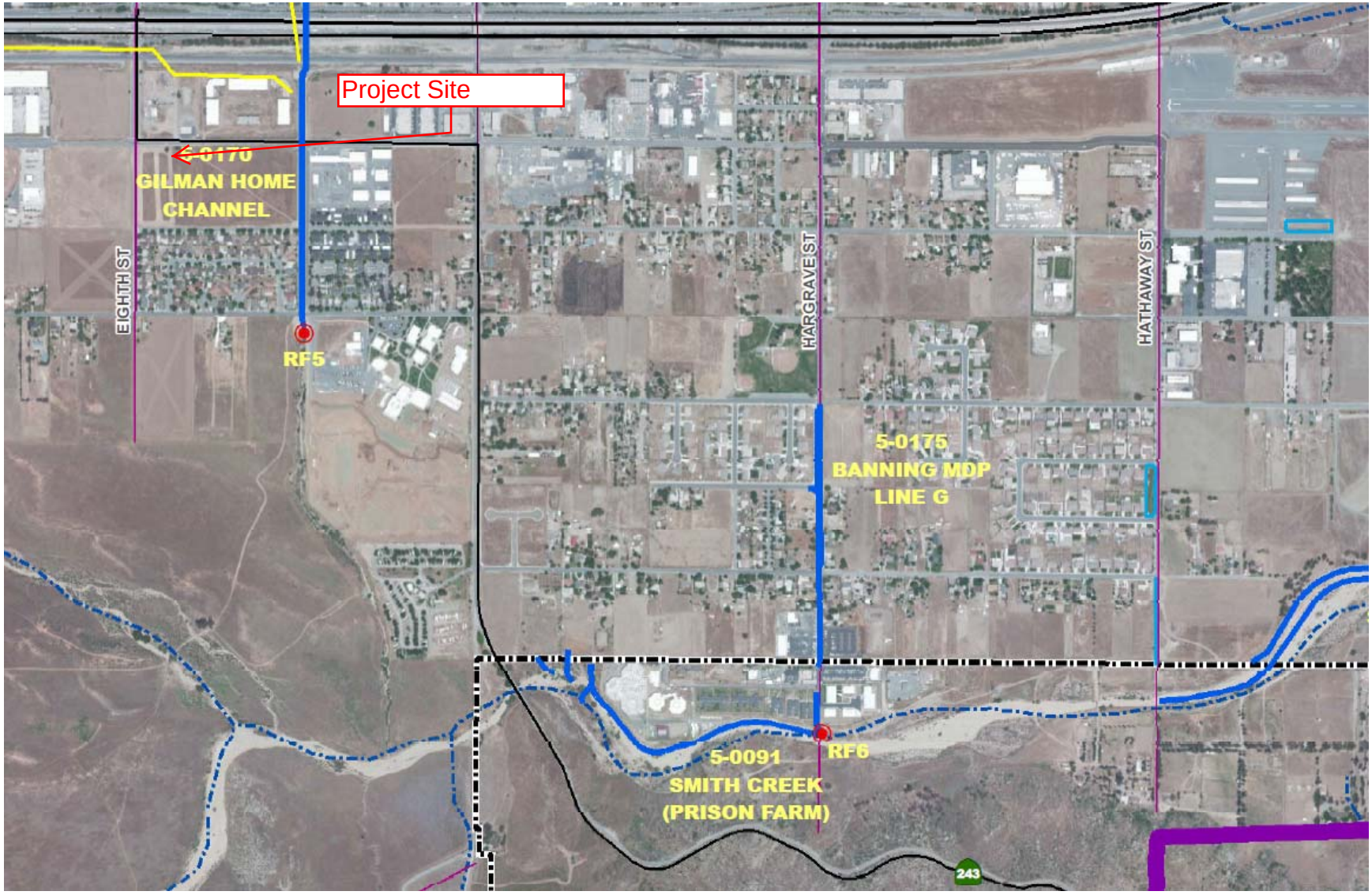
APPLICANT/OWNER:
BANNING LINCOLN STREET PARTNERS LP
C/O
DOMINION PROPERTY PARTNERS LLC.

PREPARED BY:
HUNSAKER & ASSOCIATES IRVINE, INC.
PLANNING ▪ ENGINEERING ▪ SURVEYING
Three Hughes • Irvine, CA 92618 • PH: (949) 583-1010 • FX: (949) 583-0759

8TH & LINCOLN INDUSTRIAL BUILDING
BANNING, CA

DRAFTED BY:	DATE:	W.O. NO:	SHEET NO:
JS	02/12/2020	4100-4	1 OF 1

DATE: Feb. 14, 2020 03:10:57 PM FILE: F:\1098\Planning\SY_WQ\WQMP\Exhibits\PWQMP_SP Banning Industrial.dwg



Receiving Waterbodies Map
City of Banning - 8th & Industrial Building

Appendix C

Supporting Detail Related to Hydrologic Conditions of Concern

Appendix D

Educational Materials

CONSTRUCTION SITE BEST MANAGEMENT PRACTICES

THE FOLLOWING BMPs MUST BE PROPERLY USED AT ALL CONSTRUCTION SITES IN RIVERSIDE COUNTY TO PROTECT OUR WATERSHEDS FROM POLLUTION

BMPs must be properly installed and maintained on a year round basis.

Construction sites are prohibited from discharging pollutants into storm drains and introducing pollutants to local waterways, rivers, lakes and streams.
To stay in compliance with the law and keep your project on schedule, make sure your BMPs are in place and properly functioning. Your site must be checked and maintained daily.

Erosion Control

Erosion prevention is the most important measure for keeping sediment onsite during construction.

Wherever possible, rely on erosion controls to keep sediment in place. Minimize the disturbed area to protect natural features and soil. Control stormwater flowing onto and through the project. Phase construction activity and stabilize soils promptly. Prevent erosion by implementing soil stabilization practices such as mulching, surface roughening, permanent or temporary seeding. Perform a walk-through of the site to assess stabilization practices.

Concrete Trucks /Pumpers / Finishers

BMPs such as tarps and gravel bags should be implemented to prevent materials and residue from entering into the storm drain system.

Dumpsters

Always cover dumpsters. Areas around dumpsters should be cleaned daily. Perimeter controls around dumpster area should be provided if pollutants are leaking or discharging from the dumpster. The dumpster must be fully contained on the construction site and not in the right-of-way.

Washout Area

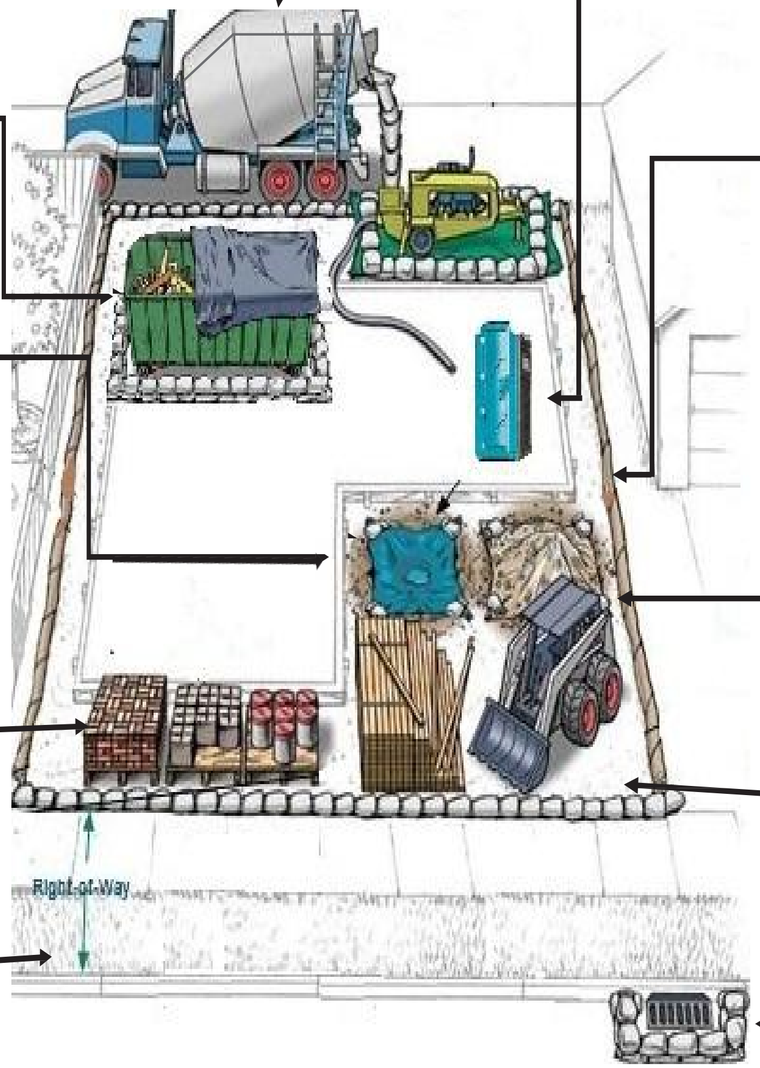
The disposal of "wet" construction materials should be handled in the washout area. This includes paint, stucco, and concrete. Do not wash out paint brushes in the street or dump any residue in the storm drain. Paint brushes and spray guns must be washed out into a hazardous materials drum, or back into the original container and disposed of properly. Washouts should never be in direct contact with the existing ground. Use a berm with an impervious liner to contain wet materials and prevent runoff to nearby areas. The washout area must be checked and maintained daily to ensure compliance. All dried material must be disposed of at a landfill.

Building Materials /Staging Area

Construction material must be stored on site at all times. Building material should always be covered when not in use to prevent dispersal or runoff caused by wind or rain. Flooding must also be prevented by monitoring your site before, during, and after rain events to ensure that BMPs are functioning properly and that there are not any safety issues.

Encroachment Permits

The right-of-way varies from the face of the curb to the private property line. Any construction work within the right-of-way requires an encroachment permit.



Portable Toilets

Portable toilets must be placed on a flat level surface away from any flow line. Portable toilets must have a secondary containment tray. Portable toilets must also be placed behind the curb. Avoid cleaning solutions from coming in contact with the soil.

Perimeter Controls

Perimeter controls are different and separate from erosion controls. Gravel bags, silt fences, and straw wattles are acceptable perimeter controls, and must be used to surround the entire site. Avoid running over perimeter controls with vehicles or heavy equipment to prevent damage to the BMPs. Keep extra absorbent materials and/or wet dry vacuum on site to quickly pick up unintended spills.

Dirt and Grading

Dust control measures shall be implemented during grading operations and throughout all aspects of site development. Mounds of dirt or gravel should be stored on site and sprayed daily with water to prevent excessive dust. The materials should be covered when not in use. For areas that are active and exposed, a wet weather active plan, including additional BMPs, should be in place to protect the site during a rain event. Sites must have a designated entrance/exit with adequate track out controls to prevent the transport of dirt/gravel from the site.

Earthmoving Equipment

Vehicles and earthmoving equipment should be cleaned, fueled and maintained off-site or in a designated contained area. Mud tracks and dirt trails left by equipment leading to and from the site must be cleaned up immediately.

Storm Drains

Storm drains must be protected at all times with perimeter controls, use ¾ inch gravel bags. Sand bags should not be used for inlet protection because they do not permit flow-through. Replace ruptured or damaged gravel bags and remove debris from the right-of-way immediately.

Revised December 2014

Resources

State Water Resources Control Board
Division of Water Quality
1001 I Street
Sacramento CA 95814
(916) 341-5455
www.swrcb.ca.gov/water_issues/programs/stormwater

To report a hazardous materials spill, call:
During normal business hours
(7:00 a.m. to 5:30 p.m.)
Riverside County Department of Environmental Health
(951)-358-5172 or **1-888-722-4234**
www.rivcoeh.org.

After business hours, on weekends or holidays, call **(951)-782-2968**

In an emergency, dial **911**

For hazardous waste disposal information call:
(951) 358-5055

To report an illegal discharge or a clogged storm drain, call:
1-800-506-2555

For more information, please call the Riverside County's "Only Rain Down the Storm Drain" Water Pollution Prevention Program at 1-800-506-2555 or www.rcflood.org



The "Only Rain Down the Storm Drain" Pollution Prevention Program acknowledges The City of Coronado for the information provided in brochure.

Santa Ana Regional Water
Quality Control Board - Region 8
3737 Main Street, Suite 500
Riverside, CA 92501-3348
(951) 782-4130
www.waterboards.ca.gov/santaana

San Diego Regional Water
Quality Control Board - Region 9
2375 Northside Drive Suite 100
San Diego, CA 92108
(619) 516-1990
www.waterboards.ca.gov/sandiego

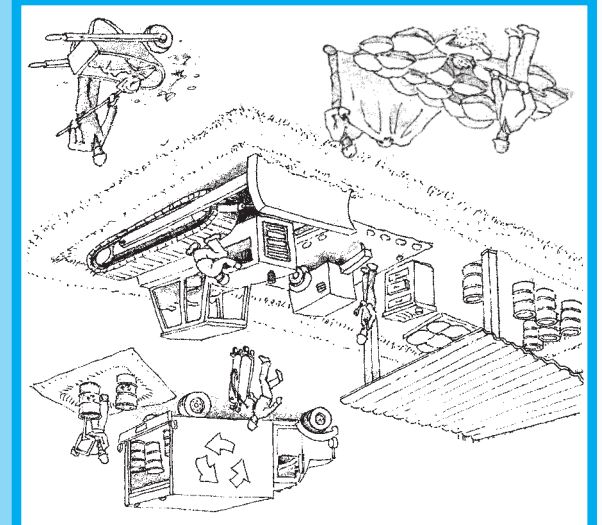
Colorado River Basin Regional Water
Quality Control Board - Region 7
73-720 Fred Waring Drive, Suite 100
Palm Desert, CA 92260
(760) 346-7491
www.waterboards.ca.gov/coloradoriver

Water Pollution Prevention

What you should know for...

- Developers
- General Contractors
- Home Builders
- Construction Inspectors
- Anyone in the construction business

Best Management Practices (BMPs) for:



GENERAL CONSTRUCTION & SITE SUPERVISION

Stormwater Pollution . . . What You Should Know

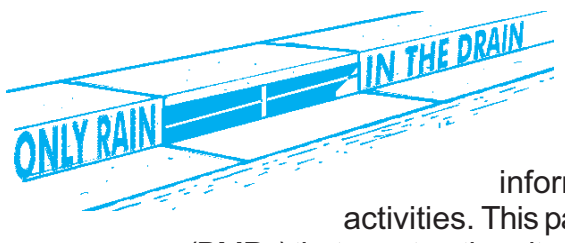
Riverside County has two drainage systems - sewers and storm drains. The storm drain system was designed to reduce flooding by carrying excess rainwater away from streets and developed areas. The storm drain system does not provide water treatment. It is connected directly to our local waterways.

Unlike sanitary sewers, storm drains are not connected to a wastewater treatment plant – they flow directly to our local streams, rivers and lakes.

Stormwater runoff is a part of the natural hydrologic process. However, land development and construction activities can affect the natural drainage processes and introduce pollutants into stormwater runoff. Polluted stormwater runoff from construction sites has been identified as a major source of water pollution in California. It jeopardizes the quality of our local waterways and can pose a serious threat to the health of our aquatic ecosystems.



The Cities and County of Riverside Water Pollution Prevention Program



Because preventing pollution is much easier and less costly than cleaning up “after the fact,” Cities and County of Riverside's "Only Rain Down the Storm Drain" Water Pollution Prevention Program informs residents and businesses on pollution prevention activities. This pamphlet describes various Best Management Practices (BMPs) that construction site operators can use to prevent stormwater pollution.

In accordance with applicable federal and state law, the Cities and County of Riverside have adopted ordinances for stormwater management that prohibit the discharge of pollutants into the storm drain system or local surface water. This includes discharges from construction sites containing sediment, concrete, mortar, paint, solvents, lubricants, vehicle fluids, fuel, pesticides, and construction debris.

PLEASE NOTE: The Federal, State and local regulations strictly prohibit the discharge of sediment and pollutants into the streets, the storm drain system or waterways. As an owner, operator or supervisor of a construction site, you may be held financially responsible for any environmental damage caused by your subcontractors or employees.

Water Pollution Prevention for Construction Activities

The two most common sources of stormwater pollution problems associated with construction activities are ***erosion*** and ***sedimentation***. Failure to maintain adequate erosion and sediment controls at construction sites often results in sediment discharges into the storm drain system, creating multiple problems once it enters local waterways.

Construction vehicles and heavy equipment can also track significant amounts of mud and sediment onto adjacent streets. Additionally, wind may transport construction materials and wastes into streets storm drains, or directly into our local waterways.



What Should You Do?
Advance Planning to Prevent Pollution

- ❑ Remove existing vegetation only as needed.
- ❑ Schedule excavation, grading, and paving operations for dry weather periods, if possible.
- ❑ Designate a specific area of the construction site, well away from storm drain inlets or watercourses, for material storage and equipment maintenance.
- ❑ Develop and implement an effective combination of erosion and sediment controls for the construction site.
- ❑ Practice source reduction by ordering only the amount of materials that are needed to finish the project.
- ❑ Educate your employees and subcontractors about stormwater management requirements and their pollution prevention responsibilities.
- ❑ Control the amount of surface runoff at the construction site by impeding internally generated flows and using berms or drainage ditches to direct incoming offsite flows to go around the site. ***Note:*** *Consult local drainage policies for more information.*

Best Management Practices

The following Best Management Practices (BMPs) can significantly reduce pollutant discharges from your construction site. Compliance with stormwater regulations can be as simple as minimizing stormwater contact with potential pollutants by providing covers and secondary containment for construction materials, designating areas away from storm drain systems for storing equipment and materials and implementing good housekeeping practices at the construction site.

- ❑ Protect all storm drain inlets and streams located near the construction site to prevent sediment-laden water from entering the storm drain system.
- ❑ Limit access to and from the site. Stabilize construction entrances/exits to minimize the track out of dirt and mud onto adjacent streets. Conduct frequent street sweeping.
- ❑ Protect stockpiles and construction materials from winds and rain by storing them under a roof, secured impermeable tarp or plastic sheeting.
- ❑ Avoid storing or stockpiling materials near storm drain inlets, gullies or streams.
- ❑ Phase grading operations to limit disturbed areas and duration of exposure.
- ❑ Perform major maintenance and repairs of vehicles and equipment offsite.
- ❑ Wash out concrete mixers only in designated washout areas at the construction site.
- ❑ Set-up and operate small concrete mixers on tarps or heavy plastic drop cloths.
- ❑ Keep construction sites clean by removing trash, debris, wastes, etc. on a regular basis.
- ❑ Clean-up spills immediately using dry clean-up methods (e.g., absorbent materials such as cat litter, sand or rags for liquid spills; sweeping for dry spills such as cement, mortar or fertilizer) and by removing the contaminated soil from spills on dirt areas. .
- ❑ Prevent erosion by implementing any or a combination of soil stabilization practices such as mulching, surface roughening, permanent or temporary seeding.
- ❑ Maintain all vehicles and equipment in good working condition. Inspect frequently for leaks, and repair promptly.
- ❑ Practice proper waste disposal. Many construction materials and wastes, including solvents, water-based paint, vehicle fluids, broken asphalt and concrete, wood, and cleared vegetation can be recycled. Materials that cannot be recycled must be taken to an appropriate landfill or disposed of as hazardous waste.
- ❑ Cover open dumpsters with secured tarps or plastic sheeting. Never clean out a dumpster by washing it down on the construction site.
- ❑ Arrange for an adequate debris disposal schedule to insure that dumpsters do not overflow.

General Construction Activities Stormwater Permit
(Construction Activities General Permit)

The State Water Resources Control Board (SWRCB) adopted a new Construction Activities General Permit (Order No. 2010-0014-DWQ) on September 2, 2009, This permit is administered and enforced by the SWRCB and the local Regional Water Quality Control Boards (RWQCB). The updated Construction Activities General Permit establishes a number of new stormwater management requirements for construction site operator.

NOTE: *Some construction activies stormwater permits are issued on a regional basis. Consult your local RWQCB to find out if your project requires coverage under any of these permits.*

Frequently Asked Questions:

How do I know if I need a Construction Activities General Permit?

If your construction project requires a land disturbance of one acre or more, or less than one acre but part of a larger common plan of development or sale.

How do I obtain coverage under the Construction Activities General Permit?

The Legally Responsible Person (LRP) must electronically submit Permit Registration Documents (PRDs) prior to commencement of construction activities in the Storm Water Multi-Application Report Tracking System (SMARTS).

PRDs consist of the Notice of Intent, Risk Assessment, Post-Construction Calculations, a Site Map, the SWPPP, a signed certification statement by the LRP, and the first annual fee. Once these components have been submitted and are deemed complete by the SMARTS system, a WDID number will automatically be emailed to the LRP.

What must I do to comply with the requirements of the Construction Activities General Permit?

- ● Have a qualified SWPPP Developer (QSD) prepare a Stormwater Pollution Prevention Plan (SWPPP) prior to commencing construction activities.
- ● Have a qualified SWPPP Practitioner (QSP) implement the SWPPP.
- ● Keep a copy of the SWPPP at the construction site for the entire duration of the project.
- ● Implement an effective combination of erosion and sediment control on all soil disturbed areas.
- ● Conduct site inspections prior to anticipated storm events, every 24-hours during extended storm events, and after an actual storm event.
- ● Implement BMPs for non-stormwater discharges year-round.
- ● Perform repair and maintenance of BMPs as soon as possible after storm events depending upon worker safety.
- ● Update the SWPPP as needed, to manage pollutants or reflect changes in site conditions.
- ● Include description of post construction BMPs at the construction site, including parties responsible for long-term maintenance.

NOTE: *Please refer to the Construction Activities General Permit for detailed information. You may contact the SWRCB, your local RWQCB, or visit the SWRCB website at www.swrcb.ca.gov/water_issues/programs/stormwater/ for more information.*

Revised July 2014

Stormwater Pollution

What you should know for...

Industrial & Commercial Facilities

Best Management Practices (BMPS) for:

- Industrial Facilities
- Commercial Facilities



Riverside County Stormwater Program Members

City of Banning
(951) 922-3105

City of Beaumont
(951) 769-8520

City of Calimesa
(909) 795-9801

City of Canyon Lake
(951) 244-2955

City of Cathedral City
(760) 770-0340

City of Coachella
(760) 398-3502

City of Corona
(951) 736-2447

City of Desert Hot Springs
(760) 329-6411

City of Eastvale
(951) 361-0900

City of Hemet
(951) 765-2300

City of Indian Wells
(760) 346-2489

City of Indio
(760) 391-4000

City of Jurupa Valley
(951) 332-6464

City of Lake Elsinore
(951) 674-3124

City of La Quinta
(760) 777-7000

City of Menifee
(951) 672-6777

City of Moreno Valley
(951) 413-3000

City of Murrieta
(951) 304-2489

City of Norco
(951) 270-5607

City of Palm Desert
(760) 346-0611

City of Palm Springs
(760) 323-8299

City of Perris
(951) 943-6100

City of Rancho Mirage
(760) 324-4511

City of Riverside
(951) 826-5311

City of San Jacinto
(951) 487-7330

City of Temecula
(951) 694-6444

City of Wildomar
(951) 677-7751

Coachella Valley Water District
(760) 398-2651

County of Riverside
(951) 955-1000

Riverside County Flood Control District
(951) 955-1200

YOU can prevent Stormwater Pollution following these practices...

Industrial and Commercial Facilities

The Riverside County Stormwater Program has identified a number of Best Management Practices (BMPs) for Industrial and Commercial Facilities. These BMPs control and reduce stormwater pollutants from reaching our storm drain system and ultimately our local water bodies. City and County ordinances require businesses to use these BMPs to protect our water quality. Local cities and the County are required to verify implementation of these BMPs by performing regular facility inspections.

Prohibited Discharges

Discontinue all non-stormwater discharges to the storm drain system. It is *prohibited* to discharge any chemicals, paints, debris, wastes or wastewater into the gutter, street or storm drain.

Outdoor Storage BMPs

- Install covers and secondary containment areas for all hazardous materials and wastes stored outdoors in accordance with County and/or City standards.
- Keep all temporary waste containers covered, at all times when not in use.
- Sweep outdoor areas instead of using a hose or pressure washer.
- Move all process operations including vehicle/equipment maintenance inside of the building or under a covered and contained area.
- Wash equipment and vehicles in a contained and covered wash bay which is closed-loop or connected to a clarifier sized to local standards and discharged to a sanitary sewer or take them to a commercial car wash.



Spills and Clean Up BMPs

- Keep the work site clean and orderly. Remove debris in a timely fashion. Sweep up the area.
- Clean up spills immediately when they occur, using dry clean up methods such as absorbent materials or sweep followed by proper disposal of materials.
- Always have a spill kit available near chemical loading dock doors and vehicle maintenance and fueling areas.
- Follow your Business Emergency Plan, as filed with the local Fire Department.
- Report all prohibited discharges and non-implementation of BMPs to your local Stormwater Coordinator as listed on the back of this pamphlet.
- Report hazardous materials spills to 951-358-5055 or call after hours to 951-782-2973 or, if an emergency, call the Fire Department's Haz Mat Team at 911.



Plastic Manufacturing Facilities BMPs

AB 258 requires plastic product manufacturers to use BMPs, such as safe storage and clean-up procedures to prevent plastic pellets (nurdles) from entering the waterway. The plastic pellets are released into the environment during transporting, packaging and processing and migrate to waterways through the storm drain system. AB 258 will help protect fish and wildlife from the hazards of plastic pollution.

Training BMPs

As prescribed by your City and County Stormwater Ordinance(s), train employees in spill procedures and prohibit non-stormwater discharges to the storm drain system. Applicable BMP examples can be found at www.cabmphandbooks.com.

Permitting

Stormwater discharges associated with specific categories for industrial facilities are regulated by the State Water Resources Control Board through an Industrial Stormwater General Permit. A copy of this General Permit and application forms are available at: www.waterboards.ca.gov, select stormwater then the industrial quick link.

To report illegal dumping or for more information on stormwater pollution prevention call: 1-800-506-2555 or e-mail us at: fcnpdes@rcflood.org.

Site Design & Landscape Planning SD-10



Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- ☑ Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Each project site possesses unique topographic, hydrologic, and vegetative features, some of which are more suitable for development than others. Integrating and incorporating appropriate landscape planning methodologies into the project design is the most effective action that can be done to minimize surface and groundwater contamination from stormwater.

Approach

Landscape planning should couple consideration of land suitability for urban uses with consideration of community goals and projected growth. Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for site design and landscapes planning should conform to applicable standards and specifications of agencies with jurisdiction and be consistent with applicable General Plan and Local Area Plan policies.

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

Designing New Installations

Begin the development of a plan for the landscape unit with attention to the following general principles:

- Formulate the plan on the basis of clearly articulated community goals. Carefully identify conflicts and choices between retaining and protecting desired resources and community growth.
- Map and assess land suitability for urban uses. Include the following landscape features in the assessment: wooded land, open unwooded land, steep slopes, erosion-prone soils, foundation suitability, soil suitability for waste disposal, aquifers, aquifer recharge areas, wetlands, floodplains, surface waters, agricultural lands, and various categories of urban land use. When appropriate, the assessment can highlight outstanding local or regional resources that the community determines should be protected (e.g., a scenic area, recreational area, threatened species habitat, farmland, fish run). Mapping and assessment should recognize not only these resources but also additional areas needed for their sustenance.

Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Conserve Natural Areas during Landscape Planning

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Cluster development on least-sensitive portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.
- Promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

Maximize Natural Water Storage and Infiltration Opportunities Within the Landscape Unit

- Promote the conservation of forest cover. Building on land that is already deforested affects basin hydrology to a lesser extent than converting forested land. Loss of forest cover reduces interception storage, detention in the organic forest floor layer, and water losses by evapotranspiration, resulting in large peak runoff increases and either their negative effects or the expense of countering them with structural solutions.
- Maintain natural storage reservoirs and drainage corridors, including depressions, areas of permeable soils, swales, and intermittent streams. Develop and implement policies and

regulations to discourage the clearing, filling, and channelization of these features. Utilize them in drainage networks in preference to pipes, culverts, and engineered ditches.

- Evaluating infiltration opportunities by referring to the stormwater management manual for the jurisdiction and pay particular attention to the selection criteria for avoiding groundwater contamination, poor soils, and hydrogeological conditions that cause these facilities to fail. If necessary, locate developments with large amounts of impervious surfaces or a potential to produce relatively contaminated runoff away from groundwater recharge areas.

Protection of Slopes and Channels during Landscape Design

- Convey runoff safely from the tops of slopes.
- Avoid disturbing steep or unstable slopes.
- Avoid disturbing natural channels.
- Stabilize disturbed slopes as quickly as possible.
- Vegetate slopes with native or drought tolerant vegetation.
- Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.
- Stabilize temporary and permanent channel crossings as quickly as possible, and ensure that increases in run-off velocity and frequency caused by the project do not erode the channel.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.
- Line on-site conveyance channels where appropriate, to reduce erosion caused by increased flow velocity due to increases in tributary impervious area. The first choice for linings should be grass or some other vegetative surface, since these materials not only reduce runoff velocities, but also provide water quality benefits from filtration and infiltration. If velocities in the channel are high enough to erode grass or other vegetative linings, riprap, concrete, soil cement, or geo-grid stabilization are other alternatives.
- Consider other design principles that are comparable and equally effective.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define “redevelopment” in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of “ redevelopment” must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under “designing new installations” above should be followed.

Redevelopment may present significant opportunity to add features which had not previously been implemented. Examples include incorporation of depressions, areas of permeable soils, and swales in newly redeveloped areas. While some site constraints may exist due to the status of already existing infrastructure, opportunities should not be missed to maximize infiltration, slow runoff, reduce impervious areas, disconnect directly connected impervious areas.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Stormwater Management Manual for Western Washington, Washington State Department of Ecology, August 2001.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Roof Runoff Controls SD-11



Rain Garden

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Description

Various roof runoff controls are available to address stormwater that drains off rooftops. The objective is to reduce the total volume and rate of runoff from individual lots, and retain the pollutants on site that may be picked up from roofing materials and atmospheric deposition. Roof runoff controls consist of directing the roof runoff away from paved areas and mitigating flow to the storm drain system through one of several general approaches: cisterns or rain barrels; dry wells or infiltration trenches; pop-up emitters, and foundation planting. The first three approaches require the roof runoff to be contained in a gutter and downspout system. Foundation planting provides a vegetated strip under the drip line of the roof.

Approach

Design of individual lots for single-family homes as well as lots for higher density residential and commercial structures should consider site design provisions for containing and infiltrating roof runoff or directing roof runoff to vegetative swales or buffer areas. Retained water can be reused for watering gardens, lawns, and trees. Benefits to the environment include reduced demand for potable water used for irrigation, improved stormwater quality, increased groundwater recharge, decreased runoff volume and peak flows, and decreased flooding potential.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Designing New Installations

Cisterns or Rain Barrels

One method of addressing roof runoff is to direct roof downspouts to cisterns or rain barrels. A cistern is an above ground storage vessel with either a manually operated valve or a permanently open outlet. Roof runoff is temporarily stored and then released for irrigation or infiltration between storms. The number of rain

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

barrels needed is a function of the rooftop area. Some low impact developers recommend that every house have at least 2 rain barrels, with a minimum storage capacity of 1000 liters. Roof barrels serve several purposes including mitigating the first flush from the roof which has a high volume, amount of contaminants, and thermal load. Several types of rain barrels are commercially available. Consideration must be given to selecting rain barrels that are vector proof and childproof. In addition, some barrels are designed with a bypass valve that filters out grit and other contaminants and routes overflow to a soak-away pit or rain garden.

If the cistern has an operable valve, the valve can be closed to store stormwater for irrigation or infiltration between storms. This system requires continual monitoring by the resident or grounds crews, but provides greater flexibility in water storage and metering. If a cistern is provided with an operable valve and water is stored inside for long periods, the cistern must be covered to prevent mosquitoes from breeding.

A cistern system with a permanently open outlet can also provide for metering stormwater runoff. If the cistern outlet is significantly smaller than the size of the downspout inlet (say ¼ to ½ inch diameter), runoff will build up inside the cistern during storms, and will empty out slowly after peak intensities subside. This is a feasible way to mitigate the peak flow increases caused by rooftop impervious land coverage, especially for the frequent, small storms.

Dry wells and Infiltration Trenches

Roof downspouts can be directed to dry wells or infiltration trenches. A dry well is constructed by excavating a hole in the ground and filling it with an open graded aggregate, and allowing the water to fill the dry well and infiltrate after the storm event. An underground connection from the downspout conveys water into the dry well, allowing it to be stored in the voids. To minimize sedimentation from lateral soil movement, the sides and top of the stone storage matrix can be wrapped in a permeable filter fabric, though the bottom may remain open. A perforated observation pipe can be inserted vertically into the dry well to allow for inspection and maintenance.

In practice, dry wells receiving runoff from single roof downspouts have been successful over long periods because they contain very little sediment. They must be sized according to the amount of rooftop runoff received, but are typically 4 to 5 feet square, and 2 to 3 feet deep, with a minimum of 1-foot soil cover over the top (maximum depth of 10 feet).

To protect the foundation, dry wells must be set away from the building at least 10 feet. They must be installed in solids that accommodate infiltration. In poorly drained soils, dry wells have very limited feasibility.

Infiltration trenches function in a similar manner and would be particularly effective for larger roof areas. An infiltration trench is a long, narrow, rock-filled trench with no outlet that receives stormwater runoff. These are described under Treatment Controls.

Pop-up Drainage Emitter

Roof downspouts can be directed to an underground pipe that daylights some distance from the building foundation, releasing the roof runoff through a pop-up emitter. Similar to a pop-up irrigation head, the emitter only opens when there is flow from the roof. The emitter remains flush to the ground during dry periods, for ease of lawn or landscape maintenance.

Foundation Planting

Landscape planting can be provided around the base to allow increased opportunities for stormwater infiltration and protect the soil from erosion caused by concentrated sheet flow coming off the roof. Foundation plantings can reduce the physical impact of water on the soil and provide a subsurface matrix of roots that encourage infiltration. These plantings must be sturdy enough to tolerate the heavy runoff sheet flows, and periodic soil saturation.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Supplemental Information

Examples

- City of Ottawa's Water Links Surface –Water Quality Protection Program
- City of Toronto Downspout Disconnection Program
- City of Boston, MA, Rain Barrel Demonstration Program

Other Resources

Hager, Marty Catherine, Stormwater, "Low-Impact Development", January/February 2003. www.stormh2o.com

Low Impact Urban Design Tools, Low Impact Development Design Center, Beltsville, MD. www.lid-stormwater.net

Start at the Source, Bay Area Stormwater Management Agencies Association, 1999 Edition

Efficient Irrigation SD-12



Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach

Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Designing New Installations

The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:
  - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff
  - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect
  - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible
  - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth
- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Trash Storage Areas SD-32

Description

Trash storage areas are areas where a trash receptacle (s) are located for use as a repository for solid wastes. Stormwater runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. Waste handling operations that may be sources of stormwater pollution include dumpsters, litter control, and waste piles.

Approach

This fact sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff associated with trash storage and handling. Preventative measures including enclosures, containment structures, and impervious pavements to mitigate spills, should be used to reduce the likelihood of contamination.

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Design requirements for waste handling areas are governed by Building and Fire Codes, and by current local agency ordinances and zoning requirements. The design criteria described in this fact sheet are meant to enhance and be consistent with these code and ordinance requirements. Hazardous waste should be handled in accordance with legal requirements established in Title 22, California Code of Regulation.

Wastes from commercial and industrial sites are typically hauled by either public or commercial carriers that may have design or access requirements for waste storage areas. The design criteria in this fact sheet are recommendations and are not intended to be in conflict with requirements established by the waste hauler. The waste hauler should be contacted prior to the design of your site trash collection areas. Conflicts or issues should be discussed with the local agency.

Designing New Installations

Trash storage areas should be designed to consider the following structural or treatment control BMPs:

- Design trash container areas so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. This might include berming or grading the waste handling area to prevent run-on of stormwater.
- Make sure trash container areas are screened or walled to prevent off-site transport of trash.

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

- Use lined bins or dumpsters to reduce leaking of liquid waste.
- Provide roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers.
- Pave trash storage areas with an impervious surface to mitigate spills.
- Do not locate storm drains in immediate vicinity of the trash storage area.
- Post signs on all dumpsters informing users that hazardous materials are not to be disposed of therein.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information

Maintenance Considerations

The integrity of structural elements that are subject to damage (i.e., screens, covers, and signs) must be maintained by the owner/operator. Maintenance agreements between the local agency and the owner/operator may be required. Some agencies will require maintenance deed restrictions to be recorded of the property title. If required by the local agency, maintenance agreements or deed restrictions must be executed by the owner/operator before improvement plans are approved.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Appendix E

Soils Report

Converse Consultants
Geotechnical Engineering
Environmental & Groundwater Science
Inspection & Testing Services

PRELIMINARY GEOTECHNICAL INVESTIGATION AND PERCOLATION TESTING REPORT

APN# 540-250-001-1

SOUTHEAST CORNER OF 8TH STREET AND LINCOLN AVENUE
CITY OF BANNING, RIVERSIDE COUNTY, CALIFORNIA

CONVERSE PROJECT NO. 19-81-167-01



Prepared For:

DOMINION PROPERTY LLC
2811 Wilshire Boulevard, Suite 400
Santa Monica, CA 90403

Presented By:

CONVERSE CONSULTANTS
2021 Rancho Drive, Suite 1
Redlands, CA 92373
909-796-0544

July 23, 2019

Converse Consultants
Geotechnical Engineering, Environmental & Groundwater Science, Inspection & Testing Services

July 23, 2019

Mr. Evan James
Chief Operating Officer
Dominion Property LLC
2811 Wilshire Boulevard, Suite 400
Santa Monica, CA 90403

Subject: **PRELIMINARY GEOTECHNICAL INVESTIGATION AND PERCOLATION TESTING REPORT**
APN# 540-250-001-1
Southeast Corner of 8th Street and Lincoln Avenue
City of Banning, Riverside County, California
Converse Project No. 19-81-167-01

Dear Mr. James:

Converse Consultants (Converse) has prepared this preliminary report to present the results of our geotechnical investigation and percolation testing for the approximately 4.1-acres site (APN# 540-250-001-1), located on the southeast corner of 8th Street and Lincoln Avenue in the City of Banning, Riverside County, California. This report was prepared in accordance with our proposal dated May 13, 2019 and your Acceptance of Agreement and Authorization to Proceed dated May 21, 2019.

Based on our field investigations, laboratory testing and engineering analyses, we conclude that the site is suitable for the proposed development from a geotechnical standpoint provided the recommendations presented in this report are incorporated during the design and construction of the project.

We appreciate the opportunity to be of service to Dominion Property LLC. Should you have any questions, please do not hesitate to contact us at 909-796-0544.

CONVERSE CONSULTANTS

Hashmi S. E. Quazi, PhD, PE, GE
Principal Engineer

Dist.: 4/Addressee
HSQ/JB/ZA/Kvg

PROFESSIONAL CERTIFICATION

This report has been prepared by the following professionals whose seals and signatures appear hereon.

The findings, recommendations, specifications and professional opinions contained in this report were prepared in accordance with the generally accepted professional engineering and engineering geologic principle and practice in this area of Southern California. We make no other warranty, either expressed or implied.



Zahangir Alam, PhD, EIT
Senior Staff Engineer

James Burnham, PG
Project Geologist



Hashmi S. E. Quazi, PhD, PE, GE
Principal Engineer

EXECUTIVE SUMMARY

The following is a summary of our preliminary geotechnical study, findings, conclusions, and recommendations, as presented in the body of this report. Please refer to the appropriate sections of the report for complete conclusions and recommendations. In the event of a conflict between this summary and the report, or an omission in the summary, the report shall prevail.

- The approximately 4.1 acres site is located at the southeast corner of 8th Street and Lincoln Avenue in the City of Banning, Riverside County, California. The vacant parcel is rectangular in shape and bounded to the north by Lincoln Avenue, to the east by open land, to the south by Barbour Street, and to the west by 8th Street. The site is presently covered with weeds and vegetation. The elevation of the overall project site is approximately 2,324 feet above mean sea level (amsl). Topography of the site increases from southeast to northwest from approximately 2,318 feet amsl to 2,340 feet amsl. No overhead utilities are present.

- At present, the plan is to divide the site into four approximately 0.9-acre parcels, numbered 1 through 4 from north to south. Only Parcel 1 at the southeast corner of 8th Street and Lincoln Avenue will be developed during Phase 1. We understand the building will be an approximately 13,000 square feet steel structure supported on shallow footings with slab on grade. Associated with the development will be a bio swale on the east side, above- and below-ground utilities, and trailer and vehicle parking stalls.

- Our scope of work included project setup, subsurface exploration, laboratory testing, percolation testing, engineering analyses, and preparation of this report.

- Six exploratory borings (BH-01 through BH-06) were drilled on June 21, 2019 to investigate the subsurface conditions at the site. The borings were advanced to depths between 15.9 and 50.3 feet below existing ground surface (bgs).

- Two test holes (PT-01 and PT-02) were drilled to 5 feet bgs on June 21, 2019 to perform percolation testing. Percolation testing was performed on June 25, 2019.

- Soil samples were also collected on June 21, 2019 by Converse environmental scientist to perform environmental laboratory testing. A separate environmental data report will be issued by Converse.

- The subsurface soil at the project site consists primarily of unconsolidated mixtures of silt, sand, gravel and cobbles. Gravel up to 2 inches in largest dimension was encountered in all borings. Cobbles up to 6 inches in largest

dimension were encountered in boring BH-01 beginning at 10 feet bgs. Though not encountered in borings, large size cobbles and possibly boulders may be present within the site.

- Groundwater was not encountered during the investigation to the maximum explored depth of 50.3 feet bgs. Based on available data, the historical high groundwater level reported at wells within approximately one mile of the site was approximately 480 feet bgs. Groundwater is not expected to be encountered during construction of the proposed project. Shallow perched groundwater may be present locally, particularly following precipitation.

- The site is not located within a currently designated State of California or Riverside County Earthquake Fault Zone. There are no known active faults projecting toward or extending across the project site. The potential for surface rupture resulting from the movement of nearby major faults is not known with certainty but is considered low.

- Based on the absence of liquefaction potential and flat topography of the site configuration, lateral spreading is not considered a risk. The potential for landsliding, tsunamis, seiches and earthquake induced flooding is considered to be low.

- The collapse potentials at the site were 3.4 and 3.7 percent, indicating moderate collapse potential. The sand equivalent of the tested soil is 13. Typically, soils with sand equivalent value of 30 or more are used as pipe bedding material.

- The sulfate contents of the sampled soils correspond to American Concrete Institute (ACI) exposure category S0 for these sulfate concentrations. No concrete type restrictions are specified for exposure category S0. A minimum compressive strength of 2,500 psi is recommended. The chloride contents of the sampled soils correspond to American Concrete Institute (ACI) exposure category C1 (concrete is exposed to moisture, but not to external sources of chlorides). For exposure category C1, ACI provides concrete compressive strength of at least 2,500 psi and a maximum chloride content of 0.3 percent.

- The measured value of the minimum electrical resistivity of the sample when saturated was 4,770 ohm-cm for the site. This indicates that the soils tested are moderately corrosive to ferrous metals in contact with the soils.

- According to the Caltrans Corrosion Guidelines (Caltrans, 2018), soils are considered corrosive if the pH is 5.5 or less, or chloride content is 500 parts per million (ppm) or greater, or sulfate content is 1,500 ppm or greater, or resistivity less than 2,000 ohm-cm. Based on the tested results, tested soils are not

considered corrosive. Converse does not practice in the area of corrosion consulting. If needed, a qualified corrosion consultant should provide appropriate corrosion mitigation measures for any ferrous metals in contact with the site soils.

- Prior to the start of construction, all existing underground utilities and appurtenances (if any) should be located at the project site. Such utilities should either be protected in-place or removed and replaced during construction as required by the project specifications. All excavations should be conducted in such a manner as not to cause loss of bearing and/or lateral support of existing utilities.

- The subsurface materials at the site are expected to be excavatable by conventional heavy-duty earth moving equipment. Excavation will be difficult due to the presence of gravel, cobbles and possibly boulders, especially for deep utilities.

- Excavated onsite earth materials cleared of deleterious materials can be moisture conditioned and re-used as compacted fill.

- The footings, slab-on-grade and pavements should be overexcavated based on Table No. 4 *Overexcavation Depths* as presented in Section 9.2 *Overexcavation*. The overexcavation below the footings, slab and pavement should be uniform. The overexcavation should extend to at least 2 feet beyond the footprint of the footings and slab and at least 1 foot beyond the edge of the pavements

- All fill placed at the site should be compacted to at least 90 percent of the laboratory maximum dry densities as determined by ASTM Standard D1557 test method, unless a higher compaction is specified herein. At least the upper 12 inches of subgrade soils underneath the footings and pavements intended to support vehicle loads should be scarified, moisture conditioned, and compacted to at least 95 percent of the laboratory maximum dry density.

- Footings should be at least 18 inches in width and embedded to at least 18 inches below the lowest adjacent grade. The footing dimensions and reinforcement should be based on structural design. Continuous and isolated footings can be designed based on an allowable net bearing capacity of 2,500 psf.

- The total settlement of shallow footings from static structural loads and short-term settlement of properly compacted fill is anticipated to be one inch or less. The differential settlement resulting from static loads is anticipated to be 0.5 inches or less over a horizontal distance of 30 feet.

- We estimate that the site has the potential for up to 0.3 inches of dry seismic settlement with negligible liquefaction induced settlement during a large earthquake. The dynamic differential settlement of the site may be up to half of the total settlement over 30 horizontal feet.

- Based on field percolation testing results, we recommend an infiltration rate of 0.18 inches per hour for the site.
- Lateral earth pressures design parameters and pavement design recommendations are presented in the text of this report.

- Recommendations for temporary sloped excavations are provided in the text of this report.

Based on our investigation, it is our professional opinion that the site is suitable for construction of the proposed development provided the recommendations presented in this geotechnical investigation report are considered in the planning, design and construction of the project.

TABLE OF CONTENTS

1.0 INTRODUCTION ---- 1

2.0 PROJECT DESCRIPTION ---- 1

3.0 SITE DESCRIPTION ---- 1

4.0 SCOPE OF WORK ---- 2

4.1 Document Review ---- 2
4.2 Project Set-up ---- 2
4.3 Subsurface Exploration ---- 2
4.4 Laboratory Testing ---- 3
4.5 Report Preparation ---- 3

5.0 SITE CONDITIONS ---- 3

5.1 Subsurface Profile ---- 4
5.2 Groundwater ---- 4
5.3 Excavatability ---- 5
5.4 Subsurface Variations ---- 5
5.5 Flooding ---- 5

6.0 ENGINEERING GEOLOGY ---- 5

6.1 Regional Geology ---- 5
6.2 Local Geology ---- 6

7.0 FAULTING AND SEISMICITY ---- 6

7.1 Faulting ---- 6
7.2 CBC 2016 Seismic Design Parameters ---- 7
7.3 Secondary Effects of Seismic Activity ---- 7

8.0 LABORATORY TEST RESULTS ---- 9

8.1 Physical Testing ---- 9
8.2 Chemical Testing - Corrosivity Evaluation ---- 10

9.0 EARTHWORK RECOMMENDATIONS ---- 10

9.1 General ---- 10
9.2 Overexcavation ---- 11
9.3 Engineered Fill ---- 11
9.4 Compacted Fill Placement ---- 12
9.5 Shrinkage and Subsidence ---- 13
9.6 Utility Trench Backfill ---- 13
9.7 Site Drainage ---- 15

10.0 DESIGN RECOMMENDATIONS ---------- 15

10.1 General Evaluation ---------- 16
10.2 Shallow Foundation Design Parameters ---------- 16
10.3 Modulus of Subgrade Reaction ---------- 16
10.4 Lateral Earth Pressures and Resistance to Lateral Loads ---------- 16
10.5 Slab-on-Grade ---------- 17
10.6 Settlement ---------- 18
10.7 Soil Corrosivity ---------- 19
10.8 Asphalt Concrete Pavement ---------- 19
10.9 Concrete Flatwork ---------- 20
10.10 Percolation Testing ---------- 21

11.0 CONSTRUCTION RECOMMENDATIONS ---------- 21

11.1 General ---------- 21
11.2 Temporary Sloped Excavations ---------- 22

12.0 GEOTECHNICAL SERVICES DURING CONSTRUCTION ---------- 22

13.0 CLOSURE ---------- 23

14.0 REFERENCES ---------- 24

FIGURES

Following Page No.

Figure No. 1, Approximate Site Location Map 1
Figure No. 2, Approximate Boring and Percolation Test Locations Map 3

TABLES

Page No.

Table No. 1, Summary of USGS Groundwater Depth Data 4
Table No. 2, Summary of Regional Faults 7
Table No. 3, CBC Seismic Design Parameters 7
Table No. 4, Overexcavation Depths 11
Table No. 5, Recommended Foundation Parameters 16
Table No. 6, Active and At-Rest Earth Pressures 17
Table No. 7, Recommended Preliminary Pavement Sections 20
Table No. 8, Estimated Infiltration Rates 21
Table No. 9, Slope Ratios for Temporary Excavations 22

APPENDICES

Appendix A ..... Field Exploration
Appendix B ..... Laboratory Testing Program
Appendix C ..... Liquefaction and Settlement Analysis
Appendix D ..... Percolation Testing

1.0 INTRODUCTION

This preliminary report presents the results of our geotechnical investigation and percolation testing and limited environmental screening performed for the approximately 4.1-acre site, located on the southeast corner of 8th Street and Lincoln Avenue in the City of Banning, Riverside County, California. The approximate location of the site is shown on Figure No. 1, *Approximate Site Location Map*.

The purposes of this investigation were to determine the nature and engineering properties of the subsurface soils and to provide recommendations for site earthwork, and design and construction of foundations for the proposed development.

This report is prepared for the project described herein and is intended for use solely by Dominion Property LLC and their authorized agents for design purposes. It should not be used as a bidding document but may be made available to the potential contractors for information on factual data only. For bidding purposes, the contractors should be responsible for making their own interpretation of the data contained in this report.

2.0 PROJECT DESCRIPTION

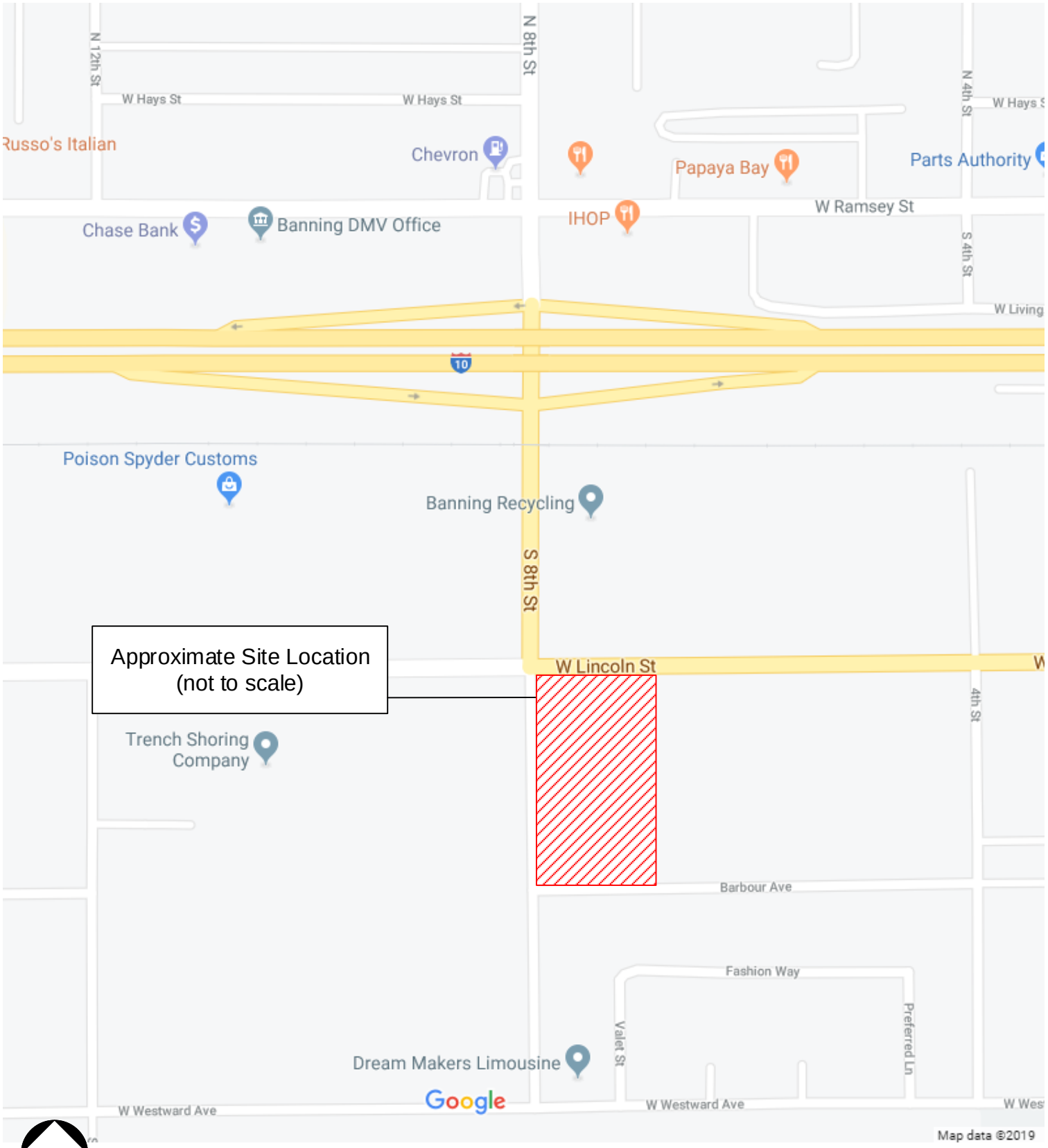
At present, the plan is to divide the site into four approximately 0.9-acre parcels, numbered 1 through 4 from north to south.

Only Parcel 1 at the southeast corner of 8th Street and Lincoln Avenue will be developed during Phase 1. We understand the building will be an approximately 13,000 square feet steel structure supported on shallow footings with slab on grade. Associated with the development will be a bio swale on the east side, above- and below-ground utilities, and trailer and vehicle parking stalls.

3.0 SITE DESCRIPTION

The overall project site is approximately 4.1 acres and located at the southeast corner of 8th Street and Lincoln Avenue in the City of Banning. The total vacant parcel is rectangular in shape and bounded to the north by Lincoln Avenue, to the east by open land, to the south by Barbour Street, and to the west by 8th Street. The site is presently covered with weeds and vegetation.

The elevation of the overall project site is approximately 2,324 feet above mean sea level (amsl). Topography of the site increases from southeast to northwest from approximately 2,318 feet amsl to 2,340 feet amsl. No overhead utilities are present. Photograph No. 1 depicts the present site conditions.



Approximate Site Location Map

Project: APN#: 540-250-001-1
Location: City of Banning, Riverside County, California

For: Dominion Property LLC

Project No
19-81-167-01

Converse Consultants

FIGURE NO.
1



Photograph No. 1, Present site conditions, facing southwest

4.0 SCOPE OF WORK

The scope of this investigation includes the following tasks presented below.

4.1 Document Review

We reviewed geologic maps, aerial photographs, groundwater data, and other information pertaining to the project site to assist in the evaluation of geologic hazards that may be present. Besides, pertinent information (the documents cited in Section 14, *References*) were used to understand the subsurface conditions and plan the investigation for this project.

4.2 Project Set-up

As part of the project set-up, our staff performed the following tasks.

- Conducted site reconnaissance and marked the boring locations such that equipment access to all the locations was available.
- Notified Underground Service Alert (USA) at least 48 hours prior to drilling to clear the borings locations of any conflicts with existing underground utilities.
- Engaged a California-licensed driller to conduct exploratory borings.

4.3 Subsurface Exploration

Six exploratory borings (BH-01 through BH-06) were drilled on June 21, 2019 to investigate the subsurface conditions at the site. The borings were advanced to depths

between 15.9 and 50.3 feet below existing ground surface (bgs).

Two test holes (PT-01 and PT-02) were drilled to 5 feet bgs on June 21, 2019 to perform percolation testing. Percolation testing was performed on June 25, 2019.

Approximate boring and percolation test locations are indicated in Figure No. 2, *Approximate Boring and Percolation Test Locations Map*. For a description of the field exploration and sampling program, see Appendix A, *Field Exploration*.

4.4 Laboratory Testing

Representative samples of the site soils were tested in the laboratory to aid in the soil classification and to evaluate the relevant engineering properties. These tests included the following.

- *In-situ* moisture contents and dry density (ASTM D2216)
- Sand equivalent (ASTM D2419)
- R-value (Caltrans CT301)
- Soil corrosivity (California Tests 422, 417, and 643)
- Collapse Potential (ASTM Standard D4546)
- Grain size analysis (ASTM D6913)
- Maximum dry density and optimum moisture content (ASTM D1557)
- Direct shear (ASTM D3080)

For *in-situ* moisture and dry density data, see the Logs of Borings in Appendix A, *Field Exploration*. For a description of the laboratory test methods and test results, see Appendix B, *Laboratory Testing Program*.

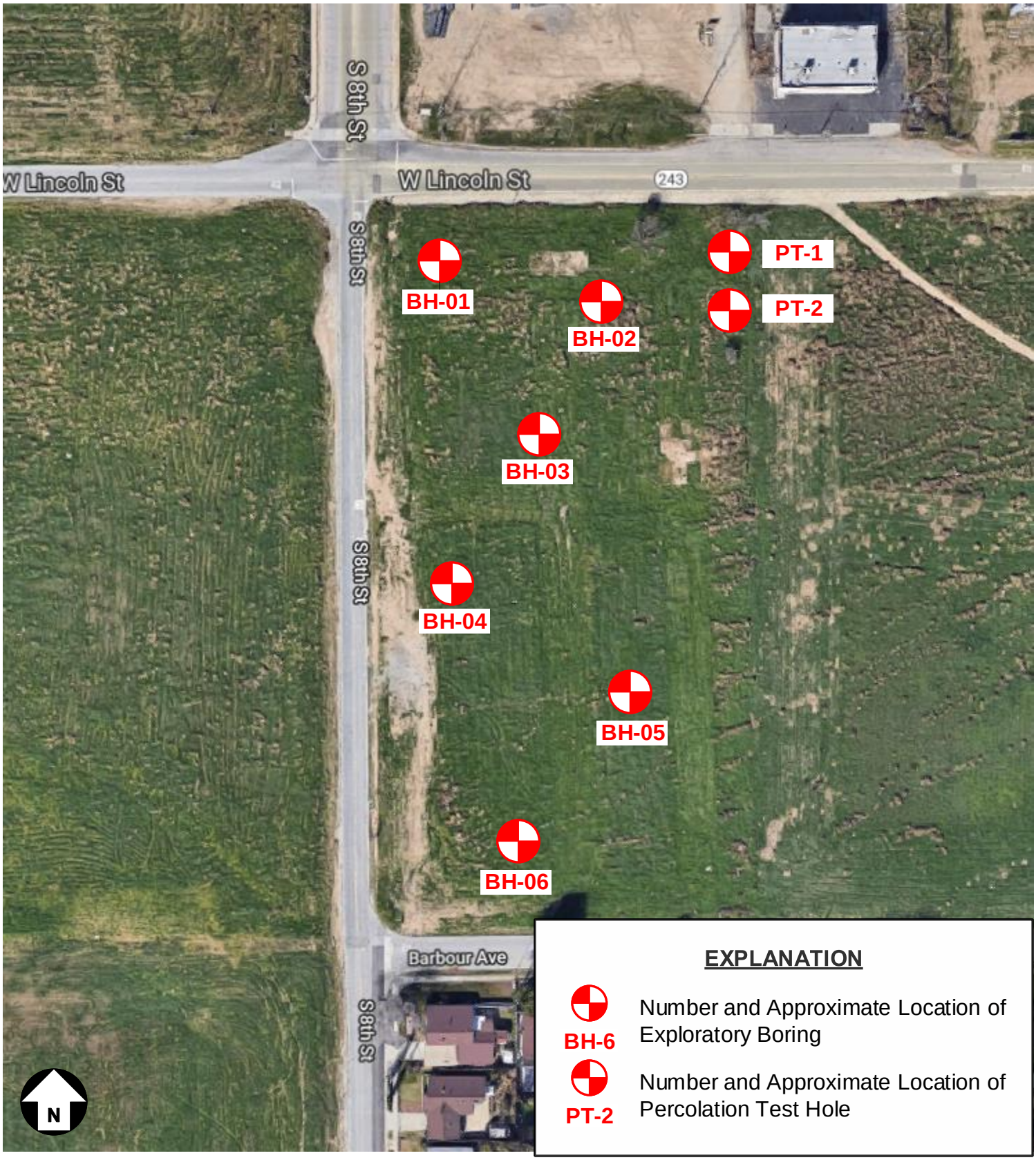
Soil samples were also collected on June 21, 2019 by Converse environmental scientist to perform environmental laboratory testing. A separate environmental data report will be issued by Converse.

4.5 Report Preparation

Data and information obtained from the document review, field exploration, and laboratory testing program were compiled and evaluated. Geotechnical analyses of the compiled data were performed, and this report was prepared to present our findings, conclusions, and recommendations for the project.

5.0 SITE CONDITIONS

A general description of the subsurface conditions and various materials encountered during our field exploration are presented in this section.



Approximate Boring and Percolation Test Locations Map

Project: APN#: 540-250-001-1
Location: City of Banning, Riverside County, California

For: Dominion Property LLC

Project No.
19-81-167-01

Converse Consultants

Figure No.
2

5.1 Subsurface Profile

Based on the findings from exploratory borings and laboratory test results, the subsurface soil at the project site consists primarily of unconsolidated mixtures of silt, sand, gravel and cobbles. Gravel up to 2 inches in largest dimension was encountered in all borings. Cobbles up to 6 inches in largest dimension were encountered in boring BH-01 beginning at 10 feet bgs. Though not encountered in borings, large size cobbles and possibly boulders may be present within the site.

For a detailed description of the subsurface materials encountered in the exploratory borings, see Drawings No. A-2 through A-9, *Logs of Borings,* in Appendix A, *Field Exploration.*

5.2 Groundwater

Groundwater was not encountered during the investigation to the maximum explored depth of 50.3 feet bgs. The GeoTracker database (SWRCB, 2019) was reviewed for groundwater data from sites within approximately a one-mile radius of the project site. No sites with available groundwater data were found within this range.

Data in the following table was found on the National Water Information System (USGS, 2019a).

Table No. 1, Summary of USGS Groundwater Depth Data

NWIS Site No.	Location	Groundwater Depth Range (ft. bgs)	Date Range
335515116522801	East of San Gorgonio Avenue between Lincoln Street and Barbour Street. Approximately 2,500 feet from the eastern boundary of the site.	480-639	1996-2005

Based on available data, the historical high groundwater level reported at wells within approximately one mile of the site was approximately 480 feet bgs. The current groundwater level at the project site is deeper than 50 feet bgs. Groundwater is not expected to be encountered during construction of the proposed project. It should be noted that the groundwater level could vary depending upon the seasonal precipitation and possible groundwater pumping activity in the site vicinity. Shallow perched groundwater may be present locally, particularly following precipitation or irrigation events.

5.3 Excavatability

The subsurface materials at the site are expected to be excavatable by conventional heavy-duty earth moving and trenching equipment. Excavation will be difficult due to the presence of gravel, cobbles and possibly boulders, especially for deep utilities.

The phrase "conventional heavy-duty excavation equipment" is intended to include commonly used equipment such as excavators, scrapers, and trenching machines. It does not include hydraulic hammers ("breakers"), jackhammers, blasting, or other specialized equipment and techniques used to excavate hard earth materials. Selection of an appropriate excavation equipment models should be done by an experienced earthwork contractor.

5.4 Subsurface Variations

Based on results of the subsurface exploration and our experience, some variations in the continuity and nature of subsurface conditions within the project site should be anticipated. Because of the uncertainties involved in the nature and depositional characteristics of the earth material, care should be exercised in interpolating or extrapolating subsurface conditions between or beyond the boring locations.

5.5 Flooding

Review of National Flood Insurance Rate Maps (FEMA, 2008) indicates that the project site is divided nearly in half by two different flood zone designations. From approximately 120 feet south of the northwestern corner along the western border of the property diagonally southeast to approximately 120 feet west of the southeastern corner along the southern border of the property, lies the flood zone boundary. The northeastern portion of the property is defined as a Flood Hazard Zone "X" with the criteria of "0.2 percent chance of annual flooding". The southwestern portion of the property is defined as Flood Hazard Zone "X" with the criteria of "Areas with Minimal Flood Risk." The entire project site is located within Riverside County Flood Zone 5 (RCFCDWCD, 2019).

6.0 ENGINEERING GEOLOGY

The regional and local geology within the proposed project site are discussed below.

6.1 Regional Geology

The proposed project site is located within the northern Peninsular Ranges Geomorphic Province of Southern California. The Peninsular Ranges Geomorphic Province consists of a series of northwest-trending mountain ranges and valleys bounded on the north by the San Bernardino and San Gabriel Mountains, on the west by the Los Angeles Basin, and on the southwest by the Pacific Ocean.

The province is a seismically active region characterized by a series of northwest-trending strike-slip faults. The most prominent of the nearby fault zones include the San Jacinto and Elsinore faults, as well as the San Gorgonio and San Andreas fault zones (CGS, 2007), all of which have been known to be active during Quaternary time.

Topography within the province is generally characterized by broad alluvial valleys separated by linear mountain ranges. This northwest-trending linear fabric is created by the regional faulting within the granitic basement rock of the Southern California Batholith. Broad, linear, alluvial valleys have been formed by erosion of these principally granitic mountain ranges.

6.2 Local Geology

The project site is located on south-sloping alluvial fan within the San Gorgonio Pass, just north of the San Timoteo Badlands mountain range. Regional mapping (Dibblee and Minch, 2003) indicates that the subsurface is characterized by Pleistocene-aged alluvial fan deposits of sand and gravel from plutonic and gneissic detritus derived from the rising San Bernardino Mountains to the north and San Timoteo Badlands Mountains to the south.

7.0 FAULTING AND SEISMICITY

The approximate distance and seismic characteristics of nearby faults are discussed in the following subsections.

7.1 Faulting

The project site is not located within a currently designated State of California or Riverside County Earthquake Fault Zone (CGS, 2007; Riverside County, 2019). There are no known active faults projecting toward or extending across the project site. The potential for surface rupture resulting from the movement of nearby major faults is not known with certainty but is considered low.

The proposed site is situated in a seismically active region. As is the case for most areas of Southern California, ground shaking resulting from earthquakes associated with nearby and more distant faults may occur at the project site. During the life of the project, seismic activity associated with active faults can be expected to generate moderate to strong ground shaking at the site.

Table No. 2, *Summary of Regional Faults,* summarizes selected data of known faults capable of seismic activity within 50 kilometers of the site. The data presented below was calculated using the National Seismic Hazard Maps Database (USGS, 2008) and other published geologic data.

Table No. 2, Summary of Regional Faults

Fault Name and Section	Closest Distance (km)	Slip Sense	Length (km)	Slip Rate (mm/year)	Maximum Magnitude
S. San Andreas	7.3	strike slip	548	n/a	8.18
San Jacinto	15.5	strike slip	241	n/a	7.88
Pinto Mtn	21.2	strike slip	74	2.5	7.30
Helendale-So Lockhart	45.2	strike slip	114	0.6	7.40
Burnt Mtn	45.6	strike slip	21	0.6	6.80
North Frontal (East)	46.7	thrust	27	0.5	7.00
North Frontal (West)	49.4	reverse	50	1.0	7.20
Cleghorn	49.8	strike slip	25	3.0	6.80
Elsinore	49.9	strike slip	241	n/a	7.85

(Source: https://earthquake.usgs.gov/cfusion/hazfaults_2008_search/)

7.2 CBC 2016 Seismic Design Parameters

Seismic parameters based on the California Building Code (CBSC, 2016) provided in the following table were determined using the Seismic Design Maps application (OSHPD, 2019). The coordinates selected correspond to the approximate center of the project site.

Table No. 3, CBC Seismic Design Parameters

Parameter	Value
Site Coordinates	33.9215 N, 116.8853 W
Site Class	D
Mapped Short period (0.2-sec) Spectral Response Acceleration, S_S	1.701g
Mapped 1-second Spectral Response Acceleration, S_1	0.808g
Site Coefficient (from Table 1613.5.3(1)), F_a	1.0
Site Coefficient (from Table 1613.5.3(2)), F_v	1.5
MCE 0.2-sec period Spectral Response Acceleration, S_{MS}	1.701g
MCE 1-second period Spectral Response Acceleration, S_{M1}	1.212g
Design Spectral Response Acceleration for short period S_{DS}	1.134g
Design Spectral Response Acceleration for 1-second period, S_{D1}	0.808g
Peak Ground Acceleration, PGA_M	0.681g

7.3 Secondary Effects of Seismic Activity

Aside from generating damaging ground motion, a nearby seismic event may impact a project by ground surface fault rupture, soil liquefaction, inducing landslides, lateral spreading, earthquake-induced flooding, seiches, differential settlement and ground

lurching. A site-specific discussion on each of the above secondary effects is provided below:

Ground Surface Fault Rupture: The site is not located within a currently designated State of California or Riverside County Earthquake Fault Zone (CGS, 2007; Riverside County, 2019). There are no known active faults projecting toward or extending across the project site. The potential for surface rupture resulting from the movement of nearby major faults is not known with certainty but is considered low.

Liquefaction: Liquefaction is defined as the phenomenon in which a cohesionless soil mass within the upper 50 feet of the ground surface suffers a substantial reduction in its shear strength, due the development of excess pore pressures. During earthquakes, excess pore pressures in saturated soil deposits may develop as a result of induced cyclic shear stresses, resulting in liquefaction.

Soil liquefaction generally occurs in submerged granular soils and non-plastic silts during or after strong ground shaking. There are several general requirements for liquefaction to occur and they are as follows.

- Soils must be submerged.
- Soils must be loose to medium-dense.
- Ground motion must be intense.
- Duration of shaking must be sufficient for the soils to lose shear resistance.

The project site is located within an area that has not been evaluated by Riverside County for liquefaction susceptibility (Riverside County, April 2019). The current and historical high groundwater levels are expected to be deeper than 50 feet bgs, and as such, liquefaction at the project site is considered negligible.

Seismic Settlement*:* Dynamic dry settlement may occur in loose, granular, unsaturated soils during a large seismic event. Based on a site-specific settlement analysis presented in Appendix C, *Liquefaction and Settlement Analysis*, we estimate that the site will have the potential for up to approximately 0.3 inches of total dry seismic settlement.

Landslides: Seismically induced landslides and slope failures are common occurrences during or soon after large earthquakes. The project site is located within an area that has not been evaluated by Riverside County for liquefaction susceptibility (Riverside County, 2019). Due to the flat nature of the site, the potential for seismically induced landslides affecting the proposed site is considered to be low.

Lateral Spreading: Seismically induced lateral spreading involves lateral movement of earth materials over a deeper layer which has liquified due to ground shaking. It differs from a slope failure in that ground failure involving a large movement does not occur due to the flatter slope of the initial ground surface. Lateral spreading is characterized by near-vertical cracks with predominantly horizontal movement of the soil mass

involved over the liquefied soils. Due to the relatively flat nature of the project site and low potential for liquefaction the potential for lateral spreading is considered to be low.

Earthquake-Induced Flooding: Dams or other water-retaining structures may fail as a result of large earthquakes. The project site is not located within a designated dam inundation area (Riverside County, 2019).

Tsunamis: Tsunamis are large waves generated by fault displacement or major ground movement. Based on the inland location of the site, tsunamis do not pose a hazard.

Seiches: Seiches are large waves generated in enclosed bodies of water in response to ground shaking. The site is not considered at risk for damage from seiching due to the lack of nearby bodies of water.

8.0 LABORATORY TEST RESULTS

Results of the various laboratory tests are presented in Appendix B, *Laboratory Testing Program,* except for the results of *in-situ* moisture and dry density tests which are presented on the Logs of Borings in Appendix A, *Field Exploration.* The results are also discussed below.

8.1 Physical Testing

The results of laboratory tests on samples obtained the site is presented below.

- *In-situ* Moisture and Dry Density – Results of *in-situ* moisture and dry density tests performed in accordance with ASTM Standard D2216 and D7263 are presented on the Logs of Borings in Appendix A, *Field Exploration.* Dry densities of upper 10 feet soils of the site ranged from 102 to 120 pounds per cubic foot (pcf) with moisture contents ranging from 6 to 11 percent. Results are presented in the log of borings in Appendix A, *Field Exploration.*
- Sand Equivalent – One representative bulk soil sample was tested to evaluate sand equivalent (SE) in accordance with the ASTM Standard D2419 test method. The measured sand equivalent was 13.
- R-Value – One representative bulk soil sample was tested in accordance with Caltrans Test Method 301. The result of the R-value test was 14.
- Collapse Potential - Two relatively undisturbed representative samples collected from the upper 7.5 feet soils were tested in accordance with the ASTM Standard D4546 test method. The collapse potential was measured under a vertical stress of 2.0 kips per square foot (ksf). The test results showed collapse potential of 3.7 and 3.4 percent, indicating moderate collapse potential.
- Grain Size Analysis – Four representative soil samples were tested to determine the relative grain size distribution in accordance with the ASTM Standard D6913. The test results are graphically presented in Drawing No. B-1, *Grain Size Distribution Results.* Based on the test results, soils are typically silty sand.

- Maximum Dry Density and Optimum Moisture Content – Typical moisture-density relationship test was performed on a representative soil sample in accordance with ASTM Standard D1557. The result is presented in Drawing No. B-2, *Moisture-Density Relationship Results*, in Appendix B, *Laboratory Testing Program*. The laboratory maximum dry density was 129.5 pcf with optimum moisture content of 8.5 percent.
- Direct Shear – One direct shear test was performed on relatively undisturbed samples under soaked moisture condition in accordance with ASTM Standard D3080. The result is presented in Drawing No. B-3, *Direct Shear Test Results* in Appendix B, *Laboratory Testing Program*.

8.2 Chemical Testing - Corrosivity Evaluation

One representative soil sample was tested to determine minimum electrical resistivity, pH, and chemical content, including soluble sulfate and chloride concentrations. The purpose of these tests was to determine the corrosion potential of site soils when placed in contact with common construction materials. These tests were performed by AP Engineering and Testing, Inc. (Pomona, CA) in accordance with California Tests 643, 422, and 417. The test results presented in Appendix B, *Laboratory Testing Program* and summarized below.

- The pH measurement of the sample was 6.7.
- The soluble sulfate content of the sample was 0.0037 percent by weight (37 ppm).
- The chloride concentration of the sample was 40 ppm.
- The minimum electrical resistivity of the sample when saturated was 4,770 ohm-cm.

9.0 EARTHWORK RECOMMENDATIONS

Recommendations for site preparation and remedial grading and estimates of shrinkage and subsidence are provided in the following sections.

9.1 General

This section contains our general recommendations regarding earthwork and grading for the proposed development. These recommendations are based on the results of our field exploration, laboratory tests, our experience with similar projects, and data evaluation as presented in the preceding sections. These recommendations may require modification by the geotechnical consultant based on findings during the final investigation or observation of the actual field conditions during grading.

Prior to the start of construction, all existing underground utilities and appurtenances (if any) should be located at the project site. Such utilities should either be protected in-place or removed and replaced during construction as required by the project

specifications. All excavations should be conducted in such a manner as not to cause loss of bearing and/or lateral support of existing utilities (if any).

All debris, deleterious material, and surficial soils containing roots and perishable materials should be stripped and removed from the site. Deleterious material, including organics, concrete, and debris generated during excavation, should not be placed as fill.

The final bottom surfaces of all excavations should be observed and approved by the project geotechnical consultant prior to placing any fill. Based on these observations, localized areas may require remedial grading deeper than indicated herein. Therefore, some variations in the depth and lateral extent of excavation recommended in this report should be anticipated.

9.2 Overexcavation

Footings, slab-on-grade and pavements should be uniformly supported by compacted fill. In order to provide uniform support, structural areas should be overexcavated, scarified, and recompacted as follows.

Table No. 4, Overexcavation Depths

Structure/Pavement	Minimum Excavation Depth
Footings	24 inches below footings bottom or 5 feet below existing ground surface, whichever is deeper
Slab-on-grade	18 inches below slab
Pavements	18 inches below finish grade

The overexcavation below the footings and slab-on-grade should be uniform. The overexcavation should extend to at least 2 feet beyond the footprint of the footings and slab and at least 1 foot beyond the edge of the pavements. The overexcavation bottom should be scarified and compacted as described in Section 9.4, *Compacted Fill Placement*.

If isolated pockets of very soft, loose, eroded, or pumping soil are encountered, the unstable soil should be excavated as needed to expose undisturbed, firm, and unyielding soils.

The contractor should determine the best manner to conduct the excavations, such that there are no losses of bearing and/or lateral support to the existing structures or utilities.

9.3 Engineered Fill

No fill or aggregate base should be placed until excavations and/or natural ground preparation have been observed by the geotechnical consultant. Excavated soils should be processed, including removal of roots and debris, removal of oversized particles,

mixing, and moisture conditioning, before placing as compacted fill. On-site soils used as fill should meet the following criteria.

- No particles larger than 3 inches in largest dimension.
- Rocks larger than one inch should not be placed within the upper 12 inches of subgrade soils.
- Free of all organic matter, debris, or other deleterious material.
- Expansion index of 20 or less.
- Sand Equivalent greater than 15 (greater than 30 for pipe bedding).
- Contain less than 40 percent fines (passing #200 sieve).

Based on field investigation and laboratory testing results, on-site soils may be suitable as fill materials (except for pipe bedding).

Imported materials, if required, should meet the above criteria prior to being used as compacted fill. Any imported fills should be tested and approved by geotechnical representative prior to delivery to the site.

9.4 Compacted Fill Placement

All surfaces to receive structural fills should be scarified to a depth of 12 inches. The soil should be moisture conditioned to within ±3 percent of optimum moisture content for coarse soils and 0 to 2 percent above optimum moisture content for fine soils. The scarified soils should be recompacted to at least 90 percent of the laboratory maximum dry density.

Fill soils should be thoroughly mixed, and moisture conditioned to within ±3 percent of optimum moisture content for coarse soils and 0 to 2 percent above optimum moisture content for fine soils. Fill soils should be evenly spread in horizontal lifts not exceeding 8 inches in uncompacted thickness.

All fill placed at the site should be compacted to at least 90 percent of the laboratory maximum dry densities as determined by ASTM Standard D1557 test method, unless a higher compaction is specified herein. At least the upper 12 inches of subgrade soils underneath the footings and pavements intended to support vehicle loads should be scarified, moisture conditioned, and compacted to at least 95 percent of the laboratory maximum dry density.

Fill materials should not be placed, spread or compacted during unfavorable weather conditions. When site grading is interrupted by heavy rain, filling operations should not resume until the geotechnical consultant approves the moisture and density conditions of the previously placed fill.

9.5 Shrinkage and Subsidence

The volume of excavated and recompacted soils may be expected to decrease as a result of grading. The shrinkage would depend on, among other factors, the depth of cut and/or fill, removal of particle greater than 6 inches, the grading method and equipment utilized. For preliminary estimation, shrinkage factors for various units of earth material at the site may be taken as presented below.

- The shrinkage factor (defined as a percentage of soil volume reduction when moisture conditioned and compacted to the average of 92 percent relative compaction) for the upper 5 feet of soils is estimated to range from 10 to 14 percent. An average value of 12 percent may be used for preliminary earthwork planning.
- Subsidence (defined as the settlement of native materials from the equipment load applied during grading) would depend on the construction methods including type of equipment utilized. For estimation purposes, ground subsidence may be taken as 0.1 feet.

Although these values are only approximate, they represent our best estimates of the factors to be used to calculate lost volume that may occur during grading. If more accurate shrinkage and subsidence factors are needed, it is recommended that field-testing using the actual equipment and grading techniques be conducted.

9.6 Utility Trench Backfill

The following sections present earthwork recommendations for utility trench backfill, including subgrade preparation and trench zone backfill.

Open cuts adjacent to existing roadways or structures are not recommended within a 1:1 (horizontal:vertical) plane extending down and away from the roadway or structure perimeter (if any).

Soils from the trench excavation should not be stockpiled more than 6 feet in height or within a horizontal distance from the trench edge equal to the depth of the trench. Soils should not be stockpiled behind the shoring, if any, within a horizontal distance equal to the depth of the trench, unless the shoring has been designed for such loads.

9.6.1 Pipeline Subgrade Preparation

The final subgrade surface should be level, firm, uniform, and free of loose materials and properly graded to provide uniform bearing and support to the entire section of the pipe placed on bedding material. Protruding oversize particles larger than 2 inches in dimension, if any, should be removed from the trench bottom and replaced with compacted on-site materials.

Any loose, soft and/or unsuitable materials encountered at the pipe subgrade should be removed and replaced with an adequate bedding material. During the digging of depressions for proper sealing of the pipe joints, the pipe should rest on a prepared bottom for as near its full length as is practicable.

9.6.2 Pipe Bedding

Bedding is defined as the material supporting and surrounding the pipe to 1 foot above the pipe. Recommendations for pipe bedding are provided below.

To provide uniform and firm support for the pipe, compacted granular materials such as clean sand, gravel or ¾-inch crushed aggregate, or crushed rock may be used as pipe bedding material. The sand equivalent of the tested soils was 13. Typically, soils with sand equivalent value of 30 or more are used as pipe bedding material. The pipe designer should determine if the soils are suitable as pipe bedding material.

The type and thickness of the granular bedding placed underneath and around the pipe, if any, should be selected by the pipe designer. The load on the rigid pipes and deflection of flexible pipes and, hence, the pipe design, depends on the type and the amount of bedding placed underneath and around the pipe.

Bedding materials should be vibrated in-place to achieve compaction. Care should be taken to densify the bedding material below the springline of the pipe. Prior to placing the pipe bedding material, the pipe subgrade should be uniform and properly graded to provide uniform bearing and support to the entire section of the pipe placed on bedding material. During the digging of depressions for proper sealing of the pipe joints, the pipe should rest on a prepared bottom for as near its full length as is practicable.

Migration of fines from the surrounding native and/or fill soils must be considered in selecting the gradation of any imported bedding material. We recommend that the pipe bedding material should satisfy the following criteria to protect migration of fine materials.

i. $\frac{D15(F)}{D85(B)} \leq 5$

ii. $\frac{D50(F)}{D50(B)} < 25$

iii. Bedding Materials must have less than 5 percent minus 75 µm (No. 200) sieve to avoid internal movement of fines.

Where,
F = Bedding Material
B = Surrounding Native and/or Fill Soils
*D*15(F) = Particle size through which 15% of bedding material will pass

*D*85(B) = Particle size through which 85% of surrounding soil will pass
*D*50(F) = Particle size through which 50% of bedding material will pass
*D*50(B) = Particle size through which 50% of surrounding soil will pass

If the above criteria do not satisfy, commercially available geofabric used for filtration purposes (such as Mirafi 140N or equivalent) may be wrapped around the bedding material encasing the pipe to separate the bedding material from the surrounding native or fill soils.

9.6.3 Trench Zone Backfill

The trench zone is defined as the portion of the trench above the pipe bedding extending up to the final grade level of the trench surface. Excavated on-site soils free of oversize particles and deleterious matter may be used to backfill the trench zone. Trench backfill recommendations are presented below.

- Trench backfill should be compacted by mechanical methods, such as sheepsfoot, vibrating or pneumatic rollers or mechanical tampers to achieve the density specified herein.
- The contractor should select the equipment and processes to be used to achieve the specified density without damage to adjacent ground, structures, utilities and completed work.
- The field density of the compacted soil should be measured by the ASTM D1556 (Sand Cone) or ASTM D6938 (Nuclear Gauge) or equivalent.
- It should be the responsibility of the contractor to maintain safe working conditions during all phases of construction.
- Observations and field tests should be performed by the project soils consultant to confirm that the required degree of compaction has been obtained. Where compaction is less than that specified, additional compactive effort should be made with adjustment of the moisture content as necessary, until the specified compaction is obtained.

9.7 Site Drainage

Adequate positive drainage should be provided away from the structure and excavation areas to prevent ponding and to reduce percolation of water into the foundation soils. The buildings pad should have a gradient of at least 2 percent towards drainage facilities. The drainage gradient should be one percent for paved areas and 2 percent in landscaped areas. Surface drainage should be directed to suitable non-erosive devices.

10.0 DESIGN RECOMMENDATIONS

Design recommendations are presented in the following sections.

10.1 General Evaluation

The various design recommendations provided in this section are based on the assumptions that in preparing the site, the above earthwork recommendations will be implemented.

10.2 Shallow Foundation Design Parameters

The proposed structure may be supported on continuous spread footing and/or isolated spread footings. The design of the shallow foundations should be based on the recommended parameters presented in the table below.

Table No. 5, Recommended Foundation Parameters

Parameter	Value
Minimum continuous spread footing width	18 inches
Minimum isolated footing width	18 inches
Minimum continuous or isolated footing depth of embedment below lowest adjacent grade	18 inches
Allowable net bearing capacity	2,500 psf

The footing dimensions and reinforcement should be based on structural design. The allowable bearing capacity can be increased by 500 psf with each foot of additional embedment and 100 psf with each foot of additional width up to a maximum of 3,500 psf.

The net allowable bearing values indicated above are for the dead loads and frequently applied live loads and are obtained by applying a factor of safety of 3.0 to the net ultimate bearing capacity. If normal code requirements are applied for design, the above vertical bearing value may be increased by 33 percent for short duration loadings, which will include loadings induced by wind or seismic forces.

10.3 Modulus of Subgrade Reaction

For the subject project, design of the structure supported on subgrade prepared in accordance with the recommendations provided in this report may be based on a soil modulus of subgrade reaction of 200 kips per cubic feet (kcf).

10.4 Lateral Earth Pressures and Resistance to Lateral Loads

In the following subsections, the lateral earth pressures and resistance to lateral loads are estimated by using on-site native soils strength parameters obtained from laboratory testing.

10.4.1 Active Earth Pressures

The active earth pressure behind any buried wall or foundation depends primarily on the allowable wall movement, type of backfill materials, backfill slopes, wall or foundation inclination, surcharges, and any hydrostatic pressures. The recommended lateral earth pressures for level backfill profile without surcharge for the site are presented in the following table.

Table No. 6, Active and At-Rest Earth Pressures

Loading Conditions	Lateral Earth Pressure (psf/ft depth)
Active earth conditions (wall is free to deflect at least 0.001 radian)	38
At-rest (wall is restrained)	58

These pressures assume a level ground surface around the structure for a distance greater than the structure height, no surcharge and no hydrostatic pressure.

If water pressure is allowed to build up behind the structure, the active pressures should be reduced by 50 percent and added to a full hydrostatic pressure to compute the design pressures against the structure.

10.4.2 Passive Earth Pressure

Resistance to lateral loads can be assumed to be provided by a combination of friction acting at the base of foundations and by passive earth pressure. A coefficient of friction of 0.35 between concrete and soil may be used with the dead load forces. An allowable passive earth pressure of 260 psf per foot of depth may be used for the sides of footings poured against recompacted soils. A factor of safety of 1.5 was applied in calculating passive earth pressure. The maximum value of the passive earth pressure should be limited to 2,500 psf for compacted fill.

Vertical and lateral bearing values indicated above are for the total dead loads and frequently applied live loads. If normal code requirements are applied for design, the above vertical bearing and lateral resistance values may be increased by 33 percent for short duration loading, which will include the effect of wind or seismic forces.

Due to the low overburden stress of the soil at shallow depth, the upper one foot of passive resistance should be neglected unless the soil is confined by pavement or slab.

10.5 Slab-on-Grade

Slab-on-grade should be supported on properly compacted fill. Compacted fill used to support slab-on-grade should be placed and compacted in accordance with Section 9.4 *Compacted Fill Placement*.

Slab-on-grade should have a minimum thickness of 4 inches for support of nominal ground-floor live loads. Structural design elements of slab-on-grade, including but not limited to thickness, reinforcement, joint spacing of more heavily loaded slabs will be dependent upon the anticipated loading conditions and the modulus of subgrade reaction of the supporting materials and should be designed by a structural engineer.

Slab should be designed and constructed as promulgated by the American Concrete Institute (ACI) and the Portland Cement Association (PCA). Care should be taken during concrete placement to avoid slab curling. Prior to the slab pour, all utility trenches should be properly backfilled and compacted.

If moisture-sensitive flooring or environments are planned, slab-on-grade should be protected by 10-mil-thick polyethylene vapor barriers. The sub-grade surface should be free of all exposed rocks or other sharp objects prior to placement of the barrier. The barrier should be overlain by 2 inches of sand, to minimize punctures and to aid in the concrete curing. At discretion of the structure engineer, the sand layer may be eliminated.

Subgrade for slab-on-grade should be firm and uniform. All loose or disturbed soils including under-slab utility trench backfill should be recompacted.

In hot weather, the contractor should take appropriate curing precautions after placement of concrete to minimize cracking or curling of the slabs. The potential for slab cracking may be lessened by the addition of fiber mesh to the concrete and/or control of the water/cement ratio.

Concrete should be cured by protecting it against loss of moisture and rapid temperature change for at least 7 days after placement. Moist curing, waterproof paper, white polyethylene sheeting, white liquid membrane compound, or a combination thereof may be used after finishing operations have been completed. The edges of concrete slabs exposed after removal of forms should be immediately protected to provide continuous curing.

10.6 Settlement

The total settlement of shallow footings from static structural loads and short-term settlement of properly compacted fill is anticipated to be 1 inch or less. The differential settlement resulting from static loads is anticipated to be 0.5 inches or less over a horizontal distance of 30 feet.

Our analysis of the potential dynamic settlement is presented in Appendix C, *Liquefaction and Settlement Analysis*. We estimate that the site has the potential for up to 0.3 inches of dry seismic settlement with negligible liquefaction induced settlement during a large earthquake. The dynamic differential settlement of the site may be up to half of the total settlement over 30 horizontal feet.

Generally, the static and dynamic settlement does not occur at the same time. For design purposes, the structural engineer should decide whether static and dynamic settlement will be combined or not.

10.7 Soil Corrosivity

The results of chemical testing of one representative soil sample was evaluated for corrosivity with respect to common construction materials such as concrete and steel. The test results are presented in Appendix B, *Laboratory Testing Program* and design recommendations pertaining to soil corrosivity are presented below.

The sulfate content of the sampled soils corresponds to American Concrete Institute (ACI) exposure category S0 for these sulfate concentrations (ACI 318-14, Table 19.3.1.1). No concrete type restrictions are specified for exposure category S0 (ACI 318-14, Table 19.3.2.1). A minimum compressive strength of 2,500 psi is recommended.

We anticipate that concrete structures such as footings, slabs, and flatwork will be exposed to moisture from precipitation and irrigation. Based on the site locations and the results of chloride testing of the site soils, we do not anticipate that concrete structures will be exposed to external sources of chlorides, such as deicing chemicals, salt, brackish water, or seawater. ACI specifies exposure category C1 where concrete is exposed to moisture, but not to external sources of chlorides (ACI 318-14, Table 19.3.1.1). ACI provides concrete design recommendations in ACI 318-14, Table 19.3.2.1, including a compressive strength of at least 2,500 psi and a maximum chloride content of 0.3 percent.

The measured value of the minimum electrical resistivity of the sample when saturated was 4,770 Ohm-cm. This indicates that the tested soil is moderately corrosive to ferrous metals in contact with the soils (Romanoff, 1957).

According to the Caltrans Corrosion Guidelines (Caltrans, 2018), soils are considered corrosive if the pH is 5.5 or less, or chloride content is 500 parts per million (ppm) or greater, or sulfate content is 1,500 ppm or greater, or resistivity less than 2,000 ohm-cm. Based on the tested results, tested soils are not considered corrosive.

Converse does not practice in the area of corrosion consulting. If needed, a qualified corrosion consultant should provide appropriate corrosion mitigation measures for any ferrous metals in contact with the site soils.

10.8 Asphalt Concrete Pavement

One representative soil sample was tested to determine the R-value of the subgrade soils. The tested R-value was 14. For pavement design, we have utilized an R-value of 14 and design Traffic Indices (TIs) ranging from 5 to 8.

Based on the above information, asphalt concrete and aggregate base thickness were determined using the Caltrans Highway Design Manual (Caltrans, 2017), Chapter 630 with a safety factor of 0.2 for asphalt concrete/aggregate base sections and 0.1 for full depth asphalt concrete sections. Preliminary asphalt concrete pavement sections are presented in the following table.

Table No. 7, Recommended Preliminary Pavement Sections

R-value	Traffic Index (TI)	Pavement Section		
		Option 1		Option 2
		Asphalt Concrete (inches)	Aggregate Base (inches)	Full AC Section (inches)
14	5	4.0	6.0	7.0
	6	4.0	10.0	9.0
	7	5.0	11.5	11.5
	8	6.0	13.5	14.0

At or near the completion of grading, subsurface samples should be tested to evaluate the actual subgrade R-value for final pavement design.

Prior to placement of aggregate base, at least the upper 12 inches of subgrade soils should be scarified, moisture-conditioned if necessary, and recompacted to at least 95 percent of the laboratory maximum dry density as defined by ASTM Standard D1557 test method.

Base materials should conform with Section 200-2.2,"*Crushed Aggregate Base*," of the current Standard Specifications for Public Works Construction (SSPWC; Public Works Standards, 2018) and should be placed in accordance with Section 301.2 of the SSPWC.

Asphaltic concrete materials should conform to Section 203 of the SSPWC and should be placed in accordance with Section 302-5 of the SSPWC.

10.9 Concrete Flatwork

Except as modified herein, concrete walks, driveways, access ramps, curb and gutters should be constructed in accordance with Section 303-5, *Concrete Curbs, Walks, Gutters, Cross-Gutters, Alley Intersections, Access Ramps, and Driveways*, of the Standard Specifications for Public Works Construction (Public Works Standards, 2018). The subgrade soils under the above structures should consist of compacted fill placed as described in this report. Prior to placement of concrete, the upper 12 inches of subgrade soils should be moisture conditioned to between within 3 percent of optimum moisture content for coarse-grained soils and 0 and 2 percent above optimum for fine-grained soils.

The thickness of driveways for passenger vehicles should be at least 4 inches, or as required by the civil or structural engineer. Transverse control joints for driveways should be spaced not more than 10 feet apart. Driveways wider than 12 feet should be provided with a longitudinal control joint.

Concrete walks subjected to pedestrian and bicycle loading should be at least 4 inches thick, or as required by the civil or structural engineer. Transverse joints should be spaced 15 feet or less and should be cut to a depth of one-fourth the slab thickness.

Positive drainage should be provided away from all driveways and sidewalks to prevent seepage of surface and/or subsurface water into the concrete base and/or subgrade.

10.10 Percolation Testing

Two percolation tests (PT-01 and PT-02) were performed on June 25, 2019 to evaluate water infiltration rate. The measured percolation test data and calculations for conversion to infiltration rates, porosity correction, and factor of safety are shown on Plates No. 1 and 3, *Estimated Infiltration Rate from Percolation Test Data* and graphically represented on Plates No. 2 and 4, *Infiltration Rate Versus Time* in Appendix D *Percolation Testing*. The estimated infiltration rate at the test holes are presented in the following table.

Table No. 8, Estimated Infiltration Rates

Percolation Test	Depth (feet)	Soil Type	Infiltration Rate (inches/hour)
PT-01	5.0	Silty Sand (SM)	0.18
PT-02	5.0	Silty Sand (SM)	0.26

Based on the calculated infiltration rates during the final 10-minute interval in each test, we recommend an infiltration rate of 0.18 inches per hour for the site.

11.0 CONSTRUCTION RECOMMENDATIONS

Temporary sloped excavation recommendations are presented in the following sections.

11.1 General

Vertical braced excavations can be considered for the foundation and pipelines associated with the project. Recommendations pertaining to temporary excavations are presented in this section.

Depending on the sequence of construction, excavations may be required near existing streets, which may require vertical side wall excavation. Where the side of the excavation is a vertical cut, it should be adequately supported by temporary shoring to protect workers and any adjacent structures.

All applicable requirements of the California Construction and General Industry Safety Orders, the Occupational Safety and Health Act, and the Construction Safety Act should be met. The soils exposed in cuts should be observed during excavation by the geotechnical consultant and the competent person designated by the contractor. If potentially unstable soil conditions are encountered, modifications of slope ratios for temporary cuts may be required.

11.2 Temporary Sloped Excavations

Temporary open-cut trenches may be constructed with side slopes as recommended in the following table. Temporary cuts encountering soft and wet fine-grained soils; dry loose, cohesionless soils or loose fill from trench backfill may have to be constructed at a flatter gradient than presented below.

Table No. 9, Slope Ratios for Temporary Excavations

Soil Type	OSHA Soil Type	Depth of Cut (feet)	Recommended Maximum Slope (Horizontal:Vertical)[1]
Silty Sand (SM)	C	0-10	1.5:1

[1] Slope ratio assumed to be uniform from top to toe of slope.

For steeper temporary construction slopes or deeper excavations, or unstable soil encountered during the excavation, shoring or trench shields should be provided by the contractor to protect the workers in the excavation. Design recommendations for temporary shoring can be provided if necessary.

Surfaces exposed in slope excavations should be kept moist but not saturated to retard raveling and sloughing during construction. Adequate provisions should be made to protect the slopes from erosion during periods of rainfall. Surcharge loads, including construction materials, should not be placed within 5 feet of the unsupported slope edge. Stockpiled soils with a height higher than 6 feet will require greater distance from trench edges.

12.0 GEOTECHNICAL SERVICES DURING CONSTRUCTION

The project geotechnical consultant should review plans and specifications as the project design progresses. Such review is necessary to identify design elements, assumptions, or new conditions which require revisions or additions to our geotechnical recommendations.

The project geotechnical consultant should be present to observe conditions during construction. Testing should be performed to determine density and moisture of the compacted soils as needed to verify compliance with project specifications. Additional geotechnical recommendations may be required based on subsurface conditions encountered during construction.

13.0 CLOSURE

This report is prepared for the project described herein and is intended for use solely by Dominion Property LLC and their authorized agents, to assist in the design and construction of the proposed project. Our findings and recommendations were obtained in accordance with generally accepted professional principles practiced in geotechnical engineering. We make no other warranty, either expressed or implied.

Converse Consultants is not responsible or liable for any claims or damages associated with interpretation of available information provided to others. Site exploration identifies actual soil conditions only at those points where samples are taken, when they are taken. Data derived through sampling and laboratory testing is extrapolated by Converse employees who render an opinion about the overall soil conditions. Actual conditions in areas not sampled may differ. In the event that changes to the project occur, or additional, relevant information about the project is brought to our attention, the recommendations contained in this report may not be valid unless these changes and additional relevant information are reviewed and the recommendations of this report are modified or verified in writing. In addition, the recommendations can only be finalized by observing actual subsurface conditions revealed during construction. Converse cannot be held responsible for misinterpretation or changes to our recommendations made by others during construction.

As the project evolves, continued consultation and construction monitoring by a qualified geotechnical consultant should be considered an extension of geotechnical investigation services performed to date. The geotechnical consultant should review plans and specifications to verify that the recommendations presented herein have been appropriately interpreted, and that the design assumptions used in this report are valid. Where significant design changes occur, Converse may be required to augment or modify the recommendations presented herein. Subsurface conditions may differ in some locations from those encountered in the explorations, and may require additional analyses and, possibly, modified recommendations.

Design recommendations given in this report are based on the assumption that the recommendations contained in this report are implemented. Additional consultation may be prudent to interpret Converse's findings for contractors, or to possibly refine these recommendations based upon the review of the actual site conditions encountered during construction. If the scope of the project changes, if project completion is to be delayed, or if the report is to be used for another purpose, this office should be consulted.

14.0 REFERENCES

AMERICAN CONCRETE INSTITUTE (ACI), 2014, Building Code Requirements for Structural Concrete (ACI 318-14) and Commentary, October 2014.

CALIFORNIA BUILDING STANDARDS COMMISSION (CBSC), 2016, California Building Code (CBC).

CALIFORNIA DEPARTMENT OF TRANSPORTATION (Caltrans), 2017, Highway Design Manual, dated November 20, 2017.

CALIFORNIA DEPARTMENT OF TRANSPORTATION (Caltrans), 2018, Corrosion Guidelines Version 3.0, dated March 2018.

CALIFORNIA GEOLOGICAL SURVEY (CGS), 2007, Fault-Rupture Hazard Zones in California, Alquist-Priolo Earthquake Faulting Zoning Act with Index to Earthquake Fault Zone Maps, Special Publication 42, revised 2007.

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD (SWRCB), 2018, GeoTracker database (http://geotracker.waterboards.ca.gov/), accessed August 2018.

DAS, B.M., 2011, Principles of Foundation Engineering, Seventh Edition, published by Global Engineering, 2011.

DIBBLEE, T.W., and MINCH, J.A., 2003, Geologic map of the Beaumont quadrangle, Riverside County, California: Dibblee Geological Foundation, Dibblee Foundation Map DF-114, scale 1:24,000.

FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA), 2008, Flood Insurance Rate Map, Riverside County, California and Incorporated Areas, Map No. 06065C2017G, revised August 28, 2008.

INFRAGEO SOFTWARE, 2019, SPTLIQ: Simplified Liquefaction Hazards Assessment Using Standard Penetration Test (SPT) Data.

PUBLIC WORKS STANDARDS, INC., 2018, Standard Specifications for Public Works Construction (“Greenbook”), 2018.

ROMANOFF, MELVIN, 1957, Underground Corrosion, National Bureau of Standards Circular 579, dated April 1957.

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT (RCFCDWCD), 2019 - Zone 5, www.rcflood.org/Zone5.aspx. Accessed July 2019.

RIVERSIDE COUNTY, 2019, Riverside County GIS - Map My County (https://gis.countyofriverside.us/Html5Viewer/?viewer=MMC_Public), accessed on July 3, 2019.

RIVERSIDE COUNTY, 2013, Technical Guidance Document for Water Quality Management Plans, dated June 7, 2013.

U.S. GEOLOGICAL SURVEY (USGS), 2019a, Groundwater for USA: Water Levels (https://nwis.waterdata.usgs.gov/nwis/gwlevels?site_no=335515116522801&agency_cd=USGS&format=html), accessed July 2019.

U.S. GEOLOGICAL SURVEY (USGS), 2019b, U.S. Seismic Design Maps Tool: Web Interface (http://earthquake.usgs.gov/hazards/designmaps/usdesign.php), accessed July 2019.

Appendix A

Field Exploration

APPENDIX A

FIELD EXPLORATION

Our field investigation included a site reconnaissance, a subsurface exploration program consisting of drilling soil borings, conducting percolation testing, and a limited environmental screening. During the site reconnaissance, the surface conditions were noted, and the borings were marked in the field using approximate distances from streets as a guide and should be considered accurate only to the degree implied by the method used to locate them.

Six exploratory borings (BH-01 through BH-06) were drilled on June 21, 2019 to investigate the subsurface conditions at the site. The borings were advanced to the maximum depths of 15.9, 16.5 and 50.3 feet below existing ground surface (bgs).

Two additional test holes (PT-01 and PT-02) were drilled on June 21, 2019 to perform percolation testing. The borings were drilled to approximately 5 feet bgs. Percolation testing was performed on June 25, 2019.

Soil samples were also collected on June 21, 2019 by Converse environmental scientist to perform environmental laboratory testing. A separate environmental data report will be issued by Converse.

The borings were advanced using a truck-mounted drill rig equipped with 8-inch diameter hollow-stem augers for soils sampling. Encountered materials were continuously logged by a Converse geologist and classified in the field by visual inspection in accordance with the Unified Soil Classification System. Where appropriate, the field descriptions and classifications have been modified to reflect laboratory test results.

Relatively undisturbed samples were obtained using California Modified Samplers (2.4 inches inside diameter and 3.0 inches outside diameter) lined with thin sample rings. The steel ring sampler was driven into the bottom of the borehole with successive drops of a 140-pound driving weight falling 30 inches. Blow counts at each sample interval are presented on the boring logs. Samples were retained in brass rings (2.4 inches inside diameter and 1.0 inch in height) and carefully sealed in waterproof plastic containers for shipment to the Converse laboratory. Bulk samples of typical soil types were also obtained.

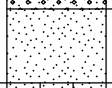
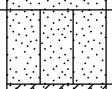
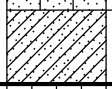
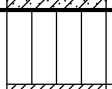
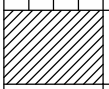
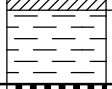
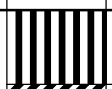
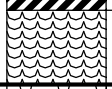
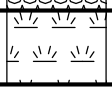
Standard Penetration Testing (SPT) was performed in accordance with the ASTM Standard D1586 test method in boring BH-01 at depths of 20, 25, 30, 40, and 50 feet bgs using a standard (1.4 inches inside diameter and 2.0 inches outside diameter) split-barrel sampler. The mechanically driven hammer for the SPT sampler was 140 pounds, falling 30 inches for each blow. The recorded blow counts for every 6 inches for a total of 1.5 feet of sampler penetration are shown on the Logs of Borings.

The exact depths at which material changes occur cannot always be established accurately. Unless a more precise depth can be established by other means, changes in material conditions that occur between drive samples are indicated on the logs at the top of the next drive sample.

Following the completion of logging and sampling, the borings were backfilled with soil cuttings and tamped except percolation test borings. After completion of percolation testing, the borings were backfilled with soil cuttings and tamped. If construction is delayed, the surface may settle over time. We recommend the owner monitor the boring locations and backfill any depressions that might occur or provide protection around the boring locations to prevent trip and fall injuries from occurring near the area of any potential settlement.

For a key to soil symbols and terminology used in the boring logs, refer to Drawing No. A-1, *Unified Soil Classification and Key to Boring Log Symbols*. For logs of borings, see Drawings No. A-2 through A-9, *Logs of Borings*.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS — MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS — MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

BORING LOG SYMBOLS

SAMPLE TYPE

STANDARD PENETRATION TEST
Split barrel sampler in accordance with ASTM D-1586-84 Standard Test Method

DRIVE SAMPLE 2.42" I.D. sampler (CMS).

DRIVE SAMPLE No recovery

BULK SAMPLE

GROUNDWATER WHILE DRILLING

GROUNDWATER AFTER DRILLING

LABORATORY TESTING ABBREVIATIONS			
TEST TYPE (Results shown in Appendix B)		STRENGTH	
		Pocket Penetrometer	p
		Direct Shear	ds
		Direct Shear (single point)	ds*
		Unconfined Compression	uc
CLASSIFICATION		Triaxial Compression	tx
Plasticity	pi	Vane Shear	vs
Grain Size Analysis	ma	Consolidation	c
Passing No. 200 Sieve	wa	Collapse Test	col
Sand Equivalent	se	Resistance (R) Value	r
Expansion Index	ei	Chemical Analysis	ca
Compaction Curve	max	Electrical Resistivity	er
Hydrometer	h	Permeability	perm
Disturb	Dist.	Soil Cement	sc

Apparant Density	Very Loose	Loose	Medium	Dense	Very Dense
SPT (N)	< 4	4 - 11	11 - 30	31 - 50	> 50
CA Sampler	< 5	5 - 12	13 - 35	36 - 60	> 60
Relative Density (%)	< 20	20 - 40	40 - 60	60 - 80	> 80

Consistency	Very Soft	Soft	Medium	Stiff	Very Stiff	Hard
SPT (N)	< 2	2-4	5-8	9-15	16-30	> 30
CA Sampler	< 3	3-6	7-12	13-25	26-50	> 50

UNIFIED SOIL CLASSIFICATION AND KEY TO BORING LOG SYMBOLS

Converse Consultants

APN #: 540-250-001-1
Southeast Corner of 8th Street and Lincoln Avenue
City of Banning, Riverside County, California

Project No.
19-81-167-01

Drawing No.
A-1

Project ID: 19-81-167-01.GPJ; Template: KEY

Log of Boring No. BH-01

Dates Drilled: 6/21/2019 Logged by: Catherine Nelson Checked By: James Burnham

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2335 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM **SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 2" in largest dimension, brown.						ma
			■		12/13/13	7	102	col
5			■		13/8/7	9	103	ds
10		- few gravel and cobbles up to 6" in largest dimension	■		25/40/50-5.5"	9	115	
15		- light brown	■		11/40/50	9	113	
20			⊠		24/50-5.5"			
25			⊠		12/22/26			
30			⊠		24/50			

Converse Consultants

APN #: 540-250-001-1
Southeast Corner of 8th Street and Lincoln Avenue
City of Banning, Riverside County, California
For: Dominion Property LLC

Project No. **19-81-167-01**

Drawing No. **A-2a**

Log of Boring No. BH-01

Dates Drilled: 6/21/2019 Logged by: Catherine Nelson Checked By: James Burnham

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2335 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM **SILTY SAND (SM):** fine to coarse-grained, scattered gravel and cobbles up to 6" in largest dinmension, brown.	■		22/50-3"	6	100	
40			⊠		31/50-5.5"			
45			■		32/50-5.5"	5	115	
50			⊠		50-3"			
		End of boring at 50.3 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and tamped on 06/21/2019.						

APN #: 540-250-001-1
Southeast Corner of 8th Street and Lincoln Avenue
City of Banning, Riverside County, California
For: Dominion Property LLC

Converse Consultants

Project No. 19-81-167-01

Drawing No. A-2b

Log of Boring No. BH-02

Dates Drilled: 6/21/2019 Logged by: Catherine Nelson Checked By: James Burnham

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2330 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM **SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 2" in largest dimension, brown.	■	▨	7/4/4	6	104	
5			■		5/4/4	10	107	
			■		10/14/15	11	120	
10		- scattered gravel up to 2" in largest dimension, trace clay	■		8/14/16	15	112	
15		- light brown	■		15/25/31	8	118	
		End of boring at 16.5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and tamped on 06/21/2019.						

Converse Consultants

APN #: 540-250-001-1
Southeast Corner of 8th Street and Lincoln Avenue
City of Banning, Riverside County, California
For: Dominion Property LLC

Project No. 19-81-167-01

Drawing No. A-3

Log of Boring No. BH-03

Dates Drilled: 6/21/2019 Logged by: Catherine Nelson Checked By: James Burnham

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2329 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM **SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 2" in largest dimension, brown.						se, max
5			■		8/7/8	9	108	
10			■		6/11/18	11	113	
15			■		15/50-5"	14	113	
		- scattered gravel up to 2" in largest dimension, trace clay, light brown						
		End of boring at 15.9 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and tamped on 06/21/2019.						

Converse Consultants

APN #: 540-250-001-1
Southeast Corner of 8th Street and Lincoln Avenue
City of Banning, Riverside County, California
For: Dominion Property LLC

Project No. 19-81-167-01

Drawing No. A-4

Log of Boring No. BH-04

Dates Drilled: 6/21/2019 Logged by: Catherine Nelson Checked By: James Burnham

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2323 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVE	SAMPLES BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM : **SILTY SAND TO SANDY SILT (SM-ML):** fine to coarse-grained, scattered gravel up to 2" in largest dimension, brown.	■	▨	12/8/6	6	102	r
5			■		4/5/7	9	102	
		- light brown	■		12/17/24	9	112	
10		- scattered gravel up to 2" in largest dimension	■	▨	16/41/50-5"	11	115	ma
15			■		30/38/38	5	121	
		End of boring at 16.5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and tamped on 06/21/2019.						

Converse Consultants

APN #: 540-250-001-1
Southeast Corner of 8th Street and Lincoln Avenue
City of Banning, Riverside County, California
For: Dominion Property LLC

Project No. 19-81-167-01

Drawing No. A-5

Log of Boring No. BH-05

Dates Drilled: 6/21/2019 Logged by: Catherine Nelson Checked By: James Burnham

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2321 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM **SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 2" in largest dimension, brown.						ca, er
5					15/9/8	8	114	col
10		- few gravel up to 2" in largest dimension, light brown			12/24/30	11	120	
15					15/32/33	6	119	
		End of boring at 16.5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and tamped on 06/21/2019.						

Converse Consultants

APN #: 540-250-001-1
Southeast Corner of 8th Street and Lincoln Avenue
City of Banning, Riverside County, California
For: Dominion Property LLC

Project No. 19-81-167-01

Drawing No. A-6

Log of Boring No. BH-06

Dates Drilled: 6/21/2019 Logged by: Catherine Nelson Checked By: James Burnham

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2323 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM **SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 2" in largest dimension, trace clay, brown.	■	▨	19/11/7	7	106	ma
5			■		6/6/8	10	107	
			■		12/14/18	11	114	
10		- few gravel up to 2" in largest dimension	■		11/25/26	9	121	
15		- light brown	■		11/22/25	9	116	
		End of boring at 16.5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and tamped on 06/21/2019.						

Converse Consultants

APN #: 540-250-001-1
Southeast Corner of 8th Street and Lincoln Avenue
City of Banning, Riverside County, California
For: Dominion Property LLC

Project No. 19-81-167-01

Drawing No. A-7

Log of Boring No. PT-01

Dates Drilled: 6/21/2019 Logged by: Catherine Nelson Checked By: James Burnham

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2329 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM: **SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 2" in largest dimension, brown.						ma
5		End of boring at 5.0 feet bgs. No groundwater encountered. Borehole utilized for percolation testing on 06/25/2019. Backfilled with pea-gravel, soil cuttings and tamped on 06/25/2019.						

APN #: 540-250-001-1
Southeast Corner of 8th Street and Lincoln Avenue
City of Banning, Riverside County, California
For: Dominion Property LLC

Converse Consultants

Project No. 19-81-167-01

Drawing No. A-8

Log of Boring No. PT-02

Dates Drilled: 6/21/2019 Logged by: Catherine Nelson Checked By: James Burnham

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2328 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM: **SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 2" in largest dimension, brown.						
5		End of boring at 5.0 feet bgs. No groundwater encountered. Borehole utilized for percolation testing on 06/25/2019. Backfilled with pea-gravel, soil cuttings and tamped on 06/25/2019.						

APN #: 540-250-001-1
Southeast Corner of 8th Street and Lincoln Avenue
City of Banning, Riverside County, California
For: Dominion Property LLC

Converse Consultants

Project No. 19-81-167-01

Drawing No. A-9

Appendix B

Laboratory Testing Program

APPENDIX B

LABORATORY TESTING PROGRAM

Tests were conducted in our laboratory on representative soil samples for the purpose of classification and evaluation of their physical properties and engineering characteristics. The amount and selection of tests were based on the geotechnical parameters required for this project. Test results are presented herein and on the Logs of Borings, in Appendix A, *Field Exploration*. The following is a summary of the various laboratory tests conducted for this project.

***In-Situ* Moisture Content and Dry Density**

In-situ dry density and moisture content tests were performed on relatively undisturbed ring samples, in accordance to ASTM D2216 and ASTM D7263 to aid soils classification and to provide qualitative information on strength and compressibility characteristics of the site soils. For test results, see the Logs of Borings in Appendix A, Field Exploration.

Sand Equivalent

One representative soil sample was tested in accordance with the ASTM D2419 test method to determine the sand equivalent. The test result is presented in the following table.

Table No. B-1, Sand Equivalent Test Result

Boring No.	Depth (feet)	Soil Description	Sand Equivalent
BH-03	0-5	Silty Sand (SM)	13

R-value

One representative bulk soil sample was tested for resistance value (R-value) in accordance with California Test Method CT301. The test is designed to provide a relative measure of soil strength for use in pavement design. The test result is shown in the following table.

Table No. B-2, R-Value Test Result

Boring No.	Depth (feet)	Soil Classification	Measured R-value
BH-04	0-5	Silty Sand to Sandy Silt (SM-ML)	14

Soil Corrosivity

One representative soil sample was tested to determine minimum electrical resistivity, pH, and chemical content, including soluble sulfate and chloride concentrations. The purpose of these tests was to determine the corrosion potential of site soils when placed in contact with common construction materials. The tests were performed by AP Engineering and Testing, Inc. (Pomona, CA) in accordance to Caltrans Tests 643, 422 and 417. Test results are presented in the following table.

Table No. B-3, Summary of Soil Corrosivity Test Results

Boring No.	Depth (feet)	pH	Soluble Sulfates (CA 417) (% by weight)	Soluble Chlorides (CA 422) (ppm)	Min. Resistivity (CA 643) (Ohm-cm)
BH-05	0-5	6.7	0.0037	40	4,770

Collapse

To evaluate the moisture sensitivity (collapse potential) of the encountered soils, two representative ring samples were loaded to approximately 2 kips, allowed to stabilize under load, and then submerged in water. Tests were performed in accordance to ASTM Standard D4546. The test results are presented in the following table.

Table No. B-4, Summary of Collapse Test Results

Boring No.	Depth (feet)	Soil Description	Percent Collapse (-) or Swell (+)	Collapse Potential
BH-01	2.5-4	Silty Sand (SM)	-3.7	Moderate
BH-05	5.0-6.5	Silty Sand (SM)	-3.4	Moderate

Grain-Size Analyses

To assist in classification of soils, mechanical grain-size analyses were performed on four select samples in accordance with the ASTM Standard D6913 test method. Grain-size curves are shown in Drawing No. B-1, *Grain Size Distribution Results*. The test results are presented in the following table.

Table No. B-5, Grain Size Distribution Test Results

Boring No.	Depth (ft)	Soil Classification	% Gravel	% Sand	%Silt	%Clay
BH-01	0-5	Silty Sand (SM)	1.0	52.0	47.0	
BH-04	10-15	Silty Sand (SM)	1.0	58.0	41.0	
BH-06	0-5	Silty Sand (SM)	1.0	60.0	39.0	
PT-01	0-5	Silty Sand (SM)	4.0	59.0	37.0	

Maximum Density and Optimum Moisture Content

Laboratory maximum dry density-optimum moisture content relationship test was performed on one representative bulk soil sample. The test was conducted in accordance with the ASTM Standard D1557 test method. The test result is presented in Drawing No. B-2, *Moisture-Density Relationship Results,* and is summarized in the following table.

Table No B-6, Summary of Moisture-Density Relationship Results

Boring No.	Depth (feet)	Soil Description	Optimum Moisture (%)	Maximum Density (lb/cft)
BH-03	0-5	Silty Sand (SM), Brown	8.5	129.5

Direct Shear Tests

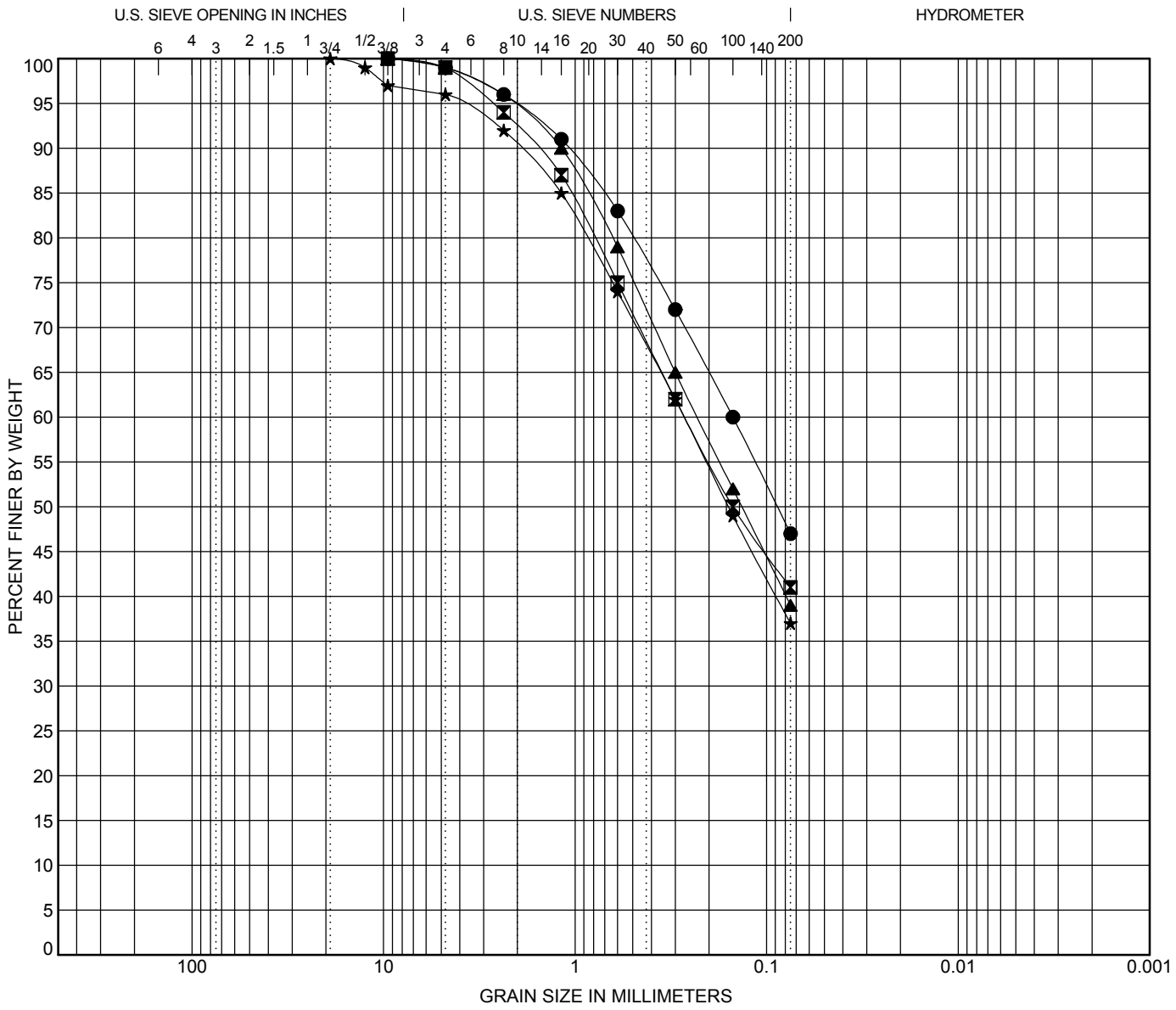
One direct shear test was performed on relatively undisturbed samples in soaked moisture condition in accordance with ASTM D3080. For each test, three samples contained in brass sampler rings were placed, one at a time, directly into the test apparatus and subjected to a range of normal loads appropriate for the anticipated conditions. The samples were then sheared at a constant strain rate of 0.02 inch/minute. Shear deformation was recorded until a maximum of about 0.25-inch shear displacement was achieved. Ultimate strength was selected from the shear-stress deformation data and plotted to determine the shear strength parameters. For test data, including sample density and moisture content, see Drawing No. B-3*, Direct Shear Test Results,* and the following table.

Table No. B-7, Summary of Direct Shear Test Results

Boring No.	Depth (feet)	Soil Description	Peak Strength Parameters	
			Friction Angle (degrees)	Cohesion (psf)
BH-01	5.0-6.5	Silty Sand (SM)	34	90

Sample Storage

Soil samples presently stored in our laboratory will be discarded 30 days after the date of this report, unless this office receives a specific request to retain the samples for a longer period.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring No.	Depth (ft)	Description	LL	PL	PI	Cc	Cu
●	**BH-01**	**0-5**	**SILTY SAND (SM)**					
⊠	**BH-04**	**10-15**	**SILTY SAND (SM)**					
▲	**BH-06**	**0-5**	**SILTY SAND (SM)**					
★	**PT-01**	**0-5**	**SILTY SAND (SM)**					

	Boring No.	Depth (ft)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH-01**	**0-5**	**9.5**	**0.15**			**1.0**	**52.0**	**47.0**	
⊠	**BH-04**	**10-15**	**9.5**	**0.267**			**1.0**	**58.0**	**41.0**	
▲	**BH-06**	**0-5**	**9.5**	**0.23**			**1.0**	**60.0**	**39.0**	
★	**PT-01**	**0-5**	**19**	**0.27**			**4.0**	**59.0**	**37.0**	

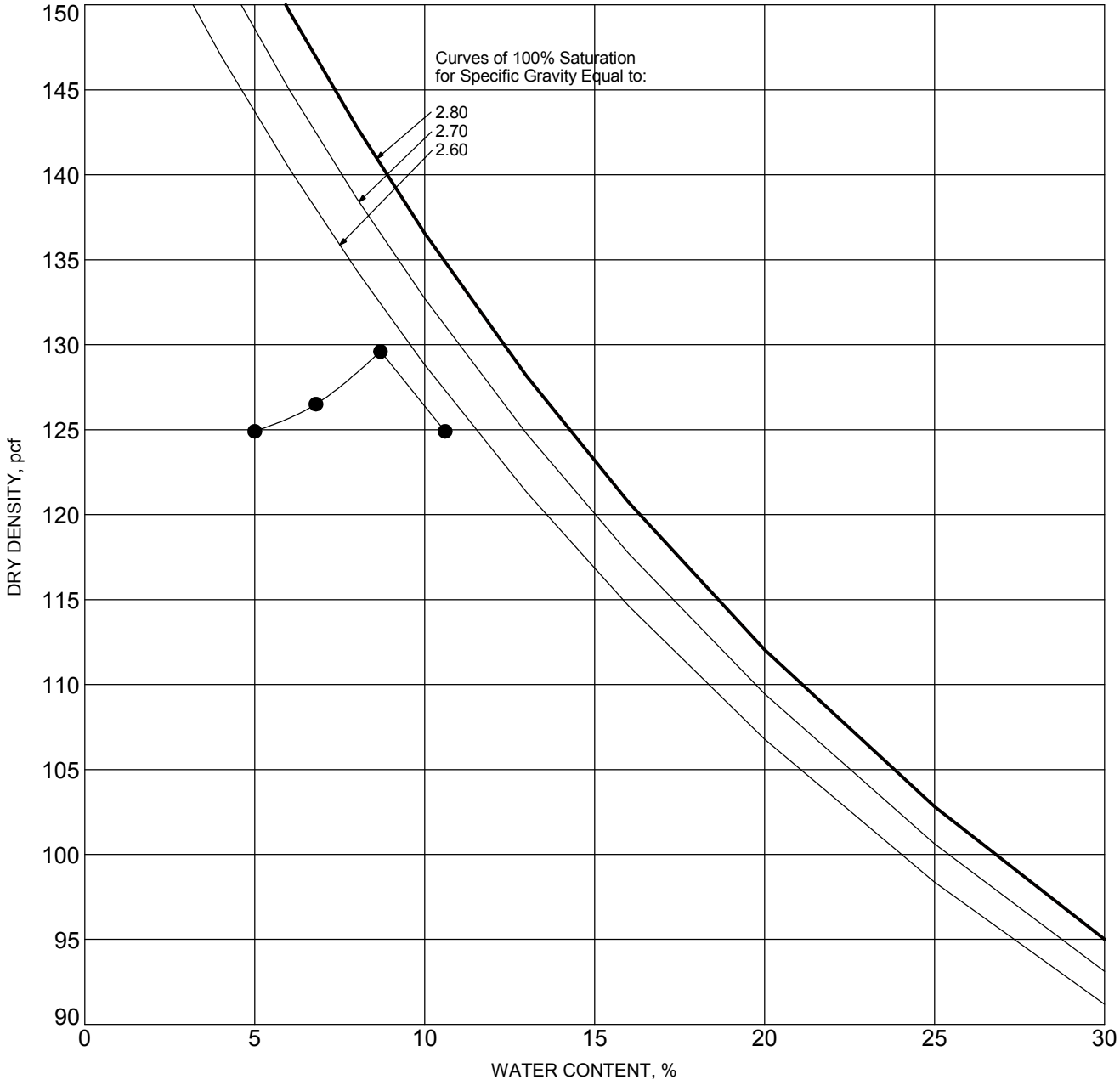
GRAIN SIZE DISTRIBUTION RESULTS

Converse Consultants

APN #: 540-250-001-1
Southeast Corner of 8th Street and Lincoln Avenue
City of Banning, Riverside County, California
For: Dominion Property LLC

Project No. **19-81-167-01**

Drawing No. **B-1**



SYMBOL	BORING NO.	DEPTH (ft)	DESCRIPTION	ASTM TEST METHOD	OPTIMUM WATER, %	MAXIMUM DRY DENSITY, pcf
●	**BH-03**	**0-5**	**SILTY SAND (SM), BROWN**	**D1557 - A**	**8.5**	**129.5**

MOISTURE-DENSITY RELATIONSHIP RESULTS

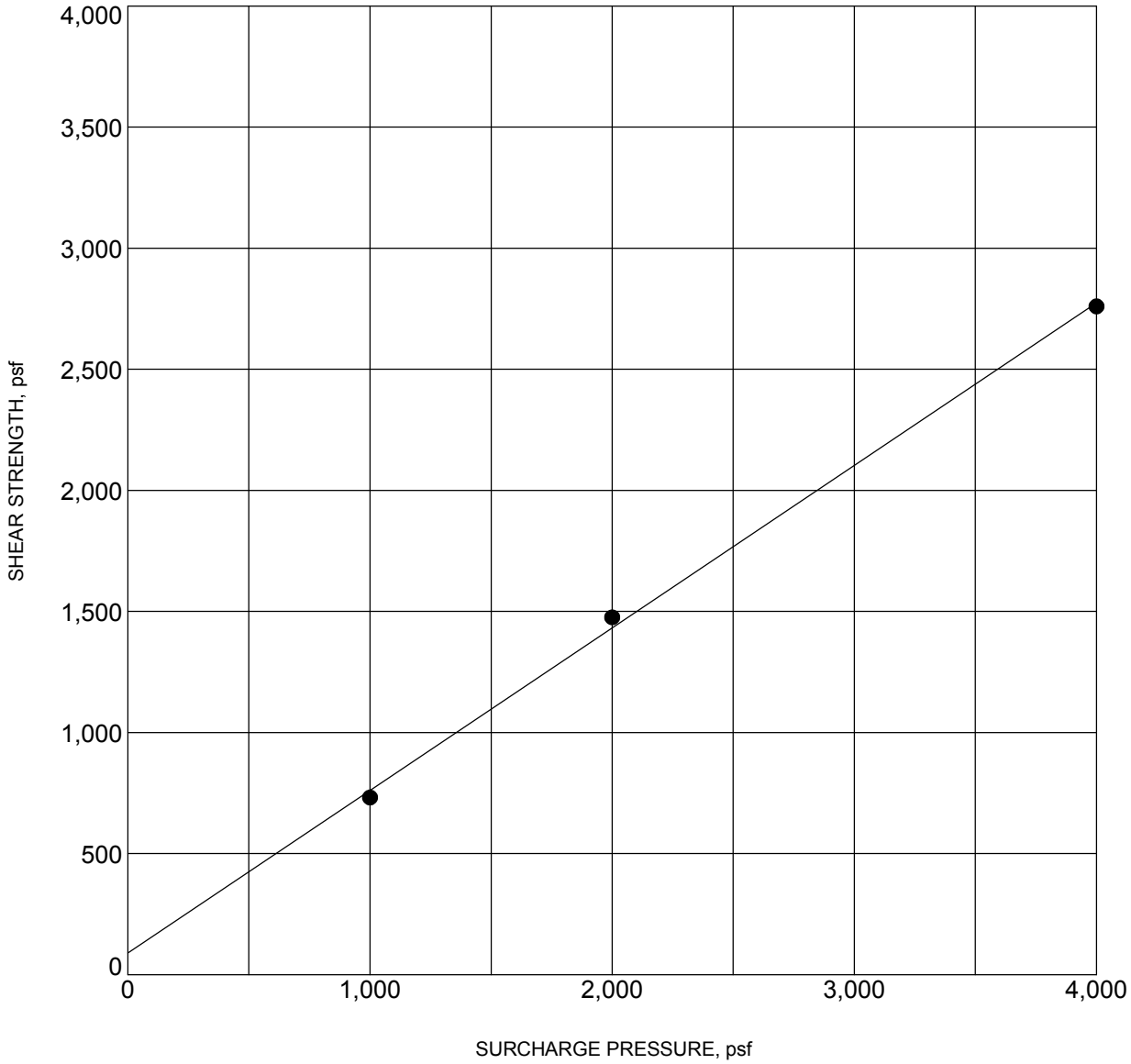
Converse Consultants

APN #: 540-250-001-1
Southeast Corner of 8th Street and Lincoln Avenue
City of Banning, Riverside County, California
For: Dominion Property LLC

Project No. **19-81-167-01**

Drawing No. **B-2**

Project ID: 19-81-167-01.GPJ; Template: COMPACTION



BORING NO.	:	**BH-01**	DEPTH (ft)	:	**5.0-6.5**
DESCRIPTION	:	**SILTY SAND (SM)**			
COHESION (psf)	:	**90**	FRICTION ANGLE (degrees):		**34**
MOISTURE CONTENT (%)	:	**9.0**	DRY DENSITY (pcf)	:	**103.0**

NOTE: Ultimate Strength.

DIRECT SHEAR TEST RESULTS

Converse Consultants

APN #: 540-250-001-1
Southeast Corner of 8th Street and Lincoln Avenue
City of Banning, Riverside County, California
For: Dominion Property LLC

Project No. **19-81-167-01**

Drawing No. **B-3**

Appendix C

Liquefaction and Settlement Analysis

APPENDIX C

LIQUEFACTION AND SETTLEMENT ANALYSIS

The subsurface data obtained from the boring BH-01 was used to evaluate liquefaction potential and associated dynamic settlement subjected to ground shaking during earthquakes.

A simplified liquefaction hazard analysis was performed using the program SPTLIQ (InfraGEO Software, 2019) using the liquefaction triggering analysis method by Boulanger and Idriss (2014). A modal earthquake magnitude of M 7.5 was selected based on the results of seismic deaggregation analysis using the USGS interactive online tool (https://earthquake.usgs.gov/hazards/interactive/).

A peak ground acceleration (PGA_M) of 0.681g for the MCE design event, where g is the acceleration due to gravity, was selected for this analysis. The PGA was based on the CBC seismic design parameters presented in Section 7.2, *CBC 2016 Seismic Parameters.*

The result of our analysis is presented on Plate C-1 and summarized in the following table.

Table C-1, Estimated Dynamic Settlement

Location	Groundwater Conditions	Groundwater Depth (feet bgs)	Dry Seismic Settlement (inches)	Liquefaction Induced Settlement (inches)
BH-01	Current	> 50	0.28	Negligible
	Historical			

Based on our analysis, the project site has the potential for up to 0.3 inches of dry seismic settlement with negligible liquefaction induced settlement under groundwater condition deeper than 50 feet bgs. The dynamic differential settlement of the site may be half of the total settlement over 30 horizontal feet.

SIMPLIFIED LIQUEFACTION HAZARDS ASSESSMENT USING STANDARD PENETRATION TEST (SPT) DATA

(Copyright © 2015, 2018, SPTLIQ, All Rights Reserved; By: InfraGEO Software)

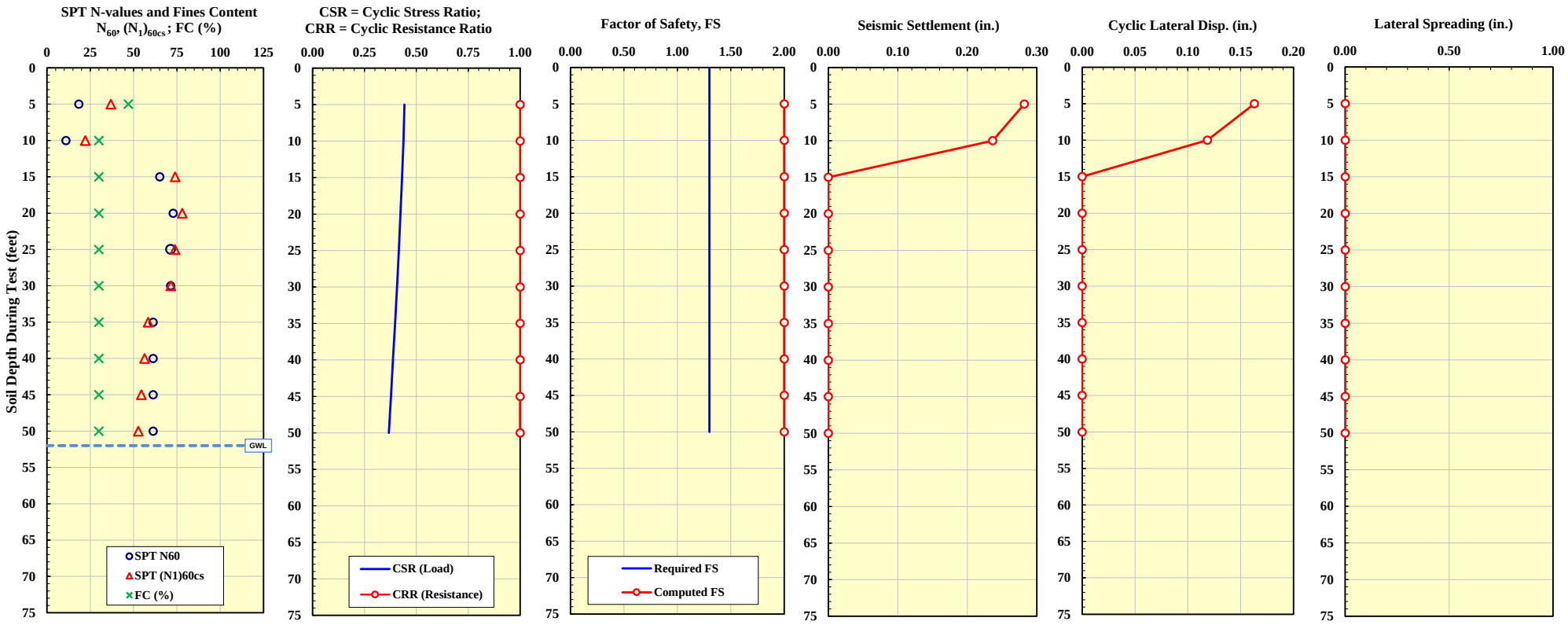
PROJECT INFORMATION	
Project Name	APN# 540-250-001-1
Project No.	19-81-167-01
Project Location	City of Banning, California
Analyzed By	Zahangir Alam
Reviewed By	Hashmi Quazi

TOPOGRAPHIC CONDITIONS		
Ground Slope, S	N/A	
Free Face (L/H) Ratio	5.00	H = 15.00 feet

GROUNDWATER LEVEL DATA	
GWL Depth Measured During Test	52.00 feet
GWL Depth Used in Design	52.00 feet

BORING DATA	
Boring No.	B-01
Ground Surface Elevation	2,335.00 feet
Proposed Grade Elevation	2,335.00 feet
Borehole Diameter	8.00 inches
Hammer Weight	140.00 pounds
Hammer Drop	30.00 inches
Hammer Energy Efficiency Ratio, ER	80.00 %
Hammer Distance to Ground Surface	5.00 feet

SEISMIC DESIGN PARAMETERS	
Earthquake Moment Magnitude, M_w	7.50
Peak Ground Acceleration, A_{max}	0.68 g
Required Factor of Safety, FS	1.30



Analysis Methods Used ==>>

Liquefaction Triggering:
Idriss and Boulanger (2008)

Seismic Settlements:
Above GWL: Pradel (1998)
Below GWL: Ishihara and Yoshimine (1992)

Cyclic Lateral Displacements:
Above GWL: Pradel (1998)
Below GWL: Tokimatsu and Asaka (1998)

Lateral Spreading:
Zhang et al. (2004)

Appendix D

Percolation Testing



APPENDIX D

PERCOLATION TESTING

Percolation testing was performed at two locations (PT-01 and PT-02) on June 21, 2019 in general accordance with the Riverside County Technical Guidance Document for Water Quality Management Plans (Riverside County, 2013) for using a percolation testing method to estimate infiltration rates.

Upon completion of drilling the test holes, a 2-inch thick gravel layer was placed at the bottom of the hole and a 2.4-inch diameter perforated pipe was installed above the gravel to the ground surface. The boring annulus around the pipe was filled with gravel. The purpose of the pipe and gravel was to reduce the potential for erosion and caving due to the addition of water to the hole.

The test holes were presoaked by filling with water to at least 5 times the radius of the test hole. More than 6 inches of water seeped away from the test holes in less than 25 minutes for 2 consecutive measurements, meeting the criteria for testing as “sandy soil”. Percolation testing was conducted immediately due to the presence of sandy soils. During testing, the water level and total depth of the test hole were measured from the top of the pipe every 10 minutes for one hour. Following the completion of percolation testing in PT-01, the pipe was removed, and the percolation test hole was backfilled with soil cuttings and tamped. Following the completion of percolation testing in PT-02, the pipe was unremovable and cut approximately four inches below the existing ground surface, filled with rock, and the percolation test hole was backfilled with soil cuttings and tamped.

Percolation rates describe the movement of water horizontally and downward into the soil from a boring. Infiltration rates describe the downward movement of water through a horizontal surface, such as the floor of a retention basin. Percolation rates are related to infiltration rates but are generally higher and require conversion before use in basin design. The percolation test data was used to estimate infiltration rates using the Porchet Inverse Borehole Method, in accordance with the Riverside County guidelines. A conversion factor derived from California Test 750 (Caltrans, 1986) was applied to adjust for the presence of the gravel and pipe within the borehole. A factor of safety of 3 was applied to the measured infiltration rates to account for subsurface variations, uncertainty in the test method, and future siltation. The infiltration structure designer should determine whether additional design-related safety factors are appropriate.

The measured percolation test data and calculations for conversion to infiltration rates, porosity correction, and factor of safety are shown on the following *Estimated Infiltration Rate from Percolation Test Data* sheets. The estimated infiltration rate at the test holes are presented in the following table.

Table D-1, Estimated Infiltration Rates

Percolation Test	Depth (feet)	Soil Type	Infiltration Rate (inches/hour)
PT-01	5.0	Silty Sand (SM)	0.18
PT-02	5.0	Silty Sand (SM)	0.26

Based on the calculated infiltration rates during the final 10-minute interval in each test, we recommend an infiltration rate of 0.18 inches per hour for the site.

Estimated Infiltration Rate from Percolation Test Data, PT-01

Project Name	APN#: 540-250-001-1
Project Number	19-81-167-01
Test Number	PT-01
Test Location	
Personnel	Catherine Nelson
Presoak Date	6/25/2019
Test Date	6/25/2019

Shaded cells contain calculated values.

Test Hole Radius, r (inches)	4
Total Depth of Test hole, D_T (inches)	60
Inside Diameter of Pipe, I (inches)	3.00
Outside Diameter of Pipe, O (inches)	3.13
Porosity of Gravel, n	0.58
Porosity Correction Factor, C	0.58
Factor of Safety (FOS), F	3

Interval No.	Time Interval, Δt (min)	Initial Depth to Water, D_0 (inches)	Final Depth to Water, D_f (inches)	Elapsed Time (min)	Initial Height of Water, H_0 (inches)	Final Height of Water, H_f (inches)	Change in Height of Water, ΔH (inches)	Average Head Height, H_{avg} (inches)	Infiltration Rate, I_t (inches/hr)	Corrected Infiltration Rate, I_c (inches/hr)	Infiltration Rate with FOS, I_f (inches/hr)
1	25.00	36.00	45.72	25.00	24.00	14.28	9.72	19.14	2.21	1.28	0.43
2	25.00	36.00	44.04	50.00	24.00	15.96	8.04	19.98	1.76	1.02	0.34
3	10.00	36.00	39.36	60.00	24.00	20.64	3.36	22.32	1.66	0.96	0.32
4	10.00	36.00	39.12	70.00	24.00	20.88	3.12	22.44	1.53	0.89	0.30
5	10.00	36.00	39.00	80.00	24.00	21.00	3.00	22.50	1.47	0.85	0.28
6	10.00	36.00	38.64	90.00	24.00	21.36	2.64	22.68	1.28	0.74	0.25
7	10.00	36.00	38.28	100.00	24.00	21.72	2.28	22.86	1.10	0.64	0.21
8	10.00	36.00	37.92	110.00	24.00	22.08	1.92	23.04	0.92	0.53	0.18

Recommended Design Infiltration Rate (inches/hr)	**0.18**

Infiltration calculations are based on the Porchet Inverse Borehole Method presented in Santa Ana Regional Water Quality Control Board Technical Guidance Document, Appendix VII, Example VII.1.

$H_0 = D_T - D_0$

$H_f = D_T - D_f$

$\Delta H = H_0 - H_f$

$H_{avg} = (H_0 + H_f) / 2$

$I_t = (\Delta H * (60 * r)) / (\Delta t * (r + (2 * H_{avg}))$

Porosity conversion calculations are based on the method provided in Caltrans California Test 750.

$C = n * (1 - (O / (2 * r))^2) + (I / (2 * r))^2$

$I_c = I_t * C$

$I_f = I_C * F$

Plate No.

1

Infiltration Rate versus Time, PT-01

Project Name	APN#: 540-250-001-1
Project Number	19-81-167-01
Test Number	PT-01
Personnel	Catherine Nelson
Presoak Date	6/25/2019
Test Date	6/25/2019

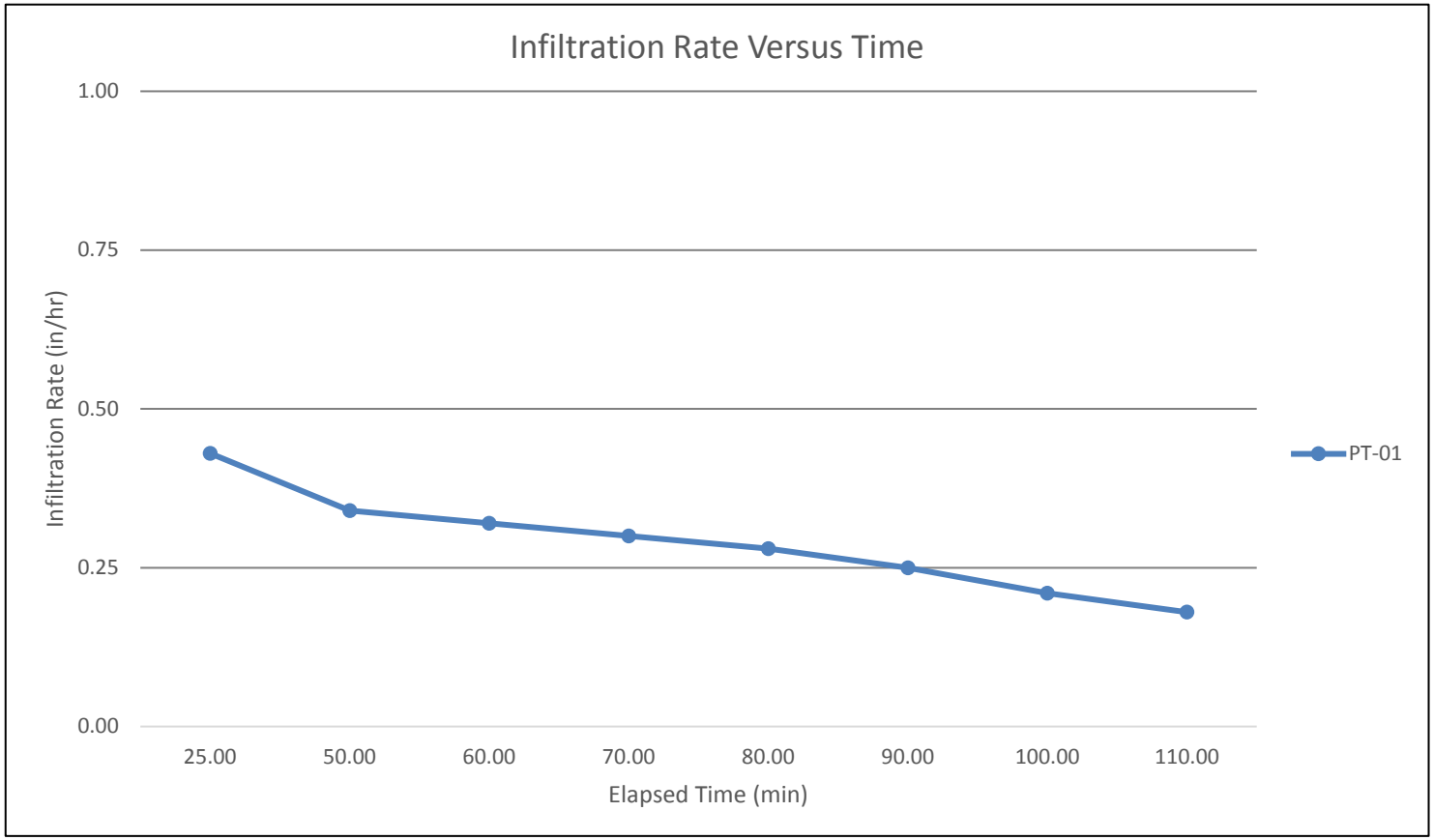


Plate No.
2

Estimated Infiltration Rate from Percolation Test Data, PT-02

Project Name	APN#: 540-250-001-1
Project Number	19-81-167-01
Test Number	PT-02
Test Location	
Personnel	Catherine Nelson
Presoak Date	6/25/2019
Test Date	6/25/2019

Shaded cells contain calculated values.

Test Hole Radius, r (inches)	4
Total Depth of Test hole, D_T (inches)	60
Inside Diameter of Pipe, I (inches)	3.00
Outside Diameter of Pipe, O (inches)	3.13
Porosity of Gravel, n	0.58
Porosity Correction Factor, C	0.58
Factor of Safety (FOS), F	3

Interval No.	Time Interval, Δt (min)	Initial Depth to Water, D_0 (inches)	Final Depth to Water, D_f (inches)	Elapsed Time (min)	Initial Height of Water, H_0 (inches)	Final Height of Water, H_f (inches)	Change in Height of Water, ΔH (inches)	Average Head Height, H_{avg} (inches)	Infiltration Rate, I_t (inches/hr)	Corrected Infiltration Rate, I_c (inches/hr)	Infiltration Rate with FOS, I_f (inches/hr)
1	25.00	36.00	45.60	25.00	24.00	14.40	9.60	19.20	2.17	1.26	0.42
2	25.00	36.00	43.44	50.00	24.00	16.56	7.44	20.28	1.60	0.93	0.31
3	10.00	36.00	39.36	60.00	24.00	20.64	3.36	22.32	1.66	0.96	0.32
4	10.00	36.00	39.48	70.00	24.00	20.52	3.48	22.26	1.72	1.00	0.33
5	10.00	36.00	39.24	80.00	24.00	20.76	3.24	22.38	1.59	0.92	0.31
6	10.00	36.00	39.12	90.00	24.00	20.88	3.12	22.44	1.53	0.89	0.30
7	10.00	36.00	38.88	100.00	24.00	21.12	2.88	22.56	1.41	0.82	0.27
8	10.00	36.00	38.76	110.00	24.00	21.24	2.76	22.62	1.35	0.78	0.26
9											
10											
11											
12											

Recommended Design Infiltration Rate (inches/hr)	**0.26**

Infiltration calculations are based on the Porchet Inverse Borehole Method presented in Santa Ana Regional Water Quality Control Board Technical Guidance Document, Appendix VII, Example VII.1.

$H_0 = D_T - D_0$

$H_f = D_T - D_f$

$\Delta H = H_0 - H_f$

$H_{avg} = (H_0 + H_f) / 2$

$I_t = (\Delta H * (60 * r)) / (\Delta t * (r + (2 * H_{avg}))$

Porosity conversion calculations are based on the method provided in Caltrans California Test 750.

$C = n * (1 - (O / (2 * r))^2) + (I / (2 * r))^2$

$I_c = I_t * C$

$I_f = I_C * F$

Plate No.

3

Infiltration Rate versus Time, PT-02

Project Name	APN#: 540-250-001-1
Project Number	19-81-167-01
Test Number	PT-02
Test Location	
Personnel	Catherine Nelson
Presoak Date	6/25/2019
Test Date	6/25/2019

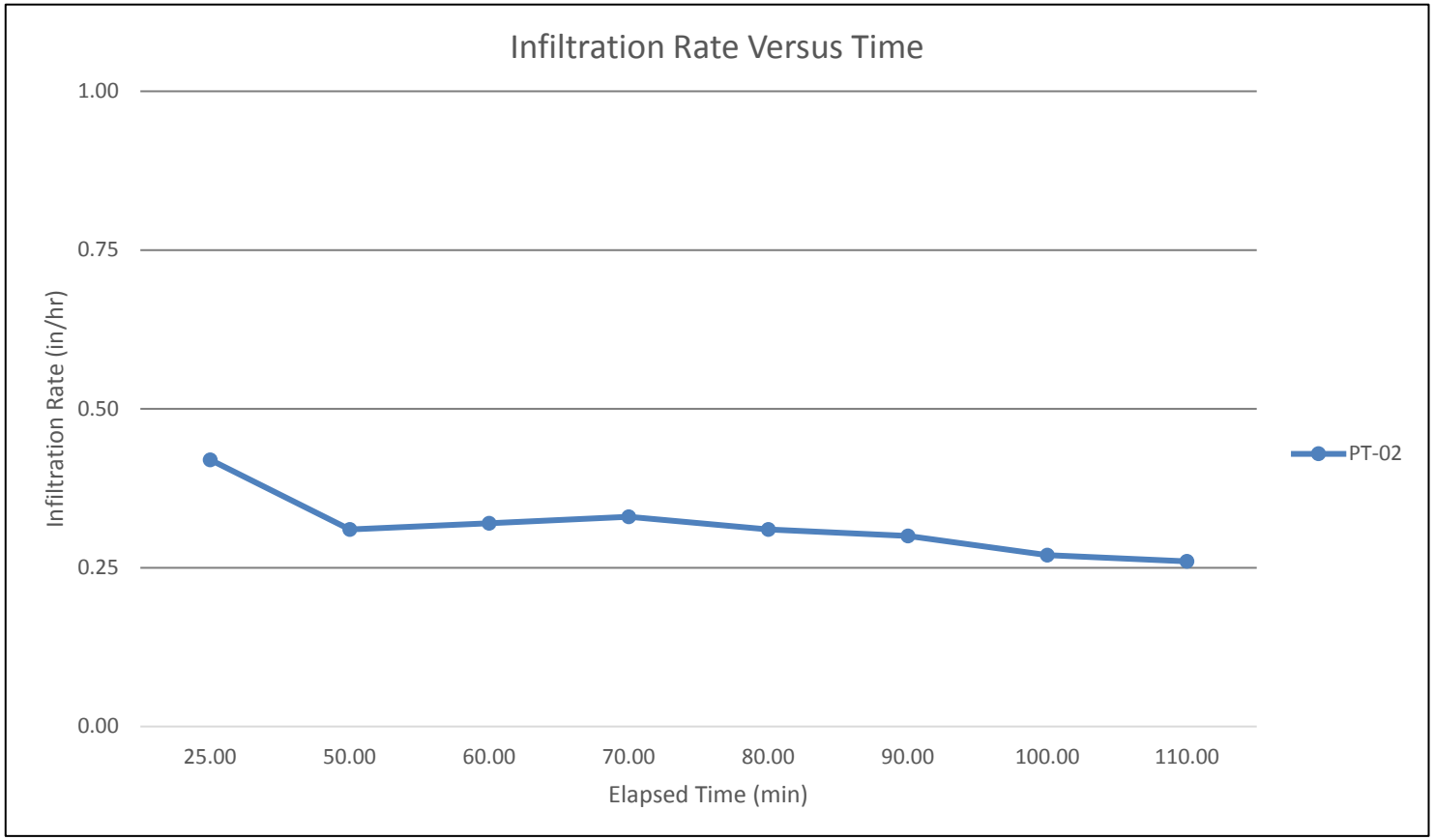


Plate No.
4

Appendix F

Structural BMP and/or Retention Facility Sizing Calculations
and Design Details

8th and LINCOLN INDUSTRIAL BUILDING
W.O. #4100-4
1/15/2020

SUMMARY TABLE

	1	2	3	4	5	6	7	8	9	10
	EXISTING CONDITION			PROPOSED CONDITION			BASIN VOL	V overflow	Q overflow	Delta Q
STORM EVENT	Q (cfs)	V (ac.ft)	V (cu.ft)	Q (cfs)	V (ac.ft)	V (cu.ft)	designed (cu.ft)	col. 6 - col. 7 (cu.ft)	from UH calcs (cfs)	col. 9 - col. 1 (cfs)
100-yr 1-hr	6.143	0.1734	7553	6.658	0.1883	8202	11051	-2849	0	-6.143
100-yr 3-hr	3.07	0.2299	10014	3.283	0.2748	11970	11051	919	0.64	-2.43
100-yr 6-hr	2.793	0.2775	12088	3.017	0.3671	15991	11051	4940	0.61	-2.183
100-yr 24-hr	1.079	0.4235	18448	1.235	0.6999	30488	11051	19437	1.24	0.161

Whitewater Watershed

BMP Design Volume, V_{BMP} (Rev. 06-2014)

Legend: Required Entries / Calculated Cells

Company Name	Hunsaker & Associates Irvine, Inc.	Date	10/9/2019
Designed by	Martin Parker	County/City Case No	
Company Project Number/Name	8th & Lincoln Industrial Building		
Drainage Area Number/Name	DMA 1		

Enter the Area Tributary to this Feature (A_{TRIB}) A_{TRIB} = 1.32 acres

Determine the Impervious Area Ratio

Determine the Impervious Area within A_{TRIB} (A_{IMP}) A_{IMP} = 1.20 acres

Calculate Impervious Area Ratio (I_f) I_f = 0.91

$I_f = A_{IMP}/A_{TRIB}$

Calculate the composite Runoff Coefficient, C for the BMP Tributary Area

Use the following equation based on the WEF/ASCE Method

$C_{BMP} = 0.858I_f^3 - 0.78I_f^2 + 0.774I_f + 0.04$ C_{BMP} = 0.74

Determine Design Storage Volume, V_{BMP}

Calculate V_U, the 80% Unit Storage Volume $V_U = 0.40 \times C_{BMP}$ V_u = 0.30 (in*ac)/ac

Calculate the design storage volume of the BMP, V_{BMP}.

$$V_{BMP}\ (ft^3) = \frac{V_U\ (in\text{-}ac/ac) \times A_T\ (ac) \times 43{,}560\ (ft^2/ac)}{12\ (in/ft)}$$

V_{BMP} = 1,437 ft^3

Notes:

Bioretention Facility - Design Procedure (Rev. 06-2014)	BMP ID	Legend:	Required Entries	
			Calculated Cells	

Company Name:	Hunsaker & Associates Irvine, Inc	Date:	15-Jan-20
Designed by:	Martin Parker	County/City Case No.:	

Design Volume

Enter the area tributary to this feature	A_{TRIB}=	1.32	acres
Enter V_{BMP} determined from Section 4.3 of this Handbook	V_{BMP}=	1,437	ft^3

Type of Bioretention Facility Design

(●) Side slopes required (parallel to parking spaces or adjacent to walkways)

( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer	d_S =	3.0	ft
Top Width of Bioretention Facility, excluding curb	w_T =	6.0	ft
Total Effective Depth, d_E $d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$	d_E =	1.68	ft
Minimum Surface Area, A_m $A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$	A_M =	854	ft^2
Proposed Surface Area	A=	3,822	ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility	z =	4	:1
Diameter of Underdrain		6	inches
Longitudinal Slope of Site (3% maximum)		2	%
6" Check Dam Spacing		25	feet
Describe Landscaping:			

Notes:

A.3 Bioretention Facilities

Treatment Mechanisms	Infiltration, Evapotranspiration, Evaporation, Biofiltration
Maximum Drainage Area	This BMP is intended to be integrated into a project's landscaped area in a distributed manner. Typically, contributing drainage areas to Bioretention Facilities range from less than one acre to a maximum of around 10 acres.
Other Names	Landscaped retention, Rain Garden, Bioretention Cell, Bioretention Basin, Biofiltration Basin, Landscaped Filter Basin, Porous Landscape Detention

A.3.1 General

Bioretention facilities are shallow, landscaped basins underlain by an engineered soil media. Healthy plant and biological activity in the root zone maintain and renew the macro-pore space in the soil and maximize plant uptake of pollutants and runoff. This keeps this BMP from becoming clogged, and allows more of the soil column to function as both a sponge (retaining water) and a highly effective and self-maintaining biofilter. In most cases, the bottom of a bioretention facility is unlined, which also provides an opportunity for infiltration to the extent the underlying onsite soil can accommodate. When the infiltration rate of the underlying soil is exceeded, fully biotreated flows are discharged via underdrains. Bioretention facilities, therefore, will inherently achieve the maximum feasible level of infiltration and evapotranspiration and achieve the minimum feasible (but highly biotreated) discharge to the storm drain system.

A.3.2 Siting Considerations

These facilities work best when they are designed in a relatively level area. Unlike other BMPs, bioretention facilities can be used in smaller landscaped spaces on the site, such as:

- Parking islands
- Medians
- Site entrances

Landscaped areas on the site (such as may otherwise be required through minimum landscaping ordinances), can often be designed as bioretention facilities. This can be accomplished by:

- Depressing landscaped areas below adjacent impervious surfaces, rather than elevating those areas;
- Grading the site to direct runoff from those impervious surfaces *into* the Bioretention facility, rather than away from the landscaping; and/or
- Sizing and designing the depressed landscaped area as a bioretention facility as described in this FactSheet.

Bioretention facilities should not be used downstream of areas where large amounts of sediment can clog the system. Placing a bioretention facility at the toe of a steep slope should also be avoided due to the potential for clogging the engineered soil media with erosion from the slope, as well as the potential for damaging the vegetation.

Important Note: Local water conservation and/or landscaping requirements should be considered when planning for these facilities, as effective landscaping cover is essential to their function. It is recommended that this BMP be used in areas where landscaping was already going to be incorporated into the project as part of the design.

A.3.3 Bioretention Facility Design Criteria

Table 1: Bioretention Facility Design Criteria

Design Parameter	Unit	Design Criteria
Design Flow	cfs	V_{BMP}
Maximum Tributary Area	acres	10
Minimum Width	ft	6
Maximum Side-Slope	-	4:1
Maximum Ponding Depth	inches	6
Minimum Side-Slope Width (Maximum Ponding Depth X Maximum Side-slope)	ft	2
Minimum Depth of Engineered Soil Media	inches	18
Minimum Depth of Gravel Layer	inches	12
Vegetation	-	Desert appropriate landscaping suitable for this BMP with 2-3 inch layer of mulch
Engineered Soil Media	-	85% mineral and 15% organic by volume. The mineral component must meet the range specified in Table 2 below; the organic component must be nitrogen stabilized compost

The recommended cross-section necessary for a bioretention facility includes:

- Landscaped area;
- 18” minimum depth of engineered soil media; and
- 12” minimum gravel layer depth with 6' perforated pipes (added flow control features such as orifice plates may be required to mitigate for HCOC conditions)

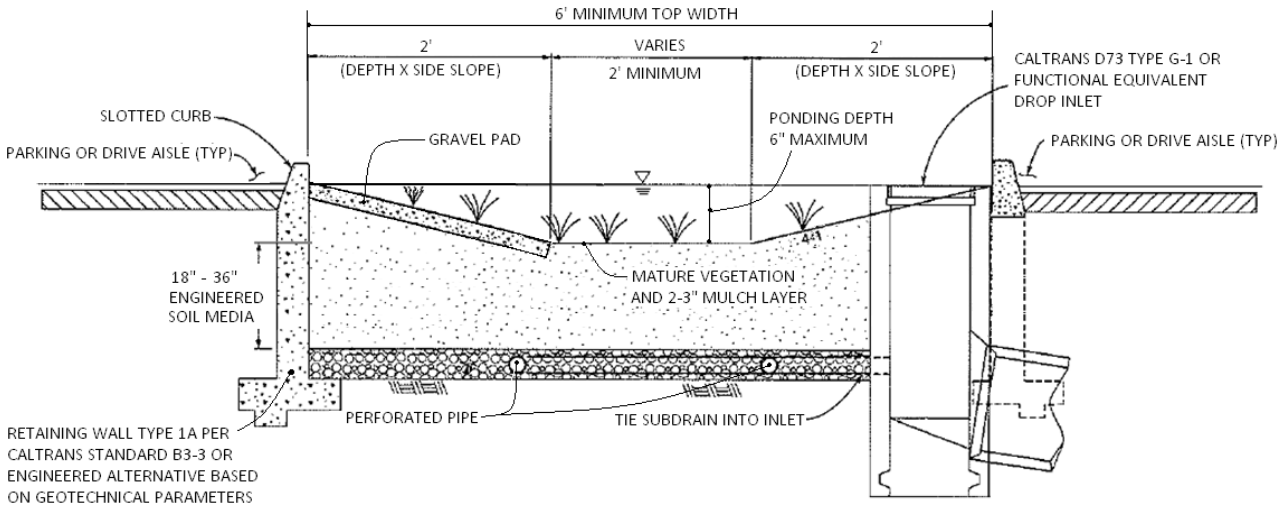


Figure 1: Standard Layout for Bioretention Facility

While the 18-inch minimum engineered soil media depth can be used in some cases, it is recommended to use 24 inches or a preferred 36 inches to provide an adequate root zone for the chosen plant palette. Such a design also provides for improved removal effectiveness for nutrients. The recommended ponding depth inside of a bioretention facility is six inches; measured from the flat bottom surface to the top of the water surface as shown in Figure 1.

Because this BMP is filled with an engineered soil media, pore space in the soil and gravel layer is assumed to provide storage volume. However, several considerations must be noted:

- Surcharge storage above the soil surface (six inches) is important to assure that design flows do not bypass the BMP when runoff exceeds the soil's absorption rate.
- In cases where the bioretention facility contains engineered soil media deeper than 36 inches, the pore space within the engineered soil media can only be counted to the 36 inch depth.
- A maximum of 30% pore space can be used for the soil media whereas a maximum of 40% pore space can be used for the gravel layer.

Engineered Soil Media Recommendations

The engineered soil media should be comprised of 85%mineral component and 15% organic component, by volume, drum mixed prior to placement. The mineral component should be a Class A sandy loam topsoil that meets the range specified in Table 2. The organic component should be nitrogen stabilized compost[1], such that nitrogen does not leach from the media.

[1] For more information on compost, visit the US Composting Council website at: http://compostingcouncil.org/

Table 2: Mineral Component Range Requirements

Percent Range	Component
70-80	Sand
15-20	Silt
5-10	Clay

Landscaping Requirements

Landscaping cover is important to minimize erosion and ensure that treatment occurs in the bioretention facility. The area should be designed for mature coverage throughout the bioretention facility using desert-appropriate landscaping. To prevent the BMP from being used as walkways, bioretention facilities are recommended to be planted with a combination of small trees, planted shrubs, and native landscaping. Landscaping should be native or ornamental; preferably ones that do not need to be mowed or irrigated. The application of fertilizers and pesticides should be minimal. To maintain oxygen levels for the vegetation and promote biodegradation, it is important that vegetation not be completely submerged for any extended period of time. Therefore, a maximum of six inches of ponded water should be used in the design to ensure that plants within the Bioretention Facility remain healthy.

A 2 to 3-inch layer of standard shredded aged hardwood mulch should be placed as the top layer inside the bioretention facility. The 6-inch ponding depth shown in Figure 1 above should be measured from the top surface of the 2 to 3-inch mulch layer.

Curb Cuts

To allow water to flow into the bioretention facility, one foot wide (minimum) curb cuts should be placed approximately every 10 feet around the perimeter of the bioretention facility. Figure 2 shows a curb cut in a bioretention facility. Curb cut flow lines must be at or above the V_{BMP} water surface level.



Figure 2: Curb Cut located in a Bioretention Facility

To reduce erosion, a gravel pad should be placed at each inlet point to the bioretention facility. The gravel should be one to 1.5-inch diameter in size. The gravel should overlap the curb cut opening a minimum of six inches. The gravel pad inside the bioretention facility should be flush with the finished surface at the curb cut and extend to the bottom of the slope.

In addition, place an apron of stone or concrete, a foot square or larger, inside each inlet to prevent vegetation from growing up and blocking the inlet. See Figure 3.

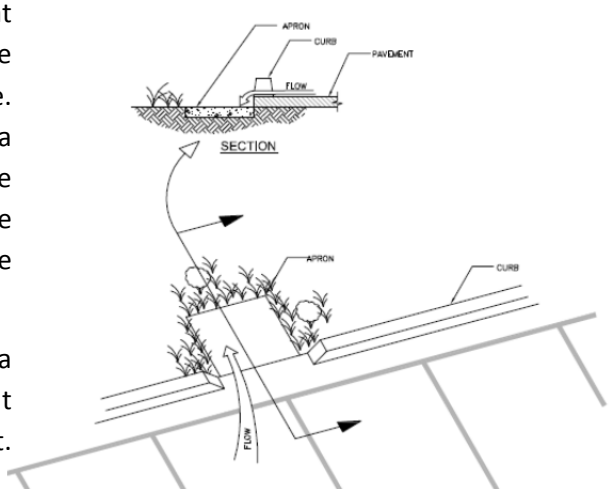


Figure 3: Apron located in a Bioretention Facility

Terracing the Bioretention Facility

It is recommended that bioretention facilities be level. In the event the facility site slopes and lacks proper design, water would fill the lowest point of the BMP and then discharge from the basin without being treated. To ensure that the water will be held within the bioretention facility on sloped sites, the BMP must be terraced with nonporous check dams to provide the required storage and treatment capacity.

The terraced version of this BMP should be used on non-flat sites with no more than a 3% slope. The surcharge depth cannot exceed 0.5 feet, and side slopes should not exceed 4:1. Table 3 below shows the spacing of the check dams, and slopes should be rounded up (i.e., 2.5% slope should use 10' spacing for check dams).

Table 3: Check Dam Spacing

6" Check Dam Spacing	
Slope	Spacing
1%	25'
2%	15'
3%	10'

Roof Runoff

Roof downspouts may be directed towards bioretention facilities. However, the downspouts must discharge onto a concrete splash block to protect the bioretention facility from erosion.

Retaining Walls

It is recommended that Retaining Wall Type 1A, per Caltrans Standard B3-3 or equivalent, be constructed around the entire perimeter of the bioretention facility. This practice will protect the sides of the bioretention facility from collapsing during construction and maintenance or from high service

loads adjacent to the BMP. Where such service loads would not exist adjacent to the BMP, an engineered alternative may be used if signed by a licensed civil engineer.

Side Slope Requirements

Bioretention Facilities Requiring Side Slopes

The design should assure that the bioretention facility does not present a tripping hazard. Bioretention facilities proposed near pedestrian areas, such as areas parallel to parking spaces or along a walkway, must have a gentle slope to the bottom of the facility. Side slopes inside of a bioretention facility should be 4:1. A typical cross-section for the bioretention facility is shown in Figure 1.

Bioretention Facilities Not Requiring Side Slopes

Where cars park perpendicular to the bioretention facility, side slopes are not required. A six inch maximum drop may be used, and the bioretention facility must be planted with trees and shrubs to prevent pedestrian access. In this case, a curb is not placed around the bioretention facility, but wheel stops should be used to prevent vehicles from entering the bioretention retention facility, as shown in Figure 4.

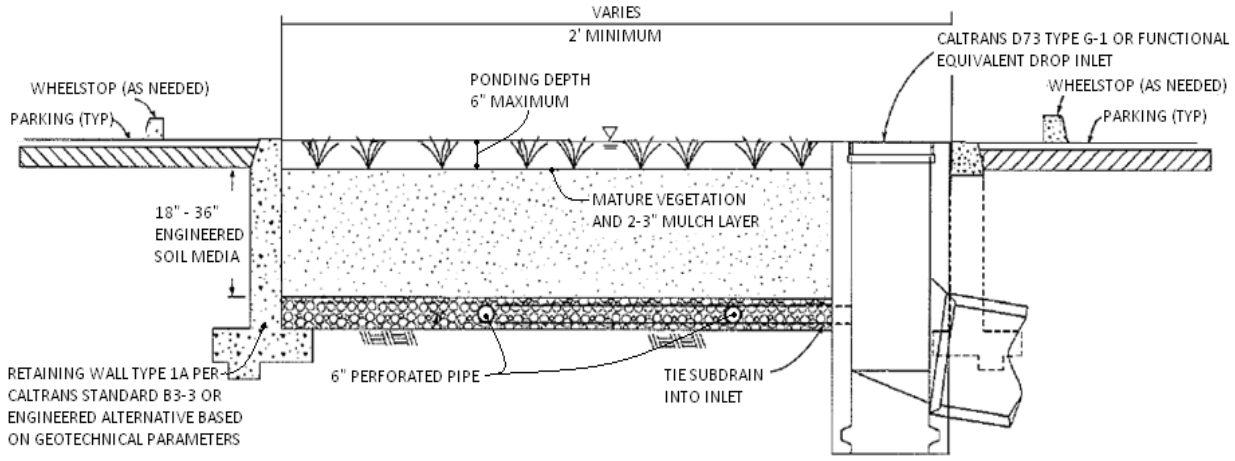


Figure 4: Bioretention Facility Not Requiring Slopes

Planter Boxes

Bioretention facilities can also be placed above ground as planter boxes. Planter boxes are recommended to have a minimum width of two feet, a maximum surcharge depth of six inches, and no side slopes are necessary. Planter boxes must be constructed so as to ensure that the top surface of the engineered soil media will remain level. This option may be constructed of concrete, brick, stone or other stable materials that will not warp or bend. Chemically treated wood or galvanized steel, which has the ability to contaminate stormwater, should not be used. Planter boxes should be lined with an impermeable liner on all sides, including the bottom. Due to the impermeable liner, the inside bottom of the planter box should be designed and constructed with a cross-fall, directing treated flows within the sub-drain layer toward the point where sub-drain exits the planter box, and sub-drains should be

oriented with drain holes oriented down. These provisions will help avoid excessive stagnant water within the gravel underdrain layer. Similar to the in-ground bioretention facility versions, this BMP benefits from healthy plants and biological activity in the root zone. Planter boxes should be planted with appropriately selected desert-appropriate landscaping.



Figure 5: Planter Box

Overflow

An overflow route is needed in the bioretention facility design to bypass stored runoff from storm events larger than V_{BMP} or in the event of facility or sub-drain clogging. Overflow systems must connect to an acceptable discharge point, such as a downstream conveyance system as shown in Figure 1 and Figure 4. The inlet to the overflow structure should be elevated inside the bioretention facility to be flush with the ponding surface for the design volume (V_{BMP}) as shown in Figure 5. This will allow the design capture volume to be fully treated by the bioretention facility, and for larger events to safely be conveyed to downstream systems. The overflow inlet should not be located in the entrance of a bioretention facility, as shown in Figure 6.

Underdrain Gravel and Pipes

An underdrain gravel layer and pipes should be provided in accordance with Appendix C – Underdrain Guidelines.



Figure 6: Incorrect Placement of an Overflow Inlet.

Inspection and Maintenance Schedule

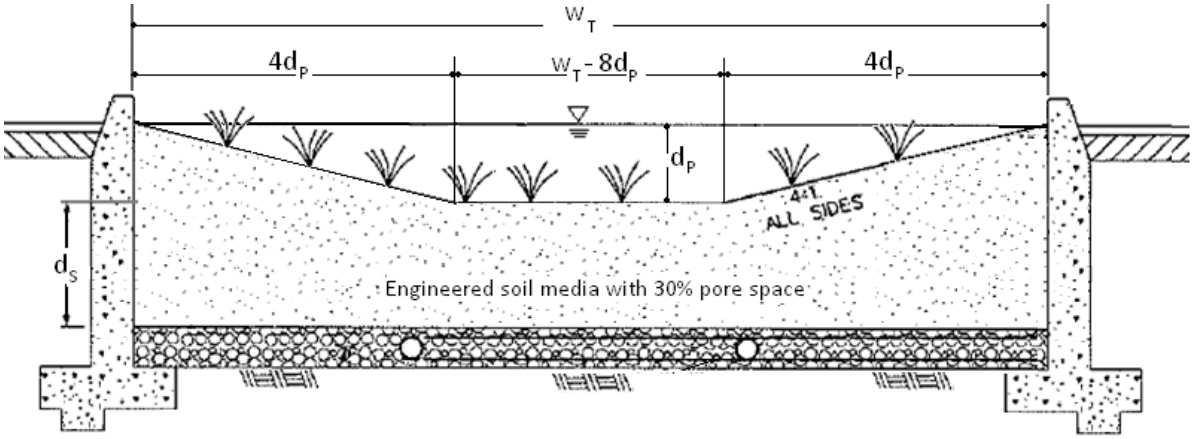
The bioretention facility area should be inspected for erosion, dead vegetation, soggy soils, or standing water. The use of fertilizers and pesticides on the plants inside the bioretention facility should be minimized.

Table 4: Inspection and Maintenance Schedule

Schedule	Activity
Ongoing	• Keep adjacent landscape areas maintained. Remove clippings from landscape maintenance activities. • Remove trash and debris. • Replace damaged landscaping and/or plants. • Replace surface mulch layer as needed to maintain a 2-3 inch soil cover.
After storm events	• Inspect areas for ponding.
Annually	• Inspect/clean inlets and outlets.

A.3.4 Bioretention Facility Design Procedure

1. Find the Design Volume, V_{BMP}.
   a) Enter the Tributary Drainage Area, A_{TRIB}.
   b) Enter the Design Volume, V_{BMP}, determined from **Worksheet 1** of this Handbook.
2. Select the type of design used. There are two types of bioretention facility designs: the standard design used for most project sites that include side slopes, and the modified design used when the BMP is located perpendicular to the parking spaces or with planter boxes that do not use side slopes.
3. Enter the depth of the engineered soil media, d_S. The minimum depth for the engineered soil media can be 18" in limited cases, but it is recommended to use 24" or a preferred 36" to provide an adequate root zone for the chosen plant palette.
4. Enter the top width of the bioretention facility.
5. Calculate the total effective depth, d_E, within the bioretention facility. The maximum allowable pore space of the soil media is 30% while the maximum allowable pore space for the gravel layer is 40%. Gravel layer deeper than 12" will only get credit for the pore space in the first 12".



   a. For the design with side slopes the following equation should be used to determine the total effective depth. Where, d_P is the depth of ponding within the basin.

$$d_E(ft) = \frac{0.3 \text{ x } \left[\left(W_T(ft) \text{x } d_S(ft)\right) + 4\left(d_P(ft)\right)2\right] + 0.4 \text{ x } 1(ft) + d_P(ft)[4d_P(ft) + \left(W_T(ft) - 8d_P(ft)\right)]}{W_T(ft)}$$

   This above equation can be simplified if the maximum ponding depth pf 0.5' is used. The equation below is used on the worksheet to find the minimum area required for the bioretention facility.

$$d_E(ft) = \left(0.3 \text{ x } d_S(ft) + \ 0.4 \text{ x } 1(ft)\right) - \left(\frac{0.7\ (ft^2)}{W_T(ft)}\right) + 0.5(ft)$$

b. For the design without side slopes the following equation should be used to determine the total effective depth:

$$d_E(ft) = d_P(ft) + [(0.3)x\ d_S(ft) + (0.4)x\ 1(ft)]$$

The equation below, using the maximum ponding depth of 0.5', is used on the worksheet to find the minimum area required for the bioretention facility:

$$d_E(ft) = 0.5(ft) + [(0.3)x\ d_S(ft) + (0.4)x\ 1(ft)]$$

6. Calculate the minimum surface area, A_M, required for the bioretention facility. This does not include the curb surrounding the bioretention facility or side slopes.

$$A_M(ft^2) = \frac{V_{BMP}(ft^3)}{d_E(ft)}$$

7. Enter the proposed surface area. This area should not be less than the minimum required surface area.
8. Verify that side slopes are no steeper than a ratio of 4:1 in the standard design, and are not required in the modified design.
9. Provide the diameter, minimum six inches, of the perforated underdrain used in the bioretention facility. See Appendix C for specific information regarding perforated pipes.
10. Provide the slope of the site around the bioretention facility, if used. The maximum slope is 3% for a standard design.
11. Provide the check dam spacing if the site around the bioretention facility is sloped.
12. Describe the landscaping used within the bioretention facility.

Worksheet 5 – This worksheet is available on the District's Municipal Stormwater Management Program page for developers at: www.rcflood.org/NPDES/developers.aspx

Bioretention Facility - Design Procedure (Rev. 06-2014)	BMP ID	Legend:	Required Entries
			Calculated Cells

Company Name: _____ Date: _____

Designed by: _____ County/City Case No.: _____

Design Volume

Enter the area tributary to this feature — A_{TRIB} = _____ acres

Enter V_{BMP} determined from Section 4.3 of this Handbook — V_{BMP} = _____ ft^3

Type of Bioretention Facility Design

(●) Side slopes required (parallel to parking spaces or adjacent to walkways)

( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer — d_S = _____ ft

Top Width of Bioretention Facility, excluding curb — w_T = _____ ft

Total Effective Depth, d_E

$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ — d_E = _____ ft

Minimum Surface Area, A_m

$$A_M\,(ft^2) = \frac{V_{BMP}\,(ft^3)}{d_E\,(ft)}$$

A_M = _____ ft^2

Proposed Surface Area — A= _____ ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility — z = _____ :1

Diameter of Underdrain _____ inches

Longitudinal Slope of Site (3% maximum) _____ %

6" Check Dam Spacing _____ feet

Describe Landscaping: _____

Notes: _____

Appendix G

AGREEMENTS – CC&RS, COVENANT AND AGREEMENTS, BMP MAINTENANCE AGREEMENTS AND/OR OTHER MECHANISMS FOR ENSURING ONGOING OPERATION, MAINTENANCE, FUNDING AND TRANSFER OF REQUIREMENTS FOR THIS PROJECT-SPECIFIC WQMP

WILL BE PROVIDED PRIOR TO FINAL WQMP APPROVAL.

Appendix H

PHASE 1 ENVIRONMENTAL SITE ASSESSMENT – SUMMARY OF SITE REMEDIATION CONDUCTED AND USE RESTRICTIONS

NOT AVAILABLE

Appendix I

PROJECT-SPECIFIC WQMP SUMMARY DATA FORM

Project-Specific WQMP Summary Data Form

Applicant Information	
Name and Title	Evan James, Chief Operating Officer
Company	Banning Lincoln Street Partners LP c/o Dominion Property Partners LLC
Phone	(310) 664-7144
Email	elj@dominionllc.com
Project Information	
Project Name (as shown on project application/project-specific WQMP)	8th & Lincoln Industrial Building
Street Address	Southeast corner of W. Lincoln Street and S. Eighth Street
Nearest Cross Streets	W. Lincoln Street and S. Eighth Street
Municipality (City or Unincorporated County)	City of Banning
Zip Code	92220
Tract Number(s) and/or Assessor Parcel Number(s)	540-250-001
Other (other information to help identify location of project)	

Indicate type of project.	**Priority Development Projects (Use an "X" in cell preceding project type):**	
		SF hillside residence; impervious area ≥ 10,000 sq. ft.; Slope ≥ 25%
		SF hillside residence; impervious area ≥ 10,000 sq. ft.; Slope ≥ 10% & erosive soils
	x	Commercial or Industrial ≥ 100,000 sq. ft.
		Automotive repair shop
		Retail Gasoline Outlet disturbing > 5,000 sq. ft.
		Restaurant disturbing > 5,000 sq. ft.
		Home subdivision ≥ 10 housing units
		Parking lot ≥ 5,000 sq. ft. or ≥ 25 parking spaces

Date Project-Specific WQMP Submitted	
Size of Project Area (nearest 0.1 acre)	1.32
Will the project replace more than 50% of the impervious surfaces on an existing developed site?	N/A
Project Area managed with LID/Site Design BMPs (nearest 0.1 acre)	Yes
Are Treatment Control BMPs required?	Yes
Is the project subject to onsite retention by ordinance or policy?	Yes
Did the project meet the 100% LID/Site Design Measurable Goal?	Yes
Name of the entity that will implement, operate, and maintain the post-construction BMPs	Property Owner
Contact Name	Evan James
Street or Mailing Address	2811 Wilshire Blvd. Suite 400
City	Santa Monica
Zip Code	90403
Phone	(310) 664-7144
Space Below for Use by City/County Staff Only	
Preceding Information Verified by (consistent with information in project-specific WQMP)	**Name:** **Date:**
Date Project-Specific WQMP Approved:	
Data Entered by	**Name:** **Date:**

Appendix G

Noise Analysis Report

NOISE ANALYSIS REPORT

8TH & LINCOLN INDUSTRIAL BUILDING

Banning, CA

July 1, 2020

Prepared for:
Albert A. Webb Associates
3788 McCray Street
Riverside, CA 92506

Prepared by:

dBF Associates, Inc.
3129 Tiger Run Court, Suite 202
Carlsbad, CA 92010
619-609-0712

© dBF Associates, Inc. 2020

Executive Summary 1

1.0 Project Description 3

2.0 Environmental Noise Background 4

3.0 Regulatory Framework 7

3.1 City of Banning 7

4.0 Environmental Setting and Existing Conditions 8

4.1 Surrounding Land Uses and Environmental Setting 8
4.2 Ambient Sound Levels 8

5.0 Potential Noise Impacts 10

6.0 Recommendations 12

7.0 References 13

8.0 List of Preparers 14

Tables

Table 1. Sound Levels of Typical Noise Sources and Noise Environments 5
Table 2. Sound Level Measurements (dBA) 8

Figures

Figure 1. Vicinity Map 2
Figure 2. Sound Level Measurement Locations 9
Figure 3. Project-Generated Noise Levels (Leq) 11

EXECUTIVE SUMMARY

This analysis evaluates noise associated with the proposed 8th & Lincoln Industrial Building Project in the City of Banning, California (Figure 1).

The Project would generate operational noise levels below 45 dBA Leq at residential property lines and below 75 dBA at nonresidential property lines. The impact of Project-generated noise would be less than significant.



dBF Associates, Inc.

FIGURE 1
Vicinity Map

1.0 PROJECT DESCRIPTION

The 8th & Lincoln Industrial Building ("Project" or "proposed Project") is a 21,000 square-foot building on the northern approximately 1.4 acres of a 4.13-acre property at the southeast corner of 8th Street and Lincoln Street, in the City of Banning, CA.

2.0 ENVIRONMENTAL NOISE BACKGROUND

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound typically associated with human activity and that interferes with or disrupts normal activities. The human environment is characterized by a certain consistent noise level which varies with each area. This is called ambient noise. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, perceived importance of the noise and its appropriateness in the setting, time of day and type of activity during which the noise occurs, and sensitivity of the individual.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air, and are sensed by the human ear. Sound is generally characterized by several variables, including frequency and intensity. Frequency describes the sound's pitch and is measured in cycles per second, or hertz (Hz), whereas intensity describes the sound's loudness and is measured in decibels (dB). Decibels are measured using a logarithmic scale. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually as pain at still higher levels. Studies have shown that the smallest perceptible change in sound level for a person with normal hearing sensitivity is approximately 3 dBA. A change of at least 5 dBA would be noticeable and would likely evoke a community reaction. A 10-dBA increase is subjectively heard as a doubling in loudness and would cause a community response [Caltrans 2013a]. Sound levels of typical noise sources and environments are provided in Table 2.

Because of the logarithmic nature of the decibel unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. A simple rule is useful, however, in dealing with sound levels. If a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example, 60 dB + 60 dB = 63 dB, and 80 dB + 80 dB = 83 dB. The normal human ear can detect sounds that range in frequency from about 20 Hz to 20,000 Hz.

However, all sounds in this wide range of frequencies are not heard equally well by the human ear, which is most sensitive to frequencies in the range of 1,000 Hz to 4,000 Hz. This frequency dependence can be taken into account by applying a correction to each frequency range to approximate the human ear's sensitivity within each range. This is called A-weighting and is commonly used in measurements of community environmental noise. The A-weighted sound pressure level (abbreviated as dBA) is the sound level with the "A-weighting" frequency correction. In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve.

Table 1. Sound Levels of Typical Noise Sources and Noise Environments

Noise Source (at Given Distance)	Noise Environment	A-Weighted Sound Level	Human Judgment of Noise Loudness (Relative to Reference Loudness of 70 Decibels*)
Military Jet Takeoff with Afterburner (50 ft)	Carrier Flight Deck	140 Decibels	128 times as loud
Civil Defense Siren (100 ft)		130	64 times as loud
Commercial Jet Take-off (200 ft)		120	32 times as loud **Threshold of Pain**
Pile Driver (50 ft)	Rock Music Concert Inside Subway Station (New York)	110	16 times as loud
Ambulance Siren (100 ft) Newspaper Press (5 ft) Gas Lawn Mower (3 ft)		100	8 times as loud **Very Loud**
Food Blender (3 ft) Propeller Plane Flyover (1,000 ft) Diesel Truck (150 ft)	Boiler Room Printing Press Plant	90	4 times as loud
Garbage Disposal (3 ft)	Noisy Urban Daytime	80	2 times as loud
Passenger Car, 65 mph (25 ft) Living Room Stereo (15 ft) Vacuum Cleaner (10 ft)	Commercial Areas	70	Reference Loudness **Moderately Loud**
Normal Speech (5 ft) Air Conditioning Unit (100 ft)	Data Processing Center Department Store	60	1/2 as loud
Light Traffic (100 ft)	Large Business Office Quiet Urban Daytime	50	1/4 as loud
Bird Calls (distant)	Quiet Urban Nighttime	40	1/8 as loud **Quiet**
Soft Whisper (5 ft)	Library and Bedroom at Night Quiet Rural Nighttime	30	1/16 as loud
	Broadcast and Recording Studio	20	1/32 as loud Just Audible
		0	1/64 as loud Threshold of Hearing

Source: Compiled by dBF Associates, Inc.

Because community noise fluctuates over time, a single measure called the Equivalent Sound Level (Leq) is often used to describe the time-varying character of community noise. The Leq is the energy-averaged A-weighted sound level during a measured time interval, and is equal to the level of a continuous steady sound containing the same total acoustical energy over the averaging time period as the actual time-varying sound. Additionally, it is often desirable to know the acoustic range of the noise source being measured. This is accomplished through the Lmax and Lmin indicators, which represent the root-mean-square maximum and minimum noise levels obtained during the measurement interval. The Lmin value obtained for a particular monitoring location is often called the "acoustic floor" for that location.

To describe the time-varying character of environmental noise, the statistical noise descriptors L10, L50, and L90 are commonly used. They are the noise levels equaled or exceeded during 10, 50, and 90 percent of a stated time, respectively. Sound levels associated with L10 typically describe transient or short-term events, whereas levels associated with L90 describe the steady-state (or most prevalent) noise conditions.

3.0 REGULATORY FRAMEWORK

To limit exposure to physically and/or psychologically damaging as well as intrusive noise levels, the federal government, state of California, and local governments have established standards and ordinances to control noise and vibration. In most areas, automobile and truck traffic is the major source of environmental noise. Traffic activity generally produces an average sound level that remains fairly constant with time. Air and rail traffic, and commercial and industrial activities are also major sources of noise in some areas. Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources and noise / land use compatibility is left to local agencies.

No federal regulations are applicable to this project.

3.1 City of Banning

Chapter 8.44 of the City of Banning Municipal Code establishes noise limits within the City.

The most-restrictive noise level limits at residential land uses are hourly limits of 55 dBA Leq during daytime (7:00 a.m. – 10:00 p.m.) and 45 dBA Leq during nighttime (10:00 p.m. – 7:00 a.m.).

The noise level limit at nonresidential land uses is 75 dBA at any time.

4.0 ENVIRONMENTAL SETTING AND EXISTING CONDITIONS

Noise-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would each be considered noise-sensitive and may warrant unique measures for protection from intruding noise.

4.1 Surrounding Land Uses and Environmental Setting

The project site is located along the east side of 8th Street and the south side of Lincoln Street. Adjacent land uses include commercial & industrial buildings to the north and northeast, single-family residences to the south, and vacant land to the east, southwest, west, and northwest.

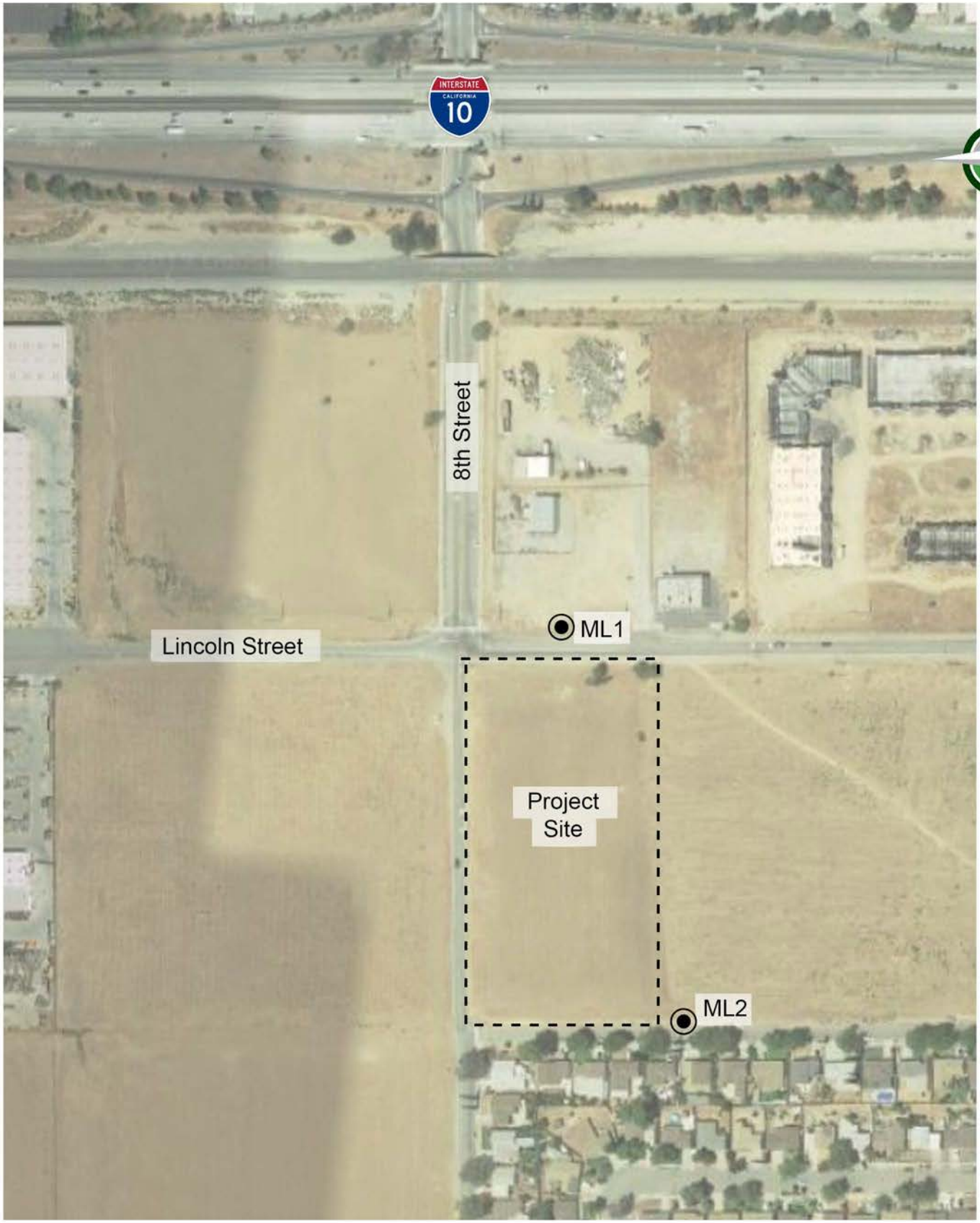
The primary existing noise sources in the vicinity of the project are natural activity, vehicular traffic on nearby roadways, industrial facilities, railroad traffic, and occasional aircraft.

4.2 Ambient Sound Levels

Ambient sound level measurements were conducted near the project site to estimate the existing acoustical environment. A RION Model NL-31 American National Standards Institute (ANSI) Type 2 Integrating Sound Level Meter (SLM) was used as the data-collection device. The meter was mounted on a tripod roughly 5 feet above ground to simulate the average height of the human ear. The microphone was fitted with a windscreen. Weather conditions during the measurements were approximately 76°F, 30% relative humidity, 0-2 mph wind speed, and 30% cloud cover. The sound level meter was calibrated before each measurement period. The measurement results are summarized in Table 2 and correspond to the locations depicted on Figure 3.

Table 2. Sound Level Measurements (dBA)

Measurement Location		Date / Time	Leq	Lmin	Lmax	L10	L50	L90
ML1	North property line	11/13//2019 10:30 a.m. – 10:40 a.m.	61.4	47.5	76.5	65.0	52.7	49.2
ML2	Near residences to south	11/13/2019 10:45 a.m. – 10:55 a.m.	52.7	42.0	66.2	55.3	47.6	44.4



dBF Associates, Inc.

FIGURE 2

Sound Level Measurement Locations

5.0 POTENTIAL NOISE IMPACTS

Noise-producing Project components include HVAC units and a transformer.

Acoustical calculations were performed to estimate Project sound levels at the Project property lines.

The Datakustik Cadna/A industrial noise prediction model was used to estimate noise levels from sources on the Project site. Outdoor Project noise sources would include one transformer; and three 5-ton, ten 8-ton, and twelve 10-ton split-system HVAC condenser units. The transformer would be located near the northeast Project site corner, approximately 10 feet from the north property line. The condensers would be located in the two "HVAC Areas" east of the Project building, as close as approximately 33 feet from the east property line. All other equipment would be inside the facility building.

National Electrical Manufacturers (NEMA) Standards Publication ST 20-2014 limits transformers to a maximum allowable noise level of 67 decibels at 1 foot. Each condenser would produce a sound power level of 69-77 dBA [Carrier 2011]. All condensers were treated as stationary point sources, 3 feet in height above rooftop level, and assumed to be constantly operational.

The Project would produce noise levels below the nighttime (most restrictive) allowable level of 45 dBA Leq at residential property lines. The Project would produce noise levels below the allowable level of 75 dBA at nonresidential land uses. Refer to Figure 3 for details. The project would comply with City of Banning Municipal Code noise limits.

The nearest noise-sensitive receptor is the single-family residence at 1536 Charles Street, which is approximately 500 feet south of the Project transformers. The Project would produce noise levels below 45 dBA Leq at this receptor.

The impact of Project-generated operational noise would be less than significant.



dBF Associates, Inc.

FIGURE 3

Project-Generated Noise Levels (Leq)

6.0 RECOMMENDATIONS

No significant impacts were identified. Therefore, no recommendations are required.

7.0 REFERENCES

City of Banning. 2019. Municipal Code. November 15.

Harris, Cyril M. 1998. Handbook of Acoustical Measurements and Noise Control, Third Edition. Acoustical Society of America. Woodbury, NY.

International Organization for Standardization (ISO). 1996a. ISO 1996/1. Acoustics – Description and Measurement of Environmental Noise – Part 1: Basic Quantities and Procedures.

1996b. ISO 1996-2. Acoustics – Description and Measurement of Environmental Noise – Part 2: Acquisition of Data Pertinent to Land Use.

1996c. ISO 1996-3. Acoustics – Description and Measurement of Environmental Noise – Part 3: Application to Noise Limits.

8.0 LIST OF PREPARERS



Steven Fiedler, INCE
Principal, dBF Associates, Inc.

Appendix H

Trip Generation Memorandum

ALBERT A. WEBB ASSOCIATES

Memorandum



To: Art Vela, PE – Public Works Director/City Engineer
City of Banning

From: Nicholas Lowe, PE – Associate Engineer
Albert A. Webb Associates

Date: February 25, 2020

Re: Trip generation for proposed cannabis development at 8th Street and Lincoln Street

Albert A. Webb Associates (WEBB) has prepared this memorandum to assess anticipated traffic conditions at the proposed cannabis grow development on the southeast corner of the intersection of 8th Street and Lincoln Street in the City of Banning (Project). The Project proposes to construct a new 21,000 square-foot (sf) cannabis production building within the northern 1.8-acres (**Figure 1**, Project site plan).

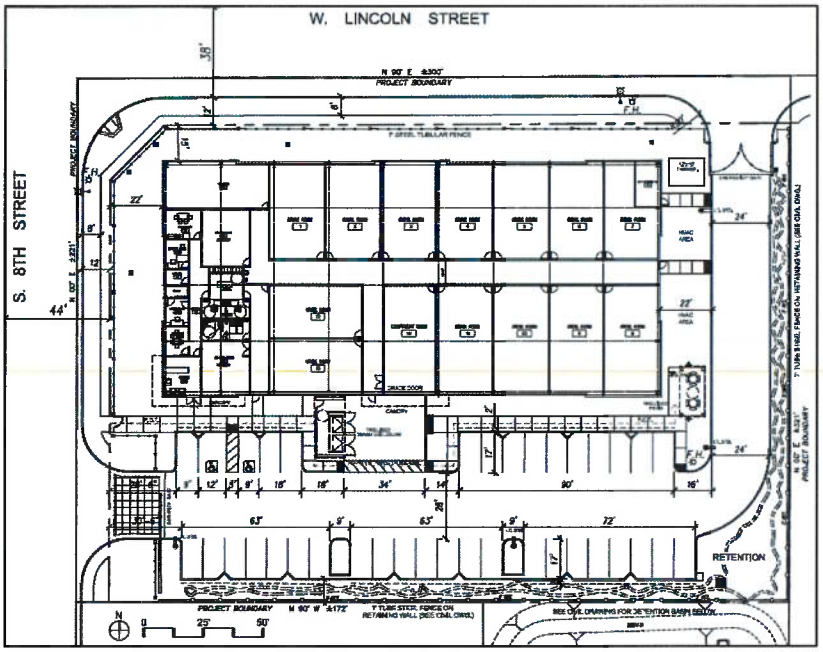


Figure 1: *Proposed Project site plan*

Project Description

The City of Banning comprises about 23 square miles in area, located in the San Gorgonio Pass area in west-central Riverside County, California. Sandwiched between the San Bernardino Mountains to the north and the San Jacinto Mountains to the south, the City's residential and commuter traffic flows are primarily served by the Interstate 10 (I-10) freeway, with several east-west major highways. At the Project location, both 8th Street and Lincoln Street are two-lane, undivided roadways classified as Major Highways in the City of

Banning General Plan Circulation Element (2013 amendment). 8th Street has a north-south orientation, providing access to the I-10 freeway about a quarter-mile north of the Project location. Lincoln Street (SR-243) has an east-west orientation and a posted speed limit of 40 mph; it is maintained and operated by the California Department of Transportation (Caltrans). Although Lincoln Street has an ultimate designation as a four-lane roadway, per Caltrans documents the roadway improvement project to provide additional lanes is currently inactive.

The Project proposes to construct a new 21,000 sf cannabis grow facility building on an existing vacant lot on the southeast corner of the intersection of 8th Street and Lincoln Street. The building would house a cannabis grow facility, including cultivation, processing, storage, and administrative facilities, with a total of 12 employees scheduled in two shifts from 6am to 11pm (shift change at 2:30pm). The Project site is zoned for light industrial (LI) use per the General Plan.

Per the proposed Project site plan, the Project would be accessible via two driveways: one on 8th Street and one on Lincoln Street. Access at both project driveways would be secured and controlled with gates: the primary access point would be the security gate on 8th Street, while the gate on Lincoln Street would be designated for emergency access only. Per the City of Banning development codes, the Project would be required to provide 37 parking spaces; the proposed site plan provides 37 on-site parking spaces, two of which would be ADA-compliant.

Proposed Project Trip Generation

The Institute of Transportation Engineers (ITE) compiles study data across North America to derive typical trip generation characteristics for various land uses, from industrial to recreational to residential. These trip generation profiles are published in the *ITE Trip Generation Manual* (10th Edition, 2017), providing trip generation rates for daily and peak-hour time periods. Peak-hour time periods are the hours of 7:00AM to 9:00PM and 4:00PM to 6:00PM.

For this project, ITE land use code 140 was used to describe trip generation characteristics for a manufacturing facility. Per the *Manual*, manufacturing facilities are "areas where the primary activity is the conversion of raw materials or parts into finished products… In addition to the actual production of goods, manufacturing facilities generally also have office, warehouse, research and associated functions."

Based on the ITE trip generation rates and the proposed Project site plan, the Project is expected to generate approximately 83 trips per weekday, with 17 AM peak-hour trips and 16 PM peak-hour trips (**Table 1**). However, it should be noted that the Project is proposing 12 employees and worker shifts that fall outside of typical peak-hour time periods. It is expected that the Project will contribute fewer trips during the peak-hours than what is shown in the ITE rates and **Table 1**.

Table 1: Proposed Project Trip Generation

8th & Lincoln Industrial

ITE Land Use Code		Units[1]		Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
140	Manufacturing	**ITE Trip Generation Rates[2]**								
		1	KSF	3.93	0.583	0.227	0.81	0.340	0.450	0.79
		Project Trip Generation (vehicles)								
		21	KSF	83	12	5	17	7	9	16

[1] KSF = 1,000 square feet gross floor area
[2] ITE Trip Generation Manual 10th Ed, 2017

Project Site Circulation and Access

Access to the Project is proposed via two driveways: one each on 8th Street and Lincoln Street. The 8th Street driveway is proposed to be the primary access point, while the Lincoln Street driveway would be designated for emergency access only. Both driveways are proposed to be gated, with 24-hour security staff controlling access at the primary driveway on 8th Street. The security staff would be contacted via an intercom system and gate access would be granted immediately if authorized, so access delays are expected to be minimal, if any. Trash pick-up would be scheduled approximately once a week, while product pick-up and supplies delivery are expected to be delivered weekly.

Summary and Conclusions

A new 21,000 sf cannabis grow building is proposed to be constructed on the southeast corner of the intersection of 8th Street and Lincoln Street in the City of Banning. Per the latest ITE trip generation rates, the Project is expected to generate approximately 83 trips per weekday, with 17 AM peak-hour trips and 16 PM peak-hour trips. The Project is expected to contribute fewer peak-hour trips than the ITE rates due to off-peak worker shifts and low number of total employees. Site access is proposed via one primary driveway on 8th Street and one driveway on Lincoln Street for emergency access only.

Project impacts on traffic flows at nearby intersections and on surrounding roadways is expected to be minimal. Per the Riverside County Transportation Department *Traffic Impact Analysis Preparation Guide*, projects with an expected peak-hour trip generation of less than 100 vehicles would generally be exempt from traffic impact analysis (TIA) requirements unless there are potential safety or operational problems within or near the Project. There are no apparent safety or operational problems with or near the Project site. Therefore, a traffic study for the Project is not warranted.

If you have any questions about this analysis, please do not hesitate to contact us at (951) 248-4289.