County of San Diego
PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP

FLUENCE FALLBROOK ENERGY STORAGE PROJECT
PDS2018-MPA-18-010

1405 E. MISSION ROAD
FALLBROOK, CA 92028

ASSESSOR'S PARCEL NUMBER(S):
105-410-10-00, 105-410-11-00 and 105-410-19-00

ENGINEER OF WORK:

ANDREW D. COX, PE #66649

PREPARED FOR:

FLUENCE ENERGY
690 N. STUDEBAKER ROAD
LONG BEACH, CA 90803
[562-577-7706]

PDP SWQMP PREPARED BY:

HALEY & ALDRICH, INC.
5333 MISSION CENTER ROAD
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619-280-9210

DATE OF SWQMP:
NOVEMBER 2019

PLANS PREPARED BY:
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714-751-7373

SWQMP APPROVED BY:

APPROVAL DATE:

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Table of Contents

Attachments

Attachment 1: Backup for PDP Pollutant Control BMPs
- Attachment 1a: Storm Water Pollutant Control Worksheet Calculations
- Attachment 1b: DMA Exhibit
- Attachment 1c: Individual Structural BMP DMA Mapbook

Attachment 2: Backup for PDP Hydromodification Control Measures
- Attachment 2a: Flow Control Facility Design
- Attachment 2b: Hydromodification Management Exhibit
- Attachment 2c: Management of Critical Coarse Sediment Yield Areas
- Attachment 2d: Geomorphic Assessment of Receiving Channels (optional)
- Attachment 2e: Vector Control Plan (if applicable)

Attachment 3: Structural BMP Maintenance Plan
- Attachment 3a: Structural BMP Maintenance Thresholds and Actions
- Attachment 3b: Draft Maintenance Agreements / Notifications(when applicable)

Attachment 4: County of San Diego PDP Structural BMP Verification for DPW Permitted Land Development Projects

Attachment 5: Copy of Plan Sheets Showing Permanent Storm Water BMPs

Attachment 6: Copy of Project's Drainage Report

Attachment 7: Copy of Project's Geotechnical and Groundwater Investigation Report

Acronyms

ACP	Alternative Compliance Project
APN	Assessor's Parcel Number
BMP	Best Management Practice
BMP DM	Best Management Practice Design Manual
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group

MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NRCS	Natural Resources Conservation Service
PDCI	Private Development Construction Inspection Section
PDP	Priority Development Project
PDS	Planning and Development Services
PE	Professional Engineer
RPO	Resource Protection Ordinance
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWQMP	Storm Water Quality Management Plan
WMAA	Watershed Management Area Analysis
WPO	Watershed Protection Ordinance
WQIP	Water Quality Improvement Plan

PDP SWQMP Preparer's Certification Page

Project Name: [Fluence Fallbrook Energy Storage Project]
Permit Application Number: [PDS2018-MPA-18-010]

PREPARER'S CERTIFICATION

I hereby declare that I am the Engineer in Responsible Charge of design of storm water best management practices (BMPs) for this project, and that I have exercised responsible charge over the design of the BMPs as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the PDP requirements of the County of San Diego BMP Design Manual, which is a design manual for compliance with local County of San Diego Watershed Protection Ordinance (Sections 67.801 et seq.) and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100) requirements for storm water management.

I have read and understand that the County of San Diego has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the BMP Design Manual. I certify that this PDP SWQMP has been completed to the best of my ability and accurately reflects the project being proposed and the applicable BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this PDP SWQMP by County staff is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of storm water BMPs for this project, of my responsibilities for project design.

66649 June 30, 2020
Engineer of Work's Signature, PE Number & Expiration Date

Andrew D. Cox, P.E.
Print Name

Haley & Aldrich, Inc.
Company

November 14, 2019
Date

Engineer's Seal:

Template Date: April 17, 2018 Preparation Date: November 14, 2019]
LUEG:SW **PDP SWQMP**

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Submittal Record

Use this Table to keep a record of submittals of this PDP SWQMP. Each time the PDP SWQMP is re-submitted, provide the date and status of the project. In column 4 summarize the changes that have been made or indicate if response to plancheck comments is included. When applicable, insert response to plancheck comments behind this page.

Preliminary Design / Planning / CEQA

Submittal Number	Date	Summary of Changes
1	12/26/2018	Initial Submittal
2	3/27/2019	Response to comments
3	4/30/2019	Response to 2nd comments
4 5	8/13/2019 11/14/2019	Response to 3rd comments Response to 4th comments

Final Design

Submittal Number	Date	Summary of Changes
1		Initial Submittal
2		
3		
4		

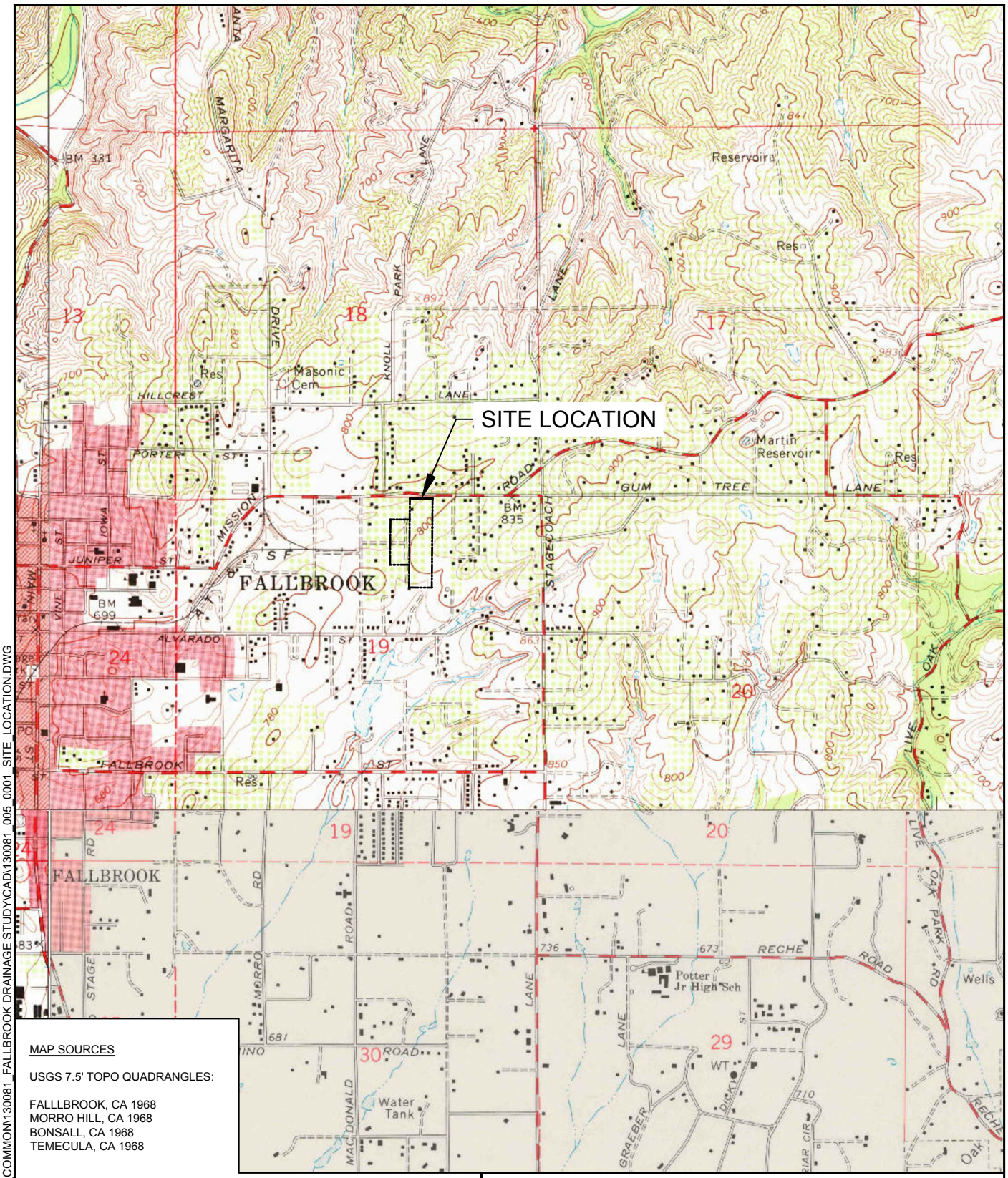
Plan Changes

Submittal Number	Date	Summary of Changes
1		Initial Submittal
2		
3		
4		

Project Vicinity Map

Project Name: [Fluence Fallbrook Energy Storage Project]
Record ID: [PDS2018-MPA-18-010]

[See next page]



MAP SOURCES

USGS 7.5' TOPO QUADRANGLES:

FALLLBROOK, CA 1968
MORRO HILL, CA 1968
BONSALL, CA 1968
TEMECULA, CA 1968

HALEY ALDRICH

CEQA PRELIMINARY DRAINAGE STUDY
FALLBROOK BATTERY ENERGY STORAGE SYSTEM
1405 E. MISSION ROAD, FALLBROOK, CALIFORNIA

SITE LOCATION

SCALE: AS SHOWN
DECEMBER 2018

FIGURE 1

Saved by: SLIVNYAK, OLEG Printed: 12/7/2018 2:55 PM Sheet: F1
\\HALEYALDRICH.COM\SHARE\OAK_COMMON\130081_FALLBROOK DRAINAGE STUDY\CAD\130081_005_0001_SITE_LOCATION.DWG

Step 1: Project type determination (Standard or Priority Development Project)

Is the project part of another Priority Development Project (PDP)? If so, a PDP SWQMP is required. Go to Step 2.			(☒ Yes ☐ No
The project is (select one): ☒ New Development ☐ Redevelopment[1]			
The total proposed newly created or replaced impervious area is:			50,965 ft^2
The total existing (pre-project) impervious area is:			15,682 ft^2
The total area disturbed by the project is:			198,634 ft^2
If the total area disturbed by the project is 1 acre (43,560 sq. ft.) or more OR the project is part of a larger common plan of development disturbing 1 acre or more, a Waste Discharger Identification (WDID) number must be obtained from the State Water Resources Control Board. WDID: ___			
Is the project in any of the following categories, (a) through (f)?[2]			
Yes ☒	No ☐	(a)	New development projects that create 10,000 square feet or more of impervious surfaces [3](collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ☐	No ☒	(b)	Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ☐	No ☒	(c)	New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses: (i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (Standard Industrial Classification (SIC) code 5812). (ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater. (iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce. (iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

[1] Redevelopment is defined as: The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways; new sidewalks construction; pedestrian ramps; or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

[2] Applicants should note that any development project that will create and/or replace 10,000 square feet or more of impervious surface (collectively over the entire project site) is considered a new development.

[3] For solar energy farm projects, the area of the solar panels does not count toward the total impervious area of the site.

Project type determination (continued)

Yes ☐	No ☒	(d)	New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). *Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. See BMP Design Manual Section 1.4.2 for additional guidance.*
Yes ☐	No ☒	(e)	New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses: (i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. (ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.
Yes ☐	No ☒	(f)	New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction. *Note: See BMP Design Manual Section 1.4.2 for additional guidance.*

Does the project meet the definition of one or more of the Priority Development Project categories (a) through (f) listed above?

☐ No – the project is not a Priority Development Project (Standard Project).

☒ Yes – the project is a Priority Development Project (PDP).

Further guidance may be found in Chapter 1 and Table 1-2 of the BMP Design Manual.

The following is for **redevelopment PDPs only**:

The area of existing (pre-project) impervious area at the project site is: ft^2 (A)
The total proposed newly created or replaced impervious area is ft^2 (B)
Percent impervious surface created or replaced (B/A)*100: %
The percent impervious surface created or replaced is (select one based on the above calculation):

☐ less than or equal to fifty percent (50%) – **only newly created or replaced impervious areas are considered a PDP and subject to stormwater requirements**

OR

☐ greater than fifty percent (50%) – **the entire project site is considered a PDP and subject to stormwater requirements**

Step 1.1: Storm Water Quality Management Plan requirements

Step	Answer	Progression
Is the project a Standard Project, Priority Development Project (PDP), or exception to PDP definitions? To answer this item, complete Step 1 Project Type Determination Checklist on Pages 1 and 2, and see PDP exemption information below. For further guidance, see Section 1.4 of the BMP Design Manual *in its entirety*.	☐ Standard Project	Standard Project requirements apply, including Standard Project SWQMP. **Complete Standard Project SWQMP.**
	☒ PDP	Standard and PDP requirements apply, including PDP SWQMP. **Complete PDP SWQMP.**
	☐ PDP with ACP	If participating in offsite alternative compliance, **complete Step 6.3 and an ACP SWQMP.**
	☐ PDP Exemption	**Go to Step 1.2 below.**

Step 1.2: Exemption to PDP definitions

Is the project exempt from PDP definitions based on either of the following:	If so:
☐ Projects that are only new or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria: (i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR (ii) Designed and constructed to be hydraulically disconnected from paved streets or roads [i.e., runoff from the new improvement does not drain directly onto paved streets or roads]; OR (iii) Designed and constructed with permeable pavements or surfaces in accordance with County of San Diego Guidance on Green Infrastructure;	Standard Project requirements apply, AND any additional requirements specific to the type of project. County concurrence with the exemption is required. *Provide discussion and list any additional requirements below in this form.* **Complete Standard Project SWQMP**
☐ Projects that are only retrofitting or redeveloping existing paved alleys, streets or roads that are designed and constructed in accordance with the County of San Diego Guidance on Green Infrastructure.	**Complete Green Streets PDP Exempt SWQMP.**
Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:	

Step 2: Construction Storm Water BMP Checklist

Minimum Required Standard Construction Storm Water BMPs		
If you answer "Yes" to any of the questions below, your project is subject to Table 1 on the following page (Minimum Required Standard Construction Stormwater BMPs). As noted in Table 1, please select at least the minimum number of required BMPs, or as many as are feasible for your project. If no BMP is selected, an explanation must be given in the box provided. The following questions are intended to aid in determining construction BMP requirements for your project. **Note: All selected BMPs below must be included on the BMP plan incorporated into the construction plan sets.**		
1. Will there be soil disturbing activities that will result in exposed soil areas? (This includes minor grading and trenching.) **Reference Table 1 Items A, B, D, and E** Note: Soil disturbances NOT considered significant include, but are not limited to, change in use, mechanical/electrical/plumbing activities, signs, temporary trailers, interior remodeling, and minor tenant improvement.	☒Yes	☐No
2. Will there be asphalt paving, including patching? **Reference Table 1 Items D and F**	☒Yes	☐No
3. Will there be slurries from mortar mixing, coring, or concrete saw cutting? **Reference Table 1 Items D and F**	☒Yes	☐No
4. Will there be solid wastes from concrete demolition and removal, wall construction, or form work? **Reference Table 1 Items D and F**	☐Yes	☒No
5. Will there be stockpiling (soil, compost, asphalt, concrete, solid waste) for over 24 hours? **Reference Table 1 Items D and F**	☒Yes	☐No
6. Will there be dewatering operations? **Reference Table 1 Items C and D**	☐Yes	☒No
7. Will there be temporary on-site storage of construction materials, including mortar mix, raw landscaping and soil stabilization materials, treated lumber, rebar, and plated metal fencing materials? **Reference Table 1 Items E and F**	☒Yes	☐No
8. Will trash or solid waste product be generated from this project? **Reference Table 1 Item F**	☒Yes	☐No
9. Will construction equipment be stored on site (e.g.: fuels, oils, trucks, etc.?) **Reference Table 1 Item F**	☒Yes	☐No
10. Will Portable Sanitary Services ("Porta-potty") be used on the site? **Reference Table 1 Item F**	☒Yes	☐No

Table 1. Construction Storm Water BMP Checklist

Minimum Required Best Management Practices (BMPs)	CALTRANS SW Handbook[4] Detail or County Std. Detail	✔ BMP Selected	Reference sheet No.'s where each selected BMP is shown on the plans. If no BMP is selected, an explanation must be provided.
A. Select Erosion Control Method for Disturbed Slopes (choose at least one for the appropriate season)			
Vegetation Stabilization Planting[5] (Summer)	SS-2, SS-4	☒	
Hydraulic Stabilization Hydroseeding[2] (Summer)	SS-4	☐	
Bonded Fiber Matrix or Stabilized Fiber Matrix[6] (Winter)	SS-3	☐	
Physical Stabilization Erosion Control Blanket[3] (Winter)	SS-7	☐	
B. Select erosion control method for disturbed flat areas (slope < 5%) (choose at least one)			
County Standard Lot Perimeter Protection Detail	PDS 659[7], SC-2	☒	
Will use erosion control measures from Item A on flat areas also	SS-3, 4, 7	☐	
County Standard Desilting Basin (must treat all site runoff)	PDS 660[8], SC-2	☐	
Mulch, straw, wood chips, soil application	SS-6, SS-8	☐	

4 State of California Department of Transportation (Caltrans). 2003. Storm Water Quality Handbooks, Construction Site Best Management Practices (BMPs) Manual. March. Available online at: http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm.

5 If Vegetation Stabilization (Planting or Hydroseeding) is proposed for erosion control it may be installed between May 1st and August 15th. Slope irrigation is in place and needs to be operable for slopes >3 feet. Vegetation must be watered and established prior to October 1st. The owner must implement a contingency physical BMP by August 15th if vegetation establishment does not occur by that date. If landscaping is proposed, erosion control measures must also be used while landscaping is being established. Established vegetation must have a subsurface mat of intertwined mature roots with a uniform vegetative coverage of 70 percent of the natural vegetative coverage or more on all disturbed areas.

6 All slopes over three feet must have established vegetative cover prior to final permit approval.

7 County of San Diego, Planning & Development Services. 2012. Standard Lot Perimeter Protection Design System. Building Division. PDS 659. Available online at http://www.sandiegocounty.gov/pds/docs/pds659.pdf.

8 County of San Diego, Planning & Development Services. 2012. County Standard Desilting Basin for Disturbed Areas of 1 Acre or Less Building Division. PDS 659. Available online at http://www.sandiegocounty.gov/pds/docs/pds660.pdf.

Table 1. Construction Storm Water BMP Checklist (continued)

Minimum Required Best Management Practices (BMPs)	CALTRANS SW Handbook Detail or County Std. Detail	✔ BMP Selected	Reference sheet No.'s where each selected BMP is shown on the plans. If no BMP is selected, an explanation must be provided.
C. If runoff or dewatering operation is concentrated, velocity must be controlled using an energy dissipater			
Energy Dissipater Outlet Protection[9]	SS-10	☐	
D. Select sediment control method for all disturbed areas (choose at least one)			
Silt Fence	SC-1	☐	
Fiber Rolls (Straw Wattles)	SC-5	☒	
Gravel & Sand Bags	SC-6 & 8	☐	
Dewatering Filtration	NS-2	☐	
Storm Drain Inlet Protection	SC-10	☐	
Engineered Desilting Basin (sized for 10-year flow)	SC-2	☐	
E. Select method for preventing offsite tracking of sediment (choose at least one)			
Stabilized Construction Entrance	TC-1	☒	
Construction Road Stabilization	TC-2	☐	
Entrance/Exit Tire Wash	TC-3	☐	
Entrance/Exit Inspection & Cleaning Facility	TC-1	☐	
Street Sweeping and Vacuuming	SC-7	☐	
F. Select the general site management BMPs			
F.1 Materials Management			
Material Delivery & Storage	WM-1	☒	
Spill Prevention and Control	WM-4	☒	
F.2 Waste Management[10]			
Waste Management Concrete Waste Management	WM-8	☒	
Solid Waste Management	WM-5	☒	
Sanitary Waste Management	WM-9	☒	
Hazardous Waste Management	WM-6	☐	

Note: The Construction General Permit (Order No. 2009-0009-DWQ) also requires all projects not subject to the BMP Design Manual to comply with runoff reduction requirements through the implementation of post-construction BMPs as described in Section XIII of the order.

[9] Regional Standard Drawing D-40 – Rip Rap Energy Dissipater is also acceptable for velocity reduction.

[10] Not all projects will have every waste identified. The applicant is responsible for identifying wastes that will be onsite and applying the appropriate BMP. For example, if concrete will be used, BMP WM-8 must be selected.

Step 3: County of San Diego PDP SWQMP Site Information Checklist

Step 3.1: Description of Existing Site Condition

Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	902.00 – Santa Margarita Hydrologic Unit; 902.10 – Ysidora Hydrologic Area; 902.13 – Upper Ysidora Hydrologic Subarea

Current Status of the Site (select all that apply):

- ☐ Existing development
- ☐ Previously graded but not built out
- ☐ Demolition completed without new construction
- ☒ Agricultural or other non-impervious use
- ☐ Vacant, undeveloped/natural

Description / Additional Information:
The majority site was previously used for agricultural purposes (primarily citrus crops) since 1994 or earlier. However, no active agricultural uses are currently taking place.

Existing Land Cover Includes (select all that apply and provide each area on site):

- ☒ Vegetative Cover 14.20 Acres (618,552 Square Feet)
- ☐ Non-Vegetated Pervious Areas _____ Acres (_____ Square Feet)
- ☒ Impervious Areas 0.36 Acres (15,682 Square Feet)

Description / Additional Information:

Underlying Soil belongs to Hydrologic Soil Group (select all that apply):

- ☐ NRCS Type A
- ☐ NRCS Type B
- ☒ NRCS Type C
- ☐ NRCS Type D

Approximate Depth to Groundwater (GW) (or N/A if no infiltration is used): N/A

- ☐ GW Depth < 5 feet
- ☐ 5 feet < GW Depth < 10 feet
- ☐ 10 feet < GW Depth < 20 feet
- ☒ GW Depth > 20 feet

Existing Natural Hydrologic Features (select all that apply):
☐ Watercourses
☐ Seeps
☐ Springs
☐ Wetlands
☐ None
☒ Other

Description / Additional Information:
The site is mostly undeveloped and as such, the existing hydraulic structures are limited to a 48-inch diameter corrugated metal culvert and natural earthen swales and berms. One berm exists along the western edge of the property line, conveying water north from the western portion of the property. An earthen swale exists in the center of the site, conveying offsite water west via the 48-inch culvert.

Step 3.2: Description of Existing Site Drainage Patterns

How is storm water runoff conveyed from the site? At a minimum, this description should answer:

(1) Whether existing drainage conveyance is natural or urban;
(2) Is runoff from offsite conveyed through the site? if yes, quantify all offsite drainage areas, design flows, and locations where offsite flows enter the project site, and summarize how such flows are conveyed through the site;
(3) Provide details regarding existing project site drainage conveyance network, including any existing storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels; and
(4) Identify all discharge locations from the existing project site along with a summary of conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations.

Describe existing site drainage patterns:
Parcel APN 105-410-19-00 is gently sloping to the northwest. Thus, the northwest corner of the site is the low point and is where stormwater runs off the site overland onto the western abutter's property. Adjacent Parcel APN 105-410-10-00 also drains to the northwest, before flowing into am existing swale north of the residence on the property and south of East Mission Road. The swale then conveys runoff into a 48-inch corrugated metal culvert. The runoff leaves the property via the culvert. The culvert then continues underneath a parking area on the neighboring property where it also picks up flow contributions from several surface drains before daylighting through a retaining wall at another property to the west. The existing swale also conveys water from offsite properties through the 48-inch culvert.

Please refer to the hydrology study titled "CEQA Preliminary Drainage Study," dated December 2018 and prepared by Haley & Aldrich, Inc. for more information on existing site drainage patterns.
.

Step 3.3: Description of Proposed Site Development

Project Description / Proposed Land Use and/or Activities:
The Fallbrook Energy Storage Project will be a battery-based energy storage to traditional peaking facilities. The plant will consist of 16 corrugated metal containers with 16 adjacent inverters/transformers to ensure thermal performance and energy efficiencies.

List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):
The project will construct 16 battery containers (756 sq. ft. each) and 16 inverter/transformers (130 sq. ft. each) that will be placed on top of concrete pads. The equipment areas at the southern end will also e on concrete pads. There will be an asphalt concrete access road extending from E. Mission Road to the facility, and along the western boundary of the facility with a turnaround at the southern end.

List/describe proposed pervious features of the project (e.g., landscape areas):
The areas surrounding the battery containers and inverter/transformers will be pervious surfaces covered with gravel. There will be minimal landscaping along the northern boundary of the site.

Does the project include grading and changes to site topography?
☒Yes
☐No

Description / Additional Information:
The area will be graded to create level lots on which to construct the facility. The total area to be graded is approximately 4.56 acres.

Insert acreage or square feet for the different land cover types in the table below:

Change in Land Cover Type Summary			
Land Cover Type	Existing (acres or ft^2)	Proposed (acres or ft^2)	Percent Change
Vegetation	14.20 acres	13.39 acres	-5.7
Pervious (non-vegetated)	0	0	0
Impervious	0.36 acres	1.17 acres	225

Step 3.4: Description of Proposed Site Drainage Patterns

Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)?

☒Yes

☐No

If yes, provide details regarding the proposed project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels, and the method for conveying offsite flows through or around the proposed project site. Identify all discharge locations from the proposed project site along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide a summary of pre- and post-project drainage areas and design flows to each of the runoff discharge locations. Reference the drainage study for detailed calculations.

Describe proposed site drainage patterns:

The following description summarizes information included in the Drainage Report included as Attachment 6.

The proposed battery storage facility will be constructed on APN 105-410-19-00. The battery storage units will be founded on concrete pads surrounded by gravel surfacing. The access road to the battery storage is proposed to run through adjacent parcel APN 105-410-10-00. The existing access road which connects to East Mission Road will be widened at an existing entrance gate. The preliminarily designed road slopes at a 15 percent grade down toward the south from the entrance gate to the low point where it transitions uphill toward the south at an 11 percent slope to the battery storage area. At the battery storage area, the proposed road has a vehicle turn-around and the slope varies from 1 percent to 4 percent uphill heading south along the edge of the proposed storage facility before terminating south of the last pad with a turnaround. In its site layout, there are two biofiltration basins (one in each of the two subcatchments), which also function as detention basins (Detention Pond 2 [DP-2] serving subcatchment SC-2 and Detention Pond 3 [DP-3] serving subcatchment SC-3). The two discharge points under existing conditions will continue to discharge stormwater and no additional discharge points will be added. Additionally, there are two smaller proposed surface depressions that are to be located west of the existing roadway, however, these are not modeled as BMPs and were assumed to simply collect surface runoff and route it into the existing 48-inch culvert and not detain water for the purposes of mitigating peak flows.

Outlet flow control for DP-2 serving sub-catchment SC-2 would be provided by a conventional overflow riser pipe. The control of flow through the perforated underdrains will be by an orifice in the base of the riser. Both the overflow and underdrains flow via 12-inch diameter pipe to the 48-inch diameter corrugated steel culvert with a flow equal to a 100-year 24-hour storm event of 36.9 cubic feet per second.

For DP-3, serving sub-catchment SC-3, outlet flow control is provided by a two-level weir. This weir was sized to limit the post-development peak runoff to a value less than the pre-development peak runoff, as well as to maintain discharge velocities below 3 feet per second to minimize the potential for erosion. When the inflow raises the water level above the flow control weir, overflow occurs over the rip-rap protected level spreader. A flow control weir was selected for this basin to avoid an overflow pipe and erosion protection encroaching on the oak tree exclusion area. For this basin, the rate of flow through the underdrains could be controlled by an orifice in a riser sealed at the top so that all overflow occurs over the weir with a flow equal to a 100-year 24-hour storm event of 16.5 cubic feet per second.

Step 3.5: Potential Pollutant Source Areas

Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply). Select "Other" if the project is a phased development and provide a description:

- ☒ On-site storm drain inlets
- ☐ Interior floor drains and elevator shaft sump pumps
- ☐ Interior parking garages
- ☐ Need for future indoor & structural pest control
- ☒ Landscape/Outdoor Pesticide Use
- ☐ Pools, spas, ponds, decorative fountains, and other water features
- ☐ Food service
- ☐ Refuse areas
- ☐ Industrial processes
- ☒ Outdoor storage of equipment or materials
- ☐ Vehicle and Equipment Cleaning
- ☐ Vehicle/Equipment Repair and Maintenance
- ☐ Fuel Dispensing Areas
- ☐ Loading Docks
- ☐ Fire Sprinkler Test Water
- ☐ Miscellaneous Drain or Wash Water
- ☒ Plazas, sidewalks, and parking lots
- ☐ Other (provide description)

Description / Additional Information:

Step 3.6: Identification and Narrative of Receiving Water and Pollutants of Concern

Describe flow path of storm water from the project site discharge location(s), through urban storm conveyance systems as applicable, to receiving creeks, rivers, and lagoons as applicable, and ultimate discharge to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable):
Santa Margarita River in the Ysidora Hydrologic Unit

List any 303(d) impaired water bodies[11] within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:

303(d) Impaired Water Body	Pollutant(s)/Stressor(s)	TMDLs / WQIP Highest Priority Pollutant
Santa Margarita River	*Phosphorous, total nitrogen as N*	
Santa Margarita River	*Enterococcus, fecal coliform*	

Identification of Project Site Pollutants*

*Identification of project site pollutants below is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs. Note the project must also participate in an alternative compliance program (unless prior lawful approval to meet earlier PDP requirements is demonstrated).

Identify pollutants expected from the project site based on all proposed use(s) of the site (see BMP Design Manual Appendix B.6):

Pollutant	Not Applicable to the Project Site	Anticipated from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment	☒	☐	☐
Nutrients	☒	☐	☐
Heavy Metals	☒	☐	☐
Organic Compounds	☒	☐	☐
Trash & Debris	☒	☐	☐
Oxygen Demanding Substances	☒	☐	☐
Oil & Grease	☒	☐	☐
Bacteria & Viruses	☒	☐	☐
Pesticides	☒	☐	☐

[11] The current list of Section 303(d) impaired water bodies can be found at http://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/#impaired

Step 3.7: Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6 of the BMP Design Manual)?

☒Yes, hydromodification management requirements for flow control and preservation of critical coarse sediment yield areas are applicable.

☐No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

☐No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

☐No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA[12] for the watershed in which the project resides.

Description / Additional Information (to be provided if a 'No' answer has been selected above):

A Hydromodification Management Exhibit is attached to provide more information in relation to Hydromodification requirements.

[12] The Watershed Management Area Analysis (WMAA) is an optional element for inclusion in the Water Quality Improvement Plans (WQIPs) described in the 2013 MS4 Permit [Provision B.3.b.(4)]. It is available online at the Project Clean Water website: http://www.projectcleanwater.org/index.php?option=com_content&view=article&id=248

Step 3.7.1: Critical Coarse Sediment Yield Areas*

***This Section only required if hydromodification management requirements apply**

Projects must satisfy critical coarse sediment yield area (CCSYA) requirements by characterizing the project as one of the scenario-types presented below and satisfying associated criteria. Projects must appropriately satisfy all requirements for identification, avoidance, and bypass, OR may alternatively elect to demonstrate no net impact.

☒ **Scenario 1**: Project is subject to and in compliance with RPO requirements *(without utilization of RPO exemptions 86.604(e)(2)(cc) or 86.604(e)(3) that result in impacts to more than 15% of the project-scale CCSYAs)*.

- ☐ Identify: Project has identified both onsite and upstream CCSYAs as areas that are coarse, ≥25% slope, and ≥50' tall. *(Optional refinement methods may be performed per guidance in Section H.1.2). AND,*
- ☐ Avoid: Project has avoided onsite CCSYAs per existing RPO steep slope encroachment criteria. AND,
- ☐ Bypass: Project has demonstrated that both onsite and upstream CCSYAs are bypassed through or around the project site with a 2 year peak storm velocity of 3 feet per second or greater. OR,
- ☒ No Net Impact: Project does not satisfy all Scenario 1 criteria above and must alternatively demonstrate no net impact to the receiving water.

☐ **Scenario 2**: Project is entirely exempt/not subject to RPO requirements without utilization of RPO exemptions 86.604(e)(2)(cc) or 86.604(e)(3).

- ☐ Identify: Project has identified upstream CCSYAs that are coarse, ≥25% slope, and ≥50' tall. *(Optional refinement methods may be performed per guidance in Section H.1.2). AND,*
- ☐ Avoid: Project is not required to avoid onsite CCSYAs as none were identified in the previous step. AND,
- ☐ Bypass: Project has demonstrated that upstream CCSYAs are bypassed through or around the project site with a 2 year peak storm velocity of 3 feet per second or greater. OR,
- ☐ No Net Impact: Project does not satisfy all Scenario 2 criteria above and must alternatively demonstrate no net impact to the receiving water. *(Skip to next row).*

☐ **Scenario 3**: Project utilizes exemption(s) via RPO Section 86.604(e)(2)(cc) or 86.604(e)(3) and impacts more than 15% of the project-scale CCSYAs.

- ☐ No Net Impact: Project is not eligible for traditional methods of identification, avoidance, and bypass. Project must demonstrate no net impact to the receiving water.

Critical Coarse Sediment Yield Areas Continued
Demonstrate No Net Impact
If the project elects to satisfy CCSYA criteria through demonstration of no net impact to the receiving water. Applicants must identify the methods utilized from the list below and provide supporting documentation in Attachment 2c of the SWQMP. Check all that are applicable. ☒ N/A, the project appropriately identifies, avoids, and bypasses CCSYAs. ☐ Project has performed additional analysis to demonstrate that impacts to CCSYAs satisfy the no net impact standard of Ep/Sp≤1.1. ☒ Project has provided alternate mapping of CCSYAs. ☒ Project has implemented additional onsite hydromodification flow control measures. ☐ Project has implemented an offsite stream rehabilitation project to offset impacts. ☐ Project has implemented other applicant-proposed mitigation measures.

Step 3.7.2: Flow Control for Post-Project Runoff*

*This Section only required if hydromodification management requirements apply
List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit. The Site can be divided into two primary watersheds: Watershed 2, consisting of four overland flow sub-catchments 2A, 2B, 2C and the existing access road sub-catchment (R), drains to the existing 48-inch diameter culvert which runs under the existing access road. The location where this culvert crosses the property line is designated as Analysis Point 2 (AP-2) on Figure A1, which represents the first POC for Hydromodification Management. Watershed 3, consisting of property APN 105-410-19-00 on which the future energy storage facility will be constructed, plus a small portion of an off-site property to the southwest, drains to the northwest corner of the property, and then runs overland across the property boundary. This location is designated Analysis Point 3 on Figure A1, which is the second POC for Hydromodification management. Existing topography and features can be found on Figure A1 of the CEQA Drainage Study. In the proposed post-development condition, there are two Biofiltration BMPs designed to meet flow and treatment requirements. The design basis of the BMPs is included in the CEQA drainage study. The location and size of the BMPs, as well as the proposed grading, drainage features, and boundaries can be found on Figure A2 of the CEQA Drainage Study.

Has a geomorphic assessment been performed for the receiving channel(s)?
☒ No, the low flow threshold is 0.1Q2 (default low flow threshold)
☐ Yes, the result is the low flow threshold is 0.1Q2
☐ Yes, the result is the low flow threshold is 0.3Q2
☐ Yes, the result is the low flow threshold is 0.5Q2

If a geomorphic assessment has been performed, provide title, date, and preparer:

Discussion / Additional Information: (optional)
A Hydromodification Management Exhibit is attached to provide more information in relation to Hydromodification requirements.

Step 3.8: Other Site Requirements and Constraints

When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements.

Optional Additional Information or Continuation of Previous Sections As Needed
This space provided for additional information or continuation of information from previous sections as needed.

Step 4: Source Control BMP Checklist

Source Control BMPs			
All development projects must implement source control BMPs 4.2.1 through 4.2.6 where applicable and feasible. See Chapter 4.2 and Appendix E of the County BMP Design Manual for information to implement source control BMPs shown in this checklist. Answer each category below pursuant to the following: • "Yes" means the project will implement the source control BMP as described in Chapter 4.2 and/or Appendix E of the County BMP Design Manual. Discussion / justification is not required. • "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. • "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification must be provided.			
Source Control Requirement	**Applied?**		
4.2.1 Prevention of Illicit Discharges into the MS4	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.1 not implemented:			
4.2.2 Storm Drain Stenciling or Signage	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.2 not implemented:			
4.2.3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.3 not implemented:			
4.2.4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.4 not implemented:			

Source Control Requirement	Applied?		
4.2.5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.5 not implemented:			
4.2.6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below):			
☒ A. On-site storm drain inlets	☒Yes	☐No	☒N/A
☐ B. Interior floor drains and elevator shaft sump pumps	☐Yes	☐No	☒N/A
☐ C. Interior parking garages	☐Yes	☐No	☒N/A
☐ D. Need for future indoor & structural pest control	☐Yes	☐No	☒N/A
☒ E. Landscape/outdoor pesticide use	☒Yes	☐No	☐N/A
☐ F. Pools, spas, ponds, fountains, and other water features	☐Yes	☐No	☒N/A
☐ G. Food service	☐Yes	☐No	☒N/A
☒ H. Refuse areas	☒Yes	☐No	☐N/A
☐ I. Industrial processes	☐Yes	☐No	☒N/A
☐ J. Outdoor storage of equipment or materials	☐Yes	☐No	☒N/A
☐ K. Vehicle and equipment cleaning	☐Yes	☐No	☒N/A
☐ L. Vehicle/equipment repair and maintenance	☐Yes	☐No	☒N/A
☐ M. Fuel dispensing areas	☐Yes	☐No	☒N/A
☐ N. Loading docks	☐Yes	☐No	☒N/A
☒ O. Fire sprinkler test water	☒Yes	☐No	☐N/A
☐ P. Miscellaneous drain or wash water	☐Yes	☐No	☒N/A
☐ Q. Plazas, sidewalks, and parking lots	☐Yes	☐No	☒N/A
Discussion / justification if 4.2.6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for <u>all</u> "No" answers shown above. Site design does not include most of these features as it is just a battery storage facility.			

Note: Show all source control measures described above that are included in design capture volume calculations in the plan sheets of Attachment 5.

Step 5: Site Design BMP Checklist

Site Design BMPs
All development projects must implement site design BMPs SD-A through SD-H where applicable and feasible. See Chapter 4.3 and Appendix E of the County BMP Design Manual for information to implement site design BMPs shown in this checklist. Answer each category below pursuant to the following: • "Yes" means the project will implement the site design BMP as described in Chapter 4.3 and/or Appendix E of the County BMP Design Manual. Discussion / justification is not required. • "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. • "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification must be provided.

Site Design Requirement	Applied?		
4.3.1 Maintain Natural Drainage Pathways and Hydrologic Features	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.1 not implemented:			
4.3.2 Conserve Natural Areas, Soils, and Vegetation	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.2 not implemented:			
4.3.3 Minimize Impervious Area	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.3 not implemented: The battery storage units are to be constructed on top of a gravel-covered surface rather than pavement.			
4.3.4 Minimize Soil Compaction	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.4 not implemented:			
4.3.5 Impervious Area Dispersion	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.5 not implemented:			

Site Design Requirement	Applied?		
4.3.6 Runoff Collection	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.6 not implemented: Runoff from the new facility will be directed into onsite detention basins.			
4.3.7 Landscaping with Native or Drought Tolerant Species	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.7 not implemented:			
4.3.8 Harvesting and Using Precipitation	☐Yes	☐No	☒N/A
Discussion / justification if 4.3.8 not implemented: No toilet or irrigation uses are proposed at the site.			

Note: Show all site design measures described above that are included in design capture volume calculations in the plan sheets of Attachment 5.

Step 6: PDP Structural BMPs

All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the BMP Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s).

PDP structural BMPs must be verified by the County at the completion of construction. This may include requiring the project owner or project owner's representative and engineer of record to certify construction of the structural BMPs (see Section 1.12 of the BMP Design Manual). PDP structural BMPs must be maintained into perpetuity, and the County must confirm the maintenance (see Section 7 of the BMP Design Manual).

Use this section to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (Step 6.2) for each structural BMP within the project (copy the BMP summary information sheet [Step 6.2] as many times as needed to provide summary information for each individual structural BMP).

Step 6.1: Description of structural BMP strategy

Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the BMP Design Manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate. At the end of this discussion provide a summary of all the structural BMPs within the project including the type and number.
The general approach to the selection of BMPs is described below. Calculations are presented in the Drainage Report included as Attachment 6.

The proposed condition was evaluated and several DMAs were identified. The proposed design was incorporated into the design to further separate the DMAs. Several DMAs were not identified as "Self-mitigating" of "De minimus" or "Self-retaining" and DMPs were required. Harvest and use was not an acceptable BMP based on the proposed site design. Additionally, infiltration is not feasible based on geotechnical recommendations and analysis. As such, no infiltration condition is used and biofiltration is selected for BMP design. Two main biofiltration basins are proposed, each capturing and treating the required Design Capture Volume as required for an 85th percentile 24-hour event.

Detention basins were designed in a "unified BMP design approach" to meet the requirements for stormwater treatment and hydromodification management using biofiltration basins for each sub-catchment area in accordance with the 2018 Regional Model BMP Design Manual. HMP sizing factors were used to calculate BMP sizes to meet hydromodification design requirements. Therefore, pollutant control and flow control are integrated into each BMP. Underdrains were designed to allow for complete drainage is less than 96 hours.

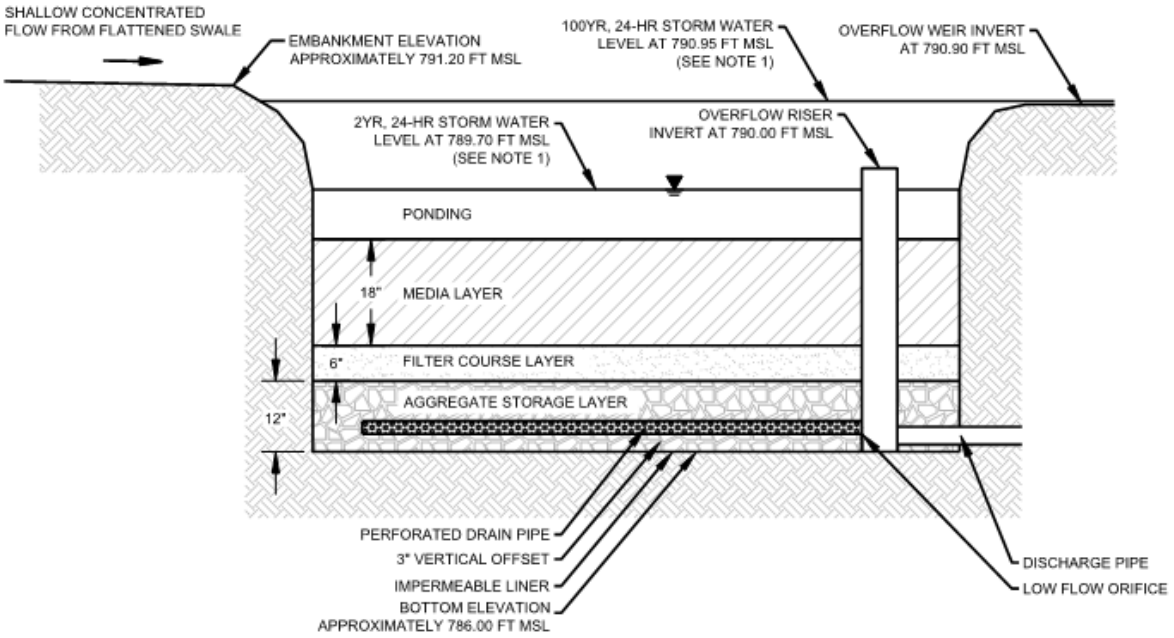
Site BMPs are used only for site drainage, no offsite water will be treated or pass through site BMPs. A total of two biofiltration basins are included in the design. Please refer to the Drainage Management Area (DMA) Exhibit in Attachment 1a for more information.

A requirement for biofiltration design, as presented in checklist BF-1 in the BMP Manual, is to limit the biofiltration basin drainage area to 5 acres of contributing area. The area draining to DP-2 is 5.9 acres, thus requiring additional modeling to verify the 85th percentile 24-hour storm event does not induce short-circuiting in DP-2 as described in Appendix A. The BMP Manual 85th percentile isopluvial map indicates the rainfall depth for the site is 0.86 inches. However, to approximate a design storm event, a 2-year 24-hour storm event was used instead, which corresponds to a rainfall depth of 2.64 inches, significantly greater than the 85th percentile 24-hour storm event. Focusing on DP-2, the 2-year 24-hour storm does not short-circuit the BMP by entering the top of the overflow riser, instead, all drainage into DP-2 will leave via the perforated underdrain via the low flow orifice in the riser pipe as designed. Therefore, the 85th percentile, 24-hour storm event of 0.86 inches will not result in runoff short-circuiting / bypassing the BMP despite having a contributing area greater than 5-acres. The cross-section detail for DP-2 is presented on the following page. As required by the BMP Manual, there is more than 2-inches of freeboard below the riser for the 2-year, 24-hour storm event, but the 1-foot of freeboard required by the Hydraulic Design Manual for a conjunctive use facility during the 100-year, 24-hour storm event has not been met. However, justification for the suitability of this design relative to site conditions is provided in Section 4 of the Drainage Report.

(Continue on following page as necessary.)

Description of structural BMP strategy continued
(Page reserved for continuation of description of general strategy for structural BMP implementation at the site)

(Continued from previous page)



NOTE:
1. PEAK PONDING LEVELS PROVIDED REPRESENT THE WORST CASE SCENARIO ASSUMING THAT THE PERFORATED UNDERDRAIN IS ENTIRELY CLOGGED AND CONVEYING NO OUTFLOW FROM THE BASIN.
2. WATER LEVEL BASED ON 2-YR, 24HR STORM EVENT RESULTS IN 0.70 FEET OF PONDING
3. WATER LEVEL BASED ON 85TH PERCENTILE CAPTURE RESULTS IN NO INFLOW.

-- DETENTION BASIN 2 - TYPICAL CROSS SECTION
SCALE: NONE

Step 6.2: Structural BMP Checklist

(Copy this page as needed to provide information for each individual proposed structural BMP)	
Structural BMP ID No. DP-2	
Construction Plan Sheet No.	
Type of structural BMP: ☐ Retention by harvest and use (HU-1) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☒ Biofiltration (BF-1) ☐ Biofiltration with Nutrient Sensitive Media Design (BF-2) ☐ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☐ Hydromodification control only ☒ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 1.12 of the BMP Design Manual)	Robert J. Talafus, PE Psomas 3 Hutton Centre Drive, Suite 200 Santa Ana, CA 92707 (714) 751-7373
Who will be the final owner of this BMP?	☐ HOA ☒ Property Owner ☐ County ☐ Other (describe)
Who will maintain this BMP into perpetuity?	☐ HOA ☒ Property Owner ☐ County ☐ Other (describe)
What Category (1-4) is the Structural BMP? Refer to the Category definitions in Section 7.3 of the BMP DM. Attach the appropriate maintenance agreement in Attachment 3.	Category 2.

Step 6.2: Structural BMP Checklist

(Copy this page as needed to provide information for each individual proposed structural BMP)	
Structural BMP ID No. DP-3	
Construction Plan Sheet No.	
Type of structural BMP: ☐ Retention by harvest and use (HU-1) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☒ Biofiltration (BF-1) ☐ Biofiltration with Nutrient Sensitive Media Design (BF-2) ☐ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☐ Hydromodification control only ☒ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 1.12 of the BMP Design Manual)	Robert J. Talafus, PE Psomas 3 Hutton Centre Drive, Suite 200 Santa Ana, CA 92707 (714) 751-7373
Who will be the final owner of this BMP?	☐ HOA ☒ Property Owner ☐ County ☐ Other (describe)
Who will maintain this BMP into perpetuity?	☐ HOA ☒ Property Owner ☐ County ☐ Other (describe)
What Category (1-4) is the Structural BMP? Refer to the Category definitions in Section 7.3 of the BMP DM. Attach the appropriate maintenance agreement in Attachment 3.	Category 2.

Discussion (as needed):
The structural BMPs proposed for this project are two biofiltration basins. Per the County's BMP Design Manual, these are moderately complex facilities that may require heavy equipment or special training in order to maintain. A Maintenance Agreement will be developed for these BMPs once the final designs have been certified and approved.

(Continue on subsequent pages as necessary)

Step 6.3: Offsite Alternative Compliance Participation Form

PDP INFORMATION	
Record ID:	
Assessor's Parcel Number(s) [APN(s)]	
What are your PDP Pollutant Control Debits? *See Attachment 1 of the PDP SWQMP	
What are your PDP HMP Debits? (if applicable) *See Attachment 2 of the PDP SWQMP	
ACP Information	
Record ID:	
Assessor's Parcel Number(s) [APN(s)]	
Project Owner/Address	
What are your ACP Pollutant Control Credits? *See Attachment 1 of the ACP SWQMP	
What are your ACP HMP Debits? (if applicable) *See Attachment 2 of the ACP SWQMP	
Is your ACP in the same watershed as your PDP? ☐ Yes ☐ No	Will your ACP project be completed prior to the completion of the PDP? ☐ Yes ☐ No
Does your ACP account for all Deficits generated by the PDP? ☐ Yes ☐ No (PDP and/or ACP must be redesigned to account for all deficits generated by the PDP.	What is the difference between your PDP debits and ACP Credits? *(ACP Credits -Total PDP Debits = Total Earned Credits)

ATTACHMENT 1

BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 1a	Storm Water Pollutant Control Worksheet Calculations -Worksheet B.3-1 (Required) -Worksheet B.1-1 (Required) -Worksheet B.4-1 (if applicable) -Worksheet B.4-2 (if applicable) -Worksheet B.5-1 (if applicable) -Worksheet B.5-2 (if applicable) -Worksheet B.5-3 (if applicable) -Worksheet B.6-1 (if applicable) -Summary Worksheet (optional)	☒ Included
Attachment 1b	Form I-8, Categorization of Infiltration Feasibility Condition (Required unless the project will use harvest and use BMPs) Refer to Appendices C and D of the BMP Design Manual to complete Form I-8.	☐ Included ☐ Not included because the entire project will use harvest and use BMPs
Attachment 1c	DMA Exhibit (Required) See DMA Exhibit Checklist on the back of this Attachment cover sheet.	☒ Included
Attachment 1d	Individual Structural BMP DMA Mapbook (Required) -Place each map on 8.5”x11” paper. -Show at a minimum the DMA, Structural BMP, and any existing hydrologic features within the DMA.	☒ Included

Use this checklist to ensure the required information has been included on the DMA Exhibit:

The DMA Exhibit must identify:

☒ Underlying hydrologic soil group
☒ Approximate depth to groundwater
☒ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
☒ Critical coarse sediment yield areas to be protected
☒ Existing topography and impervious areas
☒ Existing and proposed site drainage network and connections to drainage offsite
☒ Proposed demolition
☒ Proposed grading
☒ Proposed impervious features
☒ Proposed design features and surface treatments used to minimize imperviousness
☒ Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
☒ Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Step 3.5)
☒ Structural BMPs (identify location, structural BMP ID#, type of BMP, and size/detail)

BMP Sizing Spreadsheet V3.0			
Project Name:	AES Energy - Fallbrook Site	Hydrologic Unit:	Enter Hydrologic Unit
Project Applicant:	Corgan	Rain Gauge:	Lake Wohlford
Jurisdiction:	County of San Diego	Total Project Area:	Enter Total Project Area
Parcel (APN):	105-410-19-00	Low Flow Threshold:	0.1Q2
BMP Name:	Area A - BMP	BMP Type:	Biofiltration
BMP Native Soil Type:	C	BMP Infiltration Rate (in/hr):	0.1

Areas Draining to BMP						HMP Sizing Factors	Minimum BMP Size
DMA Name	Area (sf)	Pre Project Soil Type	Pre-Project Slope	Post Project Surface Type	Area Weighted Runoff Factor (Table G.2-1)[1]	Surface Area	Surface Area (SF)
DMA 1	53,810	C	Flat	Concrete	1.0	0.07	3767
DMA 2	9,100	C	Flat	Roofs	1.0	0.07	637
DMA 3	521,621	C	Moderate	Landscape	0.1	0.07	3651
						0	0
						0	0
						0	0
						0	0
							0
							0
						0	0
						0	0
						0	0
						0	0
						0	0
BMP Tributary Area	584,531					Minimum BMP Size	8055
						Proposed BMP Size*	8500

* Assumes standard configuration

Surface Ponding Depth	12.00	in
Bioretention Soil Media Depth	18.00	in
Filter Course	6.00	in
Gravel Storage Layer Depth	12	in
Underdrain Offset	3.0	in

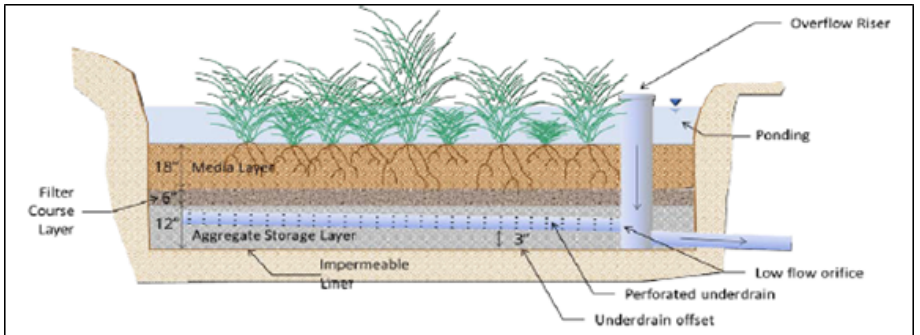
Notes:

1. Runoff factors which are used for hydromodification management flow control (Table G.2-1) are different from the runoff factors used for pollutant control BMP sizing (Table B.1-1). Table references are taken from the San Diego Region Model BMP Design Manu

Describe the BMP's in sufficient detail in your PDP SWQMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.
Designated Staff have final review and approval authority over the project design.

This BMP Sizing Spreadsheet has been updated in conformance with the San Diego Region Model BMP Design Manual, April 2018. For questions or concerns please contact the jurisdiction in which your project is located.



Biofiltration BMP Example Illustration

BMP Sizing Spreadsheet V3.0			
Project Name:	AES Energy - Fallbrook Site	Hydrologic Unit:	Enter Hydrologic Unit
Project Applicant:	Corgan	Rain Gauge:	Lake Wohlford
Jurisdiction:	County of San Diego	Total Project Area:	Enter Total Project Area
Parcel (APN):	105-410-19-00	Low Flow Threshold:	0.1Q2
BMP Name	Area A - BMP	BMP Type:	Biofiltration

DMA Name	Rain Gauge	Pre-developed Condition		Unit Runoff Ratio (cfs/ac)	DMA Area (ac)	Orifice Flow - $\%Q_2$ (cfs)	Orifice Area (in^2)
		Soil Type	Slope				
DMA 1	Lake Wohlford	C	Flat	0.49	1.235	0.[illegible]61	**0.86**
DMA 2	Lake Wohlford	C	Flat	0.49	0.209	0.01[illegible]	**0.15**
DMA 3	Lake Wohlford	C	Moderate	0.495	11.975	0.[illegible]93	**8.45**

3.75	**0.664**	**9.46**	**3.47**
Max Orifice Head (feet)	**Max Tot. Allowable Orifice Flow (cfs)**	**Max Tot. Allowable Orifice Area (in^2)**	**Max Orifice Diameter (in)**

0.042	**0.045**	**0.64**	**0.900**
Average outflow during surface drawdown (cfs)	Max Orifice Outflow (cfs)	Actual Orifice Area (in^2)	Selected Orifice Diameter (in)

Drawdown (Hrs)	56.8

BMP Sizing Spreadsheet V3.0			
Project Name:	AES Energy - Fallbrook Site	Hydrologic Unit:	Enter Hydrologic Unit
Project Applicant:	Corgan	Rain Gauge:	Lake Wohlford
Jurisdiction:	County of San Diego	Total Project Area:	Enter Total Project Area
Parcel (APN):	105-410-19-00	Low Flow Threshold:	0.1Q2
BMP Name:	Area B - BMP	BMP Type:	Biofiltration
BMP Native Soil Type:	C	BMP Infiltration Rate (in/hr):	0.1

Areas Draining to BMP						HMP Sizing Factors	Minimum BMP Size
DMA Name	Area (sf)	Pre Project Soil Type	Pre-Project Slope	Post Project Surface Type	Area Weighted Runoff Factor (Table G.2-1)[1]	Surface Area	Surface Area (SF)
DMA 1	50,500	C	Flat	Concrete	1.0	0.07	3535
DMA 2	74,050	C	Flat	Crushed Aggregate	0.1	0.07	518
DMA 3	53,213	C	Flat	Landscape	0.1	0.07	372
DMA 4	17,026	C	Moderate	Landscape	0.1	0.07	11
							0
						0	0
						0	0
						0	0
							0
						0	0
						0	0
						0	0
						0	0
						0	0
BMP Tributary Area	194,789					Minimum BMP Size	4545
						Proposed BMP Size*	5817

* Assumes standard configuration

rface Pondi epth	12.00	in
Bioreten on Soil Media Depth	18.00	in
Filter Coarse	6.00	in
ravel Storage Layer Depth	12	in
Underdrain Offset	3.0	in

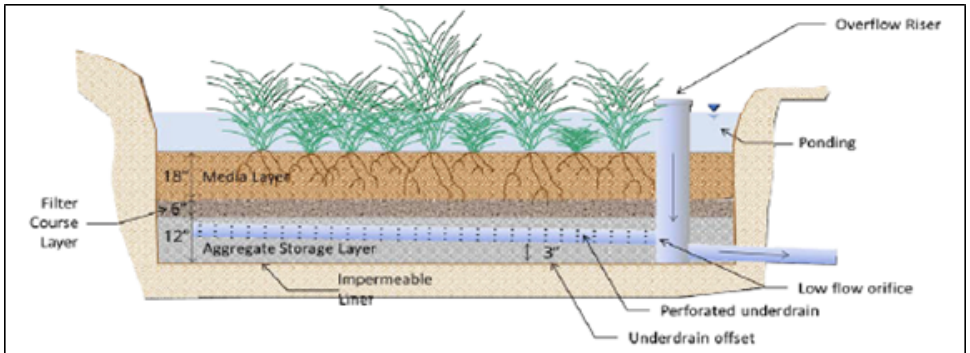
Notes:

1. Runoff factors which are used for hydromodification management flow control (Tab G.2-1) e diffe t f m the runoff factors used for pollutant control BMP sizing (Table B.1-1). Table references are taken from the San Diego Region Model BMP Design Manu

Describe the BMP's in sufficient detail in your PDP SWQMP to demonstrate the area, lume nd other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the developme project h as unstable slopes or the lack of available head.
Designated Staff have final review and approval authority over the project design.

This BMP Sizing Spreadsheet has been updated in conformance with th an Diego Reg n Model BMP Design Manual, April 2018. For



Biofiltration BMP Example Illustration

BMP Sizing Spreadsheet V3.0			
Project Name:	AES Energy - Fallbrook Site	Hydrologic Unit:	Enter Hydrologic Unit
Project Applicant:	Corgan	Rain Gauge:	Lake Wohlford
Jurisdiction:	County of San Diego	Total Project Area:	Enter Total Project Area
Parcel (APN):	105-410-19-00	Low Flow Threshold:	0.1Q2
BMP Name	Area B - BMP	BMP Type:	Biofiltrati

DMA Name	Rain Gauge	Pre-developed Condition		Unit Runoff Ratio (cfs/ac)	DMA Area (ac)	Orifi Flow - Q_2 (c	Orifice Area (in^2)
		Soil Type	Slope				
DMA 1	Lake Wohlford	C	Flat	0.49	1.159	.057	**0.81**
DMA 2	Lake Wohlford	C	Flat	0.49	1.70	0.083	**1.19**
DMA 3	Lake Wohlford	C	Flat	0.49	.222	0.060	**0.85**
DMA 4	Lake Wohlford	C	Moderate	0.495	0.391	0.019	**0.28**

3.75	**0.219**	**3.13**	**2.00**
Max Orifice Head (feet)	**Max Tot. Allowable Orifice Flow (cfs)**	**Max Tot. Allowable Orifice Area (in^2)**	**Max Orifice Diameter (in)**

0.042	**0.045**	**0.64**	**0.900**
Average outflow during surface drawdown (cfs)	Max Orifice Outflow (cfs)	Actual Orifice Area (in^2)	Selected Orifice Diameter (in)

Drawdown (Hrs)	38.9

Automated Worksheet B.3-1: Project-Scale BMP Feasibility Analysis (V1.3)

Category	#	Description	Value	Units
Capture & Use Inputs	0	Design Capture Volume for Entire Project Site	8,128	cubic-feet
	1	Proposed Development Type	Industrial	unitless
	2	Number of Residents or Employees at Proposed Development	2	#
	3	Total Planted Area within Development	2,180	sq-ft
	4	Water Use Category for Proposed Planted Areas	Low	unitless
Infiltration Inputs	5	Is Average Site Design Infiltration Rate ≤0.500 Inches per Hour?	Yes	yes/no
	6	Is Average Site Design Infiltration Rate ≤0.010 Inches per Hour?	Yes	yes/no
	7	Is Infiltration of the Full DCV Anticipated to Produce Negative Impacts?	Yes	yes/no
	8	Is Infiltration of Any Volume Anticipated to Produce Negative Impacts?	Yes	yes/no
Calculations	9	36-Hour Toilet Use Per Resident or Employee	1.10	cubic-feet
	10	Subtotal: Anticipated 36 Hour Toilet Use	2	cubic-feet
	11	Anticipated 1 Acre Landscape Use Over 36 Hours	52.14	cubic-feet
	12	Subtotal: Anticipated Landscape Use Over 36 Hours	3	cubic-feet
	13	Total Anticipated Use Over 36 Hours	5	cubic-feet
	14	Total Anticipated Use / Design Capture Volume	0.00	cubic-feet
	15	Are Full Capture and Use Techniques Feasible for this Project?	No	unitless
	16	Is Full Retention Feasible for this Project?	No	yes/no
	17	Is Partial Retention Feasible for this Project?	No	yes/no
Result	18	Feasibility Category	5	1, 2, 3, 4, 5

Worksheet B.3-1 General Notes:

A. Applicants may use this worksheet to determine the types of structural BMPs that are acceptable for implementation at their project site (as required in Section 5 of the BMPDM). User input should be provided for yellow shaded cells, values for all other cells will be automatically generated. Projects demonstrating feasibility or potential feasibility via this worksheet are encouraged to incorporate capture and use features in their project.

B. Negative impacts associated with retention may include geotechnical, groundwater, water balance, or other issues identified by a geotechnical engineer and substantiated through completion of Form I-8.

C. Feasibility Category 1: Applicant must implement capture & use, retention, and/or infiltration elements for the entire DCV.

D. Feasibility Category 2: Applicant must implement capture & use elements for the entire DCV.

E. Feasibility Category 3: Applicant must implement retention and/or infiltration elements for all DMAs with Design Infiltration Rates greater than 0.50 in/hr.

F. Feasibility Category 4: Applicant must implement standard unlined biofiltration BMPs sized at ≥3% of the effective impervious tributary area for all DMAs with Design Infiltration Rates of 0.011 to 0.50 in/hr. Applicants may be permitted to implement lined BMPs, reduced size BMPs, and/or specialized biofiltration BMPs provided additional criteria identified in "Supplemental Retention Criteria for Non-Standard Biofiltration BMPs" are satisfied.

G. Feasibility Category 5: Applicant must implement standard lined biofiltration BMPs sized at ≥3% of the effective impervious tributary area for all DMAs with Design Infiltration Rates of 0.010 in/hr or less. Applicants may also be permitted to implement reduced size and/or specialized biofiltration BMPs provided additional criteria identified in "Supplemental Retention Criteria for Non-Standard Biofiltration BMPs" are satisfied.

H. PDPs participating in an offsite alternative compliance program are not held to the feasibility categories presented herein.

Automated Worksheet B.1-1: Calculation of Design Capture Volume (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	Detention Basin 2 - DMA-2A	Detention Basin 3 - DMA-3A									unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration									unitless
	2	85th Percentile 24-hr Storm Depth	0.86	0.86									inches
	3	Design Infiltration Rate Recommended by Geotechnical Engineer	0.000	0.000									in/hr
	4	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)		50,965									sq-ft
	5	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	6	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	7	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	8	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	9	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)	257,135	36,590									sq-ft
	10	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)											sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	11	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	12	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	13	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	14	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	16	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	17	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	18	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	19	Number of Tree Wells Proposed per SD-A											#
	20	Average Mature Tree Canopy Diameter											ft
	21	Number of Rain Barrels Proposed per SD-E											#
	22	Average Rain Barrel Size											gal
Treatment Train Inputs & Calculations	23	Does BMP Overflow to Stormwater Features in Downstream Drainage?	No	No	No	No	No	No	No	No	No	No	unitless
	24	Identify Downstream Drainage Basin Providing Treatment in Series											unitless
	25	Percent of Upstream Flows Directed to Downstream Dispersion Areas											percent
	26	Upstream Impervious Surfaces Directed to Dispersion Area (Ci=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
	27	Upstream Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
Initial Runoff Factor Calculation	28	Total Tributary Area	257,135	87,556	0	0	0	0	0	0	0	0	sq-ft
	29	Initial Runoff Factor for Standard Drainage Areas	0.23	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	30	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	31	Initial Weighted Runoff Factor	0.23	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	32	Initial Design Capture Volume	4,238	3,890	0	0	0	0	0	0	0	0	cubic-feet
Dispersion Area Adjustments	33	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	34	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	35	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	36	Adjustment Factor for Dispersed & Dispersion Areas	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	37	Runoff Factor After Dispersion Techniques	0.23	0.62	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	unitless
	38	Design Capture Volume After Dispersion Techniques	4,238	3,890	0	0	0	0	0	0	0	0	cubic-feet
Tree & Barrel Adjustments	39	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	40	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Results	41	Final Adjusted Runoff Factor	0.23	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	42	Final Effective Tributary Area	59,141	54,285	0	0	0	0	0	0	0	0	sq-ft
	43	Initial Design Capture Volume Retained by Site Design Elements	0	0	0	0	0	0	0	0	0	0	cubic-feet
	44	Final Design Capture Volume Tributary to BMP	4,238	3,890	0	0	0	0	0	0	0	0	cubic-feet

Worksheet B.1-1 General Notes:

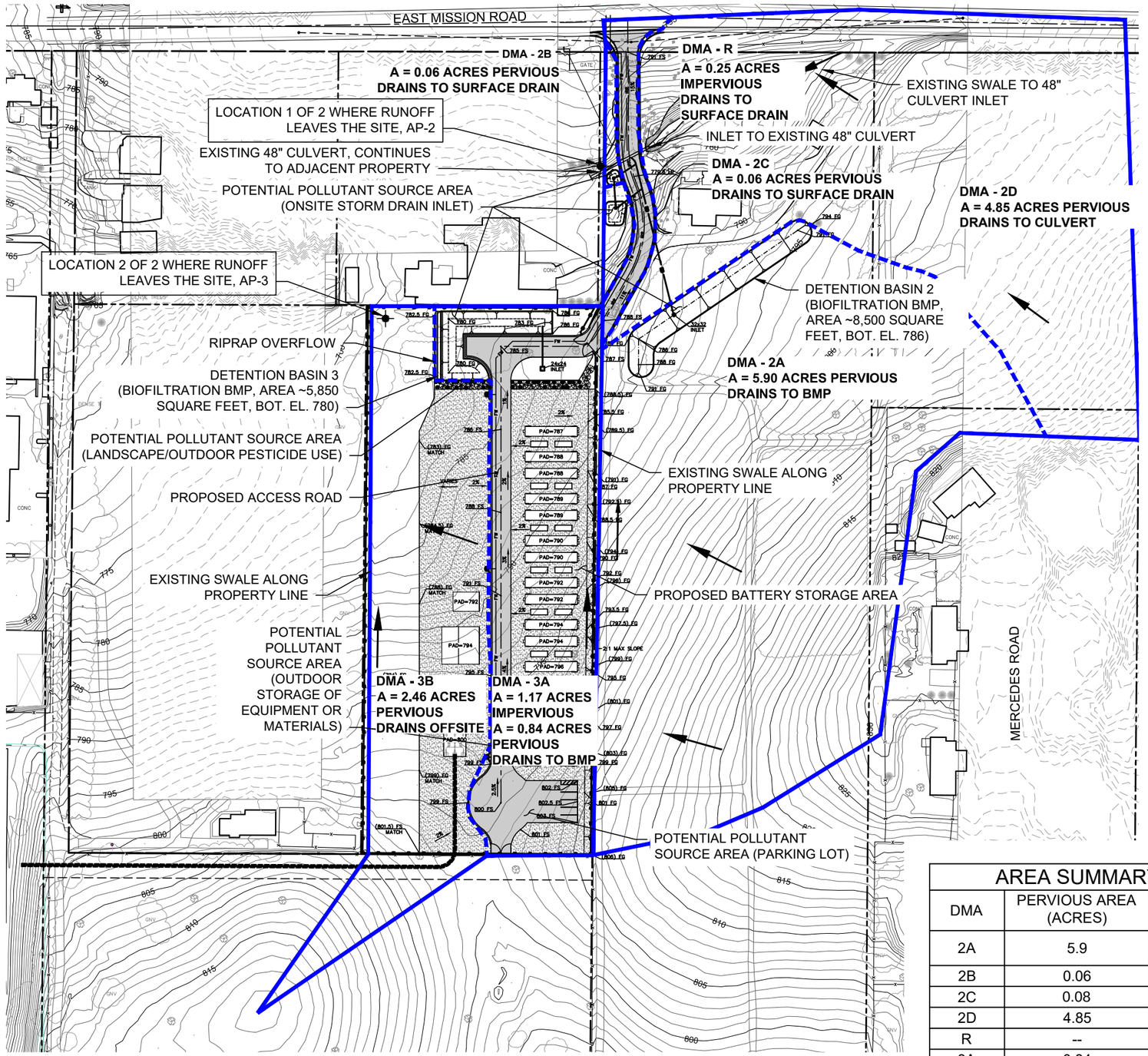
A. Applicants may use this worksheet to calculate design capture volumes for up to 10 drainage areas User input must be provided for yellow shaded cells, values for all other cells will be automatically generated, errors/notifications will be highlighted in red and summarized below. Upon completion of this worksheet, proceed to the appropriate BMP Sizing worksheet(s).

Automated Worksheet B.5-1: Sizing Lined or Unlined Biofiltration BMPs (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	ention Basin 2 - DMA	ention Basin 3 - DMA	-	-	-	-	-	-	-	-	sq-ft
	1	Design Infiltration Rate Recommended by Geotechnical Engineer	0.000	0.000	-	-	-	-	-	-	-	-	in/hr
	2	Effective Tributary Area	59,141	54,285	-	-	-	-	-	-	-	-	sq-ft
	3	Minimum Biofiltration Footprint Sizing Factor	0.030	0.030	-	-	-	-	-	-	-	-	ratio
	4	Design Capture Volume Tributary to BMP	4,238	3,890	-	-	-	-	-	-	-	-	cubic-feet
	5	Is Biofiltration Basin Impermeably Lined or Unlined?	Lined	Lined									unitless
	6	Provided Biofiltration BMP Surface Area	8,055	5,817									sq-ft
	7	Provided Surface Ponding Depth	12	12									inches
	8	Provided Soil Media Thickness	18	18									inches
	9	Provided Depth of Gravel Above Underdrain Invert	15	15									inches
	10	Diameter of Underdrain or Hydromod Orifice (Select Smallest)	1.4	1.2									inches
	11	Provided Depth of Gravel Below the Underdrain	3	3									inches
Retention Calculations	12	Volume Infiltrated Over 6 Hour Storm	0	0	0	0	0	0	0	0	0	0	cubic-feet
	13	Soil Media Pore Space Available for Retention	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	unitless
	14	Gravel Pore Space Available for Retention	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	15	Effective Retention Depth	0.90	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	inches
	16	Calculated Retention Storage Drawdown (Including 6 Hr Storm)	120	120	0	0	0	0	0	0	0	0	hours
	17	Volume Retained by BMP	604	436	0	0	0	0	0	0	0	0	cubic-feet
	18	Fraction of DCV Retained	0.14	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	19	Portion of Retention Performance Standard Satisfied	0.16	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	20	Fraction of DCV Retained (normalized to 36-hr drawdown)	0.08	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	21	Design Capture Volume Remaining for Biofiltration	3,899	3,657	0	0	0	0	0	0	0	0	cubic-feet
Biofiltration Calculations	22	Max Hydromod Flow Rate through Underdrain	0.0989	0.0727	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	CFS
	23	Max Soil Filtration Rate Allowed by Underdrain Orifice	0.53	0.54	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	in/hr
	24	Soil Media Filtration Rate per Specifications	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	25	Soil Media Filtration Rate to be used for Sizing	0.53	0.54	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	26	Depth Biofiltered Over 6 Hour Storm	3.18	3.24	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	inches
	27	Soil Media Pore Space Available for Biofiltration	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	unitless
	28	Effective Depth of Biofiltration Storage	21.60	21.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	inches
	29	Drawdown Time for Surface Ponding	23	22	0	0	0	0	0	0	0	0	hours
	30	Drawdown Time for Effective Biofiltration Depth	41	40	0	0	0	0	0	0	0	0	hours
	31	Total Depth Biofiltered	24.78	24.84	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	inches
	32	Option 1 - Biofilter 1.50 DCV: Target Volume	5,849	5,486	0	0	0	0	0	0	0	0	cubic-feet
	33	Option 1 - Provided Biofiltration Volume	5,849	5,486	0	0	0	0	0	0	0	0	cubic-feet
	34	Option 2 - Store 0.75 DCV: Target Volume	2,924	2,743	0	0	0	0	0	0	0	0	cubic-feet
	35	Option 2 - Provided Storage Volume	2,924	2,743	0	0	0	0	0	0	0	0	cubic-feet
	36	Portion of Biofiltration Performance Standard Satisfied	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
Result	37	Do Site Design Elements and BMPs Satisfy Annual Retention Requirements?	Yes	Yes	-	-	-	-	-	-	-	-	yes/no
	38	Overall Portion of Performance Standard Satisfied	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	39	This BMP Overflows to the Following Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	40	**Deficit of Effectively Treated Stormwater**	**0**	**0**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	cubic-feet

Worksheet B.5-1 General Notes:

A. Applicants may use this worksheet to size Lined or Unlined Biofiltration BMPs (BF-1, PR-1) for up to 10 basins. User input must be provided for yellow shaded cells, values for blue cells are automatically populated based on user inputs from previous worksheets, values for all other cells will be automatically generated, errors/notifications will be highlighted in red/orange and summarized below. BMPs fully satisfying the pollutant control performance standards will have a deficit treated volume of zero and be highlighted in green.



AREA SUMMARY TABLE

DMA	PERVIOUS AREA (ACRES)	IMPERVIOUS AREA (ACRES)
2A	5.9	--
2B	0.06	--
2C	0.08	--
2D	4.85	--
R	--	0.25
3A	0.84	1.17
3B	2.46	--

LEGEND

- PROPERTY LINE
- CHAIN LINK FENCE
- 5' TOPO CONTOUR (SEE NOTE)
- 1' TOPO CONTOUR (SEE NOTE)
- ASPHALT PAVEMENT 6"AC/6"AB (GEOTECHNICAL ENGINEER TO VERIFY)
- CRUSHED AGGREGATE BASE - 6 INCH THICK
- LANDSCAPING
- STORM DRAIN PIPE
- FIRE WATER LINE
- ELECTRIC LINE
- IRRIGATION LINE
- EASEMENT
- GRATE INLET
- FENCE
- SWALE
- 790 FG — PROPOSED ELEVATION SPOT GRADE
- DRAINAGE AREA BOUNDARY
- DRAINAGE SUBCATCHMENT AREA BOUNDARY
- DRAINAGE FLOW ARROW
- AP-3 — ANALYSIS POINT

NOTES

1. EXISTING CONTOURING OF THE SITE WAS PROVIDED BY PSOMAS. THE CONTOURS WERE DERIVED FROM AERIAL PHOTOGRAPHY THAT WAS FLOWN OCTOBER 16TH, 2018. ADDITIONAL DASHED CONTOURS WERE PROVIDED BY PSOMAS OUTSIDE THE PROJECT AREAS. THE SOURCE OF THE DASHED CONTOURS IS UNKNOWN, BUT THEY RESIDE EXCLUSIVELY OUTSIDE OF THE PROPOSED SCOPE OF THIS PROJECT.
2. UNDERLYING HYDROLOGIC SOIL GROUP = C.
3. APPROXIMATE DEPTH GROUNDWATER: >25 FEET.
4. DETAILS REGARDING DEMOLITION AND GRADING TO BE ADDED ONCE FINALIZED.
5. NO CRITICAL COARSE SEDIMENT YIELD AREAS PRESENT ON SITE.
6. BMPs TO BE PROVIDED WITH STORM DRAIN STENCILING OR SIGNAGE.

N

0 140 280
SCALE IN FEET

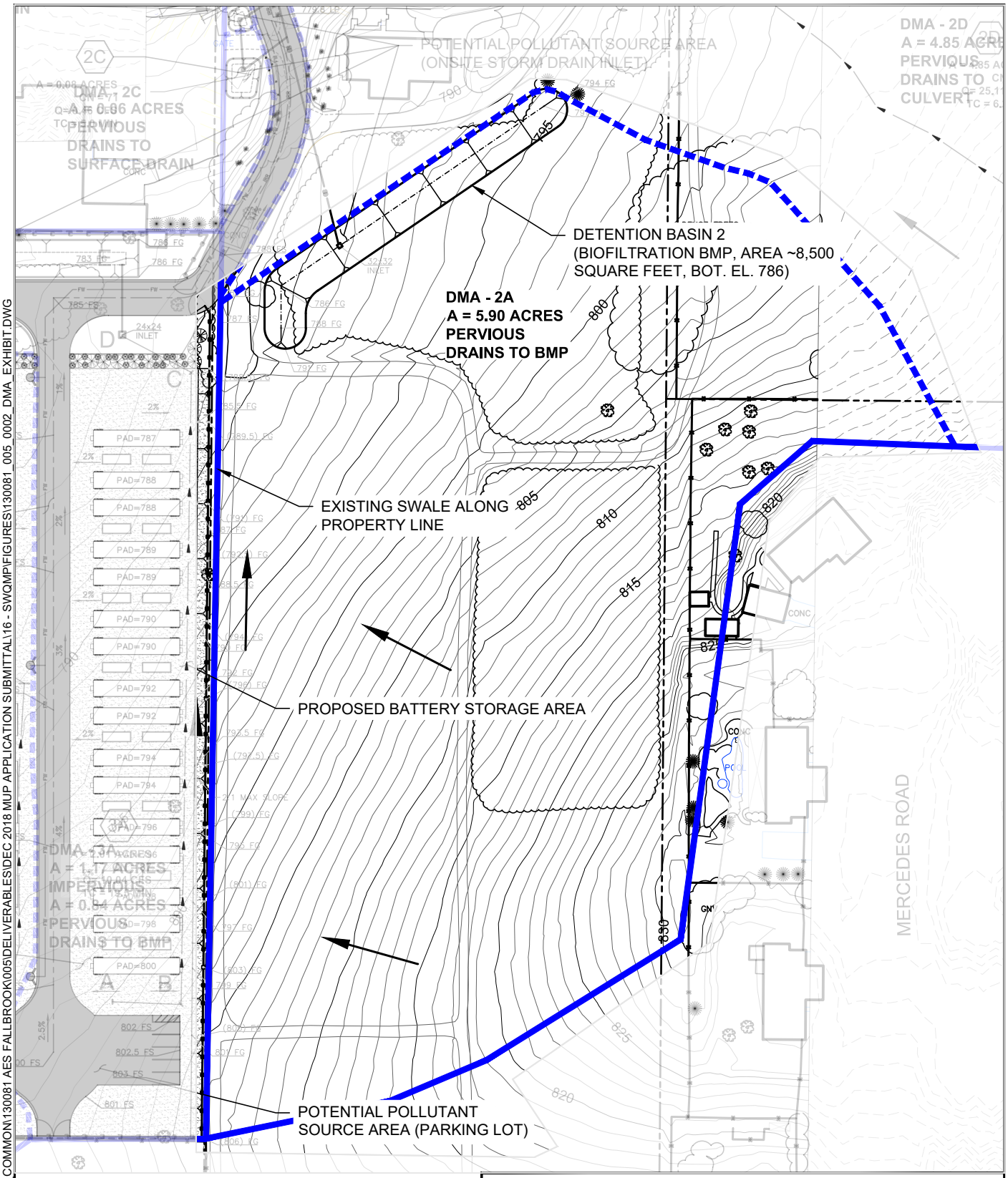
HALEY ALDRICH

CEQA PRELIMINARY DRAINAGE STUDY
FALLBROOK BATTERY ENERGY STORAGE SYSTEM
1405 E. MISSION ROAD, FALLBROOK, CALIFORNIA

DMA EXHIBIT

SCALE: AS SHOWN
MAY 2019

FIGURE 2



NOTE: AREA 2A IS ON THE ONLY SUBCATCHMENT THAT DRAINS TO DETENTION BASIN 2.

N

0 50 100

SCALE IN FEET

HALEY ALDRICH

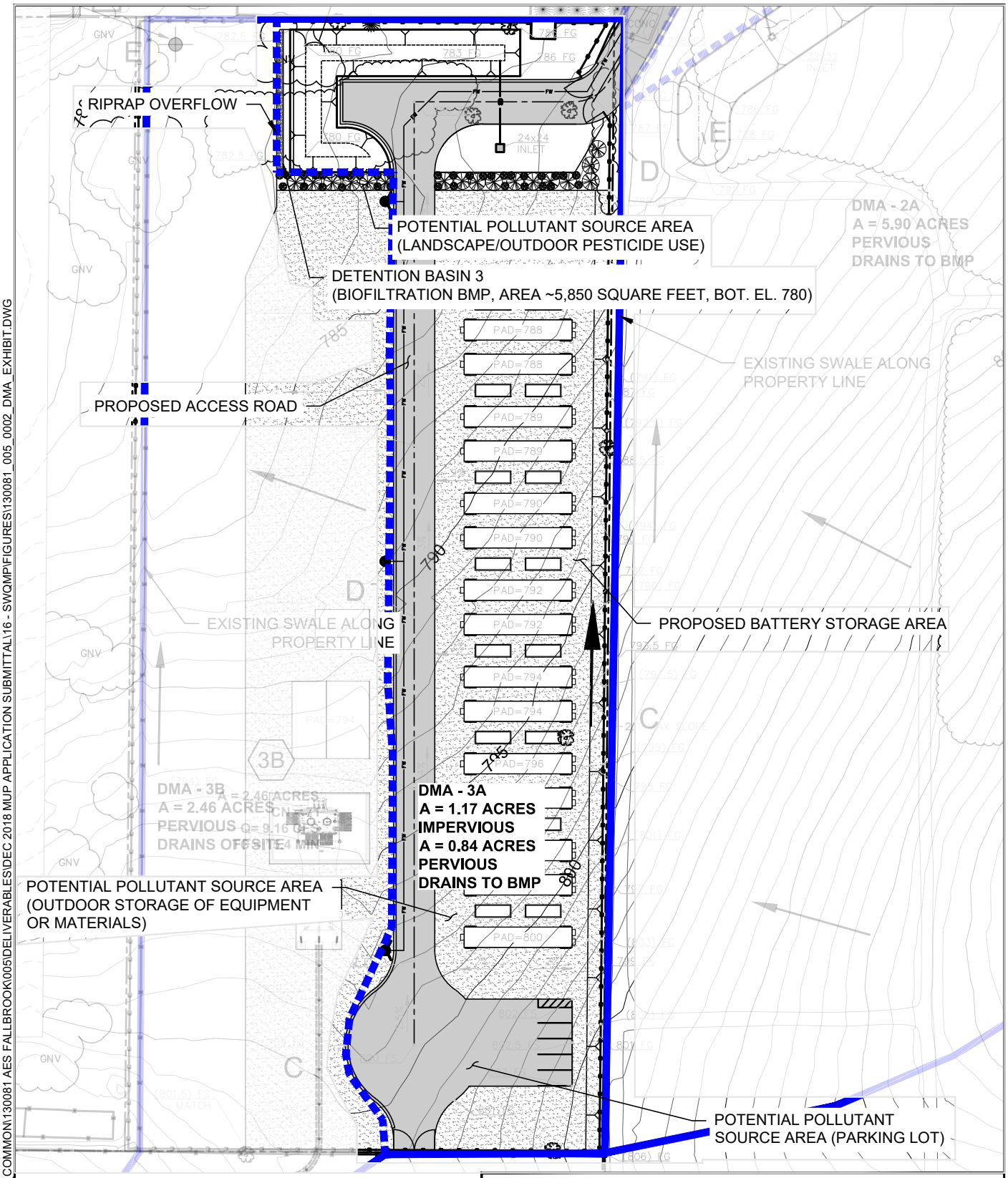
CEQA PRELIMINARY DRAINAGE STUDY
FALLBROOK BATTERY ENERGY STORAGE SYSTEM
1405 E. MISSION ROAD, FALLBROOK, CALIFORNIA

DMA EXHIBIT, DMA-2A

SCALE: AS SHOWN
MAY 2019

FIGURE 4

Saved by: GAUTSCH_ZACHARY Printed: 5/24/2019 1:26 PM Sheet: F4
\\HALEYALDRICH.COM\SHARESDG_COMMON\130081 AES FALLBROOK\005DELIVERABLESIDEC 2018 MUP APPLICATION SUBMITTAL\16 - SWQMP\FIGURES\130081_005_0002_DMA_EXHIBIT.DWG



NOTE: AREA 3A IS ON THE ONLY SUBCATCHMENT THAT DRAINS TO DETENTION BASIN 3

HALEY ALDRICH

CEQA PRELIMINARY DRAINAGE STUDY
FALLBROOK BATTERY ENERGY STORAGE SYSTEM
1405 E. MISSION ROAD, FALLBROOK, CALIFORNIA

DMA EXHIBIT, DMA-3A

SCALE: AS SHOWN
MAY 2019

FIGURE 3

Saved by: GAUTSCH_ZACHARY Printed: 5/24/2019 1:25 PM Sheet: F3
\\HALEYALDRICH.COM\SHARE\SDG_COMMON\130081 AES FALLBROOK\005\DELIVERABLES\DEC 2018 MUP APPLICATION SUBMITTAL\16 - SWQMP\FIGURES\130081_005_0002_DMA_EXHIBIT.DWG

ATTACHMENT 2

BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES

This is the cover sheet for Attachment 2.

☐ Mark this box if this attachment is empty because the project is exempt from PDP hydromodification management requirements.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	**Contents**	**Checklist**
Attachment 2a	Flow Control Facility Design, including Structural BMP Drawdown Calculations and Overflow Design Summary (Required) See Chapter 6 and Appendix G of the BMP Design Manual	☐ Included ☒ Submitted as separate stand-alone document
Attachment 2b	Hydromodification Management Exhibit (Required)	☒ Included See Hydromodification Management Exhibit Checklist on the back of this Attachment cover sheet.
Attachment 2c	Management of Critical Coarse Sediment Yield Areas See Section 6.2 and Appendix H of the BMP Design Manual.	☐ Exhibit depicting onsite and/or upstream sources of critical coarse sediment as mapped by Regional or Jurisdictional approaches outlined in Appendix H.1 AND, ☒ Demonstration that the project effectively avoids and bypasses sources of mapped critical coarse sediment per approaches outlined in Appendix H.2 and H.3. OR, ☐ Demonstration that project does not generate a net impact on the receiving water per approaches outlined in Appendix H.4.
Attachment 2d	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the BMP Design Manual.	☒ Not performed ☐ Included ☐ Submitted as separate stand-alone document
Attachment 2e	Vector Control Plan (Required when structural BMPs will not drain in 96 hours)	☐ Included ☒ Not required because BMPs will drain in less than 96 hours

Use this checklist to ensure the required information has been included on the Hydromodification Management Exhibit:

The Hydromodification Management Exhibit must identify:

☒ Underlying hydrologic soil group
☒ Approximate depth to groundwater
☒ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
☒ Critical coarse sediment yield areas to be protected
☒ Existing topography
☒ Existing and proposed site drainage network and connections to drainage offsite
☒ Proposed grading
☒ Proposed impervious features
☒ Proposed design features and surface treatments used to minimize imperviousness
☒ Point(s) of Compliance (POC) for Hydromodification Management
☒ Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions)
☒ Structural BMPs for hydromodification management (identify location, type of BMP, and size/detail)

Attachment 2 - Hydromodification Management Exhibit

This document is to demonstrate the Fluence Fallbrook Energy Storage Project's compliance with the Hydromodification Requirements for Priority Development Projects (PDPs) in Sections 1.6, 2.3, and 6.0 of *The County of San Diego BMP Design Manual for Permanent Site Design, Stormwater Treatment, and Hydromodification Management* (Best Management Practices [BMP] Manual). It is also intended to supplement pages 16, 17, and 18 of 42 and fulfill the requirements of Attachment 2 in the PDP Stormwater Quality Management Plan (SWQMP) prepared by Haley & Aldrich, Inc. (Haley & Aldrich).

APPLICABILITY OF HYDROMODIFICATION REQUIREMENTS (SECTION 6.1 OF BMP MANUAL)

As noted in Chapter 1, Section 1.6 of the BMP Manual, a project may be exempt from hydromodification management requirements if it meets any one of the following conditions:

- The project is not a PDP;
- The proposed project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;
- The proposed project will discharge runoff directly to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or
- The proposed project will discharge runoff directly to an area identified by the County as appropriate for an exemption by the Watershed Management Area Analysis (WMAA) for the watershed in which the project resides.

The above criteria reflect the latest list of exemptions that are allowed under the Municipal Separate Storm Sewer System (MS4) Permit 10 and therefore supersedes criteria found in earlier publications. However, the Fluence Fallbrook Energy Storage Project does not meet any of these conditions, and thus the project is subject to the applicable hydromodification requirements and is not considered an exempt project.

COMPLIANCE WITH CCSYA REQUIREMENTS (SECTION 6.2 OF BMP MANUAL)

According to the BMP Manual, when hydromodification management requirements are applicable, the applicant must determine if the project will impact any areas that are determined to be critical coarse sediment yield areas (CCSYAs). A CCSYA is an area that has been identified as an active or potential source of coarse sediment to downstream channel reaches. The process for demonstrating that the PDP does not impact CCSYAs is illustrated in Figure 6-1 below:

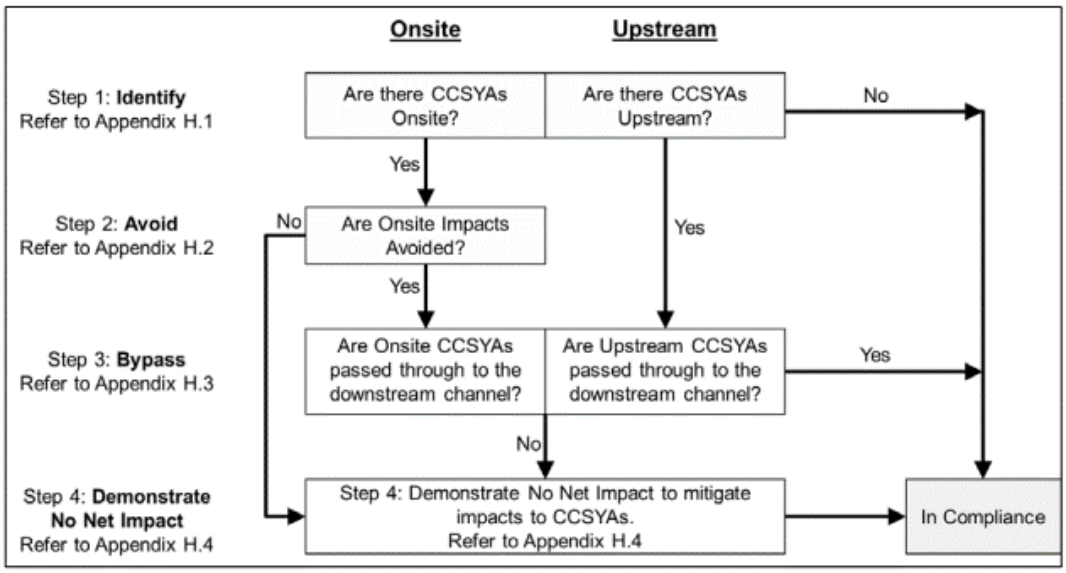


FIGURE 6-1. Pathways to meet CCSYA requirements

Appendix H.1 of the BMP Manual, referenced in Step 1 above, lists two different methodologies for identifying the CCSYAs: (1) the Resource Protection Ordinance (RPO) method; and (2) the WMAA method.

According to Appendix H.6 of the BMP Manual, Potential Critical Course Sediment Yield Areas (PCCSYAs) identified by the Regional WMAA were delineated using regional datasets for elevation, land cover, and geology. The methodology used to identify PCCSYAs from these datasets is based on Geomorphic Landscape Unit (GLU) methodology presented in the Southern California Coastal Water Research Project Technical Report 605. GLUs characterize the magnitude of sediment production from areas through three factors judged to exert the greatest influence on the variability on sediment-production rates: geology types, hillslope gradient, and land cover. The Regional WMAA document and the Geographic Information System (GIS) layers for the map can be found on the Project Clean Water website at the following address:

http://www.projectcleanwater.org/index.php?option=com_content&view=article&id=248&Itemid=219

In the case of this project, the WMAA method was used. Footnote 12 on page 16 of 42 of the PDP SWQMP states that: "The Watershed Management Area Analysis (WMAA) is an optional element for inclusion in the Water Quality Improvement Plans (WQIPs) described in the 2013 MS4 Permit [Provision B.3.b.(4)]." Haley & Aldrich created the attached Figure 1 using the GIS data available at the link above and determined there are no upstream or downstream CCSYAs in the vicinity of the work area affected by this project, thus the project complies with the CCYSA requirements. However, Page 17 of 42 of the PDP SWQMP requires boxes to be marked up as if the RPO method were followed. Haley & Aldrich has marked "Avoid" and "No Net Impact" under "Scenario 1," however, as described the WMAA methodology was used to determine conformance with the CCSYA requirements, rather than the RPO method.

COMPLIANCE WITH HYDROMODIFICATION FLOW CONTROL STANDARD (SECTION 6.3 OF BMP MANUAL)

PDPs subject to hydromodification management requirements must provide flow control for post-project runoff to meet the flow control performance standard. This is typically accomplished using structural BMPs that may include any combination of infiltration basins (bioretention, biofiltration with partial retention, or biofiltration basins) or detention basins. The design requirement for flow control measures for hydromodification management is as follows:

- For flow rates ranging from 10 percent, 30 percent or 50 percent of the pre-development 2-year runoff event (0.1Q2, 0.3Q2, or 0.5Q2) to the pre-development 10-year runoff event (Q10), the post-project discharge rates and durations must not exceed the pre-development rates and durations by more than 10 percent. The specific lower flow threshold will depend on the erosion susceptibility of the receiving stream for the project site (see Section 6.3.4).

This project does not include a stream susceptibility study (the area of the proposed project drains to a storm drain) and conservatively utilizes a value of 0.1Q2 to represent a high susceptibility to erosion. The results of Psomas' analysis following this methodology are provide in Appendix B of the California Environmental Quality Act (CEQA) Drainage Study. Additionally, Haley & Aldrich also used HydroCAD to create a dynamic model of pre-development and post-development conditions, which also determined that the two biofiltration BMPs designed for the project adequately maintain the post-development peak runoff flow rates below the pre-development values. Various return period storms were modeled up to and including the 100-year, 24-hour duration storm. The results of the HydroCAD modelling are provided in Appendix A of the CEQA Drainage Study.

ADDITIONAL ATTACHMENT 2 REQUIREMENTS (PAGE 30 OF 42 OF PDP SWQMP)

Attachment Sequence	Contents	Haley & Aldrich Comments
Attachment 2a	Flow Control Facility Design, including Structural BMP Drawdown Calculations and Overflow Design Summary (Required) See Chapter 6 and Appendix G of the BMP Design Manual	Flow control design is included in the CEQA drainage study. There are two Biofiltration BMPs designed, the drawdown times calculated were 56.8 hours and 38.9 hours. See Appendices A and B of the CEQA Drainage Study.
Attachment 2b	Hydromodification Management Exhibit (Required)	☒ Included The information on the checklist is on Figure A1 and Figure A2 provided herein.
Attachment 2c	Management of Critical Coarse Sediment Yield Areas See Section 6.2 and Appendix H of the BMP Design Manual.	Figure 1 attached to this exhibit shows that there are no CCSYAs upstream or downstream from the project area. The map was made using the WMAA method.
Attachment 2d	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the BMP Design Manual.	☒ Not performed ☐ Included ☐ Submitted as separate stand-alone document

Attachment Sequence	Contents	Haley & Aldrich Comments
Attachment 2e	Vector Control Plan (Required when structural BMPs will not drain in 96 hours)	☐ Included ☒ Not required because BMPs will drain in less than 96 hours

DEMONSTRATION OF CHECKLIST COMPLIANCE (PAGE 31 OF 42 OF THE PDP SWQMP)

According to Page 31 of 42 of the PDP SWQMP, the Hydromodification Management Exhibit must identify:

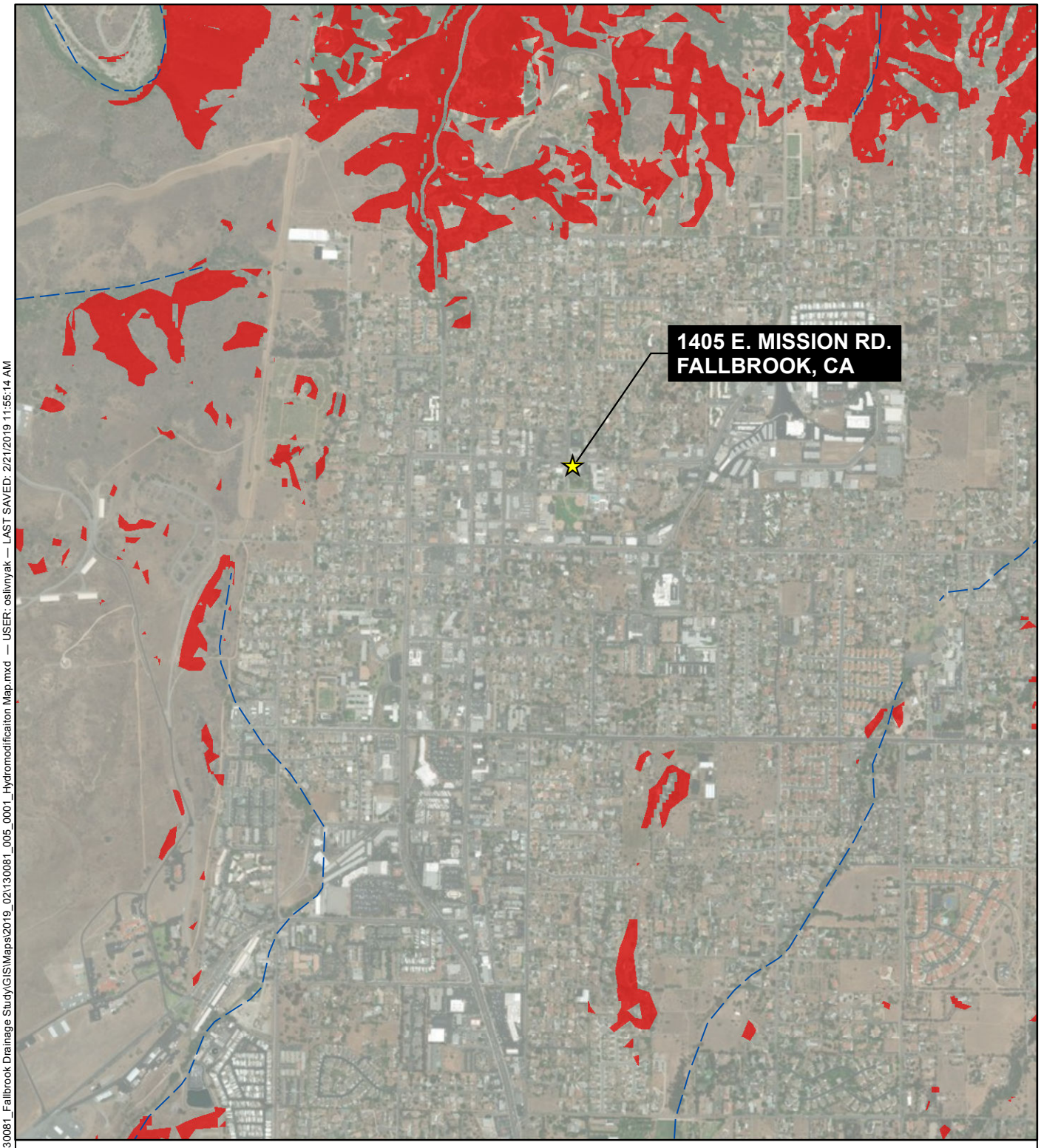
- Underlying hydrologic soil group;
- Approximate depth to groundwater;
- Existing natural hydrologic features (watercourses, seeps, springs, wetlands);
- Critical coarse sediment yield areas to be protected;
- Existing topography;
- Existing and proposed site drainage network and connections to drainage offsite;
- Proposed grading;
- Proposed impervious features;
- Proposed design features and surface treatments used to minimize imperviousness;
- Point(s) of Compliance (POC) for Hydromodification Management;
- Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions); and
- Structural BMPs for hydromodification management (identify location, type of BMP, and size/detail).

For the Fluence Fallbrook Energy Storage Project, the above information is found in Figure A1 and A2 attached. To summarize, the soil belongs to the Type C hydrologic soil group and groundwater is greater than 25 feet below the surface grade at the site. The existing drainage conditions are shown on Figure A1 in Appendix A of the CEQA Drainage Study. The site can be divided into two primary watersheds:

- Watershed 2, consisting of four overland flow sub-catchments 2A, 2B, 2C and the existing access road sub-catchment (R), drains to the existing 48-inch diameter culvert which runs under the existing access road. The location where this culvert crosses the property line is designated as Analysis Point 2 (AP-2) on Figure A1, which represents the first POC for Hydromodification Management.
- Watershed 3, consisting of property APN 105-410-19-00 on which the future energy storage facility will be constructed, plus a small portion of an off-site property to the southwest, drains to the northwest corner of the property, and then runs overland across the property boundary. This location is designated Analysis Point 3 on Figure A1, which is the second POC for Hydromodification management. Existing topography and features can be found on Figure A1 of the CEQA Drainage Study.

In the proposed post-development condition, there are two Biofiltration BMPs designed to meet flow and treatment requirements. The design basis of the BMPs is included in the CEQA drainage study. The location and size of the BMPs, as well as the proposed grading, drainage features, and boundaries can be found on Figure A2 of the CEQA Drainage Study.

FIGURE



LEGEND

SD_NHD_STREAMS

POTENTIAL CRITICAL COARSE SEDIMENT YIELD AREAS

HYDROMODIFICATION EXEMPT BODIES

N

0 750 1,500

SCALE IN FEET

HALEY ALDRICH

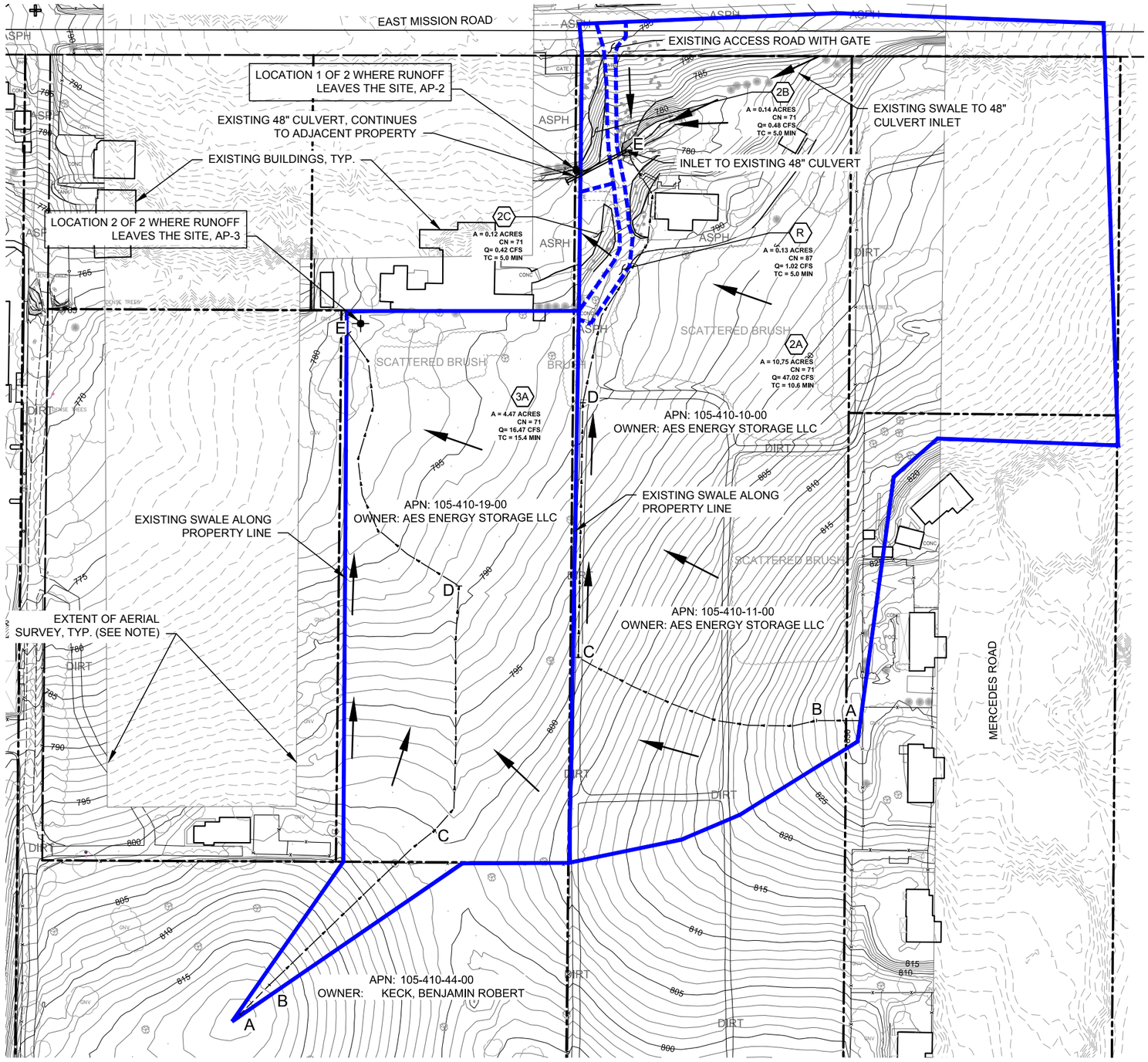
STORMWATER QUALITY MANAGEMENT PLAN
FALLBROOK BATTERY ENERGY STORAGE SYSTEM
1405 E. MISSION ROAD, FALLBROOK, CALIFORNIA

CRITICAL COARSE SEDIMENT YIELD AREA (CCSYA) EXHIBIT

SCALE: AS SHOWN
FEBRUARY 2019

FIGURE 1

GIS FILE PATH: \\haleyaldrich.com\share\oak_common\130081_Fallbrook Drainage Study\GIS\Maps\2019_02\130081_005_0001_Hydromodificaiton Map.mxd — USER: oslivnyak — LAST SAVED: 2/21/2019 11:55:14 AM



LEGEND

- PROPERTY LINE
- CHAIN LINK FENCE
- VEGETATION
- 5' TOPO CONTOUR (SEE NOTE)
- 1' TOPO CONTOUR (SEE NOTE)
- DRAINAGE AREA BOUNDARY
- DRAINAGE SUBCATCHMENT AREA BOUNDARY
- TIME OF CONCENTRATION FLOW PATHS
- AP-3 ANALYSIS POINT
- DRAINAGE FLOW ARROW

ATTACHMENT 2B CHECKLIST:

•Underlying hydrologic soil group;
TYPE C
•Approximate depth to groundwater;
>25 FEET
•Existing natural hydrologic features:
AS SHOWN
•Critical coarse sediment yield areas to be protected;
NONE PRESENT
•Existing topography;
AS SHOWN
•Existing and proposed site drainage network and connections to drainage offsite;
EXISTING SHOWN, PROPOSED ON FIGURE A2
•Proposed grading;
SEE FIGURE A2
•Proposed impervious features;
SEE FIGURE A2
•Proposed design features and surface treatments used to minimize imperviousness;
SEE FIGURE A2
•Point(s) of Compliance (POC) for Hydromodification Management;
AP-2 AND AP-3 AS LABELED HEREIN
•Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions);
PRE-DEVELOPMENT FIGURE A1,
POST-DEVELOPMENT FIGURE A2
•Structural BMPs for hydromodification management:
SEE FIGURE A2

0 140 280
SCALE IN FEET

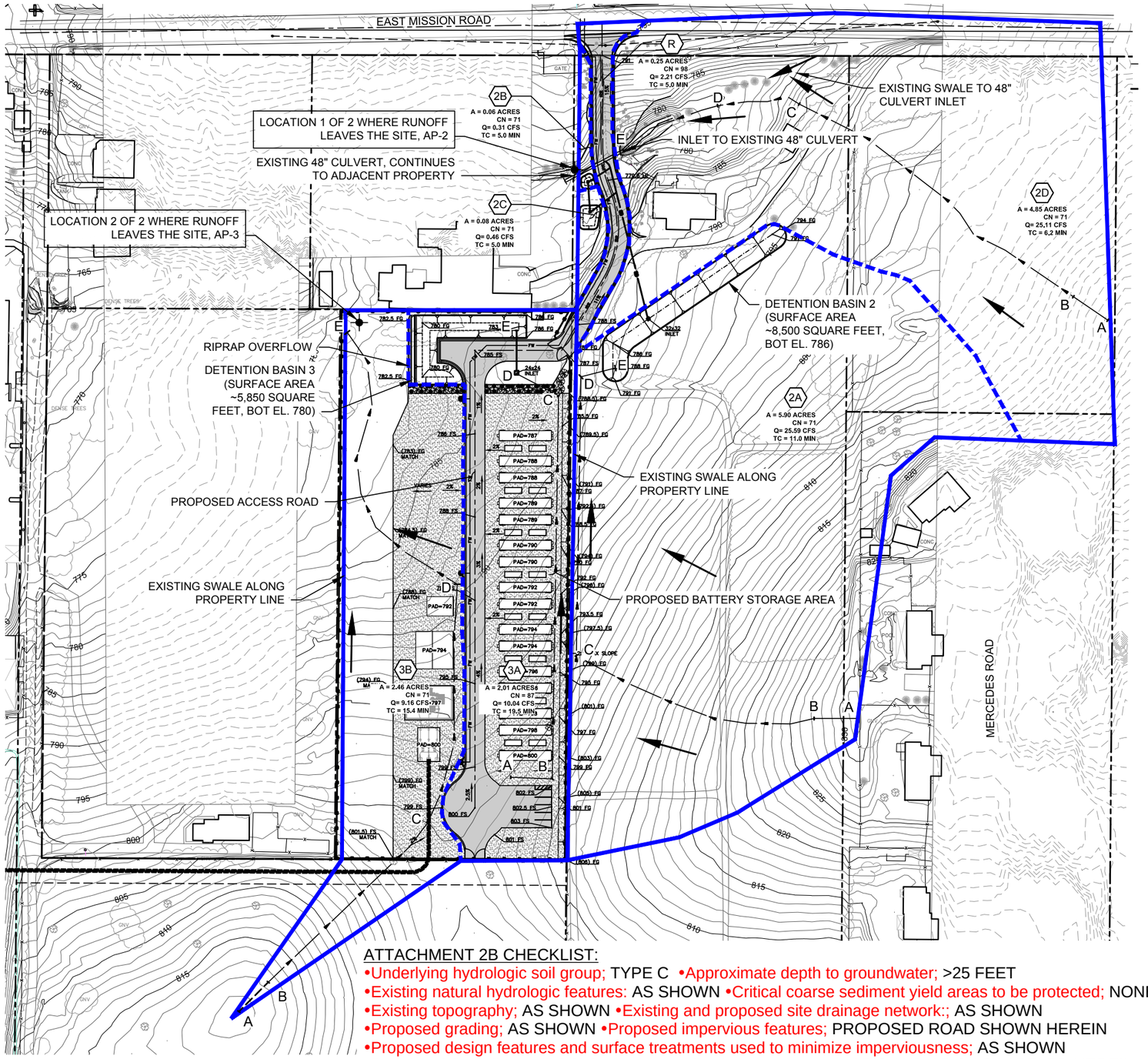
HALEY ALDRICH

CEQA PRELIMINARY DRAINAGE STUDY
FALLBROOK BATTERY ENERGY STORAGE SYSTEM
1405 E. MISSION ROAD, FALLBROOK, CALIFORNIA

PRE-DEVELOPMENT DRAINAGE CONDITIONS

SCALE: AS SHOWN
APRIL 2019

FIGURE A1



ATTACHMENT 2B CHECKLIST:

•Underlying hydrologic soil group; TYPE C •Approximate depth to groundwater; >25 FEET
•Existing natural hydrologic features: AS SHOWN •Critical coarse sediment yield areas to be protected; NONE PRESENT
•Existing topography; AS SHOWN •Existing and proposed site drainage network:; AS SHOWN
•Proposed grading; AS SHOWN •Proposed impervious features; PROPOSED ROAD SHOWN HEREIN
•Proposed design features and surface treatments used to minimize imperviousness; AS SHOWN
•Point(s) of Compliance (POC) for Hydromodification Management; AP-2 AND AP-3 AS LABELED HEREIN
•Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions); PRE-DEVELOPMENT FIGURE A1, POST-DEVELOPMENT FIGURE A2
•Structural BMPs for hydromodification management: AS SHOWN, LABELED AS "DETENTION BASIN 2" AND "DETENTION BASIN 3"

LEGEND

- PROPERTY LINE
- CHAIN LINK FENCE
- 5' TOPO CONTOUR (SEE NOTE)
- 1' TOPO CONTOUR (SEE NOTE)
- ASPHALT PAVEMENT 6"AC/6"AB (GEOTECHNICAL ENGINEER TO VERIFY)
- CRUSHED AGGREGATE BASE - 6 INCH THICK
- LANDSCAPING
- STORM DRAIN PIPE
- FIRE WATER LINE
- ELECTRIC LINE
- IRRIGATION LINE
- EASEMENT
- GRATE INLET
- FENCE
- SWALE
- 790 FG — PROPOSED ELEVATION SPOT GRADE
- DRAINAGE AREA BOUNDARY
- DRAINAGE SUBCATCHMENT AREA BOUNDARY
- TIME OF CONCENTRATION FLOW PATHS
- DRAINAGE FLOW ARROW
- AP-3 — ANALYSIS POINT

NOTES

1. EXISTING CONTOURING OF THE SITE WAS PROVIDED BY PSOMAS. THE CONTOURS WERE DERIVED FROM AERIAL PHOTOGRAPHY THAT WAS FLOWN OCTOBER 16TH, 2018. ADDITIONAL DASHED CONTOURS WERE PROVIDED BY PSOMAS OUTSIDE THE PROJECT AREAS. THE SOURCE OF THE DASHED CONTOURS IS UNKNOWN, BUT THEY RESIDE EXCLUSIVELY OUTSIDE OF THE PROPOSED SCOPE OF THIS PROJECT.

N

0 140 280
SCALE IN FEET

HALEY ALDRICH

CEQA PRELIMINARY DRAINAGE STUDY
FALLBROOK BATTERY ENERGY STORAGE SYSTEM
1405 E. MISSION ROAD, FALLBROOK, CALIFORNIA

POST-DEVELOPMENT DRAINAGE CONDITIONS

SCALE: AS SHOWN
APRIL 2019

FIGURE A2

ATTACHMENT 3

Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 3a	Structural BMP Maintenance Plan (Required)	☐ Included See Structural BMP Maintenance Information Checklist on the back of this Attachment cover sheet.
Attachment 3b	Draft Stormwater Maintenance Notification / Agreement (when applicable)	☐ Included ☒ Not Applicable

Use this checklist to ensure the required information has been included in the Structural BMP Maintenance Information Attachment:

Attachment 3a must identify:

- ☐ Specific maintenance indicators and actions for proposed structural BMP(s). This must be based on Section 7.7 of the BMP Design Manual and enhanced to reflect actual proposed components of the structural BMP(s)
- ☐ How to access the structural BMP(s) to inspect and perform maintenance
- ☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☐ Recommended equipment to perform maintenance
- ☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management

Attachment 3b: For all Structural BMPs, Attachment 3b must include a draft maintenance agreement in the County's standard format depending on the Category (PDP applicant to contact County staff to obtain the current maintenance agreement forms). Refer to Section 7.3 in the BMP Design Manual for a description of the different categories.

ATTACHMENT 4

County of San Diego PDP Structural BMP Verification for Permitted Land Development Projects

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County of San Diego PDP-IVF:

Installation Verification Form for Priority Development Projects (PDPs)

This form must be accepted by the County prior to the release of construction permits or granting of occupancy for applicable portions of a Priority Development Project (PDP). Applicants are responsible for providing all requested information. Do not leave any fields blank; indicate *N/A* for any requested item that is not applicable.

PART 1 General Project and Applicant Information

Table 1: Project and Applicant Information

A. Project Summary Information	**ID No. IVF-20__-____ To be assigned by DPW-WPP**
Project Name	***Fluence Fallbrook Energy Storage Project***
Record ID (e.g., grading/improvement plan number, building permit)	PDS2018-MPA-18-010
Project Address	1405 E. Mission Road, Fallbrook, CA 92028
Assessor's Parcel Number(s) APN(s))	105-410-10-00, 105-410-11-00 and 105-410-19-00
Project Watershed (complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	902.00 – Santa Margarita Hydrologic Unit; 902.10 – Ysidora Hydrologic Area; 902.13 – Upper Ysidora Hydrologic Subarea
B. Owner Information	
Name	Dauren Kilish, Fluence Energy
Address	690 N. Studebaker Road, Long Beach, CA 90803
Email Address	Dauren.kilish@fluenceenergy.com
Phone Number	(562) 577-7706

Document previously verified BMPs for the PDP in **Table 2**. Include the Verification Form ID No. from **Page 1** if one was issued.

****** DO NOT INCLUDE THIS PAGE UNLESS THIS IS A PARTIAL RECORD PLAN VERIFICATION ******

Table 2: Information on Verifications for Partial Record Plans Only

A: Previous Submittals

Previous Submittals	Submittal Date	Installation Verification Form ID No. if applicable (e.g., 2016-001)
1		
2		
3		
4		
5		

Add rows as needed

B: DMA and BMP Map

Please attach a map showing (1) all DMAs for the project site, (2) the DMAs and/or lots accepted under previous Verification Forms, and (3) the locations of Structural BMPs and Significant Site Design BMPs previously accepted OR listed in **Table 3** of this Verification Form.

SAMPLE DMA MAP

PART 2 DMA and BMP Inventory Information

Use this table to document Structural BMPs (S-BMPs) and Significant Site Design BMPs (SSD-BMPs) for the PDP. All DMAs are required to have at least one Structural BMP or Significant Site Design BMP.

- In **Part A**, list all Structural BMPs (including both Pollutant Control and/or Hydromodification as applicable) by DMA.
- Complete **Part B** for all DMAs that contain only Significant Site Design BMPs. SSD-BMPs are Site Design BMPs credited in **Worksheet B-1.1** of the BMP Design Manual for Design Capture Volume (DCV) reductions. Only Tree Wells and Dispersion Areas should be included in this inventory.
- For any DMA that contains both S-BMPs and SD-BMPs, document only the S-BMPs; you do not need to include the SD-BMPs.
- The information provided for each BMP in the table must match that provided in the Stormwater Quality Management Plan (SWQMP), construction plans, maintenance agreements, and other relevant project documentation.

Table 3: Required Information for Structural BMPs and Significant Site Design BMPs

DMA #	BMP Information			Maintenance Category	Maintenance Agreement or Maintenance Notification Recorded Doc. #	Construction Plan Sheet #	Landscape Plan # & Sheet # (For Vegetated BMPs Only)	FOR DPW-WPP USE ONLY *Reviewer concurs that the BMP(s) may be accepted into inventory (date and initial)*
	Quantity	Description/Type of Structural BMP	BMP ID #(s)					
Part A Structural BMPs								
2	1	Detention Basin	Detention Basin 2	2	TBD			
3	1	Detention Basin	Detention Basin 3	2	TBD			
Add rows as needed								
Part B Significant Site Design BMPs								
		Choose an item.						
		Choose an item.						
		Choose an item.						
Add rows as needed								

PART 3 Required Attachments for All BMPs Listed in Table 3

For ALL projects, submit the following to the County inspector (check all that are attached):

☐ Photographs: A photograph of each fully constructed S-BMP or SSD-BMP (or group of BMPs).

☐ Maintenance Agreements: Copies of all approved and recorded Storm Water Maintenance Agreements (SWMAs) or Maintenance Notifications (MNs) for all S-BMPs.

Note: All BMPs proposed for County ownership will remain the responsibility of the owner listed on **Page 1** until a signed Letter of Acceptance of Completion is received by the DPW Watershed Protection Program.

For Grading and Improvement projects only, ALSO submit:

☐ Landscape Plans: An 11" X 17" copy of the most current applicable Landscape Plan sheets where the BMPs are required to be vegetated, including:

- ☐ The Certification of Completion (Form 407), AND
- ☐ The Certificate of Approval from PDS Landscape Architect

Note: For each Landscape Plan, the sheets submitted must show the location of each verified as-built BMP.

☐ Construction Plans: An 11" X 17" copy of the most current applicable approved Construction Plan sheets:

- ☐ Grading Plans, AND/OR
- ☐ Improvement Plans, AND/OR
- ☐ Precise Grading Plan(s) (only for residential subdivisions with tract homes), AND/OR
- ☐ Other (Please specify) Click here to enter text.

Note: For each Construction Plan, the sheets submitted must incorporate all of the following:

- ☐ A BMP Table, AND
- ☐ A plan/cross-section of each verified as-built BMP, AND
- ☐ The location of each verified as-built BMP

Required only for Verifications for Partial Record Plans

☐ If this is a partial record plan verification, please include the following:

- ☐ A list of previously submitted Verification Forms (**Table 2, part A**)
- ☐ A map of DMAs and BMPs (**Table 2, part B**)

PART 4 Engineer of Work Certification

By signing below, I certify that the BMP(s) listed in Table 3 of this Verification Form have been constructed and all are in substantial conformance with the approved plans and applicable regulations. I understand the County reserves the right to inspect the above BMPs to verify compliance with the approved plans and Watershed Protection Ordinance (WPO). Should it be determined that the BMPs were not constructed to plan or code, corrective actions may be necessary before permits can be closed.

Please sign and provide your seal below.

[SEAL]

Professional Engineer's Printed Name:

Robert J. Talafus, PE, QSD, ENV SP

Email: Click here to enter text.

Phone Number: (714) 751-7373

Professional Engineer's Signed Name:

_____

Date: Click here to enter text.

COUNTY - OFFICIAL USE ONLY:

For County Inspectors

County Department: _____

Date verification received from EOW: _____

By signing below, County Inspector concurs that every noted BMP has been installed per plan.

Inspector Name: _____

Inspector's Signature: _____ Date: _____

For Building Division Only

Inspection Supervisor Name: _____

Inspector Supervisor's Signature: _____ Date: _____

PDCI & Building, along with the rest of this package, please provide to DPW WPP:

☐ A copy of the final accepted SWQMP and any accepted addendum

For Watershed Protection Program Only

Date Received: _____

WPP Submittal Reviewer: _____

WPP Reviewer concurs that the BMPs accepted in **Part 2** above may be entered into inventory.

WPP Reviewer's Signature: _____ Date: _____

ATTACHMENT 5

Copy of Plan Sheets Showing Permanent Storm Water BMPs, Source Control, and Site Design

This is the cover sheet for Attachment 5.

Use this checklist to ensure the required information has been included on the plans:

The plans must identify:

☒ Structural BMP(s) with ID numbers matching Step 6 Summary of PDP Structural BMPs
☒ The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
☐ Details and specifications for construction of structural BMP(s)
☒ Signage indicating the location and boundary of structural BMP(s) as required by County staff
☐ How to access the structural BMP(s) to inspect and perform maintenance
☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
☐ Recommended equipment to perform maintenance
☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
☐ Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)
☒ All BMPs must be fully dimensioned on the plans
☐ When proprietary BMPs are used, site-specific cross section with outflow, inflow, and model number must be provided. Photocopies of general brochures are not acceptable.
☐ Include all source control and site design measures described in Steps 4 and 5 of the SWQMP. Can be included as a separate exhibit as necessary.

FLUENCE FALLBROOK ENERGY STORAGE PROJECT

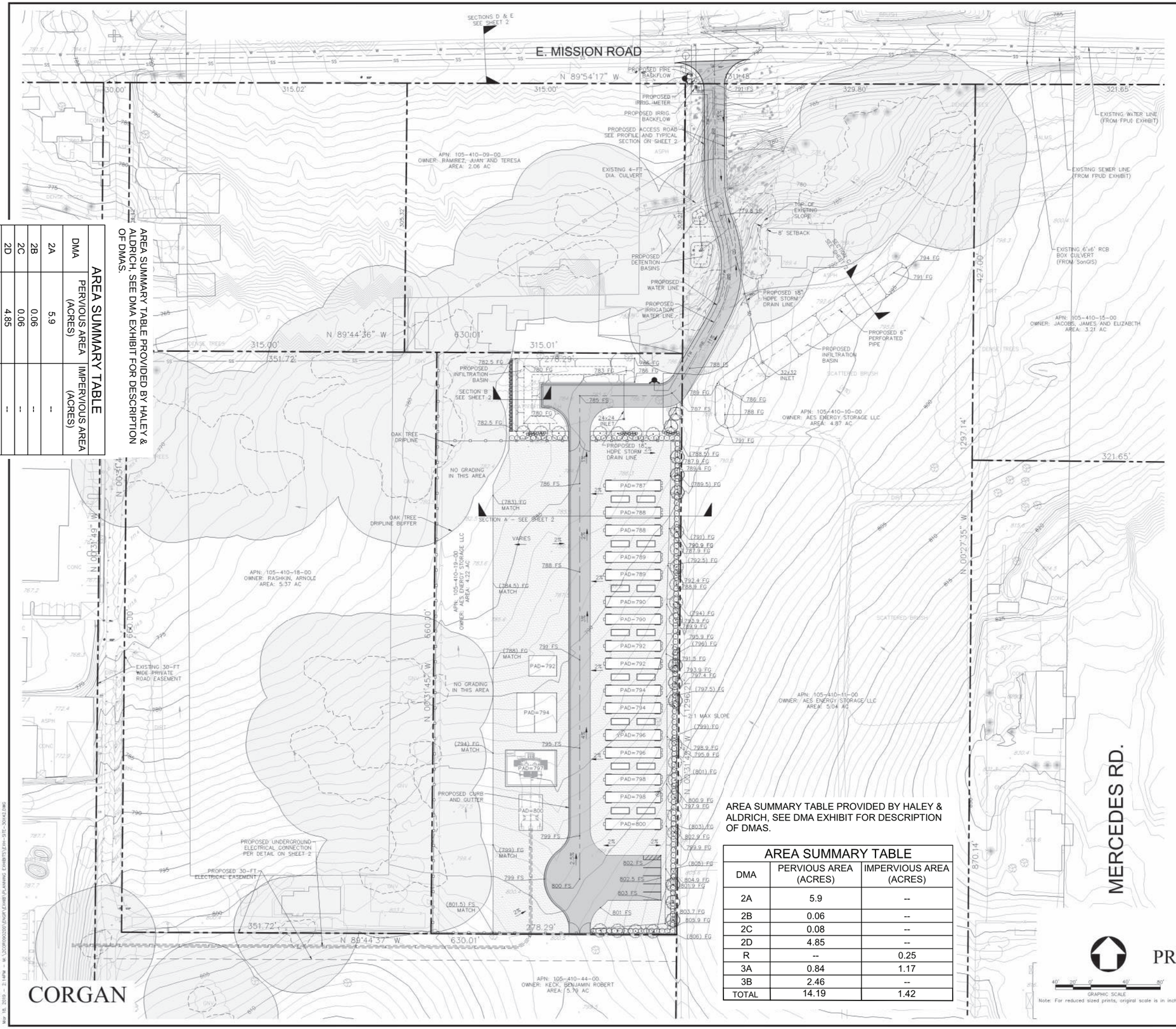
FALLBROOK, CA. SAN DIEGO COUNTY

Project Number: 18270.0000

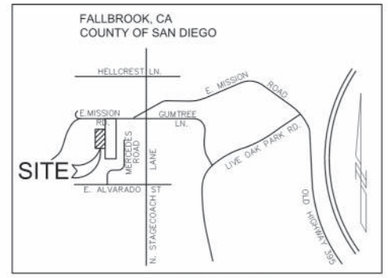
PROJECT DESCRIPTION

The Fallbrook Energy Storage Project's concept is inspired by the function within the facility. This plant is creating a battery-based energy storage to traditional peaking facilities. The Fallbrook Energy Storage Project is cutting edge and focused on energy performance and sustainability. Adaptive to the ever changing environment, this plant consists of 16 corrugated metal containers with 16 adjacent inverters/transformers to ensure thermal performance and energy efficiencies. Additionally, each storage container allows for visual placement and branding opportunity.

TABLE OF CONTENTS



FALLBROOK, CA
COUNTY OF SAN DIEGO



VICINITY MAP

NTS

SHEET INDEX

LEGEND

- ASPHALT PAVEMENT 6"AC/6"AB (GEOTECHNICAL ENGINEER TO VERIFY)
- CRUSHED AGGREGATE BASE – 6 INCH THICK
- LANDSCAPING
- SD — STORM DRAIN PIPE
- FW — FIRE WATER LINE
- E — ELECTRIC LINE
- IRR — IRRIGATION LINE
- EASEMENT
- GRATE INLET
- FENCE
- SWALE
- PROPERTY LINE
- RIP RAP
- CURB AND GUTTER

OWNER:
AES ENERGY – FALLBROOK SITE
1309 AND 1405 E. MISSION ROAD,
FALLBROOK, CA 92028

ARCHITECT:
CORGAN
12045 EAST WATERFRONT DRIVE, SUITE 425
LOS ANGELES, CA 90094
(310) 873-3601

CIVIL ENGINEER:
PSOMAS
3 HUTTON CENTRE DRIVE, SUITE 200
SANTA ANA, CA 9207
(714) 751-7373 Fax (714) 545-8883

ASSESSOR'S PARCEL NO.

APN: 105-410-11-00
APN: 105-410-19-00

BASIS OF BEARINGS:
THE BASIS OF BEARINGS FOR THIS SURVEY IS THE NORTH LINE OF THE NORTHEAST QUARTER OF SECTION 19, T. 9 S., R. 3 W., S.B.M. (CENTERLINE OF EAST MISSION ROAD), ACCORDING TO THE MAP NO. 11849 COUNTY OF SAN DIEGO TRACT NO. 4533, I.E. N 89°54'17" W

FLOOD ZONE:
SUBJECT PROPERTY IS WITHIN ZONE – "X" PER FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FIRM MAP NO. 06073C0165G, MAP REVISED MAY 16, 2012.

ZONE "X" DENOTES AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN

GRADING QUANTITIES:

CUT:	1460 CY
FILL:	70 CY
NET:	1390 CY EXPORT

NOTES:
1. THIS PLAN IS PROVIDED TO ALLOW FOR FULL AND ADEQUATE DISCRETIONARY REVIEW OF A PROPOSED DEVELOPMENT PROJECT. THE PROPERTY OWNER ACKNOWLEDGES THAT THE ACCEPTANCE OR APPROVAL OF THIS PLAN DOES NOT CONSTITUTE AN APPROVAL TO PERFORM ANY GRADING SHOWN HEREON, AND AGREES TO OBTAIN VALID GRADING PERMISSIONS BEFORE COMMENCING SUCH ACTIVITY.

AREA SUMMARY TABLE PROVIDED BY HALEY & ALDRICH. SEE DMA EXHIBIT FOR DESCRIPTION OF DMAS.

AREA SUMMARY TABLE

DMA	PERVIOUS AREA (ACRES)	IMPERVIOUS AREA (ACRES)
2A	5.9	--
2B	0.06	--
2C	0.08	--
2D	4.85	--
R	--	0.25
3A	0.84	1.17
3B	2.46	--
TOTAL	14.19	1.42

AREA SUMMARY TABLE PROVIDED BY HALEY & ALDRICH, SEE DMA EXHIBIT FOR DESCRIPTION OF DMAS.

DMA	PERVIOUS AREA (ACRES)	IMPERVIOUS AREA (ACRES)
2A	5.9	--
2B	0.06	--
2C	0.08	--
2D	4.85	--
R	--	0.25
3A	0.84	1.17
3B	2.46	--
TOTAL	14.19	1.42

GRAPHIC SCALE
40' 20' 0' 40' 80'
Note: For reduced sized prints, original scale is in inches

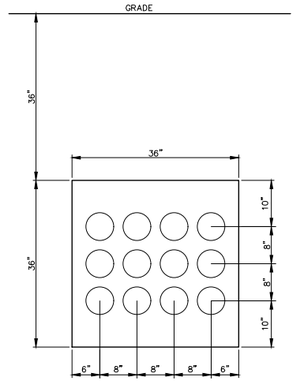
CORGAN

FALLBROOK
ENERGY STORAGE PROJECT
PRELIMINARY GRADING PLAN

PSOMAS

DATE: 3-15-19 REVISED ON:
JOB No: 2COR090200

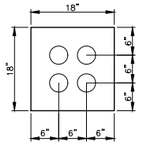
Mar 18, 2019 - 2:14PM - M:\2COR090200\ENGR\EXHIBITS\EXH-SITE-30X42.DWG



6" DUCTS

69kv & COMM.

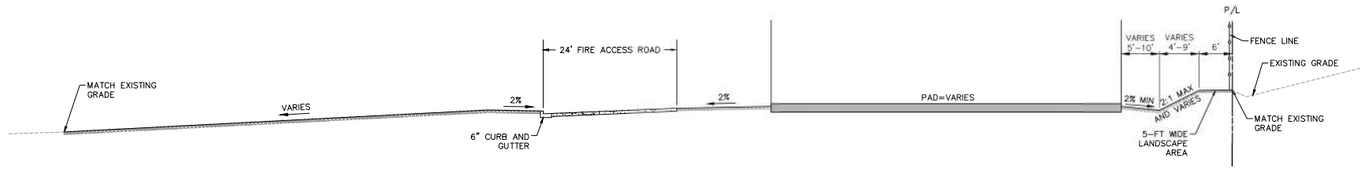
NTS



4" DUCTS

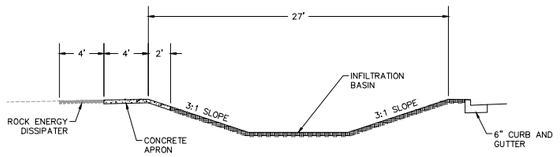
STATION SERVICE & COMM.

NTS



SECTION A

NTS



SECTION B

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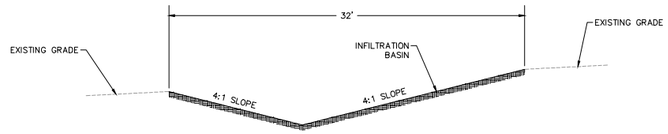

SECTION C

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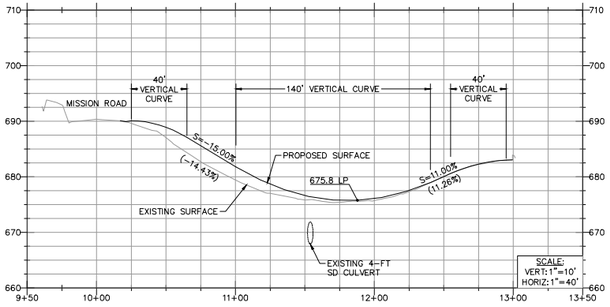
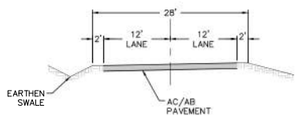
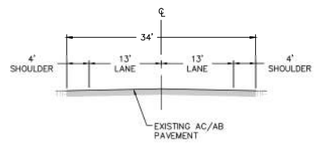


PROPOSED ACCESS ROAD PROFILE



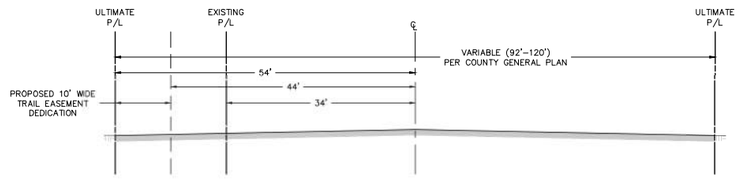
ACCESS ROAD TYPICAL SECTION

NTS



SECTION D - EXISTING MISSION ROAD TYPICAL SECTION

NTS



SECTION E - MISSION ROAD TYPICAL SECTION - ULTIMATE BUILD-OUT CONDITION

(4.2B BOULEVARD SERIES PER COUNTY OF SAN DIEGO GENERAL PLAN MOBILITY ELEMENT)

NTS

CORGAN

FALLBROOK

ENERGY STORAGE PROJECT

SECTIONS AND DETAILS

PSOMAS

DATE: 3-15-19 REVISED ON:

JOB No:2COR090200

SHEET 2 OF 2

LANDSCAPE PLAN

SCALE IN FEET
20' 10' 0 20' 40'
SCALE: 1" = 20'

TREE LEGEND

SYMBOL	PLANT NAME	SIZE	* QTY.	DETAIL	SHEET	REMARK	PLANT FACTOR
	OLEA EUROPAEA 'SWAN HILL' SWAN HILL OLIVE TREE	48" BOX 36" BOX	2 9	–	–	MULTI–TRUNK, FRUITLESS	LOW 0.3
	GEIJERA PARVIFLORA AUSTRALIAN WILLOW	36" BOX	23	–	–	STANDARD TRUNK	LOW 0.3

SHRUB/ GROUND COVER LEGEND

SYMBOL	PLANT NAME	SIZE	* QTY.	DETAIL	SHEET	REMARK	PLANT FACTOR
	CISTUS CRISPUS ROCK ROSE	5 GAL	–	–	–	SPACING PER PLAN	LOW 0.3
	LANTANA X 'NEW GOLD' NEW GOLD LANTANA	5 GAL	–	–	–	18" O.C. SPACING	VERY LOW 0.2
	PITTOSPORUM TENUIFOLIUM SILVER SHEEN KOHUHU	15 GAL	–	–	–	6'–0" O.C. SPACING	MEDIUM 0.5
	SALVIA SONOMENSIS CREEPING SAGE	5 GAL	–	–	–	3'–0" O.C. SPACING	LOW 0.3

* CONTRACTOR TO VERIFY EXACT QUANTITIES OF PLANT MATERIALS BASED ON CONDITIONS AND PLANT MATERIALS COVERAGE

ROOT BARRIER: ----------
ROOT BARRIER SHALL BE PROVIDED FOR ALL TREES WITH (5) FEET OF HARDSCAPE.

MULCH:
PLACE 3" THICK LAYER OF "FOREST FLOOR 1/2"–1 1/2"" BY AGUINAGA IN ALL PLANTING AREAS.
SUBMIT SAMPLE FOR APPROVAL. AVAILABLE THROUGH: AGUINAGA SALES AND RESEARCH DIVISION
16355 CONSTRUCTION CIRCLE WEST
IRVINE, CA 92606

NOTES:

1. ALL NEW PLANTING AREAS WILL BE IRRIGATED WITH LOW FLOW DRIP TUBING OR EMITTERS.
2. REFER TO ARCHITECTURAL, CIVIL, AND ENVIRONMENTAL PLANS FOR ADDITIONAL INFORMATION.

DIGALERT
DIAL TOLL FREE
811
AT LEAST TWO DAYS BEFORE YOU DIG
www.digalert.org
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

SHEET 1 OF 2

LANDSCAPE DESIGN PLAN
FALLBROOK ENERGY STORAGE SITE
03/15/2019

LYNN CAPOUYA INC.
LANDSCAPE ARCHITECTS
17992 MITCHELL SOUTH SUITE 110 IRVINE, CA 92614 PHONE (949) 756-0150

I:\Corgan\Fallbrook Energy Storage System\LCI Plan\Landscape Design Plan – Sheet 1.dwg;

CONCEPTUAL LANDSCAPE NOTES

1. THE CONCEPTUAL LANDSCAPE PLAN DEMONSTRATES COMPLIANCE WITH THE FALLBROOK DESIGN GUIDELINES AND DESIGN REVIEW CHECKLIST FOR INDUSTRIAL DEVELOPMENTS.
2. REFER TO ENVIRONMENTAL PLANS FOR EXISTING VEGETATION TO REMAIN, LOCATION OF ALL TREES TO BE REMOVED, LOCATION OF ALL HABITAT TYPES TO REMAIN, EXISTING TREE AND HABITAT PROTECTION DURING CONSTRUCTION ACTIVITIES AND RECOMMENDED PROCESS TO REPLACE THESE TREES IN KIND IF DAMAGED DURING CONSTRUCTION.
3. FINAL LANDSCAPE PLANS (LANDSCAPE DOCUMENTATION PACKAGE) WILL BE COMPLIANT WITH THE COUNTY'S CLIMATE ACTION PLAN, SPECIFICALLY, MEASURE W-1.2 (REDUCE OUTDOOR WATER USE). THE PROPOSED PLANTINGS FOR THIS PROJECT WILL BE ABLE TO MEET THIS REQUIREMENT.
4. THE PROPOSED LANDSCAPE WILL BE EFFICIENTLY IRRIGATED, COMPLIANT WITH THE COUNTY'S WATER CONSERVATION IN LANDSCAPING ORDINANCE AND WILL MEET THE STATE MANDATE AB1881 MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MWELO).
5. AES (OWNER) WILL BE RESPONSIBLE FOR THE ON-GOING MAINTENANCE OF THE LANDSCAPING, INCLUDING THE PUBLIC RIGHT-OF-WAY. AES TECHNICIANS WOULD TRAVEL TO THE SITE APPROXIMATELY ONCE PER MONTH TO PROVIDE CONTRACTED MAINTENANCE SERVICES INCLUDING LANDSCAPING.
6. REFER TO CIVIL PLANS FOR LOCATIONS OF ANY PROPOSED VEGETATED STORM WATER BMP'S.
7. REFER TO ENVIRONMENTAL PLANS FOR REMOVAL OF ALL INVASIVE SPECIES FROM THE SITE, INCLUDING FROM WITHIN THE EXISTING NATIVE HABITATS AND DRAINAGE CHANNEL AND EXISTING EUCALYPTUS TREES.
8. REFER TO FIRE PROTECTION PLAN FOR COORDINATION WITH ANY FIRE DISTRICT REQUIREMENTS FOR BRUSH MANAGEMENT.
9. REFER TO ENVIRONMENTAL PLANS FOR EXISTING NATIVE VEGETATION TO REMAIN, LOCATION OF THE PROPOSED 'NO GRADING' ZONE. REFER TO FIRE PROTECTION PLAN FOR MAINTENANCE AND FIRE PROTECTION NOTES.

GENERAL PLANTING NOTES

1. ALL TREE & SHRUB MATERIAL SPECIFIED MUST MEET STANDARD INDUSTRY SPECIFICATIONS FOR THE CONTAINER SIZE INDICATED. IF CONTRACTOR CANNOT LOCATE MATERIAL OF ACCEPTABLE SIZE AT THE TIME OF INSTALLATION, CONTACT LANDSCAPE ARCHITECT FOR SPECIES SUBSTITUTION. DOWN-SIZING OR SUBSTITUTION OF PLANT MATERIAL WITHOUT PRIOR APPROVAL OF LANDSCAPE ARCHITECT WILL NOT BE ALLOWED.
2. TREE LOCATIONS SHOWN ON PLAN MAY REQUIRE ADJUSTMENT IN THE FIELD. WHERE FEASIBLE, TREES SHOULD BE PLANTED A MINIMUM OF TEN (10) FEET FROM ALL UNDERGROUND UTILITIES AND OUT OF DRAINAGE FLOW LINES AND THREE (3) FEET FROM SPRAY HEADS. SHOULD THIS NOT BE POSSIBLE, CONTACT THE LANDSCAPE ARCHITECT FOR A DECISION ON TREE PLACEMENT.
3. FINISH GRADE IN ALL PLANTER AREAS SHALL BE 2 INCHES FOR SHRUB 1 INCH FOR TURF BELOW FINISH SURFACE OF SURROUNDING HARDSCAPE AND/OR UTILITY BOXES.
4. WHERE IT IS OBVIOUS IN THE FIELD THAT CONDITIONS DEVIATE FROM WHAT IS INDICATED ON THE PLANS, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE LANDSCAPE ARCHITECT OF THESE DISCREPANCIES. IN THE EVENT THIS NOTIFICATION IS NOT PERFORMED, THE CONTRACTOR SHALL ASSUME ALL RESPONSIBILITY FOR ANY NECESSARY REVISIONS.
5. INSTALL 3 INCHES OF SHREDDED WOOD MULCH OR AS NOTED PER DRAWINGS IN ALL NEWLY PLANTED AREAS UPON COMPLETION OF PLANTING. REFER TO SPECIFICATIONS FOR MULCH MATERIAL.
6. CONTRACTOR TO VERIFY EXACT QUANTITIES OF PLANT MATERIALS BASED ON CONDITIONS AND PLANT MATERIALS COVERAGE. QUANTITY PROVIDED IN THE LEGEND IS FOR CONVENIENCE ONLY.

SHRUB/ GROUND COVERS


CISTUS CRISPUS


LANTANA X 'NEW GOLD'


PITTOSPORUM TENUIFOLIUM


SALVIA SONOMENSIS

TREES


OLEA EUROPEA 'SWAN HILL'


GEIJERA PARVIFLORA

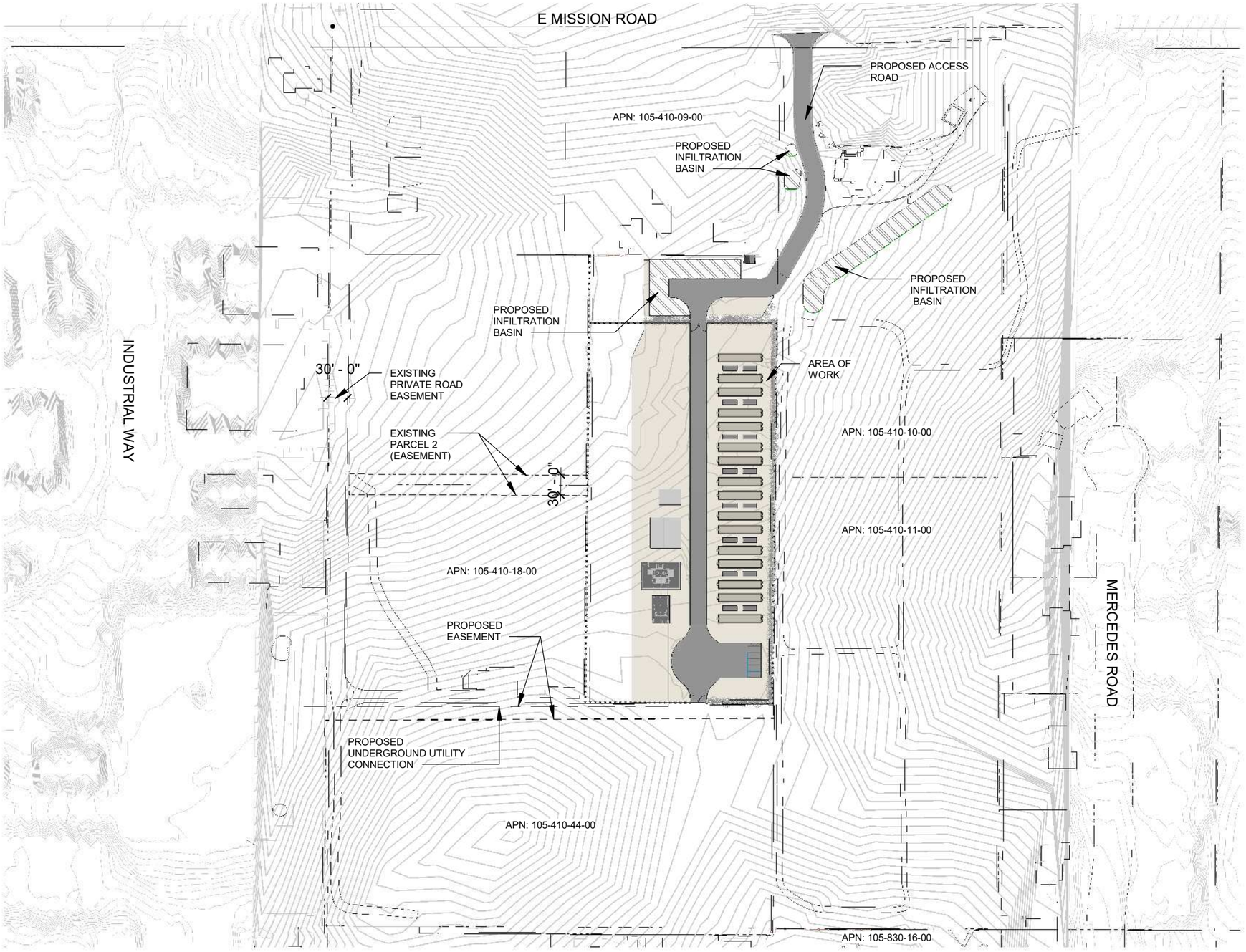
INERT MATERIALS


MULCH

DIGALERT
DIAL TOLL FREE
811
AT LEAST TWO DAYS BEFORE YOU DIG
www.digalert.org
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

LANDSCAPE DESIGN PLAN
FALLBROOK ENERGY STORAGE SITE
03/15/2019

LYNN CAPOUYA INC.
LANDSCAPE ARCHITECTS
17992 MITCHELL SOUTH SUITE 110 IRVINE, CA 92614 PHONE (949) 756-0150



OWNER:
AES Energy Storage LLC
4300 Wilson Blvd
Arlington, VA 22203

CONTACT:
Dauren Kilish
690 N. Studebaker Road
Long Beach, CA 90803
Ph. 562.577.7706

SITE ADDRESS:
1405 E. Mission Road
Fallbrook, CA 92028

APN: 105-410-19-00

SUMMARY TABLE
Existing:
LOT ACRES: 4.220
LOT Sq. Ft: 183,823

Proposed:
Total Fenced Area: 179568 Sq. Ft.
New access road
Switchgear PDC, Aux Transformer
16 Battery Containers: 756 Sq. Ft. ea.
16 Inverter/Transformers: 130 Sq. Ft. ea.

FALLBROOK, CA
COUNTY OF SAN DIEGO

VICINITY MAP
NOT TO SCALE

0' 40' 80' 160'

NORTH

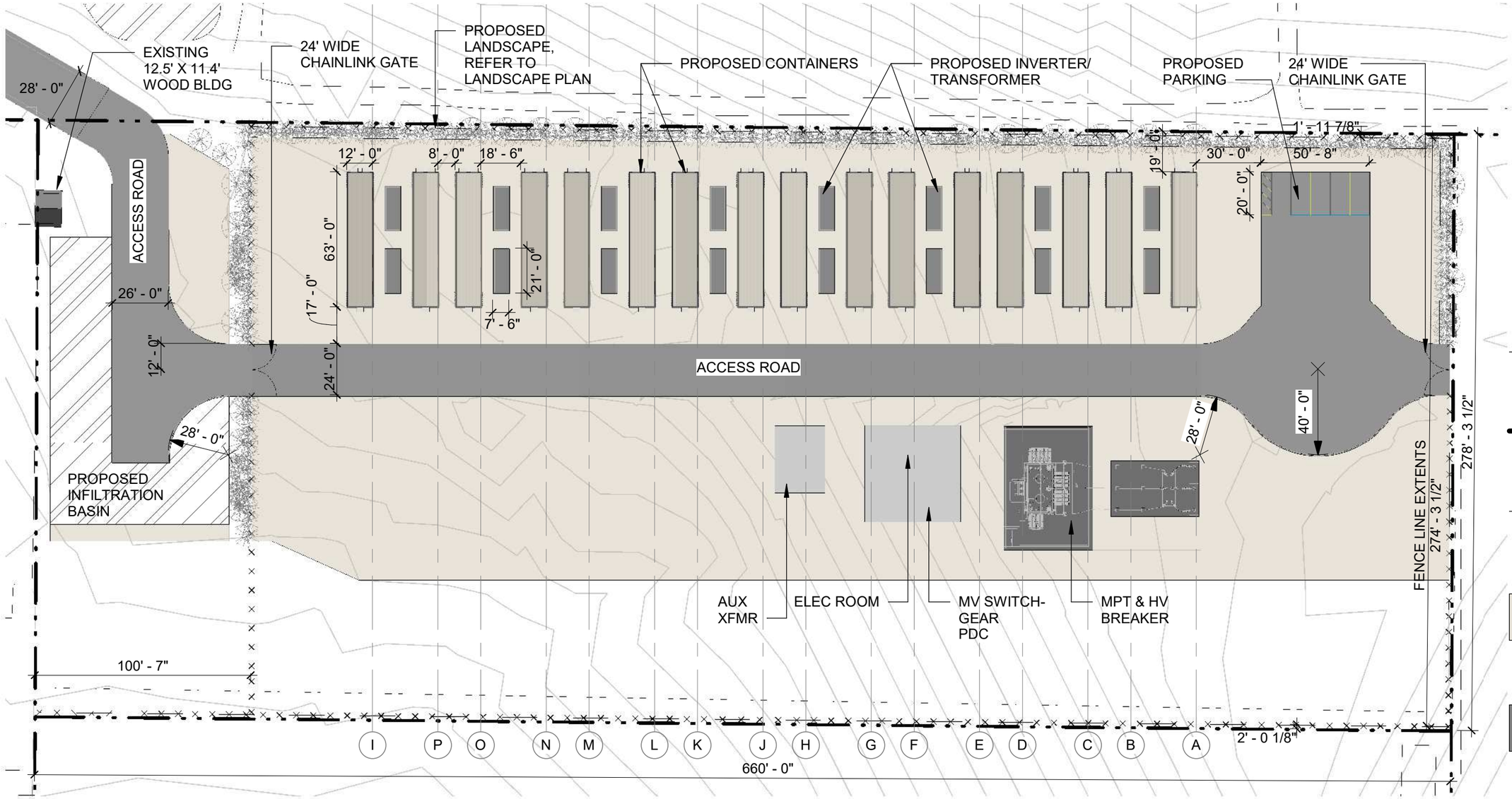
1. REFER TO ATTACHED SITE EXHIBIT BY PSOMAS FOR ADDITIONAL INFORMATION.
2. REFER TO ATTACHED ARCHITECTURAL PLOT PLAN FOR ADDITIONAL INFORMATION.

Project Number: 18270.0000

SITE PLAN

As indicated
03/15/2019

CORGAN



1. SITE LIGHTING WILL BE DESIGNED PER SAN DIEGO DEPARTMENT OF UILDING & SAFETY REQUIREMENTS.
2. REFER TO CIVIL AND LANDSCAPE DRAWINGS FOR ADDITIONAL SITE INFORMATION

PROPOSED 7'-0" HIGH FENCE

EXISTING PROPERTY LINE

EXISTING FENCE TO BE REPLACED

PROPOSED GRAVEL INFILL, REFER TO CIVIL

PROPOSED ASPHALT ACCESS ROAD, REFER TO CIVIL

0' 25' 50' 100'

NORTH

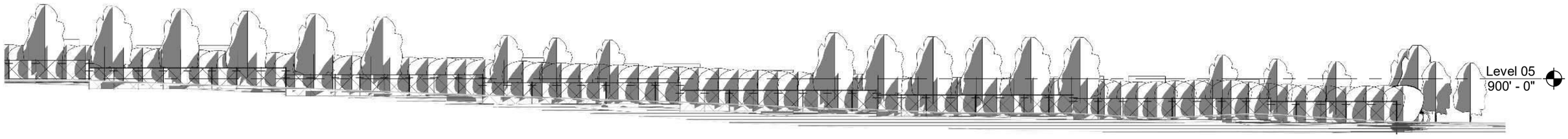
Project Number: 18270.0000

PLOT PLAN

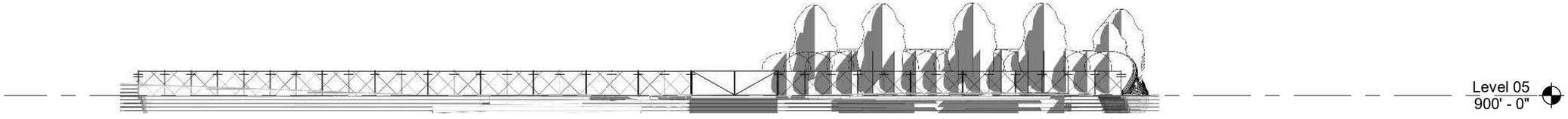
As indicated

03/15/2019

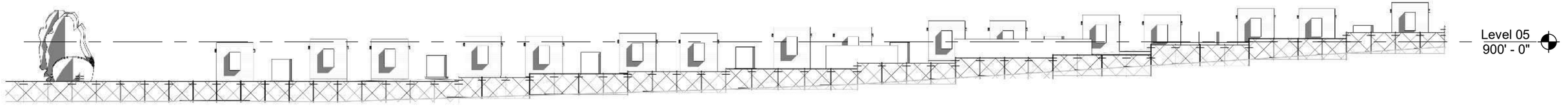
CORGAN



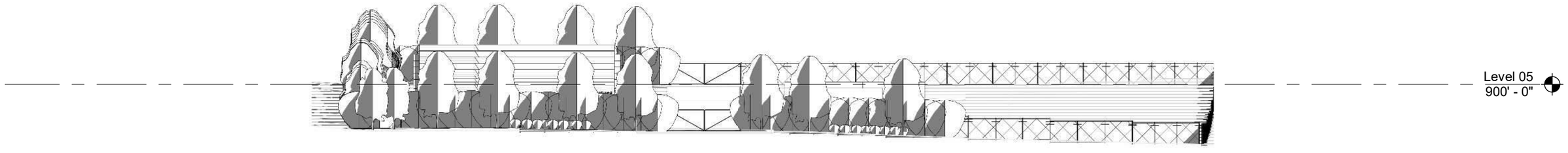
4 EAST ELEVATION
1/32" = 1'-0"



3 SOUTH ELEVATION
1/32" = 1'-0"



2 WEST ELEVATION
1/32" = 1'-0"



1 NORTH ELEVATION
1/32" = 1'-0"

Project Number: 18270.0000

ELEVATIONS

03/15/2019

CORGAN

Project Number: 18270.0000

VIEW FROM NORTH

03/15/2019

CORGAN

Project Number: 18270.0000

VIEW FROM NORTH-EAST

03/15/2019

CORGAN

Project Number: 18270.0000

VIEW FROM SOUTH-EAST

03/15/2019

CORGAN

Project Number: 18270.0000

VIEW FROM SOUTH-WEST

03/15/2019

CORGAN

Project Number: 18270.0000

VIEW FROM WEST

03/15/2019

CORGAN

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ATTACHMENT 6

Copy of Project's Drainage Report

This is the cover sheet for Attachment 6.

If hardcopy or CD is not attached, the following information should be provided:

Title: CEQA Preliminary Drainage Study – Fallbrook Battery Energy Storage System
Prepared By: Haley & Aldrich, Inc.
Date: August 2019

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ATTACHMENT 7

Copy of Project's Geotechnical and Groundwater Investigation Report

This is the cover sheet for Attachment 7.

If hardcopy or CD is not attached, the following information should be provided:

Title:
Prepared By:
Date:

R E P O R T

GEOTECHNICAL INVESTIGATION SAN DIEGO GAS & ELECTRIC FALLBROOK BATTERY STORAGE PROJECT; PARCEL 1 FALLBROOK, CALIFORNIA

Prepared for

Mr. Mike Mochan
Casteel Corporation
127 Atlas Crossing Road
Uniontown, PA 15401

AECOM Project No. 60534181

February 27, 2017

AECOM

401 West A Street, Suite 1200
San Diego, CA 92101
619-610-7600

AECOM

February 27, 2017

Mr. Mike Mochan
Casteel Corporation
127 Atlas Crossing Road
Uniontown, PA 15401

Subject: Geotechnical Investigation
San Diego Gas & Electric
Fallbrook Battery Storage Project; Parcel 1
Fallbrook, California
AECOM Project No. 60534181

Dear Mr. Mochan:

AECOM Technical Services, Inc. is providing this final geotechnical report for the above-referenced project in accordance with our proposal dated January 9, 2017 and our request for contract extension dated January 24, 2017. This geotechnical report provides the findings from the subsurface exploration performed, a discussion of geologic and geotechnical conditions, and geotechnical recommendations for design and construction of the project.

If you have any questions regarding this report, or if we can be of further service, please contact us.

Sincerely,
AECOM Technical Services, Inc.

Steven M. Fitzwilliam, G.E. 2501
Principal Geotechnical Engineer

Derek R. Rector, C.E.G. 2635
Project Engineering Geologist

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101
Tel: 619.610.7600

TABLE OF CONTENTS

Figures

Tables

Appendices

SECTION 1 INTRODUCTION

This report presents the results of AECOM Technical Services, Inc. (AECOM) geotechnical investigation for the proposed San Diego Gas & Electric Company (SDG&E) Battery Storage Project (Project) in Fallbrook, California. The Project site is located south of East Mission Road as shown on Figure 1.

1.1 PROJECT DESCRIPTION

The Project is planned to be constructed within an existing vacant lot. A site plan showing the Project location is presented in Figure 2. Based on a review of conceptual drawings, we understand that the Project consists of approximately 30 battery storage modular core containers that may be housed in a warehouse building, a main transformer, fifteen (15) isolation transformers, and an auxiliary transformer. We further understand that the equipment will be supported on shallow mat/pad foundations and the building may be supported on continuous footings.

An infiltration basin is planned for the Project. We expect the basin will be located at the northwest corner of the site, as that location is at the lowest elevation compared to the rest of the site.

We understand the Project is being designed by a joint venture between AES and Casteel Corporation, the Engineer, Procure, Construct (EPC) Contractor. The engineering recommendations presented in this geotechnical investigation report are suitable for Project design and construction.

1.2 SCOPE OF SERVICES

The purpose of our services was to evaluate the subsurface conditions at the site and perform preliminary geotechnical analyses to provide recommendations for design and construction of the proposed improvement. The scope of services included the following tasks:

- Performing a site reconnaissance and boring location mark out;
- Coordinating utility clearance through Underground Services Alert (USA);
- Engaging a contractor to complete geotechnical borings;
- Performing percolation testing;
- Performing geotechnical laboratory testing;
- Evaluating subsurface conditions (including soil and groundwater) at the site;
- Preparing engineering recommendations for the design and construction of the structure foundations, including bearing capacity, vertical subgrade modulus, and lateral resistance parameters;
- Developing of seismic design parameters in accordance with the California Building Code (CBC);
- Discussing earthwork/trenching considerations; and
- Preparing this geotechnical report.

SECTION 2 GEOTECHNICAL INVESTIGATION

The geotechnical investigation included reviewing published geologic information, as well as performing additional subsurface explorations, infiltration testing, and geotechnical and electrical resistivity laboratory testing.

2.1 FIELD INVESTIGATION

Our geotechnical field investigation included six exploratory borings and two in-situ percolation tests. The explorations were extended to depths ranging from 6 to 19 feet below ground surface (bgs). The borings were advanced on February 1, 2017 and the percolation testing was completed in Borings P1 and P2 on February 2, 2017. The locations of the explorations are shown on the Site Plan (Figure 2).

The borings were advanced with a truck mounted drill rig using hollow-stem augers. Drive samples were collected during the drilling program. Bulk grab samples were collected from the upper foot of the surficial soil and returned to the geotechnical laboroatry. An AECOM engineering geologist and a geotechnical engineer supervised the drilling activities and logged and sampled the explorations.

The exploratory program is discussed further in Appendix A, which also presents the logs of the explorations. The descriptions on the logs are based on field logging and laboratory testing.

Testing to evaluate the infiltration characteristics of the subsurface was performed in Borings P1 and P2, which extended to depths of 6 feet bgs. Percolation testing was performed in general accordance with the testing procedure outlined by the County of San Diego, Department of Environmental Health guidelines titled “Design Manual for Onsite Wastewater Treatment Systems, County of San Diego Department of Environmental Health, Land and Water Quality Division,” March 22, 2010 (Updated November 25, 2013). The summarized test data is presented in Section 5.5 below. Complete tables of data collected are presented in Appendix A, Figure A-8 (Percolation Test Data).

2.2 LABORATORY TESTING

The materials encountered in the borings were visually classified and evaluated with respect to relative density or consistency and moisture content. The samples were returned to our geotechnical laboratory for further examination and testing. The visual classifications were further evaluated by performing moisture content, unit weight, Atterberg Limits tests and grain size analyses. The shear strength of the soil was evaluated by correlating with the blow count and index test results. The pavement subgrade strength was evaluated by performing an R-Value test. Corrosion potential of the near-surface soil was also evaluated. Testing was performed in general accordance with ASTM International (ASTM) or other relevant standards.

Thermal resisitiviy testing of the subsurface materials was performed on select soil samples from the upper 5 feet of the surface. Thermal resisitivity tests were performed at various moisture contents in compliance with IEEE 442 specifications by NV5. Test results from the NV5 laboratory testing along with the corresponding thermal dryout curves are included in Appendix B.

Results of the geotechnical laboratory testing are presented at the corresponding sample locations on the boring logs in Appendix A; detailed results of the laboratory testing are presented in Appendix B.

SECTION 3 GEOLOGIC AND SITE CONDITIONS

Knowledge of the site conditions was developed from a review of the local geology, available information and current subsurface explorations.

3.1 GEOLOGIC SETTING

The project site is in the Peninsular Ranges geomorphic province and lies along the western margin of the foothills sub-province. The foothills sub-province is underlain by Cretaceous granitic rock and Jurassic age metavolcanic rocks overlain with Quaternary age alluvium, alluvial fans and valley fill deposits in the low lying areas.

The proposed battery storage Project area is underlain by variably weathered granitic rock. The ground surface in the Project area has been slightly modified for agricultural purposes. The site lies just to the south of the broad drainage area that is underlain by alluvial deposits. A Regional Geologic map on a topographic base is presented as Figure 3.

3.2 TECTONIC AND SEISMIC SETTING

The Project site, and southern California in general, lie in an active tectonic region. At the latitude of the study area, the interaction between the North American and Pacific plates is considered to take place across a wide area, extending from the San Andreas fault zone in the Imperial Valley to the east, to tens of miles offshore to the west.

The main fault zones are predominantly northwest trending right-lateral strike-slip faults. Other significant faults include northeast-trending left-lateral strike-slip conjugate faults, and locally, east-west trending reverse faults, and blind thrust faults.

To the west of the San Andreas fault zone, other main faults include the San Jacinto fault zone, Whittier-Elsinore fault zone, Newport-Inglewood-Rose Canyon fault zone and a complex zone of branching and stepping northwest-trending offshore faults. The major active faults closest to the site are the Oceanside section of the Newport-Inglewood-Rose Canyon fault zone located in the offshore zone to the west and the Elsinore fault zone located to the east. Active faults located farther offshore include the Palos Verdes-Coronado Bank fault zone and the San Diego Trough fault zone.

The active faults (i.e. Holocene-age fault rupture) and potentially active (i.e. Quaternary-age fault rupture) faults are shown on the Regional Fault and Epicenter Map, Figure 4.

The Temecula section of the active Elsinore fault zone lies approximately 8 miles to the east of the site. In the proximity of the Temecula section are the Wolff Valley fault and Murrietta Creek fault. The estimated maximum moment magnitude (Mw) of a seismic event on the Temecula section of the Elsinore fault zone ranges from 6.8 to 7.0. Larger magnitudes are possible if multiple faults in the area rupture in a single event with potential maximum moment magnitudes (Mw) ranging from 7.7 to 7.8 (USGS, 2008).

The Newport-Inglewood-Rose Canyon fault zone and the known active strands along the Oceanside section of the zone are located approximately 18 miles west of the site. Based on the USGS Quaternary

fault and fold database website of National Seismic Hazard Maps, the estimated maximum moment magnitude (M_w) of a seismic event on the Newport-Inglewood-Rose Canyon fault zone ranges from 6.7 to 6.9 (USGS, 2008). Larger earthquake events may be possible if multiple segments of these fault zones rupture in a single event

3.3 SURFACE CONDITIONS

The site area is currently a moderately vegetated vacant lot. We understand the site was previously used as an avocado grove. The ground surface elevation of the Project area grades from approximately +810 feet to +790 feet Mean Sea Level (MSL) with a gentle slope down to the northwest.

3.4 SUBSURFACE CONDITIONS

The evaluations of subsurface conditions for the Project have been based on the borings performed for this investigation and our review of available geologic information. The subsurface consists of surficial fill and residual soil underlain by weathered granitic rock. These units are described below.

3.4.1 Fill / Residual Soil

Our explorations encountered shallow fill (interpreted to be disturbance caused by the previous agricultural activities) over residual soil. These surficial units, which extended to depths of 2 to 5 feet bgs, were observed to consist of silty to clayey sand.

3.4.2 Granitic Rock

The Project site is underlain by variably weathered granitic rock. The rock is completely weathered to a maximum depth of 5 feet as encountered in our borings. The completely weathered rock typically excavates to silty or clayey sand with some gravel and generally behaves as a medium dense to dense soil. The completely weathered rock becomes highly weathered below a depth of 5 feet bgs, which extended to target depths. Highly weathered rock typically excavates to silty sand, poorly graded sand or well-graded sand. For engineering design considerations we have developed a three layer soil profile as presented in Section 5.2.1 and consisting of; engineered fill (see recommendations in earthwork section below); completely weathered rock, and highly weathered rock. The recommended design parameters and associated depths for each profile layer are presented in Table 1 in Section 5.2.1.

A potentially significant construction consideration in this granitic rock setting is that even within the zone of completely or highly weathered rock (generally rippable conditions based on recent drilling information), there is a potential for less weathered rock to occur in localized zones that could result in marginally rippable or non-rippable conditions. These hard rock zones are sometimes referred to as core stones or “floaters” and can result in more difficult excavation conditions than in adjacent areas.

3.5 GROUNDWATER

A permanent groundwater surface was not encountered in the current explorations. Groundwater is anticipated to be greater than 25 feet bgs. Localized perched groundwater conditions may exist underlying the site.

SECTION 4 SEISMIC AND GELOGIC HAZARDS

This section presents our evaluations of the seismic and geologic hazards at the site based on review of available geologic information, the results of our current investigation, engineering evaluations and analyses, and professional judgment.

4.1 FAULT RUPTURE

The potential for surface fault rupture at the site is considered to be very low. The site is not located within California Geological Survey (CGS) Fault-Rupture Hazard Zones (Alquist-Priolo Earthquake Fault Zones). There are no active or potentially active faults within the site area based on regional geologic mapping and our investigations. The nearest active fault to the site is the Elsinore fault zone located approximately 8 miles east of the site. This fault is not considered to present a significant fault rupture hazard in the site area.

4.2 LIQUEFACTION AND SECONDARY EFFECTS

Liquefaction is a phenomenon in which loose to medium dense, saturated, granular materials undergo matrix rearrangement, develop high pore water pressure, and lose shear strength because of cyclic ground vibrations induced by earthquakes or other ground vibrations. This rearrangement and strength loss is followed by a reduction in bulk volume of the liquefied soils. The secondary effects of liquefaction include sand boils, settlement, reduced soil shear strength, lateral spreading and global instability (flow slides in areas with sloping ground).

The project site is predominately underlain by variably weathered dense and very dense granitic rock. Further, groundwater is expected to occur at depth within the fractured granitic rock. Therefore, the potential for liquefaction at the site should be very low.

Strong ground motion can cause the densification of soils, resulting in settlement of the ground surface. This phenomenon is known as seismically-induced settlement or seismic compaction, which typically occurs in dry, loose cohesionless soils. During an earthquake, soil grains may become more tightly packed due to the collapse of voids or pore spaces, resulting in a reduction in the thickness of the soil column. Given the dense and very dense nature of the subsurface materials, the potential for seismic compaction at the site is considered low.

4.3 LANDSLIDES AND SLOPE STABILITY

The Project site is relatively flat. No existing slopes are located within the Project area. Site grading creating new slopes or requiring retaining walls is not expected for the Project. The potential for landsliding to impact the Project is considered to be low.

4.4 EXPANSION AND COLLAPSE POTENTIAL

The on-site residual soil as well as the granitic rock weathering is predominately silty to clayey sand with a relatively low plasticity. Excessive swelling or shrinkage of the surficial soil/rock due to wetting and

drying over time is not anticipated. The potential for expansive soil to impact performance of the proposed improvements is considered low.

Loose granular soils can be subject to collapse due to wetting and/or inundation. Collapse can occur in dry granular soils that have an unstable soil structure due to deposition or irrigation processes, typically with a skeletal structure that is weakly cemented by soluble salts or clay. Increases in moisture content can cause the interparticle cementation to reduce, causing changes in volume (collapse), especially when loaded. The native soils are primarily derived from weathering of the native granitic rock. Therefore, the potential for collapse at the site is considered low.

4.5 SETTLEMENT

The proposed improvements will be supported on shallow foundations. The soil and weathered granitic rock that will underlie the shallow foundations for the proposed improvements is dense to very dense. The estimated settlement has been evaluated with respect to the anticipated loads and has been incorporated in the engineering design. The potential for excessive settlement affecting the proposed development is low.

4.6 OTHER HAZARDS

The local geologic conditions indicate that other geologic hazards are not likely to affect the site. Given the geologic and hydrogeologic setting of the site, the potential for subsidence is very low. Given the location and relative elevation of the site, the potential for seiches or tsunamis affecting the site is considered very low. Similarly, the site is not located within a designated flood plain and the flood hazard is considered low. These hazards should not constitute constraints to proposed improvements.

SECTION 5 DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

The discussions, conclusions, and recommendations presented in this report are based on the information provided to us, results of current subsurface explorations and laboratory testing, engineering evaluations and analyses, literature research, empirical correlations, and professional judgment.

The subsurface conditions at the site are suitable for the proposed development, provided the recommendations presented in this section are incorporated into the design and construction.

5.1 EARTHWORK

Earthwork should be completed according to SDG&E Standard Specifications and the most recent editions of applicable sections of the County of San Diego grading codes and the Standard Specifications for Public Works Construction (*i.e.*, Greenbook). The following sections provide further recommendations for general earthwork that are specific to the geotechnical conditions encountered. Due to the existing site topography and the proposed site improvements, earthwork for the project is anticipated to be minimal.

5.1.1 Site Preparation

Roots and other vegetative matter, should be removed and disposed either offsite or stockpiled for reuse in landscape areas. Existing infrastructure, if any, should be properly demolished and disposed at an appropriate facility offsite. Any other soil areas disturbed by the demolition should be removed and recompacted or replaced with non-expansive fill to the satisfaction of the Geotechnical Engineer.

Existing shallow fill and residual soils are not considered suitable for the support of the proposed improvements and therefore should be removed in its entirety and replaced as engineered fill. It is recommended that the proposed foundations, slabs-on-grade and pavements should be supported on engineered fill or completely weathered rock. Upon completion of removals, the surface within areas to receive fill should be scarified, moisture conditioned as necessary, and compacted prior to fill placement. Areas temporarily vacated during earthwork should be similarly scarified, moisture conditioned and reworked to the satisfaction of a Geotechnical Engineer before placing additional fill to avoid drying out and lamination along the fill interface. Localized deeper soft soils that may be identified during subgrade exposure should be locally removed and replaced with engineered fill. A geotechnical professional should make the final determination of actual removal depths in the field during earthwork.

5.1.2 Fill Materials

Any fill or backill used for the Project should consist of select fill. Most of the onsite material is anticipated to be suitable for use as select fill, otherwise Class 2 Aggregate Base, or another quarried or natural source, could be used. Select fill should meet the following criteria:

- Contain no rocks or hard lumps greater than three inches in maximum dimension;
- Have a well-graded particle size distribution containing at least 40% of material smaller than ¼ inch in size, and a fines content (percent, by weight, passing the No. 200 sieve) less than 35%.
- Have an Expansion Index of 30 or less when tested in accordance with ASTM D4829; and
- Not have any perishable, spongy, deleterious or otherwise unsuitable material.

The Geotechnical Engineer should review and test all proposed fill sources before their use.

5.1.3 Fill Placement and Compaction

Fill material should be moisture conditioned to achieve a uniform moisture that is above the optimum moisture content. Fill material should be placed in loose lifts no thicker than eight inches, or thinner as needed to achieve the specified relative compaction. Each lift should be compacted to not less than 90 percent relative compaction, using the latest version of ASTM D1557 as the compaction standard. Any fill within the upper two feet of finished grade should be compacted to not less than 95 percent relative compaction.

5.2 FOUNDATIONS

We anticipate that mat/pad type shallow foundations will be used to support the new facility structures (modular core containers and main, auxillary and isolation transformers) outside of the Battery Storage Array Warehouse and the warehouse will be supported on continuous footings. AECOM has not been provided with the preliminary foundation sizes.

Based on the expected foundation types described above, we have performed engineering evaluations for shallow foundation support for the proposed battery storage facility structures. The recommendations provided herein may be used in the design of the foundations for the Project.

5.2.1 Subsurface Soil Profile

We have developed a subsurface soil profile to define soil parameters for use in foundation design. The design parameters presented below are intended for use in foundation design and may not reflect actual soil properties. Actual subsurface conditions in the field may vary. We recommend a subsurface soil profile consisting of engineered fill from 0 to 3 feet bgs underlain by completely weathered granitic rock from 3 to 5 feet bgs over highly weathered granitic rock from 6 to 15 feet. Groundwater can be assumed to be below a depth of 25 feet. The following soil parameters indicated in Table 1 may be used.

Table 1
Subsurface Soil Profile
Fallbrook Battery Storage Project

Strata	Depth (feet)	Soil Classification	Friction Angle, Φ (degrees)	Cohesion, c (psf)	Unit Weight, γ (pcf)
Engineered Fill	0-3	Silty/Clayey Sand, SC/SM	33	0	120
Completely Weathered Granitic Rock	3-5	Clayey Sand, SC	35	0	125
Highly Weathered Granitic Rock	>5	Silty Sand, SM	38	0	130

Note:
1. psf – pounds per square foot.
2. pcf – pounds per cubic foot.

5.2.2 Allowable Bearing Pressure

All footings should bear on engineered fill or on undisturbed completely weathered rock and should be embedded at least 18 inches below lowest adjacent grade and should be at least 24 inches wide. The foundations supported on engineered fill or undisturbed completely weathered rock may be designed for an allowable bearing pressure of 3,000 or 4,500 pounds per square foot (psf), respectively. The footings should be fully embedded in engineered fill or undisturbed weathered rock and should not transition between fill and formational soils/weathered rock. A one-third increase may be applied to the allowable bearing pressure for temporary wind and seismic loading. Adjacent footings founded at different elevations should be located such that the slope from bearing level to bearing level is flatter than 1:1 horizontal:vertical (H:V).

5.2.3 Resistance to Lateral Loading

Resistance to lateral loads on the shallow foundations can be provided by passive resistance along the edge of the foundation and by frictional resistance along the bottom of the foundation. An allowable equivalent fluid weight of 250 or 300 pounds per cubic foot (pcf) may be used for passive resistance for footings or grade beams poured neat against engineered fill or completely weathered rock, respectively. The upper 12 inches of material in areas not protected by hardscapes should not be included in the calculation of passive resistance. If friction is to be used to resist lateral loads, an allowable coefficient of friction of 0.4 may be used between foundation concrete and engineered fill or undisturbed weathered rock. If frictional and passive resistances are combined, the allowable friction coefficient should be reduced to 0.3. Passive resistance may be increased by one-third for loads that include wind or seismic forces.

5.2.4 Settlement

We anticipate that shallow foundations designed with the bearing pressures presented above may settle approximately ½-inch when loaded.

5.2.5 Modulus of Vertical Subgrade Reaction

Mat or pad foundations may be designed using a coefficient of vertical subgrade reaction (k_1). We recommend a k_1 of 260 tons per cubic foot (tcf) (300 pounds per cubic inch (pci)) for mat/pad foundations bearing on engineered fill or completely weathered rock. The k_1 value is representative of the subgrade modulus as measured from a field load test using square plate of dimensions 1 ft by 1 ft. The value of the coefficient of subgrade reaction depends on the foundation dimensions. For any given foundation geometry and size, the above recommended modulus should be adjusted as follows:

Square Foundation: $$k_{(BxB)} = k_1 \left[\frac{1}{B} \right]$$

Rectangular Foundation: $$k_{(BxL)} = \frac{k_{(BxB)} (1+0.5B/L)}{1.5}$$

Where,

$k_{(BxB)}$ = coefficient of vertical subgrade reaction of a square footing having dimensions B ft x B ft (pci)

$k_{(BxL)}$ = modulus of vertical subgrade reaction of a rectangular footing having dimensions of
B ft x L ft (pci)

k_1 = coefficient of vertical subgrade reaction of a footing measuring 1 ft x 1 ft (pci)

B = foundation width (ft), where B is either the lesser of the width of the column spacing or the width of mat foundation

L = foundation length (ft)

The above recommendations were developed from Terzaghi (1955) as referenced in Das (1999) and are appropriate for granular subgrade soil.

5.3 CONCRETE SLABS-ON-GRADE

A modulus of vertical subgrade reaction of 150 pci may be used to design the concrete slabs-on-grade constructed on engineered fill or completely weathered granitic rock. The Structural Engineer should design the thickness and reinforcement of concrete slabs-on-grade to accommodate concentrated loads and heavy distributed loads. Expansion joints and crack control sawcuts should be included at regular intervals.

Groundwater is expected to be below the planned improvements and special waterproofing measures are not anticipated for interior floor slab of the control shelter. However, waterproofing should be considered if minor moisture seepage through the floor slab due to external water sources, such as landscaping or ponding water, is a concern.

5.4 PAVEMENT

5.4.1 Flexible Pavements

The structural design of Asphalt Concrete (AC) flexible pavement depends primarily on anticipated traffic conditions, subgrade soils, and construction materials. Laboratory subgrade strength testing on a near-surface soil sample resulted in an R-Value of 57; we have assumed R-value of 45 to be representative of the as-graded condition of the pavement subgrade.

Table 2 provides recommended flexible pavement structural sections for a range of Traffic Indices (TI), which should be confirmed by the project civil engineer. The design assumes a pavement life of 20 years with normal maintenance. The sections assume properly prepared subgrade consisting of at least 12 inches of soil compacted to a minimum of 95 percent relative compaction, as determined by the latest version of ASTM D1557. The aggregate base should be placed at a minimum relative compaction of 95 percent. Aggregate base should conform to Section 26 of the Caltrans Standard Specifications or Section 200-2 of the "Standard Specification for Public Works Construction".

Table 2
Flexible Pavement Structural Sections
Fallbrook Energy Storage Project

Traffic Index	Asphalt Thickness (in)	Base Thickness (in)
5.0	3.0	4.0
6.0	3.5	5.0
7.0	4.0	6.0

5.4.2 Rigid Pavements

Portland cement concrete (PCC) pavements should be used in areas where dumpsters will be stored and picked up or in areas of anticipated heavy-truck traffic. Our experience indicates that heavy-truck traffic can shorten the useful life of AC sections. We preliminarily recommend the pavement section should consist of 6 inches of PCC over 4 inches of aggregate base or 7 inches PCC over prepared subgrade. The base and soil subgrade should be compacted as recommended above for flexible pavement. The concrete pavements should be provided with expansion joints at regular intervals.

5.5 STORMWATER CONSIDERATIONS

Measures should be taken to properly finish grade the site to direct surface water away from foundations. To avoid the potential for damage to the proposed improvements, we recommend that infiltration into the subsurface soil adjacent to the proposed improvements be avoided.

The project site is gently sloping to the northwest portion of the site. Subsurface infiltration properties were evaluated at the site by performing percolation testing in two of the borings, P-1 and P-2. Percolation rates were calculated in minutes per inch (mpi) per County guidelines. These data were then

converted to an approximate infiltration rate in inches per hour using the Porchet Method. Percolation test measurements and calculated infiltration rates are presented in Table 3 below.

Table 3
Infiltration Rates and Percolation Test Measurements
Fallbrook Battery Storage Project

Test Location	Percolation Rate [1] (min/inch)	Percolation Rate (inches/hr)	Percolation Rate (cm/sec)	Infiltration Rate[2] (inches/hr)
P-1	288	0.21	1.48E-04	0.0097
P-2	304	0.20	1.40E-04	0.0073
Average	296	0.205	1.44E-04	0.0085

Note:
1. Percolation rates as determined by borehole percolation tests.
2. Infiltration rate based on conversion from percolation rate using Porchet Method.

The measured infiltration rates are indicative of sand or a sand/clay mixture, which is consistent with the material observed in the borings (weathered granitic rock, typically a silty sand to clayey sand). We recommend a Project site-specific design infiltration rate of less than 0.01 inches per hour to be used in Worksheet C.4-1: Factor of Safety and Design Infiltration Rate Worksheet (County of San Diego 2016 Storm Water Standards) for calculating a design infiltration rate, which indicates "No Infiltration" condition.

5.6 SEISMIC DESIGN

The Project area will likely be subject to moderate to severe ground shaking in response to a local or more distant large-magnitude earthquake occurring during the expected life of the proposed facilities.

For design in accordance with the 2016 CBC (based on ASCE 7-10), the following parameters should be used. These parameters are developed in the code based on Risk-Targeted Maximum Considered Earthquake (MCE_R) ground motion response accelerations. For the purposes of seismic design, we have classified the site as Site Class C.

Table 4
2016 California Building Code (CBC) Seismic Coefficients
Fallbrook Battery Storage Project

2016 CBC Seismic Coefficients Parameter	Value	Reference
Site Class	C	ASCE 7-10, Table 20.3-1
Mapped Spectral Acceleration - Short Period, S_s (g)	1.236	2016 CBC Figure 1613.3.1(2)[1]
Mapped Spectral Acceleration - 1 Sec. Period, S_1 (g)	0.478	2016 CBC Figure 1613.5(4)[1]
Site Coefficient - Short Period, F_a	1.000	2016 CBC Table 1613.3.3(1)[1]
Site Coefficient - 1 Sec. Period, F_v	1.322	2016 CBC Table 1613.3.3(2)[1]

2016 CBC Seismic Coefficients Parameter	Value	Reference
MCE[2] Spectral Response Acceleration - Short Period, S_{MS} (g)	1.236	2016 CBC Equation 16-37, $S_{MS}=F_aS_S$
MCE[2] Spectral Response Acceleration - 1 Sec. Period, S_{M1} (g)	0.632	2016 CBC Equation 16-38, $S_{M1}=F_vS_1$
Design Spectral Response Acceleration - Short Period, S_{DS} (g)	0.824	2016 CBC Equation 16-39, $S_{DS}=2/3*S_{MS}$
Design Spectral Response Acceleration - 1 Sec. Period, S_{D1} (g)	0.421	2016 CBC Equation 16-40, $S_{D1}=2/3*S_{M1}$

Notes:
1. Calculated using U.S. Seismic Design Maps web application developed by USGS.
2. MCE – Maximum Considered Earthquake.
3. Site coordinates estimated from 'Google Earth' computer program used to evaluate coefficients: 33.38525; -117.23473.

5.7 CORROSIVITY

A near-surface sample was tested for chemical properties associated with corrosivity. Results are presented in Appendix C. Laboratory testing resulted in a minimum electrical resistivity of 1,560 ohms-centimeter (ohm-cm); these soils may be considered "Fairly corrosive" to metallic utility piping and conduits. The results of the near-surface tests indicate that the soil has negligible potential for chloride and sulfate attack to concrete.

A corrosion engineer should be consulted for additional design recommendations. The type of concrete and corrosion protection for steel should be determined by the structural and/or corrosion engineer.

5.8 CONSTRUCTION CONSIDERATIONS

5.8.1 Excavation Characteristics

Excavations will be primarily in relatively shallow surficial soils and weathered granitic rock. Shallow foundation and trench excavation in surficial soils is expected to encounter little difficulty and weathered rock is expected to encounter moderate difficulty using modern trenching machines, drill rigs or backhoes for shallow excavations. Conventional earth moving equipment (bulldozers, backhoes, excavators, etc.) should also be able to excavate these deposits to shallow depths with moderate difficulty. Localized corestones and moderately weathered granitic rock should be anticipated within the project area. Moderate to heavy ripping effort and rock excavation techniques may be required for deeper excavations.

This assessment assumes that the excavating equipment is well maintained and operating at factory-specified efficiencies. The choice of excavation method is often a function of economics, level of desired effort, logistics, quality and size of machinery used, permit conditions, and contractor convenience.

5.8.2 Temporary Slopes

The design and construction of temporary slopes, as well as their maintenance and monitoring during construction, is the responsibility of the Contractor. The Contractor should have a geotechnical or geological professional evaluate the soil/rock conditions encountered during excavation to determine permissible temporary slope inclinations and other measures as required by California OSHA

(Cal/OSHA). The Contractor's geotechnical or geological professional may use the factual information provided in this report, as well as any additional data they may need to acquire, to assess the stability of temporary slopes and prepare a specific temporary slope analysis and/or develop parameters to design temporary support systems.

Based on the existing data interpreted from site reconnaissance and subsurface exploration, the design of temporary slopes and benches for planning purposes may assume Cal/OSHA Type C for subsurface soils.

Existing infrastructure that is within a 2:1 H:V line projected up from the bottom edge (toe) of temporary slopes should be monitored during construction.

The Contractor should note the materials encountered in construction excavations could vary significantly across the site. The above assessment of Cal/OSHA soil type for temporary excavations is based on preliminary engineering classifications of material encountered in widely spaced excavations. The Contractor's geotechnical or geological professional should observe and map mass excavations and temporary slopes at regular intervals during excavation and assess the stability of temporary slopes, as necessary.

The tops of all excavations should be graded to prevent runoff from entering the excavation. Temporary slopes should not be allowed to become soaked with water or to dry out. Surcharge loads should not be permitted near the edge of excavations; they should be located a horizontal distance greater than the depth of the cut, measured horizontally from the top edge of the excavation, unless the cut is properly shored and designed to accommodate the surcharge.

5.9 CONSTRUCTION OBSERVATION AND TESTING

Earthwork and placement of engineered fill should be performed under the observation and testing services of a geotechnical professional supervised by a California-registered Geotechnical Engineer. Tests should be taken to determine the in-place moisture and relative compaction of engineered fill. Observation and mapping of removals of unsuitable materials and any temporary excavations should be performed by the project geotechnical consultant.

All foundation excavations, and slab and pavement subgrade soils, should be continuously observed by a geotechnical or geologic professional prior to placement of steel and concrete to observe that the subgrade is satisfactory. Foundation excavations should be free of soft, loose and disturbed soils.

A California-registered Geotechnical Engineer should prepare a final report of foundation installation, and earthwork testing and observation.

5.10 ADDITIONAL GEOTECHNICAL SERVICES

AECOM has prepared this report based on available assumptions of Project design. Once the Project design is progressed sufficiently, AECOM should review the plans and confirm the recommendations provided in this report are applicable. We also recommend that AECOM assist engineering changes during construction and review final construction documentation, including drawings, specifications and

special provisions. We recommend that AECOM observe earthwork observation and provide testing as applicable, including foundation bearing surfaces.

SECTION 6 LIMITATIONS

AECOM has observed only a very small portion of the pertinent subsurface conditions. The recommendations presented in this report are based on the assumption that soil and geologic conditions do not deviate appreciably from those observed in the previous and current subsurface explorations.

We recommend that AECOM provide observation and testing during subgrade preparation and fill placement, utility trench backfill, foundation excavations, and other forms of geotechnically significant types of construction to evaluate if the site conditions are as anticipated, or to provide revised recommendations, if necessary. If variations or undesirable geotechnical conditions are encountered during construction, AECOM should be consulted for further recommendations.

This report is not a contractual statement of geotechnical conditions (baseline report). The contractor should make their own interpretations using the factual information provided in this report.

Geotechnical engineering and the geologic sciences are characterized by uncertainty. Professional judgments presented herein are based partly on our understanding of the proposed construction, and partly on our general experience. Our engineering work and judgments rendered meet current professional standards; we do not guarantee the performance of the project in any respect.

SECTION 7 REFERENCES

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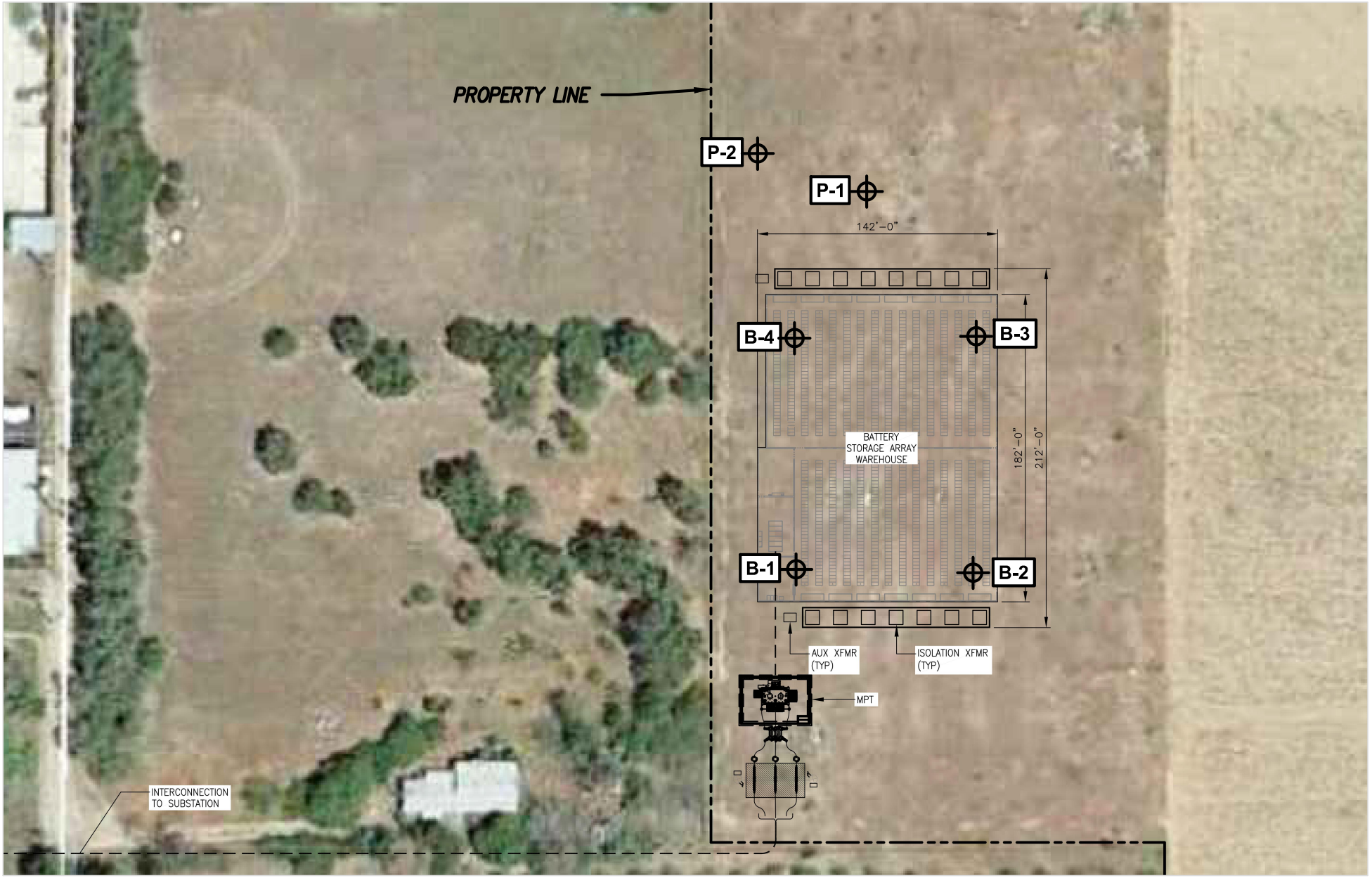
VICINITY MAP
SDG&E FALLBROOK BATTERY STORAGE PROJECT
FALLBROOK, CA

AECOM	0 NO SCALE	CHECKED BY: PB	DATE: 02-21-17	FIG. NO: 1
		PM: SMF	PROJ. NO: 60534181	

U:\Projects_Jobs\60534181_Casteel\900-CAD-GIS\910-CAD\20-SHEETS\FIGURE 1 - Vicinity Map.dwg Feb 23, 2017 - 4:17pm



LEGEND

B-1 APPROXIMATE BORING LOCATIONS

P-2 APPROXIMATE PERCOLATION TEST LOCATIONS

N

AECOM

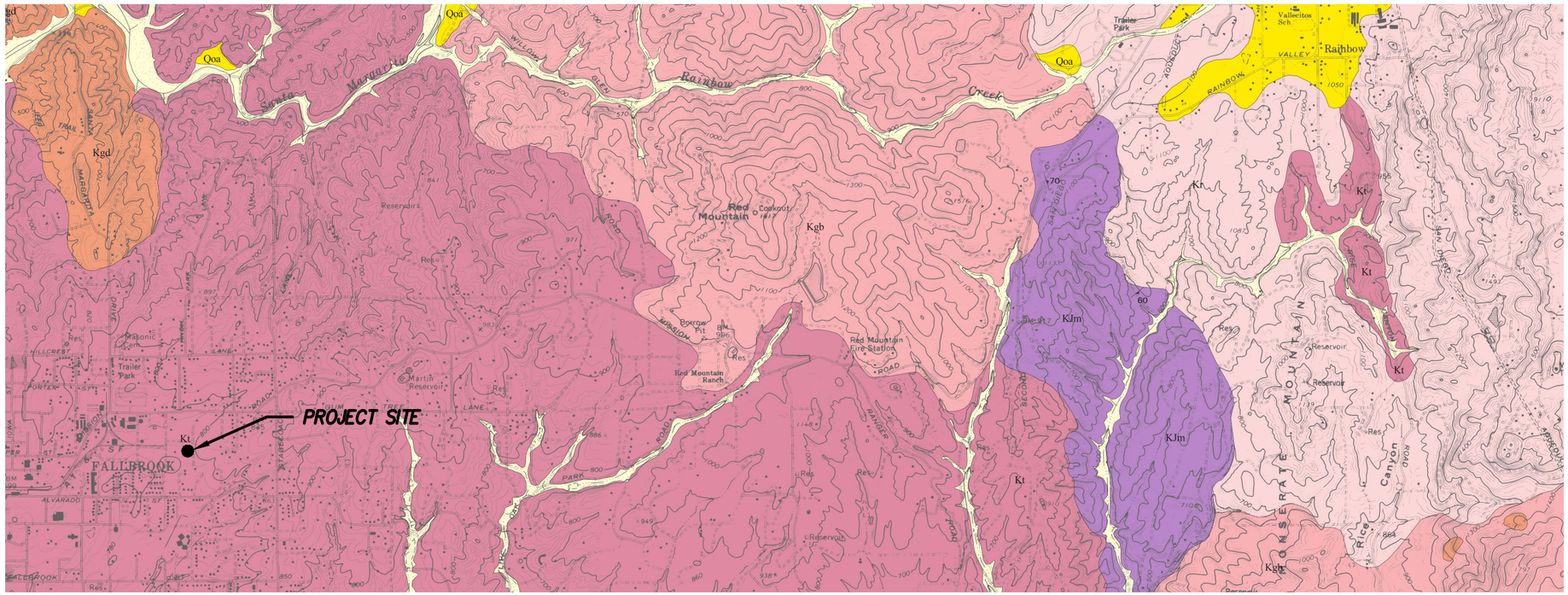
40 0 40 80 FEET

SCALE: 1"= 80'

SITE PLAN
SDG&E FALLBROOK BATTERY STORAGE PROJECT
FALLBROOK, CA

CHECKED BY: PB	DATE: 02-21-17	FIG. NO: 2
PM: SMF	PROJ. NO: 60534181	

U:\Projects_Jobs\60534181_Casteel\900-CAD-GIS\910-CAD\20-SHEETS\FIGURE 2 - Site Plan.dwg Feb 23, 2017 - 4:19pm



LEGEND

EXPLANATION OF MAP UNITS

MODERN SURFICIAL DEPOSITS - Sediment that has been recently transported and deposited in channels and washes, on surfaces of alluvial fans and alluvial plains, and on hillslopes and in artificial fills. Soil-profile development is non-existant. Includes:

Qa — Active alluvial flood plain deposits (late Holocene) - Unconsolidated to locally poorly consolidated sand and gravel deposits in active alluvial flood plains.

Qls — Landslide deposits (Holocene to Pleistocene) - Landslide slump and rock fall deposits.

OLD SURFICIAL DEPOSITS - Sedimentary units that are moderately consolidated and slightly to moderately well dissected. Older surficial deposits have upper surfaces that are capped by moderately to well-developed pedogenic soils. Includes:

Qoa — Older alluvial flood plain deposits (Pleistocene, younger than 500,000 years) - Mostly moderately well consolidated, poorly sorted, permeable flood plain deposits.

Qp — Pauba Formation sandstone facies (Pleistocene) - Light-brown moderately well-indurated, extensively crossbedded, channeled and filled sandstone and siltstone that contains occasional intervening cobble-and-boulder conglomerate beds.

Qpf — Pauba Formation fanglomerate facies (Pleistocene) - well-indurated poorly sorted sedimentary breccia and mudstone.

BEDROCK UNITS

Kr — Granodiorite of Rainbow (Cretaceous) - Leucocratic hornblende-biotite granodiorite; medium to coarse grained, massive.

Kgd — Granodiorite undivided (Cretaceous) - Mostly hornblende-biotite granodiorite; coarse to medium grained.

Kt — Tonalite undivided (Cretaceous) - Mostly hornblende-biotite tonalite; coarse grained, light gray.

Kgb — Gabbro undivided (Cretaceous) - Mostly biotite-hornblende-hypersthene gabbro; coarse grained, dark gray, massive.

KJm — Metavolcanic and metasedimentary rocks undivided (Cretaceous and Jurassic) - Low grade (greenschist facies) rocks that are in part coeval with and in part older than the Cretaceous plutonic rocks they lie in contact with.

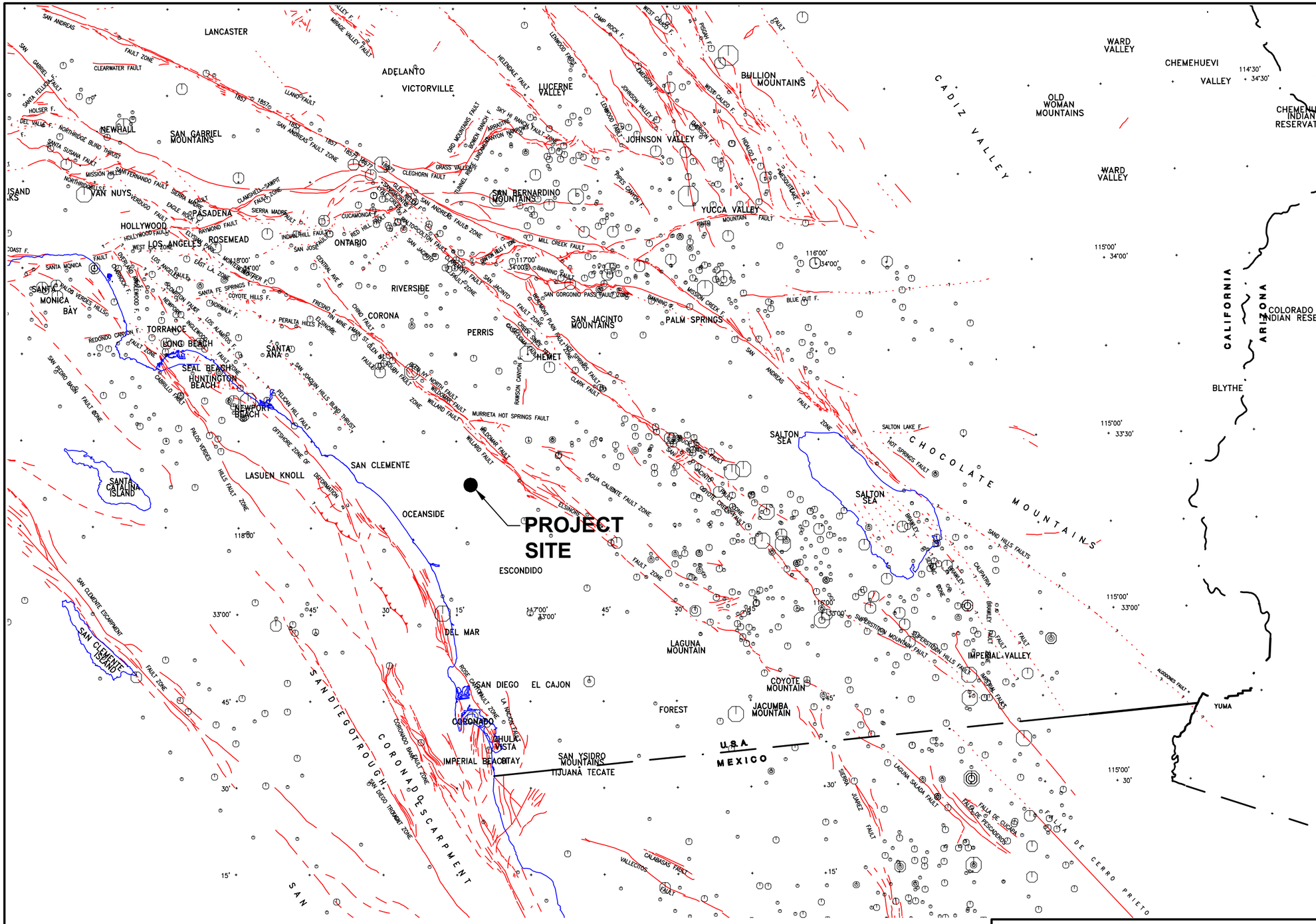
REGIONAL GEOLOGIC MAP
SDG&E FALLBROOK BATTERY STORAGE PROJECT
FALLBROOK, CA

AECOM

0
NO SCALE

CHECKED BY: PB	DATE: 02-21-17	FIG. NO: 3
PM: SMF	PROJ. NO: 60534181	

U:\Projects_Jobs\60534181_Casteel\900-CAD-GIS\910-CAD\20-SHEETS\FIGURE 3 - Regional Geologic Map.dwg Feb 23, 2017 - 4:21pm



LEGEND:

REPORTED EARTHQUAKE MAGNITUDES.

4.0 TO 4.9

5.0 TO 5.9

6.0 TO 6.9

7.0 AND GREATER

SOUTH OF LATITUDE 35°N, EPICENTER AND MAGNITUDE DATA ARE FROM THE CALIFORNIA GEOLOGICAL SURVEY (2000) EARTHQUAKE CATALOG FOR THE PERIOD FROM 1769 TO 2000. ONLY EARTHQUAKES OF MAGNITUDE 4.0 AND LARGER ARE SHOWN. AFTERSHOCKS ARE NOT INCLUDED.

APPROXIMATE LOCATION OF HOLOCENE AND PLEISTOCENE FAULTS, DOTTED WHERE CONCEALED, QUERIED WHERE CONJECTURAL. FAULT LOCATIONS BASED ON: ZIONY AND JONES, 1989; CDMG GEOLOGIC MAP SERIES OF CALIFORNIA, 1977–1986 (1:250,000 SCALE); CDMG GEOLOGIC MAP SERIES, CALIFORNIA CONTINENTAL MARGIN, 1987 (1:250,000 SCALE); HAUKSSON, 1990; SHAW AND SHEARER, 1999; WRIGHT, 1991; GRANT ET AL. 1999.

FAULT AND EPICENTER MAP
SDG&E FALLBROOK BATTERY STORAGE PROJECT
FALLBROOK, CA

AECOM

50,000 0 50,000 100,000

1" = 100,000'

CHECKED BY: PB | DATE: 02–21–17

PM: SMF | PROJ. NO: 60534181

FIG. NO: 4

U:\Projects_Jobs\60534181_Casteel\900–CAD–GIS\910–CAD\20–SHEETS\FIGURE 4 – Fault and Epicenter Map.dwg Feb 23, 2017 – 4:22pm

Our field investigation consisted of a geotechnical program that included six exploratory borings and two in-situ percolation tests. The borings performed for this investigation by AECOM at the Project site to depths ranging from 6 to 19 feet bgs. The locations of the explorations are shown on the Site Plan (Figure 2).

AECOM prepared an internal safe work plan for the project. Prior to field activities, AECOM notified Underground Service Alert (USA) to locate underground utilities.

The borings were advanced by Pacific Drilling with a truck mounted Marl M5 drill rig using hollow-stem augers, and were designated B-1 through B-4 and P-1 and P-2. Grab, bulk and drive samples were collected from the borings. The drive samples were obtained using a Standard Penetration Test (SPT) sampler and a split-spoon sampler (2.5-inch inside diameter). Blow counts required to drive the samplers the final 12 inches were recorded to evaluate the relative density or consistency of the subsurface material. The reported field blow counts have not been corrected for sampler size or depth. The drive samples and cuttings were reviewed and classified according to the Unified Soil Classification System. The borings were backfilled with a bentonite seal and soil cuttings.

Locations of the field explorations are presented in Figure 2. A Key to Logs is presented as Figure A-1. Logs of the borings are presented as Figures A-2 through A-7.

Percolation tests were performed in Borings P-1 and P-2 to evaluate the infiltration rate. The test holes were presoaked at the completion of drilling (February 1, 2017) by filling each hole with about 12 to 18 inches of water. This water level was maintained for about 4 hours. The water was then allowed to infiltrate overnight to generate a “wetted zone” prior to testing. The following day (February 2, 2017), it was observed that the presoak water had dissipated into the subsurface. Water was then added to each of the holes to a depth approximately 12 to 14 inches above the bottom of the hole. The depth to water from a fixed point at the surface was noted. Depth measurements were then collected on a regular interval. The last measurement is used to calculate the infiltration rate. An electronic sounder was used to make the depth measurements to the accuracy of 1/100th of a foot in order to measure the amount of drop (or percolation).

Project: SDG&E Fallbrook Battery Storage Project
Project Location: Fallbrook, CA
Project Number: 60534181.10000

Key to Logs

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number		Graphic Log	MATERIAL DESCRIPTION	Dry Density, pcf	Dry Density, pcf	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10

COLUMN DESCRIPTIONS

1 **Elevation:** Elevation in feet referenced to NAVD88 or site datum.

2 **Depth:** Depth in feet below the ground surface.

3 **Sample Type:** Type of soil sample collected at depth interval shown; sampler symbols are explained below.

4 **Sample Number:** Sample identification number. Unnumbered sample indicates no sample recovery. "1-1" indicates geotechnical sample. "(B-1@1')" indicates analytical sample.

5 **Blows per foot:** Number of blows required to advance driven sampler 12 inches beyond first 6-inch interval, or distance noted, using a 140-lb hammer with a 30-inch drop.

6 **Graphic Log:** Graphic depiction of subsurface material encountered; typical symbols are explained below.

7 **Material Description:** Description of material encountered; may include relative density/consistency, moisture, color, particle size; texture, weathering, and strength of formation material. If shown, designation in parentheses denotes Munsell color classification.

8 **Water Content:** Water content of soil sample measured in laboratory, expressed as percentage of dry weight of specimen.

9 **Dry Unit Weight:** Dry unit weight of soil sample measured in laboratory, in pounds per cubic foot.

10 **Remarks and Other Tests:** Comments and observations regarding drilling or sampling made by driller or field personnel.

SA	Sieve analysis, %<#200 sieve
WA	Three-point wash sieve, %<#200 sieve
LL	Liquid limit (from Atterberg limits test), %
PI	Plasticity Index [LL - PL], %; NP=nonplastic
CORR	Corrosivity Test suite
COMP	Compaction Curve (ASTM 1557D)
R-Value	R-Value test
THER	Thermal Resistivity Test (IEEE 442)

TYPICAL MATERIAL GRAPHIC SYMBOLS


Silty SAND (SM)


Clayey SAND (SC)


Poorly-graded SAND (SP)


Poorly-graded SAND with clay (SP-SC)


Well-graded SAND with silt (SW-SM)


Poorly-graded SAND (SP-SM) with silt

TYPICAL SAMPLER GRAPHIC SYMBOLS

Standard Penetration Sampler

2.5" ID Drive Sample


Bulk Sample

OTHER GRAPHIC SYMBOLS


First water encountered at time of drilling and sampling (ATD)


Static water level measured in boring or well at specified time after drilling


Change in material properties within a lithologic stratum

Inferred contact between strata or gradational change in lithology

GENERAL NOTES

1. Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive; actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.

2. Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

AECOM

Figure A-1

Project: SDG&E Fallbrook Battery Storage Project
Project Location: Fallbrook, CA
Project Number: 60534181.10000

Log of Boring B-1

Sheet 1 of 1

Date(s) Drilled	**2/1/17**	Logged By	**Ryan Bourdette**	Checked By	**Derek Rector**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**7-inch finger bit**	Total Depth of Borehole	**18.7 feet**
Drill Rig Type	**Marl M5, Truck Mounted**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**803 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT, 2.5" ID**	Hammer Data	**140lbs/30inch drop, auto hammer**
Borehole Completion	**soil cuttings with bentonite seal**	Location	**N: 33.38518, W: -117.23492**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					**Residual Soil** Approximately 1-foot of Fill over dense, moist, dark brown silty SAND (SM), with trace clay			
800			1	42		**Completely Weathered Granitic Rock** excavates to: dense, moist, brownish yellow silty SAND (SM), with some gravel	5		THER
	5		2	84 11"		**Highly Weathered Granitic Rock** excavates to: very dense, moist, brownish yellow well-graded SAND with silt (SW-SM), with little gravel			
795			3	50 4"					
	10		4	50 5"			4		SA(9)
790									
	15		5	50 5"		Very dense, moist, brownish yellow, poorly-graded SAND (SP)	5	118	
785			6	50 5"			4		
	20					Bottom of boring at 18.7'			
780									
	25								

Report: GEO_10_SNA; File: 60534181.GPJ; 2/27/2017 B-1

AECOM

Figure A-2

Project: SDG&E Fallbrook Battery Storage Project
Project Location: Fallbrook, CA
Project Number: 60534181.10000

Log of Boring B-2

Sheet 1 of 1

Date(s) Drilled	**2/1/17**	Logged By	**Ryan Bourdette**	Checked By	**Derek Rector**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**7-inch finger bit**	Total Depth of Borehole	**18.5 feet**
Drill Rig Type	**Marl M5, Truck Mounted**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**800 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT, 2.5" ID**	Hammer Data	**140lbs/30inch drop, auto hammer**
Borehole Completion	**soil cuttings with bentonite seal**	Location	**N: 33.38518, W: -117.23460**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
800	0					**Residual Soil** Shallow Fill (~1') over dense, moist, dark brown silty SAND (SM), with trace clay			
			1	17		**Completely Weathered Granitic Rock** excavates to: medium dense, moist, dark brown clayey SAND (SC), with trace fine gravel	12		WA(47)
795	5		2	83 11"		**Highly Weathered Granitic Rock** excavates to: very dense, moist, brownish yellow silty SAND (SM), with some fine gravel			THER
			3	76 9"		Very dense, moist, brownish yellow, poorly-graded SAND (SP-SM) with silt	13		
790	10		4	50 3"					No Recovery
						Becomes light yellowish brown			
785	15		5	50 3"					No Recovery
			6	50 2"					No Recovery
						Bottom of boring at 18.5 feet			
780	20								
775	25								

Report: GEO_10_SNA; File: 60534181.GPJ; 2/27/2017 B-2

AECOM

Figure A-3

Project: SDG&E Fallbrook Battery Storage Project
Project Location: Fallbrook, CA
Project Number: 60534181.10000

Log of Boring B-3

Sheet 1 of 1

Date(s) Drilled	**2/1/17**	Logged By	**Ryan Bourdette**	Checked By	**Derek Rector**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**7-inch finger bit**	Total Depth of Borehole	**19.2 feet**
Drill Rig Type	**Marl M5, Truck Mounted**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**794 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT, 2.5" ID**	Hammer Data	**140lbs/30inch drop, auto hammer**
Borehole Completion	**soil cuttings with bentonite seal**	Location	**N: 33.38551, W: -117.23463**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					**Residual Soil** Shallow Fill (~1') over dense, moist, dark brown clayey SAND (SC)			
			1a						R-Value, COMP
			1	53			12	128	LL(40), PI(26), WA(28)
790						**Completely Weathered Granitic Rock** excavates to: dense, moist, brownish yellow clayey SAND (SC), with some fine gravel			
	5		2	88 10"		**Highly Weathered Granitic Rock** excavates to: very dense, moist, brownish yellow Poorly-graded SAND (SP), with some fine gravel	8		
			3	50 4"		Becomes very pale brown	4	113	
785									
	10		4	84 10"			4		
780									
	15		5	93 9"			4	124	
			6	87 10"		Becomes dark grayish brown	4		
775									
	20					Bottom of boring at 19.2 feet			
770									
	25								

Report: GEO_10_SNA; File: 60534181.GPJ; 2/27/2017 B-3

AECOM

Figure A-4

Project: SDG&E Fallbrook Battery Storage Project
Project Location: Fallbrook, CA
Project Number: 60534181.10000

Log of Boring B-4

Sheet 1 of 1

Date(s) Drilled	**2/1/17**	Logged By	**Ryan Bourdette**	Checked By	**Derek Rector**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**7-inch finger bit**	Total Depth of Borehole	**18.5 feet**
Drill Rig Type	**Marl M5, Truck Mounted**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**791 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT, 2.5" ID**	Hammer Data	**140lbs/30inch drop, auto hammer**
Borehole Completion	**soil cuttings with bentonite seal**	Location	**N: 33.38554 W: -117.23499**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
790	0					**Residual Soil** Shallow Fill (~1') over medium dense, moist, dark brown clayey SAND (SC), with trace fine gravel			
			1	26		**Completely Weathered Granitic Rock** excavates to: medium dense, moist, brownish yellow silty SAND (SM), with some fine gravel			
785	5		2	93 9"		**Highly Weathered Granitic Rock** excavates to: very dense, moist, brownish yellow clayey SAND (SC)			THER
			3	83 11"			14		SA(43)
780	10		4	50 3"					No Recovery
775	15		5	50 3"		Very dense, moist, dark grayish brown Poorly-graded SAND (SP)	2		
			6	50 2"			2		
770	20					Bottom of boring at 18.5 feet			
	25								

Report: GEO_10_SNA; File: 60534181.GPJ; 2/27/2017 B-4

AECOM

Figure A-5

Project: SDG&E Fallbrook Battery Storage Project
Project Location: Fallbrook, CA
Project Number: 60534181.10000

Log of Boring P-1

Sheet 1 of 1

Date(s) Drilled	**2/1/17**	Logged By	**Ryan Bourdette**	Checked By	**Derek Rector**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**7-inch finger bit**	Total Depth of Borehole	**6.0 feet**
Drill Rig Type	**Marl M5, Truck mounted**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**794 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT**	Hammer Data	**140lbs/30inch drop, auto hammer**
Borehole Completion	**soil cuttings**	Location	**N: 33.38580, W: -117.23489**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					**Residual Soil** Shallow Fill (~1') over medium dense, moist, dark brown clayey SAND (SC)			
			1	20					
790						**Completely Weathered Granitic Rock** excavates to: dense, moist, brownish yellow silty SAND (SM), with some fine gravel			
	5		2	42					
						Bottom of boring at 6 feet			
785	10								
780	15								
775									
	20								
770									
	25								

Report: GEO_10_SNA; File: 60534181.GPJ; 2/27/2017 P-1

AECOM

Figure A-6

Project: SDG&E Fallbrook Battery Storage Project
Project Location: Fallbrook, CA
Project Number: 60534181.10000

Log of Boring P-2

Sheet 1 of 1

Date(s) Drilled	**2/1/17**	Logged By	**Ryan Bourdette**	Checked By	**Derek Rector**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**7-inch finger bit**	Total Depth of Borehole	**6.0 feet**
Drill Rig Type	**Marl M5, Truck Mounted**	Drilling Contractor	**Pacific Drilling**	Approximate Surface Elevation	**794 feet**
Water Level Depth	**not encountered**	Sampling Method(s)	**SPT**	Hammer Data	**140lbs/30inch drop, auto hammer**
Borehole Completion	**soil cuttings**	Location	**N: 33.38581, W: -117.23505**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Blows per foot	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0					**Residual Soil to Completely Weathered Granitic Rock** Shallow Fill (~1') over medium dense, moist, dark brown clayey SAND (SC)			
			1	17					
790						**Highly Weathered Granitic Rock** excavates to: very dense, moist, brownish yellow silty SAND (SM), with some fine gravel			
	5		2	65					
						Bottom of boring at 6 feet			
785	10								
780	15								
775									
	20								
770									
	25								

Report: GEO_10_SNA; File: 60534181.GPJ; 2/27/2017 P-2

AECOM

Figure A-7

SDG&E Fallbrook Energy Storage Project, California
Percolation Test Data

P-1 (Basin)			Description		Boring Diameter	7	inches
					Boring Depth	6.00	feet
Date	Note	Time	Elapsed Time (mins)	Drop (feet)	Perc Rate (mpi)	Perc Rate (in/hr)	Perc Rate (cm/sec)
2/1/2017	Pre-soak	14:46	0	NA	NA	NA	NA
	add water						
2/2/2017	add water	9:32 AM	0	NA	NA	NA	NA
		10:09 AM	37	0.02	154.2	0.39	2.75E-04
		10:39 AM	30	0.02	125.0	0.48	3.39E-04
		11:16 AM	37	0.01	308.3	0.2	1.37E-04
	add water	11:38 AM	22	NA	NA	NA	NA
		12:10 PM	32	0.01	266.7	0.2	1.59E-04
		Average (last two) readings =			**287.5**	**0.21**	**1.48E-04**

P-2 (Basin)			Description		Boring Diameter	7	inches
					Boring Depth	6.00	feet
Date	Note	Time	Elapsed Time (mins)	Drop (feet)	Perc Rate (mpi)	Perc Rate (in/hr)	Perc Rate (cm/sec)
2/1/2017	Pre-soak	14:54	0	NA	NA	NA	NA
	add water						
2/2/2017	add water	9:34 AM	0	NA	NA	NA	NA
		10:07 AM	33	0.01	275.0	0.22	1.54E-04
		10:43 AM	36	0.00	#DIV/0!	#DIV/0!	#DIV/0!
		11:22 AM	39	0.00	#DIV/0!	#DIV/0!	#DIV/0!
	add water	11:34 AM	12	NA	NA	NA	NA
		12:14 PM	40	0.01	333.3	0.18	1.27E-04
		Average (last two) readings =			**304.2**	**0.2**	**1.40E-04**

Infiltration Rate
Per Porchet Method

H_{avg} = 33.3 inches
I = 0.0097 in/hr Slowest Reading

H_{avg} = 41.34 inches
I = 0.0073 in/hr Slowest Reading

Porchet Method Calculation Example

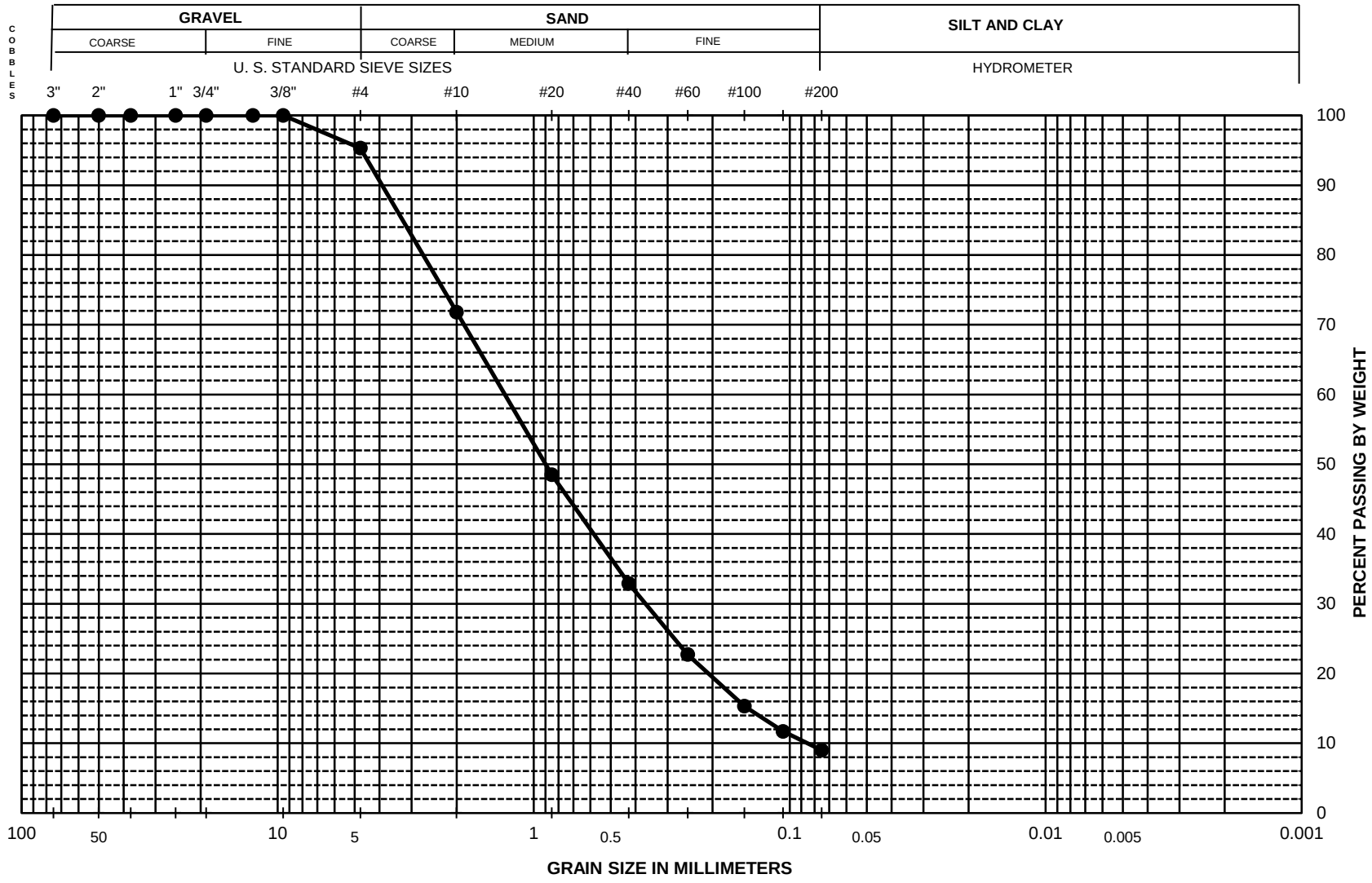
$I = DH(60r)/(Dt(r+2H_{avg}))$

DH = 0.06 ft = 0.72 in
Havg - Height of last 2 readings
r = 3.5 inches
r - radius of boring
Dt = 30 min
H_{avg} = 3.84 in

Figure A-8

Geotechnical laboratory testing was performed in general accordance with ASTM standards. Results of laboratory testing performed are presented in this appendix. The results of moisture content and fines content are shown at the corresponding sample locations on the boring logs in Appendix A.

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	95.3
#10	2.00	71.8
#20	0.850	48.5
#40	0.425	32.9
#60	0.250	22.7
#100	0.150	15.3
#140	0.106	11.7
#200	0.075	9.0
Hydrometer Analysis		

% Cobbles	0.0
% Gravel	4.7
% Sand	86.3
% Fines	9.0

D_{85}	3.251
D_{60}	1.297
D_{50}	0.898
D_{30}	0.365
D_{15}	0.146
D_{10}	0.085
C_u	15.2
C_c	1.2

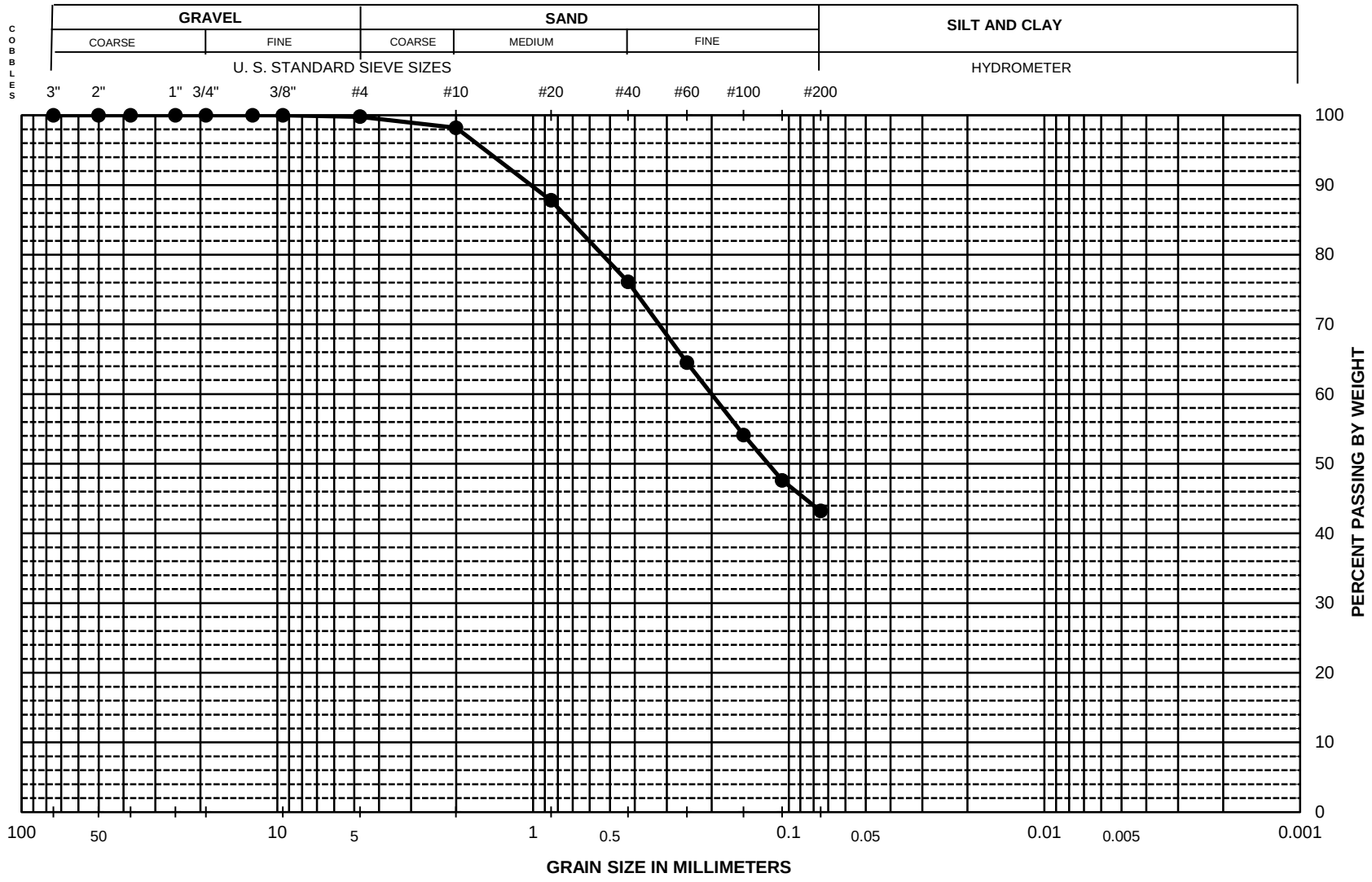
Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 μm	Description and Classification
B-1	4	10.0	●	3.5	---	---	---	**Brownish yellow Well Graded SAND with Silt (SW-SM)**

PROJECT NAME: **SDG&E Fallbrook Substation**

PROJECT NUMBER: **60534181**

PARTICLE-SIZE DISTRIBUTION CURVES

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	99.8
#10	2.00	98.2
#20	0.850	87.8
#40	0.425	76.1
#60	0.250	64.5
#100	0.150	54.1
#140	0.106	47.6
#200	0.075	43.2
Hydrometer Analysis		

% Cobbles	0.0
% Gravel	0.2
% Sand	56.6
% Fines	43.2

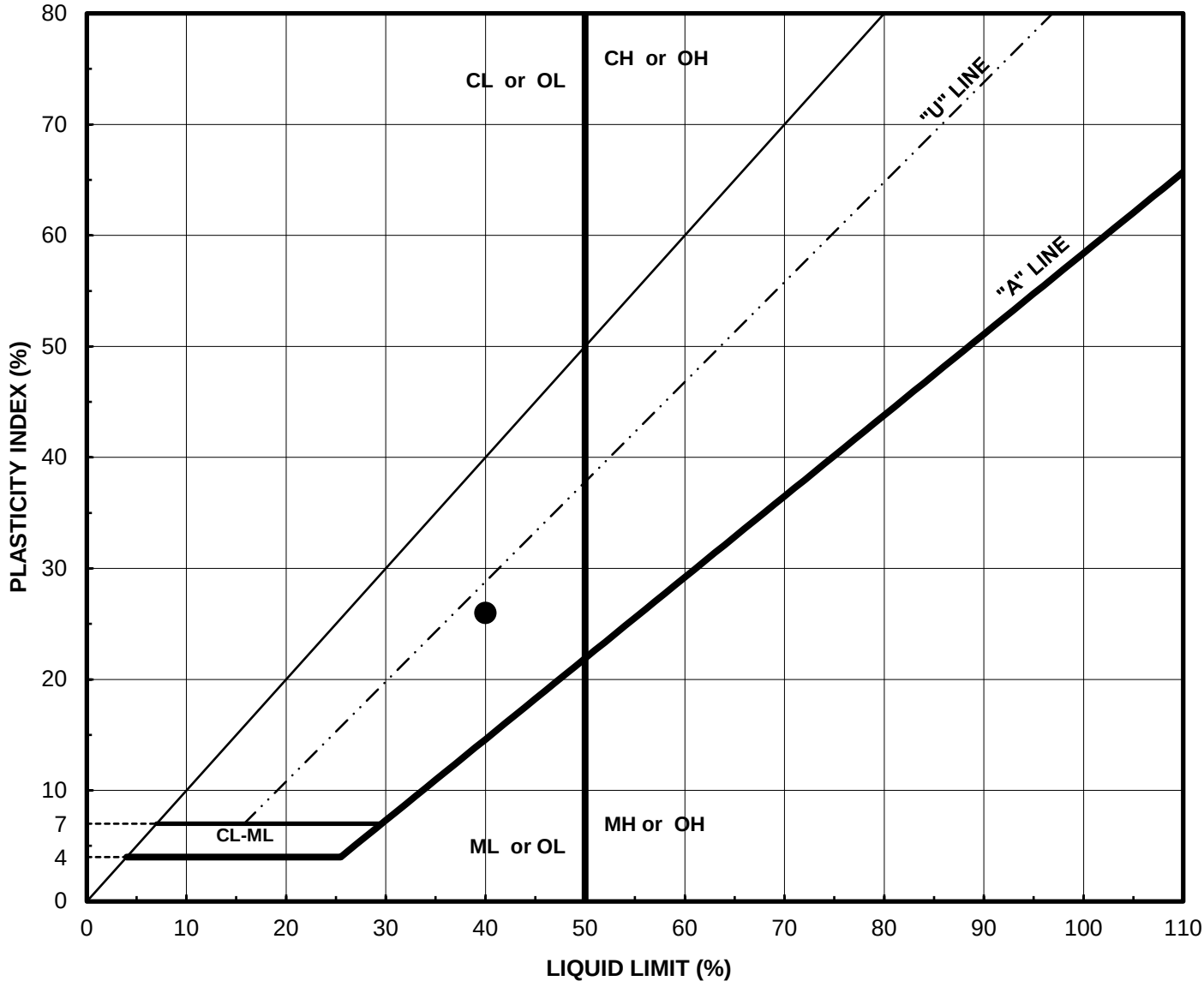
D_{85}	0.720
D_{60}	0.200
D_{50}	0.120
D_{30}	#N/A
D_{15}	#N/A
D_{10}	#N/A
C_u	----
C_c	-----

Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 μm	Description and Classification
B-4	3	7.5	●	14.3	---	---	---	**Brownish yellow Clayey SAND (SC)**

PROJECT NAME: **SDG&E Fallbrook Substation**

PROJECT NUMBER: **60534181**

PARTICLE-SIZE DISTRIBUTION CURVES



Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
B-3	1	2.5	12.0	40	26	Brownish yellow Clayey SAND (SC)

Project Name: **SDG&E Fallbrook Substation** **PLASTICITY CHART**

Project Number: **60534181**

REPORT OF MOISTURE/DENSITY RELATIONSHIP TEST

(ASTM D1557/D698)

Date:	February 16, 2017	Job Number:	891
Client:	URS Corporation (San Diego, CA)	Report Number:	4803
Address:	P.O. Box 203970 Austin, Texas	Lab Number:	113843

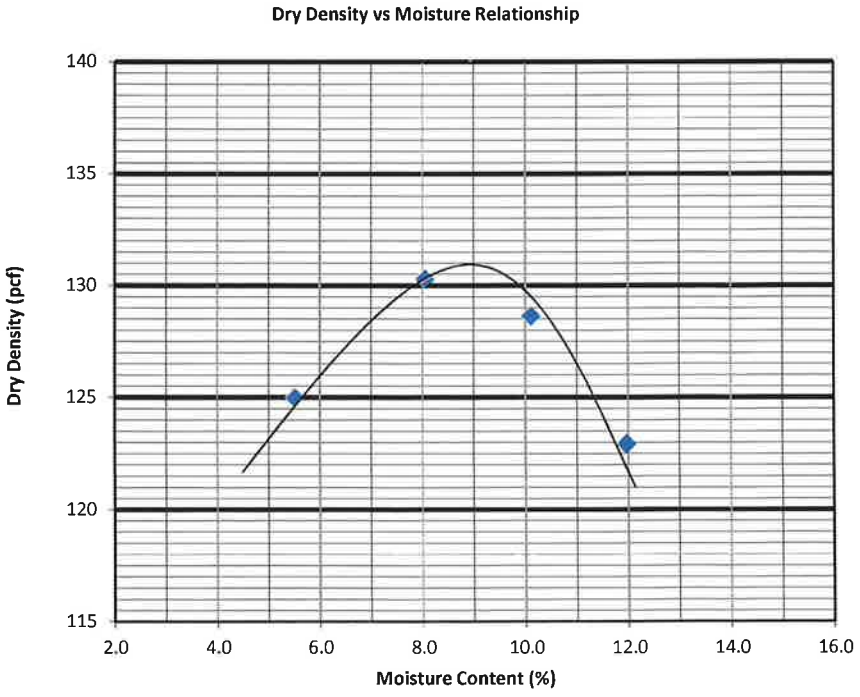
Project:	Fallbrook Substation
Project Address:	Fallbrook, California
Material:	Brown silty SAND (SM)
Material Source:	Native
Location:	Bulk 1 (1'-2')
Date Sampled:	2/10/2017
Date Submitted:	2/10/2017
Sampled By:	PB

Mold Size: 4 inch

ASTM D1557 A

Maximum Dry Density = 131.0 pcf

Optimum Moisture = 9.0%



Distribution

Client

File

Reviewed By:

Sam Koohi, PE

Engineering Manager

NV5

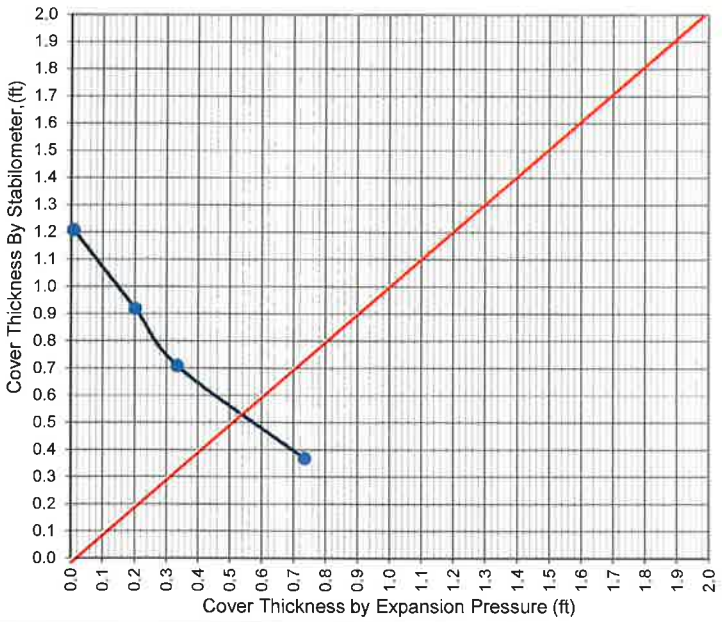
RESISTANCE "R" VALUE TEST

(CTM301 Caltrans / ASTM D2844)

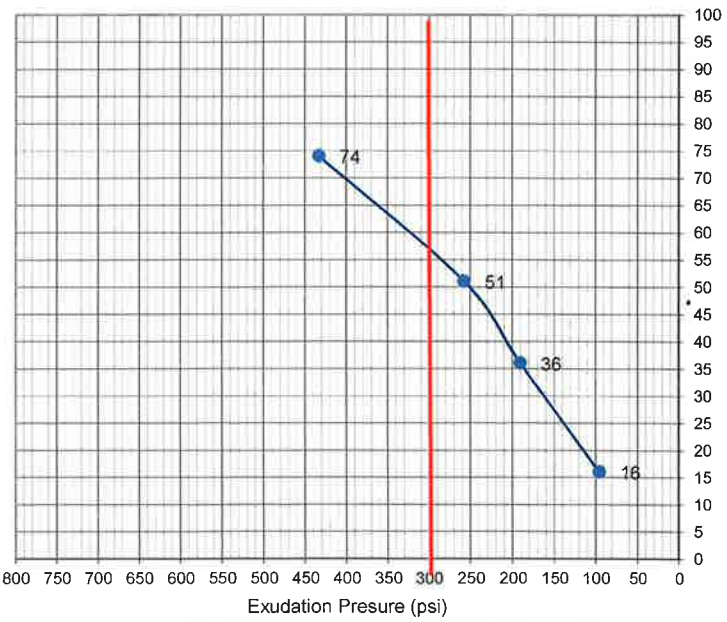
Date:	2/16/2017	Job Number:	891
Client:	URS Corporation (San Diego, CA)	Report Number:	4803
Address:	P.O. Box 203970 Austin, Texas	Lab Number:	113843
Project :	Fallbrook Substation		
Project Address :	Fallbrook, California		

Material:	Brown silty SAND (SM)
Material Source:	Native
Location:	Bulk 1 (1'-2')
Sampled By:	PB
Date Sampled:	2/10/2017
Date Received:	2/10/2017

EXPANSION PRESSURE CHART



EXUDATION PRESSURE CHART



TEST SPECIMEN	A	B	C	D
COMP. FOOT PRESSURE, psi	350	350	275	70
INITIAL MOISTURE %	6.7	6.7	6.7	6.7
MOISTURE @ COMPACTION %	10.3	11.1	12.0	13.8
DRY DENSITY, pcf	124.8	124.8	123.1	120.6
EXUDATION PRESSURE, psi	433	258	191	96
STABILOMETER VALUE 'R'	74	51	36	16

R-VALUE BY EXUDATION	57
R-VALUE BY EXPANSION	64
R-VALUE AT EQUILIBRIUM	**57**

Respectfully Submitted,
NV5 West, Inc.

Sam Koohi, PE
Engineering Manager

Table 1 - Laboratory Tests on Soil Samples

AECOM
SDGE Fall Break
Your #60534181.100, HDR Lab #17-0109LAB
23-Feb-17

Sample ID			B-2, S-3 @ 7.5' SM
Resistivity		**Units**	
as-received		ohm-cm	19,600
minimum		ohm-cm	1,560
pH			7.7
Electrical Conductivity		mS/cm	0.15
Chemical Analyses			
Cations			
calcium	Ca^{2+}	mg/kg	11
magnesium	Mg^{2+}	mg/kg	6.6
sodium	Na^{1+}	mg/kg	158
potassium	K^{1+}	mg/kg	3.1
Anions			
carbonate	CO_3^{2-}	mg/kg	ND
bicarbonate	HCO_3^{1-}	mg/kg	85
fluoride	F^{1-}	mg/kg	4.9
chloride	Cl^{1-}	mg/kg	46
sulfate	SO_4^{2-}	mg/kg	176
phosphate	PO_4^{3-}	mg/kg	ND
Other Tests			
ammonium	NH_4^{1+}	mg/kg	ND
nitrate	NO_3^{1-}	mg/kg	16
sulfide	S^{2-}	qual	na
Redox		mV	na

Minimum resistivity per CTM 643, Chlorides per CTM 422, Sulfates per CTM 417

Electrical conductivity in millisiemens/cm and chemical analyses were made on a 1:5 soil-to-water extract.

mg/kg = milligrams per kilogram (parts per million) of dry soil.

Redox = oxidation-reduction potential in millivolts

ND = not detected

na = not analyzed

431 West Baseline Road · Claremont, CA 91711
Phone: 909.962.5485 · Fax: 909.626.3316

Attn: Pallavi Balasubramanyam
Client Name: URS Corporation

Project: Fallbrook Substation
(URS Project No. 60534181)

Report Date: 02/24/2017
NV5 Project No.:

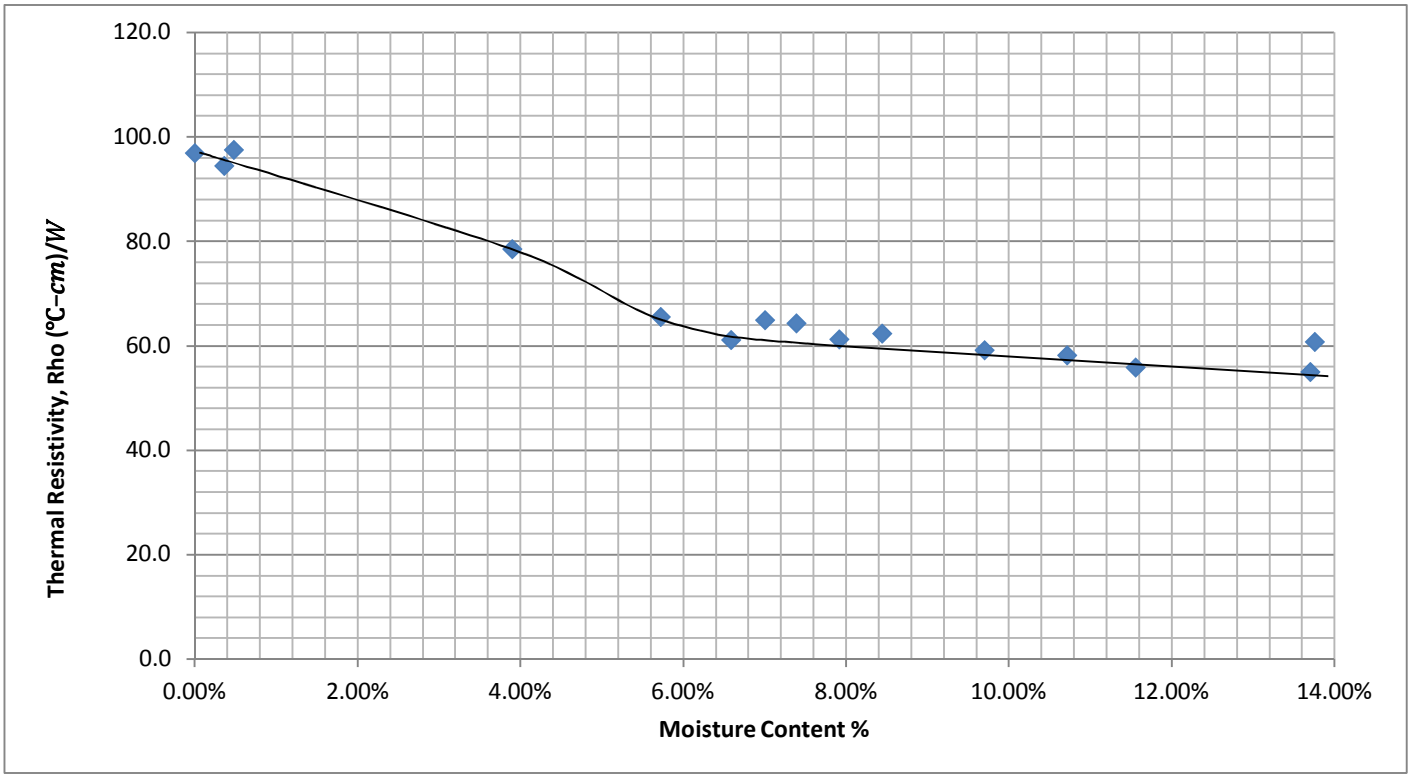
Test Material Description: Brown silty CLAY (CL)
Test Material ID: B-1 @ 2.5'
Sample Date: 2/01/17 Submitted Date: 2/07/17

Test Description	Test Method	# of Samples
Thermal Resistivity measurement	IEEE 442	1

Probe Type: TR1
Ambient Temperature: 22 °C

Dry Unit Weight (pcf)	109.7	Field Moisture (%)	13.7
Tested Max. Thermal Resistivity at 0% Moisture (°C-cm/W)	96.8	Tested Max. Thermal Resistivity at 4% Critical Moisture (°C-cm/W)	78

Thermal Resistivity Dryout Curve



Copies:

Respectfully submitted,
NV5

Sam Koohi, P.E.
Engineering Manager

Attn: Pallavi Balasubramanyam
Client Name: URS Corporation

Project: Fallbrook Substation
(URS Project No. 60534181)

Report Date: 02/24/2017
NV5 Project No.:

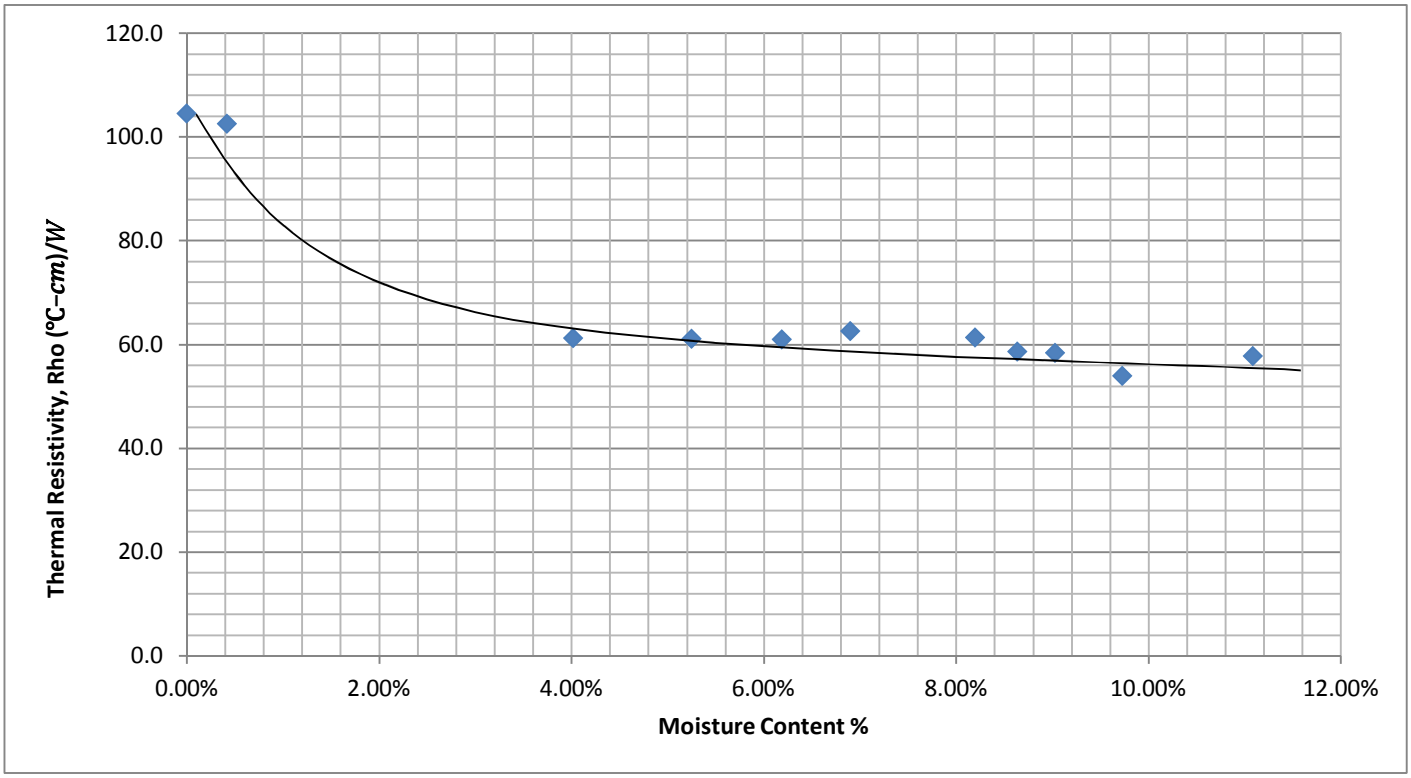
Test Material Description: Tan Brown silty SAND (SM-SP)
Test Material ID: B-2 @ 5'
Sample Date: 2/01/17 Submitted Date: 2/07/17

Test Description	Test Method	# of Samples
Thermal Resistivity measurement	IEEE 442	1

Probe Type: TR1
Ambient Temperature: 22 °C

Dry Unit Weight (pcf)	116.5	Field Moisture (%)	8.6
Tested Max. Thermal Resistivity at 0% Moisture (°C-cm/W)	104.5	Tested Max. Thermal Resistivity at 4% Critical Moisture (°C-cm/W)	62

Thermal Resistivity Dryout Curve



Copies:

Respectfully submitted,
NV5

Sam Koohi, P.E.
Engineering Manager

Attn: Pallavi Balasubramanyam
Client Name: URS Corporation

Project: Fallbrook Substation
(URS Project No. 60534181)

Report Date: 02/24/2017
NV5 Project No.:

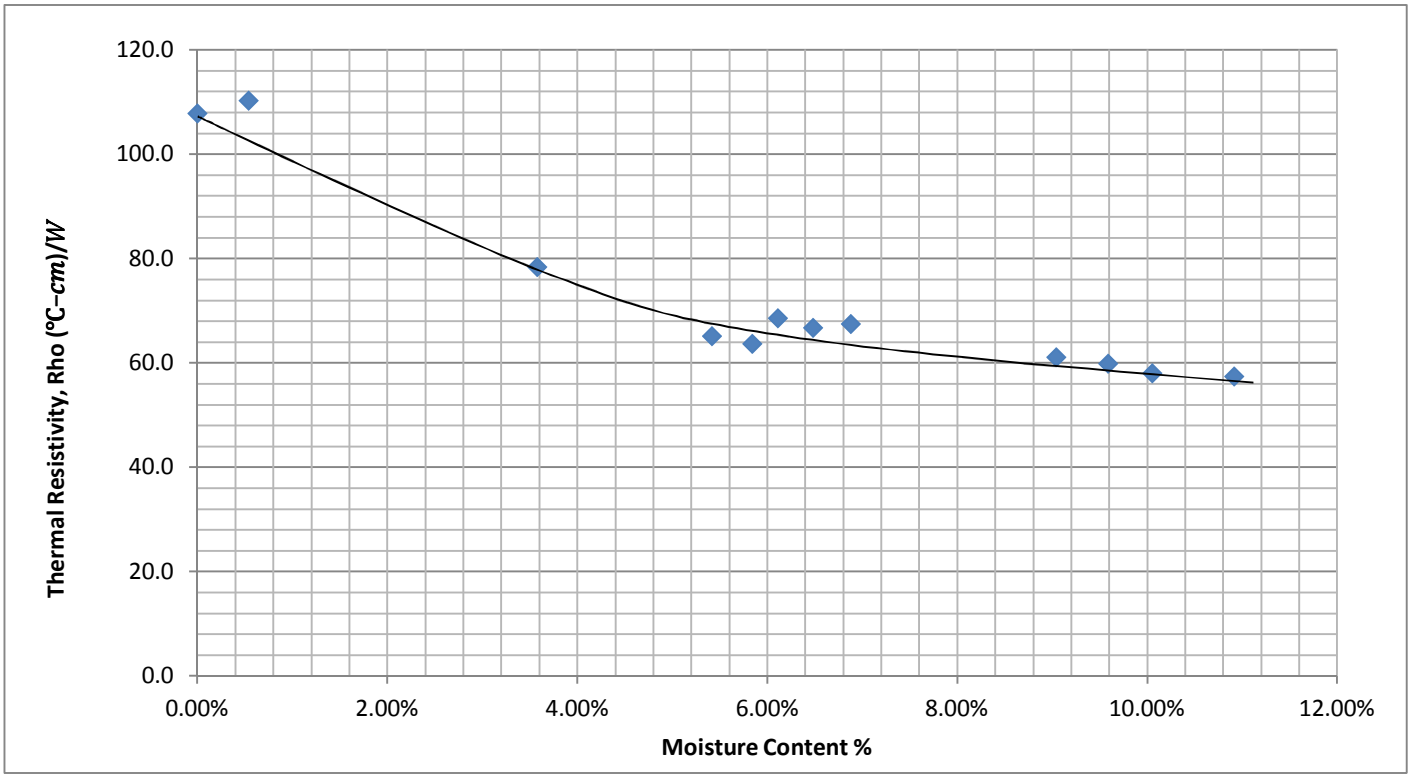
Test Material Description: Tan Brown silty SAND (SM-SP)
Test Material ID: B-4 @ 5'
Sample Date: 2/01/17 Submitted Date: 2/07/17

Test Description	Test Method	# of Samples
Thermal Resistivity measurement	IEEE 442	1

Probe Type: TR1
Ambient Temperature: 22 °C

Dry Unit Weight (pcf)	114.5	Field Moisture (%)	10
Tested Max. Thermal Resistivity at 0% Moisture (°C-cm/W)	107.8	Tested Max. Thermal Resistivity at 4% Critical Moisture (°C-cm/W)	75

Thermal Resistivity Dryout Curve



Copies:

Respectfully submitted,
NV5

Sam Koohi, P.E.
Engineering Manager

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